OCS Study
BOEM 2024-062

New York Bight Offshore Wind Seascape, Landscape, and Visual Impact Assessment

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Prepared for:
U.S. Department of the Interior
Bureau of Ocean Energy Management
Office of Renewable Energy Programs and Office of Environmental Programs

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Abbreviations and Acronyms

3D	three-dimensional
ac	acre(s)
AMMM	avoidance, minimization, mitigation, and monitoring
APVI	area of potential visual impact
BLM	Bureau of Land Management
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
CMP	Coastal Management Program
COP	construction and operations plan
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Program
DEM	digital elevation model
DOI	U.S. Department of the Interior
DSM	digital surface model
EIS	Environmental Impact Statement
EJ	environmental justice
E.O.	Executive Order
EPA	Environmental Protection Agency
ESRI	Environmental Systems Research Institute, Inc
FAA	Federal Aviation Administration
Fl	flashing
ft	foot/feet
GSOE	Garden State Offshore Energy, LLC
GIS	geographic information system
GAA	geographic analysis area
GLVIA3	Guidelines for Landscape and Visual Impact Assessment (3rd Edition)
ha	hectare(s)
HAT	highest astronomical tide
km	kilometer
KOP	key observation point

LCA	landscape character area
LiDAR	light detection and ranging
LORPPS	laws, ordinances, regulations, policies, and plans
mi	mile(s)
MLLW	mean lower low water
NEPA	National Environmental Policy Act of 1969
NM	nautical mile
NOAA	National Oceanic and Atmospheric Administration
NREL	National Renewable Energy Laboratory
NRHP	National Register of Historic Places
NYSERDA	New York State Energy Research and Development Authority
OCA	ocean character area
OCS	Outer Continental Shelf
OSP	offshore substation platform
PEIS	Programmatic Environmental Impact Statement
RPDE	representative project design envelope
s	second(s)
SCA	seascape character area
SHPO	State Historic Preservation Office
SLIA	ocean, seascape, and landscape impact assessment
SLVIA	ocean, seascape, landscape, and visual impact assessment
SME	subject matter expert
USCG	U.S. Coast Guard
VIA	visual impact assessment
WTG	wind turbine generator
Y	yellow
ZTV	zone of theoretical visibility

Chapter 1

Introduction

This document presents a programmatic-level technical analysis describing potential visual impacts on scenic resources, viewers, and receptors that could result from the development of six wind energy leases in an area offshore of New Jersey and New York known as the New York Bight (NY Bight). Potential impacts are evaluated within the bounds of a resource-specific geographic analysis area (GAA), which covers the anticipated geographic range of potential impacts to that resource[1]. The technical analysis provided detailed information critical to preparing the Seascape, Landscape, and Visual Impact Assessment (SLVIA) in Section 3.6.9 and Appendix H of the Programmatic Environmental Impact Statement (PEIS), which describes how open ocean, seascape, and landscape character areas and viewer experiences may be affected by expected development within the six NY Bight lease areas. The Bureau of Ocean Energy Management (BOEM) can also share information from this analysis with developers to use when preparing the SLVIA sections of the construction and operations plans (COPs).

1.1 Programmatic EIS Summary

The PEIS for the six NY Bight leases precedes the environmental analysis of the COPs, enabling the project-specific environmental analyses to tier to or incorporate the PEIS analysis by reference (Title 40 of the *Code of Federal Regulations* [CFR], Part 1501.11–12). The six commercial leases analyzed in the PEIS include Outer Continental Shelf (OCS)-A 0537, OCS-A 0538, OCS-A 0539, OCS-A 0541, OCS-A 0542, and OCS-A 0544 (hereinafter, the NY Bight leases or lease areas), all of which BOEM issued on May 1, 2022. Together, the area of these lease areas totals more than 488,000 acres (197,486 hectares [ha]). Each leaseholder is entitled to submit a COP as required under 30 CFR 585.600(a), and required to conduct project-specific environmental analyses.

The PEIS (1) identifies and analyzes avoidance, minimization, mitigation, and monitoring (AMMM) measures that could reduce impacts on the resources in the six NY Bight lease areas and (2) focuses project-specific environmental analyses. The PEIS provides information to assist BOEM in deciding whether to identify AMMM measures at the programmatic stage that BOEM may require as conditions of approval for activities proposed by lessees in COPs. Project-specific environmental analyses that tier to the PEIS will facilitate timely review of COPs submitted for the NY Bight leases. The project-specific environmental analyses will focus on impacts not addressed in the PEIS, or those impacts that warrant additional analysis. Project-specific environmental analyses may tier from or incorporate the PEIS by reference and could incorporate revised, additional, or different AMMM measures as needed.

[1] See Section 4 for details about the development of the GAA.

1.2 Analysis Approach of the Ocean, Seascape, Landscape, and Visual Impact Assessment (SLVIA)

If a wind energy project is visible from the shore, BOEM requires an SLVIA to support the National Environmental Policy Act of 1969 (NEPA) review process. Each SLVIA has two parts: (1) an ocean, seascape, and landscape impact assessment (SLIA) and (2) a visual impact assessment (VIA). This SLVIA conforms to the guidelines in the *Assessment of Seascape, Landscape, and Visual Impacts of Offshore Wind Energy Developments on the Outer Continental Shelf of the United States* (BOEM 2021a; hereinafter, BOEM SLVIA Methodology).

The SLIA analyzes potential impacts on the physical elements and perceptual attributes that make the ocean, seascape, and landscape distinctive and affect feel, character, or sense of place. In the SLIA, the impact receptors potentially affected by the project are the ocean, seascape, and landscape and their components, including both their physical features and their distinctive characteristics. Methodical steps are used to implement the SLIA and identify, describe, and assess the character areas to perform an overall evaluation of impacts. The character areas' physical elements and perceptual attributes make up the character and quality of visual landscapes. Section 5.1 describes the detailed analysis used in the SLIA.

VIA impact receptors are people, and the enjoyment of a particular view depends upon the viewer. The VIA analyzes how the visible elements of a proposed project would affect the view from selected viewpoints, and evaluates how these changes would affect the viewer experience at these viewpoints. Methodical steps are followed to conduct the VIA, and the results from the VIA produce a final visual impact rating for people who are at the viewpoints from which people can see the project. Section 6.1 describes the analytical methods used in the VIA.

1.3 Report Organization

After the introduction to this SLVIA, Chapter 2 describes the federal, major state, and local regulatory framework (laws, ordinances, regulations, policies, and plans [LORPPs]. Chapter 3 describes the representative project design envelope (RPDE), including offshore wind turbine generators (WTGs) and onshore landfall, export cable, substation/converter station, and distribution system project components. Chapter 4 provides a detailed explanation of the GAA using digital elevation models (DEMs) and digital surface models (DSMs). Chapter 5 describes the process and results of the SLIA for the offshore project area. Chapter 6 describes the process and results of the VIA for the offshore project area. Chapter 7 presents the cumulative impacts analysis. Chapter 8 is a list of references. Chapter 9 is a glossary of terms.

Chapter 2

Regulatory and Management Framework (Laws, Ordinances, Regulations, Policies, and Plans)

This offshore wind project is governed by a variety of federal, state, and local LORPPs that concern the protection and management of ocean, seascape, landscape, and scenic resources. Early in the SLVIA process, Argonne National Laboratory (Argonne) personnel gathered applicable LORPPs and agency policies and reviewed them for applicable references to scenic and/or visual resource protection and management, and how they may apply to offshore wind energy development. The following descriptions provide the primary federal and state LORPPs relevant to this project. Additional LORPP information associated with federal, state, and local municipal information is provided in Appendix A.

In 2009, the U.S. Department of the Interior (DOI) announced final regulations for the OCS Renewable Energy Program, which was authorized by the Energy Policy Act of 2005. The Energy Policy Act provisions implemented by BOEM provide a framework for issuing renewable energy leases, easements, and rights-of-way for OCS activities. BOEM's renewable energy program occurs in four distinct phases: (1) regional planning and analysis, (2) lease issuance, (3) site assessment, and (4) construction and operations.

On May 1, 2022, through a competitive leasing process under 30 CFR 585.211, BOEM awarded commercial leases OCS-A 0537, OCS-A 0538, OCS-A 0539, OCS-A 0541, OCS-A 0542, and OCS-A 0544 in the NY Bight. These leases grant the lessees the exclusive right to submit COPs to BOEM proposing the construction, operation, and conceptual decommissioning of offshore wind energy facilities in the lease areas. Through an intergovernmental renewable energy task force that included the States of New York and New Jersey, numerous federal agencies, Tribal nations, and local governments, BOEM identified these lease areas for consideration in developing commercial-scale offshore wind energy projects, subject to the appropriate reviews and approvals.

BOEM is the lead federal permitting agency for the anticipated NY Bight offshore wind projects. The wind turbines, offshore substation platforms, inter-array cables, and a portion of the submarine export cables will be located within the federal waters of the United States on the OCS. Portions of the submarine export cables will be located in New York and New Jersey state waters. The following sections describe the main federal review required under BOEM, along with the Coastal Zone Management Program (CZMP). Table 2-1 summarizes the federal and state LORPPs that apply to the project. Appendix A provides all LORPPs at the federal, state, and local level that have language which references scenic and visual resources within the GAA.

Local plans are reviewed for policies regarding scenic conservation, which will be considered when developing the COP. While federal decisions are not bound by local plans, the federal government attempts to comply when it can. Refer to Appendix A for a breakdown of each municipality's plans within the area of potential visual impact (APVI, described in Section 4.3).

2.1 NEPA

The primary purpose of the Outer Continental Shelf Lands Act (OCSLA; 43 U.S.C. 1337) is to facilitate the federal government's leasing of U.S. offshore mineral resources and energy resources. As set forth in the Energy Policy Act of 2005, Congress amended OCSLA to authorize the 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 authorizing COPs.

BOEM's NEPA review process for offshore wind energy projects requires assessments of impacts on scenic and/or visual resources and viewer experiences. *Information Guidelines for a Renewable Energy Construction and Operations Plan* (BOEM 2020) notes that a VIA (SLVIA) may be needed to satisfy requirements under 30 CFR Parts 585.627(a)(6) and 585.627(a)(7), and to support the NEPA review process.

2.2 CZMP

Congress recognized the growth in the coastal zone by passing the Coastal Zone Management Act (CZMA) in 1972, which is administered by the National Oceanic and Atmospheric Administration (NOAA). The goal of the CZMA is to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone" (NOAA 1972).

Authorized by the CZMA, the CZMP was established as a voluntary partnership between the federal government and U.S. coastal and Great Lakes states and territories. The CZMA requires that any federal action that has the potential to affect a state's coastal zone or use must be consistent with the state's federally approved CZMP. Under this federal consistency review, the state's coastal program has the authority to review the proposed action and confirm that it is consistent with the enforceable policies detailed in its plans. Permitting systems, which vary by state, were established to control activities that affect coastal resources. New York shares permitting jurisdiction with local governments, while permitting in New Jersey occurs at the state level only.

The NY Bight remains consistent with Policies 24 and 25 of the New York State Coastal Management Program (CMP; NYSDOC 2017) by planning to implement mitigation strategies to ensure that there are no major impairments to scenic resources and scenic qualities. Appendix A details how the expected projects also remain consistent with the State of New Jersey plans and New Jersey's county and municipal programs. Cable alignments, landfalls, and other onshore projects components have not yet been determined; therefore, a consistency determination with the CZMP cannot be made at this time.

Table 2-1 Federal and State LORPPs

Jurisdiction	Document
Federal (BOEM)	• 30 CFR Part 585, Subpart F, "Plans and Information Requirements" • Outer Continental Shelf Lands Act (1953) • Submerged Lands Act (SLA) of 1953 • NEPA • Clean Air Act of 1970 • CZMA (1972) • National Historic Preservation Act of 1966 • Inflation Reduction Act of 2022 • *Information Guidelines for a Renewable Energy Construction and Operations Plan (COP),* Version 4.0 (BOEM 2020) • *Assessment of Seascape, Landscape, and Visual Impacts of Offshore Wind Energy Developments on the Outer Continental Shelf of the United States* (BOEM 2021)
New York State Department of State (NYSDOS)	• Long Island Sound CMP (1999) • New York State CMP and Final EIS (NYSDOC 2017; Policies 24 and 25)
New York State Department of Environmental Conservation (NYSDEC)	NYSDEC Policy DEP-00-2: "Assessing and Mitigating Visual and Aesthetic Impacts"
New Jersey CMP	Section 309 Assessment and Strategy (2021–2025)
New Jersey Department of Environmental Protection	Green Acres Program (2023)

Chapter 3

Design Envelope and Assumptions

3.1 Lease Location

The six offshore wind energy lease areas analyzed in the PEIS are located within the geographic area of the NY Bight, off the coast of the states of New Jersey and New York. Refer to Figure 3-1 for the regional location and Figure 3-2 for the six NY Bight lease areas in context with surrounding lease areas.

To develop an RPDE that reflects feasible project technical details specific to the six NY Bight lease areas, BOEM reviewed existing COPs and solicited input from the NY Bight lessees, American Clean Power, National Renewable Energy Laboratory (NREL), and the States of New Jersey and New York. The RPDE is not meant to represent a specific lease area. Instead, it is an informed range of parameters that describe a hypothetical project within the six NY Bight lease areas to guide environmental analysis in the PEIS and focus subsequent COP NEPA analysis. In general, the maximum values in the RPDE represent the maximum or most conservative scenario of development (e.g., WTG spacing of 0.6 nautical miles [NM] × 0.6 NM) that could occur in the NY Bight lease areas. The RPDE is also not meant to be prescriptive or to establish limits for future development; 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.

To conduct the most conservative visual analysis, the maximum number of WTG positions was calculated based on the conservative 0.6 NM × 0.6 NM spacing and lease area size. Figure 3-3 illustrates the WTG grid spacing and WTG count used for each lease area in the SLIA and VIA.

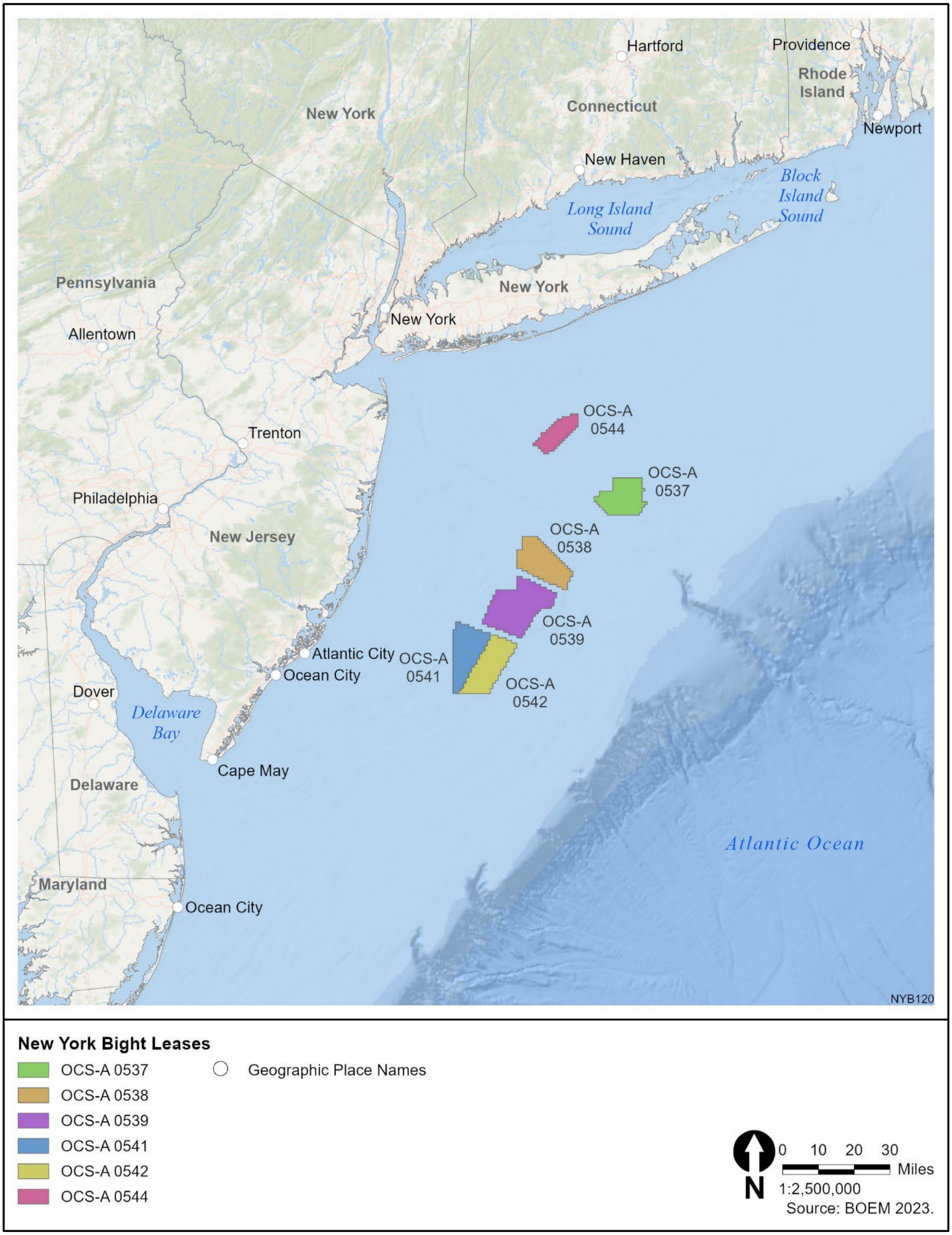


Figure 3-1 Regional Locations of NY Bight Leases

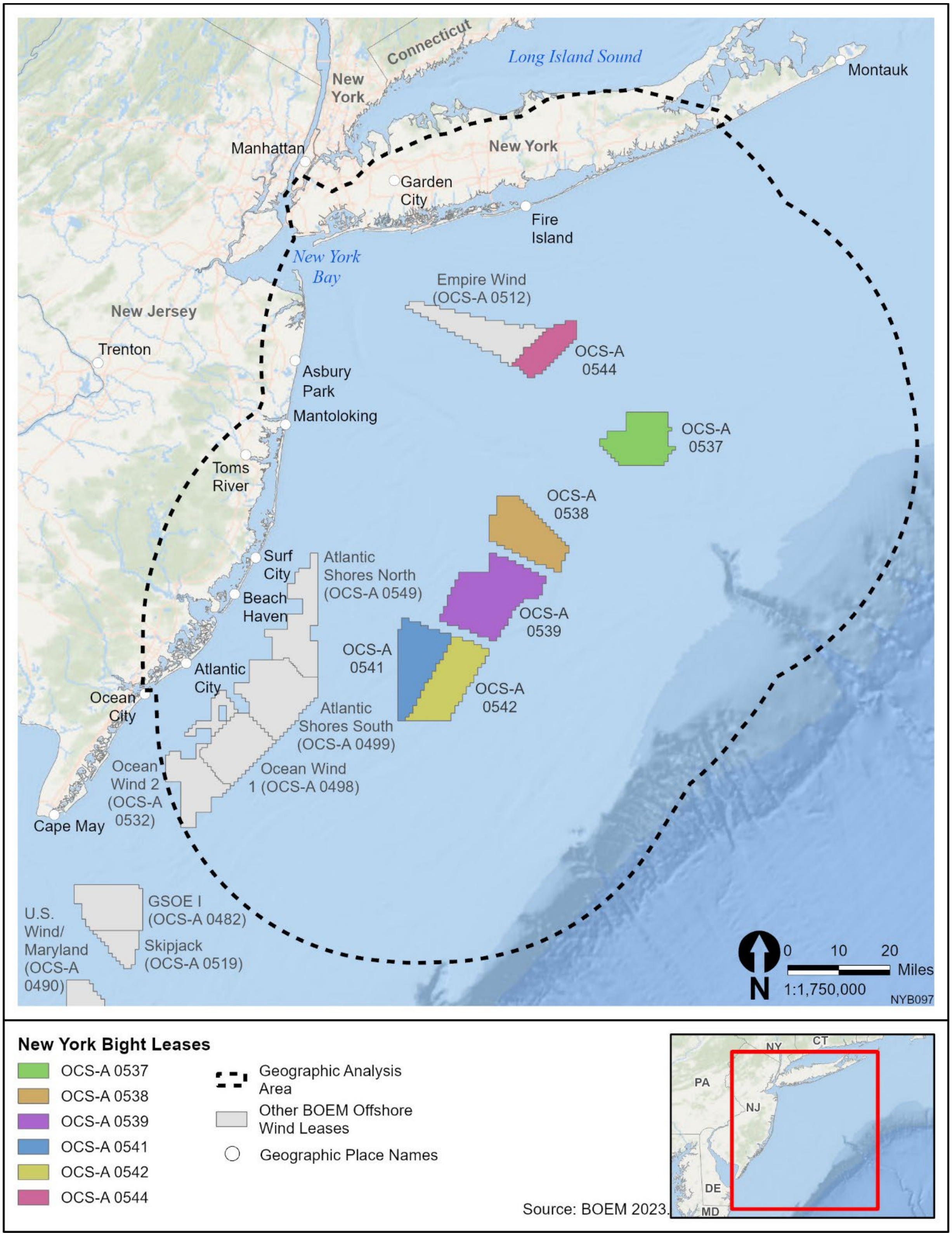
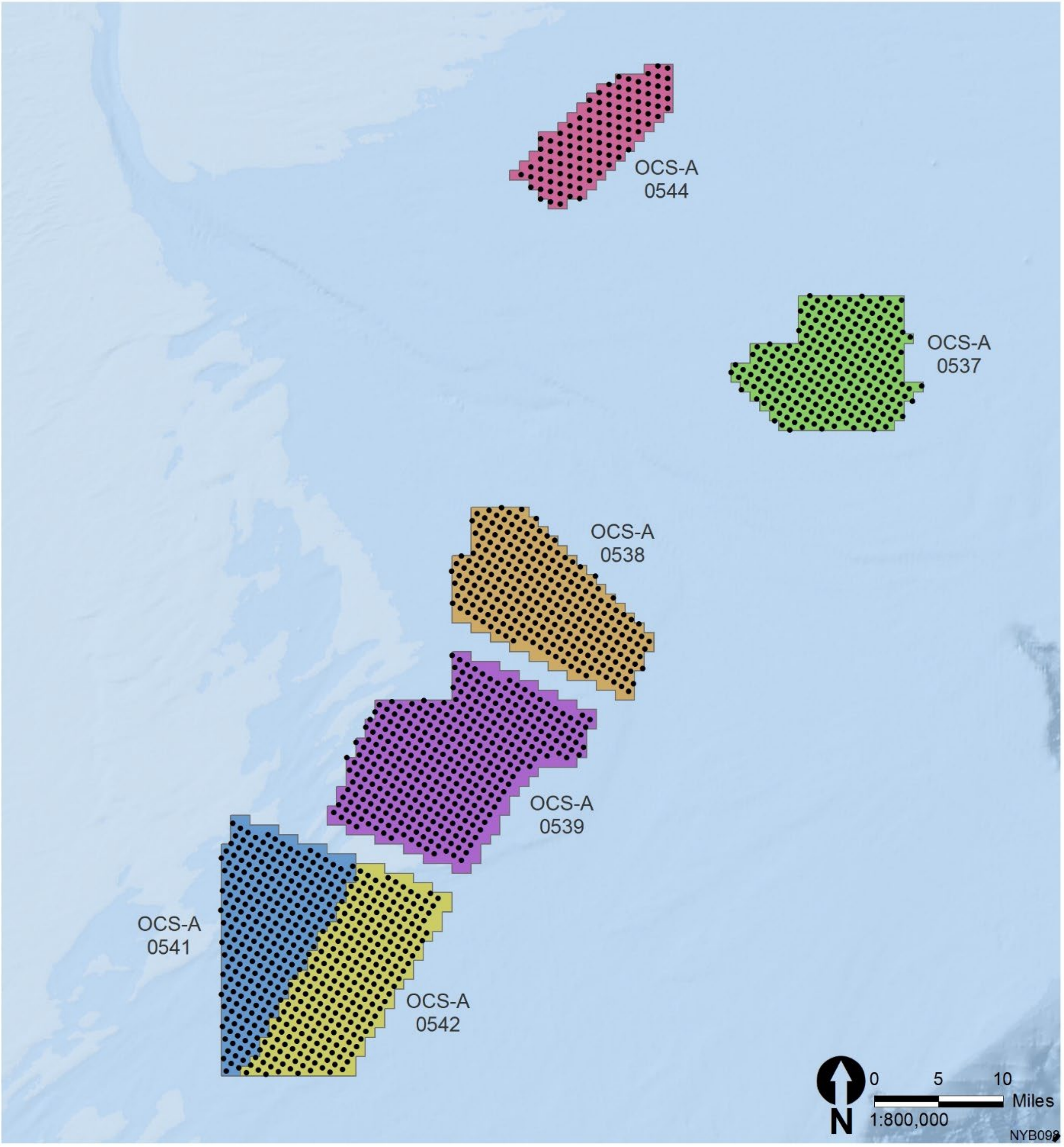


Figure 3-2 Regional Locations of NY Bight and Other BOEM Leases within the GAA[2]

[2] Section 4 provides details about the development of the GAA.



New York Bight Leases

	Lease Number	WTG Count	Grid Spacing
	OCS-A 0537	235	0.6 nm x 0.6 nm
	OCS-A 0538	260	0.6 nm x 0.6 nm
	OCS-A 0539	371	0.6 nm x 0.6 nm
	OCS-A 0541	246	0.6 nm x 0.6 nm
	OCS-A 0542	259	0.6 nm x 0.6 nm
	OCS-A 0544	110	0.68 nm x 0.68 nm
	Total	**1481**	

• WTG Maximum Development Scenario

Source: BOEM 2023

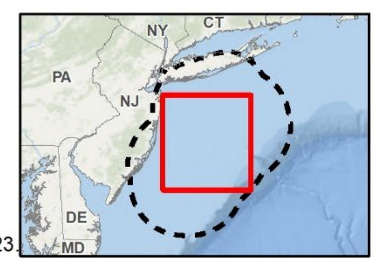


Figure 3-3 WTG Grid Spacing

3.2 WTG Scenario Dimensions

The PEIS SLVIA analysis is based on two different height scenarios: the minimum height scenario is 853 feet (260 m) to the tip of the blade, based on the tallest WTGs commercially available at the time the SLVIA was initiated, and the maximum height scenario is 1,312 ft (399.9 m) to the tip of the blade, based on consultation with lessees and the NREL on the plausible hypothetical increase in WTG height during the usable life of the PEIS. Details are presented in Table 3-1. The intent is to show the potential range of visual impacts based on minimum and maximum height scenarios that may occur as a result of the development in the six NY Bight lease areas.

Figure 3-4 shows examples of the minimum and maximum WTG schematic drawings, as well as a typical representation of wind turbine design parameters.

Table 3-1 WTG Noticeable Features

Turbine Components	Minimum Height	Maximum Height
Rotor Blade Tip	853 ft (260.0 m) MLLW[a]	1,312 ft (399.9 m) MLLW
Two Blade Tips—Wide Vertical Blade	657 ft (200.2 m) MLLW	1,009 ft (307.5 m) MLLW
Aviation Obstruction Light	382 ft (116.4 m) MLLW	728 ft (221.9 m) MLLW
Nacelle	372 ft (113.4 m) MLLW	718 ft (218. 8 m) MLLW
Hub	361 ft (110.0 m) MLLW	706 ft (215.2 m) MLLW
Mid-Tower Light	295.3 ft (90.0 m) HAT[b]	353 ft (107.6 m) MLLW
Offshore Substation Platform (OSP)	180.5 ft (55.0 m) MLLW	295.3 ft (90.0 m) HAT
Yellow Tower Base and Platform	50 ft (15.2 m) HAT	50 ft (15.2 m) HAT

[a] MLLW = mean lower low water (the average height of the lowest tide recorded at a tide station each day during a 19-year recording period, known as the National Tidal Datum Epoch as used by the United States' NOAA).
[b] HAT = highest astronomical tide.

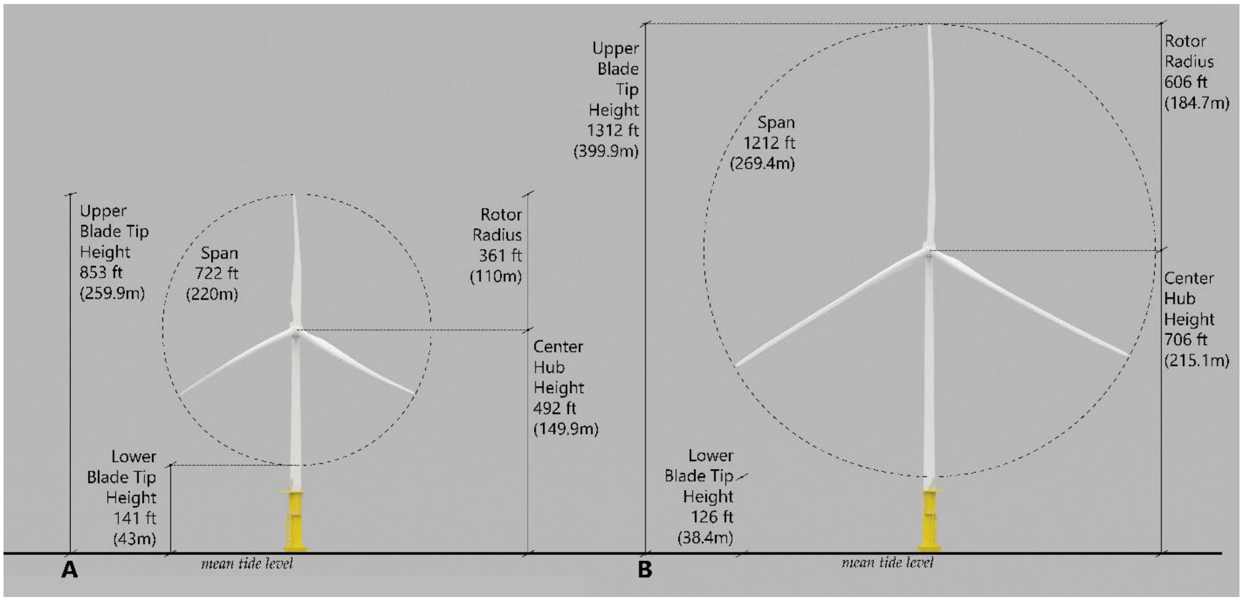


Figure 3-4 Wind Turbine Schematic Drawing: (a) 853-ft (259.9-m) and (b) 1,312-ft (399.9m) Wind Turbines

Other typical wind turbine design parameters (for a maximum representative wind turbine) include the marking and lighting, and the turbine spacing. The wind turbines would be lit and marked in accordance with Federal Aviation Administration (FAA) and U.S. Coast Guard (USCG) requirements for aviation and navigation obstruction lighting, respectively, including USCG First District Local Notice to Mariners (LNM) entry 44-20. Unless a variance is approved by the applicable agency prior to construction, WTGs for the NY Bight would comply with BOEM (2021b) and International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA 2013), as applicable and detailed below:

- Foundation structures and platforms will be painted yellow from the level of HAT up to a minimum height of 50 ft (15.3 m). Paint colors for blades and towers will follow BOEM visual guidelines (BOEM 2021b).
- Wind turbines above the yellow navigational aid demarcation line will be painted no lighter than RAL 9010 Pure White and no darker than RAL 7035 Light Grey.
- The wind turbines taller than 699 ft (213 m) above water level will require two aviation obstruction lights with synchronized flashing red lights (with medium intensity L-864 and light emitting diode [LED] color 800–900 nm) placed on the back of the nacelle on opposite sides.
- Mid-level lighting (model L-810) will be required at the halfway point on the tower between the top of the nacelle and water level. Mid-level lighting should be flashing red lights configured to flash in unison with the nacelle lighting and should contain a minimum of three L-810 lights.

Standard specifications follow IALA 0-139 and LNM entry 33-20 (USCG 2020), the following will also apply:

- Lighting will be located on turbine structures and visible throughout a 360° arc from the water's surface.
- Corner towers and/or significant peripheral structures will have quick flashing yellow lights energized at a range of 5 NM (9.3 km).
- Outer boundary towers will have yellow 2.5-second lights (flashing [Fl] yellow [Y] 2.5 seconds [s]) energized at a range of 3 NM (5.6 km).
- Interior towers will have yellow 6-second (Fl Y 6s) or yellow 10-second (Fl Y 10s) lights energized at a range of 2 NM (3.7 km) range and the lights should be synchronized by their structure location within the field of structures.

Typical turbine spacing requirements are based on NREL research and guidance (see Section 3.1 for details).

3.3 OSP Assumptions

OSPs, the systems that collect and export the power generated by turbines through specialized submarine cables, are an essential component of offshore wind farms. Typical offshore substations, as shown in Figure 3-5, may appear as small, gray blocks on the horizon, lower than the hub heights of the wind turbines. The turbines in each wind farm will send power to associated central offshore substations, which in turn deliver the generated power via a submarine export cable to an onshore substation.

OSPs can be built on monopole or pile jacket foundations. They take up an area of around 65 ft × 65 ft (20 m × 20 m) and stand 75–100 ft (22–30 m) from the ocean surface above mean sea level. The number of offshore substation platforms, which will be distributed throughout the WTG grid, depends upon the number of turbines within an array and the amount of energy produced.

Figure 3-5 Equinor-Operated Dudgeon Offshore Wind Farm: an Offshore Substation Platform on a Suction Bucket Jacket Foundation (Equinor 2021)

3.4 Onshore Interconnection Points Cable Alignment

This SLVIA does not include the cable alignment of onshore connection points. Instead, the SLVIA focuses on the offshore components of the expected development in the six NY Bight lease areas. SLIA and VIA impacts on the onshore components of the potential NY Bight projects will be analyzed and disclosed on a per-project basis by developer COPs.

Chapter 4

Viewshed Analysis and Affected Environment

A multistep viewshed analysis is necessary to determine the potential visibility of project components and for both the SLIA (Chapter 5) and VIA (Chapter 6). The GAA (Figure 3-2) is an area of study with boundaries determined by three source datasets: the maximum turbine height (1,312 ft [399.9 m]) curvature of the earth boundary for the ocean, the maximum turbine height bare earth (DEM) viewshed on land, and view cone boundaries from outlying elevated viewpoints, which include the Empire State Building and the Statue of Liberty (55.9 mi [90.0 km]). Apart from these two outlying elevated viewpoints, the buffer distance used in the onshore viewshed analyses is 50 mi (80.47 km). The offshore buffer distance is 47.4 mi (76.3 km).

4.1 Viewshed Methodology

The viewshed process began with creating a DEM and a DSM from USGS LiDAR point cloud data. A DEM is a raster dataset that represents the bare earth topography of the landscape, while a DSM is a raster dataset that represents vegetation and human-made structures in addition to topography (USGS 2023). Once produced, the DEM is used to derive the zone of theoretical visibility (ZTV; Section 4.2) and GAA. The DSM is used to derive the APVI (Section 4.3).

There were multiple LiDAR point cloud datasets in the NY Bight area, so multiple datasets were used. The most recent data were chosen in cases where there were multiple processing dates. In all, five LiDAR datasets were required to cover the NY Bight GAA. To determine the maximum extent of LiDAR data needed, the "Prospect distance from the ground and line of sight distance between two observers" tool from PlanetCalc[3] was used to calculate the line-of-sight distance between a viewer with an eye level of 1.6 m (5.3 ft) and a 399.8976-m (1,312.0-ft) tall observer. The calculation yielded a line-of-sight distance of 80.497 km (50.018 mi). An extra 8.05 km (5.0 mi) of distance were included to create an extra buffer of data.

Environmental Systems Research Institute, Inc (ESRI) ArcGIS Pro, version 3.0.1, software tools were used to process the point cloud data, produce the elevation models, and perform the viewshed analysis. The "Convert LAS" and "LAS Dataset to Raster" tools were used to process the LiDAR point cloud data and produce the elevation models. Parameters for the DEM and DSM were set using the best practices recommended by ESRI (2022). The 10-ft -resolution (3.048 m) DEM and DSM were used with the "Visibility" tool to perform the viewshed analysis. Four visibility analyses were run for each of the six NY Bight lease areas:

- Using the DEM and blade tip height of 853.0 ft (259.994 m);
- Using the DEM and blade tip height of 1,312.0 ft (399.8976 m);
- Using the DSM and blade tip height of 853 ft (259.994 m); and
- Using the DSM and blade tip height of 1,312 ft (399.8976 m).

[3] Available at https://planetcalc.com/1198/.

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 (Bislin 2022). Atmospheric refraction can increase the visibility of objects, making them look larger or taller, depending on conditions, as depicted in Figure 4-1. Every viewshed used earth curvature corrections, a refractivity coefficient of 0.13, and an eye-level height of 5.25 ft (1.6 m), and was processed out to a distance of 50 mi (80.4672 km) from the input wind turbines. Each viewshed was produced at a resolution of 16.4042 ft (5 m). The views were calculated using a refraction coefficient of 0.13. Daytime and nighttime atmospheric refraction-based visibility varies with the sea level's continuous increases and decreases in temperature, water vapor, and barometric pressure. Refraction coefficients used may go up to 0.17, especially for seascape and ocean views (Bislin 2022). However, due to the variety of locations, unpredictable conditions, and the varying range of distances to multiple lease areas, a 0.13 refraction coefficient was used as a middle ground.

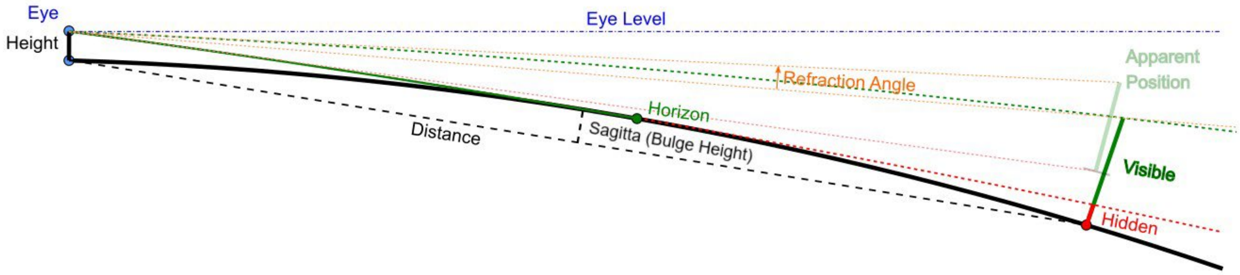


Figure 4-1 Effects of Atmospheric Refraction and Earth Curvature on WTG Visibility (Bislin 2022)

The final step to determine the APVI involved filtering the buildings and vegetation out of the viewsheds derived from the DSM. This methodology was developed by Jason Thoene at ICF. The filter for vegetation and buildings was created by finding the difference in heights, or delta, between the DEM and the DSM. The delta was then queried to retain cells visible at or below 5.5 ft (1.7 m), the simulated eye-level height. This filter was then applied to the DSM-derived viewsheds to identify the APVI (Thoene 2022).

4.2 Zone of Theoretical Visibility (ZTV)

Figures 4-2 and 4-3 display the ZTV for all six lease areas with turbine heights of 853 ft (260 m) and 1,312 ft (399.9 m), respectively. See Appendix B for a breakdown of each of the six individual lease area's ZTV with 853-ft (260-m) and 1,312-ft (399.9-m) turbine alternatives, with and without key observation points (KOPs) displayed.

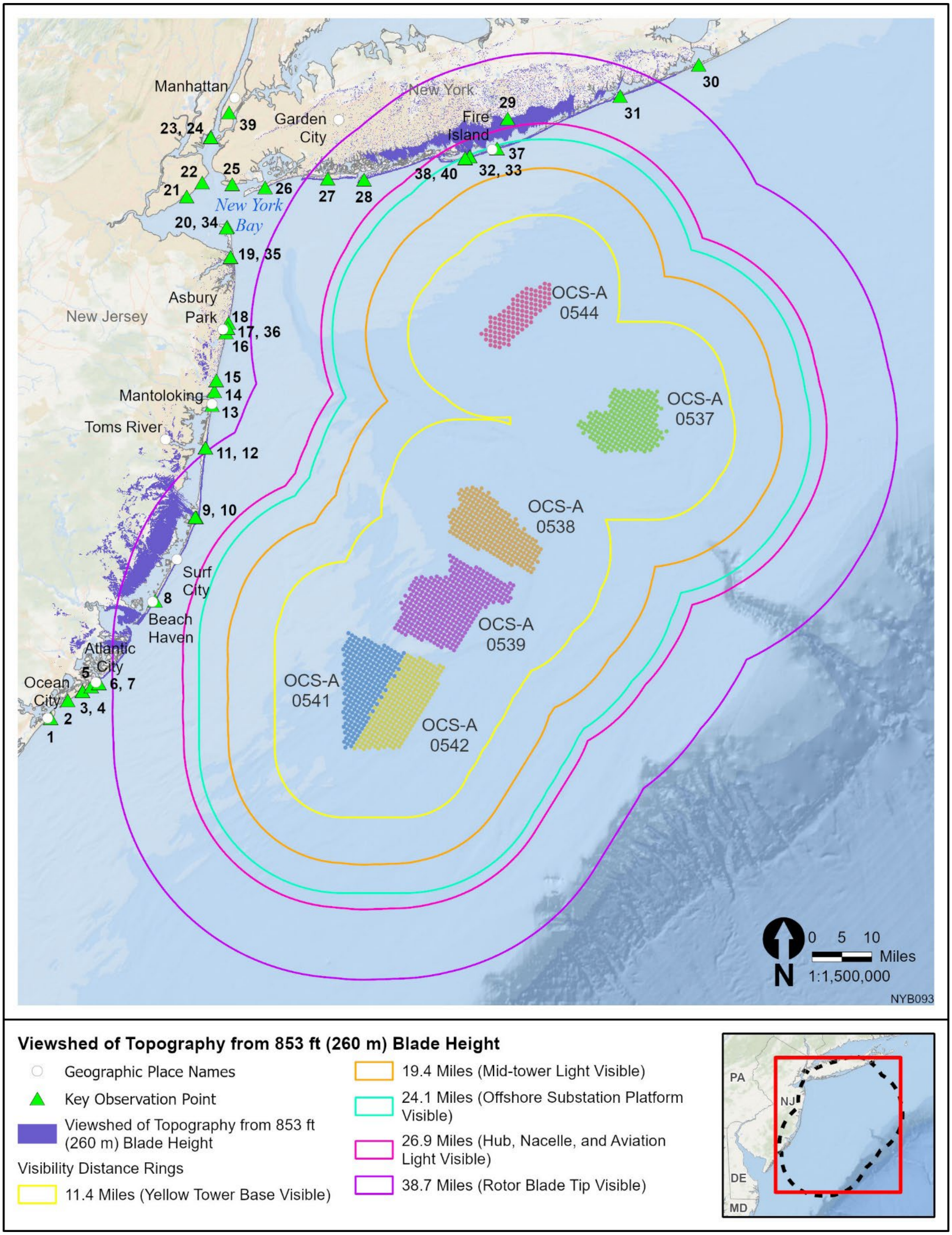


Figure 4-2 ZTV Bare-Earth Viewshed: 853-ft (260-m) Blade Height, All Lease Areas

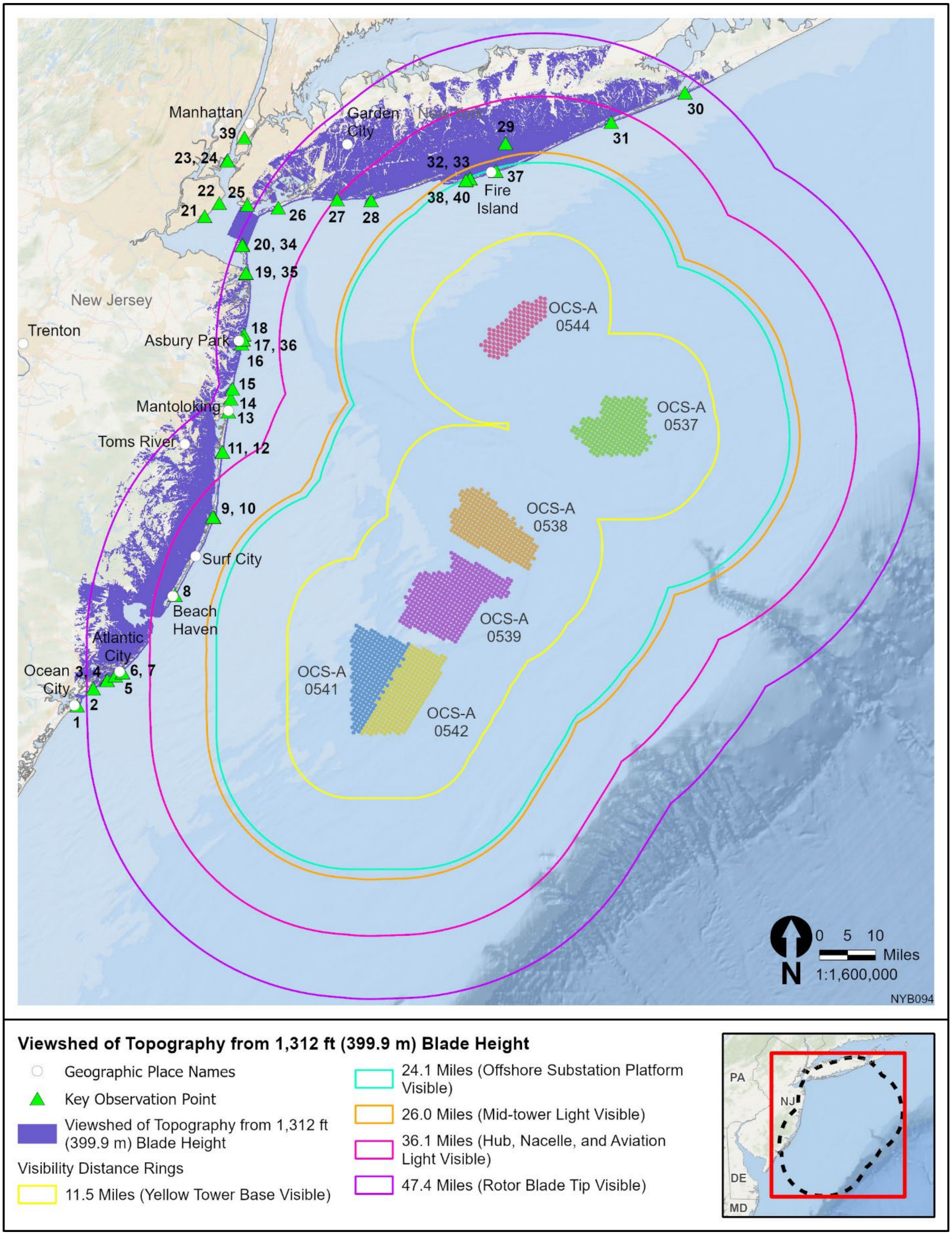


Figure 4-3 ZTV Bare-Earth Viewshed: 1,312-ft (399.9-m) Blade Height, All Lease Areas

4.3 Establishing the APVI

The DSM viewshed establishes the APVI. This viewshed map was used to select onshore viewpoints from which the project is likely to be visible. These viewpoints were verified in the field and are referred to as KOPs (see Section 6.2.1.2 for a detailed discussion of the KOP selection process and Table 6-4 for a list of KOPs). The DSM viewshed is used for both the SLIA and VIA.

Figures 4-4 through 4-10 provide the APVI for 853-ft (260-m) turbine heights for all lease areas combined and each lease area individually. Figures 4-11 through 4-17 provide the APVI for 1,312-ft (399.9-m) turbine heights for all lease areas combined and each lease area individually.

