New England Wind

AVANGRID RENEWABLES

Draft Construction and Operations Plan Addendum for the Phase 2 Offshore Export Cable Corridor South Coast Variant

Text

April 2022

Submitted by
Park City Wind LLC

Submitted to
Bureau of Ocean Energy Management
45600 Woodland Rd
Sterling, VA 20166

Prepared by
Epsilon Associates, Inc.

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List of Acronyms

BOEM	Bureau of Ocean Energy Management
CFF	Coonamessett Farm Foundation, Inc.
CMECS	Coastal and Marine Ecological Classification Standard
COP	Construction and Operations Plan
DEIS	Draft Environmental Impact Statement
DOE	Department of Environment
EA	Environmental Assessment
EcoMon	Ecosystem Monitoring
EIS	Environmental Impact Statement
ESP	Electrical Service Platform
FEIS	Final Environmental Impact Statement
GIS	Geographic Information Systems
LLC	Limited Liability Company
MA WEA	Massachusetts Wind Energy Area
MARA	Marine Archaeological Resource Assessment
MARCO	Mid-Atlantic Council on the Ocean
NEAMAP	NorthEast Area Monitoring and Assessment Program
NEFSC	Northeast Fisheries Science Center
NEODP	Northeast Ocean Data Portal
NHESP	National Heritage Endangered Species Program
NM	Nautical Miles
NOAA	National Oceanic and Atmospheric Administration
NROC	Northeast Regional Ocean Council
OCS	Outer Continental Shelf
OECC	Offshore Export Cable Corridor
PAPE	Preliminary Area of Potential Impact
RI/MA WEA	Rhode Island/Massachusetts Wind Energy Area
SMAST	School for Marine Science & Technology
SWDA	Southern Wind Development Area
TCP	Traditional Cultural Property
TNC	The Nature Conservancy
TSS	Total Suspended Solids
VMS	Vessel Monitoring System
VTR	Vessel Trip Reports
WEA	Wind Energy Area
WTG	Wind Turbine Generator

Section 1.0

Introduction

1.0 INTRODUCTION

New England Wind is the proposal to develop offshore renewable wind energy facilities in Bureau of Ocean Energy Management (BOEM) Lease Area OCS-A 0534 along with associated offshore and onshore cabling, onshore substations, and onshore operations and maintenance (O&M) facilities. New England Wind will be developed in two Phases: Phase 1 (also known as Park City Wind) and Phase 2 (also known as Commonwealth Wind). Four or five offshore export cables (two for Phase 1 and two or three for Phase 2) will transmit electricity generated by the wind turbine generators (WTGs) to onshore transmission systems (see Figure 1.0-1). Park City Wind LLC, a wholly owned subsidiary of Avangrid Renewables, LLC, is the Proponent and will be responsible for the construction, operation, and decommissioning of New England Wind.

The Proponent has identified an Offshore Export Cable Corridor (OECC) for the installation of the offshore export cables (see Figure 1.0-1). The OECC travels north from Lease Area OCS-A 0534 along the eastern side of Muskeget Channel towards landfall sites in the Town of Barnstable, Massachusetts. The expected grid interconnection point for both Phases of New England Wind is the West Barnstable Substation. While the Proponent intends to install all Phase 2 offshore export cables within this OECC, the Proponent has identified two variations of the OECC that may be employed for Phase 2: the Western Muskeget Variant (which passes along the western side of Muskeget Channel) and the South Coast Variant (which connects to a potential second grid interconnection point) (see Figure 1.0-1). These variations are necessary to provide the Proponent with commercial flexibility should technical, logistical, grid interconnection, or other unforeseen issues arise during the Construction and Operations Plan (COP) review and engineering processes.

The Proponent has submitted a draft New England Wind COP that describes the OECC and both potential Phase 2 OECC variants, with accompanying data and analysis for the OECC and the Western Muskeget Variant. The purpose of this COP Addendum is to provide relevant data and analysis supporting the South Coast Variant in federal waters for New England Wind. This COP Addendum incorporates by reference the analyses in the COP (including the appendices) and is focused on describing impacts that are unique to the South Coast Variant. Accordingly, descriptions of impacts that are associated with the OECC or its variants more generally and that are not specific to the South Coast Variant are not repeated in this COP Addendum.

G:\Projects2\MA\MA\5315\2022\Task_4\MXD\Fig1.1-1_New_England_Wind_Overview_OceanBase_20220222.mxd

Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services

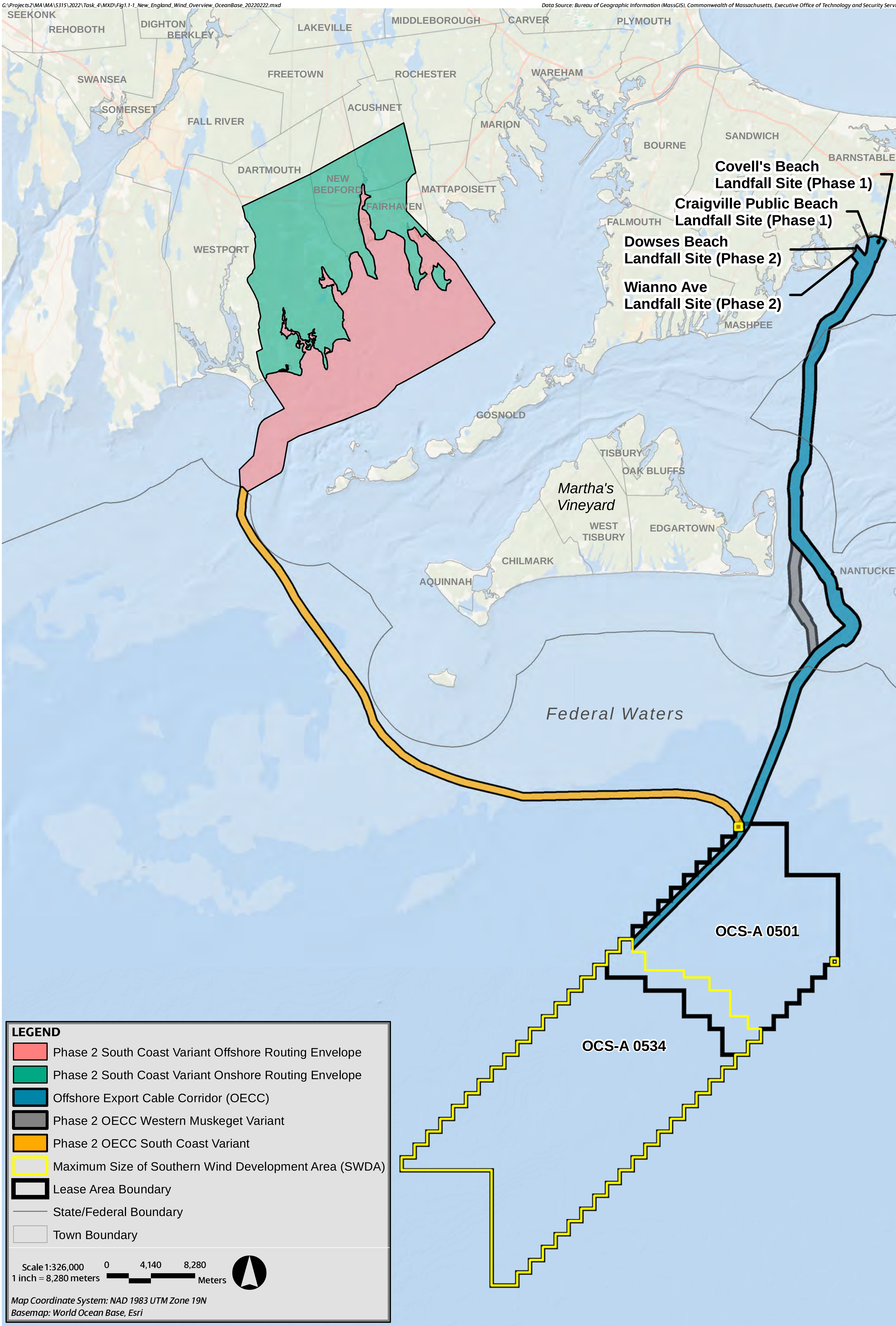

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Figure 1.0-1
New England Wind Overview

1.1 Overview of the Phase 2 OECC South Coast Variant

As shown in Figure 1.0-1, the South Coast Variant diverges from the OECC at the northern boundary of Lease Area OCS-A 0501 and travels west-northwest to the state waters boundary near Buzzards Bay. From the Southern Wind Development Area (SWDA)[1] boundary (excluding the two separate aliquots that are closer to shore) through federal waters to the state waters boundary, the South Coast Variant is approximately 79 km (42 NM) in length and approximately 720 m (2,360 ft) in width. To allow additional cable length for turns and micro-siting of the cable within the corridor, the maximum length of each cable within this variation of the OECC (from the SWDA boundary to the state waters boundary) is ~84 km (~45 NM).[2] An additional length of offshore export cable within the SWDA (up to ~34–42 km [~18–23 NM] per cable) will be needed to reach the Phase 2 ESP(s). Thus, the maximum length of each Phase 2 offshore export cable that employs the South Coast Variant is 118–126 km (64–68 NM) between the state waters boundary and the ESP(s). If three Phase 2 offshore export cables use the South Coast Variant, the maximum total length of the Phase 2 offshore export cables within federal waters (assuming three cables) is ~362 km (~196 NM). Table 1.2-1 presents the maximum total area of seafloor disturbance within the OECC during Phase 2 construction assuming one to three Phase 2 offshore export cables are installed within the South Coast Variant and the remaining Phase 2 offshore export cables are installed within the OECC that travels along the eastern side of Muskeget Channel.

At the state waters boundary, the South Coast Variant broadens to a "Phase 2 South Coast Variant Offshore Routing Envelope" that indicates a region within Buzzards Bay where the Phase 2 offshore export cable(s) may be installed before making landfall along the southwest coast of Massachusetts within the Offshore Routing Envelope. If it becomes necessary to employ the South Coast Variant and a second grid interconnection point is secured, the Proponent understands that BOEM would conduct a supplemental review of those portions of the South Coast Variant not otherwise considered in the final environmental impact statement.

The South Coast Variant is included in the COP to provide the Proponent with the commercial flexibility required should technical, logistical, grid interconnection, or other unforeseen issues arise during the COP review and engineering processes that preclude one or more Phase 2 export cables from interconnecting at the West Barnstable Substation. If the South Coast Variant is used

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1 New England Wind will occupy all of Lease Area OCS-A 0534 and potentially a portion of Lease Area OCS-A 0501 in the event that Vineyard Wind 1 does not develop "spare" or extra positions included in Lease Area OCS-A 0501 and Vineyard Wind 1 assigns those positions to Lease Area OCS-A 0534. For the purposes of the COP, the SWDA is defined as all of Lease Area OCS-A 0534 and the southwest portion of Lease Area OCS-A 0501, as shown in Figure 1.0-1.

2 The offshore export cable length includes a 15% allowance for micro-siting within Lease Areas OCS-A 0534 and OCS-A 0501 and a 5% allowance for micro-siting within the OECC and South Coast Variant outside the lease areas.

for Phase 2, there will be either: (1) one export cable installed in the South Coast Variant and two export cables installed in the OECC, (2) two export cables installed in the South Coast Variant and one export cable installed in the OECC, or (3) three export cables installed in the South Coast Variant.

The location of the South Coast Variant was developed based upon careful consideration of multiple technical, environmental, and commercial factors. In particular, the location of the South Coast Variant was chosen in order to consolidate infrastructure with other commercial wind developments (i.e., for much of its length, the South Coast Variant parallels the proposed Mayflower Wind offshore export cable corridor), which helps to minimize environmental impacts. The identified cable corridor was also chosen to avoid impacts to the Vineyard Sound and Moshup's Bridge Traditional Cultural Property (TCP), which is located just north of the South Coast Variant in Vineyard Sound and encompasses portions of Martha's Vineyard and the Elizabeth Islands.

1.2 Summary of Potential Seafloor Disturbance for the Phase 2 OECC South Coast Variant

Offshore export cable installation will occur as described in Section 4.3.1.3 of COP Volume I. The maximum expected vertical disturbance from cable installation is up to 3 m (9.8 ft), which includes both cable installation with a target burial depth of 1.5 to 2.5 m (5 to 8 ft) and any potential dredging of sand bedforms.

If for some reason it is not feasible to install all of the Phase 2 cables within the OECC, Table 1.2-1 compares the maximum area of potential seafloor disturbance during Phase 2 construction within the South Coast Variant for the following scenarios. While none of these scenarios are currently likely, Scenario 1 is considered the most likely of the three:

1. One Phase 2 offshore export cable in the South Coast Variant and two cables in the OECC that travels along the eastern side of Muskeget Channel;

2. Two Phase 2 offshore export cables in the South Coast Variant and one cable in the OECC that travels along the eastern side of Muskeget Channel;[3] and

3. Three Phase 2 offshore export cables in the South Coast Variant.[3]

[3] Scenarios 2 and 3 are both very unlikely. Scenarios 2 and 3 would both require significant capacity upgrades to the electrical grid by ISO New England to receive the Phase 2 capacity and are unlikely to be delivered on the construction timeline contemplated in the COP. These scenarios are only included as potential options in the event that Phase 2 is significantly delayed due to technical, logistical, or other unforeseen issues arise with interconnecting at the West Barnstable substation.

For cables installed within the South Coast Variant, the length is measured from the SWDA boundary to the state waters boundary. For cables installed within the OECC through the eastern side of Muskeget Channel, the length is measured from the SWDA boundary to the Phase 2 landfall site(s) in Barnstable, Massachusetts. The preliminary estimates of cable protection and dredging presented in Table 1.2-1 are based on available survey data and preliminary cable alignments; therefore, the estimates will likely be further refined upon more detailed route engineering. The maximum area of seafloor disturbance within the SWDA would not be affected by the use of the South Coast Variant and is therefore not included in this COP Addendum (see Table 4.3-2 of COP Volume I for the maximum area of potential disturbance within the SWDA during Phase 2 construction).

Table 1.2-1 Maximum Area of Potential Seafloor Disturbance During Construction for the Phase 2 OECC with the South Coast Variant

	1 Cable in South Coast Variant (federal waters only) + 2 Cables in OECC Through Eastern Muskeget	2 Cables in South Coast Variant (federal waters only) + 1 Cable in OECC Through Eastern Muskeget	3 Cables in South Coast Variant (federal waters only)	3 Cables in OECC Through Eastern Muskeget[1]
Maximum Total Length of Phase 2 Offshore Export Cables (Outside SWDA)[2]	248 km (134 NM)	250 km (135 NM)	252 km (136 NM)	246 km (133 NM)
BOTTOM DISTURBANCE DUE TO CABLE PROTECTION				
Percentage Requiring Cable Protection[3]	~7 %	~7 %	~8 %	~6%
Total Area of Cable Protection in OECC	**0.14 km^2 (35 acres)**	**0.16 km^2 (39 acres)**	**0.17 km^2 (41 acres)**	**0.13 km^2 (32 acres)**
BOTTOM DISTURBANCE DUE TO VESSELS, CABLE INSTALLATION, AND DREDGING				
Area of Disturbance from Cable Installation, Preparatory Work, and Vessels[4]	1.20 km^2 (297 acres)	1.21 km^2 (299 acres)	1.22 km^2 (301 acres)	1.19 km^2 (294 acres)
Area of Dredging Prior to Cable Installation[5]	0.20 km^2 (50 acres)	0.12 km^2 (29 acres)	0.02 km^2 (5 acres)	0.27 km^2 (67 acres)
Volume of Dredging	135,100 m^3 (176,700 cubic yards)	76,800 m^3 (100,400 cubic yards)	13,900 m^3 (18,200 cubic yards)	180,000 m^3 (235,400 cubic yards)
Total Disturbance Due To Vessels, Cable Installation, And Dredging in OECC	**1.40 km^2 (346 acres)**	**1.33 km^2 (327 acres)**	**1.24 km^2 (307 acres)**	**1.46 km^2 (361 acres)**
TOTAL SEAFLOOR DISTURBANCE IN OECC[6]	**1.48 km^2 (366 acres)**	**1.41 km^2 (349 acres)**	**1.33 km^2 (329 acres)**	**1.53 km^2 (379 acres)**

Notes:

1. The maximum area of potential seafloor disturbance for three cables through Eastern Muskeget was added to this table for reference only.
2. The total cable length for all three Phase 2 offshore export cables. For cables installed within the South Coast Variant, the length is measured from the SWDA boundary to the state waters boundary. For cables installed within the OECC through the eastern side of Muskeget Channel, the length is measured from the SWDA boundary to the Phase 2 landfall site(s) in Barnstable, Massachusetts.
3. The percent of the offshore export cables requiring cable protection is based on the OECC route length (i.e. ~77 km per cable using the OECC through the eastern side of Muskeget Channel and ~79 km per cable using the South Coast Variant) rather than the length of cable with micro-siting.

4. Includes potential impacts from a 1 m (3.3 ft) wide cable installation trench, a 3 m (10 ft) wide total skid/track width from the cable installation tool, vessel anchors that reposition every 400 m (1,312 ft) during offshore export cable installation, jack-up vessel legs during cable splicing (assumed three splices per cable), and vessel grounding (once per cable).
5. To avoid double-counting impacts, the total area of dredging disturbance does not include the 1 m (3.3 ft) wide cable installation trench and 3 m (10 ft) skid/track width. For additional details see Section 4.3.1 of COP Volume I.
6. To avoid double-counting impacts, the total seafloor disturbance in the OECC does not include the 1 m (3.3 ft) wide cable installation trench and 3 m (10 ft) skid/track width for the length of cable covered by cable protection.

Section 2.0

Resource Assessments

2.0 RESOURCE ASSESSMENTS

The resource assessments within this COP Addendum are focused on describing the affected environment and potential impacts for resources that are unique to the South Coast Variant OECC in federal waters. If it becomes necessary to employ the South Coast Variant and a second grid interconnection point is secured, the Proponent understands that BOEM would conduct a post-Record of Decision supplemental review of those portions of the South Coast Variant not otherwise considered in the final environmental impact statement. This COP Addendum incorporates by reference the analyses in the existing COP Volume III and Volume III appendices that already provide an assessment of potential impacts associated with New England Wind and the OECC. Accordingly, descriptions of the following resources that are not specific to the South Coast Variant (in federal waters) are not repeated in this COP Addendum: terrestrial fauna and inland birds, bats, coastal habitats, marine mammals, sea turtles, demographics and employment, environmental justice, visual resources, recreation and tourism, and non-routine and low probability events.

2.1 Marine Site Investigation

A marine site investigation was conducted for the South Coast Variant. Appendix A provides the geophysical, geotechnical, and biological data collected for the South Coast Variant.

2.2 Air Quality

Although the South Coast Variant (in federal waters) is slightly longer than the OECC that travels through Muskeget Channel, the use of the South Coast Variant for up to three Phase 2 offshore export cables would cause a negligible increase (less than 0.5%) in overall air emissions during the construction and operation of New England Wind. However, in the most likely scenario (one export cable installed in the South Coast Variant and two export cables installed in the OECC) the increase in emissions would be even less.

2.3 Water Quality

In order to assess the potential impacts of cable installation activities along the South Coast Variant, a sediment dispersion modeling assessment was performed, and the effects were quantified in terms of the above-ambient TSS concentrations as well as seabed deposition of sediments suspended in the water column during cable installation activities. The results of the calculations are provided in Appendix B. Additional details of the models, their applications, and calculations for the SWDA and the OECC are provided in Section 5.2 and Appendix III-A of COP Volume III.

Model results found that for export cable installation, TSS concentrations greater than 10 mg/L could extend a maximum distance of approximately 0.9 km (0.5 NM), though typically less than 150 m from the cable centerline. Most of the sediment is expected to settle out in two to three hours, with all sediments expected to settle out of suspension within six hours. Model results for typical cable installation also indicated that deposition of 1 mm (0.04 in) or greater remained within a maximum distance of 200 m (656 ft) from the cable centerline. No deposition of 5 mm (0.20 in) or greater associated with cable installation is expected.

2.4 Coastal and Marine Birds

The maximum design scenario for the coastal and marine birds assessment considers temporary construction period impacts from the installation of up to three cables within the South Coast Variant. The description of the affected environment and impacts associated with the South Coast Variant are expected to be similar to those of the OECC (excluding the Western Muskeget Variant) assessed in Section 6.2 of COP Volume III.

Common tern (*Sterna hirundo*) nesting colonies are present near the proposed South Coast Variant along the west coast of Buzzards Bay, as well as on the islands east of Buzzards Bay (Mostello, 2015). Common terns arrive in Massachusetts in April and May to nest at coastal locations, with the largest populations occurring on Cape Cod and in Buzzards Bay. Common terns depart from breeding colonies in July and August (Mostello, 2015). Installation of the offshore export cables will take place outside of the nesting timeframe to the maximum extent practicable to minimize impacts to the common tern.

Bird exposure to vessels installing offshore export cable(s) will be transitory and ephemeral (see Sections 3.3.1.3 and 4.3.1.3 of COP Volume I for a discussion of offshore cable installation). Offshore export cable installation will generate minimal suspended sediments that will be temporary and localized. For foraging marine birds, the suspended sediments could temporarily impact prey detection in the bottom few meters of the water column and could locally displace prey. However, any impacts to foraging habitat from increases in suspended sediments associated with cable installation activities are expected to be temporary and localized and water quality is expected to return to prior conditions within several hours (see COP Addendum Appendix B).

2.5 Benthic Resources

This section describes benthic resources present in the federal waters of the South Coast Variant of New England Wind.

