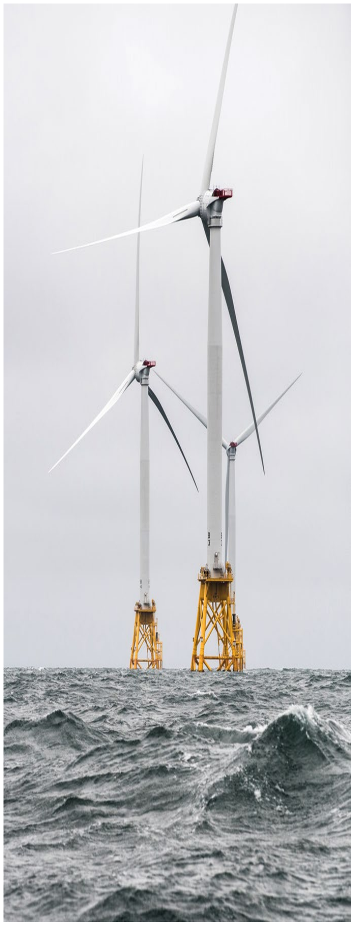
Unsolicited Right-of-Way/ Right-of-Use & Easement Grant Application



Southern New England Ocean Grid Project

PREPARED FOR

Bureau of Ocean Energy Management
45600 Woodland Road
Mail Stop VAM-ORP
Sterling, Virginia 20166

SUBMITTED BY

Anbaric Development Partners
401 Edgewater Pl, #680
Wakefield, MA 01880

PREPARED BY:

ESS Group, Inc.
404 Wyman Street, Suite 375
Waltham, MA 02451

November 18, 2019

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1.0 INTRODUCTION

Anbaric Development Partners, LLC (Anbaric) submits this Unsolicited Right-of-Way and Right-of-Use and Easement Grant (ROW/RUE Grant) Application to the Bureau of Ocean Energy Management (BOEM) for the Southern New England Ocean Grid Project (Southern New England Ocean Grid or the Project), in accordance with BOEM's regulations governing ROW and RUE Grants related to renewable energy projects (30 C.F.R. Part 585, Subpart C).

Anbaric requests a ROW/RUE Grant for potential routes of subsea transmission cables and the potential siting of Offshore Collector Platforms (OCPs) for the Southern New England Ocean Grid Project, which is proposed to be located on the Outer Continental Shelf (OCS) offshore of southern Massachusetts and Rhode Island. This ROW/RUE Grant Application is supported by preliminary engineering review and environmental impact/user conflict assessments for routing and siting purposes, initial government and stakeholder consultations, and Interconnection Requests filed (or in the process of being filed) with the Independent System Operator of New England (ISO-NE). In accordance with BOEM's renewable energy program regulations (30 C.F.R. § 585.305), this ROW/RUE Grant Application includes the following information:

(a) The area Anbaric is requesting for a ROW/RUE Grant;

(b) A general description of Anbaric's project objectives and the offshore facilities that will be used to achieve those objectives;

(c) A general schedule of proposed offshore (OCS) facilities siting and permitting activities; and

(d) Pertinent information concerning existing environmental conditions in the Areas of Interest (AOI) identified in this Application.

1.1 Overview of Southern New England Ocean Grid Project

Anbaric is proposing the Southern New England Ocean Grid – an independent open access offshore transmission system that will efficiently and competitively deliver Offshore Wind Energy (OWE) generation to the public onshore electric grid, while also offering the advantage of reducing the overall footprint and potential environmental and socio-economic impacts of offshore renewable energy transmission infrastructure. As demand from state procurements of offshore wind in southern New England grows, the need for an ocean grid to streamline delivery of energy from Wind Energy Areas (WEAs) to a limited number of interconnection points is becoming more apparent.

In 2016, the Commonwealth of Massachusetts enacted the "An Act to Promote Energy Diversity" [Acts of 2016 Chapter 188] that includes a provision (Section 83C) directing the state utilities to procure 1,600 MW of offshore wind-generated energy by 2027. In May 2018, Vineyard Wind was selected as the first project under Section 83C to receive a long-term contract for the procurement of 800 MW of OWE generated from BOEM offshore wind lease OCS-A 0501. Responses to a second Section 83C solicitation were submitted to the Massachusetts state utilities on August 23, 2019, with proposals from eligible bidders[1] of up to another 800 MW. On October 29, 2019, it was announced that Mayflower Wind was selected to negotiate a contract of 800 MW of OWE. The two awards will complete the procurement of 1,600 MW as directed in the 2016 legislation.

[1] Eligible bidders are limited to entities that hold leases on the outer continental shelf. In the MA/RI WEA these entities include Vineyard Wind (OCS-A 0501 and OCS-A 0522), Mayflower Wind (Shell and EDPR) (OCS-A 0521), Equinor (OCS-A 0520), and Ørsted (OCS-A 0486, OCS-A 0487, and OCS-A 0500).

In 2018, Governor Baker signed "An Act to Promote a Clean Energy Future" (MA Chapter 227 of the Acts of 2018, Section 21) that calls for the Massachusetts Department of Energy Resources (DOER) to study the benefits and costs of procuring an additional 1,600 MW of offshore wind by no later than 2035, putting Massachusetts on a path to procure a total 3,200 MW of OWE. The legislation also allowed the DOER to direct the distribution companies to competitively solicit wind energy transmission that may be developed independent of the offshore wind generation. The DOER completed its study in May 2019[2] and recommended the solicitation of an additional 1,600 MWs of offshore wind. It also recommended that a one-time transmission only solicitation to deliver the 1,600 MWs could be put forward as early as 2020.

Procurement of offshore wind is also a clean energy priority for the two other southern New England States of Rhode Island and Connecticut. In May 2018, Rhode Island selected 400 MW from Ørsted's Revolution Wind Project. Connecticut followed suit and announced in June 2018 that it would procure 200 MW of OWE from the Ørsted's Revolution Wind Project. Connecticut then, in December 2018, announced the procurement of 100 MWs more of OWE from Revolution Wind, bringing Connecticut's total procurement to 300 MW.

In 2019, Connecticut passed Public Act 19-71, "An Act Concerning the Procurement of Energy", requiring the Department of Energy and Environmental Protection (DEEP) to purchase up to 2,000 MW of OWE by the end of 2030. In August 2019, DEEP issued an RFP for bids of up to 2,000 MWs. Three bidders offered proposals prior to the September 30, 2019 deadline, including "Constitution Wind" (a joint venture of Eversource and Ørsted), "Park City Wind" submitted by Vineyard Wind, and Mayflower Wind (a joint venture of Shell and EDPR). Some bidders offered multiple proposals that ranged in size form 400 MWs to 1,200 MWs. Connecticut is expected to announce the winning bidder in November 2019.

The Southern New England Ocean Grid will provide a regionally beneficial renewable energy transmission system that will reliably integrate OWE resources into the ISO-NE public transmission grid to not only serve the New England states, but potentially also New York which has an ambitious offshore wind energy procurement mandate of 9,000 MW.

Utility-scale commercial offshore wind development will benefit substantially from the availability of an independent, open access offshore subsea electric transmission system, developed separately from OWE generation to provide a reliable offshore transmission network as an alternative to numerous project-by-project offshore generator lead transmission interconnections that each only serve one project.

In February 2018, Anbaric was granted an order approval from the Federal Energy Regulatory Commission (FERC) authorizing Anbaric to charge negotiated rates for electric transmission rights on an offshore grid system.[3] Through the strategic selection of onshore Points of Interconnection (POIs), careful planning to minimize the Project footprint and its potential environmental impacts, and by building an integrated and interconnected offshore subsea electric transmission network to accommodate the build-out to scale of OWE generation, the Southern New England Ocean Grid will serve as a foundational renewable energy infrastructure catalyst that will facilitate the competitive development of the regional offshore wind generation industry. In addition, the Project is consistent with the actions identified in the National Offshore

[2] "Offshore Wind Study", Massachusetts Department of Energy Resources with support from Levitan & Associates, May 2019.
[3] 162 FERC 61,097, "Order Granting Application for Authorization to Charge Negotiated Rates, Subject to Condition, and Granting Waivers," issued February 12, 2018. FERC Docket No. ER18-435-000.

Wind Strategy (DOI/DOE 2016), including the reduction of cost and technology risk, effective environmental stewardship, and an increased understanding of the benefits and efficiencies of open access transmission.

The Southern New England Ocean Grid will consist of strategically sited OCPs, each connected to one or more high voltage subsea export cables to the selected onshore POI. Each proposed OCP will be designed to accept up to 2,000 MW of intermittent OWE generation, with the ability to connect multiple OWE project Wind Turbine Generators (WTGs) and better accommodate incremental or phased build-out development within several existing lease areas and designated WEAs offshore of Massachusetts and Rhode Island.

The Southern New England Ocean Grid will capitalize on implementing newer, more efficient, and cost-effective offshore electric transmission system technologies and recent high voltage electrical transfer innovation. Anbaric will take advantage of this newer, more efficient offshore transmission system, using only commercially proven offshore electric transmission technology and reliable system design for greater and more efficient accommodation of this new bulk intermittent OWE generation serving the broader New England region.

The Southern New England Ocean Grid will help to facilitate installation and operation of the most cost-effective, leading edge technology for a robust and reliable transmission system designed specifically to accommodate growth of the New England regional offshore wind industry. This modern and proven offshore subsea transmission grid can then better serve the New England states and also support New York's offshore wind goal of 9,000 MW by wheeling power through the New England states.

1.2 BOEM's ROW/RUE Grant Approval Process

Under the applicable regulations, after receiving an unsolicited ROW/RUE grant request, BOEM must first determine whether there is competitive interest in acquiring the requested grant area (30 C.F.R. § 585.306(a)). To do so, BOEM will publish a request for competitive interest (RFCI) in the Federal Register describing the Project and soliciting expressions of competitive interest as well as public comments about the proposed Project (30 C.F.R. § 585.307). Under BOEM's regulations, ROW/RUE grants are not exclusive and BOEM may issue future ROW grants in the same grant area, as long as the future grants do not unreasonably interfere with activities under the earlier grant (30 C.F.R. § 585.302(b)(1)). After review of the responses to the RFCI, BOEM will then make a determination whether the grant may be awarded non-competitively and, if so, will publish a "Notice of Determination of No Competitive Interest" in the Federal Register.

Consistent with BOEM's regulations (30 C.F.R. § 385.303), BOEM's review of the Southern New England Ocean Grid involves two stages. First, Anbaric, through this ROW/RUE Grant Application, is requesting that BOEM issue a ROW/RUE Grant encompassing the areas in which the Southern New England Ocean Grid Project may be sited. Second, Anbaric will later submit for BOEM approval a General Activities Plan (GAP) that describes the design, construction, and specific siting within the grant area of the proposed transmission system. Under BOEM's regulations, Anbaric must submit a GAP within 12 months of issuance of the ROW/RUE Grant (30 C.F.R. § 585.640(b)). There will be appropriate environmental reviews under the National Environmental Policy Act (NEPA) at each of these stages. Because the requested ROW/RUE Grant does not authorize Anbaric to begin any level of construction activity prior to approval of a GAP, the potential environmental effects of BOEM's issuance of the ROW/RUE Grant, if any, are very limited (30 C.F.R. § 585.640(b)).

1.3 Applicant for Right-of-Way and Right-of-Use Grant

Anbaric Development Partners, LLC
401 Edgewater Place, Suite 680
Wakefield, MA 01880
Contact Person: Stephen Conant, Partner, Anbaric Development Partners, (781) 683-0708

1.4 Qualifications of Anbaric's Team

On June 21, 2018, BOEM notified Anbaric (BOEM Company Number 15075) that the company is legally qualified to acquire and hold a renewable energy lease or Grant in the OCS, as well as is technically and financially qualified to acquire and hold a Grant on the OCS, in connection with Anbaric's New York / New Jersey Ocean Grid Project. Anbaric expects that BOEM will find that the company is also qualified to acquire and hold the Grant requested in this Application. At the request of BOEM, Anbaric submitted updated qualifications materials on November 8, 2019 to support this ROW/RUE Grant request.

2.0 UNSOLICITED RIGHT-OF-WAY AND RIGHT-OF-USE & EASEMENT GRANT AREA REQUEST

This section describes the process that was used to define the AOI (lease blocks) for which Anbaric submits this unsolicited ROW/RUE Grant Application.

2.1 Selection of the ROW/RUE Grant Area

Anbaric, through its environmental consultant, ESS Group, Inc. (ESS), has conducted a preliminary desktop siting and routing assessment to identify notional locations for OCPs and subsea cable routes that will serve to connect the Southern New England Ocean Grid with existing onshore electric substations at the preferred POIs. Subsea cable routes within state waters, sea-to-shore landfall, and land cable route to the POIs were also addressed in the desktop assessment from routing and transmission capacity standpoints. However, these proposed facilities are located outside the OCS and are, therefore, not the subject of this Application.

The preliminary desktop assessment is based on available resource information and uses of a variety of publicly available and proprietary Geographic Information System (GIS) data sources. These sources of information were used in the siting and route selection screening process to identify possible environmental constraints, water or seabed use conflicts, and cultural resource considerations associated with the proposed buried subsea cables and OCPs as presented in this Application.

Anbaric will continue to assess and refine the initial linear routing and OCP siting alternatives to verify the most suitable location of the proposed facilities within the requested ROW/RUE Grant area. This will be accomplished with more detailed linear siting assessment and reconnaissance-level route conditions field surveys. These studies and surveys may include High Resolution Geophysical (HRG), geotechnical, and seabed benthic infauna surveys, as well as protected species, restricted areas, and marine archaeology/cultural resource area routing impact assessments. The OCS lease blocks comprising the ROW/RUE Grant area identified in this Application provide Anbaric with sufficient siting flexibility to support that refinement. Anbaric has not requested any lease blocks part of which may already be included in an offshore wind energy Lease Area, nor does Anbaric seek a grant for the portions of any lease block already under lease and does not intend to site any facilities related to the Project within a Lease Area.

The geographic focus of the Southern New England Ocean Grid, the Project Area, includes the portions of the OCS in the vicinity of the existing BOEM offshore wind commercial Lease Areas, designated as offshore WEAs. These are the Rhode Island and Massachusetts WEAs including Lease Areas OCS-A 0486 and OCS-A 0487 (Ørsted), Lease Area OCS-A 0500 (Bay State Wind), and Lease Area OCS-A 0501 (Vineyard Wind). It also includes Lease Areas OCS-A 0520, OCS-A 0521, and OCS-A 0522 that were auctioned in December 2018 and leases for which have been awarded to Equinor Wind US, Mayflower Wind Energy, and Vineyard Wind, respectively.

To develop initial siting for the OCPs and associated subsea cable routes, both generalized siting criteria selected by Anbaric that is typical of such efforts and location-specific evaluation factors using publicly available information were used. This section describes the general criteria. Section 5 contains more information about the resources in the Project Area and resource data sources used for this Application.

Identifying Potential Points of Interconnection

Anbaric commissioned a series of the ISO-NE electric system POI alternative studies in the Spring of 2018 to identify the most promising potential POIs to accommodate injections of up to 3,200 MW of New England OWE generation by 2035. This new intermittent renewable energy capacity will then inject into ISO-NE's regional transmission system as well as existing New York Independent System Operator (NYISO) interstate transmission connections. Anbaric has identified five (5) preferred POIs (existing substations) and other potential POIs to the onshore electric regional transmission grid and filed (or is the process of filing) Interconnection Requests for the Southern New England Ocean Grid.

Siting Offshore Collector Platforms

The following screening criteria were used to assess preliminary siting of the proposed OCPs that will be placed in strategic locations in the OCS to serve as the offshore interconnection point for one or more planned Offshore Wind Projects:

- Proximity to WEAs including the three (3) existing commercial offshore leases and the three (3) commercial offshore leases that BOEM auctioned in December 2018. Accordingly, the Southern New England Ocean Grid could serve up to six (6) individual WEA's;
- Maximum water depths of approximately 150-200 feet (46-61 meters);
- Avoid unpredictable and variable seabed surface and subsurface geological conditions or hazards (scour or mobile bed conditions);
- Site the offshore OCPs at least 9 nautical miles (NM) (10.3 statute miles) from adjacent shoreline areas to minimize OCP visibility from the land;
- Site to minimize potential for conflicts with commercial and recreational navigation and fishing uses, cultural resources, environmental hazards, and other sensitive or restricted coastal resource areas; and
- Maintain a sufficient no-build buffer zone a minimum of 750 meters (2461 feet) from a lease boundary.

Siting Subsea Electric Transmission Cable Routes

The following environmental and water use screening criteria were used for preliminary siting of the subsea electric transmission cable routes from landfall out to the OCS where they will interconnect to the OCPs:

- Minimize overall subsea cable lengths for selected transmission-level technology and routing feasibility, assess route corridor potential for environmental impacts, minimize navigational and fishing conflicts, and assess likely agency required impact monitoring and mitigation;
- Minimize direct disturbances to coastal beach and shoreline areas and sensitive coastal and associated marine environmental resources such as benthic seabed habitats, fisheries, shoreline stabilization, flood hazard protection, protected species and habitat, birds, and marine mammals;
- Site to optimize the extent to which seabed conditions along the selected subsea cable route corridors will maximize the ability to install the subsea cables to required burial depths below present bottom using low impact jet plow embedment methods. The cable system will be buried deep enough to avoid potential for mechanical damage or snagging by fishing or commercial vessel equipment in the event of an emergency anchor drop.
- Minimize potential user conflicts with commercial, defense, or recreational navigation and fishing uses;
- Minimize route corridor alignments that result in potential use conflicts associated with designated vessel anchorage areas, vessel and barge mooring areas, and other existing seabed surface or subsurface infrastructure such as cables, pipelines, and fiber optic cables; and

- Avoid or minimize cable area routing in the OCS seabed where there may be charted shipwrecks or other potentially significant marine archaeological or cultural resources.

2.2 Requested Lease Blocks

Based on the desktop siting and routing assessment outlined in Section 2.1, Anbaric has identified the Project's offshore transmission cable routing and OCP locations in Figure 1.

Anbaric requests that BOEM review and approve this unsolicited ROW/RUE Grant Application, which includes a total of 213 OCS Lease Blocks, as listed in Table 1. As part of the ROW/RUE Grant, Anbaric intends to site OCPs (RUE) in 8 of the 213 OCA Lease Blocks and intends site the transmission line (ROW) within the 213 OCS Lease Blocks, subject to further routing assessments. OCS lease blocks within which a RUE is requested are indicated in bold text in the table below.

BOEM regulations establish that the ROW Grant includes a 200-foot-wide corridor within the lease blocks (30 C.F.R. § 385.301(a)(2)). The ultimate Project facilities will occupy a small percentage of the actual OCS lease blocks for which the ROW is sought. As indicated above, Anbaric does not seek the Grant area to include any areas within a requested lease block that are already within a Lease Area. Anbaric recognizes that the ROW/RUE Grant will be subject to conditions, including that the United States may grant other rights, including ROW/RUE grants and easements related to offshore renewable energy transmission in the same area as long as any subsequent authorization does not unreasonably interfere with or impede activities or operations under Anbaric's Grant (30 C.F.R. § 385.302(b)). Given the small footprint of the future Project facilities within the ROW/RUE Grant area, interference is not expected.