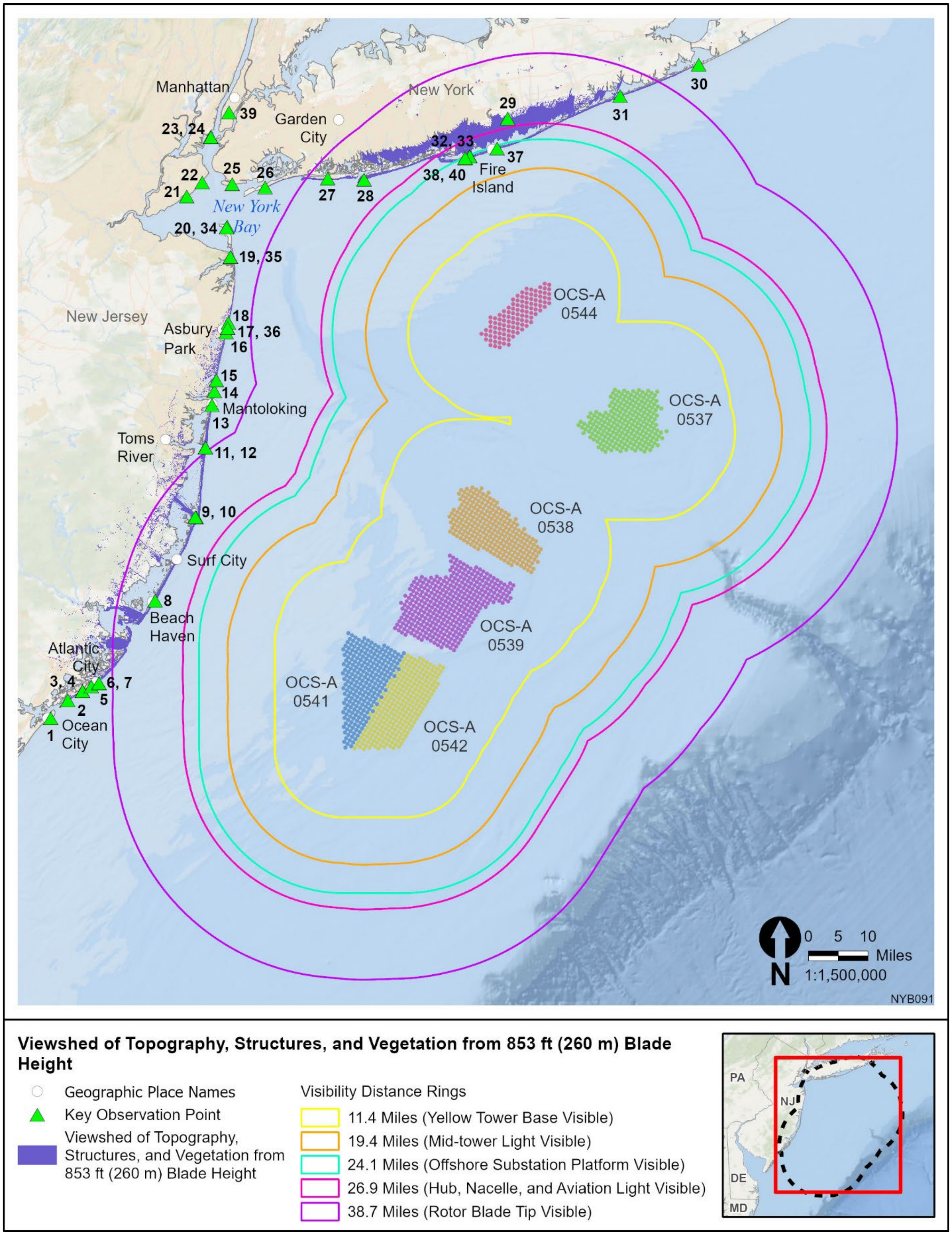


Figure 4-4 APVI Topography, Structures, and Vegetation Viewshed: 853-ft (260-m) Blade Height, All Lease Areas

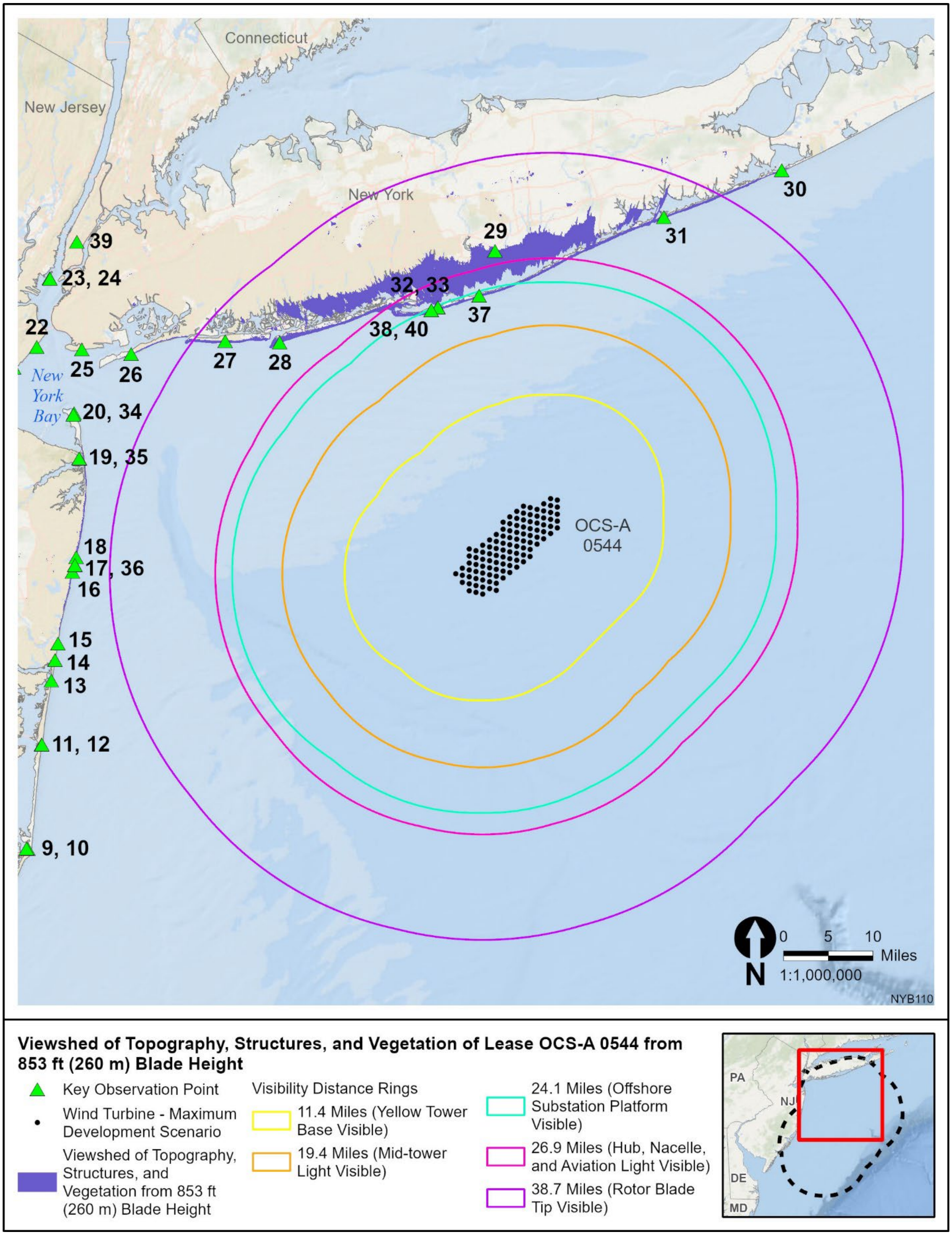


Figure 4-5 APVI Topography, Structures, and Vegetation Viewshed: 853-ft (260-m) Blade Height, OCS-A 0544

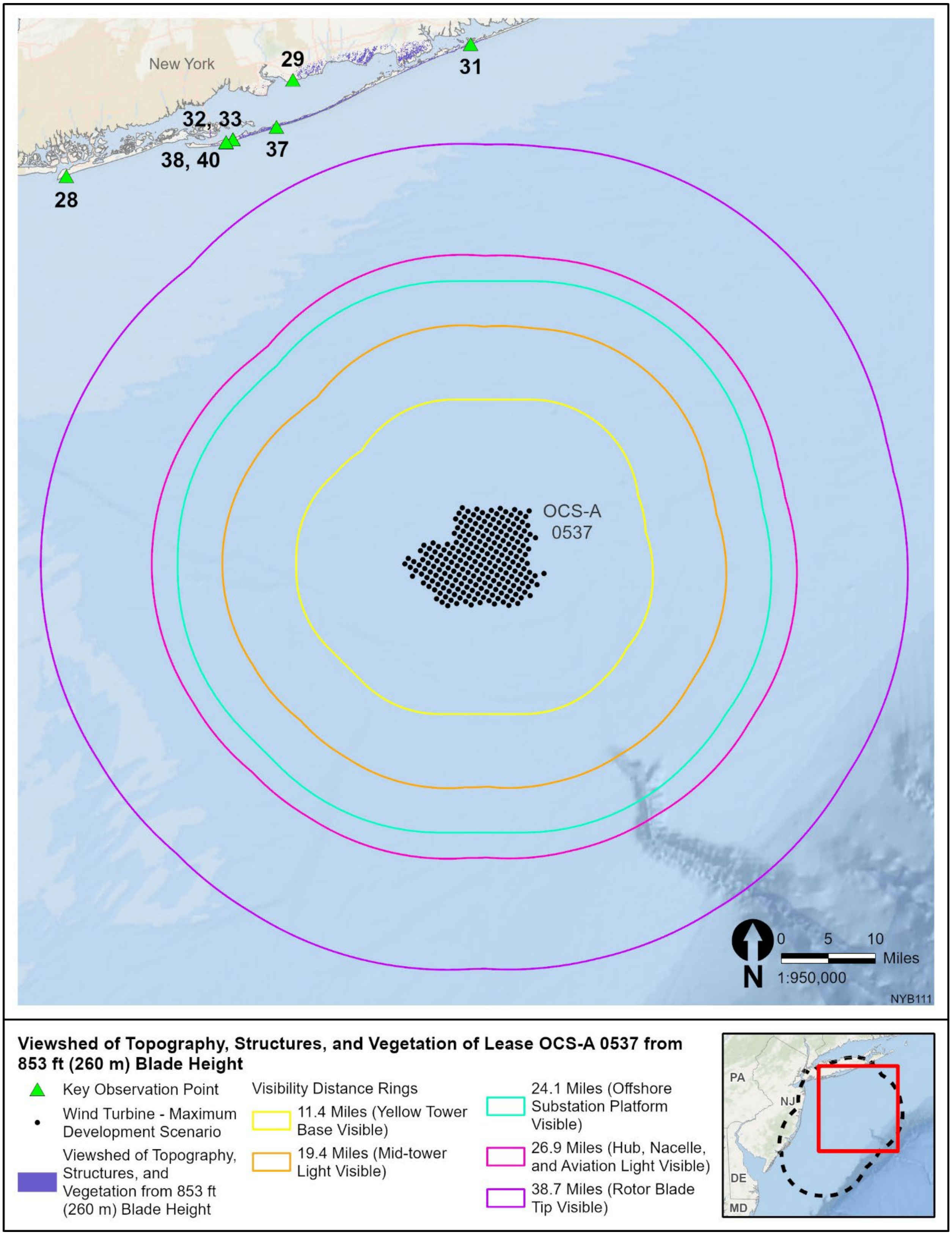


Figure 4-6 APVI Topography, Structures, and Vegetation Viewshed: 853-ft (260-m) Blade Height, OCS-A 0537

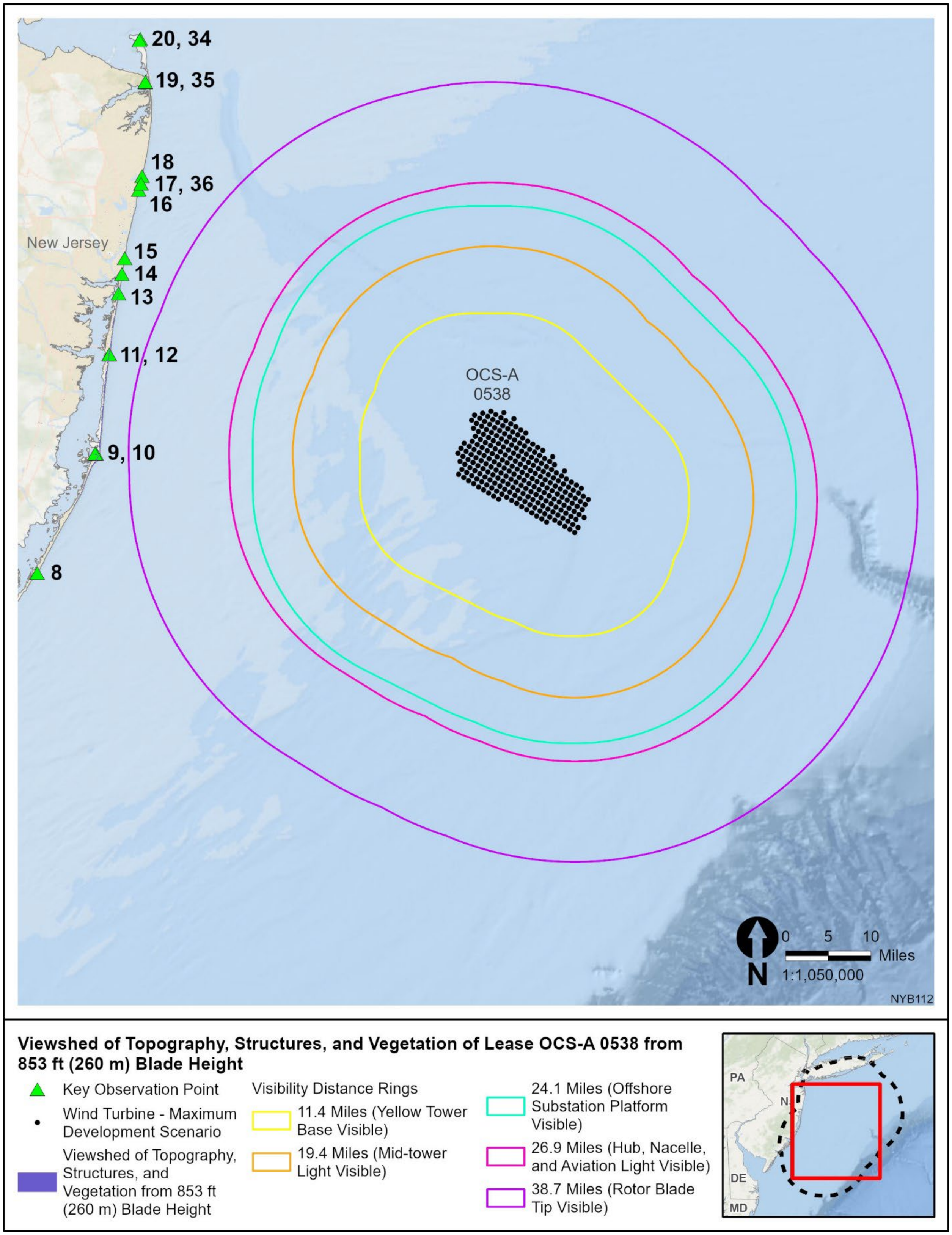


Figure 4-7 APVI Topography, Structures, and Vegetation Viewshed: 853-ft (260-m) Blade Height, OCS-A 0538

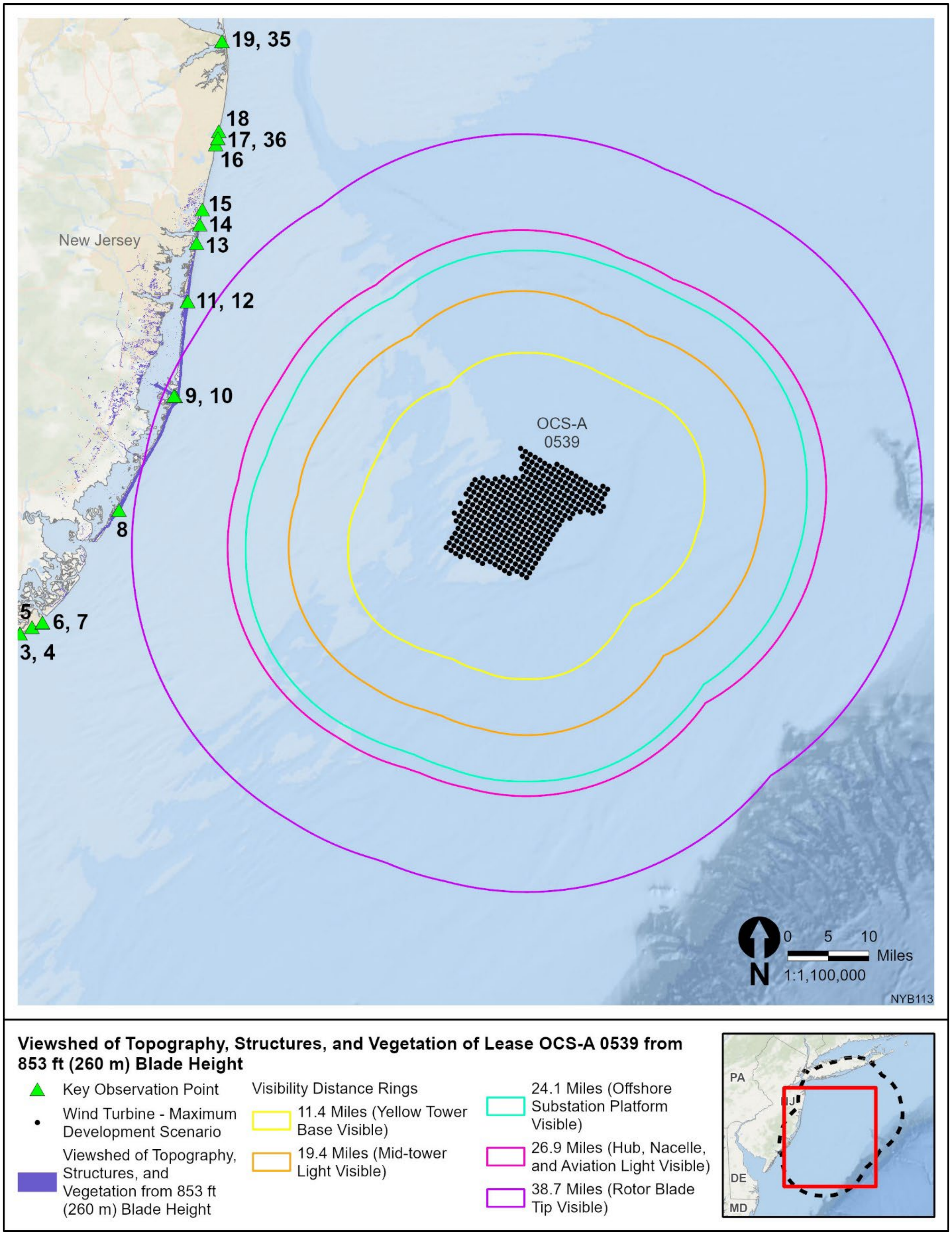


Figure 4-8 APVI Topography, Structures, and Vegetation Viewshed: 853-ft (260-m) Blade Height, OCS-A 0539

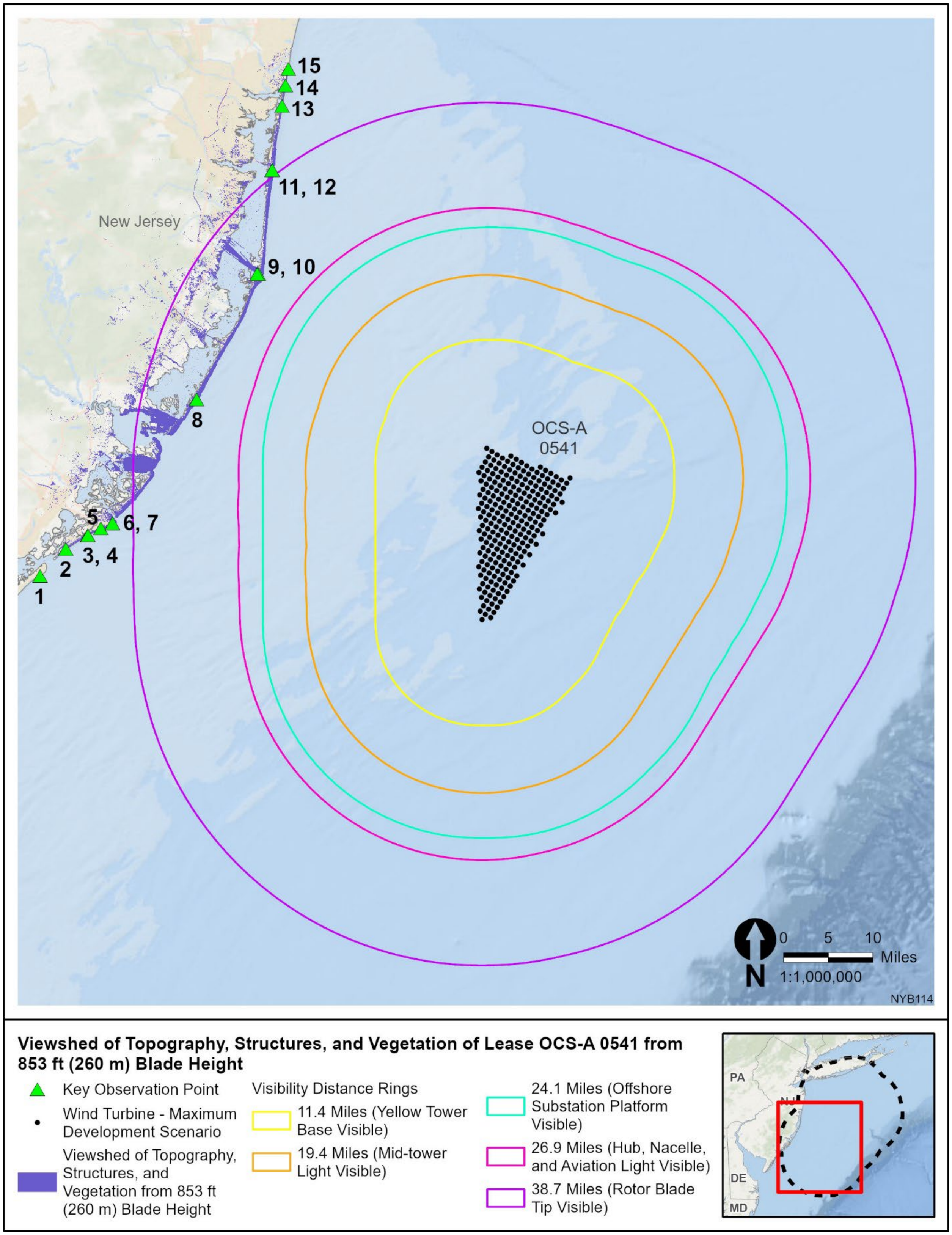


Figure 4-9 APVI Topography, Structures, and Vegetation Viewshed: 853-ft (260-m) Blade Height, OCS-A 0541

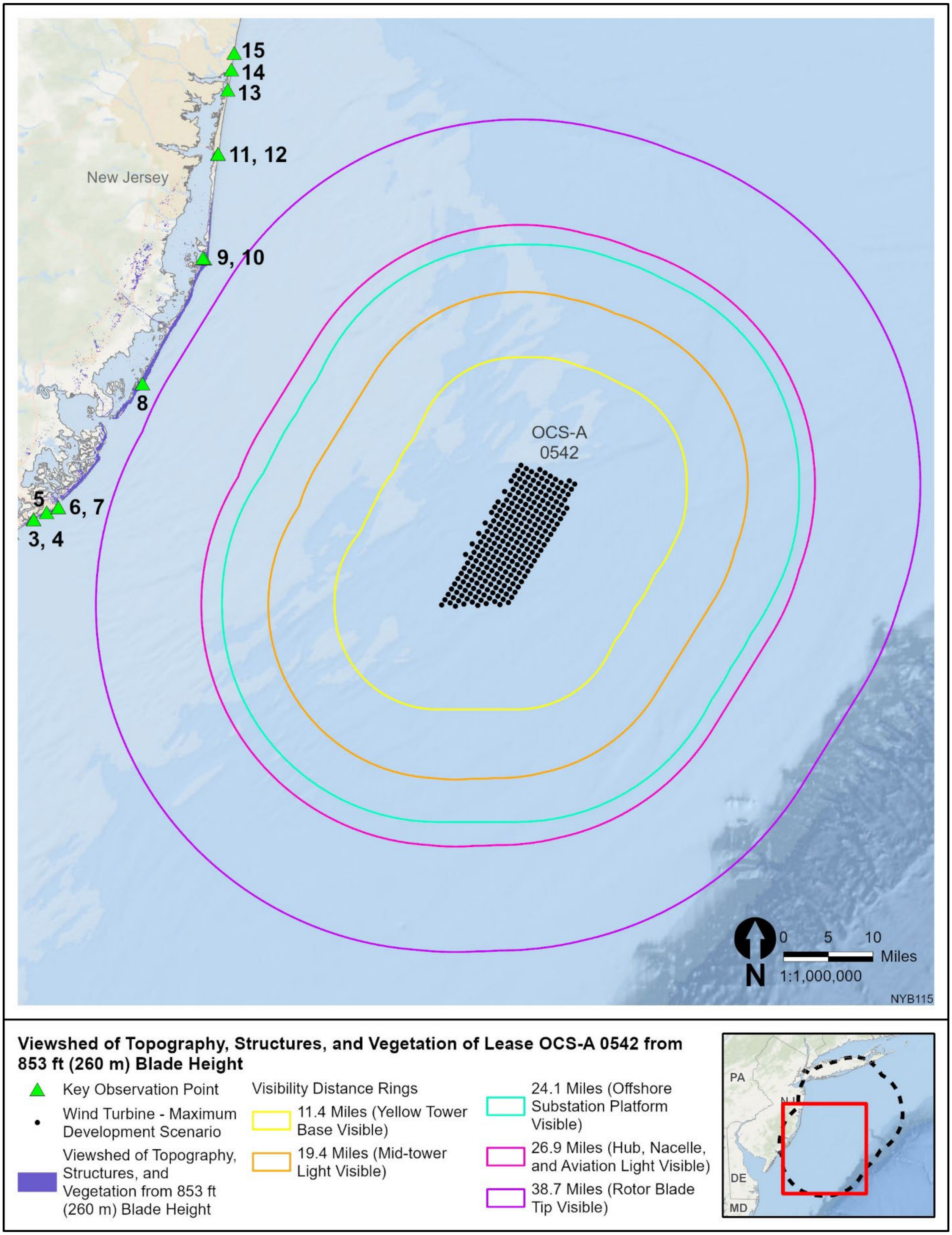


Figure 4-10 APVI Topography, Structures, and Vegetation Viewshed: 853-ft (260-m) Blade Height, OCS-A 0542

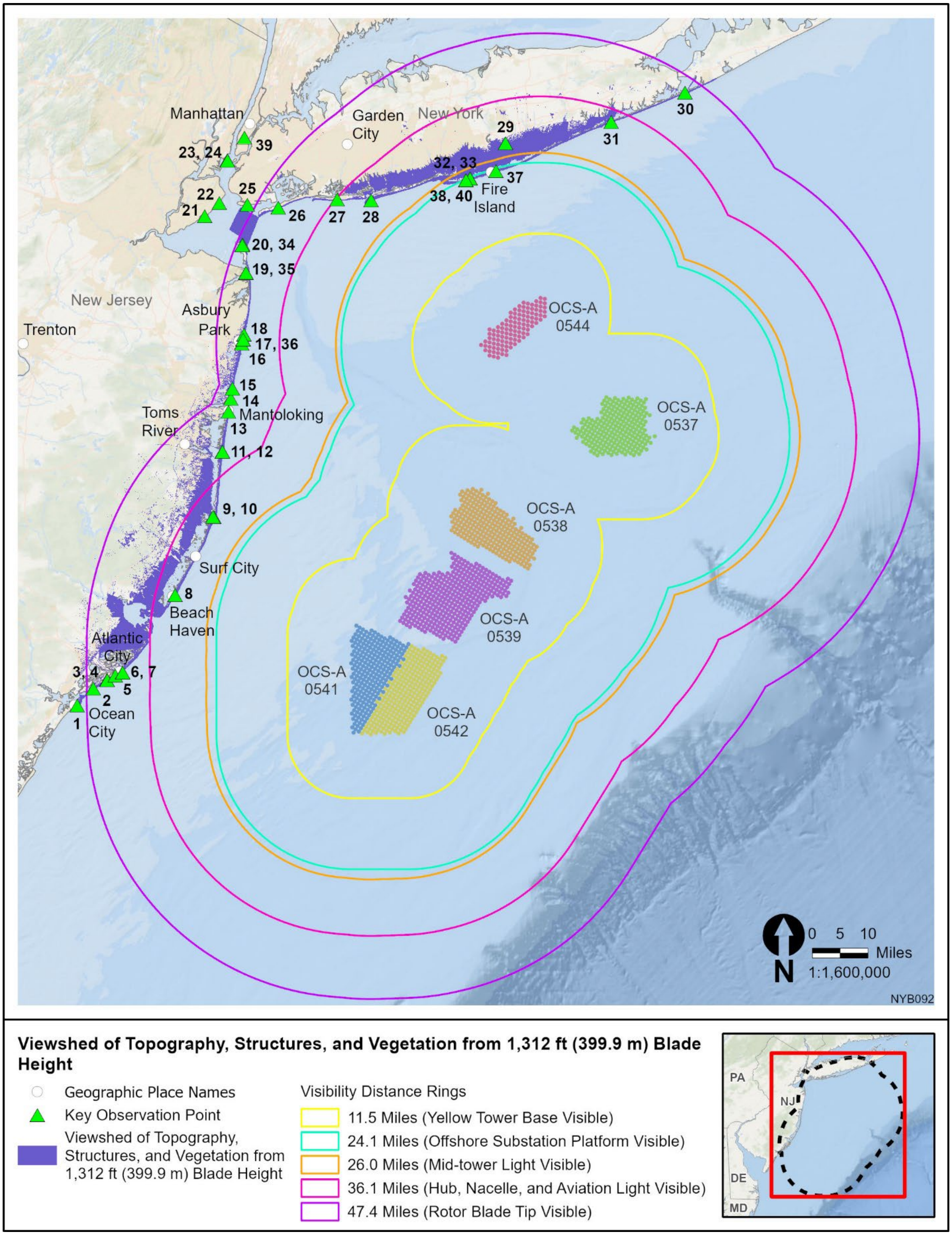


Figure 4-11 APVI Topography, Structures, and Vegetation Viewshed: 1,312-ft (399.9-m) Blade Height, All Lease Areas

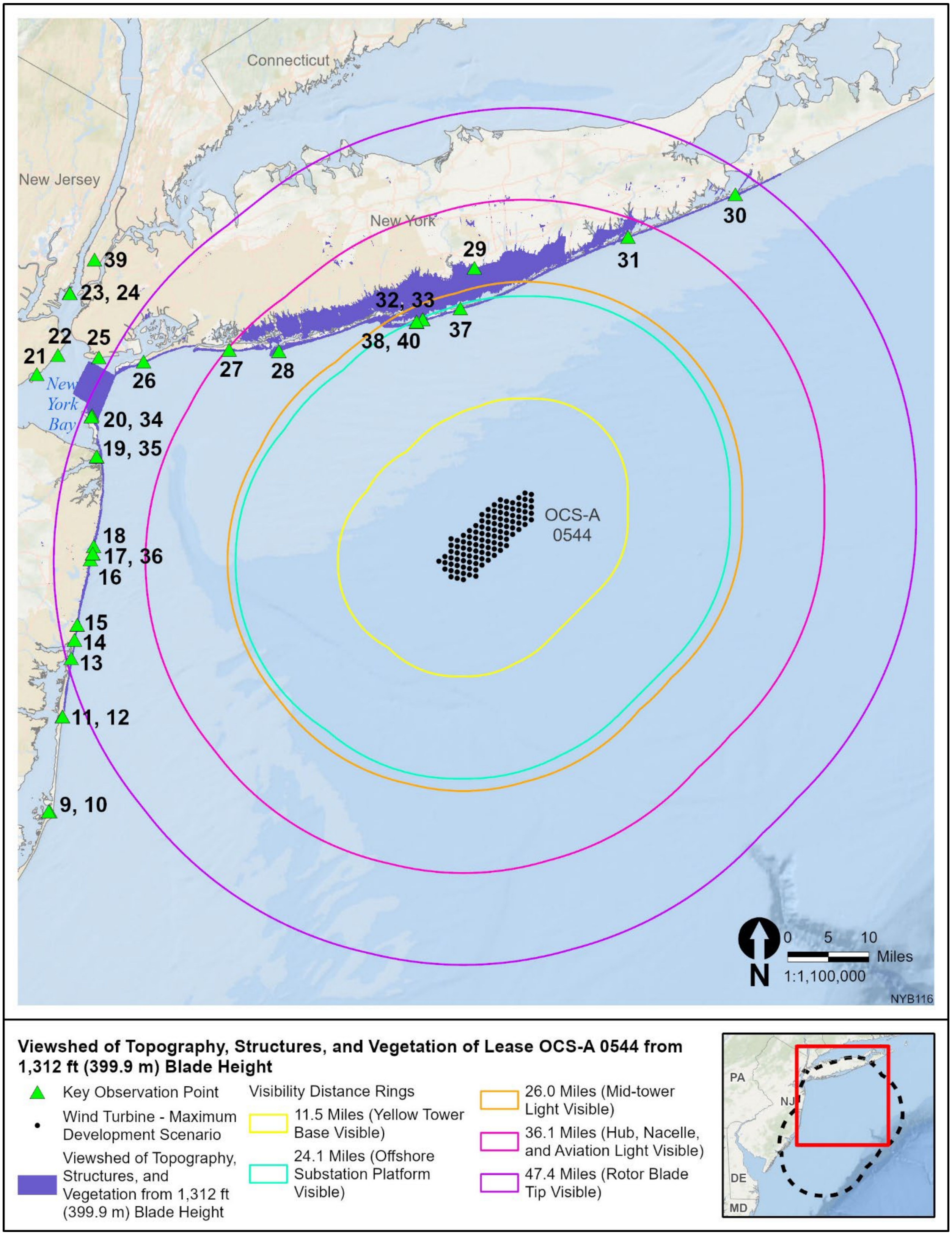


Figure 4-12 APVI Topography, Structures, and Vegetation Viewshed: 1,312-ft (399.9-m) Blade Height, OCS-A 0544

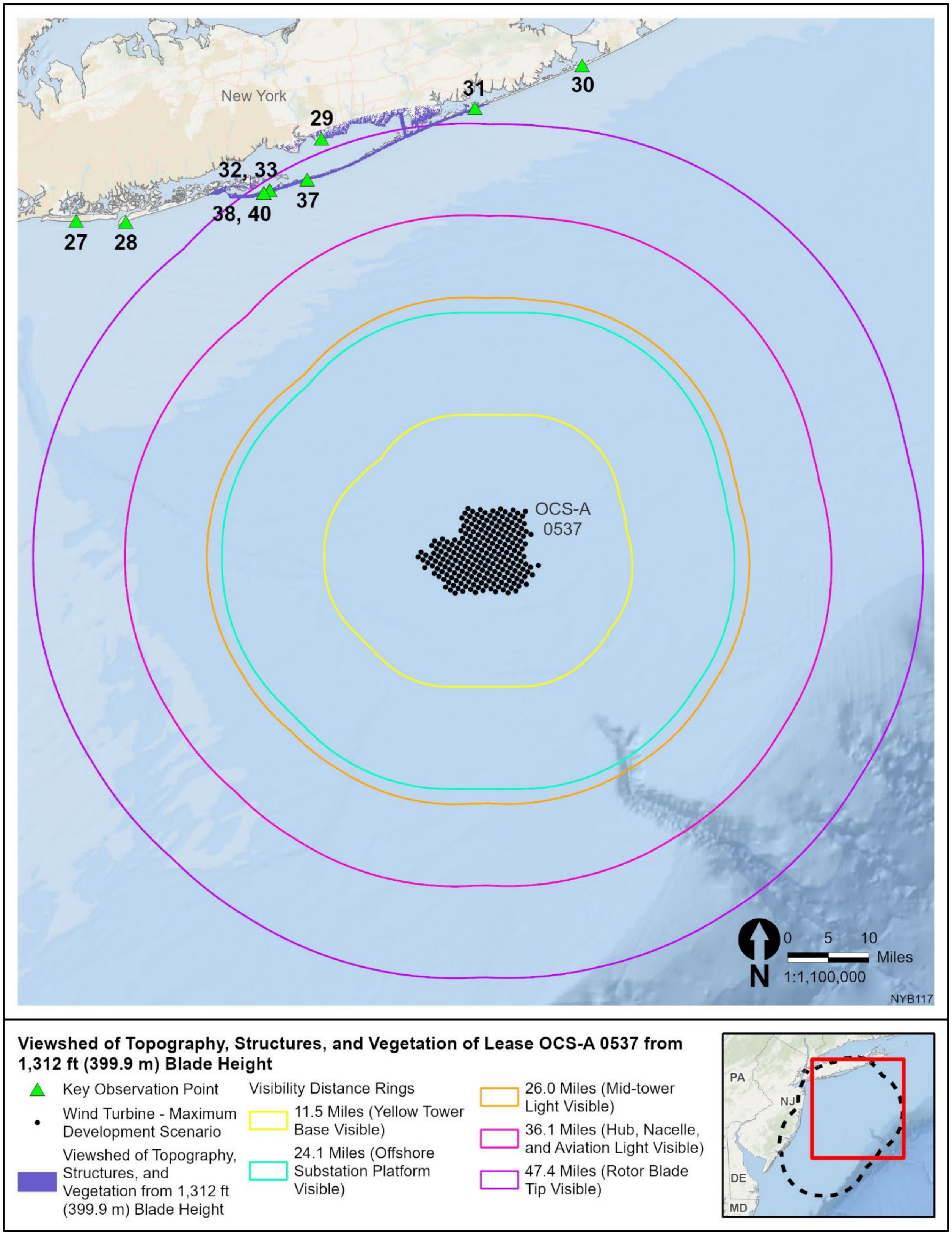


Figure 4-13 APVI Topography, Structures, and Vegetation Viewshed: 1,312-ft (399.9-m) Blade Height, OCS-A 0537

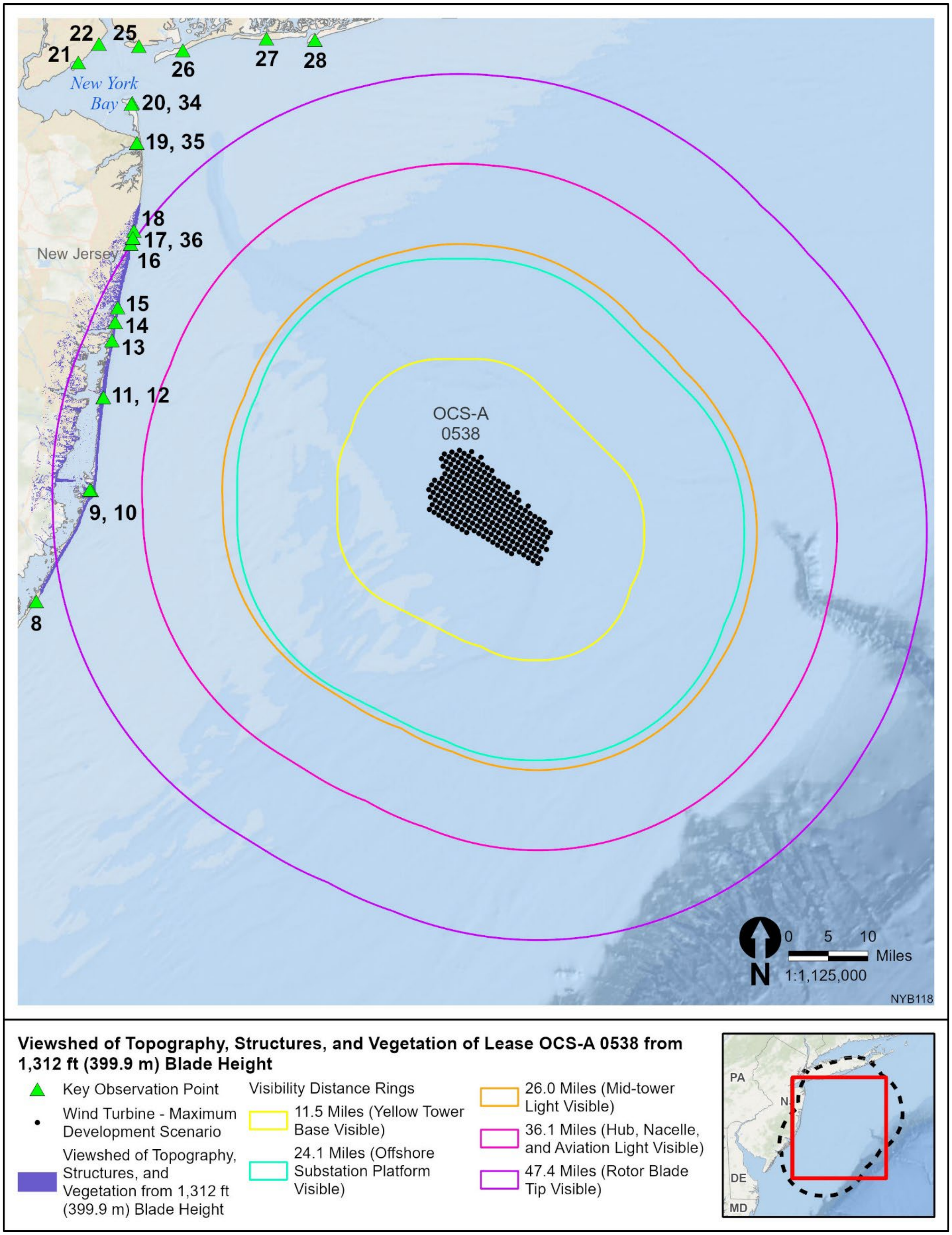


Figure 4-14 APVI Topography, Structures, and Vegetation Viewshed: 1,312-ft (399.9-m) Blade Height, OCS-A 0538

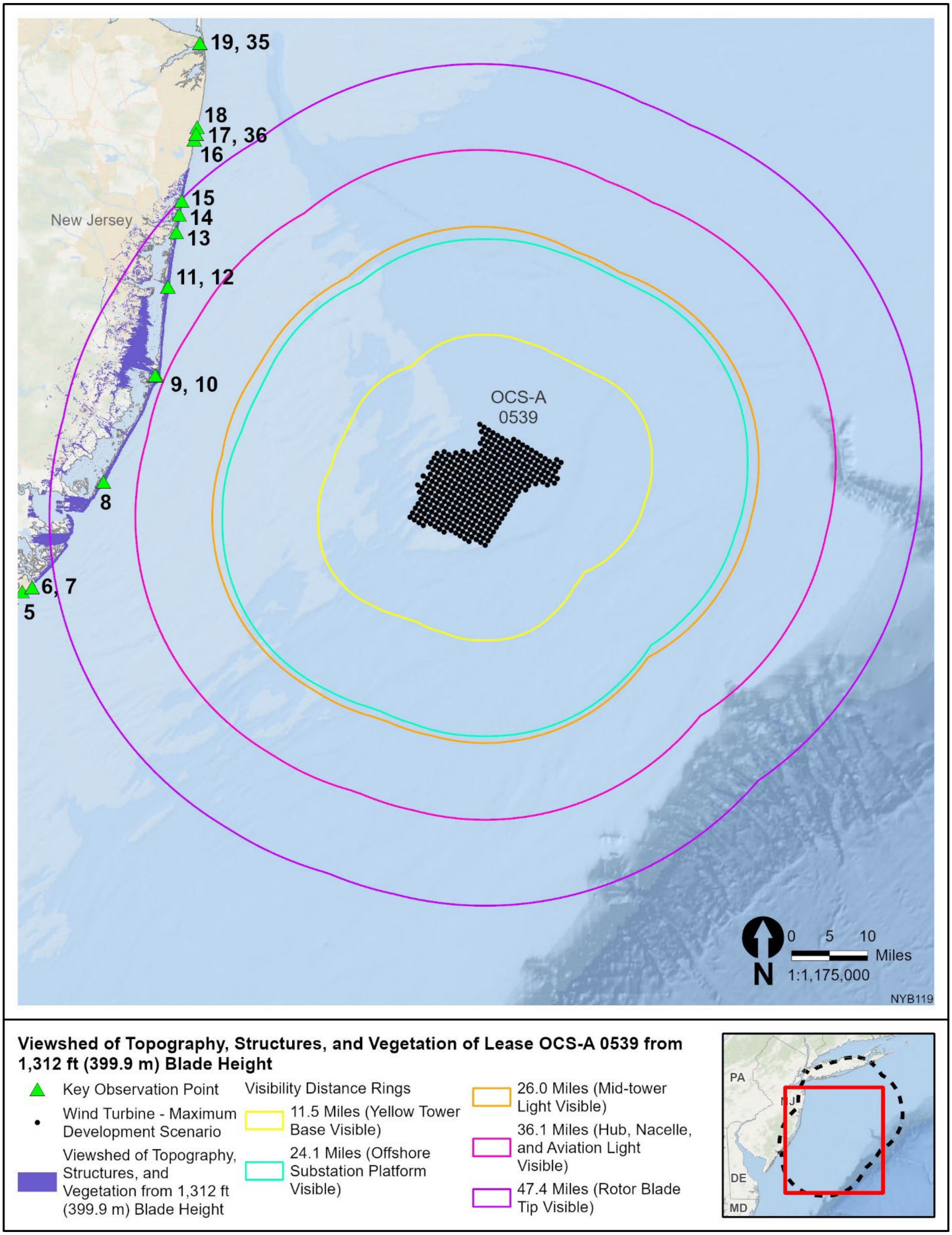


Figure 4-15 APVI Topography, Structures, and Vegetation Viewshed: 1,312-ft (399.9-m) Blade Height, OCS-A 0539

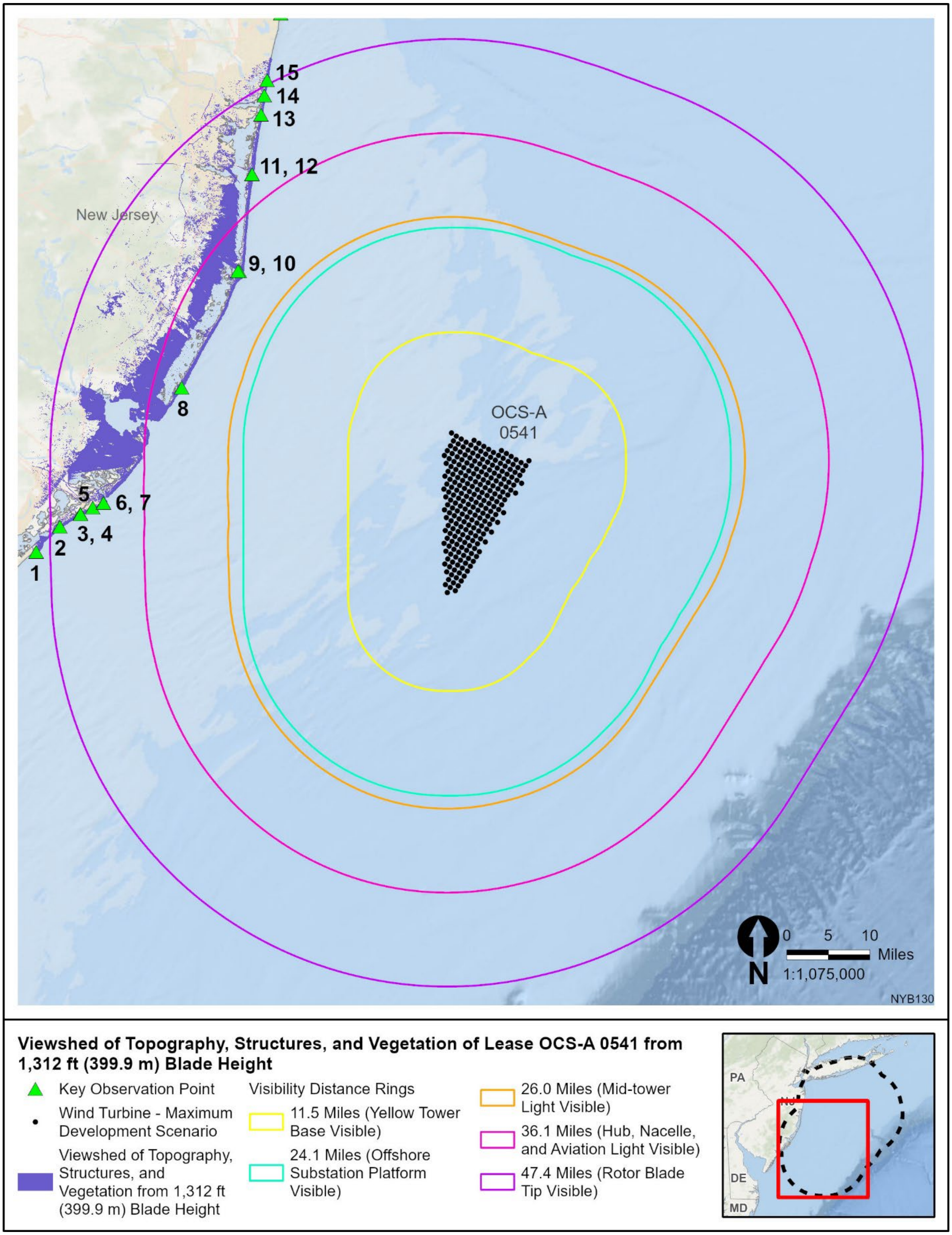


Figure 4-16 APVI Topography, Structures, and Vegetation Viewshed: 1,312-ft (399.9-m) Blade Height, OCS-A 0541

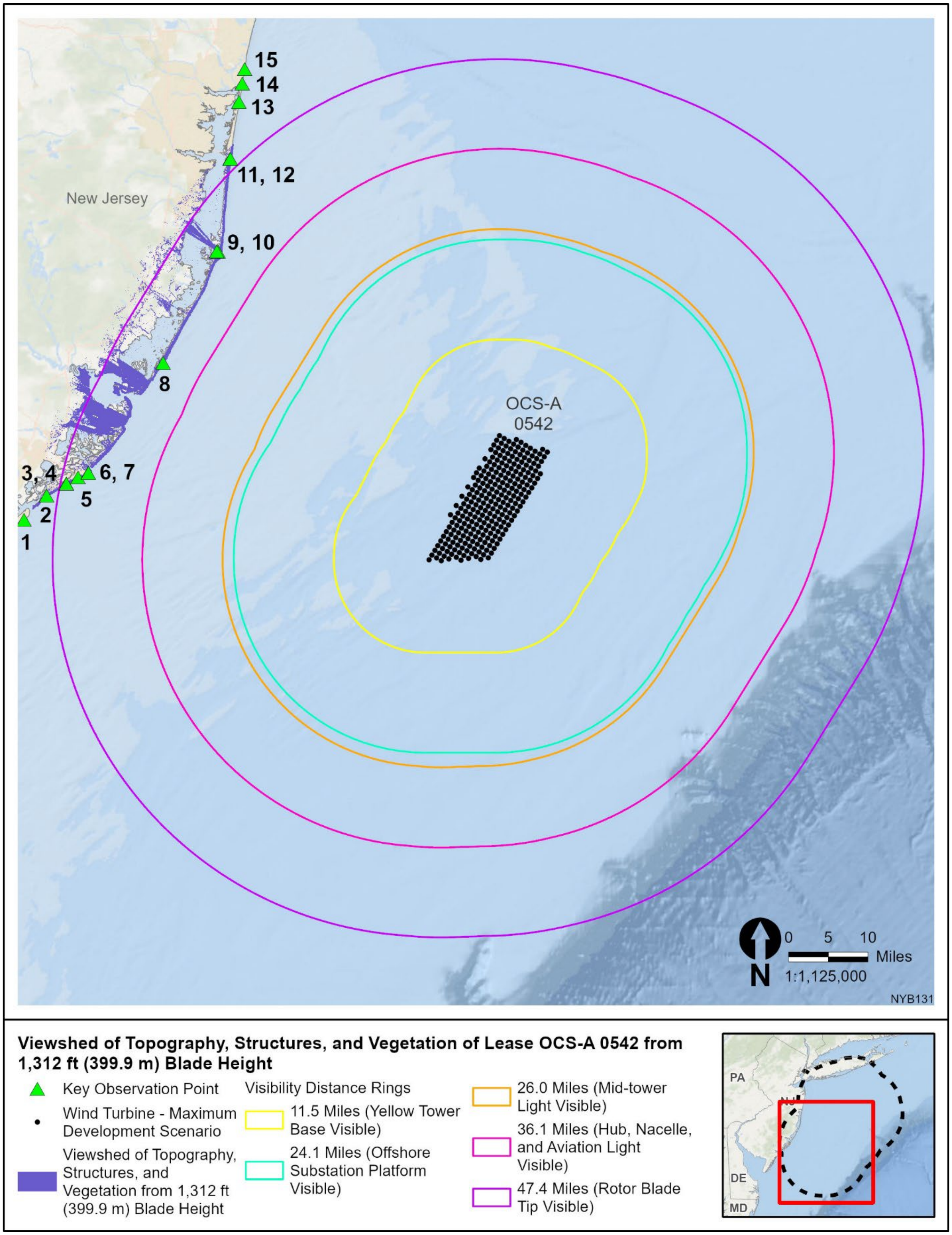


Figure 4-17 APVI Topography, Structures, and Vegetation Viewshed: 1,312-ft (399.9-m) Blade Height, OCS-A 0542

4.4 Other Factors Affecting Visibility

In addition to topography, structures, and vegetation, other factors that may affect visibility to a project in the ocean include viewer distance and meteorological and atmospheric conditions. This impact assessment considers and discusses meteorological and atmospheric conditions, but the evaluation is based on clear-day conditions.

