AECOM

APPENDIX P

Avian Impact Assessment

Photo credit: Matt Goldsmith, Equinor

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Prepared for

Beacon Wind LLC

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Abbreviations and Acronyms

Acronym	Definition
ac	acre
AGRE	Astoria Gateway for Renewable Energy
ADLS	Aircraft Detection Lighting System
AMAPPS	Atlantic Marine Assessment Program for Protected Species
AOCS	Atlantic Outer Continental Shelf
APEM	APEM, Inc.
BBA	Breeding Bird Atlas
BCC	Birds of Conservation Concern
BCR	Bird Conservation Region
Beacon Wind	Beacon Wind LLC
BGEPA	Bald and Golden Eagle Protection Act
BOEM	Bureau of Ocean Energy Management
BRI	Biodiversity Research Institute
BSEE	Bureau of Safety and Environmental Enforcement
BW1	Beacon Wind 1
BW2	Beacon Wind 2
CFR	Code of Federal Regulations
cm	centimeter
COP	Construction and Operations Plan
CS	collision sensitivity
CTDEEP	Connecticut Department of Energy and Environmental Protection
CTV	Crew Transfer Vessel
CV	coefficient of variation
dB	decibel
DOI	Department of the Interior
DS	displacement sensitivity
EcoMon	Ecosystems Monitoring
ERP	Emergency Response Plan
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FDR	Facility Design Report
FIR	Fabrication and Installation Report
ft	feet
FW	federal waters
GBIF	The Global Biodiversity Information Facility
GPS	global positioning system
GSD	ground sample distance
ha	hectare
HAT	Highest Astronomical Tide
HDD	horizontal directional drilling

Abbreviations and Acronyms	
Acronym	**Definition**
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IBA	Important Bird Area
IPaC	Information for Planning and Consultation
ISO-NE	New England Independent System Operator
JPEG	joint photographic experts group
km	kilometer
km^2	square kilometer
LiDAR	Light Detection and Ranging
m	meter(s)
m^2	square meters
MassCEC	Massachusetts Clean Energy Center
MBTA	Migratory Bird Treaty Act
MDAT	Marine-life Data and Analysis Team
MHWL	mean high water line
mi	mile
Motus	Motus Wildlife Tracking System
MSL	mean sea level
MHz	megahertz
MW	megawatt
NARW	North Atlantic Right Whale
NCCOS	National Centers for Coastal Ocean Science
NDDB	Natural Diversity Data Base
NEAMAP	Northeast Area Monitoring and Assessment Program
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NHP	Natural Heritage Program
NJBPU	New Jersey Board of Public Utilities
NY ISO	New York Independent System Operator
NYSERDA	New York State Energy Research and Development Authority
nm	nautical mile
NOAA	National Oceanic and Atmospheric Administration
nT	nanotesla
NY ISO	New York Independent System Operator
NYPA	New York Power Authority
NYSDEC	New York State Department of Environmental Conservation
NYSWAP	New York State Wildlife Action Plan
O&M	Operations and Maintenance
OCS	Outer Continental Shelf

Abbreviations and Acronyms	
Acronym	**Definition**
OCSLA	Outer Continental Shelf Lands Act
PDE	Project Design Envelope
POI	Point of Interconnection
PPA	Power Purchase Agreement
PS	Population Sensitivity
PSO	Protected Species Observer
RI Ocean SAMP	Rhode Island Ocean Special Area Management Plan
ROD	Record of Decision
RSZ	Rotor Swept Zone
SCADA	Supervisory Control and Data Acquisition
SGCN	Species of Greatest Conservation Need
SOV	Service Operations Vessel
SPCC	Spill Prevention, Control, and Countermeasures Plan
TIFF	tag image file format
TNC	The Nature Conservancy
U.S.	United States
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
UTC	Coordinated Universal Time
VIMS	Virginia Institute of Marine Science
WEA	Wind Energy Area
WHOI	Woods Hole Oceanographic Institution

Appendix P Avian Impact Assessment

P.1 Introduction

Beacon Wind LLC (Beacon Wind) has prepared this Avian Impact Assessment for inclusion in the Construction and Operations Plan (COP) of an offshore wind facility located in the designated Renewable Energy Lease Area OCS-A 0520 (Lease Area). The Lease Area covers approximately 128,811 acres (ac; 52,128 hectares [ha]) and is located approximately 20 statute miles (mi) (17 nautical miles [nm], 32 kilometers [km]) south of Nantucket, Massachusetts and 60 mi (52 nm, 97 km) east of Montauk, New York. The Lease Area was awarded through the Bureau of Ocean Energy Management (BOEM) competitive renewable energy lease auction of the Wind Energy Area (WEA) offshore of Massachusetts. An overview is shown in **Figure P.1-1**. Beacon Wind is indirectly owned by Equinor U.S. Holdings Inc. and bp Wind Energy North America Inc.

Beacon Wind proposes to develop the entire Lease Area with up to two individual wind farms, known as Beacon Wind 1 (BW1) and Beacon Wind 2 (BW2) (collectively referred to hereafter as the Project). The individual wind farms within the Lease Area will be electrically isolated and independent from the other via transmission systems that connect two separate offshore substations to two onshore Points of Interconnection (POIs). However, if BW1 and BW2 both interconnect with the New York Independent System Operator (NY ISO), the Project will assess the possibility of cable linkage between BW1 and BW2. Each wind farm will gather the power from the associated turbines to a central offshore substation and deliver the generated power via a submarine export cable to an onshore substation for final delivery into the local utility distribution system at the selected POI. The purpose of the Project is to generate renewable electricity from an offshore wind farm(s) located in the Lease Area. The Project addresses the need identified by northeast states to achieve offshore wind goals: New York (9,000 megawatts [MW]), Connecticut (2,000 MW), Rhode Island (up to 1,000 MW), and Massachusetts (5,600 MW).

BW1 will be developed first and constitutes the northern portion of the Lease Area. It covers approximately 56,535 ac (22,879 ha). The BW1 wind farm has a 25-year offtake agreement with the New York State Energy Research and Development Authority (NYSERDA) to deliver the power to its identified POI in Queens, New York.

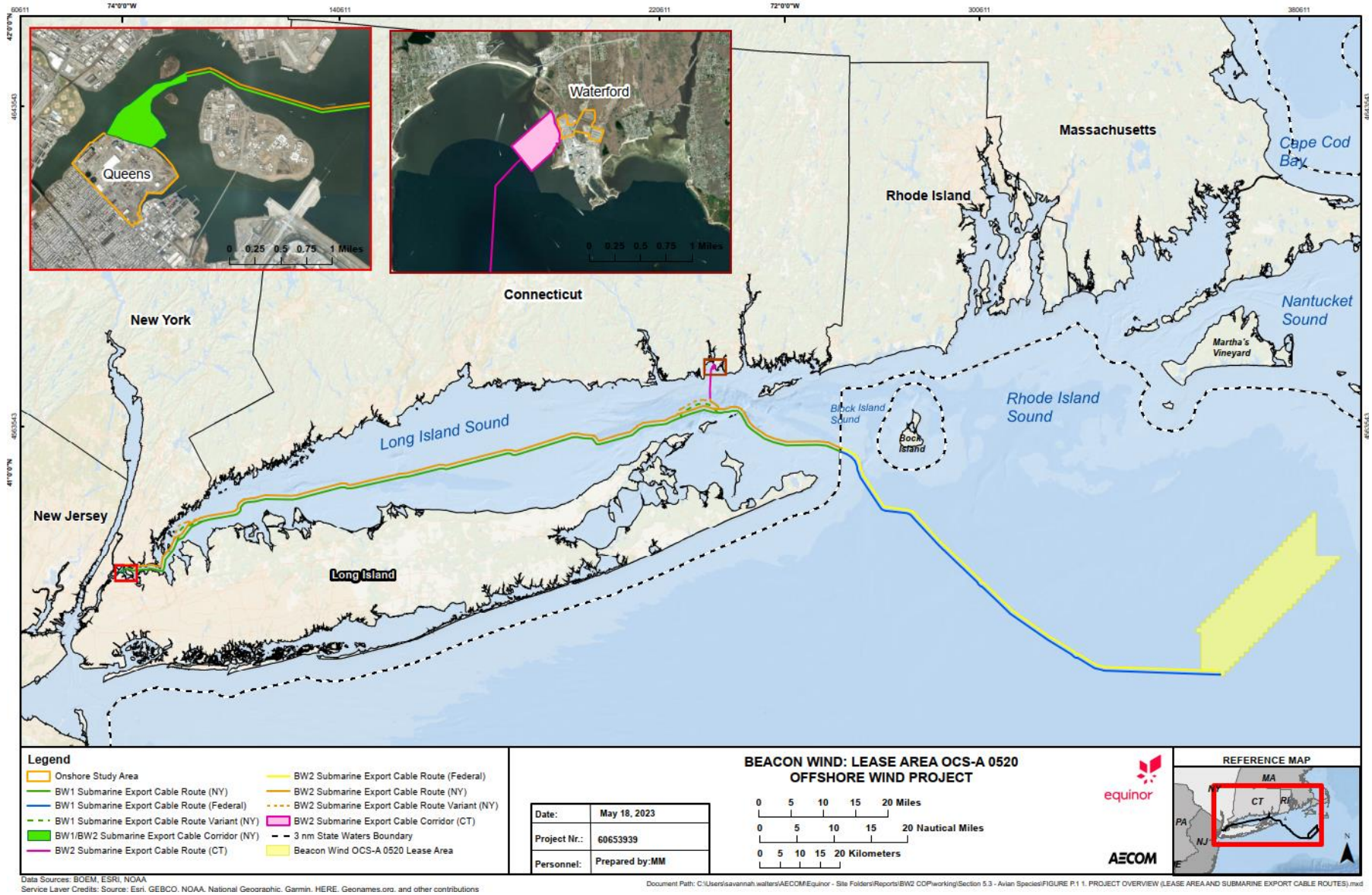
BW2 spans the southern portion of the Lease Area and will be developed after BW1. It covers approximately 51,611 ac (20,886 ha). Beacon Wind is considering an Overlap Area of 20,665 ac (8,363 ha) that may be included in either wind farm. BW2 is being developed to addresses the need for renewable energy identified by states across the region, including New York, Massachusetts, Rhode Island, and Connecticut. The interconnectedness of the New England transmission system, managed by the New England ISO (ISO-NE), allows a single point of interconnection in the region to deliver offshore wind energy to all of the New England states (Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine). The magnitude of regional targets for offshore wind and the limited amount of developable area, given current and reasonably foreseeable BOEM leasing activity, demonstrates a need for full-build out of the Lease Area.

BW2 plans to deliver power to identified POIs either in Waterford, Connecticut or Queens, New York. Two locations are under consideration in Queens, New York for the single proposed BW1 landfall and onshore substation facility. These locations include the New York Power Authority (NYPA) site in the

northeastern corner of the Astoria power complex and the Astoria Gateway for Renewable Energy (AGRE) site (which includes AGRE East and AGRE West) situated centrally and on the northern end of the complex the East River, both collectively referred to hereafter as NYPA and AGRE. The Queens, New York, onshore substation facility sites that are not used (NYPA, AGRE East, or AGRE West) for BW1 will remain under consideration, in addition to the Waterford, Connecticut, site, for the single proposed BW2 onshore substation facility.

The purpose of this Avian Impact Assessment is to identify the avian species potentially exposed to Project activities and describe the potential for impacts to these species associated with Project activities. This Avian Impact Assessment was prepared for inclusion in the COP and meets the information requirements of 30 Code of Federal Regulations (CFR) Part 585, the Outer Continental Shelf Lands Act (OCSLA), the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), the Migratory Bird Treaty Act (MBTA) (50 CFR 10.13), the Bald and Golden Eagle Protection Act (BGEPA), the New York State Wildlife Code, and other applicable laws and regulations.

FIGURE P.1-1. PROJECT OVERVIEW (LEASE AREA AND SUBMARINE EXPORT CABLE ROUTES)



P.1.1 Project Description

Beacon Wind LLC (Beacon Wind) proposes to construct and operate an offshore wind farm located in the designated Renewable Energy Lease Area OCS-A 0520 (Lease Area). The Lease Area covers approximately 128,811 acres (ac; 52,128 hectares [ha]) and is located approximately 20 statute miles (mi) (17 nautical miles [nm], 32 kilometers [km]) south of Nantucket, Massachusetts, and 60 mi (52 nm, 97 km) east of Montauk, New York (**Figure P.1-1**). The Lease Area was awarded through the BOEM competitive renewable energy lease auction of the Wind Energy Area (WEA) offshore of Massachusetts (**Figure P.1-2**).

Beacon Wind proposes to develop the entire Lease Area in what could potentially be up to a maximum of two individual wind farms, known as BW1 and BW2 (collectively referred to hereafter as the Project). Each wind farm will be electrically isolated and independent of the other via transmission systems that connect offshore substations to onshore POIs. BW1 will connect to the New York Independent System Operator (NY ISO) transmission network at POI in Queens, New York. BW2 is being developed to addresses the need for renewable energy identified by states across the region, including New York, Massachusetts, Rhode Island, and Connecticut. The interconnectedness of the New England transmission system, managed by the ISO-NE, allows a single point of interconnection in the region to deliver offshore wind energy to all of the New England states (Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine). The magnitude of regional targets for offshore wind and the limited amount of developable area, given current and reasonably foreseeable BOEM leasing activity, demonstrates a need for full-build out of the Lease Area.

Beacon Wind is assessing two submarine export cable routes and onshore substation facility locations for BW2: to Queens, New York and/or to Waterford, Connecticut.

Beacon Wind is proposing the development of wind turbines in the Lease Area based on the agreement negotiated with the other Massachusetts Rhode Island Wind Energy Area (MA/RI WEA) leaseholders. A regional layout with 1 nm (1.9 km) spacing in the cardinal directions (N/S/E/W) has been proposed to improve navigation safety for mariners across the multiple projects being developed concurrently (herein referred to as the 1x1 nm [1.9x1.9 km] layout). As of the submittal date for this COP, BOEM has approved at least one Project that adopts this layout configuration (Vineyard Wind Project). As such, Beacon Wind interprets the Vineyard Wind approval by BOEM and the cooperating agencies to be an endorsement of the layout agreement more broadly.

The Project is divided by the major development components within the offshore and onshore environments as follows:

Offshore Wind Farm/Turbine Array (within the Lease Area) – The proposed offshore wind farm/turbine array, including BW1 and BW2, will be located within the Lease Area. This will include up to 155 wind turbines and their supporting tower structures, and up to two offshore substation facilities, using up to 157 foundations in the Lease Area (encompassing both BW1 and BW2). BW1 and BW2 will each include between 61 and 94 wind turbines. The Overlap Area includes 33 wind turbines that could be incorporated into either BW1 or BW2. Within the Lease Area, there will also be interarray cables, two High Voltage Direct Current (HVDC) substation facilities, and appurtenant access and support structures for the wind turbines and offshore substation facilities. The wind turbine layout, dimensions, and parameters are provided in **Figure P.1-2**, **Figure P.1-3** and **Table P.1-1**, respectively.

Submarine Export Cable Installation Corridors – Alternatives for the HVDC submarine export cable routes have been evaluated for BW1 and BW2. It will be installed at target depths of three to six feet

(ft) (0.9-1.8 meters [m]) below the sea floor except in areas of federal channel crossings that may require up to 15 ft (4.6 m) below the authorized depth. The submarine export cables will require an installation corridor from the BW1 and BW2 offshore substation to the location of landfall in Queens, New York and/or Waterford, Connecticut. The linear path of the submarine export cables will pass through offshore federal waters as well as nearshore areas within the state territorial waters of New York and/or Connecticut. The installation corridor includes the area of cable as well as the additional area that will be temporarily disturbed by installation activities. **Figure P.1-1** shows the preferred route chosen from the Lease Area to landfall.

Onshore Electrical Infrastructure – The submarine export cable from BW1 will terminate near a point of landfall at the Astoria power complex in Queens, New York (**Figure P.1-4**). The submarine export cable from BW2 will terminate near a point of landfall either at the Astoria power complex in Queens, New York, or north of the Dominion Millstone Power Station in Waterford, Connecticut (**Figure P.1-5**). Onshore infrastructure proposed for construction will include the onshore export cable, installed underground and connected to a proposed onshore substation facility. From the onshore substation facility, underground transmission lines for NYPA and overhead transmission lines for AGRE East and AGRE West will be installed to connect the onshore substation facility to the POI, the Astoria East/West 138 kV Substations, referred to as Astoria East POI and Astoria West POI. Facilities and easements will be long-term, but additional onshore project footprint for construction activities will also be temporarily required including areas for workspace, staging, laydown, and access.

The Queens, New York area is a dense industrial energy complex bordered by residential development to the southwest and industrial/commercial development to the southeast. The Astoria power complex is bordered by the East River and associated waters to the northwest and northeast. The shorelines of the Astoria power complex are armored with either riprap or bulkheads. There are two existing substations for potential interconnection in this area: the Astoria East Substation POI and the Astoria West Substation POI.

The Dominion Millstone Power Station in Waterford, Connecticut is an industrial energy complex surrounded by open space and bordered by the Northeast Corridor railroad line to the north. The footprint of the proposed Waterford onshore substation facility contains existing buildings and pavement, maintained lawn and landscaped areas, forested upland, forested wetland, and late succession scrub-shrub/sapling habitats (**Section 5.1 Terrestrial Vegetation and Wildlife**). The shoreline of the Waterford power complex contains critical beachshore habitat along the Barrier North of Waterford Island, as designated by the Connecticut Department of Energy and Environmental Protection (CTDEEP), and is bordered by late succession scrub-shrub/sapling habitat. There is one existing substation identified as the POI for BW2 in this area.

FIGURE P.1-2. LEASE AREA LOCATION WITHIN THE MASSACHUSETTS AND RHODE ISLAND WIND ENERGY AREA

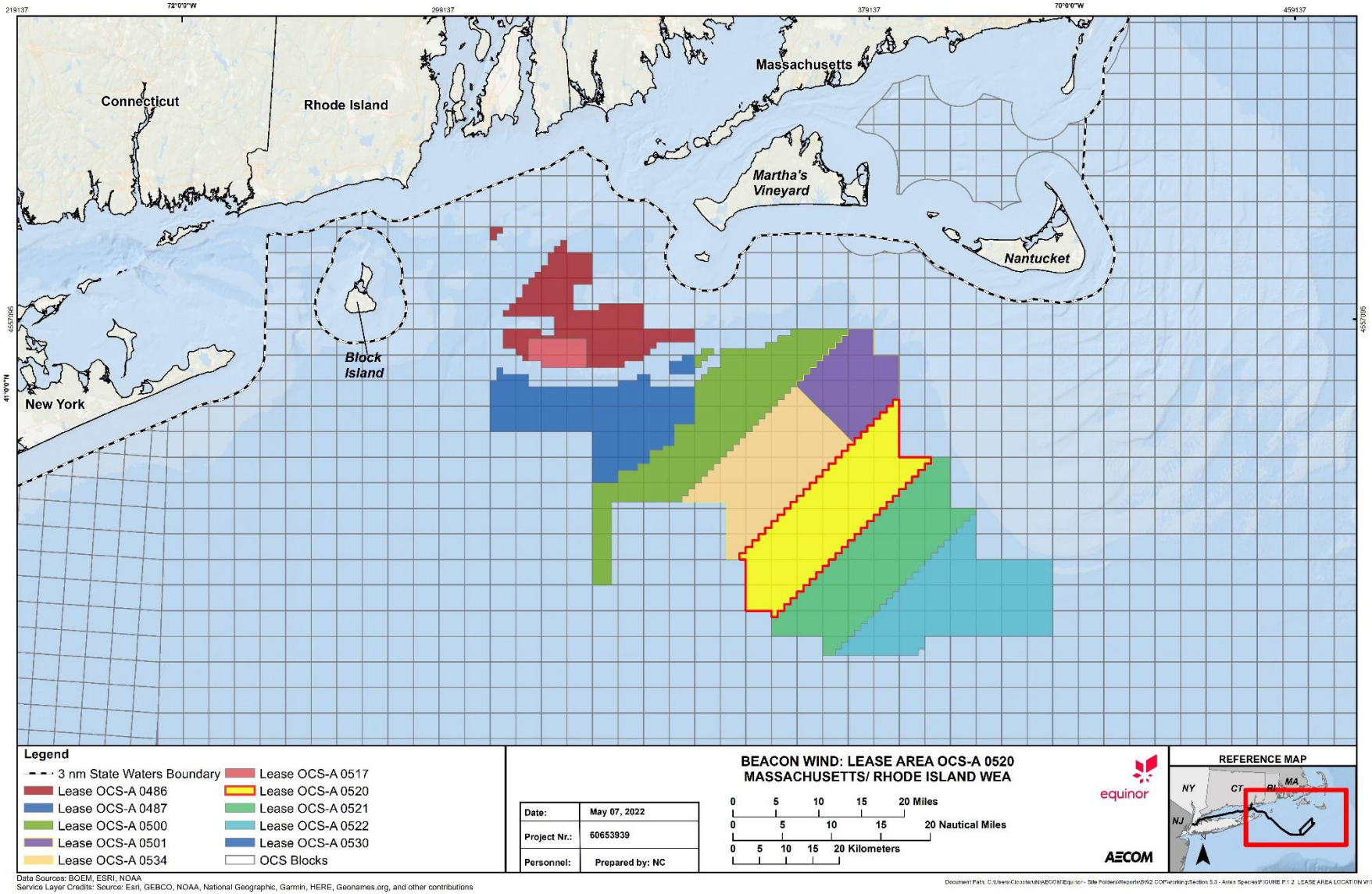


FIGURE P.1-3. MINIMUM AND MAXIMUM WIND TURBINE DIMENSIONS

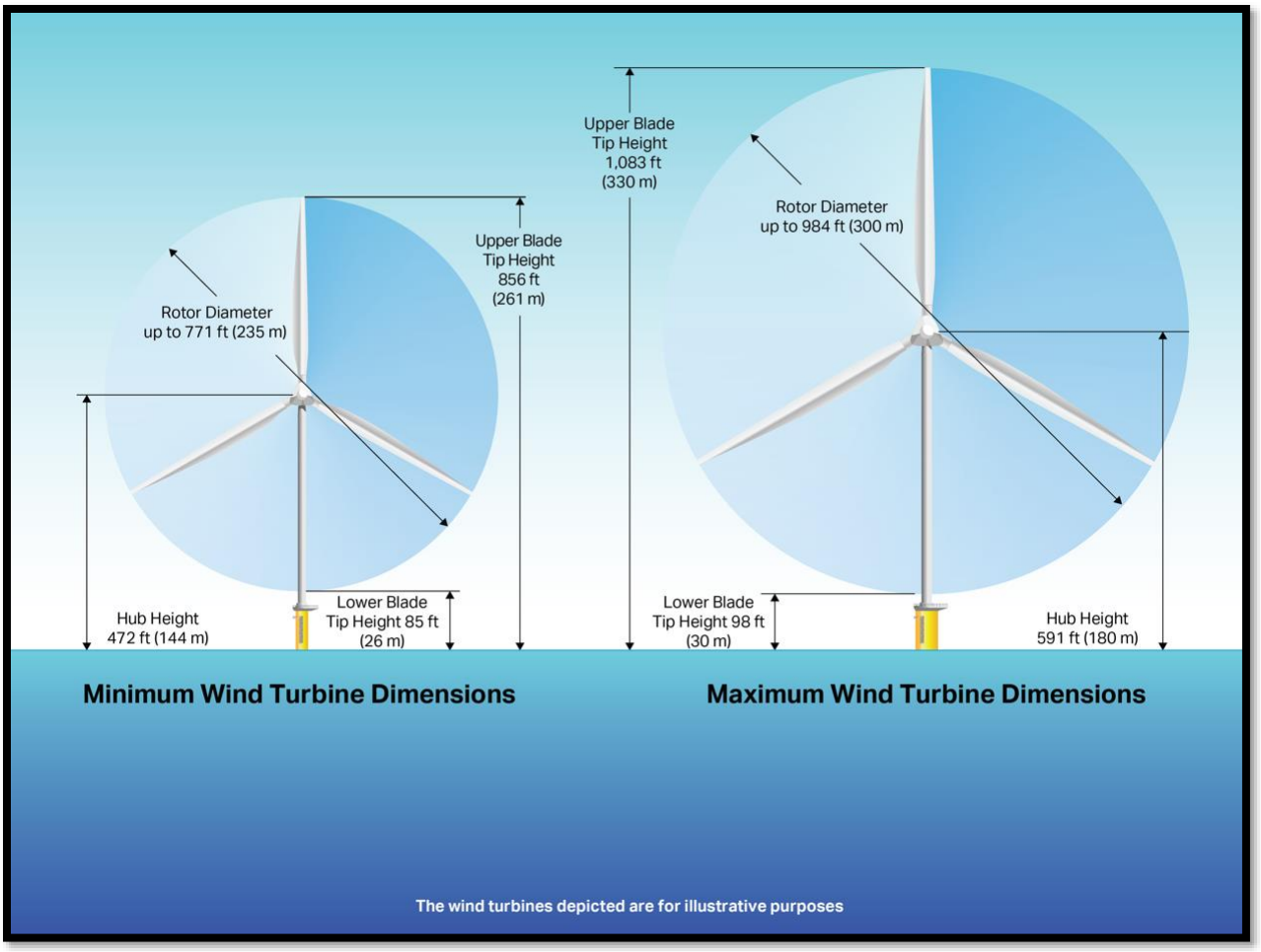


TABLE P.1-1. SUMMARY OF WIND TURBINE MINIMUM AND MAXIMUM PROJECT DESIGN ENVELOPE PARAMETERS FOR BW1 AND BW2

Parameter	Minimum	Maximum
Rotor Diameter	771 ft (235 m)	984 ft (300 m)
Hub Height above Highest Astronomical Tide (HAT)	472 ft (144 m)	591 ft (180 m)
Upper Blade Tip above HAT	856 ft (261 m)	1,083 ft (330 m)
Lower Blade Tip above HAT	85 ft (26 m)	125 ft (38 m)

FIGURE P.1-4. ASTORIA POWER COMPLEX LOCATION FOR ONSHORE INFRASTRUCTURE

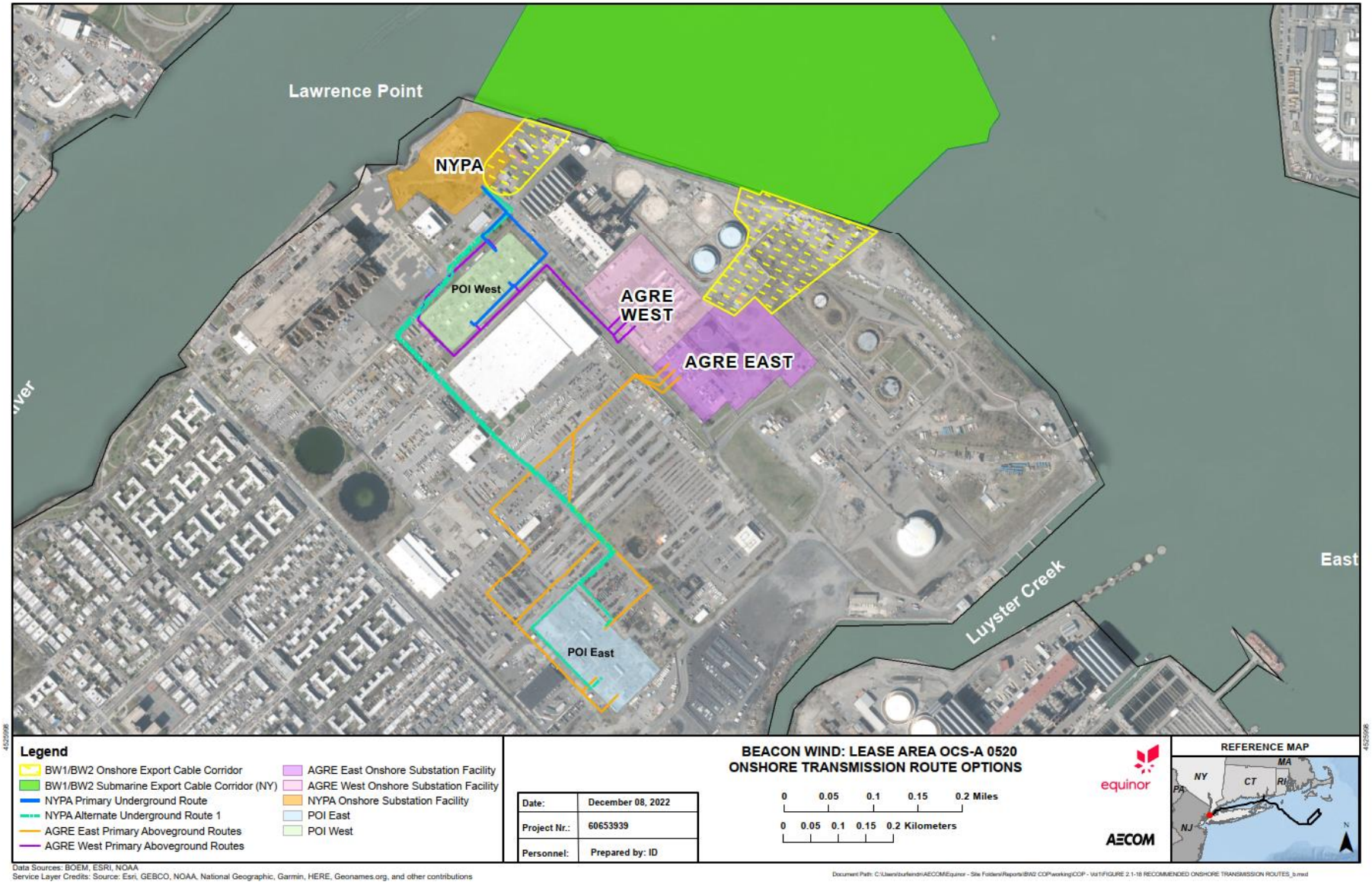
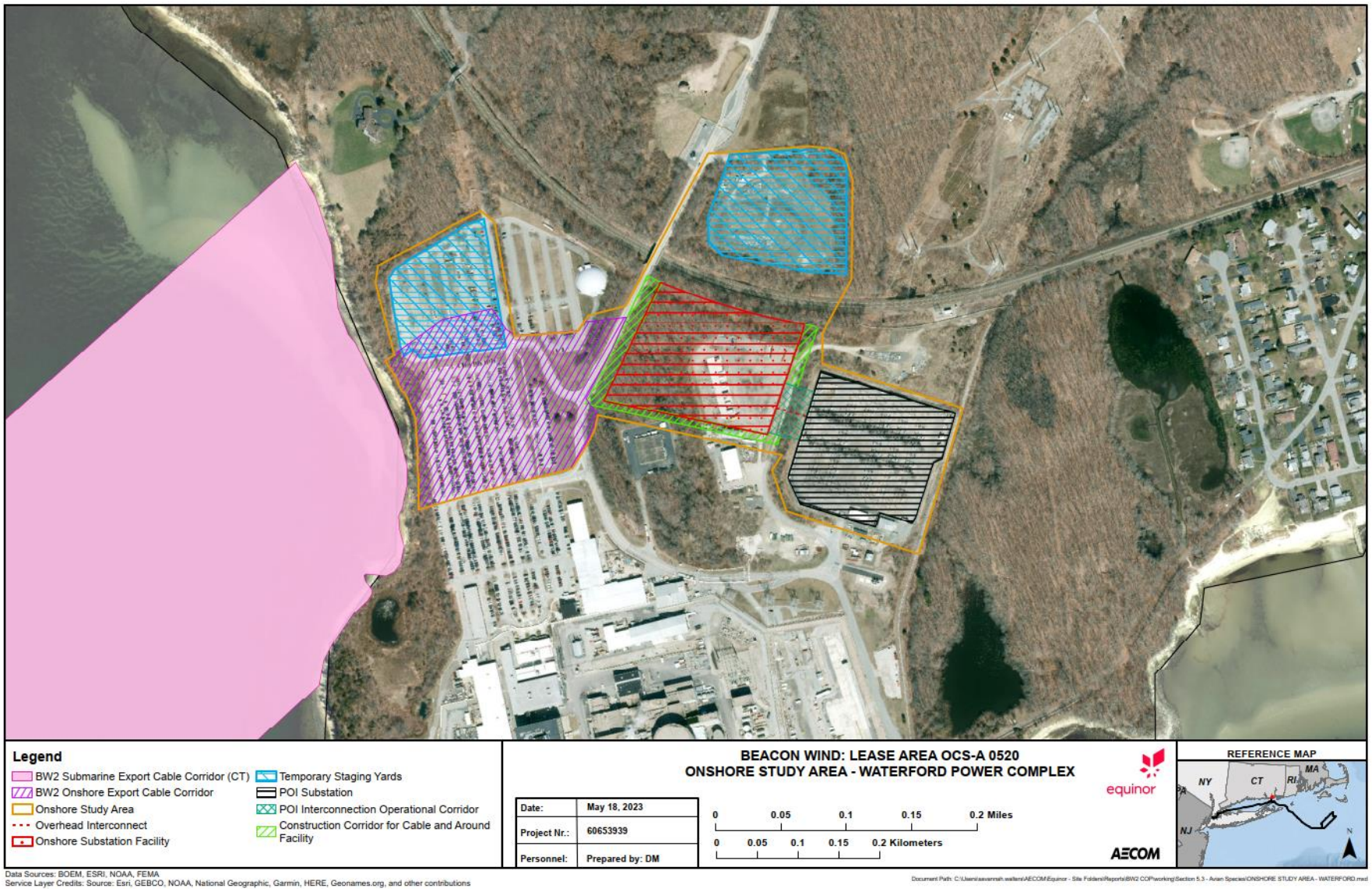


FIGURE P.1-5. WATERFORD POWER COMPLEX LOCATION FOR ONSHORE INFRASTRUCTURE



P.1.1.1 Proposed Activities

This section describes the proposed activities required for construction, operations, and decommissioning of the Beacon Wind Project. Beacon Wind proposes to build and operate two offshore wind farm facilities in Lease Area OCS-A 0520 (BW1 and BW2), with associated transmission infrastructure. This COP presents a comprehensive description of the construction and operation activities that are anticipated for both proposed facilities, to the extent that both have siting and design information developed. Beacon Wind has adopted a Project Design Envelope (PDE) approach which consists of the components listed below, as follows.

Project components offshore and within the Lease Area include:

- Up to 157 foundations and associated support and access structures for 155 wind turbines and supporting tower structures, based on the regional 1x1 nm (1.9x1.9 km) layout, and up to two offshore substations with HVDC converters, collectively referred to as the offshore substation facilities;
- BW1 will include up to 162 nm (300 km) of interarray cable;
- BW2 will include up to 162 nm (300 km) of interarray cable;
- BW1 will include one high-voltage direct-current (HVDC) submarine export cable route to Queens, New York consisting of up to 202 nm (375 km) to the BW1 landfall; and
- The HVDC submarine export cable route for BW1 and BW2 through Long Island Sound to a landfall location in the State of New York (through New York Harbor to Queens, New York) or State of Connecticut (to Waterford, Connecticut).

Project components onshore include:

- One export cable landfall area in Queens, New York for BW1;
- One export cable landfall area for BW2 will be selected from two potential locations in Queens, New York or Waterford, Connecticut;
- Up to 0.93 mi (1.5 km) of BW1 onshore export and underground or aboveground interconnection cables;
- Up to 0.55 mi (0.86 km) of BW2 onshore export and aboveground interconnection cables at Waterford, Connecticut, if selected;
- Up to two onshore substations with HVDC/HVAC converters, collectively referred to as the onshore substation facilities, as follows:
    - BW1 onshore substation facility (inclusive of an onshore converter station and onshore substation) in Queens, New York; and
    - BW2 onshore substation facility (inclusive of an onshore converter station and onshore substation) will be selected from two potential locations in Queens, New York or Waterford, Connecticut.

P.1.1.2 Project Description Details

This section provides Project description details for the activities associated with construction and installation, operation, maintenance, and decommissioning of the offshore and onshore Project components. The Project description details presented herein are based on Beacon Wind's PDE approach, which is defined as "a reasonable range of project designs" associated with various components of the project (e.g., wind turbine options) used to assess potential impacts on key environmental and human resources (BOEM 2018). The Project description details provided are primarily focused on those relevant to the assessment of the potential effects on birds that may result

from construction, operation, and decommissioning activities within the offshore and onshore areas of the Project, as defined in **Section 0**.

P.1.1.2.1 Construction and Installation Activities

Offshore Construction and Installation

Offshore infrastructure required for build out of the Project will include wind turbines, foundations, offshore substations, and interarray and submarine export cables. Port facilities may be used by Beacon Wind for construction support (e.g., staging). Since the permitting of these facilities is the responsibility of the facility owners, this Avian Impact Assessment does not address potential impacts associated with Port facilities.

Wind turbines and foundations

Up to 155 wind turbines and their foundations are proposed within the Lease Area, depending on the turbine model and nameplate capacity selected as the most technologically advanced and efficient model available during the procurement process. Minimum and maximum wind turbine dimensions have been identified. The minimum and maximum dimensions of the wind turbines are shown on **Figure P.1-3** and parameters are detailed in **Table P.1-1**. The proposed foundation types for the wind turbines could include piled jacket, suction bucket jacket, and/or monopile depending on considerations such as site-specific conditions and commercial and technical reasons. Systems including Supervisory Control and Data Acquisition (SCADA) systems and marking and lighting measures will be installed and operated as detailed in the Operations and Maintenance Activities section of this document (**Section P.1.1.2.3**).

Offshore Substation Facilities

Beacon Wind proposes to install up to two offshore substations – one for BW1 and a second one for BW2 – to collect power transmitted from the wind turbines via the interarray cable systems for conversion (alternating to direct current). These facilities will have numerous pieces of primary and auxiliary equipment installed including transformers, switchgears, reactors, power supplies and measuring units, SCADA equipment, telecommunications systems, monitoring systems, and facility, safety, and rescue equipment for personnel use. Multiple deck levels, boat landing, and additional space will be incorporated into the offshore substations.

Submarine Export Cables

The submarine export cables for BW1 and BW2 will be installed from a turntable and will include the use of specialized installation vessels/barges. The cable burial methods being considered as part of the PDE are plowing, jetting, trenching, and dredging. The equipment selected will depend on seabed conditions, the required burial depths, and the results of various cable burial studies; more than one installation and burial method may be selected with the potential to be used pre-installation, during installation, and/or post-installation. Seabed disturbance will include temporary disturbance for installation and a long-term footprint during operation of the Project. Post-installation surveys will be completed after cable burial to determine as-built conditions and identify areas requiring remedial cable protection.

Interarray Cable Installation

The installation methodology for the interarray cables will be similar to the methodology for the submarine export cable; as such, the installation may include a range of methods such as jetting and/or plowing and the use of a range of vessels (e.g., cable lay barge and support vessels, construction

support vessels). As with the submarine export cable, seabed disturbance will include temporary disturbance for installation and a long-term footprint during operation of the Project.

Cable and Scour Protection

Protections are proposed for installation over cables (submarine export and interarray) and around wind turbine and offshore substation foundations to prevent damage and scouring from environmental conditions. The locations, types, and amounts of protection will be determined based on the results of modeling (e.g., hydrodynamic scour modeling) and will be installed on a remedial basis in areas where conditions prevent cables from burial and/or where scour of seabed material may occur around foundations.

P.1.1.2.2 Onshore Construction and Installation

Onshore landfall, export cable and interconnection cable routes

Two onshore export and interconnection cable route alignments are currently being assessed to support the Project. Installation techniques may include trenchless (e.g., horizontal direction drilling [HDD], jack and bore, or micro-tunnel) and trenched (open cut trench) methods. The onshore export and interconnection cables will be installed by open-cut trenching except in areas where trenchless methods are necessary. Material will be stockpiled by the trench during excavation activities until the components are installed. Upon completion of the installation, the trench will be backfilled, and excess soil will be re-used if clean (or disposed of lawfully in the case of unsuitable or contaminated soil) and the construction corridor will be restored.

Onshore Substation Facilities

The construction and installation methodology will comply with local and state regulations and guidelines. A typical construction and installation methodology will be used for the BW1 and BW2 onshore substation facilities in the following sequence:

- Site access;
- Site preparation, including clearing and/or filling (if necessary), excavation, and grading;
- Construction of the stormwater management system;
- Installation of the foundation;
- Installation of the electrical infrastructure and other associated structures and services including connection to local utilities; and
- Land reinstatement and landscaping.

P.1.1.2.3 Operations and Maintenance Activities

The commercial lifespan of BW1 and BW2 is expected to be 35 years, based on the design life of the Project components. Consistent with BOEM's regulations and applicable guidance, Beacon Wind intends to pursue 35-year Operations Terms for BW1 and BW2 at the appropriate time. The Project will be designed to operate with minimal day-to-day supervisory input, with key systems monitored from a central location, 24-hours a day. Beacon Wind intends on utilizing an existing facility for maintaining a staffed Operations and Maintenance (O&M) Base for the purpose of operations monitoring.

An Incident Management Plan and Safety Management System will also be developed and implemented during operations and maintenance activities based on consultation with BOEM and the Bureau of Safety and Environmental Enforcement.

Offshore O&M

All offshore components will require routine maintenance and inspections. It is anticipated that Service Operations Vessels (SOVs), Crew Transfer Vessels (CTVs), and smaller support vessels will be used to support operations and maintenance activities offshore. Helicopters are currently being considered to support the Project; Beacon Wind is continuing to evaluate logistics and the relevant impact assessments will be updated pending the final decision. Offshore operations and maintenance activities will include inspections and maintenance of the wind turbines and offshore substations; submarine export cable routes and interarray cable surveys; sampling and testing; repairs and replacement of consumables, parts, and systems; improvements to systems and equipment; and monitoring of the wind turbine status and performance (e.g., SCADA system, as described in Volume 1, **Section 3.3.1.1**).

Onshore O&M

The onshore substation facilities will be equipped with monitoring equipment. The onshore substation facilities will also be regularly inspected during the Operations Term, which may result in routine maintenance activities, including the replacement of and/or updates to electrical components/equipment. The onshore export cables will require periodic testing, with readings taken from access chambers, but should not require maintenance; however, occasional repair activities may be required should there be a fault or damage caused by a third party or unanticipated events.

Offshore Marking and Lighting

The wind turbines will be marked and lit in accordance with the Federal Aviation Administration (FAA) and United States Coast Guard (USCG) requirements for aviation and navigation obstruction. Beacon Wind will light and mark all wind turbines in accordance with FAA Advisory Circular 70/7460-1L, IALA 0-139 and USCG Local Notice to Mariners (LNM) entry 33-20, and BOEM's *Guidelines for Providing Information on Lighting and Marking of Structures Supporting Renewable Energy Development* (BOEM 2021a), and *International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Recommendation O-139 on The Marking of Man-Made Offshore Structures* (IALA 2013).

In addition, Beacon Wind is considering the use of Aircraft Detection Lighting System (ADLS), subject to agency approval, and is actively completing an evaluation to determine the impacts of the implementation of this system. This commitment as a mitigation is subject to final Project evaluation and agency approval.

Waste Management

Wastes are expected to be generated during the Project including sewage from vessels, domestic water, drilling cuttings/muds/chemicals, uncontaminated bilge and ballast water, uncontaminated water used for vessel air conditioning, solid trash/debris, chemicals, solvents, oils and greases, and deck drainage from vessels. Waste management measures and an Oil Spill Response Plan will be implemented to avoid and/or minimize the potential for environmental effects associated with waste and/or discharges into the environment.

Decommissioning Activities

In accordance with 30 CFR Part 585 and other BOEM requirements, Beacon Wind will be required to remove and/or decommission the Project infrastructure and clear the seabed of obstructions. The decommissioning process for the wind turbines and offshore substations is anticipated to be the reverse of installation during the construction phase and will be conducted in accordance with a Decommissioning Plan subject to BOEM approval. For the purposes of this Avian Impact Assessment,

decommissioning activities are assumed to have equal or lesser potential to affect avian species since construction and installation activities are temporary activities and some Project components may be retired in-place. Project components that are retired in-place or re-purposed would not result in new impacts.

P.1.2 Study Areas

The study areas defined for the purposes of this assessment are based on the offshore and onshore components of the Project. Risk potential in these areas is expected to differ due to the differences in existing environmental conditions, available suitable habitat, species assemblages, species abundance and use, and seasonality.

P.1.2.1 Offshore Study Area

The Offshore Study Area is the area proposed for the development of BW1 and BW2 within the Lease Area including the area where turbines, offshore substations, and interarray cables will be installed (**Figure P.1-6**). Submarine export cables will also be located within the offshore area as they extend from the Lease Area towards landfall. Seafloor disturbance during installation of submarine export cable will be of short duration in a limited area (cable corridor); therefore, it is limited in potential for risk to birds. For most species, the assessment of the Offshore Study Area primarily focuses on the proposed BW1 and BW2 development areas within the Lease Area rather than the submarine export cable areas. This is consistent with the approach used by risk assessments for other offshore wind projects (e.g., Vineyard Wind) and with BOEM's conclusions derived from environmental assessments (BOEM 2021b). In this assessment, the exceptions to this designation of Offshore and Onshore Study Areas is for the roseate tern (*Sterna dougallii*), which is addressed due its status as an ESA-listed species and/or its use of resources during critical time periods within or near the area where the submarine export cables will be installed. Project acknowledges there will be further consultation regarding appropriate avoidance or minimization measures (i.e., work window) for cable laying activities around Great Gull Island, New York.

P.1.2.2 Onshore Study Areas

Two onshore study areas are under consideration for the BW1 and BW2 submarine export cable routes to either Queens, New York or to Waterford, Connecticut. The Onshore Study Area for Queens, New York is the area within the Astoria power complex (hereafter referred to as the Queens, New York Onshore Study Area) above the mean high water line (MHWL). The onshore components of the Project proposed for development include a single landfall location for the submarine export cable, the onshore export cable route, the onshore HVDC substation facility, the interconnection cable route, and the POI. Onshore infrastructure component locations for BW1 or BW2 may vary within this area, which is approximated by the area of the Onshore Study Area and includes two of the Queens, New York landing sites under consideration (New York Power Authority [NYPA] and AGRE) and onshore infrastructure locations associated with these two locations (**Figure P.1-7**). The Queens, New York onshore substation facility site that is not used for BW1 will remain under consideration for the single proposed BW2 landfall, in addition to the Waterford, Connecticut landing. The Onshore Study Area for Waterford, Connecticut consists of the area identified within and around the proposed onshore substation facility including areas of temporary workspace and staging yards (**Figure P.1-8**).

FIGURE P.1-6. OFFSHORE STUDY AREA

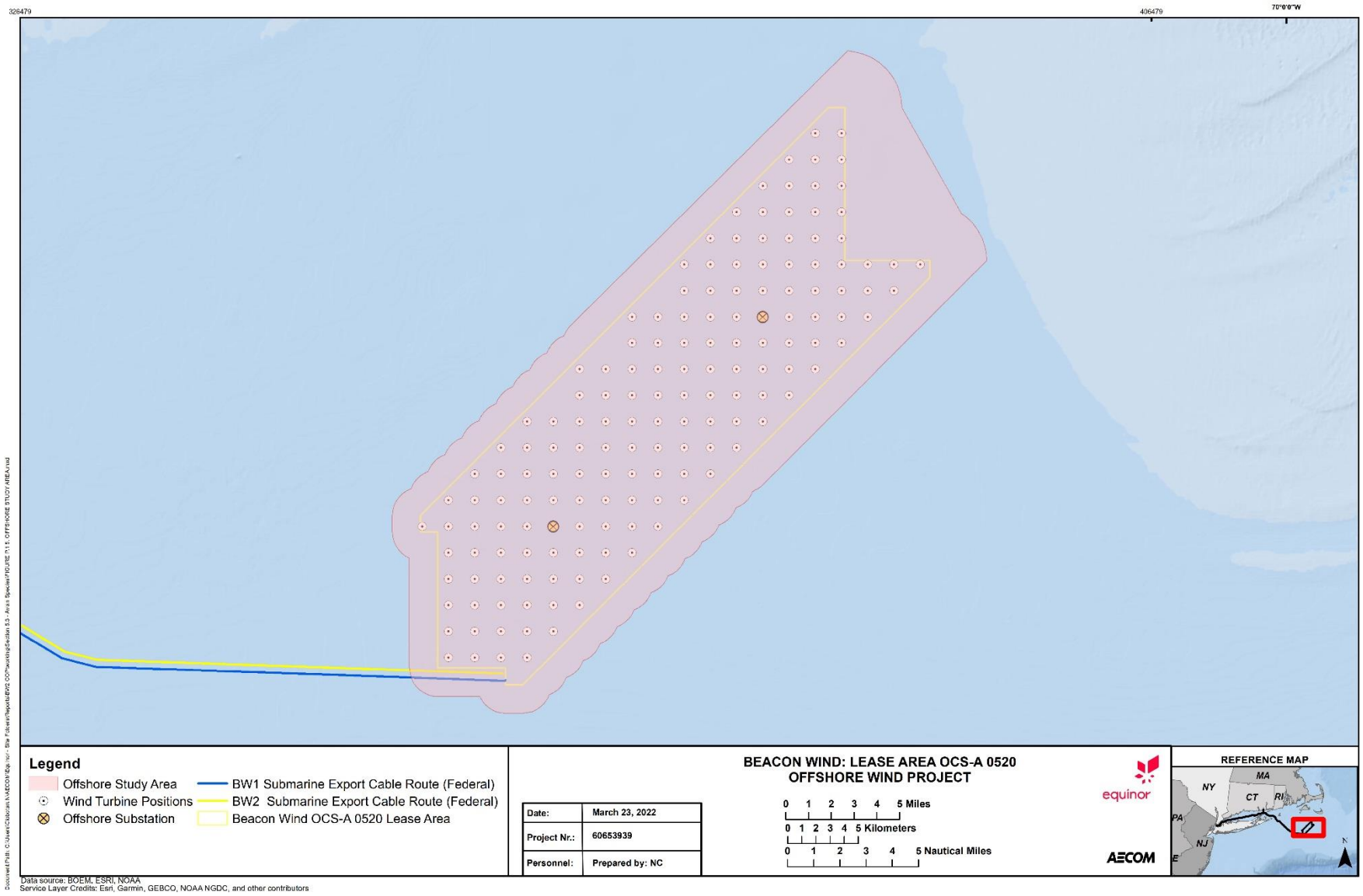


FIGURE P.1-7. ONSHORE STUDY AREA - QUEENS, NEW YORK

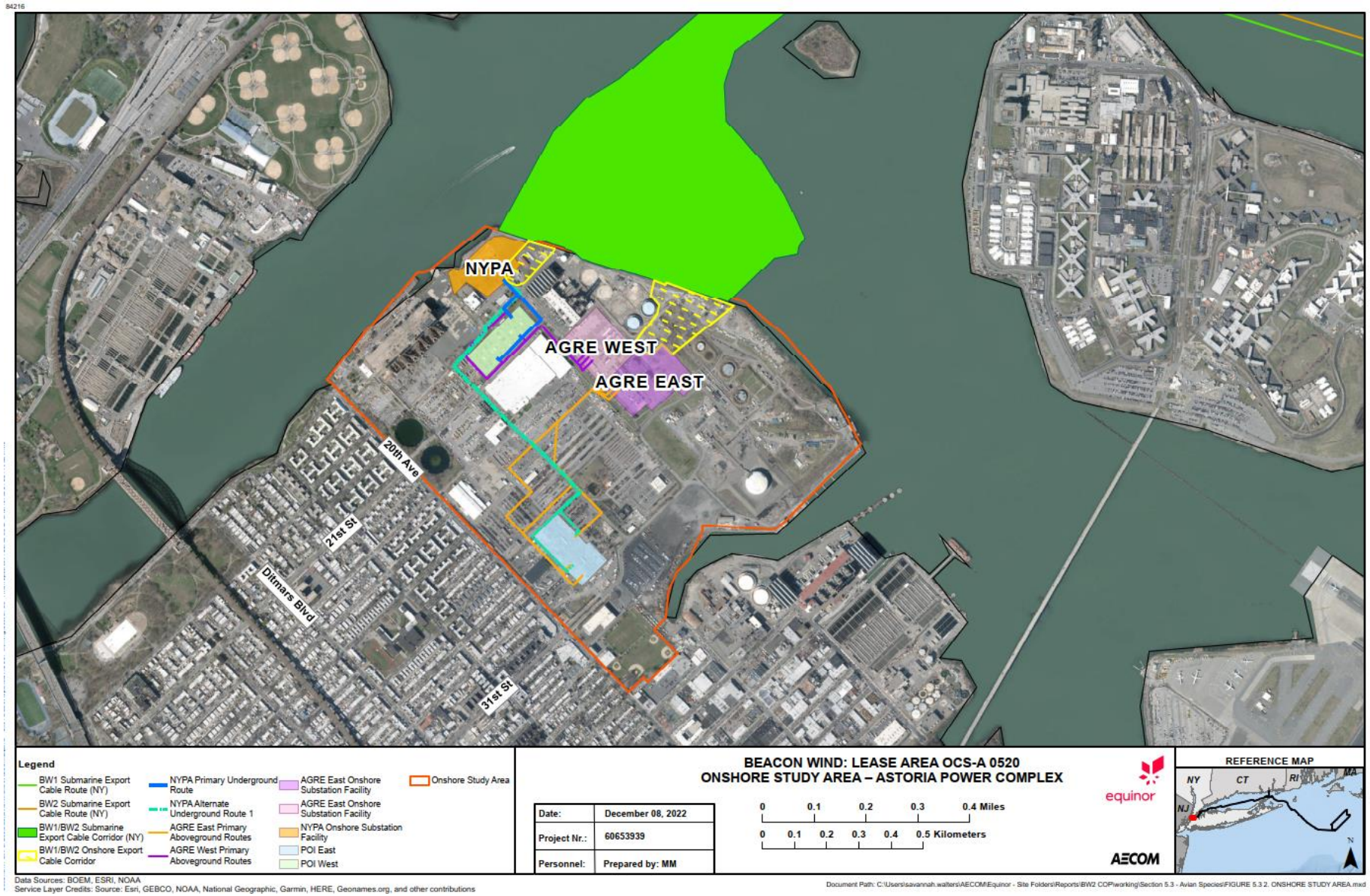
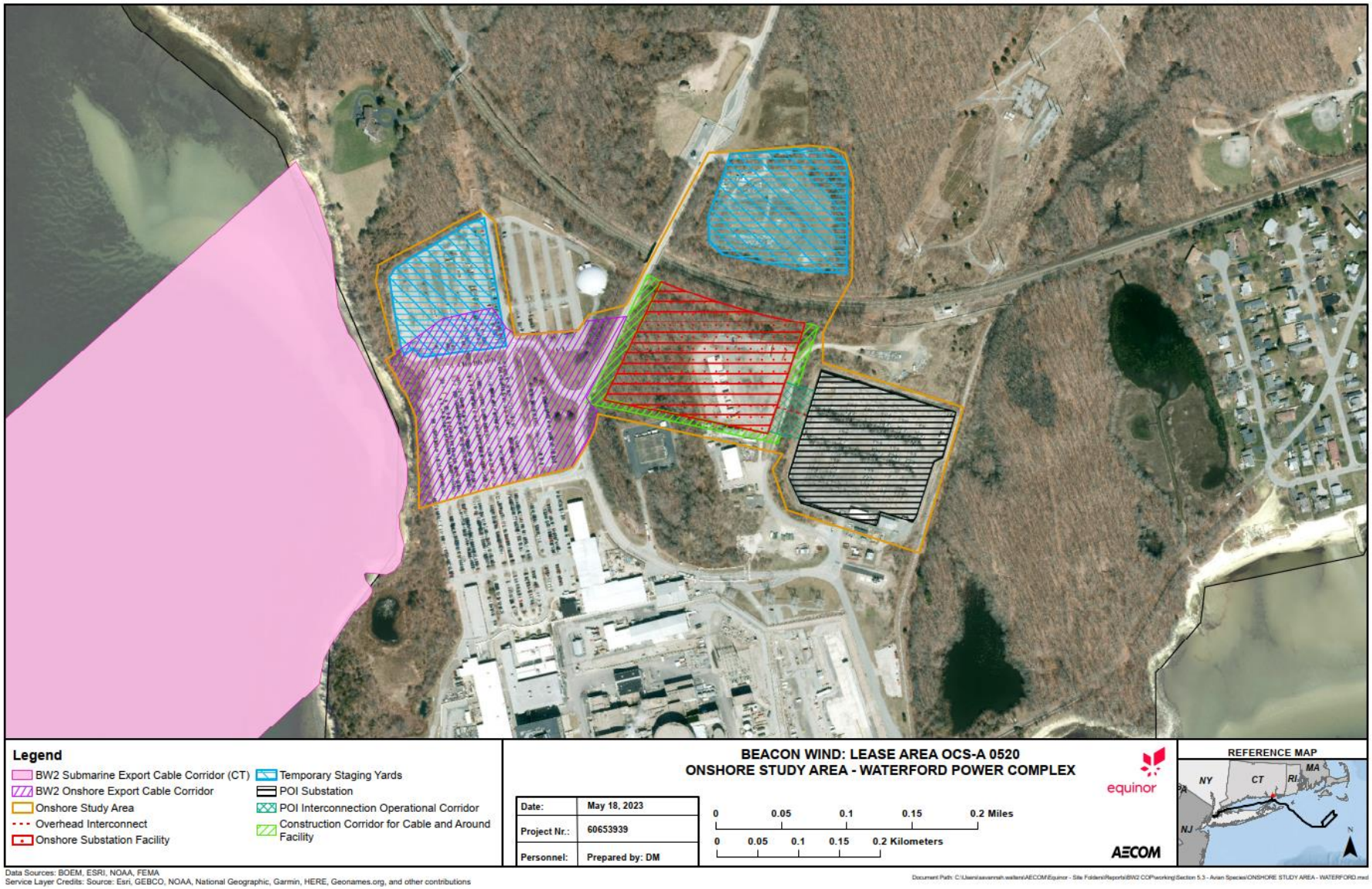


FIGURE P.1-8. ONSHORE STUDY AREA - WATERFORD, CONNECTICUT



P.2 Offshore Study Area Assessment

P.2.1 Methods

P.2.1.1 Exposure Assessment

Assessing avian exposure means evaluating where and when birds are at risk from proposed wind energy development. The exposure of seabirds to proposed development in the Lease Area was assessed using a spatiotemporal approach that accounted for the distribution, abundance, and movement of seabirds. This involved several data sources, most of which were survey-based, including boat, aerial, and/or tracking data.

P.2.1.1.1 Exposure Assessment Data Sources and Coverage

Beacon Wind High-Resolution Digital Aerial Surveys: Lease Area

High-resolution digital aerial surveys (surveys) were conducted by APEM, Inc. (APEM) within a defined Study Area between December 2019 and November 2020 (first year). These surveys were conducted to collect baseline data on the abundance and distribution of avian species (and other marine fauna) within the Lease Area in accordance with BOEM's *Guidelines for Providing Avian Survey Information for Renewable Energy Development on the Outer Continental Shelf* pursuant to 30 CFR Part 585 (BOEM 2020). The defined Study Area included the Lease Area and a 1.1-nm (2-km) buffer surrounding it with an approximately 2.1-nm (4-km) buffer towards the northeast end (**Figure P.2-1**). Surveys were conducted monthly for most months and twice per month in April, May, August, and September to provide additional survey coverage for the ESA-listed roseate tern (**Table P.2-1**).

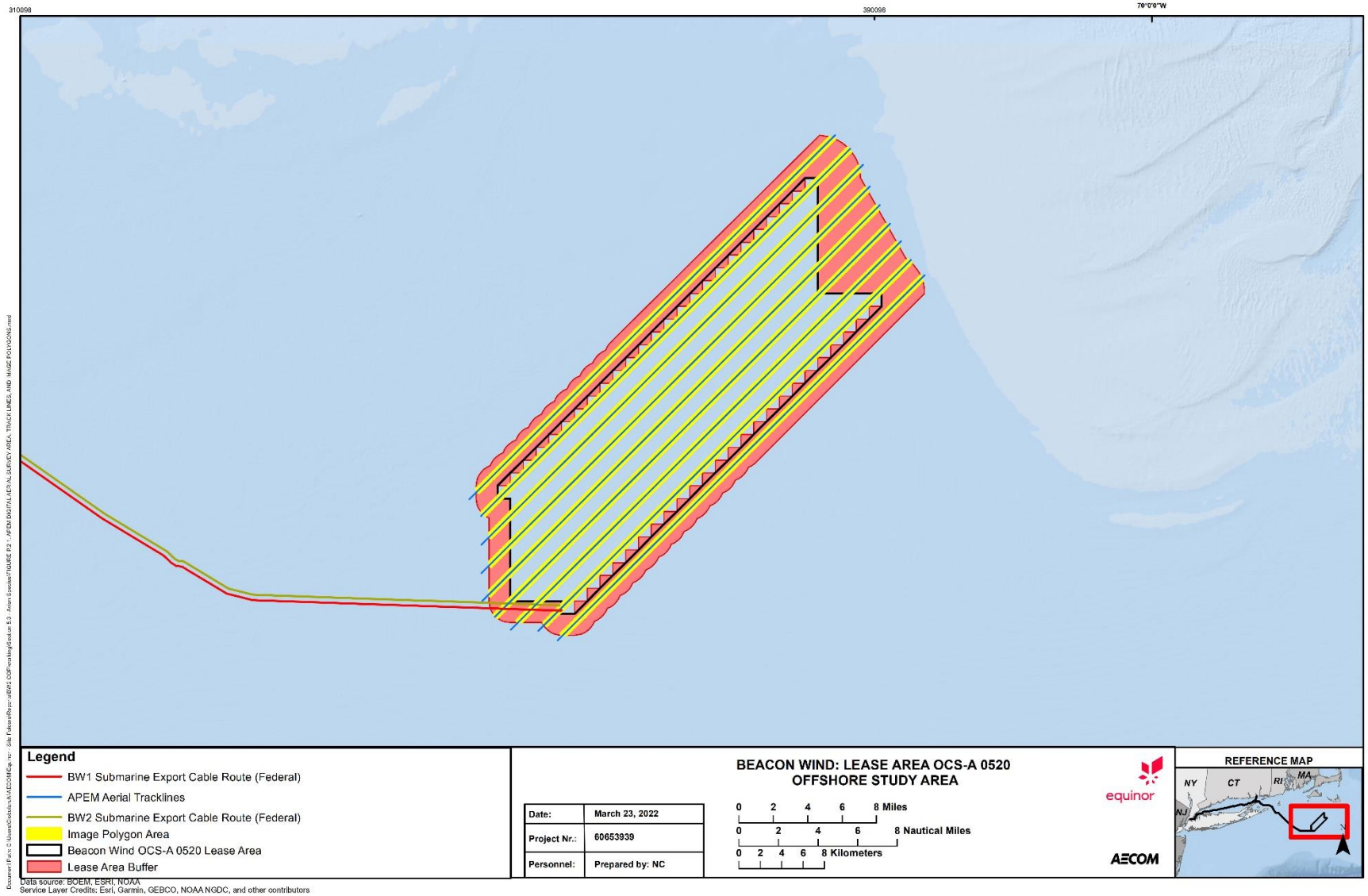
The high-resolution digital aerial survey method used by APEM is a customized camera system (Shearwater III) with flight planning software. It is designed to map survey transects prior to flight and fire each image capture node at exactly the right location at the same position along each transect within set tolerances and monitored by an on-flight technician. The aerial digital surveys captured 0.6-inch (1.5 centimeter [cm]) ground sample distance (GSD) digital still images along nine lines spaced approximately 1 nm (1.9 km) across-track and 0.27 nm (0.5 km) along-track between image nodes within the Survey Area (**Figure P.2-1**) to achieve greater than 10 percent coverage per survey. A quality control process was also implemented as described in the Annual Report (**Appendix O Ornithological and Marine Faunal Aerial Survey – APEM Studies**; Normandeau-APEM 2020) summarizing the results of surveys. Documentation of the survey results is included in Appendix A of the Annual Report. Surveys were conducted during the dates and times shown in **Table P.2-1**.

TABLE P.2-1. APEM SURVEY DATES AND TIMES

Season	Survey No.	Date	UTC Start Time	UTC End Time
Winter	01	12/7/2019	18:36	20:37
Winter	02	1/21/2020	14:54	17:08
Winter	03	2/19/2020	18:01	20:05
Spring	04	3/8/2020	17:31	19:33
Spring	05	4/7/2020	13:27	15:27
Spring	06	4/25/2020	13:56	15:51
Spring	07	5/5/2020	14:33	16:24
Spring	08	5/31/2020	17:47	19:42
Summer	09	6/14/2020	17:59	19:51
Summer	10	7/21/2020	17:42	19:40
Summer	11	8/20/2020	17:39	19:22
Summer	12	9/4/2020	16:47	18:41
Fall	13	9/14/2020	17:44	19:39
Fall	14	9/24/2020	14:40	16:35
Fall	15	10/14/2020	13:25	15:26
Fall	16	11/4/2020	17:15	19:15

Notes:
APEM is in in the process of conducting second-year surveys using the same methods within the Survey Area as per a survey schedule approved by BOEM.
UTC – Coordinated Universal Time

FIGURE P.2-1. APEM DIGITAL AERIAL SURVEY AREA, TRACK LINES, AND IMAGE POLYGONS



Northwest Atlantic Seabird Catalog

The Northwest Atlantic Seabird Catalog is a compilation of boat-based and aerial survey data dating back to 1978; it is currently managed by the National Oceanic and Atmospheric Administration (NOAA) National Centers for Coastal Ocean Science (NCCOS), who supplied the Catalog upon request (Version 0.4.1; 2021-09-01). APEM did not provide flight heights in their final report due to insufficient data, so the Northwest Atlantic Catalog was used to document flight heights. To maintain consistency and reliability among survey methods, flight height observations were extracted from the following boat surveys: Rhode Island Ocean Special Area Management Plan (RI Ocean SAMP), Atlantic Marine Assessment Program for Protected Species (AMAPPS), NOAA Northeast Fisheries Science Center (NEFSC) and the Woods Hole Oceanographic Institution (WHOI). Following the Biodiversity Research Institute (BRI) 2021, flight heights from aerial surveys were not included due to the lack of validation and quality assurance/control; e.g., it was unclear which surveys measured avian flight heights in feet as opposed to meters. The flight height data are presented transparently and objectively, although it is important to acknowledge the limitations of collecting flight heights from boat-based surveys. Data tend to be biased (Borkenhagen et al. 2018; Harwood et al. 2018; Johnston et al. 2014), in part due to sampling effects, and in part due to the safety precautions that lead boats to operate only during fair weather (Beaufort <4). Flight heights of birds may increase during poor weather conditions characterized by higher winds (Ainley et al. 2015). Other methods are more accurate and precise at collecting flight height data (e.g., radar, Light Detection and Ranging [LiDAR], global positioning system [GPS] tracking) (Largey et al. 2021), although the availability of such data in the vicinity of the Lease Area (and the Atlantic Outer Continental Shelf [AOCS]) is poor.

Marine Bird Abundance Models: U.S. Atlantic Outer Continental Shelf Waters

Winship et al. (2018) modeled boat-based and traditional (i.e., visual) aerial survey data spanning the AOCS from 1978-2016. They predicted the relative density (i.e., individuals per square kilometer [km^2]) of 47 avian species in each season throughout the study area (AOCS Florida to Maine). The products of their analysis were compiled and made available for download via the Northeast Ocean Data Portal, by the Marine-life Data and Analysis Team (MDAT, Version 2) (Curtice et al. 2019). Upon request, NOAA NCCOS supplied zero-effort data layers by season (Winship et al. 2018). These data layers were used to remove (i.e., mask out) unsampled areas of model extrapolation following the methods implemented by BRI (2021).

Additionally, Winship et al. (2018) presented uncertainty by mapping the coefficient of variation (CV) of predicted relative density, where higher CV values indicate less precise predictions and, therefore, higher uncertainty. According to Winship et al., “In some cases the CV was relatively lower in areas with predicted higher density (e.g., Northern fulmar summer), but in other cases the CV was higher in areas with predicted higher density (e.g., black guillemot summer). Higher CVs sometimes reflected an absence of survey effort in areas with predicted low (ring-billed gull winter, offshore) or high relative density (Atlantic puffin summer, off the coast of Nova Scotia).” Therefore, in those cases, the removal of zero-effort data helped to reduce uncertainty in the analysis. Additional detail on uncertainty in the MDAT data products can be found in the CV maps presented in Winship et al. (2018) Appendix C, which are also available on the Northeast Ocean Data Portal.

Prey Data Sources

Sand lance (*Ammodytes* spp) are long, slender forage fish that burrow in the sand, school throughout the water column, and serve as important prey for piscivorous seabirds that forage across the AOCS (Staudinger et al. 2020). The distribution and abundance of sand lance caught in three different spring and fall fishery-independent surveys were mapped:

a. Offshore surveys operated by NOAA NEFSC (Gulf of Maine to Cape Hatteras)
   i. Bottom Trawl Surveys for adult sand lance (2010-2017): The interpolated biomass of the Bottom Trawl Surveys, downloaded from the Northeast Ocean Data Portal (Ribera et al. 2019), are presented.
   ii. Ecosystems Monitoring (EcoMon) Surveys for larval sand lance (2010-2017): EcoMon data (NEFSC 2021, version 3.5) were downloaded and the number of sand lance per 108 square feet (10 square meters, m^2) was mapped. Sand lance were encountered at 692 spring stations (n = 2,186) and no sand lance were captured at 1,803 fall stations.
b. Nearshore Bottom Trawl Surveys conducted by NEAMAP (Rhode Island Sound to Cape Hatteras; 2008-2021): Since its start in 2007, the Northeast Area Monitoring and Assessment Program (NEAMAP) has been operated by the Virginia Institute of Marine Science (VIMS). Based on a data request to VIMS, the number of sand lance caught per station, from 3,982 random locations sampled in the nearshore Mid-Atlantic, is presented. The gear is configured for groundfishes, so it does not effectively target the population of sand lance, which was encountered at 36 stations.

Data were not available on *Ammodytes* in the Long Island Sound from the Northeast Ocean Data Portal, due to low catch rates (only species caught in more than five fall tows were included in the Portal's Long Island Sound trawl layers).

Tracking Movements of Rufa Red Knots: U.S. Atlantic Outer Continental Shelf Waters

Loring et al. (2018) used automated radiotelemetry to estimate spring and fall migratory tracks and flight altitudes of federally Threatened rufa red knots (*Calidris canutus rufa*). Figures that showed potential exposure to activity in the Lease Area were extracted from the Loring et al. (2018) report. One of the most unique aspects of the automated radiotelemetry is its ability to estimate the altitude of bird detections, in addition to their spatial coordinates. While uncertainty around these estimates is high, other tracking technology is also limited – it needs to be small enough to mount on shorebirds (or terns) and provide high spatiotemporal resolution. However, with nanotags, the detection range of receivers increases with flight heights. Birds flying 656 ft (200 m) high (e.g., shorebirds) may be detected out to 108 nm (200 km), but birds flying 65.6 ft (20 m) high (e.g., terns) can only be detected out to 10.8 nm (20 km) maximum (Loring et al. 2018, 2019). Therefore, Beacon Wind installed a receiver on two Metocean facilities in November, 2021 to help improve detection coverage. For bird tracking, 434 megahertz (MHz) avian tag receiver antenna have been installed on LiDAR and Met/Wave buoy #2. After 12 months, one antenna will be swapped from Met/Wave buoy #2 and installed on Met/Wave buoy #1LiDAR will collect data for two years and each Met/Wave buoy will collect data for one year.

Tracking Movements of Vulnerable Shorebirds and Terns: U.S. Atlantic Outer Continental Shelf Waters

Loring et al. (2019) used automated radiotelemetry to estimate fall migratory tracks and flight altitudes of federally Threatened piping plovers (*Charadrius melodus*). They also estimated breeding and post-

breeding flight paths and altitudes of the federally Endangered roseate tern (*Sterna dougallii*) and sister species, the common tern (*S. hirundo*). The figures from this report that showed potential exposure to activity in the Lease Area were extracted (see above paragraph in this section for details on data limitations).

Tracking Movements of Diving Birds: U.S. Atlantic Outer Continental Shelf Waters

Spiegel et al. (2017) used satellite telemetry to estimate the migratory and overwintering utilization distributions of larger-bodied diving birds (surf scoters, red-throated loons, and Northern gannets; see **Table P.2-2** for scientific names) in fall, winter, and spring. The products of their analysis were compiled and made available via the Northeast Ocean Data Portal map services,[1] which were used to create figures specific to the Lease Area.

P.2.1.1.2 Exposure Assessment Species

The exposure of 53 avian species to offshore activity within the Lease Area was assessed (**Table P.2-2**). Using a quantitative approach, exposure scores for the 47 marine bird species included in the MDAT abundance models were derived (more details in **Sections P.2.1.1.3 – P.2.1.1.4** below). Exposure of the other avian species was determined qualitatively using the remaining data sources. Only shorebirds and marine birds were assessed for exposure, because other avian groups were either not observed (e.g., wading birds, raptors, eagles) or were rare and not identified to genus nor species (e.g., songbirds, coastal waterbirds) in the APEM digital aerial surveys.

[1] https://services.northeastoceandata.org/arcgis1/rest/services/MarineLifeAndHabitat/MapServer

TABLE P.2-2. EXPOSURE ASSESSMENT: SPECIES

Common Name	Scientific Name	IPaC	NY Listed	MA Listed	ESA Listed	APEM	MDAT
Plovers	**Order Charadriiformes, Family Charadriidae**						
Piping plover	*Charadrius melodus*	X	E	T	T	-	-
Sandpipers	**Order Charadriiformes, Family Scolopacidae: Arenariinae**						
Rufa red knot	*Calidris canutus rufa*	X	T	T	T	-	-
Phalaropes	**Order Charadriiformes, Family Scolopacidae: Tringinae**						
Red phalarope	*Phalaropus fulicarius*	-	-	-	-	X	X
Red-necked phalarope	*Phalaropus lobatus*	X	-	-	-	XX	X
Terns	**Order Charadriiformes, Family Laridae: Sterninae**						
Roseate tern	*Sterna dougallii*	X	E	T	E	X	X
Forster's tern	*Sterna forsteri*	-	-	-	-	X	-
Common tern	*Sterna hirundo*	X	T	SC	-	X	X
Royal tern	*Sterna maxima*	X	-	-	-	-	X
Arctic tern	*Sterna paradisaea*	X	-	SC	-	XX	X
Least tern	*Sternula antillarum*	X	T	SC	-	-	X
Bridled tern	*Onychoprion anaethetus*	-	-	-	-	-	X
Sooty tern	*Onychoprion fuscatus*	X	-	-	-	-	X
Gulls	**Order Charadriiformes, Family Laridae: Larinae**						
Herring gull	*Larus argentatus*	X	-	-	-	X	X
Laughing gull	*Leucophaeus atricilla*	-	-	-	-	X	X
Ring-billed gull	*Larus delawarensis*	X	-	-	-	X	X
Lesser black-backed gull	*Larus fuscus*	-	-	-	-	X	-
Iceland gull	*Larus glaucoides*	-	-	-	-	X	-
Great black-backed gull	*Larus marinus*	X	-	-	-	X	X
Bonaparte's gull	*Chroicocephalus philadelphia*	X	-	-	-	X	X
Black-legged kittiwake	*Rissa tridactyla*	X	-	-	-	X	X
Sabine's gull	*Xema sabini*	-	-	-	-	X	-
Jaegers and Skuas	**Order Charadriiformes, Family Stercorariidae**						
South polar skua	*Stercorarius maccormicki*	-	-	-	-	-	X
Parasitic jaeger	*Stercorarius parasiticus*	X	-	-	-	X	X

Common Name	Scientific Name	IPaC	NY Listed	MA Listed	ESA Listed	APEM	MDAT
Pomarine jaeger	*Stercorarius pomarinus*	X	-	-	-	-	X
Great skua	*Stercorarius skua*	-	-	-	-	-	X
Alcids	**Order Charadriiformes, Family Alcidae**						
Razorbill	*Alca torda*	X	-	-	-	X	X
Dovekie	*Alle*	X	-	-	-	X	X
Black guillemot	*Cepphus grylle*	X	-	-	-	-	X
Atlantic puffin	*Fratercula arctica*	X	-	-	-	X	X
Common murre	*Uria aalge*	X	-	-	-	XX	X
Thick-billed murre	*Uria lomvia*	X	-	-	-	XX	X
Seaducks	**Order Anseriformes, Family Anatidae: Anatinae**						
Long-tailed duck	*Clangula hyemalis*	X	-	-	-	X	X
White-winged scoter	*Melanitta deglandi*	X	-	-	-	X	X
Black scoter	*Melanitta americana*	X	-	-	-	X	X
Surf scoter	*Melanitta perspicillata*	X	-	-	-	X	X
Red-breasted merganser	*Mergus serrator*	X	-	-	-	-	X
Common eider	*Somateria mollissima*	X	-	-	-	X	X
Loons	**Order Gaviiformes, Family Gaviidae**						
Common loon	*Gavia immer*	X	SC	SC	-	X	X
Red-throated loon	*Gavia stellata*	X	-	-	-	X	X
Pelicans	**Order Pelecaniformes, Family Pelecanidae**						
Brown pelican	*Pelecanus occidentalis*	X	-	-	-	-	X
Grebes	**Order Podicipediformes, Family Podicipedidae**						
Horned grebe	*Podiceps auratus*	-	-	-	-	-	X
Storm-petrels	**Order Procellariiformes, Families Oceanitidae and Hydrobatidae**						
Wilson's storm-petrel	*Oceanites oceanicus*	X	-	-	-	X	X
Band-rumped storm-petrel	*Hydrobates castro*	-	-	-	-	-	X
Leach's storm-petrel	*Hydrobates leucorhous*	X	-	E	-	XX	X
Shearwaters, Petrels, and Fulmars	**Order Procellariiformes, Family Procellariidae**						
Cory's shearwater	*Calonectris diomedea*	X	-	-	-	X	X
Northern fulmar	*Fulmarus glacialis*	X	-	-	-	X	X
Black-capped petrel	*Pterodroma hasitata*	-	-	-	-	-	X

Common Name	Scientific Name	IPaC	NY Listed	MA Listed	ESA Listed	APEM	MDAT
Great shearwater	*Ardenna gravis*	X	-	-	-	X	X
Sooty shearwater	*Ardenna grisea*	-	-	-	-	X	X
Audubon's shearwater	*Puffinus lherminieri*	-	-	-	-	XX	X
Manx shearwater	*Puffinus*	X	-	-	-	X	X
Cormorants	**Order Suliformes, Family Phalacrocoracidae**						
Double-crested cormorant	*Nannopterum auritum*	X	-	-	-	XX	X
Gannets	**Order Suliformes, Family Sulidae**						
Northern gannet	*Morus bassanus*	X	-	-	-	X	X

Notes:
Species assessed for exposure, grouped by taxonomic order and family (Chesser et al. 2021), included those listed in the Information for Planning and Consultation (IPaC) database, species listed as Endangered, Threatened, or Special Concern species in New York (NY), Massachusetts (MA) or under the Endangered Species Act (ESA), species observed in the APEM digital aerial surveys, and/or species modeled by the Marine-life Data and Analysis Team (MDAT). Some species were grouped with other species within the same genus by APEM, due to identifiability issues. Plovers and red knots are shorebirds, phalaropes are pelagic shorebirds, and the other species are marine birds.
X=IPaC listed, XX=included in APEM group by genus, E=Endangered, T=Threatened, SC=Special Concern.

Sources:
Chesser et al. 2021; IPaC Report (**Attachment P-2**); New York Department of Environmental Conservation (NYDEC) 2015; MassWildlife Natural Heritage & Endangered Species Program, Division of Fisheries and Wildlife [Internet]. 2020. Available from: https://www.mass.gov/info-details/list-of-endangered-threatened-and-special-concern-species; Normandeau-APEM 2020; Curtice et al. 2019

P.2.1.1.3 Exposure Mapping Categories

To map avian exposure to activity within the Lease Area, bird densities derived from the MDAT avian abundance models and APEM digital aerial surveys, by species and season, are presented. Included are the predicted relative density quantiles of the MDAT avian abundance models and the observed densities of birds detected in the APEM digital aerial surveys (effort-corrected; more details in this section, below). Rather than presenting MDAT relative densities redundant with Winship et al. 2018 Appendix C, the classified relative densities, categorized by quantile (e.g., Low, High) are mapped. These categories represent species-specific risk of exposure relative to the full MDAT study area (AOCS from Maine to Florida), and correspond directly to the exposure scores derived for this assessment (see **Section P.2.2**).

MDAT avian abundance models

To calculate exposure risk categories, the methods implemented by BRI 2021 and The Nature Conservancy (TNC) Marine Mapping Tool (maps.tnc.org/marinemap) were followed. The classification scheme implemented by TNC was used, but zero-effort grid cells were removed from the MDAT data, following BRI 2021. To derive quantile-based categories, quartiles were used, consistent with both BRI and TNC. However, the TNC classification scheme differed in the use of one extra quantile (top 10 percent). The upper quartile (i.e., above the 75th percentile, "High") was divided into two quantiles, "High" and "Very High", at the 90th percentile ("threshold"). Following this method, the MDAT grid cells were classified into the following categories:

- 5: 90 Percent < Very High ≤ 100 percent;
- 4: 75 Percent < High ≤ 90 percent;
- 3: 50 Percent < Medium ≤ 75 percent;
- 2: 25 Percent < Low ≤ 50 percent; and
- 1: 0 Percent < Minimal ≤ 25 percent.

In other words, if bird densities ranked in the 75th percentile, 75 percent of the study area (AOCS from Maine to Florida) had the same (i.e., inclusive) or lower bird densities. There were no true zeroes in the MDAT data, because: (a) detection was not explicitly accounted for in the modeling (i.e., values represented estimates of relative densities, not true abundance); and (b) the modeled data resulted in predicted densities > 0. These categorized data layers were calculated for each species-season using packages "rgdal" (Bivand et al. 2021) and "raster" (Hijmans 2021) in R version 4.1.1 (R Core Team 2021).

APEM digital aerial surveys

The approach to mapping the APEM digital aerial surveys differed from the MDAT avian abundance models due to the lack of regional reference data available for direct comparison to the local area. While the MDAT data spanned the AOCS, the Beacon Wind APEM data covered only the Lease Area and adjacent buffer zone (unlike in the New York Bight, where programmatic digital aerial surveys spanned the region). Regional, traditional (i.e., visual) aerial surveys were conducted throughout the region by Veit et al. (2016) (supported by the Massachusetts Clean Energy Center, MassCEC); however, these were not directly comparable to the APEM digital aerial surveys due to a variety of reasons, including the flight altitudes of the planes and differences in bird detectability. Additionally, the MDAT abundance models incorporated MassCEC surveys; therefore, additional analysis was not warranted.

Without regional reference data, retaining information on avian density is preferable to classifying bird densities into quantile-based categories at the local scale. That is because assigning categories (e.g., Low-High) is only informative relative to other comparable reference data, since low and high densities relative to oneself correspond to the minimum and maximum observed densities. Categorizing bird densities is intended to determine how densities within the Lease Area compare to the rest of the study area (e.g., region or full AOCS), at the expense of information loss (i.e., where continuous variability is discretized into only 5 bins). Therefore, rather than mapping quantile-based categories of the APEM surveys, the variability was retained from the effort-corrected densities of birds observed in the Lease Area and surrounding buffer zone.

To calculate effort-corrected densities of each bird species (total counts per square kilometer of survey area) per lease block, for each survey, the counts were first spatially matched and assigned to their corresponding lease blocks. For comparison to the MDAT data (1.2 nm^2; 4 km^2), lease blocks are approximately 6.7 nm^2 (23 km^2) and sub-blocks, approximately 0.4 nm^2 (1.5 km^2). Next, the corresponding area of the image polygons inside each lease block was identified. Then, the effort-corrected densities of each species per square kilometer of survey area were calculated by summing the number of each species per lease block, then summing the total area of the image polygons within each lease block. The number of each species per lease block was divided by the total area of the image polygons within each lease block to calculate the species density per lease block. The calculations were made using a combination of ArcGIS 10.8.1 and R version 4.1.1 (R Core Team 2021). Following BRI 2021, these are presented as observed effort-corrected densities; predicted densities would be best represented by extrapolating to unsampled areas through the modeling of habitat relationships and heterogeneity, similarly to the MDAT abundance models (i.e., it would be misleading to multiply the densities by the size of the Lease Area given substantial heterogeneity within the Lease Area). As a conservative approach, the maximum density per lease block for each species and season is presented (i.e., maximum across surveys within a season, by species).

P.2.1.1.4 Exposure Scoring

Ranking the MDAT data by their quantiles converts continuous bird densities into a map with categorical values that are delineated by thresholds relative to species' density in the rest of the study area (AOCS from Maine to Florida). This results in exposure scores where areas of high or low exposure risk correspond to high- or low-density species-specific estimates (relative to the entire study area). Where overlapping with WEAs, exposure risk refers to where birds are more or less likely to encounter proposed activities or structures. As stated in the TNC Marine Mapping Tool, exposure scores help answer the question: "relative to other areas [where any given species may occur], how many more of [each] species are there likely to be in this area?"

To calculate the exposure score of the Lease Area relative to the rest of the study area for each species and season, the methods of BRI were followed. First, the 1.2-nm^2 (4-km^2) MDAT grid cells were aggregated into a coarser resolution with rectangular units the size of the Lease Area (151.6 nm^2; 520 km^2). The mean density was calculated for each new 520-km^2 grid cell. Then, the quantile-based thresholds of that aggregated layer were calculated to determine which interval class categorized the Lease Area. The resulting exposure score corresponded to the quantile-based interval class (i.e., 1-5, Minimal-Very High) containing the mean density of the 4-km^2 cells within the Lease Area.

To show within-footprint variability for each species and season, the methods of TNC were followed. MDAT data layers were reclassified at their native resolution (1.2 nm^2; 4 km^2) into quantile-based

categories across the full study area (AOCS from Maine to Florida) and the proportion of the Lease Area covered by each category was calculated.

Exposure scores from the MDAT abundance models were calculated based solely on species and season. Under certain circumstances, combining scores by species groups is useful, e.g., to incorporate unidentified species such as terns. However, the predicted abundance of unidentified species was not included in MDAT products. Additionally, aggregating across species was avoided so as to inform the current regulatory environment, which is driven by species units rather than higher-level groupings (e.g., Endangered Species Act, Migratory Bird Treaty Act Protected Species).

The exposure of avian species was quantified by season and avoided averaging exposure scores across seasons for annual estimates. Averaging, by definition, reduces variation by centering around mean values. According to Winship et al. 2018, deriving annual exposure scores would require "averaging the seasonal predicted grids for that species assuming zero relative density for seasons that were not modeled". Essentially, averaging across seasons would reduce intra-seasonal variation and would thereby reflect "the seasons with the highest predicted relative density values." Inference on annual predictive maps would also be limited to important assumptions laid out in Winship et al. 2018. An analysis of annual exposure is available from the TNC Marine Mapping Tool; however, this incorporates unsampled areas of extrapolation (i.e., rather than removing areas with zero-effort), labeling them as "low quality". Therefore, annual exposure scores were not calculated to: (1) avoid diluting intra-seasonal variation; (2) avoid constraining inference to limited assumptions; and (3) avoid including low-quality areas of extrapolation (i.e., unsampled grid cells) in exposure scores. By relying solely on the empirical seasonal results (by species), from the MDAT abundance models, a conservative approach was maintained.

The MDAT abundance models comprise the best available data needed to calculate exposure scores; however, it is important to recognize the limitations of relying on relative avian densities. Because they do not represent absolute abundance, exposure scores are calculated under the assumption that the Winship et al. (2018) study area (AOCS) contains the majority of each species' range within each season. Under that assumption, estimated densities are calculated relative to the majority of the population within each season. Therefore, it was important to use the entire study area in the analysis (federal waters from Florida to Maine). Zero-effort data were removed to avoid inference based on extrapolation (particularly beyond continental shelf waters). Therefore, there is a tradeoff in using only the data that were surveyed because relative densities are only calculated with respect to the surveyed region, not other potential parts of the species range. Focusing on surveyed areas improves certainty in the results but reduces inference to the entire population of species, particularly pelagic species that forage in unsurveyed areas off the continental shelf (e.g., Audubon's shearwater, which are rare off the Northeast coast and more common offshore the Southeast US).

P.2.1.2 Vulnerability Framework

To assess the risk of populations to development, the exposure score is scaled based on species displacement or collision sensitivity (i.e., vulnerability). Some species are attracted to turbines, others avoid them, and some individuals of the same species differ in their response (e.g., Northern gannets, Peschko et al. 2021). Avoidance of wind turbines reduces collision risk but can sometimes lead to displacement vulnerability, e.g., before construction, red-throated loons in Europe foraged across wind energy planning areas but after construction, they confined themselves to a smaller foraging area between wind facilities (Mendel et al. 2019). Conversely, preliminary studies suggest that wind turbines may serve as artificial reefs and improve foraging habitat for some species; however, if this increases

attraction to turbines, it could generate increased collision risk (e.g., for common terns; Steinen et al. 2008). Species-specific behaviors may often dictate potential risk factors; e.g., some divers that forage beneath the sea surface are more sensitive to displacement (e.g., loons), whereas aerial plunge-diving foragers (e.g., terns) can be more sensitive to collision risk if they spend most of their time near the rotor-swept zone. Robinson Willmott et al. (2013) evaluated such species-specific life history traits and ecological risk factors and used them to conduct a quantitative vulnerability assessment of all the species in the study area.

P.2.1.2.1 Population Sensitivity (PS)

Vulnerability scores calculated by Robinson Willmott et al. (2013) for the AOCS were used, which incorporated population sensitivity into collision and displacement sensitivity. Their population sensitivity scores ranged 0-5 and were based on population size, conservation importance, and a suite of ecological traits.

P.2.1.2.2 Collision Sensitivity (CS)

Robinson Willmott et al. (2013) quantified collision sensitivity based on a suite of traits including the two key factors: avoidance behavior and flight height. They calculated final collision scores as the product of Collision Sensitivity × Population Sensitivity and then ranked the 177 species included in their analysis using a range of 1-10. To supplement these quantitative ranks, they "also provided a qualitative rank for each species (i.e., low, medium, and high), … by converting the 1–10 rank scale to a 0–3 rank scale and assigning values ranging between 0 and 1, low; >1 and 2, medium; and >2, high; the qualitative ranking was based on the best estimate from [their] calculations and not the upper or lower values within the range. Both qualitative and quantitative ranks are relative among the select species in [their] database." This qualitative rank scale (low, medium, high) is reported on an integer scale (1, 2, 3).

P.2.1.2.3 Displacement Sensitivity (DS)

Robinson Willmott et al. (2013) quantified displacement sensitivity based on a suite of traits including the two key factors: avoidance of wind facilities and habitat flexibility. They calculated final displacement scores as the product of Displacement Sensitivity × Population Sensitivity. Then they ranked the 177 species included in their analysis using a quantitative range of 1-10 and a qualitative range of low-high, similarly to their collision scoring (more details in **Section P.2.1.2.2** above). This qualitative rank scale (low, medium, high) is reported on an integer scale (1, 2, 3).

P.2.1.3 Final Risk Determination

The product of Exposure × Vulnerability was calculated. The exposure score of species for each season, by Lease Area (151.6-nm^2; 520-km^2 resolution), ranged from "Minimal" (1) to "Very High" (5) (see **Section P.2.1.1.3** above for more details). For species that were not included in the MDAT abundance models but were present in the APEM surveys or Loring et al. (2018, 2019), an exposure score of 3 was assigned to correspond to "Medium" (e.g., piping plovers, red knots, Forster's tern and three gull species). The vulnerability ranking by Robinson Willmott et al. (2013) incorporated population vulnerability into collision sensitivity and displacement sensitivity, ranging from "Lower" (1) to "Higher" (3). The final collision and displacement risk score was determined following the Risk Matrix below (**Table P.2-3**). Seasons without data (i.e., not modeled by MDAT nor reported in the APEM surveys or Loring et al. 2018, 2019) generally represent very low risk due to low or rare species occurrence.

TABLE P.2-3. RISK MATRIX

Exposure	Vulnerability H (3)	Vulnerability M (2)	Vulnerability L (1)			
5	15	10	5	13-15	VH	Very high
4	12	8	4	10-12	H	High
3	9	6	3	7-9	M	Medium
2	6	4	2	4-6	L	Low
1	3	2	1	1-3	N	Minimal

Note:
Risk was calculated as the product of exposure and vulnerability scores, and categorized as: Minimal (1-3, blue), Low (4-6, green), Medium (7-9, yellow), High (10-12), and Very High (13-15, red).

P.2.2 Results

P.2.2.1 Overview

P.2.2.1.1 Exposure

Exposure scores were calculated for each species and season (**Table P.2-4**, **Table P.2-5**, **Table P.2-6**, **Table P.2-7**), by Lease Area (151.6-nm^2; 520-km^2 resolution), and by the proportion of the Lease Area covered by each scoring category (1.2-nm^2; 4-km^2 resolution); see **Section P.2.1.1.3** for more details on how exposure mapping categories were classified (i.e., based on MDAT model quantiles). Flight heights of avian species were extracted from the Northwest Atlantic Seabird Catalog boat surveys (**Table P.2-8**).

TABLE P.2-4. EXPOSURE SCORES: SPRING

Common Name	Exposure Score	Proportion of Lease Area				
		Minimal	Low	Medium	High	Very High
Phalaropes						
Red phalarope	Medium	0.00	0.00	0.98	0.02	0.00
Red-necked phalarope	Low	0.00	0.88	0.12	0.00	0.00
Terns						
Roseate tern	Low	0.23	0.76	0.01	0.00	0.00
Common tern	Low	0.00	0.94	0.06	0.00	0.00
Royal tern	Low	0.00	1.00	0.00	0.00	0.00
Arctic tern	-	-	-	-	-	-
Least tern	-	-	-	-	-	-
Bridled tern	-	-	-	-	-	-
Sooty tern	Low	0.00	1.00	0.00	0.00	0.00
Gulls						
Herring gull	Medium	0.00	0.25	0.75	0.00	0.00
Laughing gull	Minimal	0.29	0.71	0.00	0.00	0.00
Ring-billed gull	Low	0.00	1.00	0.00	0.00	0.00
Great black-backed gull	Medium	0.00	0.00	1.00	0.00	0.00
Bonaparte's gull	Low	0.00	1.00	0.00	0.00	0.00

Common Name	Exposure Score	Proportion of Lease Area				
		Minimal	Low	Medium	High	Very High
Black-legged kittiwake	High	0.00	0.00	0.77	0.23	0.00
Jaegers and Skuas						
South polar skua	-	-	-	-	-	-
Parasitic jaeger	Minimal	1.00	0.00	0.00	0.00	0.00
Pomarine jaeger	Minimal	0.77	0.23	0.00	0.00	0.00
Great skua	-	-	-	-	-	-
Alcids						
Razorbill	Very High	0.00	0.00	0.00	0.00	1.00
Dovekie	Low	0.00	1.00	0.00	0.00	0.00
Black guillemot	-	-	-	-	-	-
Atlantic puffin	Medium	0.00	0.74	0.26	0.00	0.00
Common murre	Medium	0.00	0.00	1.00	0.00	0.00
Thick-billed murre	Low	0.00	0.09	0.91	0.00	0.00
Seaducks						
Long-tailed duck	Medium	0.00	0.00	0.54	0.45	0.01
White-winged scoter	Medium	0.00	0.00	0.67	0.28	0.05
Black scoter	Medium	0.00	0.00	0.99	0.01	0.00
Surf scoter	Medium	0.00	0.00	0.72	0.27	0.01
Red-breasted merganser	Medium	0.00	0.00	0.81	0.19	0.00
Common eider	Minimal	0.98	0.02	0.00	0.00	0.00
Loons						
Common loon	Medium	0.00	0.31	0.69	0.00	0.00
Red-throated loon	Medium	0.00	0.00	0.81	0.19	0.00
Pelicans						
Brown pelican	Minimal	1.00	0.00	0.00	0.00	0.00
Grebes						
Horned grebe	-	-	-	-	-	-
Storm-petrels						
Wilson's storm-petrel	Low	0.00	0.82	0.18	0.00	0.00
Band-rumped storm-petrel	-	-	-	-	-	-
Leach's storm-petrel	Low	0.00	0.94	0.06	0.00	0.00
Shearwaters, Petrels, and Fulmars						
Cory's shearwater	Minimal	0.95	0.05	0.00	0.00	0.00
Northern fulmar	Medium	0.00	0.05	0.95	0.00	0.00
Black-capped petrel	Low	0.00	1.00	0.00	0.00	0.00
Great shearwater	Low	0.00	0.34	0.66	0.00	0.00
Sooty shearwater	Medium	0.00	0.00	1.00	0.00	0.00
Audubon's shearwater	Minimal	0.99	0.01	0.00	0.00	0.00
Manx shearwater	Low	0.00	0.78	0.22	0.00	0.00

Common Name	Exposure Score	Proportion of Lease Area				
		Minimal	Low	Medium	High	Very High
Cormorants						
Double-crested cormorant	Medium	0.00	0.00	1.00	0.00	0.00
Gannets						
Northern gannet	Medium	0.00	0.00	0.98	0.02	0.00

Note:
Exposure score of species in spring (March-May), by Lease Area (151.6 nm^2; 520 km^2 resolution), and proportion of the Lease Area covered by each scoring category (1.2 nm^2; 4 km^2 resolution). See the text for additional detail and **Attachment P-1** for corresponding figures.

TABLE P.2-5. EXPOSURE SCORES: SUMMER

Common Name	Exposure Score	Proportion of Lease Area				
		Minimal	Low	Medium	High	Very High
Phalaropes						
Red phalarope	Low	0.02	0.98	0.00	0.00	0.00
Red-necked phalarope	Medium	0.00	0.00	1.00	0.00	0.00
Terns						
Roseate tern	Medium	0.00	0.00	0.97	0.03	0.00
Common tern	Medium	0.00	0.05	0.84	0.12	0.00
Royal tern	Minimal	0.00	1.00	0.00	0.00	0.00
Arctic tern	Medium	0.00	0.00	1.00	0.00	0.00
Least tern	Low	0.00	0.99	0.01	0.00	0.00
Bridled tern	Minimal	1.00	0.00	0.00	0.00	0.00
Sooty tern	Minimal	0.00	1.00	0.00	0.00	0.00
Gulls						
Herring gull	High	0.00	0.00	0.16	0.83	0.02
Laughing gull	Medium	0.00	0.74	0.26	0.00	0.00
Ring-billed gull	Medium	0.00	0.98	0.02	0.00	0.00
Great black-backed gull	High	0.00	0.00	0.60	0.40	0.00
Bonaparte's gull	-	-	-	-	-	-
Black-legged kittiwake	-	-	-	-	-	-
Jaegers and Skuas						
South polar skua	Low	0.00	0.50	0.50	0.00	0.00
Parasitic jaeger	High	0.00	0.00	0.80	0.20	0.00
Pomarine jaeger	Low	0.00	0.44	0.56	0.00	0.00
Great skua	-	-	-	-	-	-
Alcids						
Razorbill	Medium	0.00	0.00	1.00	0.00	0.00
Dovekie	Medium	0.00	0.00	0.98	0.02	0.00
Black guillemot	Medium	0.00	0.00	1.00	0.00	0.00

Common Name	Exposure Score	Proportion of Lease Area				
		Minimal	Low	Medium	High	Very High
Atlantic puffin	Medium	0.00	0.00	1.00	0.00	0.00
Common murre	-	-	-	-	-	-
Thick-billed murre	-	-	-	-	-	-
Seaducks						
Long-tailed duck	-	-	-	-	-	-
White-winged scoter	-	-	-	-	-	-
Black scoter	-	-	-	-	-	-
Surf scoter	-	-	-	-	-	-
Red-breasted merganser	-	-	-	-	-	-
Common eider	Medium	0.00	0.00	1.00	0.00	0.00
Loons						
Common loon	Medium	0.00	0.00	0.89	0.09	0.02
Red-throated loon	-	-	-	-	-	-
Pelicans						
Brown pelican	Low	0.00	1.00	0.00	0.00	0.00
Grebes						
Horned grebe	-	-	-	-	-	-
Storm-petrels						
Wilson's storm-petrel	High	0.00	0.00	0.85	0.15	0.00
Band-rumped storm-petrel	Minimal	0.00	1.00	0.00	0.00	0.00
Leach's storm-petrel	Low	0.00	1.00	0.00	0.00	0.00
Shearwaters, Petrels, and Fulmars						
Cory's shearwater	Very High	0.00	0.00	0.00	0.46	0.54
Northern fulmar	Medium	0.00	0.02	0.98	0.00	0.00
Black-capped petrel	Minimal	1.00	0.00	0.00	0.00	0.00
Great shearwater	Medium	0.00	0.00	1.00	0.00	0.00
Sooty shearwater	High	0.00	0.00	1.00	0.00	0.00
Audubon's shearwater	Low	0.02	0.98	0.00	0.00	0.00
Manx shearwater	Medium	0.00	0.00	1.00	0.00	0.00
Cormorants						
Double-crested cormorant	Medium	0.00	0.00	1.00	0.00	0.00
Gannets						
Northern gannet	Medium	0.00	0.00	1.00	0.00	0.00

Note:
Exposure score of species in summer (June to August), by Lease Area (151.6 nm^2; 520 km^2 resolution), and proportion of the Lease Area covered by each scoring category (1.2 nm^2; 4 km^2 resolution). See the text for additional detail and **Attachment P-1** for corresponding figures.

TABLE P.2-6. EXPOSURE SCORES: FALL

Common Name	Exposure Score	Proportion of Lease Area				
		Minimal	Low	Medium	High	Very High
Phalaropes						
Red phalarope	Low	0.00	0.72	0.28	0.00	0.00
Red-necked phalarope	Minimal	0.49	0.51	0.00	0.00	0.00
Terns						
Roseate tern	Medium	0.00	0.00	0.91	0.09	0.00
Common tern	Medium	0.00	0.36	0.64	0.00	0.00
Royal tern	Low	0.00	1.00	0.00	0.00	0.00
Arctic tern	-	-	-	-	-	-
Least tern	Low	0.06	0.94	0.00	0.00	0.00
Bridled tern	Minimal	0.79	0.21	0.00	0.00	0.00
Sooty tern	-	-	-	-	-	-
Gulls						
Herring gull	Medium	0.00	0.00	1.00	0.00	0.00
Laughing gull	Medium	0.00	0.19	0.81	0.00	0.00
Ring-billed gull	Medium	0.00	0.79	0.21	0.00	0.00
Great black-backed gull	Medium	0.00	0.00	1.00	0.00	0.00
Bonaparte's gull	Low	0.00	0.98	0.02	0.00	0.00
Black-legged kittiwake	Medium	0.00	0.00	1.00	0.00	0.00
Jaegers and Skuas						
South polar skua	Low	0.00	1.00	0.00	0.00	0.00
Parasitic jaeger	Low	0.00	1.00	0.00	0.00	0.00
Pomarine jaeger	Low	0.00	0.98	0.02	0.00	0.00
Great skua	Low	0.00	0.90	0.10	0.00	0.00
Alcids						
Razorbill	Low	0.05	0.85	0.10	0.00	0.00
Dovekie	Low	0.10	0.78	0.12	0.00	0.00
Black guillemot	-	-	-	-	-	-
Atlantic puffin	Low	0.14	0.86	0.00	0.00	0.00
Common murre	-	-	-	-	-	-
Thick-billed murre	-	-	-	-	-	-
Seaducks						
Long-tailed duck	Low	0.47	0.48	0.05	0.00	0.00
White-winged scoter	Medium	0.00	0.01	0.98	0.01	0.00
Black scoter	Medium	0.00	0.40	0.60	0.00	0.00
Surf scoter	Medium	0.00	0.52	0.48	0.00	0.00
Red-breasted merganser	-	-	-	-	-	-
Common eider	Medium	0.00	0.00	1.00	0.00	0.00

Common Name	Exposure Score	Proportion of Lease Area				
		Minimal	Low	Medium	High	Very High
Loons						
Common loon	Low	0.09	0.88	0.02	0.00	0.00
Red-throated loon	Low	0.60	0.26	0.14	0.00	0.00
Pelicans						
Brown pelican	Low	0.00	1.00	0.00	0.00	0.00
Grebes						
Horned grebe	-	-	-	-	-	-
Storm-petrels						
Wilson's storm-petrel	Low	0.00	1.00	0.00	0.00	0.00
Band-rumped storm-petrel	-	-	-	-	-	-
Leach's storm-petrel	Medium	0.00	0.16	0.84	0.00	0.00
Shearwaters, Petrels, and Fulmars						
Cory's shearwater	High	0.00	0.00	0.02	0.66	0.32
Northern fulmar	Medium	0.00	0.00	1.00	0.00	0.00
Black-capped petrel	Low	0.00	1.00	0.00	0.00	0.00
Great shearwater	Medium	0.00	0.00	1.00	0.00	0.00
Sooty shearwater	Medium	0.00	0.00	1.00	0.00	0.00
Audubon's shearwater	Minimal	1.00	0.00	0.00	0.00	0.00
Manx shearwater	Low	0.00	1.00	0.00	0.00	0.00
Cormorants						
Double-crested cormorant	Medium	0.00	0.53	0.47	0.00	0.00
Gannets						
Northern gannet	High	0.00	0.00	0.25	0.75	0.00

Note:
Exposure score of species in fall (September to November), by Lease Area (151.6 nm^2; 520 km^2 resolution), and proportion of the Lease Area covered by each scoring category (1.2 nm^2; 4 km^2 resolution). See the text for additional detail and **Attachment P-1** for corresponding figures.

TABLE P.2-7. EXPOSURE SCORES: WINTER

Common Name	Exposure Score	Proportion of Lease Area				
		Minimal	Low	Medium	High	Very High
Phalaropes						
Red phalarope	-	-	-	-	-	-
Red-necked phalarope	-	-	-	-	-	-
Terns						
Roseate tern	-	-	-	-	-	-
Common tern	-	-	-	-	-	-
Royal tern	-	-	-	-	-	-
Arctic tern	-	-	-	-	-	-
Least tern	-	-	-	-	-	-
Bridled tern	-	-	-	-	-	-
Sooty tern	-	-	-	-	-	-
Gulls						
Herring gull	Medium	0.00	0.00	1.00	0.00	0.00
Laughing gull	Minimal	0.63	0.37	0.00	0.00	0.00
Ring-billed gull	Low	0.00	1.00	0.00	0.00	0.00
Great black-backed gull	Low	0.00	0.95	0.05	0.00	0.00
Bonaparte's gull	Low	0.00	1.00	0.00	0.00	0.00
Black-legged kittiwake	Medium	0.00	0.02	0.98	0.00	0.00
Jaegers and Skuas						
South polar skua	-	-	-	-	-	-
Parasitic jaeger	-	-	-	-	-	-
Pomarine jaeger	-	-	-	-	-	-
Great skua	-	-	-	-	-	-
Alcids						
Razorbill	Very High	0.00	0.00	0.00	0.02	0.98
Dovekie	Medium	0.00	0.00	0.70	0.29	0.01
Black guillemot	-	-	-	-	-	-
Atlantic puffin	Medium	0.00	0.16	0.84	0.00	0.00
Common murre	High	0.00	0.00	0.00	0.60	0.40
Thick-billed murre	Low	0.00	0.63	0.37	0.00	0.00
Seaducks						
Long-tailed duck	High	0.00	0.00	0.60	0.25	0.15
White-winged scoter	High	0.00	0.00	0.45	0.41	0.14
Black scoter	Low	0.34	0.64	0.02	0.00	0.00
Surf scoter	Medium	0.00	0.62	0.36	0.02	0.00
Red-breasted merganser	Medium	0.00	0.03	0.95	0.02	0.00
Common eider	Medium	0.00	0.00	1.00	0.00	0.00
Loons						

Common Name	Exposure Score	Proportion of Lease Area				
		Minimal	Low	Medium	High	Very High
Common loon	Medium	0.00	0.73	0.27	0.00	0.00
Red-throated loon	Medium	0.00	0.81	0.19	0.00	0.00
Pelicans						
Brown pelican	Low	0.00	1.00	0.00	0.00	0.00
Grebes						
Horned grebe	Minimal	1.00	0.00	0.00	0.00	0.00
Storm-petrels						
Wilson's storm-petrel	-	-	-	-	-	-
Band-rumped storm-petrel	-	-	-	-	-	-
Leach's storm-petrel	-	-	-	-	-	-
Shearwaters, Petrels, and Fulmars						
Cory's shearwater	-	-	-	-	-	-
Northern fulmar	Medium	0.00	0.00	1.00	0.00	0.00
Black-capped petrel	Minimal	0.72	0.19	0.09	0.00	0.00
Great shearwater	Minimal	1.00	0.00	0.00	0.00	0.00
Sooty shearwater	-	-	-	-	-	-
Audubon's shearwater	Minimal	0.84	0.16	0.00	0.00	0.00
Manx shearwater	-	-	-	-	-	-
Cormorants						
Double-crested cormorant	Minimal	1.00	0.00	0.00	0.00	0.00
Gannets						
Northern gannet	Medium	0.00	0.36	0.64	0.00	0.00

Note:
Exposure score of species in winter (December to February), by Lease Area (151.6 nm^2; 520 km^2 resolution), and proportion of the Lease Area covered by each scoring category (1.2 nm^2; 4 km^2 resolution). See the text for additional detail and **Attachment P-1** for corresponding figures.