2.5.1 Description of the Affected Environment

This section presents a summary of benthic habitat and shellfish within the federal waters of the South Coast Variant. Data used to describe benthic habitats and resources in this area come from a robust dataset and previous studies conducted within the South Coast Variant, primarily between 2010–2020. Primary data sources come from the Northeast Ocean Data Portal (NEODP), Northeast Fisheries Science Center (NEFSC) bottom trawl data, and Coonamessett Farm Foundation, Inc. (CFF) video surveys and are discussed in further detail in Section 6.5 of COP Volume III. Additional information used to describe the benthic habitat and shellfish resources within the South Coast Variant include interpolated habitat data from an ecoregional assessment facilitated by The Nature Conservancy (TNC; USGS 2005, Anderson et al. 2010) and site-specific benthic grab and video data collected within the South Coast Variant cable corridor in November of 2021 for the Proponent (Fugro 2022). The datasets provide a mix of data types including grab sample and imagery data collected within and around the South Coast Variant over multiple seasons and years.

2.5.1.1 South Coast Variant Benthic Habitats and Communities

The benthic habitats and features were described and grouped into six zones based on site characterization surveys as described in Appendix A of the COP Addendum. In general, much of the surficial sediments within the South Coast Variant are sand mixed with variable amounts of silts and gravels in highly localized patterns, with generally coarser grain sizes along the northern and central portions of the corridor, and finer materials within the southeastern end of the corridor. Individual boulders, boulder fields, and subsurface boulders were numerous and occurred in the northern and central part of the South Coast Variant.

There are no corals or artificial reefs within the direct vicinity of the South Coast Variant (Figures 2.5-1 and 2.5-2, respectively).

In the ecoregional assessment facilitated by TNC, point-based data were interpolated using kriging tools from the USGS usSeabed: Atlantic coast offshore surficial sediment data series 118 and the USGS East Coast Sediment Texture Database (USGS 2005, Anderson et al. 2010). These data classified soft sediments by grain size according to the Wentworth (1922) scale interpolated from USGS sediment database at a resolution of 500 meters (Figure 2.5-3). Most of the South Coast Variant sediment is composed of fine unconsolidated substrate of silt to medium sand, with gravel occurring in federal waters off Noman's Island. This interpolated data layer corresponded with the site-specific 2021 benthic grab sample Coastal and Marine Ecological Classification Standard (CMECS) classifications closely (see next paragraph), with the majority of samples that differed off by just one grain size bin (Figure 2.5-3).

Site-specific surveys of epifauna and infauna along the South Coast Variant were conducted in November of 2021 using underwater video transects and sediment grab samples. The majority (91%) of the 117 grain size samples processed were classified under the CMECS hierarchical system (FGDC 2012) as geologic-origin, fine unconsolidated substrate of sand, muddy sand, or sandy mud grain sizes. The remaining 10 grab samples (9%) were classified under CMECS geologic-origin, coarse unconsolidated substrate of gravelly sand or gravel mix composition. The two samples composed of > 30% gravel or sandy gravel mixes were sampled towards the northernmost portion of the South Coast Variant (Figure 2.5-3). Presence of macroalgae (unidentified) was recorded in 30-second intervals along each video transect and attached macroalgae was observed in 55% of all transects. High percentages of macroalgae were observed in the central portion of the South Coast Variant, with 100% attached macroalgal presence observed in six transects. In addition, 11 transects had greater than 90% presence of unattached or free-floating macroalgae (Fugro 2022).

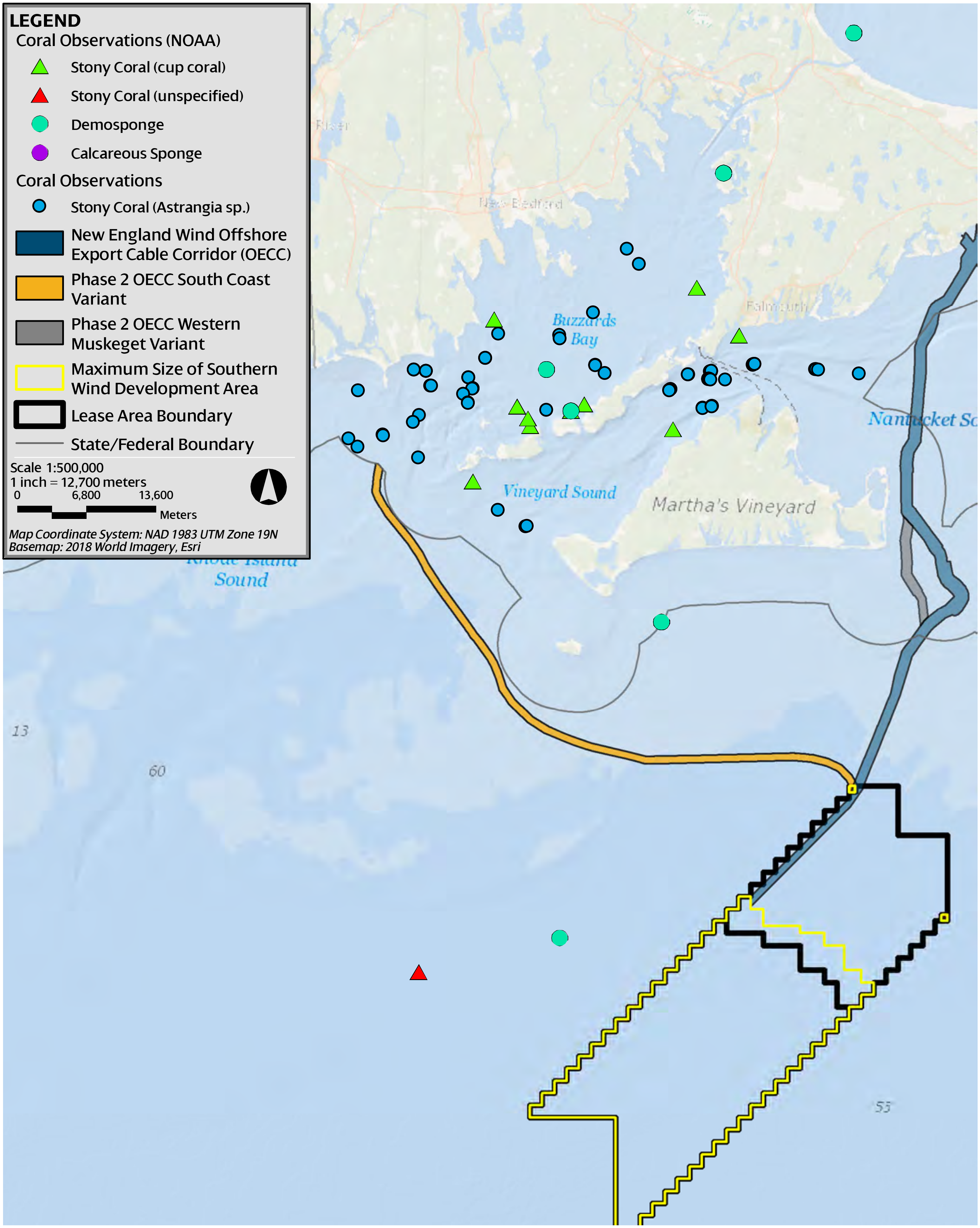

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Figure 2.5-1

Locations of Coral Observations in Relation to the New England Wind South Coast Variant

(USGS 2015; NOAA 2021)

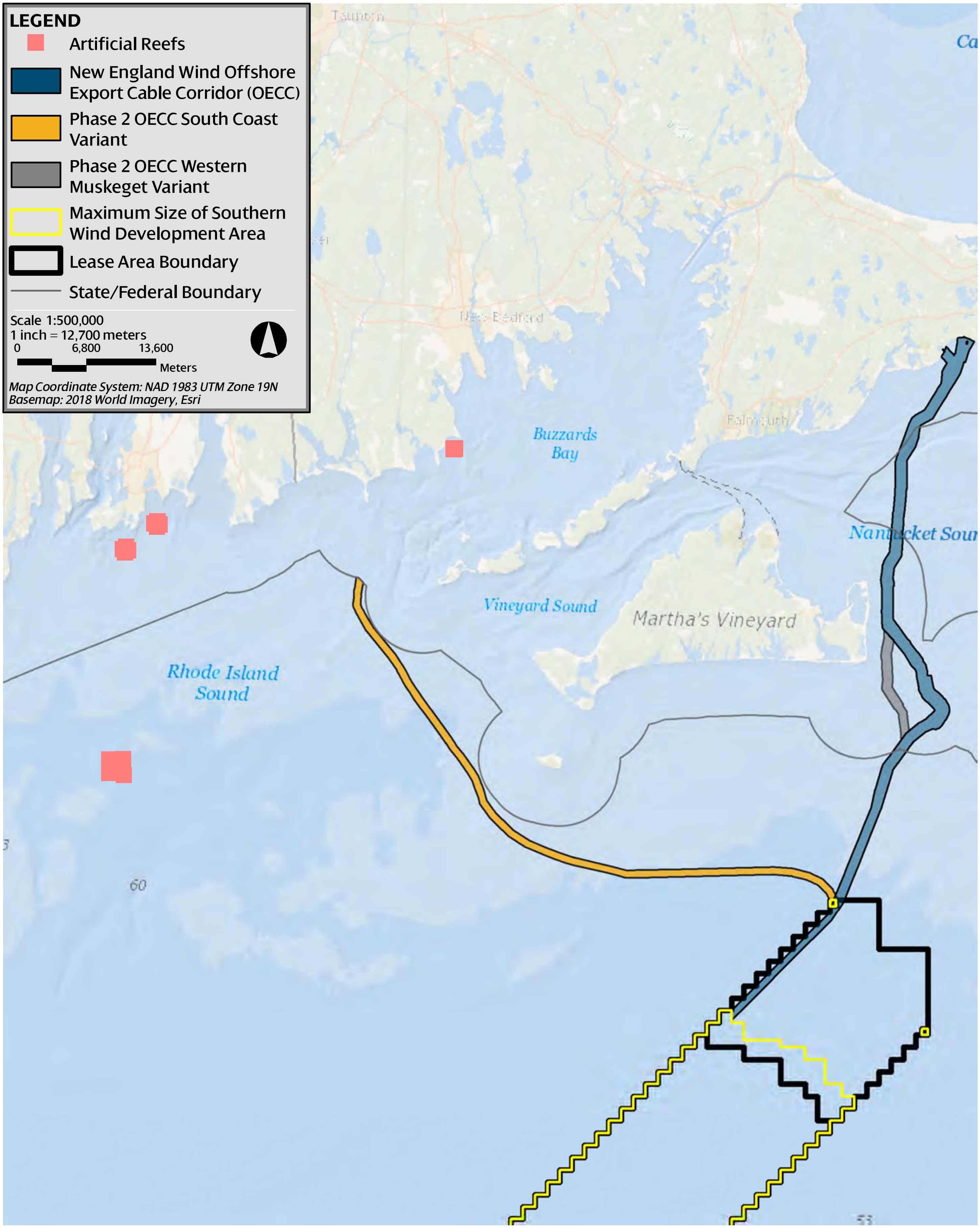

Figure 2.5-2
Locations of Artificial Reefs in Relation to the New England Wind South Coast Variant (NEODP 2022)

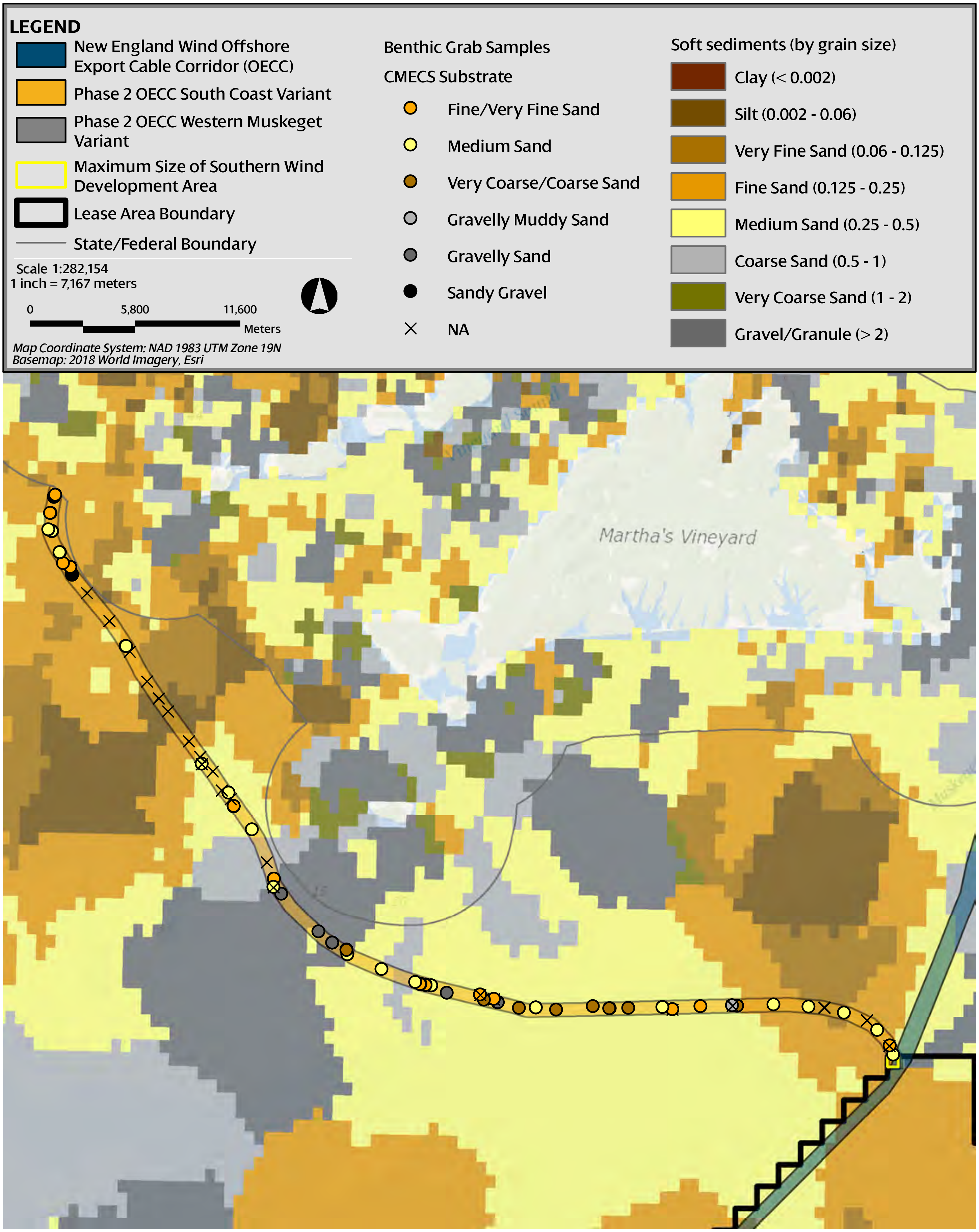

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Figure 2.5-3

2021 Benthic Grab Sample Classifications (Fugro 2022) and Interpolated USGS Sediment Data (USGS 2005; Anderson et al. 2010) along the New England Wind South Coast Variant

2.5.1.2 South Coast Variant Epifauna and Species of Importance

In addition to grain size classifications of grab samples, site-specific epifauna sampling occurred in November 2021 in the federal waters of the New England Wind South Coast Variant. Epibenthic species observed during 62 video transects included crabs (*Cancer* spp., 166 individuals), one individual Atlantic horseshoe crab (*Limulus polyphemus*), American lobster (*Homarus americanus*, 7 individuals), and sea stars (*Asterias rubens,* 27 individuals). Macrofaunal abundance was generally higher in the northern section of the South Coast Variant as it approaches the nearshore state water boundary, with 60% of all crabs observed in this northern section. Lobsters were distributed relatively evenly across the South Coast Variant, while sea stars were almost exclusively observed in the central region (93%) (Fugro 2022).

Epifaunal species of commercial or recreational importance in the region of the South Coast Variant include primarily Atlantic scallop (*Placopecten magellanicus*) and American lobster (*Homarus americanus*) (Guida 2017). Many regional datasets are discussed in more detail in Section 6.5 of COP Volume III (Figure 2.5-4). Of these, video surveys by CFF in 2015 and 2016 are most relevant and were dominated by the common sand dollar (*Echinarachnius parma*) in 18 videos that were located near the South Coast Variant. NEFSC seasonal bottom trawl data from 2010-2019 indicate that the catch of American lobster and Jonah crab occurs intermittently in the vicinity of the South Coast Variant during spring and fall with larger and more frequent catches of lobster (Figure 2.5-5). No horseshoe crabs were observed in any NEFSC trawls near the South Coast Variant in either season (Figure 2.5-5). For a broader description of the mobile benthic invertebrates within the South Coast Variant, refer to Section 2.6.

2.5.1.3 South Coast Variant Infauna

Site-specific infauna sampling occurred in November 2021 in the federal waters of the South Coast Variant. The survey consisted of 62 grab stations, with 31 designated as successful infaunal sampling stations (Figure 2.5-6). The dominant phyla collected was Mollusca, with 49% of the proportional abundance represented by bivalves and gastropods. Annelid worms (24%), arthropods (13%), and nematodes (11%) were the other abundant groups, with all other phyla composing 2% or less of the total abundance of the 2,286 individuals sampled across all grab samples within the South Coast Variant (Fugro 2022).

Abundance ranged widely from 1—263 total individuals per grab sample. The number of individuals per sample was generally higher in the northern and southern regions of the South Coast Variant and lower in the central region. Annelid worms were relatively abundant in the south and central regions of the South Coast Variant accounting for over 50% proportional abundance in nine grab samples but accounting for less than 20% proportional abundance in all northern samples. Of the northern samples, 70% were dominated by mollusks, with arthropods composing 20% of the grab samples. Most of the nematodes sampled were found in the central South Coast Variant, with the remaining found in the southern region, and only one individual nematode was sampled in the northern South Coast Variant (Fugro 2022).

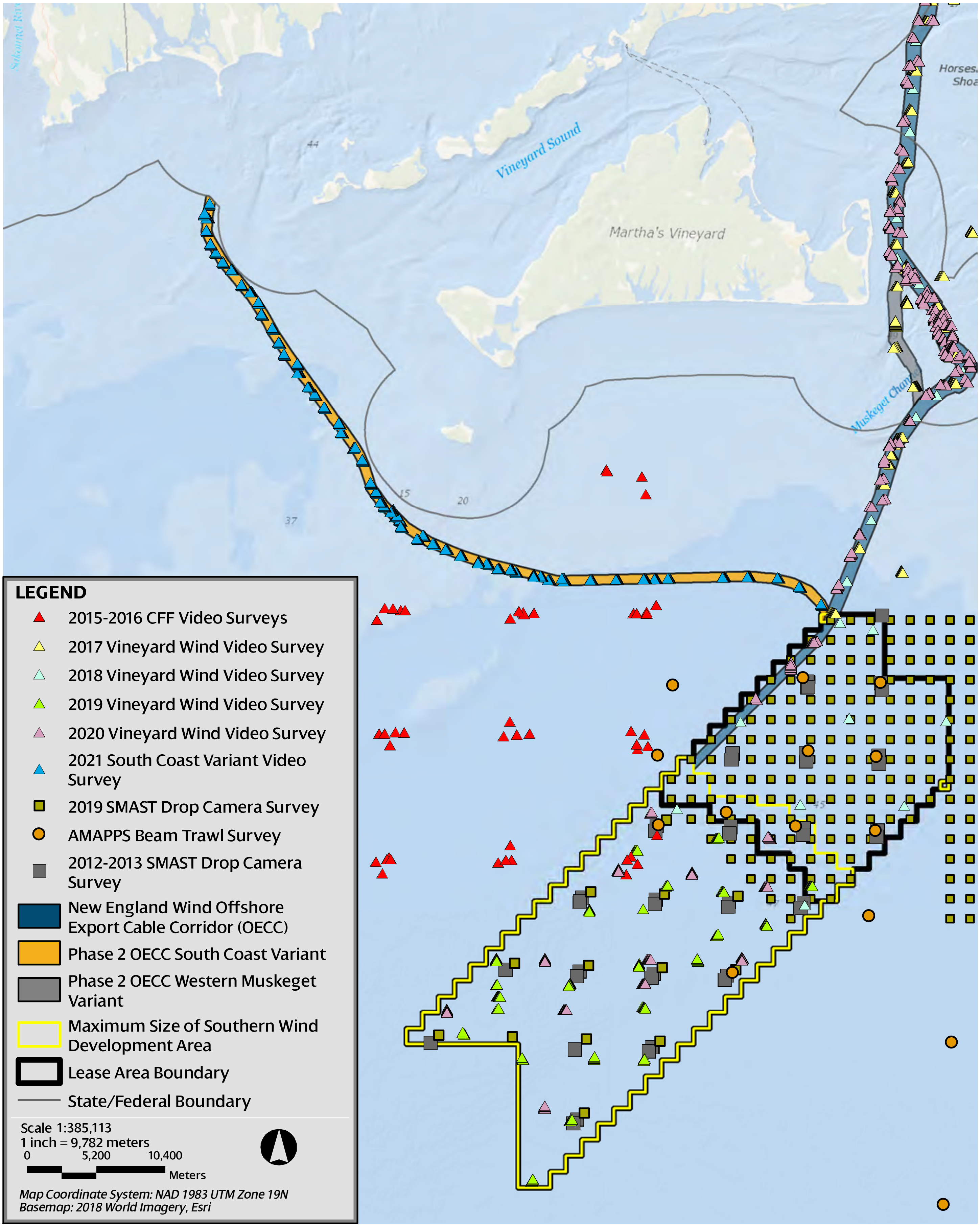

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Figure 2.5-4

Epifauna Sampling Locations in Relation to the New England Wind South Coast Variant

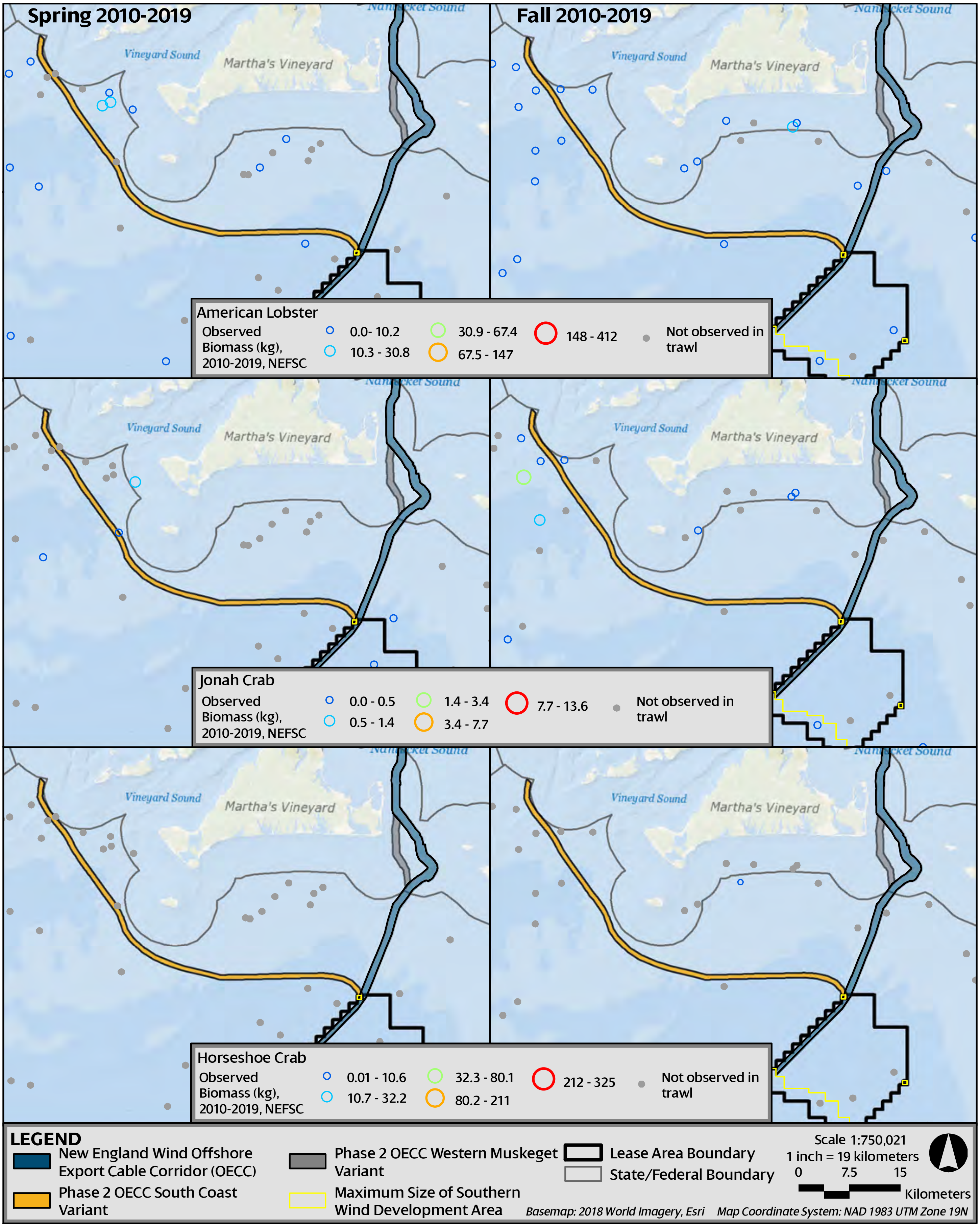

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Figure 2.5-5
Observed Biomass (kg) of American Lobster, Jonah Crab, and Horseshoe Crab captured per tow in Spring and Fall NEFSC Bottom Trawl Surveys (2010-2019; NEFSC 2022).