4.4.1 Viewer Distance

The level of visual impact from a project is influenced by the distance from which the observer is viewing the project, and the WTG's noticeable elements (e.g., WTG height). These ranges of visibility will vary depending on the viewer's elevation (for example, viewing from a lighthouse versus the beach). The KOPs selected for this analysis would view the project from a variety of distances. The RPDE affords actual visibility distances to each of the turbine components with earth curvature factored into the analyses (Table 4-1). The nearest turbine (OCS-A 0544) to an onshore KOP (KOP-37, Point O'Woods) is located 24.07 mi (38.74 km) away from the KOP.

Table 4-1 RPDE Earth Curvature Visibility Distances

Distance		Component Visible
mi	km	
0–11.5	0–18.5	WTG base, platform, tower, mid-tower light, hub, nacelle, aviation obstruction lights, and blades
11.6–6	18.6–41.9	WTG tower, mid-tower light, hub, nacelle, aviation lights, and blades
26.1–35.6	42.0–57.3	WTG tower, hub, nacelle, aviation lights, and blades
35.7–35.8	57.4–57.6	WTG nacelle, aviation lights, and blades
35.9–36.1	57.7–58.1	WTG aviation lights and blades
36.2–41.9	58.2–67.4	WTG two blades and wide vertical blade
42.0–47.4	67.5–76.3	WTG blade tip

Even on the clearest of days, the sky is not entirely transparent because atmospheric particulate matter is always present. As the distance between an observer and a visible object increases, the light-scattering effect of atmospheric particulate matter reduces color intensity and contrast between light and dark. Contrast depends upon the position of the sun and the reflectance of the object, among other conditions. The net effect is that objects appear "washed out" over great distances; this is referred to as "atmospheric perspective" (NYSDEC 2019).

Sullivan et al. (2013) concluded that small to moderately sized offshore facilities (hub heights ranging from approximately 220 to 295 ft [67 to 90 m]) were visible to the unaided eye at distances greater than 26 mi (42 km), and turbine blade movement was visible up to 24 mi (39 km) away. At night, aerial hazard navigation lighting was visible at distances greater than 24 mi (39 km). Wind facilities were deemed a major focus of visual attention at distances up to 10 mi (16 km), were noticeable to casual observers at distances of almost 18 mi (29 km) and were visible with extended or concentrated viewing at distances beyond 25 mi (40 km). The WTGs for the NY Bight are 61% to 42% taller than the WTGs evaluated in the Sullivan et al. (2013) report. Therefore, it is reasonable to expect that the range of visibility would increase proportionately under favorable visibility conditions.

NY Bight hub heights are proposed to range from a minimum of 361 ft (110 m) to a maximum of 706 ft (215.2 m). WTG distances will vary from different KOPs to specific lease areas. For example, the shortest distance from a KOP to a single, closest WTG in a given lease area is between Point O'Woods on Fire Island and the nearest WTG in lease area OCS-A 0544, which is approximately 24.08 mi (38.74 km) away. The greatest distance from a KOP to a single, nearest WTG in a given lease area is between Shinnecock Inlet in Southampton, New York, and the nearest WTG in lease area OCS-A 0541, which is approximately 110.49 mi (177.81 km) away. Taking into account the viewing distances and curvature of the earth, the visibility rings calculated suggest that the NY Bight leases may be noticeable to casual observers at eye level above ground to an estimated distance of 47.25 mi (76.04 km) with a blade tip height of 1,312 ft (399.9 km), and an estimated distance of 38.65 mi (62.20 km) with a blade tip height of 853 ft (260 m).

4.4.2 Meteorological and Atmospheric Conditions

Meteorological and atmospheric conditions can restrict visibility of the project. Potential factors include airborne particulate matter, pollution, precipitation, low cloud cover, and fog or haze, all of which vary by time of year and day. Visibility on the coast and toward the offshore environment is highly variable and has been well described in *Visualization Simulations for Offshore Massachusetts and Rhode Island Wind Energy Area, Meteorological Report* (BOEM 2017).

4.4.2.1 New York

The New York State Energy Research and Development Authority (NYSERDA) completed a visibility threshold study in which they examined meteorological data from the John F. Kennedy International Airport and the Long Island-MacArthur Airport to determine the frequency of various weather conditions throughout the year (NYSERDA 2017). NYSERDA used the data to assess visibility of a hypothetical offshore wind farm set at varying distance from the shoreline. Data for the NYSERDA study were obtained from the National Climate Data Center for a 6-year period between January 1, 2010, and December 31, 2016. These data include climate variables such as precipitation, temperature, humidity, wind speeds, sky conditions, and visibility. A frequency was determined for various sky conditions at different times of day, and within each season. Sky conditions were categorized using a cloud coverage scale of 00 to 08 as follows:

- Clear: cloud coverage of 00 to 02;
- Partly cloudy: cloud coverage of 03 to 04; and
- Overcast: cloud coverage of 05 to 08.

In the study, daylight hours were defined as the time between morning civil twilight and evening civil twilight, as published in the *Air Almanac* (Nautical Almanac Office 2017). Seasons were defined as follows:

- Spring: March 20 to June 21;
- Summer: June 22 to September 22;
- Fall: September 23 to December 21; and
- Winter: December 22 to March 19.

Results indicate that the predominant sky condition during the study period was overcast; this occurred 61% of the time (see Tables 4-2 and 4-3). Clear was the second most common sky condition, occurring 17% of days.

Table 4-2 Frequency of Occurrence of Onshore Sky Conditions at John F. Kennedy International Airport and Long Island MacArthur Airport

Cloud Cover	Percentage of Daylight Hours				
	Summer	Spring	Fall	Winter	Annual
Clear	17.4	15.6	18.1	17.4	17.1
Partly Cloudy	6.8	6.1	5.5	4.9	5.9
Overcast	63.5	59.7	60.2	58.6	60.7
Visibility less than 10 mi (16.1 km)	12.3	18.6	16.2	19.1	16.3
Total	100	100	100	100	100

Table 4-3 Breakdown of Sky Conditions by Time of Day at John F. Kennedy International Airport and Long Island MacArthur Airport

Cloud Cover	Percentage of Daylight Hours/Time of Day		
	Morning	Midday	Afternoon
Clear	19.1	15.7	15.9
Partly Cloudy	5.4	6.8	5.7
Overcast	54.5	64.1	64.5
Visibility less than 10 mi (16.1 km)	21.0	13.4	13.9
Total	100	100	100

4.4.2.2 New Jersey

A study completed by the Rutgers School of Environmental and Biological Sciences for the Atlantic Shores Offshore Wind (ASOW) project, *Initial Visibility Modeling Study for Offshore Wind for New Jersey's Atlantic Shores Offshore Wind Project* (Brodie and Frei 2020) provides data on offshore visibility frequency and trends, as influenced by meteorological conditions. Using past meteorological data (such as temperature, relative humidity, and dew point temperature) from Atlantic City International Airport and Ocean City Municipal Airport, models predicted visibility distances. Because the geographic location of the ASOW project is similar to that of the NY Bight lease areas, the results of the study are applicable. The closest turbine to shore is 15.07 mi (24.25 km) farther in the NY Bight than the ASOW project; therefore, these results are very conservative when applied to the six NY Bight lease areas. It is important to present the greatest potential visibility and visual prominence even at great distances. However, the frequency of the conditions presented in this study is a relevant and mitigating consideration. Results from the study are as follows:

- Initial observations suggest that visibility to a distance of 8 and 10 mi (13 and 16 km) from Atlantic City International Airport occurred over 73% and 89% of daylight hours, respectively, in any given year. The same observations from Ocean City Municipal Airport suggest that these visibility distances were 6% and 12% less frequent than those at Atlantic City International Airport.
- The higher visibility at Atlantic City International Airport is due to drier inland air, compared to the more humid coastal air around Ocean City Municipal Airport. Higher humidity and larger temperature differences between the air and ocean surface also cause haziness and marine clouds/fog to occur more frequently offshore.

- Between Atlantic City International Airport and the ASOW lease area, a distance of roughly 25 mi, the percentage of daylight hours with a calculated visibility of 10 mi (16 km) or more decreases from 78% to 41% based on past meteorological studies.
- Over the ocean, the average visibility in April, May, and June ranged from 2.5 to 10 mi (4 to 16 km), which is consistent with lower frequencies at greater than 10 mi in the Ocean City Municipal Airport observations.
- Over the ocean, the average visibility in July and August (when visibility frequencies greater than 10 mi in Ocean City are above 75%) ranges from 5 to 12 mi (8 to 19 km).
- The yearly, monthly, and summer average visibility all share a trend of increasing visibility from the morning to the late afternoon. Higher visibility over the land appears to extend out into the ocean throughout the day. This is consistent with warmer temperatures during the day lowering the relative humidity and causing higher visibility.

Based on these results, although inland visibility is relatively high, visibility will be lower when looking offshore toward the six NY Bight lease areas, especially because the turbines farther away compared to the ASOW lease area.

4.4.3 Night Sky Conditions

Night skies and natural darkness are components of seascape and landscape character as well as visibility. The numeric Bortel scale measures the night sky's brightness and darkness. Class 1 represents the darkest skies available on Earth, whereas Class 9 is a brilliantly lit urban sky. Dark sky areas along the coast of New England are uncommon because of the dense urban development there, and associated light domes.

However, the National Park Service (NPS) recognized Fire Island as a good star-gazing location. It has a 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 (Stare 2024). Although Fire Island has decent stargazing as compared to Long Island and New York City, residents need to travel 100 mi (161 km) to the Catskills to experience a Class 3 rating, and nearly 200 mi (322 km) to the Adirondacks to experience a Class 2 average dark sky. Morristown National Historic Park is the nearest location where the NPS is collecting data on night skies brightness and Cape Cod National Seashore the nearest collection point with high-quality night sky viewing (NPS 2023).

Chapter 5

Ocean, Seascape, and Landscape Impact Assessment (SLIA)

The SLIA assesses impacts on the physical elements that make up the ocean, seascape, or landscape, and the aesthetic, perceptual attributes of the ocean, seascape, or landscape that contribute to its distinctive character and sense of place.

The SLIA also identifies, describes, and assesses ocean, seascape, and landscape receptors. These are the potentially affected ocean character, seascape character, and landscape character collectively referred to as character areas.

Section 5.1 outlines the analysis approach to the character assessment and how impacts on the character areas are derived. Section 5.2 describes the results from the character assessment, including the baseline data collected, the character area classifications, and the resulting project impact analysis results on the character areas. A summary of the findings is presented in Section 5.2.3.

5.1 SLIA Methodology

Section 5.1.1 describes the SLIA methodology for ocean, seascape, and landscape character assessment. Section 5.1.2 describes the methodology for analyzing the project's impacts on ocean, seascape, and landscape.

5.1.1 Methodology for Ocean, Seascape, and Landscape Character Assessment

Ocean, seascape, and landscape areas are described as having their own discrete characters and identities, as expressed through built environments, geology, topography, drainage patterns, vegetation, historical land use, settlement patterns, and perceptual and aesthetic attributes within the area. The character area assessment describes the important ocean, seascape, and landscape attributes that contribute to character, such as the presence of industrial elements or the presence of historic structures obviously associated with maritime heritage. It also describes human values associated with these attributes, such as a deep connection to the sea among residents or heavy use by tourists. These attributes are the components of the ocean, seascape, or landscape that contribute to its distinctive character. They may be affected by development.

The character assessment began with the collection of baseline data within the GAA. This included a desktop study of preliminary characterization and mapping, and field surveys. The baseline data identify, classify, and describe the character areas within the study area.

5.1.1.1 Baseline Data Collection

After the DEM-based (bare earth) viewshed analysis was performed to establish the GAA (study area), as detailed and described in Chapter 4, baseline data collection began within the GAA only. The elements that were used during information gathering on the study area include:

- Physical influences, such as geology, soils, landform, drainage, and bodies of water.

- Individual noteworthy physical features and elements of the ocean, seascape, or landscape.
- Land cover, including different types and patterns of vegetation and development.
- The influence of human activity (built environment), including land use and management; the character of settlements, structures, and transportation infrastructure; and the pattern and type of fields and enclosures (in rural areas) or open spaces (in other settings).
- The aesthetic, experiential, and perceptual aspects of the landscape. This may include, for example, its scale, complexity, openness, tranquility or wildness, and the general character of its views.
- The overall character of the landscape in the study area, including any distinctive areas, and the combinations of elements and aesthetic and perceptual aspects that make each area distinctive.
- County zoning and land use.
- Important scenic resources.
- Publicly accessible visual and cultural sites.
- Communities with environmental justice (EJ) concerns (this is not a visual trait, but it is overlaid with the character discerning attributes).

Once these data were collected, preliminary mapping and description of character areas took place. Information was collected in the field to test and refine the draft ocean, seascape, and landscape character areas, and to inform written descriptions, notably to capture aesthetic, perceptual and experiential qualities. A tablet with preloaded project area base maps was used in the field to record notes on the visual characteristics that inform a sense of place. Photographs were taken in the field to represent each designated character area.

5.1.1.2 Character Area Classification

Considerations of the physical elements and perceptual attributes within the character areas describe the character and quality of visual landscapes, including their form, line, color, texture, pattern, and scale. After the field verification and preliminary mapping, a final character area delineation was performed to assess the impacts on those identified character areas.

Definitions, contextual descriptions, and photo examples are provided for each identified and mapped character area. These qualities were assessed based on notable aesthetic, perceptual, or experiential qualities, and/or any special designations at national, state, and local levels, such as historic sites or trails, areas of high scenic quality, or sacred sites.

5.1.2 Methodology for Analysis of Project Impacts on Ocean, Seascape, and Landscape

Information from the ocean, seascape, and landscape character assessments was used to identify potential impacts from the proposed development. The impact assessment was based on the sensitivity of the receptor (the potentially affected ocean, seascape, and landscape) and the magnitude of the seascape and/or landscape character changes brought about by the proposed projects. For the ocean, seascape, and landscape character, the sensitivity of the receptor was determined based on its susceptibility to impact and its perceived value. The magnitude of the impact was determined by considering the size and scale of the change to existing conditions caused by the project, the geographic extent of the area subject to the project's effects, and the effects' duration and reversibility. After the sensitivity and magnitude of the impact have been determined, its overall impact level was evaluated.

Due to the placement of the six lease areas in relation to New Jersey and New York, and the maximum and minimum turbine height scenarios, for the purposes of this analysis, four overall impact levels on the character areas were determined based on four scenarios:

5.1.2.1 Factors for Evaluation of Impact on Receptors (Character Areas)

As discussed in the BOEM SLVIA Methodology (BOEM 2021a), the impact level is a function of the sensitivity of the receptor and magnitude of effect and is ultimately a matter of professional judgment. In the SLIA, the receptors are the character areas identified in the character assessment. The components within each factor and their relationships are shown in Table 5-1.

The BOEM SLVIA Methodology (BOEM 2021a) uses four ratings to define the overall impact level: major, moderate, minor, or negligible. The BOEM SLVIA Methodology states that "a finding of negligible impact is warranted when there are minimal impacts; that is, the project is not visible or is barely visible, or the potentially affected area is very small, and the other metrics are at medium or low values" (BOEM 2021a). To better understand the aspects of the project that may constitute a rating of negligible, negligible was added to both the size and scale of effect and the geographic extent of effect components (Table 5-1).

Table 5-1 Impact Rating Factors, Components, and Importance Levels

Factor	Component	Importance Level
Receptor Sensitivity	Susceptibility	High, medium, low
	Value	High, medium, low
Impact Magnitude	Size and scale of effect	Large, medium, small, negligible
	Geographic extent of effect	Large, medium, small, negligible
	Duration and reversibility	Good, fair, poor

5.1.2.2 Receptor Sensitivity

The sensitivity of an ocean, seascape, or landscape impact receptor depends upon 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 accommodate the addition of elements or features that are not visually incongruent or incompatible with 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. The receptor sensitivity is determined using the value and susceptibility components combined in Table 5-2.

Table 5-2 Matrix for Combining Sensitivity Components

Value Rating	Susceptibility Rating		
	High	Medium	Low
High	High	High	Medium
Medium	High	Medium	Low
Low	Medium	Low	Low

5.1.2.3 Magnitude of Impact

The magnitude of an impact on an ocean, seascape, and landscape area depends on the size or scale of the change associated with the proposed project, the geographic extent of the change, and the duration and reversibility of the change.

For the purposes of this analysis, duration and reversibility is the only component to remain consistent across each of the four scenarios described.

Size and Scale of Change

A judgment is made regarding the degree of change from loss, addition, or alteration of character, features, elements, or aesthetic, experiential, or perceptual aspects of the ocean, seascape, and landscape likely to occur from the project impact. The size and scale of the change refers to whether a change is large, medium, small, or negligible relative to the potentially affected character area. The definitions for size and scale are presented in Table 5-3.

Table 5-3 Definitions of Size and Scale of Change

Size and Scale of Change	Definition[a]
Large	An object or phenomenon that is obvious to most receptors/observers and prominent or even dominant in the view and is of sufficient scale or difference to constitute a notable change to the existing character area context. In such circumstances, the object would represent a key new characteristic element in the character area at a representative viewpoint to any great extent.
Medium	An object or phenomenon that is readily apparent after even a brief look and would be visible to most casual observers. The object is clearly evident and represents a prominent new feature within a largely unchanged wider context and would not compete with key characteristic character area elements at a representative viewpoint to any great extent.
Small	An object or phenomenon that appears very small, faint, or recessive, but when the observer is scanning the horizon or looking more closely at an area, can be detected without prolonged viewing. It could sometimes be noticed by casual observers. It represents a highly localized and small-scale change that would be unlikely to compete, to any notable extent, with key characteristic character area elements at a representative viewpoint.
Negligible	An objector phenomenon that is not discernible or presents no contrast or apparent change and therefore would not alter the character area.

[a] The size and scale of change definitions were developed in part from the BOEM SLVIA Methodology (BOEM 2021a) size and scale of change descriptions and by Argonne personnel.

Geographic Extent

The assessment of magnitude of impact also includes the geographic extent over which the impact would be experienced. The geographic extent of impact (which is associated with visibility of the project) is related to the project viewshed, particularly the GAA and the APVI (DSM-based viewshed).

For a particular ocean, seascape, or landscape character area, the geographic extent of the impact is expressed quantitatively in square miles and square kilometers within the APVI project viewshed (1,312-ft [399.9-m] and 853-ft [260-m] turbines) in both New Jersey and New York, and as a percentage of the total area of the ocean, seascape, or landscape character area within the GAA. The APVI for both 1,312-ft (399.9-m) and 853-ft (260-m) turbines are overlaid on the character area delineation, as mapped according to Section 5.1.1, to obtain the square miles (square kilometers) of character area within these viewsheds. The percentage output is used to determine the geographic extent on an ordinal scale of large, medium, small, or negligible, using the definitions in Table 5-4.

Table 5-4 Thresholds for Geographic Extent Ratings

Geographic Extent	Definition
Large	Area equivalent to between 30% and 100% of the character area.
Medium	Area equivalent to between 10% and 30 % of the character area.
Small	Area equivalent to less than 10% of the character area.
Negligible	Area equivalent to less than or equal to 0.001 mi^2 (0.003 km^2) of the character area, or where theoretical visibility does not occur, or where field reconnaissance suggests there would be no actual visibility due to the screening effect of micro-topography (not represented in terrain or surface data).

Duration and Reversibility

The third element of assessing the magnitude of impact is the consideration of the project's duration and reversibility. This is the length of time over which the impact is likely to occur and the degree to which the currently existing conditions are restored after the impact ceases.

According to the BOEM SLVIA Methodology (BOEM 2021a), 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). The judgment regarding duration considers residual impacts that remain after decommissioning. 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; good combines short duration with full reversibility, and poor combines considered permanent with nonreversible. The combination matrix in Table 5-5 was created to inform whether a project will be considered good, fair, or poor in terms of duration and reversibility.

Table 5-5 Combination Matrix for Duration and Reversibility

Reversibility	Duration		
	Permanent	Long term	Short term
Nonreversible	Poor	Poor	Poor
Partially reversible	Fair	Fair	Fair
Fully reversible	Fair	Fair	Good

Combining Magnitude Factors

The combination matrix in Table 5-6 is derived from the BOEM SLVIA Methodology (BOEM 2021a), with the addition of a negligible outcome for magnitude of impact. The table is used as a guide when considering size and scale, geographic extent, and duration and reversibility to determine the magnitude of project impact on the receptors on a scale of large, medium, small, or negligible. In rating the magnitude of impact on character areas, a degree of professional judgment is used.

Table 5-6 Matrix for Combining Magnitude Components

Size and Scale Rating	Geographic Extent Rating				Duration/Reversibility Rating
	Large	Medium	Small	Negligible	
Large	Large	Large	Large	Negligible	**Poor**
	Large	Large	Medium	Negligible	**Fair**
	Large	Medium	Small	Negligible	**Good**
Medium	Large	Medium	Medium	Negligible	**Poor**
	Large	Medium	Small	Negligible	**Fair**
	Medium	Small	Small	Negligible	**Good**
Small	Large	Medium	Small	Negligible	**Poor**
	Medium	Small	Small	Negligible	**Fair**
	Small	Small	Small	Negligible	**Good**
Negligible	Negligible	Negligible	Negligible	Negligible	**Poor**
	Negligible	Negligible	Negligible	Negligible	**Fair**
	Negligible	Negligible	Negligible	Negligible	**Good**

Note: The ratings in the unhighlighted boxes are the magnitude of impact results, after combining the size and scale rating, the geographic extent rating, and the duration/reversibility rating.

5.1.2.4 Overall Impact on Ocean, Seascape, and Landscape Character Areas

The BOEM SLVIA Methodology (BOEM 2021a) includes a matrix for combining receptor (character area) sensitivity and magnitude of impact ratings to guide professional determination of the overall SLIA impact level that is "recommended but [is] subject to change in consideration of individual project circumstances" and is scored on a scale of minor, moderate, and major (BOEM 2021a).

The matrix in Table 5-7 is used as a guide for combining sensitivity and magnitude; however, a degree of professional judgment is used to determine if the nature of the sensitivity factors actually justifies adjusting to a higher or lower impact level from the magnitude of impact level. Adjustments are supported with written rationales. The definitions of major, moderate, minor, and negligible are defined in Table 5-8.

Table 5-7 Matrix for Combining Sensitivity and Magnitude Components to Identify Impact Level

Magnitude Rating	Sensitivity Rating		
	High	Medium	Low
Large	Major	Major	Moderate
Medium	Major	Moderate	Minor
Small	Moderate	Minor	Minor
Negligible	Negligible	Negligible	Negligible

Table 5-8 Impact Level Descriptions for Ocean, Seascape, and Landscape

Impact Level	Description
Major	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 to the unit's features, elements, or key qualities. The concern for change (susceptibility/value) to the character unit is high.
Moderate	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 to 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.
Minor	The project would introduce features that may have noticeable 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 somewhat inconsistent with the character of the unit, which may have minor to medium negative effects to the unit's features, elements, or key qualities, but the unit's features, elements, or key qualities have low susceptibility or value.
Negligible	Very little or no effect on ocean/seascape/landscape unit features, elements, or key qualities, either because unit has minimal visibility/susceptibility or lacks value (distinctive character or key features/elements/qualities).

5.2 SLIA Results

Section 5.2.1 presents the results of the SLIA baseline data collected to determine the character areas within the study area. Section 5.2.2 presents the analysis of those character areas in terms of sensitivity, magnitude of impact, and overall impacts. Section 5.2.3 presents a summary of these findings.

5.2.1 Ocean, Seascape, and Landscape Character Assessment

Section 5.2.1.1 presents the data and maps used to establish a defined list of character areas within the study area. Section 5.2.1.3 presents the definitions, contextual descriptions, and example photographs of each character area identified.

5.2.1.1 Baseline Data Collection

This section reviews the desktop study and research performed within the GAA, as identified in Chapter 4, along with dates of the field surveys. This involved a review of relevant background documents and spatial (mapped) information. The analysis of various sources and types of data assists in the identification of areas of common character, the mapping of ocean, seascape, and landscape character types and areas, along with the preparation of initial descriptions of natural and cultural influences. Descriptions and visualizations of the physiographic region, important scenic resources, publicly accessible visual and cultural sites, and field survey information are provided in the following subsections.

The Biden administration has made it a priority to offset impacts on underserved populations of the country, known as communities with EJ concerns. Therefore, communities with EJ concerns have been identified within the GAA and overlaid on the character area maps to identify their locations and determine visual impacts on these communities. See the Communities with EJ Concerns section within Section 5.2.1.1.

Ecoregions

The U.S. Environmental Protection Agency (EPA) Level IV ecoregions of New York and New Jersey were used to inform descriptions of the existing seascape or landscape character within the GAA. Ecoregions provide a useful starting point for describing seascape or landscape character at a regional level because they are defined based on elements of landform, vegetation, water, and cultural modifications (defined as human and/or man-made modifications to the landscape). Level IV ecoregions of New York and New Jersey that cross the GAA include Cape Cod and Long Island, Pine Barrens, Barrier Islands and Coastal Marshes, Inner Coastal Plain, Southern New England Coastal Plains and Hills, and Long Island Sound Coastal Lowlands. The landscape conditions of each ecoregion are discussed in the following subsections.

Cape Cod/Long Island

The Cape Cod/Long Island (84a) Atlantic Coastal Pine Barrens ecoregion is a transitional coastal plain with a mild climate (Bryce et al. 2010). Sandy beaches, grassy dunes, sheltered bays, salt marshes, and oak–pine forests are characteristic features found across Long Island. The elevation is low, with little variation and soils are sandy and well-draining. Key elements that distinguish the Cape Cod/Long Island Atlantic Coastal Pine Barrens ecoregion from other coastal ecoregions across the United States are its maritime climate, areas of scrubby pine and oak forests, kettle ponds that indicate the glacial history of the islands, and the unique habitats found within the marshes, swamps, bogs, and sand dunes that are present across the islands.

Portions of the GAA that are within this ecoregion include the central and eastern portions of Long Island.

Pine Barrens

The Pine Barrens (84b) ecoregion is characterized by gently undulating, low-elevation coastal plain and distinguished by sandy, droughty, infertile soils, frequent fires, and extensive pine-oak woodlands (Woods et al. 2007). Streams in this ecoregion are fed by a large aquifer of fresh water supplied by precipitation. In upland areas, vegetation type consists of low-diversity pine–oak forests and include pitch pines, shortleaf pines, and various oak species. Low-lying areas, depressions, and water courses support white cedar swamps, swamp hardwoods, pitch pine lowlands, and mineral-poor fens. Cultural modifications in this ecoregion include residential and commercial development and agriculture.

Portions of the GAA that are within this ecoregion include mostly inland New Jersey and some of northern coastal New Jersey between Asbury Park and Point Pleasant Beach.

Barrier Islands and Coastal Marshes

The Barrier Islands and Coastal Marshes (84c) ecoregion is composed of beaches, dunes, barrier islands, salt marshes, bluffs, and bays (Bryce et al. 2010), along with spits, hooks, low terraces, and lagoons (Woods et al. 2007). The primary dune zone supports dune grass, sea rocket, saltwort, and seaside spurge. The secondary dune zone supports low shrub thickets composed of bayberry, beach plum, shadbush, mountain laurel, and highbush blueberry. American holly, black gum, red cedar, pitch pine, dwarf beech, sassafras, and lianas of roundleaf sweetbriar occur in moist, protected hollows and swales on barrier islands and narrow peninsulas. Salt marshes are dominated by smooth and salt-meadow cordgrass. Barrier islands have become a popular tourist destination and recreation site. They also serve as important nesting sites for several endangered or threatened birds and protect the mainland from erosion by oceanic storms.

Portions of the GAA that are within this ecoregion include most of the eastern coastline of New Jersey, and the southern coastline of Long Island.

Southern New England Coastal Plains and Hills

The Southern New England Coastal Plains and Hills (59c) ecoregion consists of low, rolling topography and a mix of woodland, rural residential, urban, and suburban centers (Bryce et al. 2010). The landforms of the ecoregion include irregular plains with relief of 100–300 ft (31–984 m). Numerous till-covered bedrock hills rise above the valleys and outwash plains. Historically, forests were dominated by a mix of oaks, American chestnut, hickories, and some hemlock and white pine.

A portion of the GAA that is within this ecoregion is the southern tip of Manhattan, New York.

Inner Coastal Plain

The Inner Coastal Plain (84d) ecoregion is characterized by undulating plains dominated by agriculture, urban development, and transportation infrastructure (Woods et al. 2007). Native upland vegetation previously consisted of mixed oak and beech oak forests. However, very little mature upland forest remains, because it has been cleared for development or conversion to agriculture. Lowland areas include natural vegetation within marshlands, such as cattails and wild rice. Today, the uplands are primarily used for residential and agricultural purposes. Primary products include corn, wheat, soybeans, vegetables, dairy, and poultry.

Portions of the GAA that are within this ecoregion include inland New Jersey and a small coastal portion of northern New Jersey between Sea Bright and Allenhurst.

Long Island Sound Coastal Lowland

The Long Island Sound Coastal Lowland (59g) ecoregion is characterized by flat to irregular plains, coastal beaches, bays, tidal flats, and low-gradient streams. It has one of the mildest climates of New England due to its location on the coast (Bryce et al. 2010). Dominant tree species include tulip tree, black and red oak, beech, black birch, and red maple, with an understory dominated by eastern dogwood. Sweet gum and pin oak occur in wetter areas. The ecoregion is highly urbanized, leaving little of the original forest. There are small parks and preserves with reduced species diversity.

A portion of the GAA that is within this ecoregion is the western portion of Long Island.

Important Scenic Resources

Important scenic resources include resources that have been identified by national, state, or local governments, organizations, and/or Native American Tribes as sites that are afforded some level of recognition or protection. Avoiding or minimizing impacts on these resources is an important consideration in the planning stages of a project. The important scenic resources that occur within the GAA include:

- National natural landmarks
- State- and/or locally designated scenic areas and overlooks
- Scenic areas of local significance
- State-designated scenic overlooks
- National wildlife refuges
- State wildlife management areas
- National parks
- State parks
- State nature and historic preserve areas
- National forests
- State forests
- National recreation areas and/or seashores
- State beaches
- National or state-designated wild, scenic, or recreational rivers
- Highways designated or eligible as scenic
- National historic, recreation, or heritage trails
- State fishing and boating access sites
- Lighthouses (not National Register of Historic Places [NRHP] listed or state historic listed)
- Public beaches
- State and federal EJ areas
- Ferry routes (these occur across multiple states)
- Seaports (commercial maritime facilities)

Publicly Accessible Visual and Cultural Sites

Datapoints from the NRHP and BOEM were obtained to map within the project GAA (Figures 5-1 and 5-2), the 853-ft (260-m) APVI (Figures 5-3 and 5-4), and the 1,312-ft (399.9-m) APVI (Figures 5-5 and 5-6). These data include national historic landmarks (NHLs), places listed in the NRHP, and other identified publicly accessible places, both evaluated and unevaluated. The data are shown in context with Tribal lands, KOPs, and the project viewshed. The numbered KOPs on the maps can be cross-referenced with Table 6-4 for a detailed list of the KOPs chosen for this project.

See Appendix I for a detailed analysis on the cultural resources and historic properties within the GAA.

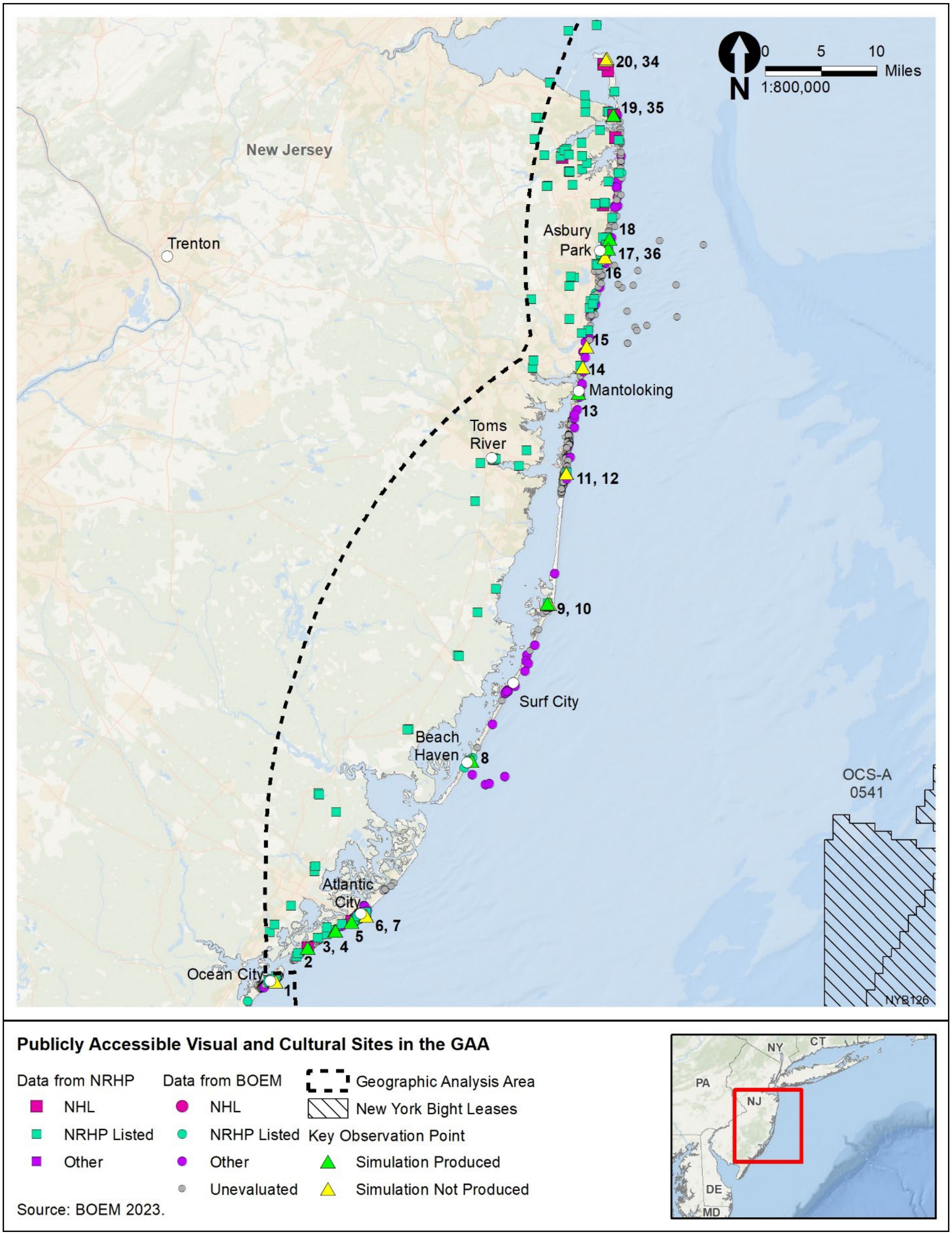


Figure 5-1 Publicly Accessible Visual and Cultural Sites in the GAA, New Jersey

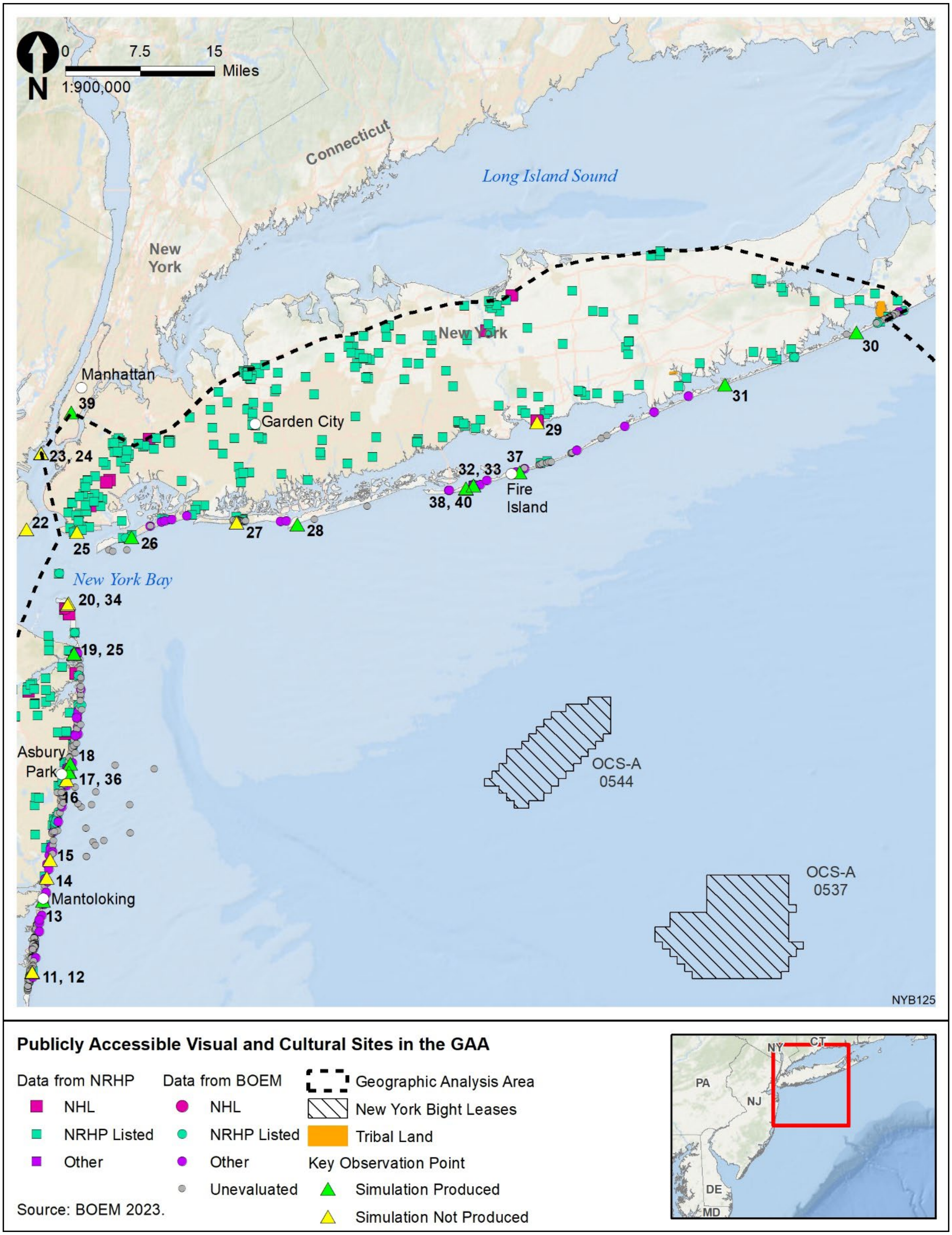


Figure 5-2 Publicly Accessible Visual and Cultural Sites in the GAA, New York

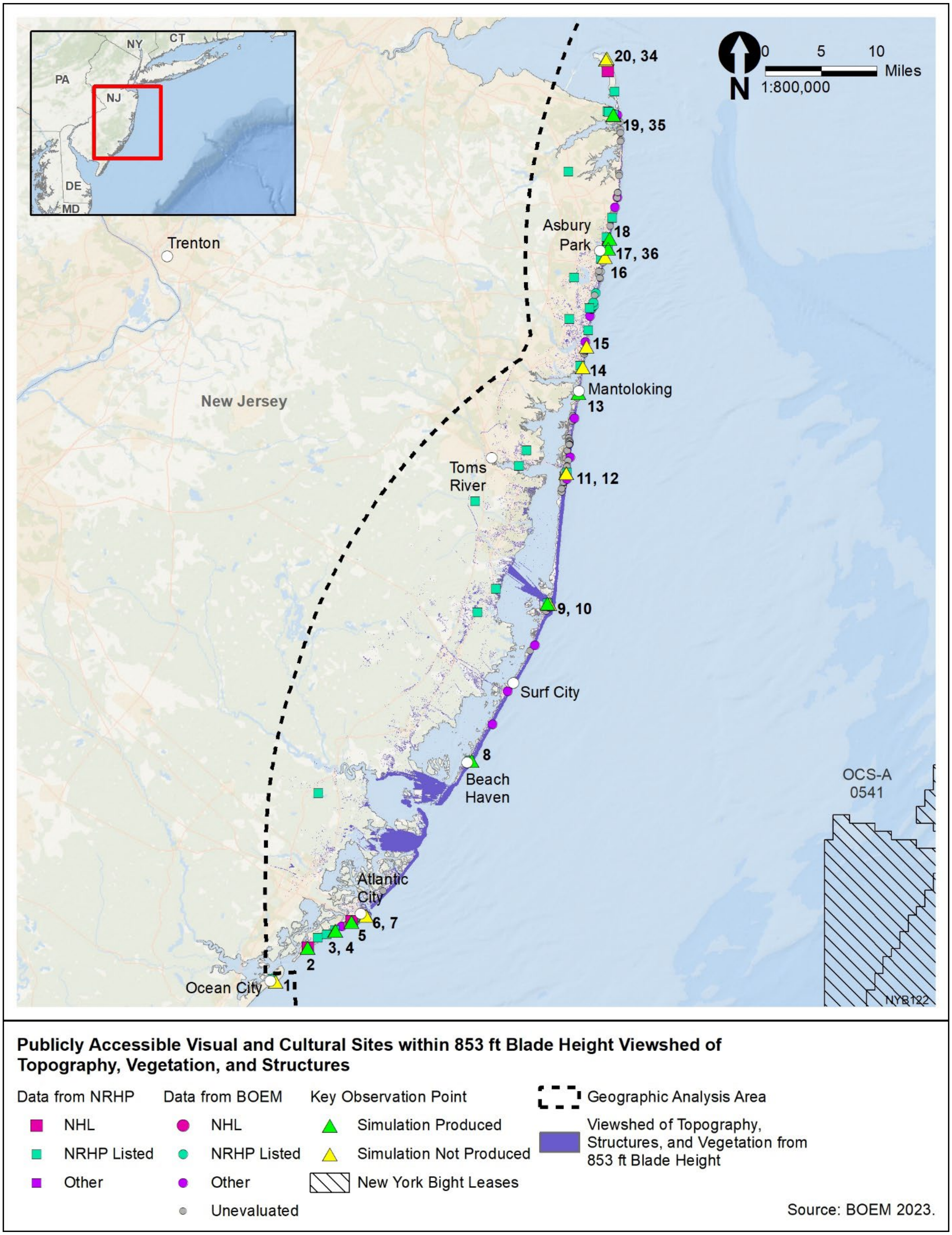


Figure 5-3 Publicly Accessible Visual and Cultural Sites in the 853-ft (260-m) APVI, New Jersey

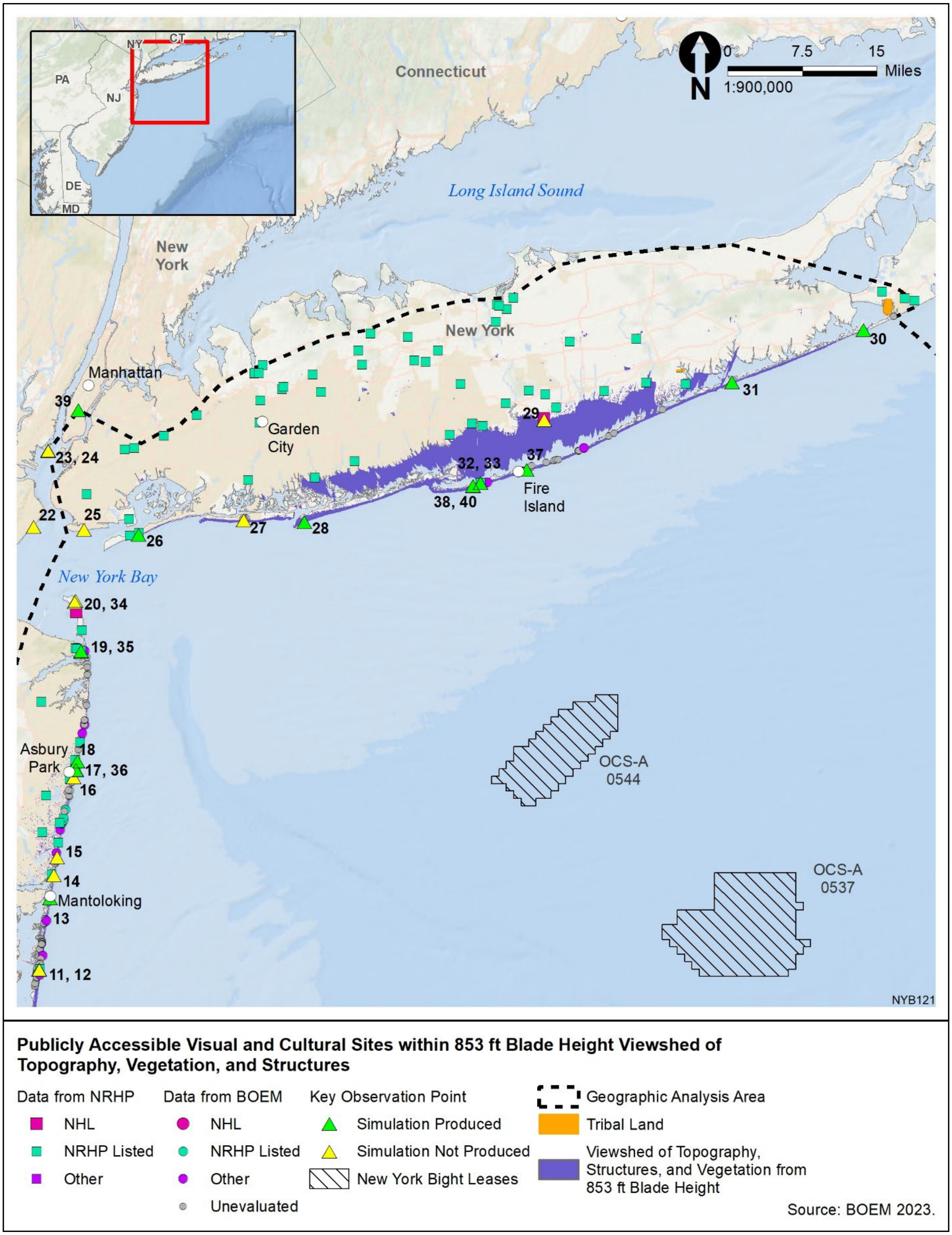


Figure 5-4 Publicly Accessible Visual and Cultural Sites in the 853-ft (260-m) APVI, New York

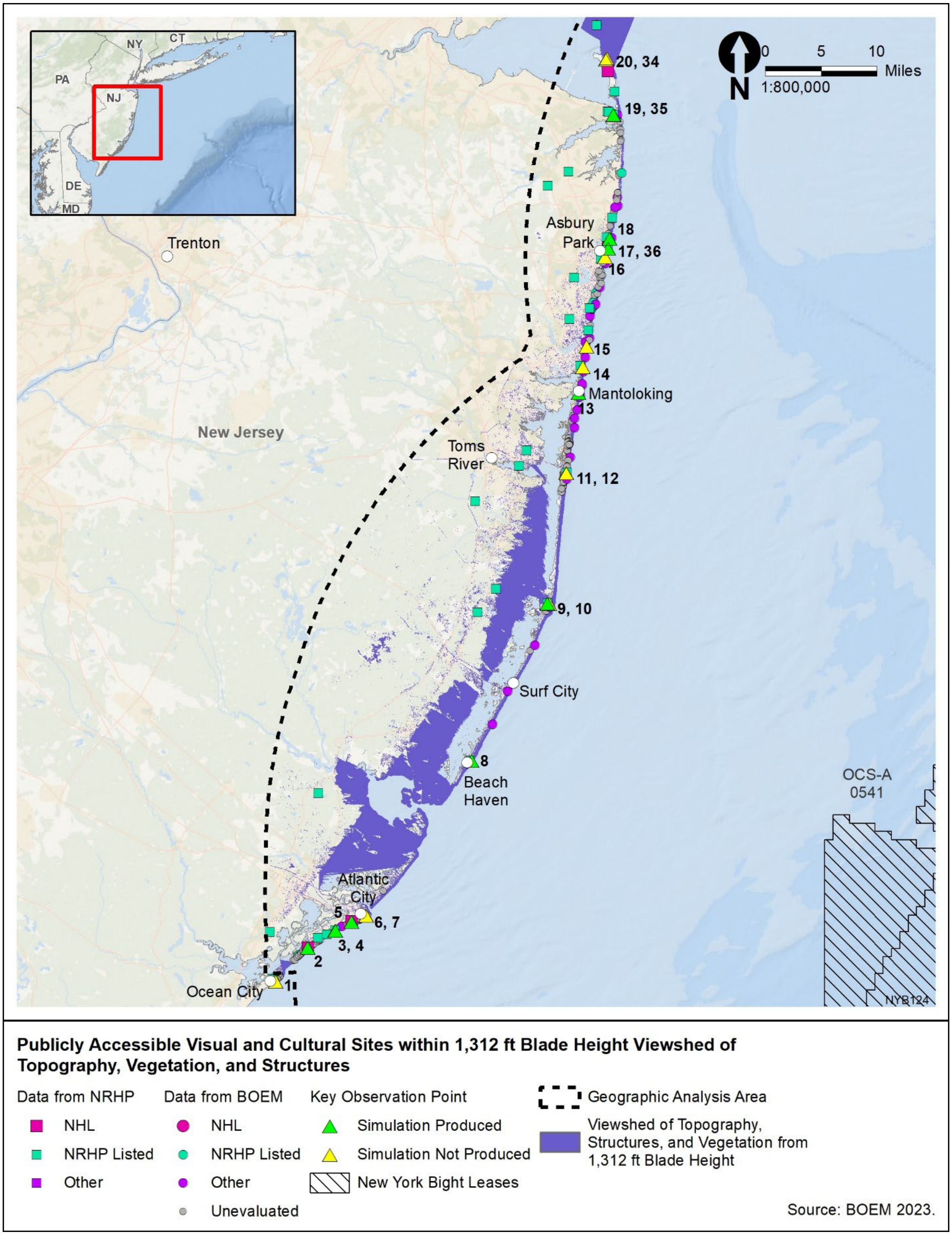


Figure 5-5 Publicly Accessible Visual and Cultural Sites in the 1,312-ft (399.9-m) APVI, New Jersey

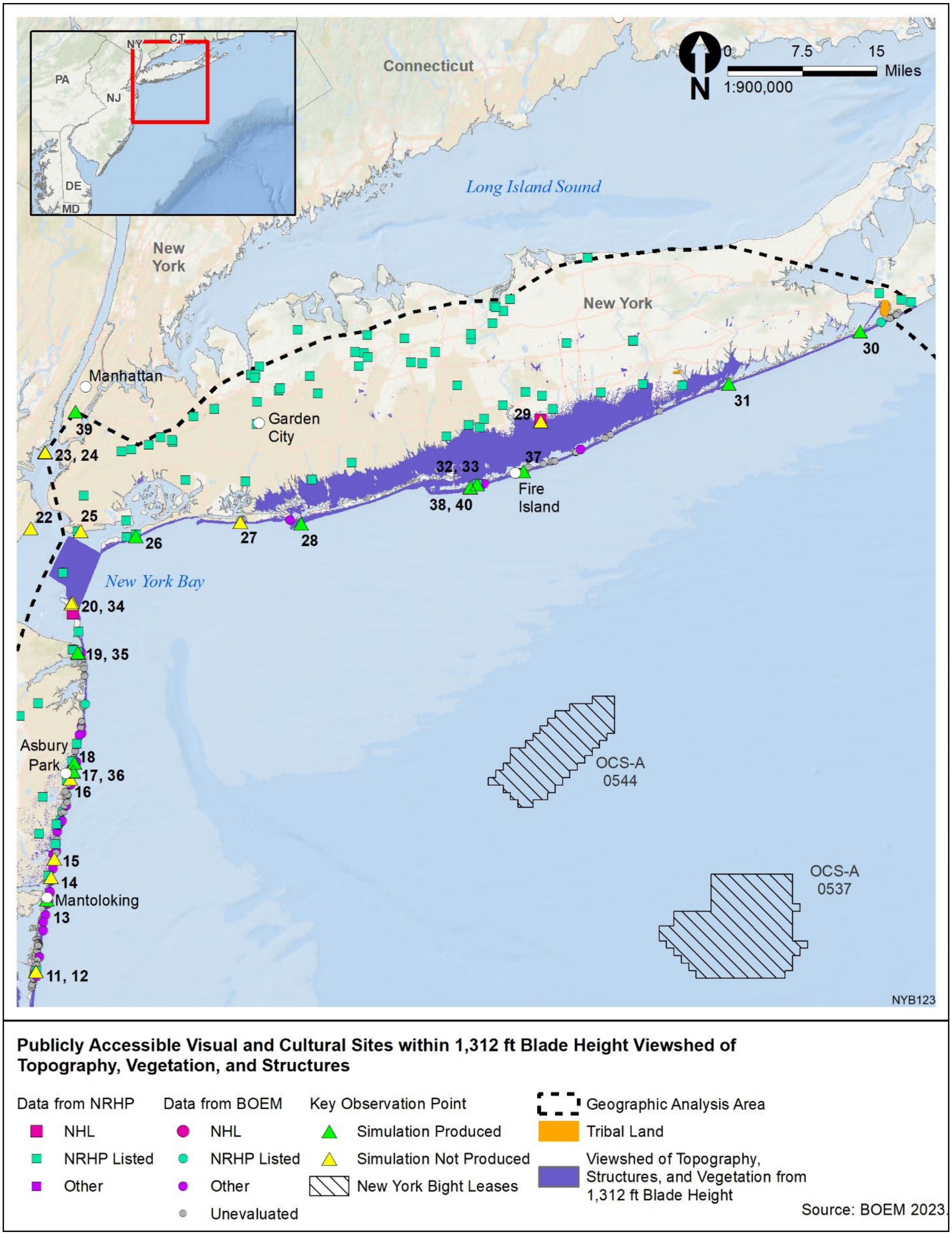


Figure 5-6 Publicly Accessible Visual and Cultural Sites in the 1,312-ft (399.9-m) APVI, New York

Communities with EJ Concerns

The NY Bight PEIS Volume I, Section 3.6.4, considers Executive Order (E.O.) 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,"[4] which requires that

> "*each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."*

When determining whether environmental effects are disproportionately high and adverse, agencies are to consider whether there is or will be an impact on the natural or physical environment that significantly and adversely affects a minority population, low-income population, or Native American Tribe, including ecological, cultural, human health, economic, or social impacts; and whether the effects appreciably exceed those on the general population or other appropriate comparison group (CEQ 1997).