Table 1. OCS Lease Blocks Requested for ROW/RUE Grant Easements

Block Number	Protraction Number	Route Segment	Block Number	Protraction Number	Route Segment	Block Number	Protraction Number	Route Segment
Right-of-Use and Easement Grant Blocks								
6927	**NK19-07**	**1A**	**6184**	**NK19-10**	**1A**	**6375**	**NK19-10**	**1C**
6921	**NK19-07**	**1A**	**7030**	**NK19-07**	**1A**	**6433**	**NK19-10**	**1C**
6032	**NK19-10**	**1A**	**6118**	**NK19-10**	**1C**			
Right-of-Way Grant Blocks								
Route Segment 1A								
6618	NK19-07	1A	6819	NK19-07	1A	6980	NK19-07	1A
6617	NK19-07	1A	6818	NK19-07	1A	6979	NK19-07	1A
6616	NK19-07	1A	6871	NK19-07	1A	7031	NK19-07	1A
6615	NK19-07	1A	6870	NK19-07	1A	**7030**	**NK19-07**	**1A**
6668	NK19-07	1A	6869	NK19-07	1A	7081	NK19-07	1A
6667	NK19-07	1A	6929	NK19-07	1A	7080	NK19-07	1A
6666	NK19-07	1A	6928	NK19-07	1A	7131	NK19-07	1A
6665	NK19-07	1A	**6927**	**NK19-07**	**1A**	7130	NK19-07	1A
6718	NK19-07	1A	6926	NK19-07	1A	6033	NK19-10	1A
6717	NK19-07	1A	6925	NK19-07	1A	**6032**	**NK19-10**	**1A**
6716	NK19-07	1A	6924	NK19-07	1A	6031	NK19-10	1A
6715	NK19-07	1A	6923	NK19-07	1A	6083	NK19-10	1A

Block Number	Protraction Number	Route Segment	Block Number	Protraction Number	Route Segment	Block Number	Protraction Number	Route Segment
6769	NK19-07	1A	6922	NK19-07	1A	6134	NK19-10	1A
6768	NK19-07	1A	**6921**	**NK19-07**	**1A**	6133	NK19-10	1A
6767	NK19-07	1A	6920	NK19-07	1A	**6184**	**NK19-10**	**1A**
6820	NK19-07	1A						
Route Segment 1B								
6153	NK19-11	1B	6201	NK19-11	1B	6403	NK19-11	1B
6152	NK19-11	1B	6234	NK19-10	1B	6402	NK19-11	1B
6151	NK19-11	1B	6253	NK19-11	1B	6401	NK19-11	1B
6203	NK19-11	1B	6303	NK19-11	1B	6434	NK19-10	1B
6202	NK19-11	1B	6353	NK19-11	1B			
Route Segment 1C								
6756	NK19-07	1C	6009	NK19-10	1C	6373	NK19-10	1C
6755	NK19-07	1C	6066	NK19-10	1C	6372	NK19-10	1C
6806	NK19-07	1C	6065	NK19-10	1C	6371	NK19-10	1C
6805	NK19-07	1C	6064	NK19-10	1C	6370	NK19-10	1C
6856	NK19-07	1C	6063	NK19-10	1C	6369	NK19-10	1C
6855	NK19-07	1C	6062	NK19-10	1C	6368	NK19-10	1C
6906	NK19-07	1C	6061	NK19-10	1C	**6433**	**NK19-10**	**1C**
6905	NK19-07	1C	6060	NK19-10	1C	6432	NK19-10	1C
6956	NK19-07	1C	**6118**	**NK19-10**	**1C**	6426	NK19-10	1C
6955	NK19-07	1C	6117	NK19-10	1C	6425	NK19-10	1C
7008	NK19-07	1C	6116	NK19-10	1C	6424	NK19-10	1C
7007	NK19-07	1C	6115	NK19-10	1C	6482	NK19-10	1C
7006	NK19-07	1C	6168	NK19-10	1C	6481	NK19-10	1C
7005	NK19-07	1C	6167	NK19-10	1C	6480	NK19-10	1C
7058	NK19-07	1C	6218	NK19-10	1C	6479	NK19-10	1C
7057	NK19-07	1C	6268	NK19-10	1C	6478	NK19-10	1C
7109	NK19-07	1C	6319	NK19-10	1C	6477	NK19-10	1C
7108	NK19-07	1C	6318	NK19-10	1C	6476	NK19-10	1C
6011	NK19-10	1C	**6375**	**NK19-10**	**1C**	6475	NK19-10	1C
6010	NK19-10	1C	6374	NK19-10	1C			
Route Segment 2A								
6857	NK19-08	2A	6905	NK19-08	2A	6951	NK19-08	2A
6856	NK19-08	2A	6904	NK19-08	2A	6983	NK19-07	2A
6855	NK19-08	2A	6954	NK19-08	2A	7033	NK19-07	2A
6854	NK19-08	2A	6953	NK19-08	2A	7032	NK19-07	2A
6906	NK19-08	2A	6952	NK19-08	2A			
Route Segment 2B								

Block Number	Protraction Number	Route Segment	Block Number	Protraction Number	Route Segment	Block Number	Protraction Number	Route Segment
6859	NK19-08	2B	7058	NK19-08	2B	6107	NK19-11	2B
6858	NK19-08	2B	7109	NK19-08	2B	6106	NK19-11	2B
6909	NK19-08	2B	7108	NK19-08	2B	6105	NK19-11	2B
6908	NK19-08	2B	6009	NK19-11	2B	6156	NK19-11	2B
6959	NK19-08	2B	6008	NK19-11	2B	6155	NK19-11	2B
6958	NK19-08	2B	6007	NK19-11	2B	6154	NK19-11	2B
7009	NK19-08	2B	6059	NK19-11	2B	6205	NK19-11	2B
7008	NK19-08	2B	6058	NK19-11	2B	6204	NK19-11	2B
7059	NK19-08	2B	6057	NK19-11	2B			
Route Segment 2C								
7005	NK19-05	2C	6105	NK19-08	2C	6507	NK19-08	2C
7004	NK19-05	2C	6156	NK19-08	2C	6558	NK19-08	2C
7003	NK19-05	2C	6155	NK19-08	2C	6608	NK19-08	2C
7056	NK19-05	2C	6206	NK19-08	2C	6659	NK19-08	2C
7055	NK19-05	2C	6256	NK19-08	2C	6658	NK19-08	2C
7054	NK19-05	2C	6306	NK19-08	2C	6709	NK19-08	2C
7106	NK19-05	2C	6357	NK19-08	2C	6708	NK19-08	2C
7105	NK19-05	2C	6356	NK19-08	2C	6759	NK19-08	2C
7104	NK19-05	2C	6407	NK19-08	2C	6758	NK19-08	2C
6006	NK19-08	2C	6406	NK19-08	2C	6757	NK19-08	2C
6005	NK19-08	2C	6458	NK19-08	2C	6809	NK19-08	2C
6056	NK19-08	2C	6457	NK19-08	2C	6808	NK19-08	2C
6055	NK19-08	2C	6508	NK19-08	2C	6807	NK19-08	2C
6106	NK19-08	2C						
Route Segment 2D								
6725	NK19-04	2D	6826	NK19-04	2D	6874	NK19-04	2D
6724	NK19-04	2D	6825	NK19-04	2D	6926	NK19-04	2D
6775	NK19-04	2D	6824	NK19-04	2D	6925	NK19-04	2D
6774	NK19-04	2D	6876	NK19-04	2D	6924	NK19-04	2D
6773	NK19-04	2D	6875	NK19-04	2D			

3.0 PROJECT DESCRIPTION OF THE SOUTHERN NEW ENGLAND OCEAN GRID PROJECT

This section describes the Southern New England Ocean Grid Project, including the objectives, benefits, Project phasing, facilities, and schedule. This Application seeks only a non-exclusive ROW/RUE Grant within which the Project may be sited. Anbaric will provide additional detail regarding specific Project siting and configuration, facilities, and operations in its GAP submission and prior to BOEM's approval of any construction activities.

3.1 Project Objectives and Benefits

Offshore wind is a nascent industry in the U.S. that is rapidly moving to scale with significant investment by offshore wind project developers. Now is the time to establish energy infrastructure that will support this form of renewable energy generation long-term. The Southern New England Ocean Grid will help the Commonwealth of Massachusetts meet its goal of developing up to 3,200 MW of offshore wind by 2035, Connecticut's goal of 2,000 MW of offshore wind, and realize the full potential of at least 11,000 MWs available in the Massachusetts/Rhode Island lease areas.[4] This level of OWE project development is regional in scale and will benefit neighboring states in the northeast, including Rhode Island, New York, and New Jersey. Independent, open access transmission infrastructure that can serve multiple offshore wind generators offers advantages over numerous project-specific radial transmission lines in terms of economies of scale, efficient use of interconnections, and reducing footprint and potential environmental impacts of transmission infrastructure.

As BOEM and the Department of Energy (DOE) have recognized, transmission has the potential to be a choke point that limits the successful integration of offshore wind power generation with the electric grid through the limited interconnection capacity available onshore (DOI/DOE 2016). ISO-NE's Connecticut, Rhode Island, Southern Massachusetts (SEMA), and Northeastern Massachusetts and Boston (NEMA) load areas have a limited number of onshore substations that can handle substantial volumes of offshore wind without triggering extensive onshore transmission upgrades. The Southern New England Ocean Grid will connect to the onshore electric grid with a goal of maximizing the deliverability from the offshore while minimizing the need and cost for onshore upgrades. At the same time, this does not interfere with developers' existing leasehold interests in any way, given that the issuance of a ROW/RUE Grant does not affect lessees' ability to develop other transmission options, including under their leases.

Building a common, independent, open access transmission system that can serve many generators and promotes competition will minimize environmental impacts by reducing the overall environmental footprint of singular or separate generator lead subsea transmission from existing and new WEAs. This multi-purpose transmission system will markedly decrease potential navigation impacts as well as potential land and water use impacts to coastal beaches, barrier beaches and dunes, estuaries, marshes, and bays associated with multiple sea-to-shore landfalls for each independent offshore wind development.

The Southern New England Ocean Grid will also provide competitive and reliable options for states, regulators, and wind developers as they consider how to best connect offshore wind power to the land-based grid. Nothing about the Southern New England Ocean Grid will preclude offshore wind developers from building their own export cables, but it instead provides offshore wind developers the option to connect

[4] US Department of Energy, 2017 Offshore wind Technologies Market Update Executive Summary, available at: https://www.energy.gov/sites/prod/files/2018/10/f56/exec-summary-71709_V4.-jf3.pdf.

to an open access offshore electric transmission system that could help speed the pace of this new energy generation market while contributing to lower delivered costs to ratepayers.

3.2 Proposed Facilities

The proposed Southern New England Ocean Grid Project is a planned offshore electric transmission system that can provide common offshore interconnection points for multiple commercial wind energy developments within the Rhode Island and Massachusetts WEAs.

Anbaric anticipates that the Project will be built in phases, coordinated with the development of the Wind Energy Areas and could, as technology for wind turbines and transmission advances, ultimately accommodate 16,000 MW of OWE. The Project will consist of a series of OCPs located in proximity to WEAs on the OCS and subsea cables connecting the OCPs to the onshore POIs to the ISO transmission grid (see Figure 1).

The following sections provide a general description of the proposed facilities that will comprise the Southern New England Ocean Grid.

Offshore Collector Platforms

Typical OCP

The Project's OCPs will be located within the Grant area in proximity to WEAs. Each OCP will include modular electrical technology to allow for flexibility and expansion of the system. The OCPs will function to accept a series of feeder subsea cables from one or more Electric Service Platforms (ESPs) constructed by the offshore wind developers within the WEAs. The ESPs within the WEAs will function as the collection point for the low-voltage inter-array cables originating from each of the WTGs. Each OCP could be equipped with electrical transformers that would increase the AC voltage levels and/or power converters that would switch the current from AC to DC. In addition to the electric equipment and switch gear, each OCP will be equipped with protection and control systems, emergency power, and communications facilities. Each OCP will also be capable of supporting several subsea export cables that will connect the platform to the POIs located on the onshore transmission grid.

The actual size and dimensions of the OCP topside and the foundation type (i.e., jacket or monopile) will be dependent on a number of factors, including selection of either AC or DC technology, advances in technology, equipment layout, and physical oceanographic conditions at the site.

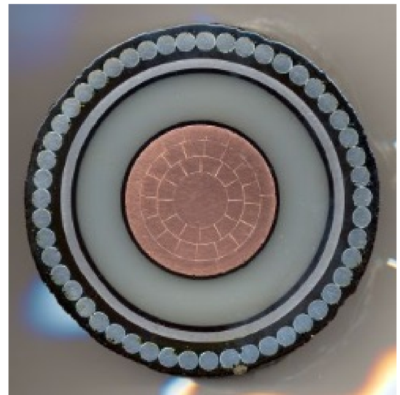
The area requested in Anbaric's ROW/RUE Grant Application would accommodate up to eight (8) OCPs, each with a design capacity to deliver up to 2,000 MW via subsea export cables to the onshore transmission grid.

The OCPs will be sited a minimum of 750 meters (2461 feet) from any lease boundary, consistent with BOEM's requirement for WEA lessees, as described in the Final Sale Notice for Atlantic Wind Lease Sale 4A. Although not directly applicable to transmission infrastructure outside of the WEAS, under that requirement, Lessees must incorporate a setback of 750 meters from any shared lease boundary within which the Lessee may not construct any surface structures, unless the Lessee and the adjacent Lessee agree to a smaller setback that is approved by BOEM.

A brief overview of the general locations of the OCPs based on the preliminary siting and desktop assessment described in Section 2 is provided below. The final siting of the OCPs will be refined based on more site-specific information gathered during additional site assessment and field surveys, including HRG, geotechnical, and benthic surveys, as well as marine archaeology and navigation assessments.

- **OCP 1:** OCP 1 is located approximately 9.2 NM (10.6 statute miles) from the southern shoreline of Martha's Vineyard, MA, adjacent to the northern boundary of MA Lease OCS-A 0500 and approximately 32 NM (37 statute miles) east of Block Island, RI. OCP 1 is located in approximately 98 feet (30 meters) of water.
- **OCP 2**: OCP 2 is located approximately 12 NM (13.9 statute miles) from the southern shoreline of Martha's Vineyard, MA, on the northern boundary of MA Lease OCS-A 0500 approximately 14.6 NM (16.8 statute miles) to the east of OCP 1. OCP 2 is located in approximately 121 feet (37 meters) of water.
- **OCP 3**: OCP 3 is located approximately 13.9 NM (16 statute miles) from the southern shoreline of Nantucket, MA, approximately 9.5 NM (11 statute miles) south of OCP 2, and approximately 0.5 NM (0.6 statute miles) east of the MA Lease OCS-A 0501. OCP 3 is located in approximately 128 feet (39 meters) of water.
- **OCP 4:** OCP 4 is located approximately 19.6 NM (22.6 statute miles) from the southern shoreline of Nantucket, MA and approximately 9.5 NM (10.9 statute miles) south of OCP 3, along the northeastern boundary of MA Lease OCS-A 0521. OCP 4 is located in approximately 121 feet (37 meters) of water.
- **OCP 5:** OCP 5 is located approximately 25.6 NM (29.5 statute miles) from the southern shoreline of Nantucket, MA, and approximately 7.9 NM (9.1 statute miles) south of OCP 4 on the northeastern boundary of MA Lease OCS-A 0522. OCP 5 is located in approximately 128 feet (39 meters) of water.
- **OCP 6:** OCP 6 is located approximately 38.2 NM (43.9 statute miles) from the southern shoreline of Nantucket, MA, and approximately 12 NM (13.8 statute miles) south of OCP 5 on the southern boundary of MA Lease OCS-A 0522. It is approximately 20.8 NM (23.9 statute miles) east of OCP 7 on the southern boundary of MA Lease OCS-A 0522. OCP 6 is located in approximately 174 feet (53 meters) of water.
- **OCP 7**: OCP 7 is located approximately 49.7 NM (57.1 statute miles) from the southeastern shoreline of Block Island, RI, and approximately 21 NM (24.2 statute miles) southeast of OCP 8 on the southern boundary of MA Lease OCS-A 0520. OCP 7 is located in approximately 203 feet (62 meters) of water.
- **OCP 8:** OCP 8 is located approximately 28.7 NM (33.0 statute miles) from the southeastern shoreline of Block Island, RI, and approximately 20.9 NM (24.0 statute miles) southwest of OCP 1 on the western boundary of MA Lease OCS-A 0500. OCP 8 is located in approximately 187 feet (57 meters) of water.

Subsea Electric Transmission Cables


Example HVDC Subsea Cable

The primary component of the Project will be the subsea electric transmission cables that will be buried below the present seabed bottom and will extend between the eight (8) OCPs and to the landfall near the onshore POIs (substations) selected in ISO-NE. At this stage of Project development, the technology of the subsea cables has not been finalized and may either be High Voltage Direct Current (HVDC) or High Voltage Alternating Current (HVAC). The selection of the most appropriate subsea cable technology will be based on a number of technical and economic factors, including the design capacity and construction schedules of the offshore wind farms, distance to POIs, electric losses, and overall costs.


Example 3-core AC Subsea Cable

Examples of the types of subsea cable technologies under consideration are represented by HVDC and 3-core AC subsea cables shown in the images on the right.

Based on preliminary desktop siting and routing assessments as described in Section 2, the total length of subsea cable associated with the Project on the OCS could be up to approximately 337.2 NM (388 statute miles). The ultimate configuration of the system will depend on the desires of each interested state and on the commercial needs of the industry. The final routing of the subsea cables will be refined based on more site-specific information gathered during additional site assessment and field surveys, including HRG, geotechnical, and benthic surveys, as well as marine archaeology and navigation assessments to prepare the subsequent GAP.

Jet plow embedment is the preferred installation method for the subsea cables. Jet plow embedment simultaneously lays and buries the cable and ensures the placement of the cable at the target burial depth with minimum bottom disturbance and with the fluidized sediment settling back into the trench. The actual burial depth of the subsea cable will be determined based on seabed characteristics and discussions with the regulatory and resource agencies. The ease of installation, the lack of the need to dredge and remove sediments, and the minimal environmental impacts make jet plow embedment the preferred method of subsea cable installation.

Subsea Cable Crossings

While the Southern New England Ocean Grid subsea cables will be buried, it is possible that some localized sections of the subsea cables will be at a shallower than normal burial depth or laid on the surface as a result of geologic obstructions or the need to cross other existing subsea cables or pipelines. In these areas, some form of cable protection will be required to protect the subsea cables from, what is known in the cable industry as, external aggression events (anchor strikes, dragging anchors, fishing gear entanglement, etc.).

Where crossings of existing subsea cable or pipeline are necessary, the Project will work directly of the owner of the utilities to coordinate design and construction to avoid adverse impacts. Anbaric is committed to working with owners of existing or planned subsea cables to establish cable crossing methods and agreements that allow both cables to occupy the seabed and fulfill their intended uses.

Similarly, where crossing(s) of an Anbaric cable already in place is proposed by another cable project, Anbaric will work cooperatively with the cable proponent to accommodate the crossing and to coordinate design and construction to avoid adverse impacts. Anbaric is committed to working with owners of existing or planned subsea cables to establish cable crossing methods and agreements that allow both cables to occupy the seabed and fulfill their intended uses.

For physical protection of the subsea cables, several options exist, including concrete mattresses or rock placement around or over the cables could be used to protect utilities and establish appropriate separation between the cables. Articulated concrete mattresses are widely used and can be placed on the seabed over the subsea cables. Such mattresses are typically 8 to 9 feet wide, 20 to 40 feet in length, and about 9 to 12 inches thick. Protective mats made out of polyurethane that provide a smoother exposed surface (Polymat™) can also be used. Cast iron split pipes (also known as ballast shells) can be attached to the subsea cable section that will be surface laid either prior to deployment from the cable lay vessel or by divers. Split pipes have a diameter slightly larger than the subsea cable they protect and when joined together can increase the bend radius of the subsea cable to allow it to match bottom contours. A similar alternative to split pipes is a polyurethane cable protection product called Uraduct®. The Uraduct® is attached to the section of subsea cable to be surface laid in the same manner as the split pipes. The design will take into account the soil conditions, the type of cable (e.g., armored), and the cable installation method.