TABLE P.2-8. AVIAN FLIGHT HEIGHTS

Common Name	RI Ocean SAMP flight heights					AMAPPS, NOAA, WHOI flight heights						
(ft)	0-33	33-82	82-410	>410		0-33	33-82	82-164	164-328	328-656	>656	
(m)	0-10	10-25	25-125	>125	n	0-10	10-25	25-50	50-100	100-200	>200	n
Plovers												
Piping plover	-	-	-	-	-	-	-	-	-	-	-	-
Sandpipers												
Rufa red knot	-	-	-	-	-	1.00	0.00	0.00	0.00	0.00	0.00	1
Phalaropes												
Red phalarope	1.00	0.00	0.00	0.00	1	0.97	0.03	0.00	0.00	0.00	0.00	99
Red-necked phalarope	1.00	0.00	0.00	0.00	1	1.00	0.00	0.00	0.00	0.00	0.00	16
Terns												
Roseate tern	0.25	0.50	0.25	0.00	4	0.60	0.40	0.00	0.00	0.00	0.00	5
Forster's tern	-	-	-	-	-	0.00	1.00	0.00	0.00	0.00	0.00	1
Common tern	0.43	0.52	0.06	0.00	54	0.67	0.32	0.01	0.00	0.00	0.00	144
Royal tern	-	-	-	-	-	0.34	0.59	0.06	0.00	0.00	0.00	111
Arctic tern	-	-	-	-	-	0.78	0.19	0.00	0.03	0.00	0.00	36
Least tern	-	-	-	-	-	0.57	0.43	0.00	0.00	0.00	0.00	7
Bridled tern	-	-	-	-	-	0.96	0.04	0.00	0.00	0.00	0.00	51
Sooty tern	-	-	-	-	-	0.61	0.32	0.06	0.01	0.00	0.00	88
Gulls												
Herring gull	0.27	0.35	0.37	0.02	665	0.37	0.50	0.12	0.01	0.00	0.00	1,186
Laughing gull	0.49	0.41	0.10	0.00	81	0.67	0.31	0.00	0.00	0.00	0.00	226
Ring-billed gull	0.31	0.42	0.23	0.04	26	0.27	0.64	0.09	0.00	0.00	0.00	11
Lesser black-backed gull	-	-	-	-	-	0.55	0.40	0.05	0.00	0.00	0.00	20
Iceland gull	-	-	-	-	-	0.33	0.33	0.33	0.00	0.00	0.00	3
Great black-backed gull	0.38	0.30	0.31	0.01	297	0.51	0.38	0.10	0.01	0.00	0.00	746
Bonaparte's gull	0.43	0.57	0.00	0.00	7	0.82	0.16	0.02	0.00	0.00	0.00	127
Black-legged kittiwake	0.35	0.50	0.15	0.00	46	0.55	0.43	0.01	0.00	0.00	0.00	67

Common Name	RI Ocean SAMP flight heights					AMAPPS, NOAA, WHOI flight heights						
(ft)	0-33	33-82	82-410	>410		0-33	33-82	82-164	164-328	328-656	>656	
(m)	0-10	10-25	25-125	>125	n	0-10	10-25	25-50	50-100	100-200	>200	n
Sabine's Gull	-	-	-	-	-	1.00	0.00	0.00	0.00	0.00	0.00	1
Jaegers and Skuas												
South polar skua	-	-	-	-	-	0.41	0.53	0.05	0.01	0.00	0.00	76
Parasitic jaeger	1.00	0.00	0.00	0.00	1	0.57	0.36	0.05	0.02	0.00	0.00	42
Pomarine jaeger	0.50	0.00	0.50	0.00	2	0.53	0.40	0.05	0.03	0.00	0.00	129
Great skua	-	-	-	-	-	0.67	0.33	0.00	0.00	0.00	0.00	3
Alcids												
Razorbill	0.91	0.07	0.01	0.00	82	0.92	0.08	0.00	0.00	0.00	0.00	51
Dovekie	1.00	0.00	0.00	0.00	20	1.00	0.00	0.00	0.00	0.00	0.00	88
Black guillemot	-	-	-	-	-	0.60	0.40	0.00	0.00	0.00	0.00	5
Atlantic puffin	-	-	-	-	-	0.98	0.02	0.00	0.00	0.00	0.00	41
Common murre	0.97	0.03	0.00	0.00	35	0.92	0.08	0.00	0.00	0.00	0.00	12
Thick-billed murre	1.00	0.00	0.00	0.00	1	1.00	0.00	0.00	0.00	0.00	0.00	6
Seaducks												
Long-tailed duck	0.67	0.33	0.00	0.00	12	0.63	0.25	0.00	0.00	0.00	0.13	8
White-winged scoter	0.71	0.22	0.07	0.00	76	0.70	0.26	0.04	0.00	0.00	0.00	53
Black scoter	0.60	0.36	0.04	0.00	25	0.69	0.28	0.02	0.02	0.00	0.00	65
Surf scoter	0.63	0.37	0.00	0.00	30	0.60	0.28	0.08	0.04	0.00	0.00	25
Red-breasted merganser	0.25	0.75	0.00	0.00	4	1.00	0.00	0.00	0.00	0.00	0.00	2
Common eider	0.93	0.02	0.05	0.00	59	0.67	0.33	0.00	0.00	0.00	0.00	9
Loons												
Common loon	0.38	0.34	0.26	0.01	73	0.48	0.33	0.15	0.04	0.00	0.00	79
Red-throated loon	0.44	0.39	0.15	0.01	97	0.60	0.24	0.16	0.00	0.00	0.00	25
Pelicans												
Brown pelican	-	-	-	-	-	0.73	0.27	0.00	0.00	0.00	0.00	22
Grebes												
Horned grebe	-	-	-	-	-	-	-	-	-	-	-	-

Common Name	RI Ocean SAMP flight heights					AMAPPS, NOAA, WHOI flight heights						
(ft)	0-33	33-82	82-410	>410		0-33	33-82	82-164	164-328	328-656	>656	
(m)	0-10	10-25	25-125	>125	n	0-10	10-25	25-50	50-100	100-200	>200	n
Storm-petrels												
Wilson's storm-petrel	1.00	0.00	0.00	0.00	354	1.00	0.00	0.00	0.00	0.00	0.00	2,721
Band-rumped storm-petrel	-	-	-	-	-	1.00	0.00	0.00	0.00	0.00	0.00	229
Leach's storm-petrel	-	-	-	-	-	1.00	0.00	0.00	0.00	0.00	0.00	1,847
Shearwaters, Petrels, and Fulmars												
Cory's shearwater	1.00	0.00	0.00	0.00	319	0.99	0.01	0.00	0.00	0.00	0.00	1,548
Northern fulmar	1.00	0.00	0.00	0.00	3	0.97	0.03	0.00	0.00	0.00	0.00	535
Black-capped petrel	-	-	-	-	-	0.97	0.03	0.00	0.00	0.00	0.00	210
Great shearwater	1.00	0.00	0.00	0.00	205	0.99	0.01	0.00	0.00	0.00	0.00	3,280
Sooty shearwater	1.00	0.00	0.00	0.00	25	0.98	0.02	0.00	0.00	0.00	0.00	655
Audubon's shearwater	-	-	-	-	-	0.99	0.01	0.00	0.00	0.00	0.00	511
Manx shearwater	1.00	0.00	0.00	0.00	4	0.96	0.04	0.00	0.00	0.00	0.00	164
Cormorants												
Double-crested cormorant	0.81	0.04	0.15	0.00	26	0.33	0.46	0.19	0.02	0.00	0.00	48
Gannets												
Northern gannet	0.46	0.36	0.18	0.00	449	0.63	0.31	0.05	0.01	0.00	0.00	1,214

P.2.2.1.2 Vulnerability and Risk

Final collision and displacement risk scores for the Lease Area (151.6-nm^2; 520-km^2 resolution) were calculated for each species and season as the product of the exposure and vulnerability scores derived from the MDAT abundance models and Robinson Willmott et al. (2013), respectively (**Table P.2-9**). Exposure scores of species for each season ranged from Minimal (1) to Very High (5), and vulnerability scores ranged from "Lower" (1) to "Higher" (3) for collision and displacement sensitivity, which incorporated population vulnerability (Robinson Willmott et al. 2013). Medium exposure scores (e.g., 3) were assigned to species documented in APEM or Loring et al. 2018, 2019, but not in the MDAT models.

TABLE P.2-9. EXPOSURE, VULNERABILITY, AND RISK SCORES

Common Name	Exposure				Vulnerability		Collision Risk				Displacement Risk			
	Spr	Sum	Fal	Win	CS	DS	Spr	Sum	Fal	Win	Spr	Sum	Fal	Win
Plovers														
Piping plover	-	-	***3***	-	2	1	-	-	6	-	-	-	3	-
Sandpipers														
Rufa red knot	***3***	***3***	***3***	-	2	1	6	6	6	-	3	3	3	-
Phalaropes														
Red phalarope	3	2	2	-	3	2	9	6	6	-	6	4	4	-
Red-necked phalarope	2	3	1	-	3	1	6	9	3	-	2	3	1	-
Terns														
Roseate tern	2	3	3	-	3	3	6	9	9	-	6	9	9	-
Forster's tern	-	-	***3***	-	2	1	-	-	6	-	-	-	3	-
Common tern	2	3	3	-	3	3	6	9	9	-	6	9	9	-
Royal tern	2	1	2	-	2	1	4	2	4	-	2	1	2	-
Arctic tern	-	3	-	-	3	3	-	9	-	-	-	9	-	-
Least tern	-	2	2	-	2	1	-	4	4	-	-	2	2	-
Bridled tern	-	1	1	-	3	3	-	3	3	-	-	3	3	-
Sooty tern	2	1	-	-	3	3	6	3	-	-	6	3	-	-
Gulls														
Herring gull	3	4	3	3	3	2	9	12	9	9	6	8	6	6
Laughing gull	1	3	3	1	3	2	3	9	9	3	2	6	6	2
Ring-billed gull	2	3	3	2	2	1	4	6	6	4	2	3	3	2
Lesser black-backed gull	***3***	-	***3***	-	3	2	9	-	9	-	6	-	6	-
Iceland gull	-	-	***3***	-	3	3	-	-	9	-	-	-	9	-
Great black-backed gull	3	4	3	2	3	3	9	12	9	6	9	12	9	6
Bonaparte's gull	2	-	2	2	1	1	2	-	2	2	2	-	2	2
Black-legged kittiwake	4	-	3	3	3	1	12	-	9	9	4	-	3	3
Sabine's gull	-	-	***3***	-	3	2	-	-	9	-	-	-	6	-
Jaegers and Skuas														
South polar skua	-	2	2	-	3	1	-	6	6	-	-	2	2	-
Parasitic jaeger	1	4	2	-	3	1	3	12	6	-	1	4	2	-

Common Name	Exposure				Vulnerability		Collision Risk				Displacement Risk			
	Spr	Sum	Fal	Win	CS	DS	Spr	Sum	Fal	Win	Spr	Sum	Fal	Win
Pomarine jaeger	1	2	2	-	3	1	3	6	6	-	1	2	2	-
Great skua	-	-	2	-	3	1	-	-	6	-	-	-	2	-
Alcids														
Razorbill	5	3	2	5	3	3	15	9	6	15	15	9	6	15
Dovekie	2	3	2	3	2	2	4	6	4	6	4	6	4	6
Black guillemot	-	3	-	-	3	3	-	9	-	-	-	9	-	-
Atlantic puffin	3	3	2	3	3	3	9	9	6	9	9	9	6	9
Common murre	3	-	-	4	3	3	9	-	-	12	9	-	-	12
Thick-billed murre	2	-	-	2	3	3	6	-	-	6	6	-	-	6
Seaducks														
Long-tailed duck	3	-	2	4	3	3	9	-	6	12	9	-	6	12
White-winged scoter	3	-	3	4	3	3	9	-	9	12	9	-	9	12
Black scoter	3	-	3	2	3	3	9	-	9	6	9	-	9	6
Surf scoter	3	-	3	3	3	3	9	-	9	9	9	-	9	9
Red-breasted merganser	3	-	-	3	3	2	9	-	-	9	6	-	-	6
Common eider	1	3	3	3	3	3	3	9	9	9	3	9	9	9
Loons														
Common loon	3	3	2	3	3	3	9	9	6	9	9	9	6	9
Red-throated loon	3	-	2	3	3	3	9	-	6	9	9	-	6	9
Pelicans														
Brown pelican	1	2	2	2	3	2	3	6	6	6	2	4	4	4
Grebes														
Horned grebe	-	-	-	1	3	2	-	-	-	3	-	-	-	2
Storm-petrels														
Wilson's storm-petrel	2	4	2	-	3	1	6	12	6	-	2	4	2	-
Band-rumped storm-petrel	-	1	-	-	3	2	-	3	-	-	-	2	-	-
Leach's storm-petrel	2	2	3	-	3	2	6	6	9	-	4	4	6	-
Shearwaters, Petrels, and Fulmars														
Cory's shearwater	1	5	4	-	3	2	3	15	12	-	2	10	8	-
Northern fulmar	3	3	3	3	3	2	9	9	9	9	6	6	6	6
Black-capped petrel	2	1	2	1	3	3	6	3	6	3	6	3	6	3
Great shearwater	2	3	3	1	3	2	6	9	9	3	4	6	6	2
Sooty shearwater	3	4	3	-	3	1	9	12	9	-	3	4	3	-
Audubon's shearwater	1	2	1	1	3	2	3	6	3	3	2	4	2	2
Manx shearwater	2	3	2	-	3	3	6	9	6	-	6	9	6	-
Cormorants														
Double-crested cormorant	3	3	3	1	3	2	9	9	9	3	6	6	6	2
Gannets														
Northern gannet	3	3	4	3	3	3	9	9	12	9	9	9	12	9

Common Name	Exposure				Vulnerability		Collision Risk				Displacement Risk			
	Spr	Sum	Fal	Win	CS	DS	Spr	Sum	Fal	Win	Spr	Sum	Fal	Win

Note:
Exposure scores derived from MDAT abundance models ranged from Minimal (1) to Very High (5). Medium exposure scores in bold italics (e.g., ***3***) were assigned to species not modeled in the MDAT abundance models but present in the APEM surveys or Loring et al. 2018, 2019. Dashes ("-") indicate seasons without data (i.e., not modeled by MDAT nor reported in the APEM surveys or Loring et al. 2018, 2019), generally due to low or rare species occurrence. Vulnerability scores from Robinson Willmott et al. (2013) ranged from "Lower" (1) to "Higher" (3) collision sensitivity (CS) and displacement sensitivity (DS). Final collision and displacement risk scores of species for each season are the product of the exposure and vulnerability scores, categorized as: Minimal (1-3, blue), Low (4-6, green), Medium (7-9, yellow), High (10-12), and Very High (13-15, red).
Sources: Normandeau-APEM 2020; Curtice et al. 2019

P.2.2.2 Shorebirds

P.2.2.2.1 Federally Threatened Shorebird Species

Piping Plover

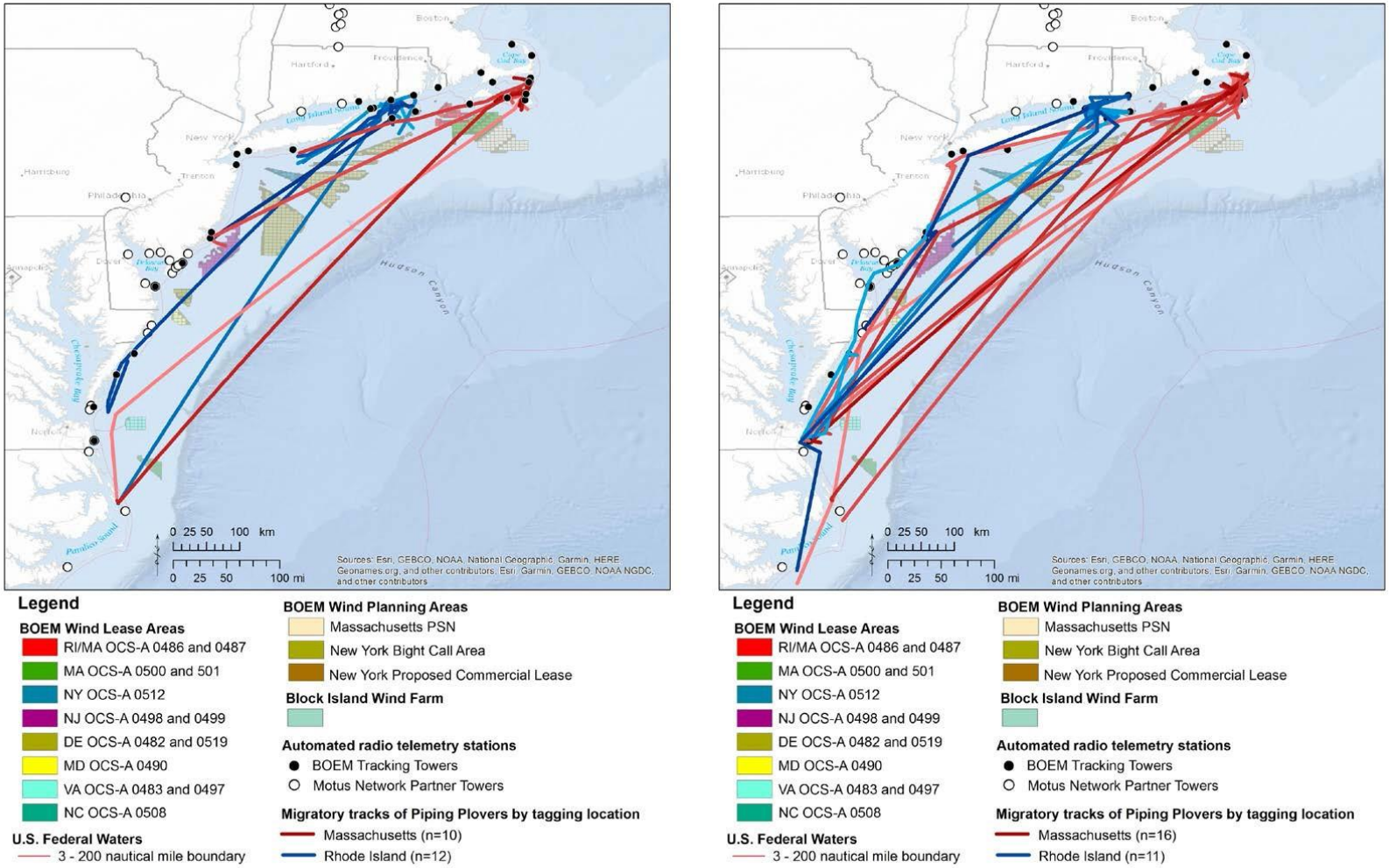
Spatiotemporal Context

The piping plover was listed as "Threatened" under the United States (U.S.) ESA in 1985 (United State Fish and Wildlife Service [USFWS] n.d.a). Piping plovers are migratory shorebirds that breed along the U.S. Atlantic coast, occur from Florida to Maine, and overwinter in the southeastern U.S. and Caribbean (USFWS IPaC report in **Attachment P-2**, Loring et al. 2019). They may occur in the Lease Area during migration (Burger et al. 2011), particularly during fall (Loring et al. 2019).

Exposure Assessment

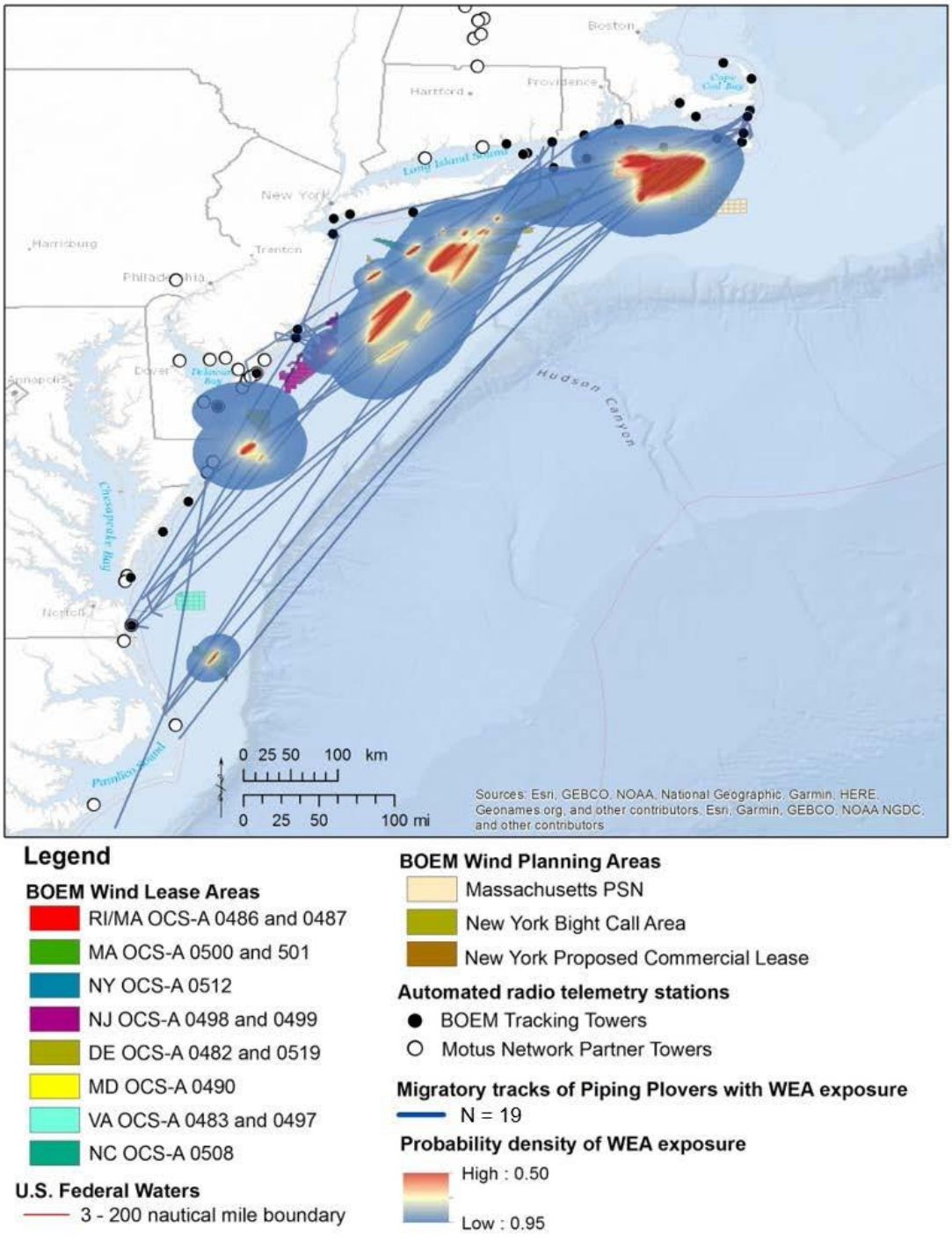
Loring et al. (2019) recorded fall migratory tracks of piping plovers that neared the Lease Area (Figure **P.2-2**), showing low exposure probability density in the Lease Area (**Figure P.2-3**). Model-estimated flight altitudes ranged within the upper limits of the Rotor Swept Zone (RSZ) 86 – 1082 ft (26 m – 330 m) and above (**Figure P.2-4**). Piping plovers were not modeled by MDAT nor observed during APEM surveys. Therefore, piping plovers were assigned an exposure score of 3 (Medium) during fall (**Table P.2-9**, **Table P.2-9**).

FIGURE P.2-2. PIPING PLOVER ESTIMATED FALL MIGRATORY TRACKS



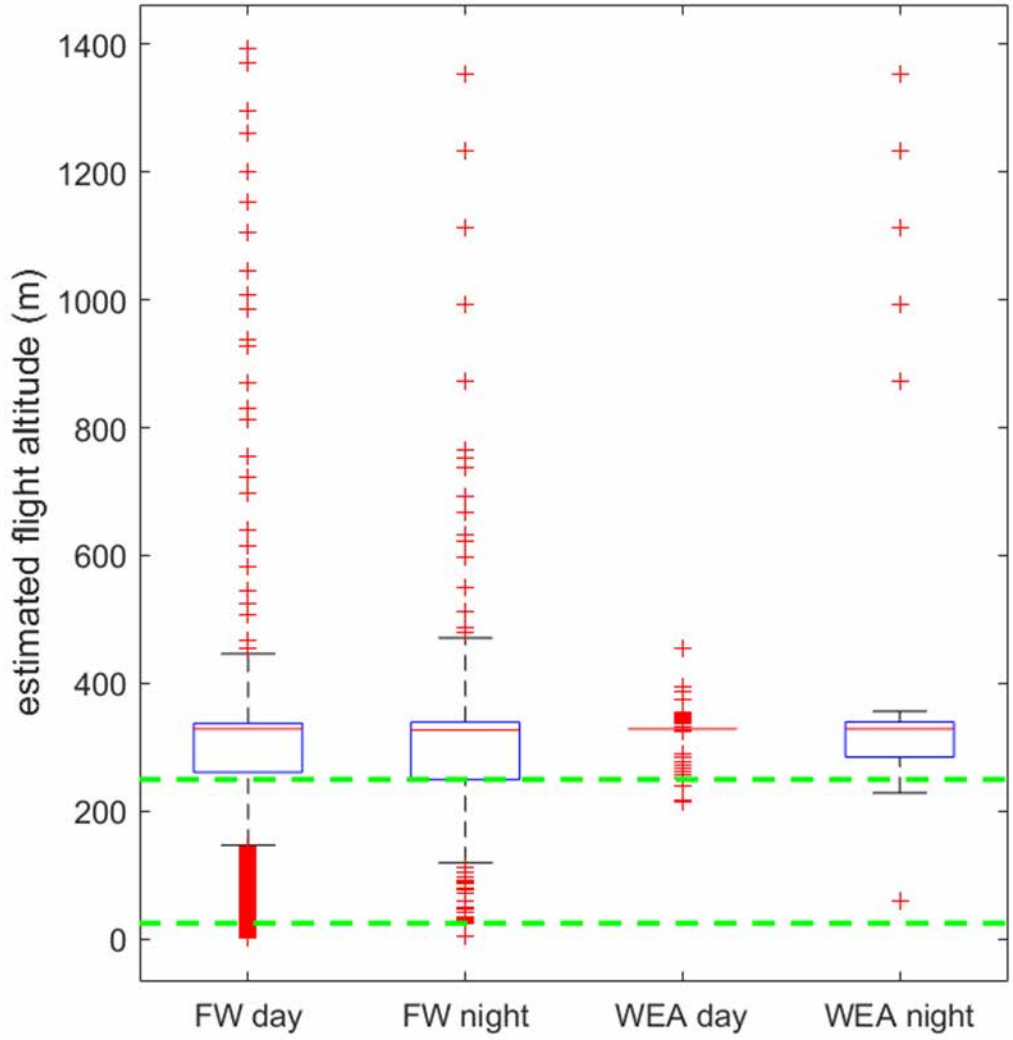
Taken from Loring et al. 2019 (Figure 57. Model estimated migratory tracks of piping plovers tagged in Massachusetts (red) and Rhode Island (blue) in 2016 (left), and 2017 (right)).

FIGURE P.2-3. PIPING PLOVER Estimated Fall Migratory Tracks and Exposure Probability Density



Taken from Loring et al. 2019 (Figure 64. Migratory tracks and composite probability density across WEAs of piping plovers (n=19) with estimated exposure to WEAs, 2015 to 2017).

FIGURE P.2-4. PIPING PLOVER ESTIMATED FLIGHT ALTITUDES



Taken from Loring et al. 2019 (Figure 75. Model-estimated flight altitude ranges (m) of piping plovers During exposure to federal waters (FW) and WEAs during day and night. The green-dashed lines represent the lower and upper limits of the RSZ 82 – 820 ft (25-250 m)).

Relative Behavioral Vulnerability Assessment and Risk

Robinson Willmott et al. (2013) estimated piping plovers to have “Medium” collision sensitivity and “Lower” displacement sensitivity. Therefore, final vulnerability scores resulted as Low collision risk and Minimal displacement risk (**Table P.2-9**).

Red Knot

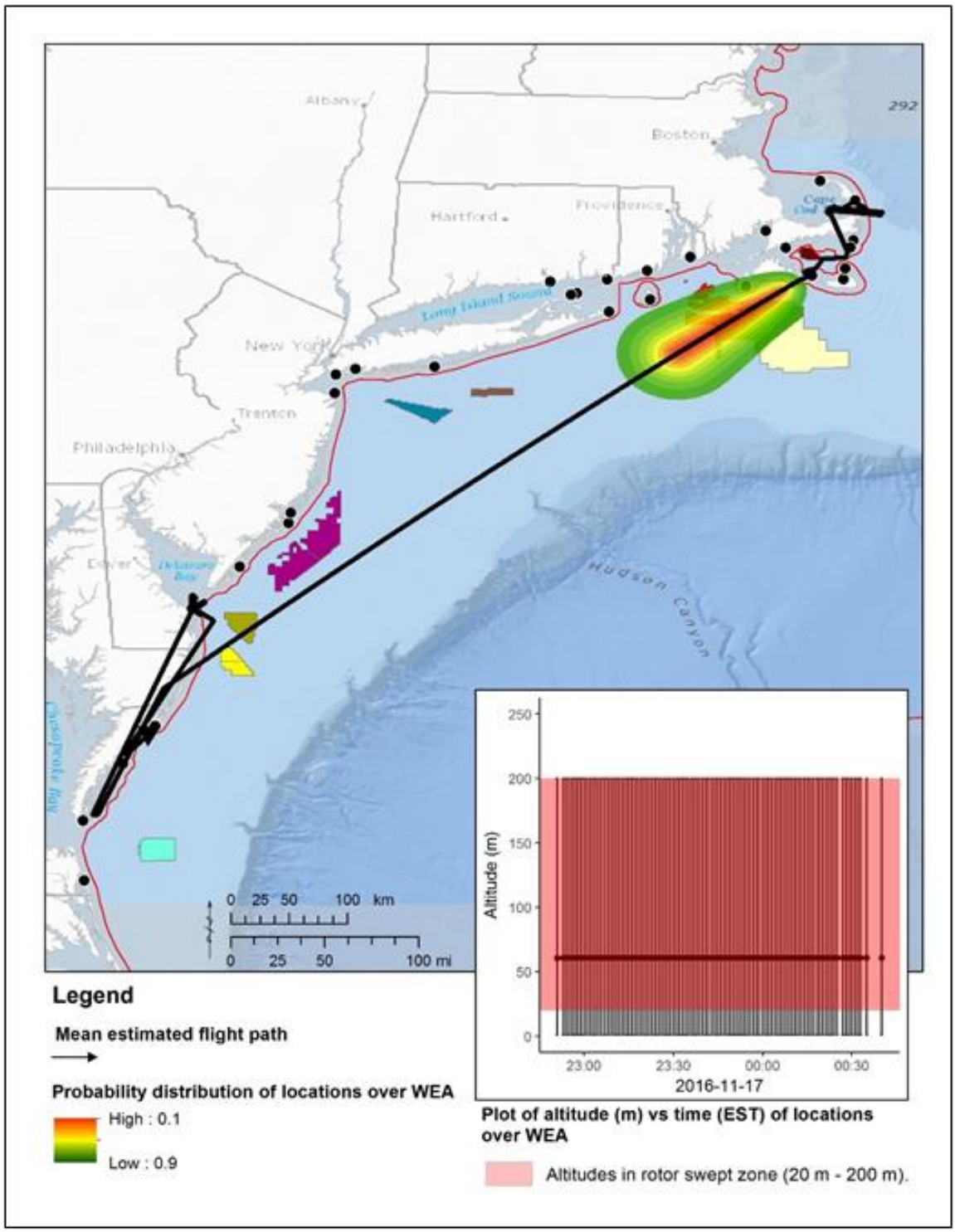
Spatiotemporal Context

The rufa Red knot was listed as "Threatened" under the U.S. ESA in 2015 (USFWS n.d.b). Red knots are long-distance migratory shorebirds that breed in the Canadian Arctic, occur along the US Atlantic coast from Florida to Maine, and overwinter in South America (see USFWS IPaC report in **Attachment P-2**; Burger et al. 2011). They may occur in the Lease Area during spring and fall migration (Burger et al. 2011; Loring et al. 2019).

Exposure Assessment

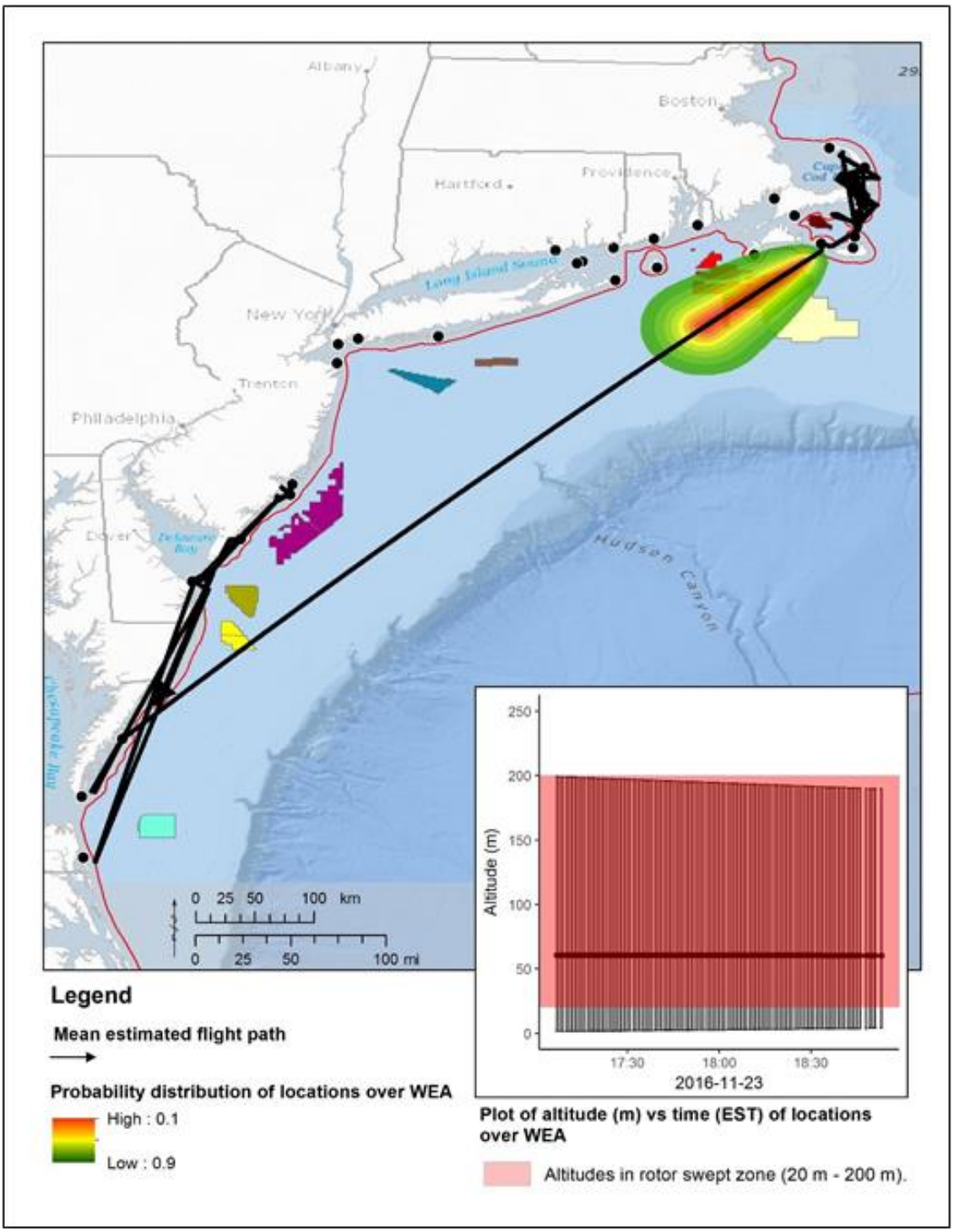
Loring et al. (2018) recorded spring and fall migratory tracks of red knots that neared the Lease Area, showing low exposure probabilities in the Lease Area (Figure P.2-5, Figure **P.2-6**, **Figure P.2-7**, Figure **P.2-8**) estimated flight altitudes ranged within the upper limits of the RSZ 86 – 1082 ft (26 m – 330 m) and above. Red knots were not modeled by MDAT nor observed during APEM surveys. Therefore, red knots were assigned an exposure score of 3 (Medium) during spring and fall (**Table P.2-9**).

Figure P.2-5. Red Knot Estimated Fall Migratory Track, Exposure Probability, and Flight Altitude



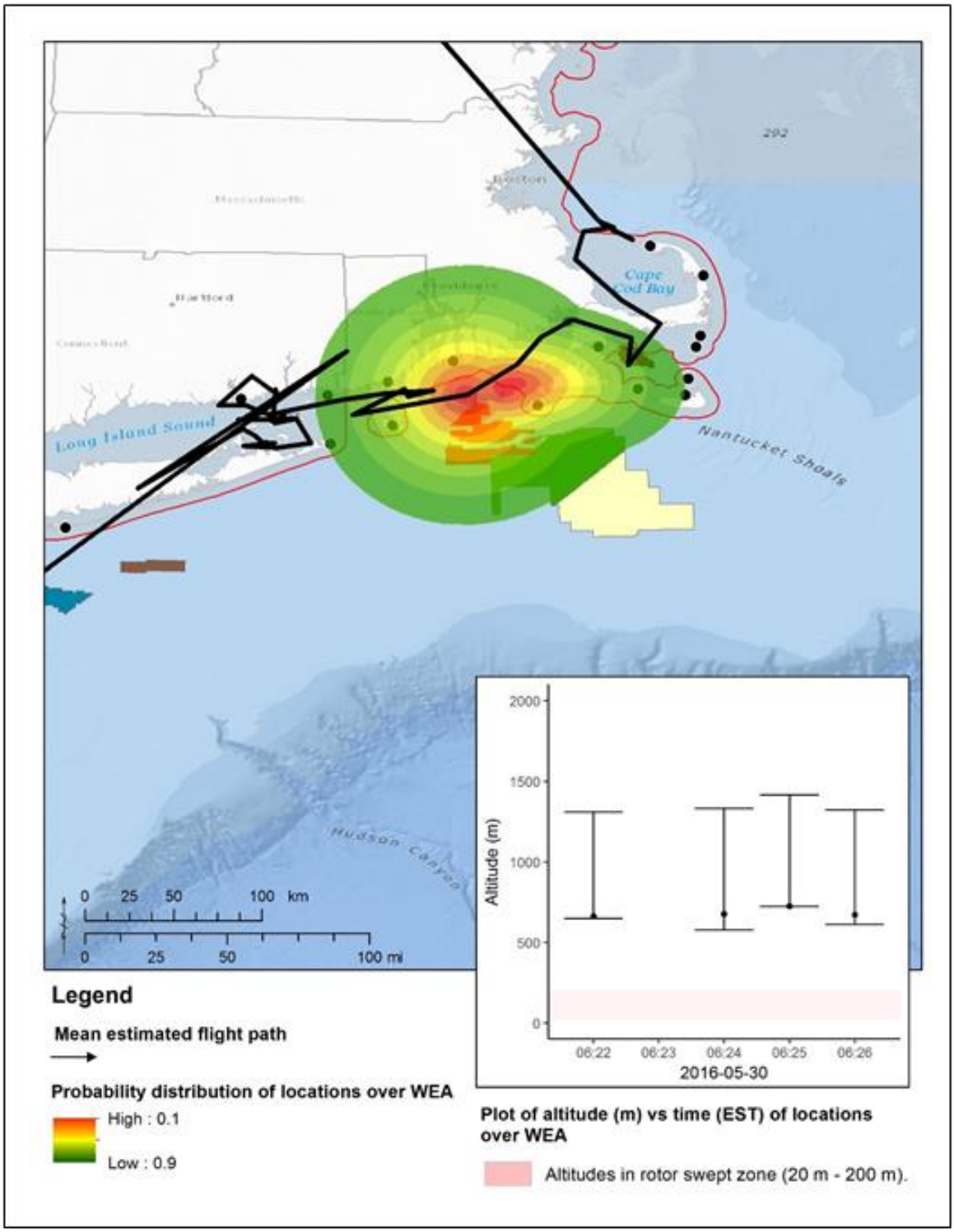
Taken from Loring et al. 2018 (Figure F-17. Estimated flight path of red knot ID 458, HY female, tagged in Massachusetts, USA. Probability bands show spatial error around locations during estimated exposure to BOEM Lease Area MA OCS-A 0478 on November 17, 2016).

FIGURE P.2-6. RED KNOT ESTIMATED FALL MIGRATORY TRACK, EXPOSURE PROBABILITY, AND FLIGHT ALTITUDE



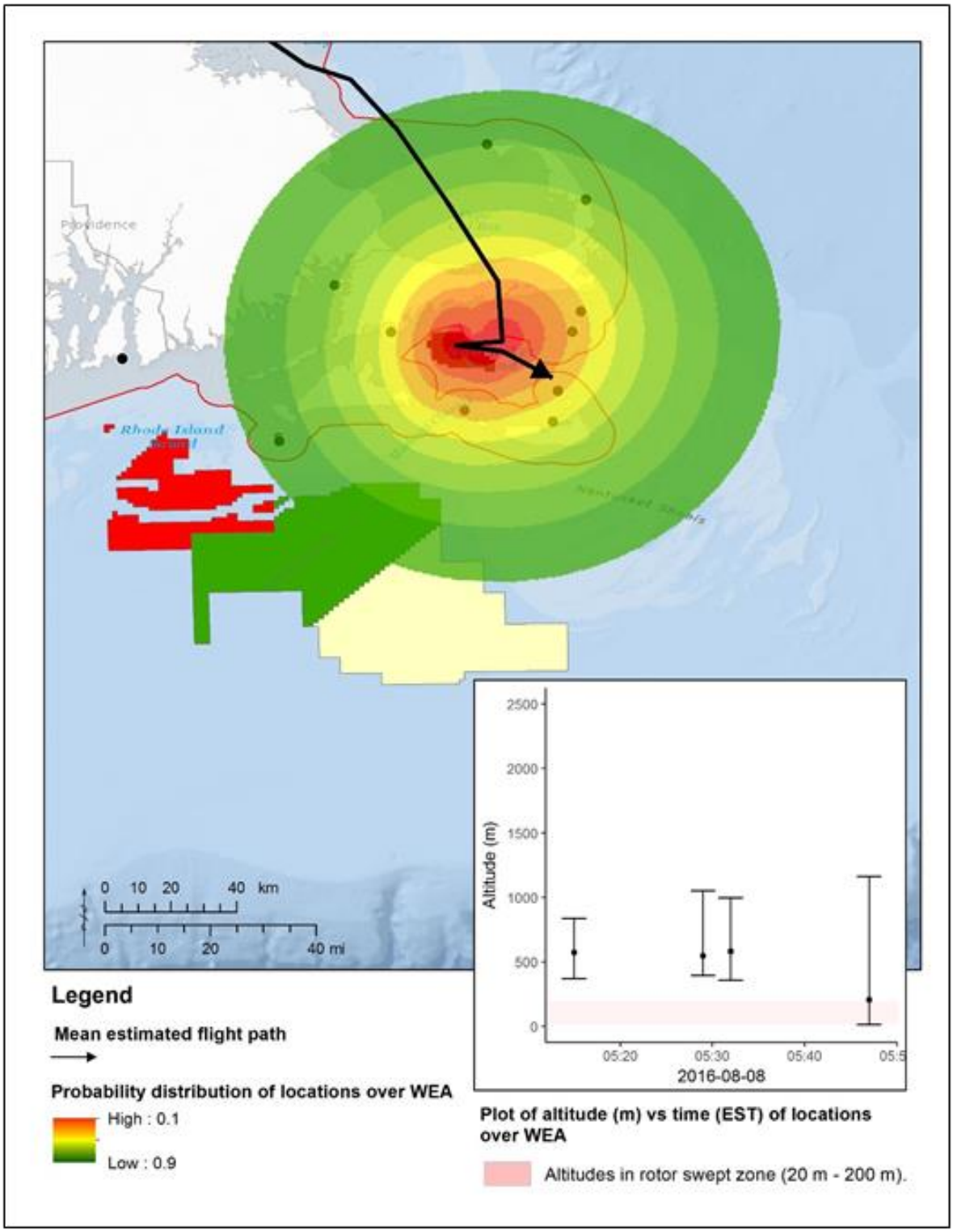
Taken from Loring et al. 2018 (Figure F-19. Estimated flight path of red knot ID 451, SY male, tagged in Massachusetts, USA. Probability bands show spatial error around locations during estimated exposure to BOEM Lease Areas NJ OCS-A 0498 and 0499, DE OCS-A 0482, and MD OCS-A 0489 and 0490 on November 18, 2016).

FIGURE P.2-7. RED KNOT ESTIMATED SPRING MIGRATORY TRACK, EXPOSURE PROBABILITY, AND FLIGHT ALTITUDE



Taken from Loring et al. 2018 (Figure E-2. Estimated flight path of red knot ID 354 (AHY, unknown sex) tagged in Delaware Bay, USA during May 2016. Probability bands show spatial error around locations during estimated exposure to BOEM Lease Area RI/MA OCS-A 0486 on May 30, 2016).

FIGURE P.2-8. RED KNOT ESTIMATED FLIGHT PATH, EXPOSURE PROBABILITY, AND FLIGHT ALTITUDE



Taken from Loring et al. 2018. (Figure E-4. Estimated flight path of red knot ID 169 (AHY, unknown sex) tagged in Delaware Bay, USA during May 2016. Probability bands show spatial error around locations during estimated exposure to BOEM Lease Area RI / MA OCS-A 0486 on Aug 8, 2016).

Relative Behavioral Vulnerability Assessment and Risk

Robinson Willmott et al. (2013) estimated red knots to have “Medium” collision sensitivity and “Lower” displacement sensitivity. Therefore, final vulnerability scores resulted as Low collision risk and Minimal displacement risk (**Table P.2-9**).

P.2.2.2.2 Phalaropes

Spatiotemporal Context

Phalaropes are pelagic shorebirds that glean plankton off the sea surface in offshore marine environments (De Graaf 1985; Shealer 2001). They breed in the Canadian Arctic, migrate and forage across the US AOCS, and overwinter in the tropical Atlantic (Nisbet et al. 2013). They may occur in the Lease Area during spring, summer, and fall migration (Winship et al. 2018).

Exposure Assessment

Red and red-necked phalaropes scored Minimal to Medium exposure to activity in the Lease Area during spring, summer, and fall according to MDAT model quantiles (**Table P.2-9**). Unidentified phalaropes (i.e., either species) were observed during summer APEM surveys and red phalaropes were observed during fall.

Relative Behavioral Vulnerability Assessment and Risk

Robinson Willmott et al. (2013) estimated phalaropes to have “Higher” collision sensitivity and “Lower” (red-necked phalarope) or “Medium” (red phalarope) displacement sensitivity. Therefore, final vulnerability scores resulted as Minimal (red-necked phalarope), Low (both), and Medium (both species) collision risk and Minimal (red-necked phalarope) to Low (red phalarope) displacement risk (**Table P.2-9**). Collision risk resulted as Medium for red phalaropes in spring and as Medium for red-necked phalaropes in summer.

P.2.2.3 Marine Birds

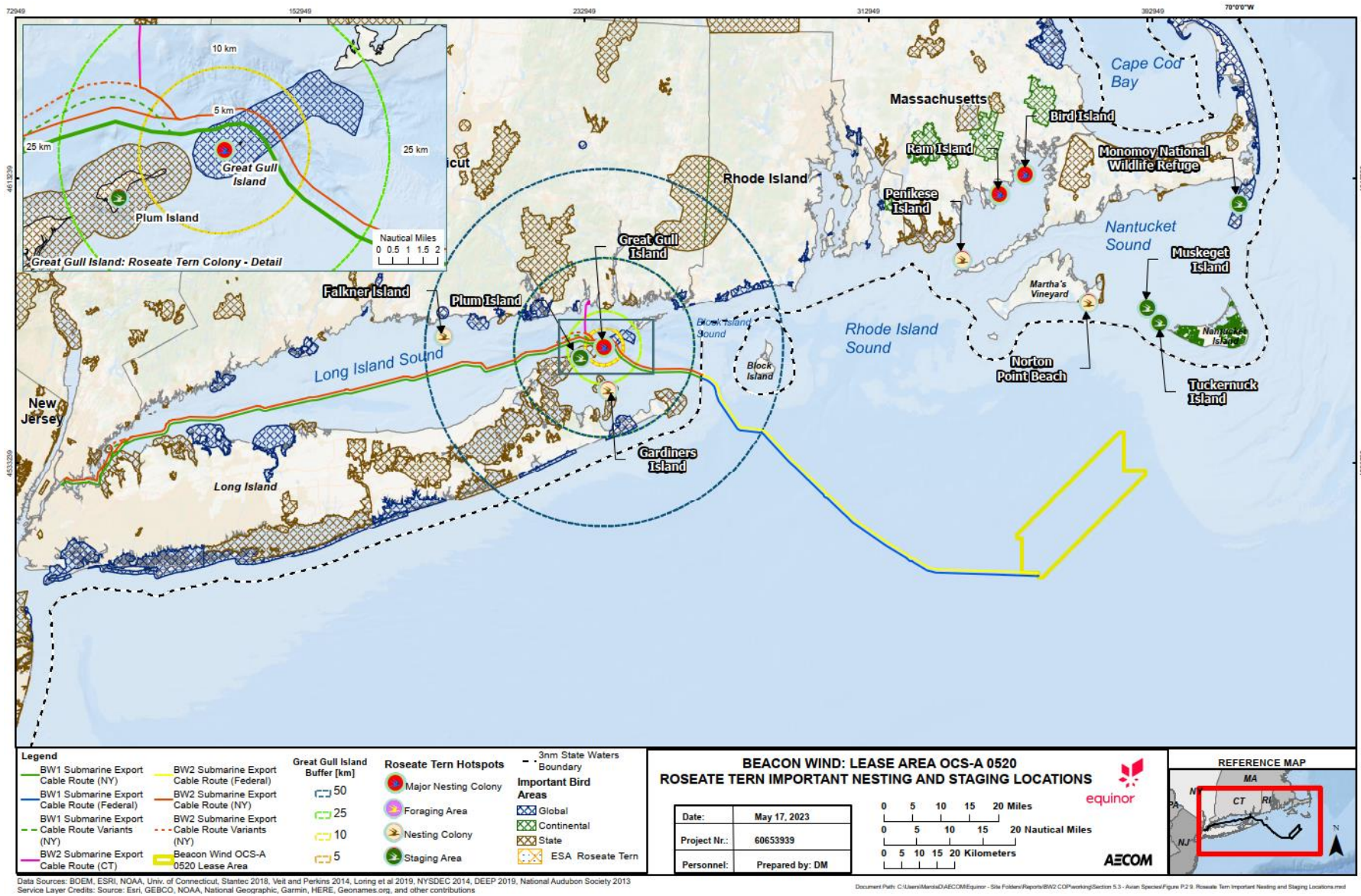
P.2.2.3.1 Terns

Federally Endangered Tern Species: Roseate Tern

Spatiotemporal Context

The roseate tern was listed as "Threatened" under the U.S. ESA in 1987 (USFWS species profile 2083). Roseate terns are migratory seabirds that breed along the Atlantic coast of the Northeast U.S., occur from North Carolina to Maine, forage and migrate across the AOCS, and overwinter in South America and the Caribbean (see USFWS IPaC report in **Attachment P-2**; Loring et al. 2019). The majority of their Northeast population nests on three islands with common terns (Gochfeld and Burger 2020): Bird Island and Ram Island in Buzzards Bay, Massachusetts; and Great Gull Island off the North Fork of Long Island, New York (Figure **P.2-9**). During the post-breeding, pre-migratory “staging” season they travel throughout these same areas in Massachusetts and New York (Figure **P.2-9**). Roseate terns are aerial plunge divers that forage for fish within the upper meter of the sea surface. They forage in mixed species flocks with common terns (Goyert 2014) and have been known to feed over schools of subsurface predators such as bluefish and tuna that drive prey up to the surface (Goyert et al. 2014; Safina 1990). Roseate terns specialize on sand lance, which comprises the majority of their diet during the breeding season (Goyert 2015). Roseate terns may occur in the Lease Area during the breeding season and migration (Burger et al. 2011; Loring et al. 2019).

FIGURE P.2-9. ROSEATE TERN IMPORTANT NESTING AND POST-BREEDING, PRE-MIGRATORY STAGING LOCATIONS



Exposure Assessment

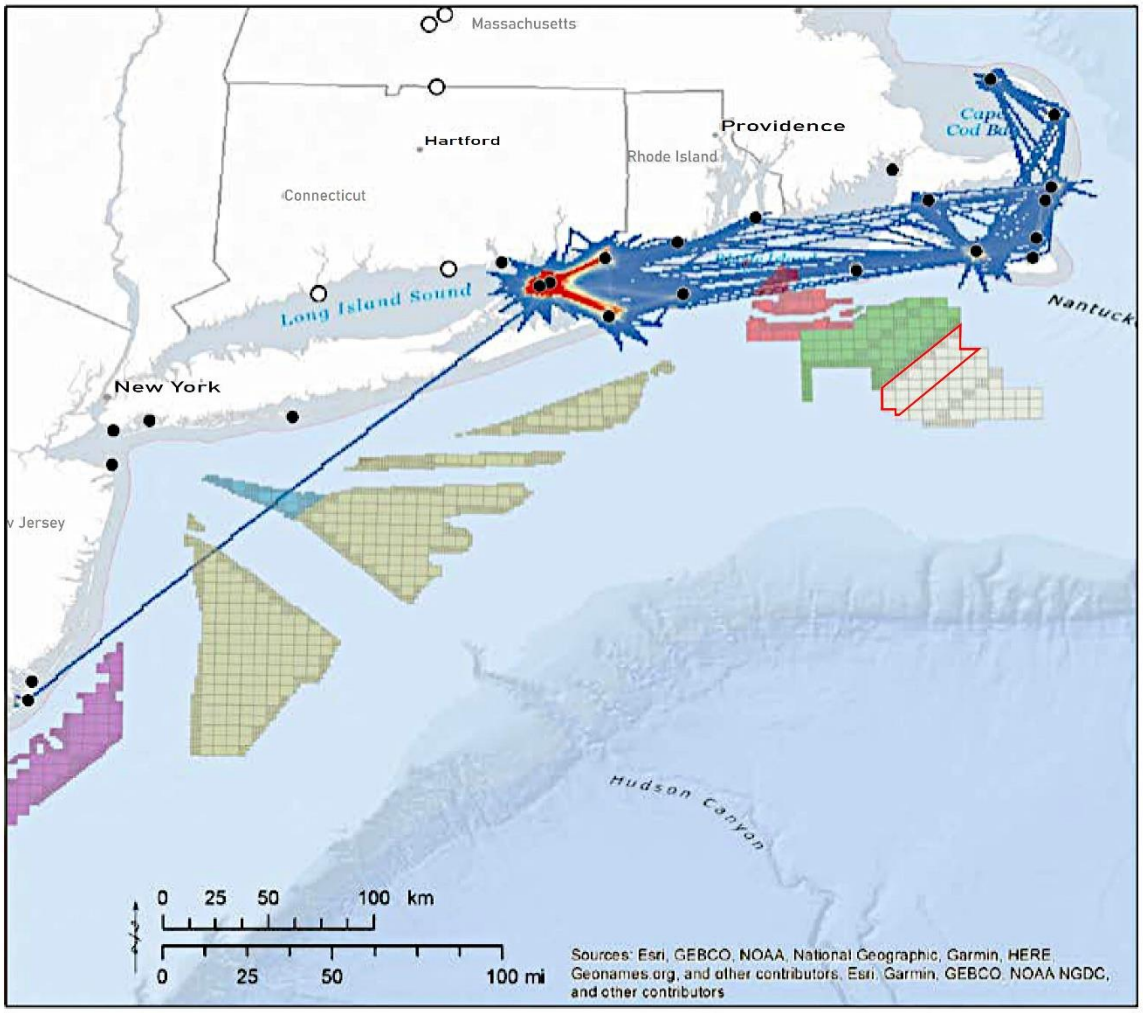
Loring et al. 2019 estimated breeding and post-breeding flight paths of roseate terns (Figure **P.2-10**, **Figure P.2-11**) that showed low exposure probability to the Lease Area (**Figure P.2-12**). Model-estimated flight altitudes ranged within the lower limits of the RSZ 86 – 1082 ft (26 m – 330 m) and below (**Figure P.2-13**). Flight heights of four roseate terns were included in the Northwest Atlantic Seabird Catalog, one of which was observed within the category 25-125 m during the Rhode Island Ocean Special Area Management Plan (RI Ocean SAMP) boat survey (Table P.2-8). It is unknown whether this observation was below or within the lower limits of the RSZ (26 m – 330 m).

Roseate terns scored Low exposure to activity in the Lease Area during spring, and Medium exposure to activity in the Lease Area during spring, summer, and fall according to MDAT model quantiles (**Table P.2-9**).

Roseate terns were observed during spring APEM surveys and unidentified Sterna terns, which may have included roseate terns, were observed during spring and summer.

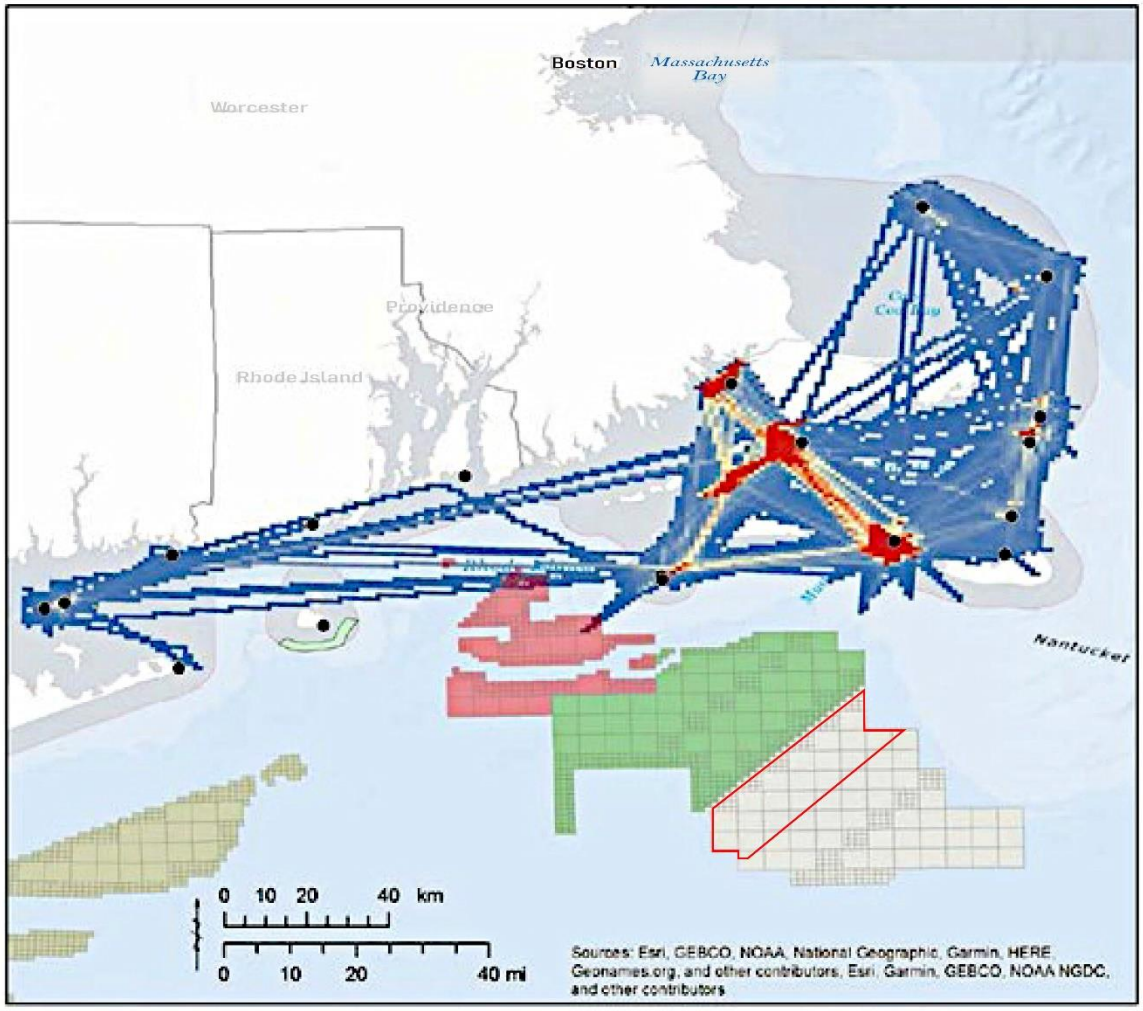
The exposure of roseate terns to Beacon Wind cable route laying activities was assessed with respect to the local abundance of sand lance. The cables are proposed to travel within 5 km of Great Gull Island, and roseate terns are known to forage within 50 km of Great Gull Island (**Figure P.2-9**; Loring et al. 2019). Sand lance are the primary prey to roseate terns and they burrow in sandy habitat throughout the region (**Figure P.2-14**, **Figure P.2-15**, **Figure P.2-16**). The Project acknowledges there will be further consultation regarding appropriate avoidance or minimization measures for cable laying activity around Great Gull Island to avoid or minimize potential impacts on sand lance availability to Roseate Terns during their pre-breeding, breeding, and post-breeding periods.

FIGURE P.2-10. ROSEATE TERN ESTIMATED BREEDING AND POST-BREEDING TRACK DENSITIES (JUNE TO SEPTEMBER), NEW YORK AND CONNECTICUT



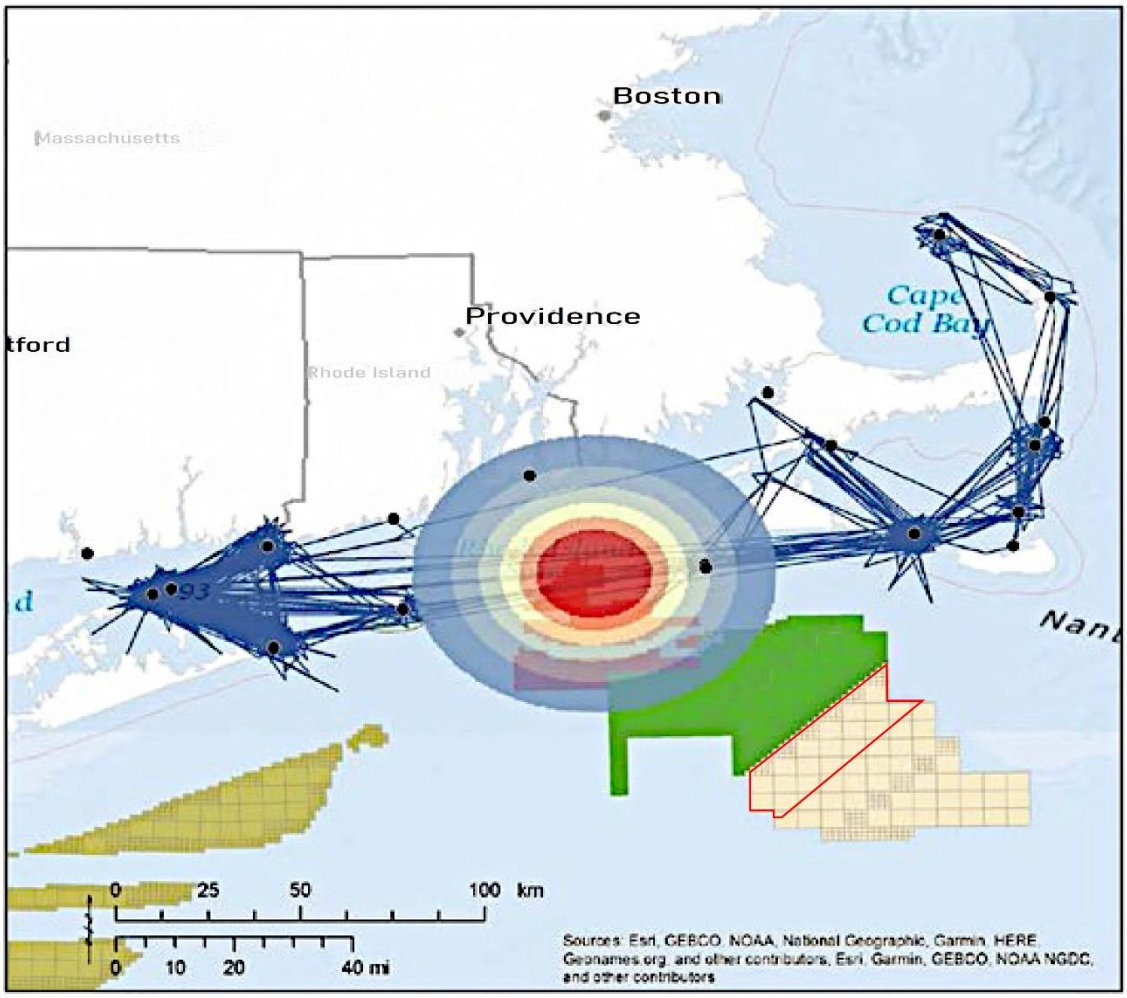
Taken from Loring et al. 2019 (Figure 14. Track densities [10-min tracks/km2] of Roseate Terns [n=90] from the colony on Great Gull Island during the breeding and post-breeding periods in 2015 to 2017 [pooled]).

FIGURE P.2-11. ROSEATE TERN ESTIMATED BREEDING AND POST-BREEDING TRACK DENSITIES (JUNE TO SEPTEMBER), MASSACHUSETTS



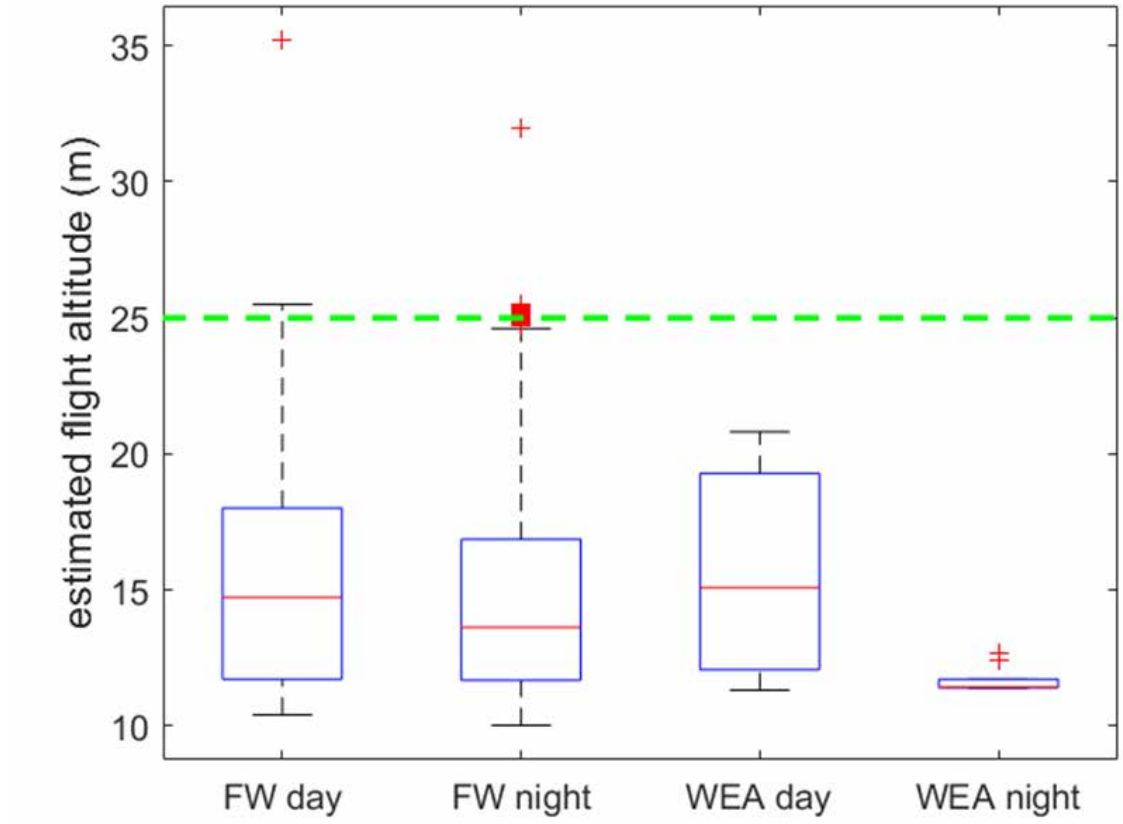
Taken from Loring et al. 2019 (Figure 15. Track densities [10-min tracks/km^2] of roseate terns [n=60] from colonies in Buzzards Bay during the breeding and post-breeding periods in 2016 and 2017 [pooled]).

FIGURE P.2-12. ROSEATE TERN ESTIMATED BREEDING AND POST-BREEDING TRACKS (JUNE TO SEPTEMBER) AND EXPOSURE PROBABILITY



Taken from Loring et al. 2019. (Figure 45. Movement tracks and composite probability density across WEAs of roseate terns [n=8], with estimated exposure to WEAs, 2016 and 2017.)

FIGURE P.2-13. ROSEATE TERN ESTIMATED FLIGHT ALTITUDES



Taken from Loring et al. 2019 (Figure 56. Model-estimated flight altitude ranges [m] of roseate terns During exposure to FW and WEAs during day and night. The green-dashed line represents the lower limit of the RSZ [25 m]).

FIGURE P.2-14. AMMODYTES DISTRIBUTION: OFFSHORE SPRING AND FALL BOTTOM TRAWL SURVEYS (ADULT SAND LANCE)

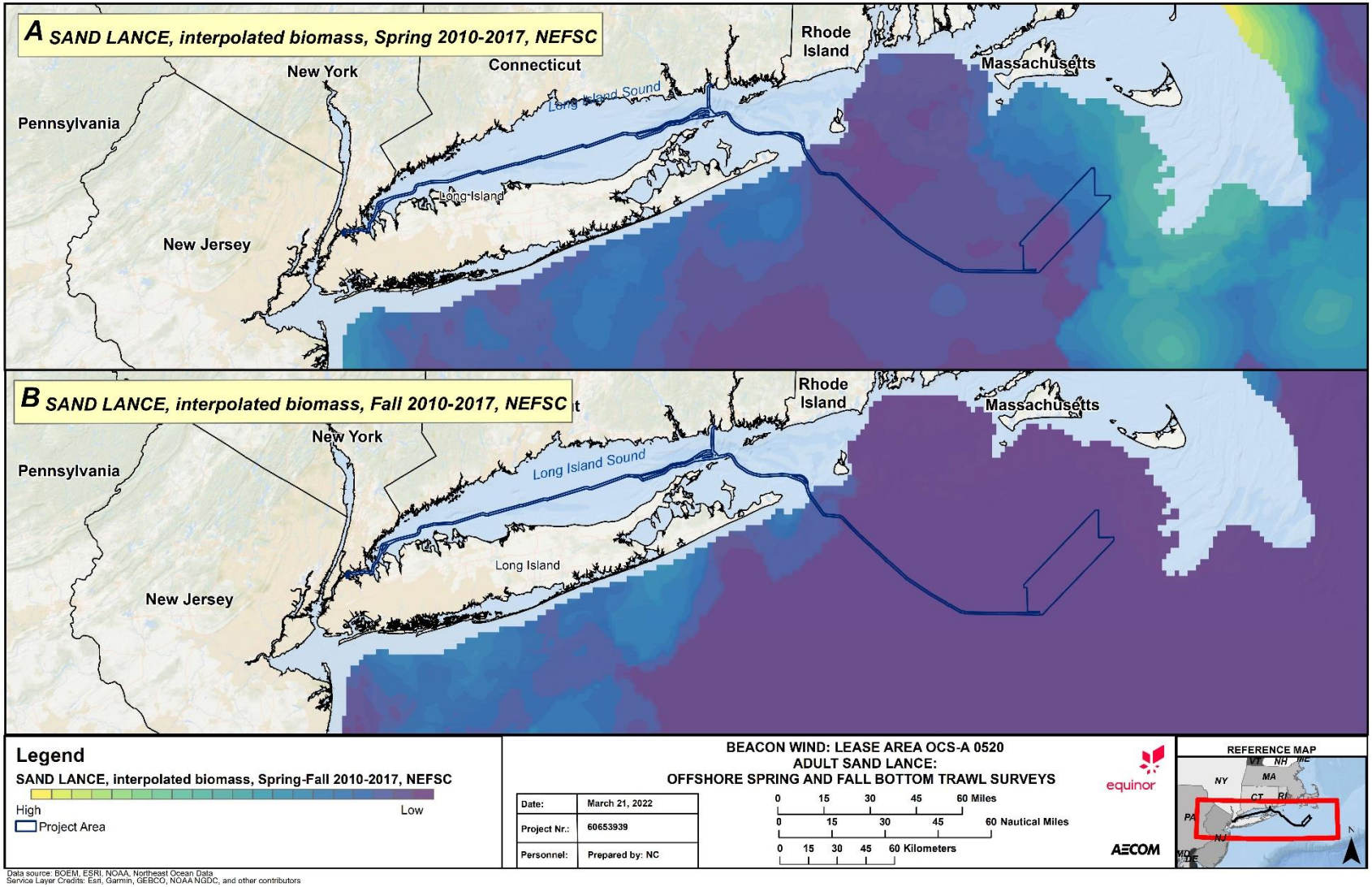
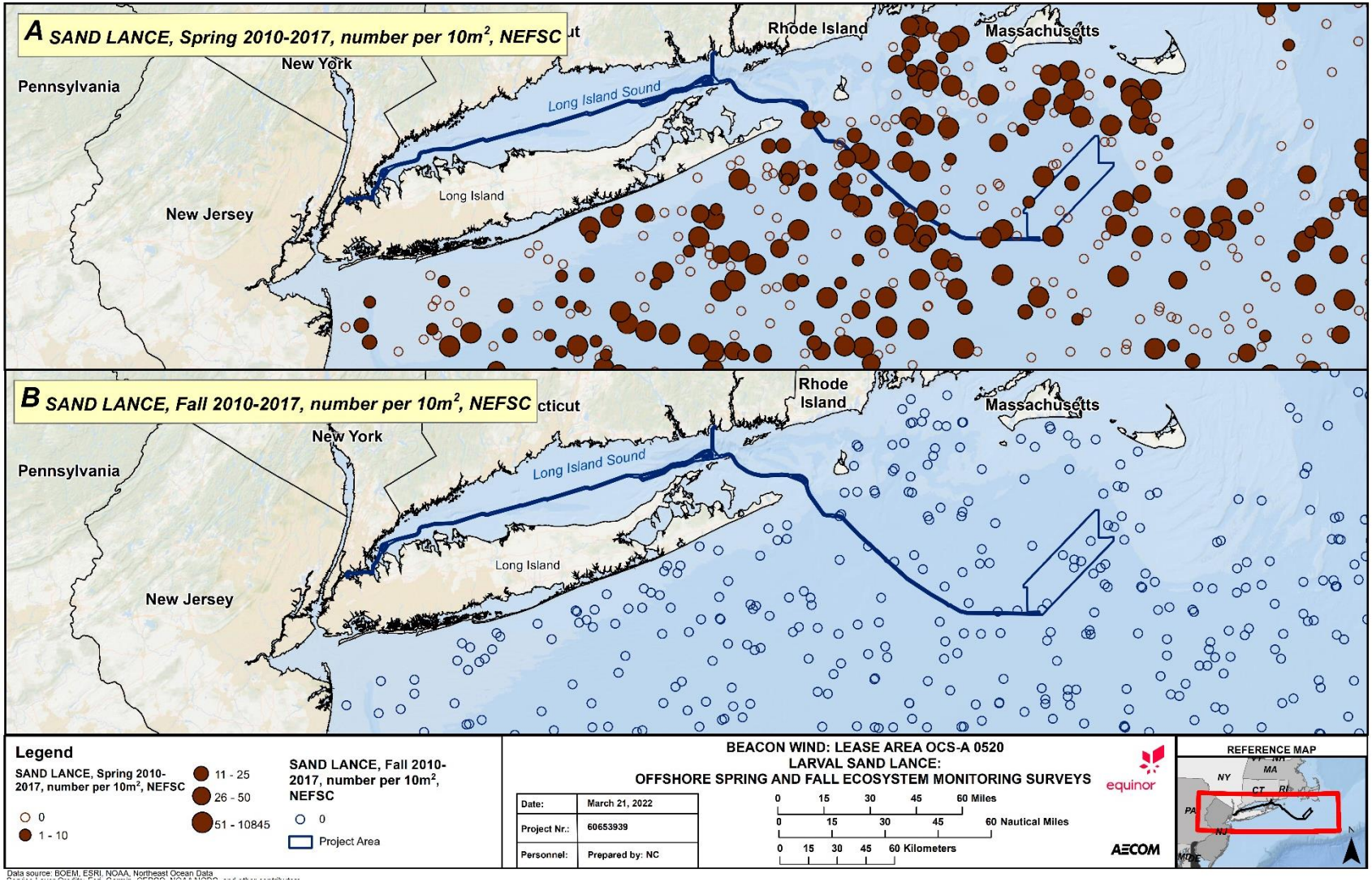
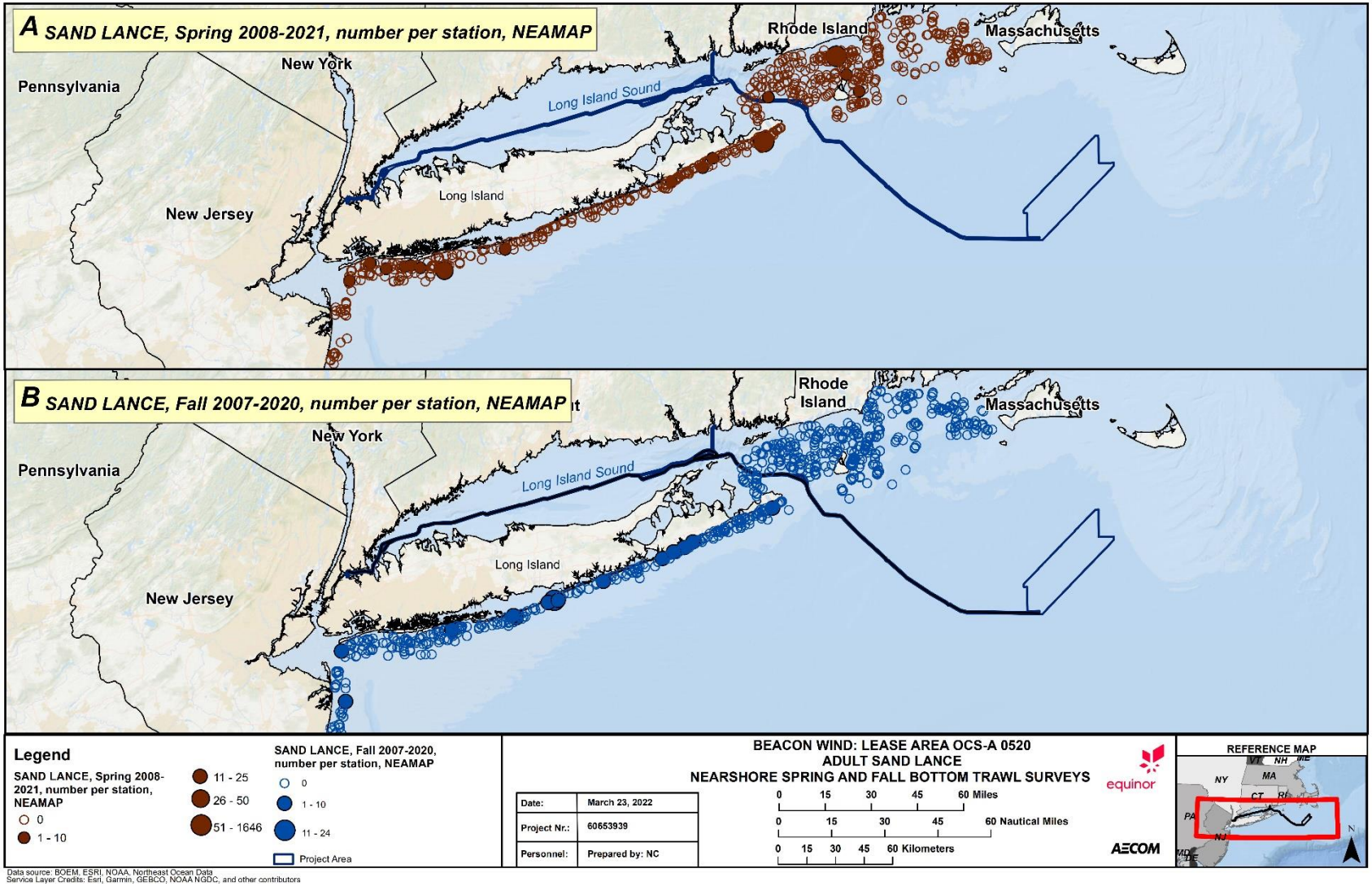


FIGURE P.2-15. AMMODYTES DISTRIBUTION: OFFSHORE SPRING AND FALL ECOSYSTEM MONITORING SURVEYS (LARVAL SAND LANCE)



Note: Circles indicate survey effort. Open circles = sand lance absent in sample, closed = sand lance present in sample.

FIGURE P.2-16. AMMODYTES DISTRIBUTION: NEARSHORE SPRING AND FALL BOTTOM TRAWL SURVEYS (ADULT SAND LANCE)



Note: Circles indicate survey effort. Open circles = sand lance absent in sample, closed = sand lance present in sample.

Relative Behavioral Vulnerability Assessment and Risk

Robinson Willmott et al. (2013) estimated roseate terns to have "Higher" collision sensitivity and "Higher" displacement sensitivity; note that both these scores incorporated population sensitivity. Therefore, final vulnerability scores resulted as Low collision risk and displacement risk in spring, and Medium collision risk and displacement risk in summer and fall (**Table P.2-9**).

Other Tern Species

Spatiotemporal Context

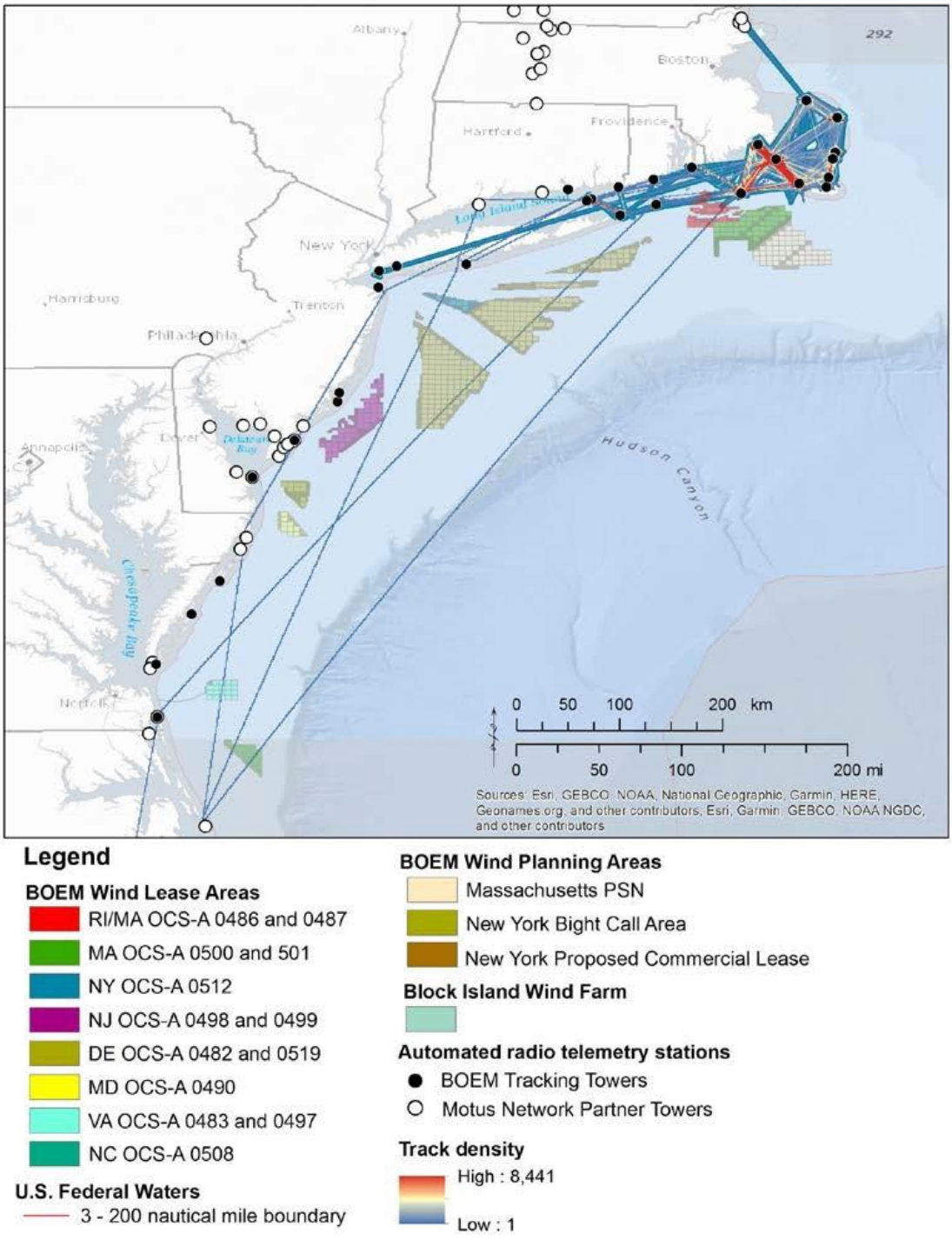
Common terns are migratory seabirds that breed along the Atlantic coast of the U.S. from South Carolina to Canada, forage and migrate across the AOCS, and overwinter in South America and the Caribbean (Nisbet et al. 2013). Common terns are aerial plunge divers that forage for fish within the upper meter of the sea surface (Arnold et al. 2020). They forage in mixed species flocks with roseate terns (Goyert 2014) and have been known to feed over schools of subsurface predators such as bluefish and tuna that drive prey up to the surface (Goyert et al. 2014; Safina 1990). Common terns are flexible, opportunistic generalists that feed on sand lance amongst other prey in their diverse diet (Goyert 2015). They may occur in the Lease Area during the breeding season and migration (Burger et al. 2011, Loring et al. 2019).

Exposure Assessment

Loring et al. 2019 estimated breeding and post-breeding flight paths of common terns (Figure **P.2-17**) that showed low exposure probability to the Lease Area (Figure **P.2-18**). Model-estimated flight altitudes ranged within the lower limits of the RSZ 86 – 1082 ft (26 m – 330 m) and below (Figure **P.2-19**). Common terns scored Low exposure to activity in the Lease Area during spring, and Medium exposure to activity in the Lease Area during spring, summer, and fall according to MDAT model quantiles (**Table P.2-9**). Common terns were observed during spring APEM surveys; they may have also comprised the unidentified Sterna terns observed during spring and summer, as well as the unidentified common or Arctic ("commic")/Forster's terns observed during fall.

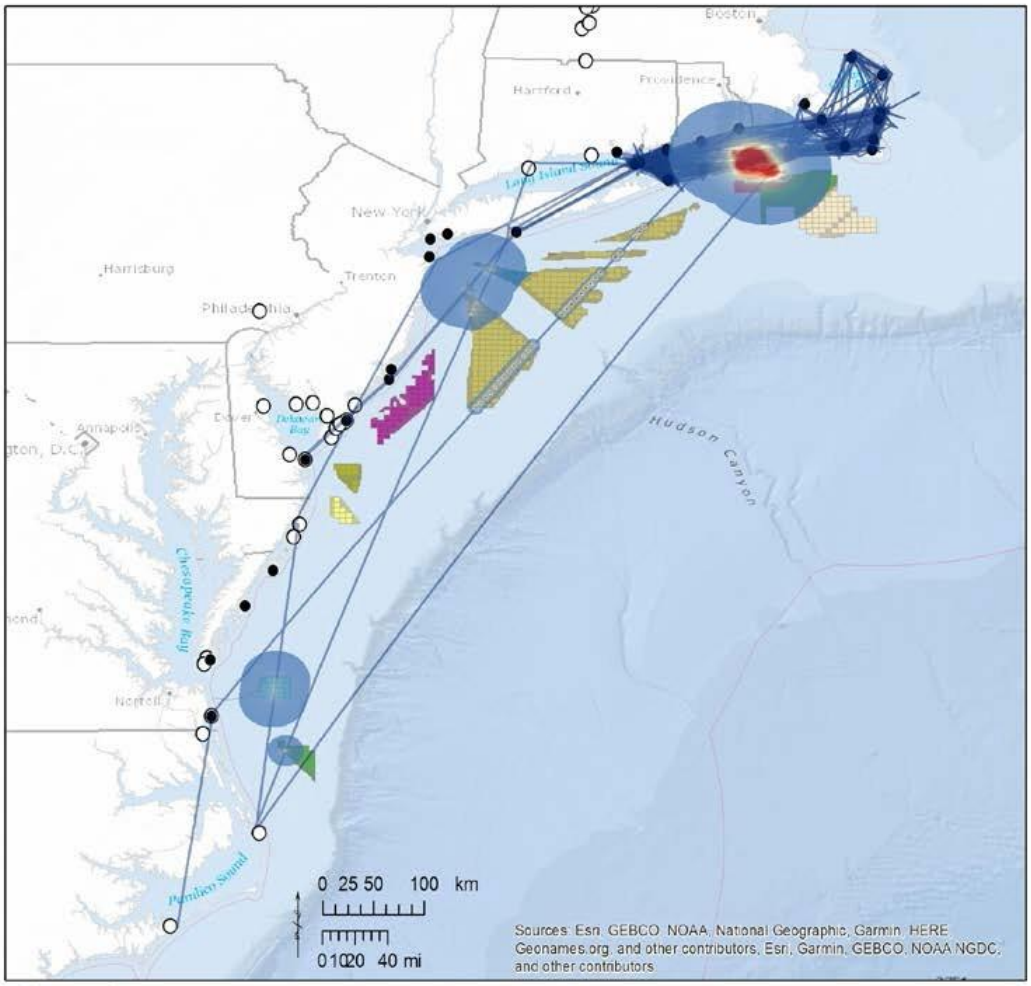
Arctic terns scored Medium exposure to activity in the Lease Area during summer, according to MDAT model quantiles (**Table P.2-9**). Arctic terns may have also comprised the unidentified Sterna terns observed during spring and summer APEM surveys, as well as the unidentified commic/Forster's terns observed during fall. Forster's terns were not modeled by MDAT but were observed during fall APEM surveys. Therefore, they were assigned an exposure score of 3 (Medium) during fall. Other terns scored Minimal to Low exposure to activity in the Lease Area during spring, summer, and/or fall (**Table P.2-9**).

FIGURE P.2-17. COMMON TERN ESTIMATED BREEDING AND POST-BREEDING TRACK DENSITIES



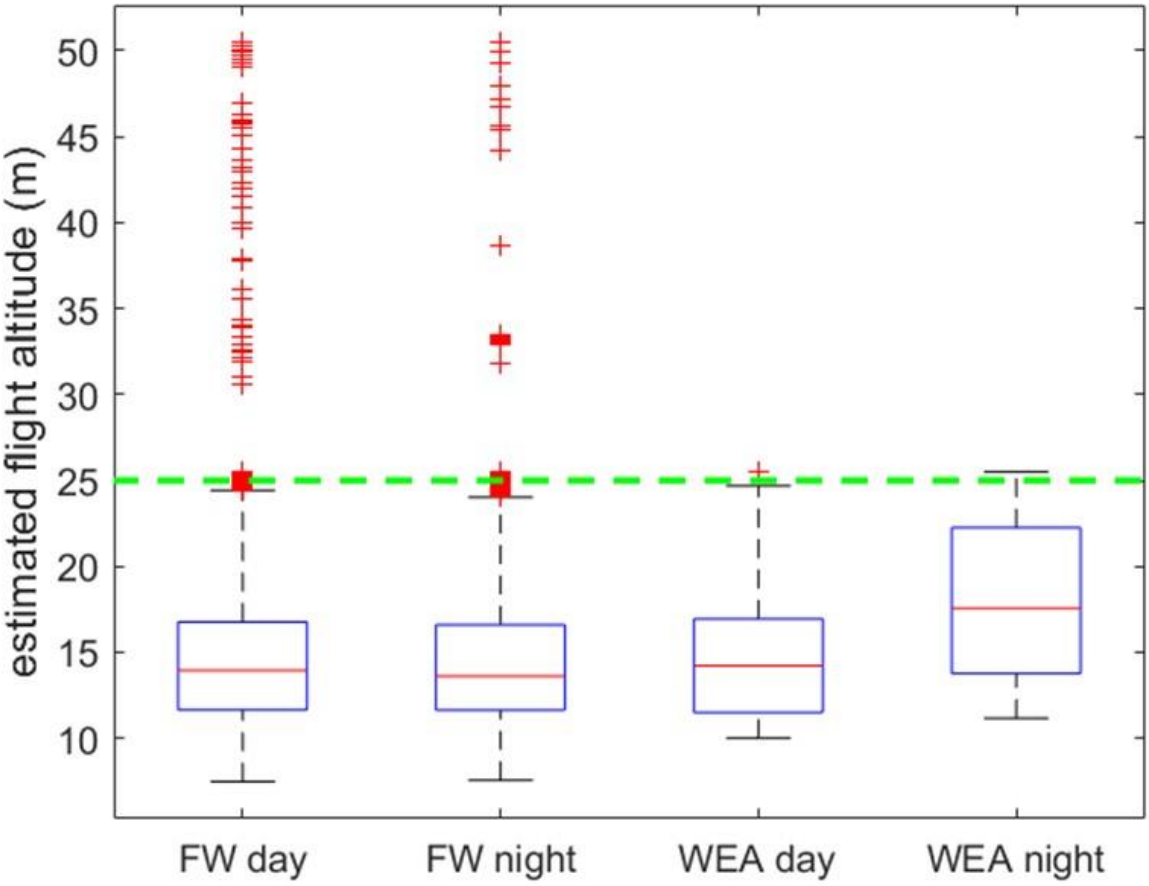
Taken from Loring et al. 2019 (Figure 13. Track densities [10-min tracks/km^2] of common terns [n=59] from colonies in Buzzards Bay during the breeding and post-breeding periods in 2015 to 2017 [pooled]).

FIGURE P.2-18. COMMON TERN ESTIMATED BREEDING AND POST-BREEDING TRACKS AND EXPOSURE PROBABILITY



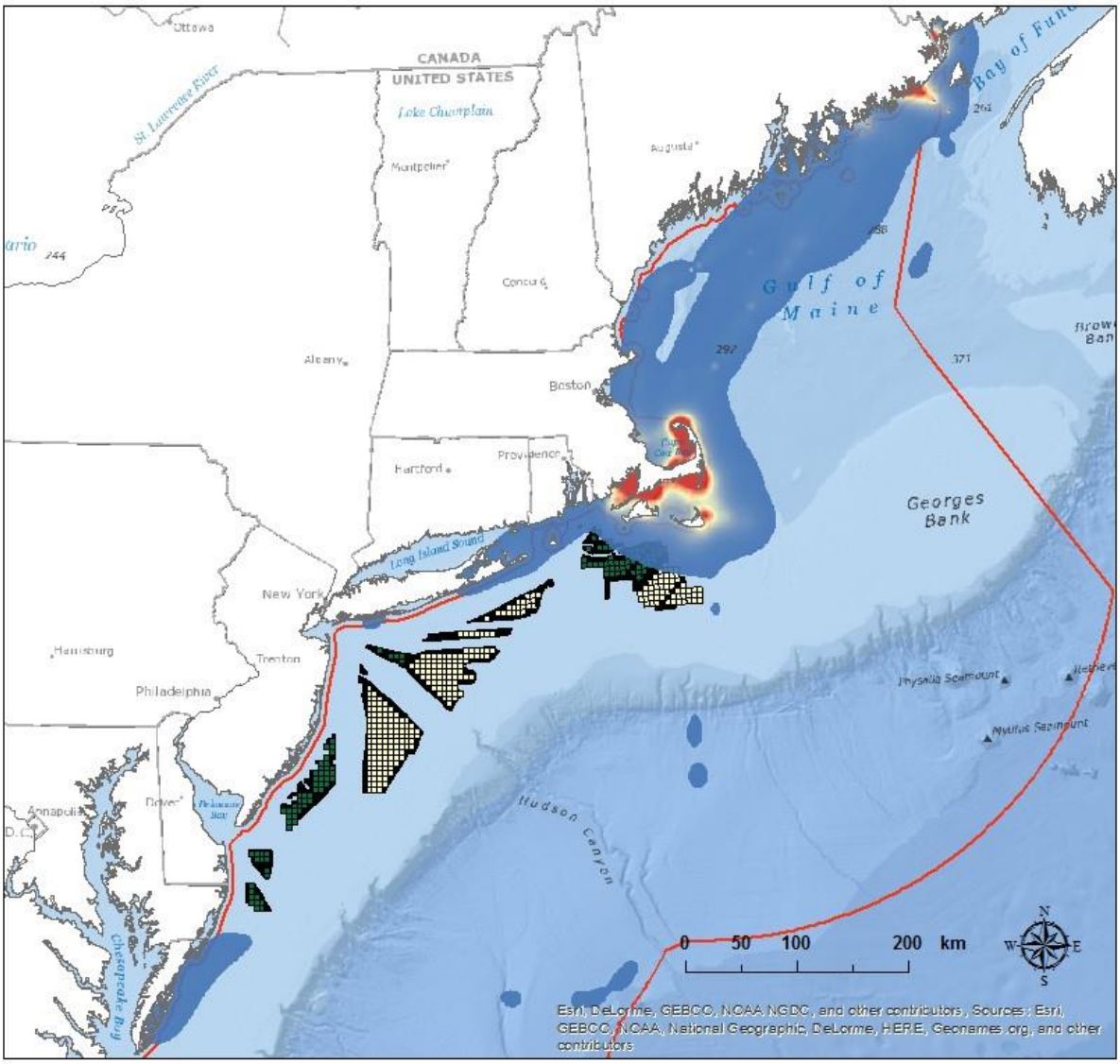
Taken from Loring et al. 2019 (Figure 34. Movement tracks and composite probability density across WEAs of common terns [n=30] with estimated exposure to WEAs, 2016 and 2017).

FIGURE P.2-19. COMMON TERN ESTIMATED FLIGHT ALTITUDES



Taken from Loring et al. 2019 (Figure 55. Model-estimated flight altitude ranges [m] of common terns During exposure to FW and WEAs during day and night. The green-dashed line represents the lower limit of the RSZ [25 m]).

FIGURE P.2-20. COMMON TERN ESTIMATED POST-BREEDING UTILIZATION DISTRIBUTION



Legend

BOEM Wind Lease Areas

BOEM Wind Planning Areas

Utilization Distribution

High: 0.50

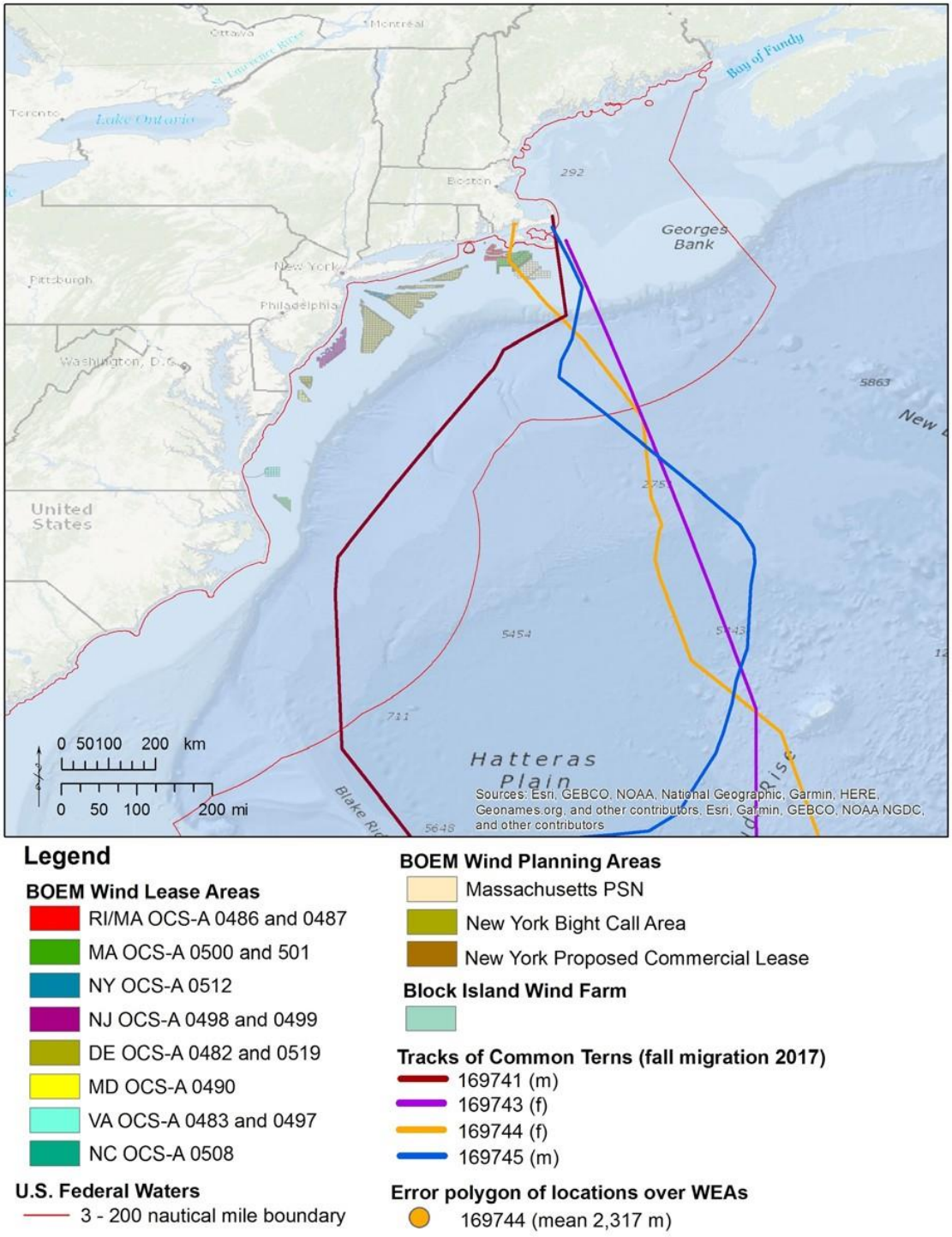
Low : 0.95

U.S. Federal Waters

3 to 200 nautical mile boundary

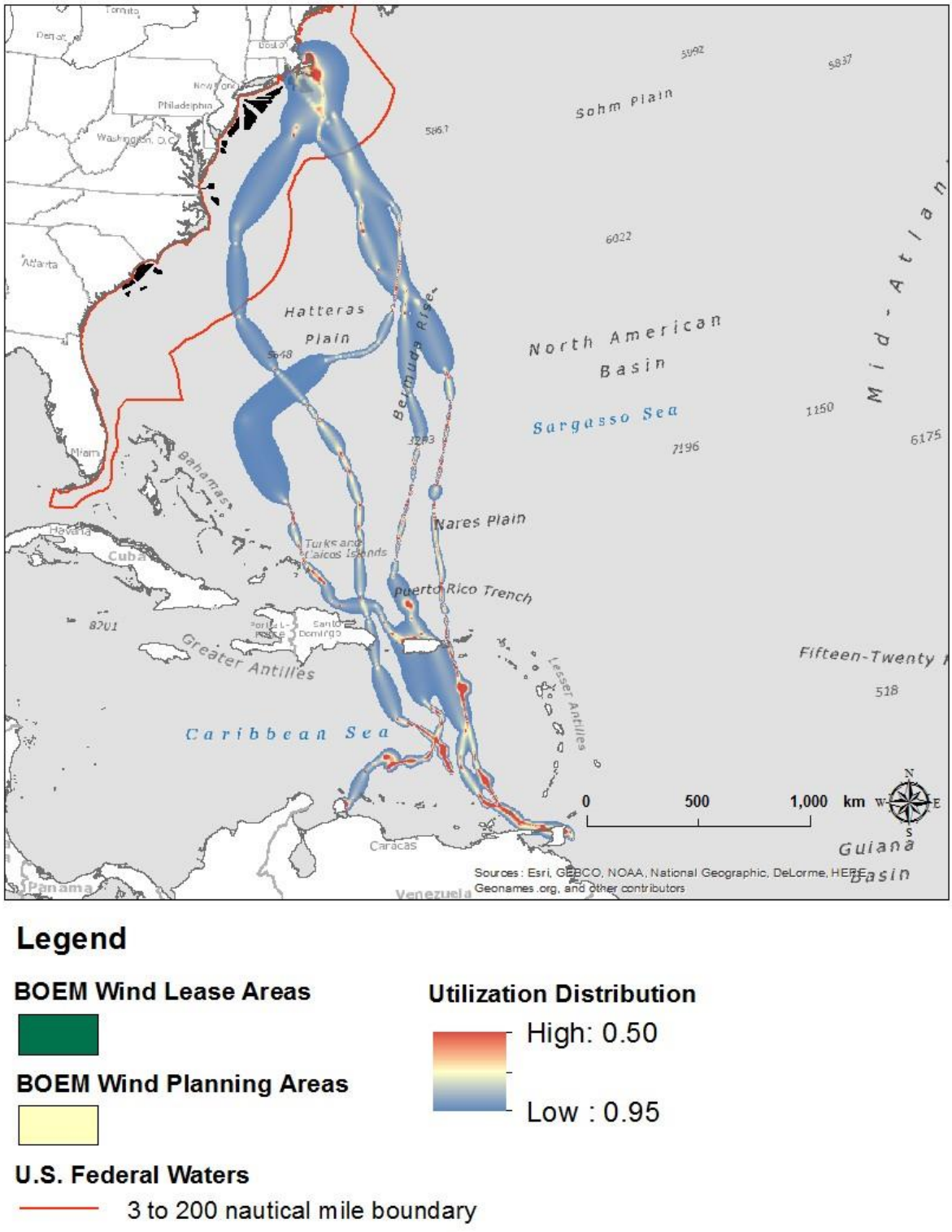
Taken from Loring et al. 2019 (Figure J-4. Composite utilization distribution of common terns [n=5] during the post-breeding dispersal period, 29 July - 26 Sep 2017).

FIGURE P.2-21. COMMON TERN ESTIMATED FALL MIGRATION TRACKS



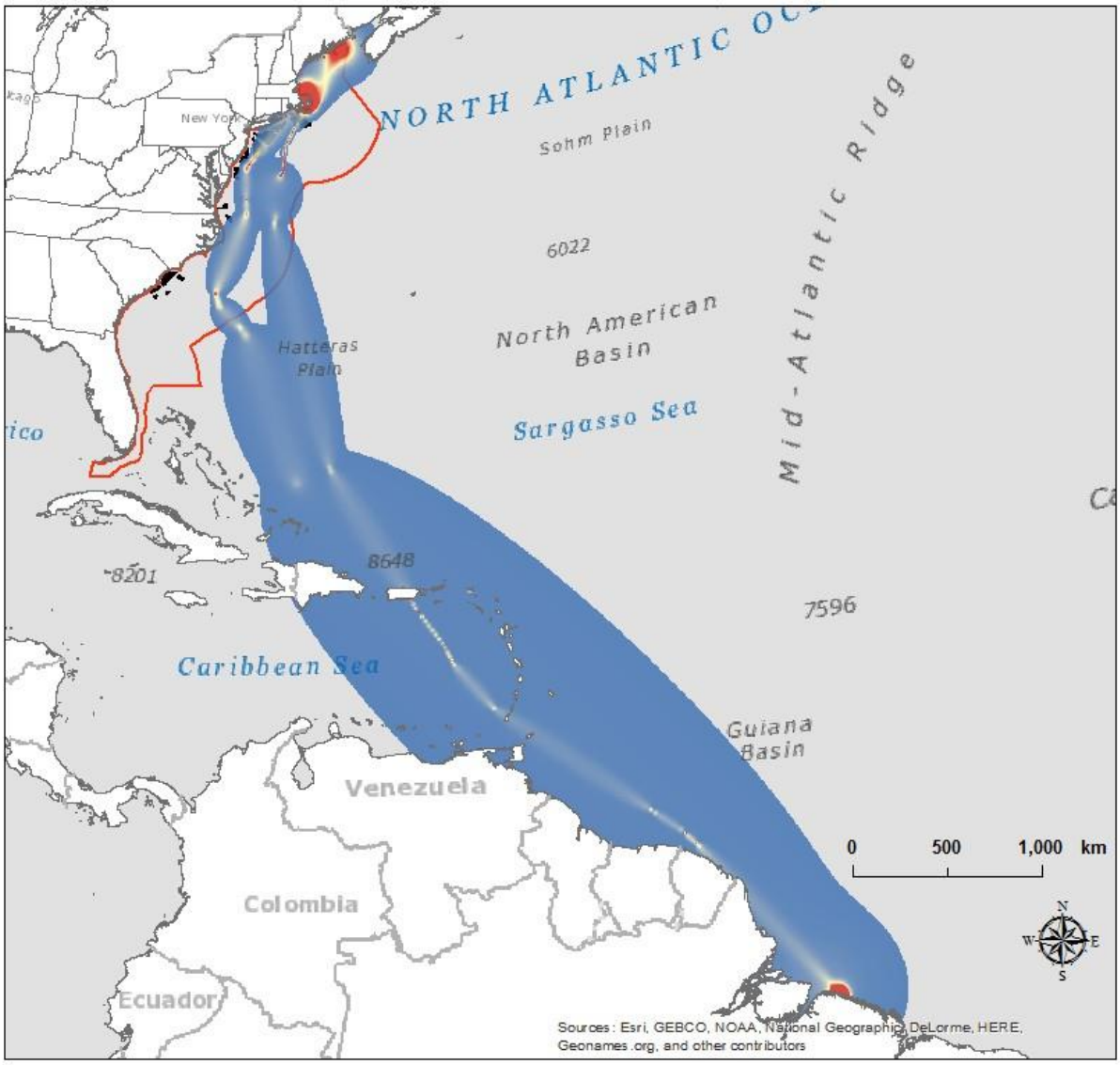
Taken from Loring et al. 2019 (Figure J-5. Model-estimated tracks of common terns [n=4] during fall migration, 6 August - 24 September 2017).

FIGURE P.2-22. COMMON TERN ESTIMATED FALL MIGRATION UTILIZATION DISTRIBUTION



Taken from Loring et al. 2019 (Figure J-6. Composite utilization distribution of common terns [n=4] during fall migration, 6 August - 24 September 2017).

FIGURE P.2-23. COMMON TERN ESTIMATED SPRING MIGRATION UTILIZATION DISTRIBUTION



Legend

BOEM Wind Lease Areas

BOEM Wind Planning Areas

Utilization Distribution

High: 0.50

Low : 0.95

U.S. Federal Waters

3 to 200 nautical mile boundary

Taken from Loring et al. 2019 (Figure J-9. Composite utilization distribution of common terns [n=2] during spring migration, 23 April 2018 - 18 May 2018).

Relative Behavioral Vulnerability Assessment and Risk

Robinson Willmott et al. (2013) estimated common, Arctic, bridled, and sooty terns to have "Higher" collision sensitivity and "Higher" displacement sensitivity; note that both these scores incorporated population sensitivity. Forster's, royal, and least terns were scored at "Medium" collision sensitivity and "Lower" displacement sensitivity. Therefore, final vulnerability scores for common and Arctic terns resulted as Low collision risk and displacement risk in spring, and Medium collision risk and displacement risk in summer and fall (**Table P.2-9**). Final risk scores for other terns were Minimal to Low in spring, summer, and/or fall.

P.2.2.3.2 Gulls

Spatiotemporal Context

Gulls are aerial surface-seizing seabirds that scavenge for fish and invertebrates on the sea surface in offshore marine environments (De Graaf et al. 1985; Shealer 2001). They breed along the U.S. Atlantic coast and Canada, and migrate, forage, and overwinter across the U.S. AOCS (Nisbet et al. 2013). They may occur in the Lease Area throughout the year, particularly in the fall (Winship et al. 2018, Beacon Wind APEM surveys).

Exposure Assessment

Gull species that scored High exposure to activity in the Lease Area were black-legged kittiwakes in spring and herring and great black-backed gulls in summer, according to MDAT model quantiles; other seasons and gull species scored Minimal to Medium (**Table P.2-9**). Lesser black-backed, Iceland, and Sabine's gulls were not modeled by MDAT but were observed during fall APEM surveys. Therefore, they were assigned an exposure score of 3 (Medium) during fall and spring (lesser black-backed gulls only). Gulls were observed throughout the year during APEM surveys.

Relative Behavioral Vulnerability Assessment and Risk

Robinson Willmott et al. (2013) estimated most gulls to have "Higher" collision sensitivity, except ring-billed and Bonaparte's Gulls. Iceland and great black-backed gulls scored "Higher" displacement sensitivity, and the other gulls scored "Lower" or "Medium"; note that these scores incorporated population sensitivity. Therefore, final vulnerability scores resulted as High collision risk for Herring and great black-backed gulls in summer, and for black-legged kittiwakes in Spring. Great black-backed gulls also scored High displacement risk in summer (**Table P.2-9**). Final risk scores for other seasons and gull species were Minimal to Medium.

P.2.2.3.3 Jaegers and Skuas

Spatiotemporal Context

Jaegers and skuas are aerial kleptoparasitic scavengers that breed in Canada (except south polar skuas, which breed in Antarctica) and migrate across the U.S. AOCS (Nisbet et al. 2013; Shealer 2001). They may occur in the Lease Area in summer and fall (Winship et al. 2018).

Exposure Assessment

Parasitic jaegers scored High exposure to activity in the Lease Area in summer, according to MDAT model quantiles; other seasons (excluding winter) and species scored Minimal to Low (**Table P.2-9**). Parasitic jaegers were observed during summer and fall APEM surveys.

Relative Behavioral Vulnerability Assessment and Risk

Robinson Willmott et al. (2013) estimated jaegers and skuas to have "Higher" collision sensitivity and "Lower" displacement sensitivity; note that these scores incorporated population sensitivity. Therefore, final vulnerability scores resulted as High collision risk for parasitic jaegers in summer, and Minimal to Low for other seasons and species (**Table P.2-9**).