E.O. 12898 directs federal agencies to actively scrutinize the following issues with respect to EJ as part of the NEPA process (CEQ 1997):

- The racial and economic composition of affected communities;
- Health-related issues that may amplify project effects to minority or low-income individuals; and
- Public participation strategies, including community or tribal participation in the NEPA process.

New York State EJ Definitions

The State of New York identifies a population with environmental justice concerns as U.S. Census block groups that meet or exceed one or more of the following criteria from New York Codes, Rules, and Regulations, Title 6, Section 487.3:

- At least 51.1% of the population in an urban area reported themselves to be members of minority groups; or

[4] On April 21, 2023, President Biden signed E.O. 14096, "Revitalizing Our Nation's Commitment to Environmental Justice for All." This E.O. further embeds "environmental justice agenda into the work of federal agencies to achieve real, measurable progress that communities can count on." That E.O. and subsequent guidance will be incorporated into the Final PEIS.

- At least 33.8% of the population in a rural area reported themselves to be members of minority groups; or
- At least 23.59% of the population in an urban or rural area had household incomes below the federal poverty level.

Populations with EJ concerns within the State of New York are present within the GAA as shown in Figure 5-7. Within the GAA, they are clustered around larger cities and towns. Within the APVI in the State of New York, they are mostly clustered along the coastline (Figure 5-9); some are situated inland for the 1,312-ft (399.9-m) alternative's viewshed (Figure 5-11).

State of New Jersey EJ Definitions

Following New Jersey Statutes Annotated 12:1D-157, the State of New Jersey identifies a community with EJ concerns as a U.S. Census block group that meets one or more of the following criteria (NJDEP 2021):

- At least 35% of households qualify as low-income households (at or below twice the poverty threshold, as determined by the U.S. Census Bureau);
- At least 40% of residents identify as minority or as members of a state-recognized tribal community; or
- At least 40% of the households have limited English proficiency (without an adult that speaks English "very well" according to the U.S. Census Bureau). For the purposes of this analysis, limited English proficiency is defined as meeting the U.S. Census criteria for linguistic isolation, specifically households where no one over the age of 14 speaks only English or English very well (New Jersey DEP 2023).

Populations with EJ concerns in the New Jersey portion of the GAA are clustered around larger cities and towns, as shown in Figure 5-7. Within the APVI in New Jersey, they are mostly clustered along the coastline (Figure 5-8), with some minor overlap inland for the 1,312-ft (399.9-m) model (Figure 5-10).

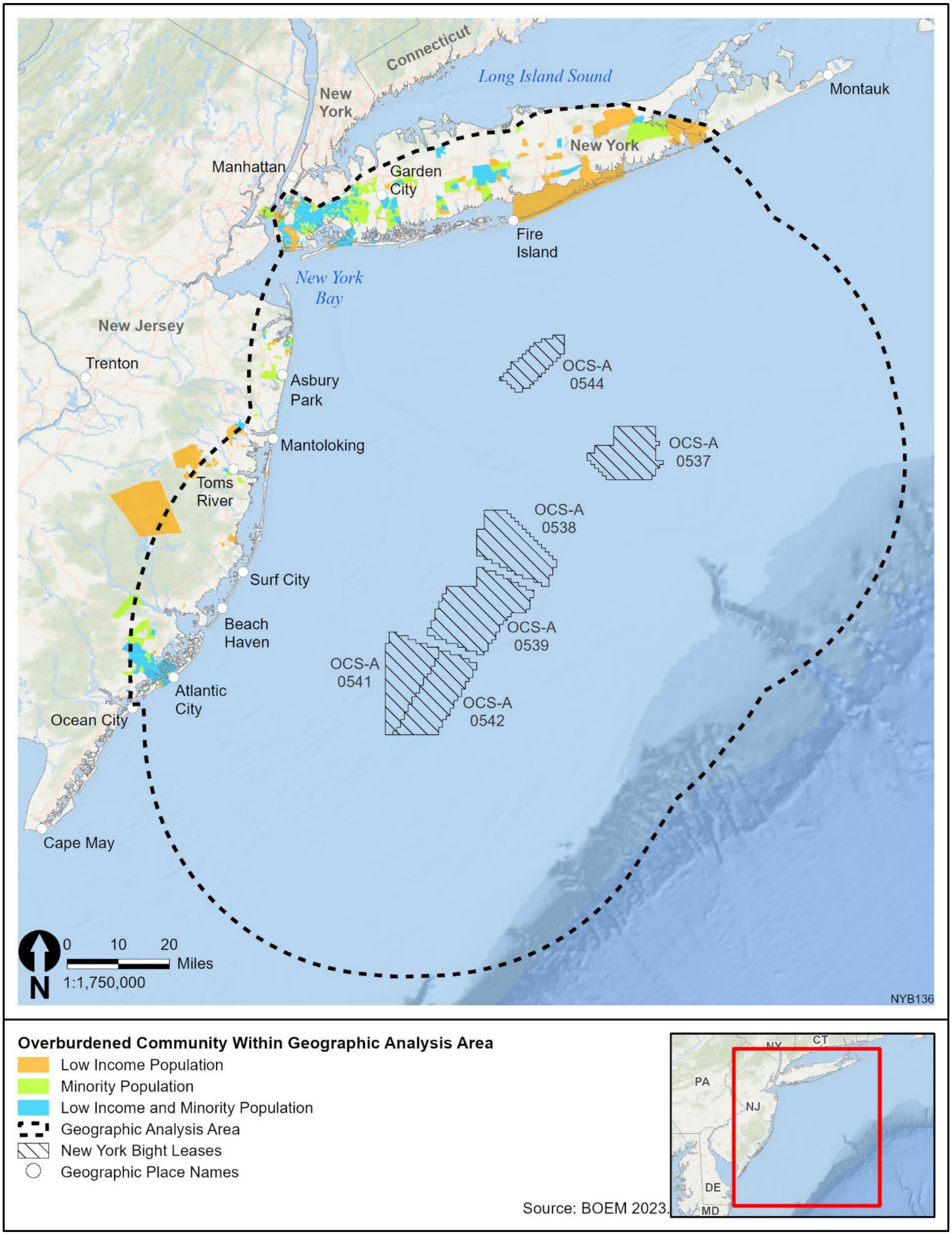


Figure 5-7 Communities with EJ Concerns that Intersect the GAA

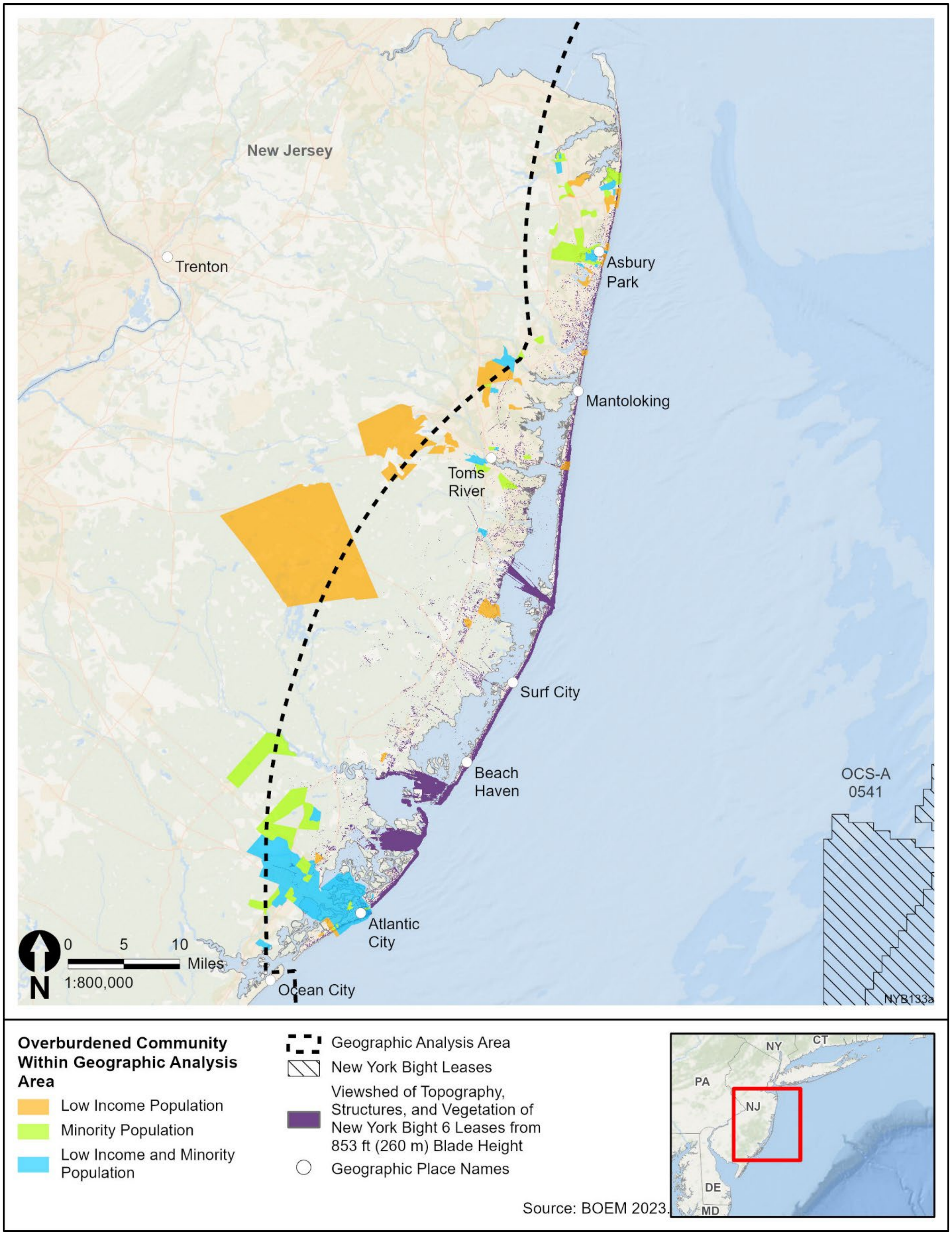


Figure 5-8 Communities with EJ Concerns in Relation to the 853-ft (260-m) APVI in New Jersey

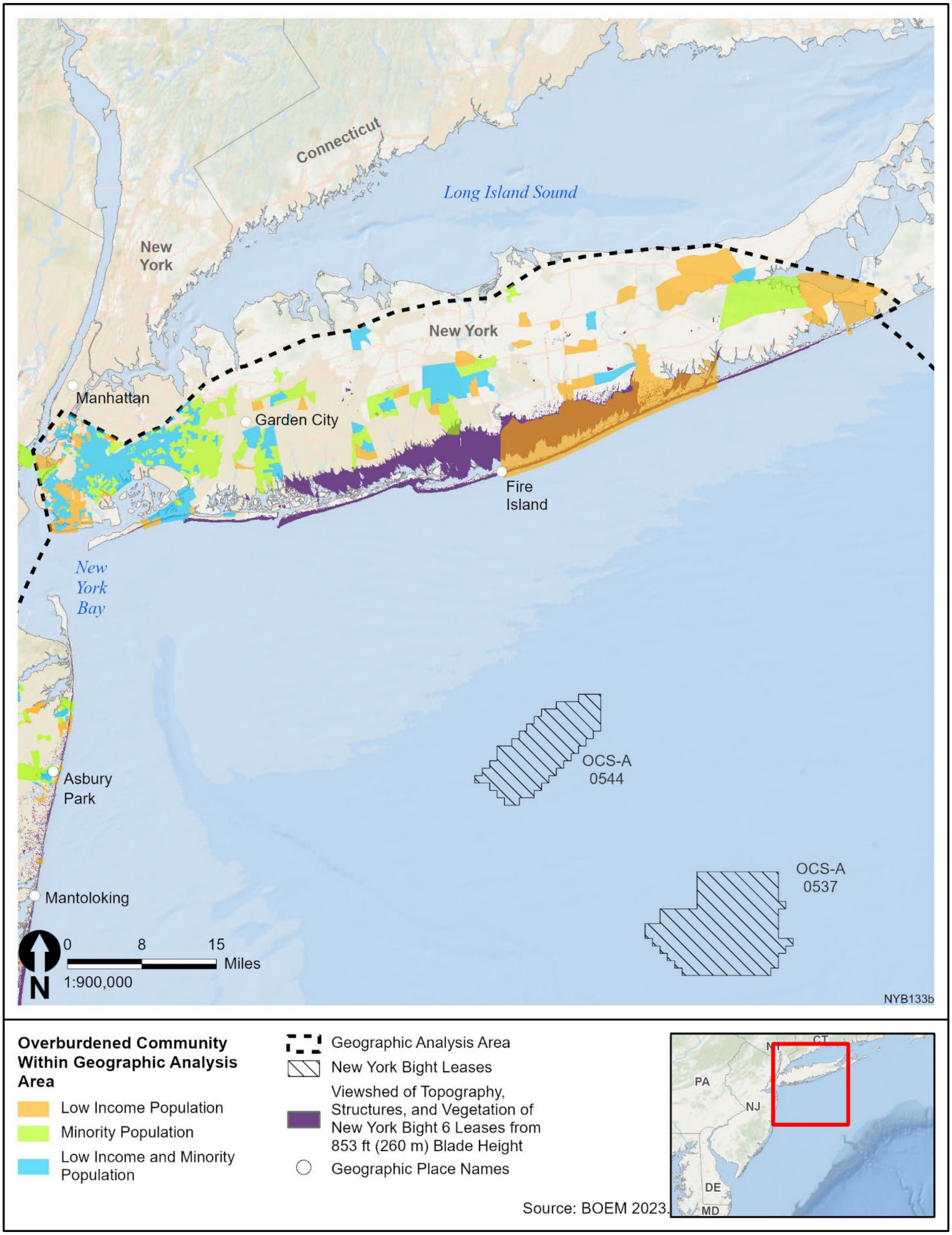


Figure 5-9 Communities with EJ Concerns in Relation to the 853-ft (260-m) APVI in New York

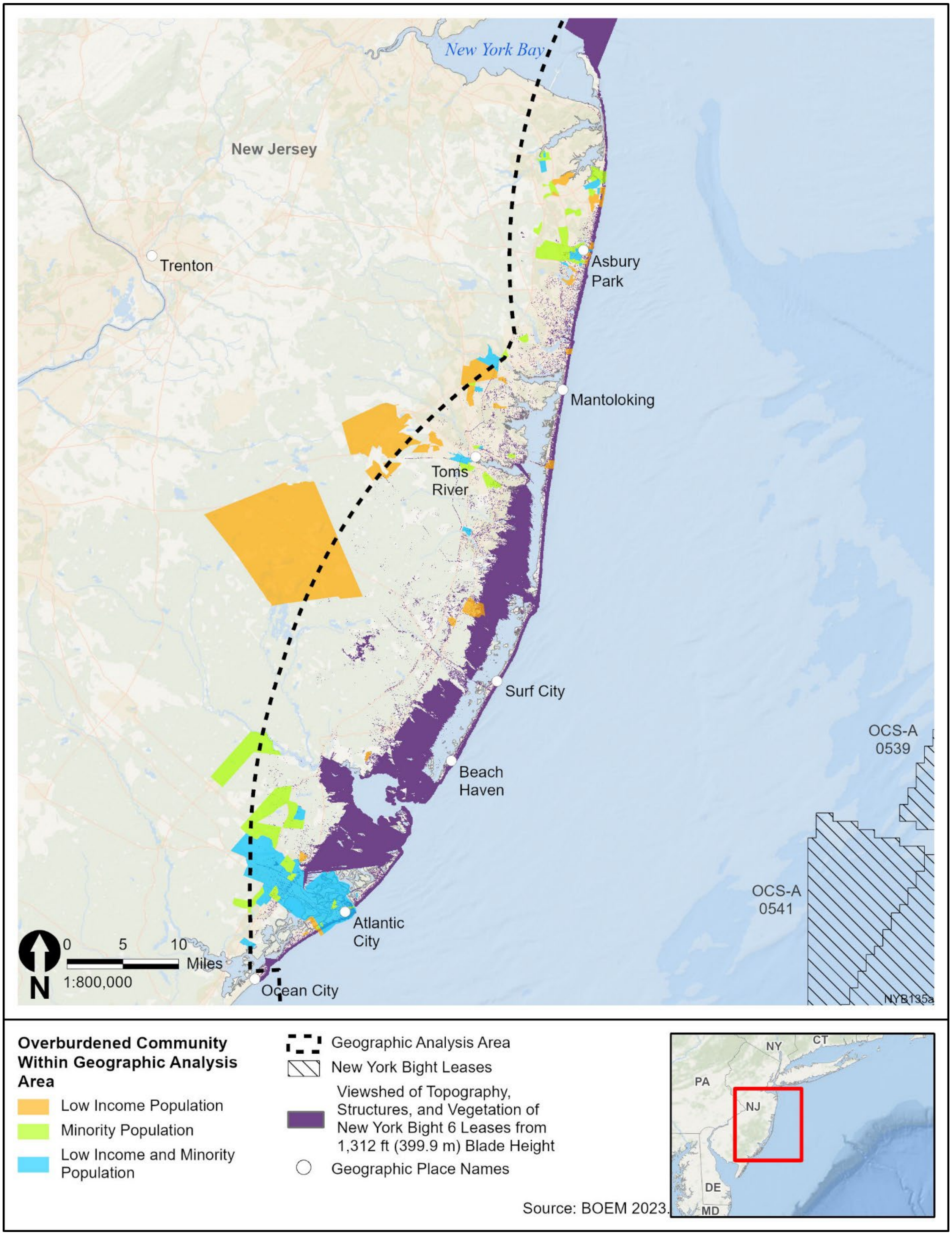


Figure 5-10 Communities with EJ Concerns in Relation to the 1,312-ft (399.9-m) APVI in New Jersey

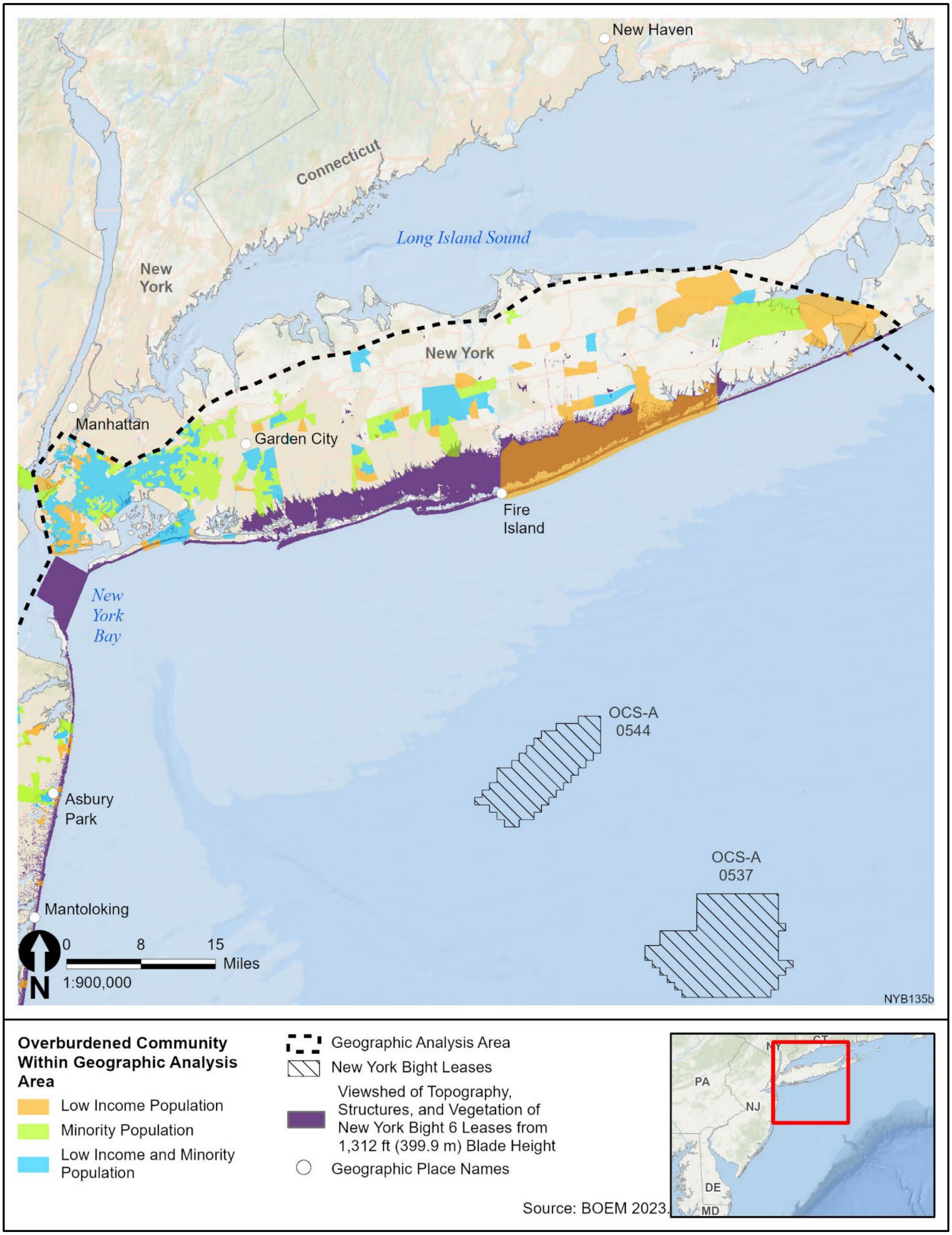


Figure 5-11 Communities with EJ Concerns in Relation to the 1,312-ft (399.9-m) APVI in New York

Tables 5-9 and 5-10 identify the communities with EJ concerns, broken out into three separate categories, that are within the 853-ft (260-m) APVI (Table 5-9) and the 1,312-ft (399.9-m) APVI (Table 5-10). Figures 5-7 through 5-11 correspond to the tables. Overall, a very small percentage of the areas within the GAA classified as either "Minority," or "Low Income and Minority" are visible within either of the APVIs. Approximately 20% of the low-income areas in the GAA are in the 853-ft (260-m) APVI, while 25% are within the 1,312-ft (399.9-m) APVI.

Table 5-9 Communities with EJ Concerns with View of Lease Areas' 853-ft (260-m) WTGs Alternative

Overburdened Community	Number of Overburdened Communities within 853-ft Affected Area	Distance to Nearest Turbine Lease Area, mi (km)	Total Area of Communities with EJ Concerns, mi^2 (km^2)	Total Area of Communities with EJ Concerns in Viewshed, mi^2 (km^2)	Percent of Area of Communities with EJ Concerns within the Viewshed
Low Income	16	24.1 (38.7)	226.45 (586.50)	45.67 (118.28)	20.17%
Minority	16	28.9 (46.5)	139.54 (361.42)	1.18 (3.06)	0.85%
Low Income and Minority	42	32.9 (53.0)	148.50 (384.62)	0.40 (1.04)	0.27%

Table 5-10 Communities with EJ Concerns with View of Lease Areas' 1,312-ft (399.9-m) WTGs Alternative

Overburdened Community	Number of Overburdened Communities Within 1,312-ft Affected Area	Distance to Nearest Turbine Lease Area, mi (km)	Total Area of Communities with EJ Concerns, mi^2 (km^2)	Total Area of Communities with EJ Concerns in Viewshed, mi^2 (km^2)	Percent of Area of Communities with EJ Concerns within the Viewshed
Low Income	24	24.0 (38.7)	226.45 (586.50)	59.72 (154.67)	26.37%
Minority	23	24.0 (38.7)	139.54 (361.42)	1.53 (3.96)	1.10%
Low Income and Minority	50	24.1 (38.9)	148.50 (384.62)	1.50 (3.88)	1.01%

Field Survey

As part of the KOP identification process, the field surveys were also used to ground truth some of the preliminary character areas that were noted in the desktop studies. During the field surveys, field forms were used to document existing scenic character areas within the GAA to understand the physical qualities and attributes that make up the character and how they relate to each other.

5.2.1.2 Character Area Classification

After the baseline data collection and field surveys were completed, the character area classifications were determined and mapped.

The GAA has three overall categories of character areas: ocean, seascape, and landscape. Ocean character areas (OCAs) are areas within open water 3.0 NM (3.45 mi; 5.5 km) out from the coastline and extends 200 NM (230 mi; 321.87 km) to the outer boundary of the U.S. Exclusive Economic Zone. Seascape character areas (SCAs) are areas of coastal landscape and adjoining areas of open water, within which there is shared intervisibility between land and sea; they include an area of sea (the seaward component), a length of coastline (the coastline component), and an area of land (the landward component; BOEM 2021a). SCAs typically, but not always, have distinct views of the beach and/or ocean, or another salty waterbody such as a bay or inlet. Landscape character areas (LCAs) are inland areas that do not include the seacoast and typically do not maintain a view of the ocean. However, in some cases, “LCAs may have visibility of the proposed offshore facility, from mountains or hilltops, for example, or from areas behind dunes or other screening elements” (BOEM 2021a).

Each character area category is further broken down to delineate visual features, uses of the area, and overall sense of place. SCAs and LCAs have significant overlap in typologies (they can both be urban, residential, natural, etc.); the key distinction is whether the ocean is visible, because that strongly impacts the relationship between forms, function, and viewers. Table 5-11 shows each of the character areas and the levels each one falls within. The levels are defined as follows:

- **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. In the nomenclature in Table 5-11, Level 2 is specific to the seascape character, which is split into two discrete character types 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. 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 with unique qualities that contribute to a sense of place. Within Level 3, character areas 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 5-11 Summary of all Characters (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 Residential
		Bayside Urban
		Bayside Waterbodies
		Seascape Urban
		Seascape Residential
		Bayside Natural Wetland
		Bayside Natural Upland
		Bayside Recreation
		Bayside Industrial
		Bayside Industrial Resource
		Bayside Military Site
		Bayside Commercial Park
	Oceanside	Oceanside Recreation
		Oceanside Residential/Commercial
		Oceanside Urban
		Oceanside Beach
		Nearshore Ocean
Landscape Character	N/A	Inland Urban
		Inland Commercial Park
		Inland Suburban/Exurban Residential
		Inland Rural
		Inland Recreation
		Inland Natural Area
		Inland Industrial
		Inland Industrial Resource
		Inland Military Site
		Inland Agriculture

Figure 5-12 shows the delineated character areas within the GAA that have been identified through desktop studies, field verification, analysis through aerial imagery, and the detailed process discussed in Section 5.1.1. Appendix C includes five map series to show the character area delineations in greater detail. Series 1 shows Figure 5-12 broken down into greater detail. Series 2 shows the character areas in relation to the 853-ft (260-m) APVI, and Series 3 shows the character areas in relation to the 1,312-ft (399.9-m) APVI. Series 4 and 5 are the same as Series 2 and 3, but with the addition of the historic-like areas and an overlay showing the locations of communities with EJ concerns.

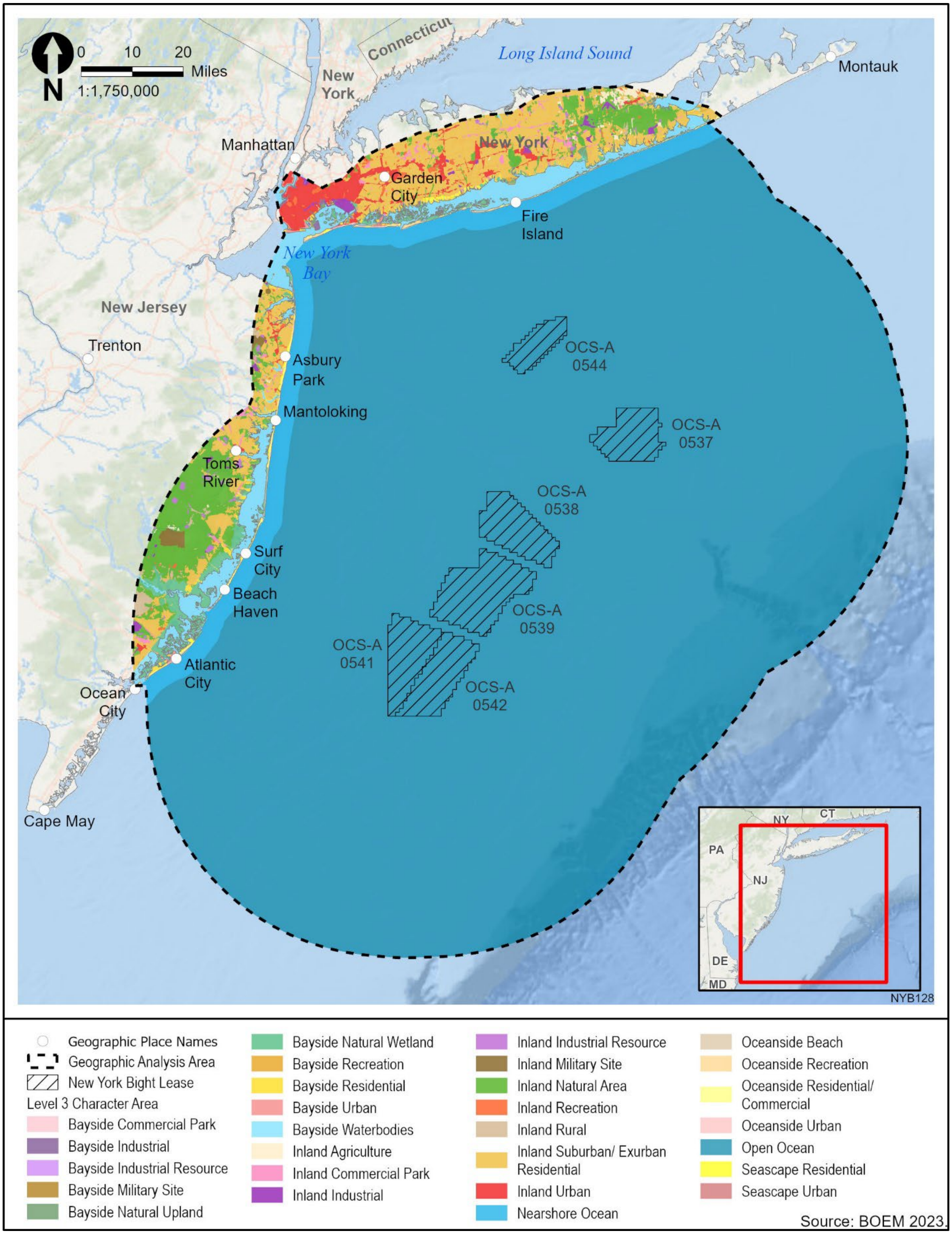


Figure 5-12 Character Areas within the GAA—Overview

Each character area is defined and described based on the context in which that area is distributed throughout the GAA, as well as its typical defining features and observed activities. Sensitivity (in terms of value and susceptibility) of each character area is included in the description for context; however, sensitivity is part of the Project Impacts Analysis on Character Areas (Section 5.2.2).

Level 1 Ocean Character

The jurisdictional ocean boundary along the Atlantic Coast north of Florida begins offshore from the coastline at 3.0 NM (3.45 mi; 5.5 km) and extends 230 mi (200 NM) to the outer boundary of the U.S. Exclusive Economic Zone. Ocean character is dominated by the presence of open water within the fore- and/or middle ground of the view, and ultimately along the horizon. The shape of the water can vary—from flat and still to rolling, wavy, and white-capped—depending on weather conditions and time of day. Human elements, such as ships of various sizes, lighthouses, buoys, and other infrastructure can be seen at various distances throughout the study area. However, the emphasis of the view is consistently on the overall flatness and varying colors of the water.

Level 2 Ocean Character Type

Level 2 is not represented in ocean or landscape character, only in seascape.

Level 3 Ocean Character Area—Definitions and Contextual Descriptions

Open Ocean

Definition: The open ocean character area primarily includes open waters of the Atlantic Ocean that are unbounded by landforms. Flat, horizontal lines of the ocean dominate this view. Atmospheric conditions and tidal patterns can produce a range of views, but overall they remain generally flat and vast. Within this character area, human-made features—such as buoys, lighthouses, ships, boats, and other marine infrastructure—can occur anywhere between the foreground and horizon line. Buildings and other onshore infrastructure may also be visible at great distances at the far extremes of the horizon.

Sensitivity: The open ocean is highly sensitive to the proposed project based on its susceptibility and value:

- **Susceptibility**: The open ocean OCA is highly susceptible to change in character by offshore renewable energy development due to its pristine, flat, vast, and minimal character.
- **Value**: The open ocean OCA is highly valued due to the high scenic qualities, wildness, tranquility, and locally held values when within the OCA. The OCA also contributes to

the scenic value of onshore seascape and landscape character areas as adjacent viewable scenery.

Contextual Description: The open OCA is consistent throughout the study area in terms of its dominant forms and horizons (Figure 5-13). Human activities change significantly, however. Inside of and immediately surrounding Lower New York Bay, there is an increase in marine infrastructure such as lighthouses and buoys. Freighters and other ships such as ferries are frequently seen in the open ocean in the near view and horizon. In this area, the bulk, color, and shape of freighters are imposing, and can even overtake the entire horizon from certain vantage points.

Farther away from New York Bay, in the direction of both Long Island and New Jersey, less shipping activity and infrastructure is visible. Large freight ships are often seen only along the horizon line and farther from New York Bay. In these instances, the freight ships maintain their significant geometric qualities but appear to vary in color due to reflections from the color of the sky along the horizontal line. Other instances of infrastructure exist here periodically, such as large dredging machinery whose angular, wiry shapes can obscure a horizon.

(a) **(b)**

Figure 5-13 Views (a) of Open Ocean in Montauk, New York, and (b) from Navesink Light Station in Highlands, New Jersey

Level 1 Seascape Character

The regions that comprise the seascape character are unified by a view of and relationship to the ocean and other saltwater bodies such as bays, inlets, and sounds, extending 3 NM (3.45 mi; 5.5 km) from the edge of the ocean's coastline into the ocean. These unified areas include oceanside and bayside features, because they are deeply connected visually, ecologically, and recreationally to each other. The land uses of areas that constitute as seascape may vary significantly, but the emphasis of the connectivity between the land and ocean remains an important visual and experiential element across all areas with seascape character.

Beachfront hotels, boardwalks, vacation homes, beaches, marinas, private homes with dock access, seaside amusement parks, and cities along the coastline are seascape character elements that exist in relationship to the activities available at the shoreline. These activities may include sunbathing on the beach, fishing off a pier, walking the boardwalk, dining at a restaurant with a view of the beach, or any other activity that guides viewers' gaze to the water's edge and beyond.

Seascape character is also defined by architectural stylings seen throughout the study area, such as cottage-style homes and Victorian architecture, an emphasis on balconies and large windows overlooking the beach and ocean, wide and flat boardwalks, dunes and dune vegetation, and finely combed sand in urban and residential spaces.

Level 2 Seascape Character Type—Bayside Seascape

The bayside seascape is comprised of areas within the seascape character that maintain a view and direct connection to bays and other related saltwater bodies such as inlets, canals, and harbors, as well as associated features such as marinas, and other rural, residential, or urban developments along the bay and related waterbodies. These areas, however, do not maintain a direct connection to the coastline or ocean itself.

Level 3 Seascape Character Areas—Bayside Seascape Definitions and Contextual Descriptions

Bayside Commercial Park

Definition: Bayside commercial park character areas reflect business districts and commercial areas. They are 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 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. Non-ocean bodies of water may be visible from the premises, but little to no infrastructure or general design of the space and the buildings themselves emphasizes the view of these waterbodies.

***Sensitivity*:** Bayside commercial parks have low sensitivity based on their susceptibility and value:

- **Susceptibility**: Commercial parks are typically characterized by blocky, nondescript built features. This results in low susceptibility to changes in character from the project.
- **Value**: The low scenic quality of commercial parks contributes to the low value associated with the character of these areas.

Contextual Description: This character area occurs along the coast of Brooklyn, within Gravesend Bay and in Belmar, New Jersey along Shark River.

Bayside Industrial

***Definition*:** Bayside industrial areas are adjacent to the bay or other bayside bodies of water that are industrial in nature. They have 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 additional visual weight and blocky patterns to this area. Although they are sometimes connected to residential and urban areas, bayside industrial areas typically lack public access and do not provide views of the ocean and horizon.

Sensitivity: Bayside industrial areas have low sensitivity based on their susceptibility and value:

- **Susceptibility**: Industrial areas are not susceptible to changes to their character from the proposed project because they have similar industrial characteristics such as tall, vertical elements and blocky infrastructure.

- **Value**: The low scenic quality of industrial areas and oftentimes poor condition of the infrastructure contribute to the low values associated with the character of these areas.

***Contextual Description*:** 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 (Figure 5-14).

(a) **(b)**

Figure 5-14 (a) Industrial Area along Nicoll Bay in West Sayville, New York, and (b) Industrial Commercial Fishing Marina in Shinnecock Bay, New York

Bayside Industrial Resource

Definition: Bayside industrial resource areas consist of industrial zones such as wastewater treatment plants, landfills, and quarries. These areas are generally smaller than other industrial facilities, less dependent on large facilities for manufacturing, and frequently visually obscured by vegetation. They are often secluded and obscured behind forested areas. The industrial elements within this category are small in scale and generally consist of low-lying, horizontal flat features, such as retention ponds and mining pits, which may not be visible from public rights-of-way.

Sensitivity: Bayside industrial resource areas have low sensitivity based on their susceptibility and value:

- **Susceptibility**: Industrial resource areas are not susceptible to changes to their character from the proposed project because of their industrial characteristics, such as blocky infrastructure.
- **Value**: The low scenic quality of industrial resource areas contributes to the low value associated with the character of these areas.

Contextual Description: Industrial resource areas occur sporadically, mostly along the mainland coast of 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. These areas tend to be isolated and surrounded by wetlands or forested areas, or are set back significantly from residential and urban areas.

Bayside Military Site

Definition: Bayside military sites within the bayside seascape 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 fences, and railways. Buildings are generally small, square, and nondescript in the traditional industrial style of the early 20th century.

Sensitivity: Bayside military sites are low in sensitivity based on their susceptibility and value:

- **Susceptibility**: Military sites are not susceptible to changes in character from the proposed project because they already have light industrial character, including blocky infrastructure.
- **Value:** Bayside military sites are moderately valued because they have some forested areas that contribute to the scenic qualities and as well as bayside elements like docks and piers.

Contextual Description: A large military site exists near Leonardo, New Jersey, within Sandy Hook Bay.

Bayside Natural Upland

Definition: Bayside natural upland areas are characterized by upland forests, shrubland, and grasses. They occur within natural or natural-appearing spaces on islands of non-ocean waterbodies, and on adjacent bayside upland areas on the mainland and barrier islands. These upland natural areas maintain visual connection to the bay, estuaries, and inlets. They often have trails or other forms of access from the natural areas to the non-ocean bodies of water.

Sensitivity: Bayside natural upland areas are highly sensitive to the proposed project based on their susceptibility and value:

- **Susceptibility**: These areas are very natural in appearance. They have little to no human development or industrial features, which makes them highly susceptible to changes.
- **Value:** Upland areas near or associated with bayside waterbodies are highly valued for their high scenic quality, wildness, and tranquility.

Contextual Description: This character area is common along the coastal edges of the mainland in both New York and New Jersey (Figure 5-15). It typically occurs directly behind, and slightly elevated above, tidal wetlands. Bayside natural uplands are more common in the mainland of southern New Jersey. They can also occur in sufficiently elevated islands and within non-ocean waterbodies and the barrier islands themselves; this is more common within Long Island.

Figure 5-15 Bayside Natural upland Area in the Foreground at Sandy Hook Light in Highlands, New Jersey (Empire Offshore Wind 2023)

Bayside Natural Wetland

Definition: Bayside natural wetlands consist of large swaths of wetlands, marshes, estuaries, mudflats, and islands within the interior inlet or sound and/or on the mainland side of coastal islands. Due to the ever-changing nature of the marsh boundaries, the 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.

***Sensitivity*:** Bayside natural wetlands are highly sensitive to the proposed project based on their susceptibility and value:

- **Susceptibility:** These areas are very natural in appearance. They have little to no human development or industrial features, which makes them highly susceptible to changes.
- **Value:** Wetland areas near or associated with bayside waterbodies are highly valued for their high scenic quality, wildness, and tranquility.

Contextual Description: From Ocean City north to Barnegat Lighthouse, a significant portion of the area between the mainland and the barrier islands is classified as bayside natural area wetlands (Figure 5-16). The dominant view consists of a patchwork mosaic of open water, trees and shrubs on small islets, and emergent, reedy aquatic vegetation. When situated at or near the water level, horizon lines and distant views are frequently obscured by the height of this vegetation. The sinuosity of navigable openings within the marshes emphasizes these views and further reduces ability to see beyond the foreground. This character type is almost entirely absent between Barnegat and Jamaica Bay. It extends from Jamaica Bay to Fire Island, where presumably the water becomes too deep for marshy conditions to persist. Conditions and density are similar in New Jersey and in New York.


(a)


(b)

Figure 5-16 (a) Wetland area in Bay Park, East Rockaway, New York (Empire Offshore Wind 2023). (b) Jamacia Bay Wildlife Refuge in Queens, New York (Empire Offshore Wind 2023).

Bayside Recreation

Definition: Bayside recreation areas consist of developed green space along the edge of a bay that has amenities adjacent to the beach. These recreational areas are differentiated from other greenspaces, such as natural areas, by the scale of human development and their recreational focus. These non-natural-appearing areas often have seascape-related amenities such as marinas, fishing piers, boat launches, and water parks. They may also have 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. These recreational activities may not necessarily depend on the bay for their recreational function, they but are situated in a way that heightens and focuses the experience on the bay.

***Sensitivity*:** Bayside recreation areas are highly sensitive to the proposed project based on their susceptibility and value:

- **Susceptibility:** The infrastructure is often limited within bayside recreation areas. When such infrastructure is present, it does not have an industrial character similar that of a WTG. This makes the character highly susceptible to change.
- **Value:** Recreation areas are highly valued for their high scenic qualities, locally held values, and often significant or historic designated parks.

Contextual Description: This character area is sporadic through New Jersey and New York along the mainland coastal edge (Figure 5-17). It consists mostly of recreational areas, marinas, and/or boat launches. Bayside recreational areas are much more common in Long Island, where they occupy a significant portion of the mainland coastal edge. There, the character area is comprised of a mix of golf courses, sports complexes, large piers, marinas, and boat launches.

(a) **(b)**

Figure 5-17 (a) Norman J. Levy Park & Preserve, Merrick, New York (Empire Offshore Wind 2023), and (b) Recreation Field Adjacent to the Bay in Oceanside Park, New York (Empire Offshore Wind 2023)

Bayside Residential

Definition: Bayside residential areas consist of developed land comprised mostly of residential units of low to high density. They may have a view of bayside saltwater waterbodies from vantage points including marinas, docks, or piers, or are located directly on the shoreline itself. These homes often have direct access to the waterfront and are generally designed to provide significant views of the inlet, marshes, rivers, or other areas on the landward side of the barrier islands. The shoreline can be hardened and highly developed. For example, houses may be built directly on piers or adjacent to hard-edged shorelines, or on soft, naturalized, gradual slopes. Often the scale of development is significant, to the point where viewers on the street do not have a clear view of the bayside waterbodies due to the density and height of homes along the bay's edge.

Sensitivity: Bayside residential character areas are highly sensitive to the proposed project based on their susceptibility and value:

- **Susceptibility:** These areas are composed of low- to high-density structures, some of which may be of architecturally historic interest, and lack industrial elements. This makes this character area highly susceptible to change due to the proposed project.
- **Value:** Bayside residential areas are highly valued due to their scenic quality, the homes' architectural and/or historic interest, and locally held values around importance of bayside orientation.

***Contextual Description*:** Along New Jersey's barrier islands, from Ocean City to Bayhead, bayside residential units are densely situated directly adjacent to the water's edge along the bay and inlets (Figure 5-18). Occasional canals and piers extend into the bay. These homes vary significantly in architectural style. There are many cottage- and Queen Anne–style homes along the interior, but conventional suburban architectural designs permeate throughout. Occasionally small hotels, multifamily structures, and businesses are located adjacent to the water.