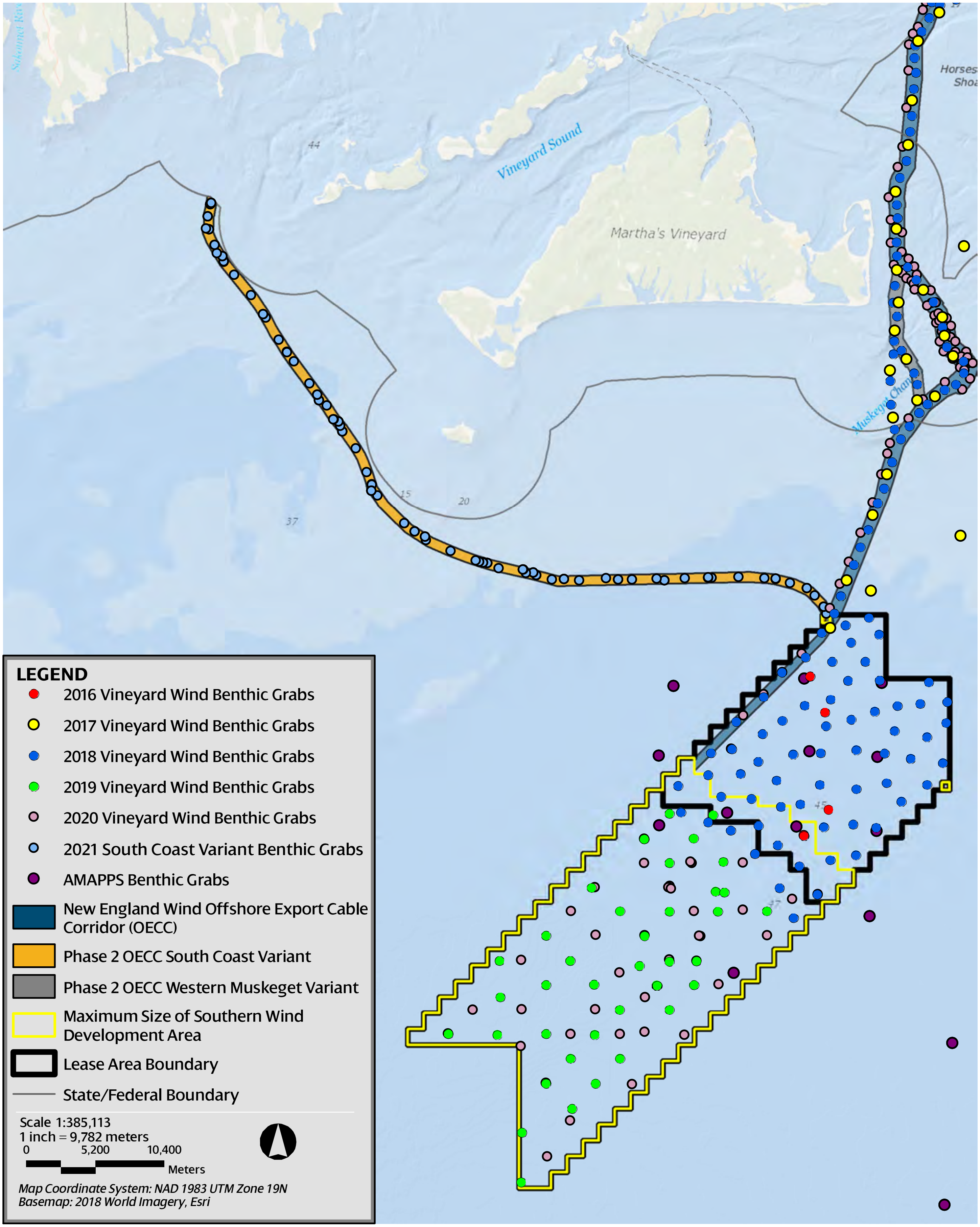

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Figure 2.5-6

Infauna Sampling Locations in relation to the New England Wind South Coast Variant

2.5.2 Potential Impacts of the South Coast Variant

This section addresses the potential unique impacts of the South Coast Variant to benthic resources, which are related to habitat alteration, suspended sediments, sediment deposition, and water withdrawals. Section 6.5 of COP Volume III provides an assessment of potential impacts associated with the OECC. This COP Addendum incorporates by reference the analyses in Section 6.5 of COP Volume III and is focused on describing impacts that are unique to the South Coast Variant. Accordingly, descriptions of impacts that are associated with the OECC or its Variants more generally and that are not specific to the South Coast Variant are not repeated in this COP Addendum. Specifically, for a list of impact producing factors and a description of potential impacts related to increased sound exposure, electromagnetic fields, cable maintenance, additional O&M impacts, and decommissioning, please refer to Section 6.5 of COP Volume III.

2.5.2.1 Habitat Alteration

As described in Sections 3.3.1.3 and 4.3.1.3 of COP Volume I, activities within the South Coast Variant are expected to include cable installation, anchoring, the potential dredging of the tops of sand waves in certain locations, the potential use of cable protection (if required), and the limited use of jack-up vessels for cable splicing. Permanent habitat alteration may occur from the potential installation of cable protection (if required), which alters habitat through the addition of artificial hard substrate. Temporary habitat disturbance may occur from cable installation, anchoring, the potential dredging of the tops of sand waves in certain locations, and the limited use of jack-up vessels for cable splicing. The maximum estimated area within the South Coast Variant for temporary and permanent benthic habitat impacts and approximate total seafloor impacts are presented in Table 1.2-1.

As described in more detail in Section 6.5 of COP Volume III, recolonization and recovery to pre-construction species assemblages is expected given the similarity of nearby habitat and species. Recovery timeframes and rates in a specific area can range from several months to two to four years, with sandy areas recovering more quickly (Van Dalfsen and Essink 2001; Dernie et al. 2003).

2.5.2.2 Suspended Sediments

Section 6.5 of COP Volume III provides an assessment of potential impacts from suspended sediments associated with the OECC and discusses the thresholds used for impact assessment. Additional modeling of sediment transport (COP Addendum Appendix B) potential was conducted for a representative cable installation within the South Coast Variant that is illustrative of expected impacts for each of the one to three offshore export cables that may be installed within the South Coast Variant.

Model results found that for export cable installation, TSS concentrations greater than 10 mg/L could extend a maximum distance of approximately 0.9 km (0.5 NM) from the cable centerline. Most of the sediment is expected to settle out in two to three hours, with only a small area (0.2

km^2) still above the 10 mg/L threshold after three hours. All sediments settle out of suspension within six hours. As described in Section 6.5 of COP Volume III, a suspended sediment threshold of 100 mg/L over 24 hours was listed as a minimum effects threshold for all life stages of crustaceans and juvenile/adult mollusks, and TSS solids are modeled at concentrations below this threshold within one hour. Fish and invertebrates may be temporarily affected by the mobilization and suspension of sediments during dredging and cable installation activities, but concentrations do not exceed the potential impact threshold durations.

2.5.2.3 Sediment Deposition

Section 6.5 of COP Volume III provides an assessment of potential impacts from sediment deposition and discusses established deposition thresholds for demersal eggs (1 mm [0.04 in]) and shellfish (20 mm [0.8 in]) used for impact assessment. Modeling of sediment transport potential was conducted for one representative cable installation within the South Coast Variant that is illustrative of expected impacts for each of the up to three cables that may be installed within the South Coast Variant. Simulations of typical cable installation parameters (without sand wave removal) in the South Coast Variant (see COP Addendum Appendix B) indicated that deposition of 1 mm (0.04 in) or greater (i.e., the threshold of concern for demersal eggs) was constrained to a maximum distance of 200 m (656 ft) from the cable centerline. At this deposition thickness, there are limited areas with potential temporary or permanent negative impacts to demersal eggs and species of similar sensitivity to sediment deposition. No deposition of 5 mm (0.20 in) or greater is expected, and therefore no impact to shellfish is expected.

2.5.2.4 Water Withdrawals

Direct mortality of planktonic life stages could potentially occur via water withdrawals for cable installation and dredging vessels during construction of the South Coast Variant. Mortality of organisms entrained in water withdrawal pumps is expected to be 100% because of the physical stresses associated with being flushed through a pump system and potential temperature changes (USDOE MMS 2009). The BOEM DEIS (2018) for Vineyard Wind 1 determined that impacts from entrainment of benthic organisms and their planktonic stages during construction would be moderate but would not have population-level effects. Water withdrawals for installation of up to three offshore export cables within the South Coast Variant can be estimated using the following assumptions:

- Cable installation occurs at a rate of up to 120 m/hr (394 ft/hr). The final installation speed will be specific to the contractor and cable installation equipment and may be different than listed here. A speed of 120 m/hr (394 ft/hr) is used to provide a general estimate of water usage.
- A jetting technique uses 11,300–45,000 liters per minute (3,000–12,000 gallons per minute) of water

- The maximum total length of offshore export cables for the South Coast Variant (from the SWDA boundary to the state waters boundary) is 362 km (196 NM).

Under these assumptions, water withdrawal volumes for the installation of three cables within the South Coast Variant are expected to be approximately 2.1-8.2 billion liters (0.6-2.2 billion gallons).

2.5.2.5 Avoidance, Minimization, and Mitigation Measures

Several mitigation measures will be employed to avoid and minimize potential impacts to benthic resources within the South Coast Variant. Offshore export cable installation will avoid important habitats such as eelgrass beds and hard bottom sediments where feasible. Where feasible and considered safe, mid-line buoys on anchor lines will be used to minimize impacts from anchor line sweep. The Proponent is also committed to developing an appropriate benthic monitoring framework for New England Wind that includes the South Coast Variant, should it be necessary, in consultation with BOEM and other agencies as appropriate (see Appendix I for the draft framework).

2.6 Finfish and Invertebrates

This section describes finfish and invertebrate resources in the federal waters of the South Coast Variant of New England Wind.

2.6.1 Description of the Affected Environment

This discussion of finfish and invertebrates is based on a review of existing literature and site-specific data. Existing data support characterization of distribution, abundance, and composition of fish species within the area potentially affected by New England Wind-related activities for the South Coast Variant. The most relevant data and information sources are the:

- Northeast Area Monitoring and Assessment Program (NEAMAP);

- Northeast Fisheries Science Center (NEFSC) multispecies bottom trawl surveys;

- NEFSC Ecosystem Monitoring (EcoMon) program; and

- Northeast Ocean Data Portal (NEODP).

A list of the major fish and invertebrates (88 species) that may be found in the New England Wind Offshore Development Area is in Table 6.6-1 in Section 6.6 of COP Volume III. Conservatively, the same species are assumed to be found along the South Coast Variant with the addition of 22 species identified from the NEAMAP bottom trawl survey data within 5 miles of the South Coast Variant (Table 2.6-1).

Table 2.6-1 Major Fish and Invertebrate Species Potentially Occurring in the South Coast Variant[1]

Common Name	Scientific Name	EFH	Listing Status	Commercial/ Recreational Importance	Habitat Association
Atlantic croaker	*Micropogonias undulatus*			●	Demersal
Atlantic cutlassfish	*Trichiurus lepturus*				Demersal / Pelagic
Atlantic moonfish	*Selene setapinnis*				Demersal
Atlantic torpedo ray	*Torpedo nobiliana*				Demersal
Bay anchovy	*Anchoa mitchilli*				Pelagic
Bigeye	*Priacanthus arenatus*				Demersal
Bigeye scad	*Selar crumenophthalmus*				Pelagic
Blue crab	*Callinectes sapidus*			●	Benthic
Bluespotted cornetfish	*Fistularia tabacaria*				Demersal
Clearnose skate	*Raja eglanteria*			●	Demersal
Florida pompano	*Trachinotus carolinus*			●	Demersal / Pelagic
Hickory shad	*Alosa mediocris*			●	Pelagic
Inshore lizardfish	*Synodus foetens*				Demersal
Kingfishes	*Menticirrhus spp.*			●	Demersal
Northern puffer	*Sphoeroides maculatus*			●	Demersal
Northern sennet	*Sphyraena borealis*				Demersal
Rough scad	*Trachurus lathami*				Pelagic
Round scad	*Decapterus punctatus*				Pelagic
Short bigeye	*Pristigenys alta*				Demersal
Smooth puffer	*Lagocephalus laevigatus*				Demersal
Spot	*Leiostomus xanthurus*			●	Demersal
Striped sea robin	*Prionotus evolans*			●	Demersal

Notes:

1. Table 6.6-1 in Section 6.6 of COP Volume III lists the major fish and invertebrates (88 species) that may be found in the New England Wind Offshore Development Area. Conservatively, the same species are assumed to be found along the South Coast Variant with the addition of the 22 species listed in Table 2.6-1, which were identified from the NEAMAP bottom trawl survey data within 5 miles of the South Coast Variant.

2.6.1.1 Finfish

NEFSC has been conducting fishery-independent autumn bottom trawl surveys annually since 1963. Two metrics—total biomass and species richness—derived from this survey show the distribution of fish assemblages along the South Coast Variant (see Figure 2.6-1 through Figure 2.6-6). The total biomass and species richness of fish is moderate along the South Coast Variant, especially in the fall. High species richness has been linked to increased ecosystem resilience or the ability of an ecosystem to recover from disturbance (MacArthur 1955).

NEAMAP currently conducts trawl surveys in the spring and fall near the South Coast Variant. The 101 stations within five miles of the South Coast Variant from surveys that occurred between spring 2010 and fall 2021 recorded the presence of 75 taxa, all of which are included in Table 6.6-1 in Section 6.6 of COP Volume III or in Table 2.6-1 (above). Species with large catches include butterfish (*Peprilus triacanthus*), scup (*Stenotomus chrysops*), spiny dogfish (*Squalus acanthias*), little skate (*Leucoraja erinacea*), silver hake (*Merluccius bilinearis*), and longfin inshore squid (*Doryteuthis pealeii*) (Figure 2.6-7).

Pelagic Fishes

The assemblage of pelagic species in the South Coast Variant are expected to be the same as described in section 6.6 of COP Volume III. Seasonal variations in biomass were apparent for pelagic species with substantial catch in the NEFSC trawl surveys, with Atlantic herring primarily caught in the colder seasons (spring/winter) and butterfish and round herring primarily caught in the warmer seasons (fall/summer) (NEODP 2022) (Figure 2.6-3 and 2.6-4).

Demersal Fishes

The assemblage of demersal species in the South Coast Variant are expected to be generally the same as described in section 6.6 of COP Volume III. The densities of demersal species tend to be lower along the South Coast Variant than within the MA WEA (Massachusetts Wind Energy Area; see Figure 2.6-5 and 2.6-6; NEODP 2022). NEAMAP survey data from 2010–2021 showed that scup, spiny dogfish, little skate, and silver hake were the demersal species with the largest catch weight near the South Coast Variant (Figure 2.6-7; NEAMAP 2022).

Highly Migratory Fishes

Conservatively, the assemblage of highly migratory species in the South Coast Variant are expected to be the same as described in section 6.6 of COP Volume III with the South Coast Variant located within the habitat of no additional species.

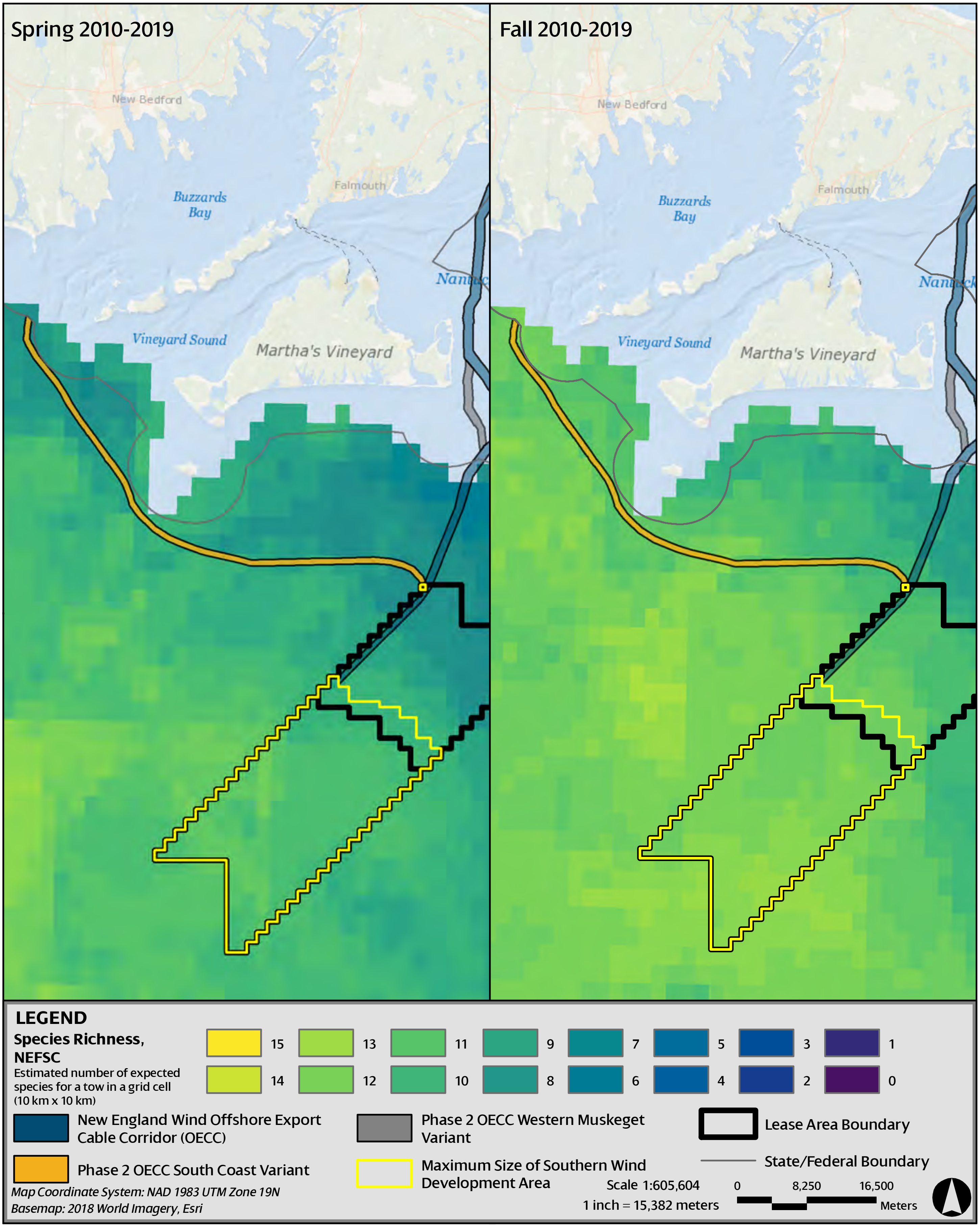
Threatened and Endangered Fish

Five federally listed threatened or endangered fish species may occur off the northeast Atlantic coast, including the shortnose sturgeon (*Acipenser brevirostrum*), Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), Atlantic salmon (*Salm Salmo salar*), oceanic whitetip shark (*Carcharhinus longimanus*), and giant manta ray (*Manta birostris*). Detailed descriptions of these Threatened and Endangered Species and other Species of Concern are provided in section 6.6 of COP Volume III.