P.2.2.3.4 Alcids

Spatiotemporal Context

Alcids are pursuit-diving piscivores and/or crustaceovores that breed along the North Atlantic coast from Maine to Canada and migrate, forage, and overwinter across the U.S. AOCS (De Graaf et al. 1985; Nisbet et al. 2013; Shealer 2001). They may occur in the Lease Area throughout the year, particularly during spring and winter (except black guillemots present in summer; Winship et al. 2018).

Exposure Assessment

Razorbills scored Very High exposure to activity in the Lease Area in spring and winter, and common murres scored High exposure during winter, according to MDAT model quantiles; other seasons and species scored Low to Medium (**Table P.2-9**). Razorbills, Atlantic puffins, and murres were observed during spring and winter APEM surveys, and dovekies were observed in winter.

Relative Behavioral Vulnerability Assessment and Risk

Robinson Willmott et al. (2013) estimated alcids to have "Higher" collision sensitivity and "Lower" displacement sensitivity, except for dovekies, which scored "Medium" collision and displacement sensitivity; note that these scores incorporated population sensitivity. Therefore, final vulnerability scores resulted as Very High collision and displacement risk for razorbills in spring and winter, High collision and displacement risk for common murres in winter, and Low to Medium risk for other seasons and species (**Table P.2-9**).

P.2.2.3.5 Seaducks

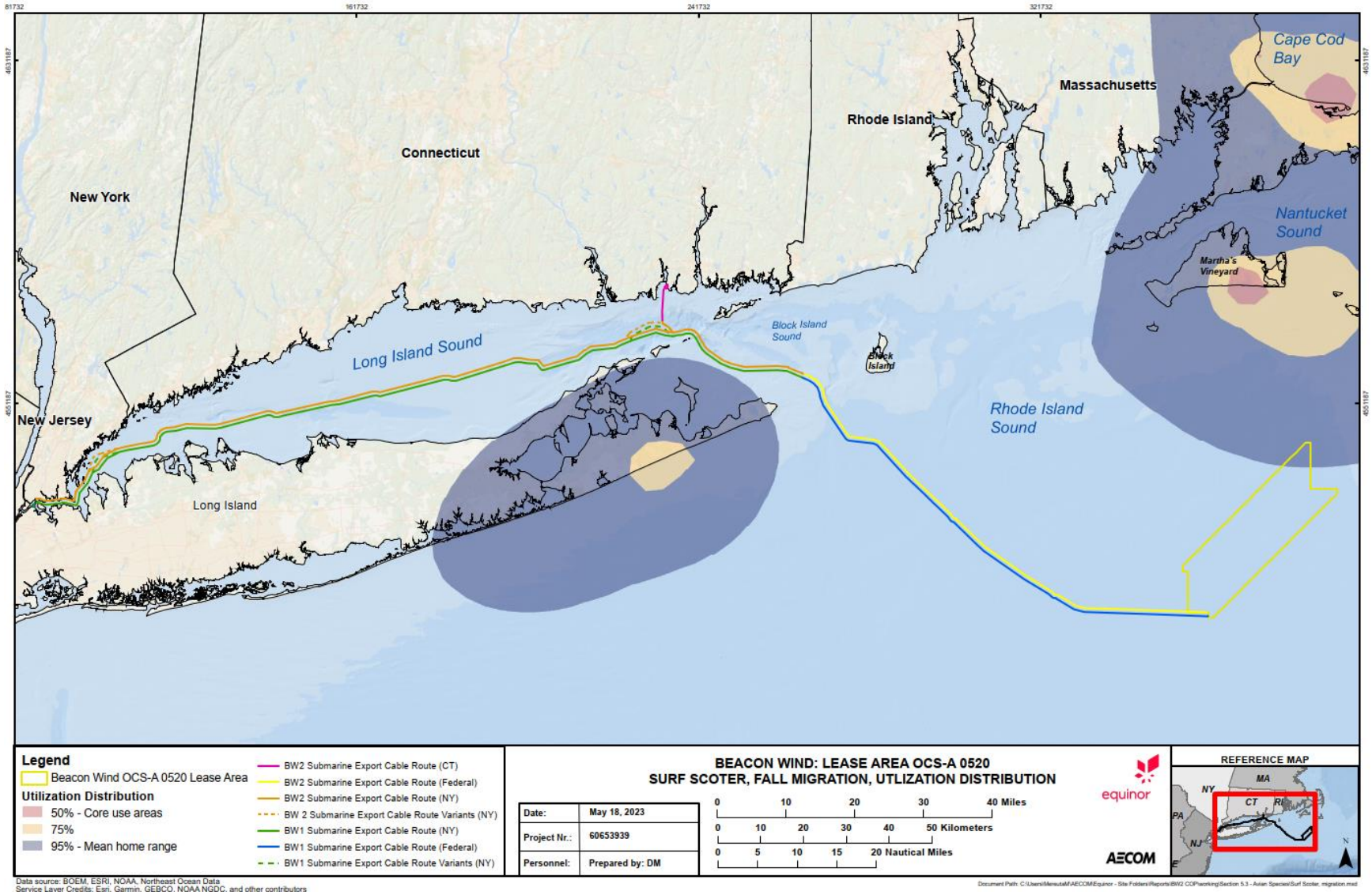
Spatiotemporal Context

Seaducks are migratory waterfowl that generally breed in Canada and overwinter along the U.S. Atlantic coast and across the AOCS; common eiders nest as far south as New York (Nisbet et al. 2013). They dive down from sitting on the sea surface to feed on seafloor benthos (e.g., scoters) or crustaceans and/or forage fish throughout the water column (e.g., long-tailed ducks, red-breasted mergansers), often shallower than 50 m (Dierschke et al. 2016; Spiegel et al. 2017; Stenhouse et al. 2020; White and Veit 2020). They may occur in the Lease Area during migration and over winter (Spiegel et al. 2017), and common eiders may additionally be present during the summer breeding season (Winship et al. 2018).

Exposure Assessment

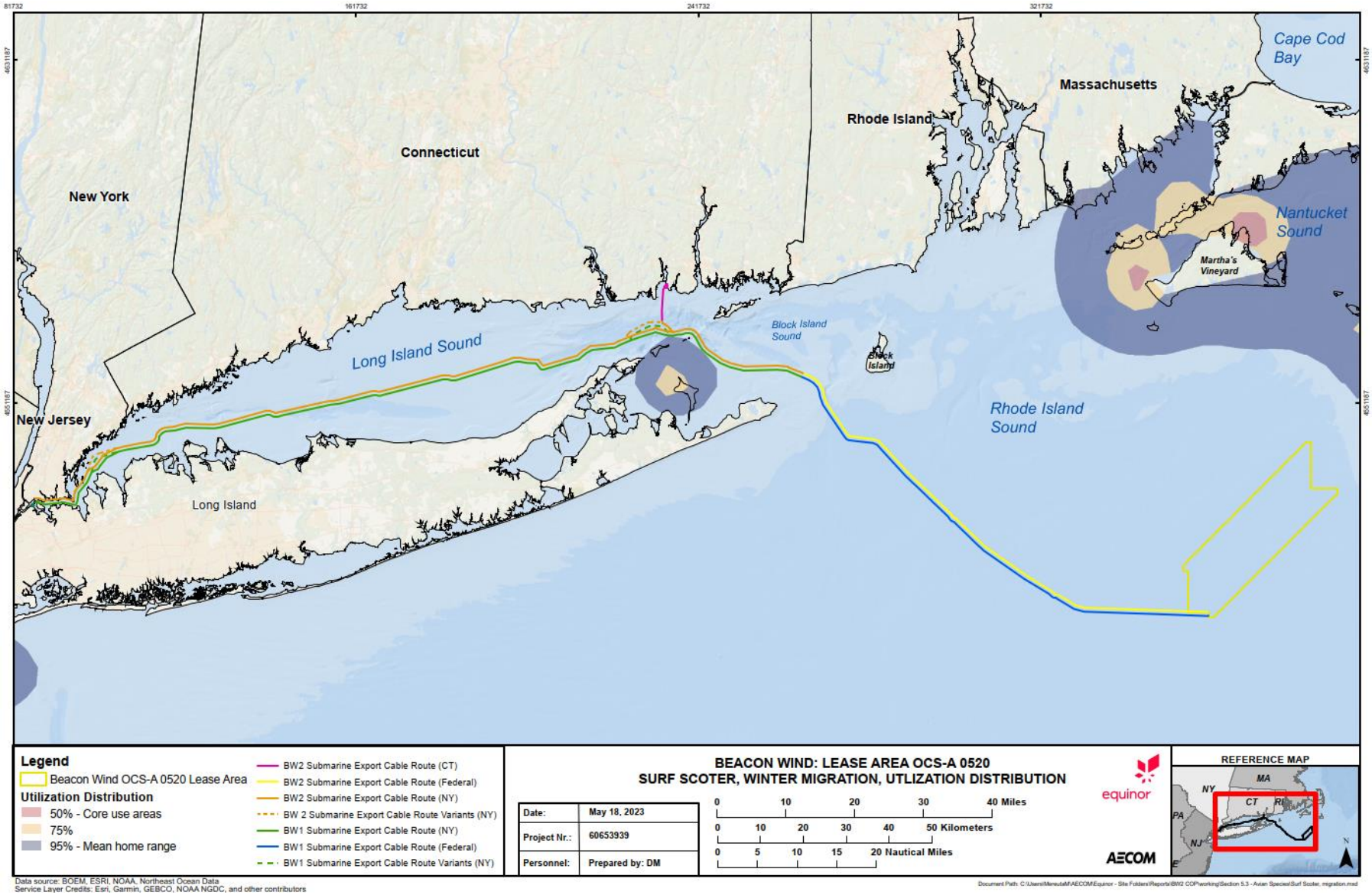
Spiegel et al. 2017 estimated migratory and overwintering utilization distributions of surf scoters that showed low exposure probability to the Lease Area in fall (Figure **P.2-24**), winter (Figure **P.2-25**), and spring (Figure P.2-26). Surf scoters scored Medium exposure to activity in the Lease Area during fall, winter, and spring, according to MDAT model quantiles (**Table P.2-9**). Other seaducks scored Minimal to Medium exposure in spring, summer, fall, and/or winter, except long-tailed ducks and white-winged scoters, which scored High exposure in winter. Seaducks were observed in fall, winter, and spring APEM surveys.

FIGURE P.2-24. SURF SCOTER ESTIMATED FALL MIGRATION UTILIZATION DISTRIBUTION



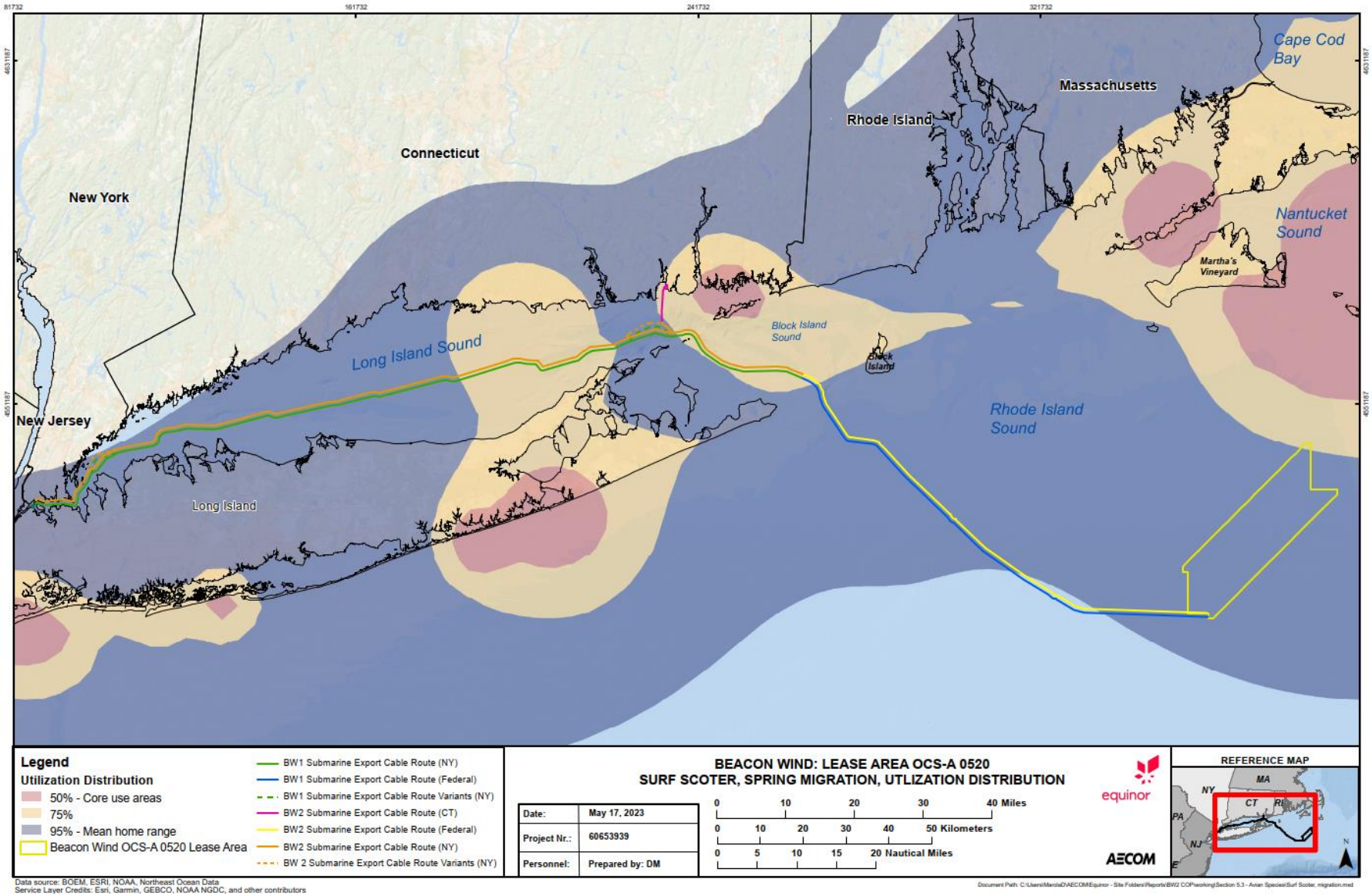
Note: Adapted from Spiegel et al. 2017 **Source:** Northeast Ocean Data Portal

FIGURE P.2-25. SURF SCOTER ESTIMATED WINTER UTILIZATION DISTRIBUTION



Note: Adapted from Spiegel et al. 2017 **Source:** Northeast Ocean Data Portal

FIGURE P.2-26. SURF SCOTER ESTIMATED SPRING MIGRATION UTILIZATION DISTRIBUTION



Note: Adapted from Spiegel et al. 2017 **Source:** Northeast Ocean Data Portal

Relative Behavioral Vulnerability Assessment and Risk

Robinson Willmott et al. (2013) estimated seaducks to have "Higher" collision sensitivity and "Higher" displacement sensitivity, except red-breasted mergansers which scored "Medium" displacement sensitivity (**Table P.2-9**); note that both these scores incorporated population sensitivity. Therefore, final vulnerability scores for collision and displacement risk were High for long-tailed ducks and white-winged scoters in winter, and Minimal to Medium for other seasons and seaducks.

P.2.2.3.6 Loons

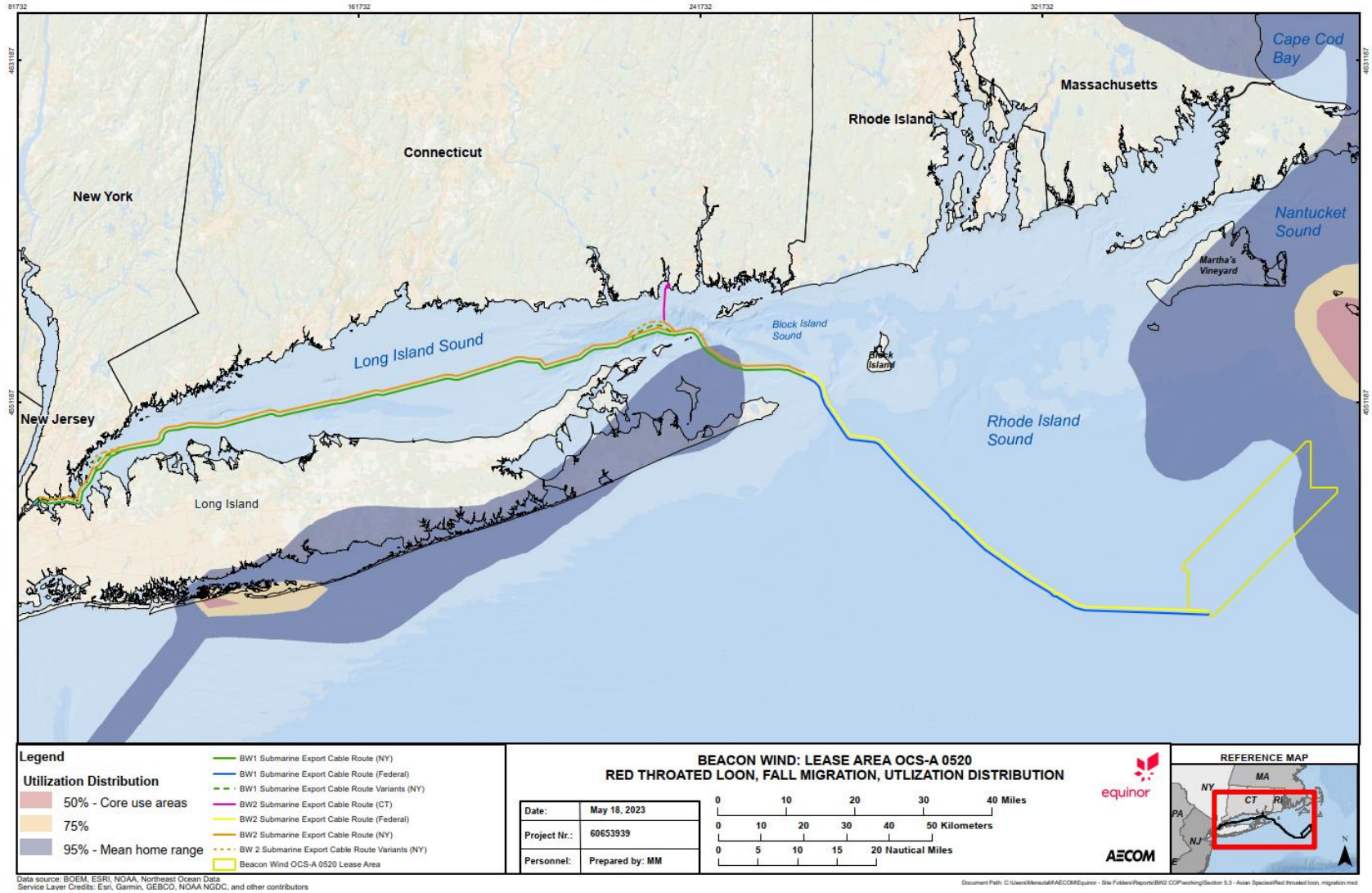
Spatiotemporal Context

Red-throated and common loons are pursuit-diving piscivores that breed from Maine to Canada and overwinter along the U.S. Atlantic coast and across the AOCS (Nisbet et al. 2013; Spiegel et al. 2017; Stenhouse et al. 2020). They may occur in the Lease Area during migration and over winter (Spiegel et al. 2017), and common loons may additionally be present during the summer breeding season (Winship et al. 2018).

Exposure Assessment

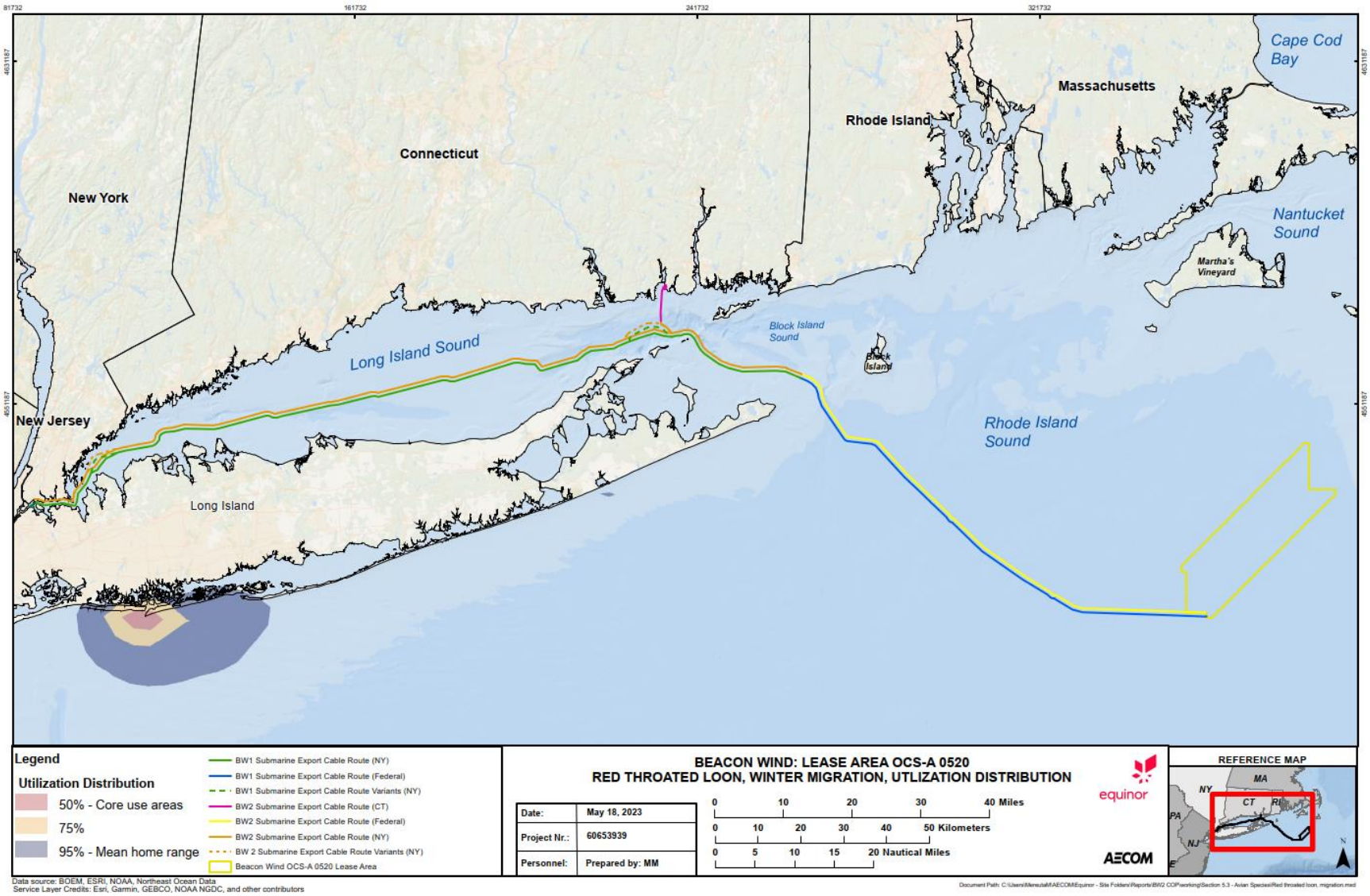
Spiegel et al. 2017 estimated migratory and overwintering utilization distributions of red-throated loons that showed low exposure probability to the Lease Area in fall (Figure P.2-27), winter (Figure **P.2-28**), and spring (Figure **P.2-29**), except for medium exposure probability in the northeast portion of the Lease Area during spring. Red-throated and common loons scored Medium exposure to activity in the Lease Area during spring and winter, and Low exposure during fall, according to MDAT model quantiles (**Table P.2-9**); Common loons additionally scored Medium exposure in summer. Loons were observed in fall, winter, and spring APEM surveys.

FIGURE P.2-27. RED-THROATED LOON ESTIMATED FALL MIGRATION UTILIZATION DISTRIBUTION



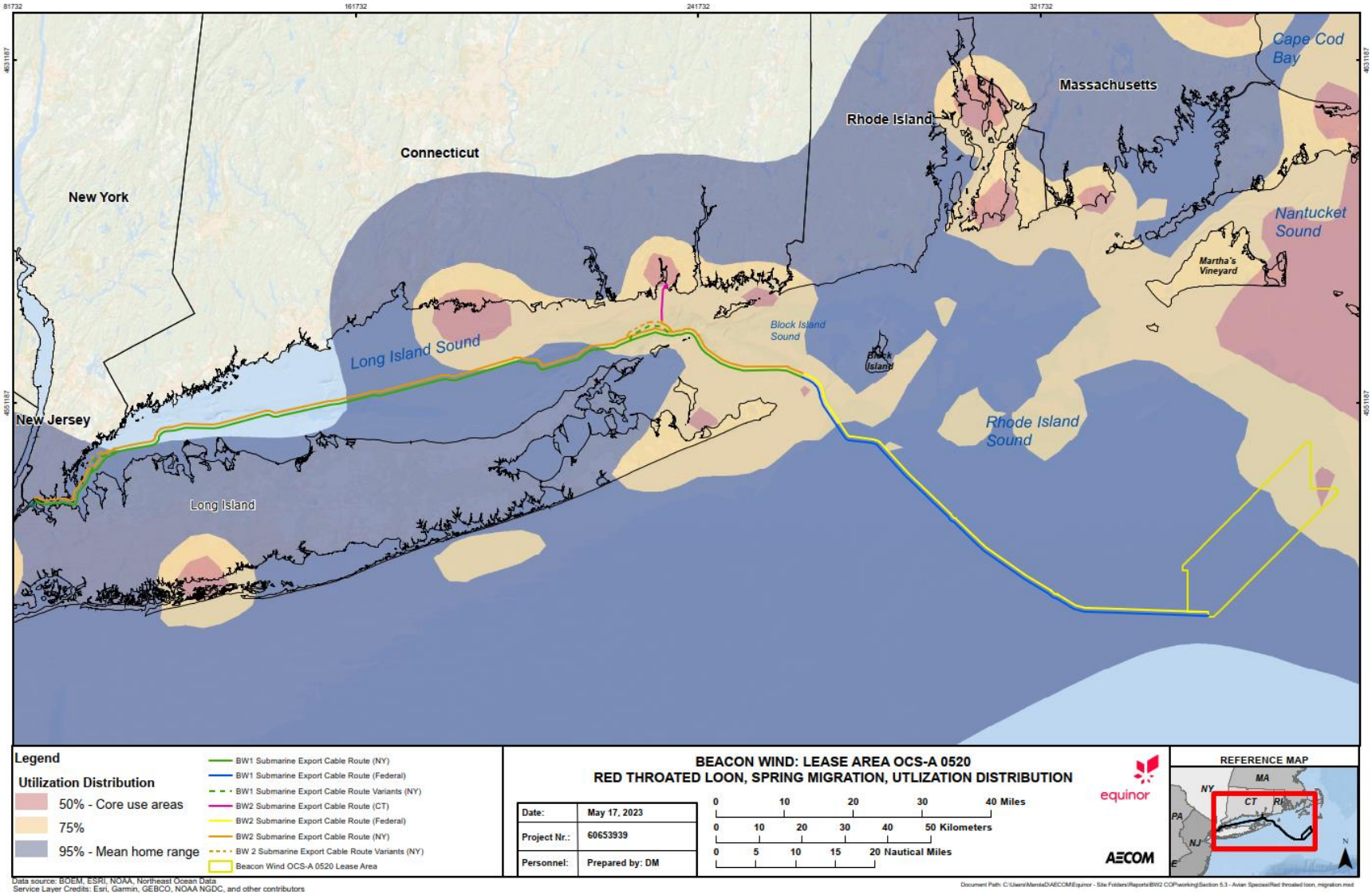
Note: Adapted from Spiegel et al. 2017 **Source:** Northeast Ocean Data Portal

FIGURE P.2-28. RED-THROATED LOON ESTIMATED WINTER UTILIZATION DISTRIBUTION



Note: Adapted from Spiegel et al. 2017 **Source:** Northeast Ocean Data Portal

FIGURE P.2-29. RED-THROATED LOON ESTIMATED SPRING MIGRATION UTILIZATION DISTRIBUTION



Note: Adapted from Spiegel et al. 2017 **Source:** Northeast Ocean Data Portal

Relative Behavioral Vulnerability Assessment and Risk

Robinson Willmott et al. (2013) estimated loons to have "Higher" collision sensitivity and "Higher" displacement sensitivity (**Table P.2-9**); note that both these scores incorporated population sensitivity. Therefore, final vulnerability scores for collision and displacement risk were Medium for Red-throated and common loons in winter, spring, and summer (common loons only), and Low in fall.

P.2.2.3.7 Pelicans

Spatiotemporal Context

Brown pelicans are surface-seizing and plunging piscivores that breed in the U.S. from Florida to New Jersey and overwinter near their breeding range (De Graaf et al. 1985; Nisbet et al. 2013; Shealer 2001). They are uncommon in the Northeast U.S.; therefore, they may occur incidentally but are not likely in the Lease Area.

Exposure Assessment

Brown pelicans scored Low exposure to activity in the Lease Area in summer, fall, and winter, and Minimal exposure in spring, according to MDAT model quantiles (**Table P.2-9**). Pelicans were not observed during APEM surveys.

Relative Behavioral Vulnerability Assessment and Risk

Robinson Willmott et al. (2013) estimated Brown Pelicans to have "Higher" collision sensitivity and "Medium" displacement sensitivity; note that these scores incorporated population sensitivity. Therefore, final vulnerability scores resulted as Low collision and displacement risk for Brown Pelicans in summer, fall, and winter, and Minimal risk in spring (**Table P.2-9**).

P.2.2.3.8 Grebes

Spatiotemporal Context

Horned grebes are inland breeders that nest in western Canada and overwinter along the U.S. Atlantic coast, usually in shallow water to dive from sitting for invertebrates or small fish (De Graaf et al. 1985; Nisbet et al. 2013). They are uncommon in pelagic environments; therefore, they may occur incidentally but are not likely in the Lease Area.

Exposure Assessment

Horned grebes scored Minimal exposure to activity in the Lease Area in winter, according to MDAT model quantiles (**Table P.2-9**). Grebes were not observed during APEM surveys.

Relative Behavioral Vulnerability Assessment and Risk

Robinson Willmott et al. (2013) estimated brown pelicans to have "Higher" collision sensitivity and "Medium" displacement sensitivity; note that these scores incorporated population sensitivity. Therefore, final vulnerability scores resulted as Minimal collision and displacement risk for brown pelicans in winter (**Table P.2-9**).

P.2.2.3.9 Storm-petrels

Spatiotemporal Context

Storm-petrels are pelagic planktivores that forage by "pattering" with their feet over the sea surface (De Graaf et al. 1985; Shealer 2001). Wilson's and band-rumped storm-petrels breed in the tropical and/or Southern Oceans and Leach's storm-petrels breed along the North Atlantic coast from

Massachusetts to Canada (Nisbet et al. 2013). They forage across the U.S. AOCS and may occur in the Lease Area during spring, summer, and fall (Nisbet et al. 2013; Winship et al. 2018).

Exposure Assessment

Wilson's storm-petrel scored High exposure to activity in the Lease Area during summer, and Low exposure during spring and fall; Leach's storm-petrel scored Medium exposure in fall and low exposure in spring and summer, according to MDAT model quantiles (**Table P.2-9**). Band-rumped storm-petrel scored Minimal exposure in summer. Unidentified storm-petrels (i.e., likely Wilson's or Leach's) were observed during spring, summer, and fall APEM surveys and Wilson's storm-petrels were observed during spring.

Relative Behavioral Vulnerability Assessment and Risk

Robinson Willmott et al. (2013) estimated storm-petrels to have "Higher" collision sensitivity and "Medium" (band-rumped, Leach's) or Low (Wilson's) displacement sensitivity; note that these scores incorporated population sensitivity. Therefore, final vulnerability scores resulted as High collision risk for Wilson's storm-petrel in summer, Medium collision risk for Leach's storm-petrel in fall, and Minimal to Low risk for other seasons and species (**Table P.2-9**).

P.2.2.3.10 Shearwaters, Petrels and Fulmars

Spatiotemporal Context

Shearwaters, petrels, and fulmars are pelagic seabirds that scavenge for fish by surface-seizing (De Graaf et al. 1985; Powers et al. 2020; Shealer 2001). Northern fulmars and a small colony of manx shearwaters breed along the Atlantic coast of Canada, manx and Cory's shearwaters breed along the eastern North Atlantic, Audubon's and black-capped petrels breed in the Caribbean, and great and sooty shearwaters breed in the Southern Oceans (Nisbet et al. 2013). They may occur in the Lease Area throughout the year, particularly in spring, summer, and fall (Winship et al. 2018).

Exposure Assessment

Cory's shearwater scored Very High exposure to activity in the Lease Area during summer, and High exposure during fall; sooty shearwater scored High exposure in summer; and other season and species scored Minimal to Medium exposure, according to MDAT model quantiles (**Table P.2-9**). Shearwaters and fulmars were observed during all seasons of APEM surveys.

Relative Behavioral Vulnerability Assessment and Risk

Robinson Willmott et al. (2013) estimated shearwaters, petrels, and fulmars to have "Higher" collision sensitivity, and "Higher" (black-capped petrel, manx shearwater), "Medium" (Cory's shearwater, Northern fulmar, great shearwater, Audubon's shearwater), or Low (sooty shearwater) displacement sensitivity; note that these scores incorporated population sensitivity. Therefore, final vulnerability scores for Cory's shearwater resulted as Very High collision risk in summer, High collision risk in fall, and High displacement risk in summer. Sooty shearwaters scored High collision risk in summer, and other seasons and/or species scored Minimal to Medium risk (**Table P.2-9**). The ESA-proposed species black-capped petrel scored Minimal to Low risk, as expected given that their distribution is documented primarily off the AOCS, south of the Lease Area (Jodice et al. 2015).

P.2.2.3.11 Cormorants

Spatiotemporal Context

Double-crested cormorants are pursuit-diving piscivores that breed in the U.S. from Florida to Canada, forage and migrate across the AOCS, and overwinter in the southern U.S. (Nisbet et al. 2013). They may occur in the Lease Area during the summer breeding season and migration (Winship et al. 2018).

Exposure Assessment

Double-crested cormorants scored Medium exposure to activity in the Lease Area in spring, summer, and fall, and Minimal exposure in winter, according to MDAT model quantiles (**Table P.2-9**). Cormorants were observed during spring and fall APEM surveys.

Relative Behavioral Vulnerability Assessment and Risk

Robinson Willmott et al. (2013) estimated Double-crested cormorants to have “Higher” collision sensitivity and “Medium” displacement sensitivity; note that these scores incorporated population sensitivity. Therefore, final vulnerability scores resulted as Medium collision risk in spring, summer and fall, Low displacement risk in spring, summer and fall, and Minimal risk in winter for cormorants (**Table P.2-9**).

P.2.2.3.12 Gannets

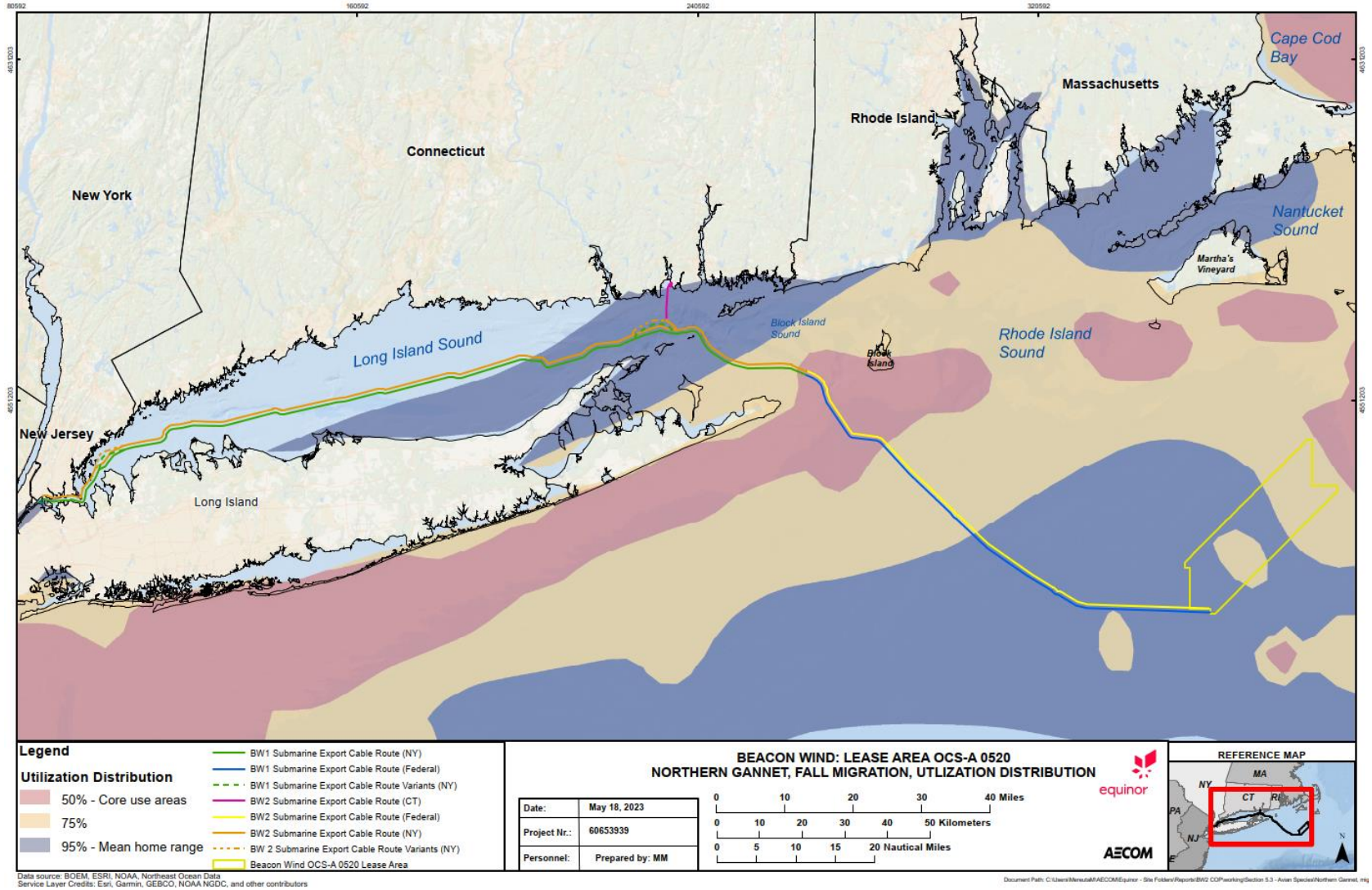
Spatiotemporal Context

Northern gannets are piscivorous aerial plunge divers that breed in Canada and overwinter along the U.S. Atlantic coast and across the AOCS (Nisbet et al. 2013; Spiegel et al. 2017, Stenhouse et al. 2020). They may occur in the Lease Area throughout the year, particularly during migration and over winter (Spiegel et al. 2017; Winship et al. 2018).

Exposure Assessment

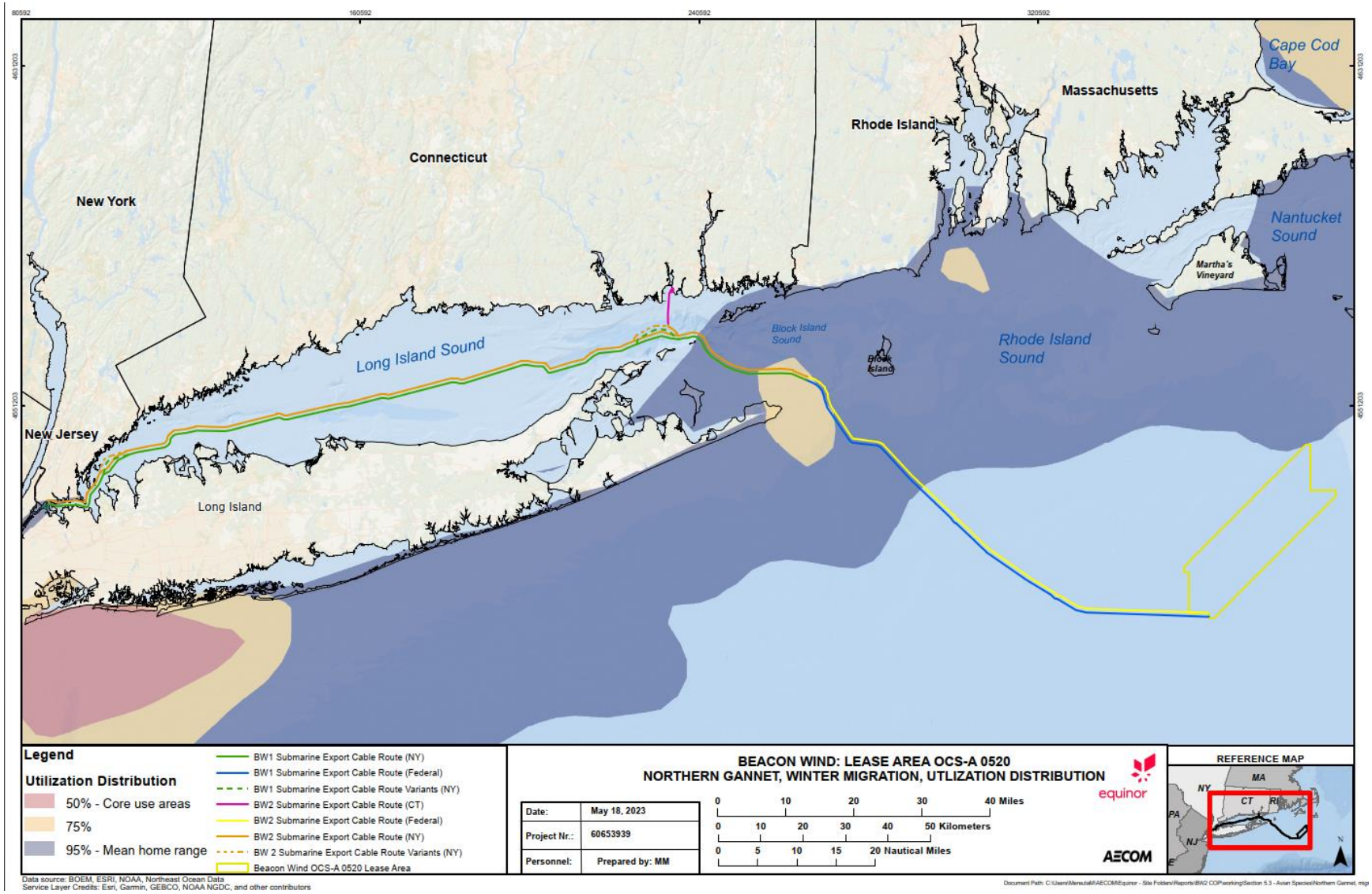
Spiegel et al. 2017 estimated migratory and overwintering utilization distributions of Northern gannets that showed low exposure probability to the Lease Area in fall (Figure **P.2-30**), and winter (Figure **P.2-31**), as well as medium in fall and spring (Figure **P.2-32**), and high in the northern portion of the Lease Area in spring. Northern gannets scored Medium exposure to activity in the Lease Area during winter, spring. and summer, and High exposure during fall, according to MDAT model quantiles (**Table P.2-9**). Gannets were observed throughout the year during APEM surveys.

FIGURE P.2-30. NORTHERN GANNET ESTIMATED FALL MIGRATION UTILIZATION DISTRIBUTION



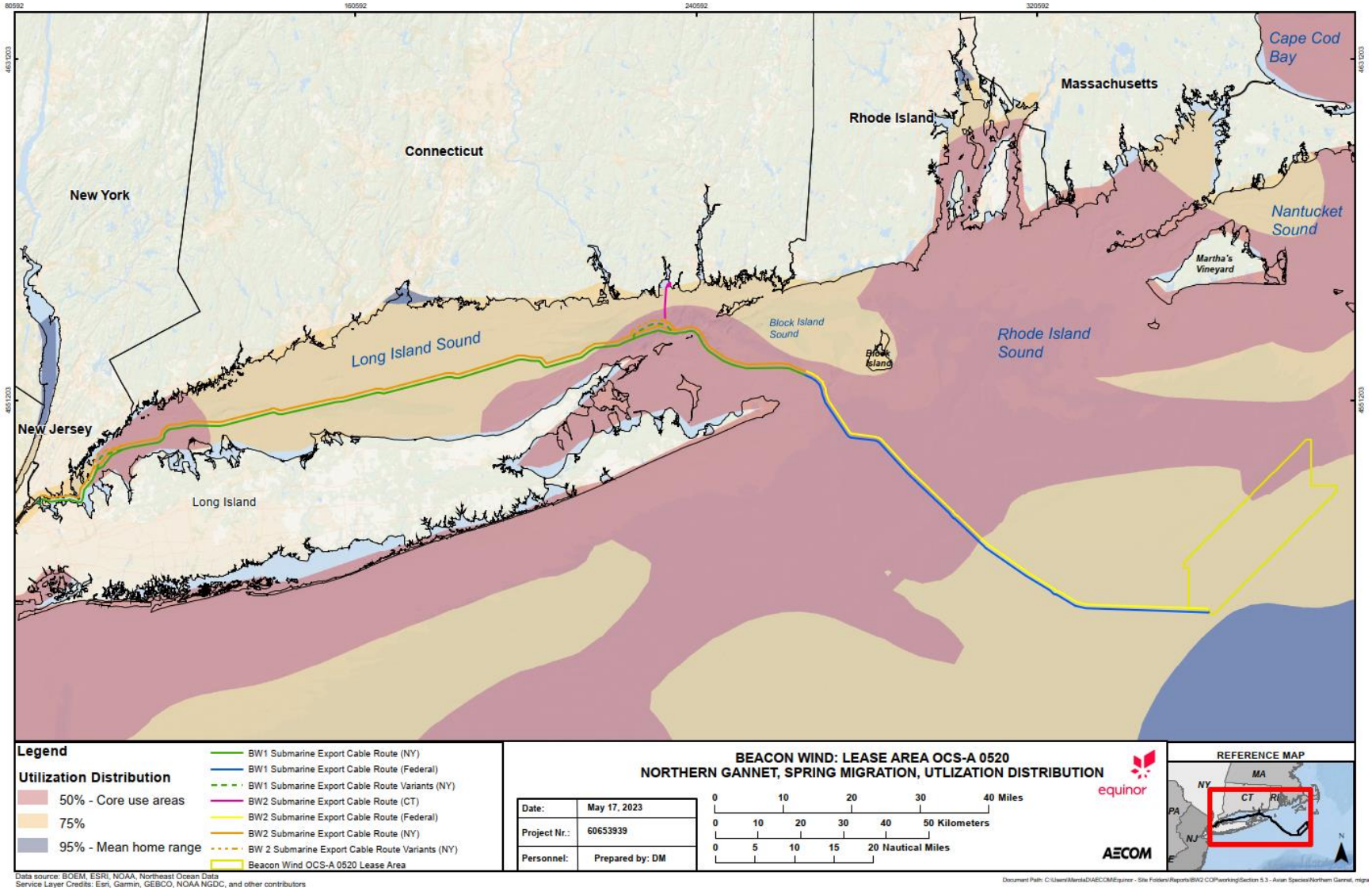
Note: Adapted from Spiegel et al. 2017 **Source:** Northeast Ocean Data Portal

FIGURE P.2-31. NORTHERN GANNET ESTIMATED WINTER UTILIZATION DISTRIBUTION



Note: Adapted from Spiegel et al. 2017 **Source:** Northeast Ocean Data Portal

FIGURE P.2-32. NORTHERN GANNET ESTIMATED SPRING MIGRATION UTILIZATION DISTRIBUTION



Note: Adapted from Spiegel et al. 2017 **Source:** Northeast Ocean Data Portal

Relative Behavioral Vulnerability Assessment and Risk

Robinson Willmott et al. (2013) estimated gannets to have “Higher” collision sensitivity and “Higher” displacement sensitivity (**Table P.2-9**); note that both these scores incorporated population sensitivity. Therefore, final vulnerability scores for collision and displacement risk were Medium for Northern gannets in winter, spring and summer, and High in fall.

P.2.2.4 Mitigation and Monitoring

A table was compiled of existing mitigation and monitoring measures proposed by the offshore wind energy industry to minimize the cumulative impacts of offshore wind energy development on birds (**Table P.2-10**). For example, the Vineyard Wind Record of Decision (ROD) issued by BOEM (2021) included the installation of Motus Wildlife Tracking System (Motus) receivers on turbines, annual deployment of Motus tags to track common and roseate terns, pre- and post-construction boat surveys, avian behavior point count surveys at turbines, annual monitoring reports reviewed by subject matter experts, public availability of data, and the possible use of new technologies as they become available for use offshore. Beacon Wind has already implemented a program for the installation of avian tag receiver antenna on LiDAR and Metocean buoys within the Lease Area, to help improve detection coverage for automated radiotelemetry (**Section P.2.1.1.1**). Additionally, further consultation regarding appropriate avoidance or minimization measures for cable laying activity around Great Gull Island, New York is proposed to reduce potential impacts on sand lance availability to the endangered roseate tern during pre-breeding, breeding, and post-breeding periods when roseate terns forage primarily on sand lance throughout the region.

TABLE P.2-10. INDUSTRY-DOCUMENTED MONITORING AND MITIGATION MEASURES PROPOSED FOR OFFSHORE WIND ENERGY DEVELOPMENT

Measure	Description
Atlantic	
Onshore siting	Onshore is sited within previously disturbed existing rights-of-way.
Wind farm siting	The location of the wind farm avoids coastal areas, which are known to attract birds, particularly shorebirds and seaducks.
Wind turbine spacing	Wind turbines are widely spaced apart allowing avian species to avoid individual wind turbines and minimize risk of potential collision. This wide spacing of wind turbines may reduce risk of barrier effects and/or displacement and may allow avian species to avoid individual wind turbines and minimize risk of potential collision.
Listed species management plan	An avian management plan for listed species is prepared. This may include a piping plover protection plan, upon consultation with state and federal agencies.
Invasive species management plan	An invasive species management plan is implemented to manage the spread of invasive plant species that could negatively impact native plants and avian habitat.
Pre-construction monitoring plan	A pre-construction monitoring plan is developed, which involves qualified biologists to perform surveys that determine the presence/absence of listed species within the work zone, time period, and surrounding buffer. The monitoring plan is provided to construction personnel prior to operations so that proper training and implementation of the plan can be achieved.
Nearshore time-of-year restrictions	Time-of-year restrictions are implemented for certain work activities, to the extent feasible, to avoid or minimize direct impacts to rare, threatened, and endangered avian species during construction. Construction monitoring and impact minimization plans, or mitigation plans, are developed, as appropriate, in coordination with state and federal agencies.
Coastal disturbance minimization and monitoring	Sea-to-shore transition cables are installed via HDD to avoid impacts to the nearshore zone. In the unlikely event that disturbance associated with HDD activities to coastal beach occurs, a qualified biologist surveys the site in advance of any equipment being brought to the beach and ensures no remedial actions will interfere with listed species.

Measure	Description
Undergrounding transmission lines	The onshore cable is buried, therefore avoiding the risk to birds associated with overhead lines. The onshore transmission cable and onshore interconnection cable does not include any overhead utility poles, thus minimizing potential impacts to birds associated with collision with overhead lines.
Lighting	Lighting during operations is limited to the minimum required by regulation and for safety, therefore minimizing the potential for attraction or disorientation. Required use of FAA-approved ADLS only activates the FAA hazard lighting when an aircraft is in the vicinity of the wind facility, to reduce the visibility of nighttime lighting and thus reduce nighttime visual impacts.
Bird deterrence	Bird deterrent devices are installed to minimize bird attraction to operating turbines and on the electrical service platform(s), where appropriate and where determined such devices can be employed safely. Measures are taken to reduce perching opportunities at operating turbines, if appropriate based on further consultations with state and federal agencies.
Avian and bat post-construction monitoring program	A framework for an avian and bat post-construction monitoring program is developed and implemented in coordination with applicable federal and state resource agencies. The framework includes: installation of acoustic monitoring devices to monitor nocturnal birds and bats; installation and maintenance of Motus receivers on wind turbines; funding for deployment of annual Motus tags to track roseate terns, common terns, and/or nocturnal passerine migrants; avian behavior point count surveys at individual wind turbines; pre- and post-construction boat surveys; annual monitoring reports that will be used to assess the need for reasonable revisions (based on subject matter expert analysis) to the monitoring plan and may include new technologies as they become available for use in offshore environments; publicly available data, in coordination with BOEM.
Annual bird mortality reporting	An annual report is required of any dead or injured birds discovered on Project vessels or structures. Report contains the following information: species, photos to confirm species, location, date, and other relevant information. Carcasses with federal or research bands must be reported to the U.S. Geological Survey Bird Band Laboratory, BOEM, and USFWS.

Measure	Description
Pile driving monitoring plan and Protected Species Observer (PSO)	A pile-driving monitoring plan must be submitted to BOEM, Bureau of Safety and Environmental Enforcement (BSEE), and NMFS for review and approval. It describes a communication plan detailing the chain of command, mode of communication, and decision authority. PSOs, as determined by NMFS and BOEM, must be used to monitor seasonal and species-specific clearance and shutdown zones.
Marine debris awareness and elimination	To understand the type and amount of marine debris generated, and to minimize the risk of entanglement in and/or ingestion of marine debris by protected species, lessees implement the following Best Management Practices: awareness training and certification, periodic underwater surveys, marking, recovery, cleanup, and reporting to BOEM and BSEE.
Spills and discharges prevention	All construction and operations vessels are required to comply with regulatory requirements related to the prevention and control of spills and discharges. Accidental spill or release of oils or other hazardous materials are managed through the Oil Spill Response Plan (COP **Appendix E Oil Spill Response Plan**).
Stormwater Pollution Prevention Plan	A Stormwater Pollution Prevention Plan, including erosion and sedimentation control measures, and a Spill Prevention, Control, and Countermeasures Plan, minimizes potential impacts to water quality during construction Onshore.
Great Lakes	
Radar	Radar is used during pre-construction and post-construction time frames to monitor flight height, behavior, presence, potential for collision and to determine if/when feathering of turbines should be implemented.
Collision monitoring	A plan is implemented for monitoring and the use of advanced technology for collision monitoring (technology not specified yet).
Feathering turbines	Curtailment of turbines occurs during certain periods to avoid times of increased bird and bat activity.

Notes:

Documented measures proposed for other wind projects within the Atlantic region (i.e., Massachusetts and Rhode Island Wind Energy Area) include: the Final Environmental Impact Statement and ROD for Vineyard Wind and South Fork, and the COP for Revolution and Sunrise Wind (available at: www.boem.gov/renewable-energy/state-activities).

Measures proposed for a wind project within the Great Lakes region are documented in the Icebreaker Opinion, Order, and Certificate (The Ohio Power Siting Board, 21 May 2020, Case No. 16-1871-EL-BGN).

P.2.3 Summary and Conclusions

The results of the quantitative risk assessment suggest that, of the avian species federally listed under the ESA, piping plovers and red knots have a Low estimated collision risk and Minimal estimated displacement risk. Roseate terns were estimated to have Low collision and displacement risk in spring and Medium collision and displacement risk in summer and fall. The project acknowledges there will be further consultation regarding appropriate avoidance or minimization measures for cable laying activity around Great Gull Island, New York, to minimize potential impacts to the prey base of roseate terns. Common terns, which are listed as threatened in the state of New York, have the same level of collision and displacement risk as roseate terns. A work window for cable laying activity should additionally minimize potential impacts to the prey base of common terns, which co-nest with roseate terns on Great Gull Island. Least terns, which are listed as threatened in New York, have an estimated Low collision risk in summer and fall and Minimal displacement risk in summer and fall. Other migratory bird species that show High estimated collision risk are herring gull (summer), great black-backed gull (summer), black-legged kittiwake (spring), parasitic jaeger (summer), razorbill (Very High in spring and winter), common murre (winter), long-tailed duck (winter), white-winged scoter (winter), Wilson's storm-petrel (summer), Cory's shearwater (fall and Very High in summer), sooty shearwater (summer), and Northern gannet (fall). Migratory bird species that show High estimated displacement risk are great black-backed gull (summer), razorbill (Very High in spring and winter), common murre (winter), long-tailed duck (winter), white-winged scoter (winter), Cory's shearwater (summer), and Northern gannet (fall).

A transparent, quantitative risk analysis of exposure and vulnerability was conducted, where exposure and vulnerability scores were based on outside, independent quantitative assessments (Winship et al. 2018; Robinson Willmott et al. 2013). Risk scores were not adjusted qualitatively following calculation, so as to avoid the use of obscure mechanisms of analysis. Outside, independent sources (e.g., Spiegel et al. 2017; Loring et al. 2018, 2019; and the APEM digital aerial surveys) aligned with the results from the exposure analysis based on the MDAT abundance models (Winship et al. 2018), confirming the lack of need to adjust scores qualitatively. Even with this conservative approach, the majority of avian species were estimated to have Minimal to Medium risk scores. Observed flight heights in the Northwest Atlantic Seabird Catalog were generally below the RSZ 86 – 1082 ft (26 m – 330 m). Additionally, the RSZ under maximum wind turbine dimensions (**Figure P.1-3**) has increased in height since the Robinson Willmott et al. (2013) vulnerability study, potentially reducing exposure for birds that fly below (e.g., from the Block Island Wind Farm erected in 2016 with RSZ 95 to 620 ft [29 to 189 m], to the turbines proposed for Beacon Wind with the potential maximum RSZ 98 – 1,083 ft [30 m – 330 m]).

Therefore, the High risk scores are suspected to be overestimates, particularly for the species that were estimated to have Very High risk (e.g., razorbill and Cory's shearwater). It is suggested that independent vulnerability assessments (e.g., Robinson Willmott et al. 2013) be updated with recent data on flight heights and the increased sizes of wind turbines. Also, because digital aerial surveys were not conducted throughout the greater region to calculate relative density scores, exposure from the APEM surveys could not be scored. Because the APEM exposure maps aligned with the MDAT abundance models, subjectively adjusting exposure scores was avoided. Implementation of region-wide programmatic, independent digital aerial surveys would be extremely useful for direct comparison to the Lease Area surveys, to calculate exposure in future risk assessment analyses (e.g., pre- and post-construction).

P.3 Onshore Study Area Assessment

The onshore risk assessment is provided to discuss the potential for impacts to birds within the Onshore Study Areas where onshore facilities and activities are proposed. For the purposes of this assessment, the Onshore Study Areas include the Project components located above the MHWL including landfall, onshore export cable and corridor, onshore substation facility, interconnection cable and corridor, and POI (**Figure P.1-7**). Depending on the final landing site selection, the submarine export cable for BW1 and BW2 would pass from Federal Waters through the Rhode Island Sound, Long Island Sound, and East River, to the Astoria power complex. The submarine export cable for BW2 would alternatively pass from the Long Island Sound into Niantic Bay to the Waterford power complex. As indicated in **Section 0** above, the submarine export cable installation activities will be temporary. With the implementation of avoidance and minimization measures, the temporary activities conducted underwater for installation of the submarine export cable should not result in potential effects to birds. It is also assumed that decommissioning activities will have similar or less potential for effects, as temporary construction activities.

P.3.1 Methods

The methods used for assessment within the Onshore Study Areas consist of the evaluation of the potential for impacts to birds associated with onshore construction, operations, and decommissioning activities. The basis for determining the potential for onshore impacts is based on the presence of bird species and their habitats within or in proximity to the onshore Project components and activities. Included in this evaluation is consideration of the impact producing factors that serve as indicators. Species groups are evaluated, except in the case of ESA-listed species (piping plover, red knot, roseate tern), eagles protected under BGEPA, and species identified as requiring additional analysis due to factors such as increased presence in the Onshore Study Areas and potential to be affected by Project activities.

P.3.1.1 Habitat Assessment

The Onshore Study Areas were reviewed for the presence of habitat types (e.g., upland, coastal, and aquatic) suitable to support the presence of bird species within the Onshore Study Areas and adjacent areas within a buffer zone of 3.1 mi. (5 km). Bird species data were collected from the best available resources to identify potential for presence within the Onshore Study Areas and adjacent areas for comparison with available habitat. Species known to swim in water were characterized as “aquatic,” those most likely to associate with the shoreline were characterized as “coastal,” and those commonly found on higher ground were categorized as “upland.” For the purposes of the onshore portion of this assessment, the proposed onshore components within the Onshore Study Areas are assessed collectively since the exact locations of these components within the Onshore Study Areas are not yet confirmed. It is anticipated that assessing the proposed activities (including construction, operations, and decommissioning within the onshore portions of the Project area and adjacent areas) will provide a conservative analysis, as the assessed area will be greater than the actual Project area footprint.

P.3.1.2 Data Sources

Several primary data sources were used to identify the potential presence of bird species, use, and suitable habitats associated with the onshore infrastructure components. Other sources were used as secondary sources according to their relevance to the Project and based on the level of detail and quality of available data sets. Primary and secondary data sources are subject to limitations or biases

associated with their respective data collection methodology. The primary and secondary data sources used to evaluate the Onshore Study Areas are detailed in **Sections P.3.1.2.1 – P.3.1.2.4** below.

P.3.1.2.1 Agency Consultation Information

Information regarding federal protected species (ESA threatened, endangered, proposed, candidate, bald and golden eagle, and migratory birds) potentially present with the Project area was requested from the USFWS' IPaC online tool as recommended by the "*Guidelines for Providing Avian Survey Information for Renewable Energy Development on the Outer Continental Shelf Pursuant to 30 CFA Part 585*" (BOEM, 2020). IPaC reports identify potential occurrences of ESA-listed species, designated critical habitat (if present), bald and golden eagles, and migratory birds including identification of those listed as Birds of Conservation Concern (BCC). Bird species were identified by using a shapefile for the Onshore Study Areas to perform a query of the IPaC database. IPaC reports are included in **Attachment P-2** and birds identified in the Onshore Study Areas and their designated status are listed in **Table 3.1-1**.

Information regarding bird species listed by New York state as endangered, threatened, special concern was obtained from the New York Department of Environmental Conservation (NYSDEC) – Natural Heritage Program (NHP) website and by an environmental review request submitted on November 8, 2021. Information on listed bird species in Connecticut was obtained from a preliminary CTDEEP Natural Diversity Data Base (NDDB) request. The responses to the environmental review requests are included in **Attachment P-2** and birds identified in **Table 3.1-1**.

Other state resources consulted included the New York State Wildlife Action Plan (NYSWAP) layers for ecoregion designations within New York and listings of High Priority Species of Greatest Conservation Need (SGCN) within the ecoregion where onshore infrastructure will be located. SGCN species are designated based on species assessments drafted by the NYSDEC Division of Fish, Wildlife, and Marine Resources and evaluated by use of a model developed by biodiversity experts from the New York Cooperative Fish and Wildlife Research Unit at Cornell University, NYSDEC staff, and other conservation partners (NYSDEC 2015). High Priority SGCN are those species of known status needing conservation action in the next ten years due to population decline, identified threats, in need of management intervention, or likely to reach critical population levels in New York (NYSDEC 2015). Other Connecticut state resources consulted included the Connecticut Wildlife Action Plan (CTDEEP 2015) and the Connecticut Coastal and Estuarine Land Conservation Program Plan (CTDEEP 2015).

P.3.1.2.2 Breeding Bird Atlas

A Breeding Bird Atlas is an inventory of breeding birds throughout the state. The most recent New York State Breeding Bird Atlas (BBA) with complete data sets is the 2nd BBA for years 2000 - 2005 (McGowan, K. J., and K. Corwin, 2008). Data are collected in the field within small blocks (approximately 9 miles^2) by volunteers who record the birds detected and document evidence of breeding. Quality control checks are underway for the most recent unpublished Connecticut BBA (Connecticut Bird Atlas, 2022), therefore only species with "confirmed" breeding status are presented for the BW2 assessment. Data for all other published BBA records include possible, probable, and confirmed breeding evidence (e.g., the New York State BBA 2000 and the Atlas of Breeding Birds of Connecticut 1994). BBA data provide important information regarding the distributional, long-term status, and changes to bird species breeding in the State including threatened and endangered status species.

The BBA grids intersecting the Queens, New York Onshore Study Area (5851B and 5851D) were obtained from the BBA online database for past BBA results (New York State Breeding Bird Atlas, 2000). The BBA block encompassing the Waterford, Connecticut Onshore Study Area (101D) was extracted from the U.S. Geological Survey Patuxent Wildlife Research Center, Breeding Bird Atlas Explorer (The Atlas of Breeding Birds of Connecticut, 1994). BBA blocks are approximately 9 mi^2 (24 km^2), which comprises up to approximately 3.5 mi (5.5 km) from the onshore facility in Queens, New York, and 2.5 mi (3.5 km) from the proposed onshore facility in Waterford, Connecticut. The grids are shown on **Figure P.3-1** and the species recorded in these grids are listed in **Table P.3-1**. It should be noted that the birds listed in grid 5851D are representative of the industrialized conditions existing within the Queens, New York Onshore Study Area whereas the birds listed in grid 5851B are more closely aligned with documented bird congregation areas outside of the Queens, New York Onshore Study Area but within the area that includes the North Brother and South Brother Islands.

P.3.1.2.3 Bird Conservation Regions

The Onshore Study Areas are located within the New England Mid-Atlantic Coast Bird Conservation Region (BCR) 30 (**Figure P.3-1**). BCR 30 has the densest human population of any region in the country (Bird Studies Canada and NABCI, 2014) but also areas of coastal wetland and beach habitat important to high priority birds, critical migration sites for shorebirds, tern and gull nesting areas, and embayments important for wintering and migrating waterfowl. Almost the entire Endangered Northeast population of the endangered roseate tern nests on three islands in southern New England: Bird and Ram Islands in Buzzards Bay, Massachusetts, and Great Gull Island, off the North Fork of Long Island, New York (Figure **P.2-9** and **Table P.3-1**, Bird Studies Canada and NABCI 2014).

P.3.1.2.4 Audubon Important Bird Areas

The Audubon Important Bird Areas (IBAs) are part of a global network of sites (Important Bird and Biodiversity Areas) identified by conservation partners (BirdLife International) as significant for the global persistence of biodiversity and the conservation of the world's birds and other species (BirdLife International 2014). Site selection is based on locally collected, ground-truthed data for areas meeting criteria that include the presence of species of global conservation concern, assemblages of restricted range and/or biome species, and congregations of multiple species. IBAs are not a regulatory mechanism; however, inventory data from IBAs provides information that can be used for conservation efforts, establishing protected areas, monitoring the status of species, and establishing the potential for presence of bird species. Review of IBA locations was conducted to identify those relevant to the Project due to proximity. The location of IBAs relative to the Onshore Study Areas are shown on **Figure P.3-1**.

P.3.1.2.5 eBird

Data on possible bird species present was compiled from eBird citizen science data (Sullivan et al. 2009) within an approximately 1.2 nm^2 (4 km^2) polygon around the potential onshore sites (up to approximately 1 mi [4 km] from the onshore facility) and was temporally constrained to 10 years (2012-2021). The coordinates of these polygon vertices were:

- Queens, New York: -73.90381, 40.77464; -73.88906, 40.78712; -73.90593, 40.8007; -73.92054, 40.7867, and -73.90381, 40.77464.
- Waterford, Connecticut: -72.17805, 41.30332; -72.15951, 41.30332; -72.15951, 41.32263; -72.17805, 41.32263; and -72.17805, 41.30332.

The eBird Observational Dataset (eBird 2021) was accessed from the Global Biodiversity Information Facility (GBIF.org). Data on the 75% quartile are reported for each of these sites, which corresponded to 3 or more observations.

TABLE P.3-1. ONSHORE BIRD SPECIES AND STATUS

Common Name	Scientific Name	IPaC Report a/	NY Status (Listed and/or Conservation Need) b/	NY Breeding Bird Atlas c/	Habitat	CT Status (Listed, New London County) d/	CT Bird Atlas e/
ESA-Listed Species							
Roseate tern	*Sterna dougallii*	x	E/SGCN HP	-	Coastal	E	x
Piping plover	*Charadrius melodus*	x	E/SGCN HP	-	Coastal	T	x
Red knot	*Calidris canutus rufa*	x	T/SGCN HP	-	Coastal	-	-
Species (Not ESA-Listed)							
Acadian flycatcher	*Empidonax virescens*	-	-	-	Upland	-	x
Alder flycatcher	*Empidonax alnorum*	-	-	-	Upland	SC	-
American bittern	*Botaurus lentiginosus*	-	-	-	Coastal	E	-
American black duck	*Anas rubripes*	-	-	-	Aquatic	-	x
American crow	*Corvus brachyrhynchos*	-	-	x	Upland	-	x
American goldfinch	*Spinus tristis*	-	-	-	Upland	-	x
American kestrel	*Falco sparverius*	-	-	-	Upland	-	x
American oystercatcher	*Haematopus palliatus*	x	SGCN	-	Coastal	T	x
American redstart	*Setophaga ruticilla*	-	-	-	Upland	-	x
American robin	*Turdus migratorius*	-	-	x	Upland	-	x
American woodcock	*Scolopax minor*	-	-	-	Upland	-	x
Bald eagle	*Haliaeetus leucocephalus*	x	T/SGCN	-	Upland	T	-
Baltimore oriole	*Icterus galbula*	-	-	x	Upland	-	x
Barn owl	*Tyto Alba*	-	SGCN HP	-	Upland	E	-
Barn swallow	*Hirundo rustica*	-	-	x	Upland	-	x
Barred owl	*Strix varia*	-	-	-	Upland	-	x
Belted kingfisher	*Megaceryle alcyon*	-	-	-	Upland	-	x
Black-billed cuckoo	*Coccyzus erythropthalmus*	x	SGCN	-	Upland	-	x
Black-capped chickadee	*Poecile atricapillus*	-	-	-	Upland	-	x

Common Name	Scientific Name	IPaC Report a/	NY Status (Listed and/or Conservation Need) b/	NY Breeding Bird Atlas c/	Habitat	CT Status (Listed, New London County) d/	CT Bird Atlas e/
Black-crowned night-heron	*Nycticorax*	-	-	x	Coastal	-	x
Black scoter	*Melanitta nigra*	x	SGCN	-	Aquatic	-	-
Black skimmer	*Rynchops niger*	x	SC/SGCN HP	-	Coastal	-	-
Blue-gray gnatcatcher	*Polioptila caerulea*	-	-	-	Upland	-	x
Blue-winged warbler	*Vermivora cyanoptera*	x	-	-	Upland	-	x
Blue jay	*Cyanocitta cristata*	-	-	-	Upland	-	x
Bobolink	*Dolichonyx oryzivorus*	x	SGCN HP	-	Upland	SC	-
Bonaparte's gull	*Chroicocephalus philadelphia*	x	SGCN	-	Coastal	-	-
Brown-headed cowbird	*Molothrus ater*	-	-	x	Upland	-	x
Brown thrasher	*Toxostoma rufum*	-	-	-	Upland	SC	x
Buff-breasted sandpiper	*Calidris subruficollis*	x	-	-	Upland	-	-
Canada goose	*Branta canadensis*	-	-	x	Aquatic	-	(x)
Canada warbler	*Cardellina canadensi*	x	SGCN HP	-	Upland	-	-
Carolina wren	*Thryothorus ludovicianus*	-	-	-	Upland	-	x
Cattle egret	*Bubulcus ibis*	-	SGCN HP	-	Coastal	-	-
Cedar waxwing	*Bombycilla cedrorum*	-	-	-	Upland	-	x
Cerulean warbler	*Setophaga cerulea*	x	-	-	Upland	SC	-
Chimney swift	*Chaetura pelagica*	-	-	-	Upland	-	x
Chipping sparrow	*Spizella passerina*	-	-	-	Upland	-	x
Clapper rail	*Rallus crepitans*	x	-	-	Coastal	-	-
Common gallinule	*Gallinula galeata*	-	-	-	Coastal	E	-
Common grackle	*Quiscalus quiscula*	-	-	x	Upland	-	x
Common loon	*Gavia immer*	x	SC/SGCN	-	Aquatic	SC	-
Common tern	*Sterna hirundo*	x	SGCN	-	Coastal	SC	x
Common yellowthroat	*Geothlypis trichas*	-	-	-	Upland	-	x
Double-crested cormorant	*Phalacrocorax auritus*	x	-	x	Aquatic	-	x

Common Name	Scientific Name	IPaC Report a/	NY Status (Listed and/or Conservation Need) b/	NY Breeding Bird Atlas c/	Habitat	CT Status (Listed, New London County) d/	CT Bird Atlas e/
Downy woodpecker	*Picoides pubescens*	-	-	x	Upland	-	x
Dunlin	*Calidris alpina arcticola*	x	-	-	Coastal	-	-
Eastern kingbird	*Tyrannus*	-	-	x	Upland	-	x
Eastern meadowlark	*Sturnella magna*	-	-	-	Upland	T	x
Eastern towhee	*Pipilo erythrophthalmus*	-	-	-	Upland	-	x
Eastern whip-poor-will	*Antrostomus vociferus*	x	-	-	Upland	-	-
Eastern wood-pewee	*Contopus virens*	-	-	-	Upland	-	x
European starling	*Sturnus vulgaris*	-	-	x	Upland	-	x
Evening grosbeak	*Coccothraustes vespertinus*	x	-	-	Upland	-	-
Field sparrow	*Spizella pusilla*	-	-	-	Upland	-	x
Fish crow	*Corvus ossifragus*	-	-	-	Coastal	-	x
Glossy ibis	*Plegadis falcinellus*	-	SGCN	x	Coastal	SC	x
Golden-winged warbler	*Vermivora chrysoptera*	x	-	-	Upland	-	-
Golden eagle	*Aquila chrysaetos*	x	E/SGCN	-	Upland	-	-
Grasshopper sparrow	*Ammodramus savannarum*	-	-	-	Upland	E	-
Gray catbird	*Dumetella carolinensis*	-	-	x	Upland	-	x
Great black-backed gull	*Larus marinus*	x	-	x	Coastal	-	(x)
Great crested flycatcher	*Myiarchus crinitus*	-	-	-	Upland	-	x
Great egret	*Ardea alba*	-	-	x	Coastal	T	x
Green heron	*Butorides virescens*	-	-	-	Coastal	-	x
Gull-billed tern	*Gelochelidon nilotica*	x	-	-	Coastal	-	-
Hairy woodpecker	*Dryobates villosus*	-	-	-	Upland	-	x
Henslow's sparrow	*Ammodramus henslowii*	-	-	-	Upland	SC*	-
Herring gull	*Larus argentatus*	x	-	x	Coastal	-	(x)
Horned lark	*Eremophila alpestris*	-	-	-	Upland	E	-
House finch	*Carpodacus mexicanus*	-	-	x	Upland	-	x

Common Name	Scientific Name	IPaC Report a/	NY Status (Listed and/or Conservation Need) b/	NY Breeding Bird Atlas c/	Habitat	CT Status (Listed, New London County) d/	CT Bird Atlas e/
House sparrow	*Passer domesticus*	-	-	x	Upland	-	x
House wren	*Troglodytes aedon*	-	-	-	Upland	-	x
Hudsonian godwit	*Limosa haemastica*	x	-	-	Coastal	-	-
Indigo bunting	*Passerina cyanea*	-	-	x	Upland	-	-
Ipswich sparrow	*Passerculus sandwichensis*	-	-	-	Upland	SC	-
Kentucky warbler	*Geothlypis formosa*	x	-	-	Upland	-	-
Killdeer	*Charadrius vociferus*	-	-	x	Upland	-	x
King rail	*Rallus elegans*	-	-	-	Coastal	E	-
Least bittern	*Ixobrychus exilis*	-	-	-	Coastal	T	x
Least tern	*Sternula antillarum*	x	-	-	Coastal	T	-
Lesser yellowlegs	*Tringa flavipes*	x	-	-	Coastal	-	-
Little blue heron	*Egretta caerulea*	-	SGCN	x	Coastal	SC	-
Long-eared owl	*Asio otus*	x	-	-	Upland	E	-
Long-tailed duck	*Clangula hyemalis*	x	SGCN	-	Aquatic	-	-
Mallard	*Anas platyrhynchos*	-	-	x	Aquatic	-	x
Marsh wren	*Cistothorus palustris*	-	-	-	Upland	-	x
Mourning dove	*Zenaida macroura*	-	-	x	Upland	-	x
Mute swan	*Cygnus olor*	-	-	x	Aquatic	-	x
Nelson's sparrow	*Ammodramus nelsoni*	x	-	-	Coastal	-	-
Northern bobwhite	*Colinus virginianus*	-	-	-	Upland	-	x
Northern cardinal	*Cardinalis*	-	-	x	Upland	-	x
Northern flicker	*Colaptes auratus*	-	-	x	Upland	-	x
Northern goshawk	*Accipiter gentilis*	-	-	-	Upland	T	-
Northern harrier	*Circus hudsonius*	-	-	-	Upland	E	-
Northern mockingbird	*Mimus polyglottos*	-	-	x	Upland	-	x
Northern parula	*Setophaga americana*	-	-	-	Upland	SC	-

Common Name	Scientific Name	IPaC Report a/	NY Status (Listed and/or Conservation Need) b/	NY Breeding Bird Atlas c/	Habitat	CT Status (Listed, New London County) d/	CT Bird Atlas e/
Northern rough-winged swallow	*Stelgidopteryx serripennis*	-	-	-	Upland	-	x
Osprey	*Pandion haliaetus*	-	-	-	Coastal	-	x
Ovenbird	*Seiurus aurocapilla*	-	-	-	Upland	-	x
Peregrine falcon	*Falco peregrinus*	-	E/SGCN	x	Upland	T	(x)
Prairie warbler	*Dendroica discolor*	x	SGCN	-	Upland	-	x
Prothonotary warbler	*Protonotaria citrea*	x	-	-	Upland	-	-
Purple martin	*Progne subis*	-	-	-	Upland	SC	x
Purple sandpiper	*Calidris maritima*	x	-	-	Coastal	-	-
Red-bellied woodpecker	*Melanerpes carolinus*	-	-	-	Upland	-	(x)
Red-breasted merganser	*Mergus serrator*	x	-	-	Aquatic	-	-
Red-eyed vireo	*Vireo olivaceus*	-	-	-	Upland	-	x
Red-headed woodpecker	*Melanerpes erythrocephalus*	x	SGCN HP	-	Upland	E	-
Red-shouldered hawk	*Buteo lineatus*	-	-	-	Upland	-	x
Red-throated loon	*Gavia stellata*	x	-	-	Aquatic	-	-
Red-winged blackbird	*Agelaius phoeniceus*	-	-	x	Upland	-	x
Ring-billed gull	*Larus delawarensis*	x	-	-	Coastal	-	-
Ring-necked pheasant	*Phasianus colchicus*	-	-	x	Upland	-	-
Rock pigeon	*Columba livia*	-	-	x	Upland	-	x
Rose-breasted grosbeak	*Pheucticus ludovicianus*	-	-	-	Upland	-	x
Royal tern	*Thalasseus maximus*	x	-	-	Coastal	-	-
Ruddy turnstone	*Arenaria interpres*	x	-	-	Coastal	-	-
Rusty blackbird	*Euphagus carolinus*	x	SGCN HP	-	Upland	-	-
Saltmarsh sharp-tailed sparrow	*Ammodramus caudacutus*	-	-	-	Upland	SC	-
Savannah sparrow	*Passerculus sandwichensis*	-	-	-	Upland	SC	x
Scarlet tanager	*Piranga olivacea*	-	-	-	Upland	-	x

Common Name	Scientific Name	IPaC Report a/	NY Status (Listed and/or Conservation Need) b/	NY Breeding Bird Atlas c/	Habitat	CT Status (Listed, New London County) d/	CT Bird Atlas e/
Seaside sparrow	*Ammodramus maritimus*	x	SC/SGCN HP	-	Coastal	T	-
Sedge wren	*Cistothorus platensis*	-	-	-	Upland	E	-
Semi-palmated sandpiper	*Calidris pusilla*	x	SGCN HP	-	Coastal	-	-
Short-billed dowitcher	*Limnodromus griseus*	x	SGCN HP	-	Coastal	-	-
Short-eared owl	*Asio flammeus*	-	-	-	Upland	T	-
Snowy egret	*Egretta thula*	-	SGCN	x	Coastal	T	x
Snowy owl	*Bubo scandiacus*	x	-	-	Upland	-	-
Song sparrow	*Melospiza melodia*	-	-	x	Upland	-	x
Spotted sandpiper	*Actitis macularius*	-	-	-	Coastal	-	x
Tree swallow	*Tachycineta bicolor*	-	-	-	Upland	-	x
Tufted titmouse	*Baeolophus bicolor*	-	-	x	Upland	-	x
Upland sandpiper	*Bartramia longicauda*	-	-	-	Upland	E	-
Veery	*Catharus fuscescens*	-	-	-	Upland	-	x
Virginia rail	*Rallus limicola*	-	-	-	Coastal	-	x
Whimbrel	*Numenius phaeopus*	x	-	-	Coastal	-	-
Whip-poor-will	*Caprimulgus vociferus*	-	-	-	Upland	SC	-
White-breasted nuthatch	*Sitta carolinensis*	-	-	-	Upland	-	x
White-eyed vireo	*Vireo griseus*	-	-	-	Upland	-	x
Wild turkey	*Meleagris gallopavo*	-	-	-	Upland	-	(x)
Willet	*Tringa semipalmata*	x	-	-	Coastal	-	-
Willow flycatcher	*Empidonax traillii*	-	-	-	Upland	-	x
Wood thrush	*Hylocichla mustelina*	x	SGCN	-	Upland	-	x
Yellow-billed cuckoo	*Coccyzus americanus*	-	-	-	Upland	-	x
Yellow-breasted chat	*Icteria virens*	-	-	-	Upland	E	x
Yellow-crowned night-heron	*Nyctanassa violacea*	-	SGCN	x	Coastal	-	-
Yellow warbler	*Dendroica petechia*	-	-	x	Upland	-	x

Common Name	Scientific Name	IPaC Report a/	NY Status (Listed and/or Conservation Need) b/	NY Breeding Bird Atlas c/	Habitat	CT Status (Listed, New London County) d/	CT Bird Atlas e/

Notes:

ESA – Endangered Species Act

E - Endangered, T - Threatened, SC - Special Concern, SGCN - Species of Greatest Conservation Need, HP - High Priority, * - Believed Extirpated

Sources:

a/ IPaC Report (NY, CT, and submarine cable routes), **Appendix M**

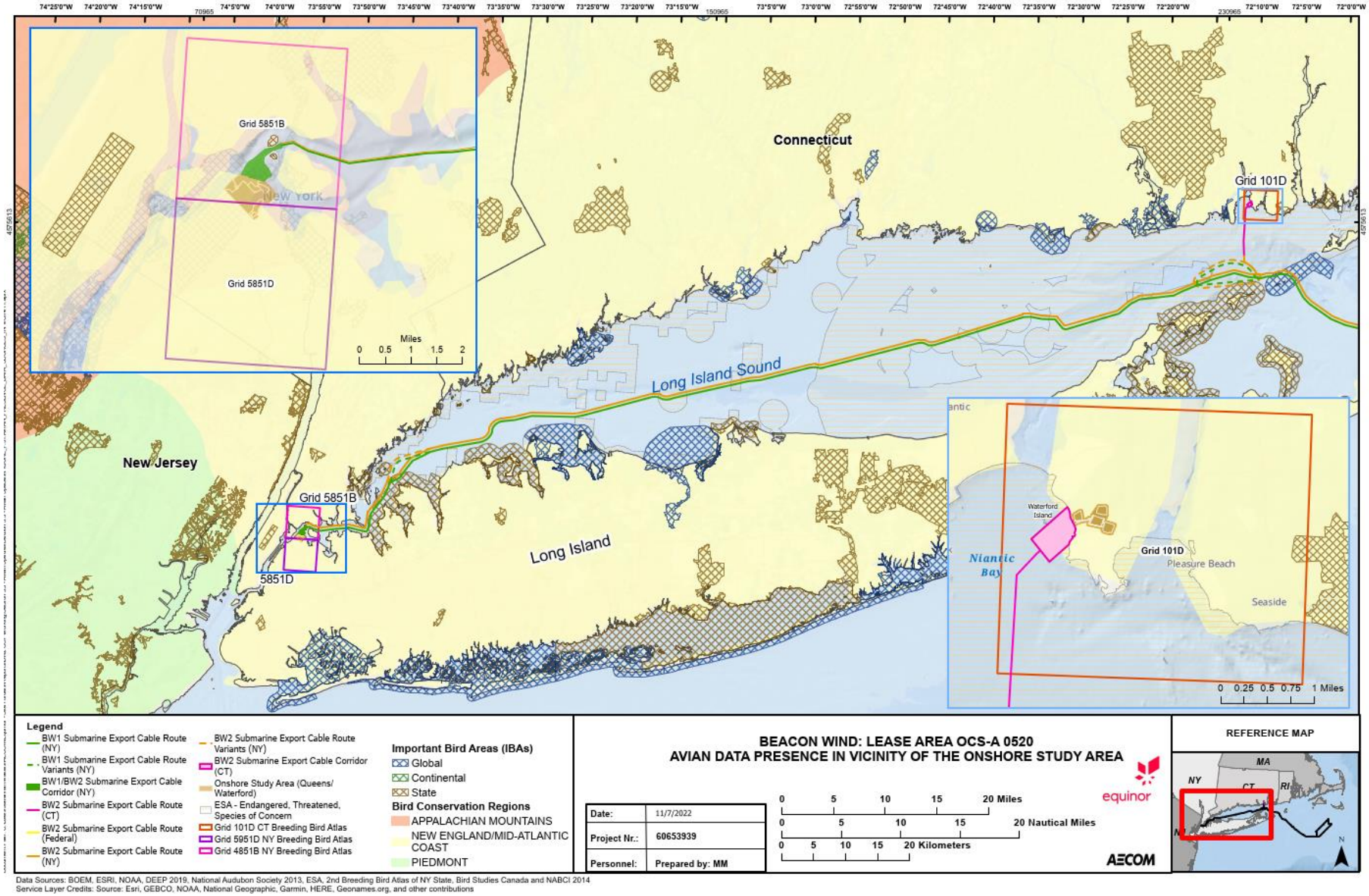
b/ New York State Department of Environmental Conservation (NYSDEC). 2015. New York State Wildlife Action Plan. September 2015.

c/ New York State Breeding Bird Atlas 2000 [Internet]. 2000 - 2005. Release 1.0. Albany (New York): New York State Department of Environmental Conservation. [updated 2007 Jun 11; cited 2021 Oct 18]. Available from: http://www.dec.ny.gov/animals/7312.html.

d/ Connecticut Department of Energy and Environmental Protection (CTDEEP). 2015. Connecticut Wildlife Action Plan. August 2015.

e/ The Atlas of Breeding Birds of Connecticut 1994 [Internet]. 1982-1986. Hartford (Connecticut): CTDEEP. [Accessed 2022 Mar 15]. Available from: U.S. Geological Survey Patuxent Wildlife Research Center, Breeding Bird Atlas Explorer http://www.pwrc.usgs.gov/bba.
(x) - Confirmed breeding in the unpublished Connecticut Bird Atlas 2022. [Internet]. CTDEEP. North Franklin (Connecticut): CTDEEP. [Accessed 2022 Mar 15]. Available from: http://ctbirdatlas.org/lists/breeding/Breeding_101D.html

FIGURE P.3-1. AVIAN PRESENCE DATA SOURCES IN VICINITY OF THE ONSHORE STUDY AREAS



P.3.1.3 Impact Producing Factors

BOEM refers to cause-and-effect relationships between wind energy infrastructure, activities and their potentially affected resources as impact producing factors (BOEM 2019). These are actions or activities that may have effects on sensitive environmental resources either as direct impacts or indirect impacts or some combination thereof. Impact producing factors effects on levels of risk to avian species will vary according to factors such as abundance, seasonal use, flight height, collision risk, sensitivity to disturbance, foraging habits, and other behaviors. Impact producing factors can be identified and categorized by construction, operations, and decommissioning phase and by impact type (direct or indirect). Direct impacts would generally include collision and habitat loss or modification, and indirect impacts would include displacement, barrier effects, attraction, and other secondary effects. Typical impact producing factors include land disturbance, noise, visual disturbance, interaction with structures (collision, displacement, attraction), lighting, effects on prey species, and other actions associated with construction, operations, and decommissioning activities.

The potential impacts to birds from the onshore infrastructure components of the Project were evaluated by identifying onshore Project activities that may be associated with potentially adverse effects to wildlife exposed to such environmental changes. Impact producing factors relevant to the construction, operations, and decommissioning of the onshore infrastructure include land disturbance (permanent and temporary), noise, visual, vibration, and lighting disturbances, and contact with construction equipment.

TABLE P.3-2. POTENTIAL EFFECTS OF ONSHORE ACTIVITIES ON BIRDS BY PROJECT ACTIVITY

Impact Producing Factors	Effect	Project Component	Description	Construction & Decommissioning*	Operations
Land Disturbance	Temporary Habitat Modification	Upland	Temporary habitat disturbance during Project activities	X	—
Land Disturbance	Permanent Habitat Modification	Upland	Permanent disturbance of habitat (loss of habitat)	—	X
Construction Equipment/Activities	Temporary Disturbance (Displacement)	Upland	Noise, vibration, visual disturbance during temporary activities	X	—
Construction Equipment/Activities	Mortality or Injury	Upland	Contact with Equipment	X	—
Construction Activities	Mortality or Injury	Upland	Contact with Spills or Debris	X	—
Operations	Mortality or Injury (Collision/ Electrocution)	Upland	Interaction with Overhead Transmission Lines and Structures	—	X
Operations	Disturbance (Displacement)	Upland	Noise and visual disturbance during operations	—	X

Note:
*Decommissioning effects are likely to be similar or less than the effects of construction activities.

P.3.1.4 Final Risk Assessment

The final step in avian risk assessment of the Onshore Study Areas was to determine, by a weight-of-evidence approach, the level or category of risk to avian species from the identified categories as having potential for direct or indirect effects to birds.

The following categories were used to determine levels of risk:

- Minimal: Development activities primarily located within disturbed areas with little to no permanent habitat modification, low presence of birds, little to no disturbance, and temporary in nature.
- Low: Development activities primarily located in disturbed areas with some permanent habitat modification, low presence of birds, little disturbance, and temporary in nature.
- Medium: Development activities in non-disturbed areas with some permanent habitat modification, likely presence of birds, and disturbances both temporary and/or permanent in nature.
- High: Development activities in non-disturbed areas with permanent habitat modification, multiple disturbances both temporary and/or permanent in nature.

Adjustments to a lower level of risk were made in cases where measures were identified that could provide for the avoidance and minimization of potential impacts to birds. In other cases, adjustments were made to a higher level of risk if necessitated by a particular species or group of species to account for increased presence or increased likelihood of interaction during any of the Project development phases.

P.3.2 Results

P.3.2.1 Habitat

Habitats within the Queens, New York Onshore Study Area are minimal due to the industrialized, developed nature of the surrounding area. The area contains a mosaic of constructed buildings, paved impervious surfaces (concrete pads and parking areas) and grind material surfaces (gravel and bituminous concrete driveways), with mixed soil and vegetation, a few trees, and lawn areas. The onshore infrastructure location is in an ecological zone designated by NYSDEC as coastal lowland (Zone I) known to be experiencing a rapid expansion of urban and suburban development. The closest habitat of note is located approximately 0.5 mi (0.78 km) northeast on two uninhabited islands known as the North Brother/South Brother Islands. The islands are designated as a New York State IBA, as colonial wading birds and other birds (gulls, terns, cormorants) nest there as documented by the New York City Audubon's Harbor Herons Project Surveys (Winston, 2019) as well as during the New York State BBA (New York State Breeding Bird Atlas, 2000).

The Waterford, Connecticut Onshore Study Area is found within the Greater Hammonasset Complex, a 12 mi (19 km) long ecological zone identified in the Connecticut Coastal and Estuarine Land Conservation Program Plan (CTDEEP 2015) for its tidal wetlands. The Dominion Millstone Power Station property is zoned by the Town of Waterford for industrial use, whereas waterfront development and an open space district is designated northwest of the study area, in the vicinity of wetlands between "the Gut" of the Niantic River and the Northeast Corridor railroad line (Connecticut Zoning and Wetlands Maps[2]). The land cover surrounding the proposed Waterford onshore substation facility

[2] https://www.waterfordct.org/planning-development/pages/land-use-regulations-maps

consists of disturbed open space, overhead electric transmission lines, maintained lawn and landscaped areas, forested upland, forested wetland, late succession scrub-shrub/sapling, and stream habitats (**Section 5.1 Terrestrial Vegetation and Wildlife**). The shoreline of the Waterford power complex contains critical beachshore habitat along the Barrier North of Waterford Island, as designated by CTDEEP, and is bordered by late succession scrub-shrub/sapling habitat. A 400 ft (125 m) reef ledge feature is located approximately 1,500 ft (450 m) west of the Waterford shoreline, which historically hosted roseate and common tern nests (Dutcher 1901; Nisbet 1989). The closest Audubon IBA of state priority, Harkness Memorial State Park and Goshen Cove, is located approximately two miles (3.2 km) to the east, in Waterford near its corporate boundary with New London. Pattagansett Marsh is the nearest global IBA, located in East Lyme, Connecticut, 2.5 mi (4 km) to the west of Waterford.

P.3.2.2 Bird Presence (Birds likely to occur in existing habitat)

Data sources collected for the Onshore Study Areas include inventories that encompass the area outside of the Onshore Study Areas, due to the method of data collection (e.g., data collection in grid systems that are larger than the Onshore Study Areas). A variety of bird species are documented in areas nearby Queens, New York, primarily associated with the presence of the uninhabited North Brother/South Brother Islands and the East River. The North Brother/South Brother Islands provide nesting habitat for congregations of colonial nesting birds including yellow-crowned night-heron, snowy egret, cattle egret, little blue heron, and glossy Ibis as well as habitat for use by other species such as gulls and terns (**Table P.3-3**). Some aquatic species such as ducks, geese, and cormorants may use the East River for foraging outside of the Queens, New York Onshore Study Area. The species most likely to be present within the Queens, New York Onshore Study Area are primarily common or introduced species with tolerance or affinity for heavily disturbed areas (**Table P.3-3**). Common species often present on construction sites include mourning dove, American robin, killdeer, and Canada goose. Introduced species, which thrive in urban environments and are not protected under federal or state law, include European starling and house sparrow. Peregrine falcons, which are urban tolerant, have been recorded nesting on Throgs Neck Bridge, Queens, New York and the Gold Star Memorial Bridge, New London, Connecticut as discussed in **Section P.3.2.4** below. It should be noted that the species listed in IPaC (**Attachment P-2**) are based on other factors other than documented presence within the specific area where onshore infrastructure is proposed. These factors include regulatory status (e.g., ESA, BGEPA, listing as BCC) as well as attention warranted by potential susceptibilities in offshore areas from certain types of activities. Additionally, probability of presence of species listed in IPaC reports is based on presence within a 10 km grid cell rather than Project disturbance footprints. Species of Conservation Concern are discussed in **Section P.3.2.4** below.

TABLE P.3-3. LIST OF BIRD SPECIES IDENTIFIED IN THE EBIRD DATABASE (75% QUARTILE) UP TO APPROXIMATELY 1 MI [4 KM] FROM EACH POTENTIAL ONSHORE SUBSTATION FACILITY, 2012-2021.

Common Name	Scientific Name	eBird Count NY a/	eBird Count CT b/
American black duck	*Anas rubripes*	7	27
American coot	*Fulica Americana*	12	-
American crow	*Corvus brachyrhynchos*	13	36
American goldfinch	*Spinus tristis*	-	45
American kestrel	*Falco sparverius*	5	12
American oystercatcher	*Haematopus palliatus*	-	3
American pipit	*Anthus rubescens*	-	5
American redstart	*Setophaga ruticilla*	5	1
American robin	*Turdus migratorius*	17	42
American tree sparrow	*Spizelloides arborea*	-	10
American woodcock	*Scolopax minor*	2	9
Bald eagle	*Haliaeetus leucocephalus*	-	34
Baltimore oriole	*Icterus galbula*	-	5
Bank swallow	*Riparia riparia*	-	3
Barn swallow	*Hirundo rustica*	7	31
Belted kingfisher	*Megaceryle alcyon*	3	18
Black-and-white warbler	*Mniotilta varia*	5	-
Black-capped chickadee	*Poecile atricapillus*	7	24
Black-crowned night-heron	*Nycticorax nycticorax*	15	17
Black-throated blue warbler	*Setophaga caerulescens*	3	-
Black vulture	*Coragyps atratus*	-	29
Blackpoll warbler	*Setophaga striata*	2	4
Blue-gray gnatcatcher	*Polioptila caerulea*	1	4
Blue-winged warbler	*Vermivora cyanoptera*	-	4
Blue jay	*Cyanocitta cristata*	18	25
Brant	*Branta bernicla*	2	18
Brown-headed cowbird	*Molothrus ater*	1	7
Brown thrasher	*Toxostoma rufum*	-	3
Bufflehead	*Bucephala albeola*	22	36
Canada goose	*Branta canadensis*	20	37
Carolina wren	*Thryothorus ludovicianus*	-	44
Cedar waxwing	*Bombycilla cedrorum*	-	18
Chimney swift	*Chaetura pelagica*	6	1
Chipping sparrow	*Spizella passerina*	4	20
Common eider	*Somateria mollissima*	-	14
Common goldeneye	*Bucephala clangula*	2	13
Common grackle	*Quiscalus quiscula*	11	14
Common loon	*Gavia immer*	-	56
Common nighthawk	*Chordeiles minor*	-	3
Common raven	*Corvus corax*	13	44

Common Name	Scientific Name	eBird Count NY a/	eBird Count CT b/
Common tern	*Sterna hirundo*	-	17
Common yellowthroat	*Geothlypis trichas*	5	28
Cooper's hawk	*Accipiter cooperii*	7	24
Cark-eyed junco	*Junco hyemalis*	4	10
Downy woodpecker	*Dryobates pubescens*	5	18
Eastern bluebird	*Sialia sialis*	-	5
Eastern phoebe	*Sayornis phoebe*	6	13
Eastern towhee	*Pipilo erythrophthalmus*	2	13
European starling	*Sturnus vulgaris*	28	42
Field sparrow	*Spizella pusilla*	1	20
Fish crow	*Corvus ossifragus*	2	11
Forster's tern	*Sterna forsteri*	-	3
Fox sparrow	*Passerella iliaca*	-	15
Glossy ibis	*Plegadis falcinellus*	-	5
Gray catbird	*Dumetella carolinensis*	9	57
Great black-backed gull	*Larus marinus*	4	67
Great blue heron	*Ardea herodias*	7	39
Great cormorant	*Phalacrocorax carbo*	3	8
Great egret	*Ardea alba*	3	33
Greater yellowlegs	*Tringa melanoleuca*	-	5
Green heron	*Butorides virescens*	2	17
Hermit thrush	*Catharus guttatus*	3	14
Herring gull	*Larus argentatus*	11	98
Hooded merganser	*Lophodytes cucullatus*	1	17
Horned grebe	*Podiceps auritus*	1	12
Horned lark	*Eremophila alpestris*	-	8
House finch	*Haemorhous mexicanus*	9	36
House sparrow	*Passer domesticus*	51	44
House wren	*Troglodytes aedon*	-	18
Iceland gull	*Larus glaucoides*	-	12
Killdeer	*Charadrius vociferus*	7	17
Laughing gull	*Leucophaeus atricilla*	7	17
Least tern	*Sternula antillarum*	-	5
Lesser black-backed gull	*Larus fuscus*	-	5
Lincoln's sparrow	*Melospiza lincolnii*	-	6
Long-tailed duck	*Clangula hyemalis*	1	6
Mallard	*Anas platyrhynchos*	31	28
Merlin	*Falco columbarius*	1	7
Mourning dove	*Zenaida macroura*	34	21
Mute swan	*Cygnus olor*	-	22
Northern cardinal	*Cardinalis cardinalis*	14	43
Northern flicker	*Colaptes auratus*	9	19
Northern gannet	*Morus bassanus*	-	7
Northern harrier	*Circus hudsonius*	-	4

Common Name	Scientific Name	eBird Count NY a/	eBird Count CT b/
Northern mockingbird	*Mimus polyglottos*	27	46
Northern parula	*Setophaga Americana*	3	1
northern rough-winged swallow	*Stelgidopteryx serripennis*	1	20
Orange-crowned warbler	*Leiothlypis celata*	-	3
Osprey	*Pandion haliaetus*	5	61
Ovenbird	*Seiurus aurocapilla*	6	1
Peregrine falcon	*Falco peregrinus*	4	55
Pine siskin	*Spinus pinus*	-	6
Purple finch	*Haemorhous purpureus*	1	9
Razorbill	*Alca torda*	-	5
Red-bellied woodpecker	*Melanerpes carolinus*	3	17
Red-breasted merganser	*Mergus serrator*	3	39
Red-breasted nuthatch	*Sitta canadensis*	-	4
Red-eyed vireo	*Vireo olivaceus*	-	3
Red-necked grebe	*Podiceps grisegena*	-	3
Red-shouldered hawk	*Buteo lineatus*	-	30
Red-tailed hawk	*Buteo jamaicensis*	12	26
Red-throated loon	*Gavia stellata*	1	9
Red-winged blackbird	*Agelaius phoeniceus*	2	33
Ring-billed gull	*Larus delawarensis*	21	18
Rock pigeon	*Columba livia*	18	21
Roseate tern	*Sterna dougallii*	-	4
Ruby-throated hummingbird	*Archilochus colubris*	-	4
Ruddy duck	*Oxyura jamaicensis*	4	-
Savannah sparrow	*Passerculus sandwichensis*	-	13
Sharp-shinned hawk	*Accipiter striatus*	-	18
Snowy egret	*Egretta thula*	4	12
Song sparrow	*Melospiza melodia*	8	95
Surf scoter	*Melanitta perspicillata*	-	4
Swamp sparrow	*Melospiza georgiana*	-	28
Tennessee warbler	*Leiothlypis peregrina*	-	3
Tree swallow	*Tachycineta bicolor*	2	13
Tufted titmouse	*Baeolophus bicolor*	4	26
Turkey vulture	*Cathartes aura*	-	39
Warbling vireo	*Vireo gilvus*	-	5
White-breasted nuthatch	*Sitta carolinensis*	-	11
White-crowned sparrow	*Zonotrichia leucophrys*	-	9
White-eyed vireo	*Vireo griseus*	-	14
White-throated sparrow	*Zonotrichia albicollis*	12	34
Wild turkey	*Meleagris gallopavo*	-	23
Willow flycatcher	*Empidonax traillii*	-	11
Winter wren	*Troglodytes hiemalis*	-	4
Yellow-bellied sapsucker	*Sphyrapicus varius*	-	6
Yellow-breasted chat	*Icteria virens*	-	5

Common Name	Scientific Name	eBird Count NY a/	eBird Count CT b/
Yellow-crowned night-heron	*Nyctanassa violacea*	17	-
Yellow-rumped warbler	*Setophaga coronata*	5	25
Yellow warbler	*Setophaga petechia*	3	26

Sources:
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b/ eBird. 2021. [Internet]. 2012-2021. eBird: An online database of bird distribution and abundance [web application]. Ithaca (New York): Cornell Lab of Ornithology. [Accessed: March 10, 2021]. Available from: The Global Biodiversity Information Facility (GBIF.org) Occurrence Download https://doi.org/10.15468/dl.y7a2ry.

P.3.2.3 Onshore Project Components (Landfall, Onshore Export Cable, Interconnection Cable, and Substation Facilities)

The proposed onshore infrastructure components will be located within the existing developed area in the Onshore Study Areas. Two locations are being considered for the single landfall location, onshore substation, and POI proposed for BW1; the NYPA and AGRE sites shown on **Figure P.1-7**. The Queens, New York onshore substation facility site that is not used for BW1 will remain under consideration for the single proposed BW2 landfall, in addition to the Waterford, Connecticut landing. The onshore disturbance footprint for BW1 and BW2 will be less than the area assessed for the Onshore Study Areas, which provides a conservative approach.

P.3.2.4 Species of Conservation Concern

The Queens, New York onshore infrastructure location is situated within a highly developed, industrial area within the Queens, New York Onshore Study Area and does not contain habitat suitable to support Species of Conservation Concern. The most likely species of special status to use the area on a transient basis is the peregrine falcon (New York State Endangered), which is documented to nest on Throgs Neck Bridge approximately 6 mi (9 km) to the northeast of the Queens, New York Onshore Study Area (**Appendix M Information for Planning and Conservation (IPaC) Report, and State Listed Species**). Nesting wading bird congregations are also located, as discussed in **Section P.3.2.1**, on the nearby North Brother/South Brother Islands.

Birds listed in a CTDEEP preliminary response on the Waterford, Connecticut Onshore Study Area (**Appendix M**) included the peregrine falcon, piping plover (*Charadrius melodus*) and purple martin (*Progne subis*). A nest site for the peregrine falcon has been documented on the Gold Star Memorial Bridge, New London, Connecticut, which crosses the Thames River approximately 5.5 mi (8.5 km) to the northeast of the Waterford, Connecticut Onshore Study Area. Historically, the piping plover was recorded as a confirmed breeder in the Connecticut BBA Niantic/Waterford block (1982-1986), but in the last 10 years of eBird data (2012-2021) was not recorded up to approximately one mi (1.6 km) from the proposed onshore substation facility. Of the 25 bird species listed as threatened or endangered in New London County, Connecticut (**Table P.3-1**), 10 of them were recorded in eBird data (2012-2021): the American oystercatcher, bald eagle, great egret, horned lark, least tern, Northern harrier, peregrine falcon, roseate tern, snowy egret, and yellow-breasted chat (**Table P.3-3**). The entire eastern population of purple martins nests exclusively in artificial nesting cavities (human-

designed houses or hollow gourds) actively managed by conservation organizations and/or landowners (CTDEEP Fact Sheet). [3]

The IPaC reports for the Onshore Study Areas list the roseate tern, piping plover, and red knot as species that should be considered in effects analysis of the Project. Critical habitat has not been designated for these species in the Onshore Study Areas. Historically, roseate terns nested on Shore Rock offshore Ocean Beach Park, New London, Connecticut (3-4 nests 1977-1984) and on Waterford Island (11 nests 1977, 1 nest 1984), the reef ledge approximately 1,500 ft (450 m) west of the Waterford shoreline (Nisbet 1989). The proposed submarine cable route is located approximately 900 ft (275 m) south of Waterford Island and 500 ft (155 m) north of Black Rock.

P.3.2.5 Potential Impacts

P.3.2.5.1 Construction

For the onshore infrastructure components, construction activities are not expected to create more than minimal to low potential for impacts to birds (**Table P.3-4** and **Table P.3-5**). Land disturbance will be minimal in Queens, New York, due to existing conditions and land use. In Waterford, Connecticut, short-term and permanent impacts may occur during construction of the onshore components, as a consequence of vegetation removal and tree clearing. Such alteration of terrestrial habitat may occur in a small non-developed area (proposed onshore substation facility) that is not expected to provide critical habitat for most species of birds. With respect to the landfall, time of year restrictions and trenchless installation methodologies including HDD are under consideration to avoid disturbance of the inter-tidal zone and critical beachshore habitat along the Barrier North of Waterford Island, as designated by the CTDEEP.

Identification of additional monitoring, avoidance, minimization, management, or protection measures will be determined, as necessary, upon consultation with the applicable agencies (e.g., USFWS, CTDEEP). To the extent practicable, Beacon Wind will limit activities in beach areas during construction of the onshore Project components in Waterford, Connecticut, to avoid sensitive bird habitat (e.g., piping plover nesting or foraging area) during sensitive times of the year (e.g., piping plover breeding season), and/or to minimize risk to tree nesting birds from tree clearing activities in sensitive bird habitat during sensitive times of the year (e.g., breeding season), unless otherwise determined to be acceptable by the applicable agencies.

Other disturbances during construction activities, including noise, vibration, and lighting are temporary activities in an area with low bird presence. As a result of such disturbance, birds are likely to avoid onshore construction equipment and work areas, such that the potential for injury or mortality to birds due to collision or electrocution is limited. Hazards caused by interaction with fluids (spills), debris, and construction equipment have minimal to low potential but will be further avoided and minimized by the implementation of best management practices during construction (e.g., Oil Spill Response Plan).

P.3.2.5.2 Operations and Maintenance

For the onshore infrastructure components, operations and maintenance activities are expected to create few, if any, hazards that would cause potential effects to birds (**Table P.3-4** and **Table P.3-5**). Maintenance activities may cause minor disturbances on an intermittent basis that birds would move away from temporarily. Overhead transmission lines and structures have potential for injury or mortality

[3] https://portal.ct.gov/-/media/DEEP/wildlife/pdf_files/outreach/fact_sheets/purplemartinpdf.pdf

to birds due to collision and electrocution. However, the likelihood is low for such occurrences due to the low presence of birds using or congregating in the area and the short distances of the overhead lines proposed for the Project.

P.3.2.5.3 Decommissioning

Potential impacts from decommissioning are expected to be similar or less than impacts from construction as some components may be retired in place and, therefore, would not result in new temporary disturbances (**Table P.3-4** and **Table P.3-5**). Potential decommissioning impacts are minimal to low due to the developed, disturbed conditions in the proposed onshore infrastructure locations. With the implementation of best management practices during temporary construction activities, risk should be reduced to the level of minimal.

TABLE P.3-4. SUMMARY OF POTENTIAL IMPACTS OF ONSHORE INFRASTRUCTURE TO BIRDS – QUEENS, NEW YORK

Effect	Description	Construction and Decommissioning a/			Operations
		Landfalls	Onshore Cables	Onshore Substations	All Components
Habitat Modification (Temporary)	Land Disturbance	Minimal	Minimal	Minimal	—
Habitat Modification (Permanent)	Land Disturbance	—	—	—	Minimal
Disturbance (Displacement)	Construction & Decommissioning Activities and Operations	Minimal	Minimal	Minimal	Minimal
Mortality/Injury	Construction & Decommissioning Activities and Operations	Minimal to Low	Minimal to Low	Minimal to Low	Minimal to Low

Note:
a/ Decommissioning effects are likely to be similar or less than the effects of construction activities.

TABLE P.3-5. SUMMARY OF POTENTIAL IMPACTS OF ONSHORE INFRASTRUCTURE TO BIRDS – WATERFORD, CONNECTICUT

Effect	Description	Construction and Decommissioning a/			Operations
		Landfall	Onshore Cables	Onshore Substation	All Components
Habitat Modification (Temporary)	Land Disturbance	Low	Low	Low	Low
Habitat Modification (Permanent)	Land Disturbance	Low	Minimal	Low	Minimal to Low
Disturbance (Displacement)	Construction & Decommissioning Activities and Operations	Low	Low	Low	Low
Mortality/Injury	Construction & Decommissioning Activities and Operations	Minimal to Low	Minimal to Low	Minimal to Low	Minimal to Low

Note:
a/ Decommissioning effects are likely to be similar or less than the effects of construction activities.

P.3.2.6 Mitigation and Monitoring

Risk to birds from the onshore infrastructure components associated with BW1 and BW2 are in the minimal to low category due to the lack of suitable habitat available within the Queens, New York Onshore Study Area, a heavily industrialized area located in an otherwise highly developed area (**Table P.3-4**). Similarly, risk to birds from the onshore infrastructure components associated with the BW2 Waterford, Connecticut Onshore Study Area are in the minimal to low category due to the expected low presence of birds and low exposure of non-disturbed habitat to Project activities within an industrial area located adjacent to an estuarine environment (**Table P.3-5**). Bird presence is low within this area and most construction, operations, and decommissioning activities are of minimal risk to birds. However, minimal to low risks exist for some species or groups of species whose location in adjacent areas and/or whose behavioral tendencies may result in transient use of the area and, therefore, slightly higher chance of exposure to Project activities.