To provide mariner awareness protection for subsea cables during the life of the cable, the use of Virtual Automatic Identification Systems (AIS) is becoming more commonplace and, in some cases, now required by cable insurers. These systems provide the ability to remotely mark the location of the subsea cable in the seabed so it is visible to mariners through their onboard AIS system. The system can be configured to automatically send an alert to vessels within an established virtual protection zone around the cable to advise the mariner of their position relative to the subsea cable and to allow them to take corrective actions if necessary. Virtual AIS systems have already been deployed on subsea cables in New York State waters.

Onshore Facilities and Point of Interconnection

The Project will include ancillary nearshore and onshore facilities that will be located outside of the OCS and, therefore, are not included within the ROWs and RUEs subject to this Application. These facilities include the sea-to-shore landfall locations, land cable routes, and interconnection to an existing substation (the POI) on the transmission grid. Depending on the subsea cable technology, an onshore converter station may also be required to transform the current from DC to AC before interconnection with the onshore electric grid.

For discussion purposes throughout this Application, the subsea cable routes are labeled by route segments (Figure 1). A brief overview of the general subsea cable routes based on the preliminary siting and desktop assessment described in Section 2 is provided below. The final siting of the subsea cable routes will be refined based on more site-specific information gathered during additional site assessment and field surveys, including HRG, geotechnical, and benthic surveys, as well as marine archaeology and navigation assessments.

- Route Segment 1A includes the area between southeastern Rhode Island and OCP 5 to the east of the WEAs (approximately 64.3 NM [74 statute miles]).

- Route Segment 1B includes the area to the southeast of OCS-A 0522 between OCP 5 and OCP 6 (approximately 29.5 NM [34 statute miles]).

- Route Segment 1C includes the area to the west of the WEAs from OCP 6 north to approximately the Rhode Island-Connecticut border, west of Block Island (approximately 101.7 NM [117 statute miles]).

- Route Segment 2A includes the area from OCP 3 east across the northern side of the Nantucket Shoals to just east of Nantucket (approximately 30.4 NM [35 statute miles]).

- Route Segment 2B includes the area from OCP 5 on the southeastern side of the WEAs around the southern side of the Nantucket Shoals to just east of Nantucket (approximate 39.1 NM [45 statute miles]).

- Route Segment 2C includes the area from eastern Nantucket up north around the eastern side of Cape Cod into Massachusetts State waters east of Provincetown and Truro (approximately 57.4 NM [66 statute miles]).

- Route Segment 2D includes the area west of Stellwagen Bank from northern Cape Cod Bay to the mouth of Massachusetts Bay (approximately 14.8 NM [17 statute miles]).

Route Segments 2A and 2B are two alternatives to bring the subsea cable from the OCPs through the Nantucket Shoals and around Cape Cod. The Project may or may not include the use of both routes. The use of Route Segments 2A and/or 2B will depend on field surveys and evaluations as well as a determination from which platform will be used to bring OWE around Cape Cod.

The preliminary desktop siting and routing studies discussed in Section 2 identified potential sea-to-shore landfalls associated with these POIs. The final selection of the landfall locations and land cable routes will be refined based on more site-specific information collected during field surveys and discussions with local authorities, property owners, and stakeholders along the routes. Anbaric will continue to evaluate landfall locations and land cable routes that minimize interference with existing shoreline and recreational uses and avoid or, if avoidance is not possible, minimize disturbances to sensitive environmental resources such as wetlands, waterbodies, protected habitats, and prime agricultural lands by utilizing previously disturbed areas. Specialized construction methods, such as Horizontal Directional Drilling (HDD) will be considered at the sea-to-shore landfall transition and at wetland crossings to avoid and minimize potential impacts.

3.3 Project Schedule

From Anbaric's perspective, maintaining the proposed schedule below is important because it will be critical to Anbaric's participation in the upcoming 2020 Massachusetts DOER Transmission Request for Proposals. Anbaric has already filed Interconnection Requests with ISO-NE, so it is important that the offshore and land-based permitting efforts proceed in a timely way as well in parallel with those offtake contract bid opportunities and schedule. Anbaric also expects to participate in other competitive bid solicitations for New England state offtake agreements.

Anbaric is proposing a 16-month timeline for BOEM's review and approval of Anbaric's requested ROW/RUE Grant. As reflected in the proposed schedule, this provides sufficient time for BOEM to complete each step in the ROW/RUE Grant approval process, including the competitive interest determination, NEPA review, and issuance of the Grant.

The schedule also will allow Anbaric's proposed planned transmission system to progress through the BOEM regulatory process in parallel with the review of wind energy development projects and planned transmission as an option for BOEM, the states, utilities, and developers.

The following preliminary Project schedule reflects the anticipated timeline of the initial phases of the proposed Project.

	2019				2020				2021				2022			
PROJECT PHASE	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
BOEM ROW/RUE Grants and Approvals																
Submission of ROW/RUE Grant Application				■												
BOEM Determination of No Competitive Interest						■										
BOEM ROW/RUE Grant EA and FONSI									■							
ROW/RUE Grant Issued									■							
Interconnection Studies & Agreements																
Field Surveys & Assessments																

4.0 STAKEHOLDER OUTREACH

Anbaric has been meeting with and seeking input from key stakeholders and decision makers involved with offshore wind in southern New England since July 2018. Outreach to date has focused on federal and state agencies, utilities, state and local governments, offshore wind developers, community and environmental organizations, and representatives of the fishing industry. The goal of outreach has been to proactively obtain input on current Project plans and to discuss policy relating to offshore wind and specifically a planned transmission system. Anbaric's outreach will continue as the Project progresses, including during BOEM's review of this ROW/RUE Grant Application.

5.0 EXISTING ENVIRONMENTAL CONDITIONS IN AREA OF INTEREST

This section provides a general description of the existing environmental conditions (physical, biological, socioeconomic, and cultural) within the general Project Area and AOI. The Project Area represents the broader geographic region, while the AOI represents the ROW/RUE Grant area within the requested lease blocks that are included in this ROW/RUE Grant Application. Information about these resources was compiled from publicly available data that were identified, reviewed, and used as part of the preliminary desktop siting and routing assessment process. This information included geospatial data available from national, regional, and state GIS portals and National Oceanographic and Atmospheric Administration (NOAA) navigation chart data. These data were compiled using GIS software to create a series of maps showing various resources (see Figures 2-11).

Resource characterizations of the general Project Area contained within other readily available sources (e.g., BOEM environmental studies) were used to supplement the information obtained during the preliminary desktop assessment.

Anbaric recognizes that BOEM will conduct appropriate NEPA review at both the ROW/RUE Grant stage and the GAP review stage. This Application provides information about existing environmental conditions to support BOEM's environmental review of Anbaric's unsolicited request for a ROW/RUE Grant. Since the ROW/RUE Grant will not authorize any level of construction activity or significant disturbance, very limited environmental effects, if any, related to the ROW/RUE Grant issuance are anticipated. As the Project is advanced, a more detailed characterization of the potentially affected environment within the AOI will be completed. This will be facilitated by more site-specific research and comprehensive field surveys including HRG, geotechnical, and benthic surveys, as well as marine archaeology and navigation assessments. The findings from these surveys will assist in refining Project siting and inform the engineering and design of the Project. These detailed materials will be provided to BOEM to support BOEM's review of Anbaric's subsequent GAP proposal, consistent with BOEM's regulations. 30 C.F.R. §§ 585.640 – 648.

5.1 Physical Conditions

Physical Oceanography

Hydrography of the Project Area is generally sloping to the south and west with intermittent rises and troughs. As shown in Figure 2, charted water depths in the Project Area range between approximately 98 feet (30 meters) and 394 feet (120 meters) deep (east of Cape Cod). Water depths at each of the OCPs vary from about 98 feet (30 meters) to 203 feet (62 meters) with an average depth of approximately 145 feet (44 meters) (Table 2).

Table 2. Water Depth at Proposed OCP Locations

Offshore Collector Platform	Water Depth
OCP 1	98 ft (30 m)
OCP 2	121 ft (37 m)
OCP 3	128 ft (39 m)
OCP 4	121 ft (37 m)
OCP 5	128 ft (39 m)
OCP 6	174 ft (53 m)
OCP 7	203 ft (62 m)

Offshore Collector Platform	Water Depth
OCP 8	187 ft (57 m)

Tidal characteristics of the Project Area are generally semi-diurnal (approximately twice each day). Between Nantucket, MA and Cape May, NJ, the tidal currents are generally rotary and shift direction, usually clockwise, at a rate of 30 degrees per hour. To the east of the Project Area, throughout the Nantucket Shoals/Georges Bank area, tidal current velocities reach 1 to 2.4 knots or higher. Offshore, between Nantucket Island and Sandy Hook, these tidal currents measure less than 0.5 knot, maintaining an approximately uniform velocity. Closer to the coast, in the vicinity of the large inland waterways, velocities can be expected to increase. Wind-driven currents are considered the most impactful on navigation and may reach 1.5 knots under storm conditions (NOAA 2018a).

Historic wave conditions for NOAA buoys 44097 (Block Island, RI), 44070 (Buzzards Bay), 44028 (Buzzards Bay) and 44018 (Cape Cod) were reviewed through the National Data Buoy Center. For the data period of 2010 to 2017, buoy 44097 (Block Island, RI) recorded its highest significant wave height, measured as the average of the highest one-third of the waves, of 31.1 feet (9.48 meters) on October 29, 2012. For the data period of 2008 to 2010, buoy 44070 (Buzzards Bay) recorded its highest significant wave height of 15.1 feet (4.60 meters) on March 9, 2008. For the data period of 1994 to 1997, buoy 44028 (Buzzards Bay) recorded its highest significant wave height of 16.1 feet (4.90 meters) on November 12, 1995. For the data period of 2002 to 2008, buoy 44018 (Cape Cod) recorded its highest significant wave height of 28.2 feet (8.6 meters) on December 27, 2004 and again on January 23, 2005 (NOAA 2018b).

Geology and Sediment Type

Geology within the Project Area is characterized by gentle south and southwestern seaward slopes that ultimately end at a margin where the steeper continental slope begins. Bedrock consisting of metamorphic and igneous rocks is found under the WEA. Sand waves and other sedimentary features are found in the Project Area along the eastern margin of the WEA to Nantucket Shoals and Monomoy Shoals, which are dynamic and often change in depth and location (NOAA 2018a). These “significant physiographic features on the shelf in this region are the result of the advance and retreat of the Laurentide Ice Sheet during the Pleistocene era between 25,000 and 12,000 years before the present. As the ice retreated, sea levels began to rise, and the shelf was again inundated” (BOEM 2014). However, much of the Project Area is characterized by sand deposits throughout the continental shelf and gravel along Nantucket Shoals and eastern Cape Cod. Similarly, the Project Area west of Block Island is characterized by sand and gravel deposits. Additional research on mobile seabed forms (e.g., sand waves) will be needed for the selected platform locations and subsea cable routes as the Project is advanced (BOEM 2014).

Seabed surface sediment conditions vary due to sorting caused by waves, tidal currents, and storm events. Generally speaking, the finer sediments (fine sand and silts) are found in deeper water characterized by low-energy depositional environments. Shallower areas (e.g., high-flat formations) are characteristically coarser (e.g., sands). As shown in Figures 3A and 3B, the geologic conditions of the Project Area are characterized predominantly by mid-flat and upper flat formations, depressions, and predominantly sand and gravel with varying amounts of silt in the Project Area. Table 3 describes the seabed form and sediment type at each OCP location.

Table 3. Seabed Form and Sediment Type at Proposed OCP Locations

Offshore Collector Platform	USGS Seabed Form	Sediment Type
OCP 1	Mid Flat	Medium Sand (0.25 - 0.5)
OCP 2	Mid Flat	Fine Sand (0.125 - 0.25)
OCP 3	Depression	Fine Sand (0.125 - 0.25)
OCP 4	Mid Flat	Medium Sand (0.25 - 0.5)
OCP 5	Mid Flat	Medium Sand (0.25 - 0.5)
OCP 6	Mid Flat	Fine Sand (0.125 - 0.25)
OCP 7	Mid Flat	Silt (0.002 - 0.06)
OCP 8	Mid Flat	Silt (0.002 - 0.06)

5.2 Biological Resources

Birds and Bats

Areas of high bird abundance offshore of southeastern MA and RI occur in Nantucket Sound, south of Nantucket, and in the area southeast of Chatham MA (Figure 4). Bird abundance generally drops as distance from shore increases (Kinlan et al. 2016; MDAT 2016).

Avian taxa likely to occur in the Project Area include waterfowl, loons and grebes, shearwaters and petrels, gannets and cormorants, shorebirds, jaegers, alcids, sulids, and gulls and terns. Long-tailed duck (*Clangula hyemalis*) and other species of sea ducks are likely to be found in the Project Area throughout winter months. Species likely to occur in the Project Area are also generally found in the nearshore environments of Massachusetts and Rhode Island. Representative bird species that may be present in the Project Area throughout the year are shown in Table 4 below (BOEM 2014).

Table 4. Representative Bird Species found in the Project Area

Bird Type	Common Name	Scientific Name
Waterfowl		
	Canada Goose	*Branta canadensis*
	Common Eider	*Somateria mollissima*
	Surf Scoter	*Melanitta perspicillata*
	White-winger Scoter	*Melanitta fusca*
	Black Scoter	*Melanitta nigra*
	Red-breasted Merganser	*Mergus serrator*
	Long-tailed Duck	*Clangula hyemalis*
Loons and Grebes		
	Common Loon	*Gavia immer*
	Red-threated Loon	*Gavia stellate*
Shearwaters and Petrels		
	Northern Fulmar	*Fumarus glacialis*
Sulids		
	Northern Gannet	*Morus bassanus*
	Double-crested Cormorant	*Phalacrocorax auritus*
	Great Cormorant	*Phalacrocorax carbo*

Bird Type	Common Name	Scientific Name
Shorebirds		
	Red phalarope	*Phalacrocorax fulicarius*
	Dunlin	*Calidris alpina*
Alcids		
	Dovekie	*Alle alle*
	Atlantic Puffin	*Fratercula artica*
	Black-legged Kittiwake	*Rissa tridactyla*
	Bonaparte's Gull	*Larus philadelphia*
	Ring-billed Gull	*Larus delawarensis*
	Herring Gull	*Larus argentatus*
	Lesser Black-backed Gull	*Larus fuscus*
	Great Black-backed Gull	*Larus marinus*
	Forster's Tern	*Sterna forsteri*

Source: BOEM 2014

The Atlantic Flyway, a chief bird migration route, stretches along the eastern seaboard and includes the Project Area. Migratory birds may be found within the Project Area, using it as a stopover during migration for resting and refueling. However, given the distance between the OCPs and shore, avian abundance in the AOI is anticipated to be low (BOEM 2013).

Birds are concentrated in Nantucket Sound northeast of the AOI in Massachusetts waters. An area of medium to high bird abundance south of Nantucket was used as an easterly boundary when siting the offshore platform locations. The abundance of bird species is low at each of the potential platform locations identified (Figure 4). All of the platform locations avoid waters less than 20 meters in depth that coincide with sea duck habitat used by the RI Coastal Resources Management Council (CRMC) to create an Area Designated for Protection in the RI Ocean Special Area Management Plan (Ocean SAMP) (RI CRMC 2010).

No OCPs or structures above the seafloor will be located in areas of high avian abundance. The subsea cable Route Segment 1A is generally located in an area of low avian abundance. Route Segment 1A will pass through an area of low to medium avian abundance between OCP 4 and OCP 5. Route Segments 1B and 1C to the southeast and west of the WEAs, respectively, will traverse a path with low avian abundance and will not pass through any areas considered to have high avian abundance. Route Segment 2A heads east from OCP 3 and passes through an area of medium avian abundance south of Nantucket. Route Segment 2B travels east from OCP 5 south of Nantucket Shoals and passes through an area of medium to high avian abundance. As Route Segment 2B proceeds north, it continues through areas of low avian abundance. The subsea cable Route Segment 2C will pass through an area of high avian abundance to the east of Chatham, referenced above. Route Segment 2D will pass through an area of low avian abundance (Figure 4).

Bat sightings have occurred in the Atlantic offshore environment. Sightings include migratory tree bats such as hoary bats, eastern red bats, and silver-haired bats (BOEM 2014). However, given the distance of the platforms from shore, bats are unlikely to be found in the Project Area.

ESA-listed Bird and Bat Species

The federal Endangered Species Act (ESA) established a program for conserving species listed as endangered or threatened by the Secretaries of the Interior and Commerce. NOAA Fisheries is responsible for managing listed marine and anadromous species and the U.S. Fish and Wildlife Service (USFWS) is responsible for managing listed inland fish and terrestrial species. Bird species listed under the ESA that may be found in the Project Area include piping plover (*Charadrius melodus*), red knot (*Calidris canutus*), and roseate tern (*Sterna dougallii*) (Table 5). Piping plover and red knot may fly over the Project Area during migration. During their breeding season, piping plover can be found in sandy coastal habitats in Massachusetts and are unlikely to be found offshore and in the Project Area during breeding season. Roseate terns occur in coastal habitats throughout Cape Cod, Martha's Vineyard, and the Nantucket islands as well as the Nantucket Shoals. Roseate terns may be found in the northern parts of the Project Area inland near Martha's Vineyard and Nantucket; however, occurrence of roseate terns in the AOI is low (BOEM 2013; BOEM 2014).

Two species of ESA-listed non-migratory bat occur in Massachusetts and Rhode Island: the northern long-eared bat (*Myotis septentrionalis*) and the Indiana bat (*Myotis sodalis*) (BOEM 2013) (Table 5). Northern long-eared bats may occur in coastal habitats along the Project Area, but are not expected to occur offshore. However, they are known to inhabit coastal islands, such as Martha's Vineyard, which suggests that they are capable of traveling offshore (Pelletier et al. 2013). A 2016 study conducted for BOEM by the University of Massachusetts tagged and tracked northern long-eared bats off the northwestern coast of Martha's Vineyard. The study did not observe offshore movement of the species in this area. Therefore, northern long-eared bats are considered unlikely to occur in the offshore environment, but may occur in coastal environments and the islands in the Project Area (Dowling et al. 2017). Indiana bats inhabit caves, mines, and hollow trees in inland areas. They are not found in eastern Massachusetts and are, therefore, unlikely to be found in the Project Area (MA NHESP 2015a).

Table 5. Threatened and Endangered Bird and Bat Species that May be Present in the Project Area

Common Name	Scientific Name	Federal Status	Occurrence
Birds			
Piping plover	*Charadrius melodus*	Threatened	Potential during migration
Red knot	*Calidris canutus*	Threatened	Potential during migration
Roseate tern	*Sterna dougallii*	Endangered	Rare
Bats			
Northern long-eared bat	*Myotis septentrionalis*	Threatened	Rare
Indiana bat	*Myotis sodalis*	Endangered	Rare

Reference: BOEM 2013; BOEM 2014

Benthic Seabed Resources

The Project cable routes traverse a wide range of benthic habitat types in federal waters. Seafloor sediments along Route Segments 2A, 2B, 2C, and 2D around Nantucket Shoals and Cape Cod largely consist of medium and coarse sand and gravel, though very coarse sand and fine sand are likely also present (Anderson et al. 2010). These sediment types are also common along Route Segment 1A, though very fine sand and limited areas of silt are also expected (Anderson et al. 2010). Route Segment 1B and 1C south and west of the WEAs is characterized by silt, very fine sand, and fine sand between OCP 6 and

OCP 8. Along the northern portion of Route Segment 1C, sediment types are predominantly medium sand with some silt, very fine sand, fine sand, coarse sand, and gravel. Due to the length and positioning of the cable routes, limited information about the benthic communities in these areas is available. Benthic sampling would occur along the subsea cable routes prior to construction to adequately characterize these habitats.