Beginning around Monmouth and extending north, bayside residential homes become larger and sit on larger parcels of land. These homes often maintain rural or suburban aesthetics and are situated farther away from the water's edge, with a softer transition from lawn to the waterbody's edge.

In Long Island, from Brighton Beach to Point Lookout, barrier island bayside residential homes are on a city grid form, and a road separates the water's edge from the first row of houses. These homes vary in architectural style, but are very similar to the styles found throughout Long Island's barrier island: a mix of conventional suburban styles, bungalow architecture, and everything in between.

Throughout New Jersey and New York, mainland bayside residential areas are generally less densely developed than the barrier islands. Architectural styles tend toward conventional suburban and rural designs, with larger parcels and larger homes farther from urban areas. Shorelines are frequently soft or softened, with turf grass where possible. In dense residential areas, such as between Lawrence and Bay Shore in Long Island, little room is available for landscaping between the houses and the waterfront. Like the barrier islands, there is little visibility of the waterbodies within the bayside area.

(a) **(b)**

Figure 5-18 (a) Near Ventnor City, Bayside Features Often Include Decks, Piers, and Walkways along a Hardened Edge to the Water; (b) View of Residential Homes along Barnegat Bay in Seaside Park, New Jersey

Bayside Urban

Definition: Bayside urban areas consist of highly developed land with a view of bayside waterbodies, including marinas, docks, or piers. They may be located directly on the bayside shoreline itself. These areas are multiuse, with a mix of commercial, residential, and public lands. These can be restaurants, commercial districts, or public and/or private parks with significant infrastructure for waterfront access, such as large marinas or piers.

***Sensitivity*:** The sensitivity for bayside urban areas is medium based on their susceptibility and value:

- **Susceptibility:** Bayside urban areas are typically characterized by dense built structures and significant infrastructure surrounding the waterfront for access. This results in low susceptibility to changes in character from the project.
- **Value:** Bayside urban areas are highly valued for tourism, connection to the bayside waterbodies, and sometimes historically significant features.

Contextual Description: In Atlantic City, much of the bayside urban area is comprised of large hotels and entertainment complexes situated along the water's edge. Houses, condos, and apartment buildings are densely situated along canals and marinas.

Within Manhattan, Queens, and Brooklyn, bayside urban areas are very highly developed (Figure 5-19). The coastline is interspersed with urban parks, highways, piers, and ports. The notable exception is Coney Island, which features significant coastal amenities at the boardwalk and amusement park. Buildings within these areas are large, often high-rises, of similar architectural styles to the rest of New York City.

Throughout the rest of New Jersey and New York, wherever bayside urban environments occur, they are mostly areas with a mixture of uses, including hotels, condos, and restaurants along the water's edge. These buildings are several stories tall at most, and maintain clear and open access and lines of sight to the water. Restaurants often exist within piers and marinas. When these restaurants and other commercial areas are not on the water's edge, they face the water to provide a view of the water from within the establishment.

Figure 5-19 Manhattan, New York, along the East River

Bayside Waterbodies

Definition: Bayside waterbodies consist of a partially enclosed saltwater body with direct access to the ocean and the associated docks, marinas, and other related infrastructure. These areas may have full, partial, or no views of the ocean and extend to the edge of river deltas and other waterbodies, but these views are not essential to the viewing experience. They typically consist of flat water, with less movement compared to the open ocean. However, they can vary based on atmospheric conditions and tidal patterns.

Sensitivity: Bayside waterbodies are highly sensitive to the proposed project based on their susceptibility and value:

- **Susceptibility:** These waterbodies are flat, enclosed by landforms and structures, and lack industrial elements. This makes them highly susceptible to changes in character from the proposed project.
- **Value:** Bayside waterbodies are highly valued for their scenic qualities, wildness, and tranquility.

Contextual Descriptions: The stretch of inlet between Ocean City and Seaside Park is wide, and extensive natural areas surround the water that makes up its inlets, sounds, and bays (Figure 5-20a). These natural areas intermittently bound the inlet on the landward and barrier island shores. There is also periodic dense residential marine development. Despite the visibility of the inlet residential development nearby, the natural environment provides a sense of solitude and calm. These waters are flat and calm.

Wherever an inlet occurs between Seaside Park and Mantoloking, it is surrounded by much denser and more consistent residential development along the shorelines of the mainland and barrier islands as compared to Ocean City and/or Seaside Park. In addition, this stretch of inlet contains significantly more marinas, piers, and similar structures. This lends a much more recreational environment to the inlet. Many coastal communities have channel access from each home to the coastline. These are likely built on piers and canals, and increase the amount of recreational activity within this stretch of inlet.

This typology is similar on Long Island, between Babylon and Southampton. Significant coastal development imparts a sense of activity along the edge, especially along New York Bay (Figure 5-20b). In New Jersey, the stretch of inlet from Monmouth to Sandy Hook continues to impart a sense of activity, while the boundaries take on a much more residential character. Property boundaries along the shoreline tend to be wider here than farther south along the Jersey Shore, with shorelines softened and lined with trees. This reduces the density and sense of development.

(a)

(b)

Figure 5-20 (a) Barnegat Bay, Seen from Barnegat Lighthouse State Park; (b) Freighter in Lower New York Bay, with Manhattan in Background

Seascape Residential

Definition: Seascape residential areas consist of developed residential land that is directly tied to seascape character but does not maintain direct views of the ocean, non-ocean waterbodies, beaches, or other marine infrastructure. These areas are 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 they may be too far from beach access points or disconnected due to distance and large roads that act as visual and physical barriers to the ocean and non-ocean waterbodies.

Sensitivity: Seascape residential areas are highly sensitive to the proposed project based on their susceptibility and value:

- **Susceptibility:** These areas are composed of medium-density structures, some of which may be of architecturally historic interest, and lack industrial elements. This produces a character that is highly susceptible to change due to the proposed project.

- **Value:** Seascape residential areas are highly valued for their important aesthetic, experiential, or perceptual elements, including the seascape character integrated into these areas. Some homes may be of architectural and/or historic interest.

Contextual Description: Between Ocean City and Mantoloking, inland residential development within the seascape character is mostly comprised of dense, single- and multifamily structures in cottage- and Victorian-style homes (Figure 5-21). There is less emphasis on balconies and large windows compared to those residential areas that directly face the ocean.

Between Mantoloking and Navesink, seascape residential buildings are split between historic Victorian- and cottage-style homes and typical mid- to late-century suburban-style homes. These homes have balconies and patios, but they relate to the architectural styling and the structure of the street and neighborhood, not to the beach. The streets are wide, and the houses are set back. Aside from the architectural stylings, the structure of these neighborhoods relates little to seascape character.

Throughout Long Island, seascape residential homes have little to no architectural relationship to traditional beach and coastal design. The architecture consists of conventional bungalow styles; the relationship to ocean character is in the density and orientation of the homes, whose gridded streets clearly end at the shoreline along recreational seaside parks and beaches. This regular, articulated access connects what otherwise would appear to be a neighborhood much farther inland from the ocean. These areas' proximity to the ocean and structure of the neighborhoods, which guides visitors to the beach, creates a seascape character despite the lack of architectural cohesion.

(a) **(b)**

Figure 5-21 Residential Streets in (a) Asbury Park, New Jersey and (b) Point Pleasant Beach, New Jersey.

Seascape Urban

Definition: Seascape urban areas consist of 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. These areas are intrinsically connected to the seascape character but do not directly connect to any feature. 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 far from beach access points or are disconnected.

Sensitivity**:** Seascape urban areas have medium sensitivity to the proposed project based on their susceptibility and value:

- **Susceptibility:** Seascape urban areas are typically characterized by densely built structures, resulting in low susceptibility to changes in character from the project.
- **Value:** Seascape urban areas are locally valued for their seascape character elements and highly valued for their tourism.

Contextual Description: Atlantic City, New Jersey, and Long Beach and Island Park, New York, are dense, multiuse, highly developed urban areas (Figure 5-22). Several blocks from their boardwalks and coastal infrastructure—which may include casinos, beaches, and hotels—there is little to no visibility of the ocean, inlet, or the bay. Architecturally, these buildings do not present a distinct seascape character and are similar to conventional urban design along the Eastern Seaboard. Despite the lack of seascape-oriented architecture and cultural vernacular, their proximity to the water, gridded streets oriented toward the boardwalk and coastal activities, and presence along the barrier islands emphasize the visual and cultural significance of the beachfront as a part of this seascape.

(a)

(b)

(c)

Figure 5-22 Atlantic City, New Jersey: (a) Development Several Blocks Inland from the Beach, (b) Homes as Seen from the Boardwalk, and (c) Development

Level 2 Seascape Character Type—Oceanside Seascape

Oceanside seascape areas are bands of natural and developed areas that maintain clear visibility and connectivity to the ocean. There is shared intervisibility between land and sea, such that an area of sea (3 NM, or 3.45 mi [5.5 km] from the coastline), the coastline itself, and the landward area of land continue to maintain visibility of the ocean. Any area that contains both bayside and oceanside views is considered a part of the oceanside area.

Level 3 Seascape Character Areas—Oceanside Seascape Definitions and Contextual Descriptions

Nearshore Ocean

Definition: Nearshore ocean areas extend 3.0 NM (3.45 mi; 5.5 km) from the coastline. Here, long horizontal waves typically roll toward the coast. Regular whitecaps and breaking waves occur, except in calm weather. Colors and textures vary and change constantly throughout this stretch of water. In this area, viewers can see a range of color and motion of the ocean. Beyond this stretch of ocean, the open ocean is generally reduced to varying degrees of darkening blues until eventually reaching the dark horizontal horizon.

Sensitivity: Nearshore ocean is highly sensitive to the proposed project based on its susceptibility and value:

- **Susceptibility**: The nearshore ocean is pristine, flat, vast, and minimal. It lacks major infrastructure or other industrial elements, which makes it highly susceptible to changes in character from the proposed project.
- **Value**: The nearshore ocean is highly valued for its scenic qualities, wildness, and tranquility.

Contextual Description: The nearshore ocean extends along all the New York and New Jersey coastlines out to 3.0 NM (3.45 mi; 5.5 km). The nearshore ocean varies depending on the atmospheric and tidal conditions but will remain relatively uniform along the state coastlines (Figure 5-23).


(a)


(b)

Figure 5-23 Ocean Waves Breaking on Beaches in (a) Mantoloking, New Jersey and (b) Beach Haven, New Jersey

Oceanside Beach

Definition: Oceanside beach areas consist of beaches that maintain features such as dunes and vegetation that appear to be natural or have minimal human impact. Here, human development is not present, mostly obscured, or built in a way that enhances rustic and/or natural features. Activities are both passive and active. They include swimming, surfing, beachcombing, relaxation, and viewing nature. The emphasis of the view is the uninterrupted, wide horizon of the beach and ocean.

Sensitivity: Oceanside beach is highly sensitive to the proposed project based on its susceptibility and value:

- **Susceptibility**: Oceanside beach is highly susceptible to changes to its character from the project due to its simple horizontal and relatively flat nature, along with its natural appearance and minimal human development.

- **Value:** Oceanside beaches are highly valued for high scenic quality, wildness, tranquility, locally held values, and tourism values.

Contextual Description: In New Jersey, examples of such beaches include Brigantine Beach, North Brigantine Natural Area, the barrier island coastline south of Holgate, Island Beach State Park, and Highland Beach of Sandy Hook National Park. Within Long Island, Breezy Point, and a majority of Fire Island's coastline constitute Oceanside Beach (Figure 5-24).

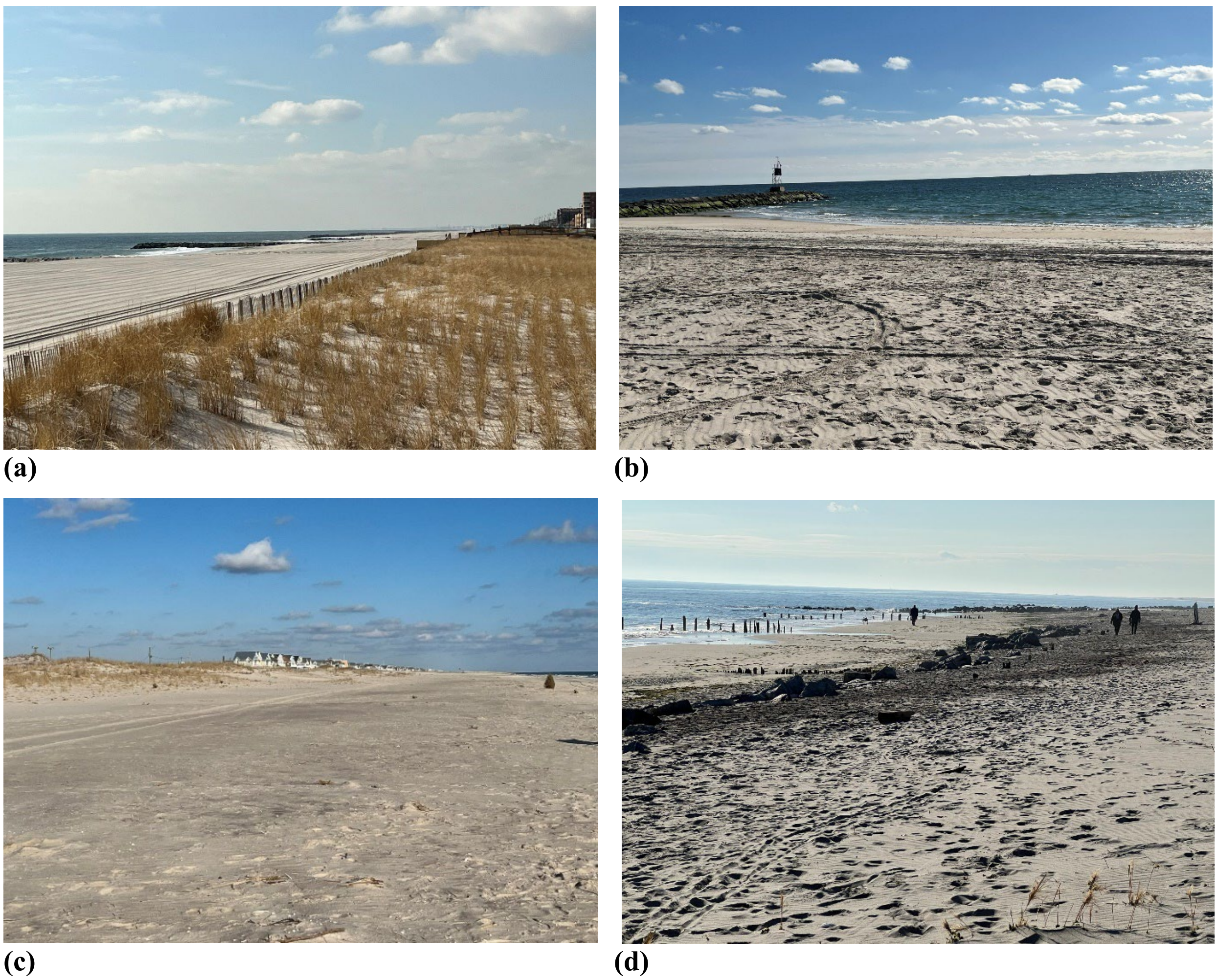


Figure 5-24 Beaches in New York: (a) Magnolia Beach in Long Beach; (b) Shinnecock Inlet in Hampton Bays; (c) Hampton Dunes; and (d) Near Fort Tilden in Queens.

Oceanside Recreation

Definition: Oceanside recreation areas consist of developed recreational parkland with a view of the beach and/or ocean. These include parks with significant sports and recreational resources such as tennis courts, baseball diamonds, or walking trails in non-natural landscapes; large stretches of beach, water- or beach-focused resources such as boat slips, public marinas, or piers; and/or public and private golf courses. Recreational activities may not necessarily depend on the ocean or beachfront. They are situated in a way that heightens and focuses the experience, and often maintain beach and/or coastline access.

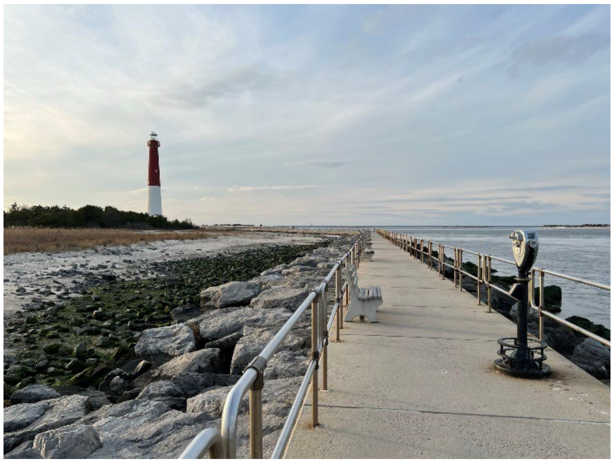
***Sensitivity*:** Oceanside recreation areas are highly sensitive to the proposed project based on their susceptibility and value:

- **Susceptibility**: Infrastructure is often limited in oceanside recreation areas. However, when it is present, it does not resemble the industrial character of a WTG. Therefore, this character of oceanside recreation areas is highly susceptible to change.
- **Value:** Oceanside recreation areas are highly valued for their high scenic qualities, oceanside characteristics, locally held values, and often significant or historic designated parks.

Contextual Description: Oceanside recreational areas are likely to include extensive parking lots in less-populated portions of the coastline, such as central and eastern Long Island. Other amenities may include amusement parks or water slides. Where extensive beachfront activity dominates landscape use, such as at Jones Beach or Robert Moses State Park, there are large facilities for parkgoers, often directly adjacent to the beach. Often these facilities are historic, comprised of brick buildings and water towers. However, they may also include contemporary architectural patterns that connect to historic seascape themes such as natural-colored wood siding (Figure 5-25).

(a) **(b)**

(c)



(d)

Figure 5-25 (a) Recreational Facilities and Nature Center at Robert Moses State Park, New York; (b) Recreation Area at Jones Beach in Wantagh, New York; (c) Jacob Riis Park Promenade in Rockaway, New York; and (d) Pier Associated with Barnegat Lighthouse State Park in New Jersey

Oceanside Residential/Commercial

Definition: Oceanside residential/commercial character are comprised of developed residential land with a view of the beach and/or ocean. Architectural styles vary throughout the study area, but seaside residences 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 are often delineated through fenced walkways or boardwalks. These are often at the ends of streets that abut the dunes, and guide individuals up the dunes to the beach and ocean. In other instances, commercial areas such cafes, gift shops, hotels, and local businesses may exist intermixed with residences. In these cases, the businesses are often small, lining or perpendicular to the boardwalk, and maintain architectural vernacular that connects them to the seascape. Vegetation can include dune grasses and shrubs along the edges of more natural beaches and dunes. There may be conventional landscaping elements within the properties themselves.

Sensitivity**:** Oceanside residential and commercial areas are highly sensitive to the proposed project based on susceptibility and value:

- **Susceptibility**: Their mix of medium-density structures ranges from potentially architecturally significant or historic buildings to commercial businesses. This produces a character that is moderately susceptible to change due to the proposed project.
- **Value:** Oceanside residential and commercial areas are highly valued for their scenic quality, residential architectural and/or historic interest, and locally held values around the importance of oceanside orientation.

Contextual Description: Between Ocean City and Ventnor City, oceanside residential and commercial areas primarily consist of a flat beach with gentle sloping dunes, a boardwalk behind the dunes, and ultimately, residences that dominate the developed areas. Within historic-like areas, homes are typically of folk Victorian, colonial revival, and Queen Anne styles, with several gothic revival churches. These styles generally appear elsewhere within this region, with a strong emphasis on balconies and large windows near the boardwalk. Siding is very popular, but older style homes may use red brick. The seascape style is reflected in homes several hundred feet inland from the boardwalk, but rarely extends beyond the first major road. The transition between the boardwalk and the beach may include a dune. Even in instances where there is not a dune, dune grass and shrub vegetation generally serve as a buffer between the boardwalk and the beach.

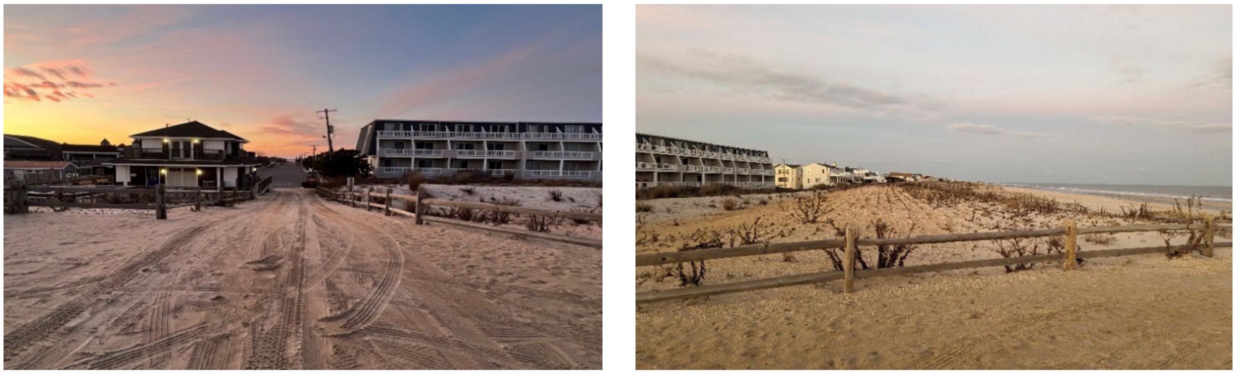
Brigantine oceanside residential/commercial is mostly similar in architectural style to that of Ocean City, albeit with an increase in multifamily structures and contemporary suburban styles. The key difference is the structural relationship to the beach and ocean. This area has a much wider beach, and a sand dune that ranges from steep and densely vegetated to moderately sloped with somewhat sparse dune vegetation. At the southern extreme, the beach is not visible from the seascape homes because the slope, length, and vegetation of the dunes block the view. There is no boardwalk; instead, each street dead-ends into a beach access walkway that runs atop and across the dunes.

From Beach Haven to Barnegat, homes become larger and beach access becomes more secluded (Figure 5-26). Roadways dead-end at the beach, but public access is infrequent because some roads are private property. Homes are mixed architecturally between a resort style, with Queen Anne and Victorian elements, and modern and mid-century suburban styles. The beach is flat. It begins as a thin strip near Surf City and widens farther north up to Barnegat. The dune is sparsely vegetated, if at all, in the narrow sections. The northernmost portions contain wide swaths of vegetated dune grasses, shrubs, and trees. There is no boardwalk. Homes overlook the dunes, beach, and ocean, providing a strong vertical backdrop against the beach.

In Long Island, between Brighton Beach and Point Lookout, oceanside residential units are dense. There is a consistent, somewhat eclectic mix of single-family bungalow-style brick homes, larger homes with seascape character reminiscent of Queen Anne, and a mix of hotels and multifamily units across generations of architectural styles. Here, homes are small and densely situated perpendicular to the ocean, with wide, accessible beach access at the ends of the streets. Dunes are directly adjacent to the homes nearest the beach. They are steep but narrow and highly vegetated with dune grasses, shrubs, and ornamental plants.

Throughout Fire Island, the parcel and home size increases and houses tend to situate themselves parallel to the beach. There are many historic elements in the homes, which trend toward natural wood colors. Homes tend to be on stilts, such that the ground floor of the homes is at grade with the top of the grassy, narrow dunes.

Farther east toward the Hamptons, homes continue to increase in size. They take on a variety of architectural styles, from cottage-influenced designs to more modern structures. Dunes here are narrow, but very steep on the ocean side. They have dense vegetation and areas of restoration with linear rows of dune grass.



(a) **(b)**

Figure 5-26 (a) Beach Access near Beach Haven, New Jersey and (b) View of Vegetated Dunes between Oceanside Residences and the Beach in Beach Haven, New Jersey

Oceanside Urban

Definition: Oceanside urban areas are comprised of dense residential, commercial, and public lands that emphasize the view of the beach and/or ocean. Certain elements occur regularly, such as boardwalks or other paths along the beach edge. They provide means for recreation, including food, drink, and other entertainment. Architectural forms vary from short, brightly colored, densely packed commercial and entertainment spaces to larger blocky, multistoried spaces such as casinos, hotels, and apartment complexes. Strong horizontality along the beach edge provides a continuous experience along the beach.

***Sensitivity*:** Oceanside urban areas are overall highly sensitive to the proposed project based on susceptibility and value:

- **Susceptibility**: Oceanside urban areas typically consist of dense, blocky, short structures, and infrastructure that connects these areas to the beach. This creates moderate susceptibility to change in character from the project.
- **Value:** These areas are highly valued for their tourism value and their locally held values around the importance of oceanside orientation. These areas sometimes have historically significant features.

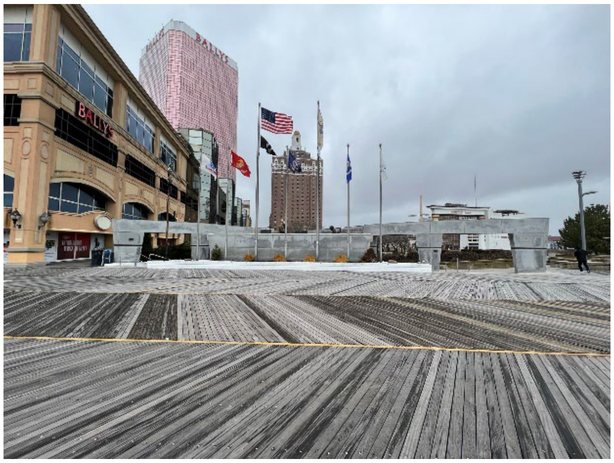
Contextual Description: In Ocean City, oceanside urban areas consist of a flat beach, a wide, flat boardwalk, and dense, one- or two-story commercial buildings that abut the boardwalk (Figure 5-27). These commercial structures are simple and blocky, but brightly colored with elaborate signage, and they emphasize access to the boardwalk. The boardwalk itself is extremely wide. It offers plenty of seating, opportunities to congregate, and frequent access to the beachfront. There is little to no vegetation along this stretch of beach. The beach is not very wide, and the distance between the boardwalk and the shore is fairly short. This provides a sense of continuity and access between the beach and the commercial strip of the boardwalk.

In Atlantic City, the oceanside urban area is similarly dense, but the scale of development increases significantly. Many venues, such as casinos or amphitheaters, are several stories tall. Many smaller venues face the boardwalk, but casinos and amphitheaters generally lack a view of the boardwalk from within. The structures do not interface with the boardwalk in the same way, aside from providing access to the structure directly from the boardwalk. The boardwalk itself is wide, with frequent access to walkways that lead to the beachfront. The beach is flat, but there is a wide stretch of dune vegetation between segments of the boardwalk and the beach.

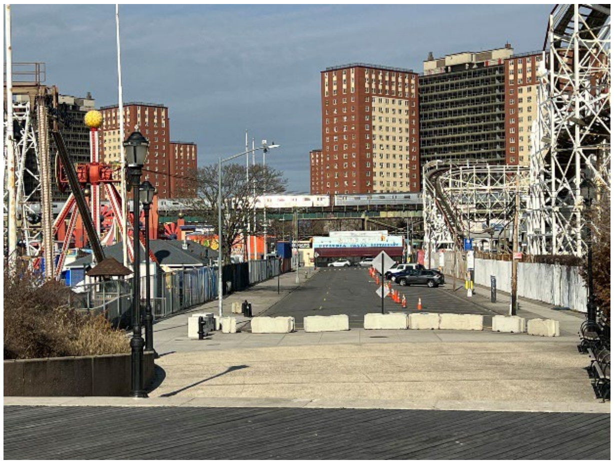
Overall, there is less commercial development at Seaside Heights compared to Ocean City. However, the urban environment is similar in many ways. First, the urban environment of Seaside Heights is brightly colored and busy. It primarily consists of one-story buildings with whimsical shapes, colors, and architectural details. At times the boardwalk is at grade, but it can also be elevated. It is wide and meant to accommodate many people, with semi-frequent access to the beach. The beach and boardwalk are separated by moderately tall dunes. As such, the ocean is at times slightly obscured from the boardwalk due to the height of the terrain and the grassy dune vegetation that grows along the dune. The beach is wide, separating the commercial strip of the boardwalk from beachgoers.

Coney Island's oceanside urban area is markedly dense. Multiple amusement park rides and commercial strips border the boardwalk and beach. The beach itself is flat and thin, connecting beachgoers directly to the boardwalk and commercial and entertainment spaces. The boardwalk is very wide, with frequent benches. There are apartment high-rises directly adjacent to the boardwalk and beyond, providing a further sense of activity. Commercial strips are generally shorter, one or two stories tall, and brightly colored like those described in other oceanside urban areas. Periodic brightly colored, whimsical structures, typically amusement park rides, sit behind the commercial structures.

From Brighton Beach to Long Beach, seaside urban areas include a mix of dense multiuse buildings, hotels, and a variety of beach recreational infrastructure. The oceanside urban area around Rockaway Beach is distinctly less commercial than other oceanside urban areas. The intensity of residential development sets this area apart from the surrounding single-family oceanside residential areas. On Long Island, apartment high-rises, which are several stories tall, are situated across the street from the boardwalk. The boardwalk itself has only a handful of commercial establishments, most of which are small, nondescript seasonal restaurants. The beach is wide and flat with little to no vegetation. The boardwalk is narrower than in other locations, about 15–20 ft wide, with very frequent access to the beach.



(a) (b)



(c) (d)

Figure 5-27 (a) Boardwalk near Ocean City, New Jersey; (b) Boardwalk near Atlantic City, New Jersey; (c) Urban Development along the Boardwalk and Beachfront near Long Beach, New York; and (d) Looking into an Urban Area from Coney Island, Brooklyn.

Level 1 Landscape Character

Land uses and landcover types vary significantly across the LCA. The common thread among the LCAs is that they have minimal visibility and opportunities for interaction with the ocean and/or seascape in general. Typologies in the study include the highly urban, dense built environment of Manhattan, suburban New Jersey, the agricultural landscapes of eastern Long Island, and the extensive natural areas of central New Jersey. While changes in elevation may allow for a rare view of the ocean from certain vantage points, such as skyscrapers in Midtown Manhattan, the landscape–seascape boundary is on the mainland wherever such direct, ground-level connectivity to the seascape has ended.

Level 2 Landscape Character Type

Level 2 is not represented in ocean or landscape character, only in seascape.

Level 3 Landscape Character Areas—Definitions and Contextual Descriptions

Inland Agriculture

Definition: The inland agriculture 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 and rectangular. They consist of pasture, row crops, or large raised beds and/or greenhouse structures for a variety of crops and agricultural products.

***Sensitivity*:** Inland agricultural areas are highly sensitive to the proposed project based on their susceptibility and value:

- **Susceptibility**: Agricultural areas consist of open fields with flat to rolling hills. They contain farm-related light industrial infrastructure such as silos, which add significant vertical elements to the character. This makes the character of the area moderately susceptible to change due to the project.

- **Value:** Agricultural fields provide a sense of scenic quality, tranquility, and open landscape views. They have high locally held values and are overall high value in character.

Contextual Description: This character area is found inland and to the far south in New Jersey, and inland to the far east of Long Island. In New Jersey, these agricultural areas are often individual or small clusters of fields surrounded by forested land and/or wetlands. In Long Island, east of East Shoreham, the agricultural landscape is the dominant feature. Many adjacent agricultural fields create an interconnected, cohesive agricultural landscape.

Inland Commercial Park

Definition: Inland commercial parks are composed of office complexes, big-box stores, strip malls, and parking lots. Relatively few residential spaces exist within these landscapes. Buildings are nondescript, often a single story, but there may be office complexes that are 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.

Sensitivity: Inland commercial parks have low sensitivity to the proposed project based on their susceptibility and value:

- **Susceptibility**: Commercial parks are typically characterized by blocky, nondescript built features and varying human development. They have low susceptibility to changes in character from the project.

- **Value:** The low scenic quality of commercial parks contributes to the low value associated with the character of these areas.

Contextual Description: Inland commercial parks occur frequently, adjacent to urban and residential areas along stretches of highway (Figure 5-28). Throughout the study area they persist along the periphery of highly populated areas. In Long Island, there are often very large areas of office complexes and adjacent shopping malls. In New Jersey, these areas are more linear, following highways and arterial roads.


(a)


(b)

Figure 5-28 Strip Mall Plazas in (a) Miller Place, New York, and (b) Sayville, New York

Inland Industrial

Definition: Inland industrial areas are significant areas of developed land that are industrial in nature. They have features such as smokestacks, large blocky buildings, and limited access to the shoreline for the public. Although 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.

Sensitivity: Inland industrial areas have low sensitivity to the proposed project based on their susceptibility and value:

- **Susceptibility**: Industrial areas are not susceptible to changes in character from the proposed project, because they have similar industrial characteristics including tall, vertical elements and blocky infrastructure.

- **Value:** The low scenic quality of industrial areas and oftentimes poor condition of the infrastructure contribute to the low value associated with the character of these areas.

Contextual Description: Inland industrial areas occur sporadically throughout the study area. They become increasingly frequent in areas surrounding New York City (Figure 5-29) and Jersey City.

(a) **(b)**

Figure 5-29 Inland Industrial Areas (a) in New York (Empire Offshore Wind 2023) and (b) off 2nd Avenue in Manhattan, New York (Empire Offshore Wind 2023).

Inland Industrial Resource

Definition: Inland industrial resource areas consist of industrial zones related to natural resources, such as wastewater treatment plants, landfills, and quarries. These resource industrial areas are generally smaller than other industrial facilities. They depend less on large facilities for manufacturing and 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.

Sensitivity: Inland industrial resource areas have low sensitivity to the proposed project based on their susceptibility and value:

- **Susceptibility**: Inland industrial resource areas are moderately susceptible to changes to their character from the proposed project. Although these areas have an industrial character, infrastructure is at a smaller scale, often with low-lying horizontal flat features.
- **Value:** The low scenic quality of industrial resource areas contributes to the low value associated with the character of these areas.

Contextual Description: Inland industrial resource areas are infrequent but dispersed evenly throughout the study area. They often exist along the edge of large population centers, adjacent to forests and/or wetlands.

Inland Military Site

Definition: When not obscured by vegetation such as dense trees, inland 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.

Sensitivity**:** Inland military sites are moderately sensitive to the proposed project based on their susceptibility and value:

- **Susceptibility:** Inland military sites are comprised of extensive forested areas along with varying industrial elements. This makes them moderately susceptible to changes in character from the proposed project.
- **Value:** Inland military sites consist of extensive forest areas of moderate to high scenic quality, as well as light industrial infrastructure. This makes them moderately valued.

Contextual Description: Sections of central and southern New Jersey are comprised of large military complexes, most of which are set far from developed areas.

Inland Natural Area

Definition: Inland natural areas consist of greenspace that is natural or natural appearing. Inland, this typically is comprised of forests, savannahs, and grasslands. Pine barrens are a representative habitat. These spaces lack significant development, or at least appear to lack development. They have smaller trails and paths enclosed in these natural spaces, rather than wide trails with high visibility. Park geospatial layers from relevant states, counties, and cities are the basis for this character area; small neighborhood parks are removed because they are too small to be considered character areas. Aerial imagery was used to identify parks that were mostly comprised of recreational amenities and non-natural landscapes; these were removed and instead considered inland recreational areas. If trees and other natural features extended beyond the parks border in aerial imagery, the natural area was extended to reflect the continuation of habitat.

Sensitivity**:** Inland natural areas are highly sensitive to the proposed project based on their susceptibility and value:

- **Susceptibility**: These areas are highly natural-seeming with little to no human-development/built environment. This makes these environments highly susceptible to changes in character from the proposed project.
- **Value**: Inland natural areas are highly valued for their high scenic quality, wildness, and tranquility.

Contextual Description: Much of inland central and southern New Jersey is composed of natural areas. Far eastern Long Island has significant natural areas, and western and central Long Island have natural areas along inland bodies of water.

Inland Recreation

Definition**:** Inland recreation areas are developed recreational parklands with no view of the beach and/or ocean. They have no connection to seascape character. These include parks with significant sports and recreational resources such as tennis courts, baseball diamonds, and walking trails in non-natural landscapes, as well as public and private golf courses.

Sensitivity**:** Inland recreation areas are highly sensitive to the proposed project based on their susceptibility and value:

- **Susceptibility**: Inland recreation areas are mainly composed of developed parks and sports infrastructure. This infrastructure is minimal and not similar in character to a WTG, which makes the character of the area highly susceptible to change.
- **Value**: Recreation areas have high locally held value. They are often significant or historical and have high scenic qualities. This makes them highly valued in character.

Contextual Description: In Long Island and New Jersey, many of these areas are highly developed parks with baseball fields, tracks, open fields for recreation, and clearly designed walking paths, all of which identify areas for specific types of active recreation (Figure 5-30). These parks are surrounded by residential and urban environments. The trails and fields have many infrastructural amenities, including benches, signage, and other means of engagement, such as exercise stations.

In New Jersey, these areas tend to be located between residential areas and natural areas. They are mostly circumscribed by trees, with fewer infrastructural elements than the more urban parks of Long Island.

(a) **(b)**

Figure 5-30 (a) Green-wood Cemetery in Brooklyn, New York (Empire Offshore Wind 2023), and (b) Holmdel Park in Holmdel, New Jersey (Empire Offshore Wind 2023)

Inland Rural

Definition: Inland rural areas have low population density. Architecturally, there may be similar vernacular elements to agricultural areas. However, inland rural areas and the inland residential character area have significant architectural and structural elements.

***Sensitivity*:** Inland rural areas are highly sensitive to the proposed project based on their susceptibility and value:

- **Susceptibility**: Inland rural areas are typically open with flat to rolling hills and sparse residential structures. This makes the character of the area highly susceptible to change due to the project.
- **Value**: Inland rural areas may have valued conservation and open space areas around the sparse residential homes. However, the homes themselves typically lack architectural interest, which makes these areas moderately valued.

Contextual Description: 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 low-density development far from the urban or suburban core.

Inland Suburban/Exurban Residential

Definition: Inland suburban and exurban residential areas reflect developed land. They mostly consist of residential units that do not have a view of the beach and/or ocean. There is no apparent connection to seaside character. Residences vary in architectural styles and densities, but most importantly do not have architectural or cultural elements associated with seaside communities. There is significant variation in architectural and structural styles of inland suburban and exurban residential areas. These range from conventional suburban design at various densities, to exurban and rural styles.

***Sensitivity*:** Inland and suburban exurban residential areas are highly sensitive to the proposed project based on their susceptibility and value:

- **Susceptibility**: Inland suburban and exurban residential areas do not have industrial elements similar to a WTG. They are composed of mostly residential structures, which are minimal when compared to the project infrastructure. This makes the area highly susceptible to changes in character from the project.
- **Value**: Inland suburban and exurban residential areas may have valued conservation and open space areas around residential neighborhoods. However, the homes themselves lack significant architectural elements and there are no particular local values tied to this character. This makes these areas moderately valued.

Contextual Description: In Long Island, inland suburban or exurban residential areas are defined by dense, gridded networks of streets and homes of various styles typical to suburban conventions of the 20th century. In New Jersey, there is a similar density closer to the coast. Farther inland, the housing density and size of homes increases, and the structure of neighborhoods is less gridded.

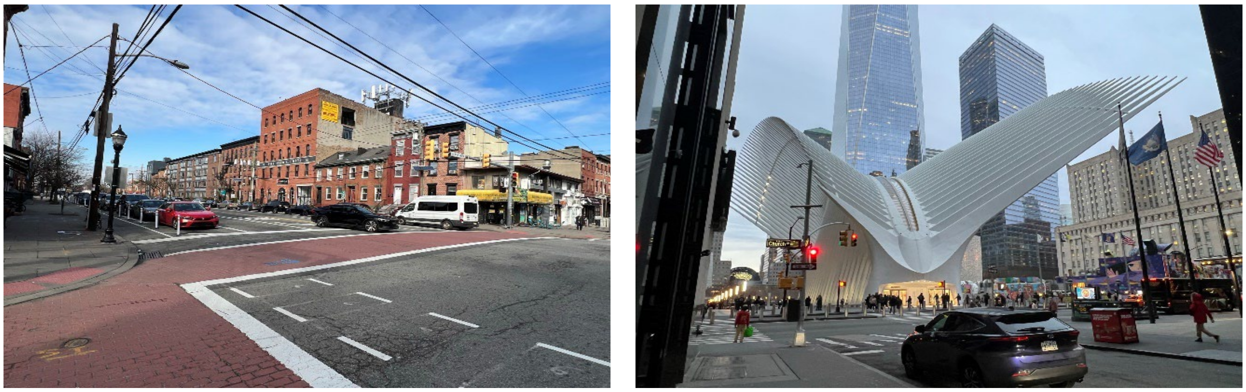
Inland Urban

Definition: Inland urban areas consist of developed land with a view of the beach and/or ocean from any vantage point. There is no apparent connection to seaside character. Dense commercial areas, dense residential areas with apartment buildings, and other areas with significant development are considered part of this inland urban landscape.

***Sensitivity*:** Inland urban areas have low sensitivity to the proposed project based on their susceptibility and value:

- **Susceptibility**: Urban areas are typically characterized by densely built structures. This produces low susceptibility to changes in character from the project.
- **Value**: Urban areas typically have lower scenic qualities. However, they may have locally held value, tourism value, and sometimes historically significant features. This makes their character moderately valued.

Contextual Description: There is significant variation in architectural and structural styles of inland urban areas (Figure 5-31). They range from conventional suburban design at various densities to exurban and rural stylings. Long Island is densely populated with gridded streets until roughly the hamlet of Mastic. Farther east, homes become slightly larger, with neighborhoods designed in a looser, sprawling streetscape. Farther inland from the bay in the New Jersey side of the project area, the streetscapes become progressively less dense and more sprawling.



(a) **(b)**

Figure 5-31 (a) Intersection of Jersey Avenue and Christopher Columbus Drive in Jersey City, New Jersey, and (b) 9/11 Memorial along Church Street in Manhattan, New York.

5.2.1.3 Historic-Like Areas

The nature of the seascape and landscape themselves cannot be described as historic-like areas. Therefore, defining historic-like areas is a separate analysis in addition to the character area analysis. The historic-like areas, mapped alongside all other character areas, represent any place within the study area that has a unifying sense of historicity. That is, the overall character of an area holds a historic feeling with its structures, streetscape elements, and overall experience for visitors and/or viewers. NRHP and State Historic Preservation Office (SHPO) resources were used as a starting point to define these areas.

While architectural details vary across the study area, historic-like areas will have a higher number of structures and elements dedicated to site-specific historical styles, such as Queen Anne or Victorian homes, historic-like main street style commercial blocks, civic institutional buildings, and cores. Thy may also include historic parks with historic architectural features, such as lighthouses and towers. Boundaries of historic-like areas may extend over a variety of distinct landcovers. Historic-like areas are overlaid on the character areas in Appendix C, Series 4 and 5.

Contextual Description

Beach Haven's historic-like area contains a high concentration of representative 19th century resort architecture, particularly in the Queen Anne style. Shingles, siding, and large porches are particularly evident in this area. The unifying Queen Anne style is present even in non-historically designated structures. Single-family and multifamily homes alike, as well as hotels, abut the beach directly, with each street ending in public beach access. The beach itself is wide, with a slight slope in dune and sparsely vegetated with dune grasses and shrubs. This pattern continues up to Surf City, albeit with an increase in mid- to late-century suburban and modern architectural styles intermixed.

In places like Mantoloking, Bay Head within New Jersey, and the Hamptons in Long Island, homes are of similar stately sizes. They are of a consistent cottage style reminiscent of seascape historic stylings. Homes on the bayside tend to be smaller than the homes on the ocean-facing side, with less ornate landscaping; architectural emphasis via large windows and balconies is focused on both the views of the bay and the ocean in the middle distance. Historic-like areas around Ventnor City maintain clear visual continuity with adjacent ocean-facing architecture, cottage style, and Queen Anne homes at a particular density, with a narrow streetscape. These homes are adjacent to the bay and provide views of the non-ocean waterbodies on the interior side of the barrier islands. Fort Hancock is located in the western side of a peninsula in New Jersey, oriented toward and with views of Sandy Hook Bay. The buildings on Fort Hancock are historic, along with the Sandy Hook Lighthouse (Figure 5-32a and 5-32b).

An area such as Ocean Grove has markedly dense historic homes situated on a green. It includes homes in the Victorian and Queen Anne styles, along with the maintained community buildings such as a church at the end of the green. From Asbury Park up to Long Beach there is a consistent sense of historicity along the ocean-facing homes and beachfronts. Here, both homes and parcels are consistently sized and maintain a blend of ornate historical architectural themes. In Long Island's case, the area has a historical feel due to the hedgerows and curb cuts of the streetscape, in addition to wrought occasional iron lampposts.

Barnegat Lighthouse, Riis Park, and Robert Moses State Park are examples of recreational and/or natural areas that are historic-like in character (Figure 5-32c). The experience at these recreational areas is impacted by highly visible historic elements of particular architectural and cultural value, such as lighthouses, water towers, military barracks, and beach infrastructural facilities.

Asbury Park's historic-like area is dominated by brick buildings adjacent to the large boardwalk and a narrow, flat beach with little to no vegetation (Figure 5-32d). The boardwalk itself is wide, flat, and slightly elevated, with significant seating and several access points to the beach. Historic brick buildings are large and ornate, and often two to three stories tall. The boardwalk commercial strip is less densely developed than other areas. Here, historic brick structures along and adjacent to the boardwalk connect the adjacent urban area to the boardwalk and beach. The boardwalk itself is wide, with infrastructure such as benches and light posts that incorporate historic materials such as wrought iron.

From Allenhurst up to the Elberon district of Long Branch, New Jersey, the homes along the beachfront are of consistent, stately sizes, and generally maintain neoclassical and/or Tuscan architectural elements (Figure 5-32e). Landscaping is similar to the character of the buildings: rectilinear, ordered, and regular. Within Long Beach, Penn Street within Long Beach has a density of well-maintained historic homes, along a dense, brick street with iron gaslight features. It is just one or two streets away from the oceanfront but lacks views of the water and beach because there are taller structures between, and because these homes are densely situated and fairly insular. Regardless, the proximity of the ocean to these homes provides a seascape context to the streetscape; the waterfront cannot be seen but is unavoidable at each intersection.

Throughout Fire Island, New York, the parcel and home size increases and houses tend to be situated parallel to the beach. There are many historic elements in these homes, which trend toward natural wood colors. Homes tend to be on stilts, such that the ground floors of the homes are at grade with the top of the grassy, narrow dunes.

In the easternmost portion of the study area, in Southampton, New York, historic features of the streetscape and homes are consistent well beyond the oceanside. There is hedgerow fencing, gas lamp streetlight treatments, and homes that are both ornately historic and of a seascape nature. These provide the viewer with a sense of adjacency to the ocean and its beaches from the interior.

Figure 5-32 (a) View of Sandy Hook Bay and the historic Fort Hancock from Sandy Hook Lighthouse in Highlands, New Jersey. (b) Historic Sandy Hook Lighthouse in Fort Hancock in Highlands, New Jersey. (c) Historic Landmark Feature, Robert Moses Water Tower, within the Entry to the State Park. (d) Asbury Park Convention Hall, a Historic Boardwalk Feature in Asbury Park, New Jersey. (e) Victorian/Queen Anne–style Residence in Allenhurst, New Jersey. (f) View of Kennedy Plaza, Oriented toward the Ocean, off the Atlantic City Boardwalk in New Jersey.

5.2.2 Project Impacts Analysis on Character Areas

As discussed in Section 5.1, the character areas are described in terms of sensitivity and magnitude to determine the overall potential impact from the project. The results presented include the SLIA for both 1,312-ft (399.9-m) and 853-ft (260-m) turbine heights by state (character areas in New Jersey and in New York).

5.2.2.1 Sensitivity

In Section 5.2.1.2, each character area identified within the GAA is classified using both susceptibility and value to determine sensitivity. Of the 28 character areas, 14 are highly susceptible to changes in character due to the introduction of the proposed project, 5 have medium susceptibility to change, and 9 have low susceptibility to change. Out of the same 28 character areas, 17 are highly valued, 5 have a medium value, and 6 have a low value. As explained in Section 5.1.2, Table 5-2 is combines susceptibility and value to determine the sensitivity of a character area. Overall, 17 of the 28 character areas are highly sensitive to the introduction of the proposed project, 3 have medium sensitivity, and 8 have low sensitivity. Table 5-12 summarizes the sensitivity results for each character area. Refer to Section 5.2.1.2 for the rationales associated with each sensitivity designation.

Table 5-12 Character Area Sensitivity Summary

Character Area	Ratings		
	Susceptibility	Value	Sensitivity
Ocean			
Open Ocean	High	High	High
Seascape			
Bayside			
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 Upland	High	High	High
Bayside Natural 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
Oceanside			
Nearshore Ocean	High	High	High
Oceanside Beach	High	High	High
Oceanside Recreation	High	High	High
Oceanside Residential/Commercial	Medium	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

5.2.2.2 Magnitude of Impact

The magnitude of an impact on ocean, seascape, and landscape areas 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 the project. The geographic extent of impacts and the size and scale of change are analyzed for turbine heights of both 1,312 ft (399.9 m) and 853 ft (260 m) and are broken down by state. The duration and reversibility factors remain the same throughout the SLIA. Tables 5-16 and 5-17 use the methodology as described in Section 5.1.2.3 to summarize the 1,312-ft (399.9-m) and 853-ft (260-m) results of each factor of analysis when considering the magnitude component. As explained in Section 5.1.2, Table 5-6 combines the magnitude of impact components; however, a degree of professional judgment is used in consideration of the data. The following sections provide a narrative about each magnitude factor. Table 5-14 and Table 5-15 summarize the magnitude of impact ratings for each character area.