Beacon Wind proposes to minimize risk to birds by locating the onshore infrastructure for BW1 and BW2 within an industrialized, developed area, consideration of the use of trenchless installation methodologies including HDD, jack and bore, or micro-tunnel for transition to landfall, installation of the interconnection cable underground, and where required, minimizing the extent of the overhead transmission line, and conducting temporary construction and decommissioning activities with the implementation of standard best management practices. To the extent practicable, Beacon Wind will limit activities in beach areas during sensitive times of year (e.g., breeding season) to minimize potential effects to beach nesting birds. Furthermore, forested habitat that could represent suitable roosting and/or foraging for various bird species may be cleared; tree clearing is anticipated to be minor, and will be minimized to the extent practicable. Beacon Wind will coordinate with USFWS regarding potential tree clearing timing restrictions to minimize potential effects on sensitive bird habitat during sensitive times of year (e.g., migratory bird breeding season). It is anticipated that the resource agencies will provide additional input on avoidance and minimization measures for the Project as the consultation process with Beacon Wind continues.

P.3.3 As potential impacts are minimal to low, no specific best management practices or monitoring are proposed during the operations phase of BW1 or BW2.Summary and Conclusions

Onshore infrastructure activities will avoid potential impacts to birds due to the industrialized, disturbed conditions where these activities are proposed within the Onshore Study Areas. As suitable habitat for most bird species is limited or not present and bird presence is expected to be low or transient, activities will not alter habitat or displace birds from important or critical nesting, feeding, or sheltering areas. Potential hazards to birds may be further minimized by the use of HDD for transition to shore, if this is the selected solution. In addition, the adoption of minimizingoverhead portions of the transmission line, and the implementation of best management practices during temporary construction activities will further aid in minimized impacts to birds. Population level effects and effects to Species of Conservation Concern, including ESA-listed species, are not expected to occur during construction, operations, and decommissioning activities for BW1 or BW2 onshore infrastructure.

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Attachment P-1

Maps: Assessment of Exposure for Marine Birds in the Lease Area

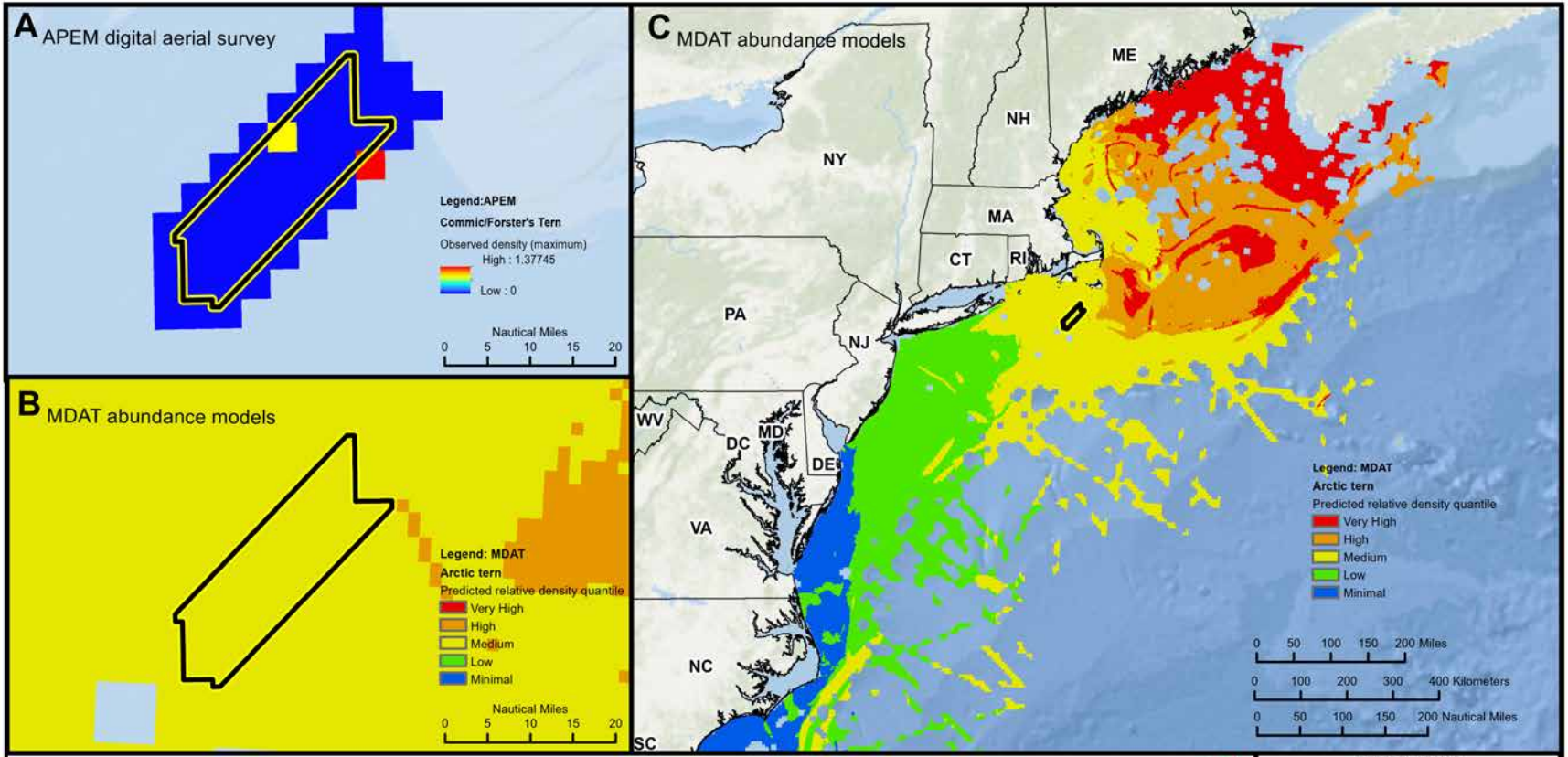
Attachment P-1 presents 140 figures of bird densities derived from the APEM digital aerial surveys and MDAT avian abundance models, by species and season.

Panel A presents the effort-corrected observed densities of birds (total counts per km^2 of survey area, for each 23 km^2 lease block) detected in the APEM digital aerial surveys, which were conducted from December 2019 to November 2020. As a conservative approach, the maximum density per lease block across surveys within a season is presented for each species (see **Section P.2.1** for more details).

Panels B and C present exposure categories derived from the predicted relative density (i.e., individuals per km^2) of 47 avian species occurring in each season throughout the study area (AOCS Florida to Maine). Predicted densities were modeled from boat-based and traditional (i.e., visual) aerial survey data spanning the AOCS from 1978 - 2016 by the Marine-life Data and Analysis Team (MDAT; Winship et al. 2018). Following the removal of unsampled areas (i.e., zero-effort grid cells) to reduce uncertainty), predicted relative densities (1.2 nm^2; 4 km^2 resolution) were classified into exposure categories, using the following quantiles:

- 5: 90 percent < Very High ≤ 100 percent;
- 4: 75 percent < High ≤ 90 percent;
- 3: 50 percent < Medium ≤ 75 percent;
- 2: 25 percent < Low ≤ 50 percent; and
- 1: 0 percent < Minimal ≤ 25 percent.

These categories represent species-specific risk of exposure relative to the full MDAT study area (Atlantic Outer Continental Shelf from Maine to Florida), and correspond directly to the exposure scores derived for this assessment (see **Section P.2.2**).



Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
ARCTIC TERN ABUNDANCE
SUMMER: JUNE - AUGUST

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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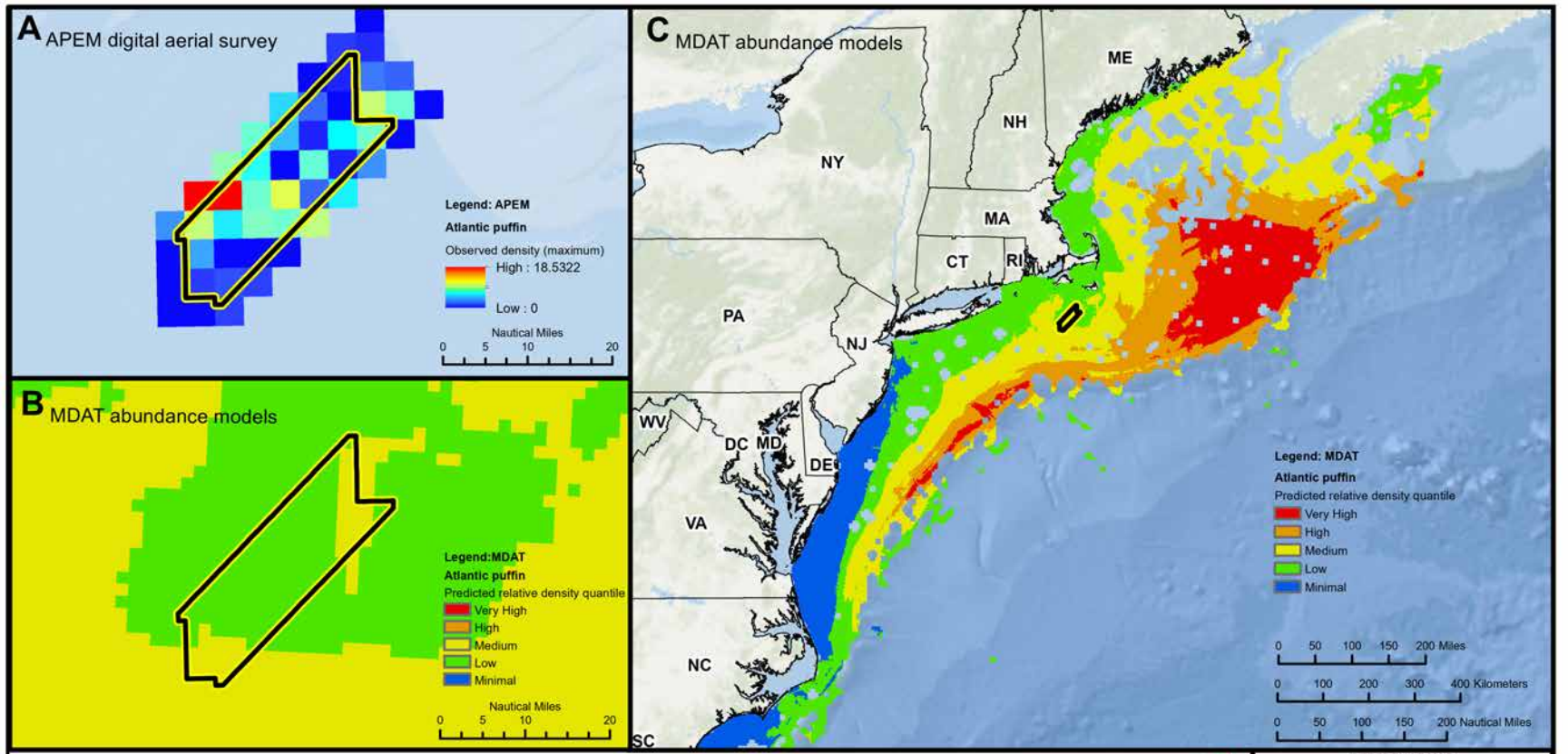

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
ATLANTIC PUFFIN ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP

Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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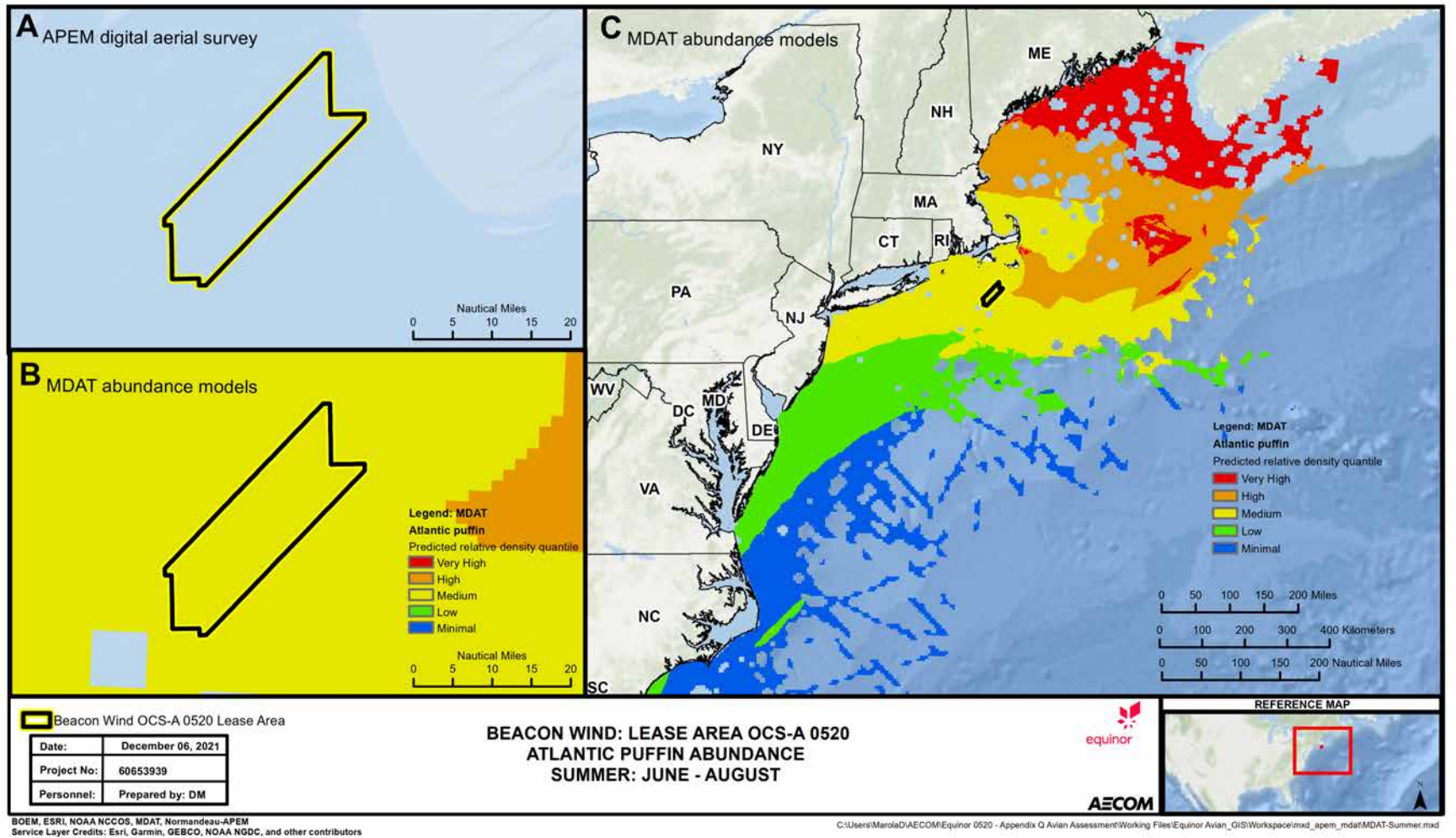
A
APEM digital aerial survey
Nautical Miles
0 5 10 15 20
B
MDAT abundance models
Legend: MDAT
Atlantic puffin
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 15 20
C
MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
MD
DC
DE
VA
NC
SC
Legend: MDAT
Atlantic puffin
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
ATLANTIC PUFFIN ABUNDANCE
SUMMER: JUNE - AUGUST
equinor
AECOM
REFERENCE MAP
BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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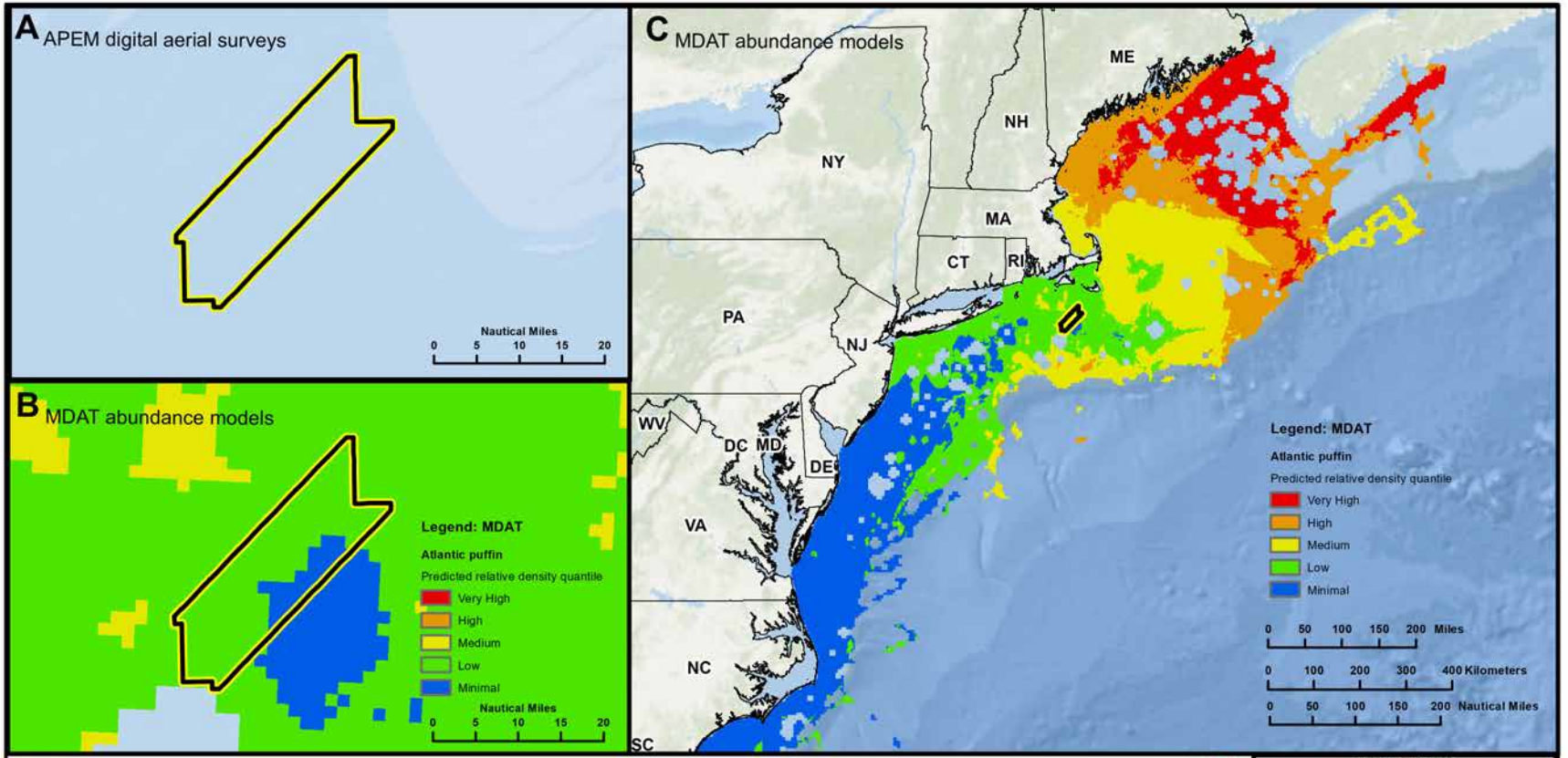

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
ATLANTIC PUFFIN ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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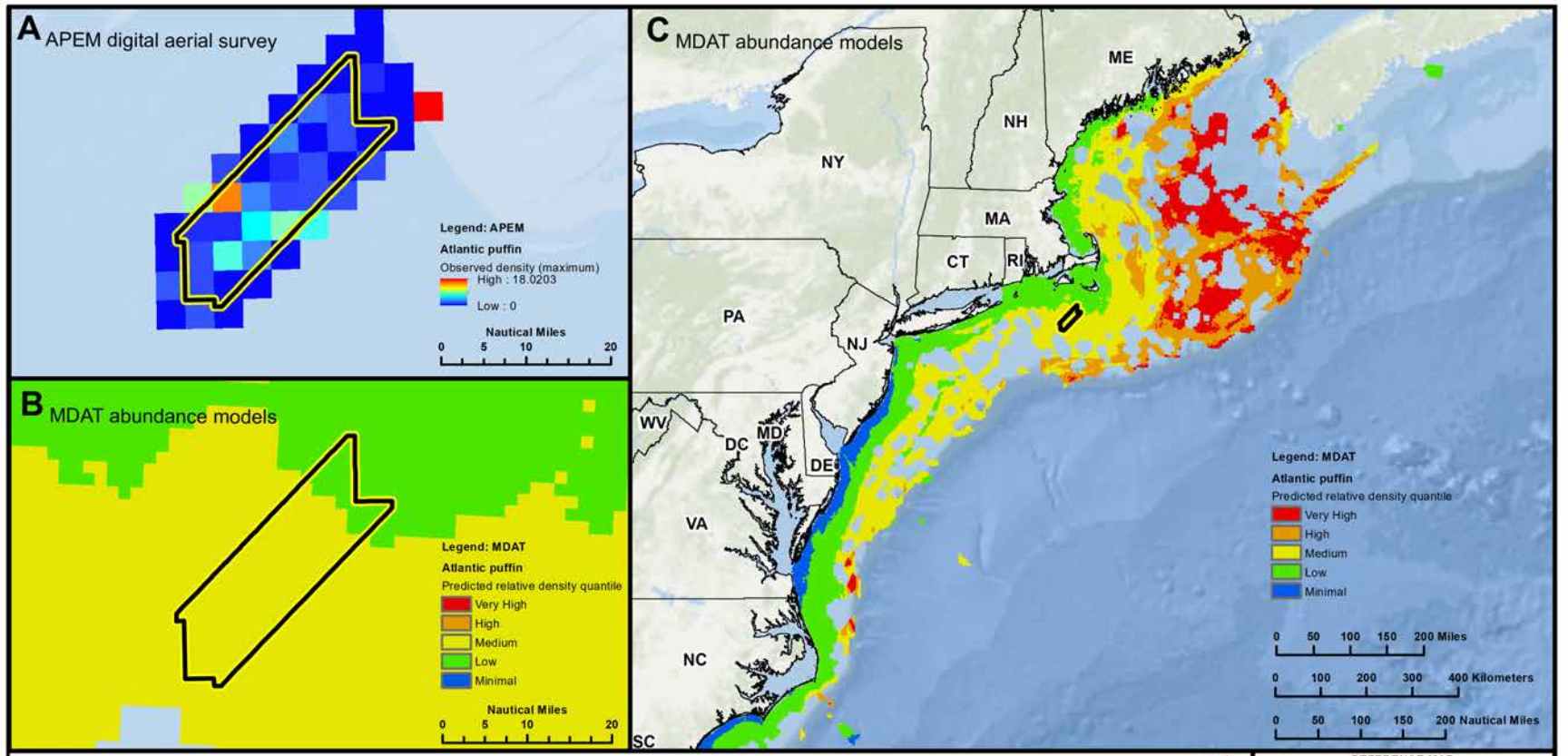


Beacon Wind OCS-A 0520 Lease Area

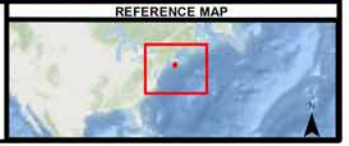
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
ATLANTIC PUFFIN ABUNDANCE
WINTER: DECEMBER - FEBRUARY

equinor

AECOM

REFERENCE MAP



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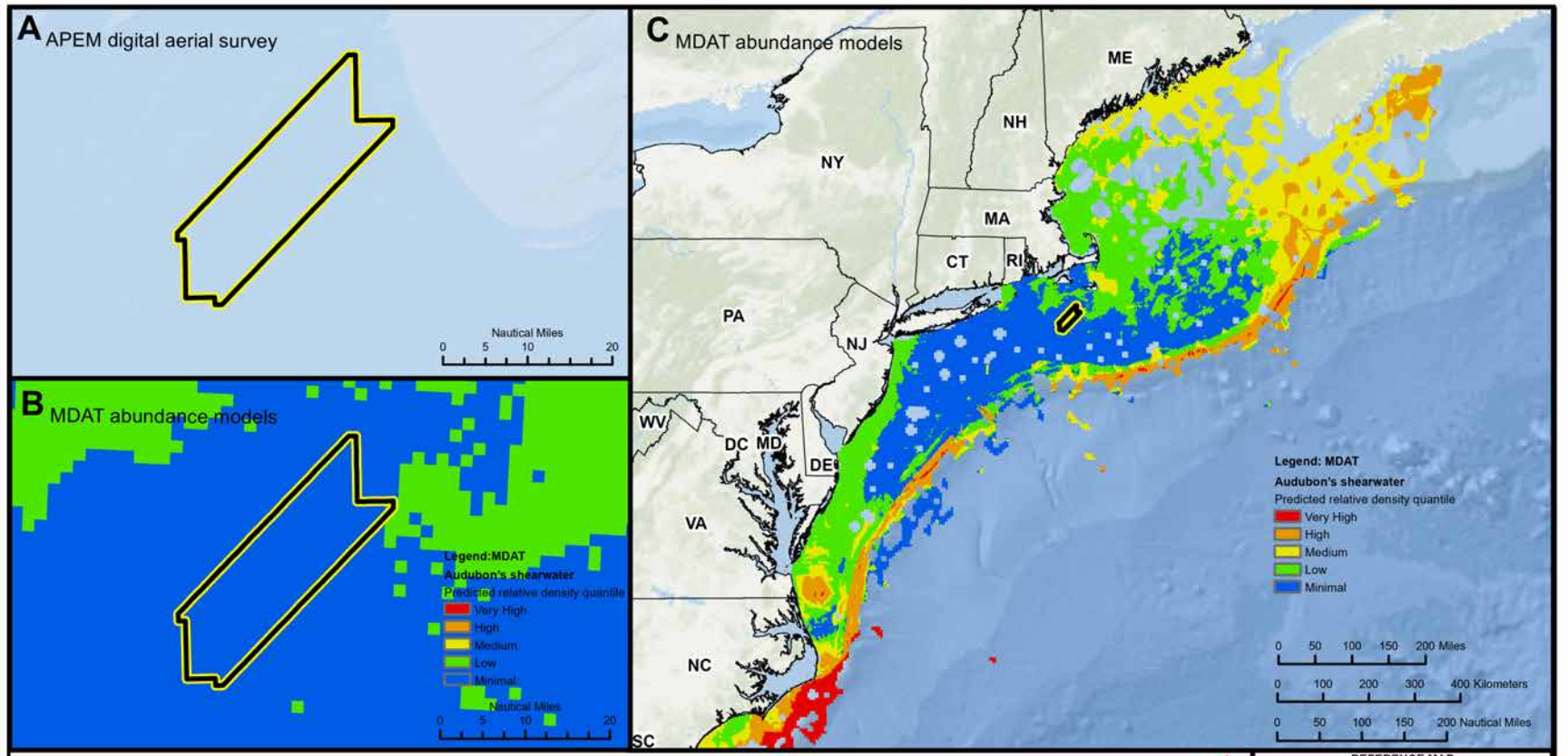


Beacon Wind OCS-A 0520 Lease Area

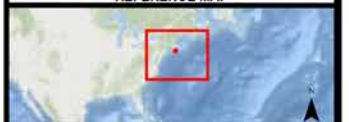
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
AUDUBON'S SHEARWATER ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



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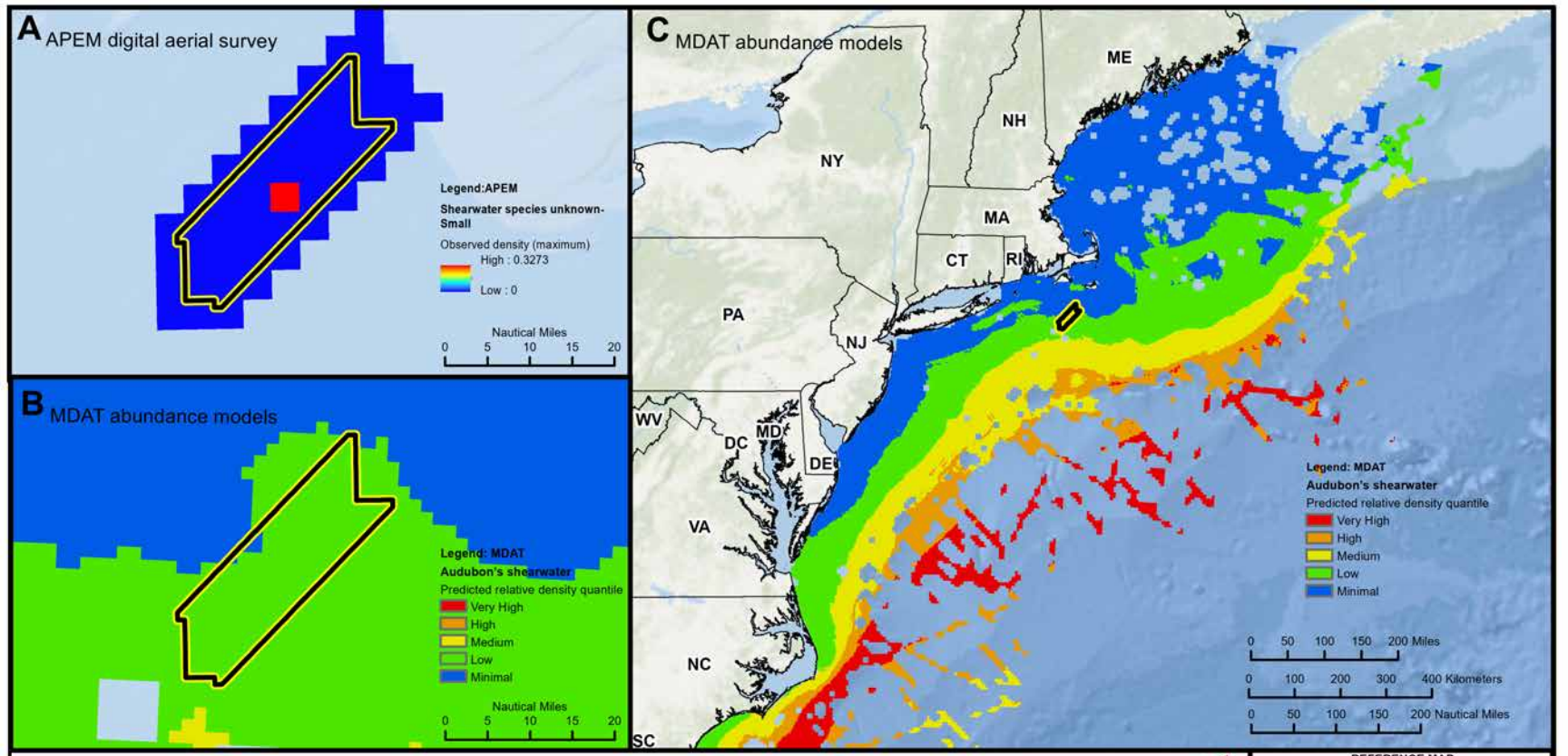

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
AUDUBON'S SHEARWATER ABUNDANCE
SUMMER: JUNE - AUGUST

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REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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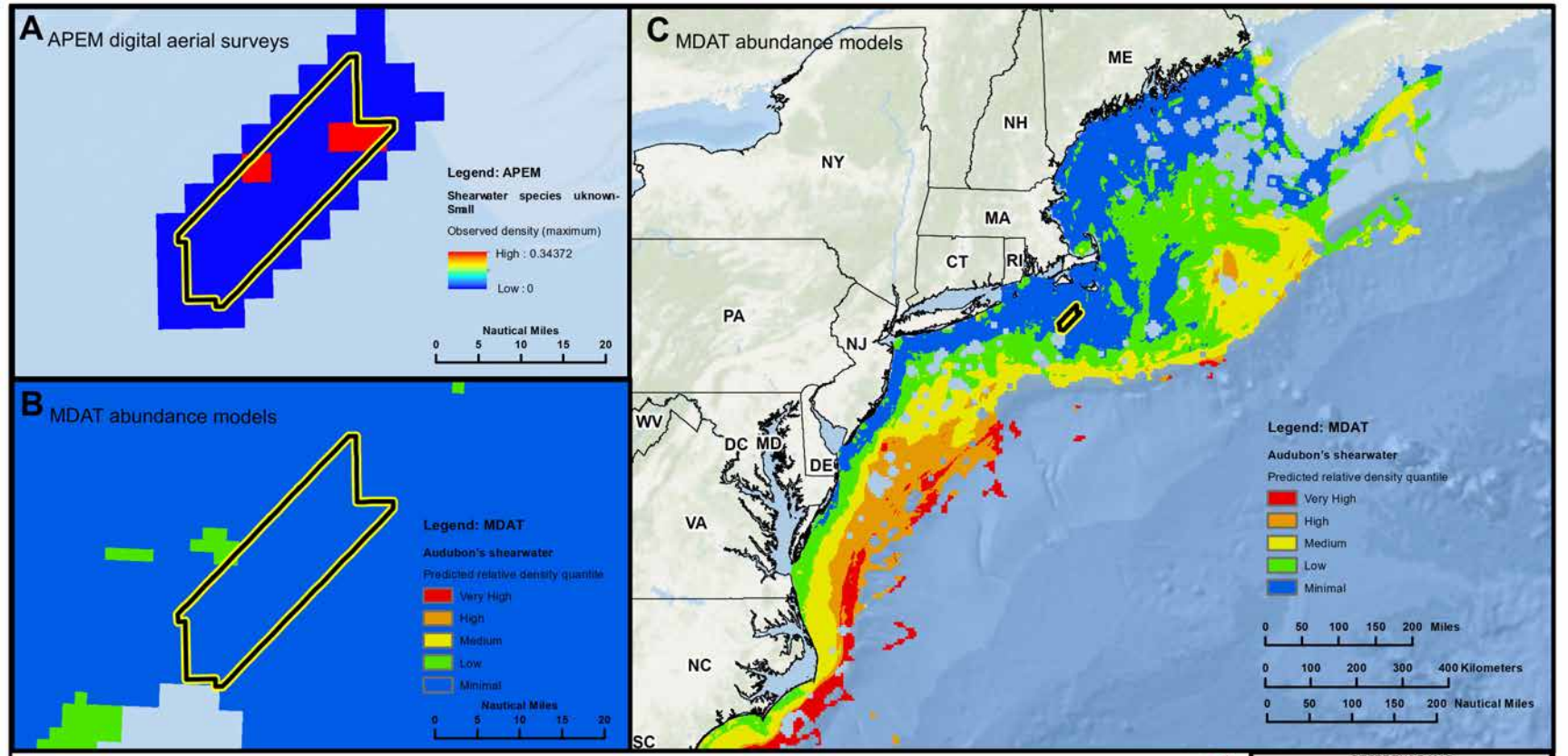


Beacon Wind OCS-A 0520 Lease Area

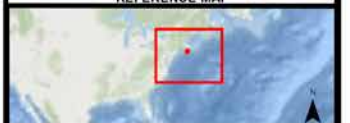
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
AUDUBON'S SHEARWATER ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP



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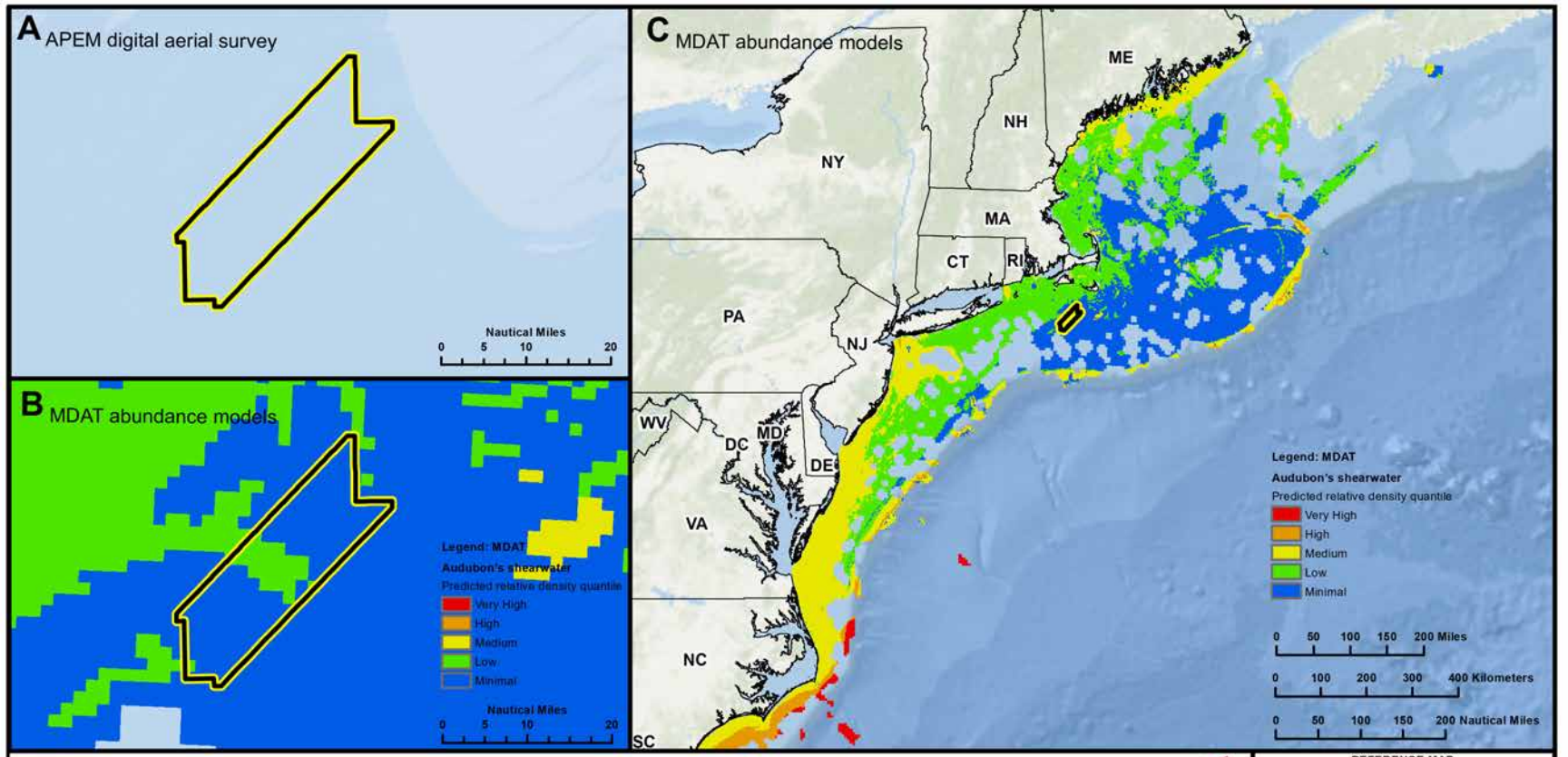

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
AUDUBON'S SHEARWATER ABUNDANCE
WINTER: DECEMBER - FEBRUARY

equinor

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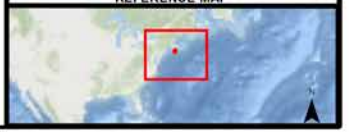
REFERENCE MAP



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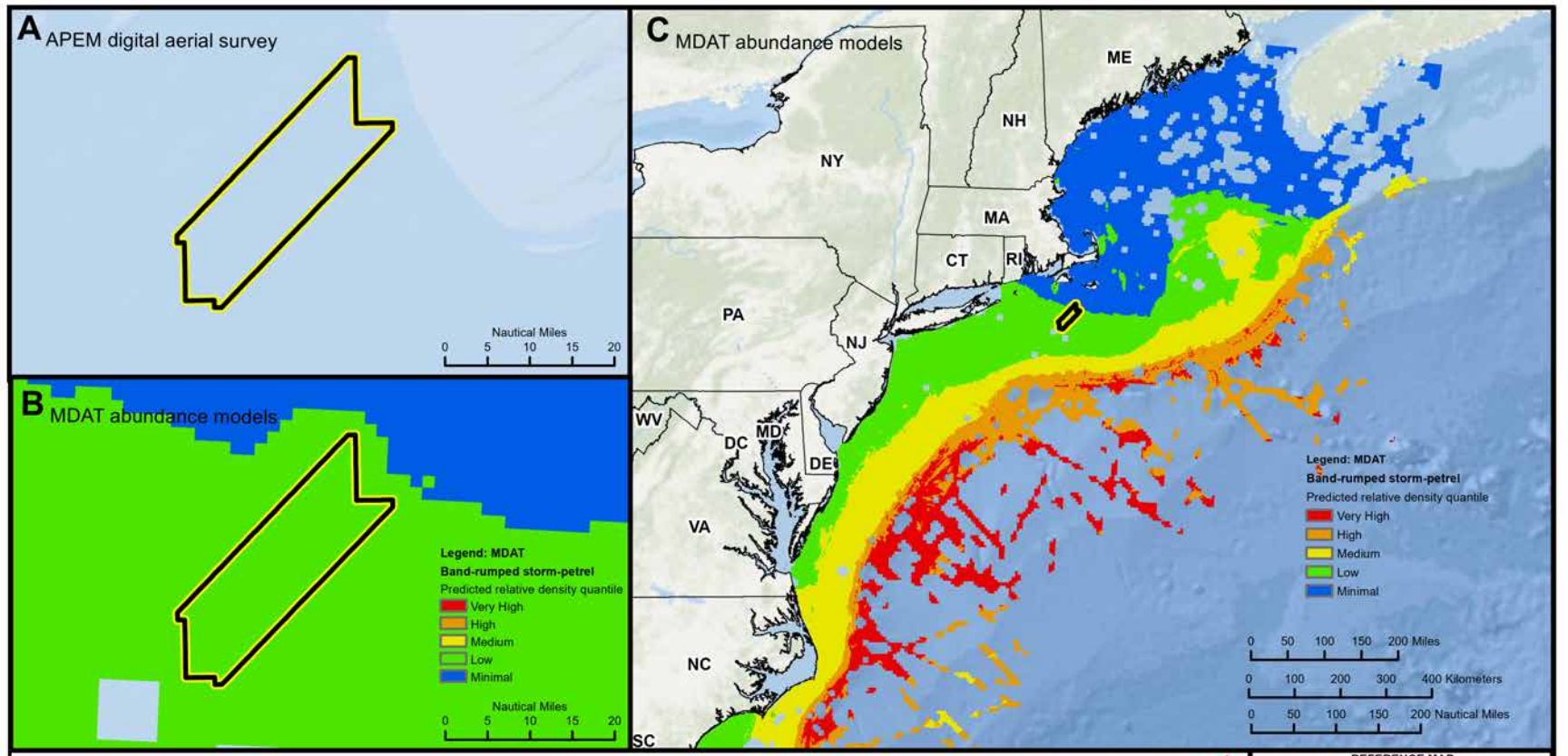

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
BAND-RUMPED STORM-PETREL ABUNDANCE
SUMMER: JUNE - AUGUST

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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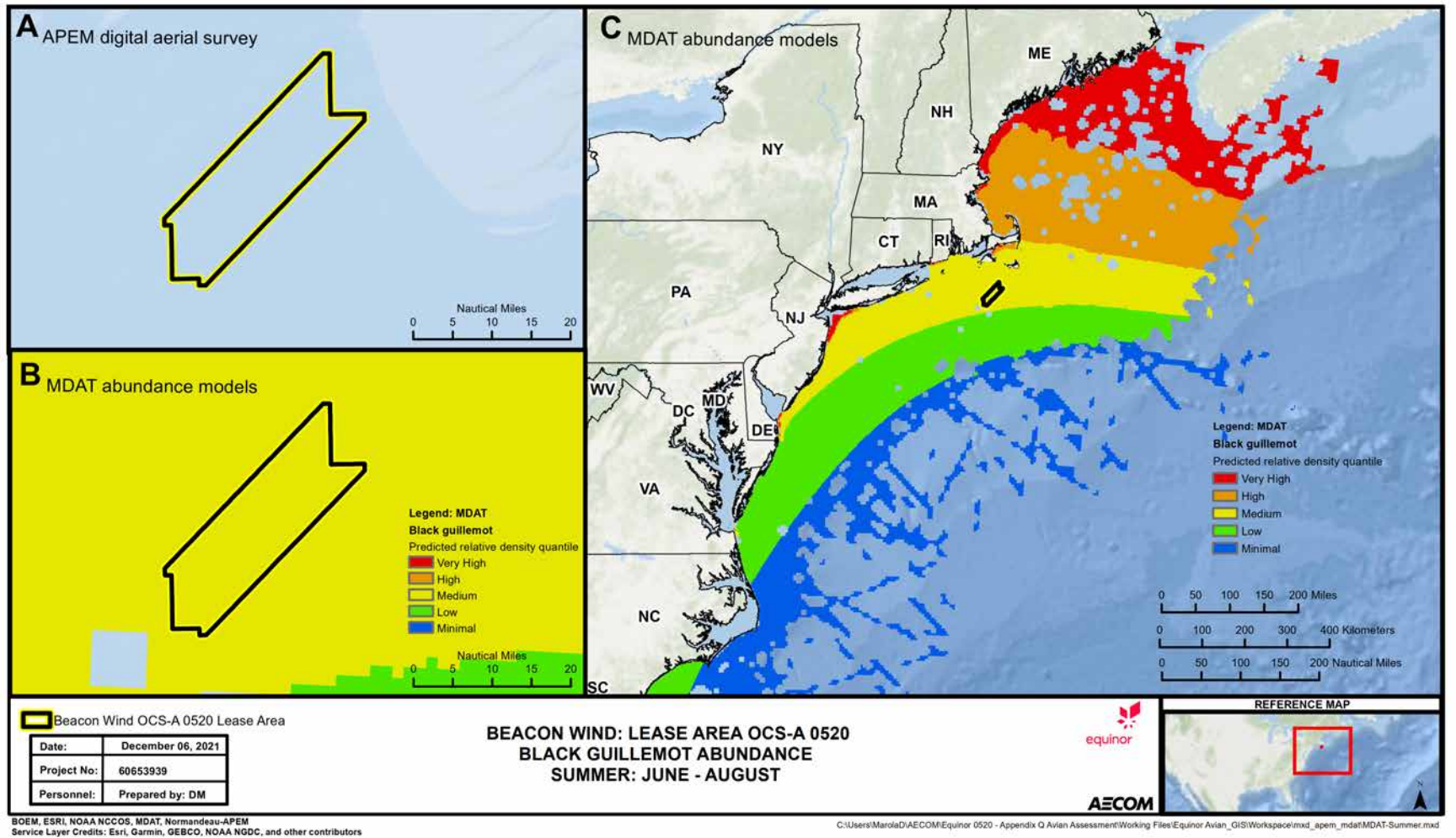
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APEM digital aerial survey
Nautical Miles
0 5 10 15 20
B
MDAT abundance models
Legend: MDAT
Black guillemot
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 15 20
C
MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
MD
DC
DE
VA
NC
SC
Legend: MDAT
Black guillemot
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
BLACK GUILLEMOT ABUNDANCE
SUMMER: JUNE - AUGUST
equinor
AECOM
REFERENCE MAP
BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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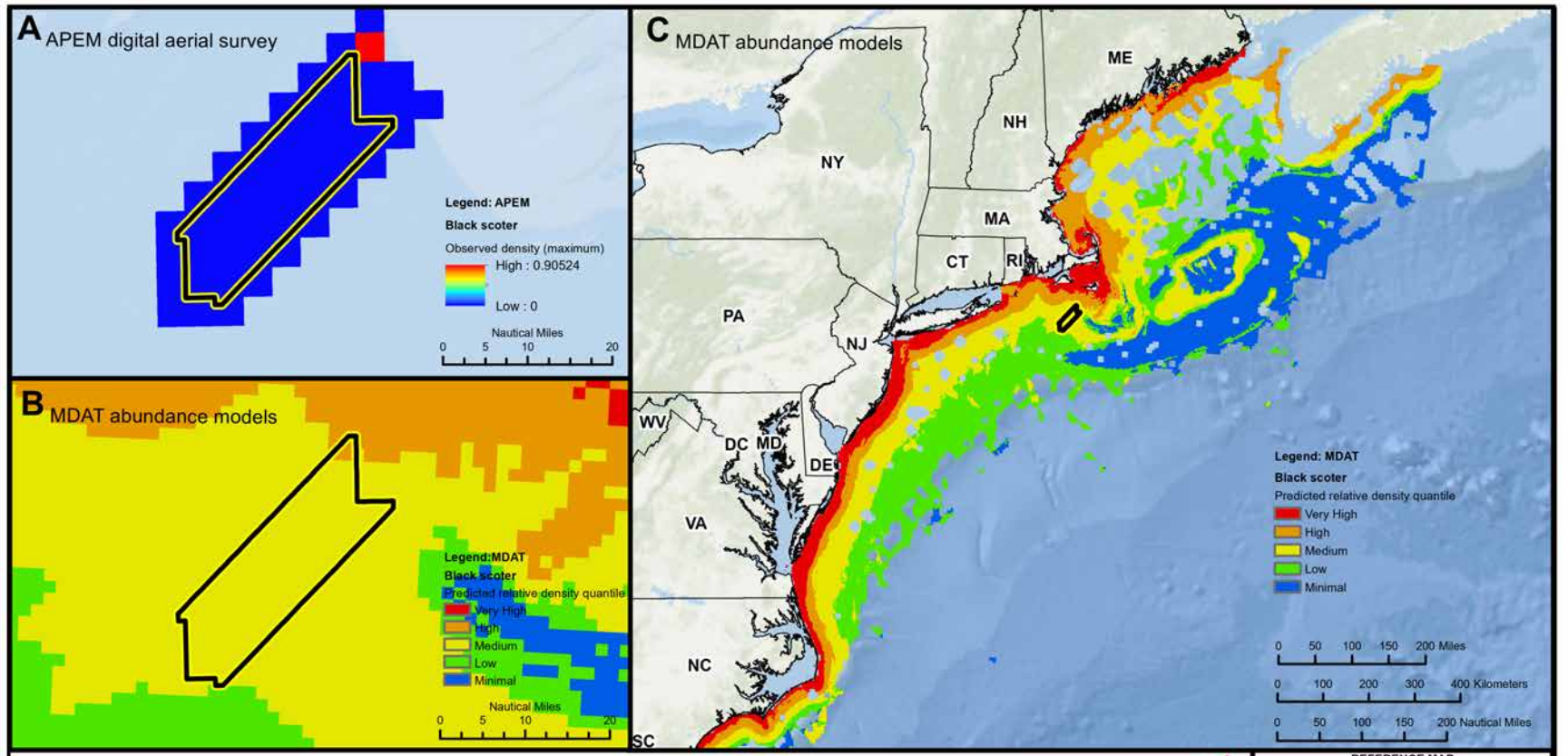


Beacon Wind OCS-A 0520 Lease Area

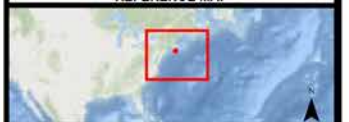
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
BLACK SCOTER ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



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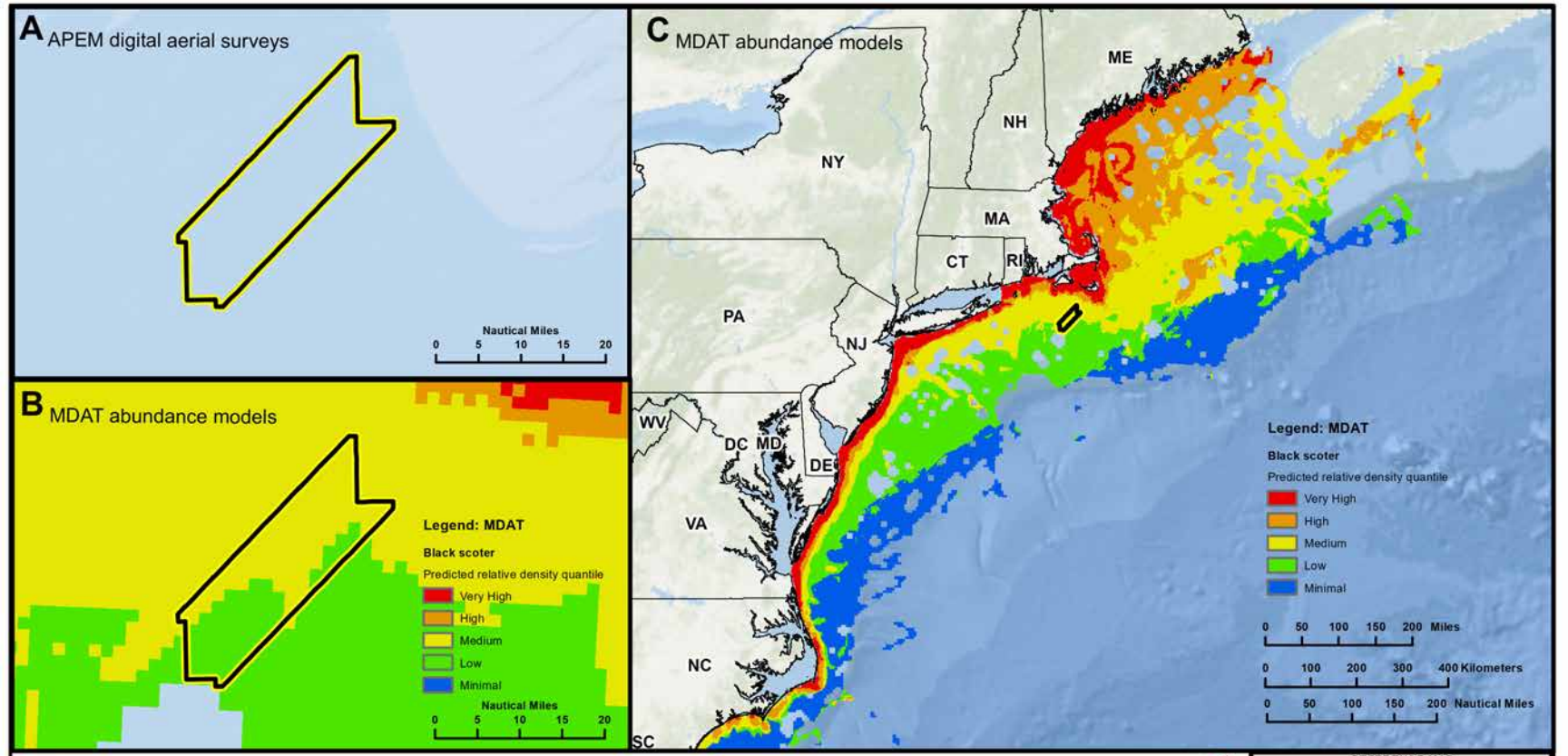

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
BLACK SCOTER ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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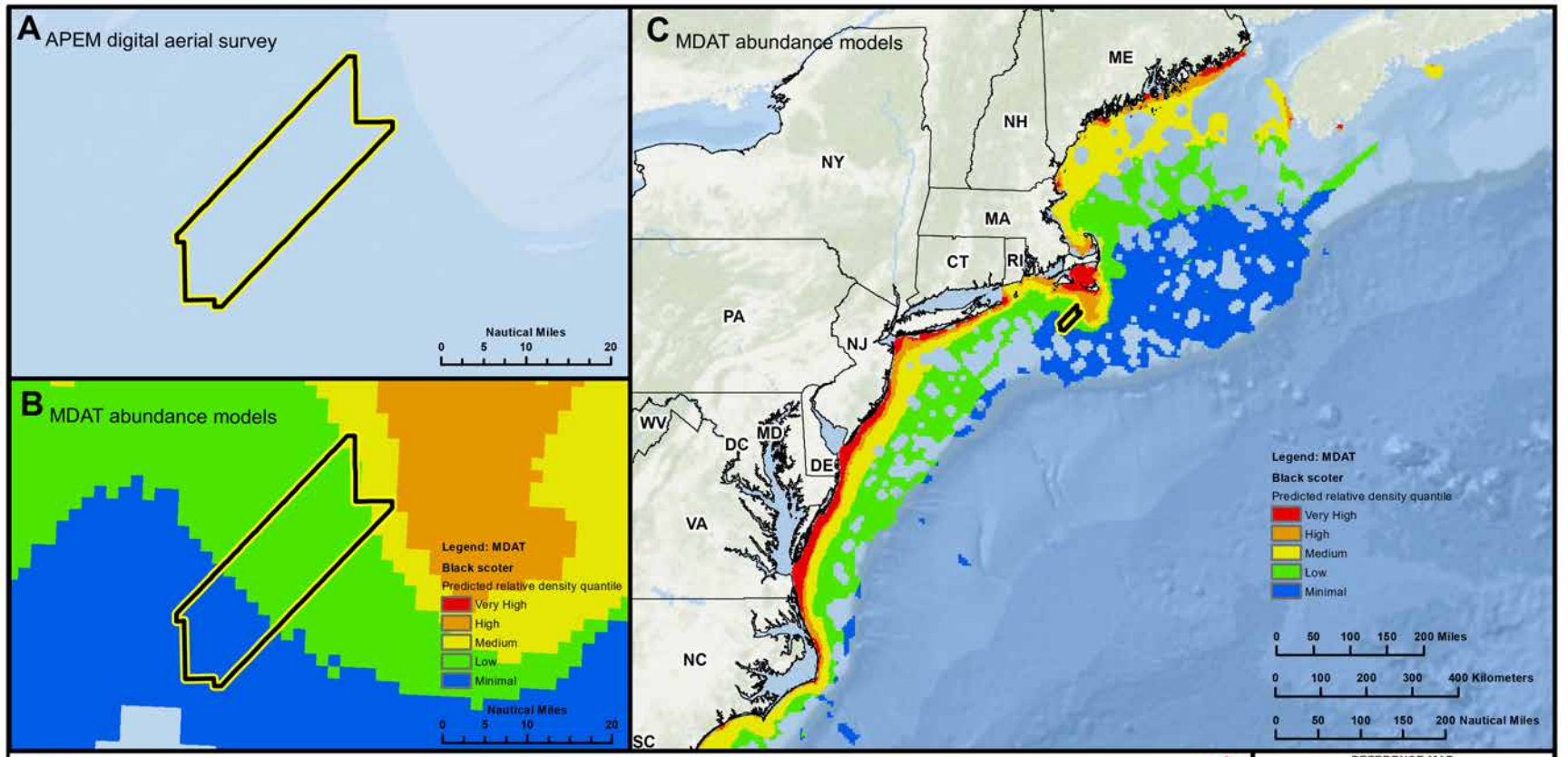


Beacon Wind OCS-A 0520 Lease Area

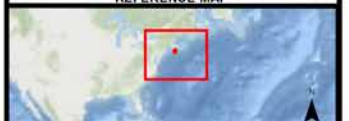
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
BLACK SCOTER ABUNDANCE
WINTER: DECEMBER - FEBRUARY

equinor

AECOM

REFERENCE MAP



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Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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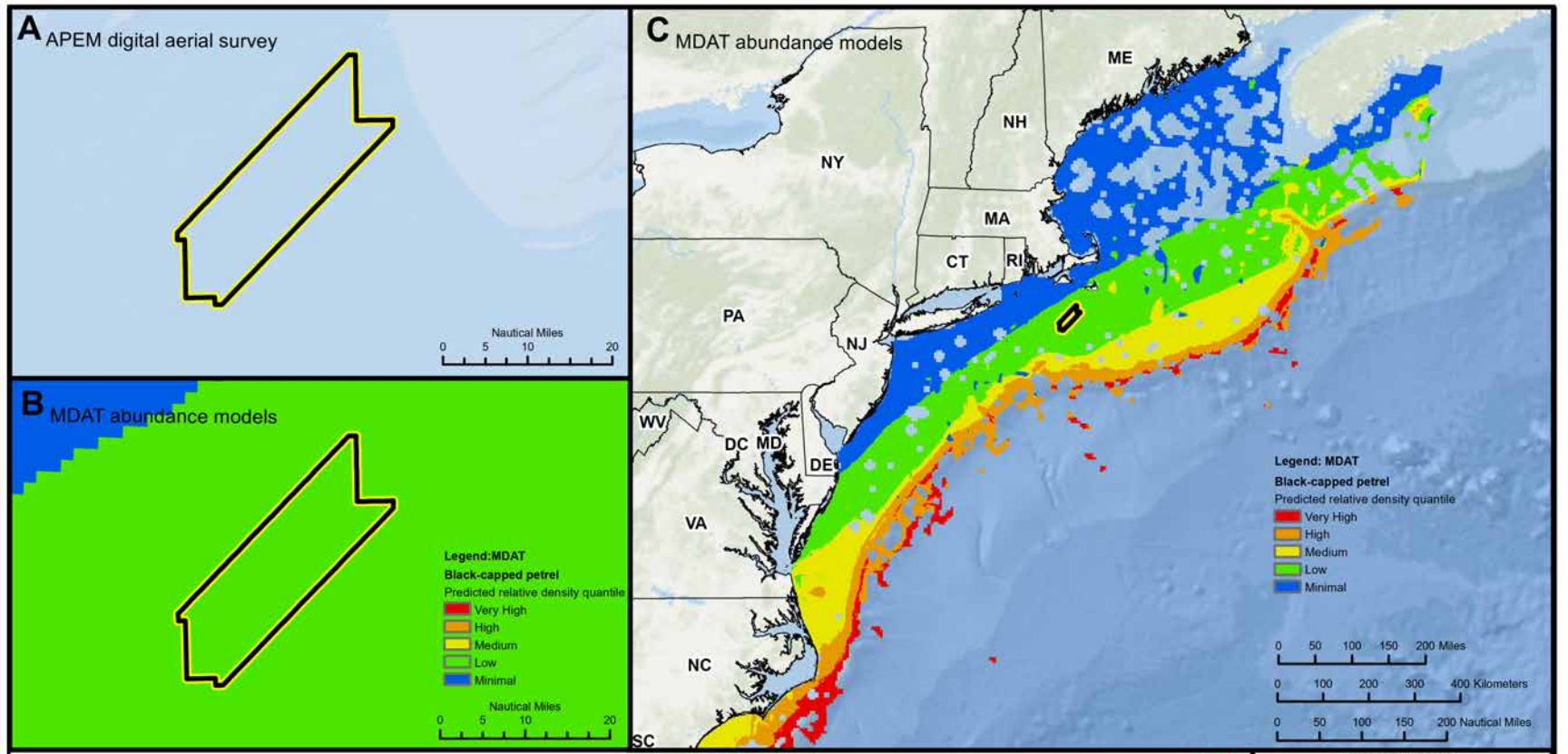


Beacon Wind OCS-A 0520 Lease Area

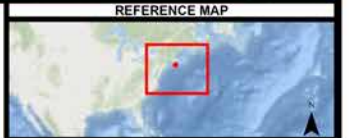
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
BLACK-CAPPED PETREL ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



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Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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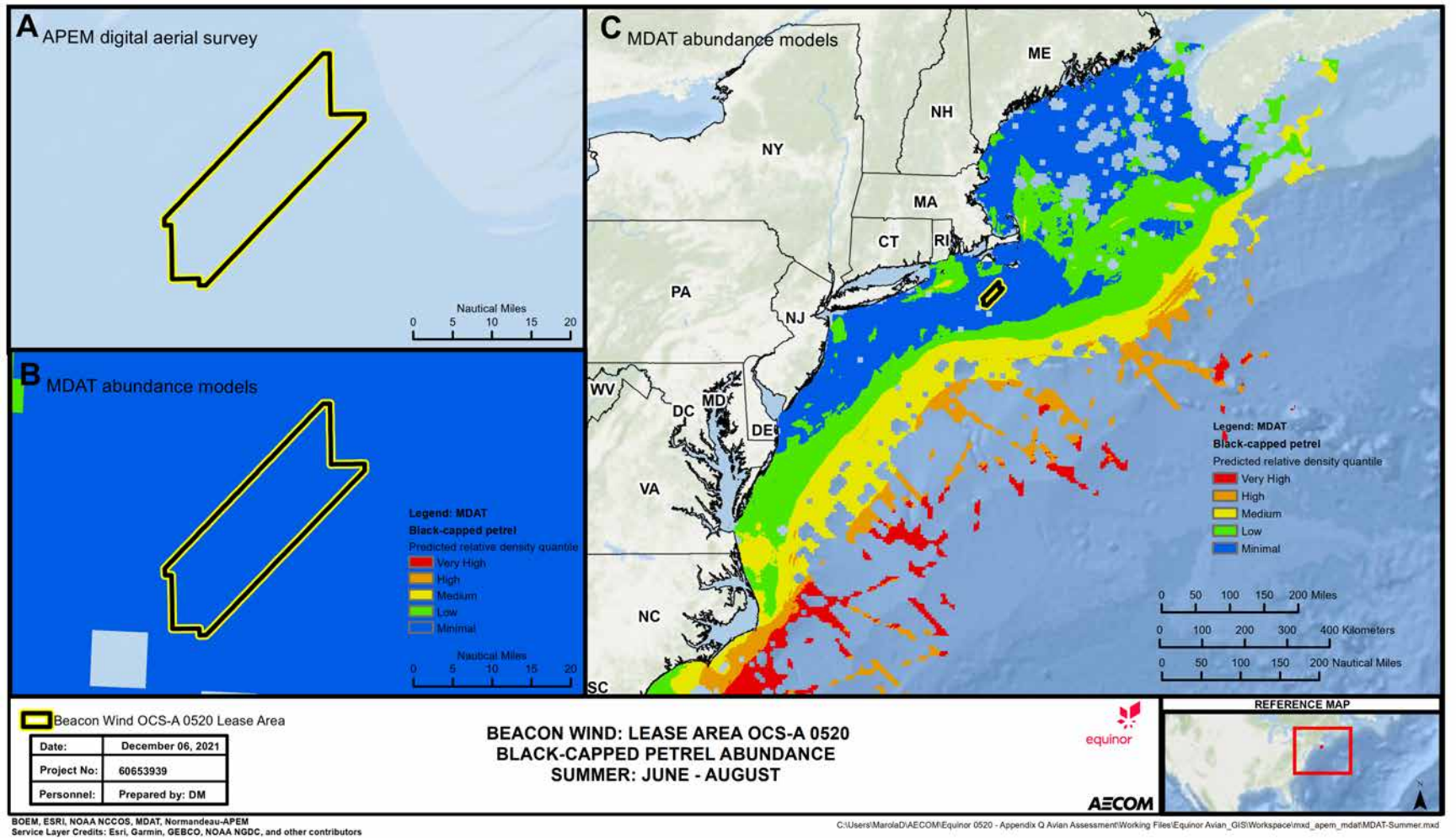
A
APEM digital aerial survey
Nautical Miles
0 5 10 15 20
B
MDAT abundance models
Legend: MDAT
Black-capped petrel
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 15 20
C
MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
MD
DC
DE
VA
NC
SC
Legend: MDAT
Black-capped petrel
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
BLACK-CAPPED PETREL ABUNDANCE
SUMMER: JUNE - AUGUST
equinor
AECOM
REFERENCE MAP
BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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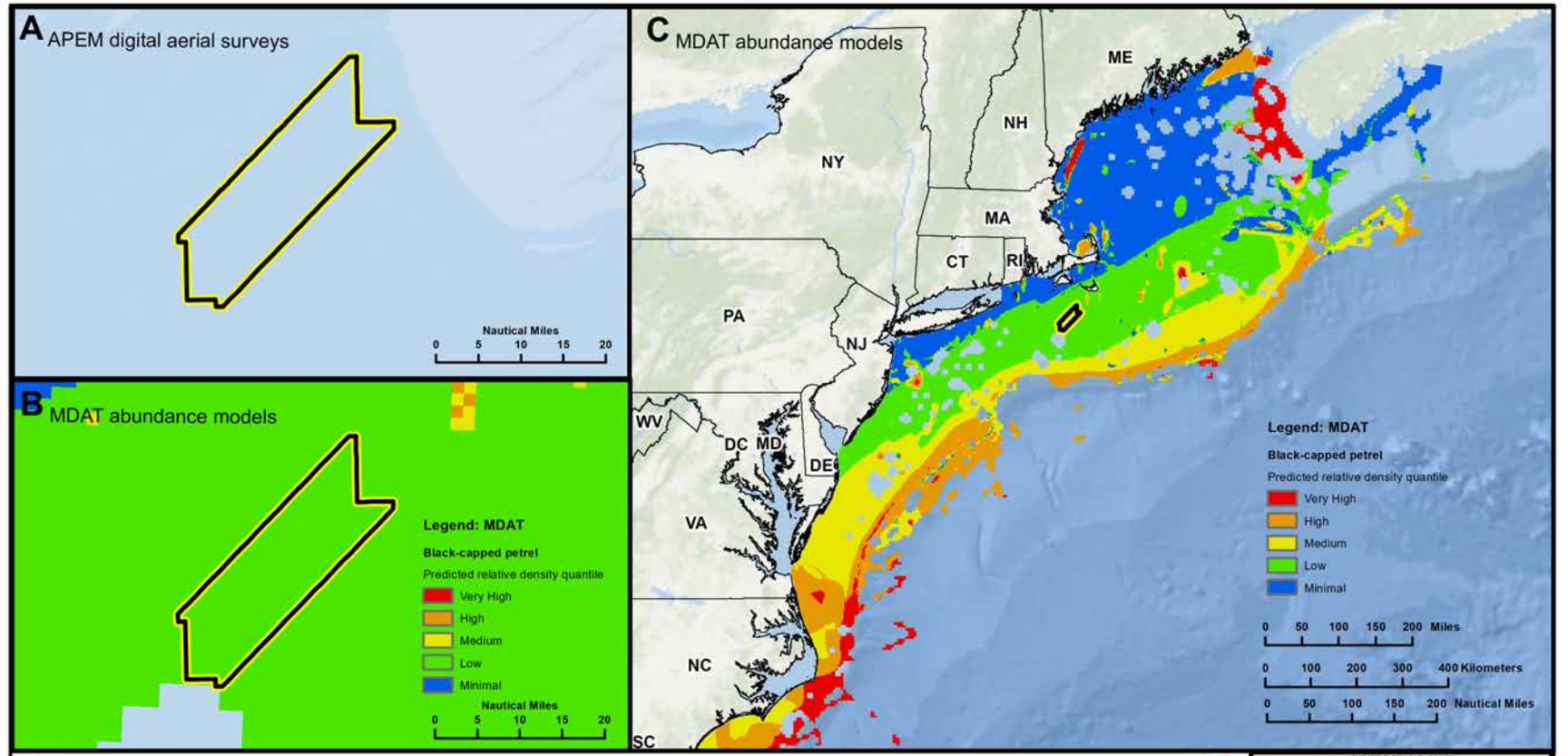

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
BLACK-CAPPED PETREL ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

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REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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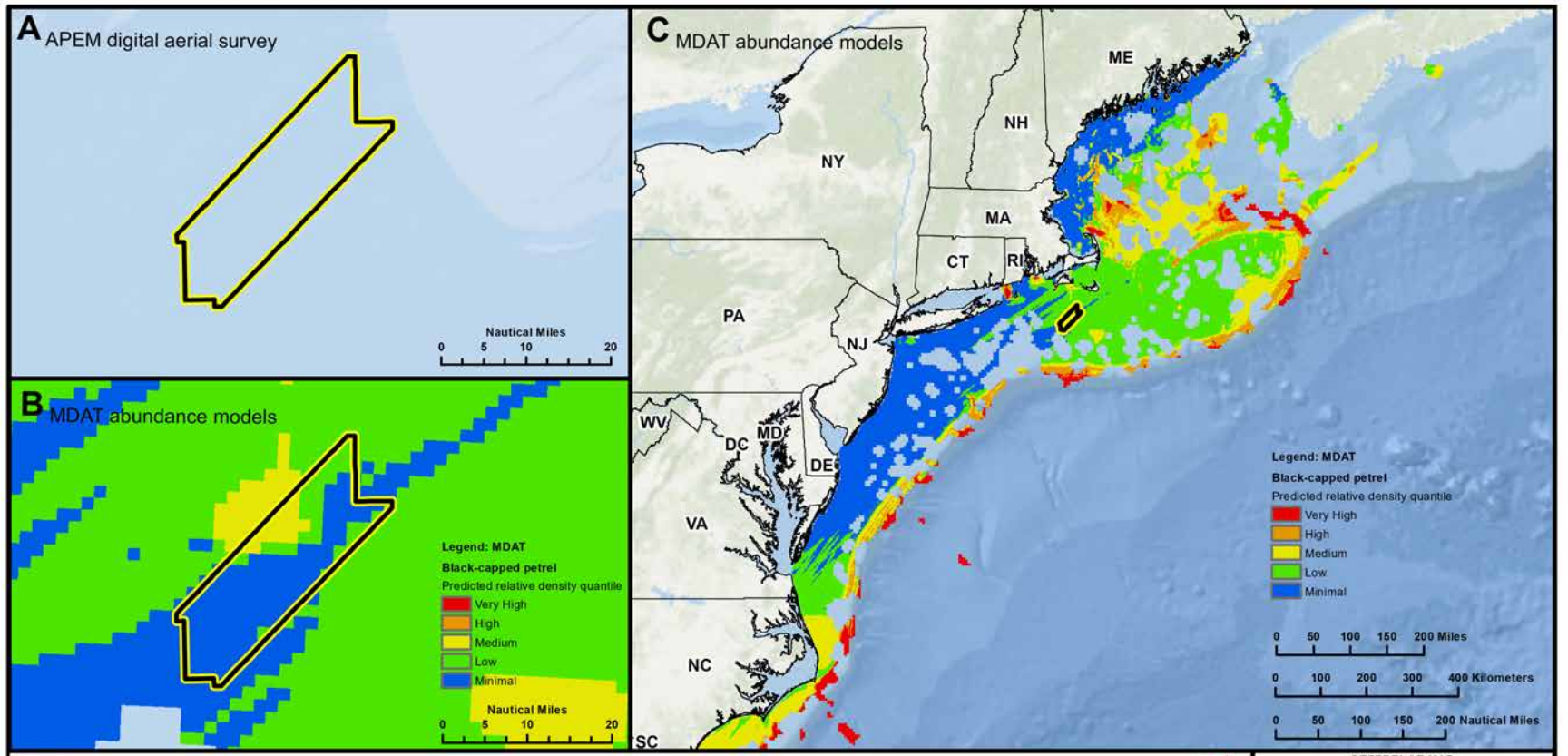
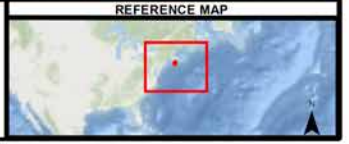


Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
BLACK-CAPPED PETREL ABUNDANCE
WINTER: DECEMBER - FEBRUARY

REFERENCE MAP



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Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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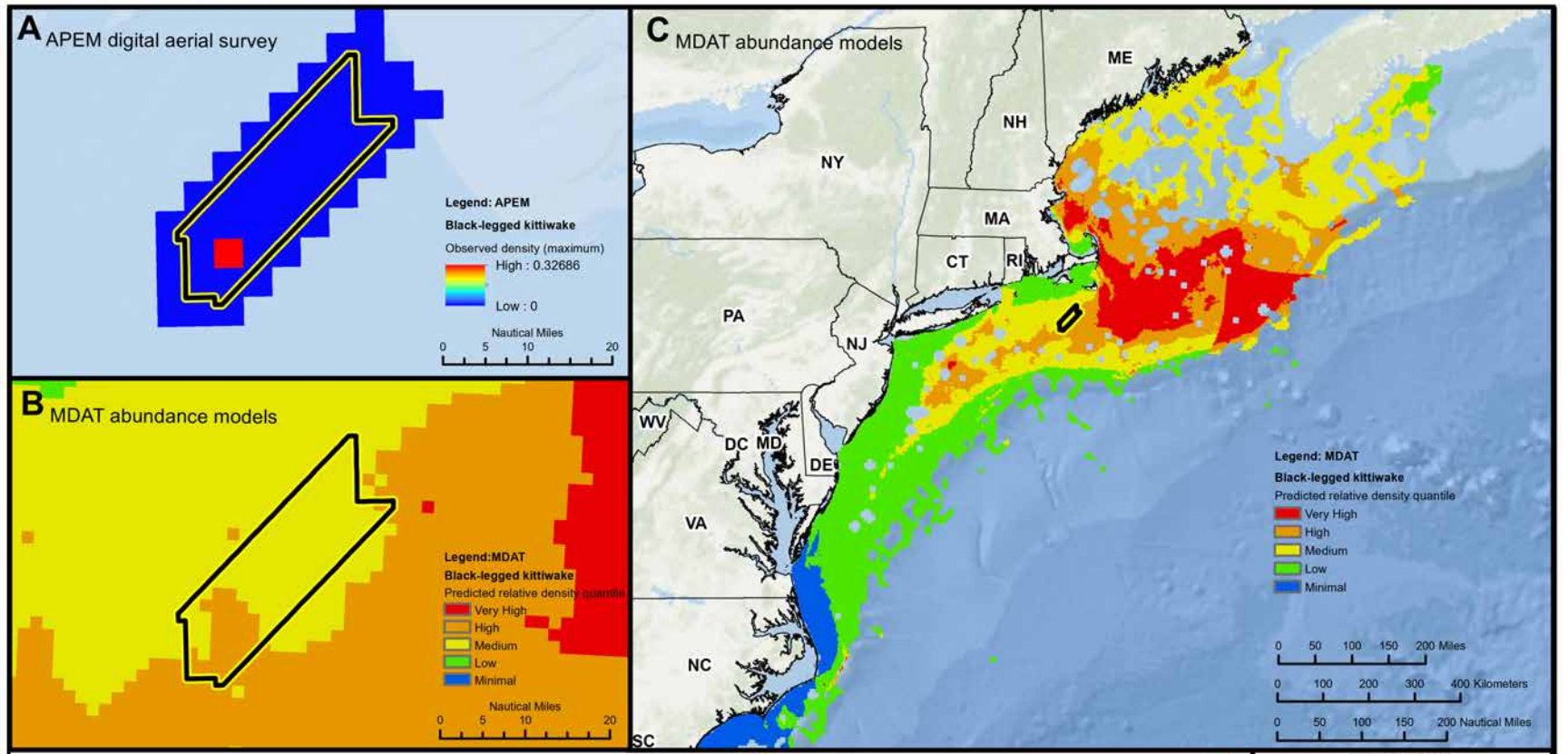


Beacon Wind OCS-A 0520 Lease Area

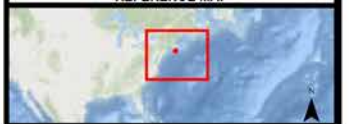
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
BLACK-LEGGED KITTIWAKE ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



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Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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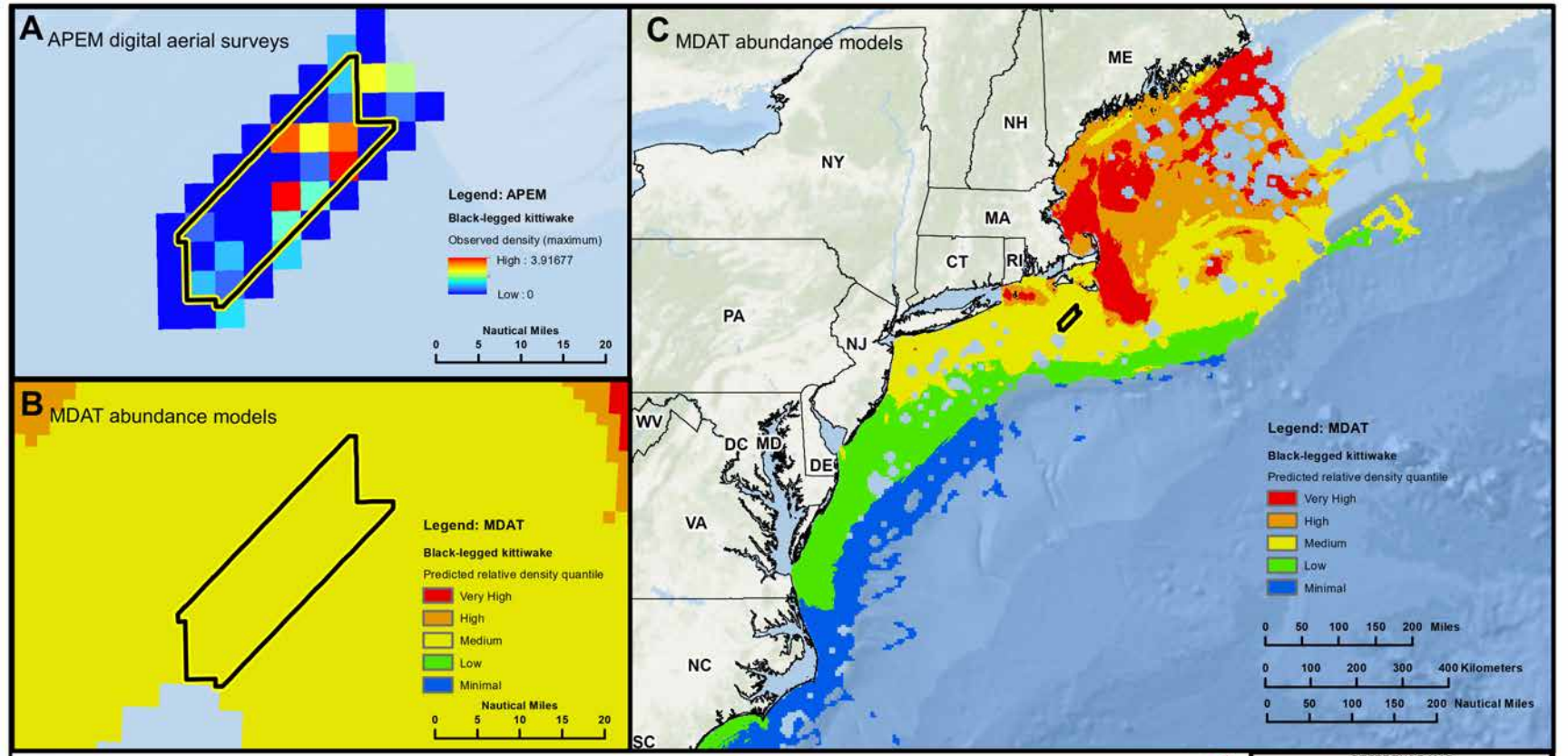

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
BLACK-LEGGED KITTIWAKE ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

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REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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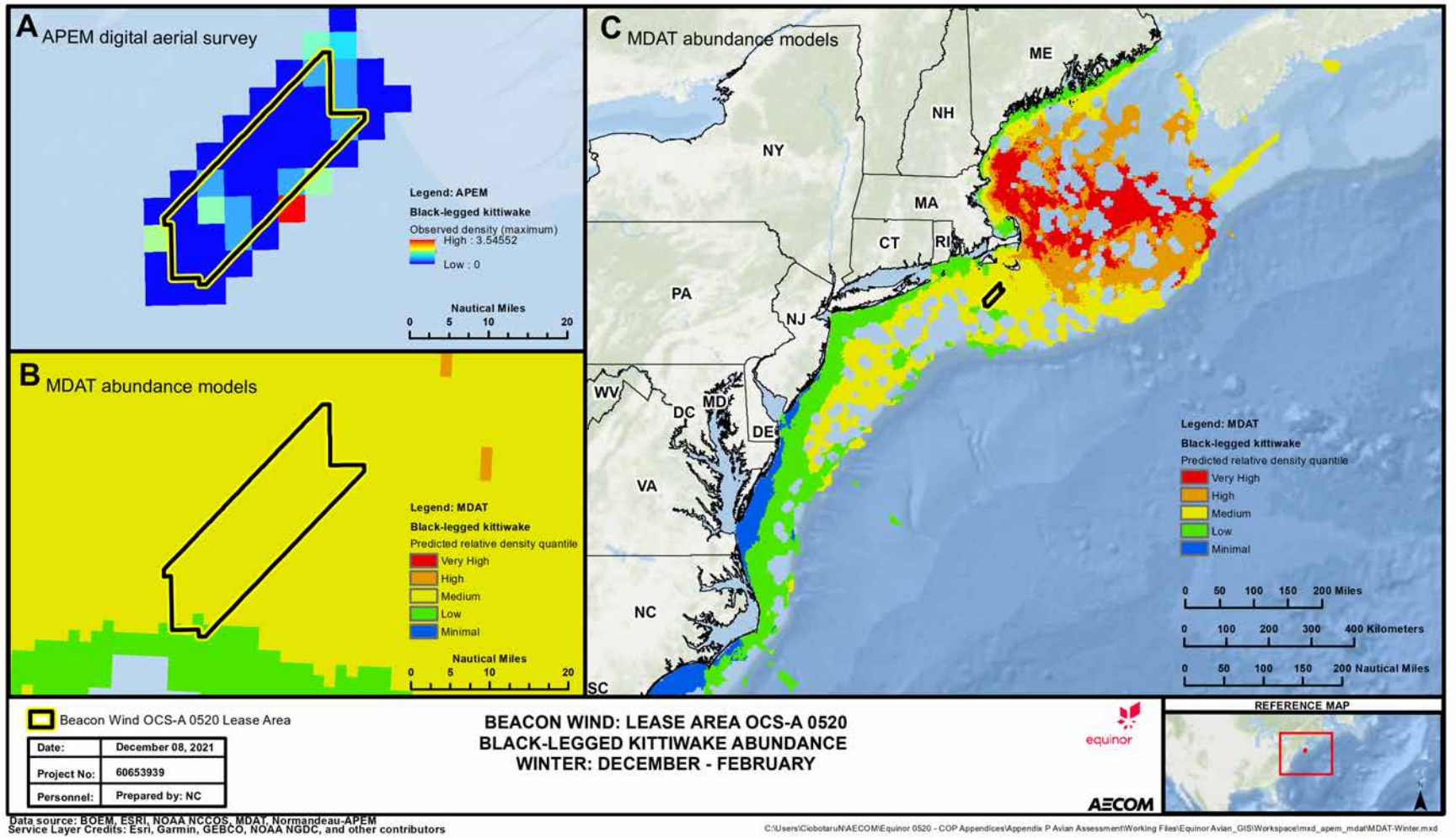
A APEM digital aerial survey
Legend: APEM
Black-legged kittiwake
Observed density (maximum)
High : 3.54552
Low : 0
Nautical Miles
0 5 10 20
B MDAT abundance models
Legend: MDAT
Black-legged kittiwake
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 20
C MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
Black-legged kittiwake
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 08, 2021
Project No: 60653939
Personnel: Prepared by: NC
BEACON WIND: LEASE AREA OCS-A 0520
BLACK-LEGGED KITTIWAKE ABUNDANCE
WINTER: DECEMBER - FEBRUARY
equinor
AECOM
REFERENCE MAP
Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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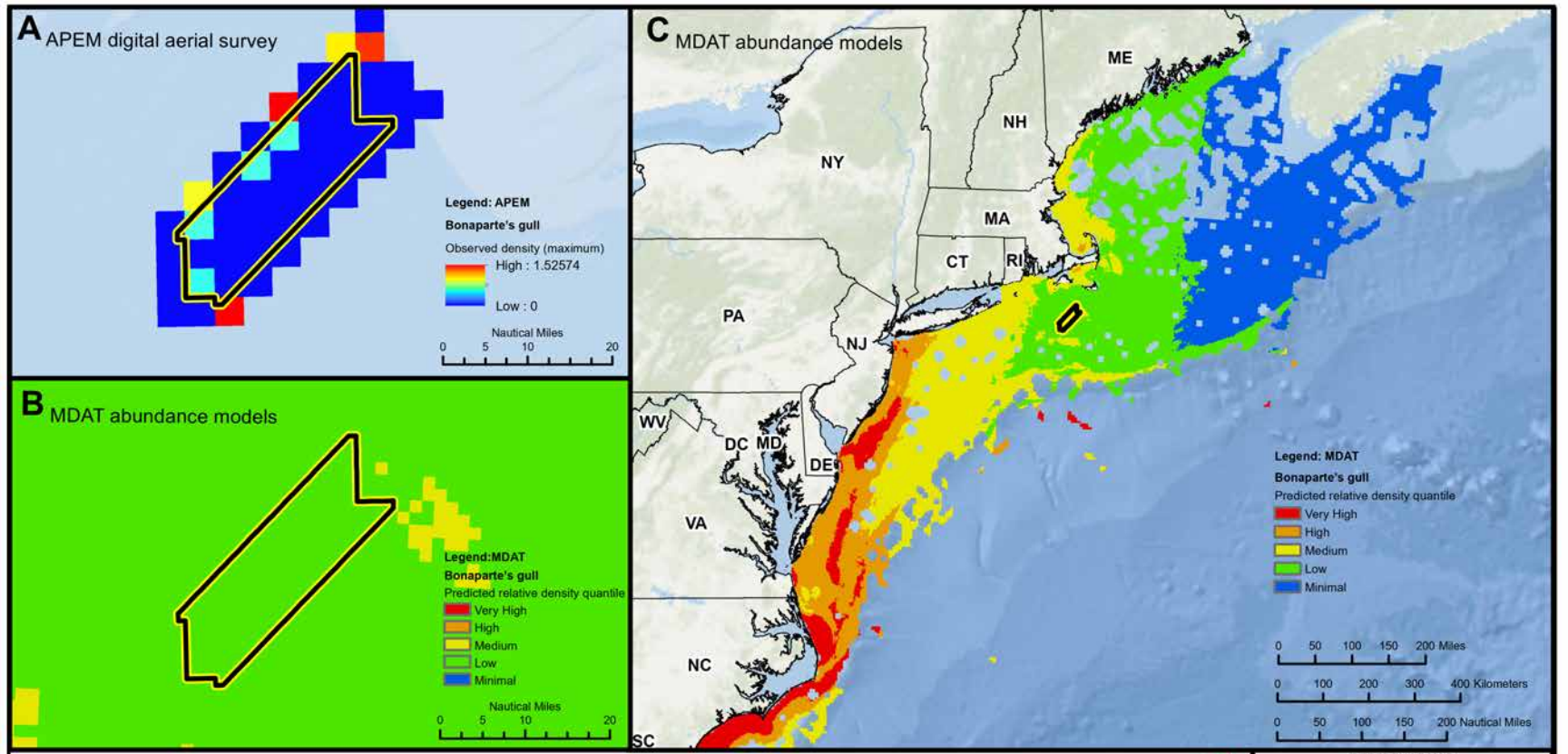

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
BONAPARTE'S GULL ABUNDANCE
SPRING: MARCH - MAY

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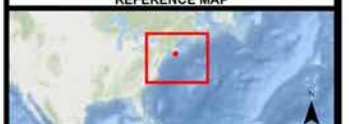
AECOM

REFERENCE MAP



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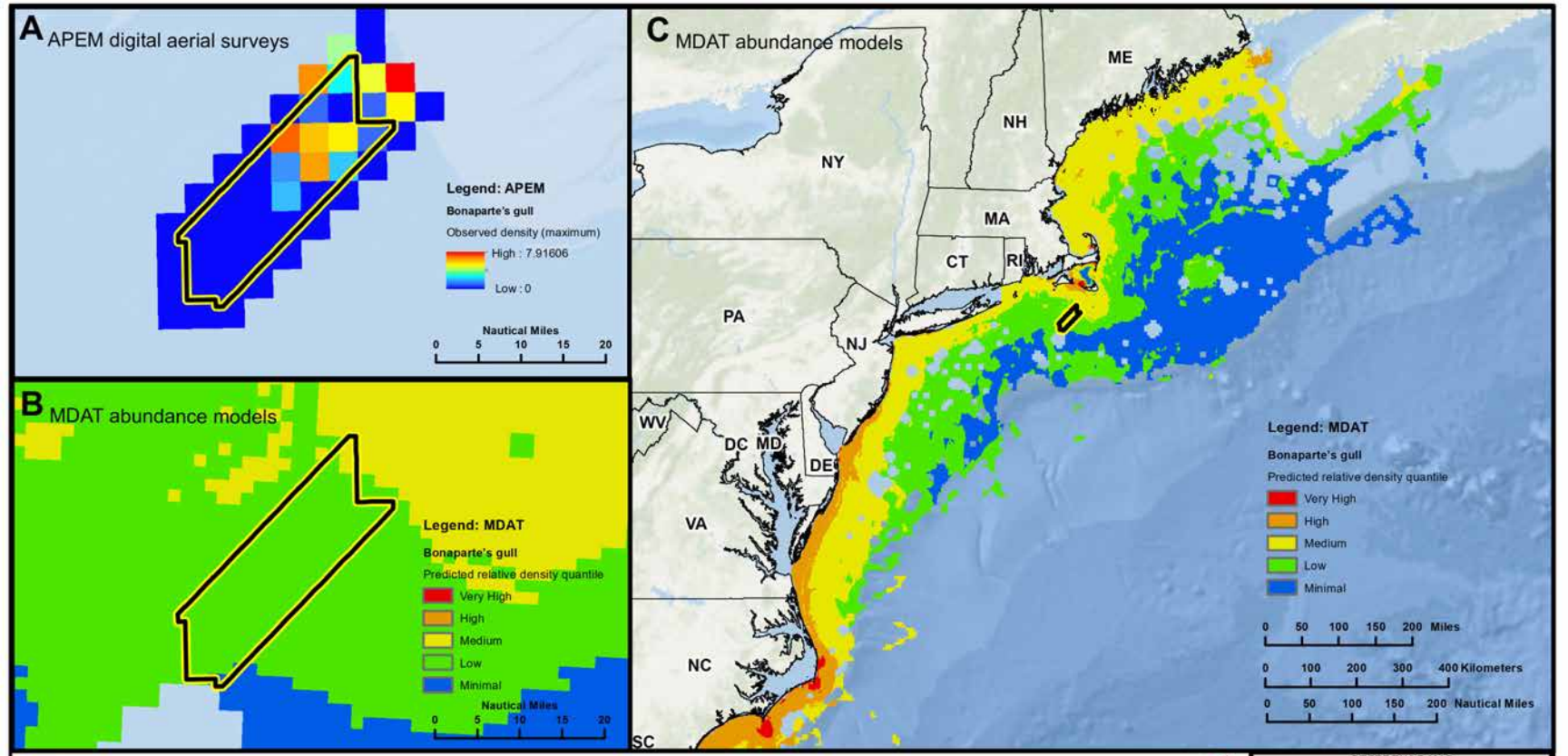

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
BONAPARTE'S GULL ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

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REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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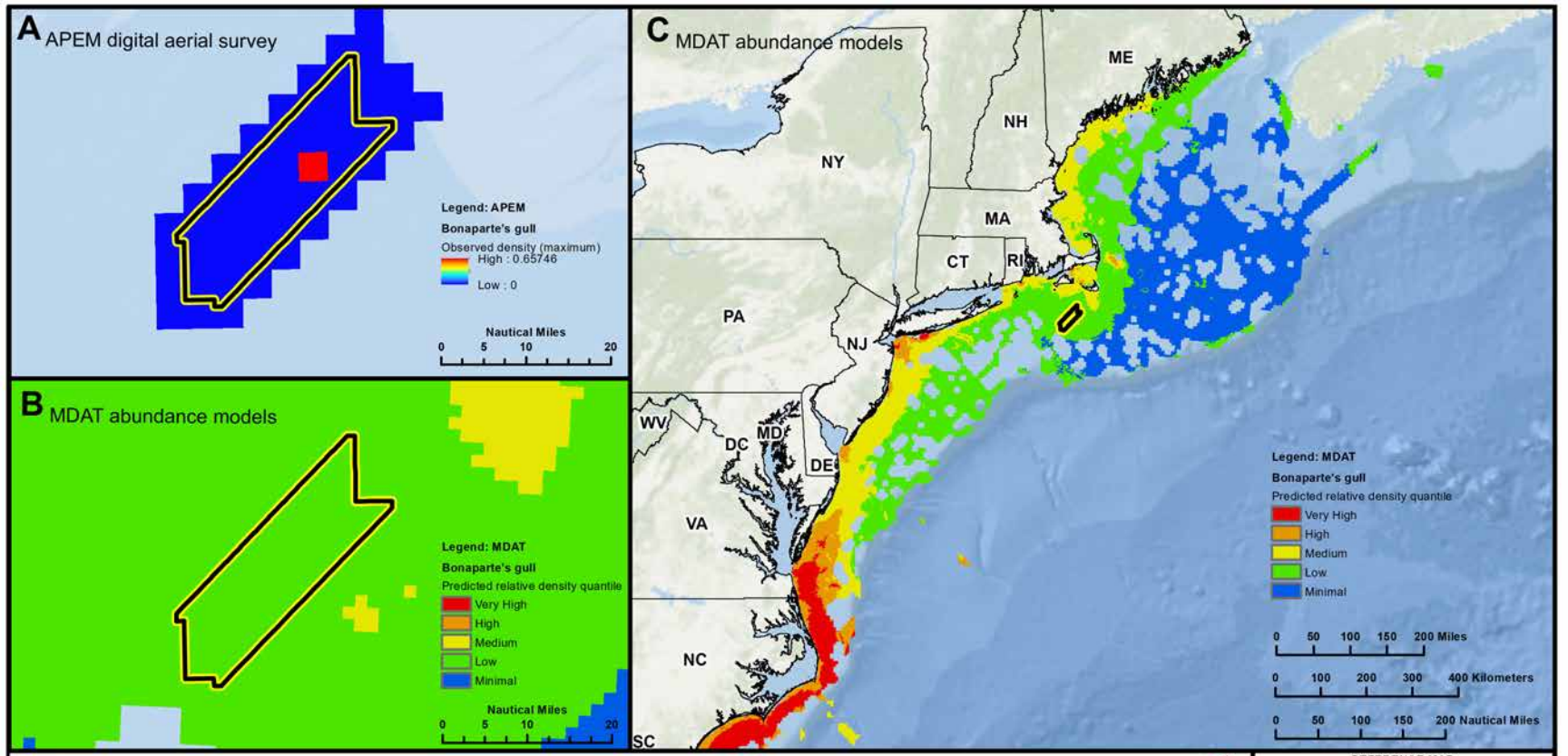

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
BONAPARTE'S GULL ABUNDANCE
WINTER: DECEMBER - FEBRUARY

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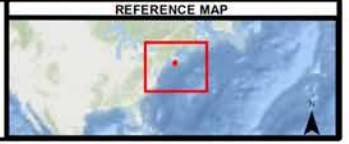
AECOM

REFERENCE MAP



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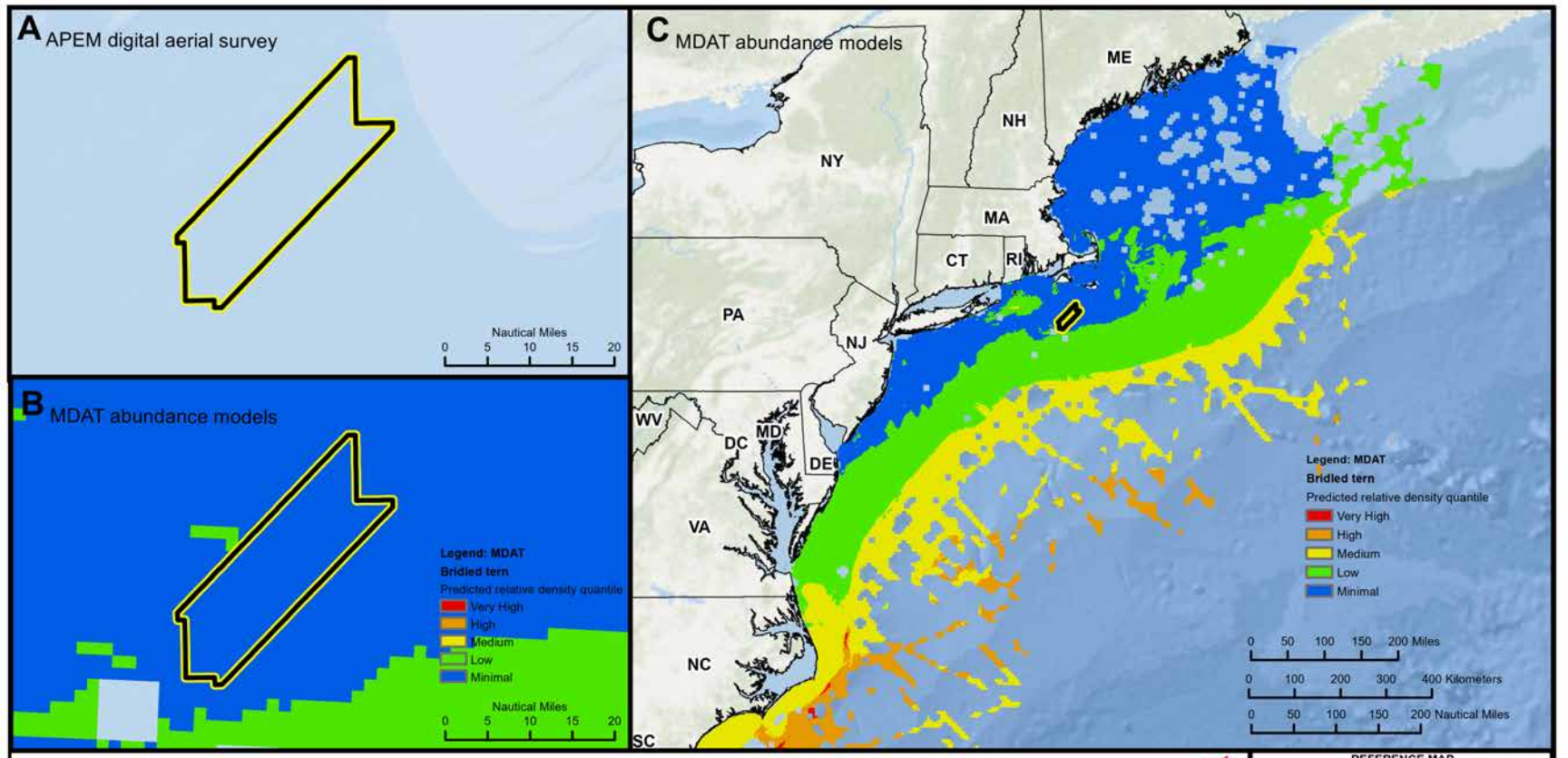

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
BRIDLED TERN ABUNDANCE
SUMMER: JUNE - AUGUST

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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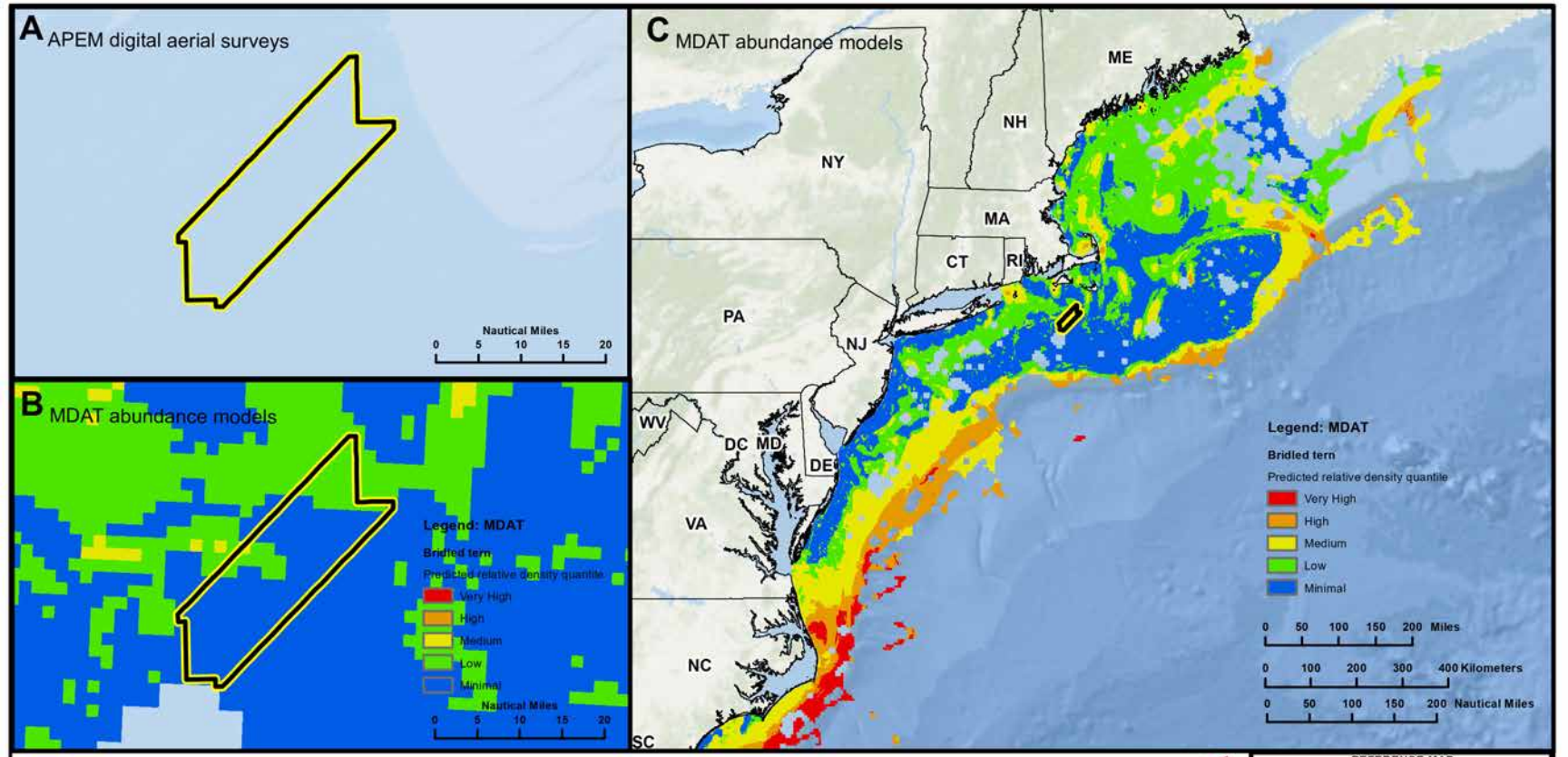

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
BRIDLED TERN ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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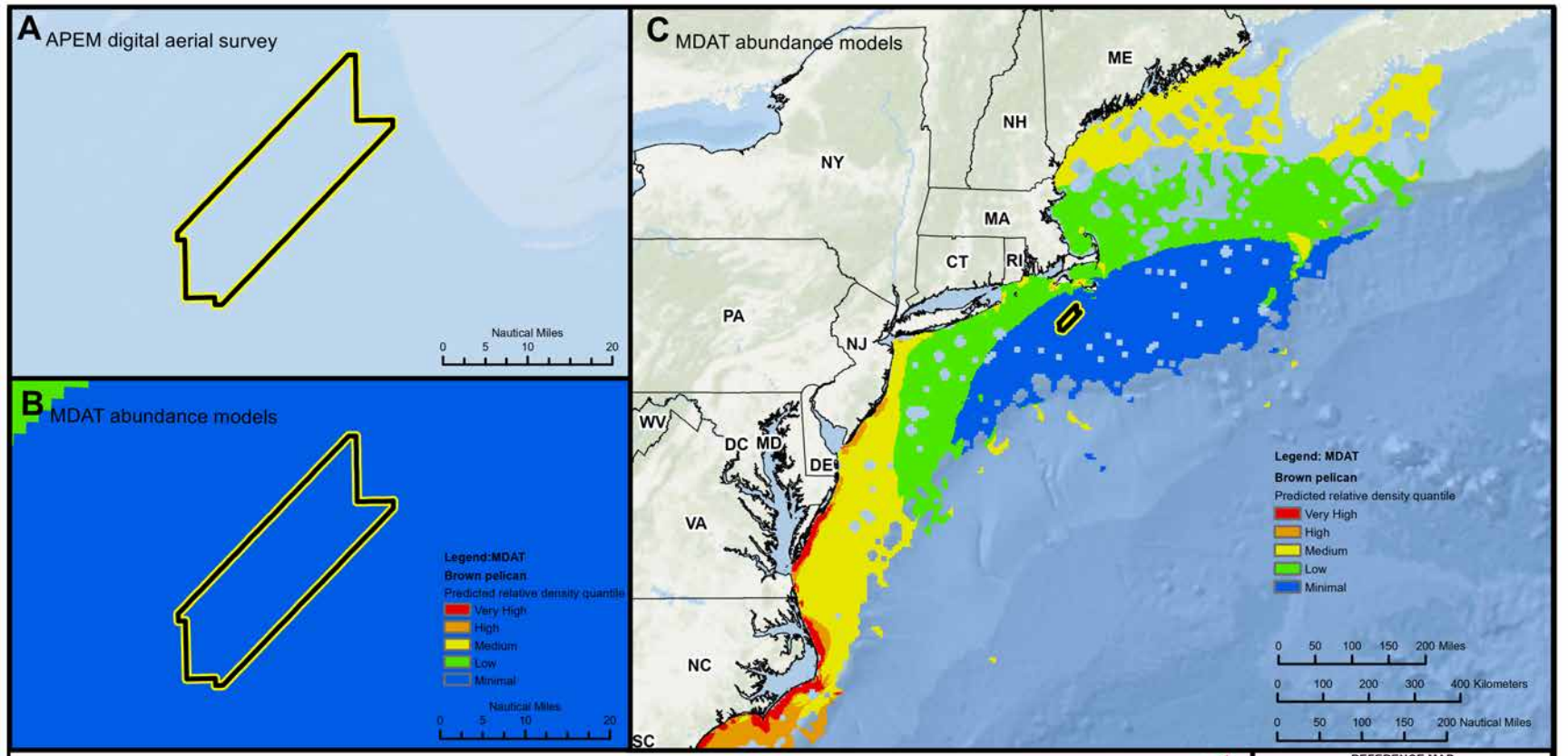


Beacon Wind OCS-A 0520 Lease Area

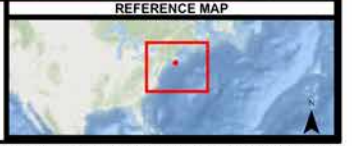
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
BROWN PELICAN ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



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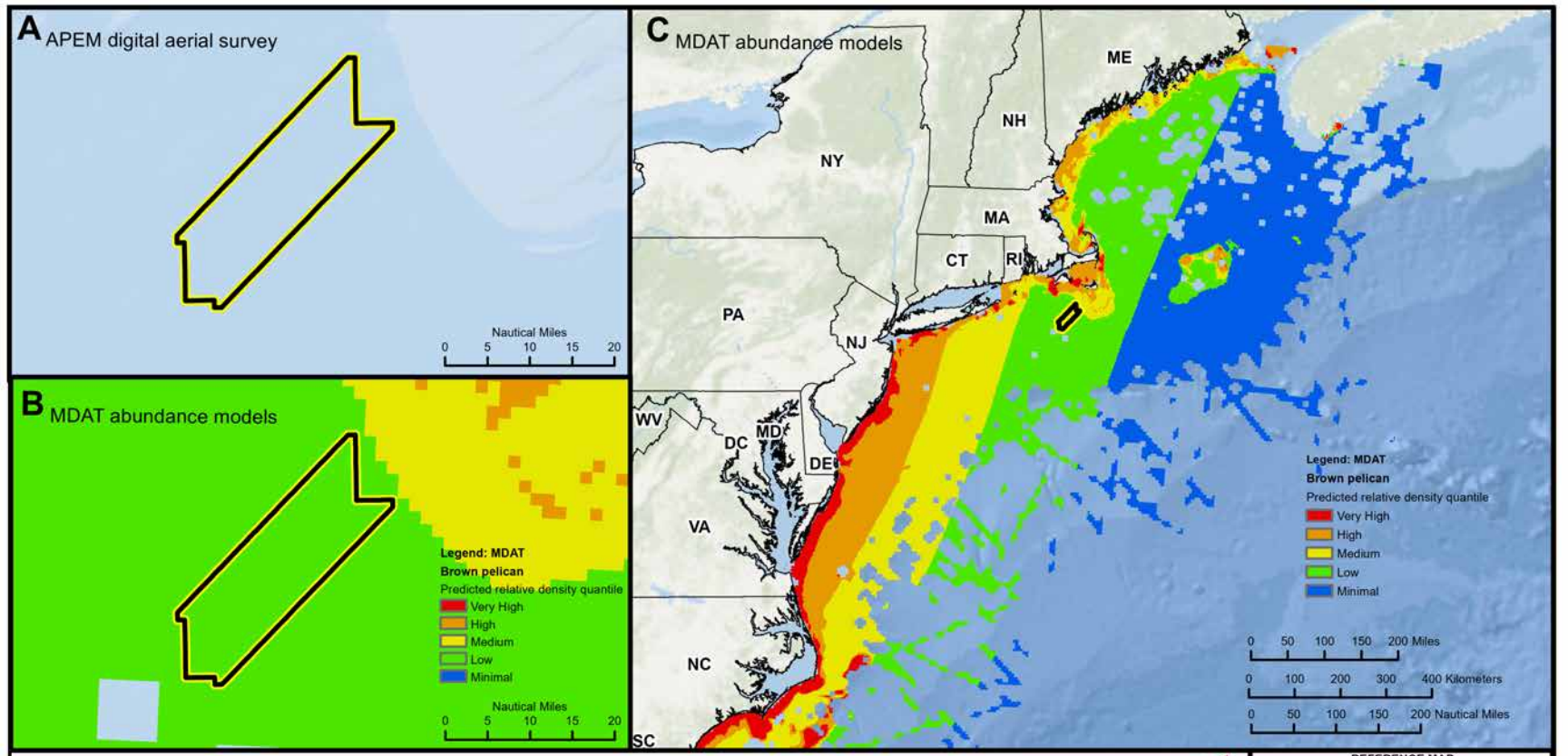