Data from 2003 to 2012 SMAST video surveys provides some occurrence information about larger surface-dwelling benthic organisms in the cable route area. This study indicates that hermit crab, moon snail, and sea star abundance along the cable route is generally very low to low, and bryozoans and sponges were usually encountered in less than 25% of samples in the area (SMAST 2016). In contrast, sand dollars were frequently identified along the cable route; these organisms were present in 75 to 100% of samples collected in the vicinity of the proposed OCPs, and were also very frequently observed north of Provincetown along Route Segment 2C around Cape Cod (SMAST 2016).

Though benthic community information for the specific area of the cable routes is limited, extensive studies have been conducted in the MA and RI/MA WEAs and in the waters south of Rhode Island. Benthic sediments in the WEAs are continuously redistributed, creating a variable seafloor characterized by medium, coarse, and fine sand (BOEM 2013). Similarly, the RI Ocean SAMP study concluded that this region has a complex and patchy benthic habitat structure comprised of a variety of topographic features (RI CRMC 2010). Benthic communities in these regions vary by sediment type, but are dominated by invertebrates, and generally inhabited by tube-building amphipods, polychaetes, and bivalves (BOEM 2013, RI CRMC 2010).

As shown in Figure 5, several artificial reefs are found in Rhode Island Sound and just south of Aquidneck Island. No known seagrass beds have been mapped offshore Massachusetts and Rhode Island. OCPs and subsea cables have been sited away from known artificial reefs and inshore seagrass beds.

Finfish & Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act and the 1996 Sustainable Fisheries Act mandate that NOAA identify and protect important marine and anadromous fish habitat. This essential fish habitat (EFH) is defined as “those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity” (16 U.S.C. 1802(10)). The Magnuson-Stevens Act requires consultation with NOAA Fisheries for proposed activities that may adversely affect EFH. NOAA Fisheries designates EFH for most species in association with a grid of 10 x 10 minute squares, which covers all marine habitats along the United States coastline. NOAA Fisheries also designates EFH for estuarine waters (including estuaries, bays and rivers).

There are glacial moraines in Rhode Island Sound that are designated as Areas of Particular Concern under the RI Ocean SAMP due to their importance as fish habitat (RI CRMC 2010). Portions of Route Segment 1A and 1C would likely pass through these areas, and additional route refinement would be necessary to minimize the crossing length through these areas or determine if there is a possible way to avoid them. Route Segment 2C around Cape Cod, and the eastern portion of Route Segments 2A and 2B, would pass through the Great South Channel Habitat Management Area (HMA). This area includes waters from the eastern extreme of Nantucket north along Cape Cod and areas southeast of the Cape. In 2007, the New England Fishery Management Council designated the Great South Channel HMA as habitat essential to the survival of juvenile cod. The eastern portion of Route Segments 2A and 2B and Route Segment 2C around Cape Cod to Massachusetts Bay would pass through Habitat Areas of Particular

Concern (HAPC). Route Segment 2C would pass well to the south of Jeffery's Ledge, which is located north of the Project Area.

As shown in Figure 5, EFH occurs throughout the coastal and offshore portions of the Project Area, where the OCPs and the subsea cable routes are located. The number of species for which EFH has been designated within the Project Area varies by square and location, ranging from 3 species along portions of Route Segment 2C southeast of Cape Cod and 2D in Massachusetts Bay to up to 15 species offshore (along Route Segment 1C and OCP 8) for highly migratory species, and from 9 to 30 species per square for groundfish and shellfish depending upon location. Project Area-specific habitat conditions may indicate that EFH does not exist for some of the listed species or life stages in the Project Area. In preparation of a GAP, Anbaric will conduct a detailed assessment of EFH in the AOI.

ESA-listed Fish Species

Federally-endangered shortnose sturgeon (*Acipenser brevirostrum*) may be found in coastal New England waters throughout its oceanic life stages. Shortnose sturgeons occur primarily in fresh and estuarine waters and occasionally in coastal oceans, but have not been observed in Barnstable County in the last 25 years (MA NHESP 2015b). This species is not known to make long-distance offshore migrations (NOAA Fisheries 2018a). Therefore, shortnose sturgeons are not likely to be found in the offshore marine environment or the Project Area (BOEM 2014).

Federally-endangered Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) may be found in the Project Area. Atlantic sturgeon have been found in nearshore, shallow coastal waters of Massachusetts (Dunton et al. 2010; NOAA Fisheries 2018a; MA NHESP 2015c). In 2012, NOAA Fisheries listed five Distinct Population Segments (DPS) of Atlantic sturgeon as federally endangered or threatened. The Chesapeake Bay, New York Bight, Carolina, and South Atlantic populations were listed as endangered and the Gulf of Maine population was listed as threatened. Based on genetic analysis of collected individuals, Atlantic sturgeon from all five DPSs are found in the Project Area (BOEM 2014). The majority of Atlantic sturgeon in the Project Area likely originate from the New York Bight DPS (BOEM 2014). In general, adult Atlantic sturgeon may be found in the Project Area year-round (NOAA Fisheries 2018a).

Alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), and cusk (*Brosme brosme*) are candidate species for listing under the ESA and may be found in the Project Area. Alewife, blueback herring, and American shad (*Alosa sapidissima*) are common anadromous fish found in MA and RI coastal waters and are protected under sustainable fisheries management plans and American shad habitat plans as required by the Interstate Fishery Management Plan for Shad and River Herring (ASMFC 2018). They are most likely to be present in the Project Area between July and February as they migrate inland to spawn in freshwaters between March and June. However, cusk is generally found in deepwater marine environments (NOAA Fisheries 2018a; NOAA Fisheries 2018b).

Table 6. Threatened and Endangered Fish Species that May be Present in the Project Area

Common Name	Scientific Name	Federal Status	Occurrence
Atlantic sturgeon	*Acipenser oxyrinchus*	Endangered	Winter in nearshore marine environments and summer inland
Shortnose sturgeon	*Acipenser brevirostrum*	Endangered	Rare
Alewife	*Alosa pseudoharengus*	Candidate	Winter in nearshore marine environments and summer inland
Blueback herring	*Alosa aestivalis*	Candidate	Winter in nearshore marine environments and summer inland
Cusk	*Brosme brosme*	Candidate	Rare

Reference: NOAA Fisheries 2018a; NOAA Fisheries 2018b; MA NHESP 2015b; MA NHESP 2015c; USFWS 2018a; RI CRMC 2010

<u>Marine Mammals</u>

Thirty-eight species of marine mammals are present in the North Atlantic, including baleen whales, sperm whales, beaked whales, a porpoise, dolphins, and seals (BOEM 2014). Marine mammal abundance is greatest along the continental shelf, south of the AOI (MDAT 2016).

ESA-listed Marine Mammal Species

Five marine mammal species listed under the ESA occur in the waters of the North Atlantic (Table 7) (BOEM 2013; NOAA Fisheries 2018a). Fin whales (*Balaenoptera physalus*), North Atlantic right whales (*Eubalaena glacialis*), and sperm whales (*Physeter macrocephalus*) are the three most common ESA-listed marine mammals in the Project Area. Blue whales (*Balaenoptera musculus musculus*) and sei whales (*Balaenoptera borealis*) are considered rare and regular, respectively, in the Project Area. Blue whales are primarily found in deep water, while sei and sperm whales are primarily found near the edge of the continental shelf (BOEM 2013; BOEM 2014).

Of the five ESA-listed marine mammals, the North Atlantic right whale (NARW) is the most endangered; this species has seen little to no recovery since it was listed as endangered in 1970 and continues to be one of the most endangered large whale species in the world (NOAA Fisheries 2004; NOAA Fisheries 2018a). NARWs are currently suffering an unusual mortality event; twenty mortalities have been documented between June 7, 2017, and the time of this writing, less than 450 NARWs are thought to remain in the world (NOAA Fisheries 2018a; NOAA Fisheries 2018c). NARWs use the southern waters of Massachusetts and Rhode Island throughout all seasons for feeding and migration, but are most common in the spring (BOEM 2013).

Seasonal Management Areas (SMAs) have been designated in waters off of the U.S. and Canada to reduce ship strikes of NARWs. All vessels greater than 65 ft (19.8 m) in overall length must operate at speeds of 10 knots or less within these areas during seasonal restriction periods. A SMA has been designated for the area south of Block Island between the eastern end of Long Island and the western end of Martha's Vineyard from November 1 through April 20 (Figure 6) (BOEM 2013). OCP 1 and OCP 8 are both located within this SMA, and Route Segments 1A and 1C would pass through this SMA. Route Segment 2C around the eastern side of Cape Cod would pass through one NARW SMA, the off Race Point area, active from March 1 to April 30. The southern portion of Route Segment 2D would pass through one NARW SMA, the Cape Cod Bay area, active from January 1 to May 15. The Great South Channel SMA is active from April

1 to July 31 and is located to the east and outside of Route Segment 2C around Cape Cod. Critical foraging habitat for NARWs has also been designated in the Gulf of Maine and Georges Bank region. Route Segment 2C around Cape Cod would pass through this critical habitat (NOAA Fisheries 2018d). For ships of 300 gross tons or more, an additional area to be avoided has also been established in the Great South Channel (NOAA 2018d).

Table 7. Threatened and Endangered Marine Mammals that May be Present in the Project Area

Common Name	Scientific Name	Federal Status	Occurrence[1]
Fin whale	*Balaenoptera physalus*	Endangered	Common; year-round
Blue whale	*Balaenoptera musculus musculus*	Endangered	Rare; summer
Sei whale	*Balaenoptera borealis*	Endangered	Regular; spring/summer
Sperm whale	*Physeter macrocephalus*	Endangered	Common; spring/summer/fall
North Atlantic right whale	*Eubalaena glacialis*	Endangered	Common; year-round

Reference: NOAA Fisheries 2018a; BOEM 2014; RI CRMC 2010

[1]Occurrence defined in RI Ocean SAMP and BOEM 2014 EA as follow: Common = greater than 100 records; Regular = 10-100 records; Rare = less than 10 records; Hypothetical = remote possibility to occur in region at some time.

Non-ESA Listed Marine Mammal Species

The Marine Mammal Protection Act (MMPA), enacted in 1972, prohibits the take of marine mammals in U.S. waters. The act also prohibits U.S. citizens from taking marine mammals in the high seas and the importation of marine mammals into the U.S. (USFWS 2018b).

Thirty-three non-ESA species protected under the MMPA occur in the waters of the North Atlantic, including sixteen species of whales, thirteen species of dolphins and porpoises, and four species of pinnipeds (Table 8) (BOEM 2014). Two of the MMPA-protected species of whales, humpback whale (*Megaptera novaeangliae*) and long-finned pilot whale (*Globicephala melas*), commonly occur year-round throughout these waters. Other whale species are rare in the area or are more common in spring and summer. Three species of dolphins commonly occur year-round, including the Atlantic white-sided dolphin (*Lagenorhynchus acutus),* bottlenose dolphin (*Tursiops truncates*), and short-beaked common dolphin (*Delphinus delphis*). Two species of pinnipeds (i.e., seals) found in Massachusetts and Rhode Island waters commonly occur year-round, the grey seal (*Halichoerus grypus*) and the harbor seal (*Phoca vitulina*) (BOEM 2013).

Table 8. MMPA-Protected Marine Mammals that May be Present in the Project Area

Common Name	Scientific Name	Occurrence[1]
Whales		
Blainville's beaked whale	*Mesoplodon densirostris*	Rare; late spring/summer
Cuvier's beaked whale	*Ziphius cavirostris*	Rare; late spring/summer
Dwarf sperm whale	*Kogia sima*	Rare; late spring/summer
False Killer whale	*Pseudorca crassidens*	Rare; late spring/summer
Gervais' beaked whale	*Mesoplodon europaeus*	Rare; late spring/summer
Humpback whale	*Megaptera novaeangliae*	Common; year-round
Killer whale	*Orcinus orca*	Rare; late spring/summer
Long-finned pilot whale	*Globicephala melas*	Common; year-round
Melon-headed whale	*Peponocephala electra*	Hypothetical
Minke whale	*Balaenoptera acutorostrata*	Common; spring/summer
Northern Bottlenose Whale	*Hyperoodon ampullatus*	Hypothetical
Pygmy killer whale	*Feresa attenuata*	Hypothetical
Pygmy sperm whale	*Kogia breviceps*	Rare; late spring/summer
Short-finned pilot whale	*Globicephala macrorhynchus*	Rare; late spring/summer
Sowerby's beaked whale	*Mesoplodon bidens*	Rare; late spring/summer
True's beaked whale	*Mesoplodon mirus*	Rare; late spring/summer
Dolphins and Porpoises		
Atlantic spotted dolphin	*Stenella frontalis*	Rare; year-round
Atlantic white-sided dolphin	*Lagenorhynchus acutus*	Common; year-round
Bottlenose dolphin	*Tursiops truncates*	Common; year-round
Clymene dolphin	*Stenella clymene*	Hypothetical
Fraser's Dolphin	*Lagenodelphis hosei*	Data Deficient
Harbor porpoise	*Phocoena phocoena*	Rare; year-round
Pantropical spotted dolphin	*Stenella attenuata*	Rare; late spring/summer
Risso's dolphin	*Grampus griseus*	Rare; year-round
Rough-toothed dolphin	*Steno Bredanensis*	Rare; late spring/summer
Short-beaked common dolphin	*Delphinus delphis*	Common; year-round
Spinner dolphin	*Stenella longirostris*	Hypothetical
Striped dolphin	*Stenella coeruleoalba*	Rare; year-round
White-beaked dolphin	*Lagenorhynchus albirostris*	Rare; late spring/summer
Pinnipeds		
Grey seal	*Halichoerus grypus*	Common; year-round
Harbor seal	*Phoca vitulina*	Common; year-round
Harp seal	*Pagophilus groenlandicus*	Common; winter/spring
Hooded seal	*Cystophora cristata*	Rare; winter/spring

Reference: BOEM 2013; BOEM 2014; NOAA 2018a

[1]Occurrence defined in RI Ocean SAMP and BOEM 2014 EA as follow: Common = greater than 100 records; Regular = 10-100 records; Rare = less than 10 records; Hypothetical = remote possibility to occur in region at some time.

As shown in Figure 6, marine mammal abundance is low throughout the majority of the Project Area. OCP 1 and OCP 8 are located within the SMA for NARW south of Martha's Vineyard and Block Island. However, this SMA is an indication of an area of high vessel traffic rather than high NARW abundance. Portions of Route Segment 1A and 1C pass through this SMA. Almost the entirety of Route Segment 2C passes through one SMA, off Race Point. Route 2C also passes through areas of medium to high marine mammal abundance off the coast of Cape Cod. The southern portion of Route Segment 2D passes through one SMA, Cape Cod Bay SMA. All other Route Segments are located within areas of low marine mammal abundance as shown on Figure 6.

Sea Turtles

Five federally-listed endangered or threatened sea turtle species have the potential to occur within the Project Area as transient species (Table 9). The loggerhead turtle (*Caretta caretta*), green turtle (*Chelonia mydas*), Kemp's ridley turtle (*Lepidochelys kempii*), and leatherback turtle (*Dermochelys coriacea*) are generally found in the coastal and offshore sections of the Project Area from spring to fall (BOEM 2014; NOAA Fisheries 2018a). The hawksbill sea turtle (*Eretmochelys imbricata*) prefers warm, tropical and subtropical water and is unlikely to be found in the Project Area (NOAA Fisheries 2018a).

Table 9. Threatened and Endangered Sea Turtles that May be Present in the Project Area

Common Name	Scientific Name	Federal Status	Occurrence
Loggerhead turtle	*Caretta caretta*	Threatened	Common; coastal waters summer and early fall
Green turtle	*Chelonia mydas*	Threatened	Possible; summer
Kemp's ridley turtle	*Lepidochelys kempii*	Endangered	Possible; inshore summer and early fall
Leatherback turtle	*Dermochelys coriacea*	Endangered	Common; summer and fall
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	Remote Possibility; inhabits warm, tropical and subtropical water; unlikely to occur in MA/RI waters

Reference: BOEM 2013; BOEM 2014; NOAA Fisheries 2018a

Stellwagen Bank

Stellwagen Bank National Marine Sanctuary (Stellwagen Bank or Stellwagen) is located on the OCS north of Cape Cod in Massachusetts Bay. The NOAA Office of National Marine Sanctuaries (ONMS) manages national marine sanctuaries under the National Marine Sanctuaries Act (NMSA) to protect special, nationally significant areas of the marine environment. Nationally significant areas may include marine habitats, cultural resources, historic sites, and feed and breeding grounds (DOC 2010).

Stellwagen Bank is an underwater plateau, approximately 638 square nautical miles (842 square miles) in size with water depths ranging from 65 to 600 feet (19.8 to 182.9 meters) and the plateau averaging 100 to 120 feet (30.5 to 36.6 meters). The plateau and physical features of the seafloor allow for mixing of coastal waters and deep nutrient-rich waters, which draw a diverse assemblage of fish species and marine mammals (DOC 2010).

Stellwagen Bank serves as a productive fishing ground for recreational and commercial fishermen. It is known for groundfish species such as cod, haddock, and flounder as well as giant Atlantic Bluefin tuna, sharks, and herring. Marine mammals are drawn to Stellwagen to feed on sand lance and a variety of other fish species. Marine mammals found in Stellwagen at different times throughout the year include humpback whale, fin whale, minke whale, northern right whale, Atlantic white-sided dolphin, harbor porpoise, pilot whale, and harbor seal.

Anbaric recognizes Stellwagen Bank as an important area from both a conservation and commercial standpoint. The Project does not propose to site within Stellwagen, but rather would site that portion of the Project in state waters.

Nantucket Lightship Closed Area

The Nantucket Lightship Closed Area (NLCA) is approximately 2,400 square miles in size, and is located approximately 28 miles south of Nantucket below the Nantucket Shoals. It was established in 1994 to protect benthic habitat and groundfish species (i.e., Atlantic cod, haddock, winter flounder, hake, yellowtail flounder) and rebuild depleted stocks. This area is closed to groundfishing, such as gillnet fishing (NOAA 2019).

The NLCA overlaps with a significant portion of lease area OCS-A 0522 and a portion of lease area OCS-A 0521. Portions of Route Segments 1A, 1B, 1C, and 2B along with OCPs 5 and 6 are located within the northwestern corner of the NLCA. The subsea cable installation within the NLCA would result in a temporary disturbance to this habitat area. However, after the one-time cable installation is complete, the subsea cables are not anticipated to impact the NLCA. The OCPs would have similar resource area impacts as siting a WTG within those lease areas overlapping the NLCA. Additionally, siting portions of the project within the northwest corner of the NLCA would reduce impacts to commercial fishing interests since the area is closed to groundfishing.

5.3 Socioeconomic Resources

Commercial Fisheries and Recreational Fishing

The diverse finfish assemblages, squid, and shellfish present in the Project Area support both commercial and recreational fishing.

There are a number of fishery management plans administered by the New England Fishery Management Council in place for regulating and managing fisheries in the region. These include plans for cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*), pollock (*Pollachius pollachius*), redfish (*Sebastes fasciatus*), yellowtail flounder (*Pleuronectes ferruginea*), winter flounder (*Pseudopleuronectes americanus*), American plaice (*Hippoglossoides platessoides*), witch flounder (*Glyptocephalus cynoglossus*), windowpane flounder (*Scophthalmus aquosus)*, white hake (*Urophycis tenuis*), ocean pout (*Zoarces americanus*), Atlantic halibut (*Hippoglossus hippoglossus*), Atlantic wolffish (*Anarhichas lupus*), Atlantic salmon (*Salmo salar*), Atlantic sea scallops (*Placopecten magellanicus*), Atlantic herring (*Clupea harengus harengus*), monkfish (*Lophius americanus*; *L. piscatorius*; *L. upsicephalus*), skates (Rajidae), spiny dogfish (*Squalus acanthias*), red crab (*Gecarcoidea natalis*), silver hake (*Merluccius bilinearis*), red hake (*Urophycis chuss*), and offshore hake (*Melanogrammus aeglefinus*) (NEMFC 2018).