2.6.1.2 Invertebrates

Descriptions of the important managed invertebrates that may be found in the New England Wind Offshore Development Area can be found in Section 6.6 of COP Volume III. Conservatively, the same species are assumed to be found in the South Coast Variant except for the addition of blue crab (*Calinectes sapidus*), which was identified from NEAMAP bottom trawl survey data to occur near the South Coast Variant.

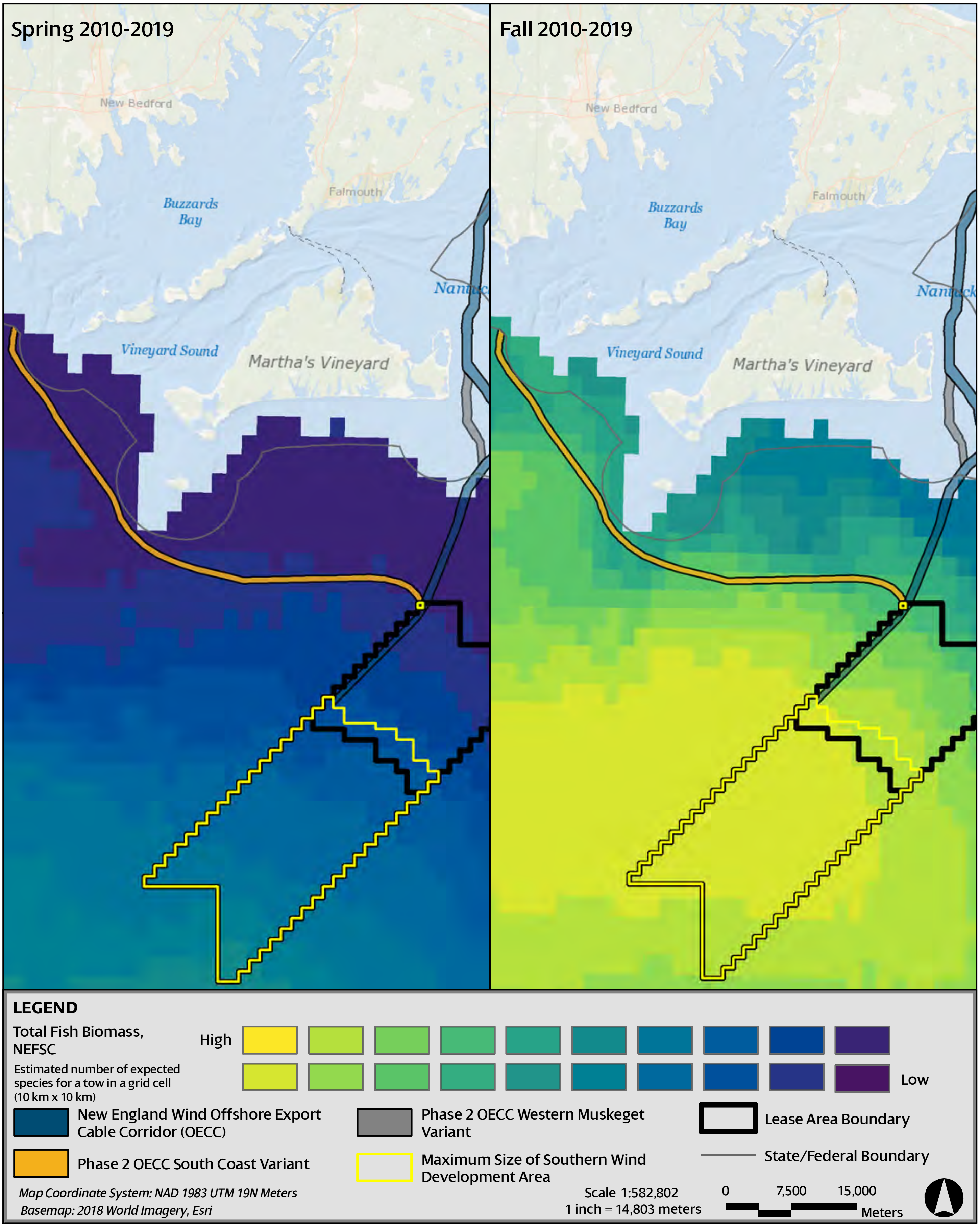
Video surveys conducted by the University of Massachusetts Dartmouth School for Marine Science and Technology (SMAST) between 2003–2012 indicated low abundances of most benthic invertebrates along the South Coast Variant (see Figure 2.6-8 and Figure 2.6-9). The most abundant benthic invertebrates along the South Coast Variant were *Cancer spp.* crabs, with 166 individuals observed in 62 video transects completed in November 2021 (Fugro 2022).



New England Wind

Figure 2.6-1

Expected Species Richness of the Fish Captured in Spring (2010-2019) and Fall (2010-2019) NEFSC Bottom Trawl Surveys (NEODP 2022)



New England Wind

AVANGRID RENEWABLES

Figure 2.6-2

Expected Biomass of the Fish Captured in Spring (2010-2019) and Fall (2010-2019) NEFSC Bottom Trawl Surveys (NEODP 2022)

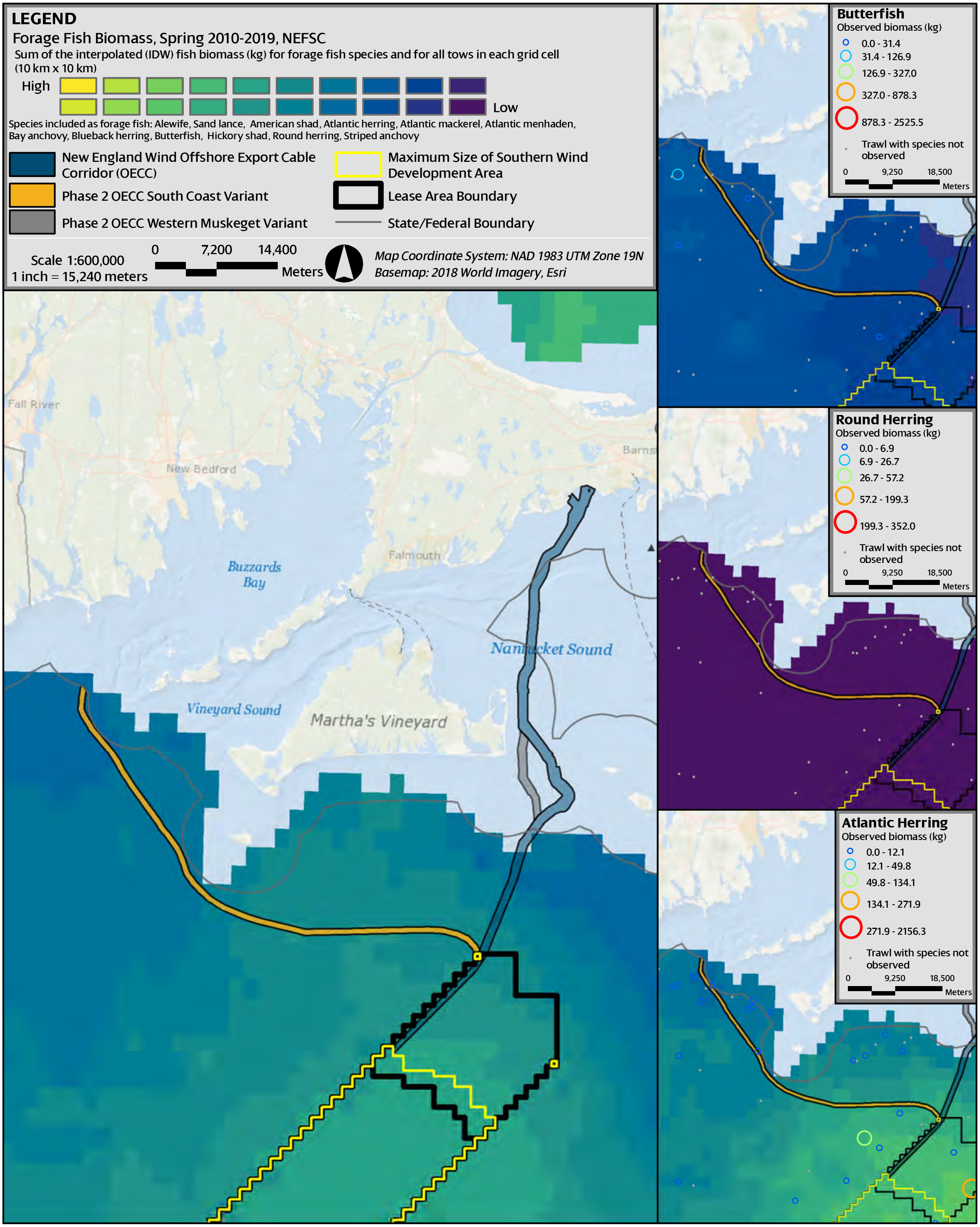
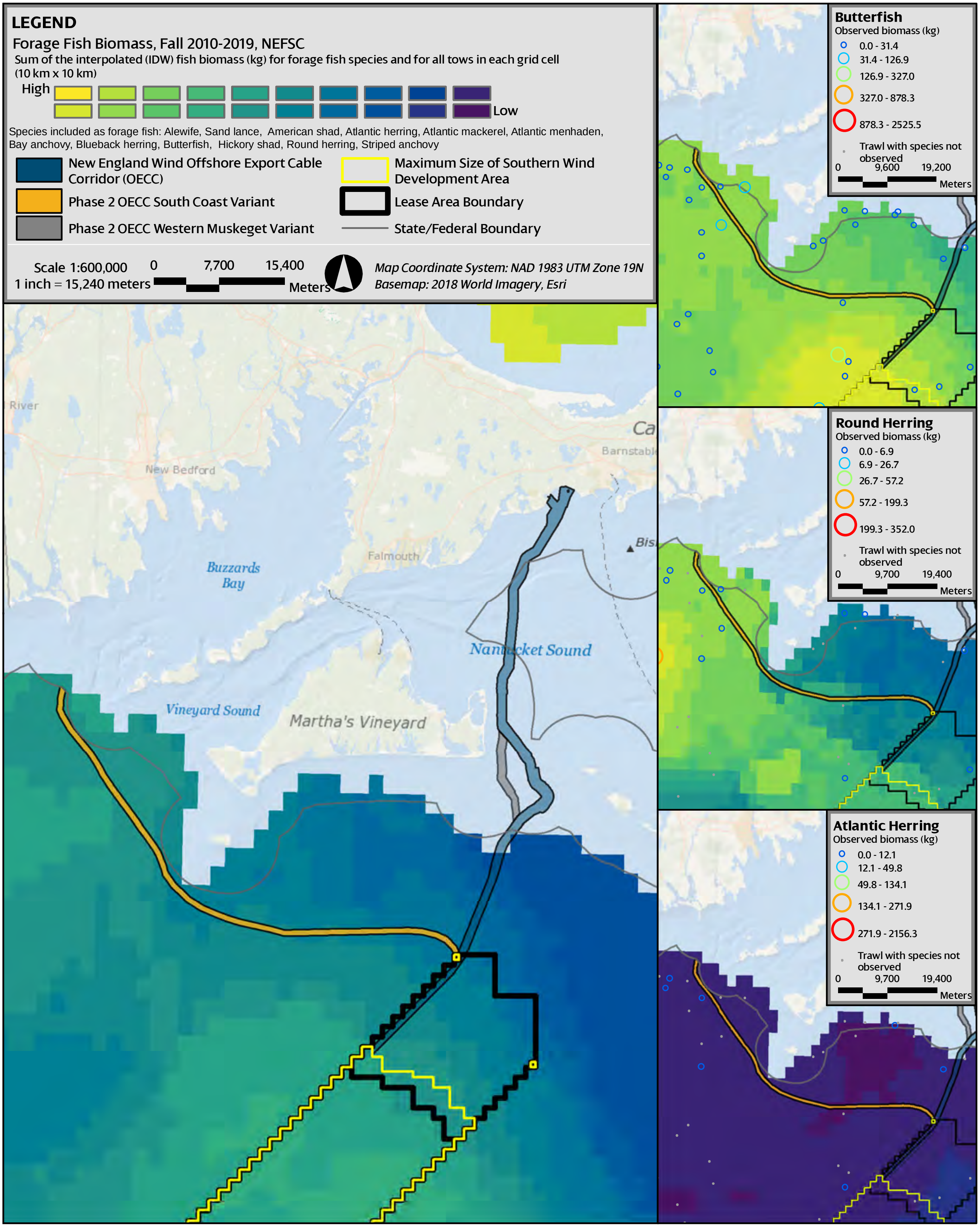


Figure 2.6-3

Expected Forage Fish Biomass and Individual Biomass for Butterfish, Round Herring, and Atlantic Herring Captured in Spring NEFSC Bottom Trawl Surveys from 2010-2019 (NEODP 2022)



New England Wind

Figure 2.6-4

Expected Forage Fish Biomass and Individual Biomass for Butterfish, Round Herring, and Atlantic Herring Captured in Fall NEFSC Bottom Trawl Surveys from 2010-2019 (NEODP 2022)

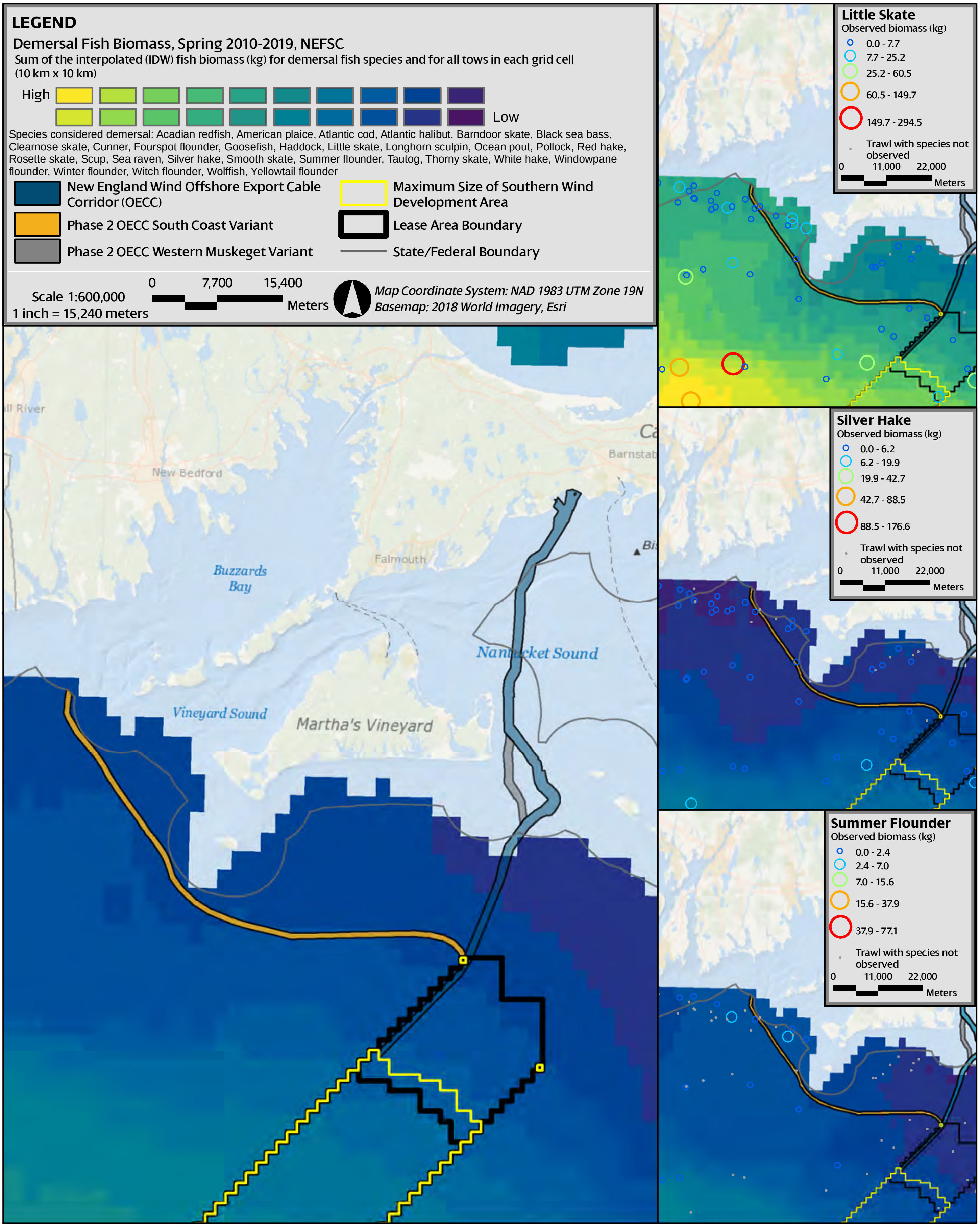


Figure 2.6-5

Expected Demersal Fish Biomass and Individual Biomass for Little Skate, Silver Hake, and Summer Flounder Captured in Spring NEFSC Bottom Trawl Surveys from 2010-2019 (NEODP 2022)

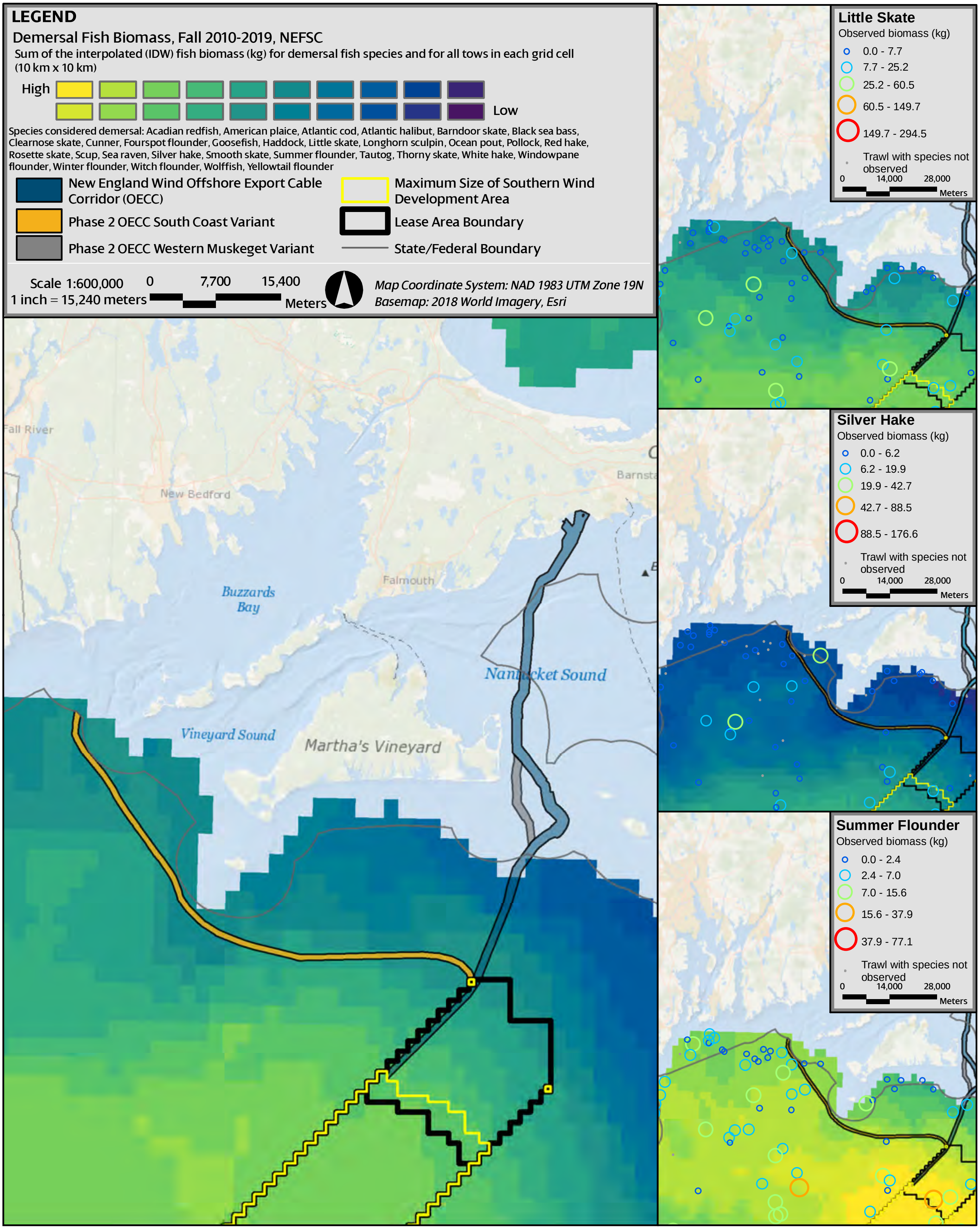
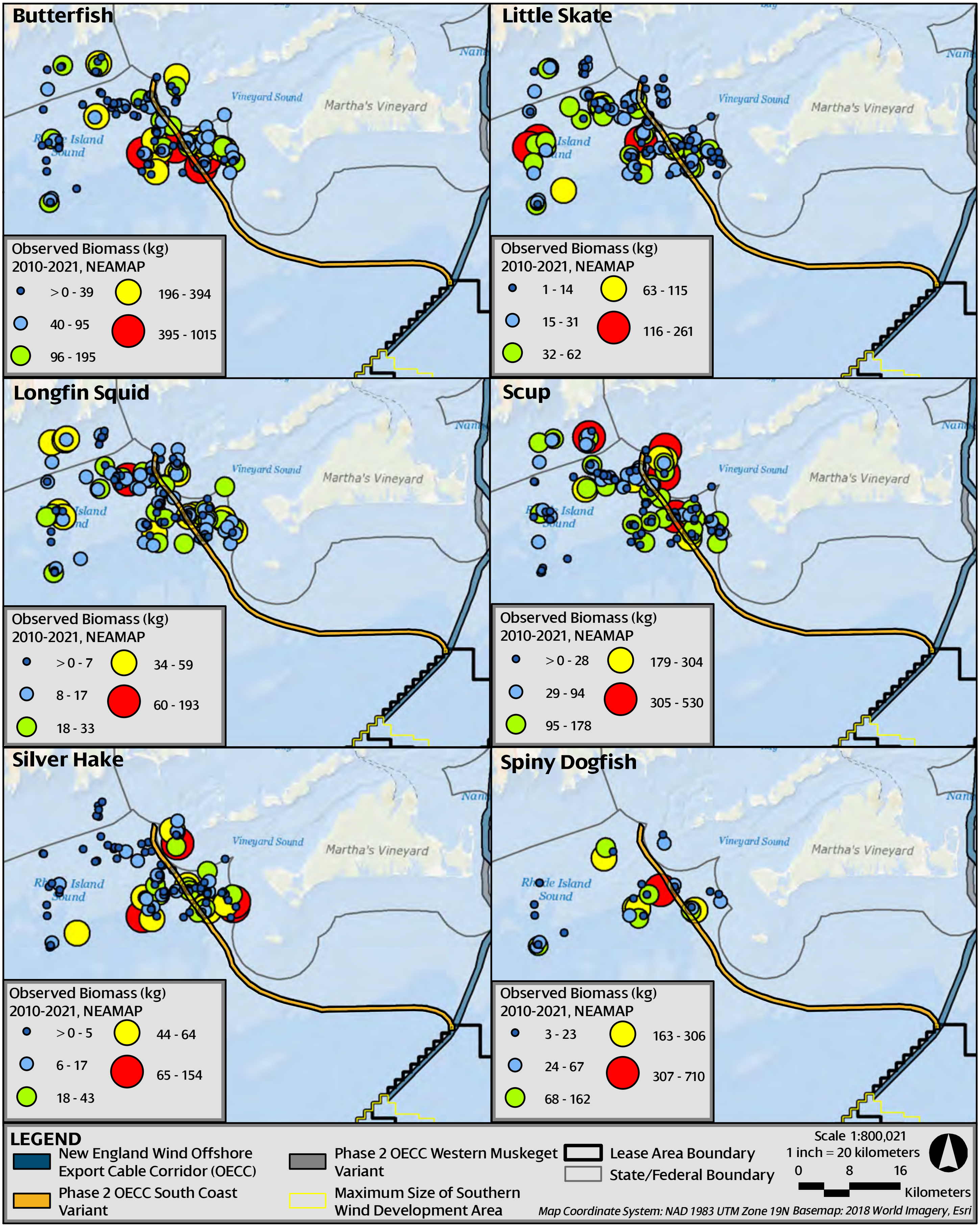