Size and Scale of Change

The size and scale definitions in Table 5-3 are used to determine whether a change is large, medium, small, or negligible relative to the potentially affected character area. The size and scale of change from the 1,312-ft (399.9-m) turbines concludes that in New Jersey, 2 of the 28 character areas are determined to have a large change, 5 have a medium change, 20 have a small change, and 1 has a negligible change. The size and scale of change of the 1,312-ft (399.9-m) turbines concludes that in New York, 2 of the 28 character areas have a large change, 6 have a medium change, 17 have a small change, and none have a negligible change. Three of the character areas are not within the GAA of New York, and therefore are not impacted by the project in this state. Table 5-14 displays these results.

The size and scale of change ratings differ slightly depending on the turbine heights. The size and scale of change from the 853-ft (260-m) turbines concludes that in New Jersey, 2 of the 28 character areas have a large change, 4 have a medium change, 20 have a small change, and 2 have a negligible change. The size and scale of change of the 853-ft (260-m) turbines concludes that in New York, 2 of the 28 character areas have a large change, 5 have a medium change, 18 have a small change, and none have a negligible change. Three of the 28 character areas are not within the GAA of New York, and therefore are not evaluated for project impacts. Table 5-15 displays these results.

Duration and Reversibility of Impacts

The lifecycle of this project is estimated to be 33 years. Therefore, according to the BOEM SLVIA Methodology (BOEM 2021a), the duration is considered permanent. However, residual impacts on the character areas are not expected after decommissioning. Therefore, these impacts would be considered fully reversible. The assessment of duration and reversibility impacts considered in combination (Table 5-5) has been determined to be fair given the permanent duration but full reversibility.

Geographic Extent

As described in Section 5.1, the geographic extent is a measure of the size of each character area within the GAA (in square miles and square kilometers), the area of each character area within the project viewshed (APVIs of both 1,312-ft [399.9-m] and 853-ft [260-m] turbines), and the percentage of the total area of each character area within the APVIs, broken out by state. A summary of this analysis for all six lease areas combined is shown in Table 5-13. The Appendix C map series show the APVI of 1,312-ft (399.9-m) and 853-ft (260-m) turbines with the mapped character areas within the GAA. Appendix D shows the breakdown of each lease area's APVI in relation to the character areas. Using the percentages of impacted character area, displayed in Table 5-13, the thresholds for geographic extent ratings (Table 5-4) are applied to each character area to determine the geographic extent of impacts. The following sections describe the results associated with the geographic extent ratings for the six lease areas for both 1,312-ft (399.9-m) and 853-ft (260-m) turbine heights. Appendix D also contains tables of character area impacts in each municipality within the GAA.

Regardless of turbine height alternative 853 ft (260 m) or 1,312 ft (399.9 m), the APVI viewsheds of OCS-A 0537 do not reach New Jersey and therefore would have no effect on the character areas within New Jersey. Similarly, the APVI viewsheds of OCS-A 0538, OCS-A 0539, OCS-A 0541, and OCS-A 0542 do not reach New York and therefore would have no effect on the character areas within New York. With a turbine height of both 853 ft (260 m) and 1,312 ft (399.9 m), OCS-A 0544 and OCS-A 0537 are the only lease areas to have a potential effect on character areas in New York, and OCS-A 0544 produces the majority of impacts.

Geographic Extent Results of the 1,312-ft (399.9-m) Turbines

The geographic extent of impacts of the 1,312-ft (399.9-m) turbines in New Jersey concludes the following: 6 character areas are determined to have a large geographic extent, 2 have a medium geographic extent, 15 have a small geographic extent, and 5 have a negligible geographic extent of impacts. The 1,312-ft (399.9-m) APVI viewshed of lease area OCS-A 0537 does not affect any character areas in New Jersey. The other five lease areas' viewsheds intersect with New Jersey, with OCS-A 0541 having the most impact.

The geographic extent of impacts of the 1,312-ft (399.9-m) turbines in New York concludes the following: 7 character areas are determined to have a large geographic extent, 2 have a medium geographic extent, 14 have a small geographic extent, and 2 have a negligible geographic extent of impacts. The vast majority of impacts are from the APVI of OCS-A 0544, and some minimal impacts are from OCS-A 0537. Lease areas OCS-A 0538, OCS-A 0539, OCS-A 0541, and OCS-A 0542 do not have any effect on New York.

Geographic Extent Results of the 853-ft (260-m) Turbines

The geographic extent of impacts of the 853-ft (260-m) turbines in New Jersey concludes the following: 3 character areas are determined to have a large geographic extent, 3 have a medium geographic extent, 13 have a small geographic extent, and 9 have a negligible geographic extent of impacts. The 853-ft (260-m) APVI viewshed of lease area OCS-A 0537 does not affect any character areas in New Jersey. The other five lease areas' viewsheds intersect with New Jersey, with OCS-A 0541 having the most impact.

The geographic extent of impacts of the 853-ft (260-m) turbines in New York concludes the following: 6 character areas have a large geographic extent, 3 have a medium geographic extent, 14 have a small geographic extent, and 2 have a negligible geographic extent of impacts. Similarly to the 1,312-ft (399.9-m) turbines, the majority of impacts are from the APVI of OCS-A 0544, and some minimal impacts are from OCS-A 0537. Lease areas OCS-A 0538, OCS-A 0539, OCS-A 0541, and OCS-A 0542 do not have any effect on New York.

Table 5-13 Character Area Measurements within the GAA and within APVI Viewsheds of Turbine Heights 1,312 ft (399.9 m) and 853 ft (260 m) in New Jersey and New York

Character Area	Total Area in GAA		Area within the Six Lease Areas' Combined 1,312-ft (399.9-m) APVI			Area within the Six Lease Areas' Combined 853-ft (260-m) APVI		
	mi^2	km^2	mi^2	km^2	% Affected	mi^2	km^2	% Affected
New Jersey								
Total	**1,343.507**	**3,479.668**	**140.494**	**363.878**	**10.46**	**25.201**	**65.270**	**1.88**
Seascape	**722.119**	**1,870.280**	**139.206**	**360.541**	**19.28**	**24.850**	**64.362**	**3.44**
Bayside	**365.436**	**946.476**	**116.067**	**300.611**	**31.76**	**13.624**	**35.285**	**3.73**
Bayside Commercial Park	0.352	0.911	0.001	0.003	0.29	0.000	0.001	0.12
Bayside Industrial	0.049	0.128	0.000	0.001	0.75	0.000	0.000	0.02
Bayside Industrial Resource	0.141	0.364	0.001	0.003	0.87	0.001	0.001	0.38
Bayside Military Site	0.575	1.490	0.040	0.103	6.90	0.004	0.011	0.74
Bayside Natural Upland	3.866	10.014	0.062	0.161	1.60	0.003	0.009	0.08
Bayside Natural Wetland	113.074	292.859	51.728	133.976	45.75	7.279	18.851	6.44
Bayside Recreation	3.704	9.593	0.059	0.154	1.60	0.019	0.048	0.51
Bayside Residential	37.411	96.894	0.664	1.721	1.78	0.158	0.408	0.42
Bayside Urban	4.108	10.639	0.068	0.176	1.66	0.030	0.078	0.73
Bayside Waterbodies	197.399	511.261	63.408	164.226	32.12	6.108	15.821	3.09
Seascape Residential	4.740	12.277	0.033	0.086	0.70	0.021	0.055	0.45
Seascape Urban	0.018	0.046	0.001	0.002	4.78	0.001	0.002	4.30
Oceanside	**356.682**	**923.802**	**343.252**	**889.018**	**96.23**	**163.997**	**424.749**	**45.98**
Nearshore Ocean	335.676	869.396	335.192	868.144	99.86	158.762	411.192	47.30
Oceanside Beach	4.844	12.545	2.956	7.657	61.03	2.156	5.585	44.52
Oceanside Recreation	0.326	0.845	0.082	0.212	25.05	0.039	0.101	11.97
Oceanside Residential/Commercial	13.440	34.808	4.355	11.279	32.40	2.658	6.884	19.78
Oceanside Urban	2.397	6.208	0.667	1.726	27.81	0.381	0.988	15.92
Landscape	**621.388**	**1609.389**	**1.288**	**3.337**	**0.21**	**0.350**	**0.908**	**0.06**
Inland Agriculture	2.000	5.179	0.013	0.033	0.64	0.001	0.004	0.07
Inland Commercial Park	13.413	34.740	0.031	0.080	0.23	0.019	0.048	0.14
Inland Industrial	7.121	18.442	0.002	0.006	0.03	0.001	0.002	0.01
Inland Industrial Resource	14.322	37.094	0.097	0.252	0.68	0.050	0.130	0.35

Character Area	Total Area in GAA		Area within the Six Lease Areas' Combined 1,312-ft (399.9-m) APVI			Area within the Six Lease Areas' Combined 853-ft (260-m) APVI		
	mi^2	km^2	mi^2	km^2	% Affected	mi^2	km^2	% Affected
Inland Military Site	20.393	52.817	0.244	0.632	1.20	0.003	0.008	0.02
Inland Natural Area	316.458	819.623	0.439	1.138	0.14	0.070	0.181	0.02
Inland Recreation	7.000	18.129	0.063	0.163	0.90	0.010	0.026	0.14
Inland Rural	23.102	59.833	0.008	0.021	0.04	0.002	0.005	0.01
Inland Suburban/Exurban Residential	207.329	536.980	0.377	0.978	0.18	0.189	0.488	0.09
Inland Urban	10.252	26.551	0.013	0.034	0.13	0.006	0.015	0.06
New York								
Total	**1,528.028**	**3,957.574**	**158.815**	**411.328**	**10.39**	**105.009**	**271.972**	**6.87**
Seascape	**660.776**	**1,711.402**	**157.821**	**408.755**	**23.88**	**104.479**	**270.600**	**15.81**
Bayside	**336.447**	**871.393**	**137.611**	**356.410**	**40.90**	**88.880**	**230.197**	**26.42**
Bayside Commercial Park	0.091	0.235	0.000	0.001	0.45	0.000	0.001	0.29
Bayside Industrial	5.690	14.738	0.046	0.120	0.82	0.043	0.110	0.75
Bayside Industrial Resource	0.282	0.729	0.114	0.295	40.48	0.106	0.273	37.46
Bayside Military Site	-	-	-	-	-	-	-	-
Bayside Natural Upland	9.941	25.746	0.378	0.980	3.81	0.184	0.476	1.85
Bayside Natural Wetland	40.922	105.987	14.224	36.840	34.76	5.674	14.696	13.87
Bayside Recreation	10.279	26.623	0.865	2.240	8.41	0.641	1.659	6.23
Bayside Residential	34.406	89.111	1.183	3.065	3.44	0.837	2.168	2.43
Bayside Urban	7.948	20.586	0.054	0.139	0.68	0.029	0.076	0.37
Bayside Waterbodies	221.210	572.932	120.733	312.697	54.58	81.362	210.727	36.78
Seascape Residential	4.303	11.144	0.013	0.032	0.29	0.004	0.011	0.10
Seascape Urban	1.375	3.561	-	-	-	-	-	-
Oceanside	**324.329**	**840.009**	**311.125**	**805.809**	**95.93**	**237.937**	**616.253**	**73.36**
Nearshore Ocean	300.444	778.148	300.444	778.148	100.00	229.580	594.609	76.41
Oceanside Beach	8.021	20.775	4.848	12.555	60.43	3.905	10.114	48.68
Oceanside Recreation	6.641	17.201	3.182	8.242	47.92	2.617	6.778	39.41
Oceanside Residential/Commercial	6.678	17.295	1.835	4.754	27.49	1.237	3.204	18.53
Oceanside Urban	2.544	6.590	0.815	2.111	32.03	0.597	1.547	23.48

Character Area	Total Area in GAA		Area within the Six Lease Areas' Combined 1,312-ft (399.9-m) APVI			Area within the Six Lease Areas' Combined 853-ft (260-m) APVI		
	mi^2	km^2	mi^2	km^2	% Affected	mi^2	km^2	% Affected
Landscape	**867.252**	**2246.172**	**0.993**	**2.573**	**0.11**	**0.530**	**1.372**	**0.06**
Inland Agriculture	19.272	49.914	0.002	0.004	0.01	0.000	0.000	0.00
Inland Commercial Park	24.749	64.099	0.011	0.029	0.04	0.002	0.004	0.01
Inland Industrial	22.964	59.475	0.241	0.623	1.05	0.047	0.123	0.21
Inland Industrial Resource	4.224	10.941	0.179	0.463	4.23	0.163	0.423	3.86
Inland Military Site	-	-	-	-	-	-	-	-
Inland Natural Area	139.486	361.267	0.030	0.077	0.02	0.019	0.050	0.01
Inland Recreation	22.297	57.750	0.019	0.049	0.08	0.012	0.032	0.06
Inland Rural	2.496	6.464	0.106	0.273	4.23	0.033	0.086	1.33
Inland Suburban/Exurban Residential	484.621	1255.162	0.218	0.564	0.04	0.120	0.311	0.02
Inland Urban	147.143	381.099	0.190	0.491	0.13	0.132	0.343	0.09

Magnitude of Impact Results

The size and scale, geographic extent, and duration and reversibility factors presented in Tables 5-14 and 5-15 are combined in part using the matrix in Table 5-6 and in part using a degree of professional judgment, to determine the magnitude of impact on the character areas.

Magnitude of Impact Results of the 1,312-ft (399.9-m) Turbines

The magnitude of impact of the 1,312-ft (399.9-m) turbines in New Jersey concludes the following: 2 of the 28 character areas are determined to have a large magnitude of impacts, 6 are medium, 15 are small, and 5 are negligible.

The magnitude of impact of the 1,312-ft (399.9-m) turbines in New York concludes the following: 2 of the 28 character areas have a large magnitude of impacts, 8 are medium, 13 are small, and 2 are negligible. Three of the character areas are not present in the GAA of New York.

Magnitude of Impact Results of the 853-ft (260-m) Turbines

The magnitude of impact of the 853-ft (260-m) turbines in New Jersey concludes the following: 2 of the 28 character areas has a large magnitude of impacts, 4 are medium, 12 are small, and 10 are negligible.

The magnitude of impact of the 853-ft (260-m) turbines in New York concludes the following: 2 character areas have a large magnitude of impacts, 6 are medium, 15 are small, and 2 are negligible.

Table 5-14 Character Areas' Magnitude of Impacts Summary for Turbine Height of 1,312 ft (399.9 m)

Character Area	Size and Scale	Geographic Extent	Duration/ Reversibility	Magnitude of Impact
New Jersey				
Ocean				
Open Ocean	Large	Large	Fair	Large
Seascape				
Bayside				
Bayside Commercial Park	Small	Negligible	Fair	Negligible
Bayside Industrial	Small	Negligible	Fair	Negligible
Bayside Industrial Resource	Small	Negligible	Fair	Negligible
Bayside Military Site	Small	Small	Fair	Small
Bayside Natural Upland	Small	Small	Fair	Small
Bayside Natural Wetland	Small	Large	Fair	Medium
Bayside Recreation	Small	Small	Fair	Small
Bayside Residential	Medium	Small	Fair	Medium

Character Area	Size and Scale	Geographic Extent	Duration/ Reversibility	Magnitude of Impact
Bayside Urban	Small	Small	Fair	Small
Bayside Waterbodies	Medium	Large	Fair	Medium
Seascape Residential	Small	Small	Fair	Small
Seascape Urban	Small	Negligible	Fair	Negligible
Oceanside				
Nearshore Ocean	Large	Large	Fair	Large
Oceanside Beach	Medium	Large	Fair	Medium
Oceanside Recreation	Small	Medium	Fair	Small
Oceanside Residential/Commercial	Medium	Large	Fair	Medium
Oceanside Urban	Medium	Medium	Fair	Medium
Landscape				
Inland Agriculture	Small	Small	Fair	Small
Inland Commercial Park	Small	Small	Fair	Small
Inland Industrial	Negligible	Negligible	Fair	Negligible
Inland Industrial Resource	Small	Small	Fair	Small
Inland Military Site	Small	Small	Fair	Small
Inland Natural Area	Small	Small	Fair	Small
Inland Recreation	Small	Small	Fair	Small
Inland Rural	Small	Small	Fair	Small
Inland Suburban/Exurban Residential	Small	Small	Fair	Small
Inland Urban	Small	Small	Fair	Small
New York				
Ocean				
Open Ocean	Large	Large	Fair	Large
Seascape				
Bayside				
Bayside Commercial Park	Small	Negligible	Fair	Negligible
Bayside Industrial	Small	Small	Fair	Small
Bayside Industrial Resource	Small	Large	Fair	Medium
Bayside Military Site	N/A	N/A	N/A	N/A
Bayside Natural Upland	Small	Small	Fair	Small
Bayside Natural Wetland	Small	Large	Fair	Medium
Bayside Recreation	Small	Small	Fair	Small
Bayside Residential	Medium	Small	Fair	Medium
Bayside Urban	Small	Small	Fair	Small
Bayside Waterbodies	Medium	Large	Fair	Medium
Seascape Residential	Small	Small	Fair	Small
Seascape Urban	N/A	N/A	N/A	N/A
Oceanside				
Nearshore Ocean	Large	Large	Fair	Large
Oceanside Beach	Medium	Large	Fair	Medium
Oceanside Recreation	Medium	Medium	Fair	Medium
Oceanside Residential/Commercial	Medium	Large	Fair	Medium

Character Area	Size and Scale	Geographic Extent	Duration/ Reversibility	Magnitude of Impact
Oceanside Urban	Medium	Medium	Fair	Medium
Landscape				
Inland Agriculture	Small	Negligible	Fair	Negligible
Inland Commercial Park	Small	Small	Fair	Small
Inland Industrial	Small	Small	Fair	Small
Inland Industrial Resource	Small	Small	Fair	Small
Inland Military Site	N/A	N/A	N/A	N/A
Inland Natural Area	Small	Small	Fair	Small
Inland Recreation	Small	Small	Fair	Small
Inland Rural	Small	Small	Fair	Small
Inland Suburban/Exurban Residential	Small	Small	Fair	Small
Inland Urban	Small	Small	Fair	Small

Table 5-15 Character Areas' Magnitude of Impacts Summary for Turbine Height of 853 ft (399.9 m)

Character Area	Size and Scale	Geographic Extent	Duration/ Reversibility	Magnitude of Impact
New Jersey				
Ocean				
Open Ocean	Large	Large	Fair	Large
Seascape				
Bayside				
Bayside Commercial Park	Small	Negligible	Fair	Negligible
Bayside Industrial	Small	Negligible	Fair	Negligible
Bayside Industrial Resource	Small	Negligible	Fair	Negligible
Bayside Military Site	Small	Negligible	Fair	Negligible
Bayside Natural Upland	Small	Negligible	Fair	Negligible
Bayside Natural Wetland	Medium	Small	Fair	Medium
Bayside Recreation	Small	Small	Fair	Small
Bayside Residential	Small	Small	Fair	Small
Bayside Urban	Small	Small	Fair	Small
Bayside Waterbodies	Medium	Small	Fair	Medium
Seascape Residential	Small	Small	Fair	Small
Seascape Urban	Small	Negligible	Fair	Negligible
Oceanside				
Nearshore Ocean	Large	Large	Fair	Large
Oceanside Beach	Medium	Large	Fair	Medium
Oceanside Recreation	Small	Medium	Fair	Small
Oceanside Residential/Commercial	Medium	Medium	Fair	Medium
Oceanside Urban	Small	Medium	Fair	Small
Landscape				
Inland Agriculture	Small	Negligible	Fair	Negligible
Inland Commercial Park	Small	Small	Fair	Small

Character Area	Size and Scale	Geographic Extent	Duration/ Reversibility	Magnitude of Impact
Inland Industrial	Negligible	Negligible	Fair	Negligible
Inland Industrial Resource	Small	Small	Fair	Small
Inland Military Site	Negligible	Small	Fair	Negligible
Inland Natural Area	Small	Small	Fair	Small
Inland Recreation	Small	Small	Fair	Small
Inland Rural	Small	Negligible	Fair	Negligible
Inland Suburban/Exurban Residential	Small	Small	Fair	Small
Inland Urban	Small	Small	Fair	Small
New York				
Ocean				
Open Ocean	Large	Large	Fair	Large
Seascape				
Bayside				
Bayside Commercial Park	Small	Negligible	Fair	Negligible
Bayside Industrial	Small	Small	Fair	Small
Bayside Industrial Resource	Small	Large	Fair	Medium
Bayside Military Site	N/A	N/A	N/A	N/A
Bayside Natural Upland	Small	Small	Fair	Small
Bayside Natural Wetland	Medium	Medium	Fair	Medium
Bayside Recreation	Small	Small	Fair	Small
Bayside Residential	Small	Small	Fair	Small
Bayside Urban	Small	Small	Fair	Small
Bayside Waterbodies	Medium	Large	Fair	Medium
Seascape Residential	Small	Small	Fair	Small
Seascape Urban	N/A	N/A	N/A	N/A
Oceanside				
Nearshore Ocean	Large	Large	Fair	Large
Oceanside Beach	Medium	Large	Fair	Medium
Oceanside Recreation	Medium	Large	Fair	Medium
Oceanside Residential/Commercial	Medium	Medium	Fair	Medium
Oceanside Urban	Small	Medium	Fair	Small
Landscape				
Inland Agriculture	Small	Negligible	Fair	Negligible
Inland Commercial Park	Small	Negligible	Fair	Negligible
Inland Industrial	Small	Small	Fair	Small
Inland Industrial Resource	Small	Small	Fair	Small
Inland Military Site	N/A	N/A	N/A	N/A
Inland Natural Area	Small	Small	Fair	Small
Inland Recreation	Small	Small	Fair	Small
Inland Rural	Small	Small	Fair	Small
Inland Suburban/Exurban Residential	Small	Small	Fair	Small
Inland Urban	Small	Small	Fair	Small

5.2.3 Summary of SLIA Findings

The impact results of the SLIA are documented Table 5-16 and Table 5-17. The sensitivity and magnitude of impact ratings of each character area are combined using the combination matrix in Table 5-7 as a guiding indicator of impact, but are adjusted using professional judgment to determine the overall impact level. The following sections summarize the results for both the minimum and maximum turbine heights for all six lease areas combined.

The APVI of OCS-A 0537 for both wind turbine height scenarios (853 ft [260 m] or 1,312 ft [399.9 m]) are not within view from New Jersey and would have no effect on the New Jersey character areas. Similarly, the APVI of OCS-A 0538, OCS-A 0539, OCS-A 0541, and OCS-A 0542 are not within view from New York and would have no effect on the character areas within New York.

5.2.3.1 Overall SLIA Results of the 1,312-ft (399.9-m) Turbines

Conclusions on the overall SLIA impacts by the 1,312-ft (399.9-m) turbines in New Jersey includes: 2 of the 28 character areas have a major impact, 6 have a moderate impact, 15 have a minor impact, and 5 have a negligible impact. The 1,312-ft (399.9-m) APVI viewshed of lease area OCS-A 0537 does not affect any character areas in New Jersey. The other five lease areas' viewsheds intersect with New Jersey, with OCS-A 0541 having the most impact.

Conclusions on the overall SLIA impacts by the 1,312-ft (399.9-m) turbines in New York includes: 2 character areas have a major impact, 7 have a moderate impact, 14 have a minor impact, and 2 have a negligible impact. The majority of impacts are from the APVI of OCS-A 0544 with minimal impacts from OCS-A 0537. Lease areas OCS-A 0538, 0539, 0541, and 0542 have no effect on New York.

Table 5-16 summarizes the sensitivity and magnitude of impact ratings, and the overall impact level for each character area by the 1,312-ft (399.9-m) wind turbines located within all six lease areas.

Table 5-16 Summary of Findings for 1,312-ft (399.9-m) Turbines in New Jersey and New York

Character Area	Sensitivity[a]	Magnitude of Impact[b]	Overall Impact Rating[c]
New Jersey			
Ocean			
Open Ocean	High	Large	Major
Seascape			
Bayside			
Bayside Commercial Park	Low	Negligible	Negligible
Bayside Industrial	Low	Negligible	Negligible
Bayside Industrial Resource	Low	Negligible	Negligible
Bayside Military Site	Low	Small	Minor
Bayside Natural Upland	High	Small	Minor
Bayside Natural Wetland	High	Medium	Moderate
Bayside Recreation	High	Small	Minor
Bayside Residential	High	Medium	Moderate
Bayside Urban	Medium	Small	Minor
Bayside Waterbodies	High	Medium	Moderate
Seascape Residential	High	Small	Minor
Seascape Urban	Medium	Negligible	Negligible
Oceanside			
Nearshore Ocean	High	Large	Major
Oceanside Beach	High	Medium	Moderate
Oceanside Recreation	High	Small	Minor
Oceanside Residential/Commercial	High	Medium	Moderate
Oceanside Urban	High	Medium	Moderate
Landscape			
Inland Agriculture	High	Small	Minor
Inland Commercial Park	Low	Small	Minor
Inland Industrial	Low	Negligible	Negligible
Inland Industrial Resource	Low	Small	Minor
Inland Military Site	Medium	Small	Minor
Inland Natural Area	High	Small	Minor
Inland Recreation	High	Small	Minor
Inland Rural	High	Small	Minor
Inland Suburban/Exurban Residential	High	Small	Minor
Inland Urban	Low	Small	Minor
New York			
Ocean			
Open Ocean	High	Large	Major
Seascape			
Bayside			
Bayside Commercial Park	Low	Negligible	Negligible
Bayside Industrial	Low	Small	Minor

Character Area	Sensitivity[a]	Magnitude of Impact[b]	Overall Impact Rating[c]
Bayside Industrial Resource	Low	Medium	Minor[5]
Bayside Military Site	Low	N/A	N/A
Bayside Natural Upland	High	Small	Minor
Bayside Natural Wetland	High	Medium	Moderate
Bayside Recreation	High	Small	Minor
Bayside Residential	High	Medium	Moderate
Bayside Urban	Medium	Small	Minor
Bayside Waterbodies	High	Medium	Moderate
Seascape Residential	High	Small	Minor
Seascape Urban	Medium	N/A	N/A
Oceanside			
Nearshore Ocean	High	Large	Major
Oceanside Beach	High	Medium	Moderate
Oceanside Recreation	High	Medium	Moderate
Oceanside Residential/Commercial	High	Medium	Moderate
Oceanside Urban	High	Medium	Moderate
Landscape			
Inland Agriculture	High	Negligible	Negligible
Inland Commercial Park	Low	Small	Minor
Inland Industrial	Low	Small	Minor
Inland Industrial Resource	Low	Small	Minor
Inland Military Site	Medium	N/A	N/A
Inland Natural Area	High	Small	Minor
Inland Recreation	High	Small	Minor
Inland Rural	High	Small	Minor
Inland Suburban/Exurban Residential	High	Small	Minor
Inland Urban	Low	Small	Minor

[a] Sensitivity ratings are high, medium, or low for each character area. They remain the same throughout the multiple analyses (New Jersey, New York, and 1,312-ft and 853-ft turbine heights).
[b] Magnitude of impact is large, medium, small, or negligible for each character area.
[c] Overall impact rating is major, moderate, minor, or negligible for each character area.

5.2.3.2 Overall SLIA Results of the 853-ft (260-m) Wind Turbines

Conclusions on the overall SLIA impacts by the 853-ft (260-m) wind turbines in New Jersey includes:2 of the 28 character areas has a major impact, 4 have a moderate impact, 12 have a minor impact, and 10 have a negligible impact. Similarly to the 1,312-ft (399.9-m) wind turbines, the 853-ft (260-m) APVI viewshed of lease area OCS-A 0537 does not affect any

[5] Except for one, all character areas' magnitude of impact rating reflects the overall rating. Although the magnitude of impact for bayside industrial resource areas in New York are medium, the overall impact is minor due to the low susceptibility and low value that the character area holds. Bayside industrial resource areas have a low scenic quality, holding no social scenic value, and they are not susceptible to changes to their character from the proposed project due to the similar industrial characteristics including blocky infrastructure.

character areas in New Jersey. The other five lease areas' viewsheds intersect with New Jersey, with OCS-A 0541 having the most impact.

Conclusions on the overall SLIA impacts by 853-ft (260-m) wind turbines in New York includes: 2 character areas have a major impact, 5 have a moderate impact, 14 have a minor impact, and 3 have a negligible impact. Similarly to the 1,312-ft (399.9-m) wind turbines, the vast majority of impacts are from the APVI of OCS-A 0544, and some minimal impacts are from OCS-A 0537. Lease areas OCS-A 0538, OCS-A 0539, OCS-A 0541, and OCS-A 0542 do not have any effect on New York.

Table 5-17 summarizes the sensitivity and magnitude of impact ratings, and the overall impact level for each character area by the 853-ft (260-m) wind turbines of all six lease areas.

Table 5-17 Summary of Findings for 853-ft (260-m) Wind Turbines in New Jersey and New York

State and Character Area	Sensitivity[a]	Magnitude of Impact[b]	Overall Impact Rating[c]
New Jersey			
Ocean			
Open Ocean	High	Large	Major
Seascape			
Bayside			
Bayside Commercial Park	Low	Negligible	Negligible
Bayside Industrial	Low	Negligible	Negligible
Bayside Industrial Resource	Low	Negligible	Negligible
Bayside Military Site	Low	Negligible	Negligible
Bayside Natural Upland	High	Negligible	Negligible
Bayside Natural Wetland	High	Medium	Moderate
Bayside Recreation	High	Small	Minor
Bayside Residential	High	Small	Minor
Bayside Urban	Medium	Small	Minor
Bayside Waterbodies	High	Medium	Moderate
Seascape Residential	High	Small	Minor
Seascape Urban	Medium	Negligible	Negligible
Oceanside			
Nearshore Ocean	High	Large	Major
Oceanside Beach	High	Medium	Moderate
Oceanside Recreation	High	Small	Minor
Oceanside Residential/Commercial	High	Medium	Moderate
Oceanside Urban	High	Small	Minor
Landscape			
Inland Agriculture	High	Negligible	Negligible
Inland Commercial Park	Low	Small	Minor
Inland Industrial	Low	Negligible	Negligible
Inland Industrial Resource	Low	Small	Minor
Inland Military Site	Medium	Negligible	Negligible
Inland Natural Area	High	Small	Minor
Inland Recreation	High	Small	Minor
Inland Rural	High	Negligible	Negligible
Inland Suburban/Exurban Residential	High	Small	Minor
Inland Urban	Low	Small	Minor
New York			
Ocean			
Open Ocean	High	Large	Major
Seascape			
Bayside			
Bayside Commercial Park	Low	Negligible	Negligible
Bayside Industrial	Low	Small	Minor

State and Character Area	Sensitivity[a]	Magnitude of Impact[b]	Overall Impact Rating[c]
Bayside Industrial Resource	Low	Medium	Minor[6]
Bayside Military Site	Low	N/A	N/A
Bayside Natural Upland	High	Small	Minor
Bayside Natural Wetland	High	Medium	Moderate
Bayside Recreation	High	Small	Minor
Bayside Residential	High	Small	Minor
Bayside Urban	Medium	Small	Minor
Bayside Waterbodies	High	Medium	Moderate
Seascape Residential	High	Small	Minor
Seascape Urban	Medium	N/A	N/A
Oceanside			
Nearshore Ocean	High	Large	Major
Oceanside Beach	High	Medium	Moderate
Oceanside Recreation	High	Medium	Moderate
Oceanside Residential/Commercial	High	Medium	Moderate
Oceanside Urban	High	Small	Minor
Landscape			
Inland Agriculture	High	Negligible	Negligible
Inland Commercial Park	Low	Negligible	Negligible
Inland Industrial	Low	Small	Minor
Inland Industrial Resource	Low	Small	Minor
Inland Military Site	Medium	N/A	N/A
Inland Natural Area	High	Small	Minor
Inland Recreation	High	Small	Minor
Inland Rural	High	Small	Minor
Inland Suburban/Exurban Residential	High	Small	Minor
Inland Urban	Low	Small	Minor

[a] Sensitivity ratings are high, medium, or low for each character area. They remain the same throughout the multiple analyses (New Jersey, New York, and 1,312-ft and 853-ft turbine heights).
[b] Magnitude of impact is large, medium, small, or negligible for each character area.
[c] Overall impact rating is major, moderate, minor, or negligible for each character area.

[6] Except for one, all character areas' magnitude of impact rating reflects the overall rating. Although the magnitude of impact for bayside industrial resource areas in New York are medium, the overall impact is minor due to the low susceptibility and low value that the character area holds. Bayside industrial resource areas have a low scenic quality, holding no social scenic value, and they are not susceptible to changes to their character from the proposed project due to the similar industrial characteristics including blocky infrastructure.

Chapter 6

Visual Impact Assessment (VIA)

The VIA for BOEM-reviewed offshore wind projects analyzes visual impacts based on the assessment of magnitude of impact and sensitivity. The VIA assesses impacts on viewers caused by adding the proposed development to views from selected viewpoints, referred to as KOPs, as seen by particular people. The VIA analyzes the change to the view itself and how the change will affect the visual experience of people who are likely to be at the viewpoint, and how they are likely to respond to the change. Enjoyment of a particular view is dependent on the viewers, and in VIA, the impact receptors are people, not the ocean, seascape, or landscape.

The methodology for the VIA is described in Section 6.1 and the results are presented in Section 6.2.

6.1 VIA Analysis Methodology

The VIA analysis methodology was split into two steps. Step 1 was the methodology for establishing the affected environment description and impact receptor identification as part of the baseline data collection (Section 6.1.1). Step 2 of the VIA analysis methodology was the project visual impact analysis (Section 6.1.2).

6.1.1 Methodology for Baseline Data Collection

Sections 6.1.1.1 through 6.1.1.7 identify the visual impact receptors (viewer groups) within the GAA and describe the KOP selection process and KOP descriptions, all while taking into consideration the applicable LORPPs that were identified early in the process. They also outline the field process, the preparation of project visualization, assessment of visual compatibility, contrast, and evaluation of visual change, combined with the receptor and KOP sensitivities identified.

6.1.1.1 Receptor/Viewer Group Identification

Receptors or viewers are the people who interface with the project and experience its effects. Understanding the characteristics of viewers is important because the project's effects on the viewer experience and the viewer response to these effects contribute to the visual impact. When identifying viewer groups, those within the established GAA were initially considered. After developing the viewshed within the GAA, additional information was gathered, including a review of local planning documents, input from stakeholder outreach activities, reviewing COP VIAs prepared for other nearby offshore wind projects, and the activities observed during field reconnaissance. Examples of viewers may include tourists, recreational users, residents (including those in communities with EJ concerns), travelers and/or commuters, and commercial fishers.

6.1.1.2 Selection of KOPs

The APVI viewshed indicates that views of the project are theoretically present from numerous locations along or near the eastern coastline of New Jersey and southern coastline of Long Island, New York. An initial list of candidate KOPs was chosen within the study area by using the results from the SLIA (Section 5.2) and Viewshed Analysis (Chapter 4), along with the following:

- Mapping of publicly accessible locations within the ZTV;
- Identification of designated cultural resources through consultation with Section 106 BOEM subject matter experts (SMEs);
- Review of COP VIAs prepared for other nearby offshore wind projects, specifically Empire Wind, Atlantic Shores North and South, and Ocean Wind 1 and 2;
- Identification of locations where the view of the project would be relatively unobstructed and represents the full extent of the project's visual effect on the surrounding area;
- The location of the viewpoint is within an area where scenery is valued (for example, a recognized scenic resource); and
- Field checking the viewpoint for visibility to the proposed project area. Existing features in the landscape such as mature vegetation, structures, or landforms may block the view of the project from certain viewpoints.

6.1.1.3 Field Survey

Measured, geo-referenced panoramic photography was taken at each candidate KOP location. Photo data were recorded on field sheets, as well as the assessment of visual contrast and compatibility and ocean, seascape, or landscape character of the area. This data was used to choose those KOPs for development of project simulations and analysis of impacts.

Base Photography

Photographs were taken, using standards common to the practice, as described in the BOEM SLVIA Guidance (BOEM 2021a), to provide realistic images. Base photographs were taken at each candidate KOP during the site visits. The photo points were surveyed while identifying additional reference points that enabled the surveyor to survey fix the exact location of the camera. The images that were captured during the site visit were digitally stitched together to create one seamless 124° panoramic view of the existing view that was experienced when the photographer was on site. Photos were taken from KOPs in New Jersey and New York for the potential viewing of offshore project components. A photographic log is provided in Appendix D for all KOPs visited.

For offshore simulations, the viewpoint of the camera was set to the middle of the wind turbine and OSP array. Its view parameters were set using the calculated distance to the horizon and calculated visible heights above the horizon of the nearest wind turbine. For each period modeled, the program's daylight parameters were set to the date of the photo and the time the photo was taken. This provided the correct sun angle and intensity for the rendering. For other weather conditions, the light parameters in the model were adjusted to reflect the light conditions (e.g., no sun for cloudy conditions). The final rendering is a composite of the modeled structures within the photographs from various KOPs.

Assessment of Visual Compatibility

Visual compatibility considers compatibility of the project with its surroundings. Compatibility considers how the project features fit within the visual resource, and considers:

- Unity of the project shape or form with existing features of the resource;
- Influence of the project on the intactness of views;
- Scale of the project relative the scale of the visual resource; and
- Dominance or prominence of the project in the resource.

Compatibility is based on the capacity of the visual resource, in this case, the KOPs, to absorb or integrate changes due to the KOPs and/or characteristic features, such as form and variability.

Assessment of Visual Contrast

Visual contrast was evaluated in the field from KOPs and described as the extent to which a project appears different from the surrounding visual environment. It was measured using the four basic visual design elements of form, line, color, and texture (BLM 1986), along with horizontal and vertical scale, motion, and lighting. The aesthetic and perceptual characteristics of landform, ocean, vegetation, inland waterbodies, and structures were taken into consideration at each KOP:

- **Form:** Form is defined as the "Structure, mass, or shape of a landscape or object […] defined by edges or outlines of landforms, rock forms, vegetation patterns, or water forms, or the enclosed spaces created by these attributes" (BLM 1986). The form of WTGs is simple patterned, vertical, and linear with angular blades.

- **Line:** Line is defined as an intersection of two planes; a point that has been extended, or the silhouette of a form. Ridges, skylines, structures, changes in vegetation (for example, forest meeting meadow), the ocean horizon, or the beach meeting the ocean, may all be perceived by the viewer as lines. The WTGs along the horizon line create many straight vertical lines in contrast with the essentially flat horizontal horizon line.

- **Color:** Color is the property of reflecting light of a particular wavelength that enables an observer to differentiate objects that may otherwise be indistinguishable. A hue (red, green, blue, etc.) is contrasted with a value, such as black, white, or grey. Wind turbines above the yellow navigational aid demarcation line will be painted no lighter than RAL 9010 Pure White and no darker than RAL 7035 Light Grey. The WTG color will vary depending on the time of day and atmospheric conditions.

- **Texture:** Texture is a visual interplay of light and shadow created by variations in the surface of an object. The grain or "nap" of a landscape, a repetitive pattern of tiny forms. Visual texture ranges along a gradient from smooth (i.e., flat water surface) to coarse. WTGs are individually smooth, but in groupings may create a stippled texture due to the repetitive pattern of small forms in the distance.

- **Horizontal and Vertical Scale:** These elements are compared to both the horizontal and vertical scales that may contrast against the built environment and the natural character of the existing setting. For example, a dark colored horizon line is a defining visual characteristic in a seascape setting. The vertical scale and light color of the WTGs may contrast with the strong horizontal line and darker color of the ocean horizon line meeting the sky.

- **Motion:** The movement of offshore WTGs has been documented to increase visibility and draw viewer attention (Sullivan et al. 2013).

- **Lighting:** Lighting of structures for air and marine navigation safety may likewise increase visibility and draw viewer attention when lights are in operation.

These observations on landform, ocean, vegetation, inland waterbodies, and structures were recorded onsite at each KOP and developed to support the inventory and descriptions of contrasting elements found within the view from the selected KOPs.

6.1.1.4 KOP Refinement and Simulation Creation

Based on the field visits at each of the initial KOPs, a subset of KOPs was selected to simulate and assess project conditions.

Project simulations were prepared from the base panoramic photographs taken from the viewing sites at KOPs within ocean, seascape, and LCAs. Each simulation was prepared to represent viewer position at a specific location that is publicly accessible.

6.1.1.5 KOP Selection Rationales

A list of KOPs was developed through a review of existing SLVIA reports prepared for projects in the wind energy areas off the south coast of Long Island, New York, and the eastern shore of New Jersey. Projects reviewed were Empire Wind, Atlantic Shores North and South and Ocean Wind 1 and 2. These precedent studies were used as a starting point to identify places of visual significance or importance to the community within the GAA. These KOPs include designated historic structures and buildings, historically important landscapes, recreation areas, scenic roads, overlooks and vistas, public beaches, town centers, residential communities, and estates. Historic KOPs were selected in consultation with BOEM Section 106 SMEs and consultation with New York and New Jersey SHPOs. These historic sites were identified along with public access location related to the highest number of viewers, are high tourist destinations, and all provide open views toward the project. KOPs were also selected to represent views of the project from multiple angles, distances, vantages, and viewer types (e.g., residents, tourists, economic interests).

6.1.1.6 Turbine Visibility Calculations

Part of the project impact assessment was calculating the number of wind turbines that would be visible and which part of the wind turbines would be visible (blade tip, hub, and mid tower). Geospatial analyses were used to determine how many blade tips, hubs, and mid-towers are seen, if any, from each lease area at each KOP. First, Walter Bislin's Advanced Earth Curvature Calculator tool was used to find the visible distance from each KOP to the blade tip, hub, and mid tower (Bislin 2022). The height of the turbine feature affects the visible distance. For example, at Lucy the Margate Elephant NHL (KOP-02), the mid-tower of the 1,312 ft (399.9 m) WTG is visible up to 34.17 mi (54.99 km) from the KOP, the hub is visible up to 44.38 mi (71.42 km) away, and the blade tips are visible up to 57.05 mi (91.81 km) from the KOP. Buffers were then created from the KOPs using those visible distances. Turbine points from the maximum development scenario were then intersected with the buffers to determine the visible turbine count at each distance and height combination.

To be consistent with the simulations, no refraction was used in the initial analysis. The same processes were run using the inland refraction coefficient of 0.13[7], as described in Section 4.1, to show the difference of impacts with and without refraction. Although it is important to understand the differences in potential project impacts with multiple refraction coefficients, project impacts are primarily determined by carefully observing the simulations using professional judgment.

6.1.1.7 Preparation of Project Visualizations

Project visualizations are critical for representing how a project will look during the day or night in the ocean, seascape, or landscape setting after construction. Specific detail support in the creation of visualization can be found in Sullivan et al. (2021). This document provides specific technical details associated with the creation of visualizations and simulations and instructions for how to use them to evaluate impacts.

Simulations were created using three-dimensional (3D) visualization software tools. 3D models of the above ground/sea surface structures (e.g., wind turbines/OSPs and onshore substation facilities) were created at each of the selected KOP photo locations and developed into a

[7] The recommended inland refraction coefficient is 0.13. It is recommended to use a coefficient of 0.17 for seascape and ocean views (Bislin 2022).

simulation. Simulations were developed using geo-referenced, measured photographs that integrate the proposed project components in scale based on the distances and atmospheric conditions from the viewpoint to project. Two types of simulations are presented in this report: one showing the predicted visibility, and the other showing the maximum visibility. The predicted visibility simulations represent the atmospheric conditions taken at the time of the day. One hundred fifty simulations were produced representing maximum visibility where the atmospheric interference was removed. These simulations are representative of the clearest, most visible conditions generally referred to as the most conservative scenario for visual impact analysis, even though at times project facilities will be obscured. Although atmospheric interference was altered, the simulations still use the representative weather and natural light conditions at the moment a photograph was taken, such as a clear sky or overcast conditions.

6.1.2 Methodology for Visual Impact Analysis

After the baseline data was collected and visual simulations for the proposed project were produced, the visual impact analysis was conducted. Information from the VIA baseline data collection was used to identify potential visual impacts from the proposed development. The impact assessment was based on the sensitivity of the viewer and KOP and the magnitude of the impact brought about by the proposed project. Similarly to the SLIA, sensitivity was determined based on the viewer and the KOP's susceptibility to impact and its perceived value of the viewpoint. Along with sensitivity, impacts were also based on the magnitude of the impact, which was determined by considering the size and scale of the change to existing conditions caused by the project, the geographic extent of the area subject to the project's effects, and the effects' duration and reversibility. After the sensitivity and magnitude of the impact were determined, with consideration of visual contrast and compatibility of the project to the existing view, the projects' overall impact level on each KOP was evaluated.

Due to the proximity of the six lease areas to the New Jersey and New York shorelines, and the maximum and minimum turbine height scenarios, for the purposes of this VIA, impact levels were analyzed based on the 1,312-ft (399.9-m) turbine heights and 853-ft (260-m) turbine heights for all six lease areas combined as well as each individual lease area.

In conformance with the BOEM SLVIA Methodology (BOEM 2021a), professional judgment was used to rate each factor and its components on an ordinal scale with three levels. These relationships are presented in Table 5-1.

6.1.2.1 Sensitivity

As noted in the third editions of *Guidelines for Landscape and Visual Impact Assessment* (GLVIA3; LI and IEMA 2013), the visual receptors most susceptible to change may include the following:

- Residents with views of the proposed project from their homes;
- People engaged in outdoor recreation whose attention or interest is likely to be focused on the seascape or landscape, and on particular views;
- Visitors to historic or culturally important sites, where views of the surroundings are an important contributor to the experience;
- People who regard the visual environment as an important asset to their community; and
- People traveling on scenic highways, railroads, or other transport specifically for enjoyment of views.

Visual receptors who, on average, may be less sensitive to changes in views include people who are:

- Engaged in outdoor recreation whose attention or interest is unlikely to be focused on the landscape and on views because of the type of activity in which they are engaged; and
- At their place of work (inside or outside) whose attention is generally focused on their work, not on scenery, and where the seascape or landscape setting is not important to the quality of working life.

Commuters and other travelers on non-scenic routes are generally regarded as moderately sensitive viewers (LI and IEMA 2013).

Impacts on viewers also depend upon the value they place on views. Impacts at heavily visited, widely recognized, and highly valued viewpoints are more likely to be important. Relative judgments about the values viewers attach to particular views are determined in a variety of ways, including:

- The number of likely viewers, as known, estimated, or judged;
- Designation as a scenic viewpoint, especially within a designated scenic area such as a scenic roadway, estuary, river, beach or historic site, state park, or national park;
- Association with a historic or culturally important site or sites, especially within a designated area;

- Appearances in guidebooks, tourist maps, websites, online photo collections, and social media;
- References to the views in literature or art;
- Provision of facilities for view enjoyment, such as parking, restrooms, interpretive panels, and telescopes; and
- Consultation with residents, visitors' bureaus, tourism service providers, and other local entities.

As in the SLIA, sensitivity is determined based on the combination of the susceptibility and value components as presented in Table 5-2.

6.1.2.2 Magnitude of Visual Impact

Large-scale changes that introduce new, non-characteristic, discordant, or intrusive elements into the view are likely to have a greater impact on the receptors than small changes or changes that involve features already present within the view. The magnitude of visual impacts expected from the proposed project was based on the size or scale of the change, the geographic extent of its effects, and its duration and reversibility. The same matrix for these magnitude components was used for the VIA as used in the SLIA (Table 5-2), along with professional judgment.

Size and Scale of Change

Argonne SMEs made a judgment regarding the degree of change to the view quality from loss, addition, or alteration of features or elements of the view. Considerations of the size and scale of change due to the addition of the project include:

- The scale of the change in the view with respect to the loss or addition of features in the view and its composition.
- The degree to which added features or changes to the view contrast with existing elements in terms of form, line, color, and texture, and any effects of the added elements or changes on scale relationships, spatial composition of the view, and motion. These scales of changes are determined in terms of visual contrast and prominence on the existing conditions descriptions in Appendix F.
- The degree to which the project components, or the project, draw visual attention away from existing features of the view.
- The nature of the view of the proposed development in terms of the relative amount of time over which it will be experienced (view duration) and whether views will be full, partial, or glimpses.

A modified BLM Visual Resource Management System contrast rating scale was used to analyze contrast with respect to the evaluation of visual change in form, line, color, texture, scale and movement as presented in the KOP forms included in Appendix F. The rating scale used is presented in Table 6-1. It is based upon the system developed by Sullivan and Cothren (2013) for offshore wind turbine visibility, and augmented by material from the GLVIA3 and BOEM's SLVIA Methodology (BOEM 2021a). Table 6-1 is used to inform professional judgment regarding the level of contrast, visual prominence, and influence on the receptor.

The size and scale component does not refer to the size or scale of the project. Instead, it refers to the size or scale of the change, that is, whether it is a large, medium, small, or negligible change to the potentially affected view. The size and scale of change rating definitions are summarized in Table 5-3.

A component in determining size and scale of change is the number of wind turbines visible and what part of the wind turbines are visible (blade tip, hub, mid-tower). Using geographic information system (GIS) models, these numbers were run to determine how many blade tips, hubs, and mid-towers are seen from each lease area at each KOP. To be consistent with the simulations, no refraction was used in this initial calculation. The same model was run, using 0.13 refraction, to show the difference this factor makes.