From 2011 to 2017, commercial fisherman in Massachusetts, Rhode Island, and Connecticut earned a total of $4.66 billion of landings revenue, equating to approximately 1,131,890 metric tons (2.51 billion pounds) of fish. Approximately $114 million of this landings revenue came from Connecticut fishermen, $588 million came from Rhode Island fishermen, and approximately $3.96 billion came from Massachusetts fishermen (NOAA Fisheries 2018e). The top commercial fisheries by dollar value in Massachusetts, Rhode Island, and Connecticut in 2017 are listed in Table 10.

Table 10. Top Commercial Fisheries by Dollar Value in 2017

Fishery	Scientific Name	Dollar Value	Metric Tons
Massachusetts			
Sea scallop	*Placopecten magellanicus*	$330,247,259	14,694.1
American lobster	*Homarus americanus*	$82,290,976	7,568.8
Eastern oyster	*Crassostrea virginica*	$28,377,781	280.1
Atlantic surf clam	*Spisula solidissima*	$18,316,265	8,464.9
Goosefish	Lophiidae	$11,837,902	7,798.3
Jonah crab	*Cancer borealis*	$11,400,576	5,284.8
Haddock	*Melanogrammus aeglefinus*	$11,371,728	5,312.7
Atlantic herring	*Clupea harengus*	$6,718,520	13,928.0
Softshell clam	*Mya arenaria*	$6,254,156	343.9
Winter flounder	*Pseudopleuronectes americanus*	$5,752,756	873.1
Rhode Island			
Sea scallop	*Placopecten magellanicus*	$21,651,985	993.1
Longfin squid	*Doryteuthis pealeii*	$14,795,851	4,863.1
Northern shortfin squid	*Illex illecebrosus*	$13,536,617	10,457.7
American lobster	*Homarus americanus*	$10,978,486	925.1
Eastern oyster	*Crassostrea virginica*	$5,770,129	101.1
Northern quahog	*Mercenaria mercenaria*	$5,005,362	247.4
Summer flounder	*Paralichthys dentatus*	$4,299,262	406.4
Jonah crab	*Cancer borealis*	$3,633,009	1,760.6
Scup	*Stenotomus chrysops*	$3,069,673	2,707.2
Silver hake	*Merluccius bilinearis*	$2,205,522	1,780.3
Connecticut			
Sea scallop	*Placopecten magellanicus*	$7,203,953	352.6
Longfin squid	*Doryteuthis pealeii*	$996,325	295.0
Skates	Rajidae	$727,367	958.5
Summer flounder	*Paralichthys dentatus*	$673,328	60.8
American lobster	*Homarus americanus*	$669,849	57.2
Silver hake	*Merluccius bilinearis*	$647,060	338.4
Scup	*Stenotomus chrysops*	$565,390	341.0
Goosefish	Lophiidae	$359,701	180.6
Channeled whelk	*Busycotypus canaliculatus*	$346,408	29.9
Black sea bass	*Centropristis striata*	$167,234	19.9

Reference: NOAA Fisheries 2018f

Atlantic sea scallops are the most valuable fishery in Massachusetts based on landings value (Table 10). Areas of high sea scallop abundance in the Project Area are shown in Figure 7A. None of the OCPs or subsea cable routes are located in these areas.

NMFS Vessel Monitoring System (VMS) data indicate that moderate scallop harvesting activity occurs along Route Segment 2C around Cape Cod (greatest activity in waters north of Provincetown, NROC &

RPS 2018). Similarly, Route Segment 2C along the east of Cape Cod also sees moderate fishing activity for herring, monkfish, and other groundfish (primarily offshore of Orleans) (NROC & RPS 2018). Though intensive squid fishing occurs off the southern coasts of Nantucket and Martha's Vineyard, the cable routes in this area largely avoid the most densely-fished region, and limited squid fishing occurs along Route Segment 2C (NROC & RPS 2018). Some surf clam and ocean quahog harvesting occurs in the vicinity of OCP 2, but intensive fishing for these species is primarily confined to the Nantucket Shoals, which would be crossed by Route Segments 2B and 2A (NROC & RPS 2018).

Fishing vessel transit routes, as derived from vessels with automatic identification system (AIS) transponders, are shown in Figure 7B. Fishing vessel data in the figure represents speed over ground (SOG) equal to or exceeding 5 knots (vessels operating below this speed are typically engaged in fishing rather than transiting). The months of July and December 2017 represent the greatest and least volume, respectively, of AIS vessel data available and thus are estimated to reflect a representative range for in transit fishing vessel traffic within area waters. In the Project Area, the highest fishing vessel densities occur along the vessel routes in and out of port areas along the subsea cable routes through Rhode Island Sound. The OCPs have been sited to avoid highly-traversed vessel routes. Patterns and densities of actual fishing activity are not readily observed in these data.

Along the southern Massachusetts and Rhode Island shore, New Bedford, MA and Point Judith, RI are the major commercial fishing ports based on revenue NOAA Fisheries 2018e; BOEM 2014). Commercial and recreational fishing off southern Massachusetts and Rhode Island also originates from Fairhaven, MA, North Kingstown, RI, Narragansett, RI, and Newport, RI (BOEM 2013; Kirkpatrick et al. 2017). Along Cape Cod and Massachusetts Bay, Gloucester, MA; Provincetown-Chatham, MA; and Boston, MA are the major commercial fishing ports (NOAA Fisheries 2018e). In Connecticut, the major commercial fishing ports based on revenue are Stonington, CT and New London, CT (NOAA Fisheries 2018e).

In addition to the commercial fishing activity described above, recreational fishing for a variety of species is known to occur throughout the Project Area. Additional data for recreational boaters includes routes for vessels engaged in activities that include fishing, diving, relaxing, scenic enjoyment, swimming, and wildlife viewing (SeaPlan 2013). Of these activities, fishing is assumed to be the most common recreational activity. These data do not provide volumes of vessel activity, but are illustrated in Figure 7B.

Navigation and Vessel Traffic

The following sections describe vessel and navigation routing systems located in the vicinity of the Project Area.

Shipping Lanes

Traffic Separation Schemes (TSS) are designated to help manage collision risk for commercial vessel traffic entering and existing major ports by creating traffic lanes and separation zones. Many if not all of the TSSs in the United States, including those serving U.S. ports along the Atlantic, were established under guidelines by the International Maritime Organization (IMO) set forth in the 1974 Safety Of Life At Sea (SOLAS) Convention. The guidelines and criteria developed by the IMO allows foreign-flagged vessels to operate in routing systems that are familiar regardless of the Port. Making changes to any routing system, including a TSS, is possible; however, this would require the U.S. Coast Guard (USCG) to submit a proposal for a change to IMO.

One TSS, the Buzzards Bay Traffic Lane, is located along Route Segment 1A. The Buzzards Bay TSS serves the Port of New Bedford. A second TSS, the Nantucket-Ambrose Traffic Lane, is located in the southern Project Area along Route Segments 1B and 1C,. This serves the Ports of New York and New Jersey. Each TSS has three key features: an inbound traffic lane, an outbound traffic lane, and a separation zone between them.

One TSS is located along the northeastern portion of Route Segment 2C and the northern portion of the Route Segment 2D: the Boston Harbor Traffic Lane. Route Segment 2C runs generally parallel to the Boston Harbor Traffic Lane until it reaches Provincetown. It may enter portions of the TSS along the eastern side of Cape Cod.

The USCG has developed Marine Policy Guidelines based on the Atlantic Coast Port Access Route Study (ACPARS). These guidelines recommend setbacks of 2 NM from the seaward boundary (outer edge) of a TSS (assumes 300 to 400 meter vessels) and 5 NM from the entry/exit (terminations) of a TSS to reduce risk to maritime uses (USCG 2016). However, project risk is ultimately determined on a case-by-case basis after review of a Navigation Safety Risk Assessment.

As shown in Figure 8, all of the OCPs are located outside of the traffic lanes within the TSSs. All of the OCPs, except OCP 6, are located more than the recommended 2 NM setback from the outer boundary of a traffic lane. OCP 6 is currently proposed to be located 1.2 NM from the outer boundary of a traffic lane, similar to portions of the southern boundary of lease area OCS-A 0522. The location of this OCP will be further evaluated in the project’s Navigation Safety Risk Assessment and as plans to develop OCS-A 0522 are advanced by the lease holder.

Vessel Traffic

Vessel traffic is understood to exist along most of the Atlantic OCS with higher densities of use closest to the shore and within TSSs. While vessel traffic patterns are guided by use of routing systems, which include TSSs, safety fairways, two-way traffic lanes, recommended tracks, areas to be avoided, inshore traffic zones, precautionary areas, and deep-water routes, the master of each vessel may navigate freely upon the waters in the vicinity of the Project Area while operating between ports of call. The presence of uncharted coastwise traffic routes, outside the USCG or IMO routing systems, are evident in annual summaries of vessel AIS data. These uncharted coastwise routes are commonly used by passenger vessels, fishing vessels, and tug and barge vessels and frequently connect ports along a straight line. Along the coast of southern Massachusetts and Rhode Island and through Rhode Island Sound, AIS data shows coastwise routes utilized by vessels (Figure 8).

The OCPs have been sited seaward of the existing uncharted coastwise shipping routes as reviewed in the AIS data to minimize potential conflicts. South of Martha’s Vineyard, OCP 1, OCP 2, OCP 7, and OCP 8 are located in moderately traversed routes, but are situated in close proximity to the WEA. The subsea cable routes cross these uncharted routes closer to shore (Figure 8) (MarineTraffic 2018).

Fishing Transits

Anbaric is aware of the effort by the USCG to establish designated fishing vessel transit corridors in the area where the Southern New England Ocean Grid will be located. Anbaric’s understanding is this process is still developing, and Anbaric is committed to adjusting the OCP locations if the currently proposed locations fall within a transit corridor designated by the USCG.

Other Uses

Offshore Energy and Marine Infrastructure

The Project Area includes the portions of the OCS that contain the existing BOEM offshore wind commercial Lease Areas, designated as offshore WEAs south of Rhode Island and Massachusetts. These WEAs include the areas leased by Deepwater Wind, Ørsted, and Vineyard Wind. The Southern New England Ocean Grid will also support the WEAs auctioned in December 2018 (OCS-A 0520, OCS-A 0521, and OCS-A 0522). The proposed OCPs and subsea cable routes are located proximate to but outside of the WEAs.

In the general vicinity of the Project Area off the coast of southern Rhode Island and Massachusetts, undersea cables are the most abundant offshore infrastructure feature currently developed in the Atlantic OCS, but there are no submarine cables in the general vicinity of the OCPs or Route Segments 1A, 1B, 2A, 2B, and 2D. However, Route Segment 2C around Cape Cod route crosses two (2) NOAA-charted submarine cables. Route Segment 1C may cross up to seven (7) NOAA-charted submarine cables (Figure 9). The crossing of infrastructure will be addressed in the GAP, and as discussed in Section 3.2, will be coordinated with the owner of the utilities to avoid potential adverse impacts.

Marine Minerals

BOEM has indicated there are seven potential offshore marine minerals (i.e., sand and gravel) resource areas of interest to the BOEM Marine Minerals Program and stakeholders in the ROW/RUE Grant area that Anbaric is requesting in this Application.

Three of the OCS lease blocks are located southwest of Buzzards Bay. This area is referred to by BOEM as the Buzzards Bay Site. BOEM identified portions of each block as potential resource areas. BOEM noted this area "for future investigation due to the presence of an uncharacterized subsurface channel deposit that most likely consists of sand and gravel deposits of unknown thickness."[5] These portions are generally located in the northern and/or eastern quadrants of the blocks. Anbaric does not anticipate a conflict with routing the subsea cable around these identified areas.

BOEM also identified the four OCS lease blocks west of Stellwagen Bank off of Cohasset and Scituate, Massachusetts. This is referred to as the Marshfield Site and was noted that it "contains a lenticular body of sand and gravel that has the potential to supply sand, gravel, and cobbles for beaches that require coarser materials."[6] The quadrants identified within these four blocks are centered within this 6-mile by 6-mile area. There is sufficient space within these OCS lease blocks to route the subsea cable either east or west of this potential resource area. Anbaric does not anticipate a conflict with routing the subsea cable around these identified areas.

Marine Restricted Areas

Several danger areas charted by NOAA are interspersed throughout Rhode Island Sound in the general vicinity of the Project Area. These areas are associated with historic wartime use and disposal of mines, depth charges and munitions, and carry charted warnings to avoid fishing, dragging, and laying cables. Danger areas may also be used for target practices or other hazardous operations and are, therefore,

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[5] Correspondence received as attachment to email from Casey Reeves, BOEM, to Stephen Conant, Anbaric Development Partners October 28, 2019.

[6] *Id.*

closed to the public on either a full-time or intermittent basis. The subsea cable routes from the OCPs generally avoid these danger areas (Figure 10).

Portions of the Atlantic OCS have been impacted by the uncontrolled ocean disposal of municipal sewage sludge, industrial acids and wastes, unexploded ordnances (UXOs), and explosives. OCPs and subsea cables routes have been sited to avoid the charted disposal areas and UXOs (Figure 10).

Military Use Areas

The Department of Defense (DOD) has identified areas in the Atlantic OCS that may be used for military activities. The Project Area is located within two DOD Operating Areas, the Narragansett Complex and the Boston Complex. All eight OCPs and Route Segments 1A, 1B, 1C, 2A, and 2B are located within the Narragansett Complex Operating Area. The majority of Route Segment 2C and the entirety of Route Segment 2D around Cape Cod are within the Boston Operating Area. This area constitutes two of the four available locations for U.S. Navy training and testing events in the region. Each of the range complexes consists of surface sea space and subsurface space. In addition, each complex also consists of special use airspace.

5.4 Cultural Resources

Marine archaeological resources include pre-contact archaeological sites and historic archaeological sites (e.g., shipwrecks). Submerged historical and pre-contact archaeological sites may be found within the Project Area. After the late glacial maximum (21,500 years before present [BP]), the inner continental shelf would have exhibited similar characteristics to the modern coastal zones of southern New England and may have been inhabited between 13,000 and 9,000 years BP (BOEM 2013). However, "no pre-contact period archaeological deposits have been identified to date within federally-controlled waters in the [Southern New England-Georges Bank] area," according to a 2012 BOEM report.

The Project Area has a long history of intensive maritime activity with numerous wrecks and obstructions reported in NOAA's Office of Coast Survey's Automated Wreck and Obstruction Information System database and charted within or in close proximity to the subsea cable routes (NOAA 2017). Shipwrecks and other obstructions are concentrated along the Massachusetts and Rhode Island coasts and within Rhode Island Sound and Narragansett Bay. The proposed locations for OCPs and subsea cable routes were sited to avoid known shipwrecks and other obstructions. Subsea cables routed through Rhode Island Sound and Block Island Sound will require more refined siting to avoid a greater concentration of wrecks and other obstructions (Figure 11).

5.5 Aesthetics

The distance at which a remote structure is visible is determined primarily by the height of the object, the elevation of the viewer, atmospheric conditions, and the curvature of the Earth. An object closer than the horizon is entirely visible to the observer, while objects beyond the horizon are partially or completely obscured by the surface of the planet. The requested ROW/RUE Grant area was selected taking aesthetics into consideration.

The proposed OCPs are primarily located near WEAs to minimize visual impacts. OCPs 1, 2, and 3 will be located within 15 NM (17 statute miles) of the nearest shoreline and may be visible from the shore, depending on design considerations. OCPs 4 through 8 will be located further than 15 NM (17 statute miles) from the nearest shoreline and are not expected to be visible from shore. OCP visibility and appearance will be influenced by final design (e.g., monopile vs. jacket foundation). All subsea cables will be buried and are not expected to have any visual effects.

5.6 Environmental Justice

Executive Order 12898 instructs federal agencies to consider environmental justice issues in all agency decisions. It directs each federal agency to identify and address disproportionately high and adverse human health or environmental effects of the agency programs or actions on minority and low-income populations.

Table 11 presents data from the United States Census Bureau on the demographic composition of minority and low-income persons living within coastal communities adjacent to the Project Area. The following information was collected at the county level, including percentage of minority population and low-income population by county.

Table 11. Percent of Minority Persons and Persons below Poverty Line for Massachusetts, Rhode Island, and Connecticut Coastal Counties Adjacent to the Project Area

County (State)	Minority Percentage of County (2018) [7,8]	Persons Below Poverty Line in County (2017) [9,10]
Barnstable (MA)	10.2%	7.6%
Bristol (MA)	17.6%	11.1%
Dukes (MA)	12.7%	7.6%
Essex (MA)	30.5%	10.2%
Nantucket (MA)	28.3%	5.7%
Norfolk (MA)	25.6%	6.7%
Plymouth (MA)	18.3%	7.3%
Suffolk (MA)	55.1%	17.9%
Bristol (RI)	8.5%	7.7%
Kent (RI)	11.9%	8.5%
Newport (RI)	14.4%	9.0%
Washington (RI)	9.1%	8.9%
Fairfield (CT)	38.5%	8.8%
Middlesex (CT)	16.3%	6.8%
New London (CT)	24.7%	8.6%

5.7 Summary of Existing Environmental Conditions

Based on the preliminary desktop siting and routing assessment and supplemental research, the potential environmental constraints and use conflicts within the AOI are expected to be negligible to minor as the subsea cables will be buried within the seabed and the OCPs will be supported by monopile or jacket

[7] U.S. Census Bureau. 2018. QuickFacts: Race. https://www.census.gov/quickfacts/fact/map/US/RHI825216#viewtop

[8] Percentage of Minority Persons in Massachusetts was 28.6%, 28.0% in Rhode Island, and 33.5% in Connecticut based the 2018 U.S. Census.

[9] U.S. Census Bureau. 2017. Small Area Income and Poverty Estimates. https://www.census.gov/data-tools/demo/saipe/#/?map_geoSelector=aa_c

[10] Percentage of Poverty Rates (all ages) in Massachusetts was 10.5%, in Rhode Island was 12.3%, and in Connecticut was 9.7% based the 2017 U.S. Census.

foundations with limited environmental impact. By adhering to the siting and routing criteria for the OCPs and subsea cables, most of the existing environmental, socioeconomic, and cultural resources of significance have been avoided. As previously indicated, Anbaric will continue to refine and verify the location of the proposed facilities through additional site assessment and field surveys, including HRG, geotechnical, and benthic surveys as well as marine archaeology and navigation assessments.