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
BROWN PELICAN ABUNDANCE
SUMMER: JUNE - AUGUST

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AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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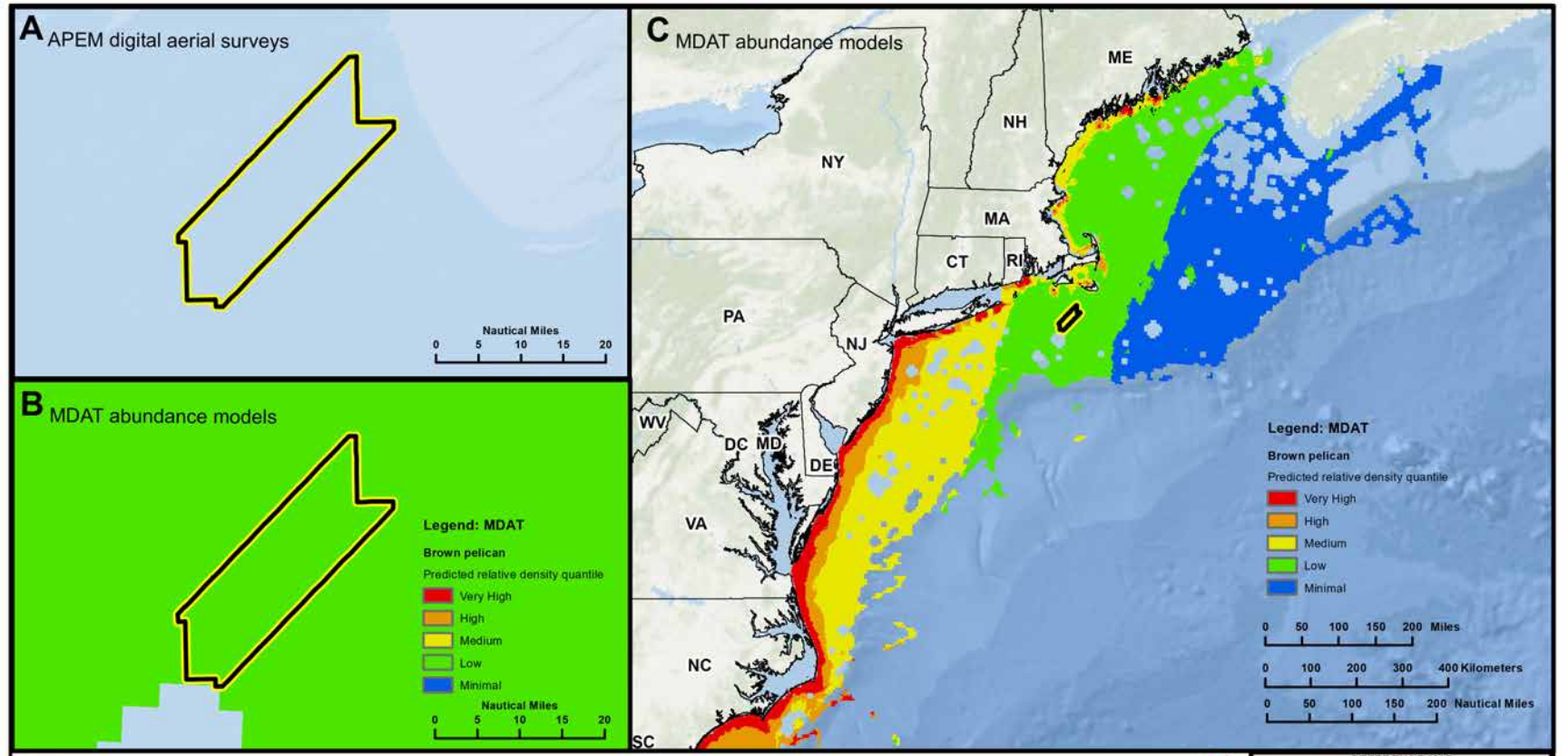

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
BROWN PELICAN ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

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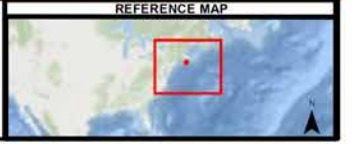
AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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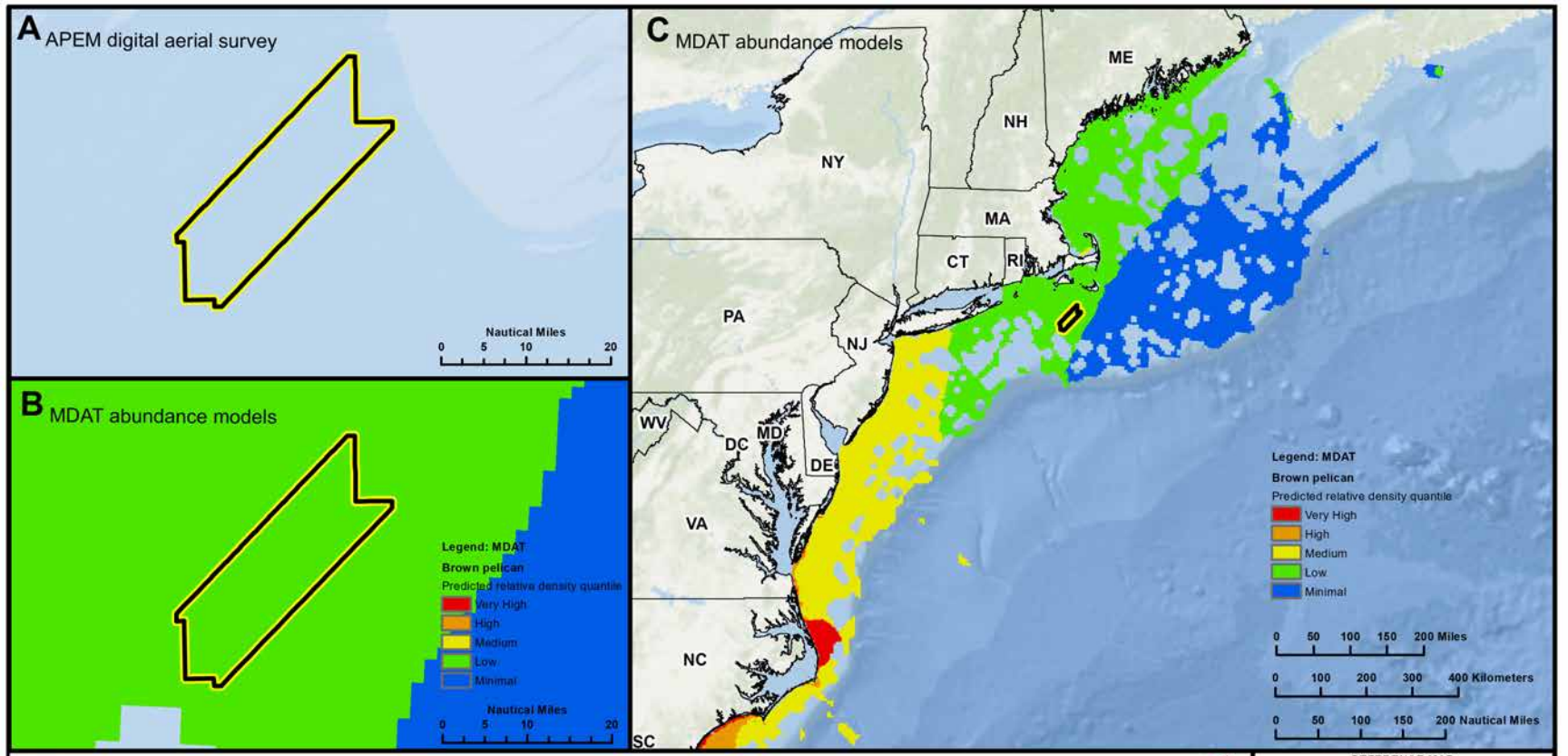


Beacon Wind OCS-A 0520 Lease Area

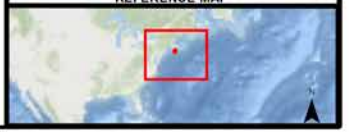
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
BROWN PELICAN ABUNDANCE
WINTER: DECEMBER - FEBRUARY

equinor

AECOM

REFERENCE MAP



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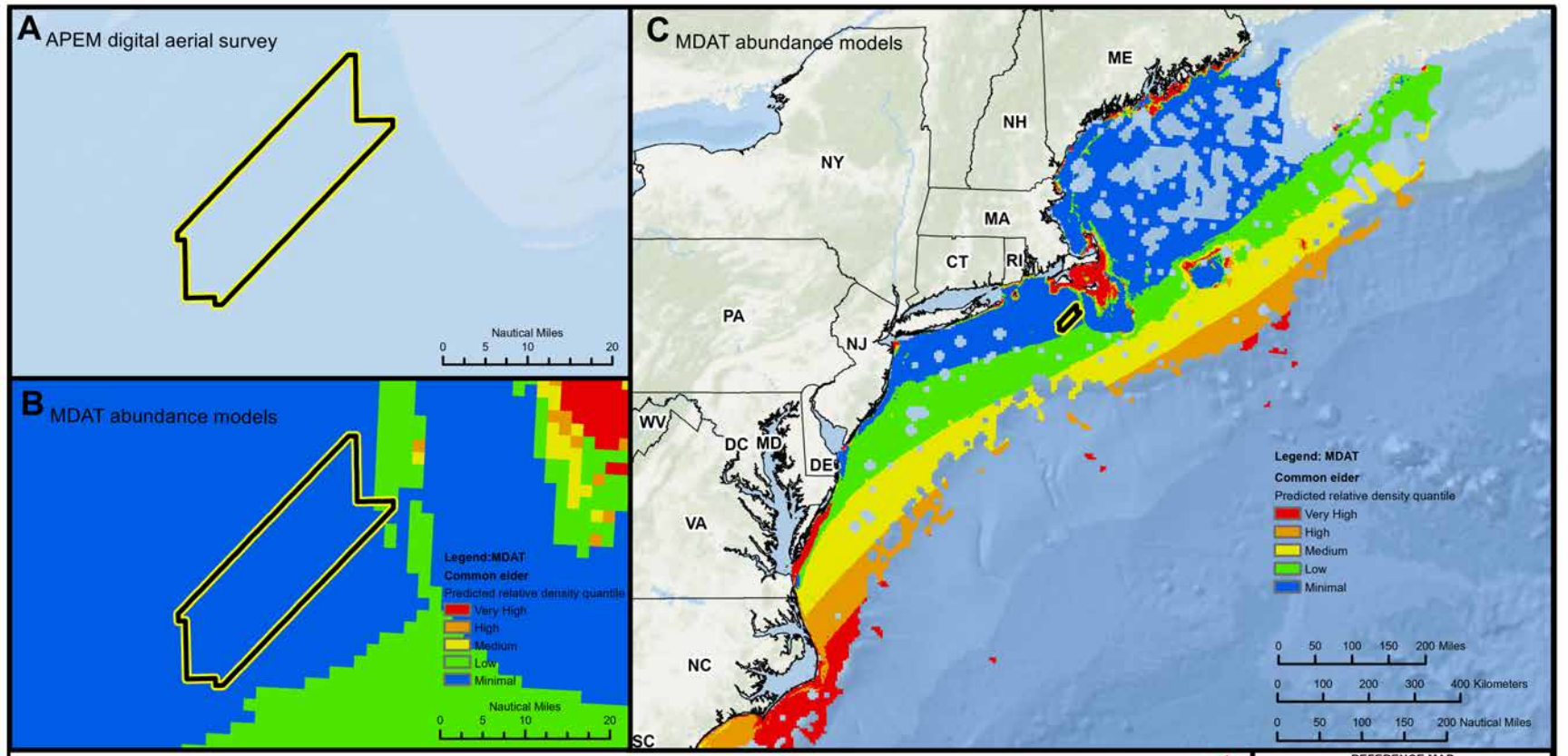

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
COMMON EIDER ABUNDANCE
SPRING: MARCH - MAY

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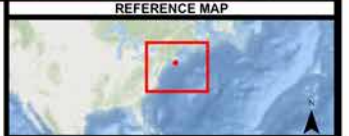
AECOM

REFERENCE MAP



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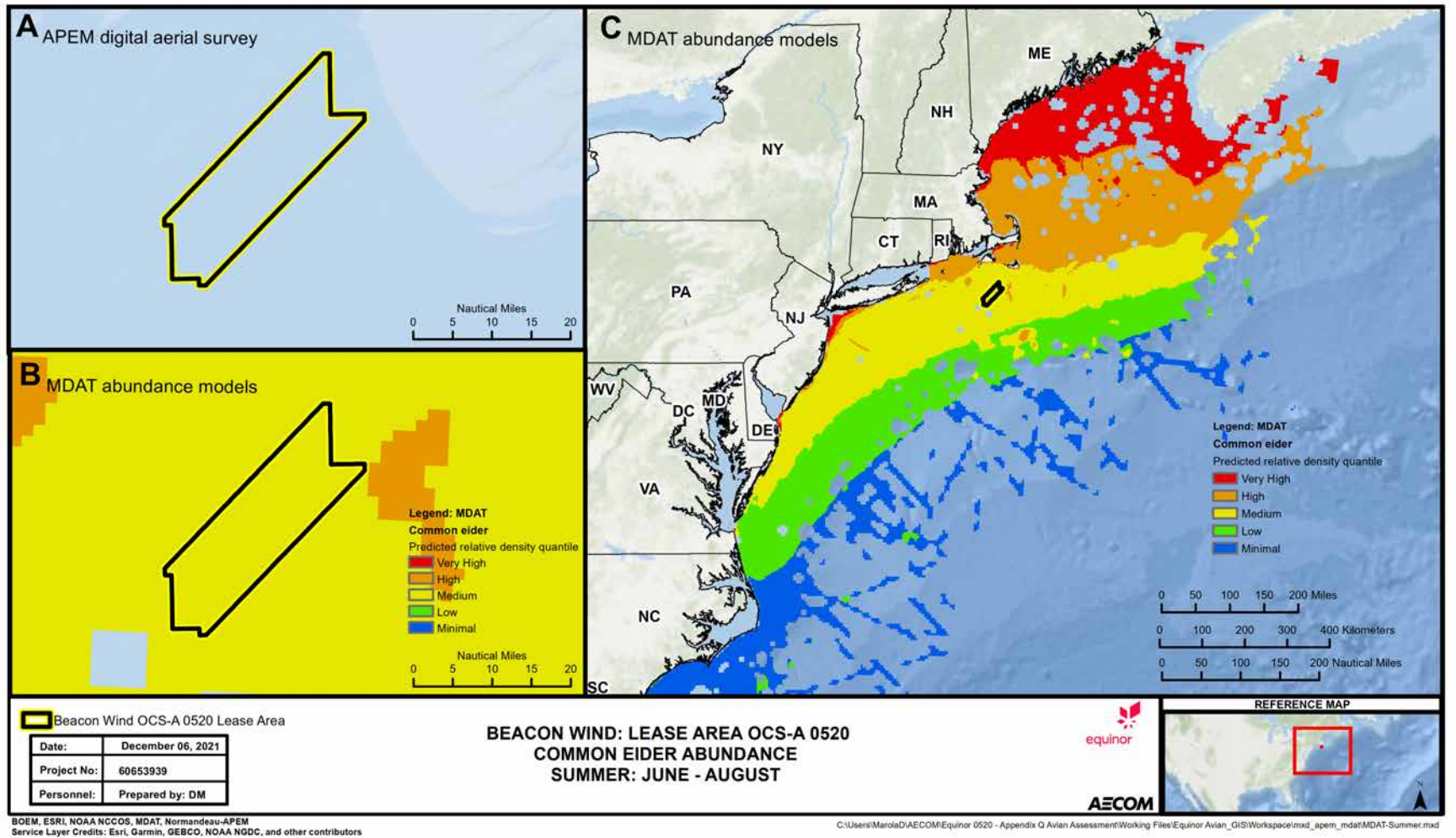
A
APEM digital aerial survey
Nautical Miles
0 5 10 15 20
B
MDAT abundance models
Legend: MDAT
Common eider
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 15 20
C
MDAT abundance models
ME
NH
NY
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RI
PA
NJ
WV
MD
DC
DE
VA
NC
SC
Legend: MDAT
Common eider
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
COMMON EIDER ABUNDANCE
SUMMER: JUNE - AUGUST
equinor
AECOM
REFERENCE MAP
BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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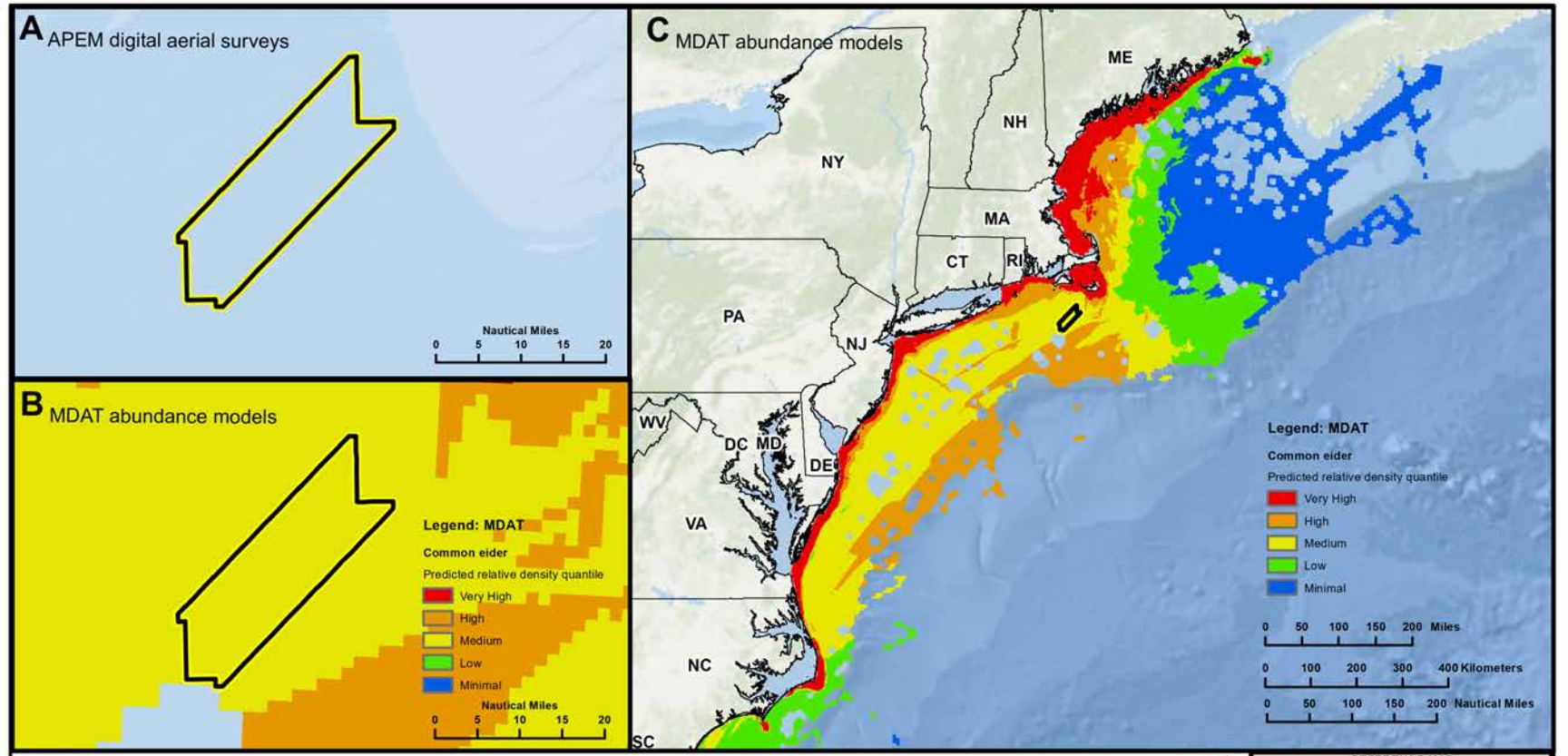

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
COMMON EIDER ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

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REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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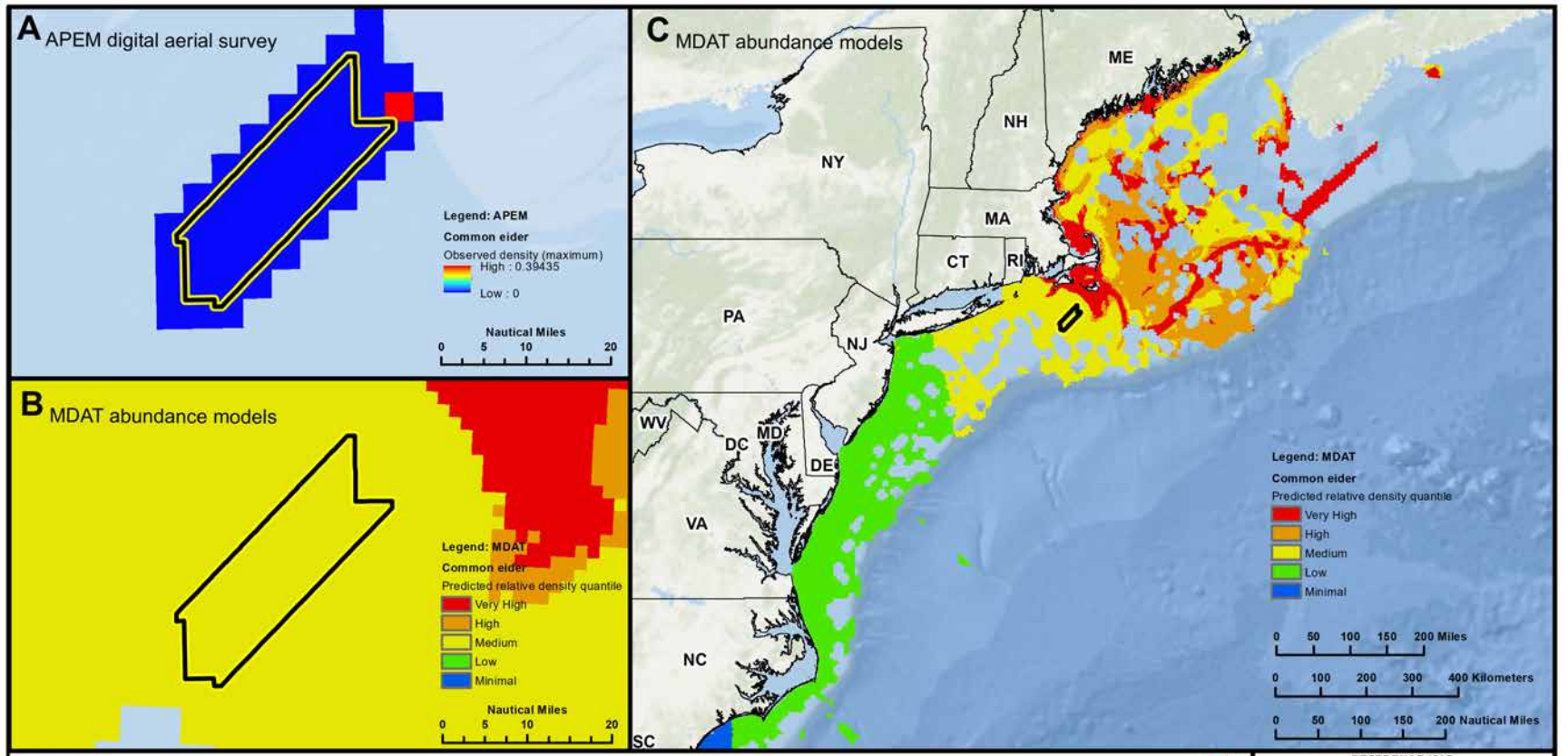


Beacon Wind OCS-A 0520 Lease Area

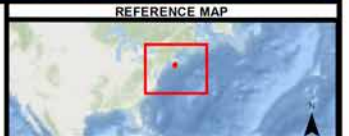
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
COMMON EIDER ABUNDANCE
WINTER: DECEMBER - FEBRUARY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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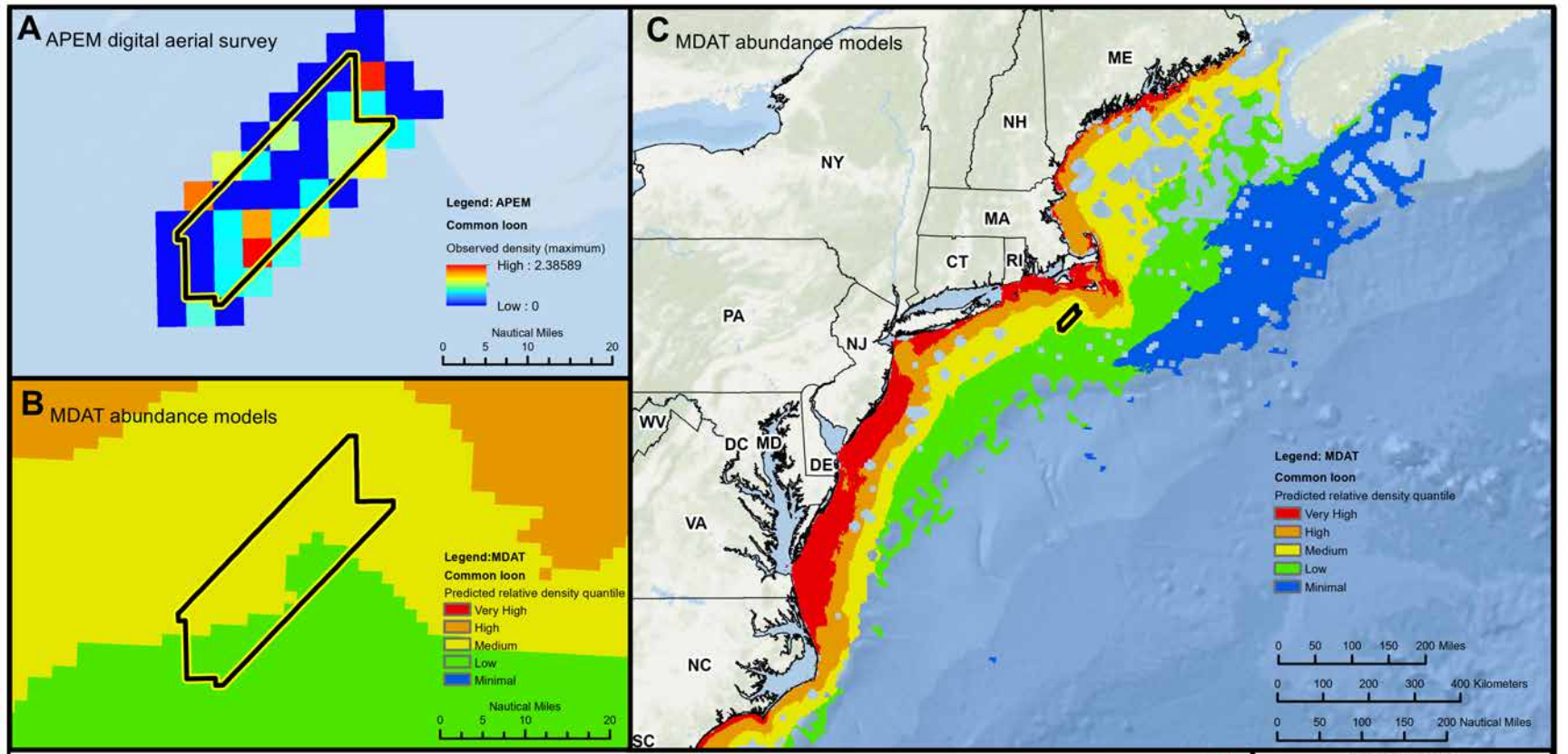
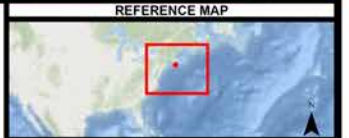


Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
COMMON LOON ABUNDANCE
SPRING: MARCH - MAY

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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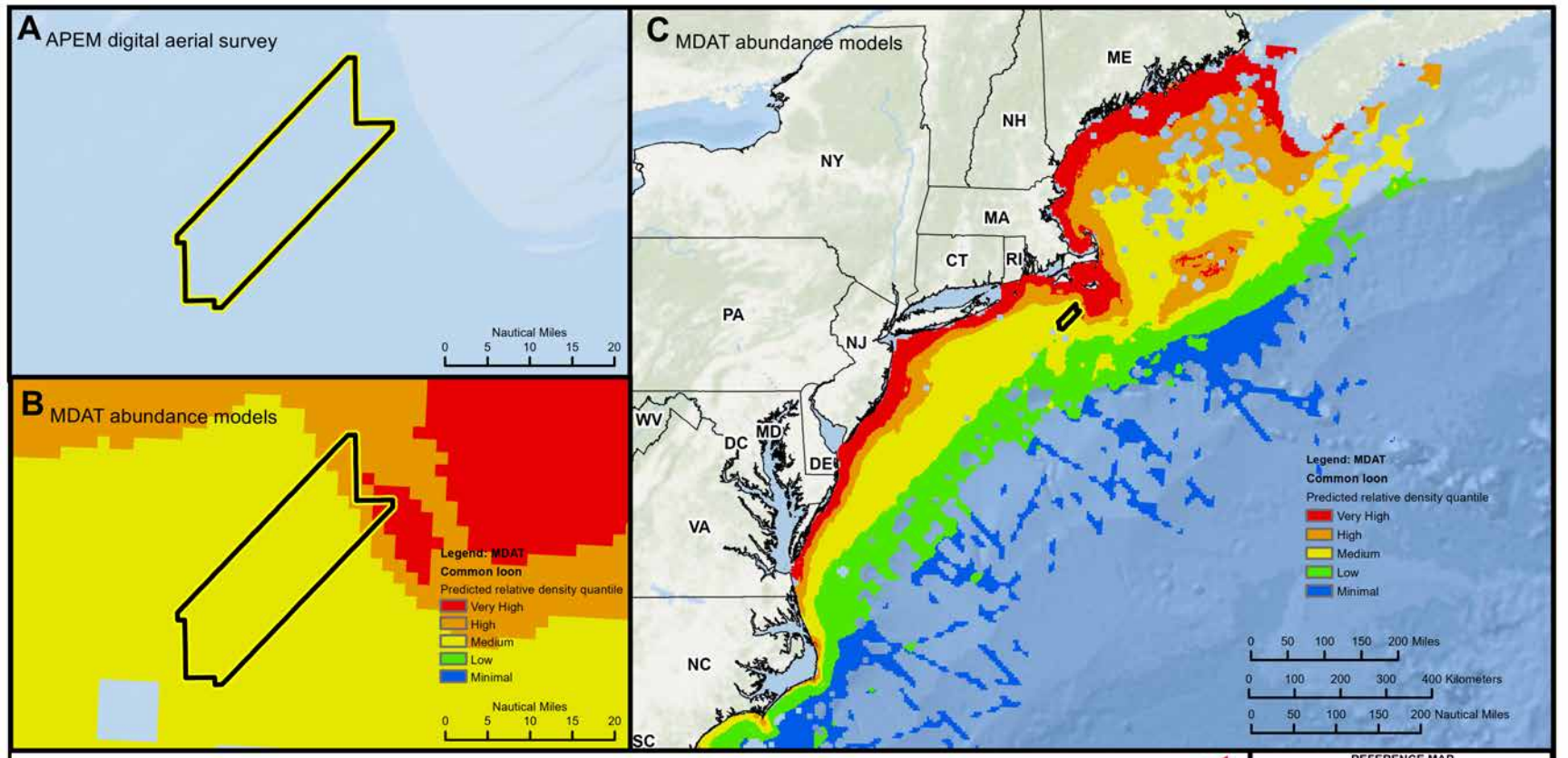

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
COMMON LOON ABUNDANCE
SUMMER: JUNE - AUGUST

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REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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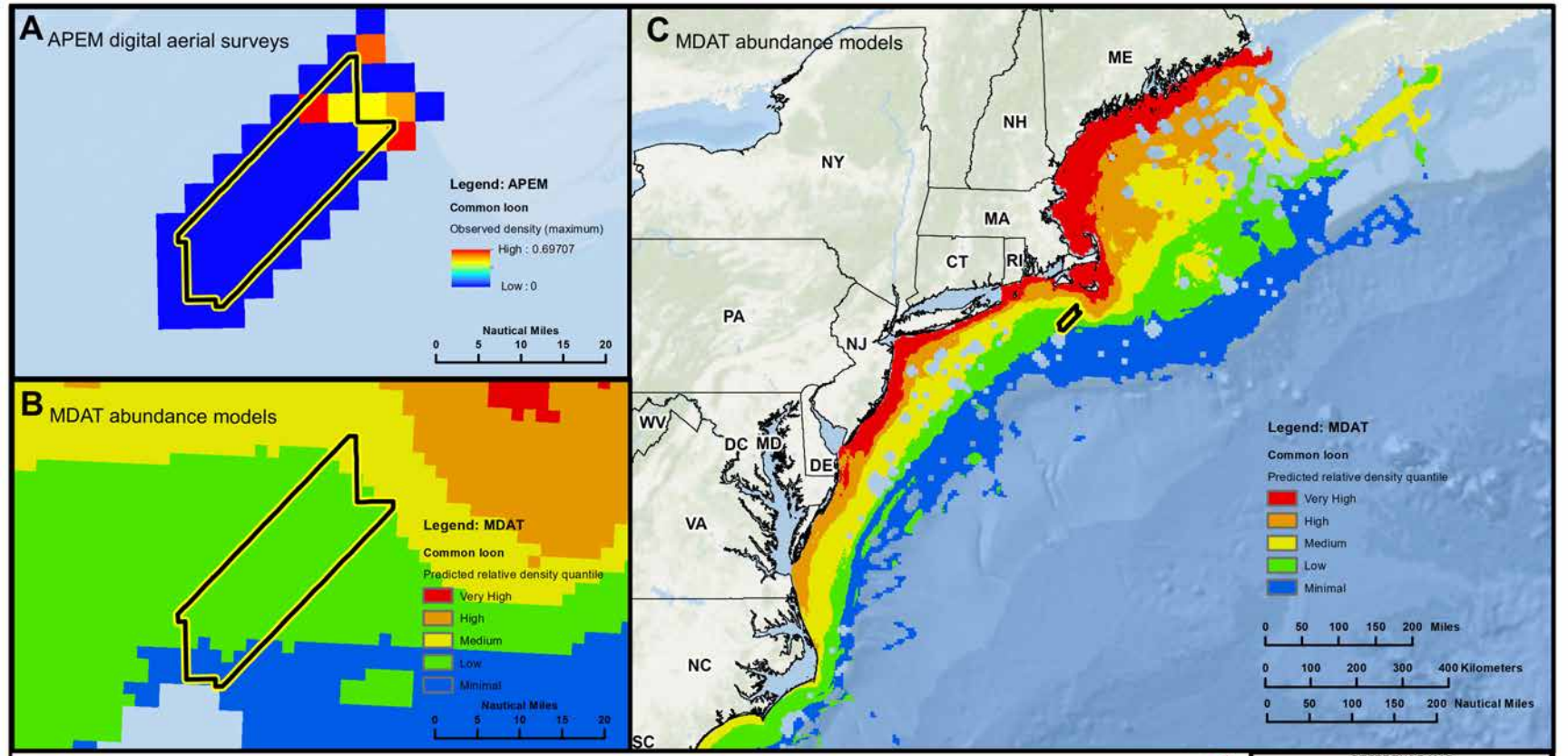

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
COMMON LOON ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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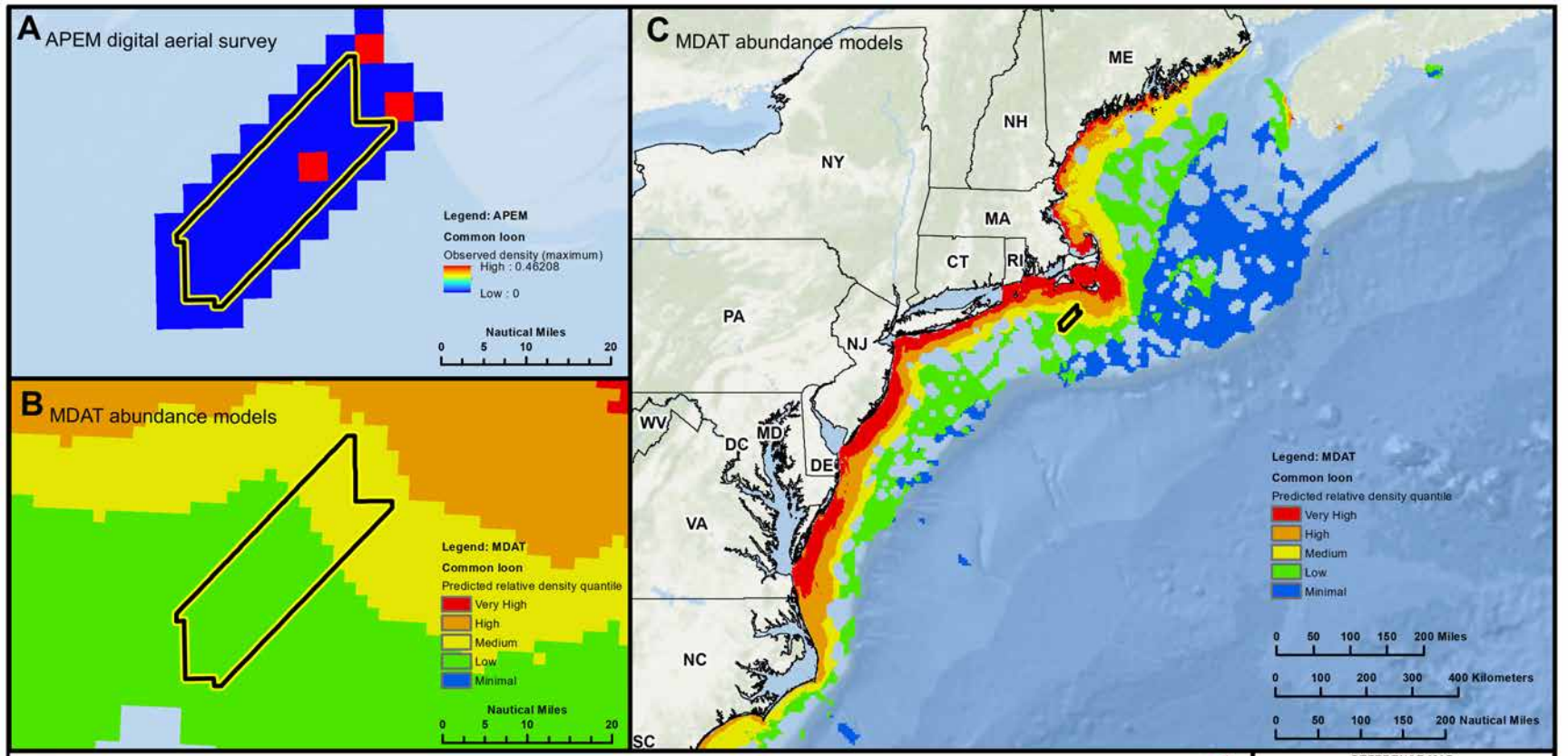


Beacon Wind OCS-A 0520 Lease Area

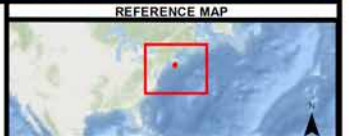
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
COMMON LOON ABUNDANCE
WINTER: DECEMBER - FEBRUARY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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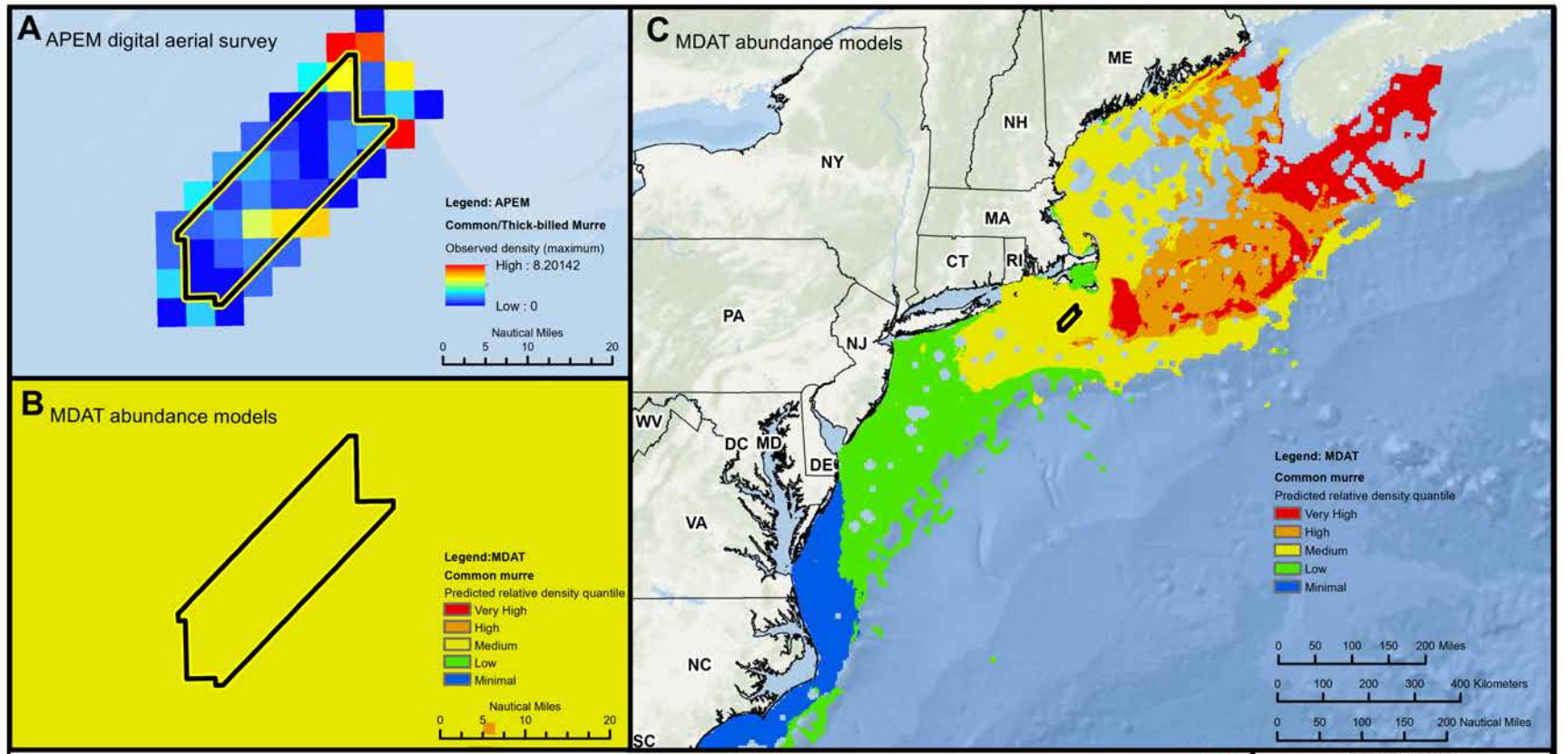


Beacon Wind OCS-A 0520 Lease Area

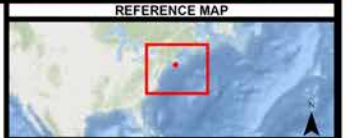
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
COMMON MURRE ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



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Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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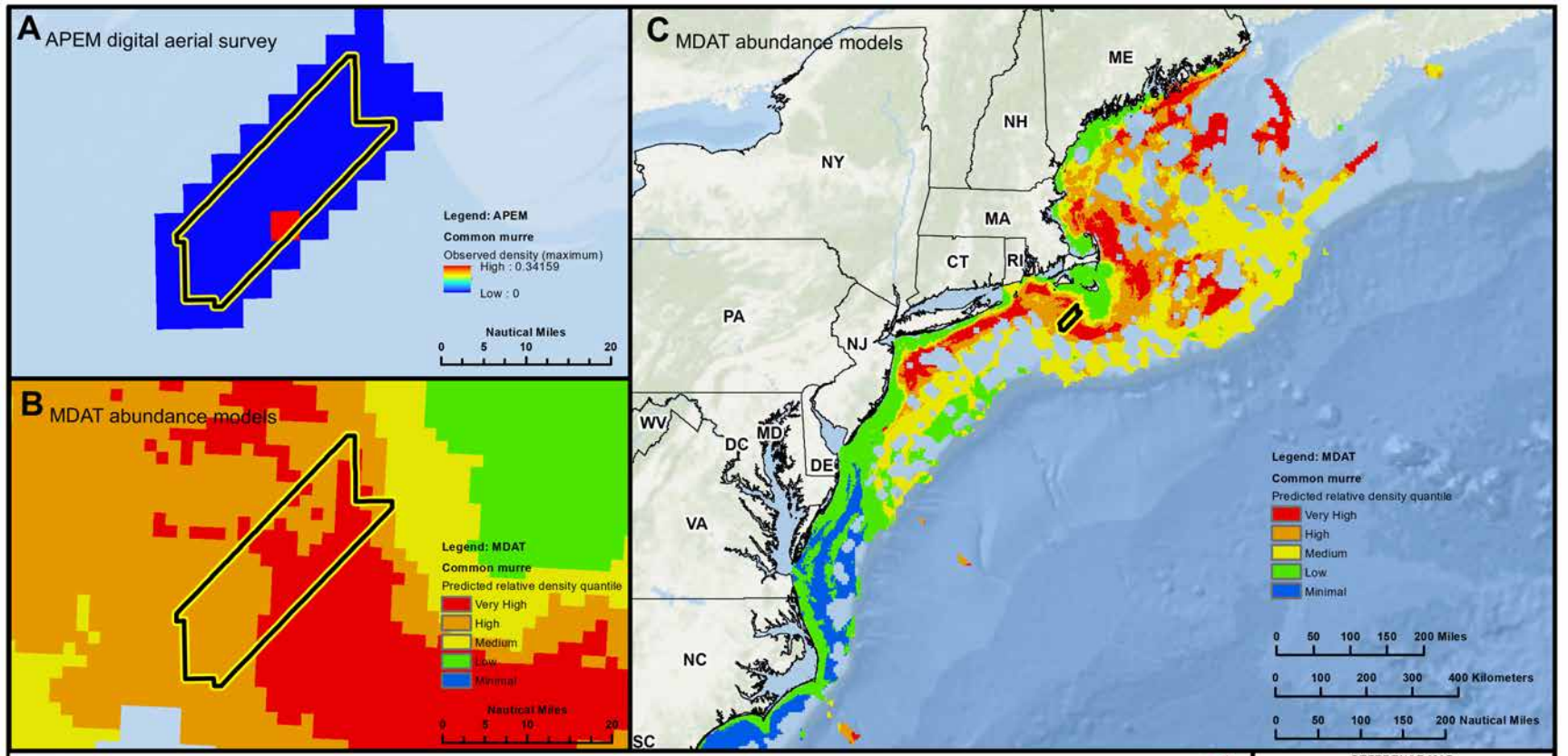


Beacon Wind OCS-A 0520 Lease Area

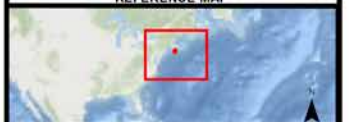
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
COMMON MURRE ABUNDANCE
WINTER: DECEMBER - FEBRUARY

equinor

AECOM

REFERENCE MAP



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Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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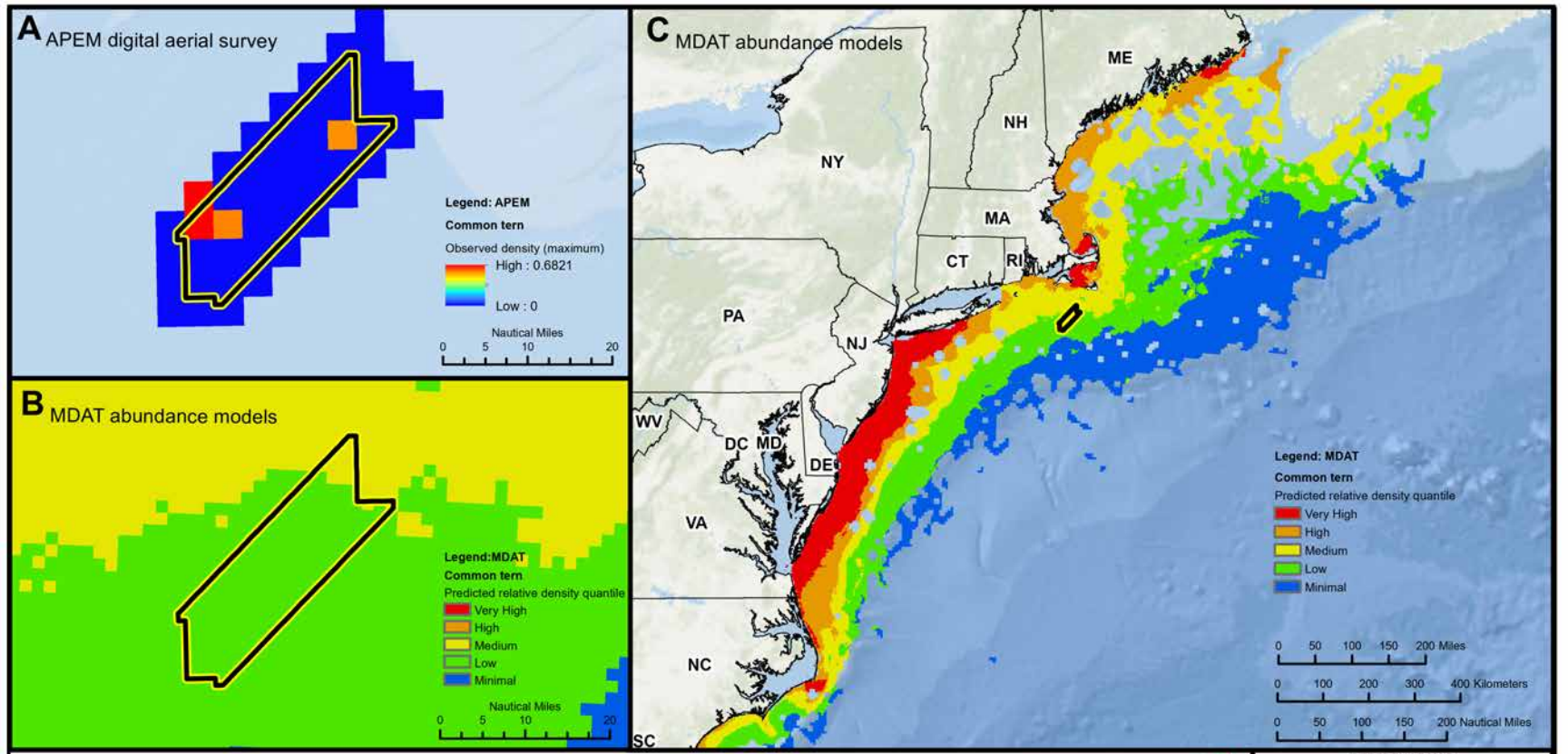


Beacon Wind OCS-A 0520 Lease Area

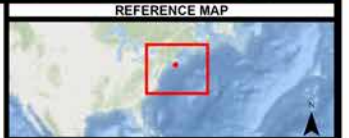
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
COMMON TERN ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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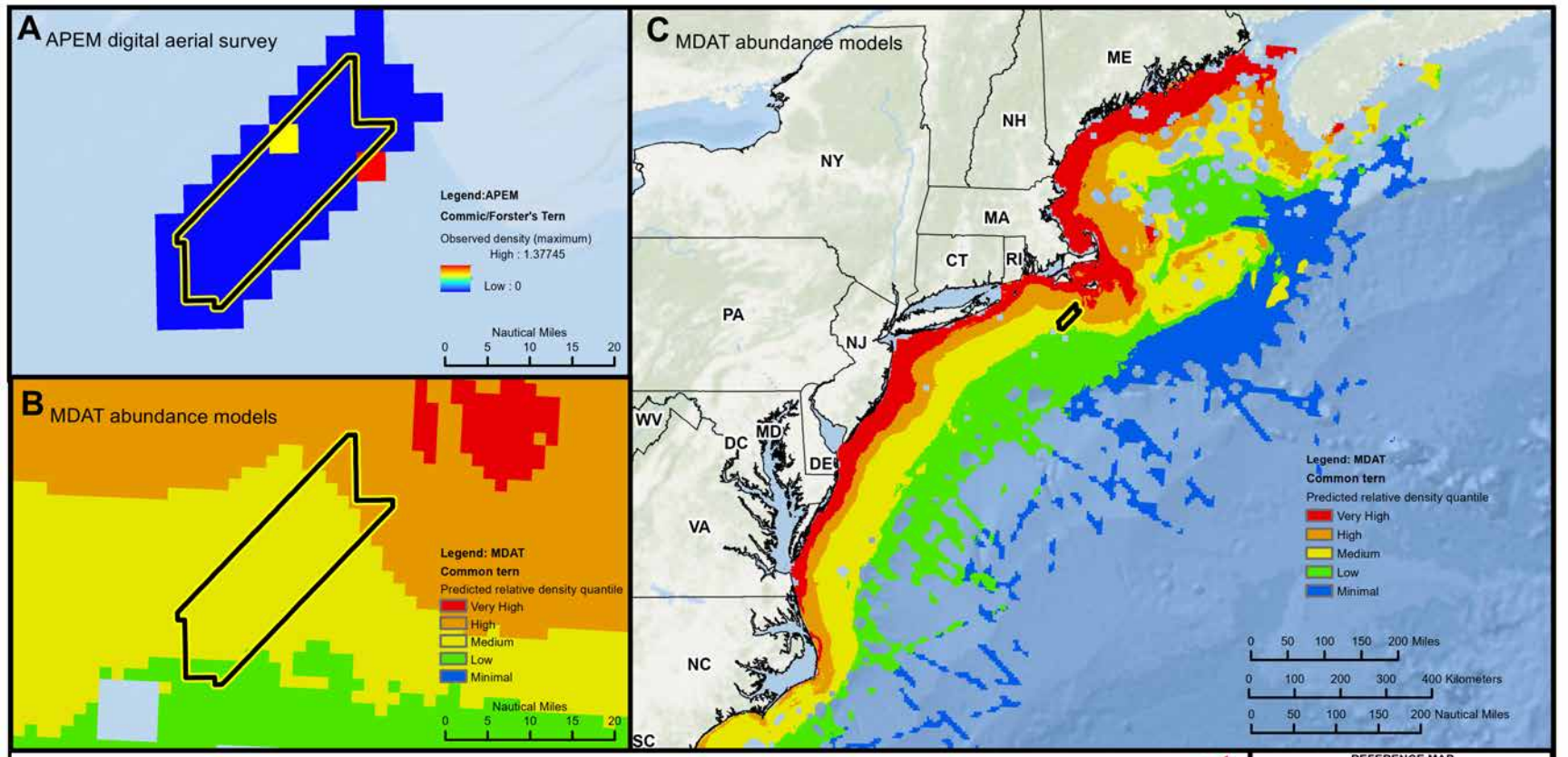

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
COMMON TERN ABUNDANCE
SUMMER: JUNE - AUGUST

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AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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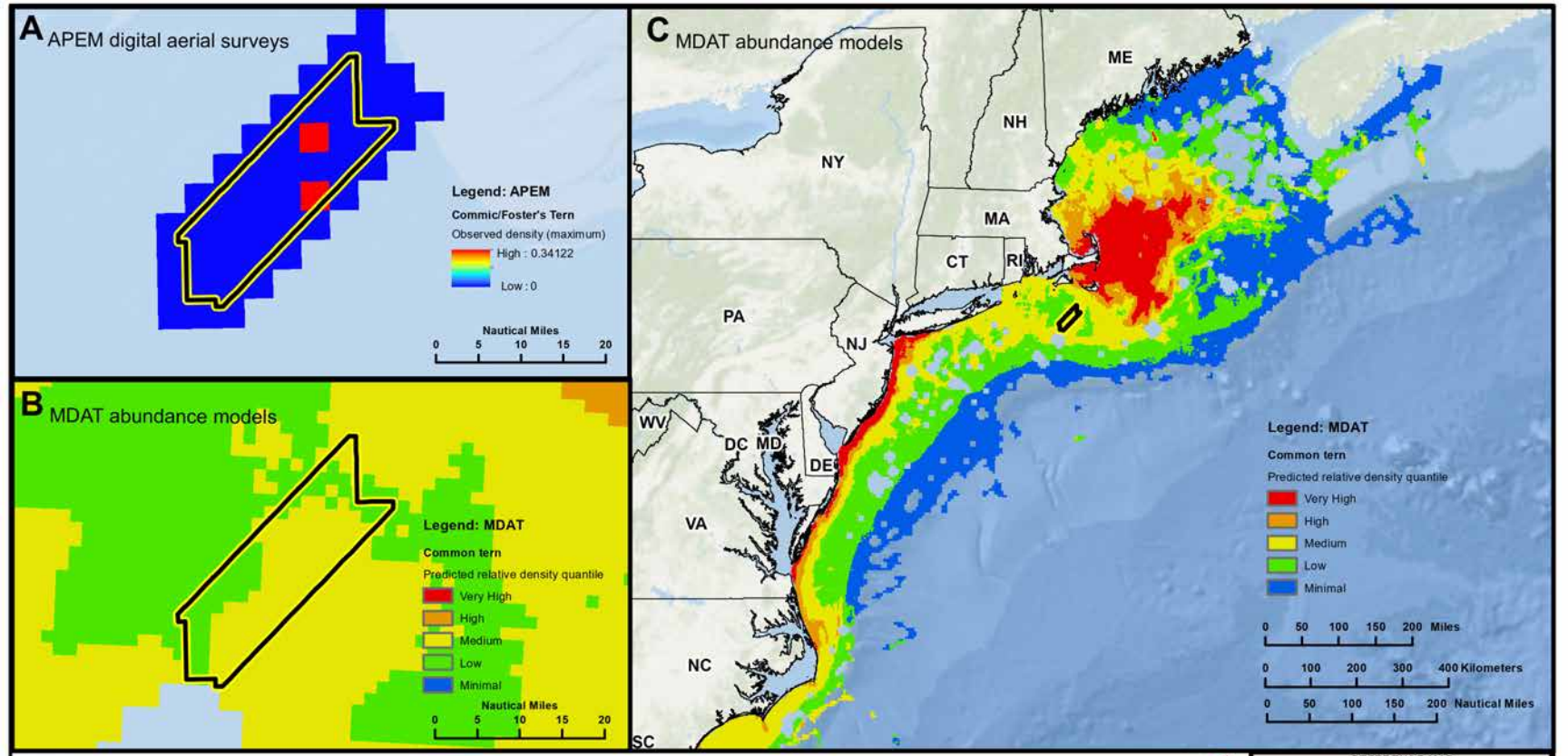

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
COMMON TERN ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

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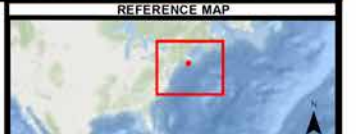
AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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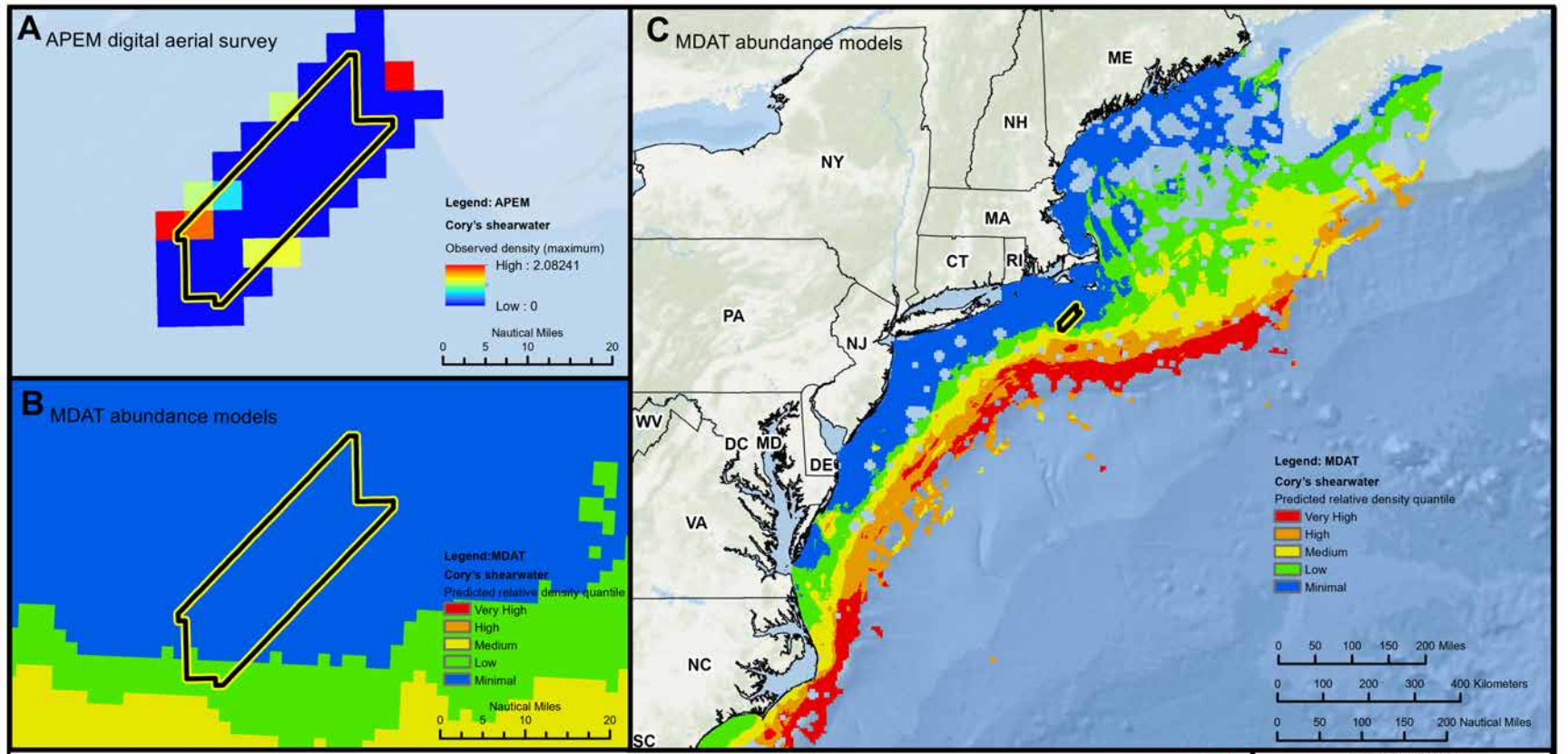


Beacon Wind OCS-A 0520 Lease Area

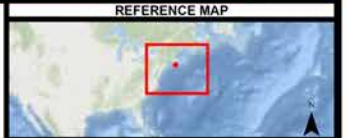
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
CORY'S SHEARWATER ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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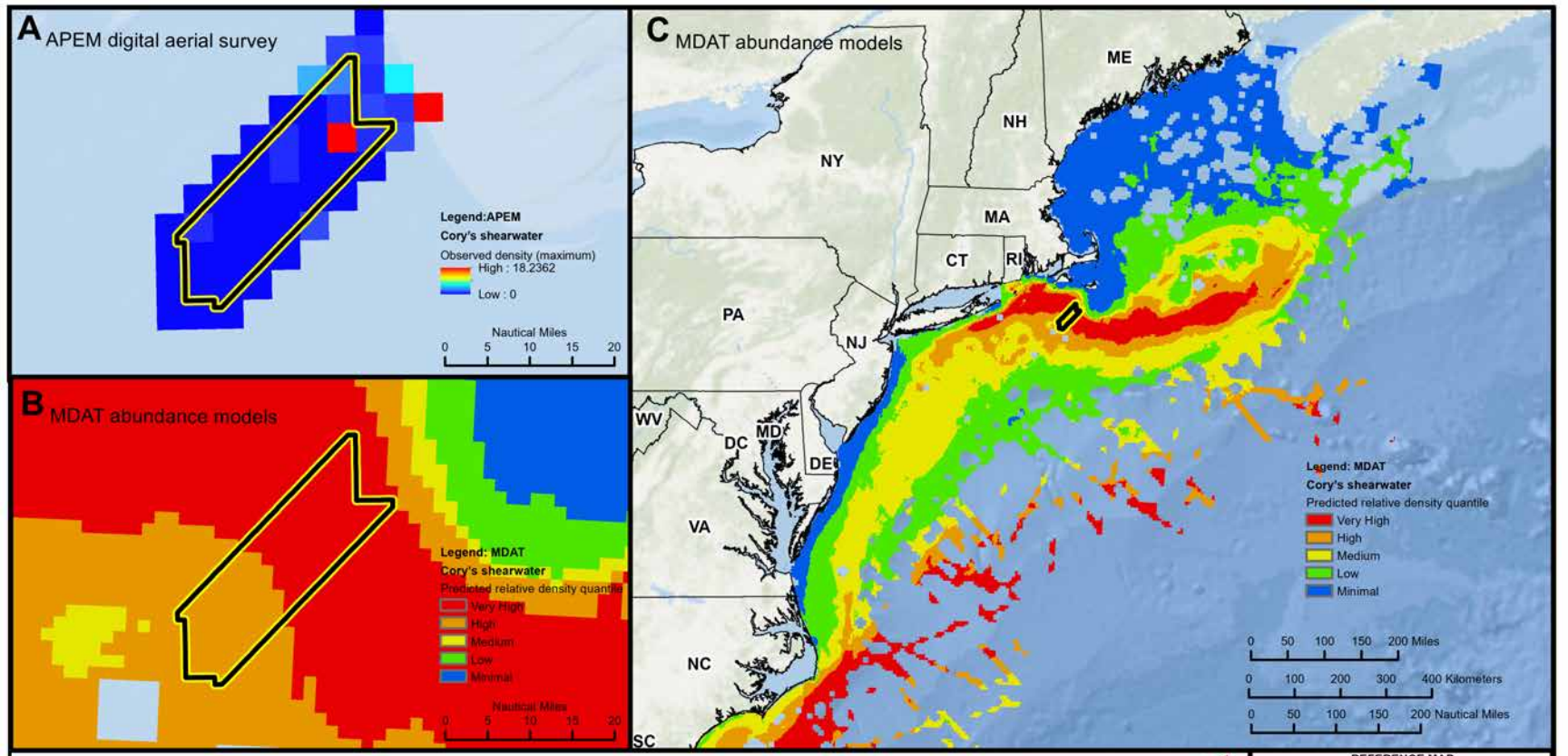

Beacon Wind OCS-A 0520 Lease Area

Date:	December 09, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
CORY'S SHEARWATER ABUNDANCE
SUMMER: JUNE - AUGUST

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AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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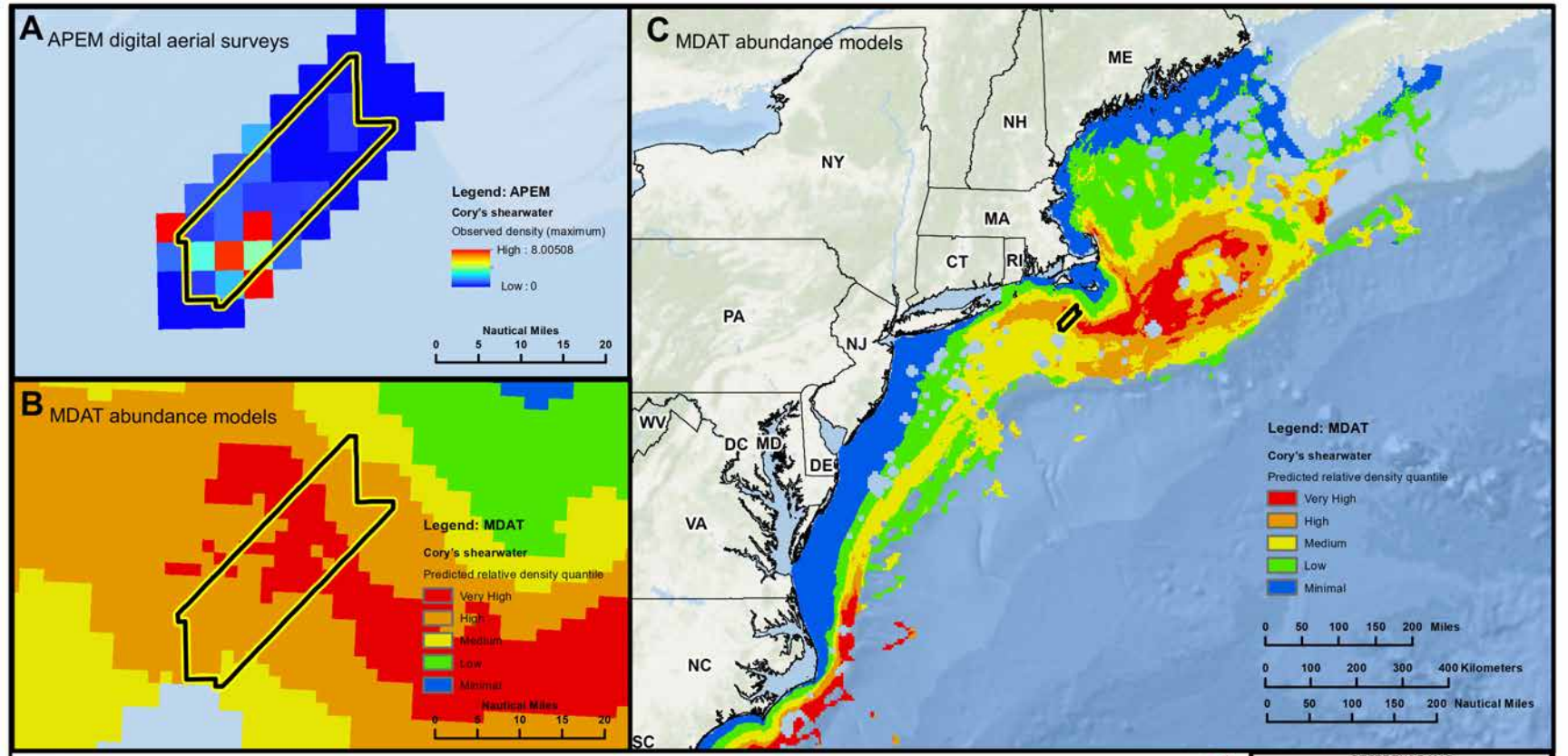

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
CORY'S SHEARWATER ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

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AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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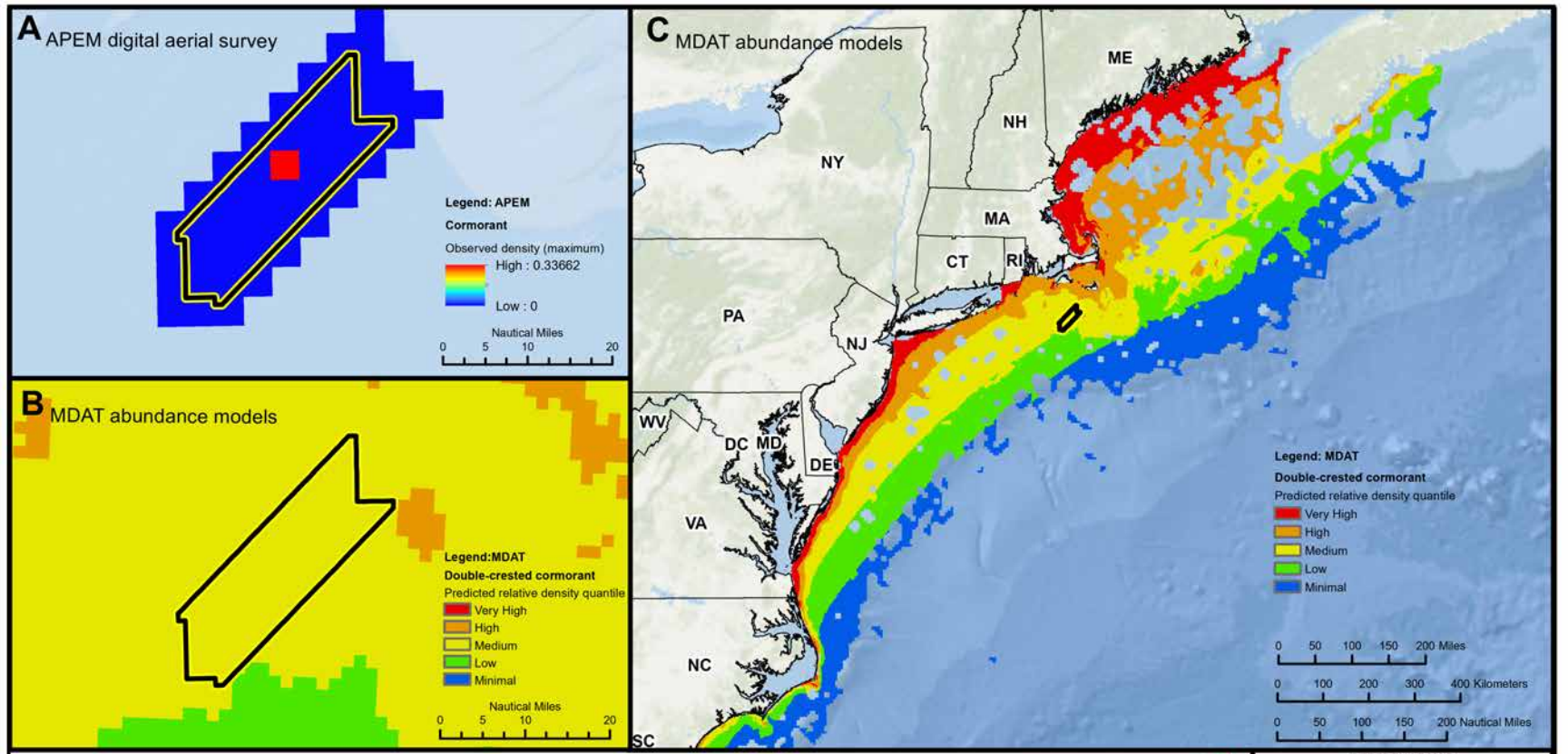

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
DOUBLE-CRESTED CORMORANT ABUNDANCE
SPRING: MARCH - MAY

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AECOM

REFERENCE MAP

Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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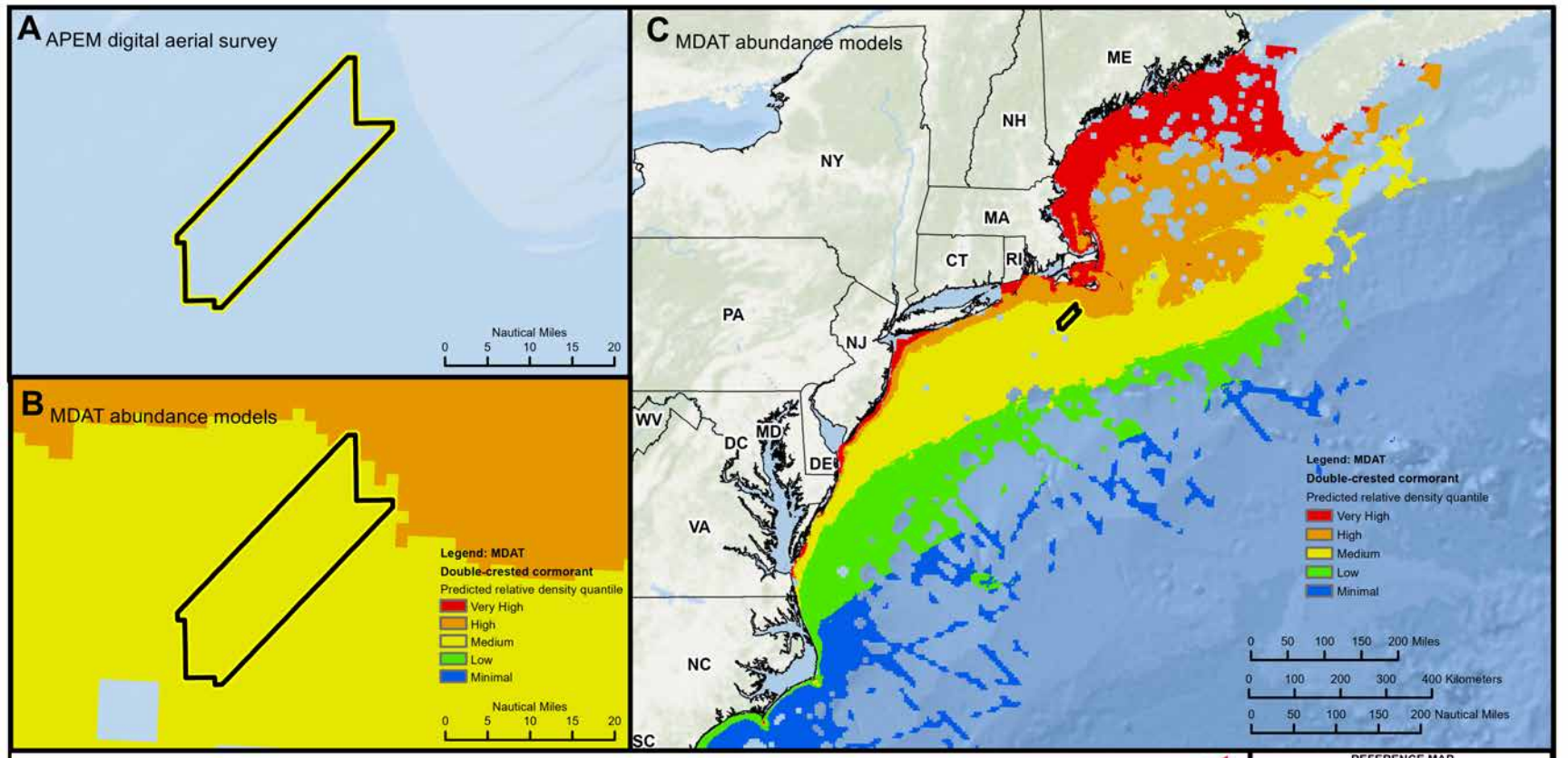

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
DOUBLE-CRESTED CORMORANT ABUNDANCE
SUMMER: JUNE - AUGUST

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AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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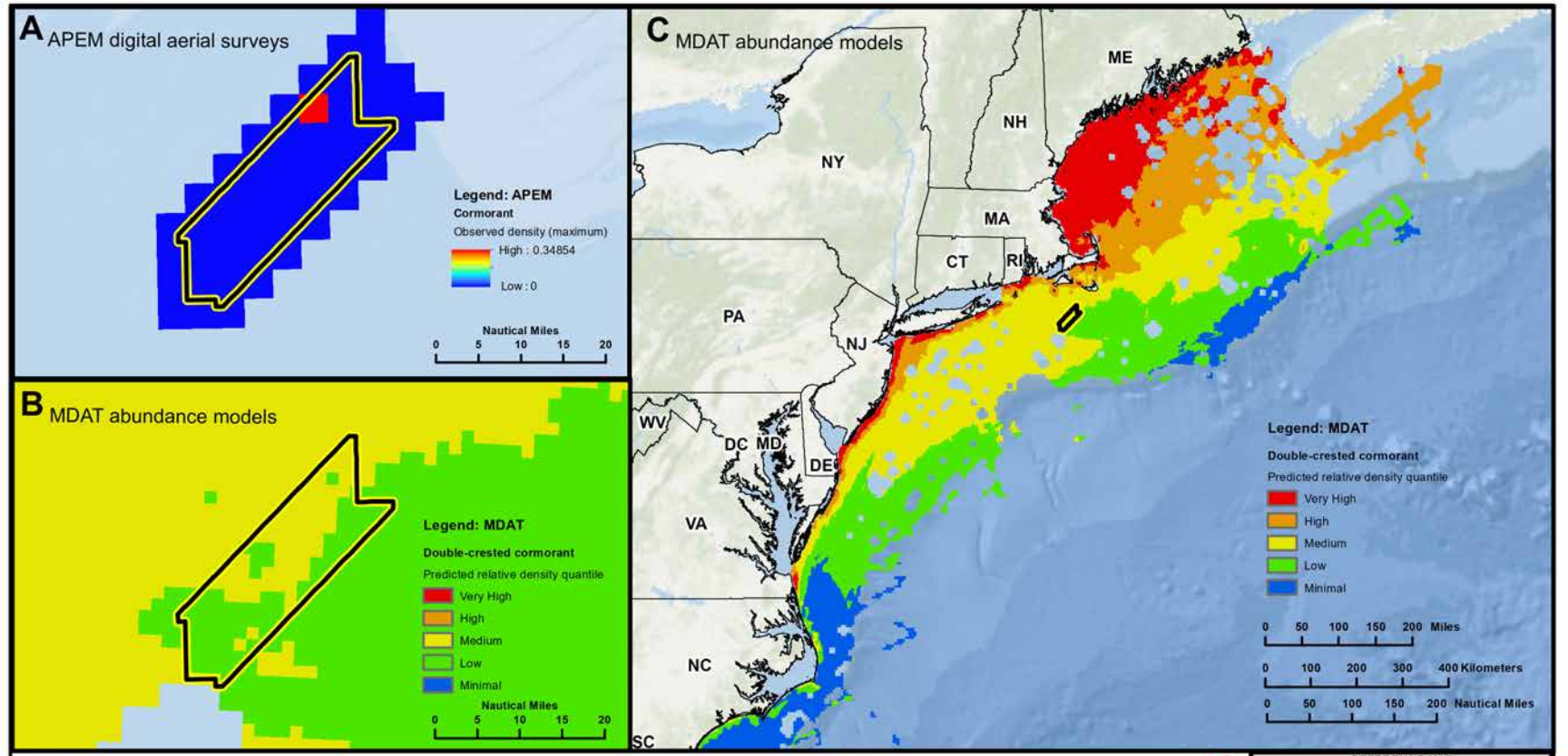

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
DOUBLE-CRESTED CORMORANT ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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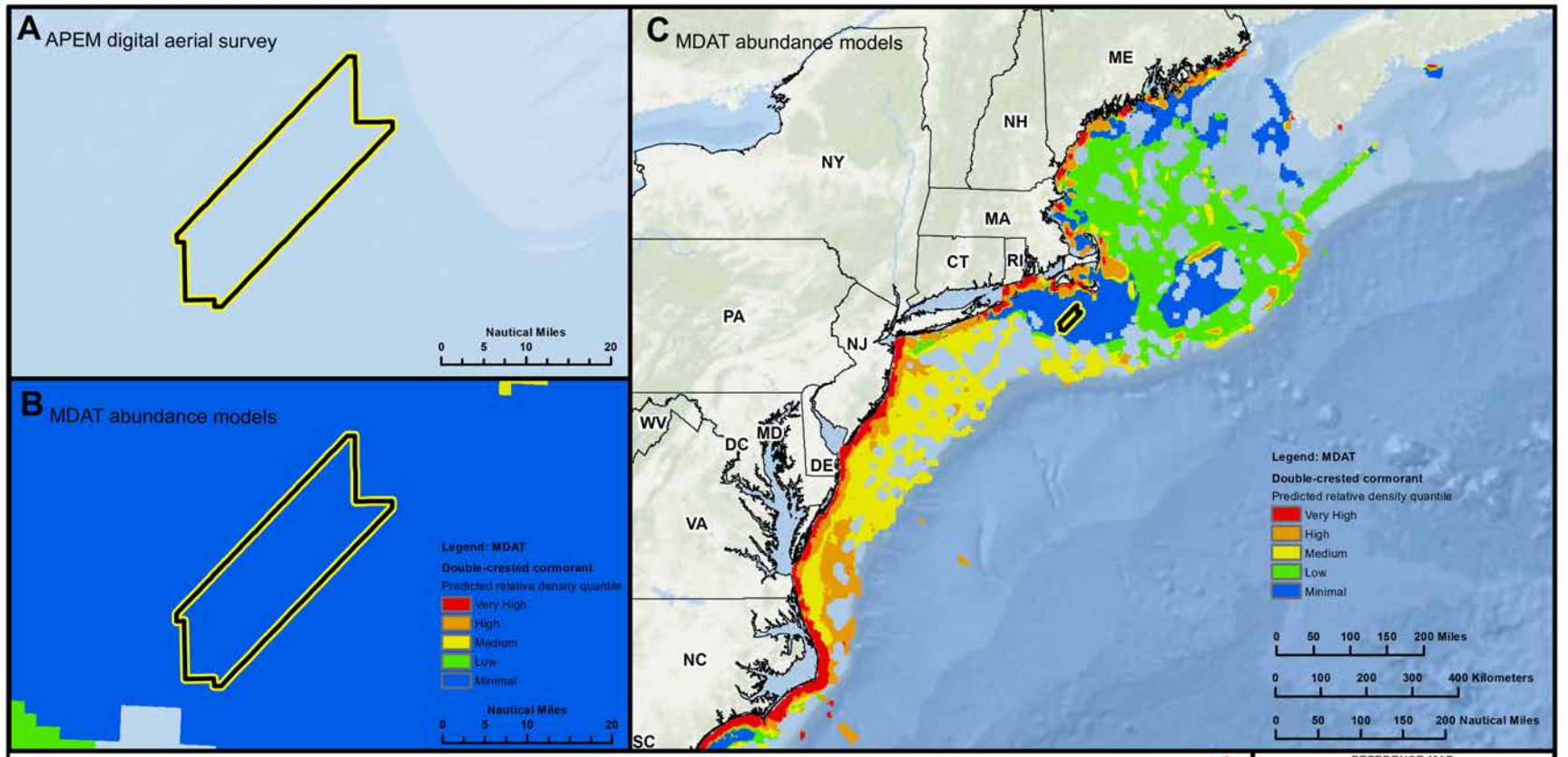


Beacon Wind OCS-A 0520 Lease Area

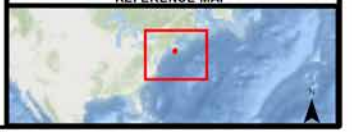
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
DOUBLE-CRESTED CORMORANT ABUNDANCE
WINTER: DECEMBER - FEBRUARY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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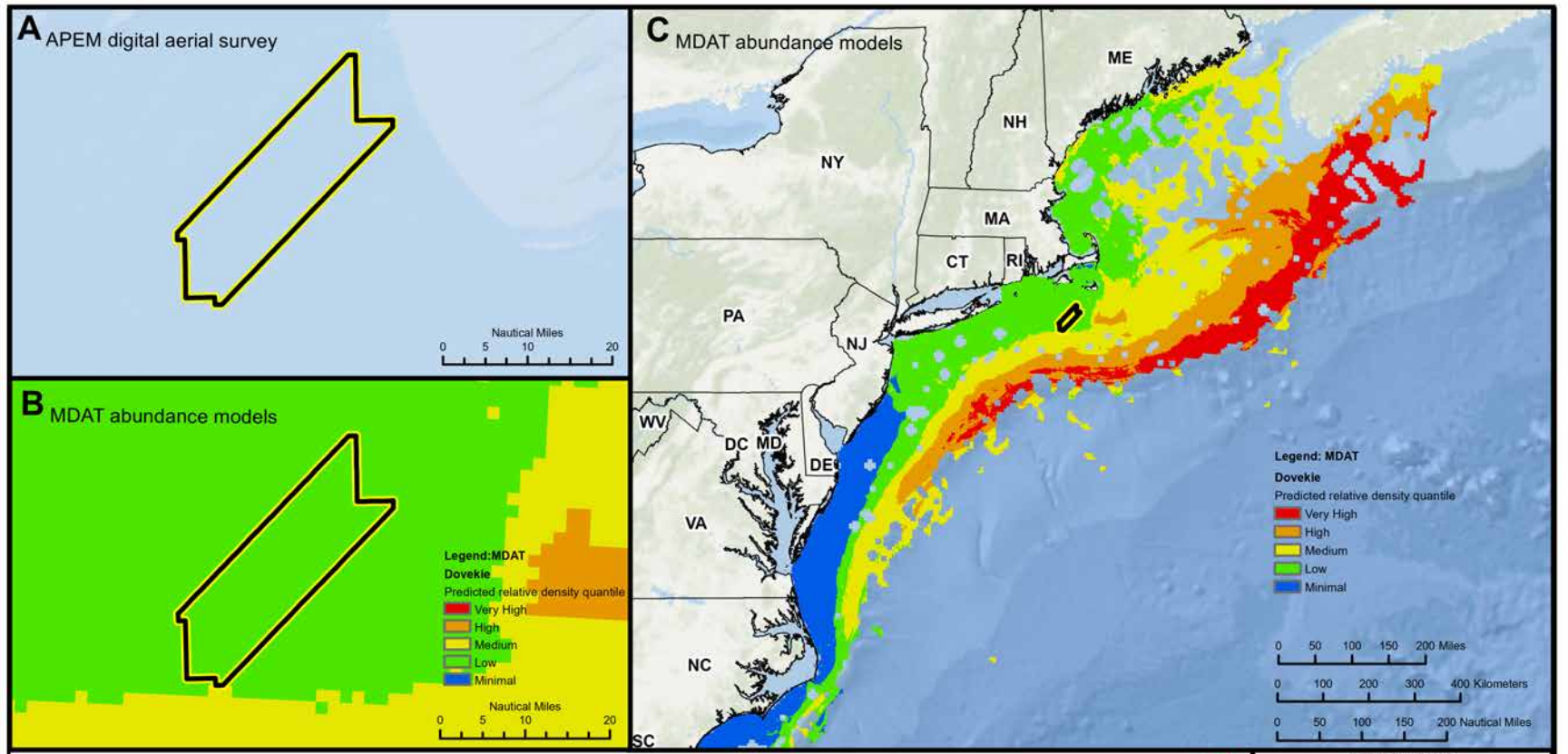


Beacon Wind OCS-A 0520 Lease Area

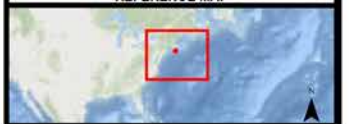
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
DOVEKIE ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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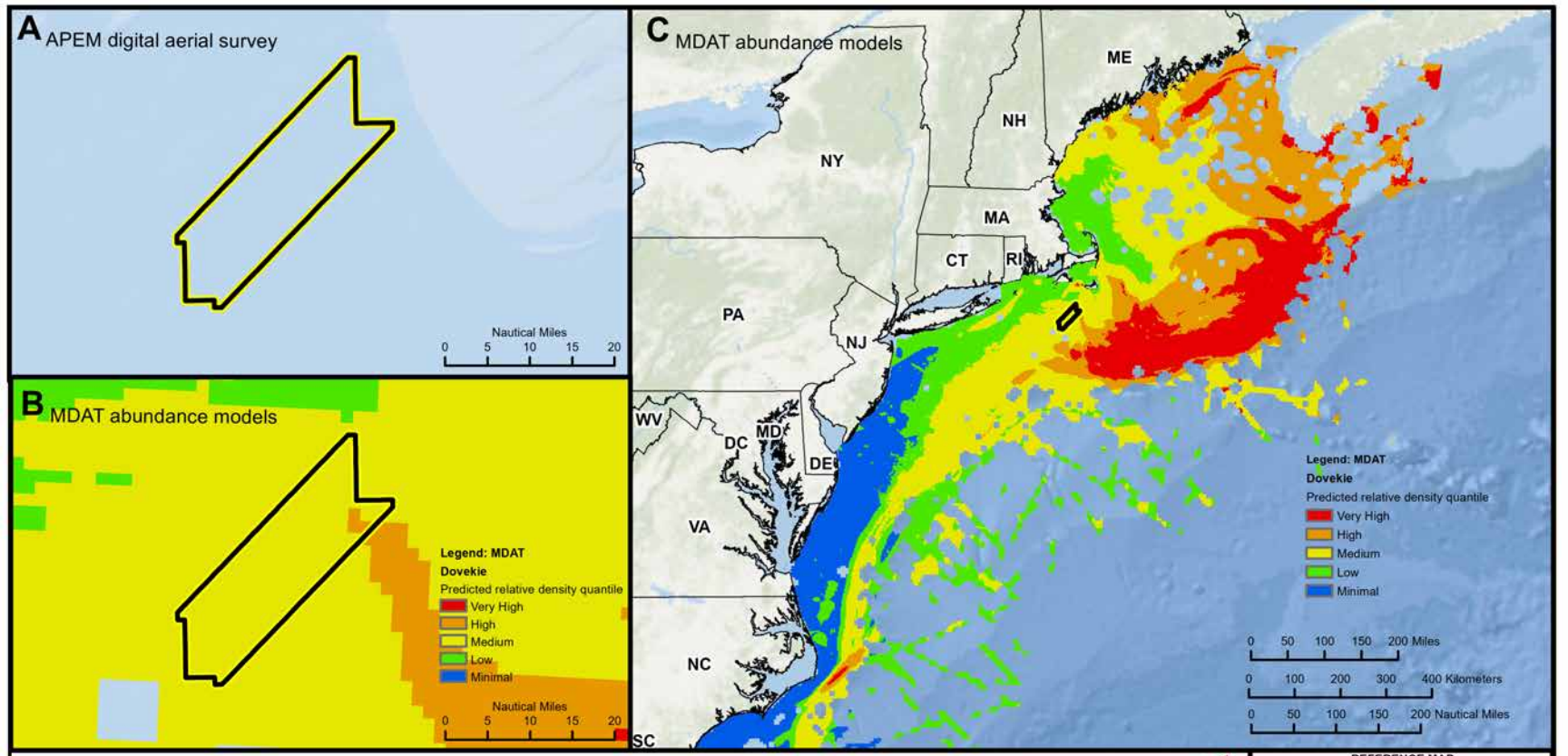

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
DOVEKIE ABUNDANCE
SUMMER: JUNE - AUGUST

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AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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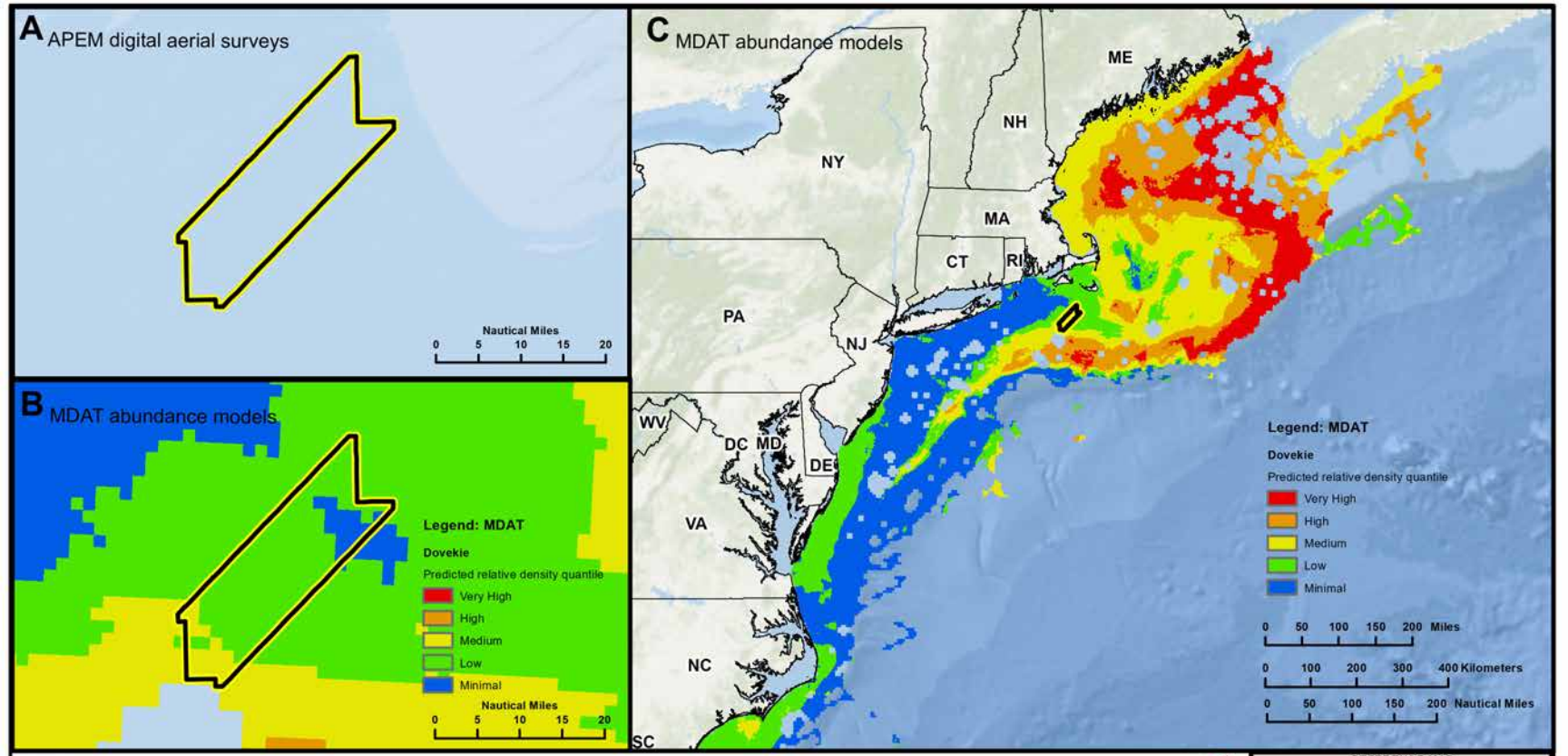

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
DOVEKIE ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

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REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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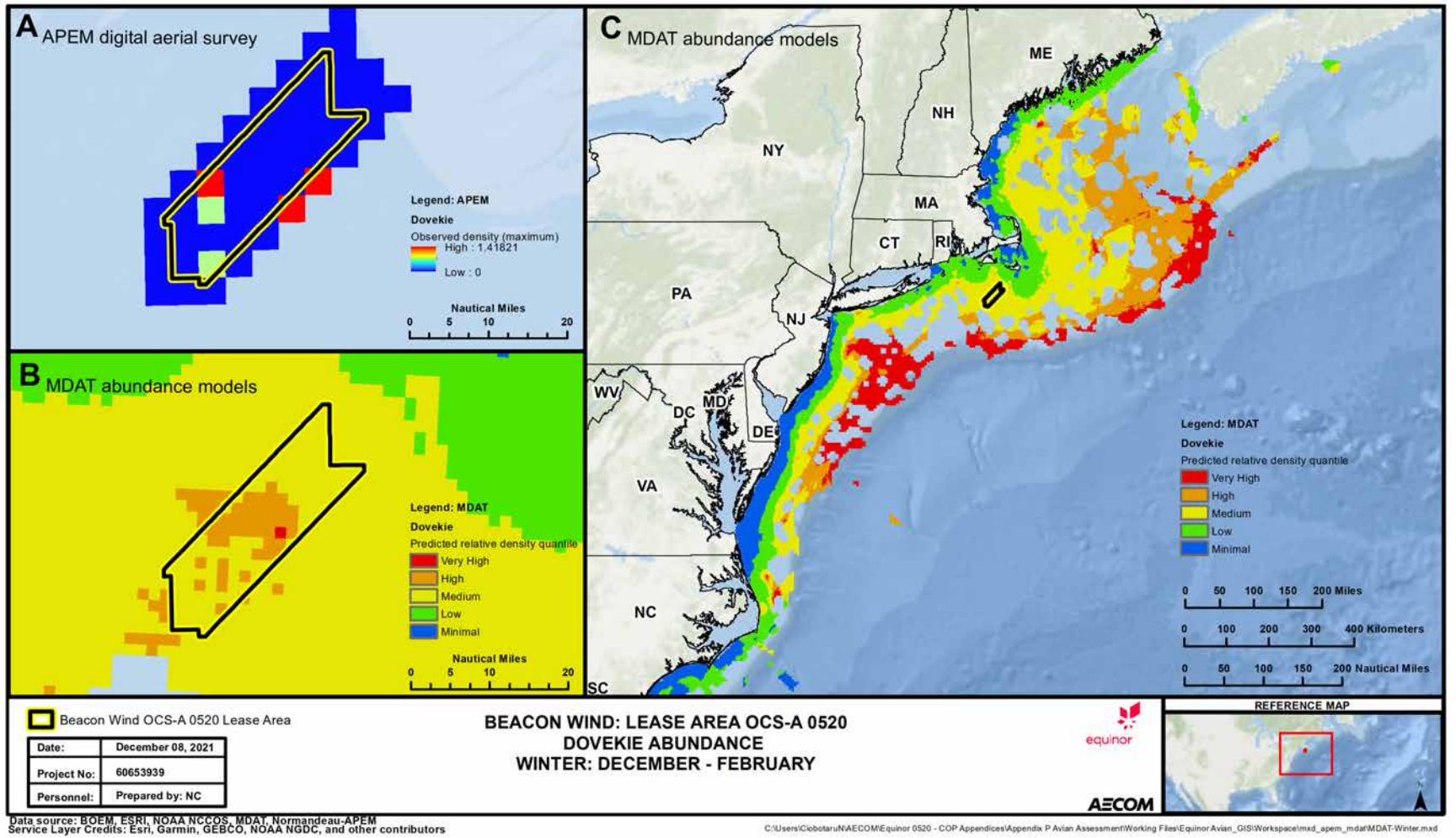
A APEM digital aerial survey
Legend: APEM
Dovekie
Observed density (maximum)
High : 1.41821
Low : 0
Nautical Miles
0 5 10 20
B MDAT abundance models
Legend: MDAT
Dovekie
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 20
C MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
Dovekie
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 08, 2021
Project No: 60653939
Personnel: Prepared by: NC
BEACON WIND: LEASE AREA OCS-A 0520
DOVEKIE ABUNDANCE
WINTER: DECEMBER - FEBRUARY
equinor
AECOM
REFERENCE MAP
Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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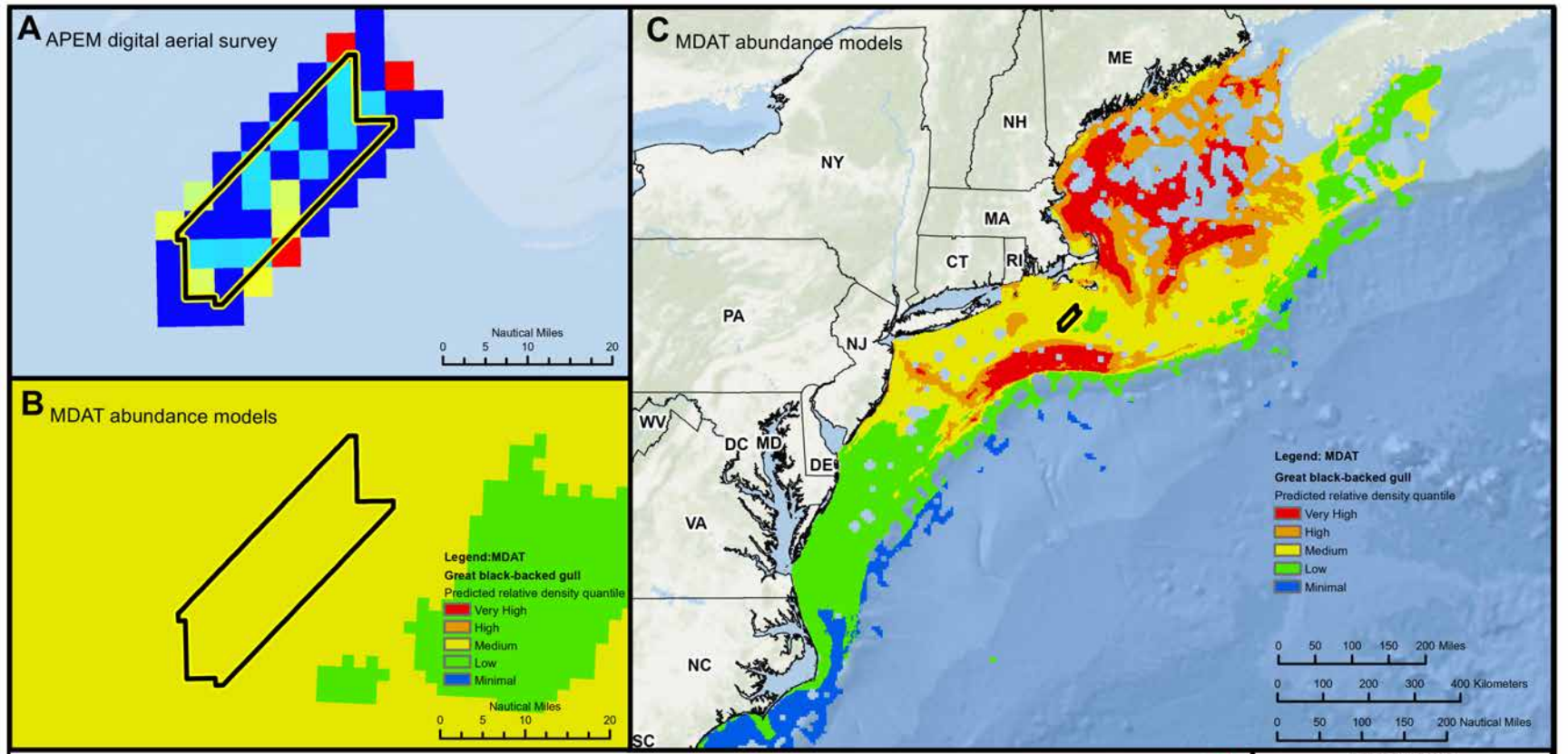


Beacon Wind OCS-A 0520 Lease Area

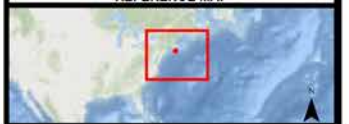
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
GREAT BLACK-BACKED GULL ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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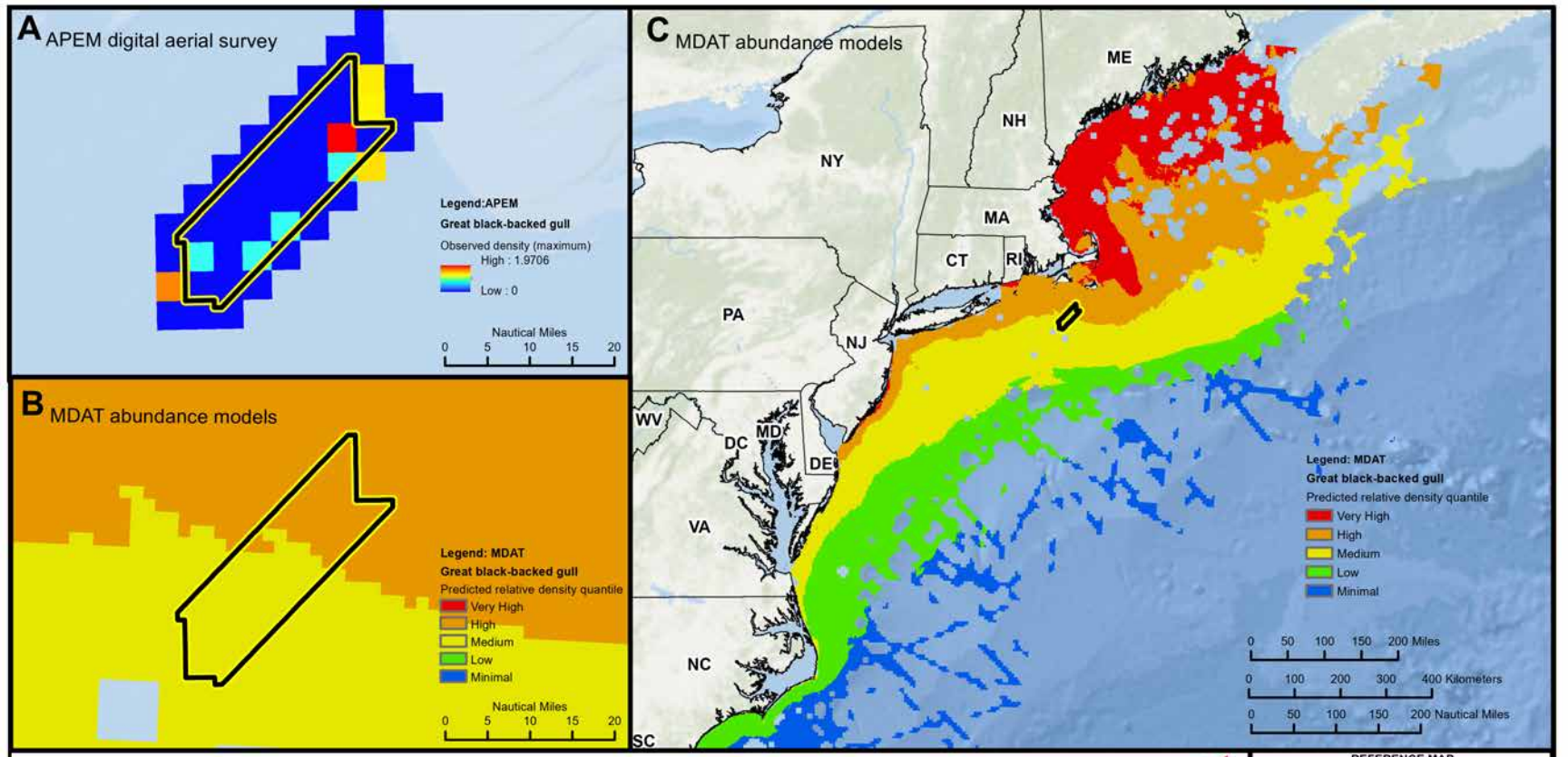