Table 6-1 Visual Contrast and Magnitude of Impact Rating

Degree of Contrast[a]	Equivalent Visual Prominence Level[b]	Definition	Equivalent Size and Scale of Change[c]
Strong	6	An object or phenomenon that constitutes a strong visual contrast and occupies most of the visual field. Views of it cannot be avoided except by turning one's head more than 45° from a direct view of the object. The objector phenomenon is the major focus of visual attention, and its large apparent size is a major factor in its view dominance. In addition to size, contrasts in form, line, color, and texture, bright light sources and moving objects associated with the study subject may contribute substantially to drawing viewer attention. The visual prominence of the object detracts noticeably from the existing view elements.	Large
	5	An object or phenomenon that does not appear 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 that attention. In addition to strong contrasts in form, line, color, and texture, bright light sources, such as lighting and reflections and moving objects associated with the study subject, may contribute substantially to drawing viewer attention. The visual prominence of the study subject interferes noticeably with views of existing visual elements.	
Moderate	4	An object or phenomenon that is obvious and with sufficient size or contrast to compete with baseline visual elements, but with insufficient visual contrast to strongly attract visual attention and insufficient size to occupy most of an observer's visual field.	Moderate
	3	An object or phenomenon that is easily detected after a brief look and would be visible to most casual observers, but without sufficient size or contrast to compete with key characteristic visual elements to any great extent.	
Weak	2	An object or phenomenon that appears very small and/or faint, but when the observer is scanning the horizon or looking more closely at an area, can be detected without prolonged viewing. It could sometimes be noticed by casual observers. However, most people would not notice it without actively looking, so it is unlikely to compete with key characteristic visual elements to any great extent.	Small
	1	An object or 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 not looking for it. Even under those circumstances, the object can be seen only after looking at it closely for an extended period and therefore unlikely to compete with key visual elements to any great extent.	
None	0	An object or phenomenon that is not discernible or presents no contrast or apparent change.	Negligible/ None

[a] Based on BLM Manual 8431, Visual Resource Contrast Rating (BLM 1986).
[b] Derived from the visibility levels as described in Sullivan et al. (2013).
[c] Follows the BOEM Methodology (BOEM 2021) and has been further defined using the visibility levels as described in Sullivan et al. (2013).

Geographic Extent

The geographic extent of a visual impact varies as seen from different viewpoints and reflects the following:

- The angle of view in relation to the viewer, for example, whether the project is in the center of the view or in the periphery of the view. If the project is closer to the center of the view, it is assumed that the effect would be more noticeable (BOEM 2021a).
- The apparent size of the proposed project within the view. Projects that appear larger to the viewer will have a greater effect on the view.
- The extent of the area over which essentially the same changes would be visible, that is, whether the impact of the project on the view is evident only in the immediate vicinity of the KOP or over a wide area in and around the KOP. Projects that are visible over a larger area result in greater impact. To determine this, the percentage of the view the project occupies is calculated.

Similar to the geographic extent in the SLIA, the VIA uses the percentage thresholds in Table 6-2 for the horizontal field of view the project occupies. The percentage is the amount of the horizontal field of view the project occupies out of the 124° field of view.

Table 6-2 Thresholds for VIA Geographic Extent Ratings

Geographic Extent	Definition
Large	Area equivalent to between 30% and 100% of the horizontal field of view.
Medium	Area equivalent to between 10% and 30% of the horizontal field of view.
Small	Area equivalent to less than 10% of the horizontal field of view.
Negligible	Area equivalent where theoretical visibility does not occur or where field reconnaissance suggests there would be no actual visibility due to the screening effect of micro-topography (not represented in terrain or surface data).

Duration and Reversibility of Impacts

The third element of assessing the magnitude of impact is to consider its duration and reversibility. This is the length of time over which the impact is likely to occur and the degree to which the currently existing conditions are restored after the impact ceases.

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). The judgment regarding duration takes into consideration residual impacts remaining after decommissioning. 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. The combination matrix in Table 5-5 was created to inform whether a project will be considered good, fair, or poor in terms of duration and reversibility.

Combining Magnitude Factors

The combination matrix in Table 5-6 is derived from the BOEM SLVIA Methodology (BOEM 2021a), with the addition of a *negligible* outcome for magnitude of impact. The table is used as a guide when considering the size and scale, geographic extent, and duration and reversibility to determine the magnitude of project impact on the receptors on a scale of large, medium, small, or negligible. In rating the magnitude of impact on a KOP, a degree of professional judgment is used.

6.1.2.3 Overall Project Impact Analysis on KOPs

The BOEM SLVIA Methodology (BOEM 2021a) includes a matrix for combining receptor sensitivity and magnitude of impact ratings to derive an overall VIA rating, which is "recommended but [is] subject to change in consideration of individual project circumstances" and is scored on a scale of minor, moderate, and major (BOEM 2021a).

As in the SLIA, the matrix in Table 5-7 is used as a guide for combining sensitivity and magnitude; however, a degree of professional judgment is used. The definitions of major, moderate, minor, and negligible are defined in Table 6-3.

Table 6-3 Impact Level Descriptions for VIA

Impact Level	Description
Major	The visibility of the project would introduce a major level of character change to the view; would 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 susceptibility and 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.
Moderate	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 levels 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 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.
Minor	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 sensitivity to determine if elevating the impact to the next level is justified. For instance, a KOP with a low magnitude of change, but has a high level of viewer concern (combination of susceptibility/value) may justify adjusting to a moderate level of impact.
Negligible	Very little or no effect on viewers' experiences, because project visibility/contrast/magnitude of change are minimal, and/or view receptor sensitivity/susceptibility/value is minimal.

6.2 VIA Results

Section 6.2.1 presents the results of the VIA in terms of the baseline data collected in order to determine appropriate KOPs within the GAA. Section 6.3 presents the analysis of visual impacts on KOPs.

6.2.1 Baseline Data Collection

Sections 6.2.1.1 through 6.2.1.4 provide the results associated with the receptor and/or viewer group identification, selection of KOPs, field survey, refinement classification and simulation creation, and preparation of project visualizations.

6.2.1.1 Receptor/Viewer Group Identification

The following receptor and/or viewer groups were identified: tourists, recreational users, residents, travelers and commuters, and water-based receptors. There is an expectation that most receptors will be sensitive to visual changes to seascape views along the New Jersey and Long Island coastlines, due to the high value placed on these areas by the receptors, and the receptors susceptibility to change at each KOP identified receptors and viewer groups identified in the following sections are referenced in other offshore wind projects (Empire Wind, Atlantic Shores North and South, and Ocean Wind 1 and 2), as well as direct discussions with key stakeholders and observations at KOP locations.

Tourists and Recreational Receptors

New Jersey and Long Island, New York, offer a wide range of recreational activities and destinations for both tourists and recreational users. This section focuses on those tourist and recreational receptors that are related to the enjoyment of the seascape and landscape and views, such as visitors to vantage points and parks, users of walking and biking trails, and beachgoers. For the purposes of this assessment, recreational receptors are highly sensitive to the type of development proposed, given that the value placed on the seascape and landscape. The susceptibility from the views is a key part of the experience for people who engage in tourism and outdoor recreational activities.

The New Jersey coastline consists of miles of boardwalks set just behind the many public beaches. These boardwalks within the GAA are located in Ocean City, Atlantic City, Seaside Heights, and Point Pleasant Beach. In places like Atlantic City and Ocean City, these boardwalks are also adjacent to urbanized developments that attract tourists, while also allowing them to enjoy the ocean views. New Jersey has many lighthouses that serve as historic destinations for visitors. These include Barnegat Lighthouse, Sandy Hook Lighthouse, Navesink Twin Lighthouses, Sea Girt Lighthouse, Tucker’s Island Lighthouse, and Absecon Lighthouse.

The southern coast of Long Island, New York, is filled with state parks, including Robert Moses State Park, Jones Beach State Park, Barrett Beach Park, and other points of interest for tourists and recreational users such as Fort Tilden National Recreation Area and Fire Island National Seashore. Long Island also contains boardwalks in locations such as in Rockaway Park, Long Beach, and Jones Beach. Typically, these boardwalks provide access to oceanfront beaches. Long Island also has lighthouses that serve as tourist destination points, such as Coney Island Lighthouse, Breezy Point Lighthouse, and Fire Island Lighthouse.

Residents

Permanent and year-round residents and those in communities with EJ concerns are considered in the assessment of impacts on residential receptors. Residents (permanent or year-round) are considered to have high sensitivity. Their attention or interest is focused on their surroundings, upon which they place a high value. Views of the surrounding area contribute to the landscape setting, which is highly susceptible to change.

Travelers and Commuters

Travelers and commuters are both road users who have different sensitivities, and sensitivity varies within each group.

General road users' susceptibility to change may vary from low to high, depending on the frequency of their road use and the value they place on the road experience. Some everyday travelers may feel more attached to the sense of place and more susceptible to the changes in their everyday commutes; others may not feel affected by changes because their expectations have less to do with appreciation of landscape and scenic quality. Therefore, frequent road users' sensitivity to the type of development proposed ranges from low to high because their expectations have less to do with appreciation of landscape and scenic quality.

Similarly, tourist road users also have a range of sensitivity. Typically, their expectations relate to appreciating the character of the landscape and the scenic quality of routes. Travelling to and from destinations is a valued part of their experience. However, their susceptibility may be lower because they may be one-time travelers or occasional tourists who will not encounter these effects repeatedly from day to day. Therefore, the overall sensitivity for tourist road users is likely to vary from medium to high.

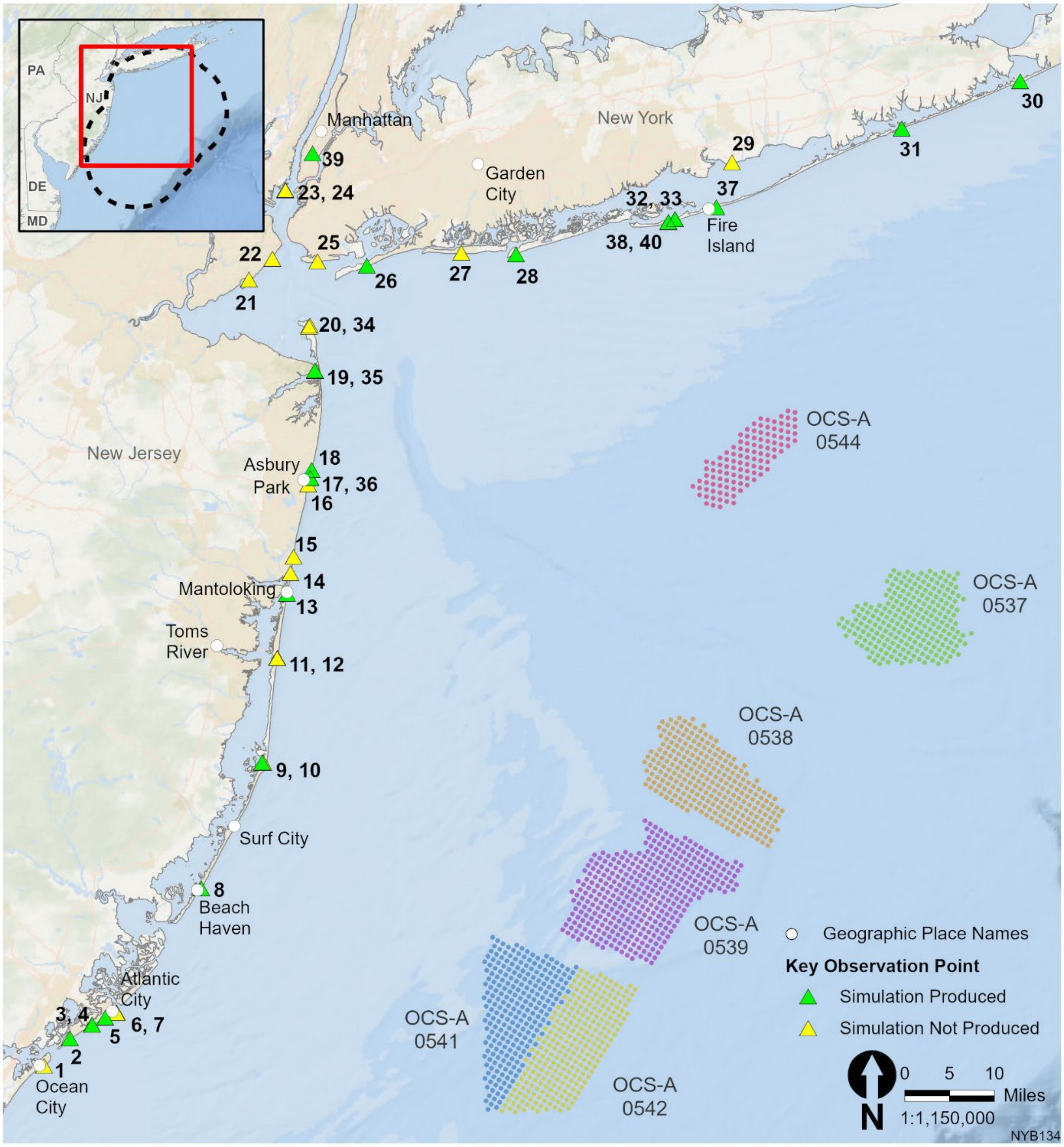
Water-Based Receptors

The eastern coastline of New Jersey and the southern coastline of Long Island are popular for boating, sailing, kayaking, swimming, and fishing. Many ferry terminals connect New Jersey to New York. Those starting in New Jersey are in Belford, Highlands, and Sandy Hook. There are also ferries on Long Island from the main island to the barrier islands, including those between Rockaway and Manhattan, Bayshore and Kismet on Fire Island, Sayville and Fire Island, and Bellport and Patchogue on Fire Island. Private docks are located within the inlets, salt ponds, and waterways within New Jersey and Long Island.

Water-based recreation is popular with both residents and tourists. Activities include boating, sailing, surfing, kayaking, swimming, fishing, and whale watching. These activities occur along each coastline and some within inland water bodies. The water-based receptors are most numerous during the warmer summer months but remain present in smaller numbers and frequencies during the colder months. Depending on the activity of the water-based receptor, their sensitivity may vary. In general, their sensitivity is likely to be high because of the high value they place on the setting. Because of the openness of the seascape near the project, their susceptibility to changes in the environment is high.

6.2.1.2 Selection of KOPs

As noted in Chapter 4, the APVI for both 1,312-ft (399.9-m) and 853-ft (260-m) turbine heights indicates that views of the lease areas are theoretically available from numerous locations across the New Jersey eastern coastline and southern coastline of Long Island, New York. The selected KOPs stretch from Ocean City, New Jersey, north to Manhattan, New York, and east onto Long Island (Figure 6-1). Table 6-4 lists each of the KOPs and general site information. See Appendix G for a photographic log of each KOP.



1 Ocean City Music Hall
2 Lucy the Margate Elephant NHL
3 John Stafford Hall - Boardwalk
4 John Stafford Beach Entrance
5 Jim Whelan Hall - Balcony
6 Atlantic City Boardwalk - Ocean Casino Boardwalk
7 Atlantic City Boardwalk - Top of Ocean Casino
8 Beach Haven - Day/Night
9 Barnegat Jetty
10 Barnegat Lighthouse
11 US Life Saving Stn. #14
12 Seaside Park Beach
13 Mantoloking
14 Bayhead
15 Point Pleasant
16 Ocean Grove
17 Asbury Park Beach
18 Allenhurst Residential Historic District
19 Navesink Twin Lights
20 Sandy Hook Beach
21 Great Kills
22 Roosevelt Pier
23 Statue of Liberty - Upper Deck
24 Statue of Liberty - Base
25 Coney Island Boardwalk
26 Fort Tilden
27 Magnolia Beach
28 Jones Beach
29 Rudolph Oyster House
30 Shinnecock Inlet
31 Westhampton Beach
32 Fire Island Lighthouse - Upper Deck
33 Fire Island Lighthouse - Base
34 Sandy Hook Observatory
35 Twin Lights Lighthouse
36 Asbury Park Hall - Top
37 Point O' Woods NHL
38 Robert Moses Field 5
39 Empire State Building
40 Robert Moses Field 5 - Night

Figure 6-1 Locations of KOPs

Table 6-4 KOP Information[a]

KOP #	KOP Name	Latitude	Longitude	County	Municipality	Character Area	Receptor/Viewer Group	1,312-ft APVI	853-ft APVI
KOP-01	Ocean City Music Hall	39.277064	-74.565456	Cape May	Ocean City, NJ	Outside GAA	Tourist/Recreational	Out	Out
KOP-02	Lucy the Margate Elephant NHL	39.320830	-74.511680	Atlantic	Margate City, NJ	Oceanside Residential/Commercial	Residents, Tourist/Recreational	In	In
KOP-03	John Stafford Hall—Boardwalk	39.342938	-74.465568	Atlantic	Ventnor City, NJ	Oceanside Residential/Commercial	Residents, Tourist/Recreational	Out	Out
KOP-04	John Stafford Beach Entrance	39.342563	-74.465343	Atlantic	Ventnor City, NJ	Oceanside Residential/Commercial	Residents, Tourist/Recreational, Water-Based	In	In
KOP-05	Jim Whelan Hall—Balcony	39.354060	-74.437924	Atlantic	Atlantic City, NJ	Oceanside Urban	Tourist/recreational	Out	Out
KOP-06	Atlantic City Boardwalk—Ocean Casino Boardwalk View	39.361718	-74.413738	Atlantic	Atlantic City, NJ	Oceanside Urban	Tourist/recreational	Out	Out
KOP-07	Atlantic City Boardwalk—Top of Ocean Casino	39.362044	-74.413452	Atlantic	Atlantic City, NJ	Oceanside Urban	Tourist/recreational	Out	Out
KOP-08	Beach Haven—Night	39.561880	-74.235480	Ocean	Beach Haven Borough, NJ	Oceanside Residential/Commercial	Residents, Tourist/Recreational	In	In
KOP-08	Beach Haven	39.561888	-74.235487	Ocean	Beach Haven Borough, NJ	Oceanside Residential/Commercial	Residents, Tourist/Recreational	In	In
KOP-09	Barnegat Jetty	39.763707	-74.103035	Ocean	Barnegat Light Borough, NJ	Bayside Waterbodies	Tourist/Recreational, Water-Based	In	In
KOP-10	Barnegat Lighthouse	39.763648	-74.103019	Ocean	Barnegat Light Borough, NJ	Oceanside Recreation	Tourist/Recreational	Out	Out
KOP-11	U.S. Life Saving Station 14	39.932907	-74.072363	Ocean	Seaside Park Borough, NJ	Oceanside Residential/Commercial	Residents, Tourist/Recreational	In	In
KOP-12	Seaside Park Beach	39.933060	-74.071935	Ocean	Seaside Park Borough, NJ	Oceanside Residential/Commercial	Residents, Tourist/Recreational, Water-Based	In	In
KOP-13	Mantoloking	40.036690	-74.049815	Ocean	Mantoloking Borough, NJ	Oceanside Residential/Commercial	Residents, Tourist/Recreational	In	Out
KOP-14	Bayhead	40.070002	-74.042099	Ocean	Bayhead Borough, NJ	Oceanside Residential/Commercial	Residents, Tourist/Recreational	In	In
KOP-15	Point Pleasant	40.096635	-74.035518	Ocean	Point Pleasure Beach Borough, NJ	Oceanside Residential/Commercial	Residents, Tourist/Recreational	In	In

KOP #	KOP Name	Latitude	Longitude	County	Municipality	Character Area	Receptor/Viewer Group	1,312-ft APVI	853-ft APVI
KOP-16	Ocean Grove	40.212682	-74.002915	Monmouth	Neptune Township, NJ	Oceanside Residential/Commercial	Residents, Tourist/Recreational	In	In
KOP-17	Asbury Park Beach	40.223300	-73.997698	Monmouth	Asbury Park, NJ	Oceanside Urban	Tourist/Recreational	Out	Out
KOP-18	Allenhurst Residential Historic District	40.236266	-73.995185	Monmouth	Allenhurst Borough, NJ	Oceanside Residential/Commercial	Residents, Tourist/Recreational	In	In
KOP-19	Navesink Twin Lights—Base	40.396058	-73.985508	Monmouth	Highlands Borough, NJ	Bayside Residential	Residents, Tourist/Recreational	Out	Out
KOP-20	Sandy Hook Beach	40.470111	-73.995812	Monmouth	Middletown Township, NJ	Oceanside Beach	Tourist/Recreational	In	Out
KOP-21	Great Kills	40.544847	-74.123545	Richmond	Staten Island, NY	Outside GAA	Tourist/Recreational	Out	Out
KOP-22	Roosevelt Pier	40.578244	-74.073534	Richmond	Staten Island, NY	Outside GAA	Tourist/Recreational	Out	Out
KOP-23	Statue of Liberty—Upper Deck	40.689267	-74.044577	New York	Manhattan, NY	Outside GAA	Tourist/Recreational	Out	Out
KOP-24	Statue of Liberty—Base	40.688562	-74.044277	New York	Manhattan, NY	Bayside Recreation	Tourist/Recreational	Out	Out
KOP-25	Coney Island Boardwalk	40.573285	-73.978055	Kings	Brooklyn, NY	Bayside Urban	Tourist/Recreational	Out	Out
KOP-26	Fort Tilden—Night	40.564984	-73.873080	Queens	Queens, NY	Oceanside Recreation	Tourist/Recreational	In	Out
KOP-27	Magnolia Beach	40.583793	-73.672650	Nassau	Long Beach, NY	Oceanside Urban	Residents, Tourist/Recreational	In	In
KOP-28	Jones Beach	40.580080	-73.556652	Nassau	Wantagh, NY	Oceanside Recreation	Tourist/Recreational	In	In
KOP-29	Rudolph Oyster House	40.722025	-73.094612	Suffolk	West Sayville, NY	Bayside Recreation	Residents, Tourist/Recreational	In	In
KOP-30	Shinnecock Inlet	40.841221	-72.478497	Suffolk	Hampton Bays, NY	Oceanside Beach	Tourist/Recreational, Water-Based	In	Out
KOP-31	Westhampton Beach	40.770159	-72.732787	Suffolk	Westhampton Beach, NY	Oceanside Beach	Residents, Tourist/Recreational	In	In
KOP-32	Fire Island Lighthouse —Upper Deck	40.632177	-73.218436	Suffolk	Islip, NY	Oceanside Beach	Tourist/Recreational	Out	Out
KOP-33	Fire Island Lighthouse —Base	40.632158	-73.218458	Suffolk	Islip, NY	Oceanside Beach	Tourist/Recreational	In	In
KOP-34	Sandy Hook Observatory	40.467889	-73.997542	Monmouth	Middletown Township, NJ	Oceanside Beach	Tourist/Recreational	Out	Out
KOP-35	Twin Lights Lighthouse—Top	40.396128	-73.985463	Monmouth	Highlands Borough, NJ	Bayside Residential	Residents, Tourist/Recreational	In	In
KOP-36	Asbury Park Hall Balcony	40.223276	-73.997693	Monmouth	Asbury Park, NJ	Oceanside Urban	Tourist/Recreational	Out	Out

KOP #	KOP Name	Latitude	Longitude	County	Municipality	Character Area	Receptor/Viewer Group	1,312-ft APVI	853-ft APVI
KOP-37	Point O' Woods	40.649968	-73.130065	Suffolk	Brookhaven, NY	Oceanside Residential/Commercial	Residents, Tourist/Recreational	In	In
KOP-38	Robert Moses Field 5	40.627602	-73.232677	Suffolk	Fire Island, NY	Oceanside Recreation	Tourist/Recreational	In	In
KOP-39	Empire State Building	40.748423	-73.985669	New York	New York, NY	Inland Urban	Tourist/Recreational	Out	Out
KOP-40	Robert Moses Field 5—Night	40.627602	-73.232677	Suffolk	Fire Island, NY	Oceanside Recreation	Tourist/Recreational	Out	Out
KOP-A	Representative Commercial and Cruise Ship Lanes	N/A	N/A	N/A	N/A	Open Ocean	Water-based	In	In

[a] Grey rows are KOPs that have simulated conditions.

6.2.1.3 Field Survey

Argonne, BOEM, and Truescape personnel visited sites in New Jersey and New York from January 23 to February 10, 2023. Truescape personnel took the panoramic photographs and were accompanied by surveyors to obtain accurate GPS locations for each KOP.

During the field visits, personnel observed and described the form, line color, texture, horizontal scale, vertical scale, and movement within the landform, ocean, inland waterbodies, vegetation, and structures. Appendix B provides the results of the field observations. These descriptions are important in assessing the compatibility of the surrounding character from each KOP.

6.2.1.4 Refinement Classification and Simulation Creation

After multiple field visits, KOPs were selected to be used for simulations. The simulated KOPs called out in both Figure 6-1 and Table 6-5 suggest simulated KOPs that may be used as representative simulation conditions for those KOPs that have been assessed and visited in the field but were not selected for simulations. These KOPs are in similar proximity to the lease areas and have similar characteristics and sense of place.

Table 6-5 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 #[a]	**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-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 Balcony	**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)[b]
		KOP-37	Point O'Woods[b]
KOPs without Simulation Representation			
KOP-09	Barnegat Jetty		
KOP-11	U.S. Life Saving Station 14		
KOP-12	Seaside Park Beach		

[a] Eight KOPs were identified but following the analysis appeared outside of the affected viewshed and have been removed from the impact analysis: 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.

[b] KOP-40 provides a representative example of nighttime effects for KOP-33 and KOP-37.

6.2.2 Visual Impact Analysis

As discussed in Section 6.1, the KOPs are described in terms of the receptor and/or viewer group sensitivity and magnitude of visual impact on the KOP. This information is then used to determine the overall impact level from the project. The results presented include the VIA on KOPs for both the 1,312-ft (399.9-m) and 853-ft (260-m) turbine height alternatives.

6.2.2.1 Sensitivity

The sensitivity of the receptors and/or viewers from a KOP that has been selected for simulation is described in Appendix F. Table 6-6 summarizes the sensitivity ratings in terms of susceptibility and value. All but two of the KOPs are highly susceptible to changes from the introduction of the project. KOP-02 is rated moderately susceptible, because it is set back from the beach and set contextually within the developed landscape. KOP-05 is not a publicly accessible balcony, and therefore is moderately susceptible. All KOPs are highly valued, as explained in the methodology. Table 5-2 shows how susceptibility and value work together to determine the sensitivity at the specific KOP. Ultimately, the determination of sensitivity is based on professional judgment and rational descriptions as described in Appendix F for the ratings and rationales associated with the sensitivity designation of each simulated KOP.

Table 6-6 KOP Sensitivity Results

KOP #	KOP Name	Ratings		
		Susceptibility	Value	Sensitivity
KOP-02	Lucy the Margate Elephant NHL	Medium	High	High
KOP-04	John Stafford Beach Entrance	High	High	High
KOP-05	Jim Whelan Hall—Balcony	Medium	High	High
KOP-08	Beach Haven—Night	High	High	High
KOP-08	Beach Haven	High	High	High
KOP-10	Barnegat Lighthouse	High	High	High
KOP-13	Mantoloking	High	High	High
KOP-18	Allenhurst Residential Historic District	High	High	High
KOP-26	Fort Tilden—Night	High	High	High
KOP-28	Jones Beach	High	High	High
KOP-30	Shinnecock Inlet	High	High	High
KOP-31	Westhampton Beach	High	High	High
KOP-32	Fire Island Lighthouse—Upper Deck	High	High	High
KOP-35	Twin Lights Lighthouse	High	High	High
KOP-36	Asbury Park Hall Balcony	High	High	High
KOP-37	Point O'Woods	High	High	High
KOP-39	Empire State Building	High	High	High
KOP-40	Robert Moses Field 5—Night	High	High	High

6.2.2.2 Magnitude of Visual Impact

The results for the magnitude of visual impact on the KOPs at the 1,312-ft (399.9-m) and 853-ft (260-m) height alternatives are presented in the following sections.

Size and Scale of Change

Looking at the visual simulations produced, the size and scale of change were evaluated using degree of contrast and visual prominence levels translated to definitions of the degree of change: large, medium, small, or negligible (see Section 6.1.2.2 for definitions used). See Appendix F for the degree of contrast and visual prominence ratings of how the project interacts with the landform, open ocean, vegetation, inland waterbodies, and structures at each KOP. Overall size and scale ratings and rationales are presented in Appendix F. The size and scale ratings are summarized in Tables 6-8 and 6-9.

Geographic Extent

Table 6-7 displays the results of the geographic extent of the wind turbines at both height alternatives. As noted in the methodology (Section 6.1.2.2), the horizontal field of view was calculated based on turbine visibility with 0.0 refraction. The geographic extent ratings are determined using Table 5-5.

Out of the 18 KOP simulations, the 1,312-ft (399.9-m) wind turbines have a large geographic extent rating at 10 KOPs, a medium rating at 4, a small rating at 2, and a negligible rating at 2.

Out of the 18 KOP simulations, the 853-ft (260-m) wind turbines have a large geographic extent rating at 2 KOPs, a medium rating at 6, a small rating at 2, and a negligible rating at 8.

Table 6-7 Geographic Extent

KOP #	KOP Name	1,312-ft (399.9-m) Wind Turbines			853-ft (260-m) Wind Turbines		
		Horizontal Field of View (°)	% of 124° Panoramic View	Geographic Extent Rating	Horizontal Field of View (°)	% of 124° Panoramic View	Geographic Extent Rating
KOP-02	Lucy the Margate Elephant NHL	23.1	19%	Medium	0.0	0%	Negligible
KOP-04	John Stafford Beach Entrance	24.4	20%	Medium	0.0	0%	Negligible
KOP-05	Jim Whelan Hall-Balcony	25.2	20%	Negligible[a]	21.4	17%	Negligible[a]
KOP-08	Beach Haven-Night	42.7	34%	Large	0.0	0%	Negligible
KOP-08	Beach Haven	42.7	34%	Large	27.2	22%	Medium
KOP-10	Barnegat Lighthouse	91.0	73%	Large	63.0	51%	Large
KOP-13	Mantoloking	80.5	65%	Large	0.0	0%	Negligible
KOP-18	Allenhurst Residential Historic District	48.4	39%	Large	0.0	0%	Negligible
KOP-26	Fort Tilden-Night	0.0	0%	Negligible	0.0	0%	Negligible
KOP-28	Jones Beach	23.1	19%	Medium	23.1	19%	Medium
KOP-30	Shinnecock Inlet	5.7	5%	Small	0.0	0%	Negligible
KOP-31	Westhampton Beach	11.5	9%I	Small	8.9	7%	Small
KOP-32	Fire Island Lighthouse-Upper Deck	41.1	33%	Large	34.7	28%	Medium
KOP-35	Twin Lights Lighthouse	57.8	47%	Large	41.1	33%	Large
KOP-36	Asbury Park Hall Balcony	61.9	50%	Large	6.1	5%	Small
KOP-37	Point O' Woods	38.2	31%	Large	25.7	21%	Medium
KOP-39	Empire State Building	42.4	34%	Large	33.5	27%I	Medium
KOP-40	Robert Moses Field 5-Night	31.5	25%	Medium	28.3	23%	Medium

[a] The WTGs from this viewpoint are blocked by buildings, therefore a rating of negligible geographic extent.

Duration and Reversibility of Impacts

The lifecycle of this project is estimated to be 33 years. Therefore, according to the BOEM SLVIA Methodology (BOEM 2021a), the duration is considered permanent. However, no residual character area impacts are expected to remain after decommissioning, and therefore, these impacts would be considered fully reversible. The assessment of duration and reversibility impacts considered in combination has been determined to be fair, given the permanent duration but full reversibility (Table 5-5).

Magnitude of Visual Impact Results

Table 5-6 was considered in assessing the combining factors of size and scale, geographic extent, and the duration and reversibility to determine the magnitude of impact the project has on each of the simulated KOPs; however, rather than relying solely on the combination matrix in Table 5-6, a degree of professional judgment is used to determine the magnitude of impact. Tables 6-8 and 6-9 display the summarized results of the magnitude of visual impact ratings and each component that goes into the rating.

Table 6-8 Magnitude of Visual Impact on KOPs from 1,312-ft (399.9-m) Wind Turbines

KOP #	KOP Name	Ratings			
		Size and Scale	Geographic Extent	Duration/ Reversibility	Magnitude of Visual Impact
KOP-02	Lucy the Margate Elephant NHL	Negligible	Medium	Fair	Negligible
KOP-04	John Stafford Beach Entrance	Negligible	Medium	Fair	Negligible
KOP-05	Jim Whelan Hall—Balcony	Negligible	Negligible	Fair	Negligible
KOP-08	Beach Haven—Night	Small	Large	Fair	Small
KOP-08	Beach Haven	Small	Large	Fair	Small
KOP-10	Barnegat Lighthouse	Medium	Large	Fair	Medium
KOP-13	Mantoloking	Small	Large	Fair	Small
KOP-18	Allenhurst Residential Historic District	Small	Large	Fair	Small
KOP-26	Fort Tilden—Night	Negligible	Negligible	Fair	Negligible
KOP-28	Jones Beach	Small	Medium	Fair	Small
KOP-30	Shinnecock Inlet	Negligible	Small	Fair	Negligible
KOP-31	Westhampton Beach	Small	Small	Fair	Small
KOP-32	Fire Island Lighthouse—Upper Deck	Medium	Large	Fair	Medium
KOP-35	Twin Lights Lighthouse	Small	Large	Fair	Small
KOP-36	Asbury Park Hall Balcony	Negligible	Large	Fair	Negligible
KOP-37	Point O' Woods	Medium	Large	Fair	Medium
KOP-39	Empire State Building	Small	Large	Fair	Small
KOP-40	Robert Moses Field 5—Night	Medium	Medium	Fair	Medium

Table 6-9 Magnitude of Visual Impact on KOPs from 853 ft (299 m) Wind Turbines

KOP #	KOP Name	Ratings			
		Size and Scale	Geographic Extent	Duration/ Reversibility	Magnitude of Visual Impact
KOP-02	Lucy the Margate Elephant NHL[a]	Negligible	Negligible	Fair	Negligible
KOP-04	John Stafford Beach Entrance[a]	Negligible	Negligible	Fair	Negligible
KOP-05	Jim Whelan Hall—Balcony	Negligible	Negligible	Fair	Negligible
KOP-08	Beach Haven—Night	Negligible	Negligible	Fair	Negligible
KOP-08	Beach Haven	Small	Medium	Fair	Small
KOP-10	Barnegat Lighthouse	Small	Large	Fair	Small
KOP-13	Mantoloking[a]	Negligible	Negligible	Fair	Negligible
KOP-18	Allenhurst Residential Historic District[a]	Negligible	Negligible	Fair	Negligible
KOP-26	Fort Tilden—Night	Negligible	Negligible	Fair	Negligible
KOP-28	Jones Beach	Small	Medium	Fair	Small
KOP-30	Shinnecock Inlet	Negligible	Negligible	Fair	Negligible
KOP-31	Westhampton Beach	Negligible	Small	Fair	Negligible
KOP-32	Fire Island Lighthouse—Upper Deck	Medium	Medium	Fair	Medium
KOP-35	Twin Lights Lighthouse	Negligible	Large	Fair	Negligible
KOP-36	Asbury Park Hall Balcony[a]	Negligible	Small	Fair	Negligible
KOP-37	Point O'Woods	Small	Medium	Fair	Small
KOP-39	Empire State Building	Negligible	Medium	Fair	Negligible
KOP-40	Robert Moses Field 5—Night	Medium	Medium	Fair	Medium

[a] No 853-ft (260-m) simulation was produced. Ratings are based on GIS data.

6.2.3 Summary of Findings

Table 5-7 was used when assessing the combination of the sensitivity at each KOP and magnitude of visual impact ratings; however, professional judgment was weighed more heavily in the outcome of the ratings because the projects have minimal effect on many of the KOPs. Table 6-10 summarized the final impact ratings on the KOPs. See Appendix F for details of site location descriptions and assessment results for each component described in Section 6.2.2.

The 1,312-ft (399.9-m) wind turbines have a moderate visual impact on 4 of the 18 KOPs, a minor visual impact on 8, and a negligible impact on 6. The 853-ft (299-m) wind turbines have a moderate visual impact on 2 of the KOPs, a minor visual impact on 4, and a negligible impact on 12.

Table 6-10 VIA Summary of Findings

KOP #	KOP Name	Overall Impact Level	
		1,312-ft (399.9-m) Wind Turbines	853-ft (260-m) Wind Turbines
KOP-02	Lucy the Margate Elephant NHL	Negligible	Negligible [a]
KOP-04	John Stafford Beach Entrance	Negligible	Negligible [a]
KOP-05	Jim Whelan Hall-Balcony	Negligible	Negligible
KOP-08	Beach Haven—Night	Minor	Negligible
KOP-08	Beach Haven	Minor	Minor
KOP-10	Barnegat Lighthouse	Moderate	Minor
KOP-13	Mantoloking	Minor	Negligible [a]
KOP-18	Allenhurst Residential Historic District	Minor	Negligible [a]
KOP-26	Fort Tilden—Night	Negligible	Negligible
KOP-28	Jones Beach	Minor	Minor
KOP-30	Shinnecock Inlet	Negligible	Negligible
KOP-31	Westhampton Beach	Minor	Negligible
KOP-32	Fire Island Lighthouse—Upper Deck	Moderate	Moderate
KOP-35	Twin Lights Lighthouse	Minor	Negligible
KOP-36	Asbury Park Hall Balcony	Negligible	Negligible[a]
KOP-37	Point O' Woods	Moderate	Minor
KOP-39	Empire State Building	Minor	Negligible
KOP-40	Robert Moses Field 5—Night	Moderate	Moderate

[a] No 853-ft (260-m) simulation was produced. Ratings are based on GIS data.

Chapter 7

Cumulative Impacts

7.1 Cumulative Impacts Assessment Methodology

This cumulative impact assessment focuses on proposed foreseeable future actions based on external lease areas that intersect with the NY Bight GAA. Simulated external lease areas that fall within the GAA are OCS-A 0498 (Ocean Wind 1), OCS-A 0512 (Empire Wind), OCS-A 0512 (Empire Wind II), OCS-A 0499 (Atlantic Shores Offshore Wind South), OCS-A 0539 (Atlantic Shores Offshore Wind North), and OCS-A 0532 (Ocean Wind 2). These external leases have been simulated in combination with the NY Bight leases to understand the potential in combination impacts of a maximum build-out. See Figure 3-2 for the NY Bight GAA intersection with the external leases. Cumulative impacts were simulated from 16 representative KOPs.

Additional, foreseeable future actions that are addressed in this section include OCS-A 0482 (Garden State Offshore Energy, LLC [GSOE] I), OCS-A 0490 (US Wind/Maryland), and OCS-A 0519 (Skipjack). These three external BOEM lease areas do not fall directly within the NY Bight GAA; however, the viewsheds of these three lease areas overlap the GAA within the ocean only (Figures 7-1 and 7-2). These three lease areas were not simulated in the cumulative impact examples because ocean-based KOPs were not part of this analysis.

Table 7-1 External Lease Status[a]

External Lease Area	Status
OCS-A 0549 (Atlantic Shores—North)	Under BOEM Review
OCS-A 0499 (Atlantic Shores—South)	Under BOEM Review – Final EIS Released
OCS-A 0512 (Empire Wind) [b]	Approved
OCS-A-0498 (Ocean Wind 1) [c]	Approved
OCS-A 0532 (Ocean Wind 2) [c]	Awarded
OCS-A 0482 (Garden State Offshore Energy, LLC [GSOE] I)	Awarded
OCS-A 0490 (US Wind/Maryland)	Under BOEM Review – Final EIS Released
OCS-A 0519 (Skipjack)	Under BOEM Review

[a] Statuses of the lease areas are from August 15, 2024.
[b] 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 report consistent with the assumptions identified in Section 3.
[c] On October 31, 2023, Orsted publicly announced its 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 its COP for lease OCS-A 0498. Therefore, BOEM has analyzed the project within this report 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 OCSLA, 43 USC 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 in this report consistent with the assumptions identified in Section 3.

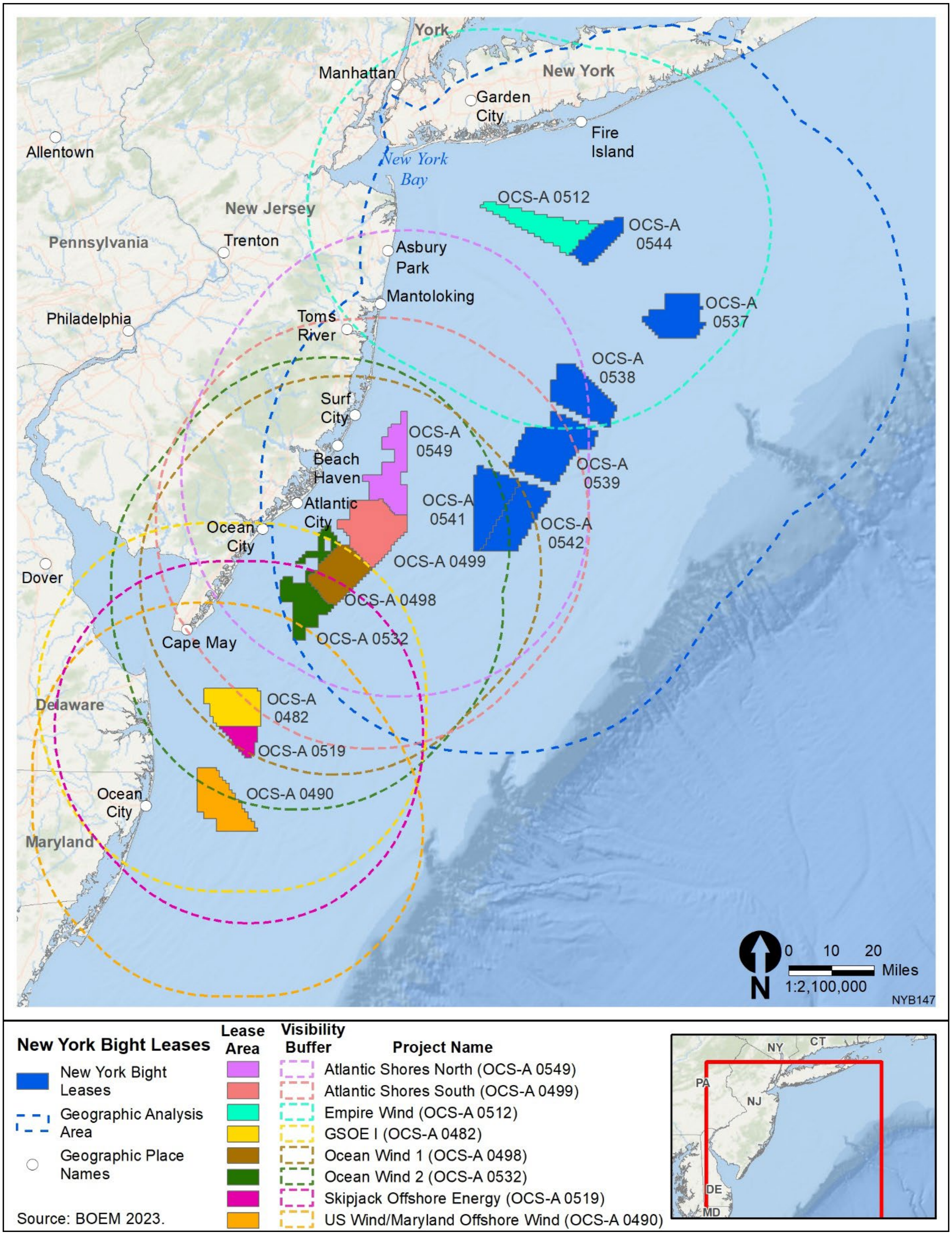


Figure 7-1 NY Bight GAA and other BOEM External Lease Area Visibility Rings

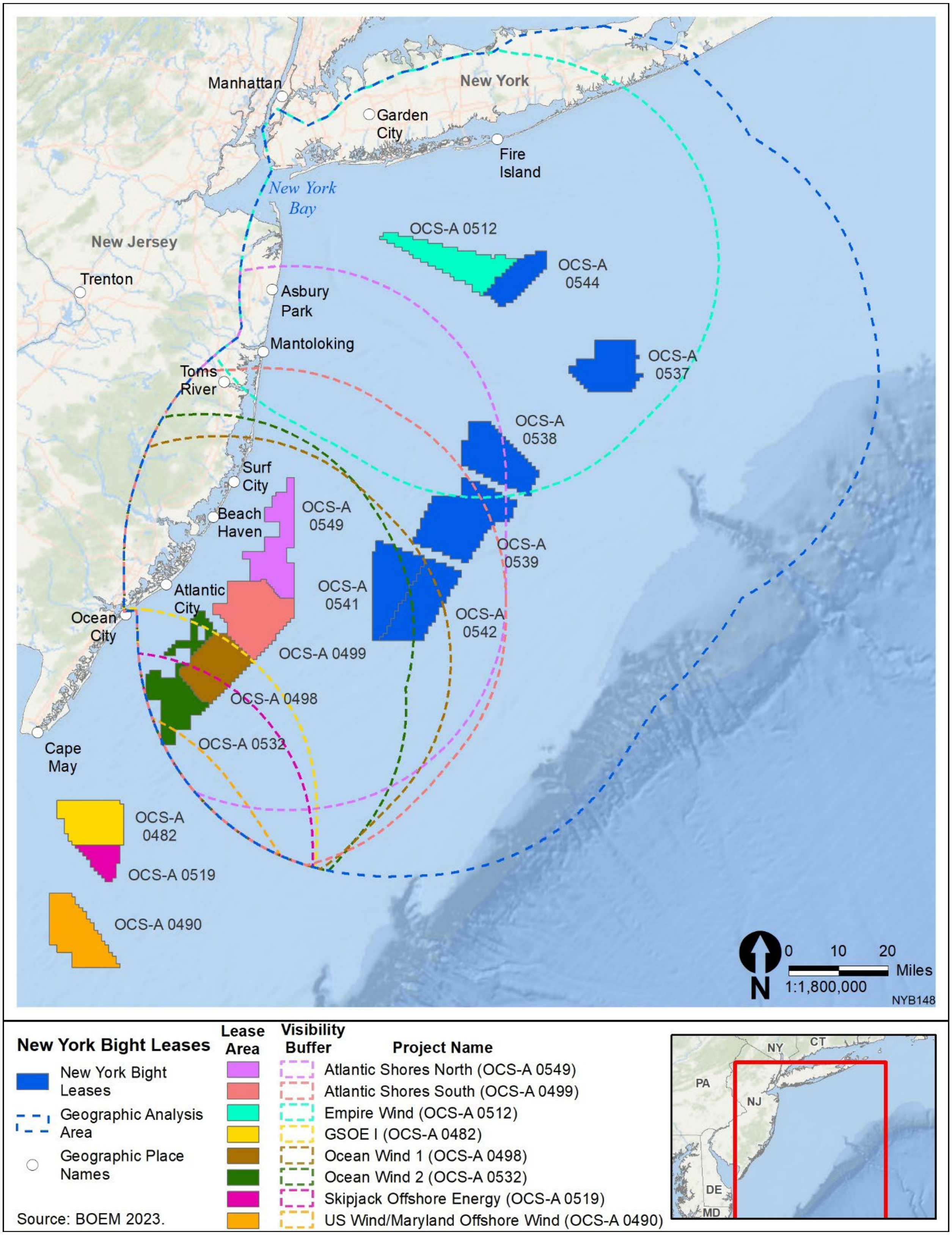


Figure 7-2 Intersection of NY Bight GAA with other BOEM External Lease Area Visibility Rings

7.2 Cumulative Ocean, Seascape, and Landscape Impact Analysis

This section describes cumulative impacts to ocean, seascape, and landscape. See Appendix D for a breakdown of the level I character, level II character type, and level III character area intersections with NY Bight, external, and cumulative lease Area of Potential Visal Impact (APVI) in New York and New Jersey.

When comparing the NY Bight to the external leases and cumulative APVIs in New Jersey, 10.5% of the area in the GAA is within the 1,312 ft (399.9 m) APVI of the NY Bight, whereas 47.3% is within the external leases APVI, and 47.4% is within the cumulative APVI. Similarly in New York, 10.4% of the area in the GAA is within the 1,312 ft (399.9 m) APVI of the NY Bight, whereas 33.2% is within the external leases APVI and 34.0% is within the cumulative APVI.

The level II Bayside character type has a high percentage of APVI, mostly within the Bayside Waterbodies and Bayside Natural Wetlands level III character areas. In New Jersey, 31.8% of the Bayside character type is within the 1,312 ft (399.9 m) NY Bight APVI, while 73.8% is within the cumulative APVI.

The level II Oceanside character type is noticeably less affected by the cumulative leases when the NY Bight wind turbines are 853 ft (260 m). In New Jersey, 45.8% of the Oceanside character type is within the NY Bight APVI, while 97.5% is within the cumulative APVI. In New York, 73.4% of the Oceanside character type is within the NY Bight APVI, while 85.96% is within the cumulative APVI. When NY Bight wind turbines are 1,312 ft (399.9 m), the APVI to the Oceanside character type is very similar to that of the cumulative APVI.

Table 7-2 and Table 7-3 summarize the NY Bight, external, and cumulative APVIs when NY Bight turbines are at a height of 853 ft (260 m), and Table 7-4 and Table 7-5 summarize the NY Bight, external, and cumulative APVIs when NY Bight turbines are at a height of 1,312 ft (399.9 m). The cumulative APVI when NY Bight wind turbines are 853 ft (260 m) are generally similar (see Appendix D for a detailed breakdown); therefore, the overall cumulative impacts to ocean, seascape, and landscape do not change depending on the height of the NY Bight wind turbines, as presented in Table 7-6.

Table 7-2 Seascape and Landscape Intersections with APVIs in New Jersey (when NY Bight Wind Turbines are 853 ft [260 m])

Lease Area	Area of Seascape within the Lease Areas' APVI (sq mi [sq km])	Percent of Seascape in the GAA Intersected with the APVIs	Area of Landscape within the Lease Areas' APVI (sq mi [sq km])	Percent of Landscape in the GAA Intersected with the APVIs
NY Bight only (853-ft [260-m])	24.9 (64.4)	3.4%	0.4 (0.9)	0.06%
External leases only[a]	616.5 (1,596.7)	85.4%	18.4 (47.8)	2.97%
Cumulative leases (NY Bight & external leases)	617.0 (1,598.1)	85.5%	18.7 (48.3)	3.00%

[a] External leases included in this analysis are OCS-A-0498 (Ocean Wind 1), OCS-A 0512 (Empire Wind), OCS-A 0512 (Empire Wind II), OCS-A 0499 (Atlantic Shores Offshore Wind South), OCS-A 0539 (Atlantic Shores Offshore Wind North), and OCS-A 0532 (Ocean Wind 2).