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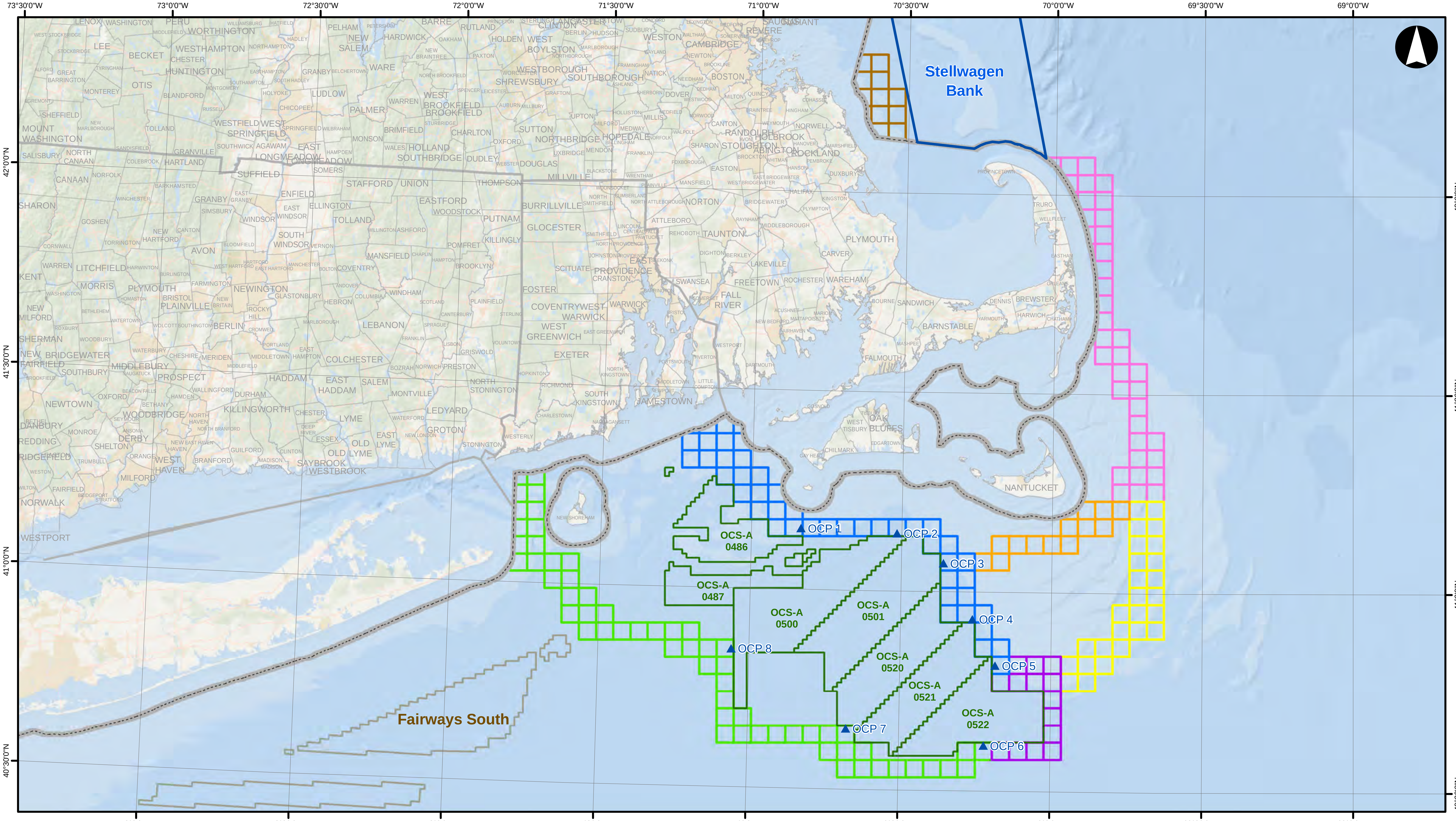
Figures



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Author: wellvisitor

Drawing Date: 11/12/2019

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0 2.5 5 10 Nautical Miles

Anbaric Development Partners
Southern New England Ocean Grid

Source: 1) ESRI, World Ocean Base, 2019
2) BOEM, OCS and Wind Planning/ Lease Areas, 2018

Legend

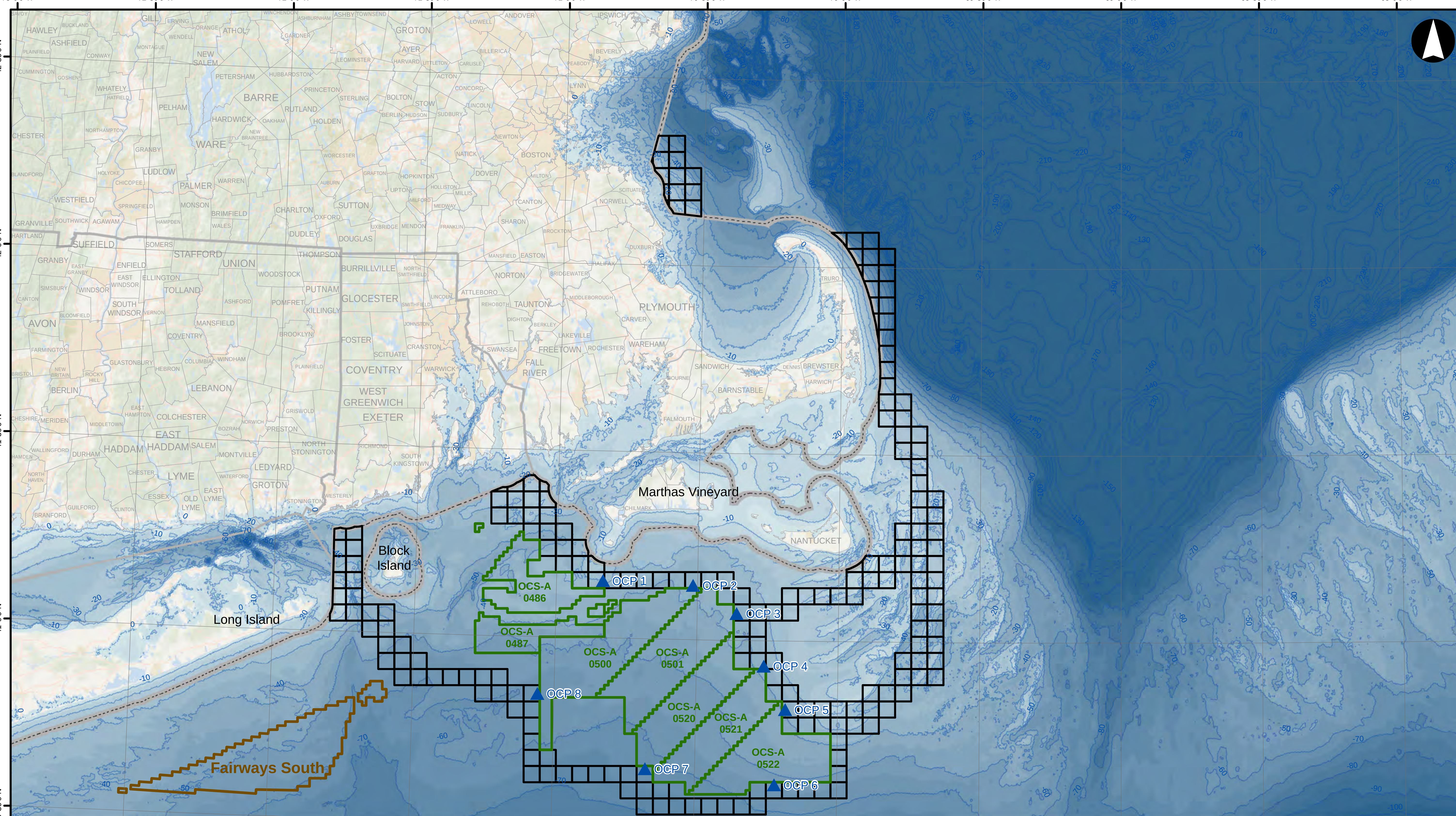
- Proposed Offshore Collector Platform
- BOEM Call Area
- 3 Nautical Mile Boundary
- State Boundary
- OCS Lease Area

Requested OCS Lease Blocks

- Route Segment 1A
- Route Segment 1B
- Route Segment 1C
- Route Segment 2A
- Route Segment 2B
- Route Segment 2C
- Route Segment 2D

Offshore Electric Service Platforms

Figure 1



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Anbaric Development Partners
Southern New England Ocean Grid

Bathymetry

Legend

- Proposed Offshore Collector Platform
- BOEM Call Area
- OCS Lease Area
- Requested OCS Lease Blocks
- 3 Nautical Mile Boundary
- State Boundary
- Bathymetry Contours (10 Meter Interval)

Water Depth (5 Meter Interval)

0 to -5; -5 to -10; -10 to -15; -15 to -20; -20 to -25; -25 to -30; -30 to -35; -35 to -40; -40 to -45; -45 to -50; -50 to -55; -55 to -60; -60 to -65; -65 to -70; -70 to -75; -75 to -80; -80 to -85; -85 to -90; -90 to -95; > -95

Source: 1) ESRI, World Ocean Base, 2018
2) BOEM, Wind Planning/Lease Areas, 2017
3) The Nature Conservancy, Bathymetry, 2010

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0 2.5 5 10 Nautical Miles

Figure 2

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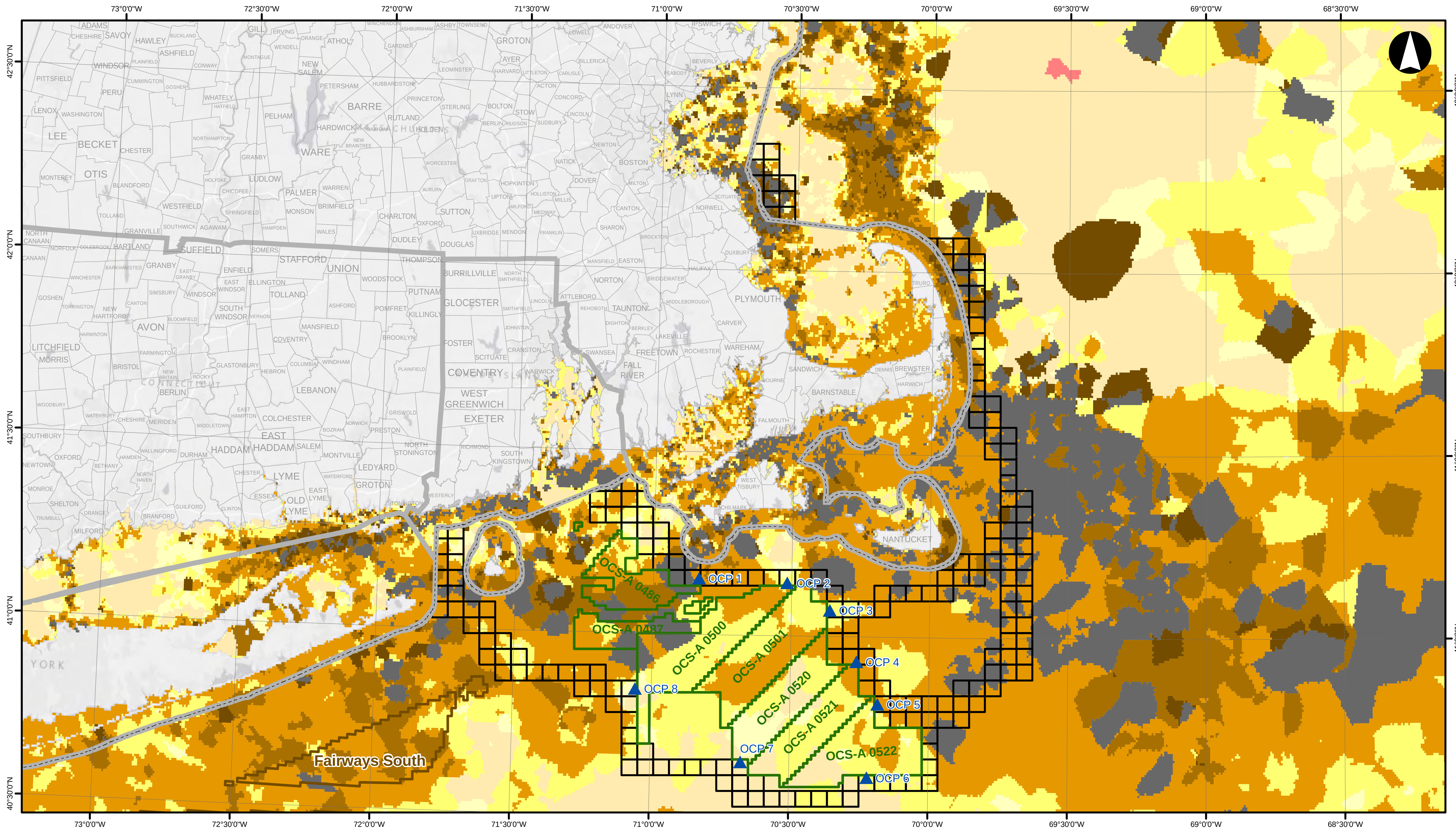

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0 2.5 5 10 Nautical Miles

Anbaric Development Partners
Southern New England Ocean Grid

Source: 1) ESRI, World Ocean Base, 2018
2) BOEM, Wind Planning/Lease Areas, 2017
3) The Nature Conservancy, Seabed Forms, 2015

Legend

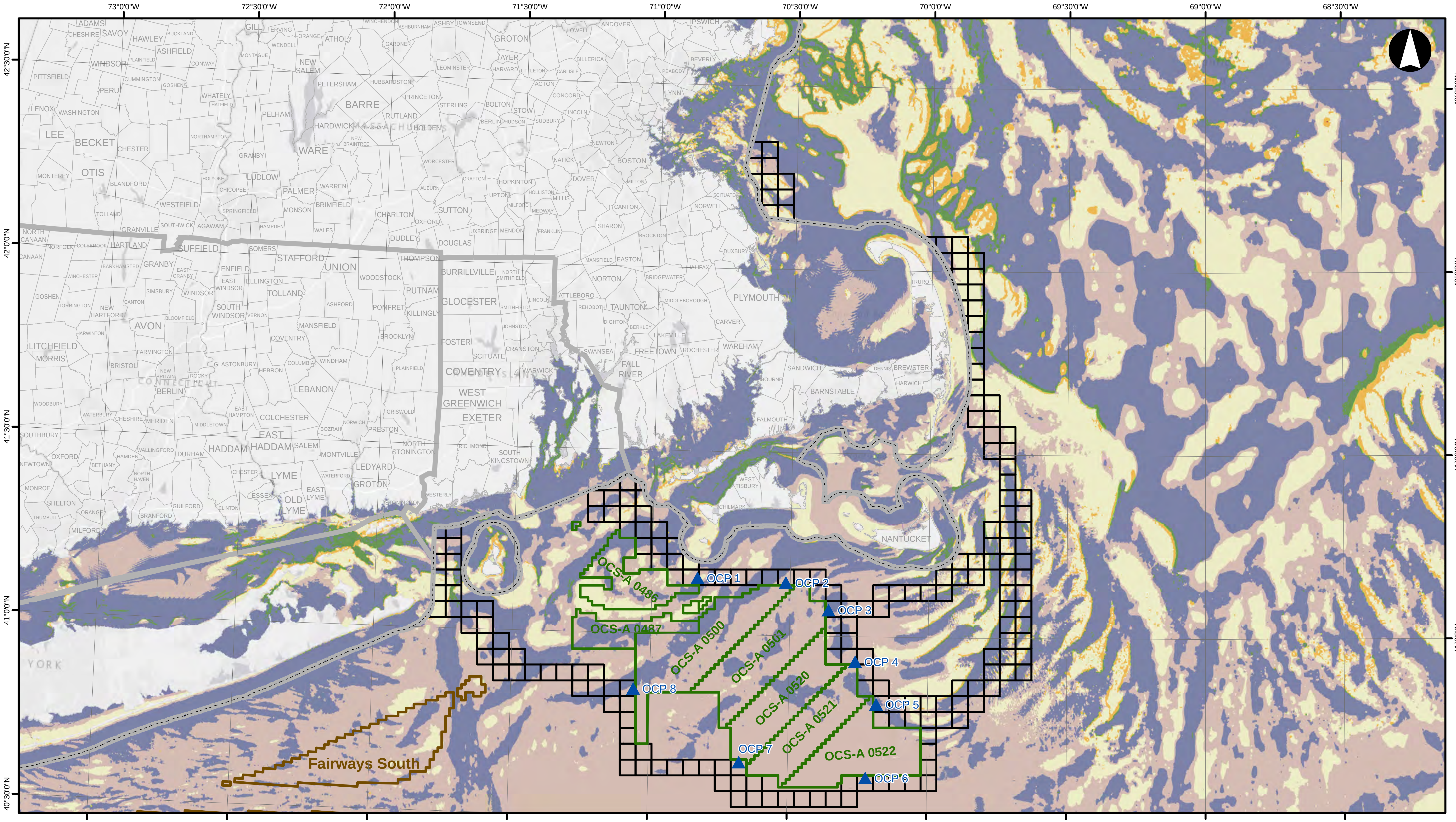
- Proposed Offshore Collector Platform
- BOEM Call Area
- 3 Nautical Mile Boundary
- State Boundary
- OCS Lease Area
- Requested OCS Lease Blocks

Grain Size (mm)

- Clay (< 0.002)
- Silt (0.002 - 0.06)
- Very Fine Sand (0.06 - 0.125)
- Fine Sand (0.125 - 0.25)
- Medium Sand (0.25 - 0.5)
- Coarse Sand (0.5 - 1)
- Very Coarse Sand (1 - 2)
- Gravel/Granule (> 2)

Sediment Type

Figure 3A



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0 2.5 5 10 Nautical Miles

Anbaric Development Partners
Southern New England Ocean Grid

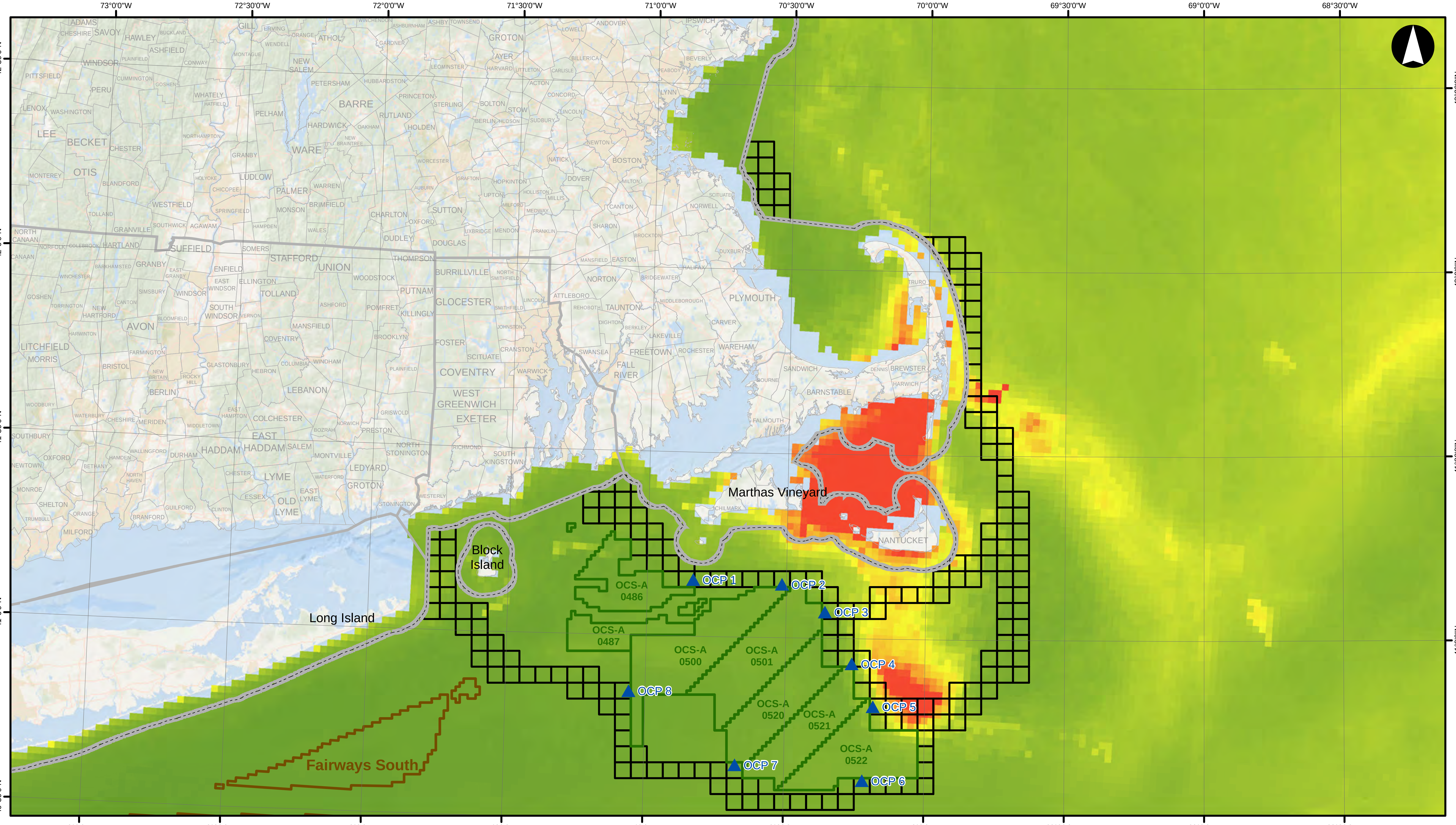
Source: 1) ESRI, World Ocean Base, 2018
2) BOEM, Wind Planning/Lease Areas, 2017
3) The Nature Conservancy, Seabed Forms, 2015