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
GREAT BLACK-BACKED GULL ABUNDANCE
SUMMER: JUNE - AUGUST

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AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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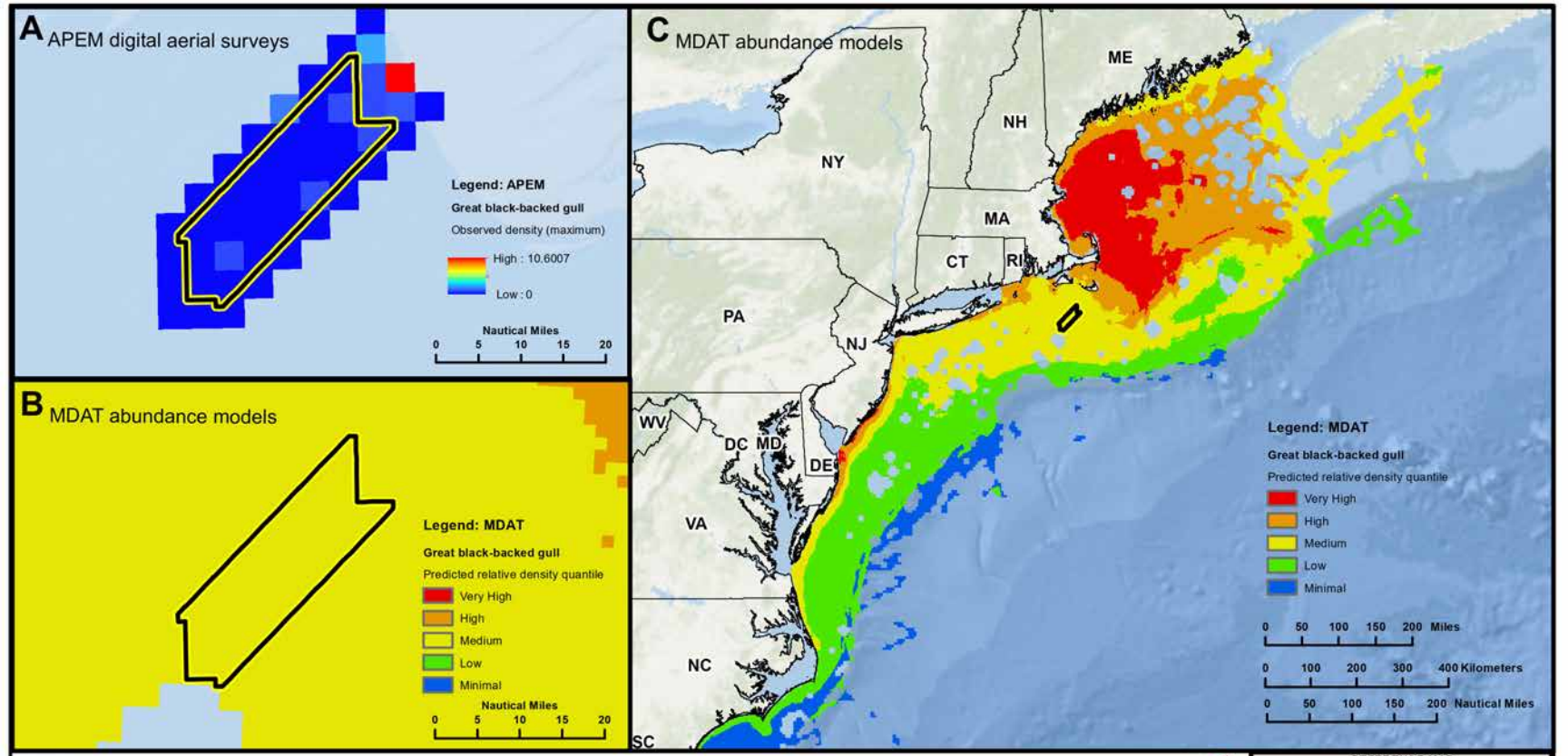

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
GREAT BLACK-BACKED GULL ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

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AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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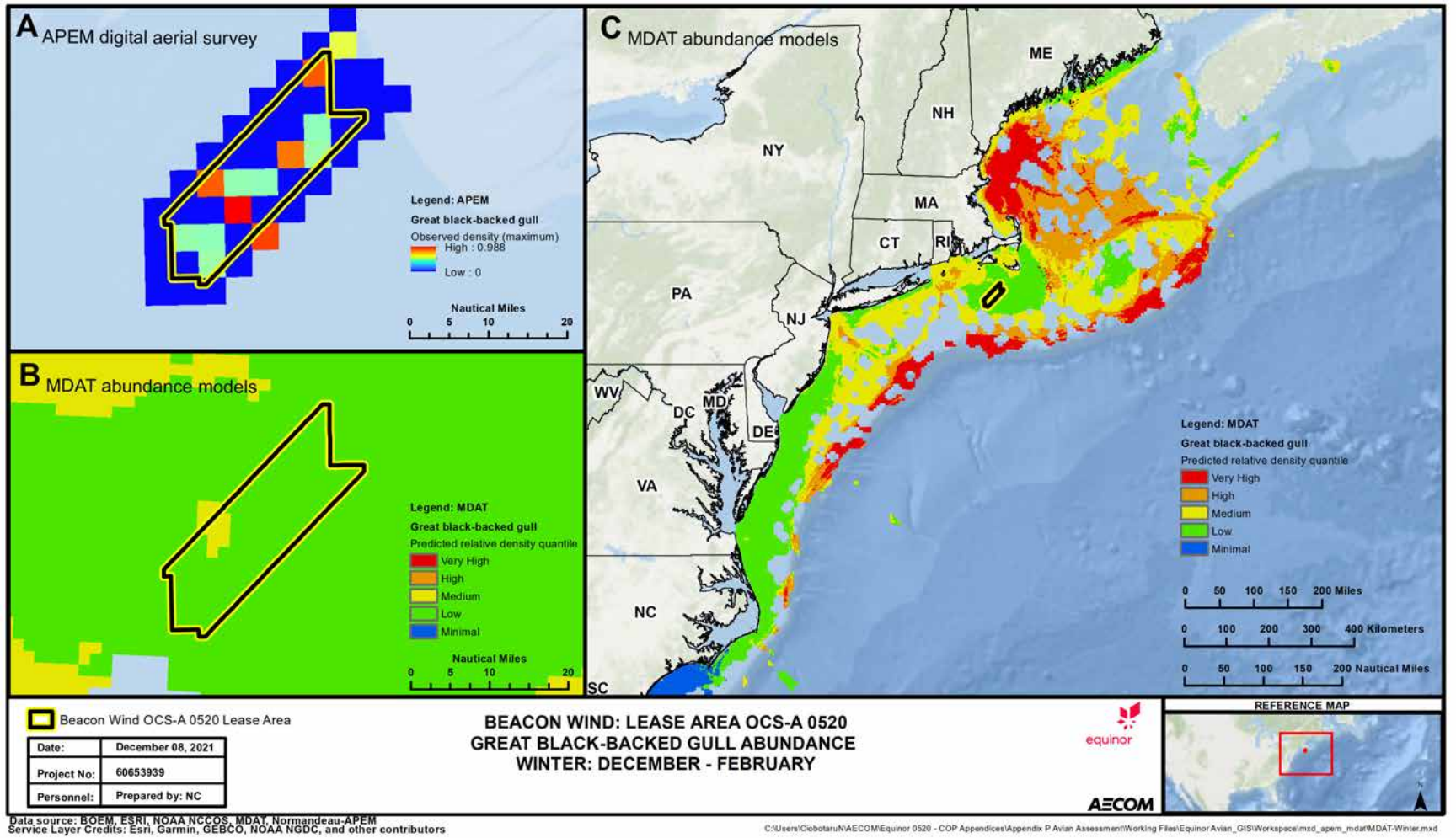
A APEM digital aerial survey
Legend: APEM
Great black-backed gull
Observed density (maximum)
High : 0.988
Low : 0
Nautical Miles
0 5 10 20
B MDAT abundance models
Legend: MDAT
Great black-backed gull
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 20
C MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
Great black-backed gull
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 08, 2021
Project No: 60653939
Personnel: Prepared by: NC
BEACON WIND: LEASE AREA OCS-A 0520
GREAT BLACK-BACKED GULL ABUNDANCE
WINTER: DECEMBER - FEBRUARY
equinor
AECOM
REFERENCE MAP
Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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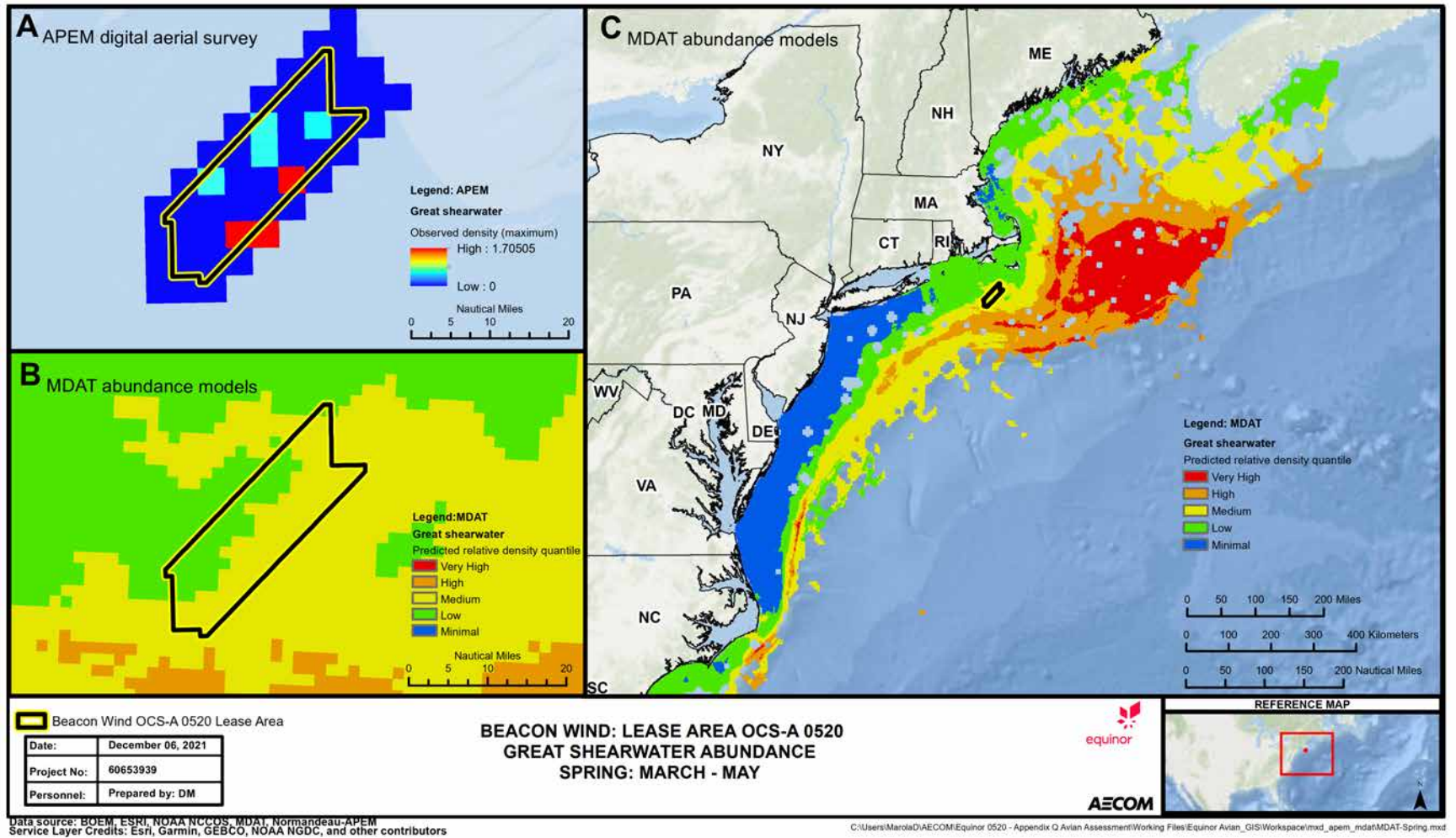
A
APEM digital aerial survey
Legend: APEM
Great shearwater
Observed density (maximum)
High : 1.70505
Low : 0
Nautical Miles
0 5 10 20
B
MDAT abundance models
Legend:MDAT
Great shearwater
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 20
C
MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
Great shearwater
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
GREAT SHEARWATER ABUNDANCE
SPRING: MARCH - MAY
equinor
AECOM
REFERENCE MAP
Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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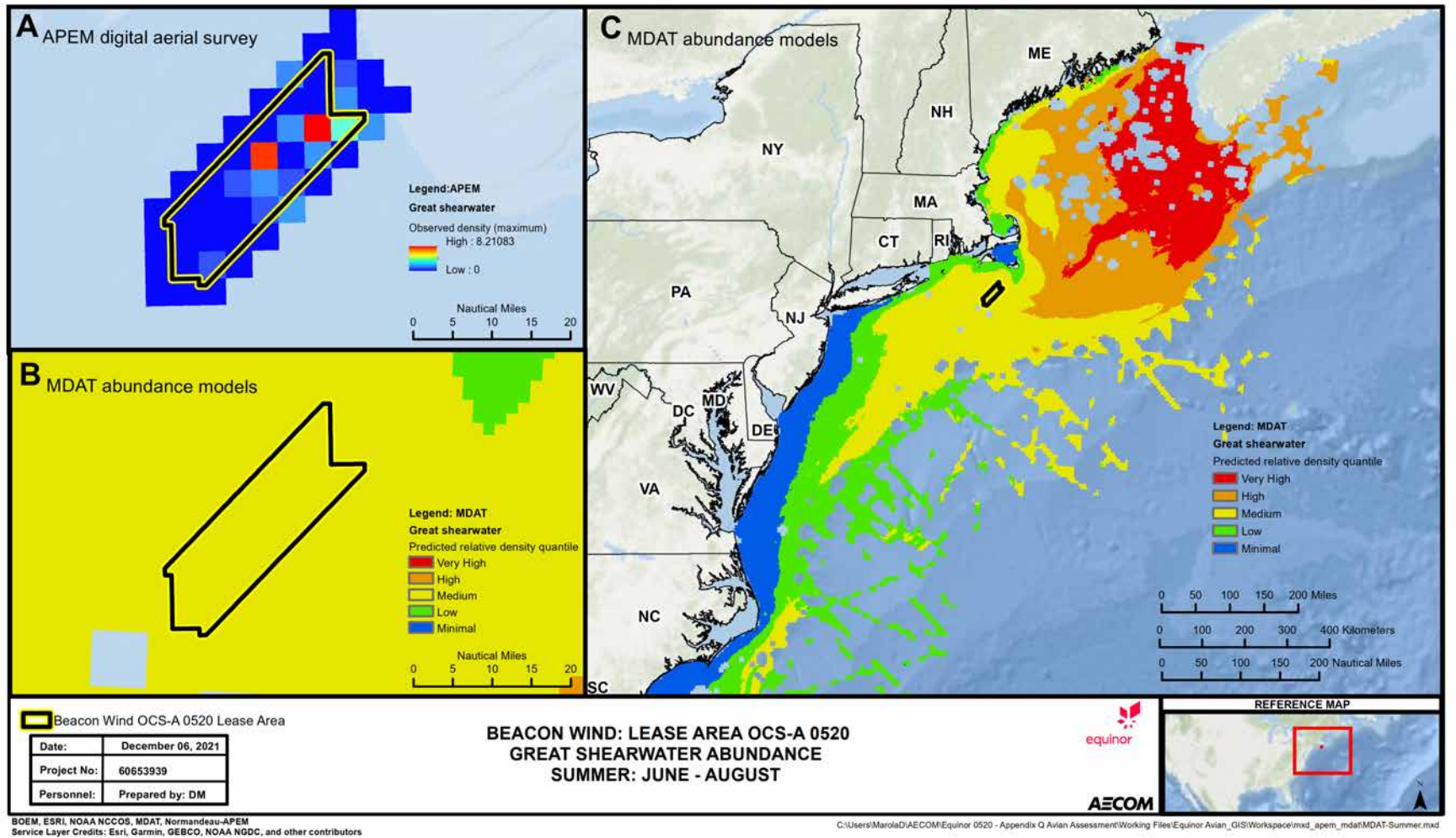
A APEM digital aerial survey
Legend:APEM
Great shearwater
Observed density (maximum)
High : 8.21083
Low : 0
Nautical Miles
0 5 10 15 20
B MDAT abundance models
Legend: MDAT
Great shearwater
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 15 20
C MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
Great shearwater
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
GREAT SHEARWATER ABUNDANCE
SUMMER: JUNE - AUGUST
equinor
AECOM
REFERENCE MAP
BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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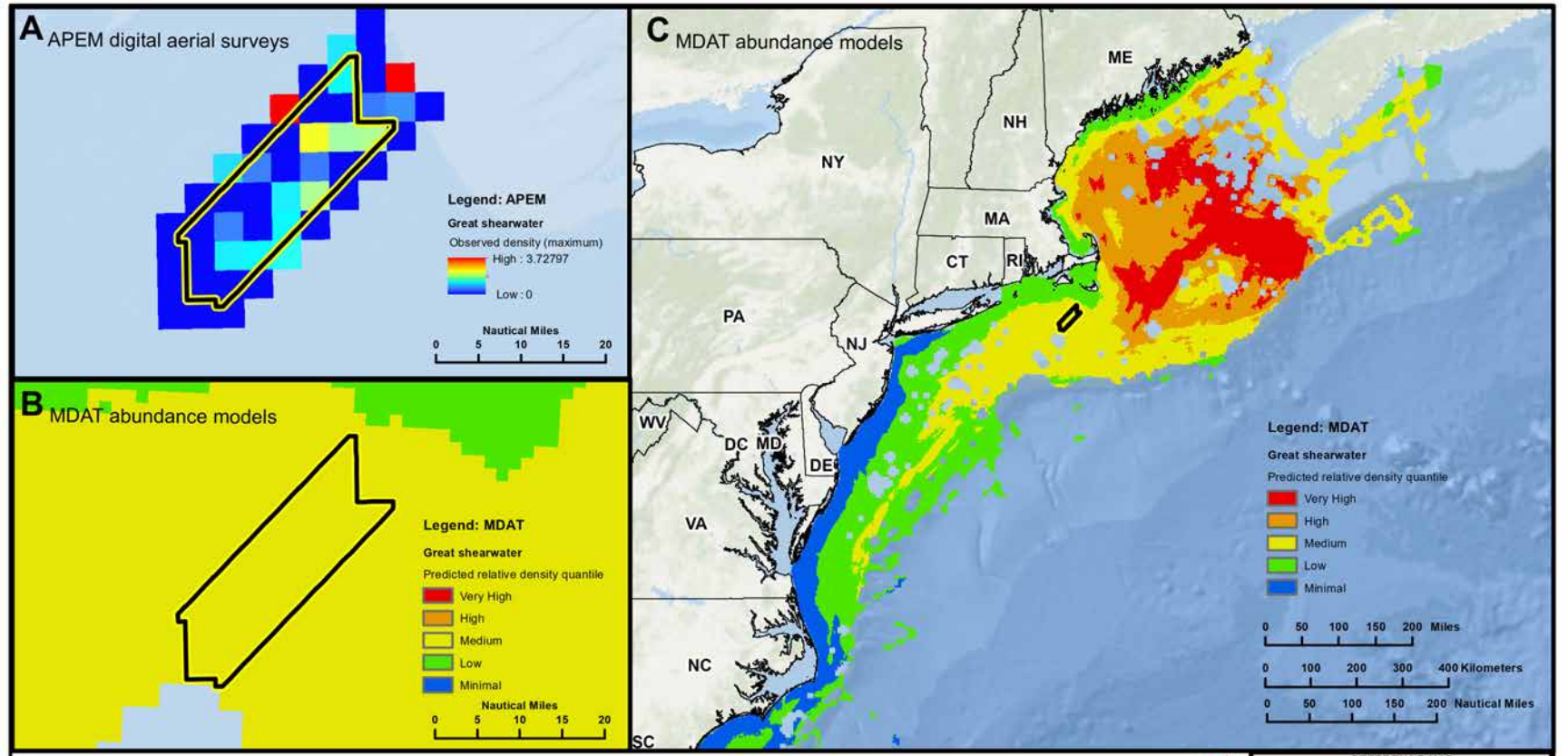

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
GREAT SHEARWATER ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

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REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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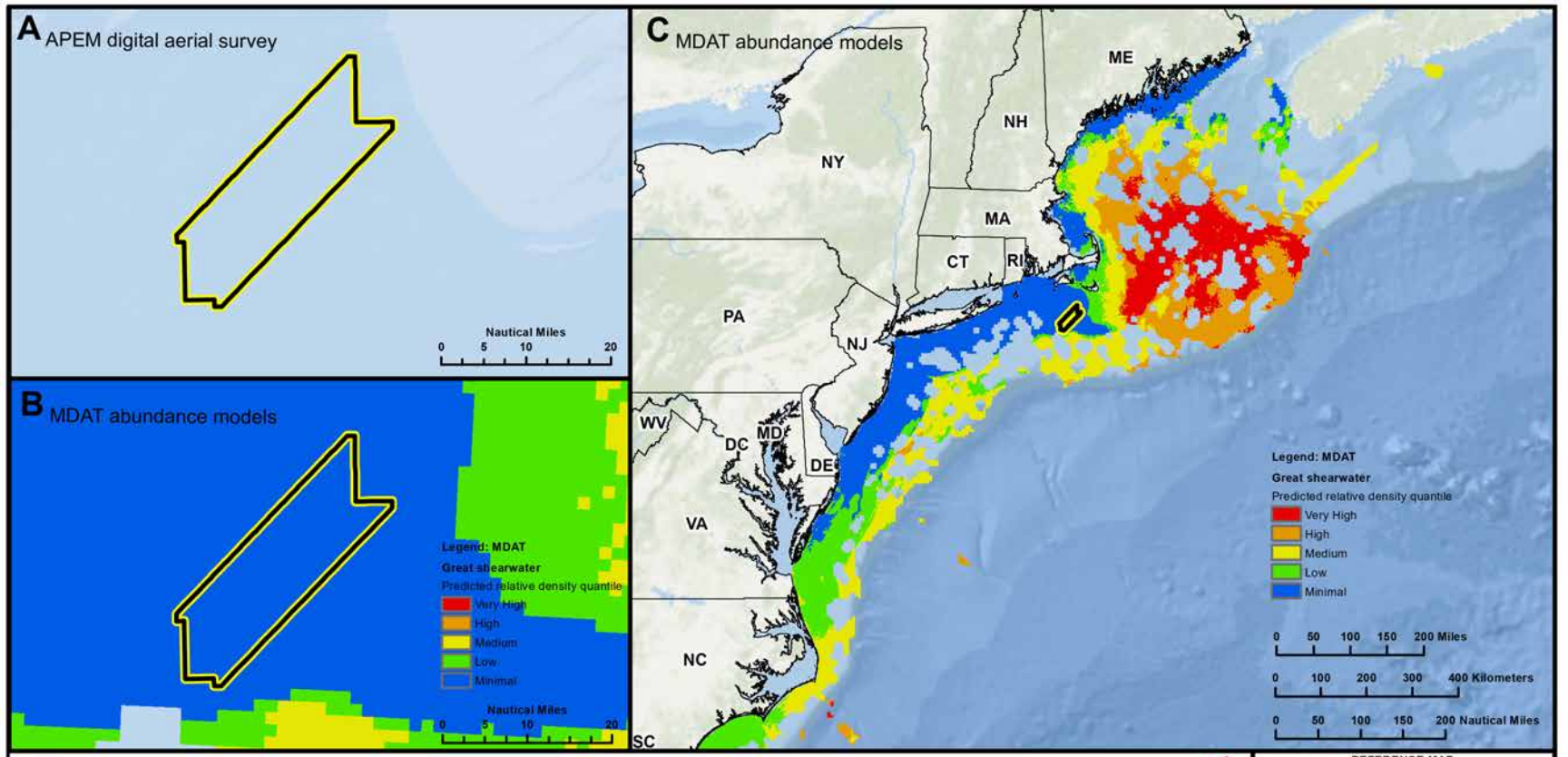


Beacon Wind OCS-A 0520 Lease Area

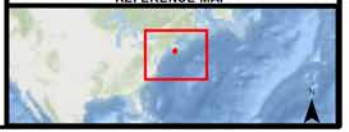
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
GREAT SHEARWATER ABUNDANCE
WINTER: DECEMBER - FEBRUARY

equinor

AECOM

REFERENCE MAP



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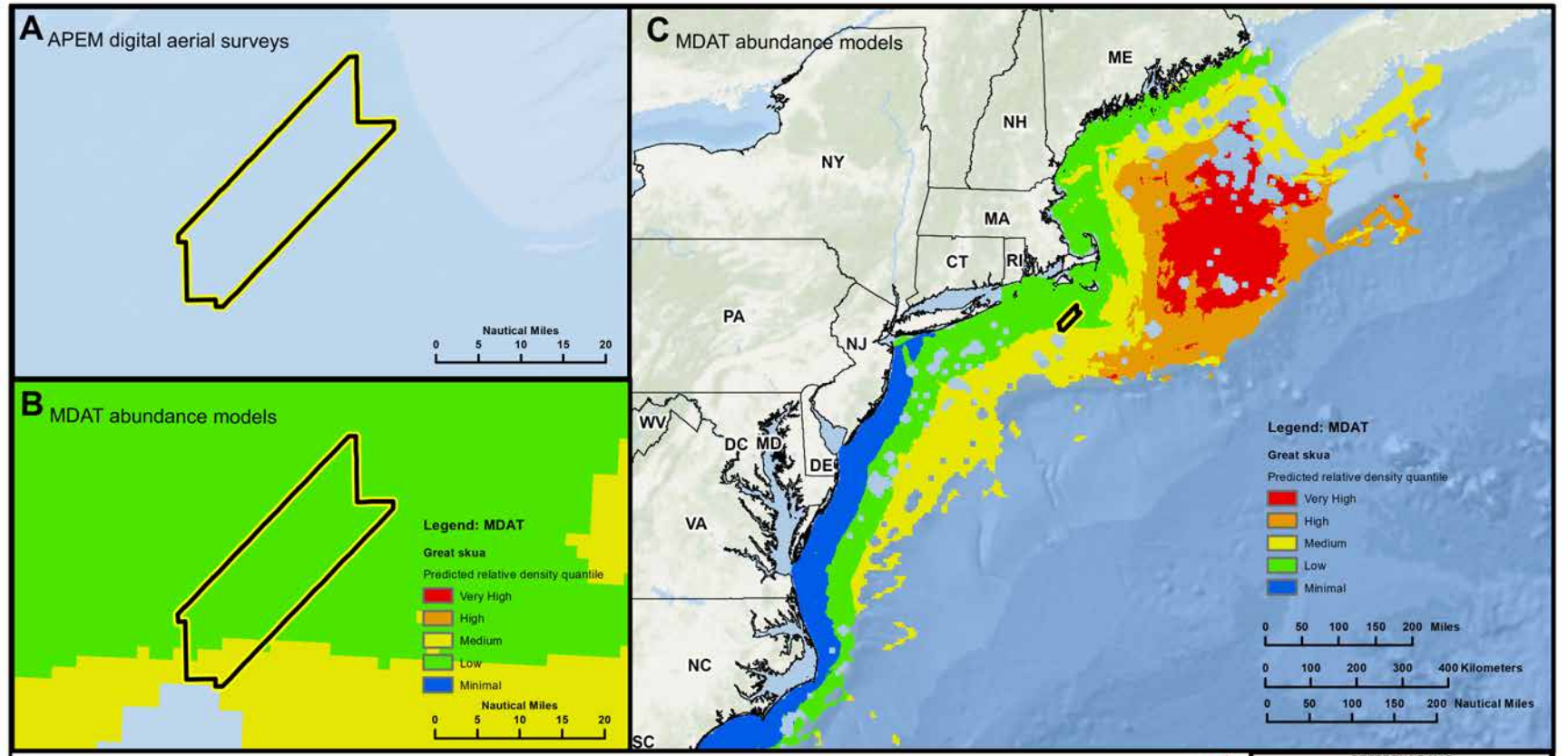

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
GREAT SKUA ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

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AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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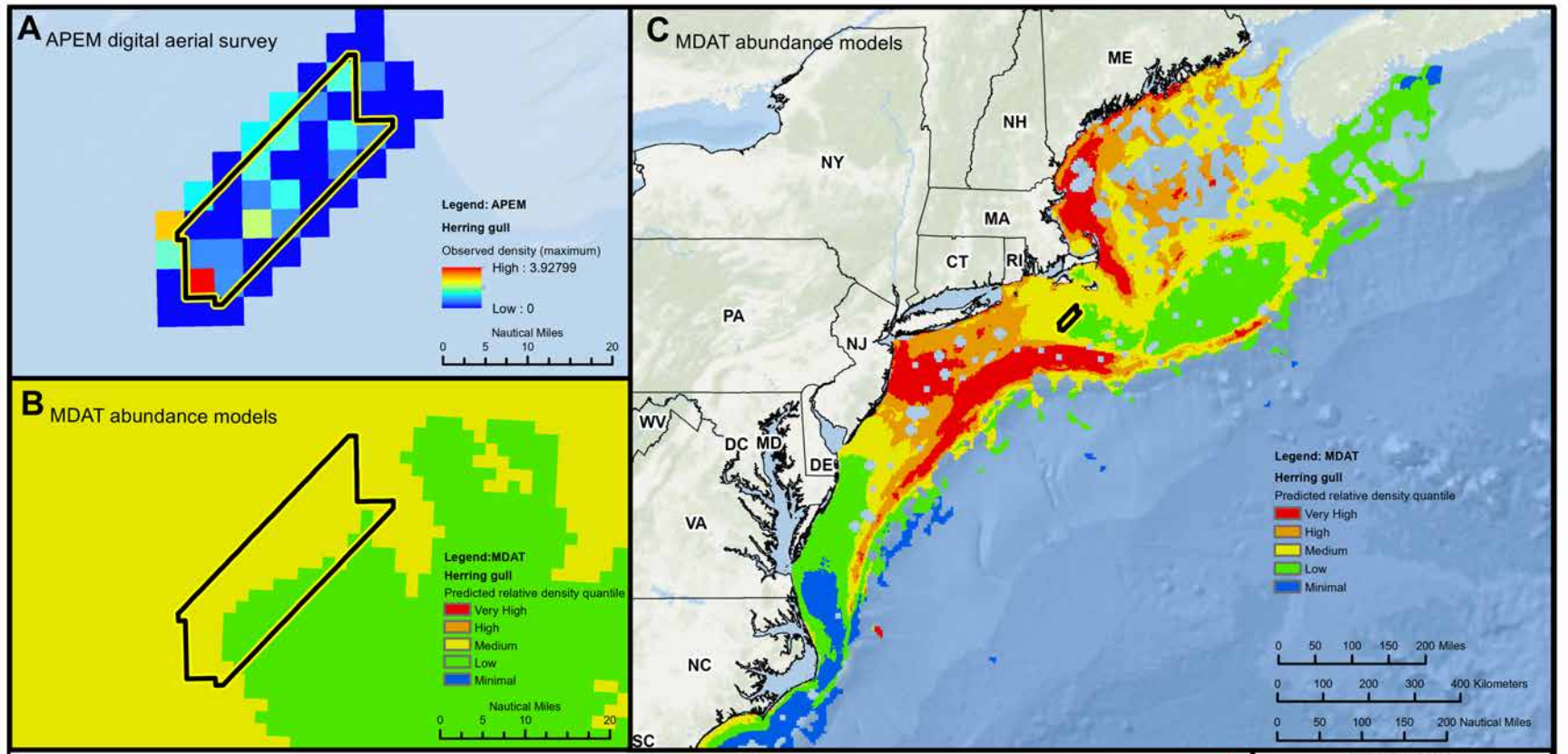

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
HERRING GULL ABUNDANCE
SPRING: MARCH - MAY

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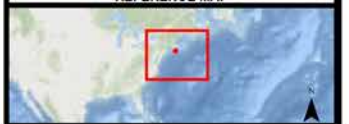
AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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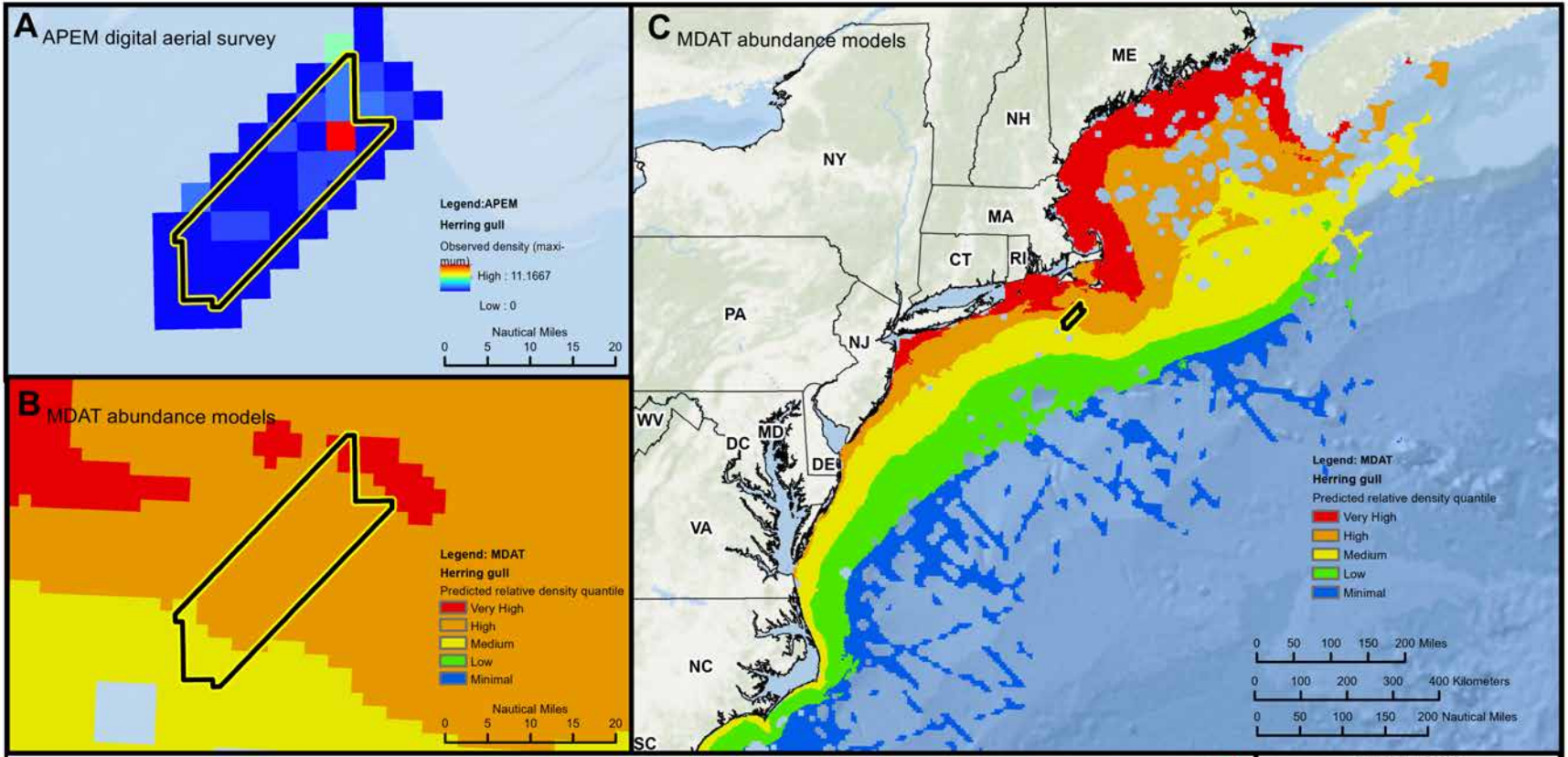

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
HERRING GULL ABUNDANCE
SUMMER: JUNE - AUGUST

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AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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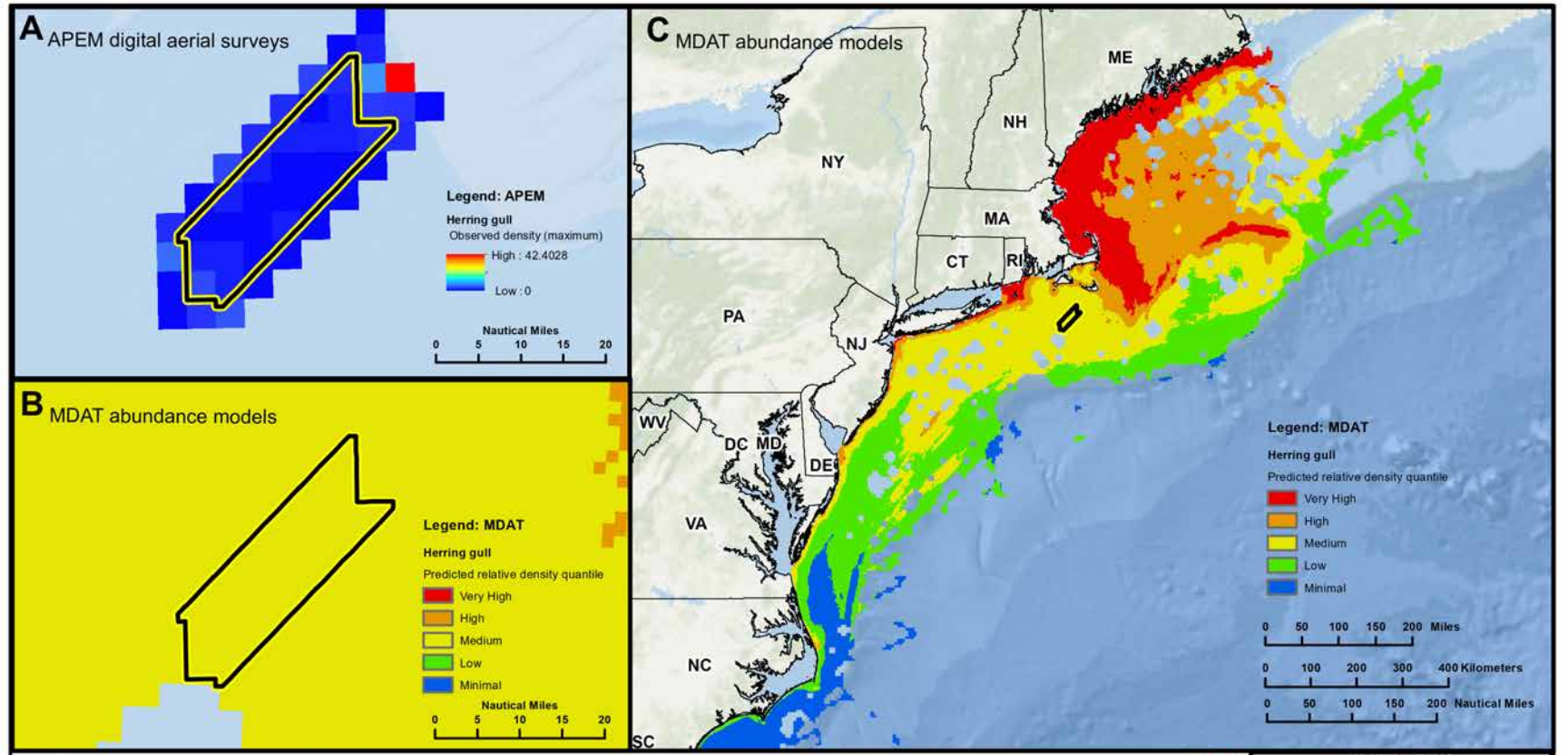

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
HERRING GULL ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

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AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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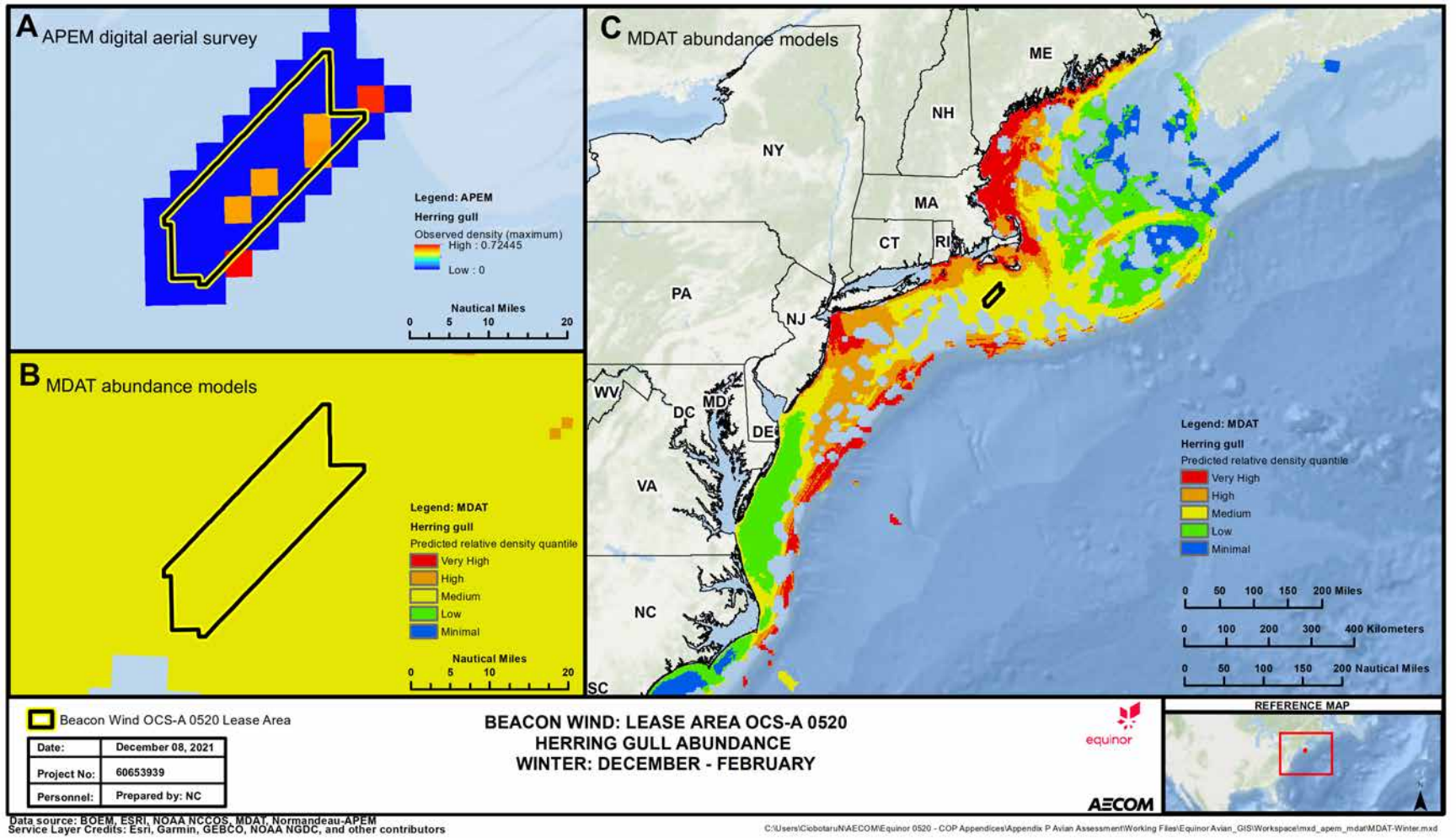
A APEM digital aerial survey
Legend: APEM
Herring gull
Observed density (maximum)
High : 0.72445
Low : 0
Nautical Miles
0 5 10 20
B MDAT abundance models
Legend: MDAT
Herring gull
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 20
C MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
Herring gull
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 08, 2021
Project No: 60653939
Personnel: Prepared by: NC
BEACON WIND: LEASE AREA OCS-A 0520
HERRING GULL ABUNDANCE
WINTER: DECEMBER - FEBRUARY
equinor
AECOM
REFERENCE MAP
Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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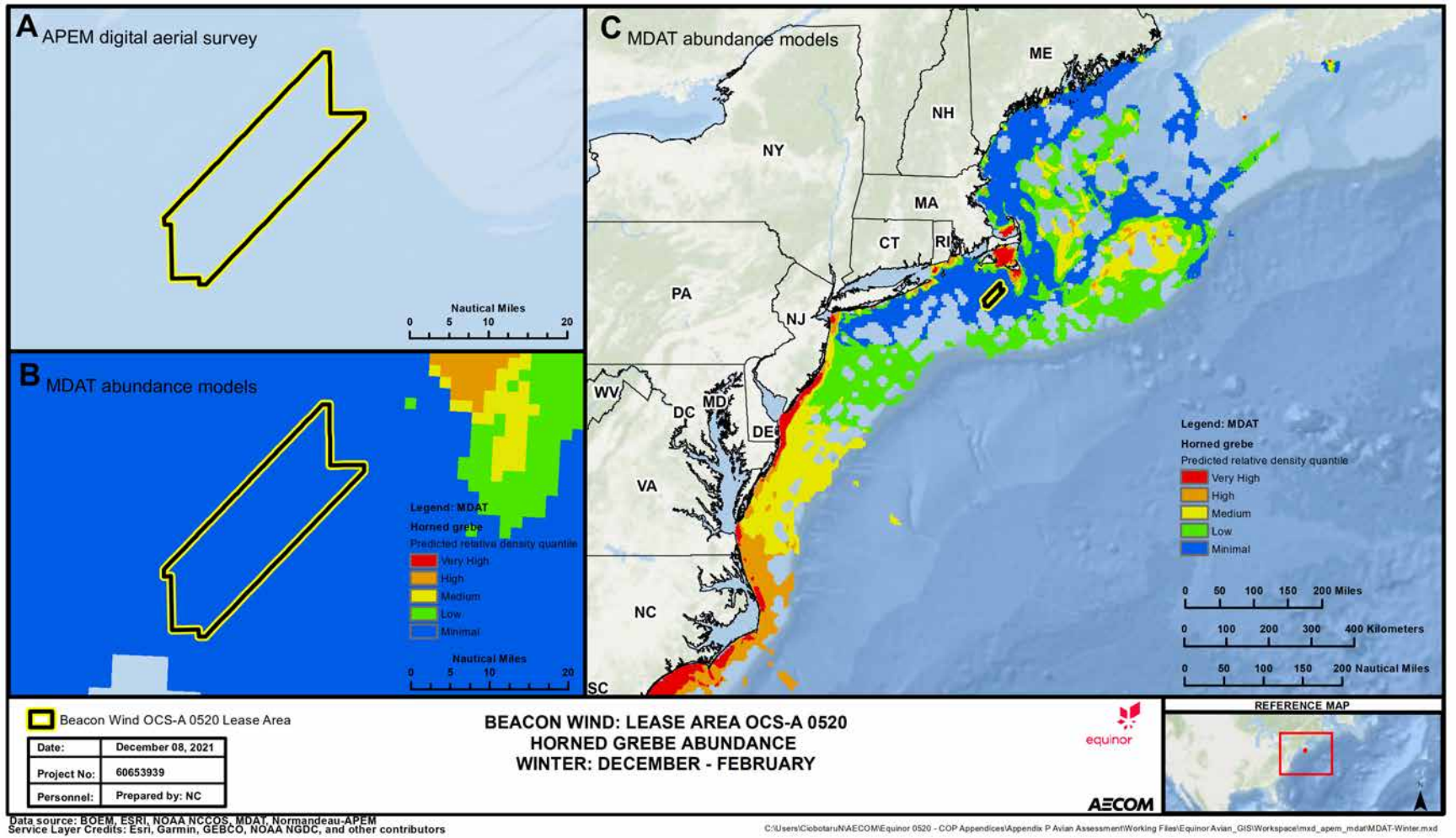

Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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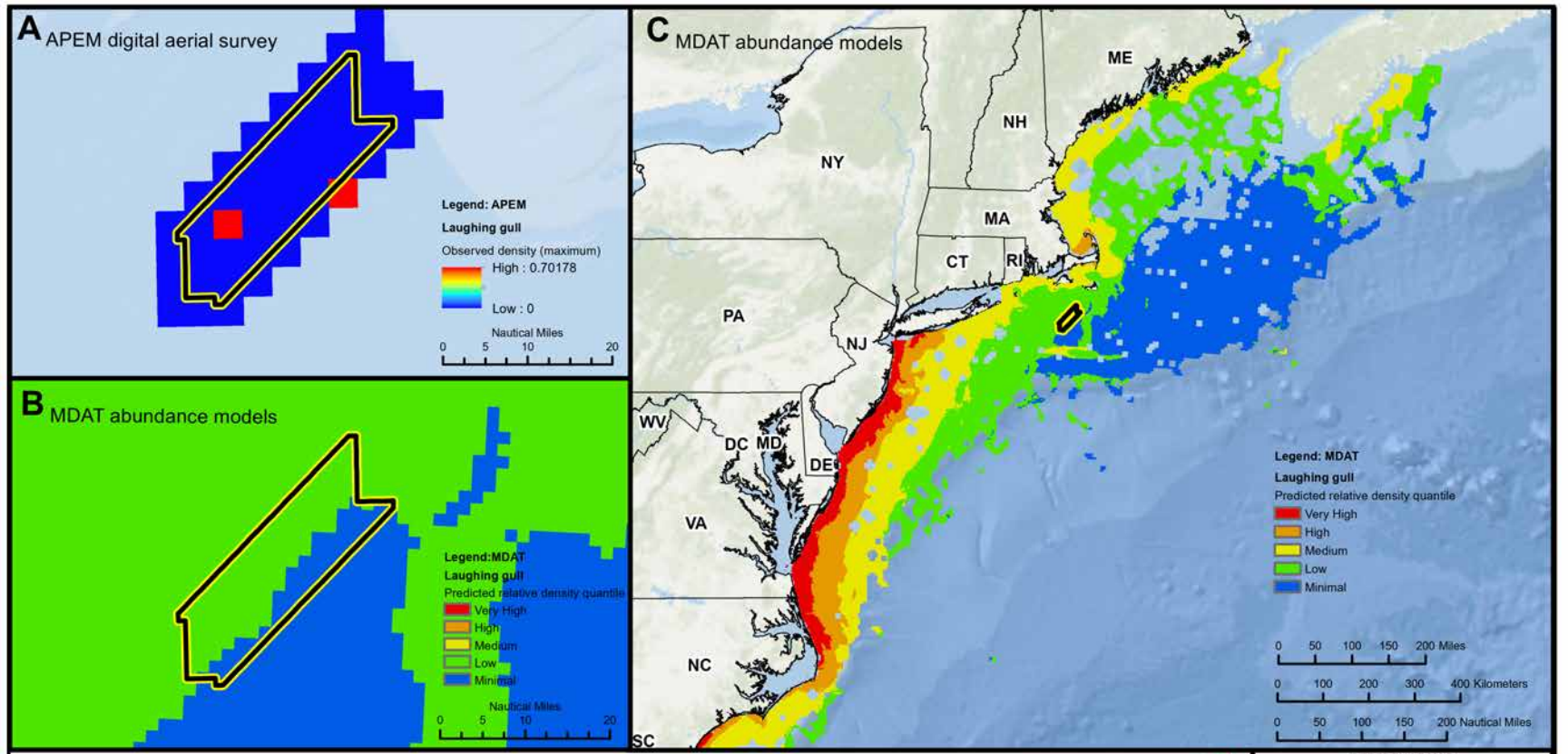
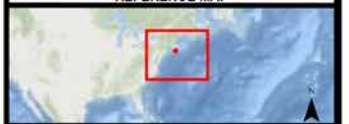


Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
LAUGHING GULL ABUNDANCE
SPRING: MARCH - MAY

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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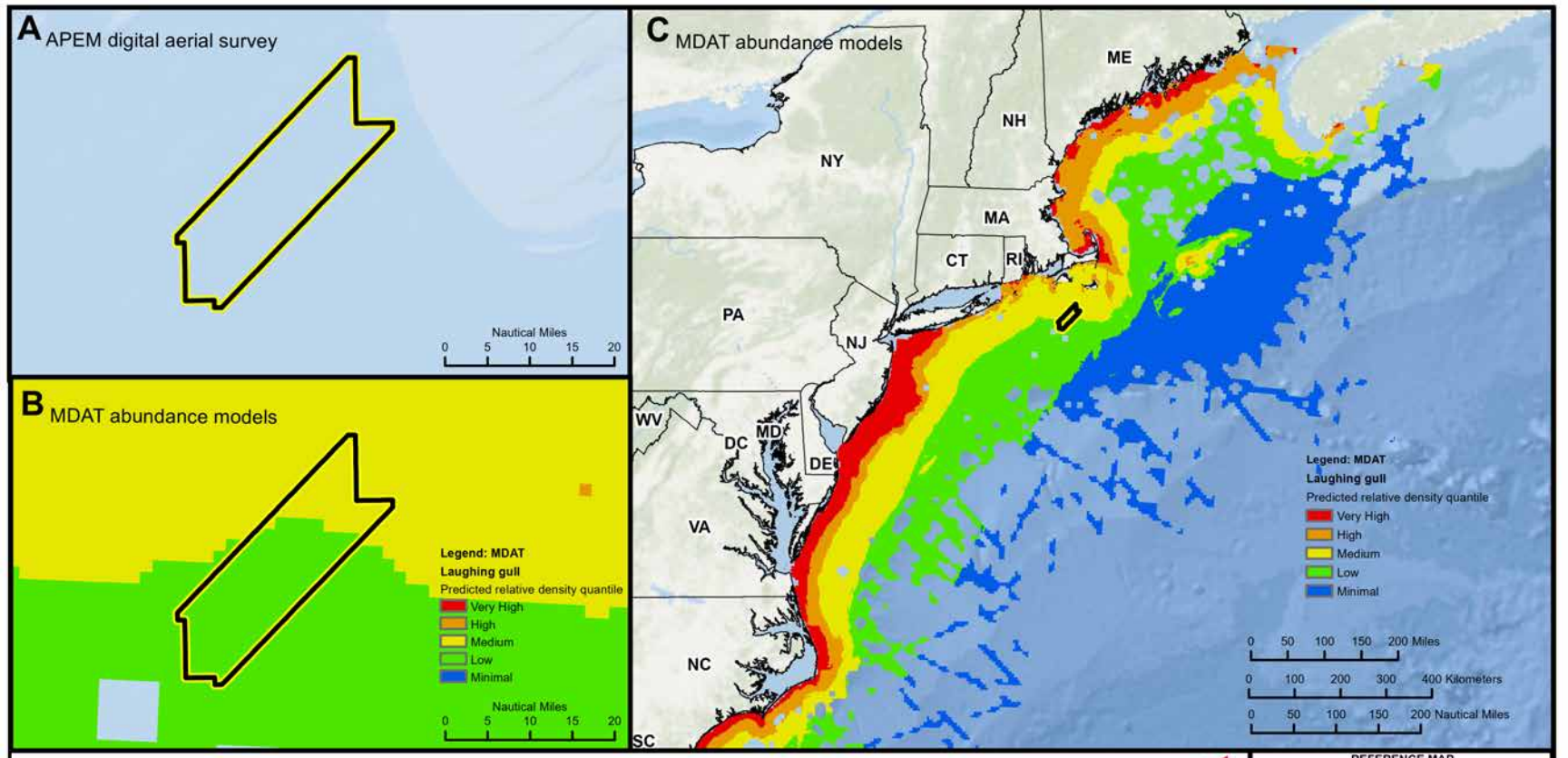

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
LAUGHING GULL ABUNDANCE
SUMMER: JUNE - AUGUST

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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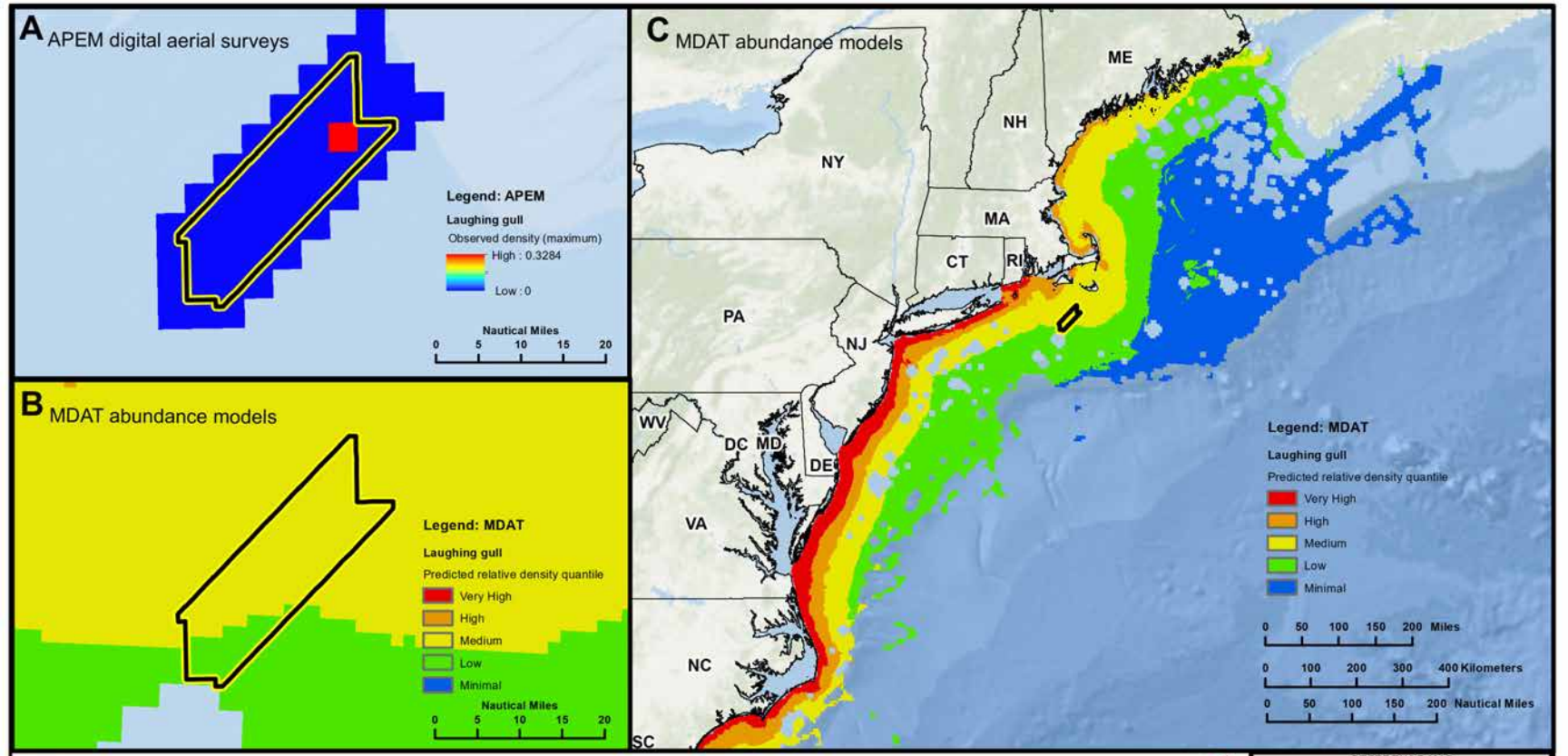


Beacon Wind OCS-A 0520 Lease Area

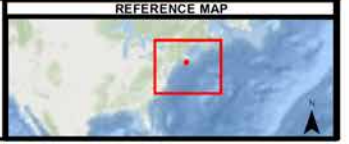
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
LAUGHING GULL ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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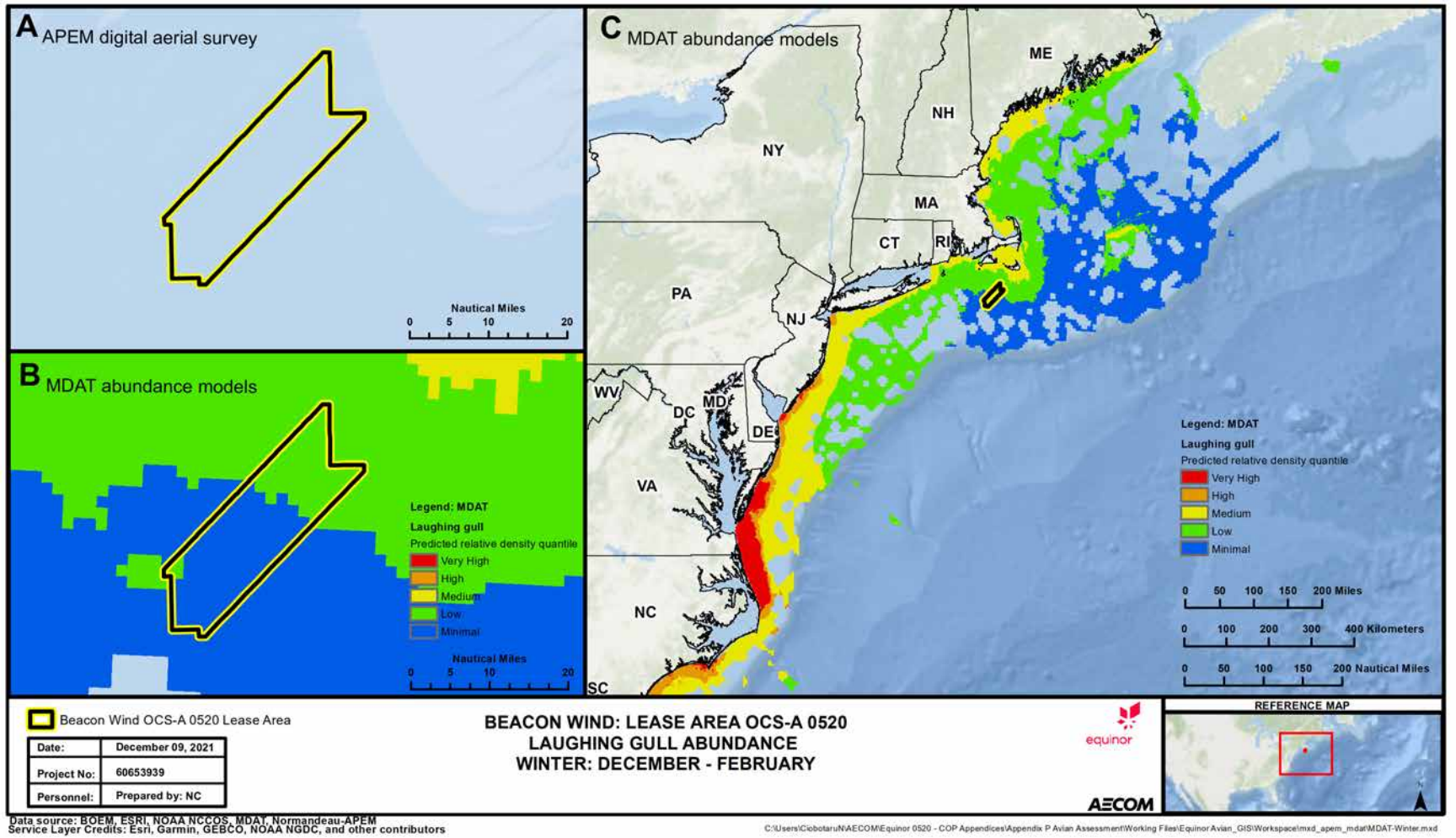

Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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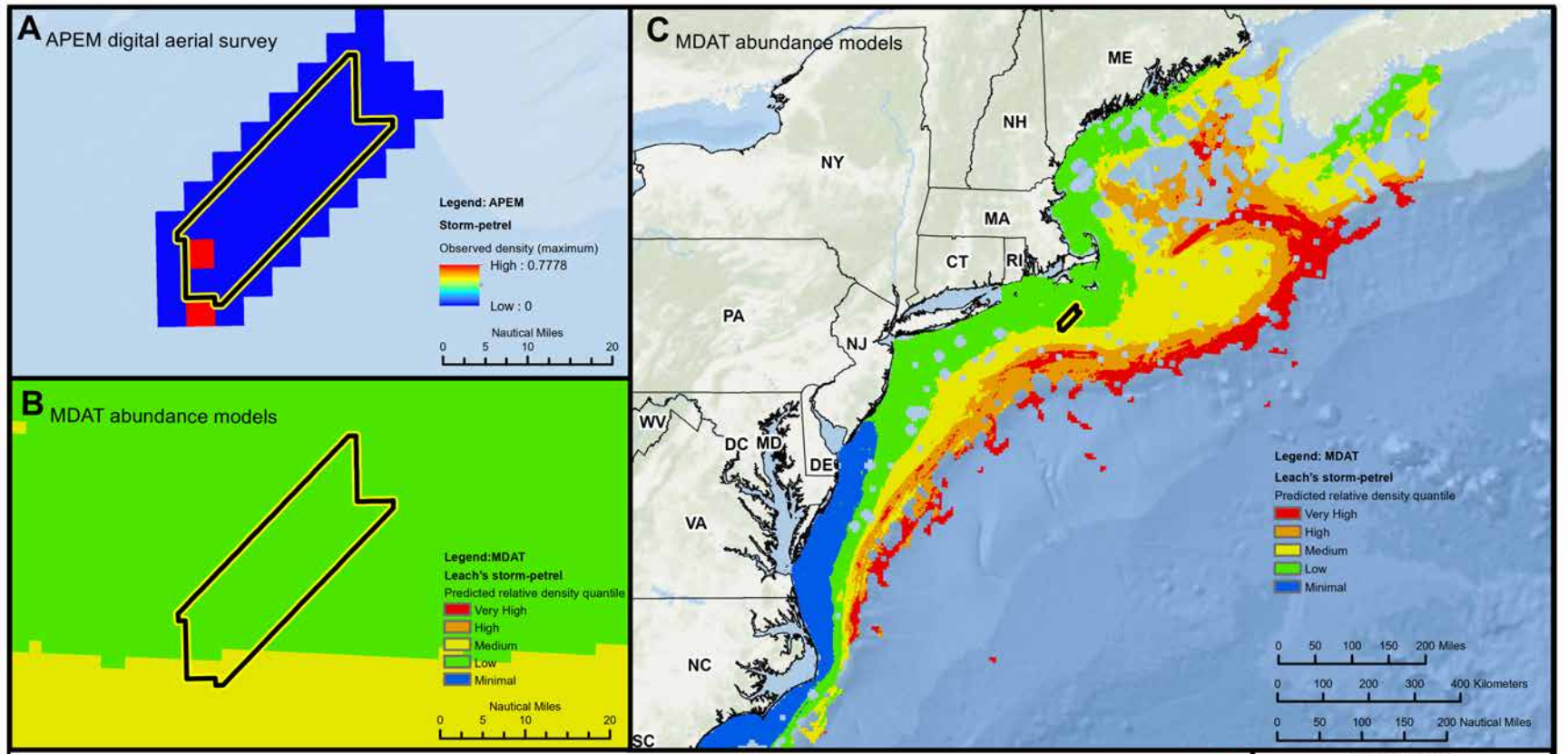


Beacon Wind OCS-A 0520 Lease Area

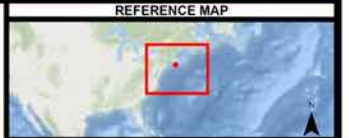
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
LEACH'S STORM-PETREL ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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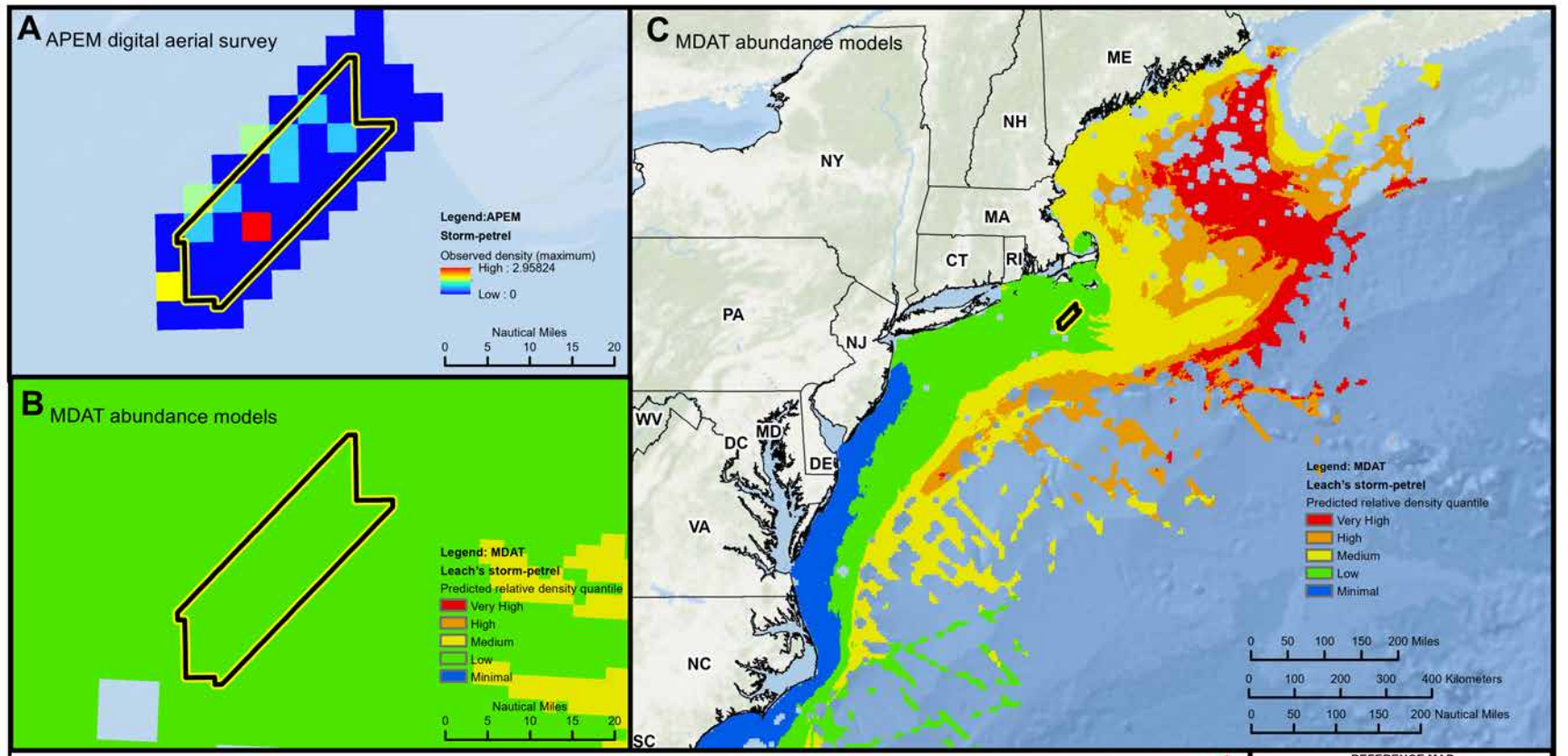


Beacon Wind OCS-A 0520 Lease Area

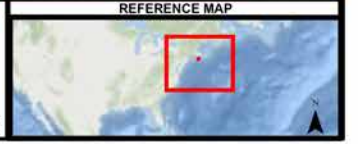
Date:	December 09, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
LEACH'S STORM-PETREL ABUNDANCE
SUMMER: JUNE - AUGUST

equinor

AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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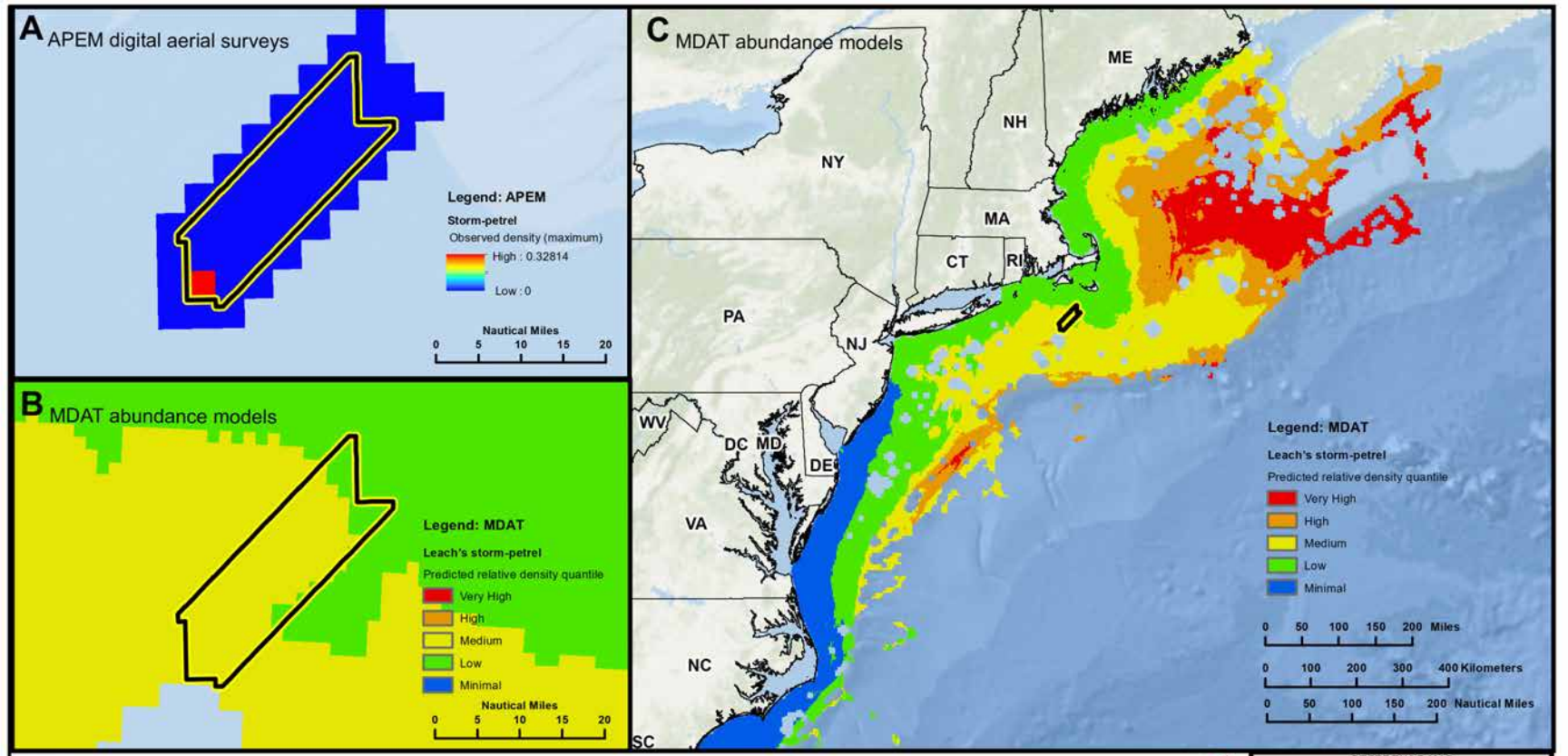

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
LEACH'S STORM-PETREL ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

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AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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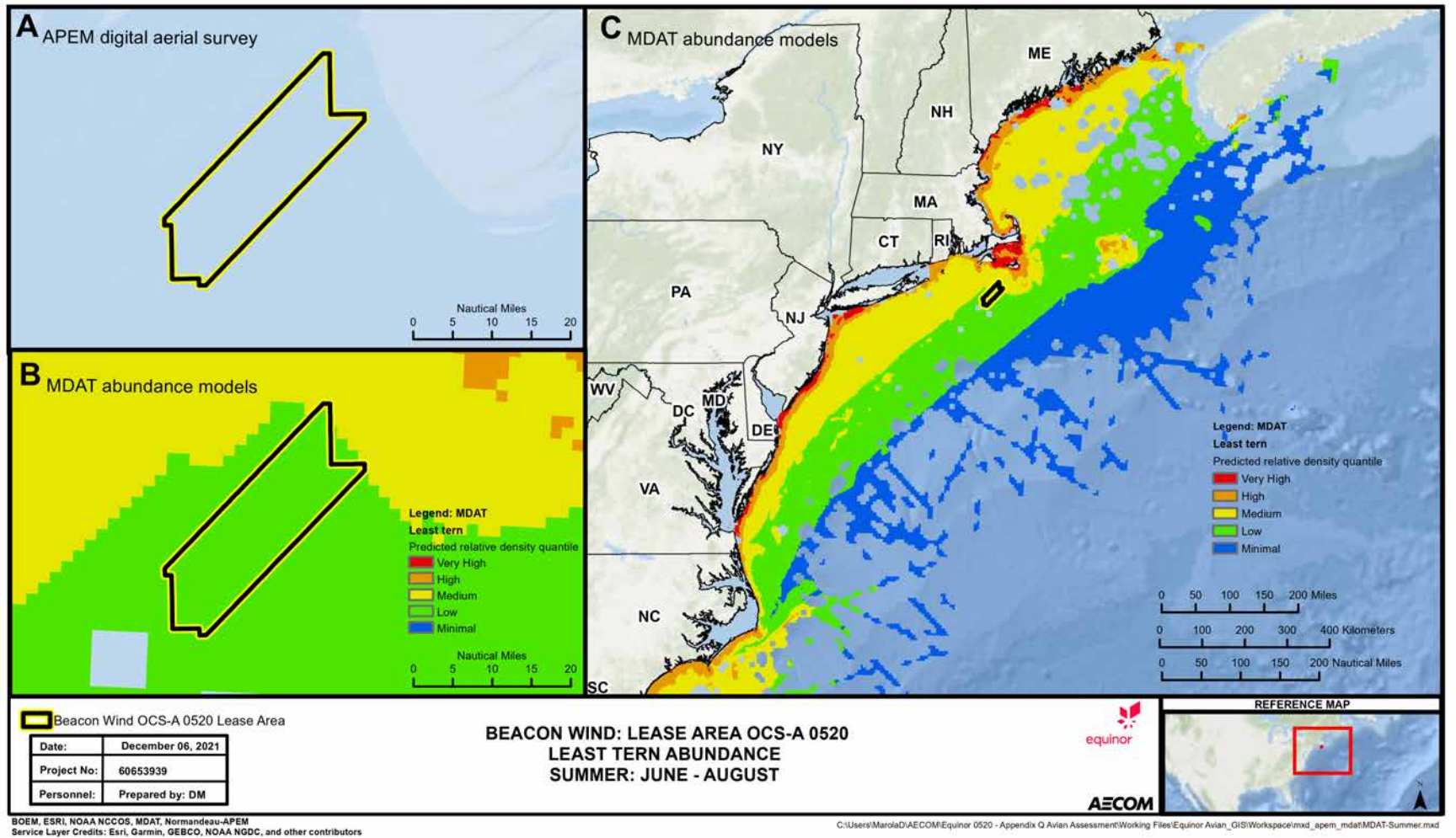
A
APEM digital aerial survey
Nautical Miles
0 5 10 15 20
B
MDAT abundance models
Legend: MDAT
Least tern
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 15 20
C
MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
MD
DC
DE
VA
NC
SC
Legend: MDAT
Least tern
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
LEAST TERN ABUNDANCE
SUMMER: JUNE - AUGUST
equinor
AECOM
REFERENCE MAP
BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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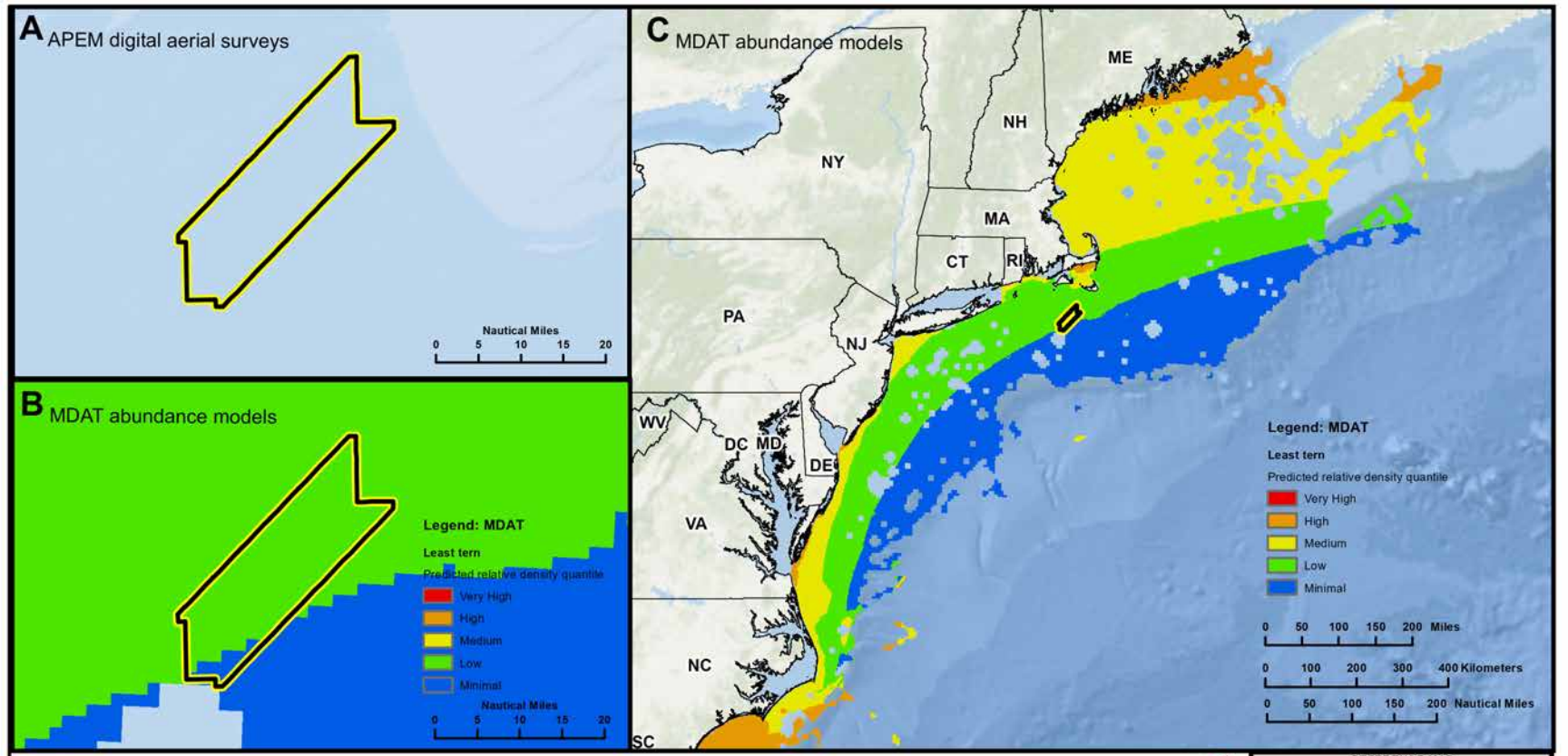


Beacon Wind OCS-A 0520 Lease Area

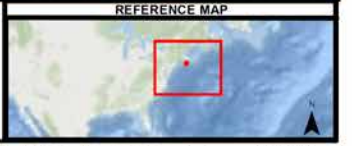
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
LEAST TERN ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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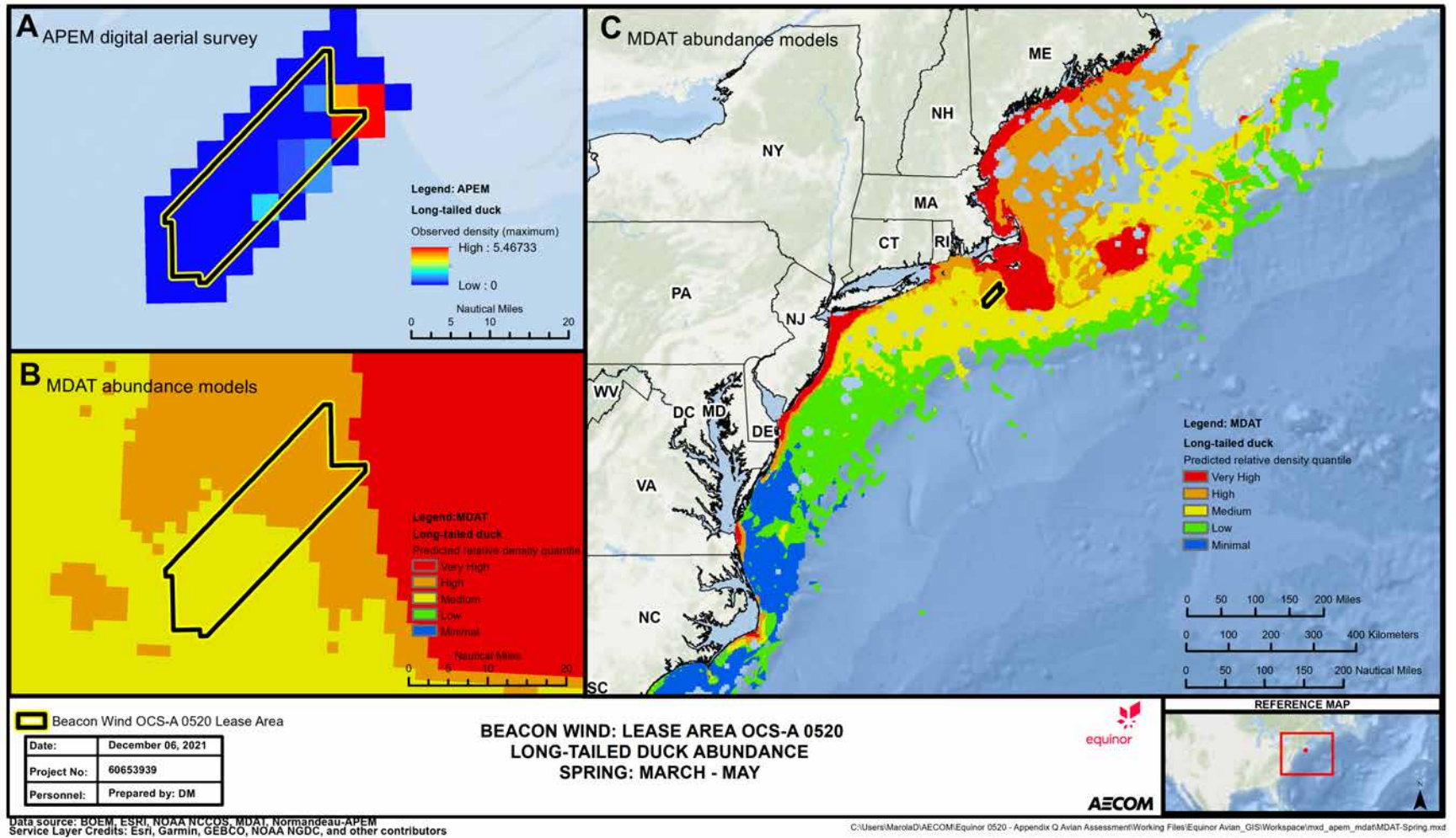
A APEM digital aerial survey
Legend: APEM
Long-tailed duck
Observed density (maximum)
High : 5.46733
Low : 0
Nautical Miles
0 5 10 20
B MDAT abundance models
Legend:MDAT
Long-tailed duck
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 20
C MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
Long-tailed duck
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
LONG-TAILED DUCK ABUNDANCE
SPRING: MARCH - MAY
equinor
AECOM
REFERENCE MAP
Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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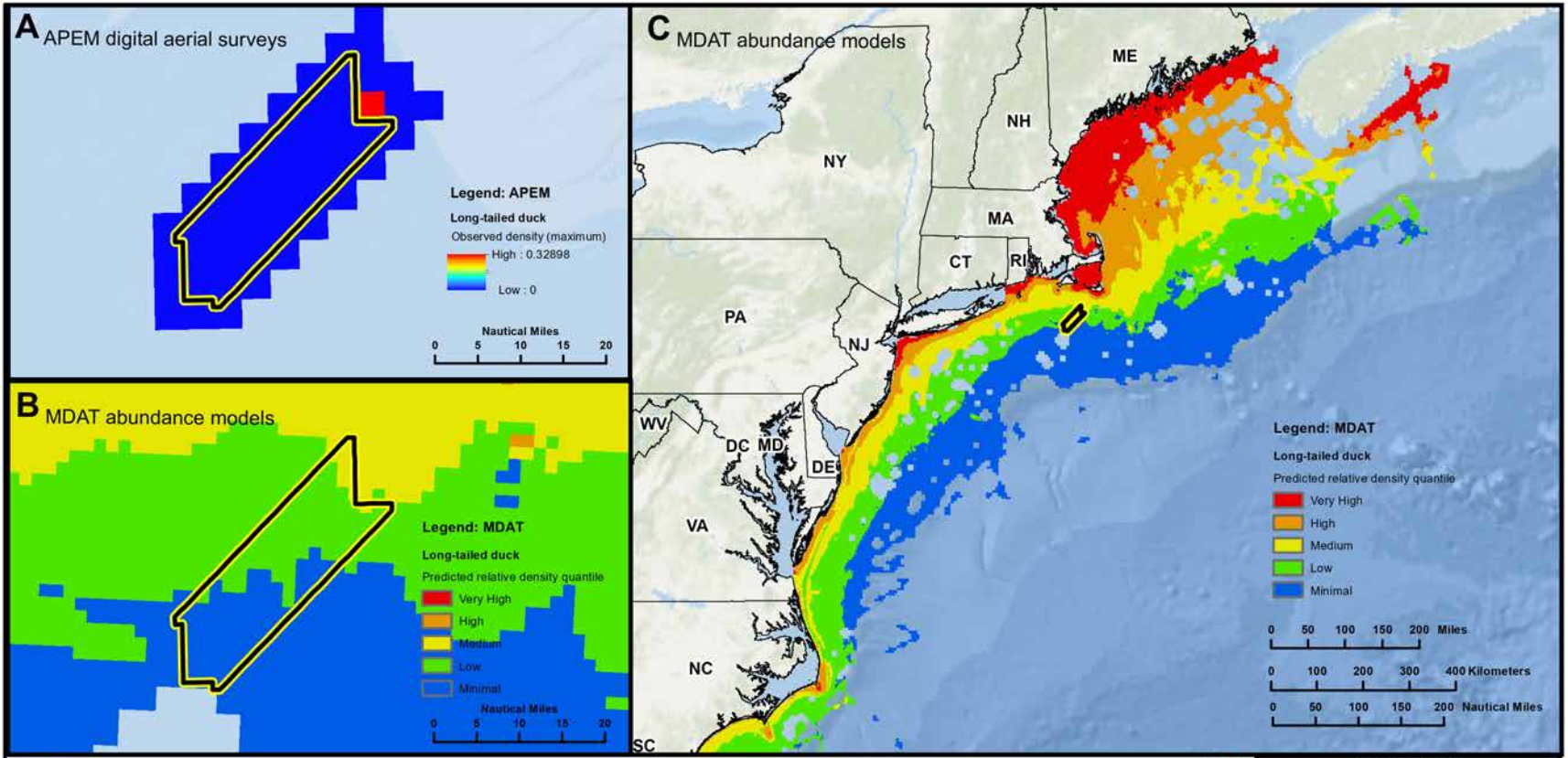

Beacon Wind OCS-A 0520 Lease Area

Date:	December 10, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
LONG-TAILED DUCK ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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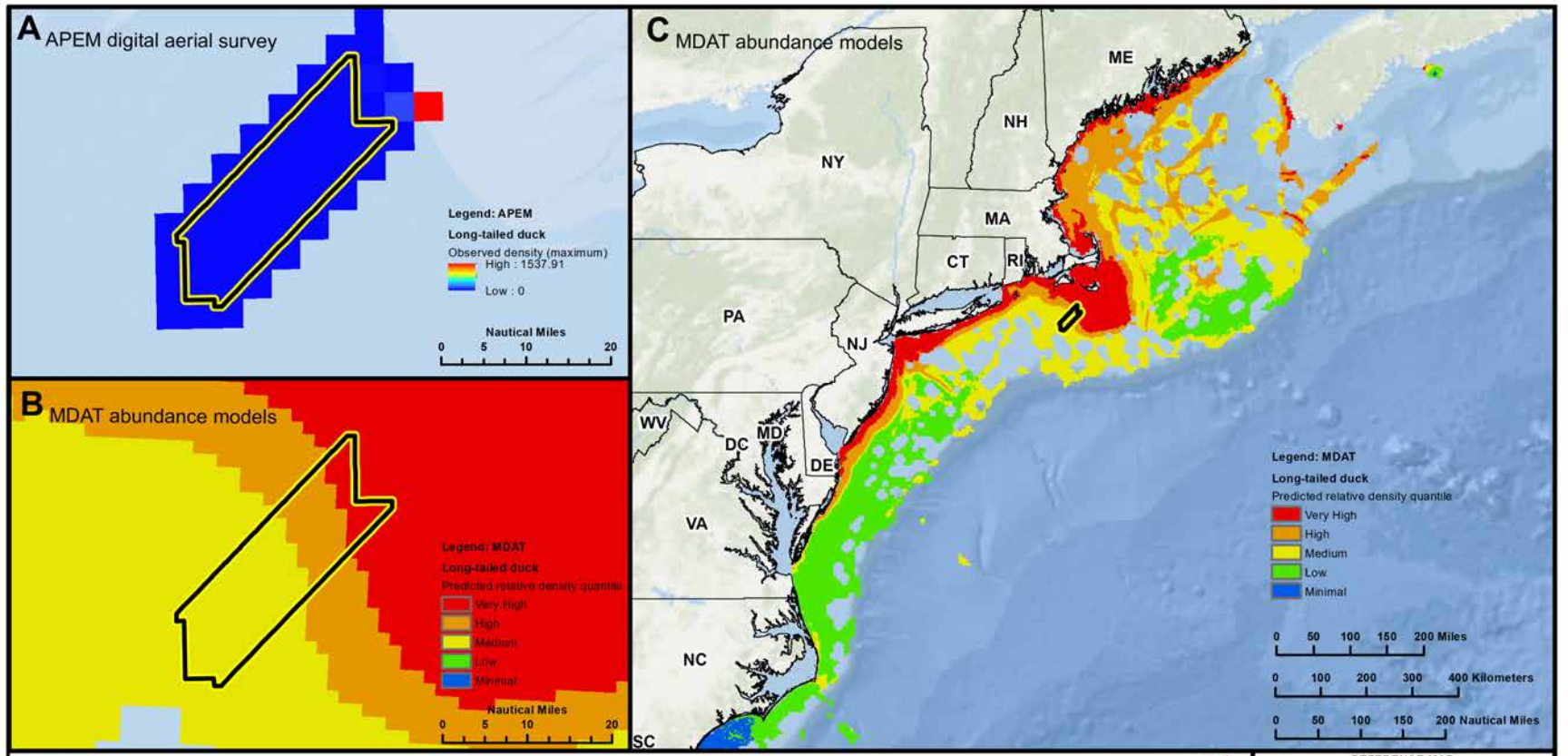


Beacon Wind OCS-A 0520 Lease Area

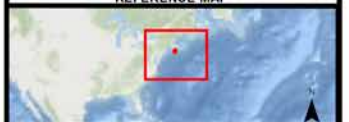
Date:	December 09, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
LAUGHING GULL ABUNDANCE
WINTER: DECEMBER - FEBRUARY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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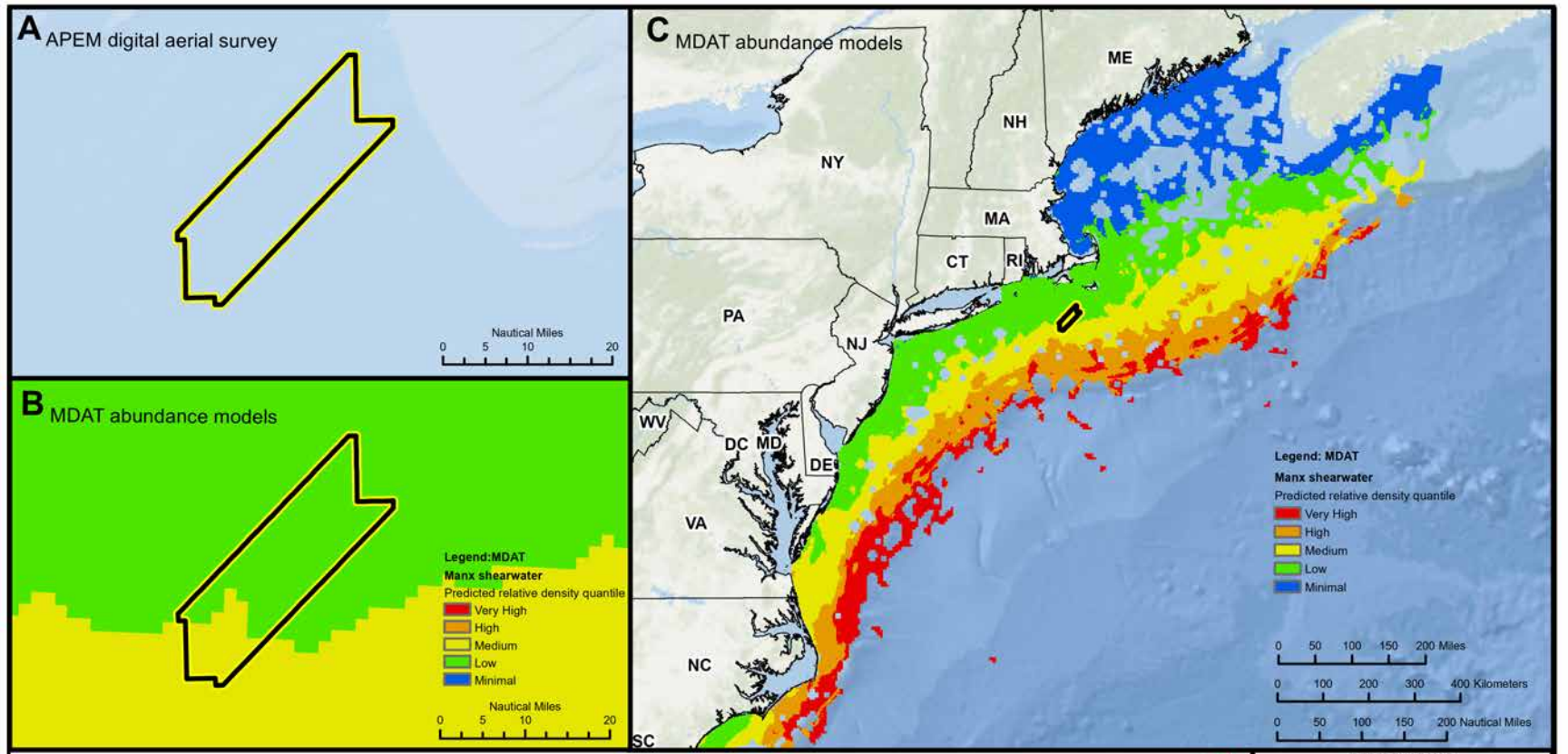

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
MANX SHEARWATER ABUNDANCE
SPRING: MARCH - MAY

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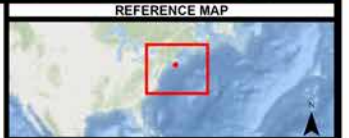
AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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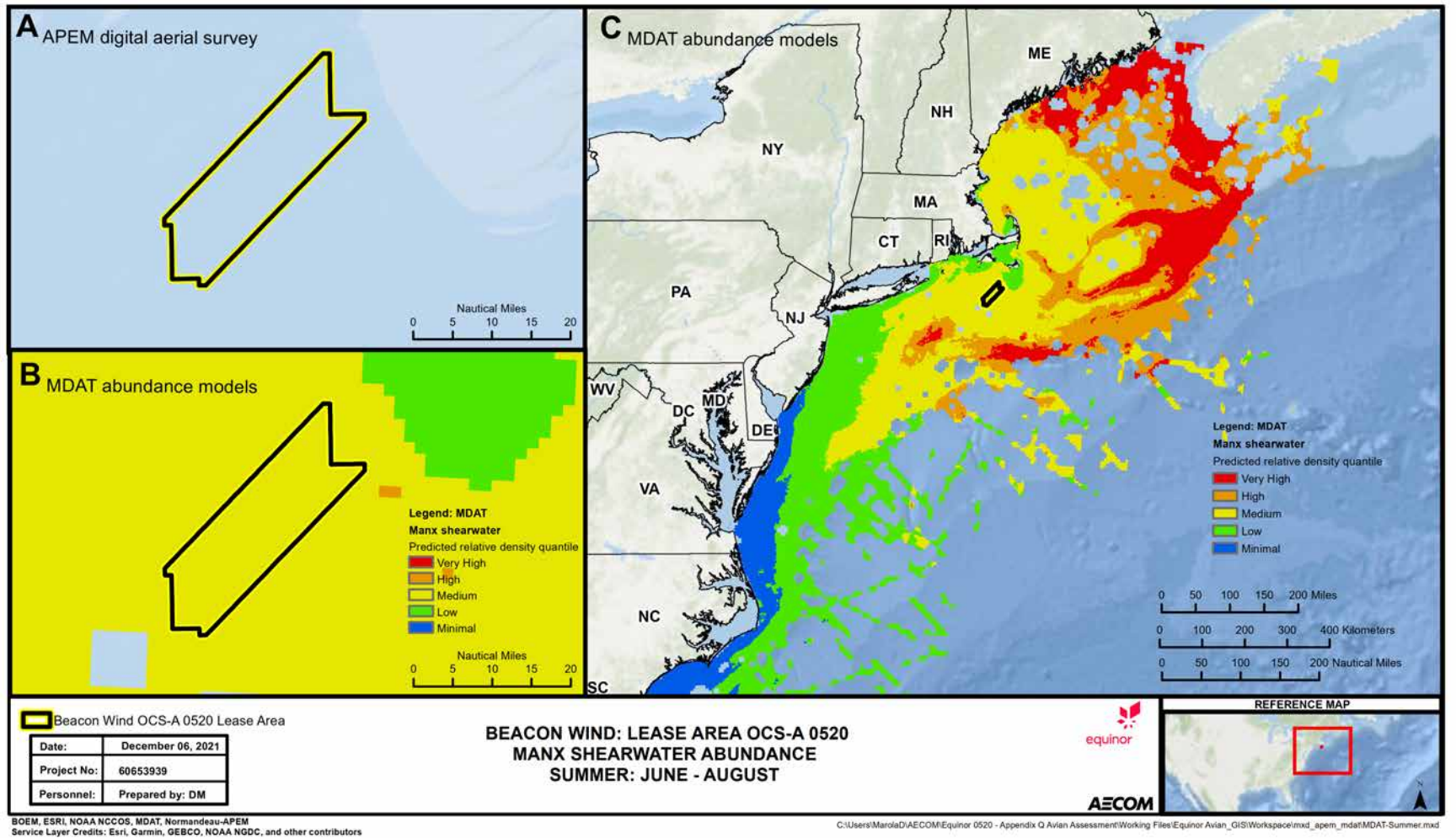
A
APEM digital aerial survey
Nautical Miles
0 5 10 15 20
B
MDAT abundance models
Legend: MDAT
Manx shearwater
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 15 20
C
MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
Manx shearwater
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
MANX SHEARWATER ABUNDANCE
SUMMER: JUNE - AUGUST
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AECOM
REFERENCE MAP
BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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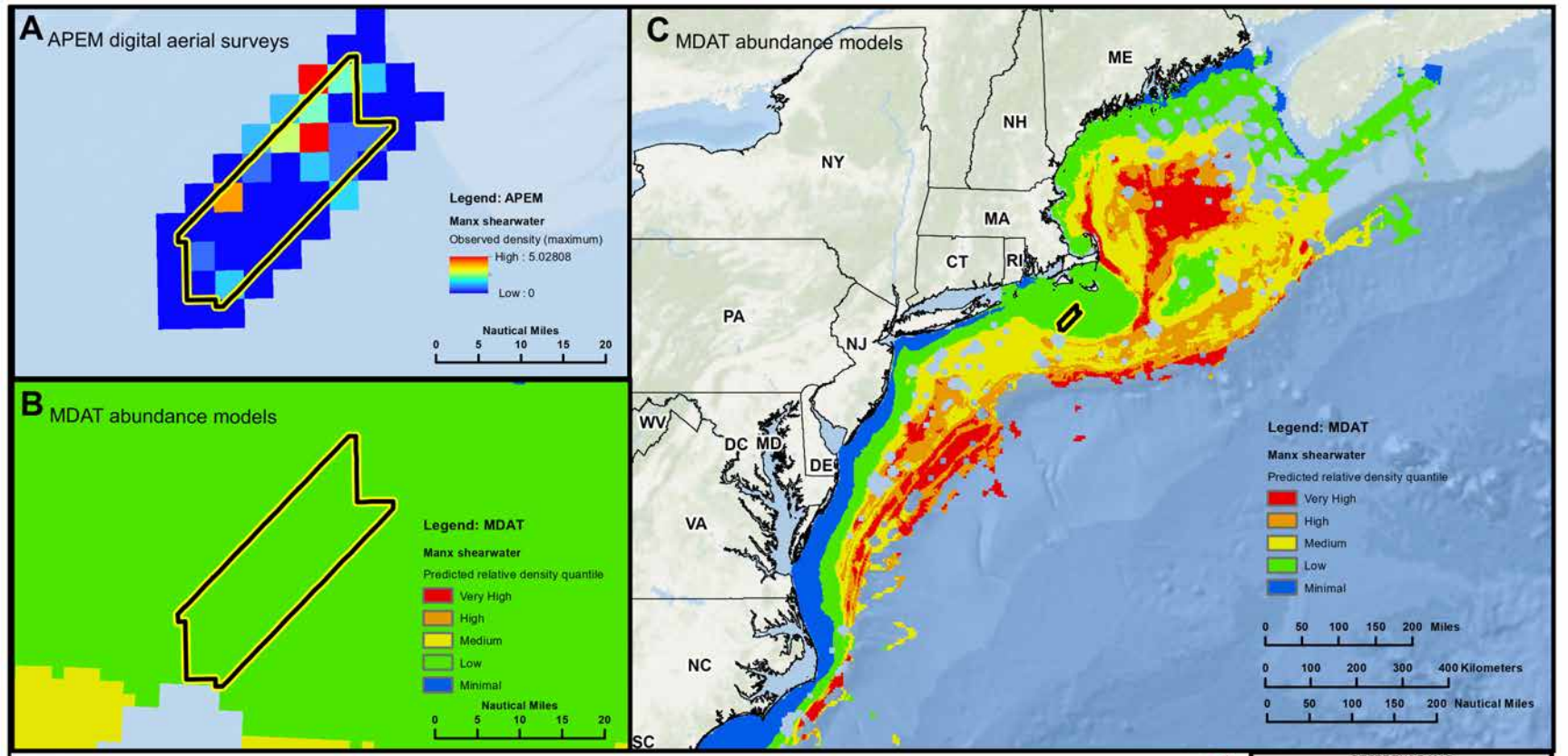

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
MANX SHEARWATER ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

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AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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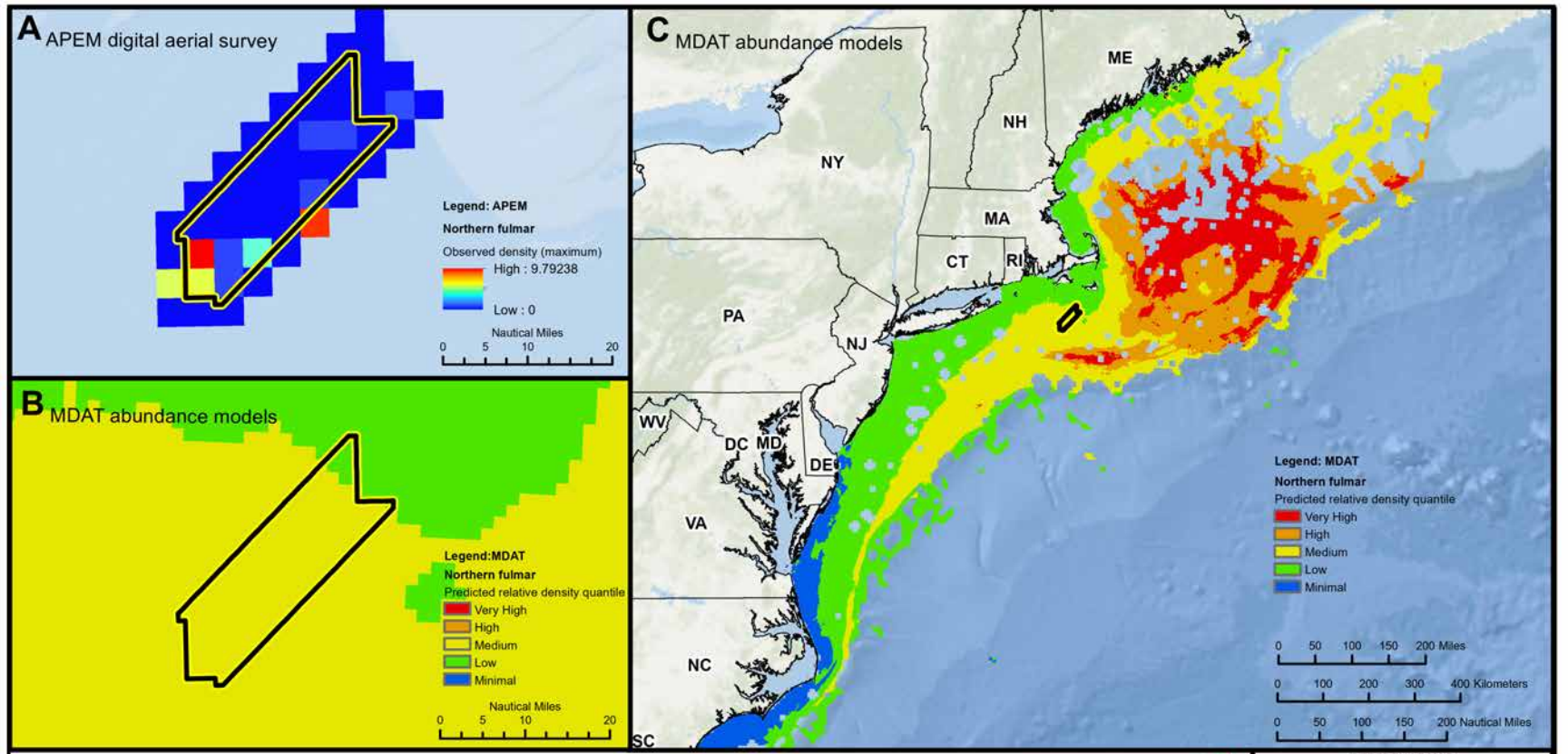


Beacon Wind OCS-A 0520 Lease Area

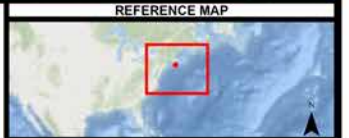
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
NORTHERN FULMAR ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