Figure 2.6-6

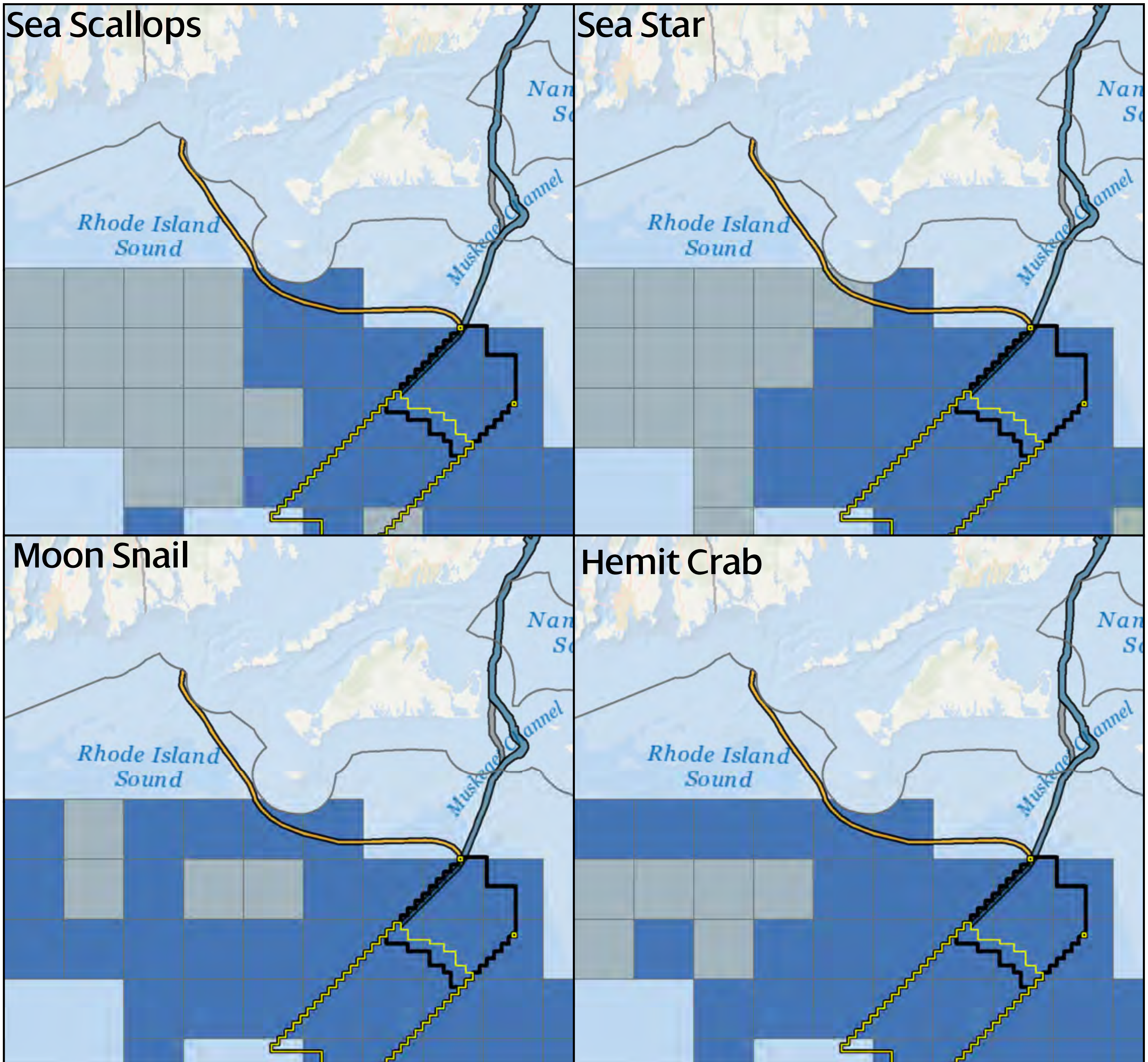
Expected Demersal Fish Biomass and Individual Biomass for Little Skate, Silver Hake, and Summer Flounder Captured in Fall NEFSC Bottom Trawl Surveys from 2010-2019 (NEODP 2022)



New England Wind

Figure 2.6-7

Observed Biomass of Butterfish, Little Skate, Longfin Squid, Scup, Silver Hake, and Spiny Dogfish Captured per Tow in the NEAMAP Bottom Trawl Surveys 2010-2021 (NEAMAP 2022).



LEGEND

- New England Wind Offshore Export Cable Corridor (OECC)
- Phase 2 OECC South Coast Variant
- Phase 2 OECC Western Muskeget Variant
- Maximum Size of Southern Wind Development Area
- Lease Area Boundary
- State/Federal Boundary

Sea Scallops	Sea Star	Moon Snail	Hermit Crab
0	0	0	0
>0 - 4	0 - 24	>0 - 0.2	>0 - 0.78
5 - 7	25 - 40	0.3	0.79 - 1.2
8 - 10	41 - 56	0.4	1.3 - 1.7
11 - 32	57 - 140	0.5 - 0.8	1.8 - 6.2

Scale 1:1,000,605
1 inch = 25,415 meters

0 12,500 25,000 Meters

Map Coordinate System: NAD 1983 UTM Zone 19N
Basemap: 2018 World Imagery, Esri

Figure 2.6-8
Average Abundance of Benthic Invertebrates Observed in SMAST Video Surveys from 2003–2012 (SMAST 2016)

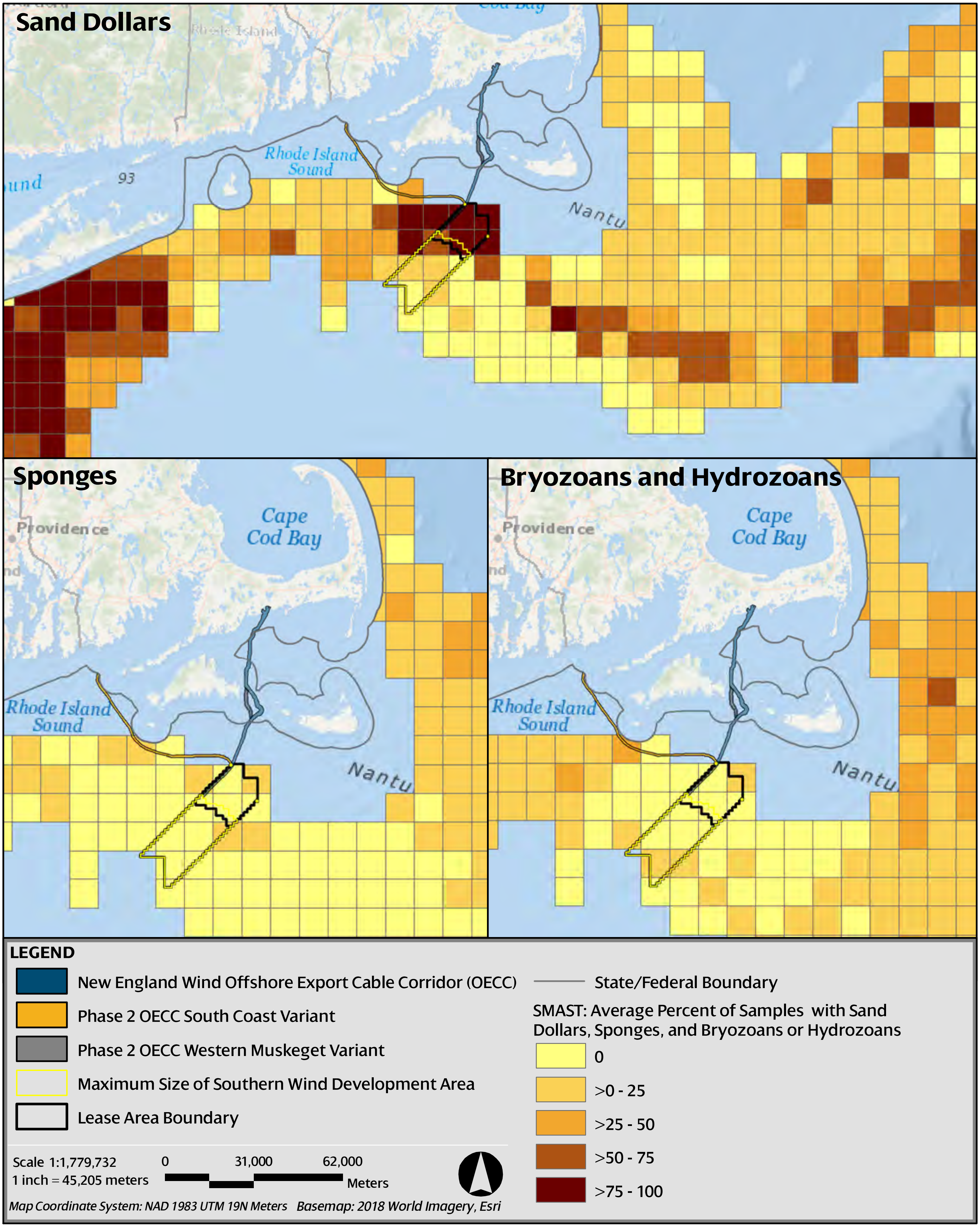


Figure 2.6-9

Average Percent of Samples with Sand Dollars, Sponges, or Bryozoans and Hydrozoans in SMAST Video Surveys from 2003–2012 (SMAST 2016)

The NEAMAP bottom trawl survey samples squid and longfin squid egg mops. Figure 2.6-10 and Figure 2.6-11 provide the distribution of catch for longfin inshore squid and their eggs and northern shortfin squid (*Illex illecebrosus*) near the South Coast Variant between the years 2010 and 2021 in the spring and fall. Only 1.3 kg of longfin squid egg mops were recorded from one tow within 5 miles of the South Coast Variant over this 11-year period. Longfin squid are widely distributed and observed in both the spring and fall surveys throughout the sampling overlap with the South Coast Variant. Northern shortfin squid were also caught where sampling overlaps with the South Coast Variant in the spring but absent from fall sampling in the same area.

The NEAMAP bottom trawl surveys also recorded limited additional valuable invertebrate species in both spring and fall. Blue crabs and sea scallops (*Placopecten magellanicus*) were rarely present, with four and two individuals recorded between 2010 and 2021, respectively.

2.6.1.3 Essential Fish Habitat

A detailed assessment of EFH in the South Coast Variant and potential impacts is included in COP Addendum Appendix C. For a detailed EFH assessment for New England Wind, see Appendix III-F of COP Volume III.

2.6.2 Potential Impacts of the South Coast Variant

This section addresses the potential unique impacts of the South Coast Variant development on finfish and invertebrates, which include habitat alteration, suspended sediments, sediment deposition, and water withdrawals. Section 6.6 of COP Volume III provides an assessment of potential impacts associated with the OECC. This COP Addendum incorporates by reference the analyses in Section 6.6 of COP Volume III and is focused on describing impacts that are unique to the South Coast Variant. Accordingly, descriptions of impacts that are associated with the OECC or its Variants more generally and that are not specific to the South Coast Variant are not repeated in this COP Addendum. Specifically, for the complete list of impact-producing factors and a description of potential impacts related to increased sound exposure, electromagnetic fields, cable maintenance, additional O&M impacts, and decommissioning, please refer to Section 6.6 of COP Volume III.

2.6.2.1 Habitat Alteration

As described in Sections 3.3.1.3 and 4.3.1.3 of COP Volume I, activities within the OECC are expected to include cable installation, anchoring, the potential dredging of the tops of sand waves in certain locations, the potential use of cable protection (if required), and the limited use of jack-up vessels for cable splicing. Long-term habitat alteration may occur from the potential installation of cable protection (if required), which alters habitat through the addition of artificial hard substrate. Temporary and short-term habitat disturbance may occur from cable installation,

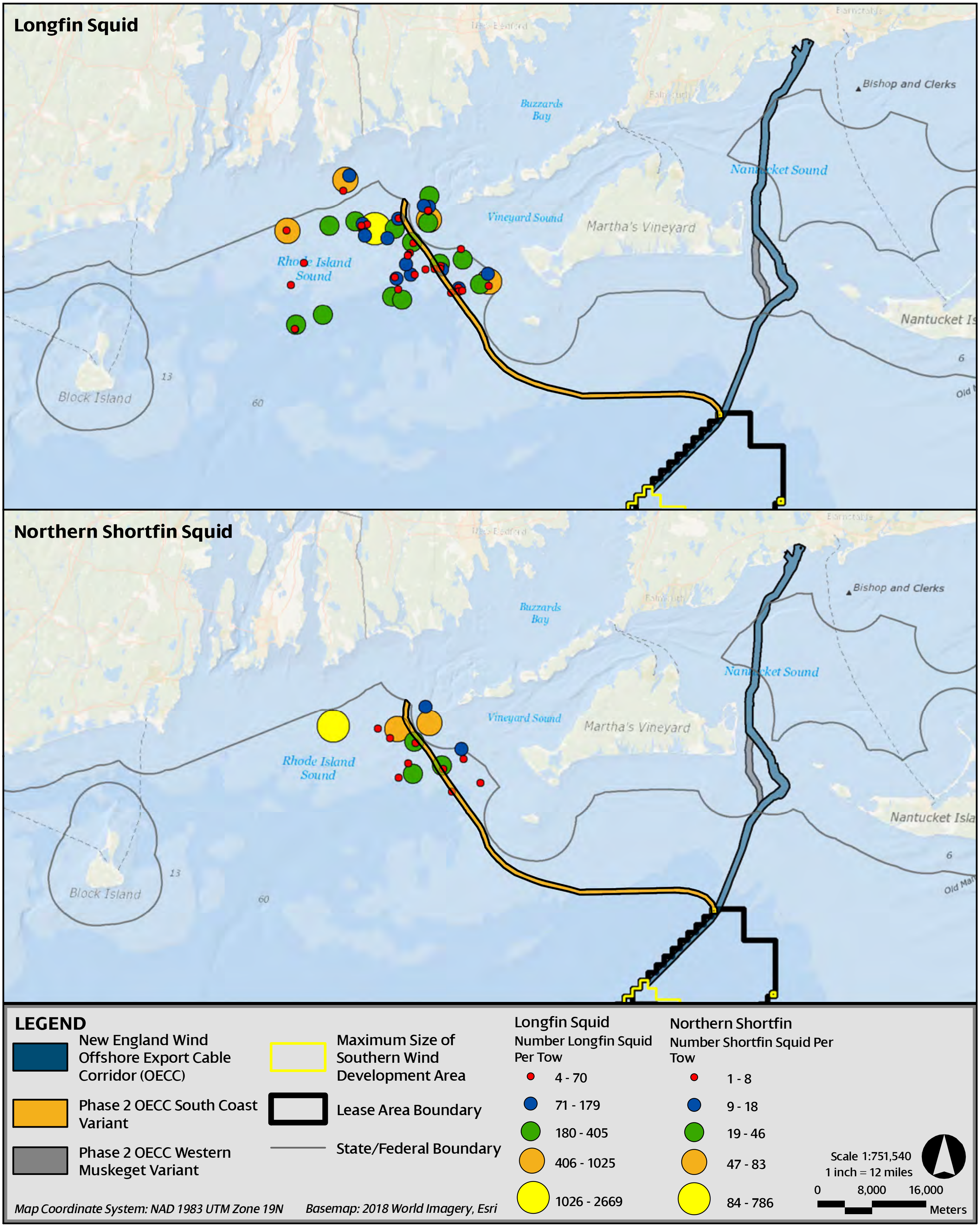
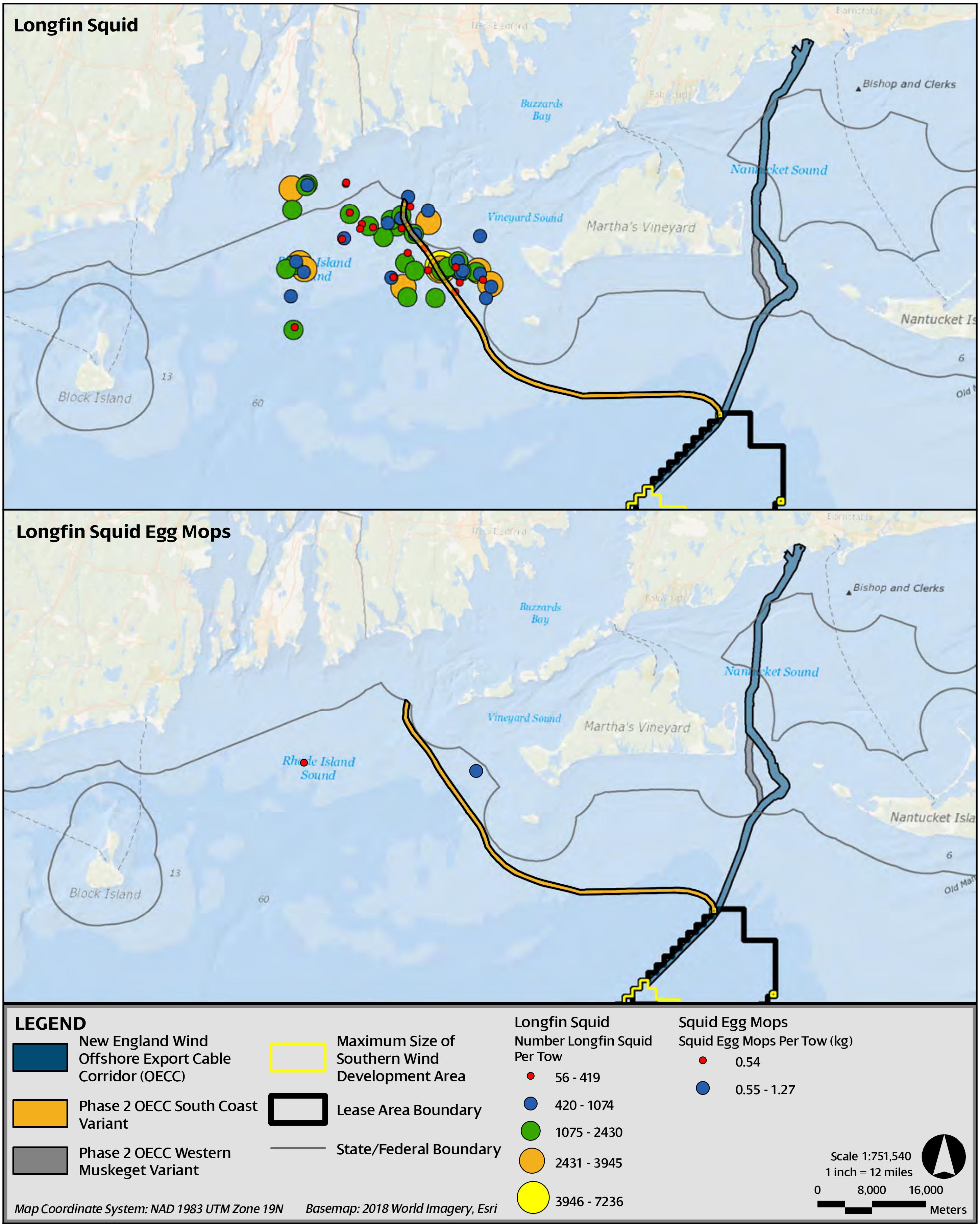


Figure 2.6-10

Longfin Squid and Northern Shortfin Squid Catch Data from NEAMAP Bottom Trawl Spring Surveys 2010-2021 (NEAMAP 2022)



New England Wind

Figure 2.6-11

Longfin Squid and Egg Mop Catch Data from NEAMAP Bottom Trawl Fall Surveys 2010-2021 (NEAMAP 2022) anchoring, the potential dredging of the tops of sand waves in certain locations, the potential for limited vessel grounding in the nearshore, and the limited use of jack-up vessels for cable splicing. The maximum estimated area within the South Coast Variant for temporary and long-term benthic habitat impacts and approximate total seafloor impacts are presented in Table 1.2-1.