Legend
- Proposed Offshore Collector Platform
- BOEM Call Area
- 3 Nautical Mile Boundary
- State Boundary
- OCS Lease Area
- Requested OCS Lease Blocks

Seabed Forms
- Depression
- Mid Flat
- Upper Flat
- Low Slope
- Scarp
- Side Slope
- Upper Slope

Seabed Form

Figure 3B



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Anbaric Development Partners
Southern New England Ocean Grid

Source: 1) ESRI, World Ocean Base, 2018
2) BOEM, Wind Planning/Lease Areas, 2017
3) Duke Univ., Avian Abundance, 2016

Legend

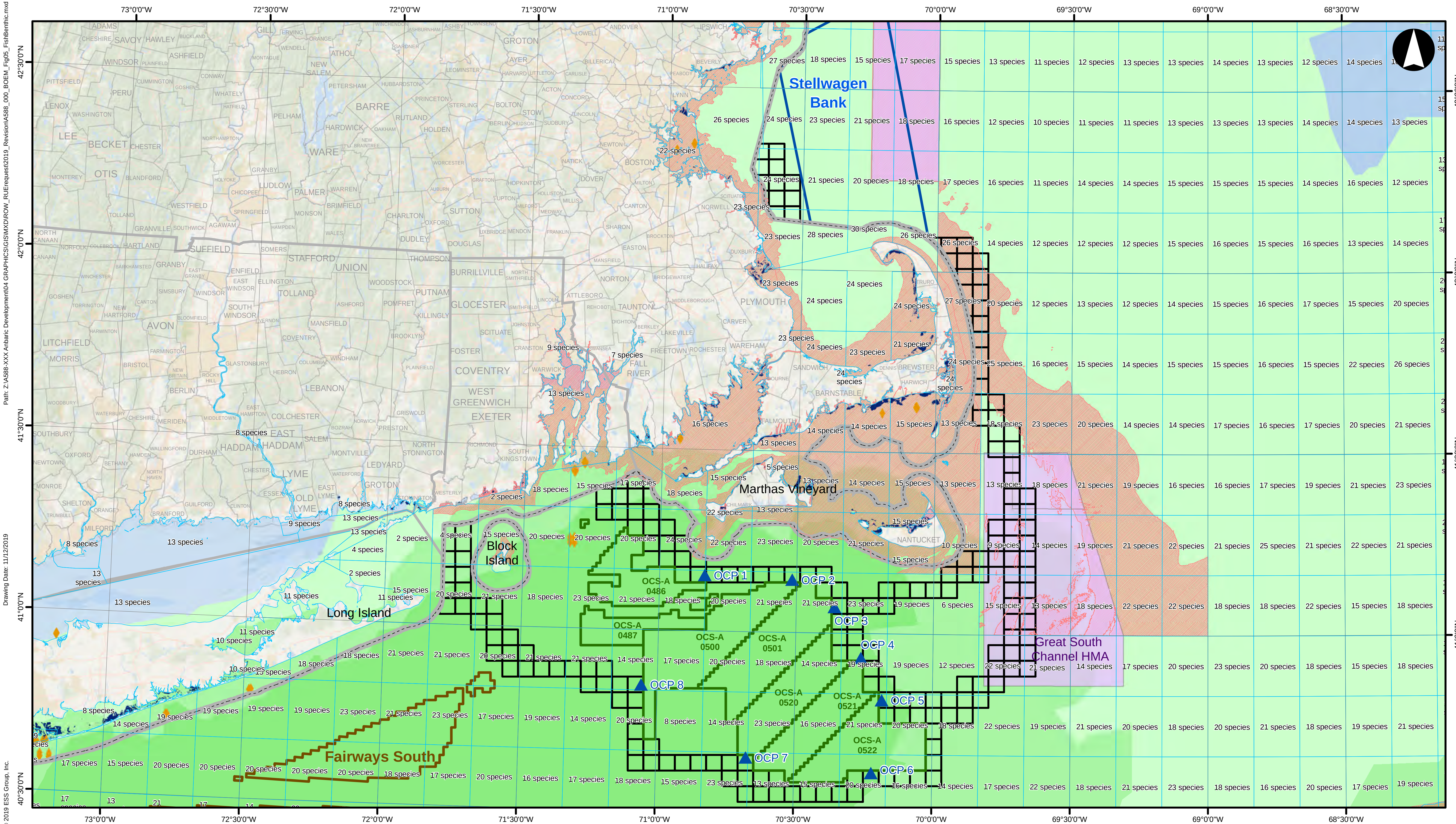
- Proposed Offshore Collector Platform
- 3 Nautical Mile Boundary
- State Boundary
- BOEM Call Area
- OCS Lease Area
- Requested OCS Lease Blocks

Avian Abundance (All Species)
High : 2620.35
Low : 0

0 2.5 5 10
Nautical Miles

Avian

Figure 4



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0 2.5 5 10 Nautical Miles

Anbaric Development Partners
Southern New England Ocean Grid

Source: 1) ESRI, World Ocean Base, 2018
2) BOEM, Wind Planning/Lease Areas, 2017
3) NOAA, Habitat Areas of Particular Concern, 2010
4) EFH, Seagrasses (2015), Artificial Reefs (2017)

Legend

- Proposed Offshore Collector Platform
- Artificial Reefs
- 3 Nautical Mile Boundary
- State Boundary
- Essential Fish Habitat 10' Grid, Groundfish and Shellfish (Labels Indicate - # of Species)
- BOEM Call Area
- OCS Lease Area
- Requested OCS Lease Blocks
- Habitat Management Areas
- Seagrasses
- Habitat Areas of Particular Concern

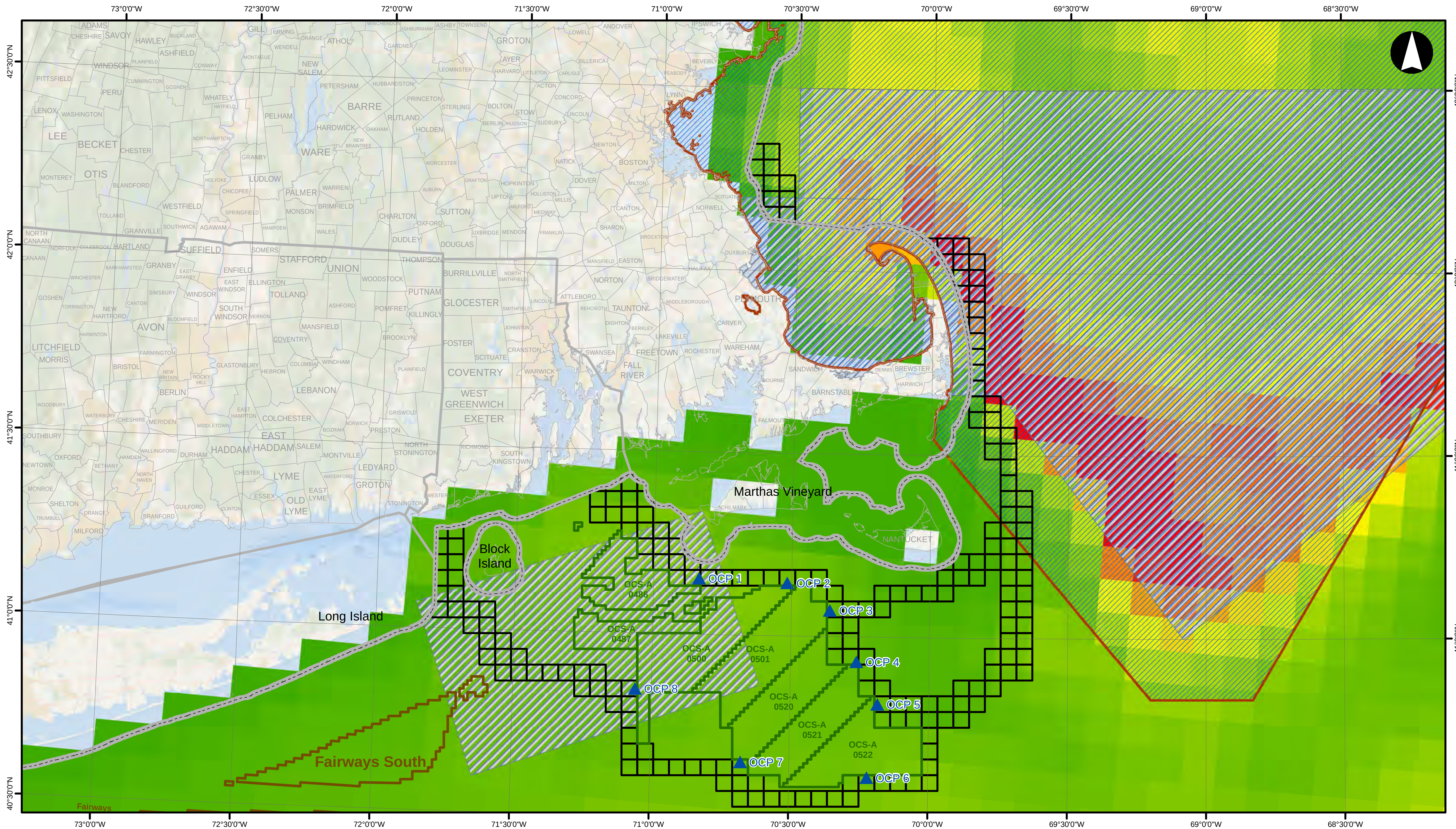
Highly Migratory Species EFH Overlay

Species Count

- 2 - 5
- 6 - 10
- 11 - 15

Fish & Benthic Habitat

Figure 5



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Drawing Date: 11/12/2019

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Anbaric Development Partners
Southern New England Ocean Grid

Source: 1) ESRI, World Ocean Base, 2018
2) BOEM, Wind Planning/Lease Areas, 2017
3) NOAA, Coastal Critical Habitat (2017), Right Whale Critical Habitat (2016), Right Whale SMA (2013)
4) Duke Univ., Mammal Abundance, 2016

Legend

- Proposed Offshore Collector Platform
- 3 Nautical Mile Boundary
- State Boundary
- BOEM Call Area
- OCS Lease Area
- Requested OCS Lease Blocks
- Coastal Critical Habitat Designations
- Right Whale Critical Habitat
- Right Whale Seasonal Management Area

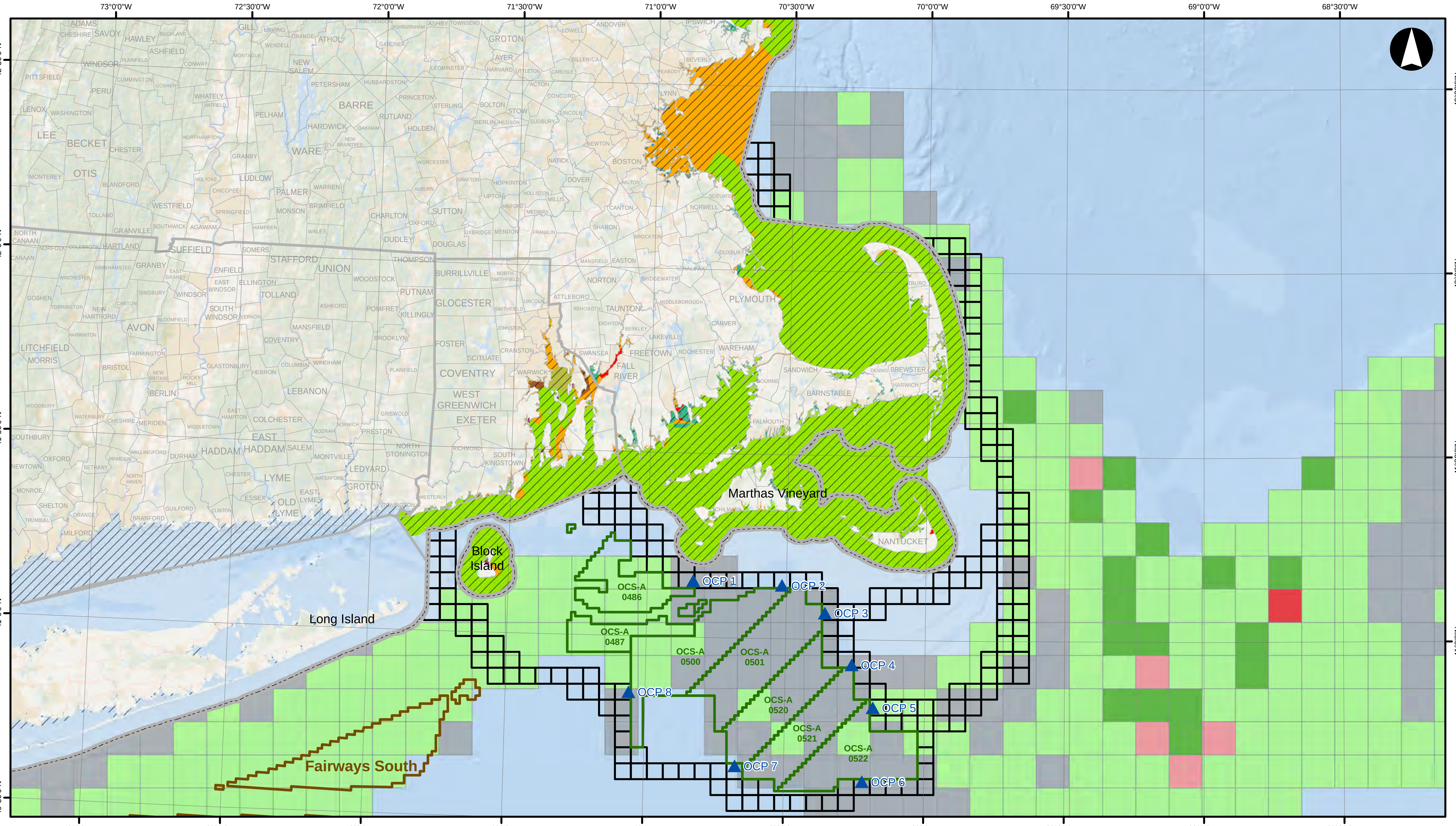
Mammal Abundance All ESA Listed

High : 11.3

Low : 0

Marine Mammals

Figure 6



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Drawing Date: 11/12/2019

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0 3 6 12 Nautical Miles

Anbaric Development Partners
Southern New England Ocean Grid

Source: 1) ESRI, World Ocean Base, 2018
2) BOEM, Wind Planning/Lease Areas, 2017
3) Division of Marine Fisheries, Shellfish Growing Areas, 2017
4) SMAST, Sea Scallop Average Abundance, 2003

Legend

- Proposed Offshore Collector Platform
- 3 Nautical Mile Boundary
- State Boundary
- Requested OCS Lease Blocks
- OCS Lease Area
- BOEM Call Area
- Shellfish Management Areas

Designated Shellfish Growing Areas

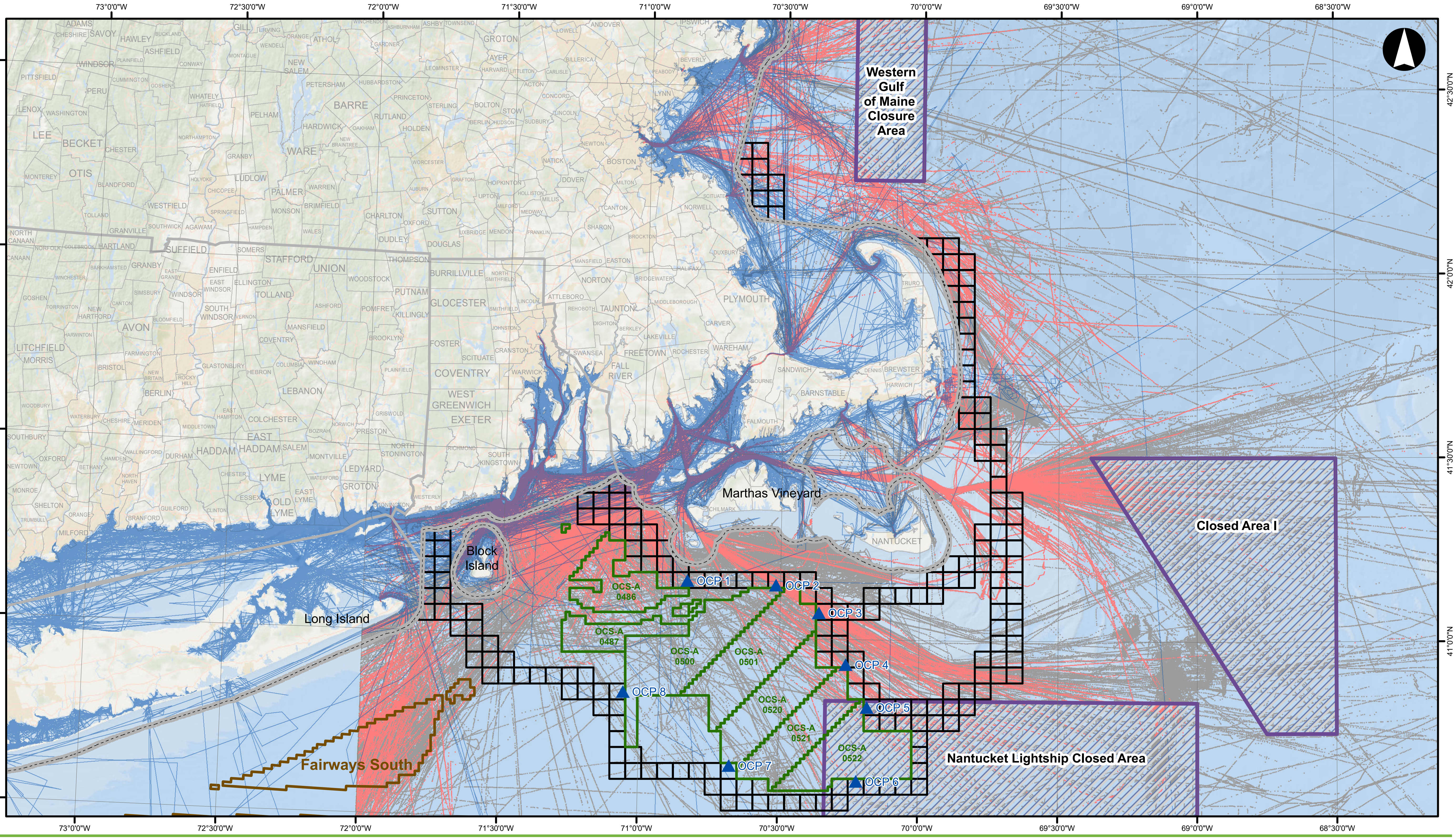
- Approved
- Conditional Closure
- MA Conditionally Approved
- MA Conditionally Restricted
- Prohibited
- RI Conditional Area
- RI Seasonal Closure
- Restricted