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Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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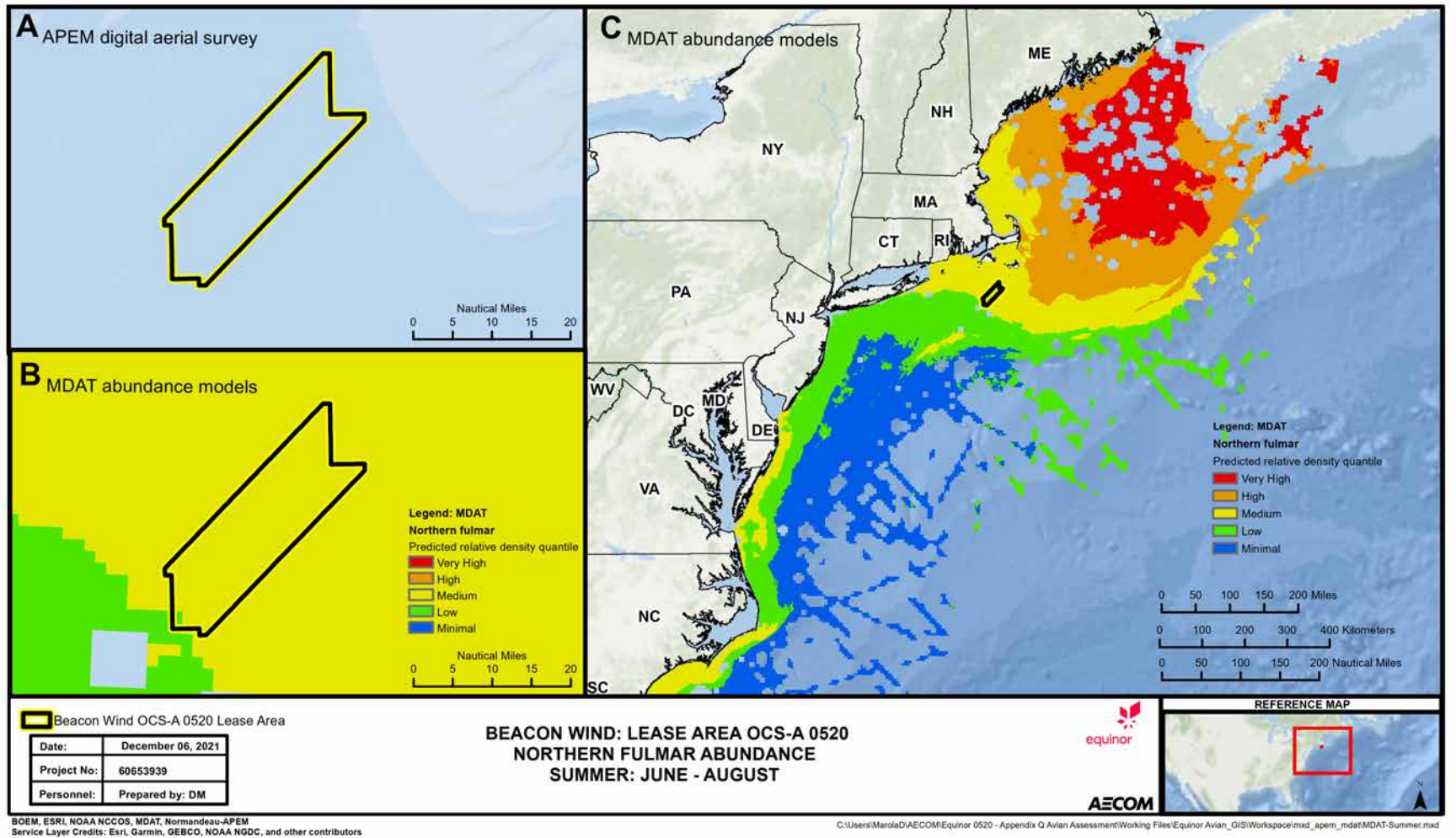
A
APEM digital aerial survey
Nautical Miles
0 5 10 15 20
B
MDAT abundance models
Legend: MDAT
Northern fulmar
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 15 20
C
MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
MD
DC
DE
VA
NC
SC
Legend: MDAT
Northern fulmar
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
NORTHERN FULMAR ABUNDANCE
SUMMER: JUNE - AUGUST
equinor
AECOM
REFERENCE MAP
BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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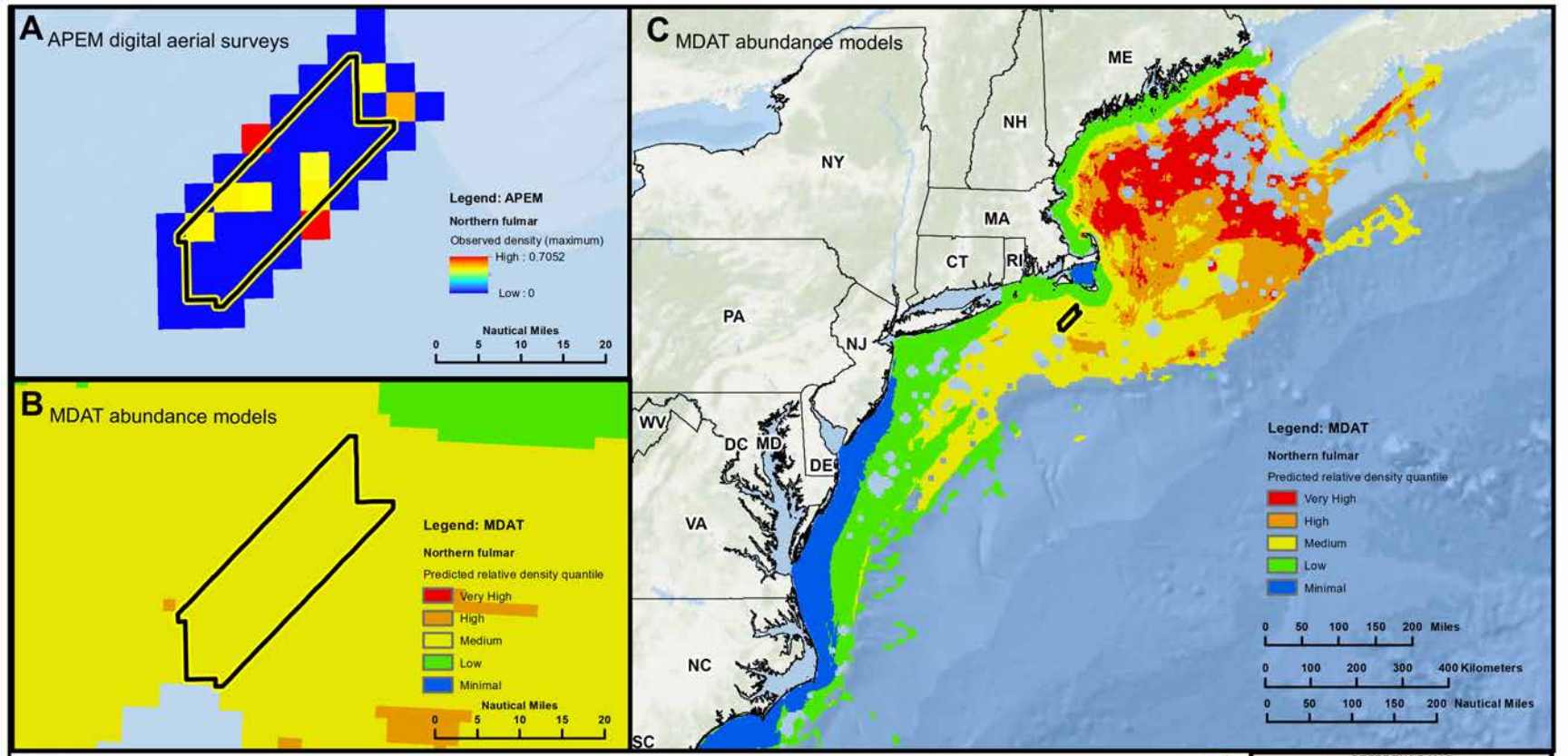


Beacon Wind OCS-A 0520 Lease Area

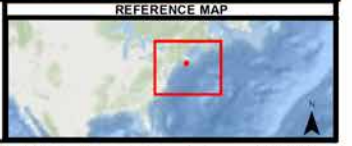
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
NORTHERN FULMAR ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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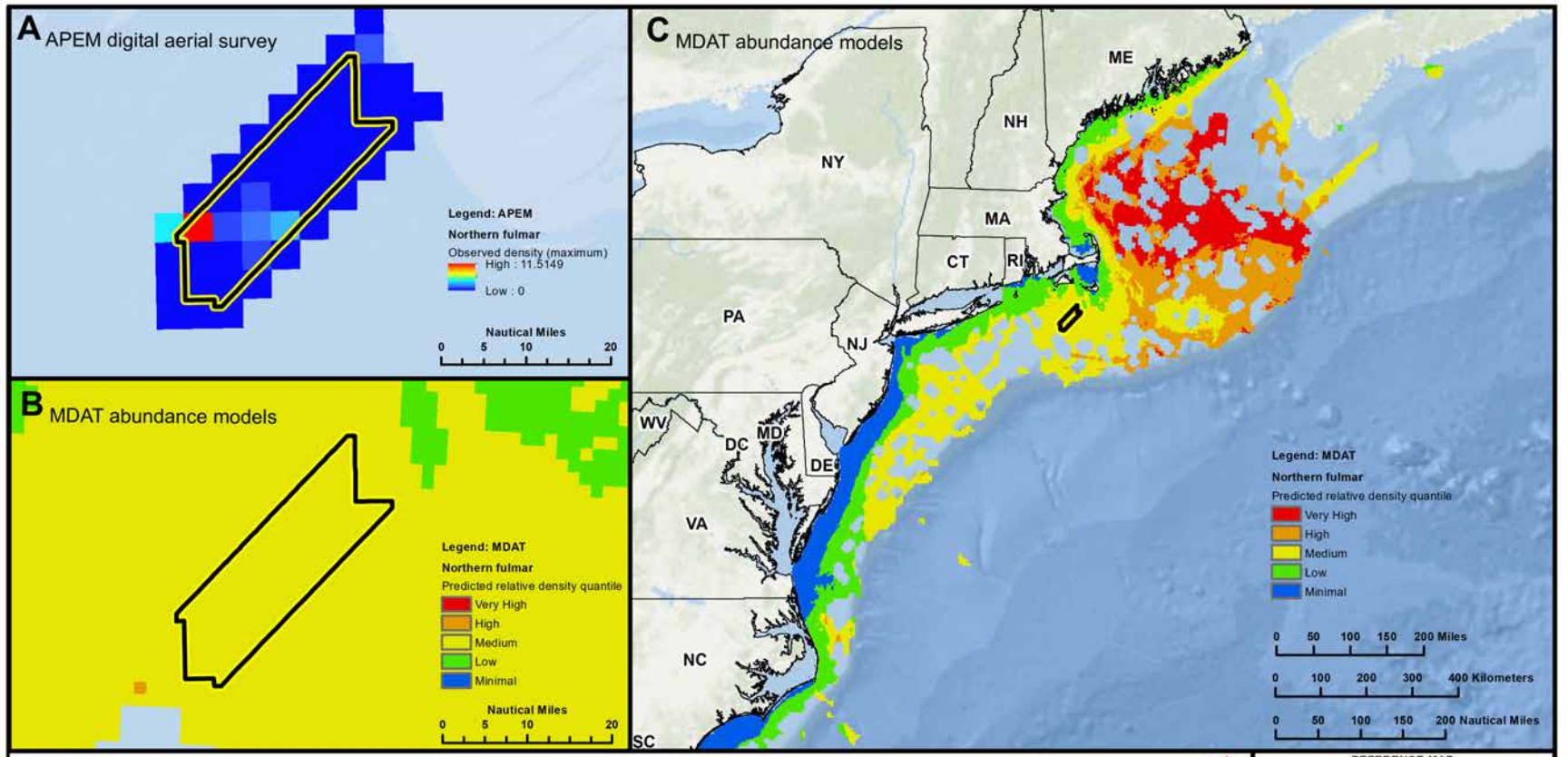


Beacon Wind OCS-A 0520 Lease Area

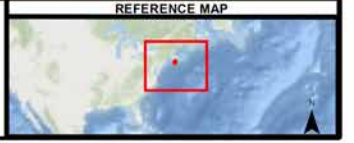
Date:	December 09, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
NORTHERN FULMAR ABUNDANCE
WINTER: DECEMBER - FEBRUARY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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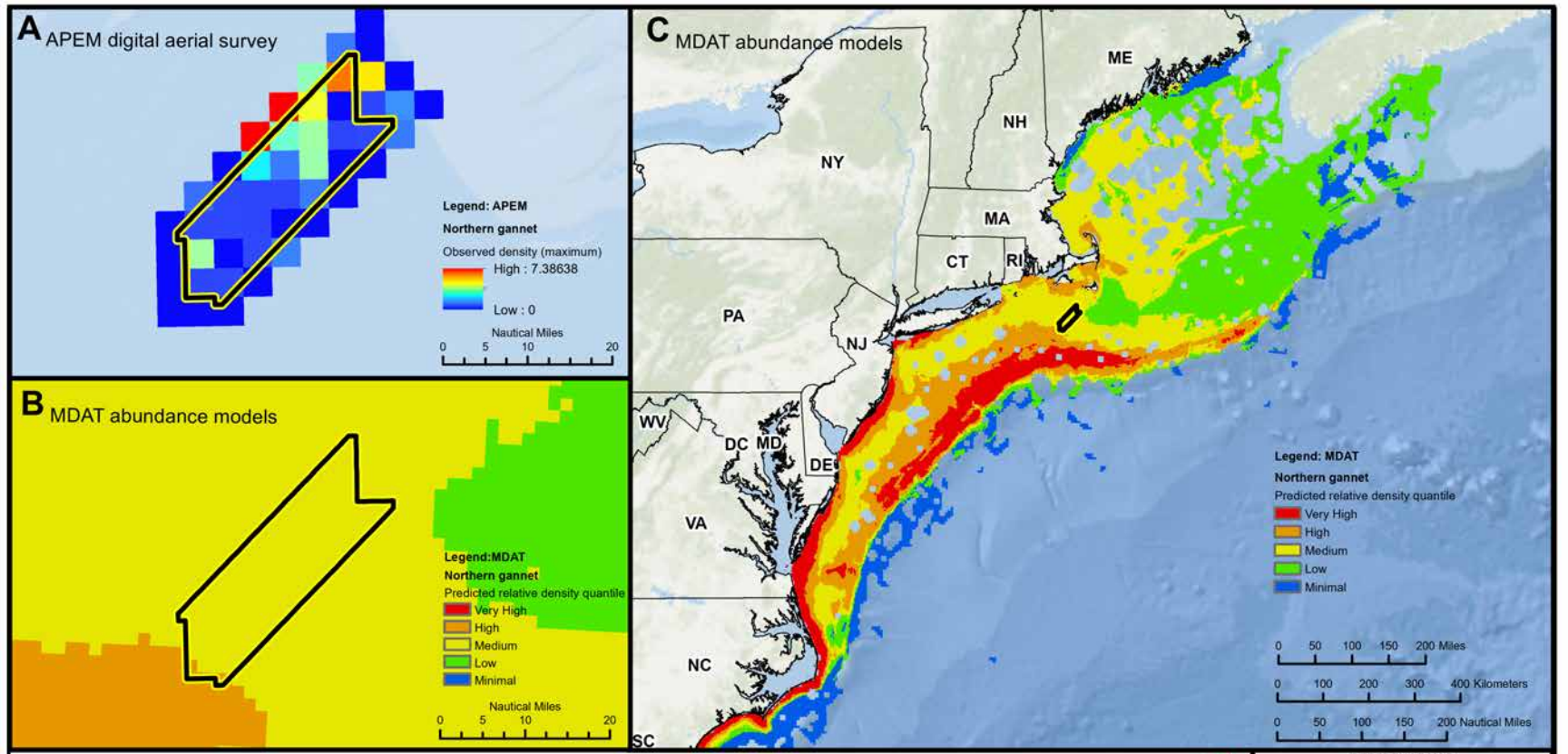


Beacon Wind OCS-A 0520 Lease Area

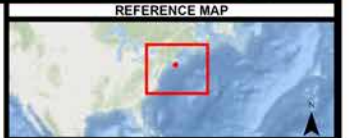
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
NORTHERN GANNET ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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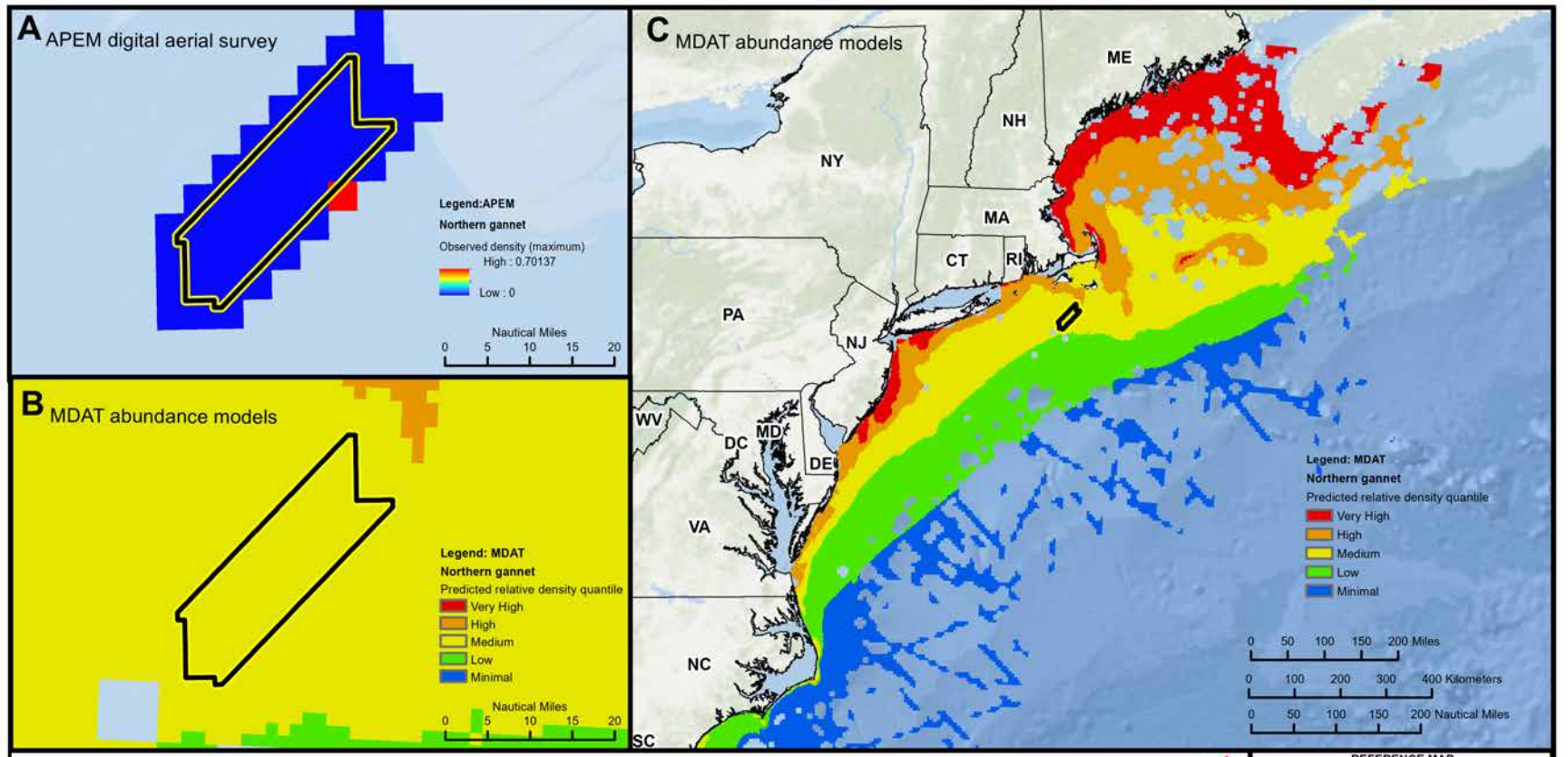


Beacon Wind OCS-A 0520 Lease Area

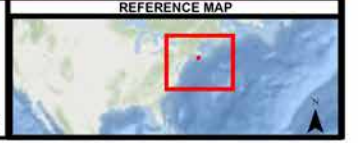
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
NORTHERN GANNET ABUNDANCE
SUMMER: JUNE - AUGUST

equinor

AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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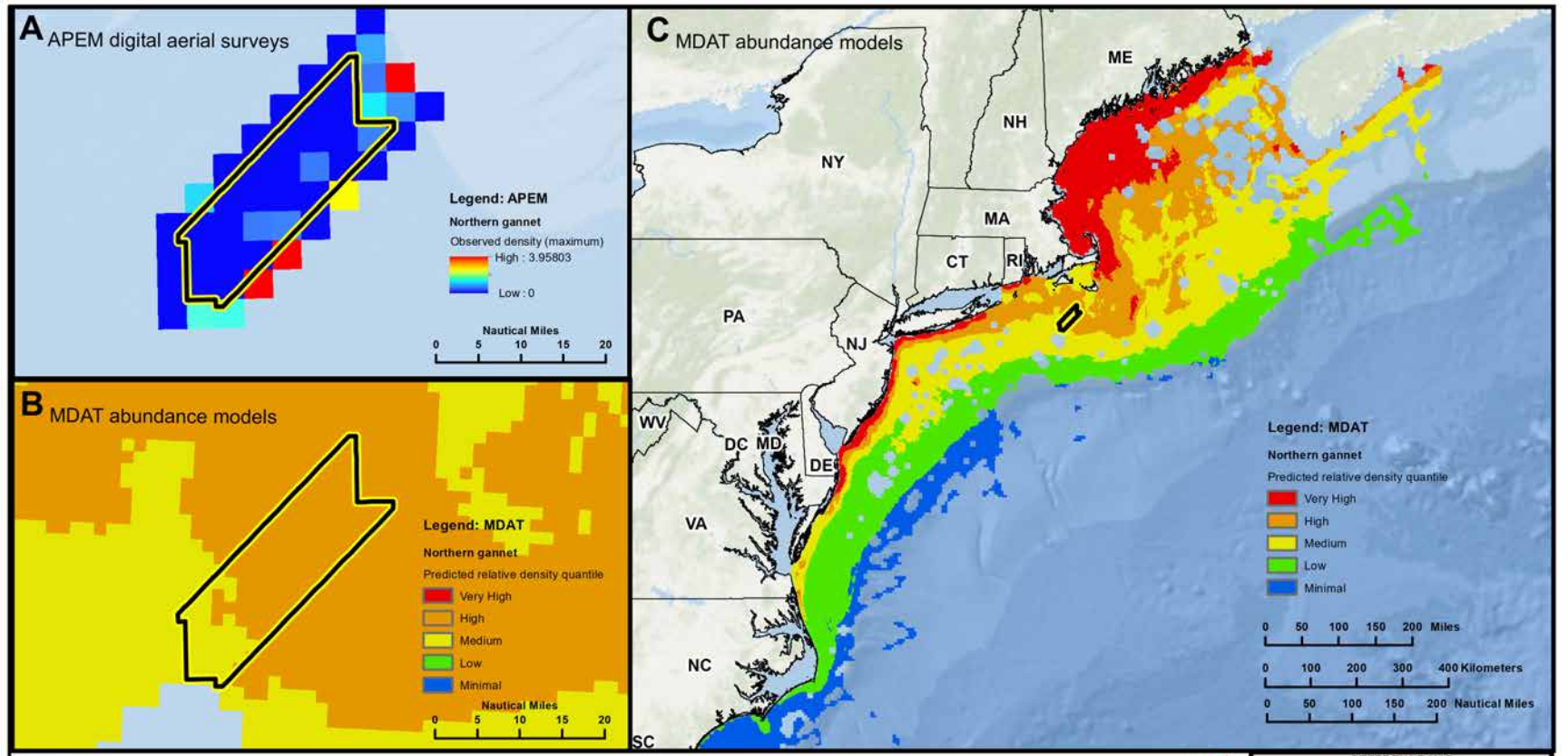

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
NORTHERN GANNET ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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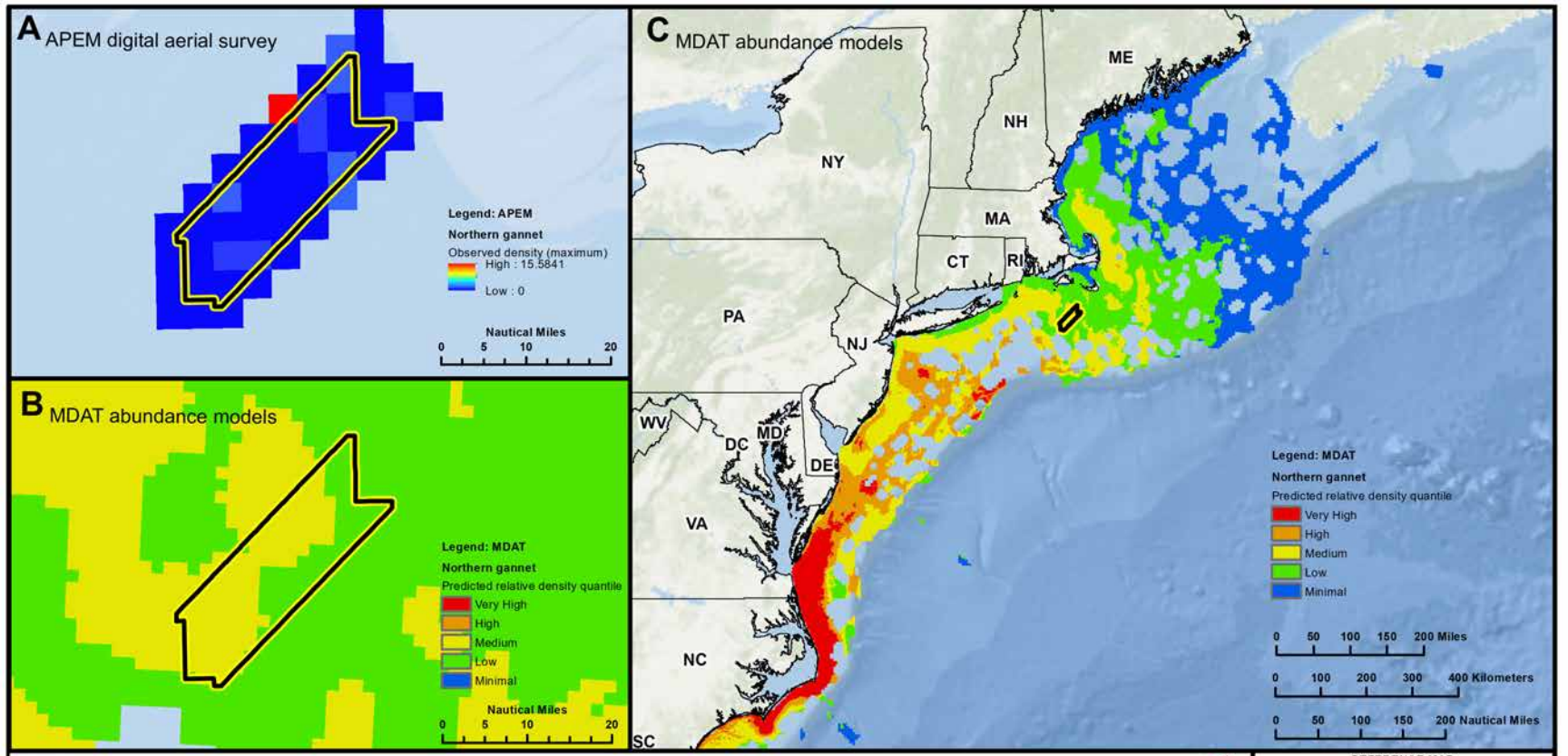


Beacon Wind OCS-A 0520 Lease Area

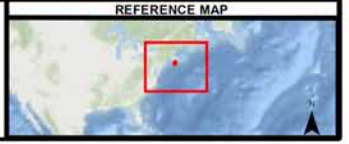
Date:	December 09, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
NORTHERN GANNET ABUNDANCE
WINTER: DECEMBER - FEBRUARY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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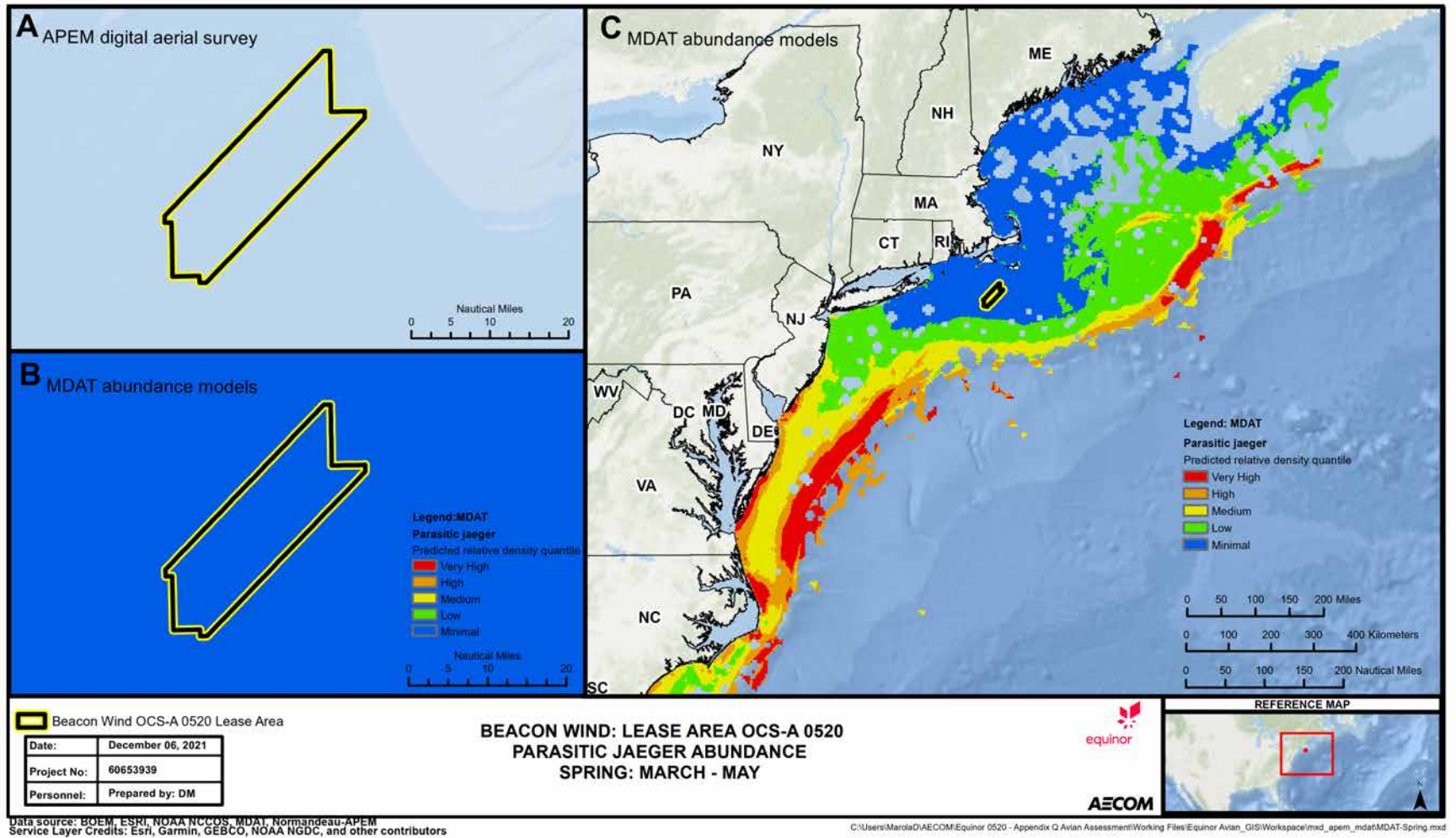
A
APEM digital aerial survey
Nautical Miles
0 5 10 20
B
MDAT abundance models
Legend:MDAT
Parasitic jaeger
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 20
C
MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
Parasitic jaeger
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
PARASITIC JAEGER ABUNDANCE
SPRING: MARCH - MAY
equinor
AECOM
REFERENCE MAP
Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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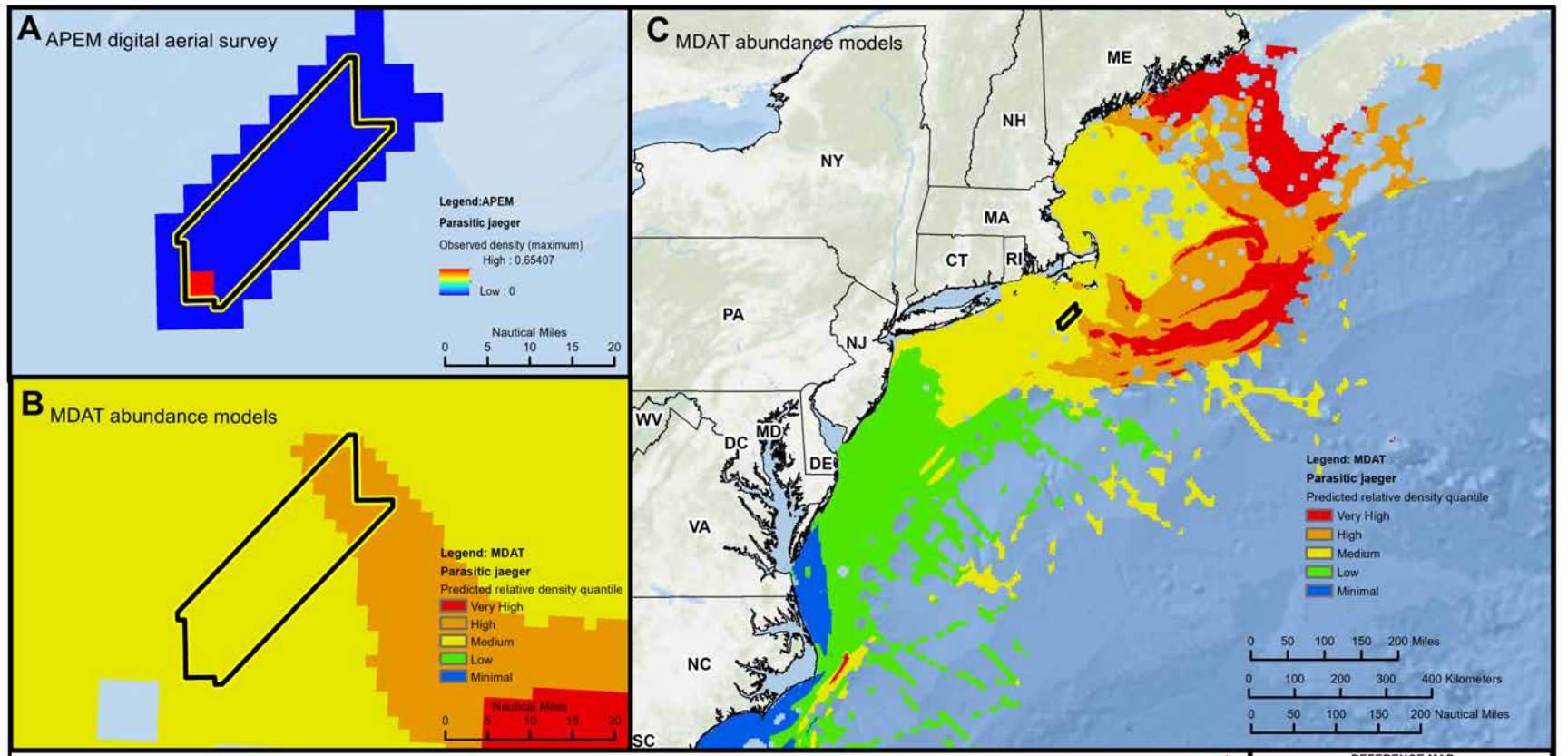


Beacon Wind OCS-A 0520 Lease Area

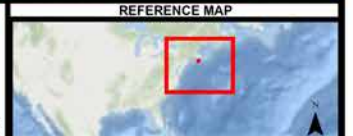
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
PARASITIC JAEGER ABUNDANCE
SUMMER: JUNE - AUGUST

equinor

AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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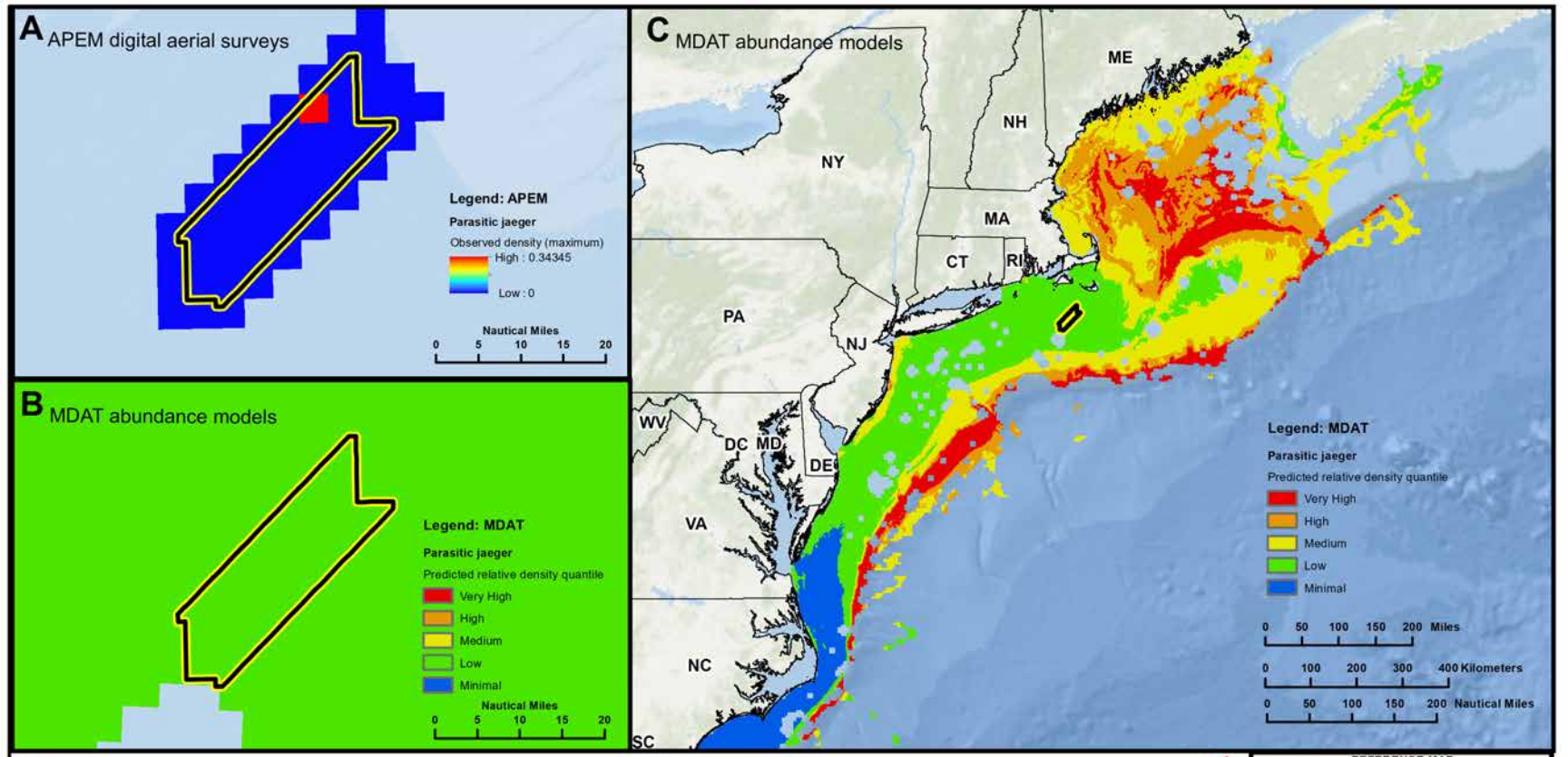


Beacon Wind OCS-A 0520 Lease Area

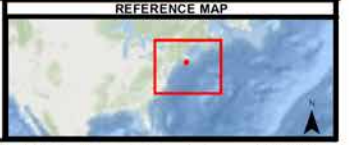
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
PARASITIC JAEGER ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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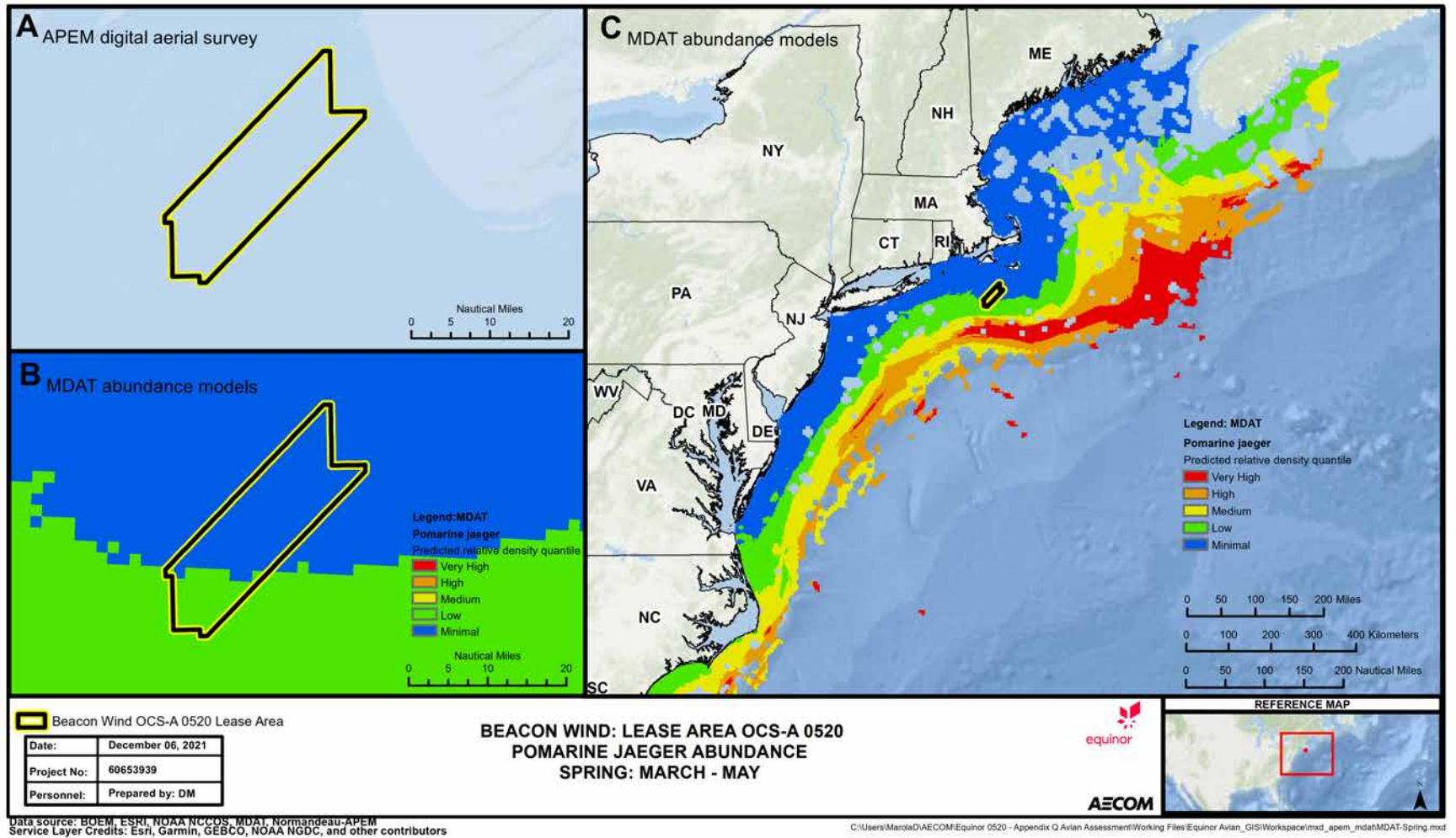
A
APEM digital aerial survey
Nautical Miles
0 5 10 20
B
MDAT abundance models
Legend:MDAT
Pomarine jaeger
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 20
C
MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
Pomarine jaeger
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
POMARINE JAEGER ABUNDANCE
SPRING: MARCH - MAY
equinor
AECOM
REFERENCE MAP
Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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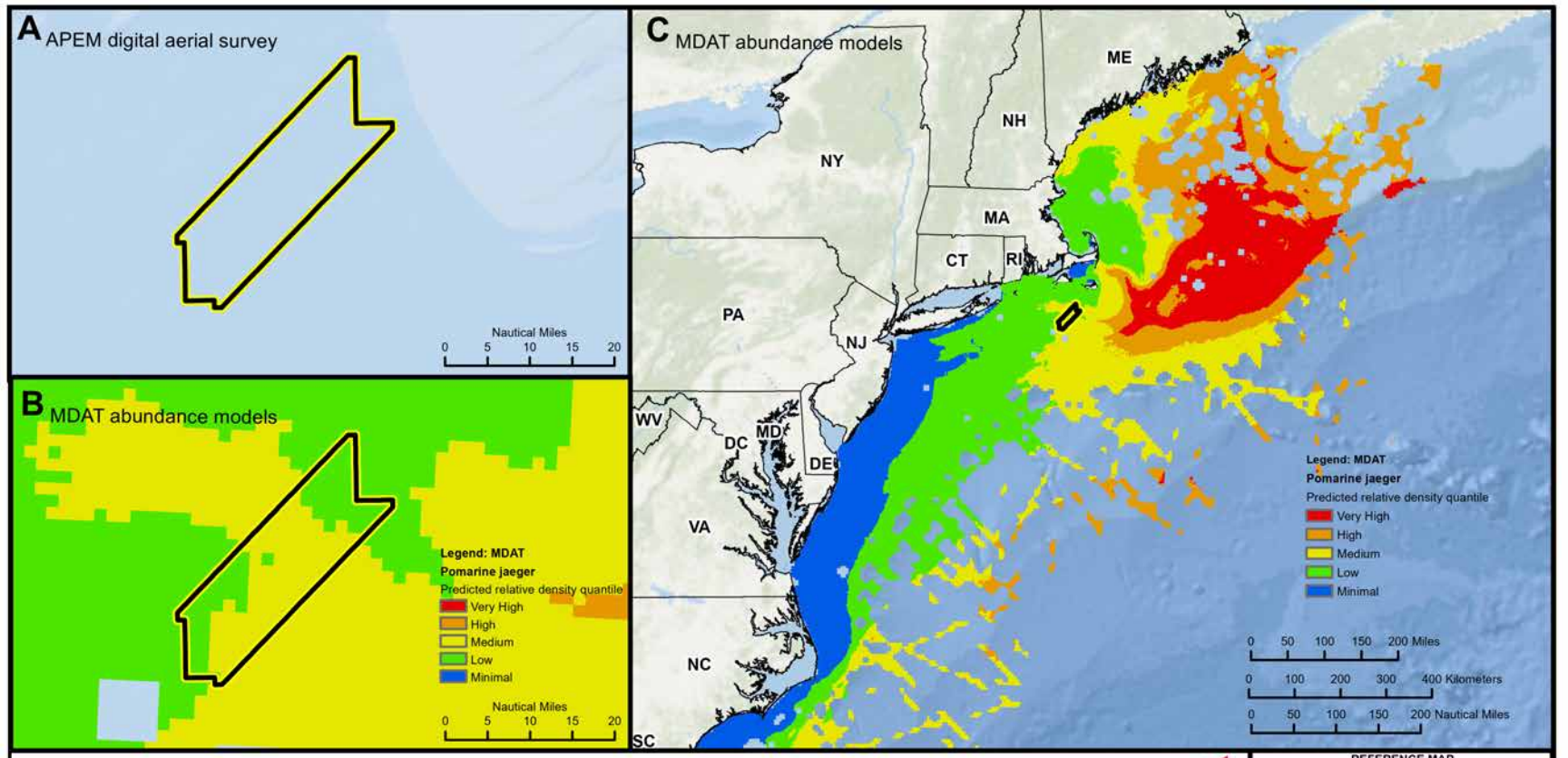


Beacon Wind OCS-A 0520 Lease Area

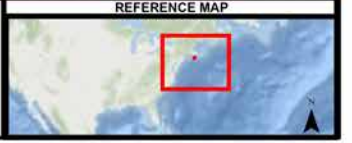
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
POMARINE JAEGER ABUNDANCE
SUMMER: JUNE - AUGUST

equinor

AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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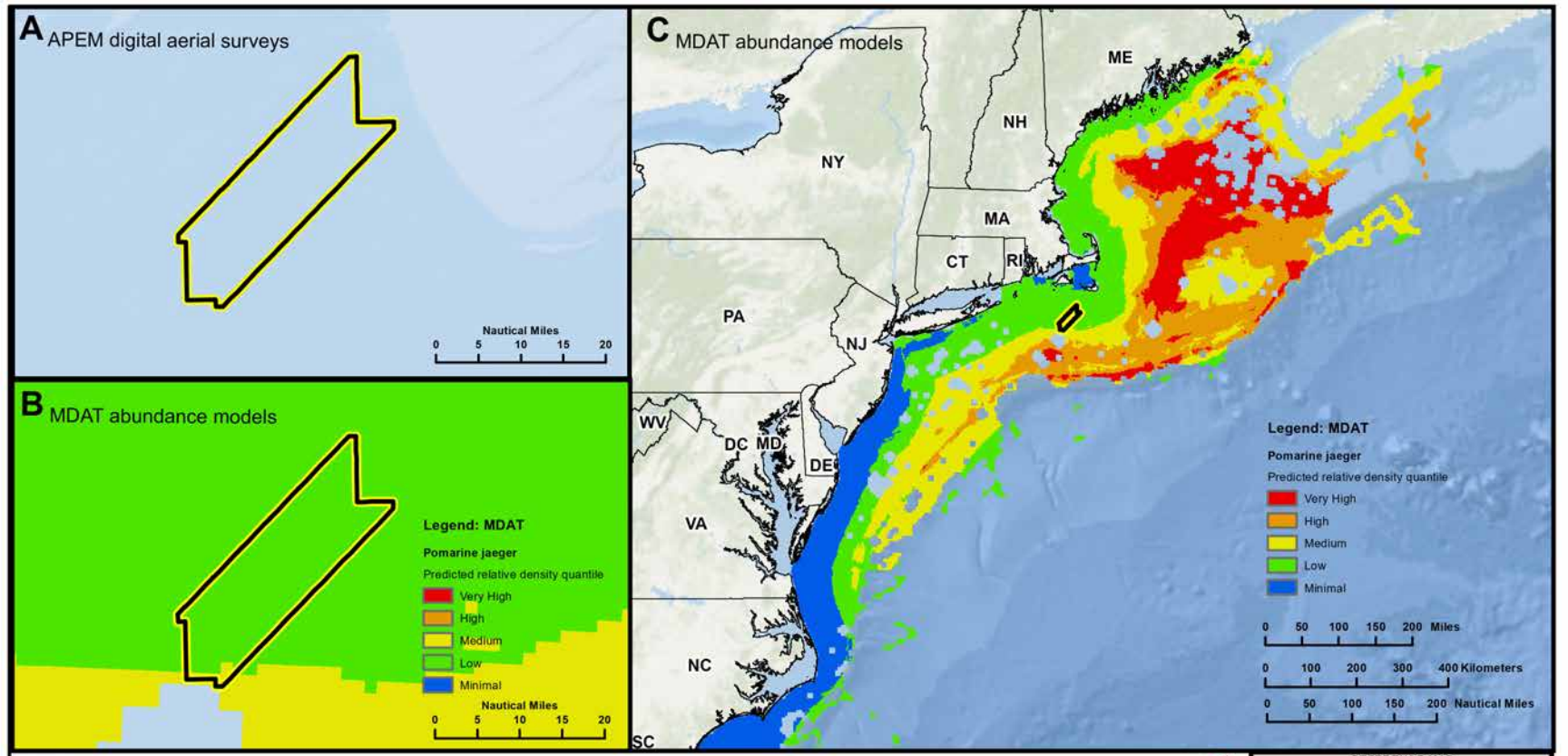


Beacon Wind OCS-A 0520 Lease Area

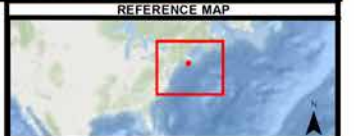
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
POMARINE JAEGER ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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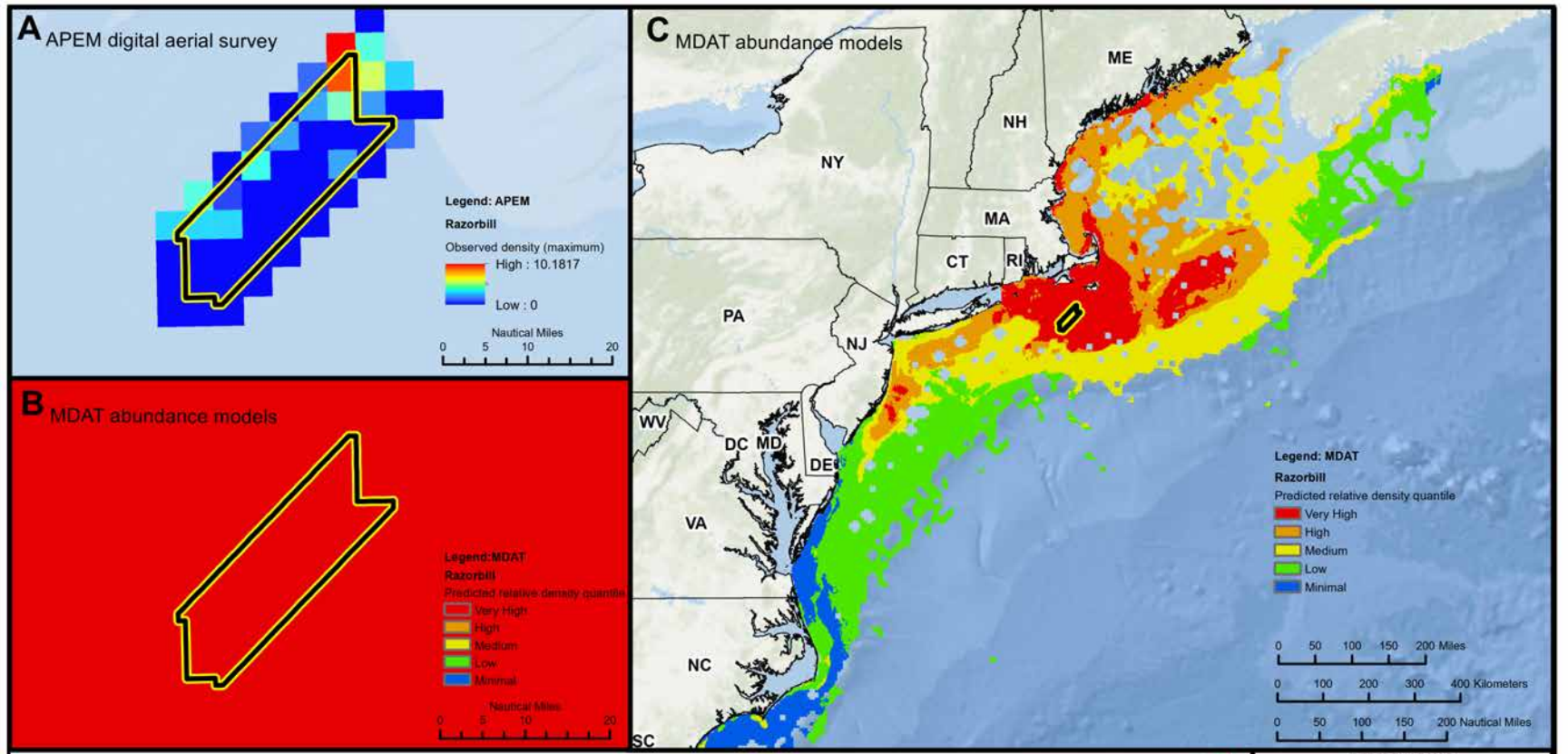


Beacon Wind OCS-A 0520 Lease Area

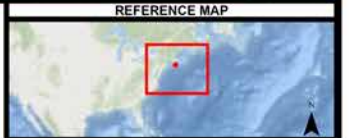
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
RAZORBILL ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



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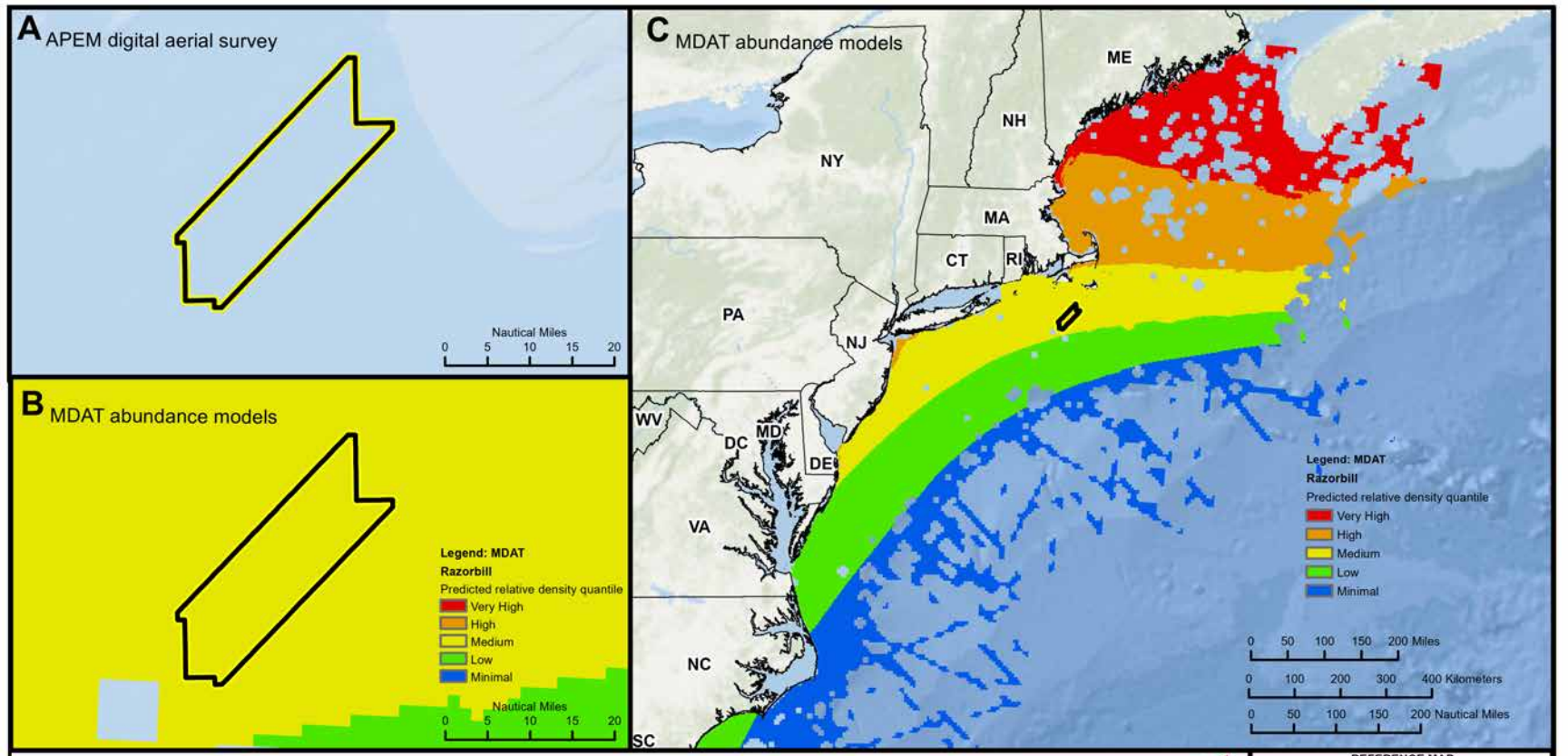

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
RAZORBILL ABUNDANCE
SUMMER: JUNE - AUGUST

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AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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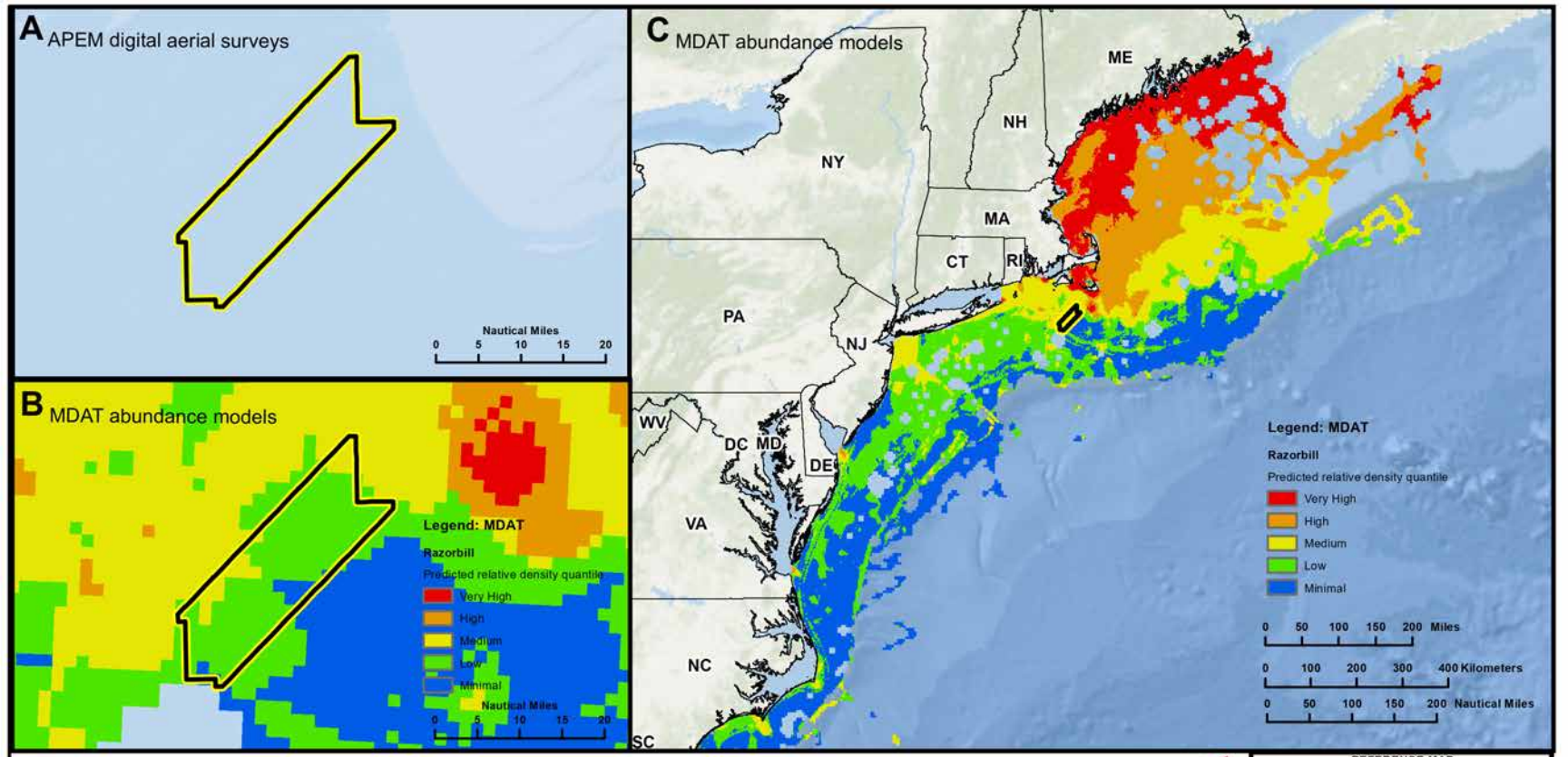


Beacon Wind OCS-A 0520 Lease Area

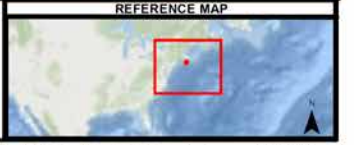
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
RAZORBILL ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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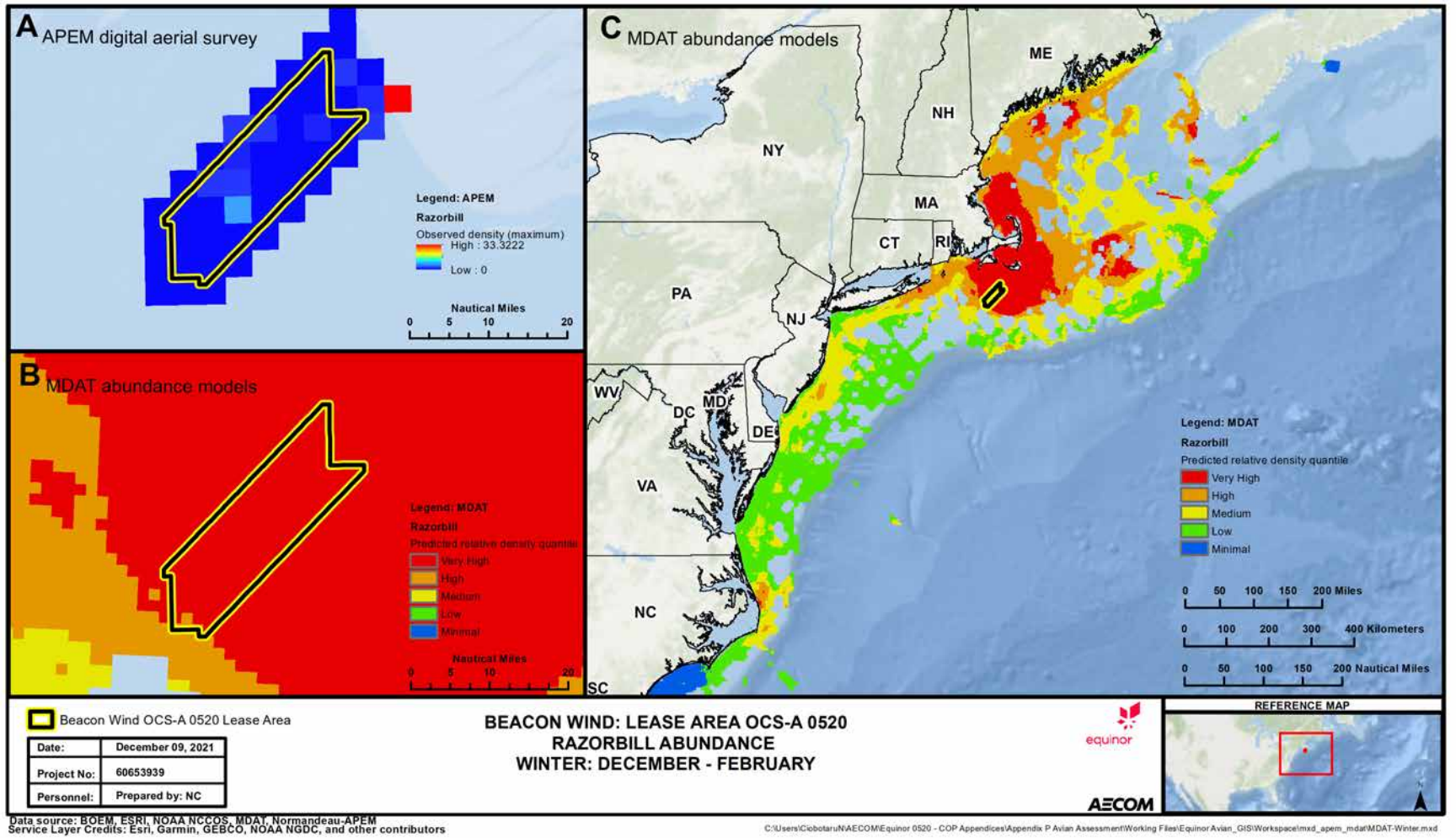
A
APEM digital aerial survey
Legend: APEM
Razorbill
Observed density (maximum)
High : 33.3222
Low : 0
Nautical Miles
0 5 10 20
B
MDAT abundance models
Legend: MDAT
Razorbill
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 20
C
MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
Razorbill
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 09, 2021
Project No: 60653939
Personnel: Prepared by: NC
BEACON WIND: LEASE AREA OCS-A 0520
RAZORBILL ABUNDANCE
WINTER: DECEMBER - FEBRUARY
equinor
AECOM
REFERENCE MAP
Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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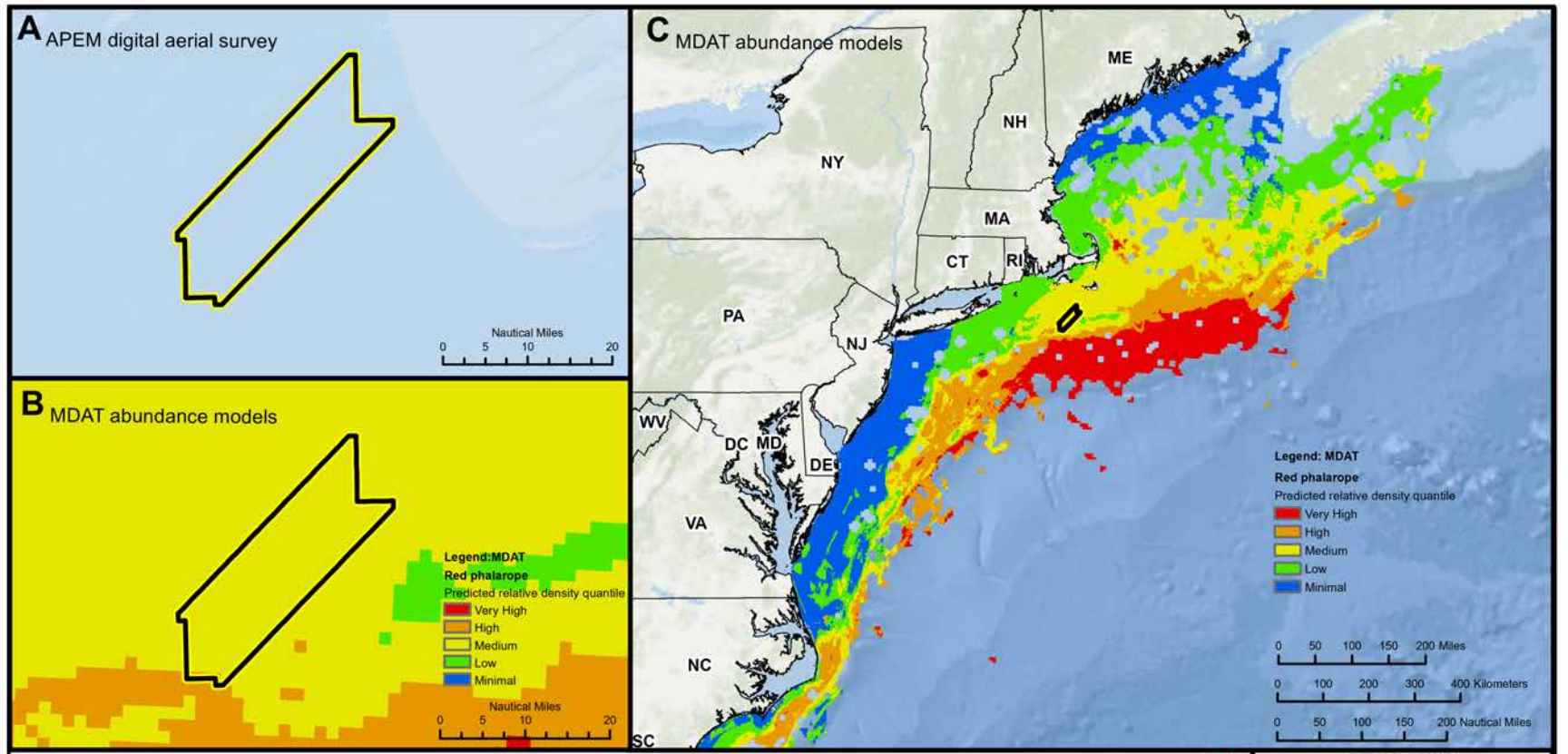


Beacon Wind OCS-A 0520 Lease Area

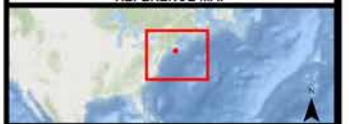
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
RED PHALAROPE ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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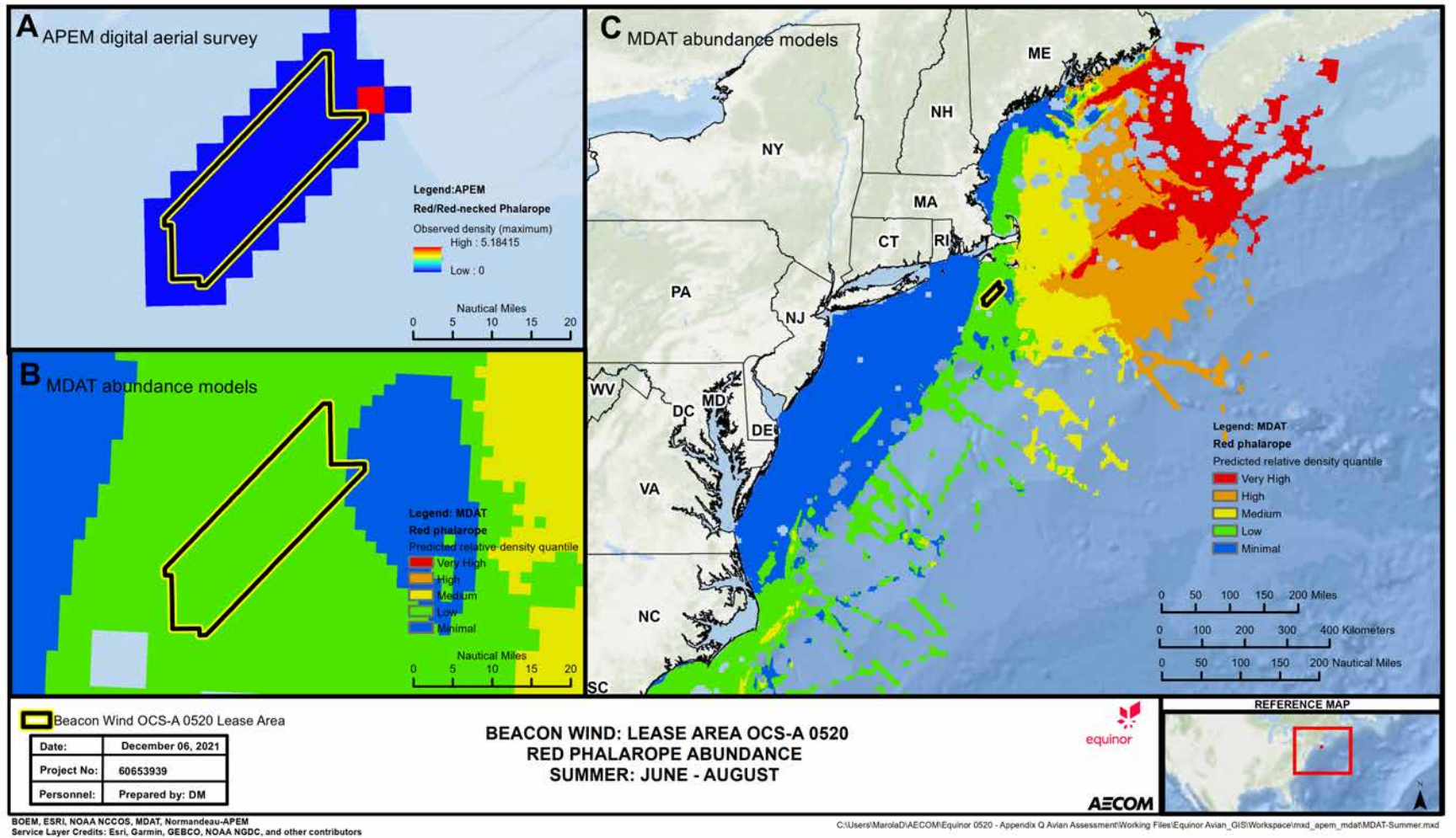
A APEM digital aerial survey
Legend:APEM
Red/Red-necked Phalarope
Observed density (maximum)
High : 5.18415
Low : 0
Nautical Miles
0 5 10 15 20
B MDAT abundance models
Legend: MDAT
Red phalarope
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 15 20
C MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
Red phalarope
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
RED PHALAROPE ABUNDANCE
SUMMER: JUNE - AUGUST
equinor
AECOM
REFERENCE MAP
BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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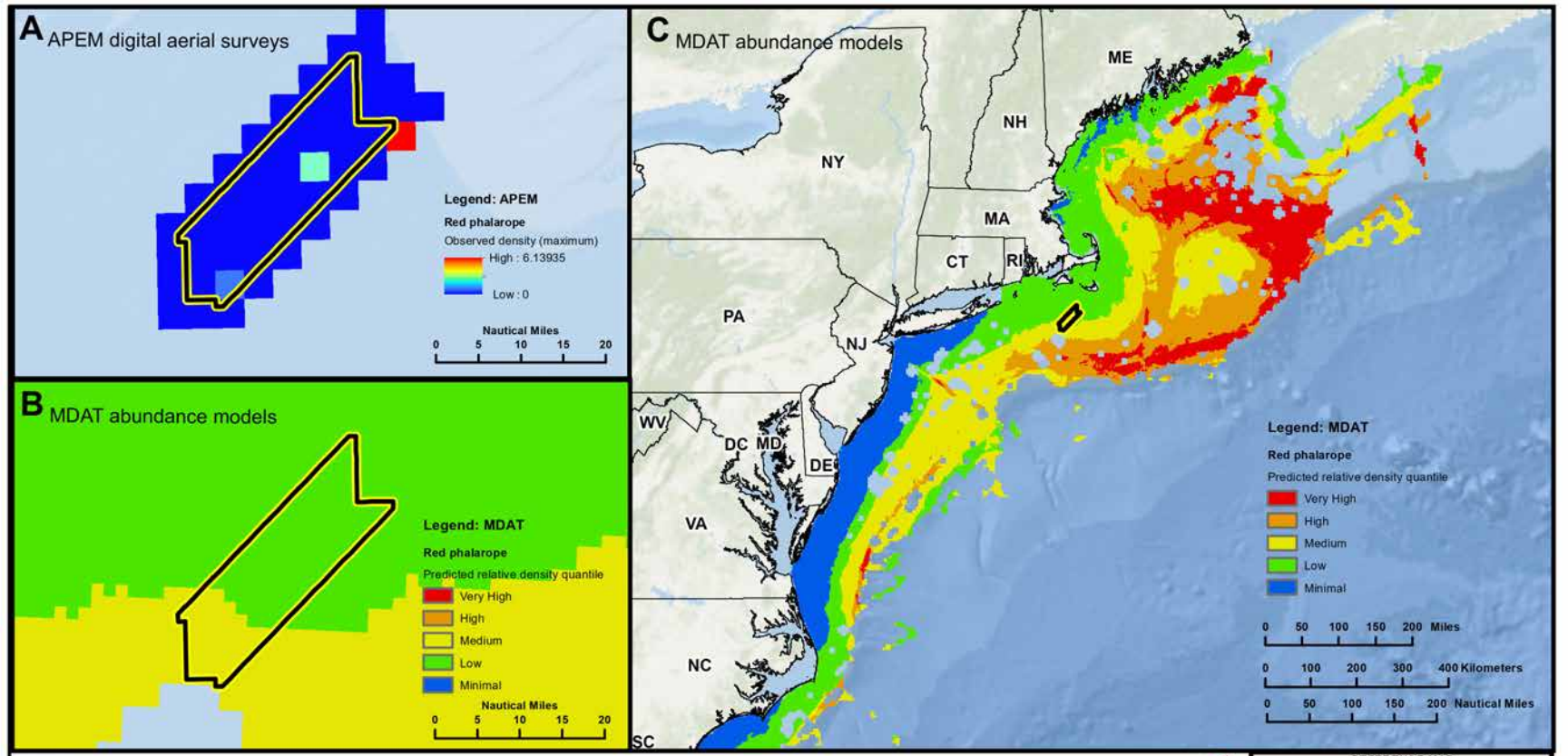


Beacon Wind OCS-A 0520 Lease Area

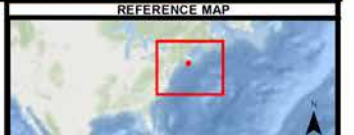
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
RED PHALAROPE ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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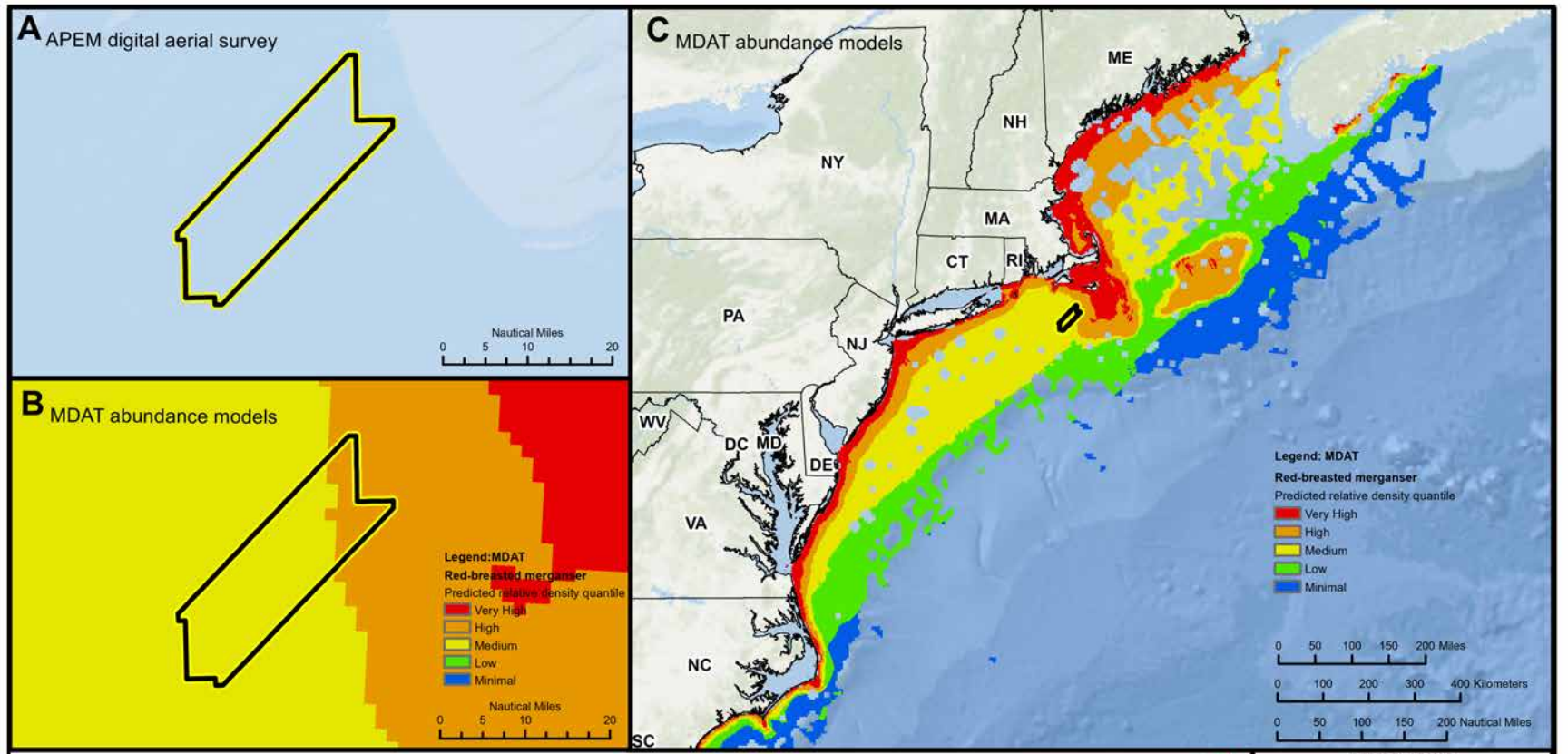


Beacon Wind OCS-A 0520 Lease Area

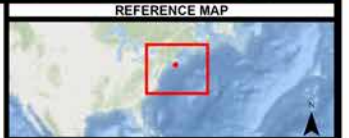
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
RED-BREASTED MERGANSER ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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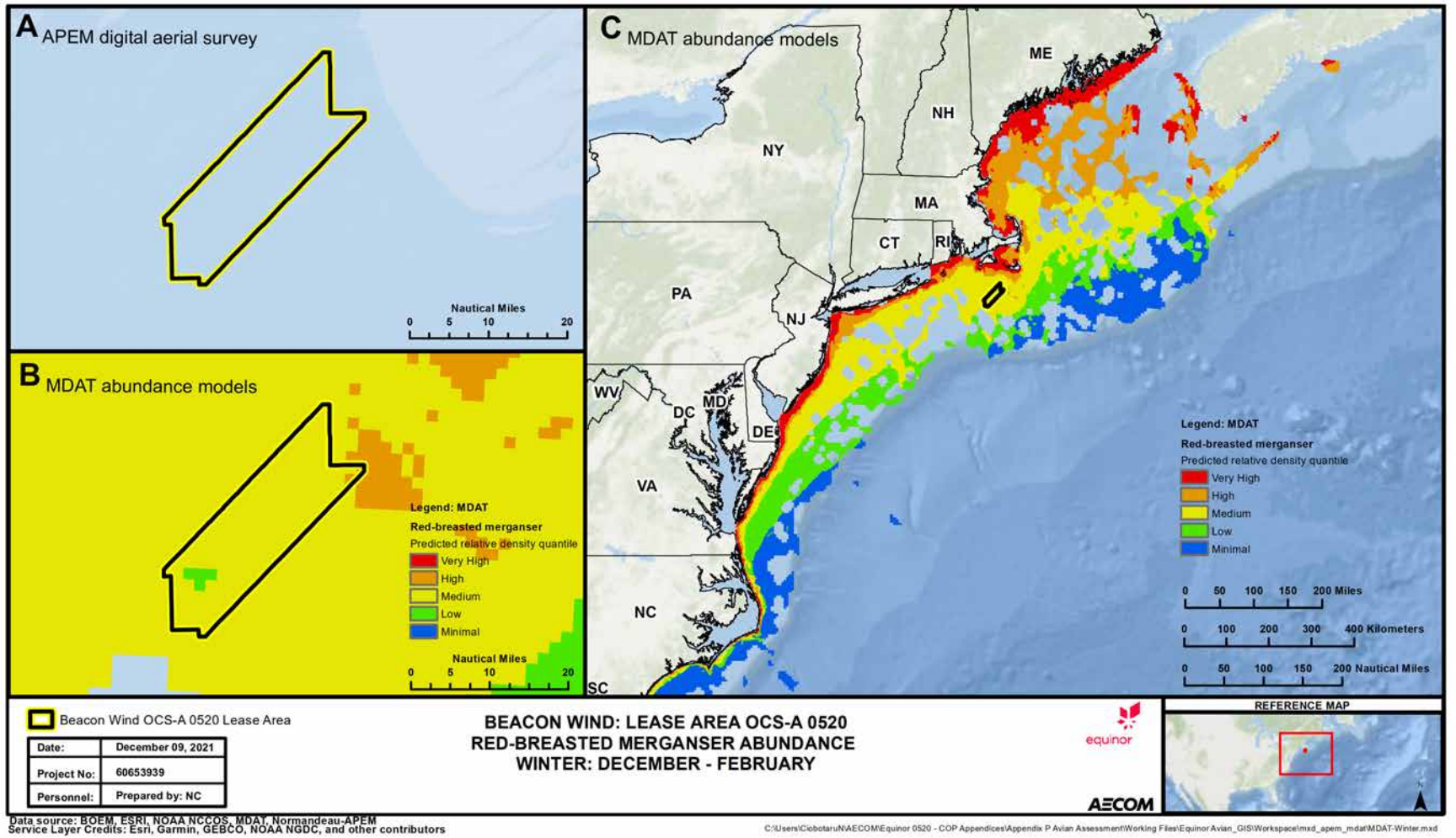
A
APEM digital aerial survey
Nautical Miles
0 5 10 20
B
MDAT abundance models
Legend: MDAT
Red-breasted merganser
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 20
C
MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
Red-breasted merganser
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 09, 2021
Project No: 60653939
Personnel: Prepared by: NC
BEACON WIND: LEASE AREA OCS-A 0520
RED-BREASTED MERGANSER ABUNDANCE
WINTER: DECEMBER - FEBRUARY
equinor
AECOM
REFERENCE MAP
Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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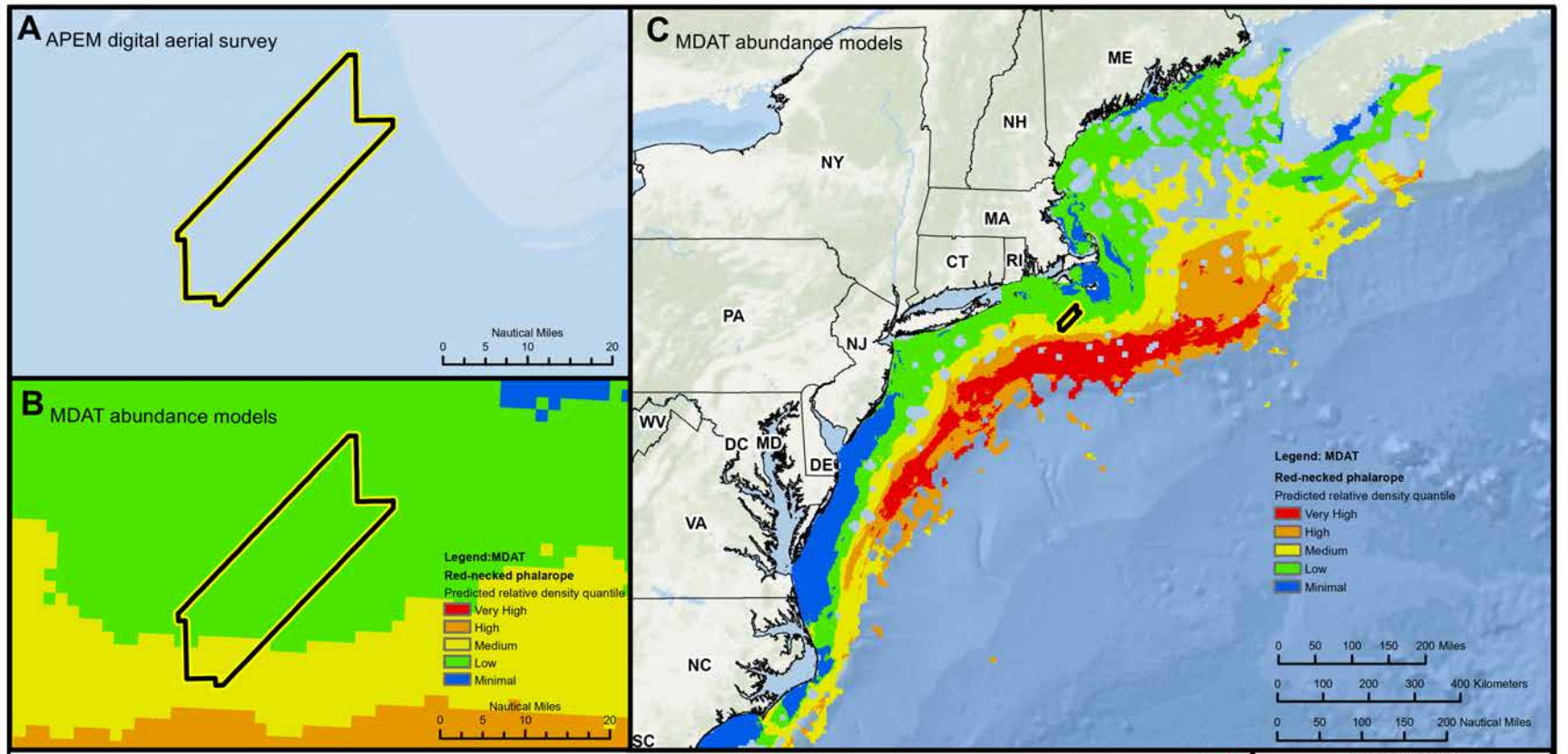


Beacon Wind OCS-A 0520 Lease Area

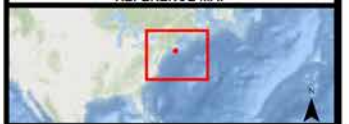
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
RED-NECKED PHALAROPE ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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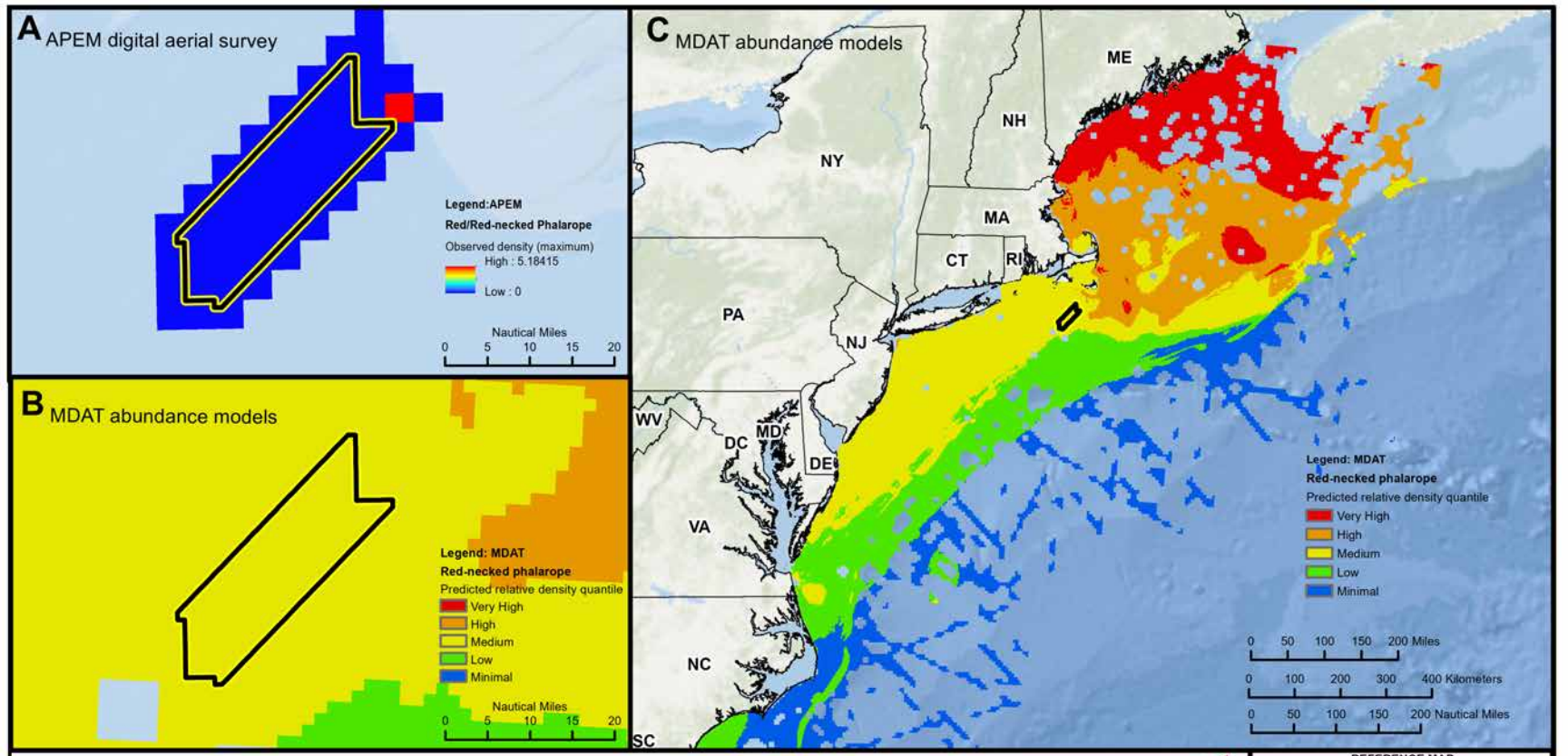

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
RED-NECKED PHALAROPE ABUNDANCE
SUMMER: JUNE - AUGUST

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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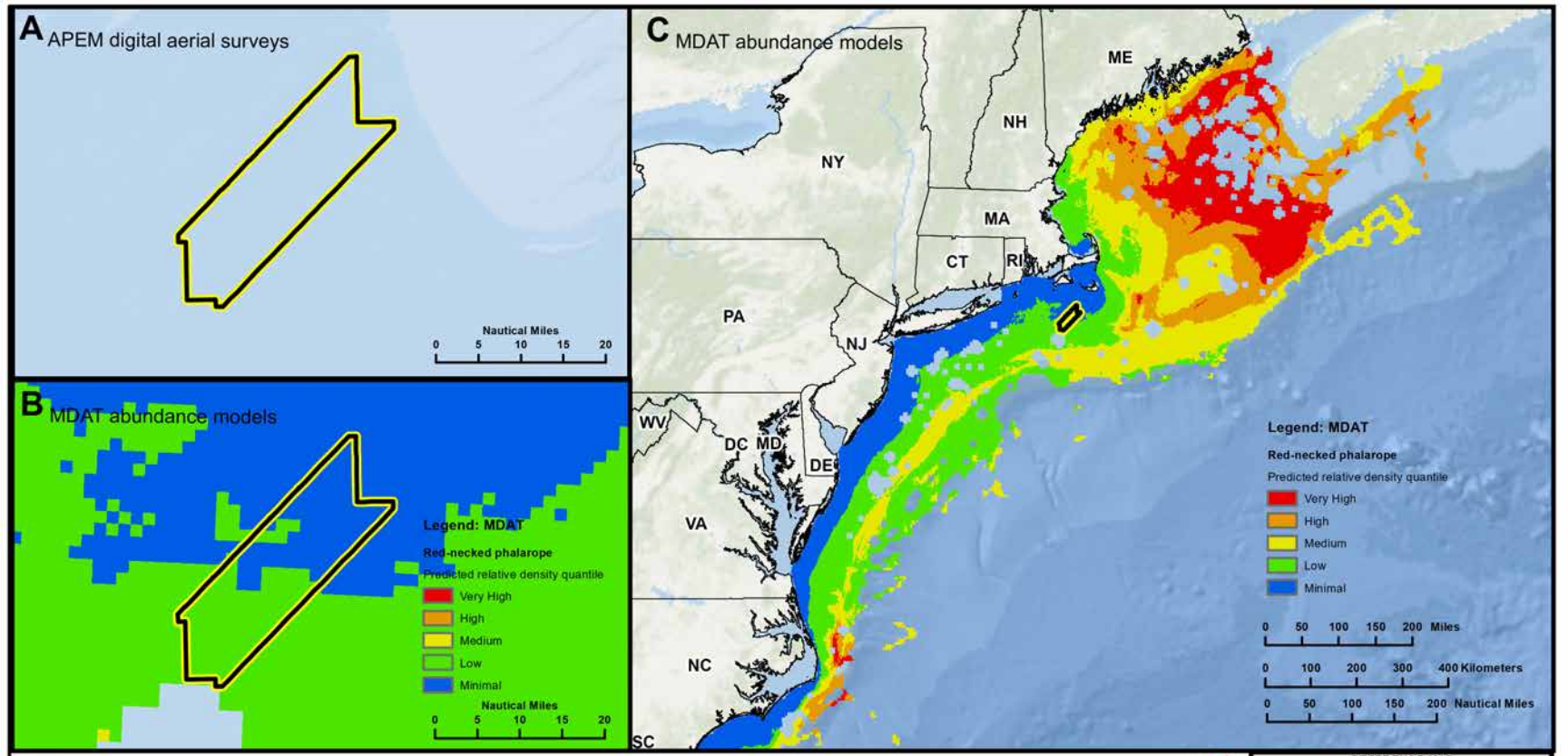


Beacon Wind OCS-A 0520 Lease Area

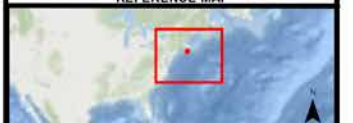
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
RED-NECKED PHALAROPE ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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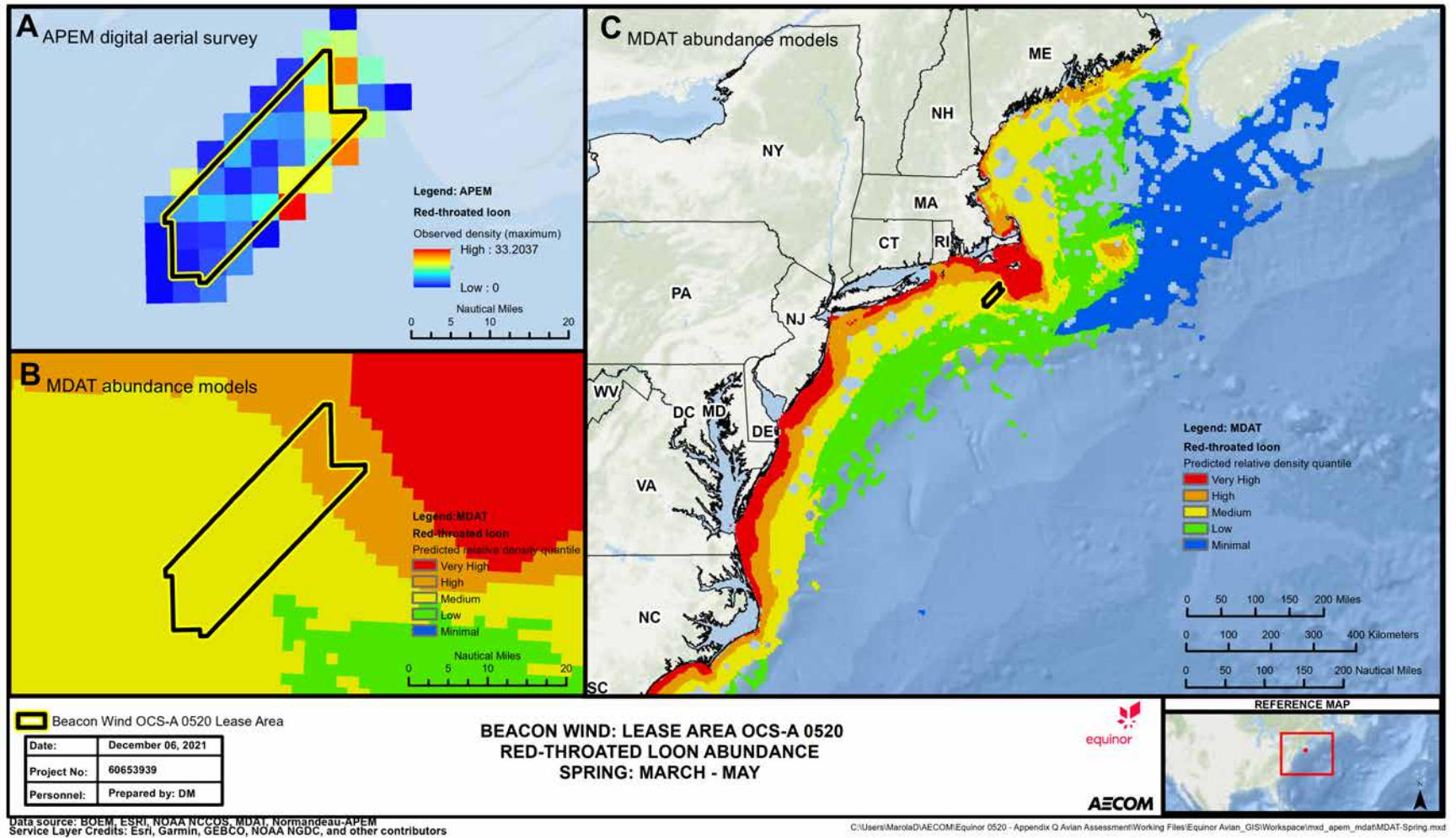
A APEM digital aerial survey
Legend: APEM
Red-throated loon
Observed density (maximum)
High : 33.2037
Low : 0
Nautical Miles
0 5 10 20
B MDAT abundance models
Legend: MDAT
Red-throated loon
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 20
C MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
Red-throated loon
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
RED-THROATED LOON ABUNDANCE
SPRING: MARCH - MAY
equinor
AECOM
REFERENCE MAP
Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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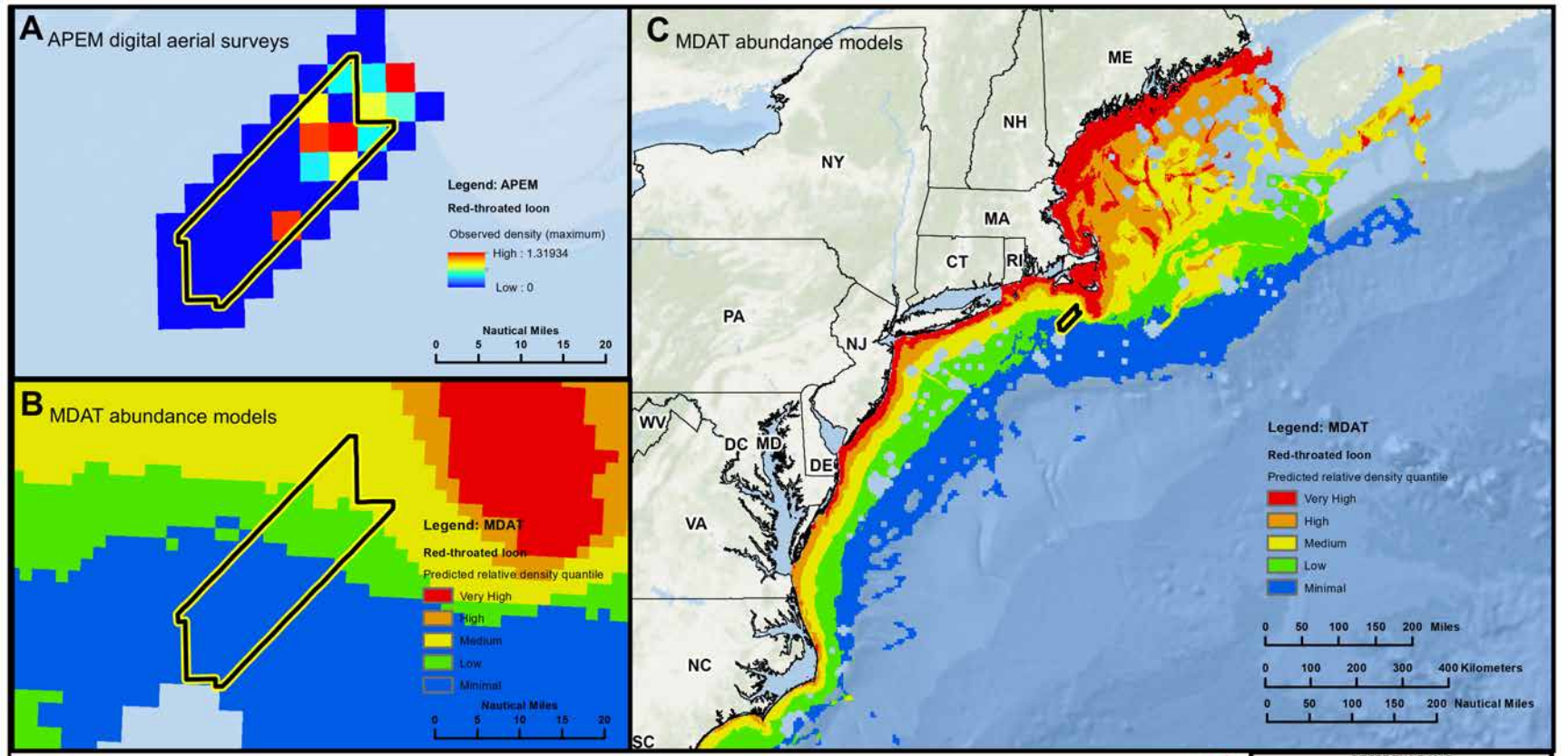

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
RED-THROATED LOON ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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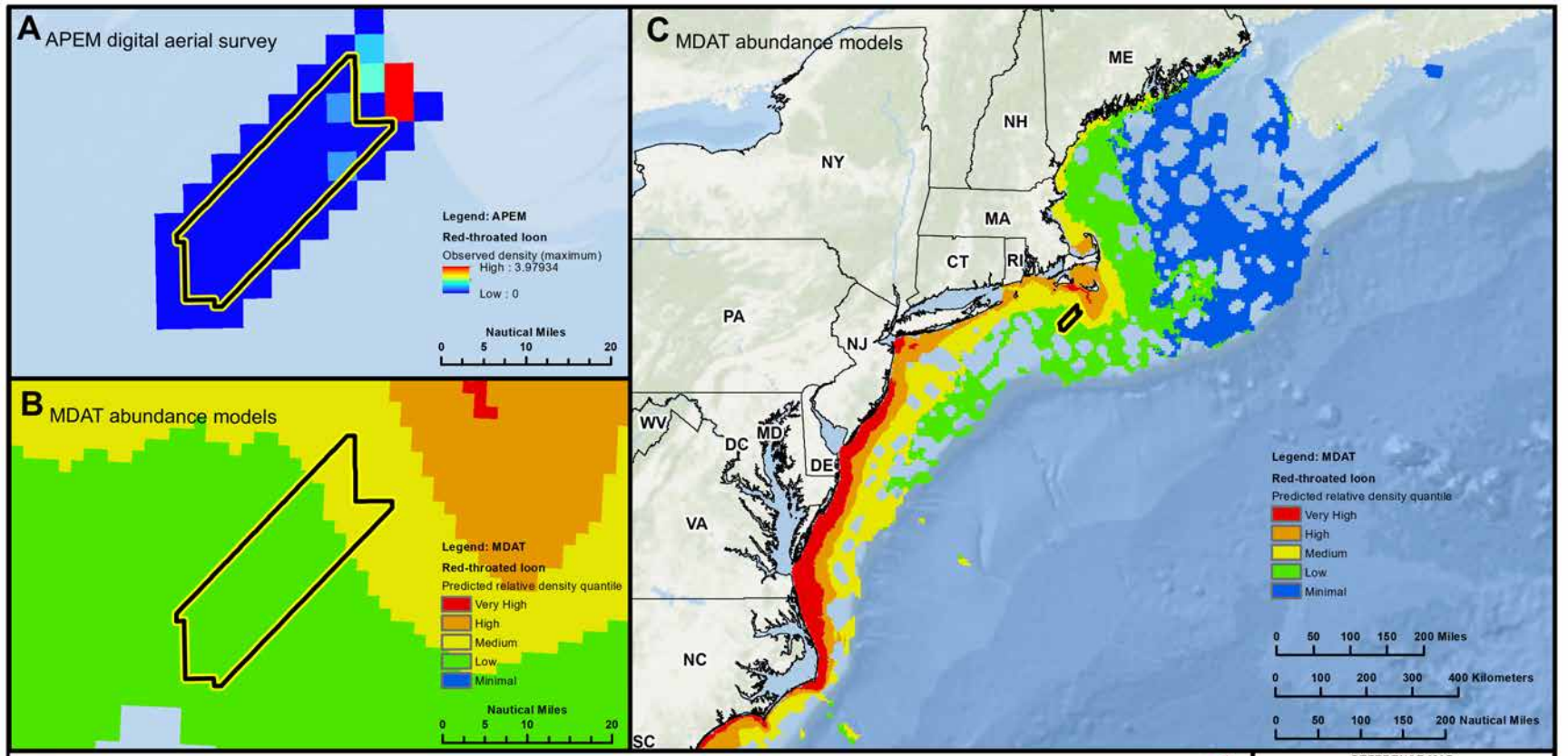