2.6.2.2 Suspended Sediments

Section 6.6 of COP Volume III provides an assessment of potential impacts from suspended sediments associated with the OECC and discusses the 10 mg/L and 100 mg/L thresholds used for impact assessment. Additional sediment dispersion modeling (COP Addendum Appendix B) of cable installation in the South Coast Variant indicated that concentrations of suspended sediments above 10 mg/L extended up to a maximum of 0.9 km (0.5 NM) from the cable centerline. Most of the sediment settled out in less than three hours, with only a small area (0.2 km^2) remaining above the 10 mg/L threshold at the three-hour mark. All sediments settle out of suspension within six hours; thus concentrations over the short duration do not exceed the potential lethal or sublethal impact thresholds for fish and invertebrates.

2.6.2.3 Sediment Deposition

Section 6.6 of COP Volume III provides an assessment of potential impacts from sediment deposition associated with the OECC and discusses the 1 mm (0.04 in) threshold for demersal eggs and 20 mm (0.8 in) threshold for shellfish used for impact assessment. Additional modeling (COP Addendum Appendix B) of cable installation in the South Coast Variant indicated that deposition of 1 mm (0.04 in) or greater (i.e., the threshold of concern for demersal eggs) was constrained to within 200 m (656 ft) from the route centerline. There was no deposition at or above 5 mm; thus, no impact is expected for shellfish. At these deposition amounts, there are limited areas with potential temporary or permanent negative impacts to the hard-bottom habitats and associated sessile or immobile species or life stages.

2.6.2.4 Water Withdrawals

Direct mortality of planktonic life stages could potentially occur via water withdrawals for cable installation and dredging vessels during construction of the South Coast Variant. Mortality of organisms entrained in water withdrawal pumps is expected to be 100% because of the physical stresses associated with being flushed through a pump system and potential temperature changes (USDOE MMS 2009). The BOEM DEIS (2018) for Vineyard Wind 1 determined that impacts from entrainment of finfish and invertebrates and their planktonic stages during construction would be moderate but would not have population-level effects. Water withdrawals for installation of up to three offshore export cables within the South Coast Variant can be estimated using the following assumptions:

- Cable installation occurs at a rate of up to 120 m/hr (394 ft/hr). The final installation speed will be specific to the contractor and cable installation equipment and may be different than listed here. A speed of 120 m/hr (394 ft/hr) is used to provide a general estimate of water usage.

- A jetting technique uses 11,300–45,000 liters per minute (3,000–12,000 gallons per minute) of water

- The maximum total length of offshore export cables for the South Coast Variant (from the SWDA boundary to the state waters boundary) is 362 km (196 NM).

Under these assumptions, water withdrawal volumes for the installation of three cables within the South Coast Variant are expected to be approximately 2.1–8.2 billion liters (0.6–2.2 billion gallons).

2.6.2.5 Avoidance, Minimization, and Mitigation Measures

Offshore export cable installation will avoid important habitats such as eelgrass beds and hard bottom sediments where feasible. Impacts may be minimized using mid-line buoys that are designed to minimize seabed impacts from cable sweep, if feasible and safe, and installation equipment that further minimizes installation impacts on the seabed.

The Proponent is committed to fisheries science and research as it relates to offshore wind energy development. Working with SMAST, the Proponent is already collecting pre-construction fisheries data (via trawl and drop camera surveys) within New England Wind. The results of ongoing fisheries studies are published on the Proponent's website at the following link: www.parkcitywind.com/fisheries. The Proponent plans to develop a framework for during and post-construction fisheries studies within New England Wind. In recognition of the regional nature of fisheries science, the Proponent expects that such studies during and post-construction will involve coordination with other offshore wind energy developers in the MA WEA and RI/MA WEA. The Proponent also expects the development of the fisheries studies will be undertaken in coordination with BOEM, agencies, fisheries stakeholders, academic institutions, and other stakeholders. The Proponent is already engaging in collaboration with other developers, fishing industry representatives, and state and federal agencies through its participation in the Responsible Offshore Science Alliance and a Regional Wildlife Science Entity.

2.7 Cultural, Historical, and Archaeological Resources

2.7.1 Terrestrial Archaeology

An archaeological review was performed in order to provide information on known cultural resources within the Phase 2 South Coast Variant onshore routing envelope (see Appendix D).

2.7.2 Marine Archaeology

A marine archaeological resources assessment (MARA) was conducted for the South Coast Variant and is included as Appendix E. Gradiometer, side-scan sonar, bathymetry, seismic, sub-bottom profiler, and vibracore data were reviewed to assess the presence or absence of potential submerged cultural resources within the preliminary area of potential effects (PAPE). [redacted] Avoidance is recommended for each of these features located within the PAPE during bottom-disturbing activities for New England Wind to the extent feasible. If avoidance of these features is not possible, further geotechnical investigations may be warranted to better characterize their full archaeological sensitivity. Potential mitigation measures for unavoidable impacts are provided in Appendix O of the MARA for the OECC included in Volume II-D of the COP.

2.8 Commercial Fisheries and For-Hire Recreational Fishing

The maximum design scenario for commercial fisheries and for-hire recreational fishing considers temporary impacts from the installation of up to three cables within the South Coast Variant. The following sections focus on commercial fishing activities in and around the South Coast Variant and potential impacts from the South Coast Variant from construction activities. Impacts associated with the South Coast Variant are expected to be similar to those of the OECC (including the Western Muskeget Variant) assessed in Section 7.6 and Appendix III-N of COP Volume III. See Section 7.6.4 of COP Volume III for a description of for-hire recreational fishing in the Offshore Development Region and potential impacts that are associated with the OECC and its variants.

2.8.1 Baseline Commercial Fishing Activity in and around the South Coast Variant

Maps of commercial fishing activity based on vessel monitoring system (VMS) data and vessel trip reports (VTRs) developed by the Northeast Regional Ocean Council (NROC) and the Mid-Atlantic Council on the Ocean (MARCO) were used to characterize the relative intensity of commercial fishing activities in and around the South Coast Variant (NROC 2009; MARCO 2016; Fontenault 2018). For additional information on VMS and VTR data, as well as the maps produced through the NROC and MARCO data portals, see Sections 7.6.2.1 and 7.6.2.2 of COP Volume III. See Section 7.6.1 of COP Volume III for an overview of fishing fleets, fishing ports, fishing activity, and the value of commercial landings in each state within the Offshore Development Region.[4]

Figures 2.8-1 through 2.8-6 depict a standardized density of commercial fishing vessel activity within the groundfish, monkfish, herring, scallop, surf clam/ocean quahog, and squid fisheries in the northeast and mid-Atlantic regions of the US based on VMS data for the years 2015 to 2016. Vessels targeting groundfish, monkfish, scallops, surf clam/ocean quahog, and herring appear to be deploying gear in limited areas of the South Coast Variant during the years analyzed (Figures 2.8-1, 2.8-2, 2.8-3, and 2.8-6). Squid vessels appear active along the South Coast Variant near the northern boundary of Lease Area OCS-A 0501 and where the South Coast Variant reaches the state waters boundary (Figure 2.8-5).

Figures 2.8-7 through 2.8-12 are VTR-based maps depicting the bottom trawl, dredge, gillnet, longline, and pots and traps fisheries (excluding lobster) for 2011 to 2015. During the years analyzed, low fishing effort by small and large bottom trawl vessels and gillnet vessels occurs along portions of the South Coast Variant (see Figures 2.8-7, 2.8-8, and 2.8-10). There were no fishing vessels deploying dredge or longline gear within the South Coast Variant (see Figures 2.8-9 and 2.8-11) and there were limited areas of low fishing effort by vessels deploying pots and traps along the South Coast Variant (Figure 2.8-12).

2.8.2 Potential Impacts of the South Coast Variant

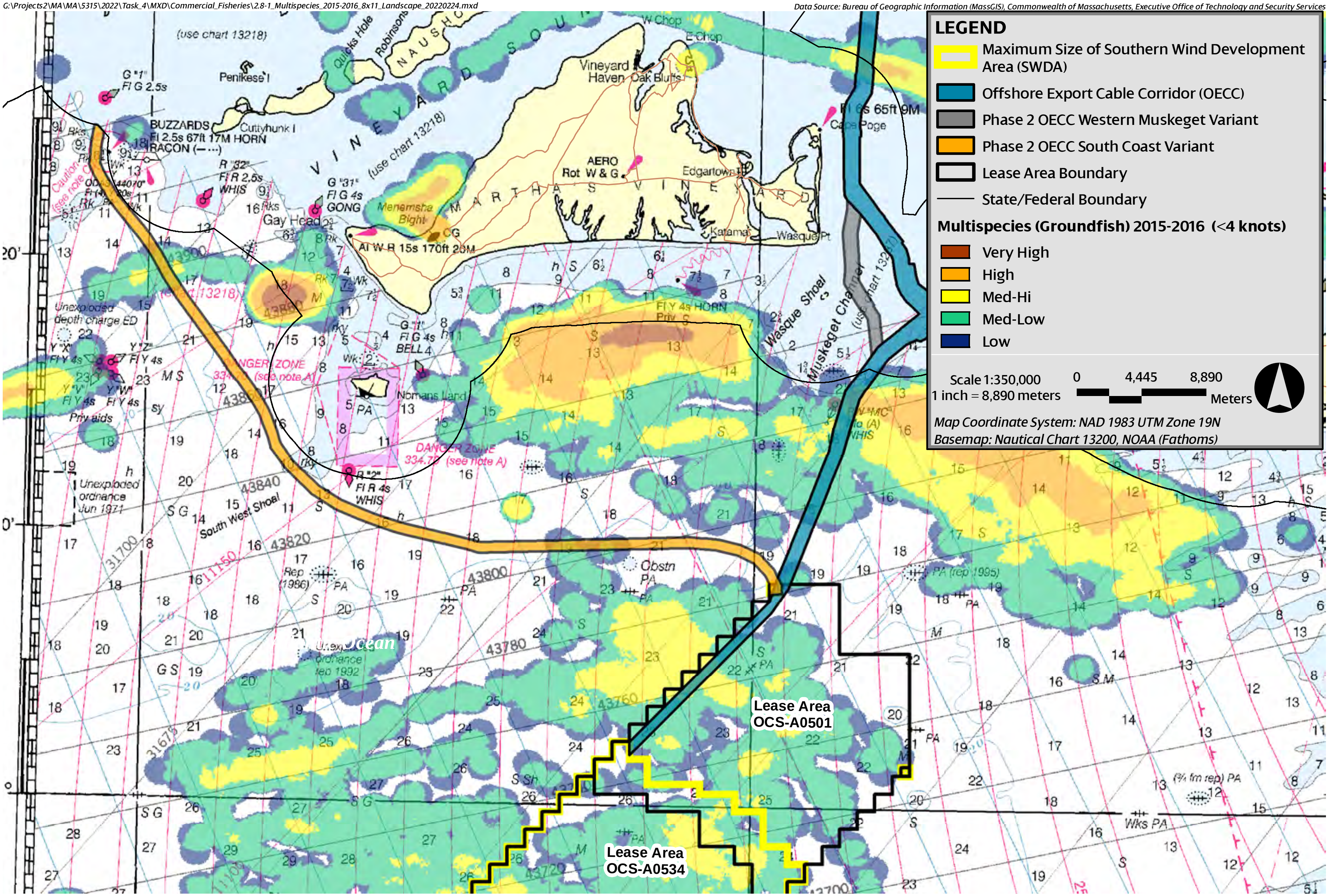
See Section 7.6.3 of COP Volume III for an overview of general potential impacts to commercial fisheries from construction and installation, operations and maintenance, and decommissioning of the OECC and its variants, including the South Coast Variant.

During construction, it is expected that commercial fishing will be restricted only in the 3.14 km^2 temporary safety buffer zone established around where cable installation activities are taking place. Based on fishing revenue intensity data generated by BOEM and NOAA Fisheries for years 2007-2018, annual fishing revenue intensities in the South Coast Variant area average $2,621 per km^2 (2019 dollars; BOEM 2020). The economic exposure in the South Coast Variant is estimated to be $9,259 during approximately 13.5 months of cable installation based on the maximum design scenario of three cables installed in the South Coast Variant. If only one or two cables are installed, the economic exposure would be approximately $3,086 during 4.5 months of cable installation for one cable or approximately $6,172 during 9 months of cable installation for two cables. See COP Addendum Appendix F for additional details on the economic exposure analysis for the South Coast Variant.

[4] Commercial and for-hire recreational fishing are vital economic activities that take place in both state and federal waters off the south coast of Massachusetts, Cape Cod and the Islands; off the coast of Rhode Island, Connecticut, and the eastern Long Island region of New York; and off the coast of New Jersey. For purposes of describing commercial and for-hire regional fisheries and assessing potential fishery-related economic impacts of New England Wind, this area is referred to as the "Offshore Development Region."

G:\Projects2\MA\MA\5315\2022\Task_4\MXD\Commercial_Fisheries\2.8-1_Multispecies_2015-2016_8x11_Landscape_20220224.mxd

Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services



New England Wind

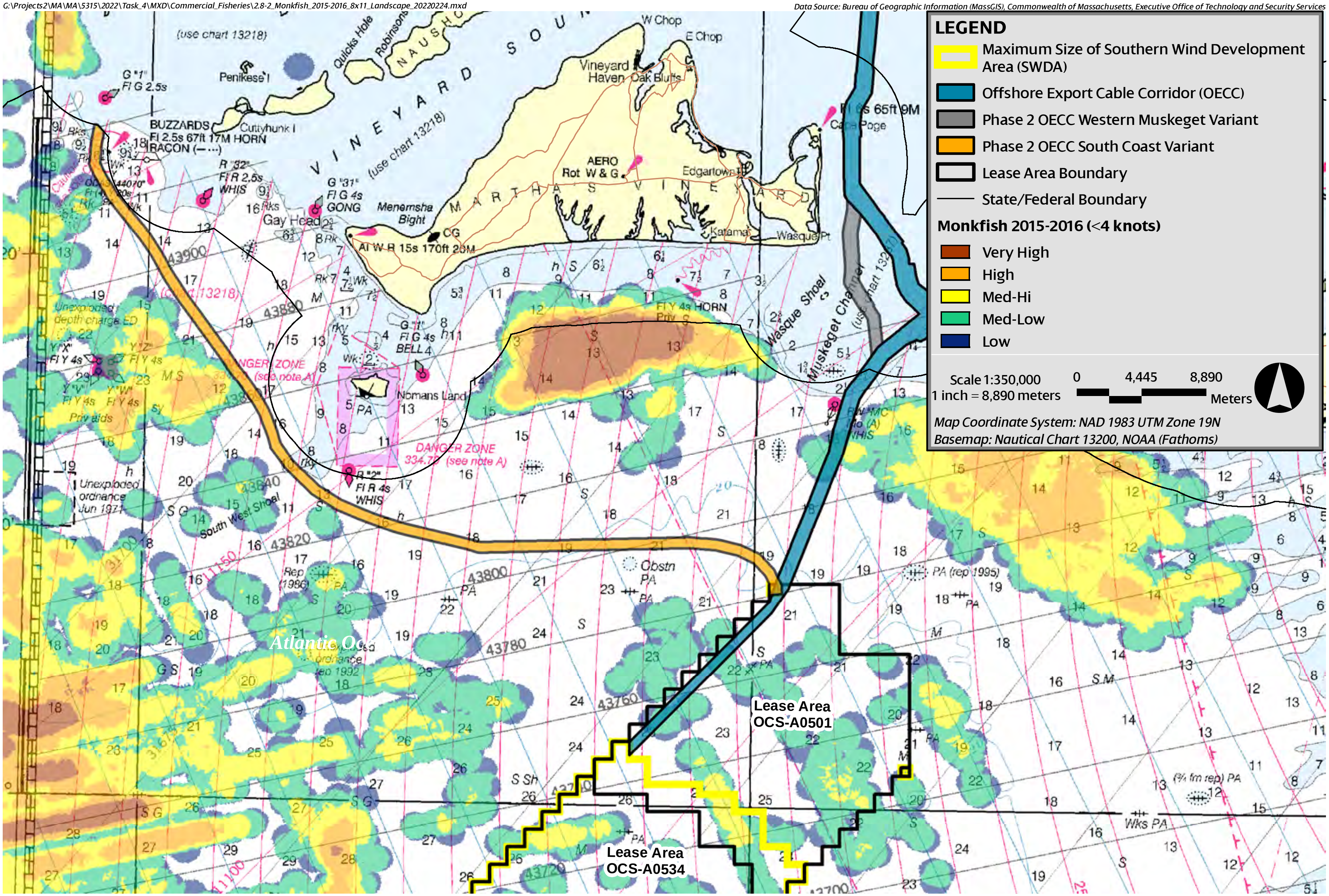
AVANGRID RENEWABLES

Figure 2.8-1

(VMS) Northeast Multispecies 2015-2016 (<4 knots) Commercial Fishing Density

G:\Projects2\MA\MA\5315\2022\Task_4\MXD\Commercial_Fisheries\2.8-2_Monkfish_2015-2016_8x11_Landscape_20220224.mxd

Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services



New England Wind

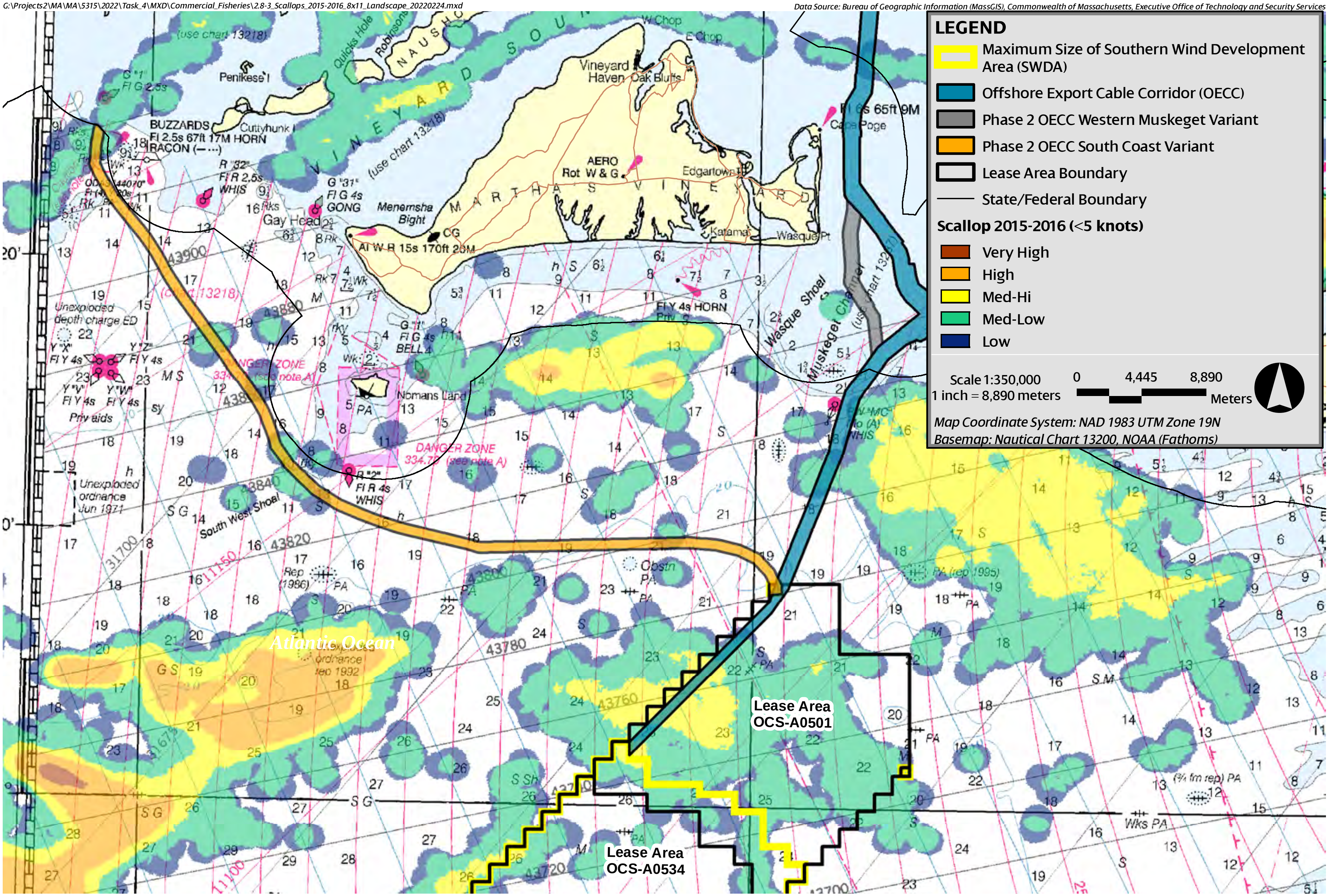
AVANGRID RENEWABLES

Figure 2.8-2

(VMS) Monkfish 2015-2016 (<4 knots) Commercial Fishing Density

G:\Projects2\MA\MA\5315\2022\Task_4\MXD\Commercial_Fisheries\2.8-3_Scallops_2015-2016_8x11_Landscape_20220224.mxd

Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services



New England Wind

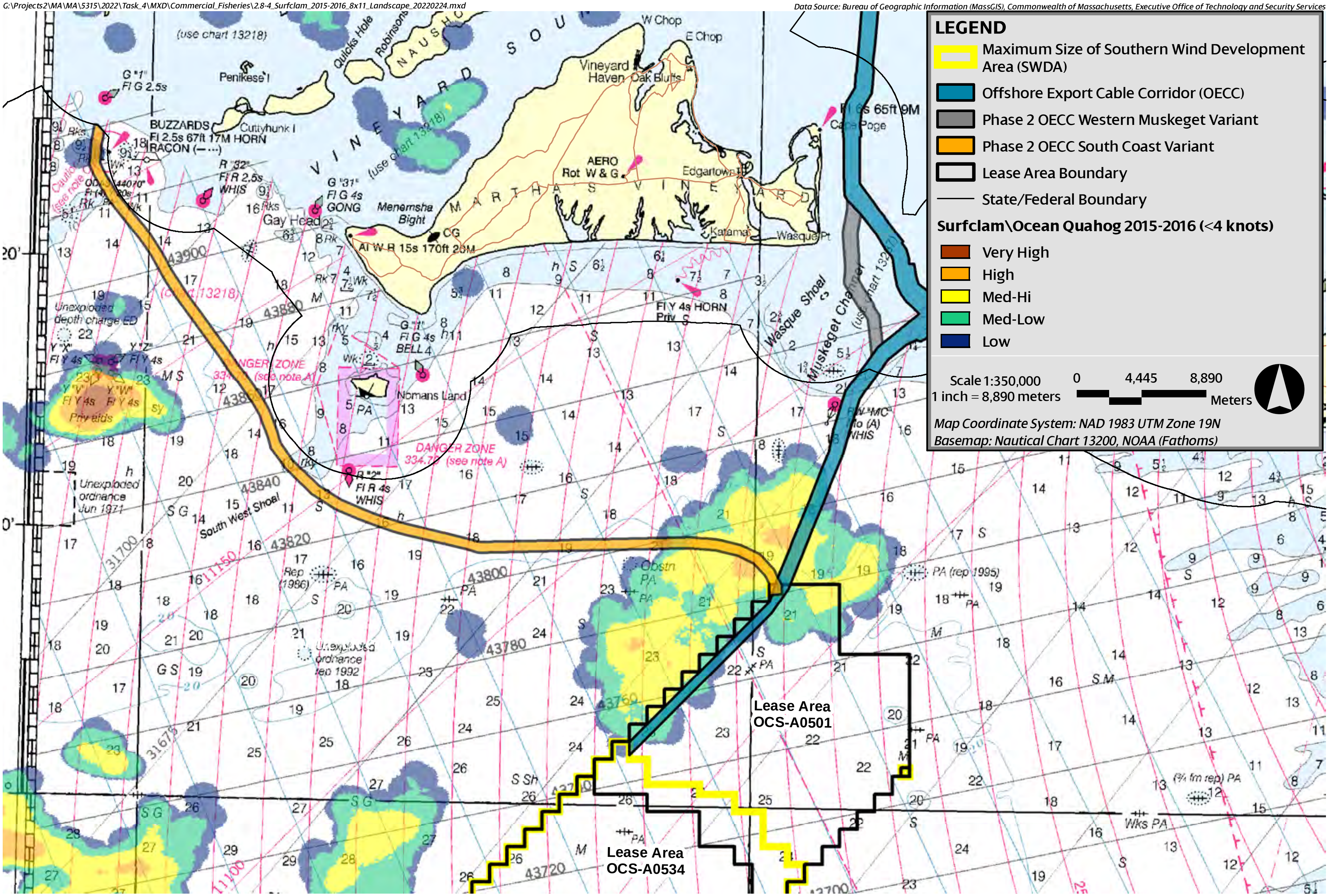
AVANGRID RENEWABLES

Figure 2.8-3

(VMS) Scallop 2015-2016 (<5 knots) Commercial Fishing Density

G:\Projects2\MA\MA\5315\2022\Task_4\MXD\Commercial_Fisheries\2.8-4_Surfclam_2015-2016_8x11_Landscape_20220224.mxd

Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services



New England Wind

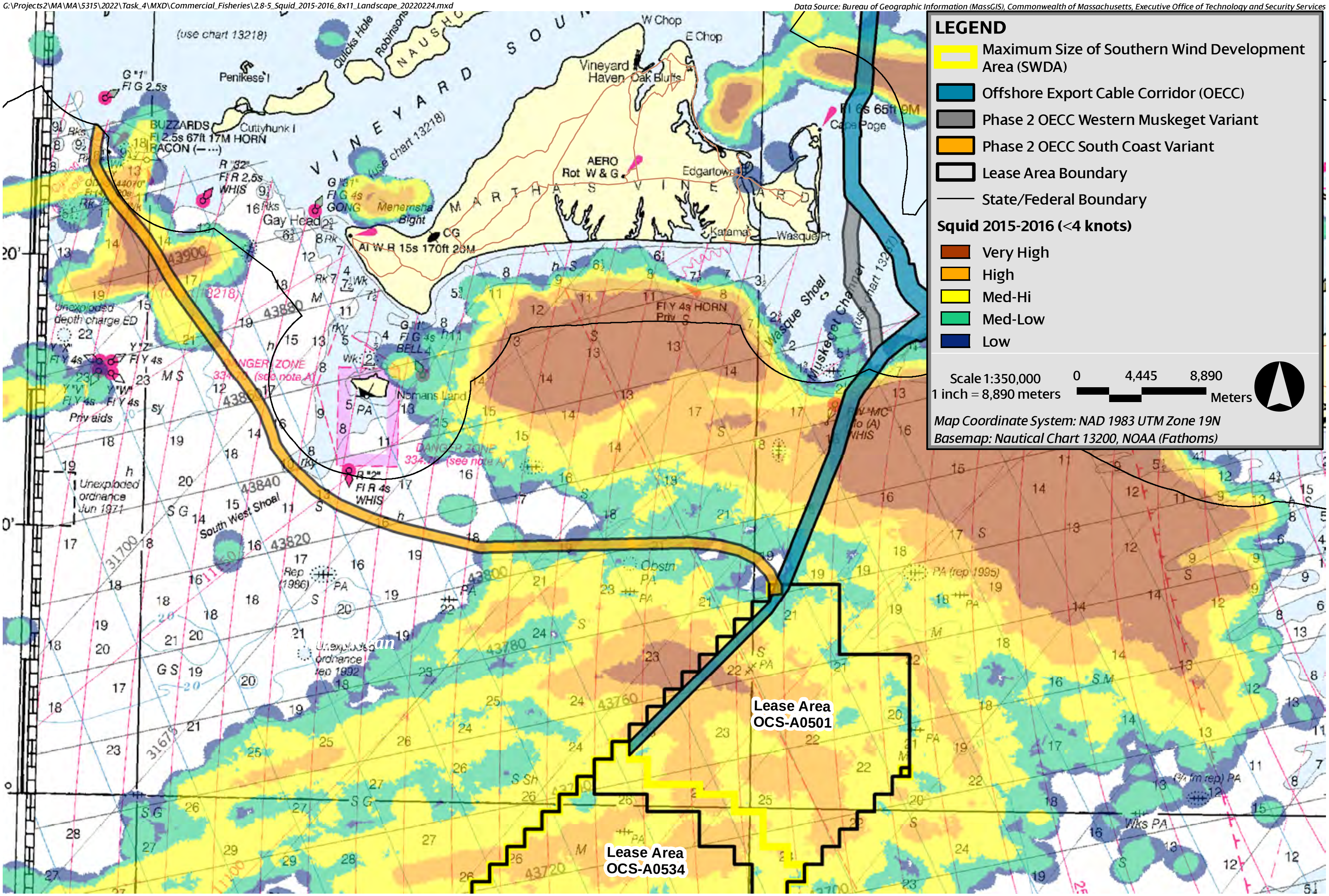
AVANGRID RENEWABLES

Figure 2.8-4

(VMS) Surfclam/Ocean Quahog 2015-2016 (<4 knots) Commercial Fishing Density

G:\Projects2\MA\MA\5315\2022\Task_4\MXD\Commercial_Fisheries\2.8-5_Squid_2015-2016_8x11_Landscape_20220224.mxd

Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services



New England Wind

AVANGRID RENEWABLES

Figure 2.8-5

(VMS) Squid 2015-2016 (<4 knots) Commercial Fishing Density

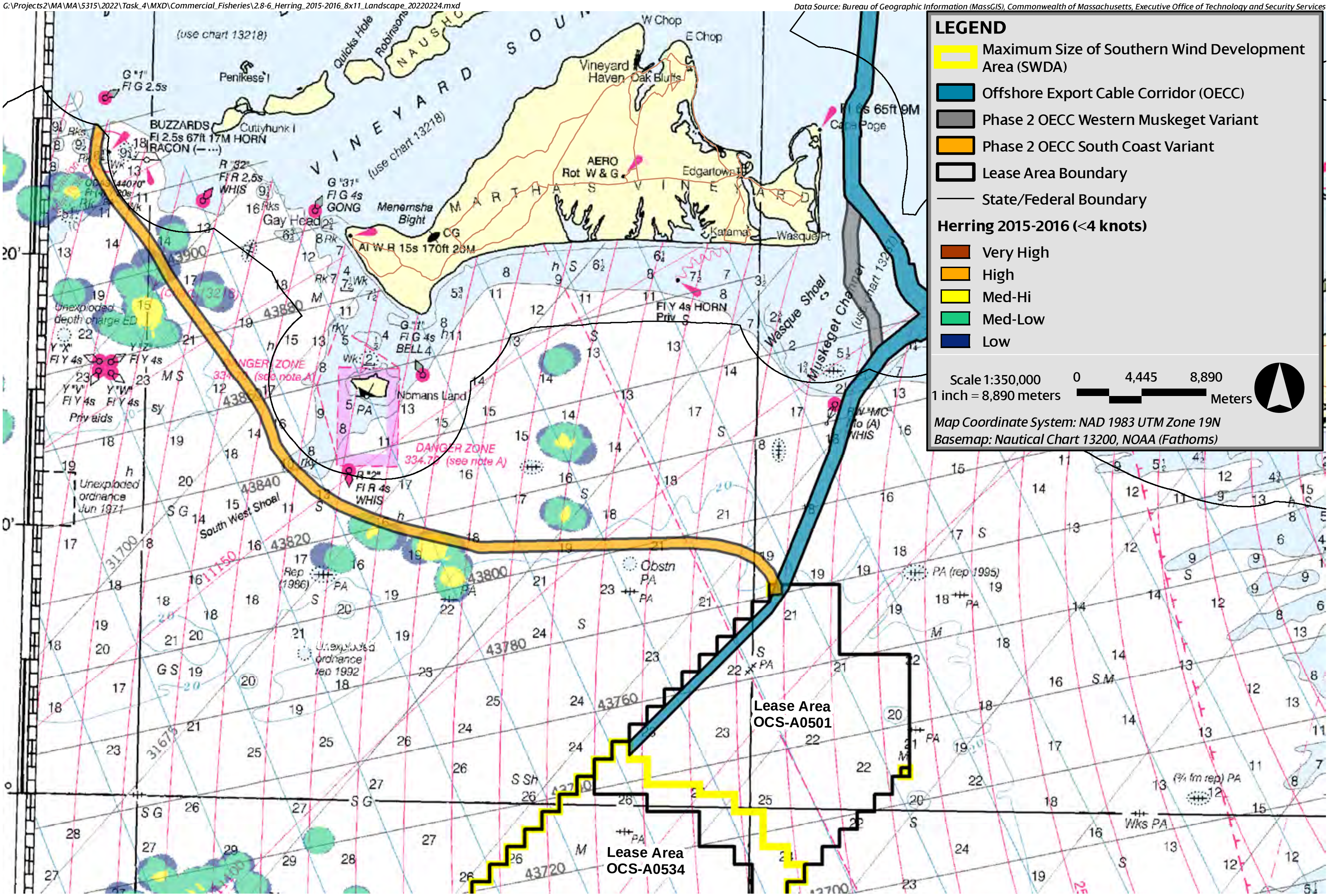
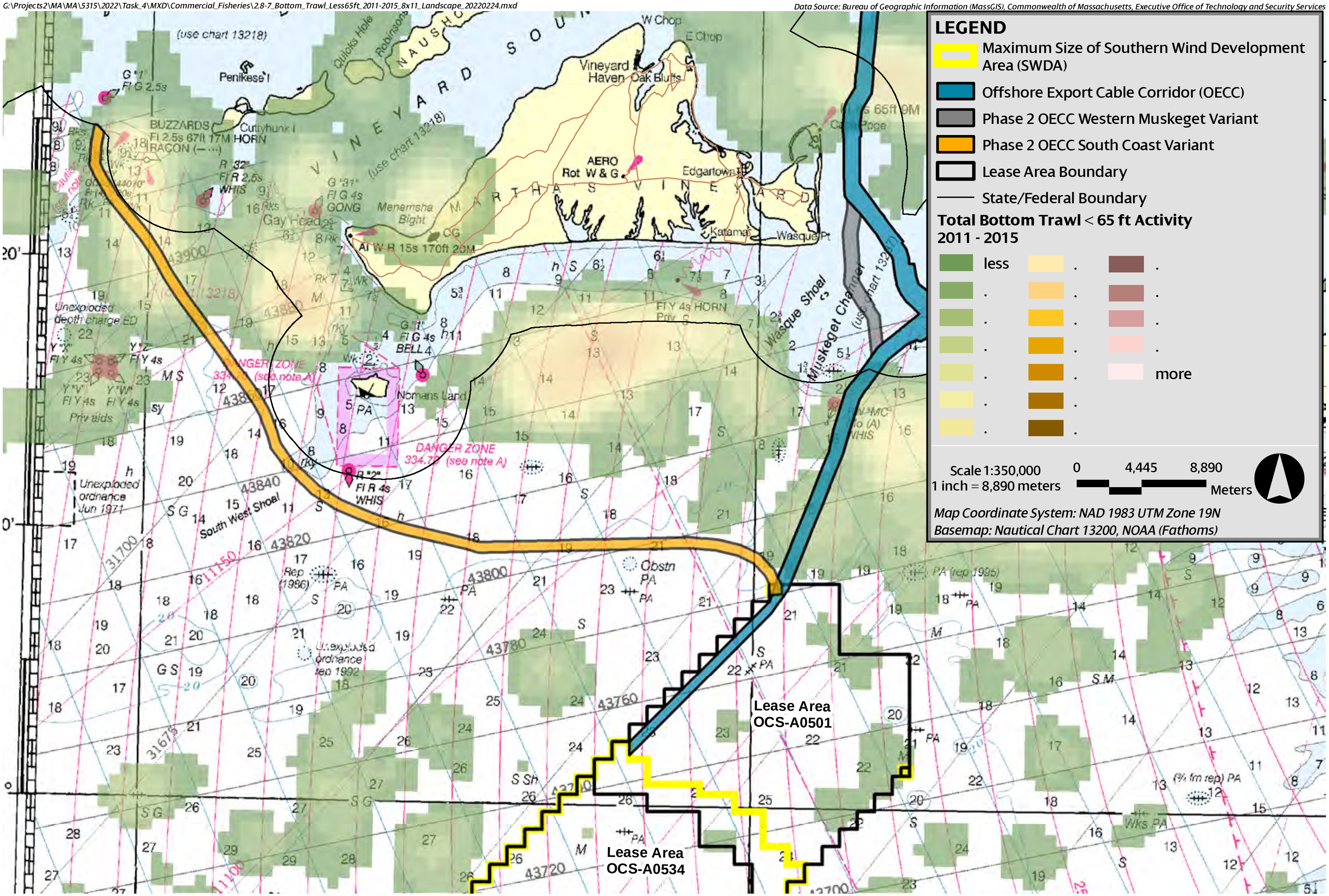


Figure 2.8-6

(VMS) Herring 2015-2016 (<4 knots) Commercial Fishing Density

Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services



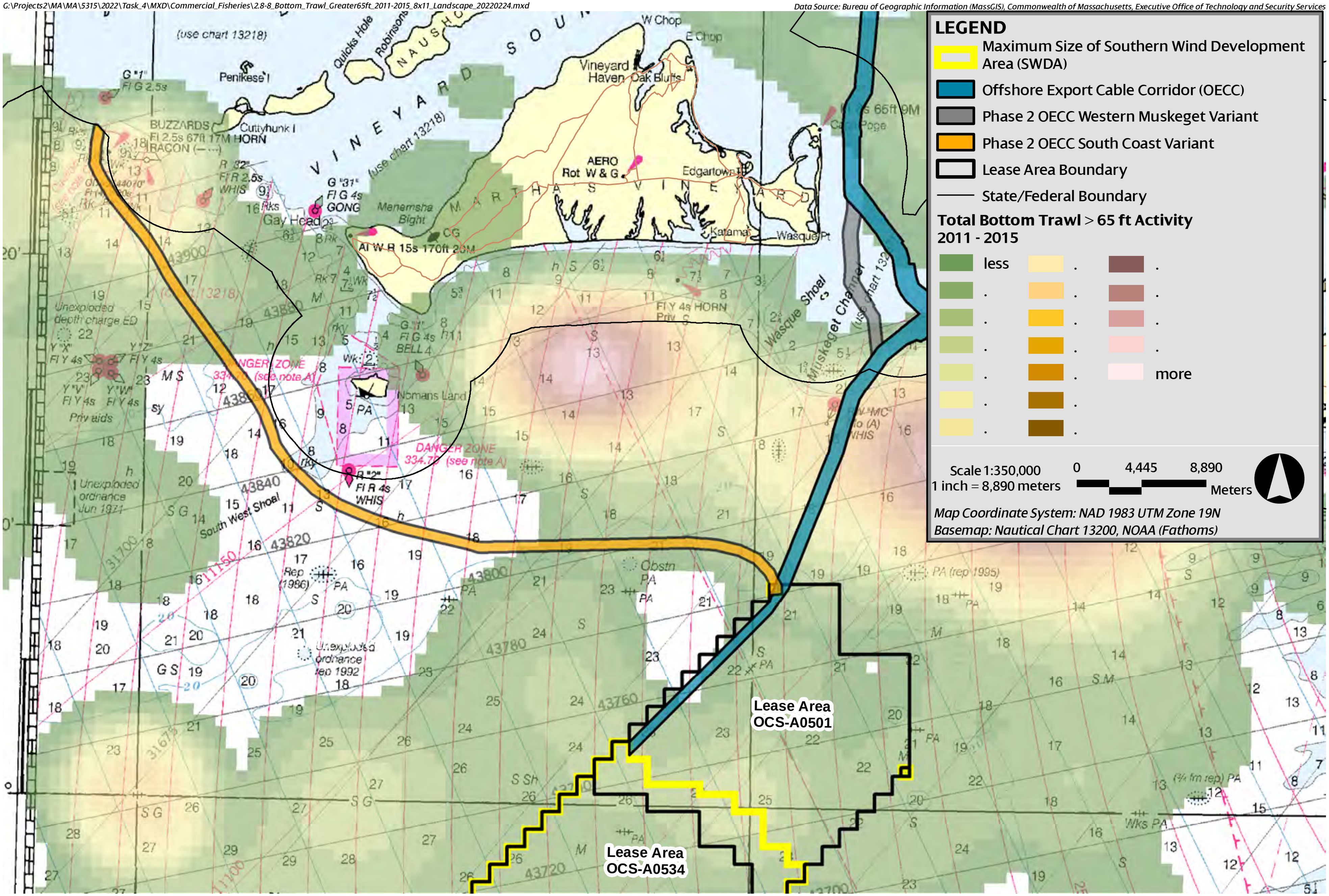
New England Wind

Figure 2.8-7

(VTR) Bottom Trawl (Vessels <65 ft.) 2011 - 2015

G:\Projects2\MA\MA\5315\2022\Task_4\MXD\Commercial_Fisheries\2.8-8_Bottom_Trawl_Greater65ft_2011-2015_8x11_Landscape_20220224.mxd

Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services



New England Wind

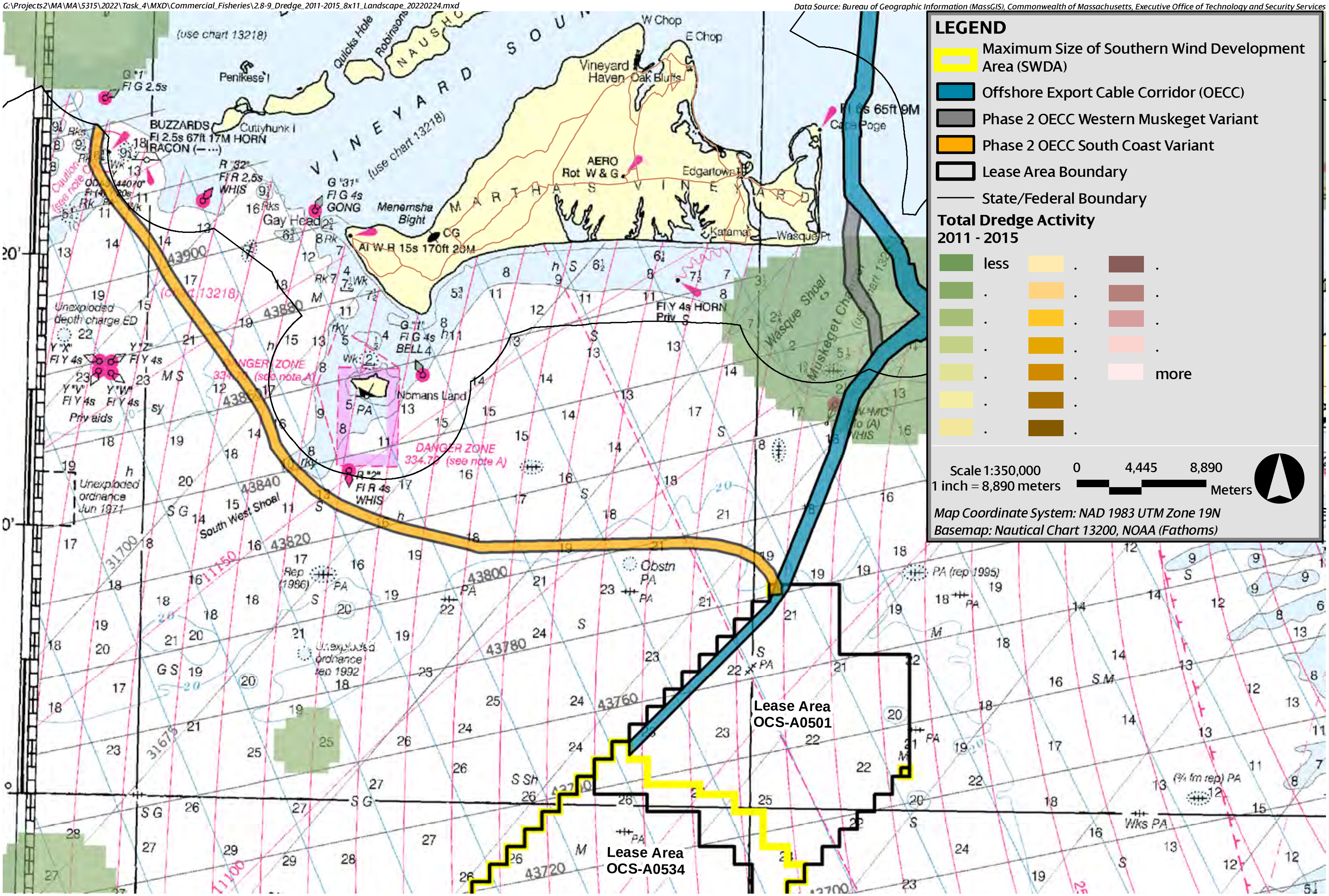
AVANGRID RENEWABLES

Figure 2.8-8

(VTR) Bottom Trawl (Vessel >65 ft.) 2011 - 2015

G:\Projects2\MA\MA\5315\2022\Task_4\MXD\Commercial_Fisheries\2.8-9_Dredge_2011-2015_8x11_Landscape_20220224.mxd

Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services



New England Wind

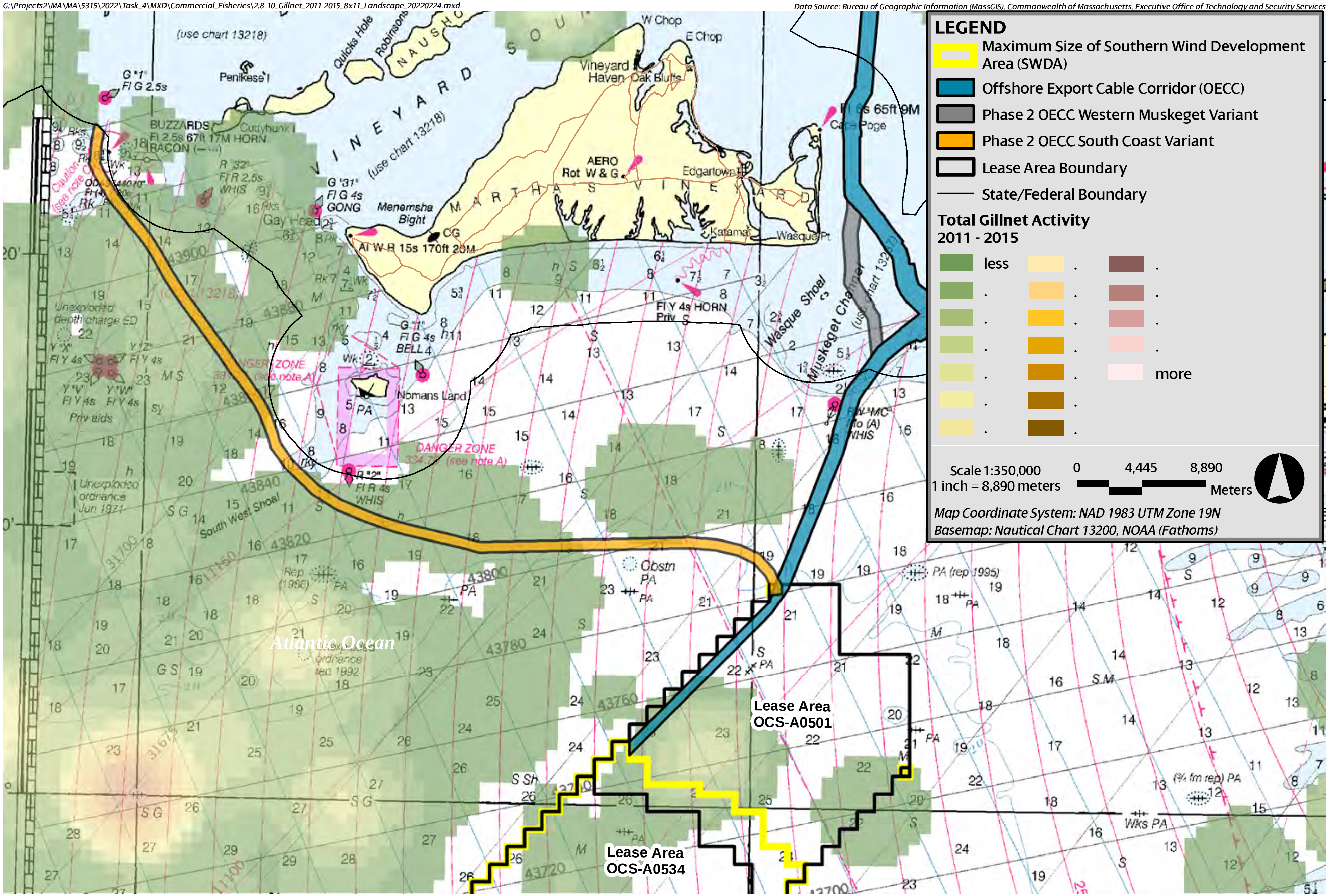
AVANGRID RENEWABLES

Figure 2.8-9

(VTR) Dredge 2011 – 2015

G:\Projects2\MA\MA\5315\2022\Task_4\MXD\Commercial_Fisheries\2.8-10_Gillnet_2011-2015_8x11_Landscape_20220224.mxd

Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services



New England Wind

Figure 2.8-10

(VTR) Gillnet 2011 – 2015

G:\Projects2\MA\MA\5315\2022\Task_4\MXD\Commercial_Fisheries\2.8-11_Longline_2011-2015_8x11_Landscape_20220224.mxd

Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services

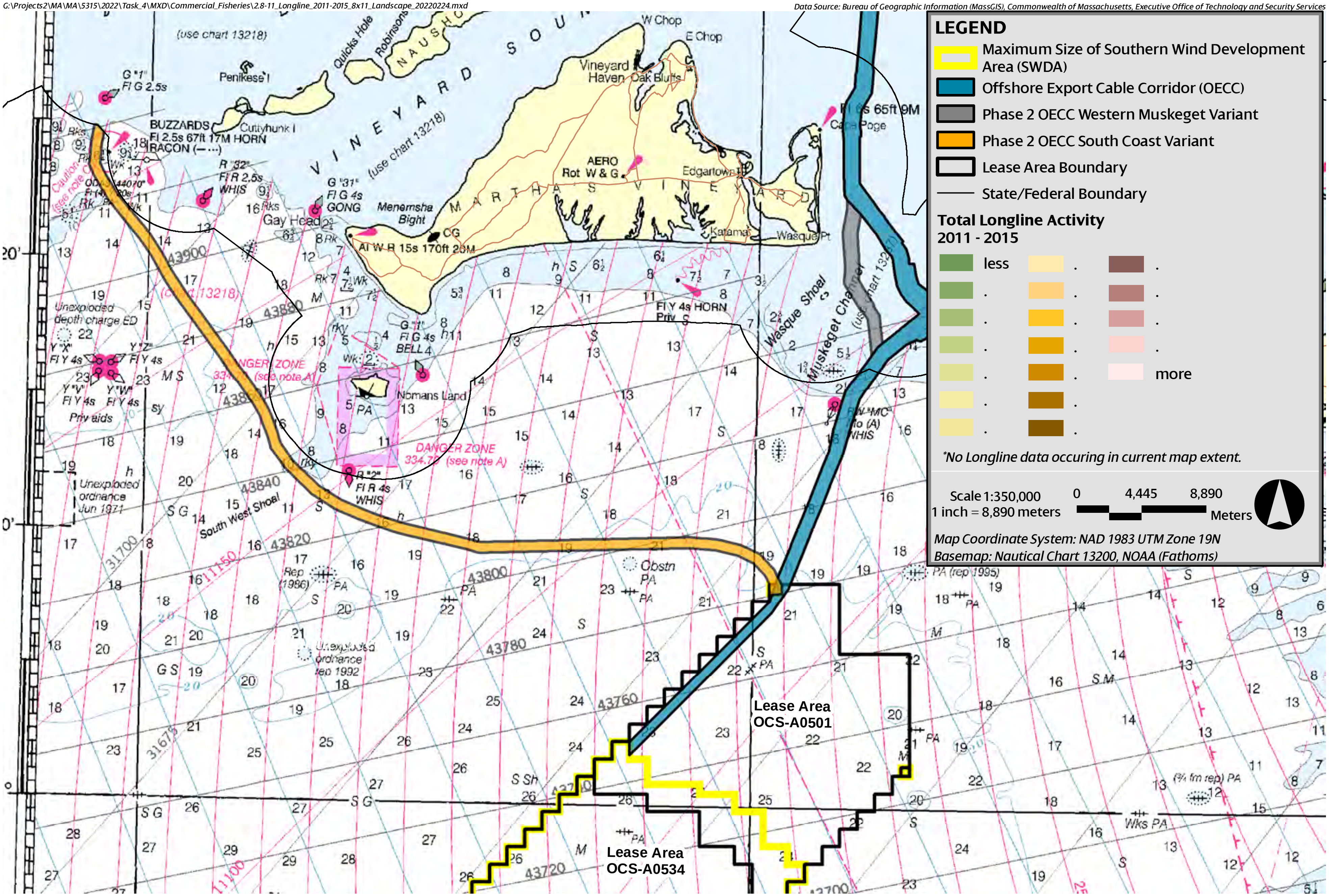
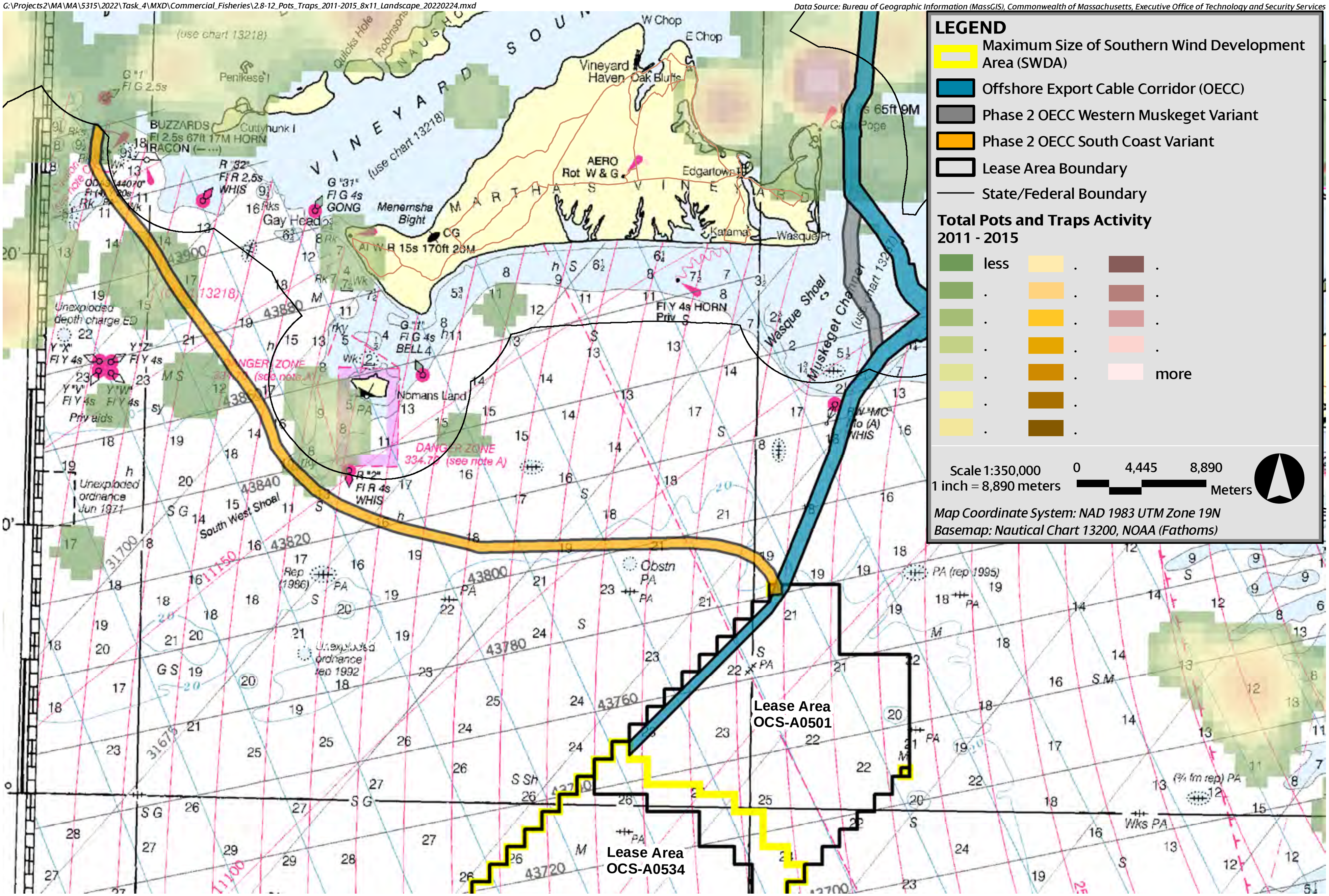


Figure 2.8-11

(VTR) Longline 2011 – 2015

Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services



New England Wind

Figure 2.8-12

(VTR) Pots and Traps 2011 – 2015

The offshore export cables will have a target burial depth of 1.5 to 2.5 m (5 to 8 ft) below the seafloor, which the Proponent's engineers have determined is more than twice the burial depth required to protect the cables and prevent them from interfering with commercial fishing operations. While the Proponent will make every effort to achieve that target burial depth, it is conservatively estimated that bottom conditions may prevent achieving proper cable burial depth along up to approximately 8% of the South Coast Variant (from the SWDA boundary to the state waters boundary), which may require cable protection to be installed on the seafloor. Cable protection will be designed to minimize potential impacts to bottom fishing gear to the maximum extent practicable, and fishermen will be informed about where cable protection has been used. For details on communications with fishermen, see the Fisheries Communication Plan (Appendix III-E of COP Volume III).

During O&M of New England Wind, there will be a possibility that mobile bottom fishing gear, such as bottom trawl nets, could snag on cable protection resulting in gear and/or vessel damage, personal injuries, and lost catches and fishing time. The Proponent expects to establish a gear loss/damage protocol that will compensate fishermen for economic losses associated with incidents involving cable protection if and when they occur. Additional avoidance, minimization, and mitigation measures are summarized in Section 7.6 of COP Volume III.

2.9 Navigation and Vessel Traffic

Existing vessel traffic along the South Coast Variant is described in the Vessel Crossing Analysis provided as Appendix G. See Section 7.8 of COP Volume III for a description of New England Wind activities that may affect navigation and vessel traffic within the Offshore Development Region, including the South Coast Variant, and a detailed Navigation Safety Risk Assessment is provided as Appendix III-I of COP Volume III.

2.10 Other Uses

As described in Section 7.9.1.3 of COP Volume III, several other offshore wind projects are currently planned for the Massachusetts Wind Energy Area (MA WEA) and the Rhode Island/Massachusetts Wind Energy Area (RI/MA WEA). Mayflower Wind is the only other project with publicly-announced plans to install offshore cables within the vicinity of the South Coast Variant. Based on a review of publicly-available information, Mayflower Wind currently plans to install an export cable corridor that traverses from Lease Area OCS-A 0521 and follows a similar route as the South Coast Variant in federal waters to a landfall site at Brayton Point in Somerset, Massachusetts. The Proponent and Mayflower Wind are coordinating on cable routes and any required cable crossings. For information on other uses that may be affected by New England Wind, see Section 7.9 of COP Volume III.

Section 3.0

References

3.0 REFERENCES

Section 2.4

[NHESP] C.S. Mostello. 2015. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife, Common Tern. https://www.mass.gov/doc/common-tern/download

Section 2.5

Bureau of Ocean Energy Management [BOEM]. 2018. Vineyard Wind offshore wind energy project Draft Environmental Impact Statement. BOEM. OCS EIS/EA BOEM 2018-060. US Department of the Interior, Bureau of Ocean Energy Management, Headquarters, Herndon, VA. https://www.boem.gov/Vineyard-Wind-EIS/

Anderson, M. G., Greene, J., Morse, D., Shumway, D. and Clark, M. 2010. Benthic Habitats of the Northwest Atlantic in Greene, J.K., M.G. Anderson, J. Odell, and N. Steinberg, eds. The Northwest Atlantic Marine Ecoregional Assessment: Species, Habitats and Ecosystems. Phase One. The Nature Conservancy, Eastern U.S. Division, Boston, MA.

Dernie KM, Kaiser MJ, Warwick RM. 2003. Recovery rates of benthic communities following physical disturbance. J Anim Ecol. 72(6):1043-1056.

Federal Geographic Data Committee (FGDC). 2012. Coastal and Marine Ecological Classification Standard, June 2012. FGDC-STD-018-2012. 353 pp. Fugro. 2022. Vineyard Wind LLC. New England Wind 534 ECC Benthic Survey Factual Report. Doc no. 21020084-1.

Fugro. 2022. Vineyard Wind LLC. New England Wind 534 ECC Benthic Survey Factual Report. Doc no. 21020084-1.

Guida V, Drohan A, Welch H, McHenry J, Johnson D, Kentner V, Brink J, Timmons D, Estela-Gomez E. 2017. Habitat mapping and assessment of northeast Wind Energy Areas. Sterling, VA: US Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2017-088. 312 p.

Northeast Ocean Data Portal (NEODP). Northeast Ocean Data: Maps and Data for Ocean Planning in the Northeastern United States. 2022. Available from http://www.northeastoceandata.org/data-explorer/

National Oceanic and Atmospheric Administration [NOAA]. 2021. NOAA Deep-Sea Coral and Sponge Data Portal. https://deepseacoraldata.noaa.gov/

Northeast Fisheries Science Center [NEFSC]. 2022. Fall Bottom Trawl Survey. https://www.fisheries.noaa.gov/inport/item/22560

United States Department of Energy, Minerals Management Service [USDOE MMS]. 2009. Final Environmental Impact Statement for the proposed Cape Wind Energy Project, Nantucket Sound, Massachusetts (adopted). DOE. DOE/EIS-0470. https://www.boem.gov/Cape-Wind-FEIS/

United States Geological Survey [USGS]. 2015. An introduction to NOAA's national database for deep-sea corals and sponges.

United States Geological Survey [USGS]. 2005. U.S. Geological Survey East-Coast Sediment Texture Database. http://woodshole.er.usgs.gov/project-pages/sediment/

Van Dalfsen JA, Essink K. 2001. Benthic community response to sand dredging and shoreface nourishment in Dutch coastal waters. *Senckenbergiana marit*. 31(2):329-332.

Wentworth, C. K. 1922. A scale of grade and class terms for clastic sediments. The journal of geology, 30(5), 377-392.

Section 2.6

Bureau of Ocean Energy Management [BOEM]. 2018. Vineyard Wind offshore wind energy project Draft Environmental Impact Statement. BOEM. OCS EIS/EA BOEM 2018-060. US Department of the Interior, Bureau of Ocean Energy Management, Headquarters, Herndon, VA. https://www.boem.gov/Vineyard-Wind-EIS/

Fugro. 2022. Vineyard Wind LLC. New England Wind 534 ECC Benthic Survey Factual Report. Doc no. 21020084-1.

MacArthur R. 1955. Fluctuations of Animal Populations and a Measure of Community Stability. Ecol. 36: 533–536.

Northeast Ocean Data Portal [NEODP] [Internet]. Northeast Ocean Data: Maps and Data for Ocean Planning in the Northeastern United States. 2022. Available from http://www.northeastoceandata.org/data-explorer/.

School for Marine Science and Technology [SMAST][Internet]. 2016. SMAST Benthic Survey Pyramid Study. Available from: http://www.northeastoceandata.org/files/metadata/Themes/Habitat/AveragePresenceAbundanceSMAST.pdf.

United States Department of Energy, Minerals Management Service [USDOE MMS]. 2009. Final Environmental Impact Statement for the proposed Cape Wind Energy Project, Nantucket Sound, Massachusetts (adopted). DOE. DOE/EIS-0470. https://www.boem.gov/Cape-Wind-FEIS/

VIMS Multispecies Research Group Northeast Area Monitoring and Assessment Program (NEAMAP). 2022. Personal Communication.

Section 2.8

[BOEM] Bureau of Ocean Energy Management. 2020. Renewable energy GIS data: Socio-economic impact of Outer Continental Shelf wind energy development on fishing in the U.S. Atlantic. https://www.boem.gov/renewable-energy/mapping-and-data/renewable-energy-gis-data

Fontenault J. 2018. Vessel Monitoring Systems (VMS) commercial fishing density Northeast and Mid-Atlantic Regions. https://www.northeastoceandata.org/files/metadata/Themes/CommercialFishing/VMSCommercialFishingDensity.pdf

Kirkpatrick AJ, Benjamin S, DePiper GD, Murphy T, Steinback S, Demarest C. 2017. Socio-economic impact of outer continental shelf wind energy development on fisheries in the U.S. Atlantic, Vol. I – Report Narrative. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Atlantic OCS Region. Washington, D.C. OCS Study BOEM 2017-012. Volume I: https://espis.boem.gov/final%20reports/5580.pdf Volume II: https://espis.boem.gov/final%20reports/5581.pdf

[MARCO] Mid-Atlantic Council on the Ocean. 2016. Mid-Atlantic Ocean Data Portal. https://portal.midatlanticocean.org/

[NROC] Northeast Regional Ocean Council. 2009. Northeast Ocean Data Portal. https://www.northeastoceandata.org