Table 7-3 Seascape and Landscape Intersections with APVIs in New York (when NY Bight Wind Turbines are 853 ft [260 m])

Lease Area	Area of Seascape within the Lease Areas' APVI (sq mi [sq km])	Percent of Seascape in the GAA Intersected with the APVIs	Area of Landscape within the Lease Areas' APVI (sq mi [sq km])	Percent of Landscape in the GAA Intersected with the APVIs
NY Bight only (853-ft [260-m])	104.5 (270.6)	15.8%	0.5 (1.4)	0.1%
External leases[a]	435.7 (1,128.4)	65.9%	72.0 (186.4)	8.3%
Cumulative leases (NY Bight & external leases)	448.6 (1,161.7)	67.9%	72.1 (186.8)	8.3%

[a] External leases included in this analysis are OCS-A-0498 (Ocean Wind 1), OCS-A 0512 (Empire Wind), OCS-A 0512 (Empire Wind II), OCS-A 0499 (Atlantic Shores Offshore Wind South), OCS-A 0539 (Atlantic Shores Offshore Wind North), and OCS-A 0532 (Ocean Wind 2).

Table 7-4 Seascape and Landscape Intersections with APVIs in New Jersey (when NY Bight Wind Turbines are 1,312 ft [399.9 m])

Lease Area	Area of Seascape within the Lease Areas' APVI (sq mi [sq km])	Percent of Seascape in the GAA Intersected with the APVIs	Area of Landscape within the Lease Areas' APVI (sq mi [sq km])	Percent of Landscape in the GAA Intersected with the APVIs
NY Bight only (1,312-ft [399.9-m])	139.2 (360.5)	19.3%	1.3 (3.3)	0.2%
External leases only[a]	616.5 (1,596.7)	85.8%	18.4 (47.8)	3.0%
Cumulative leases (NY Bight & external leases)	617.9 (1,600.5)	85.6%	19.0 (49.3)	3.1%

[a] External leases included in this analysis are OCS-A-0498 (Ocean Wind 1), OCS-A 0512 (Empire Wind), OCS-A 0512 (Empire Wind II), OCS-A 0499 (Atlantic Shores Offshore Wind South), OCS-A 0539 (Atlantic Shores Offshore Wind North), and OCS-A 0532 (Ocean Wind 2).

Table 7-5 Seascape and Landscape Intersections with APVIs in New York (when NY Bight Wind Turbines are 1,312 ft [399.9 m])

Lease Area	Area of Seascape within the Lease Areas' APVI (sq mi [sq km])	Percent of Seascape in the GAA Intersected with Viewsheds	Area of Landscape within the Lease Areas' APVI (sq mi [sq km])	Percent of Landscape in the GAA Intersected with Viewsheds
NY Bight only (1,312-ft [399.9-m])	157.8 (408.8)	23.9%	1.0 (2.6)	0.1%
External leases[a]	435.7 (1,128.4)	65.9%	72.0 (186.4)	8.3%
Cumulative leases (NY Bight & external leases)	493.5 (1,278.1)	74.7%	72.5 (187.8)	8.4%

[a] External leases included in this analysis are OCS-A-0498 (Ocean Wind 1), OCS-A 0512 (Empire Wind), OCS-A 0512 (Empire Wind II), OCS-A 0499 (Atlantic Shores Offshore Wind South), OCS-A 0539 (Atlantic Shores Offshore Wind North), and OCS-A 0532 (Ocean Wind 2).

Table 7-6 Overall Cumulative Impact on Ocean, Seascape, and Landscape in New Jersey and New York

Lease Area	New Jersey			New York		
	Ocean	Seascape	Landscape	Ocean	Seascape	Landscape
NY Bight only (853-ft [260-m] and 1,312-ft [399.9-m])	Major	Moderate	Minor	Major	Moderate	Minor
External leases[a]	Major	Major	Major	Major	Major	Major
Cumulative leases (NY Bight & external leases)	Major	Major	Major	Major	Major	Major

[a] External leases included in this analysis are OCS-A-0498 (Ocean Wind 1), OCS-A 0512 (Empire Wind), OCS-A 0512 (Empire Wind II), OCS-A 0499 (Atlantic Shores Offshore Wind South), OCS-A 0539 (Atlantic Shores Offshore Wind North), and OCS-A 0532 (Ocean Wind 2).

7.3 Cumulative Visual Impact Analysis

Section 6.1.2 is used to analyze cumulative impacts. As described in that section, the analysis considers sensitivity, size and scale of change, geographic extent, and duration and reversibility.

Simulations of the incremental effects of the project in the context of other offshore wind projects are available in Appendix E. The cumulative visual impact analysis is based on the KOP-based visual simulations for the NY Bight portraying 1,312-ft (399.9-m) and 853-ft (260-m) WTGs in combination with the six other foreseeable future planned activities (external leases) at predicted and maximum visibility scenarios. The specifications in Table 7-7 were used in the simulations for the external leases. The cumulative impacts were analyzed based on the visual simulations, GIS data, and in-the-field evaluation. Detailed results of each simulated KOP form are presented in Appendix F and a summary of findings is presented in Table 7-8.

Appendix E also contains KOP-based simulations of the six other foreseeable future (planned) activities without the six NY Bight leases (external leases only).

Figure 7-3 through Figure 7-8 show the number of NY Bight lease areas and external offshore wind lease areas within the viewshed of topography, structures, and vegetation (DSM-based, APVI viewshed) from 835-ft (260-m) and 1312-ft (399.9-m) blade heights. See Appendix F for the lease area-specific visibility information from each KOP.

Table 7-7 External Lease Specifications[a]

External Lease Areas Simulated	Blade Tip Height in ft (m)	Hub Height in ft (m)
OCS-A 0549 (Atlantic Shores—North)	1,049 (319.7)	577 (176)
OCS-A 0499 (Atlantic Shores—South)	1,049 (319.7)	577 (176)
OCS-A 0512 (Empire Wind)	951 (290)	525 (160)
OCS-A-0498 (Ocean Wind 1)	906 (276)	512 (156)
OCS-A 0532 (Ocean Wind 2)	906 (276)	512 (156)

[a] WTG heights were provided by BOEM for development of the simulations. See individual project COPs for the most up-to-date WTG heights.

Table 7-8 Cumulative Impact Levels

KOP #	KOP Name	Overall Impact Level of External Leases in Combination with NY Bight		Distance	
		1,312-ft (399.9-m) WTGs	853-ft (260-m) WTGs	To Nearest NY Bight Lease Area (mi [km])	To Nearest External Lease Area (mi [km])
KOP-02	Lucy the Margate Elephant NHL	Major	Major[a]	OCS-A 0541 46.26 (74.45)	OCS-A 0532 10.76 (17.31)
KOP-04	John Stafford Beach Entrance	Major	Major[a]	OCS-A 0541 43.80 (70.49)	OCS-A 0532 9.62 (15.48)
KOP-05	Jim Whelan Hall-Balcony	Major	Major	OCS-A 0541 42.31 (68.10)	OCS-A 0532 9.16 (14.75)
KOP-08	Beach Haven-Night	Major	Major	OCS-A 0541 32.64 (52.52)	OCS-A 0549 9.85 (15.85)
KOP-08	Beach Haven	Major	Major	OCS-A 0541 32.64 (52.52)	OCS-A 0549 9.85 (15.85)
KOP-10	Barnegat Lighthouse	Major	Major	OCS-A 0541 32.26 (51.92)	OCS-A 0549 10.07 (16.20)
KOP-26	Fort Tilden-Night	Moderate	Moderate	OCS-A 0544 43.70 (70.32)	OCS-A 0512 21.06 (33.89)
KOP-28	Jones Beach	Major	Major	OCS-A 0544 31.38 (50.51)	OCS-A 0512 14.23 (22.90)
KOP-30	Shinnecock Inlet	Negligible	Negligible	OCS-A 0544 44.67 (71.89)	N/A[b]
KOP-31	Westhampton Beach	Minor	Negligible	OCS-A 0544 33.86 (54.49)	OCS-A 0512 37.92 (61.02)
KOP-32	Fire Island Lighthouse-Upper Deck	Major	Major	OCS-A 0544 24.23 (39.00)	OCS-A 0512 21.75 (35.00)
KOP-35	Twin Lights Lighthouse-Top	Major	Major	OCS-A 0544 44.06 (70.91)	OCS-A 0512 22.44 (36.11)
KOP-36	Asbury Park Hall Balcony	Moderate	Moderate[a]	OCS-A 0544 42.62 (68.60)	OCS-A 0512 24.87 (40.03)
KOP-37	Point O' Woods	Major	Major	OCS-A 0544 24.07 (38.74)	OCS-A 0512 23.91 (38.47)
KOP-39	Empire State Building	Moderate	Moderate	OCS-A 0544 55.78 (89.77)	OCS-A 0512 34.12 (54.91)
KOP-40	Robert Moses Field 5-Night	Major	Major	OCS-A 0544 24.21 (38.97)	OCS-A 0512 21.27 (34.22)

[a] No cumulative simulation was produced for these KOPs with external leases in combination with 853-ft (260-m) NY Bight leases. From these KOPs, the 853-ft (260-m) NY Bight leases are not visible, or they present a negligible impact, based on the GIS data. Therefore, the external-lease-only simulation can be used for reference.

[b] External leases are not visible from the KOP; therefore, no distance was calculated.

In general, the external leases present greater impacts than the NY Bight leases. Except from two KOPs, the external leases are significantly nearer to the KOPs and oftentimes block the view to the NY Bight lease areas. In some instances, the NY Bight leases are still visible, even with the combination of the external leases (for example, KOP-10). Appendix F provides specific KOP data in relation to each of the external and NY Bight leases to better understand which lease areas contribute the majority of impacts in the cumulative scenario.

As discussed in Section 7.1, the additional three BOEM lease areas OCS-A 0482 (GSOE I), OCS-A 0490 (U.S. Wind/Maryland), and OCS-A 0519 (Skipjack) are taken into consideration due to their ocean-based viewsheds' overlap with the NY Bight GAA, although the lease areas themselves do not fall within the NY Bight GAA. As previously stated, these three lease areas were not simulated in Appendix E. It is important to acknowledge the potential impacts that these lease areas may have on views from boats and cruise ships as part of the cumulative analysis. As shown in Figure 7-2, the intersection of their viewsheds and the GAA only fall within the ocean; therefore, none of the KOPs discussed in this report would be affected from these additional external BOEM lease areas.

OCS-A 0490 (U.S. Wind/Maryland) is south of OCS-A 0519 (Skipjack) and OCS-A 0482 (GSOE I); therefore, if the cumulative leases were built out, any potential views of OCS-A 0490 (U.S. Wind/Maryland) from the ocean would be partially blocked from the other two lease areas. Similarly, OCS-A 0519 (Skipjack) would be partially blocked by OCS-A 0482 (GSOE I). OCS-A 0519 (Skipjack) is directly south of OCS-A 0482 (GSOE I), which would block views to OCS-A 0519 (Skipjack) from the ocean.

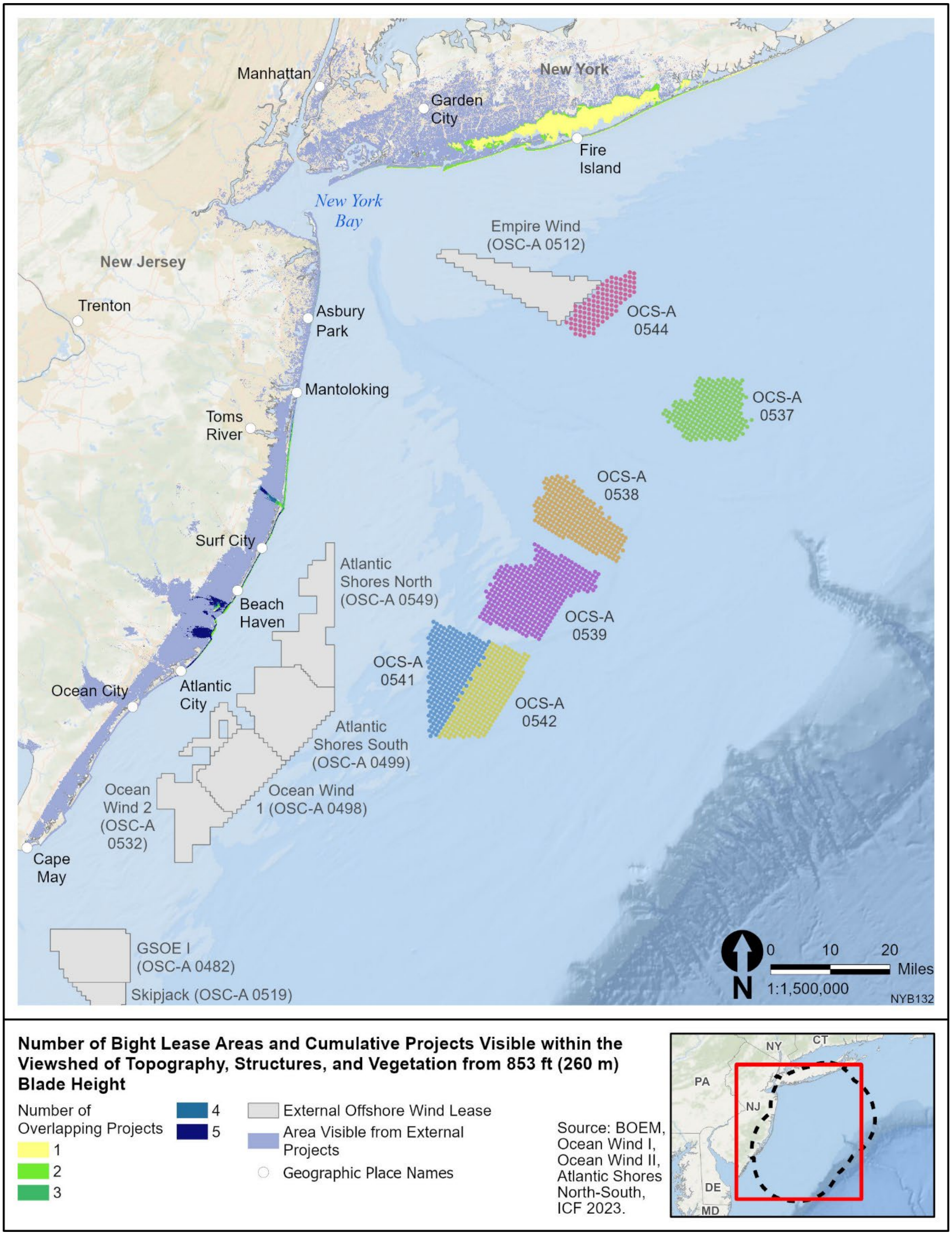


Figure 7-3 Number of NY Bight Lease Areas and External Offshore Wind Lease Areas within the Viewshed of Topography, Structures, and Vegetation from 853-ft (260-m) Blade Height, Regional Overview

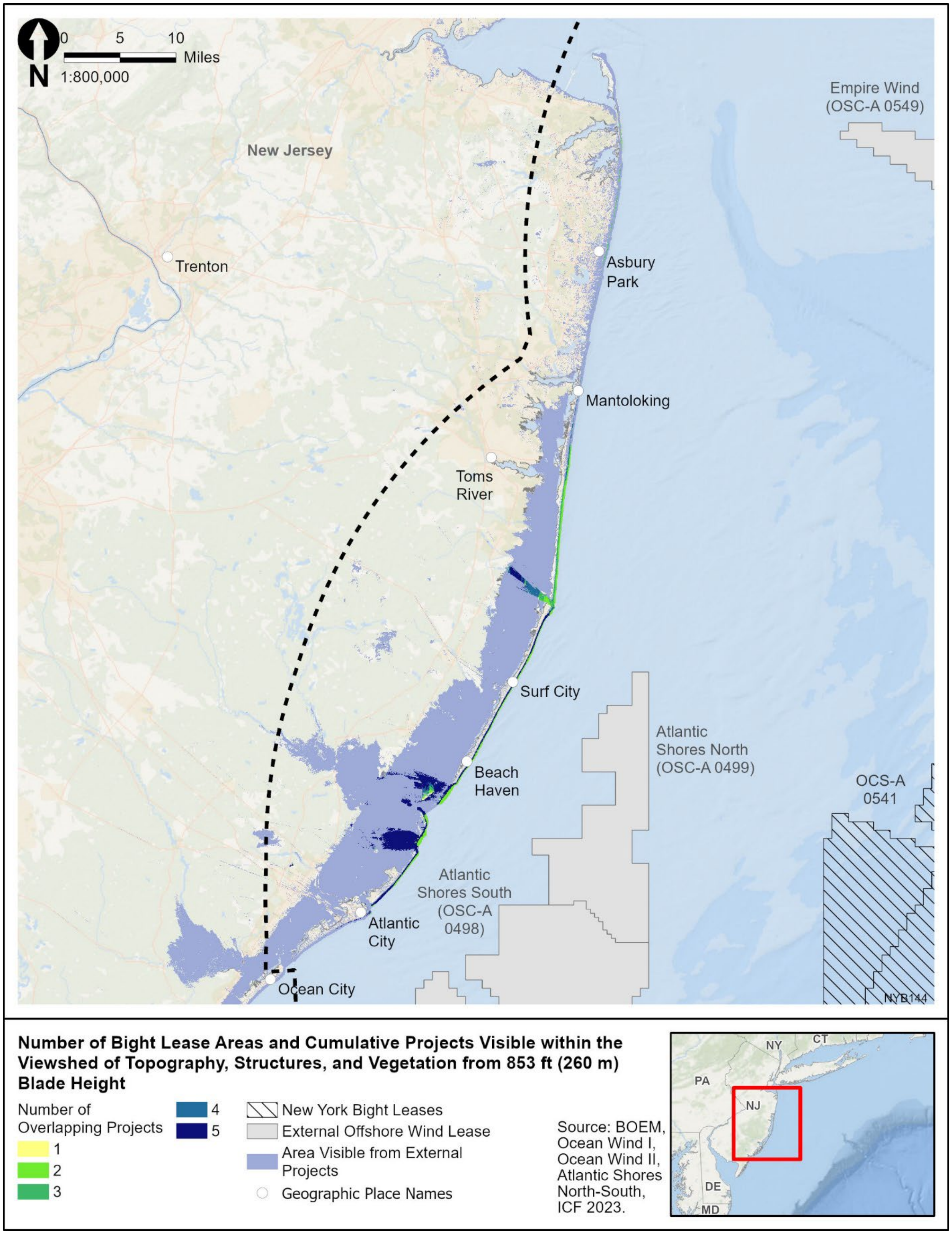


Figure 7-4 Number of NY Bight Lease Areas and External Offshore Wind Lease Areas within the Viewshed of Topography, Structures, and Vegetation from 853-ft (260-m) Blade Height, New Jersey

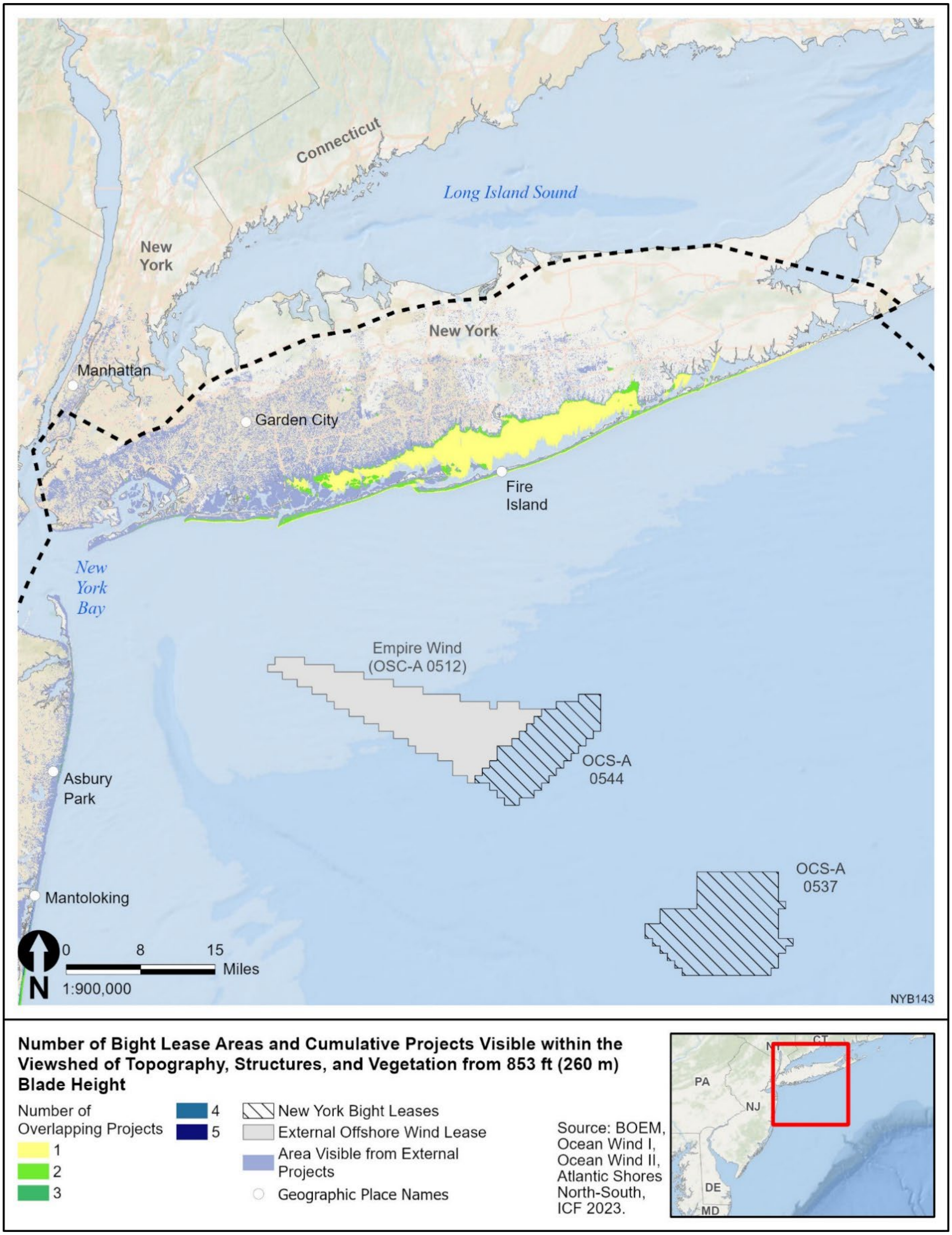


Figure 7-5 Number of NY Bight Lease Areas and External Offshore Wind Lease Areas within the Viewshed of Topography, Structures, and Vegetation from 853-ft (260-m) Blade Height, New York

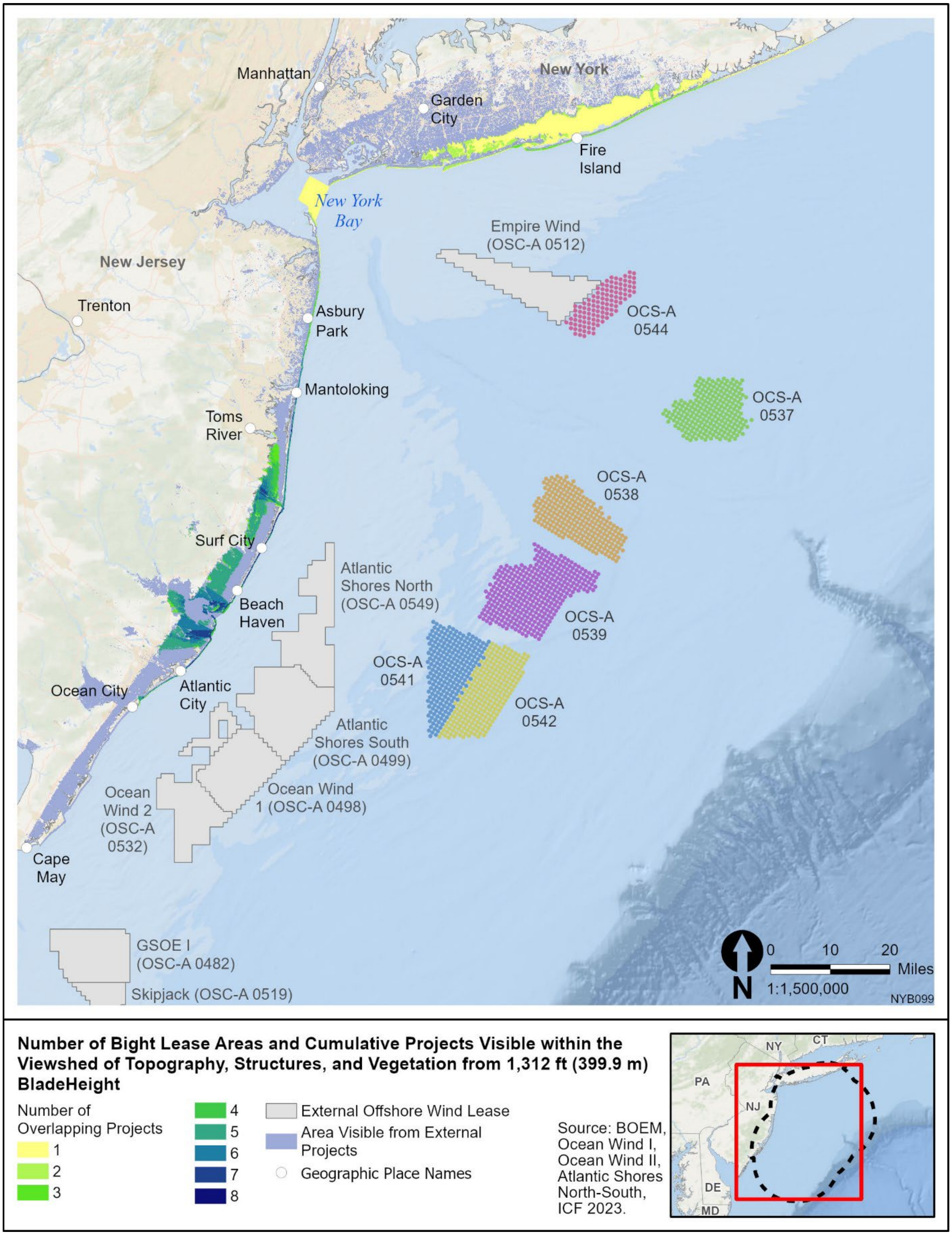


Figure 7-6 Number of NY Bight Lease Areas and External Offshore Wind Lease Areas within the Viewshed of Topography, Structures, and Vegetation from 1,312-ft (399.9-m) Blade Height, Regional Overview

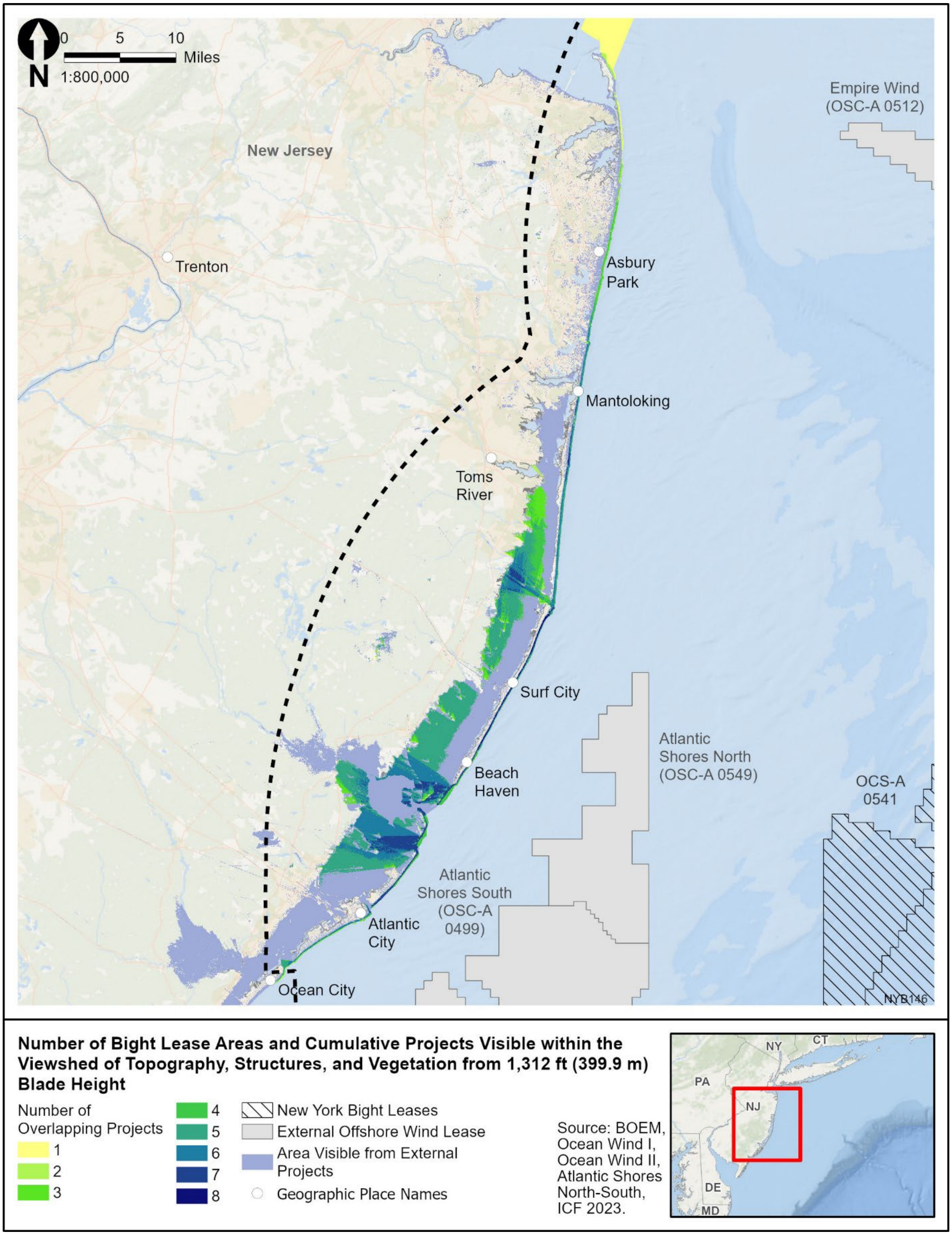


Figure 7-7 Number of NY Bight Lease Areas and External Offshore Wind Lease Areas within the Viewshed of Topography, Structures, and Vegetation from 1,312-ft (399.9-m) Blade Height, New Jersey

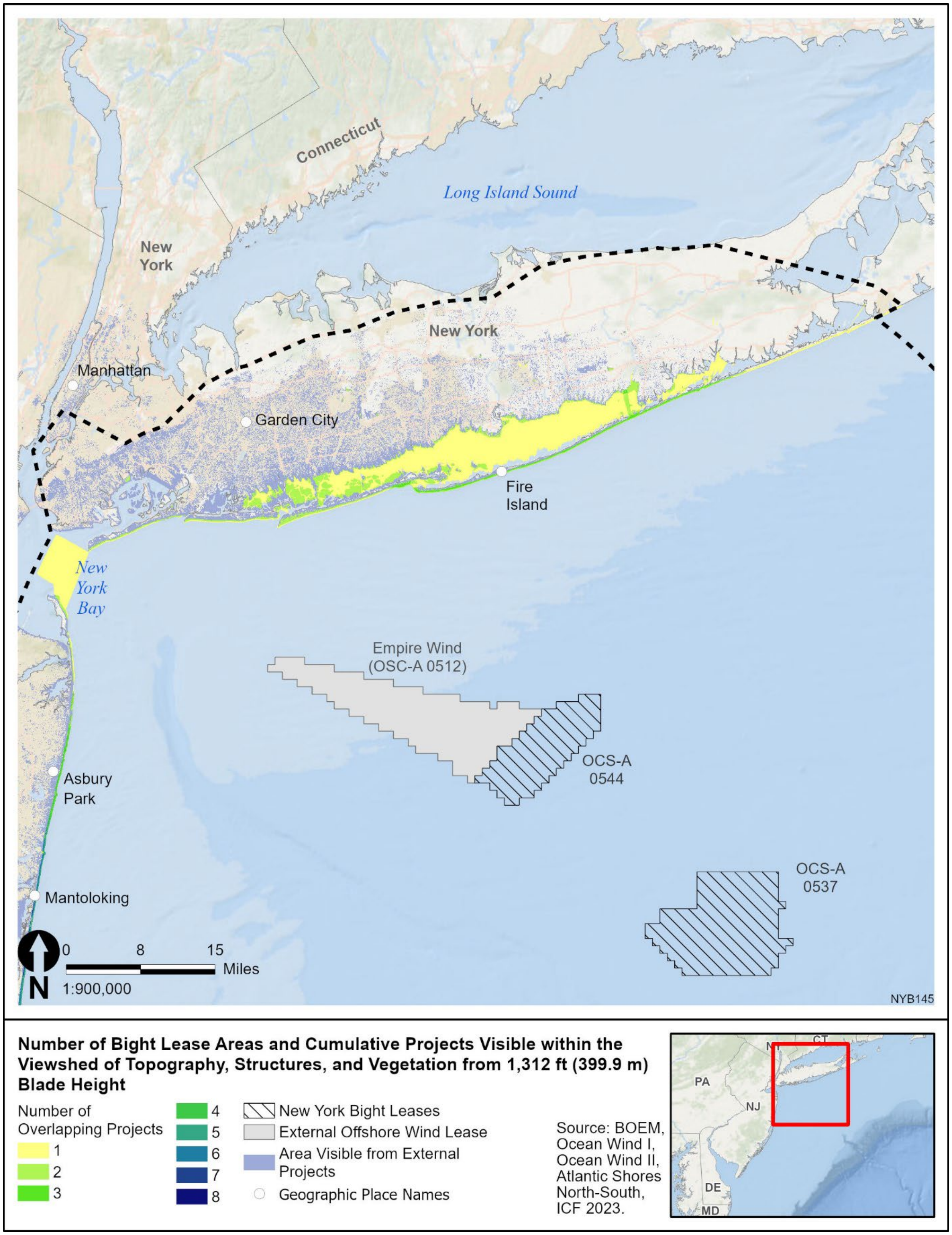


Figure 7-8 Number of NY Bight Lease Areas and External Offshore Wind Lease Areas within the Viewshed of Topography, Structures, and Vegetation from 1,312-ft (399.9-m) Blade Height, New York

Chapter 8

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Chapter 9

Glossary

Affected environment section. Section of an EIS that describes existing conditions in the area potentially subject to impacts against which any future changes can be measured or predicted and assessed.

Alternative. Within an EIS, a reasonable way to fix the identified problem or satisfy the stated need for which the EIS is written.

Aspect. The positioning of a building or thing in a specified direction; the direction that something (such as a building) faces or points toward. The aspect combined with the bearing determines which side of a facility is in view from a particular viewpoint, as well as the angle of the object's vertical surfaces with respect to the viewer.

Atmospheric Refraction. The deviation of light from a straight line as it passes through the atmosphere due to the variation in air density as a function of altitude.

Aviation obstruction lighting. Lighting devices attached to tall structures as an aircraft collision avoidance measure.

Backdrop. The landscape, seascape, or sky visible directly behind the visible elements of a facility, as seen from a particular viewpoint.

Bearing. The compass direction from an observer to a viewed object.

Blade. The aerodynamic structure on a wind turbine that catches the wind. Most utility-scale wind turbines have three blades.

Characterization. The process of identifying areas of similar seascape/landscape character, classifying and mapping them and describing their character.

Characteristics. Elements, or combinations of elements, that make a contribution to distinctive seascape/landscape character.

Color. The property of reflecting light of a particular intensity and wavelength (or mixture of wavelengths) to which the eye is sensitive. Color is the major visual property of surfaces.

Construction and operations plan (COP). A project planning document for offshore wind facilities includes design, fabrication, installation, and operations concepts as well as results of site surveys, offshore and onshore support, decommissioning plans, and a Navigational Risk Assessment.

Contrast. Opposition or unlikeness of different forms, lines, colors, or textures in a landscape.

Council on Environmental Quality (CEQ). A U.S. federal government council established under Title II of NEPA to develop federal agency-wide policy and regulations for implementing the procedural provisions of NEPA, resolving interagency disagreements concerning proposed major federal actions, and ensuring that federal agency programs and procedures are in compliance with NEPA.

Cultural resources. Archaeological sites, structures, or features, traditional use areas, and Native American sacred sites or special-use areas that provide evidence of the prehistory and history of a community.

Decommissioning. All activities necessary to take a facility out of service and dispose of its components after its useful life.

Developer. A person or company that builds or sells buildings or facilities on a piece of land. In the context of VIAs, *developer* usually refers to the project proponent.

Development. Any project that results in a change to the seascape/landscape and/or visual environment.

Digital elevation model (DEM). A 3D representation of the surface terrain of an area. A DEM does not take into account trees, buildings, or other screening structures.

Effect. *See* impact

Elements. Individual components that make up the seascape/landscape, such as trees, hedges, and buildings.

Environmental Impact Statement (EIS). An environmental impact assessment document required of federal agencies by NEPA for major proposals or legislation that will or could significantly affect the environment. An EIS must include a description of the proposed action, the environmental setting, and potentially affected areas. It must also include an analysis of reasonable alternatives to the proposed action, all environmental impacts related to the proposed action and its alternatives, and ways to mitigate adverse impacts.

Experiential aspect. Any trait of seascapes or landscapes involving or based on experiences in the seascapes/landscapes.

Facility. An existing or planned location or site at which equipment for converting mechanical, chemical, solar, thermal, and/or nuclear energy into electric energy or for transporting energy is situated, or will be situated, and the equipment itself.

Feature. A particularly prominent or eye-catching element or elements in the seascape/landscape, such as a clump of trees, a church tower, or a wooded skyline.

Form. The mass or shape of an object or objects that appears unified, such as a vegetative opening in a forest, a cliff formation, or a water tank.

Generation (electricity). The process of producing electric energy by transforming other forms of energy; also, the amount of electric energy produced, typically expressed in megawatt-hours (MWh).

Glare. The sensation produced by luminance within the visual field that is sufficiently greater than the luminance to which the eyes are adapted and that causes annoyance, discomfort, or loss in visual performance and visibility. *See also* glint.

Glint. A momentary flash of light resulting from a spatially localized reflection of sunlight. *See also* glare.

Heritage. The historic environment and especially valued assets and qualities such as historic buildings and cultural traditions.

Horizon line. The apparent line in the landscape formed by the meeting of the visible land surface and the sky, or any line of a structure or landform feature parallel to that line.

Horizontal field of view (HFOV). The horizontal extent of the observable landscape that is seen at any given moment, usually measured in degrees.

Impact (effect). Environmental consequences that occur as a result of a proposed action. Impacts may be caused by the action and occurring at the same time and place, caused by the action but occurring later in time or farther removed in distance but still reasonably foreseeable, or be incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions. In NEPA documents, *effect* is synonymous with *impact*.

Impact level. A measure of the importance or gravity of an environmental impact, defined by criteria specific to the environmental topic. Characterized as *negligible, minor, moderate,* or *major.*

Key characteristics. Those combinations of elements that are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place.

Key observation point (KOP). A point at a use area or a potential use area, or a series of points or a segment on a travel route, where there may be views of a management activity, which is used in the VIA as a location for assessing potential visual impacts resulting from a proposed activity, such as the construction and operation of a power generation facility.

Land cover. The surface cover of the land, usually expressed in terms of vegetation cover or lack of it, such barren lands, forests, or water.

Landform. Any recognizable physical form of the earth's surface having a characteristic shape. Landforms include major forms, such as plains, plateaus, and mountains, and minor forms, such as hills, valleys, slopes, and moraine. Taken together, the landforms make up the surface configuration of the earth.

Landscape. An area, as perceived by people, the character of which is the result of the action and interaction of natural and/or human factors. Landscape includes the expanse of visible scenery, including landforms, waterforms, vegetation, and man-made elements such as roads and structures, as well as its anthropogenic or social patterns.

Landscape character. A distinct recognizable and consistent pattern of elements in the landscape that makes one landscape or seascape different from another.

Landscape character areas (LCAs). Distinct types of landscape that are relatively homogeneous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation, historical land use and settlement patterns, and perceptual and aesthetic attributes.

Landscape character assessment. The process of identifying and describing variation in the character of the landscape, and using this information to assist in managing change in the landscape. It seeks to identify and explain the unique combination of elements and features that make landscapes distinctive. The process results in the production of a written Landscape Character Assessment.

Landscape impacts. Impacts on a landscape as a resource in its own right.

Land use. Characterization of land in terms of its potential utility for various activities, or the activities carried out on a given piece of land.

Lighting impact. An interference with enjoyment of dark night skies or an effect on nocturnal wildlife resulting from artificial light pollution, such as may be caused by facility or other lighting.

Line. The path, real or imagined, that the eye follows when perceiving abrupt differences in form, color, or texture. Within landscapes, lines may be found as ridges, skylines, the edges of structures, the edges of water bodies, changes in vegetative types, or individual trees and branches.

Magnitude (of impact). A term that combines judgments about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible, and whether it is short- or long-term in duration.

Mitigation. Planning actions taken to avoid an impact altogether, minimize the degree or magnitude of the impact, reduce the impact over time, rectify the impact, or compensate for the impact.

Mitigation measures. Methods or actions that reduce adverse impacts from facility development. Mitigation measures can include best management practices, stipulations in right-of-way agreements, siting criteria, and technology controls.

Nacelle. The housing that contains and protects the major components (e.g., generator and gear box) of a wind turbine.

National Register of Historic Places (NRHP). A comprehensive list of districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture. The NRHP is administered by the NPS, which is part of the U.S. Department of the Interior.

No action alternative. A NEPA-required alternative within an EIS that assumes the agency will not implement the proposed action or alternative actions, and in which current conditions and trends are projected into the future without another proposed action. In other words, the alternative that involves no action.

Ocean character area (OCA). The area of ocean within the project viewshed but outside of any seascape character areas within the viewshed. The OCA includes the offshore components of the project. There is one OCA for each proposed project.

Ocean, Seascape, and Landscape Impact Assessment (SLIA). Analysis of impacts on both the physical elements and features that make up a landscape or seascape and the aesthetic, perceptual, and experiential aspects of the landscape or seascape that make it distinctive, usually presented as a stand-alone technical report or as part of an EIS.

Offshore substation platform (OSP). An offshore substation, the system that collects and exports the power generated by offshore wind turbines through specialized submarine cables.

Outer Continental Shelf (OCS). All submerged lands, subsoil, and seabed that belong to the United States and lie seaward and outside of the coastal states' jurisdiction.

Perception. Combines the sensory (that we receive through our senses) with the cognitive (our knowledge and understanding gained from many sources and experiences).

Perceptual aspect. Any trait of seascapes or landscapes involving or based on perceptions about the seascapes/landscapes.

Photosimulation. A still image of a highly realistic 3D model of a proposed facility superimposed onto a photograph of the existing landscape.

Project design envelope. A permitting approach that allows a project proponent the option to submit a reasonable range of design parameters within its permit application, allows a permitting agency to then analyze the maximum impacts that could occur from the range of design parameters, and may result in the approval of a project that is constructed within that range.

Receptors. See seascape/landscape receptors and visual receptors.

Reasonably foreseeable planned action (RFPA) impacts. Impacts that could potentially result from incremental impacts of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of the agency (Federal or non-Federal), private industry, or individual undertaking such other actions. RFPA impacts can result from individually minor but collectively significant actions taking place over a period of time.

Renewable energy. Energy derived from resources that are regenerative or that cannot be depleted. Renewable energy resources include wind, solar, biomass, geothermal, and moving water.

Seascape. An area of land that includes coastline and adjacent marine areas, with views of the coast or seas and coasts, and with cultural, historical, and archaeological links with each other.

Seascape character. A distinct recognizable and consistent pattern of elements in the seascape that makes one seascape different from another. Also, a discrete area of coastal landscape and adjoining areas of open water, within which there is shared inter-visibility between land and sea and which includes an area of sea (the seaward component), a length of coastline (the coastline component), and an area of land (the landward component).

Seascape character areas (SCAs). Distinct types of seascape that are relatively homogeneous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation, historical land use and settlement patterns, and perceptual and aesthetic attributes.

Seascape character assessment. The process of identifying and describing variation in the character of the seascape, and using this information to assist in managing change in the seascape. It seeks to identify and explain the unique combination of elements and features that make seascapes distinctive. The process results in the production of a written Seascape Character Assessment.

Seascape, Landscape, and Visual Impact Assessment (SLVIA). A process used to identify, describe, and assess the impacts of development both on the seascape/landscape as an environmental resource in its own right and on people's views of the seascape/landscape.

Seascape/landscape/ocean receptors. Defined aspects of the seascape/landscape resource that have the potential to be affected by a proposal.

Seascape/landscape/oceans value. The relative value that is attached to different seascapes/landscapes by society.

Scenic quality. A measure of the intrinsic beauty of landform, waterform, or vegetation in the landscape, as well as any visible human additions or alterations to the landscape.

Screening. A visual barrier consisting of earth, vegetation, structures, or other materials intended to block a particular view, or the actual blocking of a view through the use of a visual barrier.

Seascape impacts. Impacts on a seascape as a resource in its own right.

Sensitivity. A term applied to specific receptors, combining judgments of the susceptibility of the receptor to the specific type of change or development proposed and the perceived societal value of that receptor.

Specially designated areas. Areas of seascape/landscape identified as being of importance at international, national, or local levels, either designated by statute or identified in development plans or other documents.

Stakeholder. A person or group who has an interest in or concern about the proposed project.

Substation. A facility containing equipment through which electricity is passed for transmission, transformation, distribution, or switching. Substations generally include switching, protection and control equipment, and transformers, but the equipment present and the size of the substation vary depending on the particular functions of the substation.

Surface elevation model. A 3D representation of the surface terrain of an area that takes into account trees, buildings, or other screening structures in determining elevation.

Susceptibility. The ability of a defined landscape or visual receptor to accommodate the specific proposed development without undue negative consequences.

Texture. The visual manifestations of light and shadow created by the variations in the surface of an object or landscape.

Topography. The shape of the earth's surface; the relative position and elevations of natural and manmade features of an area.

Tower. The base structure that supports and elevates a wind turbine rotor and nacelle.

Tranquility. A state of calm and quietude associated with peace, considered to be a significant asset of a seascape/landscape.

Transmission (electric). The movement or transfer of electricity over an interconnected group of lines and associated equipment between points of supply and points at which it is transformed for delivery to consumers or is delivered to other electric systems. Transmission is considered to end when the energy is transformed for distribution to the consumer. Also, the interconnected group of lines and associated equipment that performs this transfer.

Turbine. A machine for generating rotary mechanical power from the energy of a stream of fluid (such as wind, water, steam, or hot gas), in which a stream of fluid turns a bladed wheel, converting the kinetic energy of the fluid flow into mechanical energy available from the turbine shaft. Turbines are considered the most economical means of turning large electrical generators. *See* wind turbine.

Utility-scale. Descriptive term for energy facilities that generate large amounts of electricity delivered to many users through transmission and distribution systems.

Vegetation. Plant life or total plant cover in an area.

Viewer characteristics. Traits of the individual viewer, such as visual acuity, visual engagement, experience, and viewer motion that affect the viewer's perception of contrast and the ability to discern objects in the landscape.

Viewer motion. Change in position of the viewer within the landscape. The visual experience changes as the viewer moves through the landscape.

Viewing geometry. The spatial relationship of viewer to the viewed object (e.g., a renewable energy facility), including the viewer position and aspect.

Viewpoint. A point from which a landscape is viewed. Also, a point from which a landscape view is analyzed and/or evaluated.

Viewshed. The total landscape seen or potentially seen from a point, or from all or a logical part of a travel route, use area, or water body.

Viewshed analysis. A spatial analysis that uses elevation data such as a DEM or surface elevation model to determine which parts of the surrounding landscape are likely to be visible from a designated point or points.

Visibility. The ability to visually discern an object in the landscape; also, the distance an individual can see as determined by light and weather conditions.

Visibility factors. Variables that determine and affect the visibility and apparent visual characteristics of an object in a landscape setting. Visibility factors include viewshed-limiting factors that define the potentially visible area, viewer characteristics, distance, viewing geometry, background/backdrop, lighting, atmospheric conditions, and the object's visual characteristics.

Visual attention. Noticing and focusing of vision on a particular object or landscape element.

Visual contrast. Opposition or unlikeness of different forms, lines, colors, or textures in a landscape.

Visual experience. The observation of an object or of the landscape/seascape.

Visual impact. Any modification in landforms, water bodies, or vegetation, or any loss or introduction of structures or other human-made visual elements, that negatively or positively affect specific views experienced by people.

Visual Impact Assessment (VIA). Analysis of the visual impacts of a proposed project, usually presented as a stand-alone technical report or as part of an EIS.

Visualization. Development of pictorial representation (usually using computer hardware and software) of a proposed facility.

Visual impact mitigation. Actions taken to avoid, eliminate, or reduce potential adverse impacts on scenic resources.

Visual receptors. Individuals and/or defined groups of people who have the potential to be subjected to visual impacts from a proposed project.

Visual resource. Any objects (man-made and natural, moving and stationary) and features, such as landforms and water bodies, that are visible in a landscape.

Visual simulation. A pictorial representation of a proposed project in its landscape setting, as it would be seen from a specified viewpoint, used to visualize the project before it is built, typically in order to determine its potential visual contrasts and associated visual impacts.

Wind energy. The kinetic energy of wind converted into mechanical energy by wind turbines (i.e., blades rotating from a hub) that drive generators to produce electricity for distribution.

Wind facility, wind farm. One or more wind turbines operating within a contiguous area for the purpose of generating electricity.

Wind turbine. A device that converts wind energy into mechanical energy, used to produce electricity.

Zone of theoretical visibility (ZTV). A map, usually digitally produced, showing areas of land within which a development is theoretically visible.

Appendices

Appendices A–G

Appendix A: Laws, Ordinances, Regulations, Policies, and Plans (LORPPs)

Appendix B: ZTV Figures

Appendix C: Character Areas Map Series

Appendix D: Character Area Impact Tables

Appendix E: Visual Simulations

Appendix F: KOP Forms

Appendix G: Photographic Log