Sea Scallops Average Abundance (SMAST)

- 0
- 0-4
- 4-7
- 7-10
- 10-36

Shellfishing Areas

Figure 7A



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Drawing Date: 11/15/2019

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0 3 6 12 Nautical Miles

Anbaric Development Partners
Southern New England Ocean Grid

Source: 1) ESRI, World Ocean Base, 2018
2) BOEM, Wind Planning/Lease Areas, 2017
3) NorthEast Ocean Data, Fishing Vessel Routes, 2017
4) NROC, Recreational Boater Routes, 2012
5) USCG, AIS Data, 2017
6) NOAA Fisheries, Closure Areas, 2018

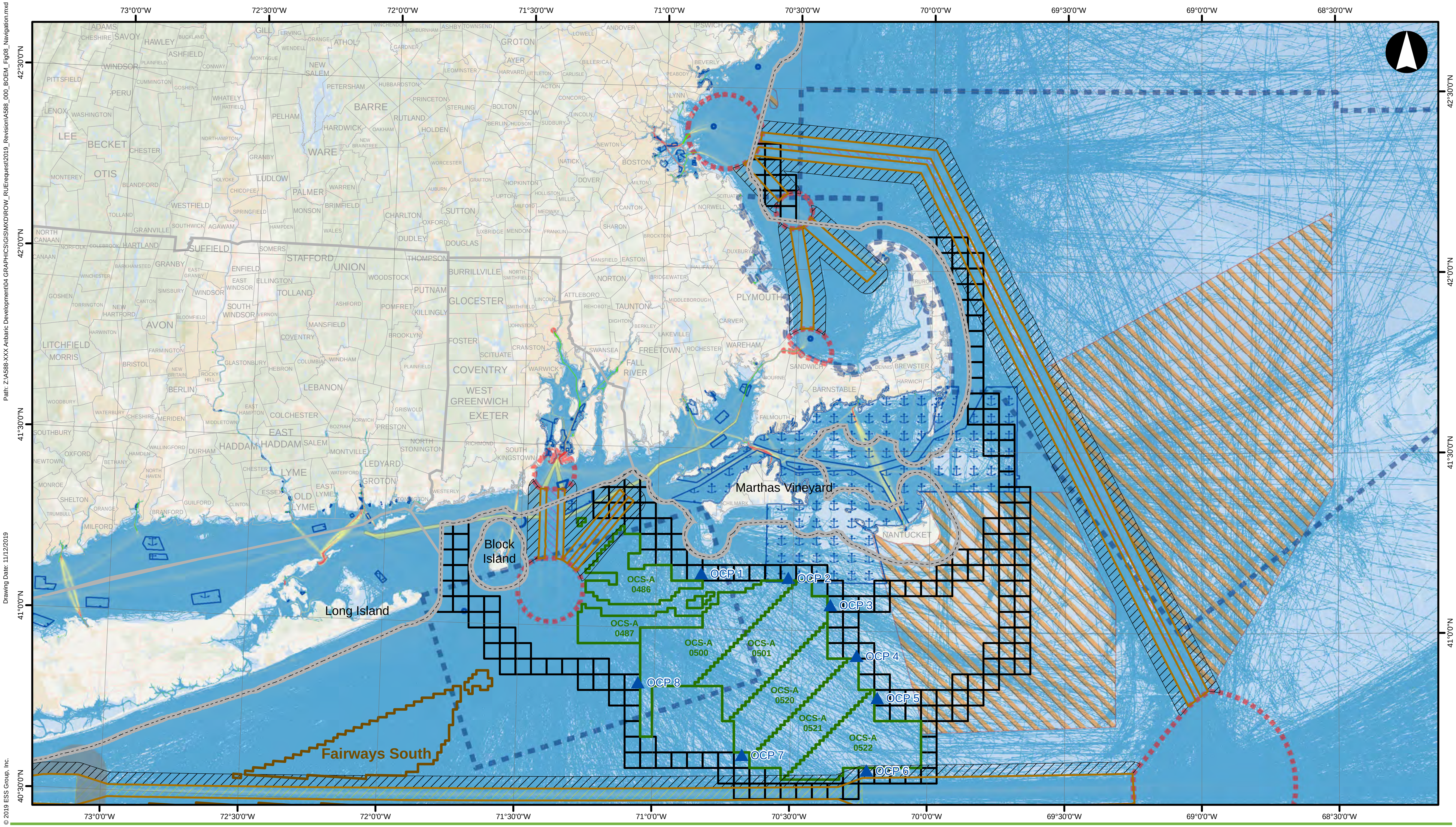
*Fishing vessel data represents speed over ground (SOG) equal to or exceeding 5 knots. The months of July and December 2017 represent the greatest and least volume of AIS vessel data available and thus reflect a representative range for in transit fishing vessel traffic within area waters.

Legend

- Proposed Offshore Collector Platform
- Fishing Vessel Traffic (July 2017)*
- Fishing Vessel Traffic (December 2017)*
- Recreational Boater Routes
- Fisheries Closure Areas
- 3 Nautical Mile Boundary
- State Boundary
- Requested OCS Lease Blocks
- OCS Lease Area
- BOEM Call Area

Commercial/Recreational Fishing Based on 2017 AIS Data

Figure 7B



Anbaric Development Partners
Southern New England Ocean Grid

Source: 1) ESRI, World Ocean Base, 2018
2) BOEM, Wind Planning/Lease Areas, 2017
3) NOAA, Vessel Density (2013), Pilot Boarding Areas (2014), Shipping Lanes (2015), Coastal Channels (2013)
4) USCG, Anchorage Areas, 2017, ACPARS (2016)

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Legend

- Proposed Offshore Collector Platform
- 3 Nautical Mile Boundary
- State Boundary
- Requested OCS Lease Blocks
- OCS Lease Area
- 2 NM Separation Zone
- Coastal Maintained Channel
- BOEM Call Area
- Pilot Boarding Area
- Anchorage Areas
- USCG Setback

Shipping Lanes

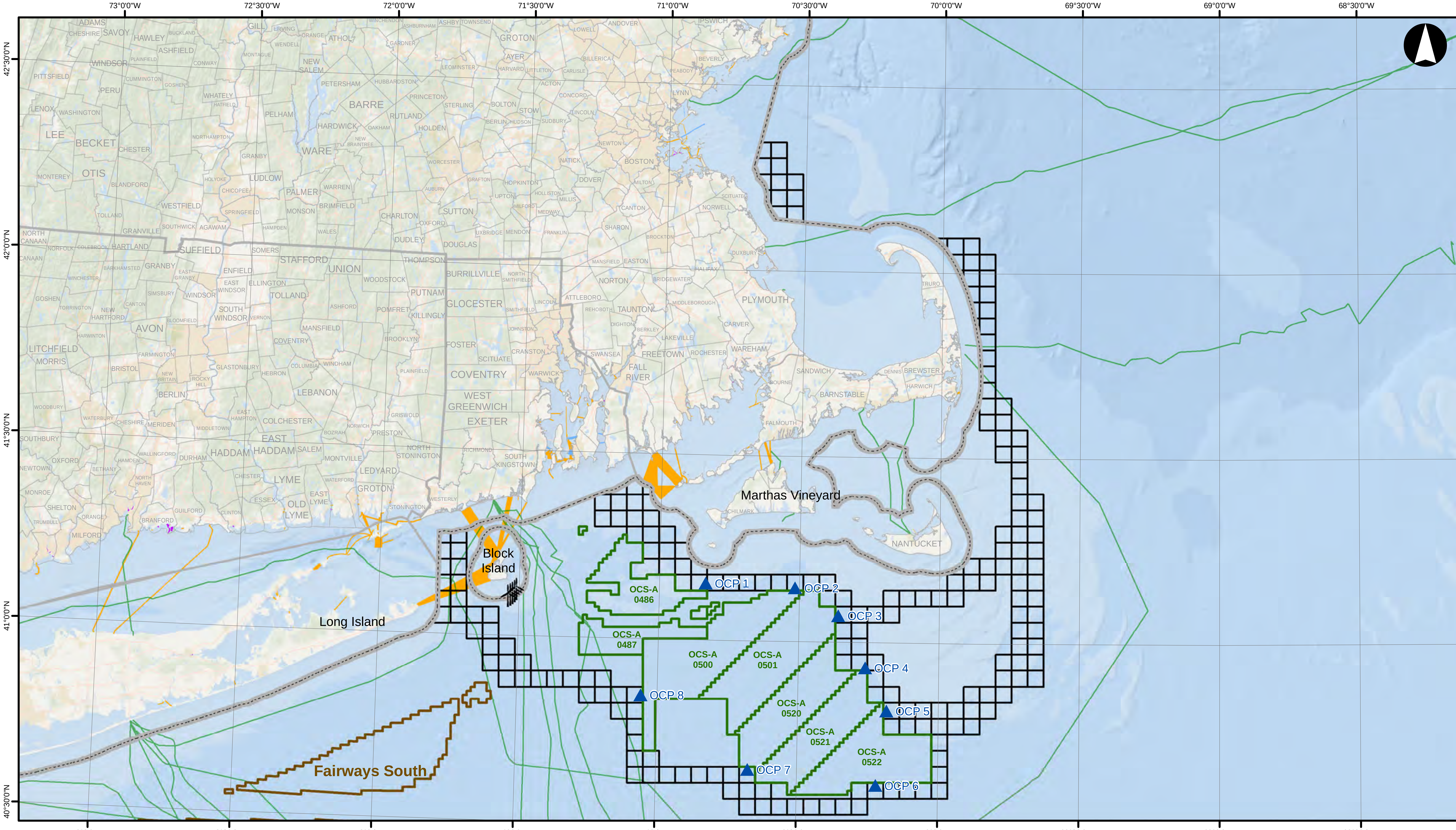
- Area to be Avoided
- Particularly Sensitive Sea Area
- Precautionary Areas
- Recommended Routes
- Safety Fairways
- Speed Restrictions/Right Whales
- Traffic Separation Schemes
- Traffic Separation Schemes/Traffic Lanes

2013 Vessel Density

- High Vessel Traffic
- Low Vessel Traffic

Navigation & Vessel Traffic

Figure 8



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Anbaric Development Partners
Southern New England Ocean Grid

Source: 1) ESRI, World Ocean Base, 2018
2) BOEM, Wind Planning/Lease Areas, 2017
3) NOAA, ENC Data, 2018
4) NASCA/MarineCadastre, Submarine Cables, 2017
5) BOEM, Sand and Gravel Areas, 2017

Legend

- Existing Turbine Location
- Proposed Offshore Collector Platform
- 3 Nautical Mile Boundary
- State Boundary
- Requested OCS Lease Blocks
- OCS Lease Area
- BOEM Call Area
- NOAA Charted Submarine Cables
- Cable Area
- Pipeline Area

Offshore Energy & Marine Infrastructure

Figure 9

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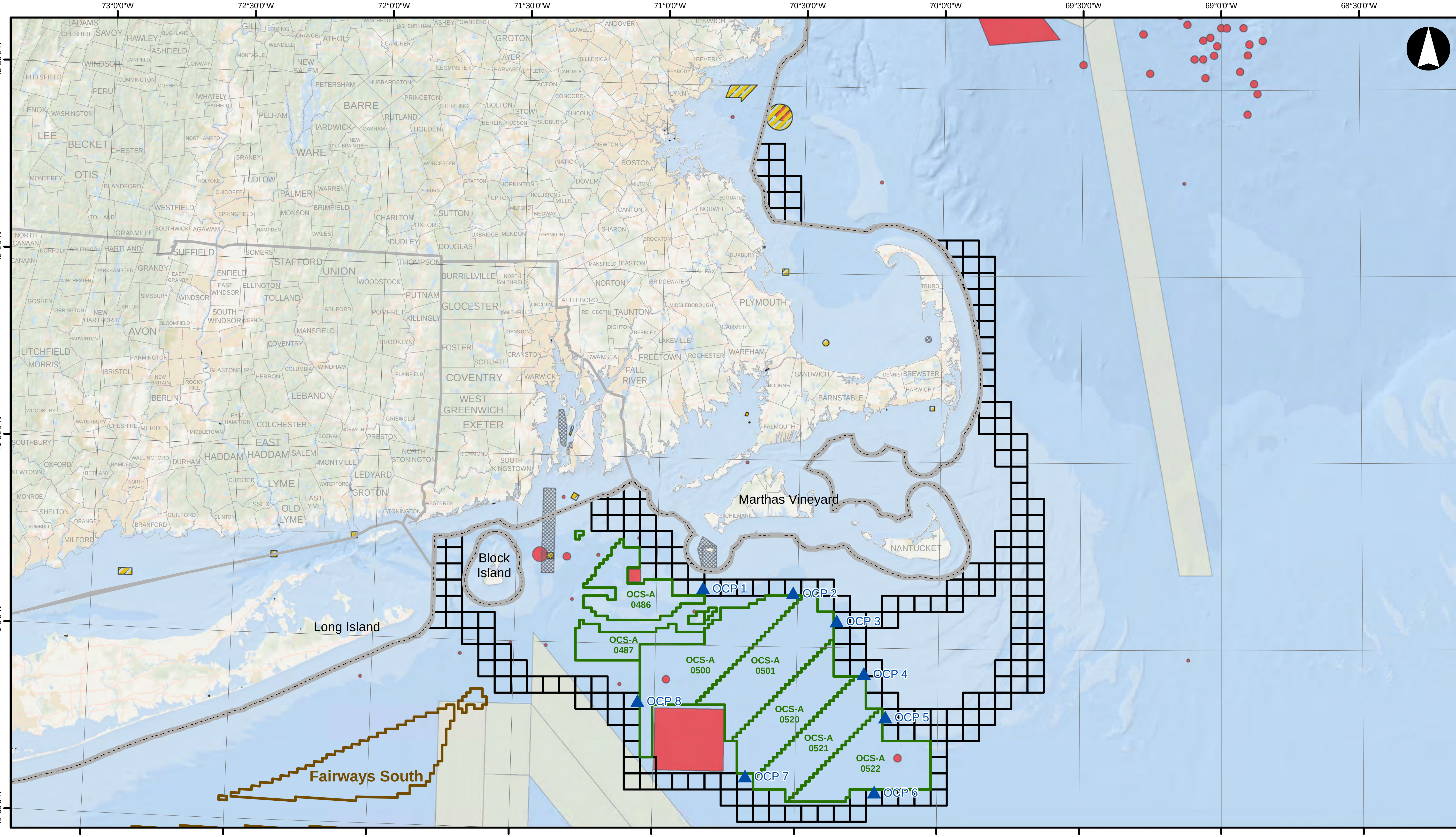

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0 2.5 5 10 Nautical Miles

Anbaric Development Partners
Southern New England Ocean Grid

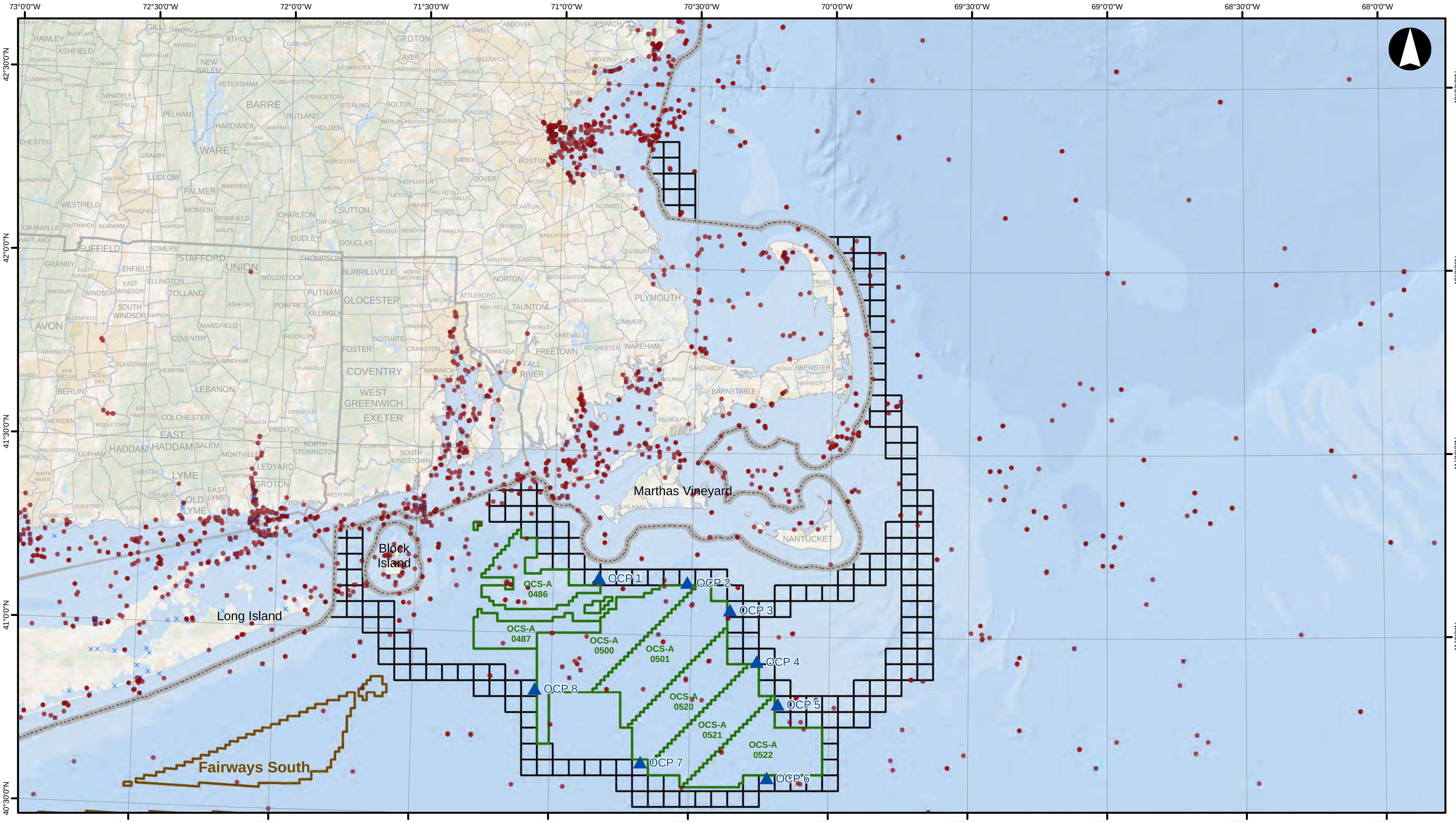
Source: 1) ESRI, World Ocean Base, 2018
2) BOEM, Wind Planning/Lease Areas, 2017
3) NOAA, Wrecks and Obstructions Data (2011, 2018), AWOIS (2016), ENC Data (2018)

Legend

- Proposed Offshore Collector Platform
- 3 Nautical Mile Boundary
- State Boundary
- Requested OCS Lease Blocks
- OCS Lease Area
- BOEM Call Area
- Danger Zones/Restricted Areas
- Ocean Disposal Sites
- Submarine Transit Lanes
- Unexploded Ordnances

Marine Restricted Areas

Figure 10



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Drawing Date: 11/12/2019

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Anbaric Development Partners
Southern New England Ocean Grid

Source: 1) ESRI, World Ocean Base, 2018
2) BOEM, Wind Planning/Lease Areas, 2017
3) NOAA, Wrecks and Obstructions Data (2011, 2018), AWOIS (2016), ENC Data (2018)

Legend

- Wrecks or Obstructions
- AWOIS Obstruction
- Proposed Offshore Collector Platform
- 3 Nautical Mile Boundary
- State Boundary
- Requested OCS Lease Blocks
- OCS Lease Area
- BOEM Call Area

Wrecks & Obstructions

Figure 11