Beacon Wind OCS-A 0520 Lease Area

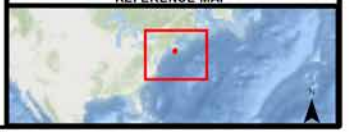
Date:	December 09, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
RED-THROATED LOON ABUNDANCE
WINTER: DECEMBER - FEBRUARY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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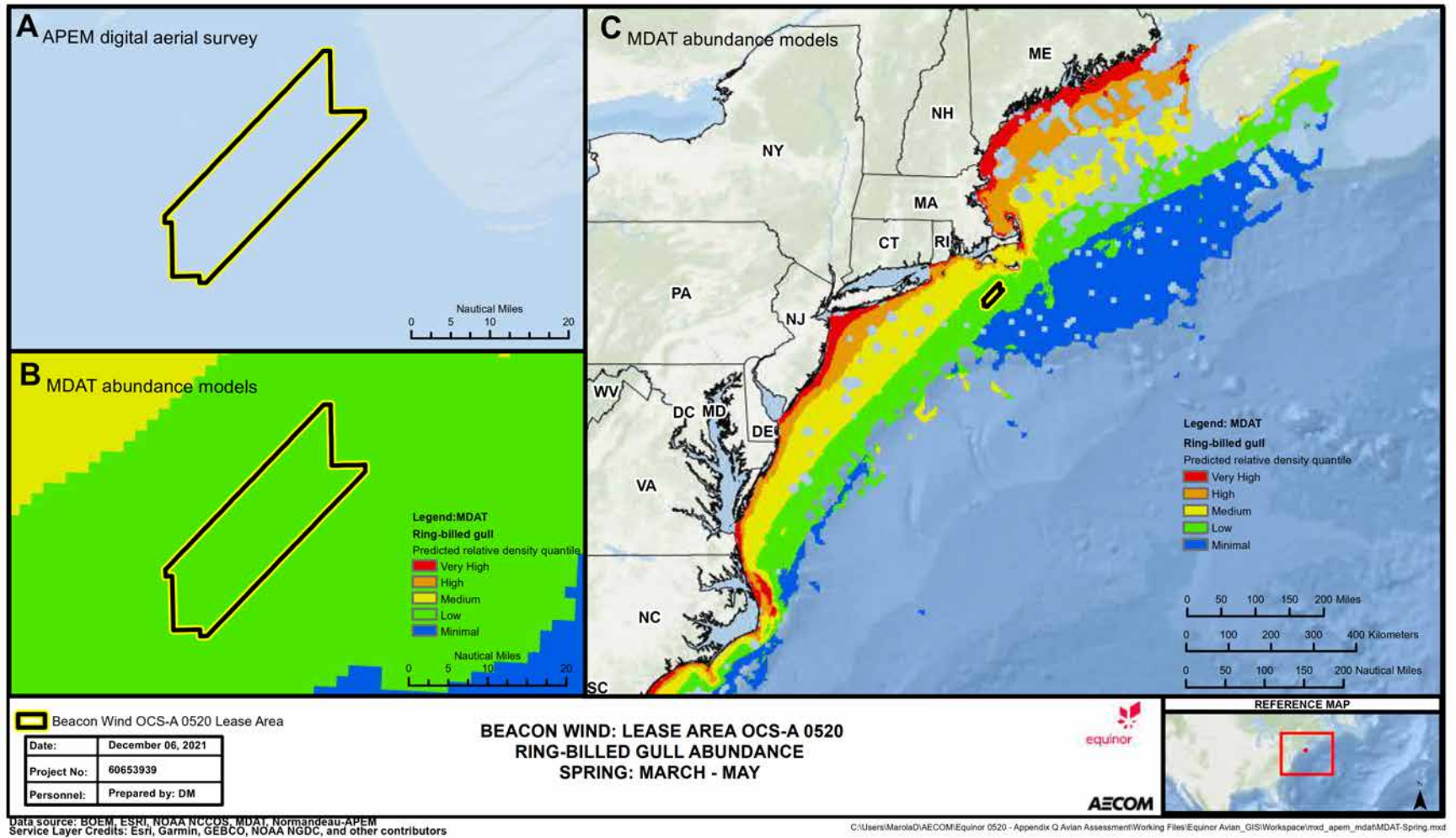
A APEM digital aerial survey
Nautical Miles
0 5 10 20
B MDAT abundance models
Legend:MDAT
Ring-billed gull
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 20
C MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
Ring-billed gull
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
RING-BILLED GULL ABUNDANCE
SPRING: MARCH - MAY
equinor
AECOM
REFERENCE MAP
Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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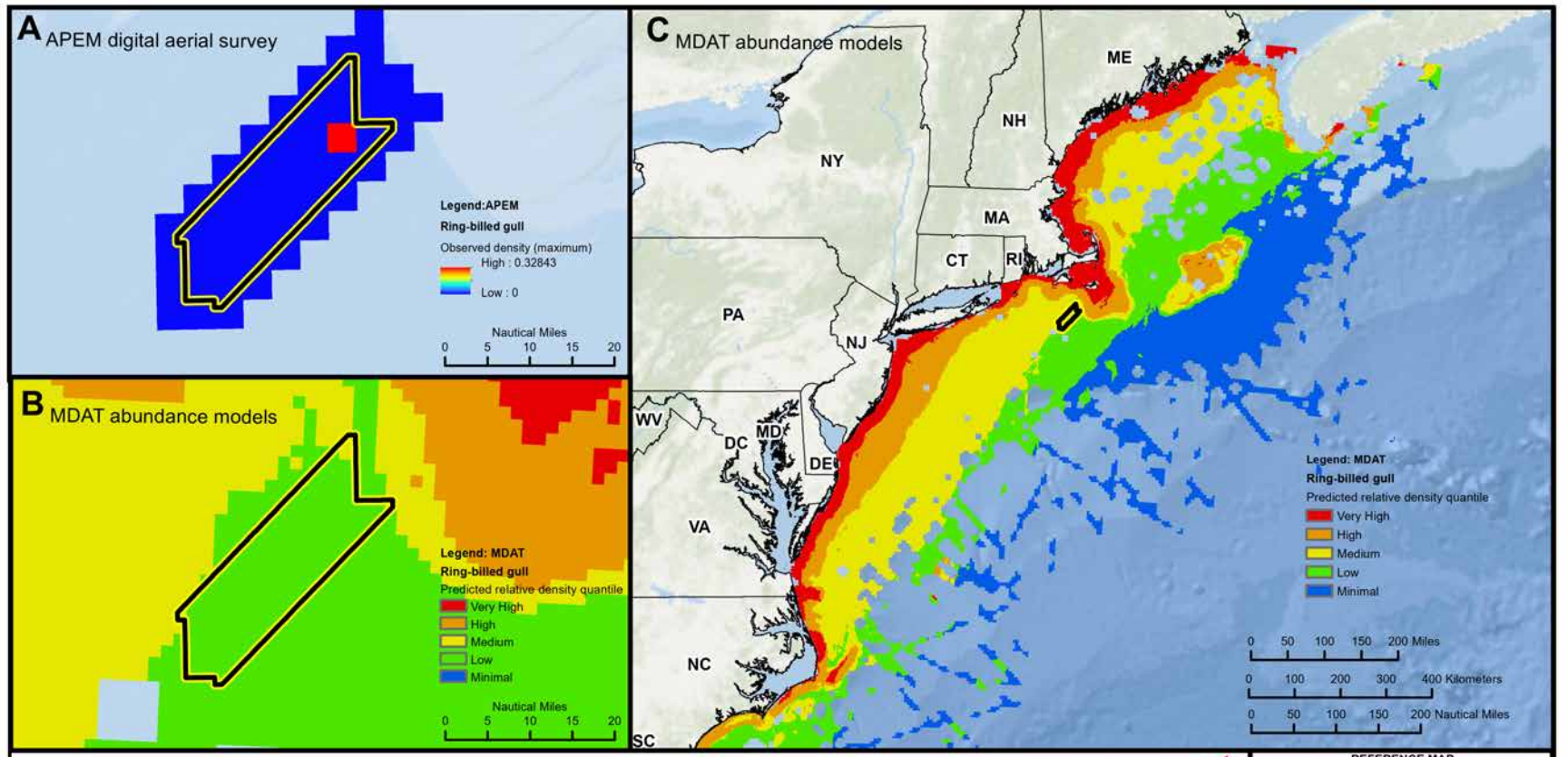

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
RING-BILLED GULL ABUNDANCE
SUMMER: JUNE - AUGUST

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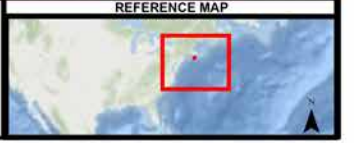
AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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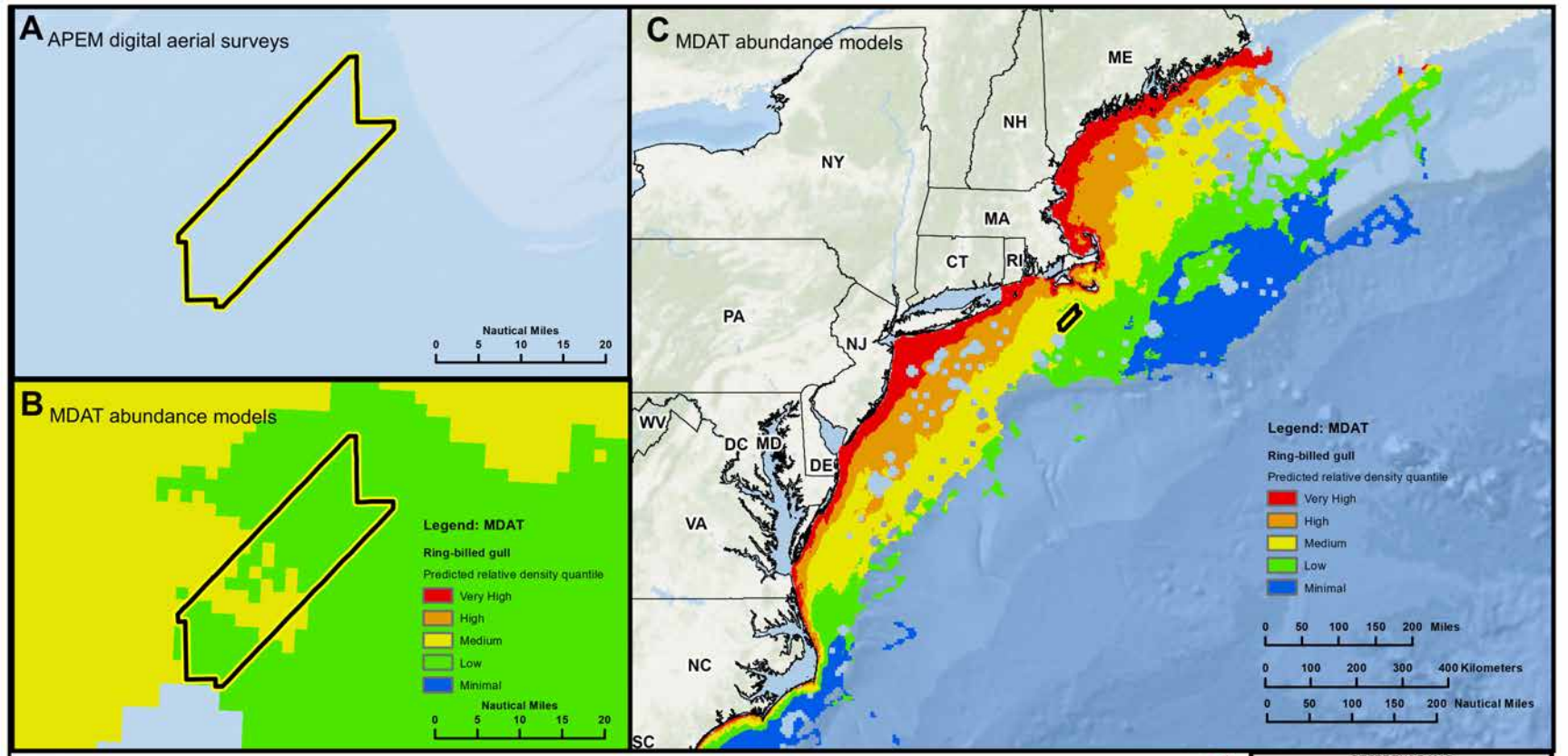

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
RING-BILLED GULL ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

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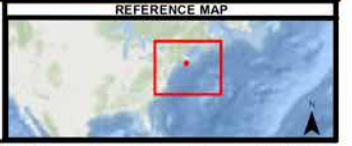
AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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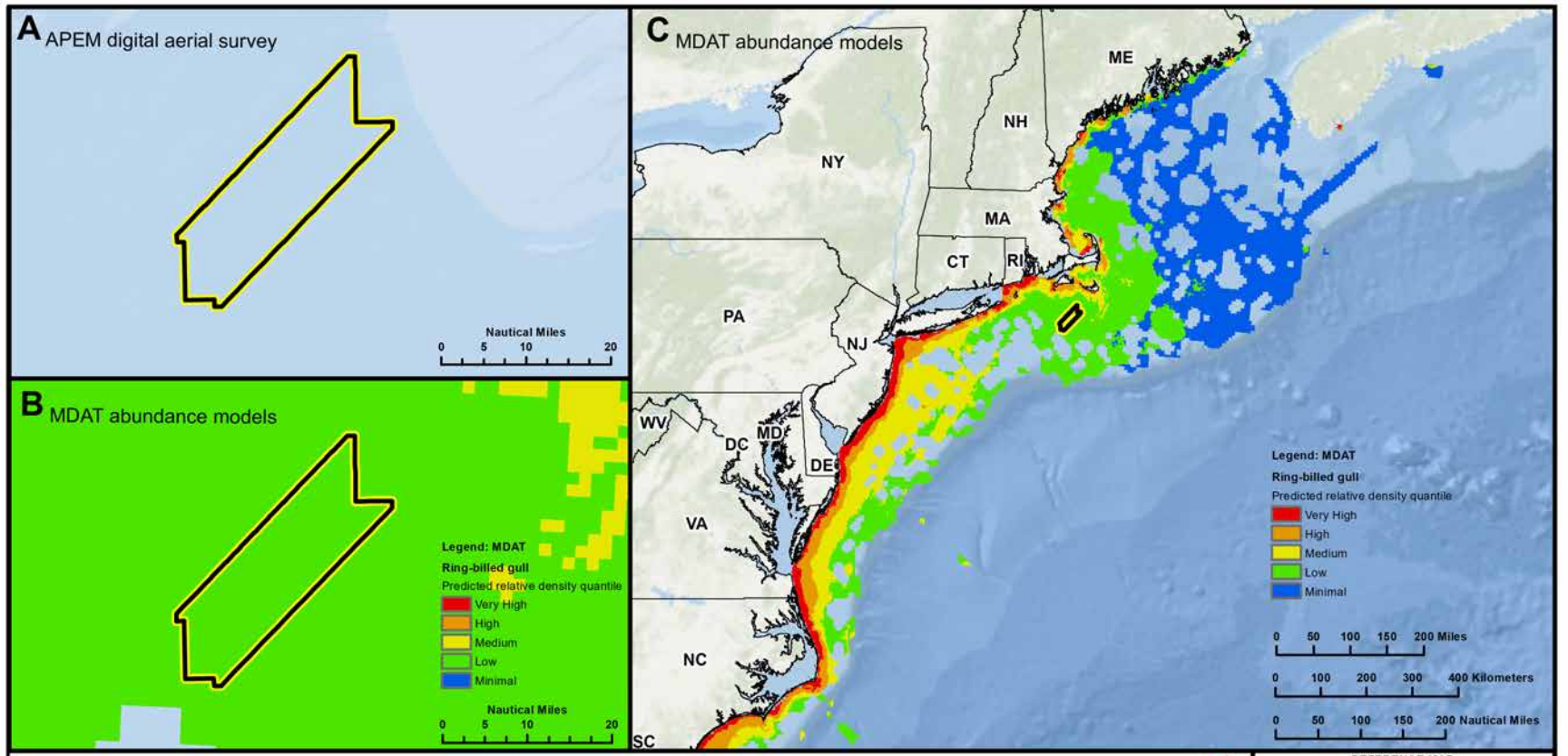


Beacon Wind OCS-A 0520 Lease Area

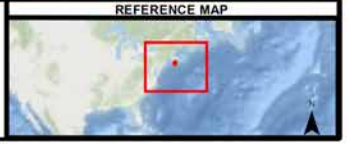
Date:	December 09, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
RING-BILLED GULL ABUNDANCE
WINTER: DECEMBER - FEBRUARY

equinor

AECOM

REFERENCE MAP



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Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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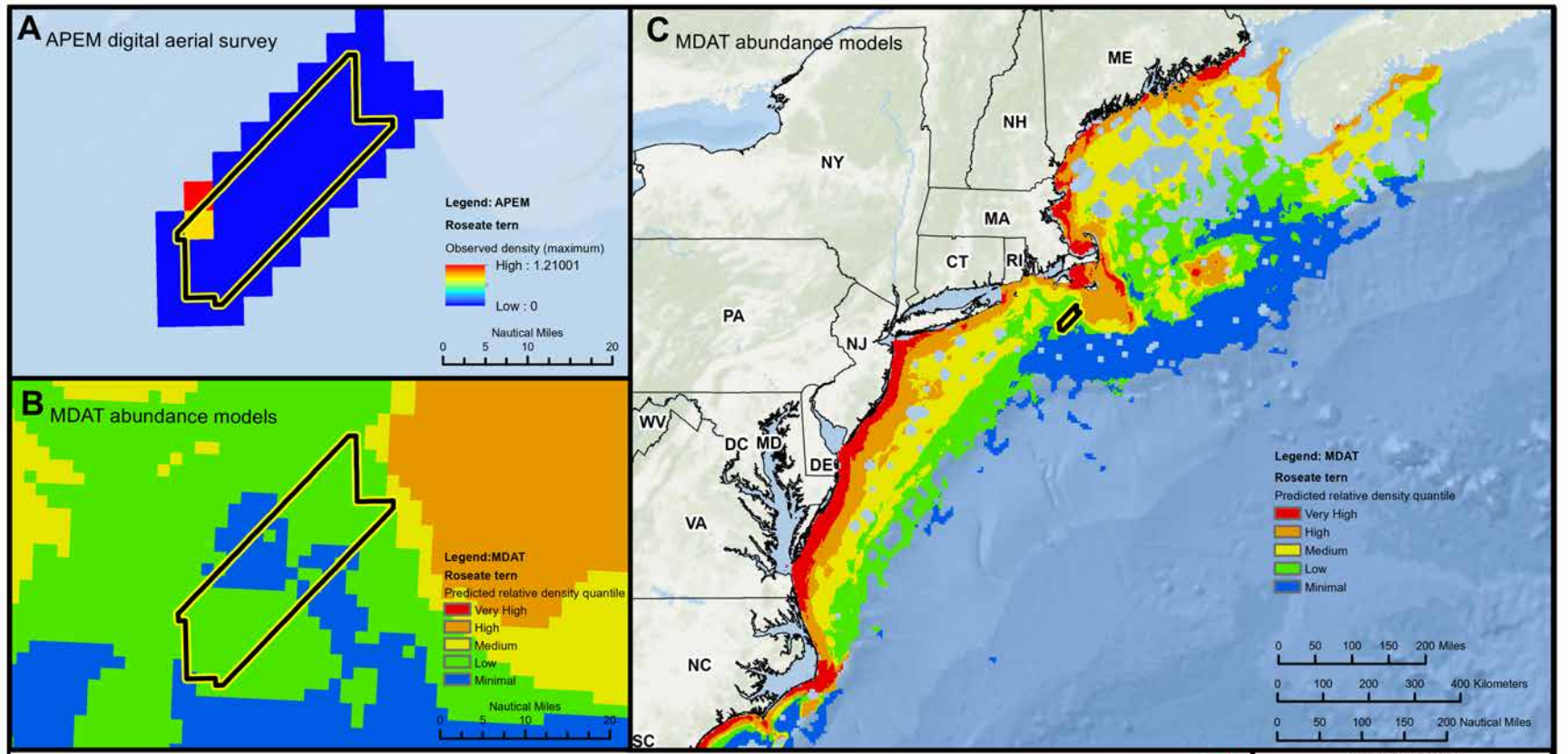


Beacon Wind OCS-A 0520 Lease Area

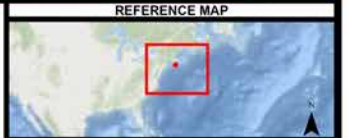
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
ROSEATE TERN ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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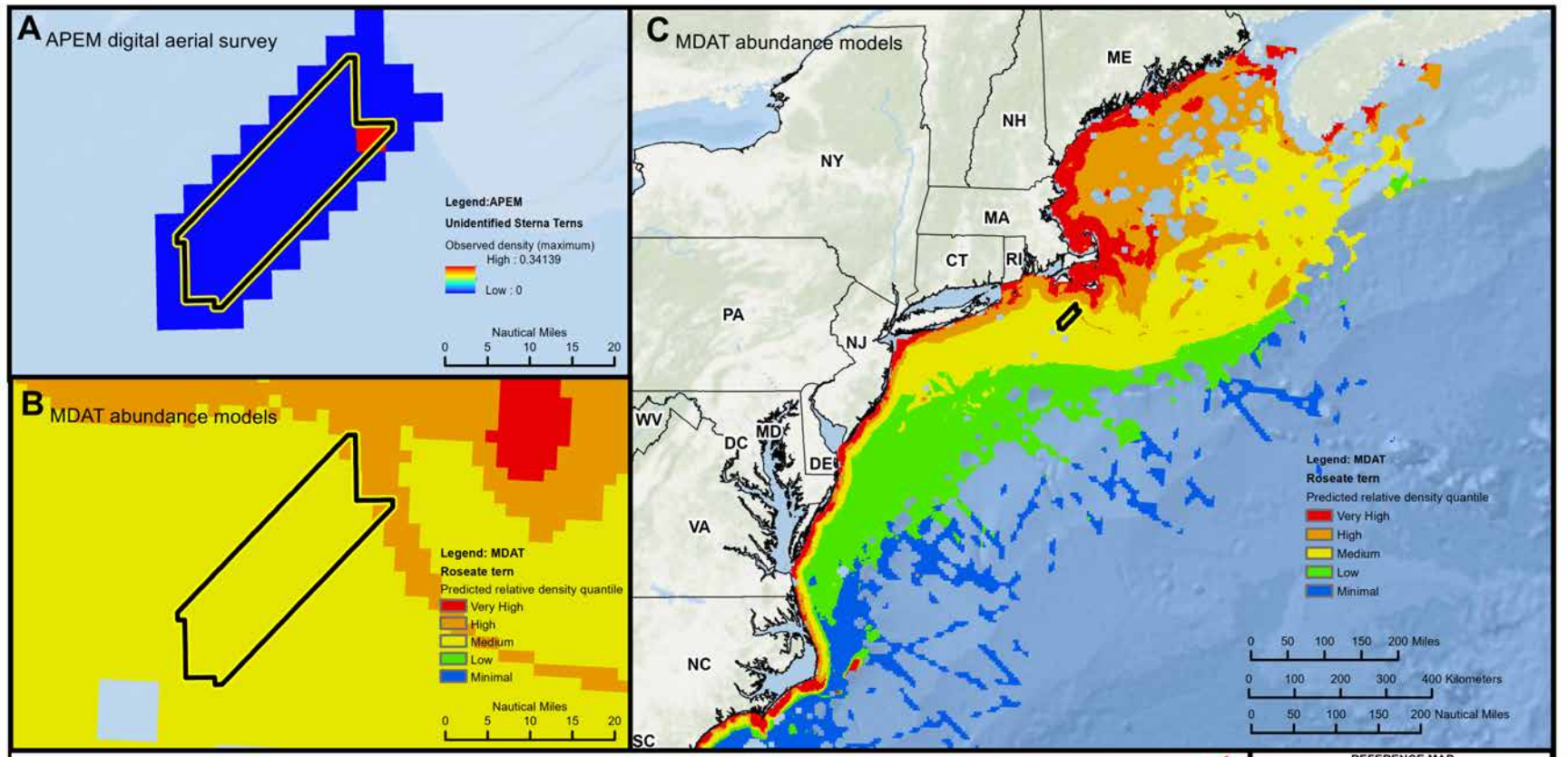

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
ROSEATE TERN ABUNDANCE
SUMMER: JUNE - AUGUST

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AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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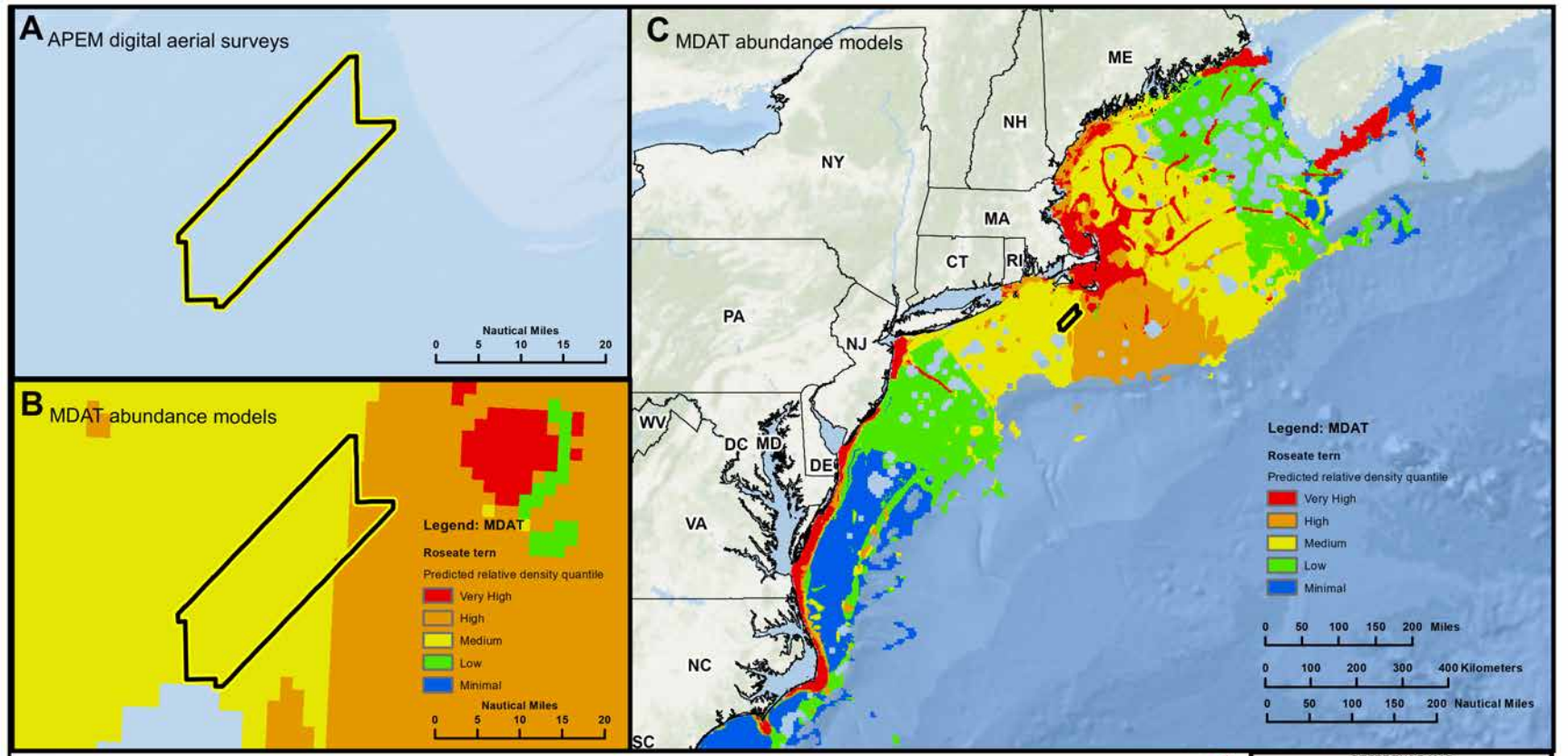

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
ROSEATE TERN ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

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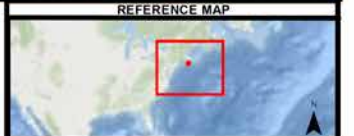
AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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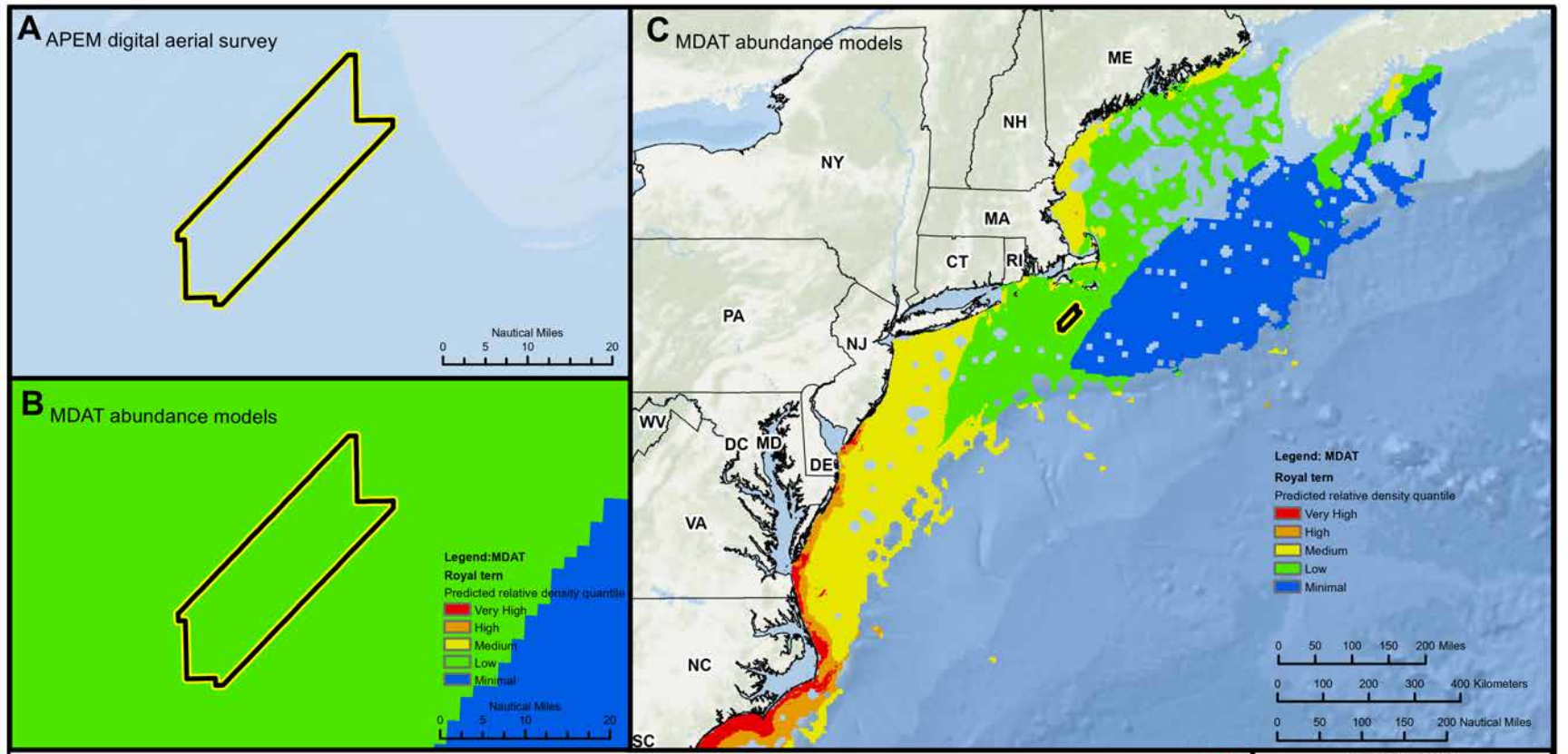
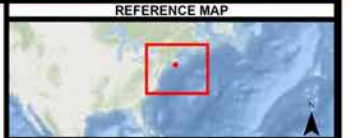


Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
ROYAL TERN ABUNDANCE
SPRING: MARCH - MAY

REFERENCE MAP



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Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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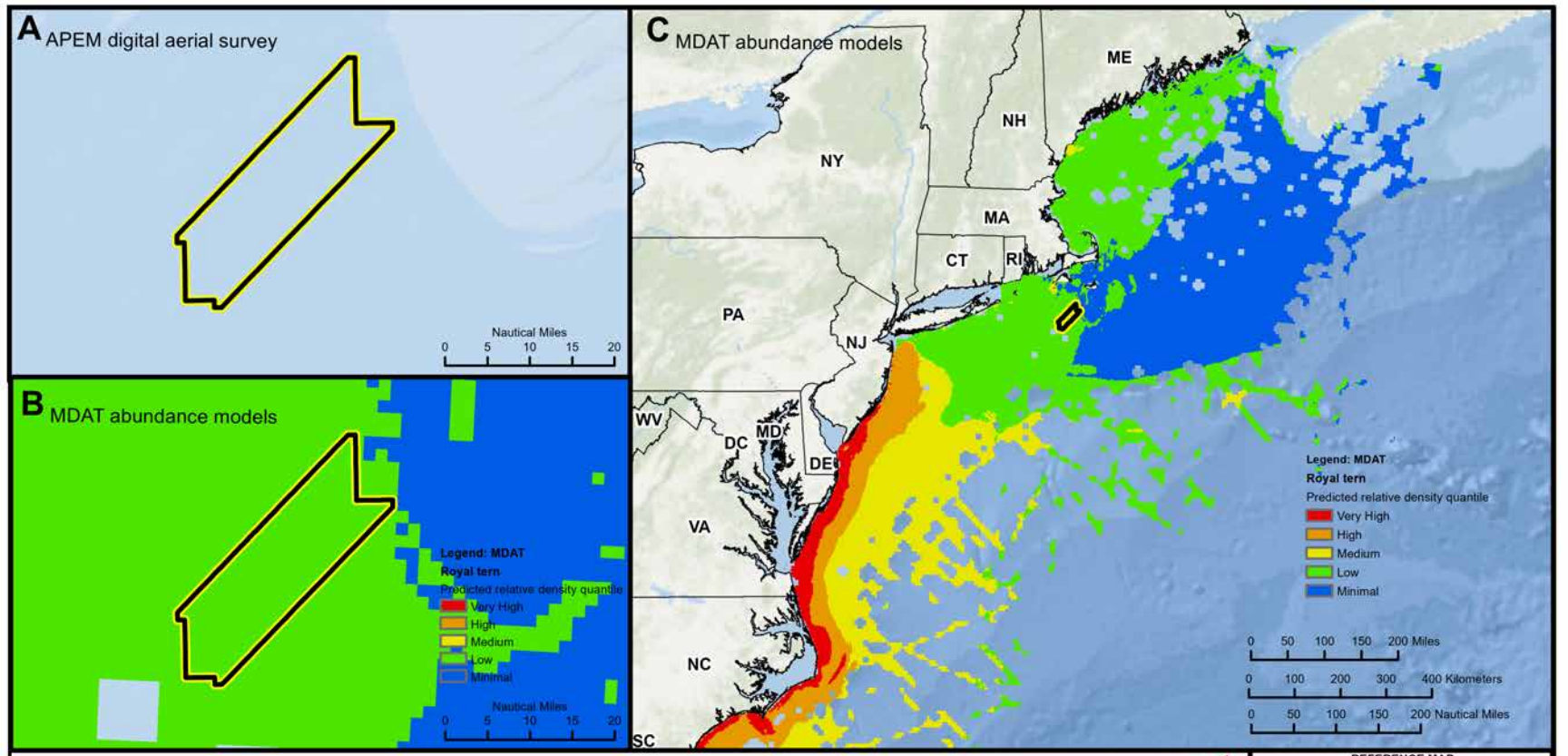

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
ROYAL TERN ABUNDANCE
SUMMER: JUNE - AUGUST

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AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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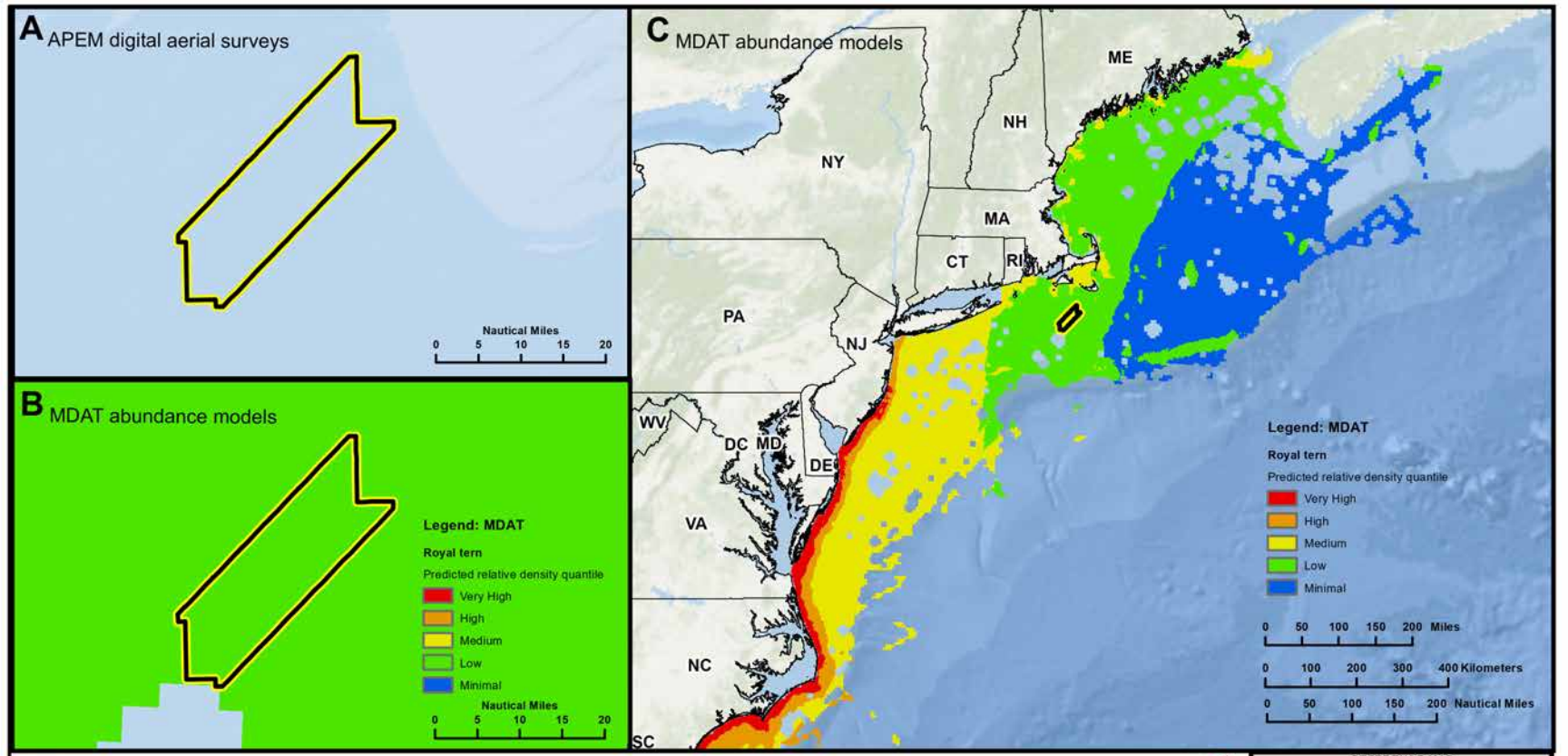


Beacon Wind OCS-A 0520 Lease Area

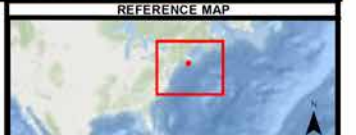
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
ROYAL TERN ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP



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Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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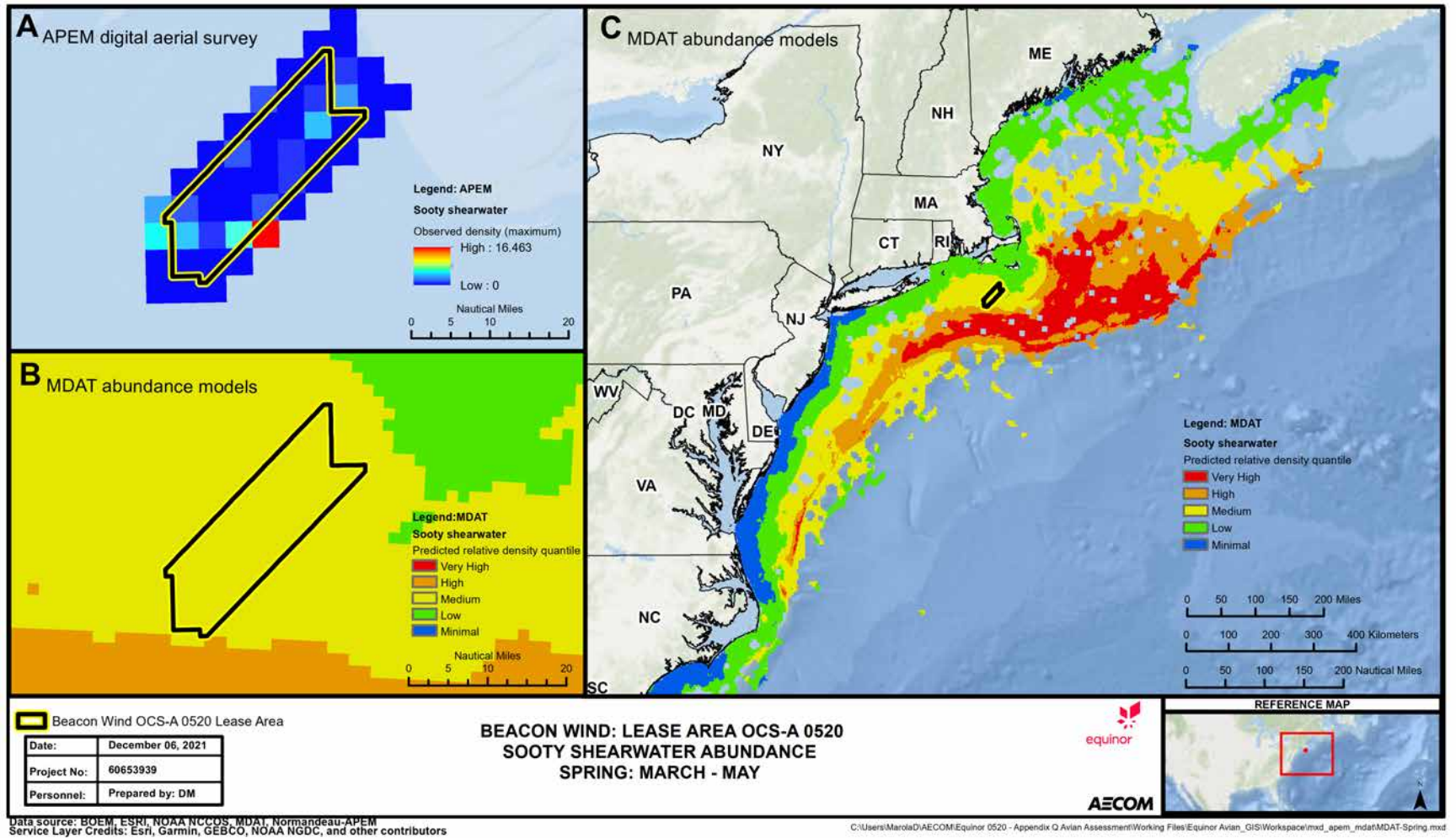
A APEM digital aerial survey
Legend: APEM
Sooty shearwater
Observed density (maximum)
High : 16.463
Low : 0
Nautical Miles
0 5 10 20
B MDAT abundance models
Legend:MDAT
Sooty shearwater
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 20
C MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
Sooty shearwater
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
SOOTY SHEARWATER ABUNDANCE
SPRING: MARCH - MAY
equinor
AECOM
REFERENCE MAP
Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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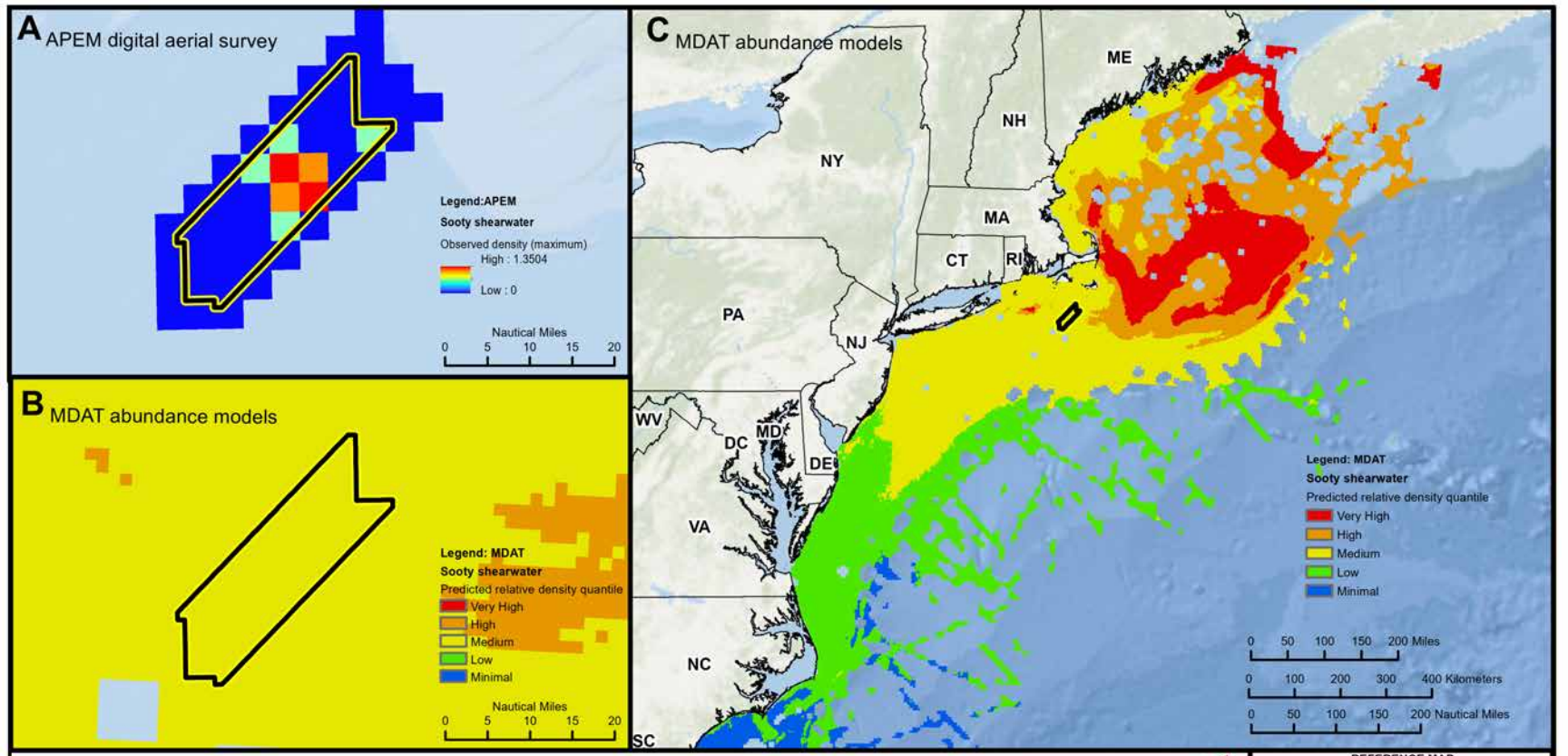

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
SOOTY SHEARWATER ABUNDANCE
SUMMER: JUNE - AUGUST

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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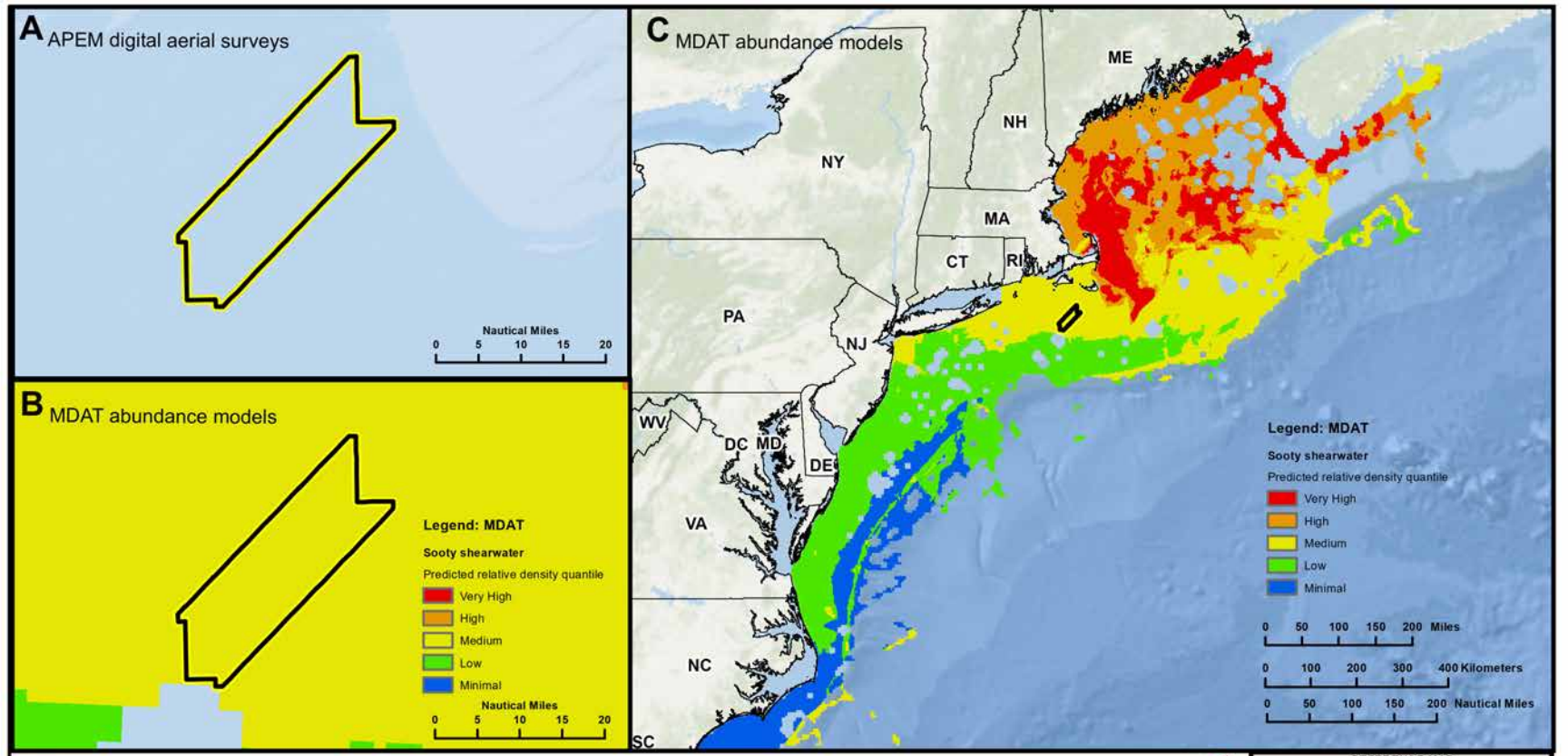


Beacon Wind OCS-A 0520 Lease Area

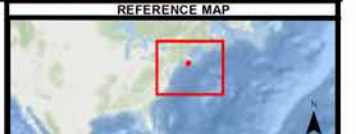
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
SOOTY SHEARWATER ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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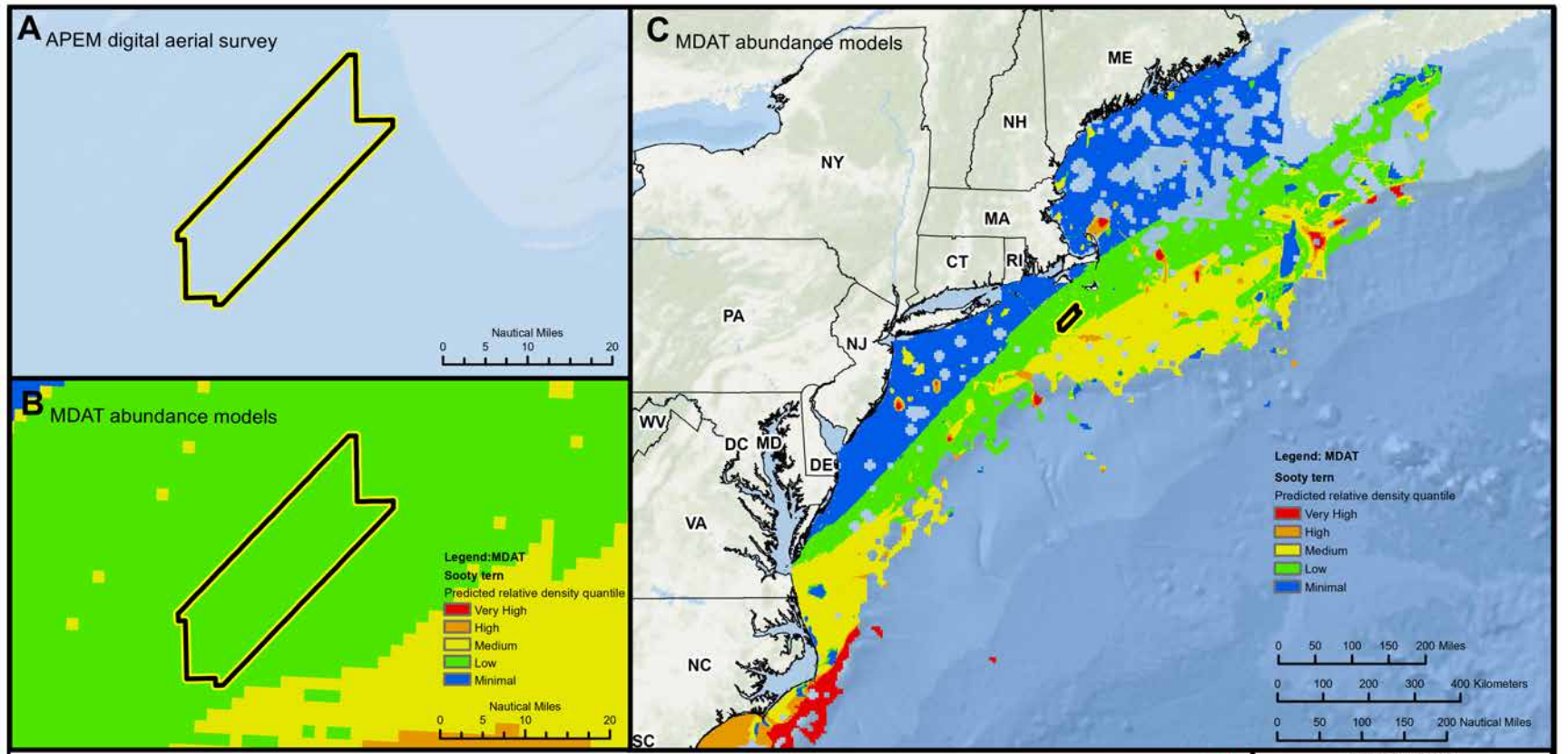


Beacon Wind OCS-A 0520 Lease Area

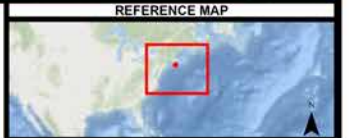
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
SOOTY TERN ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



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Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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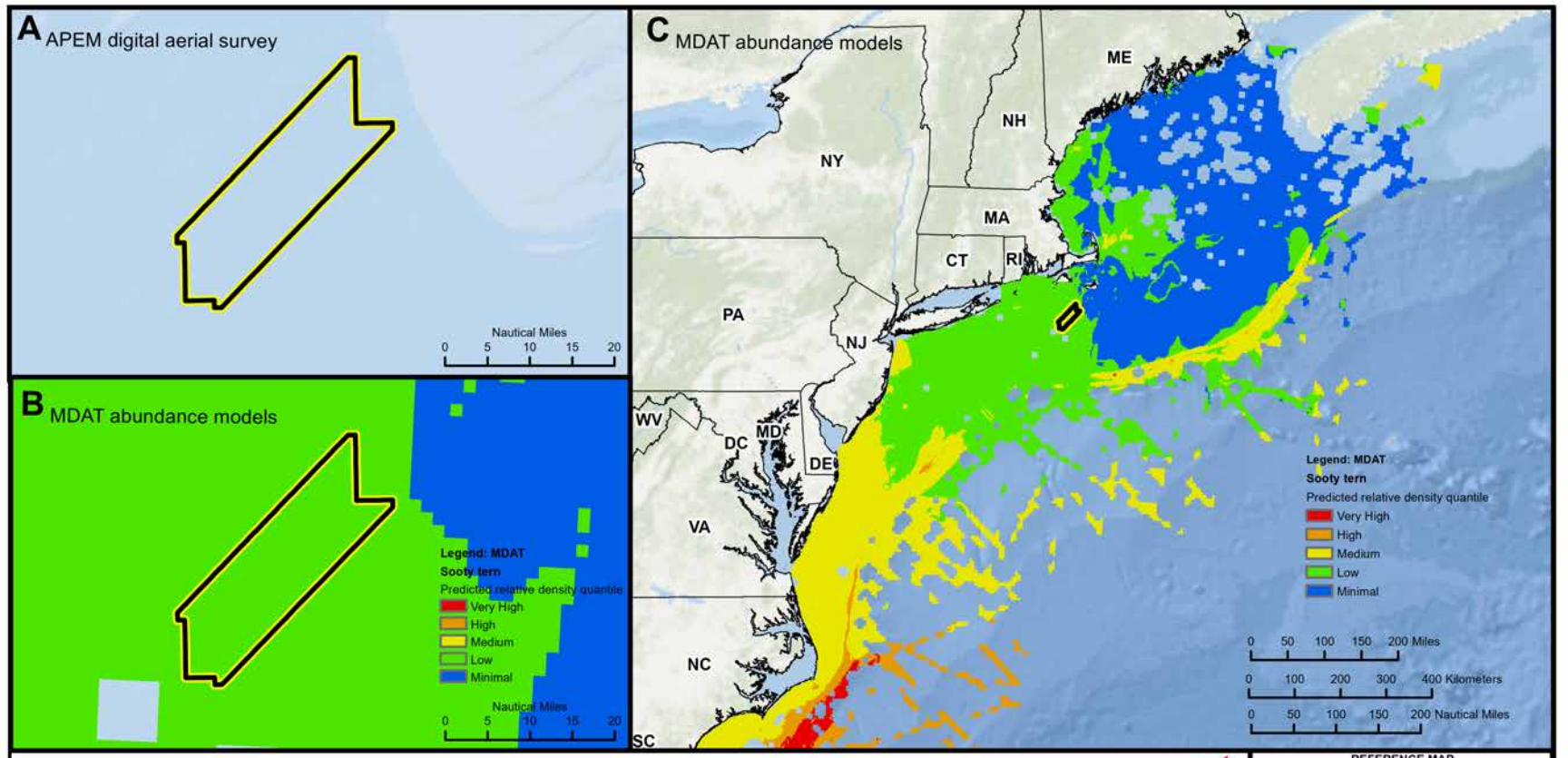

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
SOOTY TERN ABUNDANCE
SUMMER: JUNE - AUGUST

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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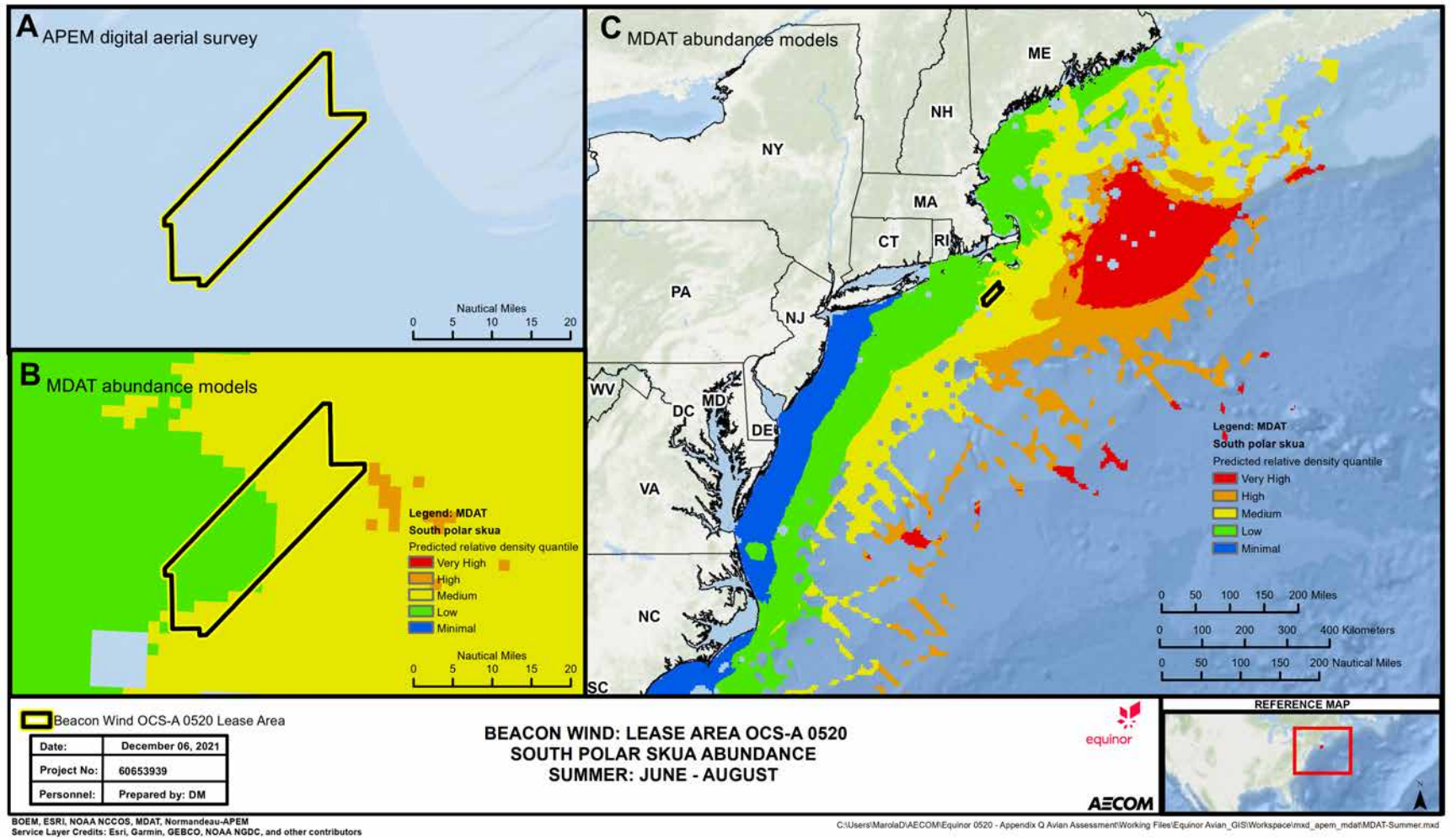
A
APEM digital aerial survey
Nautical Miles
0 5 10 15 20
B
MDAT abundance models
Legend: MDAT
South polar skua
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 15 20
C
MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
South polar skua
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
SOUTH POLAR SKUA ABUNDANCE
SUMMER: JUNE - AUGUST
equinor
AECOM
REFERENCE MAP
BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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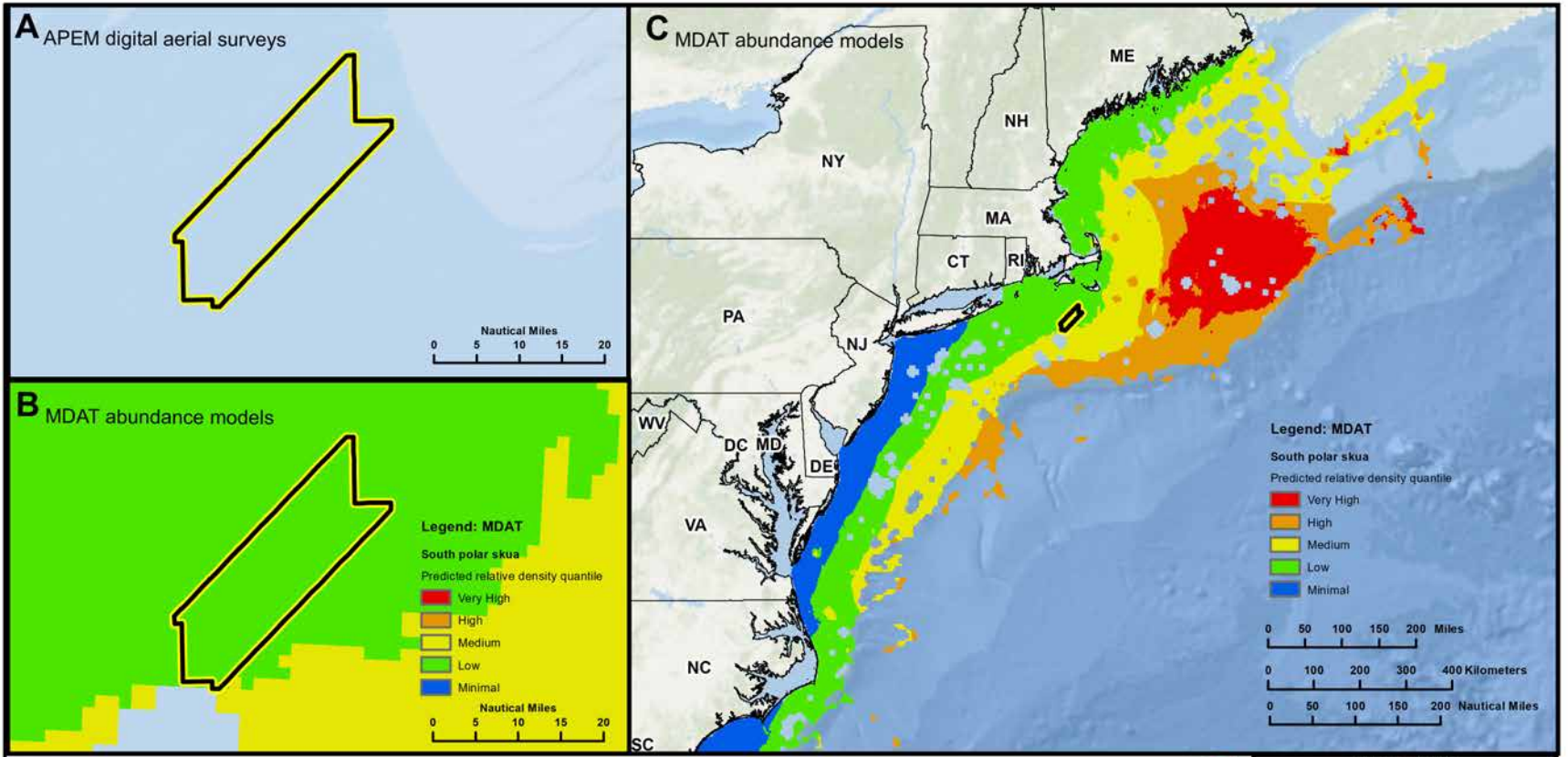

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
SOUTH POLAR SKUA ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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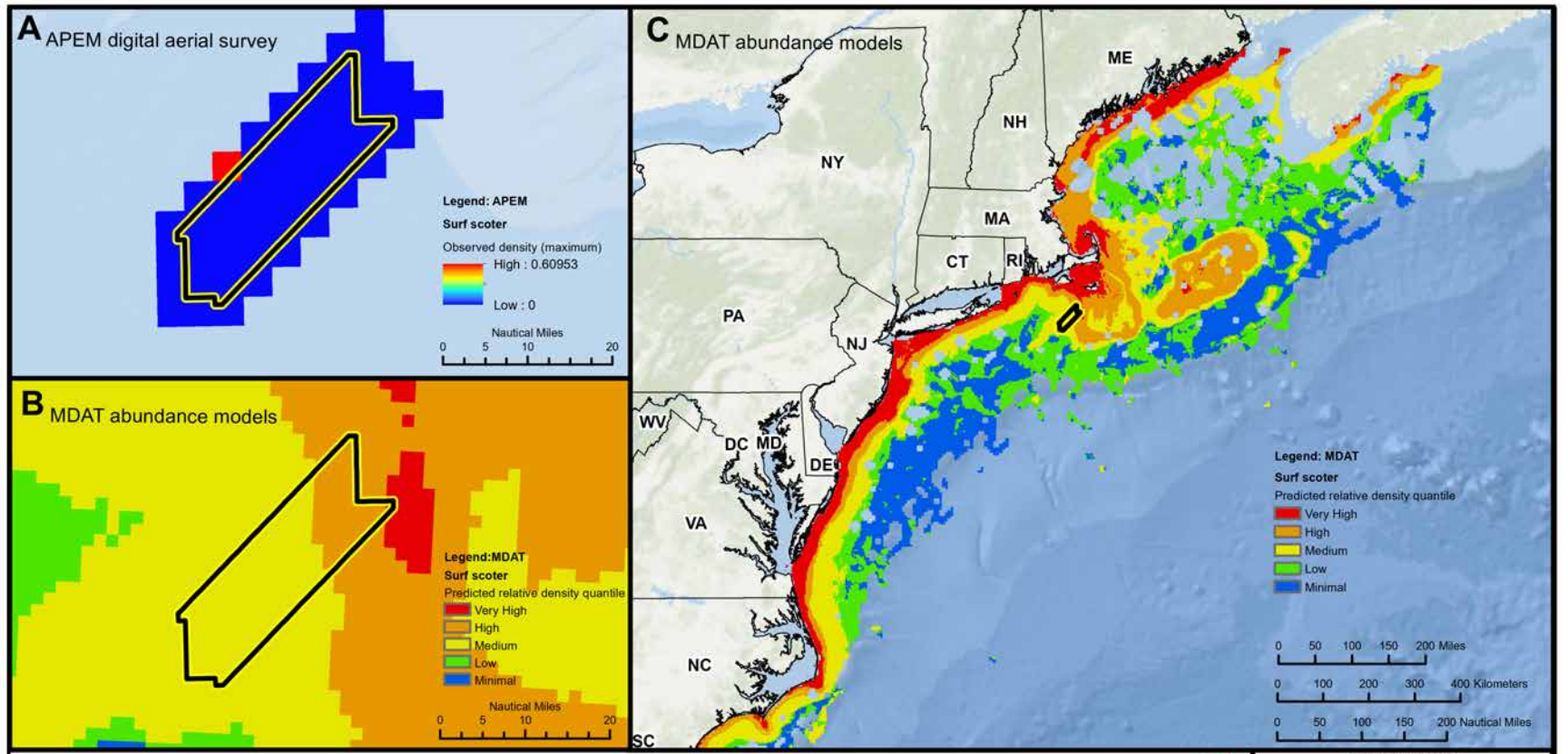


Beacon Wind OCS-A 0520 Lease Area

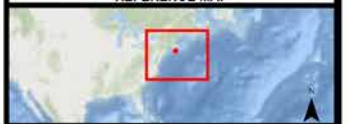
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
SURF SCOTER ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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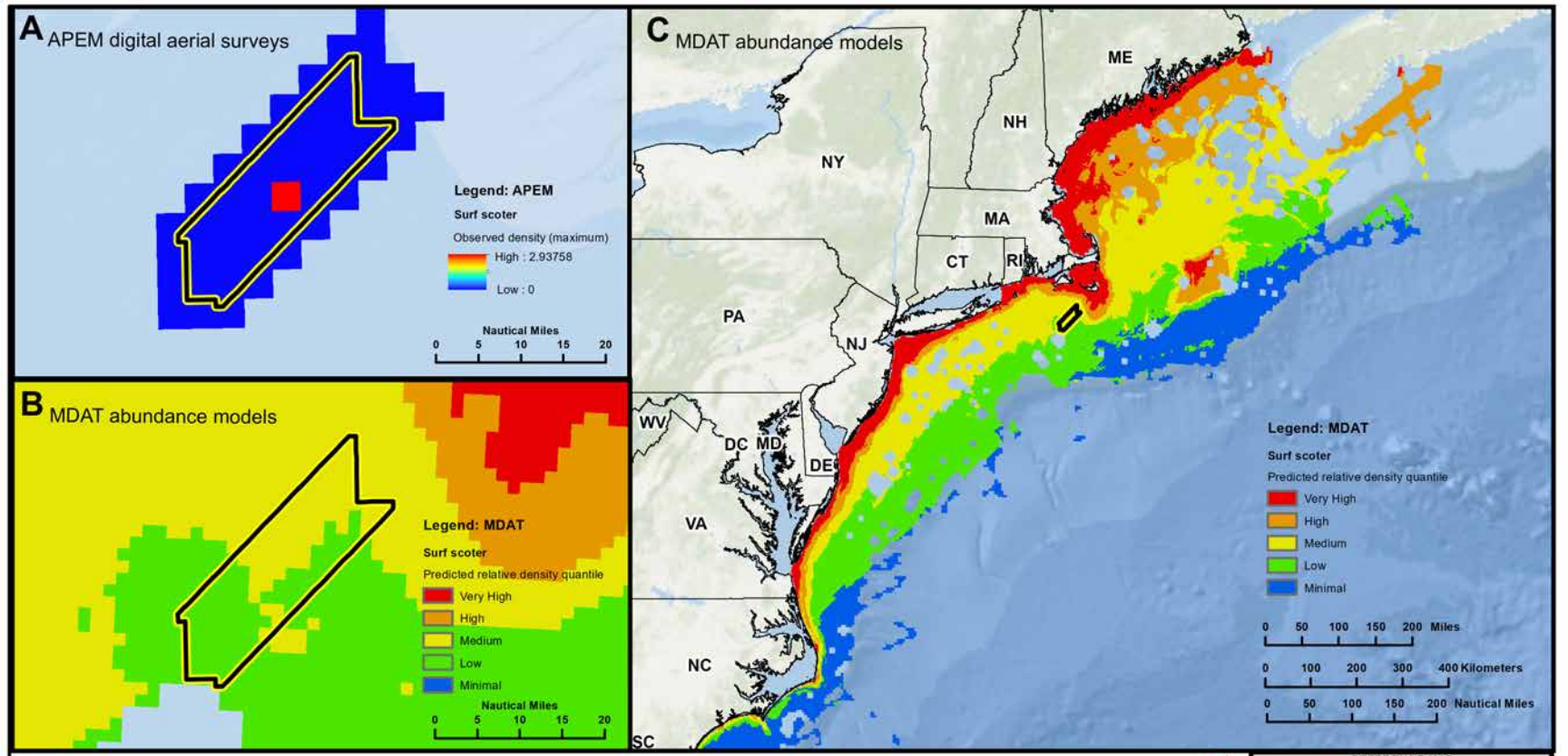


Beacon Wind OCS-A 0520 Lease Area

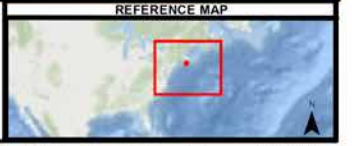
Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
SURF SCOTER ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP



BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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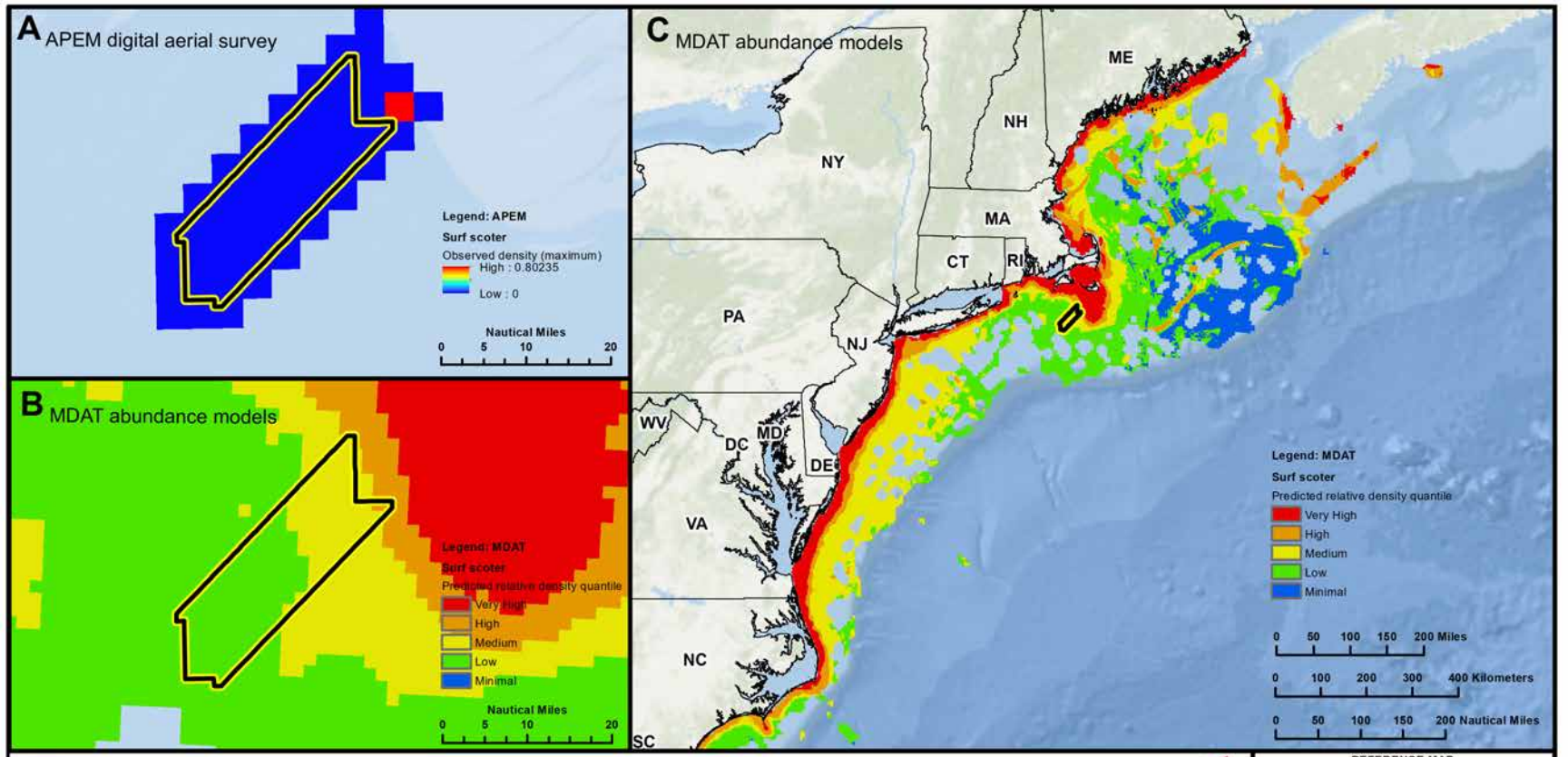


Beacon Wind OCS-A 0520 Lease Area

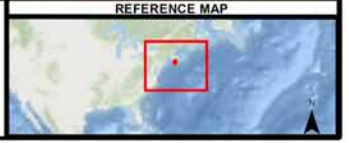
Date:	December 09, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
SURF SCOTER ABUNDANCE
WINTER: DECEMBER - FEBRUARY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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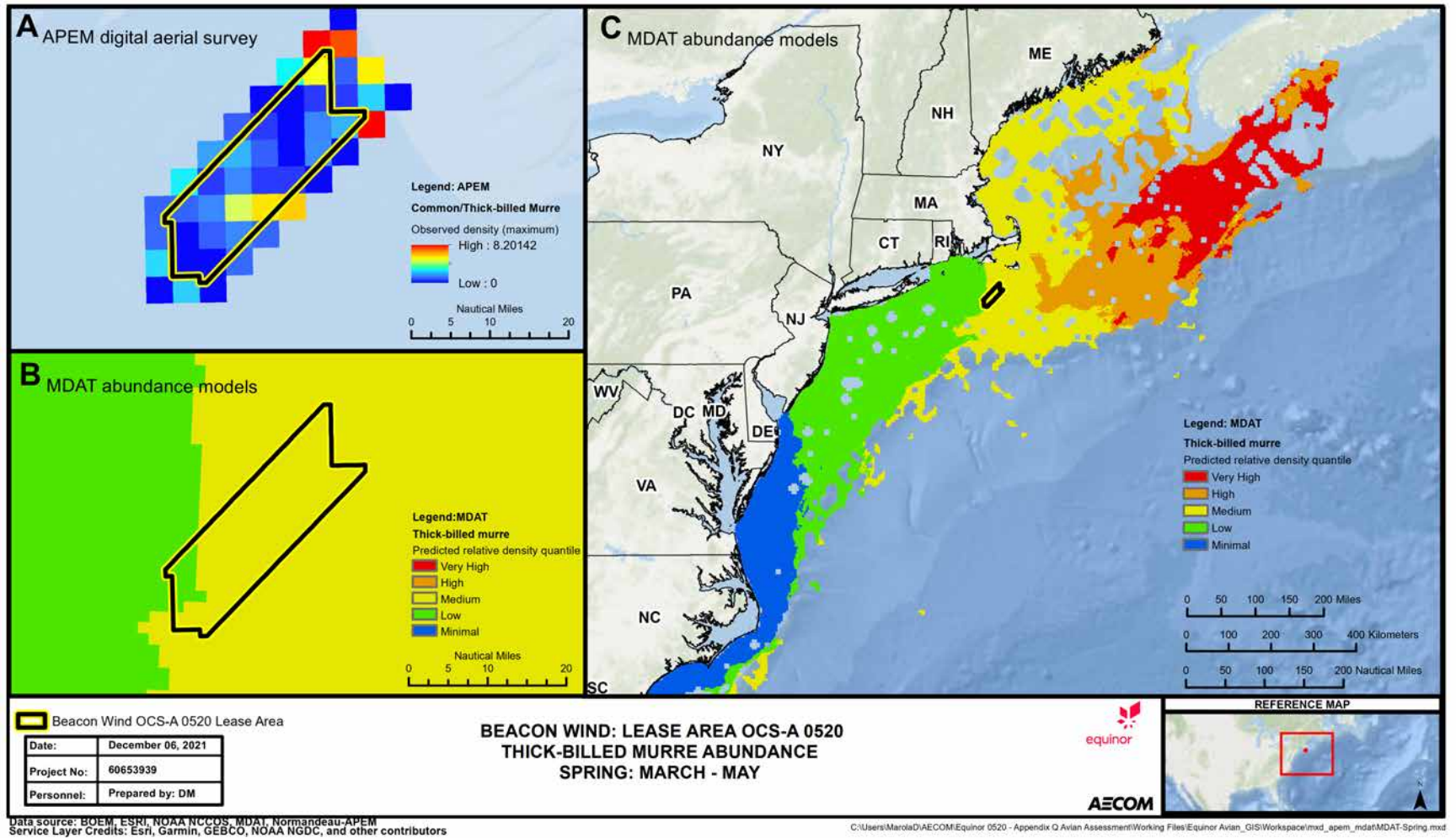
A APEM digital aerial survey
Legend: APEM
Common/Thick-billed Murre
Observed density (maximum)
High : 8.20142
Low : 0
Nautical Miles
0 5 10 20
B MDAT abundance models
Legend:MDAT
Thick-billed murre
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 20
C MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
Thick-billed murre
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
THICK-BILLED MURRE ABUNDANCE
SPRING: MARCH - MAY
equinor
AECOM
REFERENCE MAP
Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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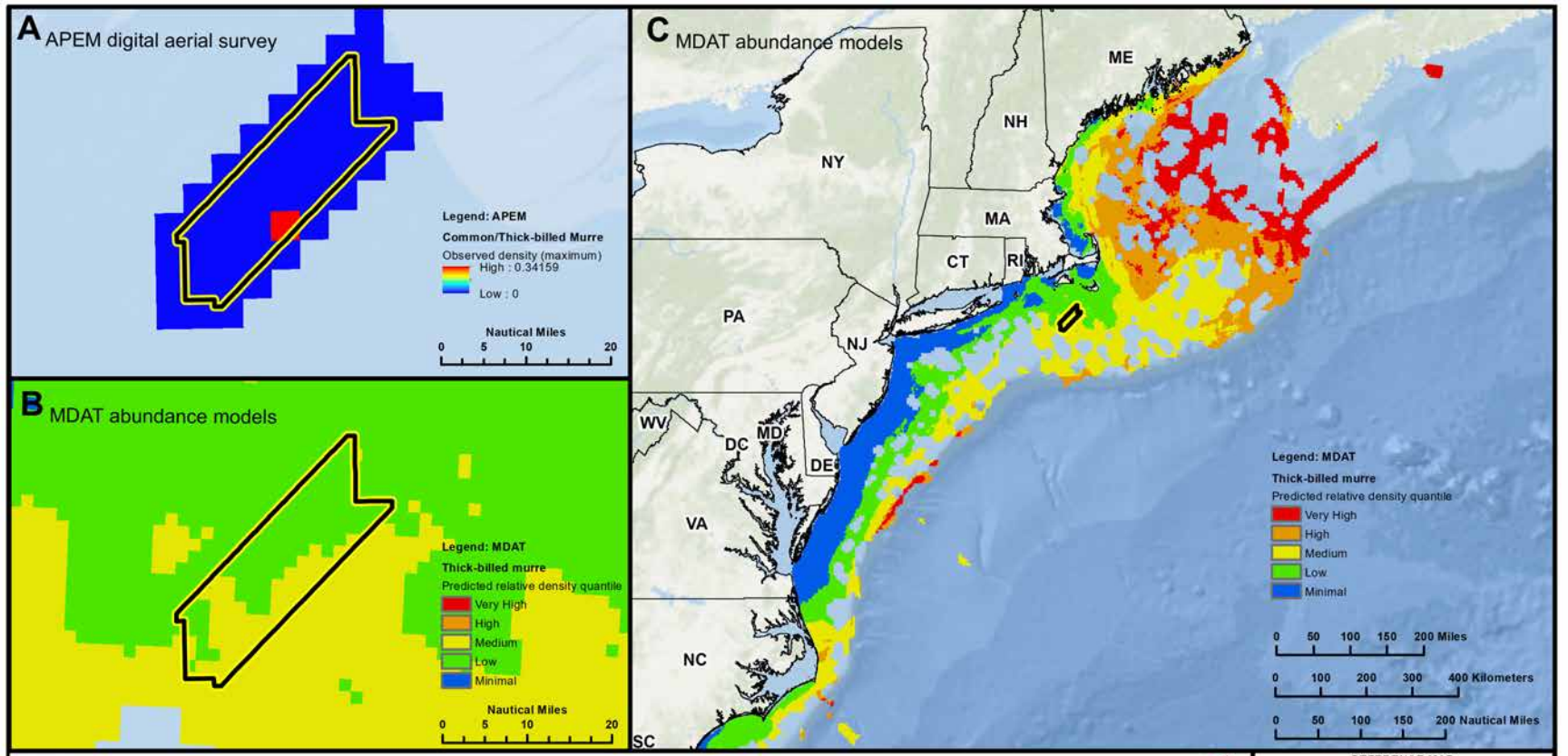

Beacon Wind OCS-A 0520 Lease Area

Date:	December 09, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
THICK-BILLED MURRE ABUNDANCE
WINTER: DECEMBER - FEBRUARY

REFERENCE MAP

Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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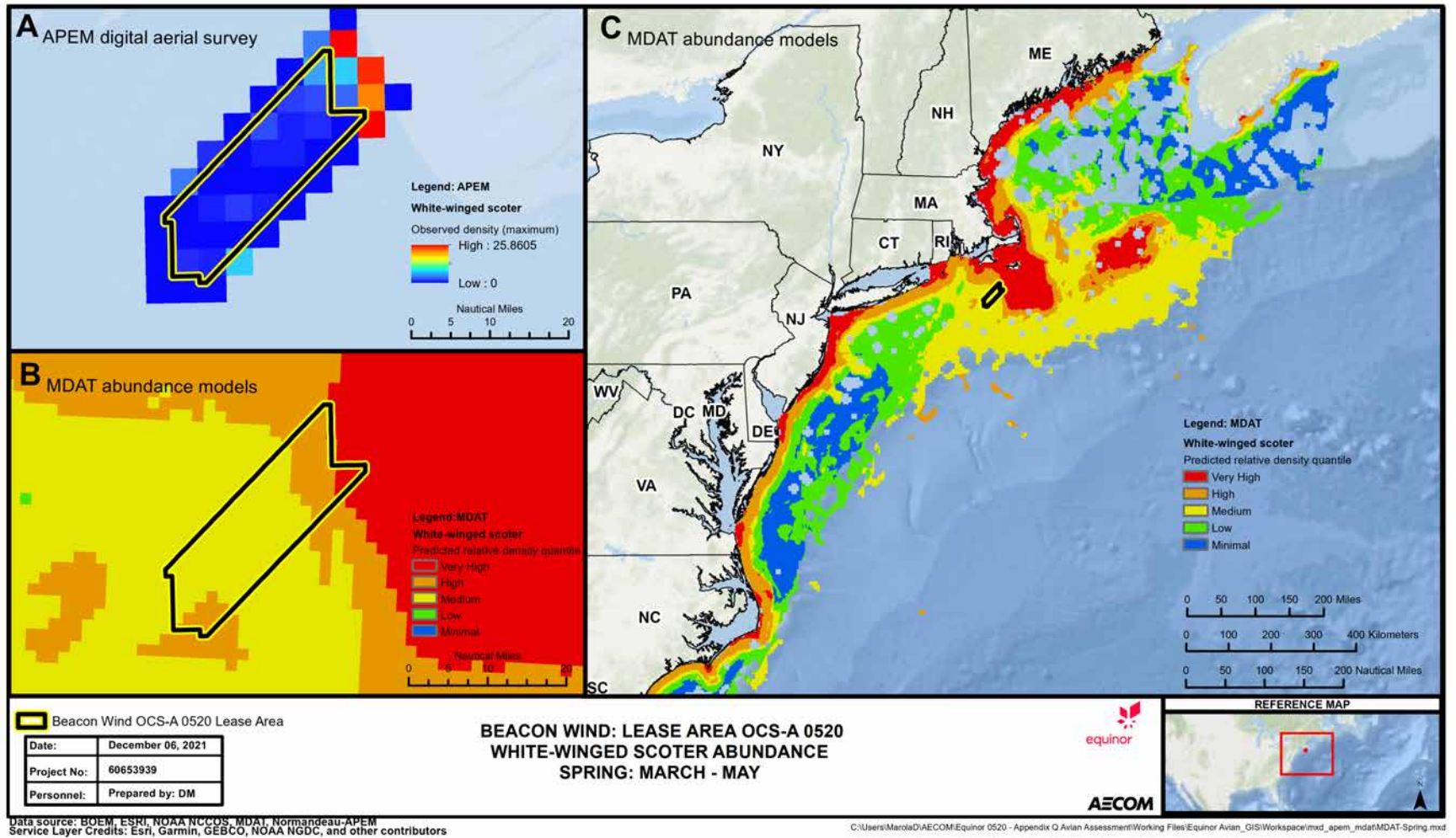
A
APEM digital aerial survey
Legend: APEM
White-winged scoter
Observed density (maximum)
High : 25.8605
Low : 0
Nautical Miles
0 5 10 20
B
MDAT abundance models
Legend:MDAT
White-winged scoter
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 20
C
MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
White-winged scoter
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 06, 2021
Project No: 60653939
Personnel: Prepared by: DM
BEACON WIND: LEASE AREA OCS-A 0520
WHITE-WINGED SCOTER ABUNDANCE
SPRING: MARCH - MAY
equinor
AECOM
REFERENCE MAP
Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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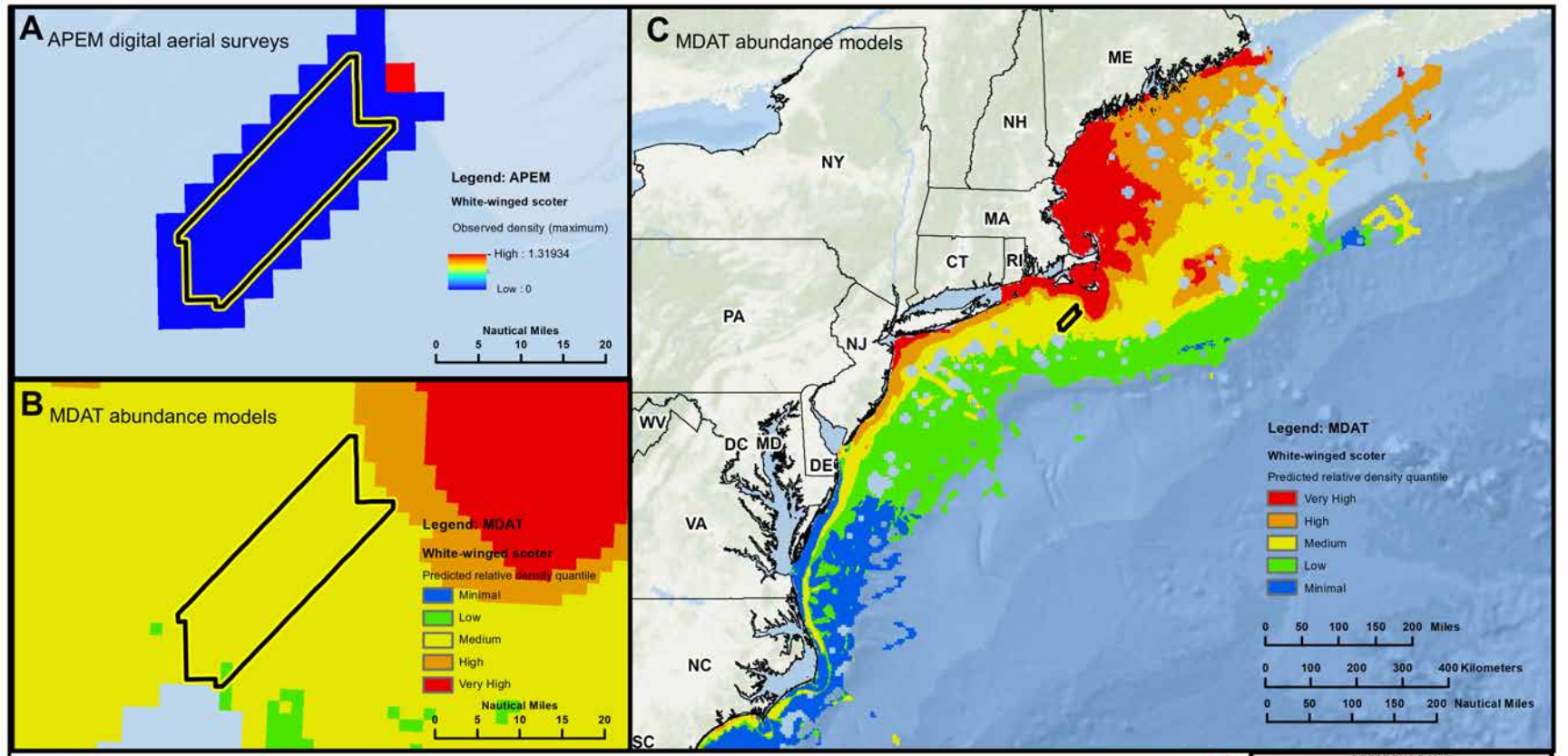

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
WHITE-WINGED SCOTER ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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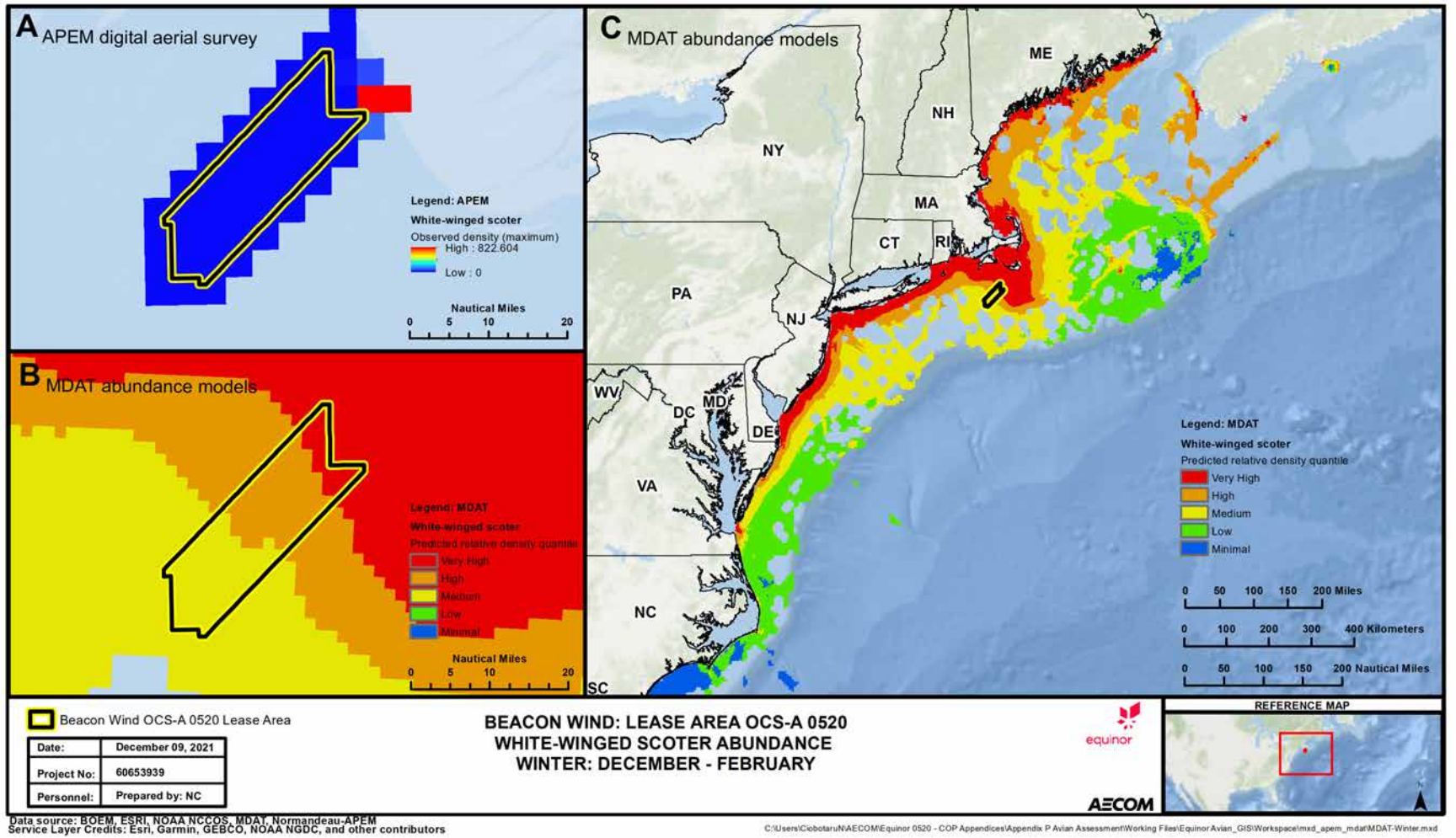
A
APEM digital aerial survey
Legend: APEM
White-winged scoter
Observed density (maximum)
High : 822.604
Low : 0
Nautical Miles
0 5 10 20
B
MDAT abundance models
Legend: MDAT
White-winged scoter
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
Nautical Miles
0 5 10 20
C
MDAT abundance models
ME
NH
NY
MA
CT
RI
PA
NJ
WV
DC
MD
DE
VA
NC
SC
Legend: MDAT
White-winged scoter
Predicted relative density quantile
Very High
High
Medium
Low
Minimal
0 50 100 150 200 Miles
0 100 200 300 400 Kilometers
0 50 100 150 200 Nautical Miles
Beacon Wind OCS-A 0520 Lease Area
Date: December 09, 2021
Project No: 60653939
Personnel: Prepared by: NC
BEACON WIND: LEASE AREA OCS-A 0520
WHITE-WINGED SCOTER ABUNDANCE
WINTER: DECEMBER - FEBRUARY
equinor
AECOM
REFERENCE MAP
Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
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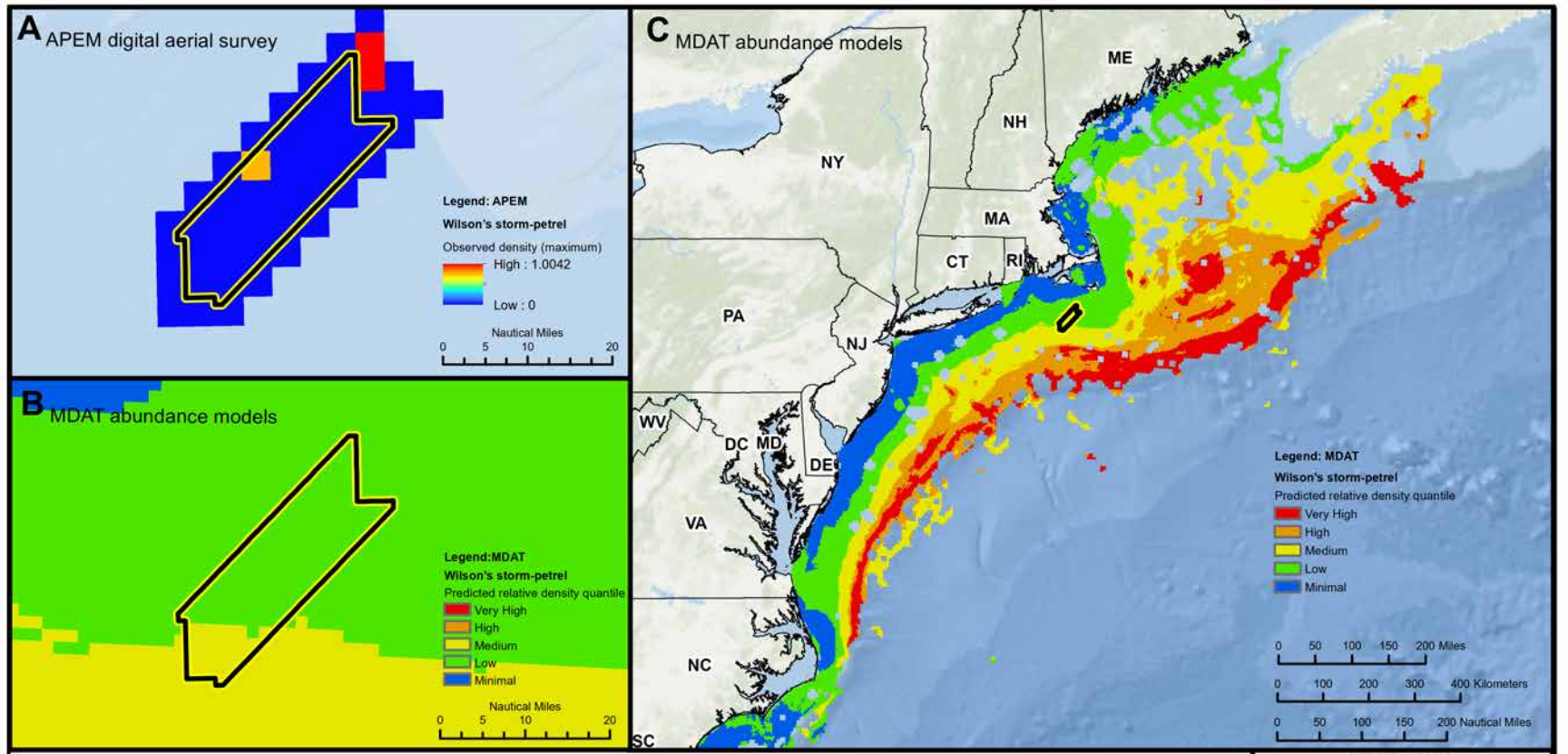


Beacon Wind OCS-A 0520 Lease Area

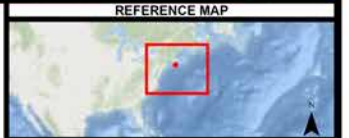
Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
WILSON'S STORM-PETREL ABUNDANCE
SPRING: MARCH - MAY

equinor

AECOM

REFERENCE MAP



Data source: BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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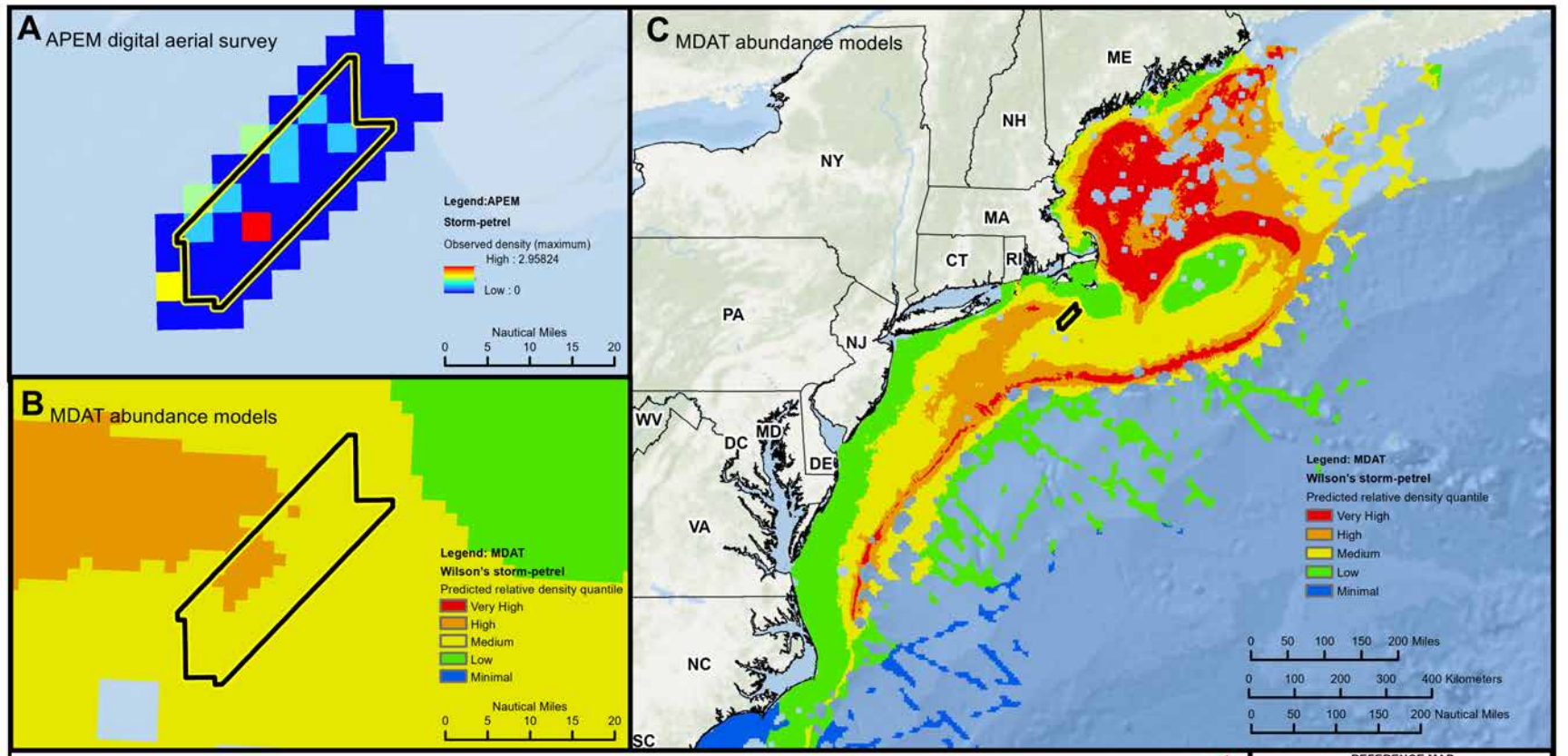

Beacon Wind OCS-A 0520 Lease Area

Date:	December 06, 2021
Project No:	60653939
Personnel:	Prepared by: DM

BEACON WIND: LEASE AREA OCS-A 0520
WILSON'S STORM-PETREL ABUNDANCE
SUMMER: JUNE - AUGUST

equinor

AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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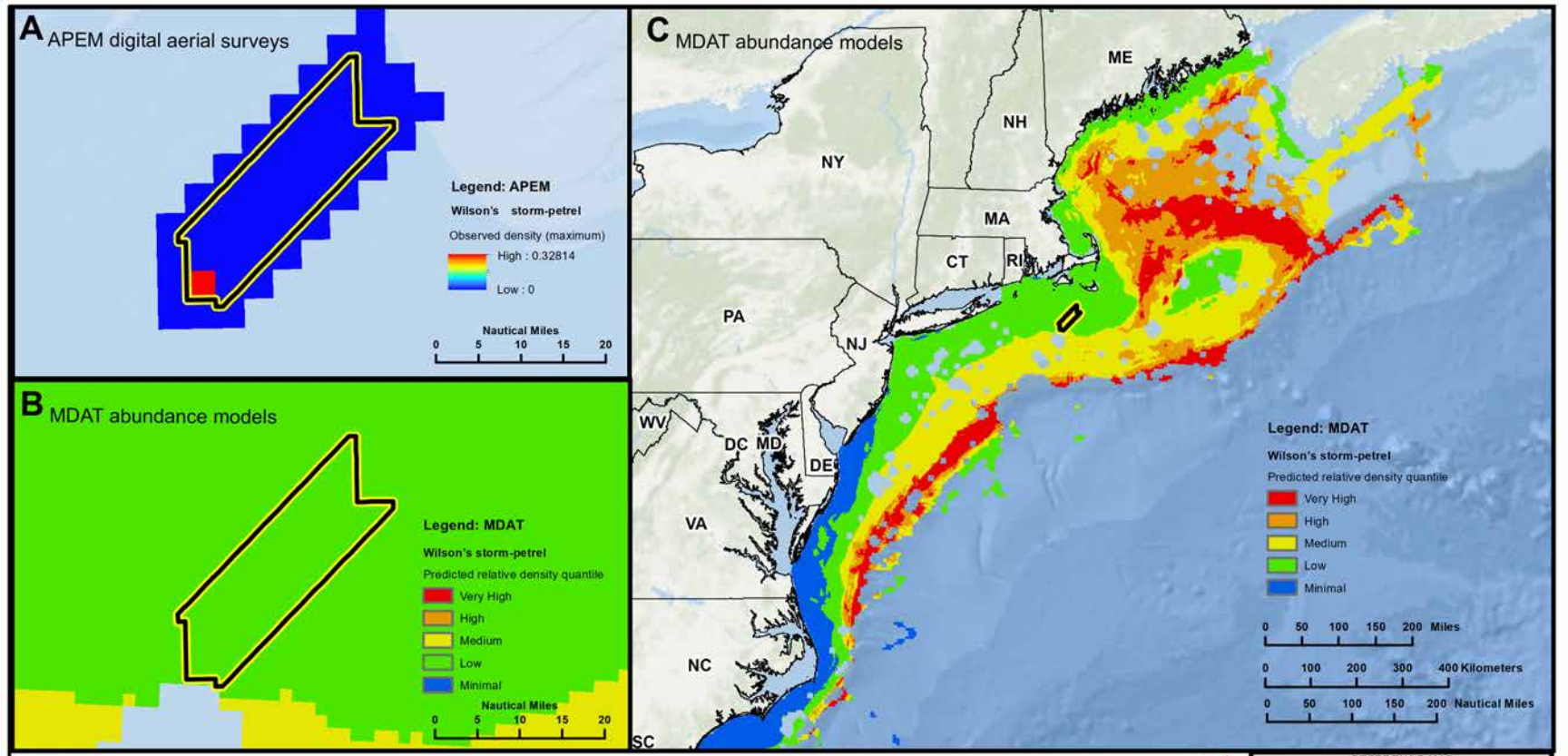

Beacon Wind OCS-A 0520 Lease Area

Date:	December 08, 2021
Project No:	60653939
Personnel:	Prepared by: NC

BEACON WIND: LEASE AREA OCS-A 0520
WILSON'S STORM-PETREL ABUNDANCE
FALL: SEPTEMBER - NOVEMBER

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AECOM

REFERENCE MAP

BOEM, ESRI, NOAA NCCOS, MDAT, Normandeau-APEM
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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Attachment P-2

Agency Consultation Information (IPaC, NYSDEC-DFW NHP, and CTDEEP-NDDB)

P.2 INTRODUCTION

This Appendix to the Construction and Operations Plan presents correspondence conducted by AECOM Technical Services, Inc. on Beacon Wind LLC's behalf with the U.S. Fish and Wildlife Service, the New York State Department of Environmental Conservation, and the Connecticut Natural Diversity Database regarding threatened, endangered, proposed and candidate species, as well proposed or designated critical habitat that may occur within the BW1 and BW2 Study Area and/or may be affected by the Project. Note the USFWS IPaC report titled "Project Name: Queens, New York: Onshore Project Area" entails the Astoria, New York power complex and covers both the AGRE and NYPA parcels under consideration for the BW1 and BW2 onshore substation facilities. A record of the correspondence is included as attachments:

- **Attachment P2-1A: Information for Planning and Conservation (IPaC) Report - Queens, New York BW1/BW2 Onshore Substation Facilities**
- **Attachment P2-1B: Information for Planning and Conservation (IPaC) Report – Waterford, Connecticut BW2 Onshore Substation Facility**
- **Attachment P2-1C: Information for Planning and Conservation (IPaC) Report – BW1/BW2 Submarine Export Cable Routes**
- **Attachment P2-2: New York State Department of Environmental Conservation Natural Heritage - Queens, New York BW1/BW2 Onshore Substation Facilities**
- **Attachment P2-3: Connecticut Natural Diversity Database (NDDB) Correspondence – Waterford, Connecticut BW2 Onshore Project Area.**

ATTACHMENT P2-1A
INFORMATION FOR PLANNING AND CONSERVATION (IPAC) REPORT - QUEENS, NEW YORK BW1/BW2 ONSHORE SUBSTATION FACILITIES

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Long Island Ecological Services Field Office
340 Smith Road
Shirley, NY 11967-2258
Phone: (631) 286-0485 Fax: (631) 286-4003

In Reply Refer To: May 19, 2023
Project Code: 2023-0083853
Project Name: Queens, New York: Onshore Project Area

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Long Island Ecological Services Field Office
340 Smith Road
Shirley, NY 11967-2258
(631) 286-0485

PROJECT SUMMARY

Project Code: 2023-0083853
Project Name: Queens, New York: Onshore Project Area
Project Type: Power Gen - Wind
Project Description: Queens, New York: Onshore Project Area
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@40.7839372,-73.9046739002325,14z

Counties: New York and Queens counties, New York

ENDANGERED SPECIES ACT SPECIES

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered

BIRDS

NAME	STATUS
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Roseate Tern *Sterna dougallii dougallii* Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: AECOM
Name: Conor Makepeace
Address: 500 Enterprise Drive #1a
City: Rocky Hill
State: CT
Zip: 06067
Email conor.makepeace@aecom.com
Phone: 2036406692

ATTACHMENT P2-1B
INFORMATION FOR PLANNING AND CONSERVATION (IPAC) REPORT - WATERFORD, CONNECTICUT BW2 ONSHORE SUBSTATION FACILITY

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To:
Project Code: 2023-0083872
Project Name: BW2 - Waterford

May 19, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 4/12/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the "**New England Field Office Endangered Species Project Review and Consultation**" website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat - (**Updated 4/12/2023**) The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule went into effect on March 31, 2023. You may utilize the **Northern Long-eared Bat Rangewide Determination Key** available in IPaC. More information about this Determination Key and the Interim Consultation Framework are available on the northern long-eared bat species page:

https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis

For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

Additional Info About Section 7 of the Act
Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/service/section-7-consultations

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to

consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

https://www.fws.gov/program/migratory-bird-permit

https://www.fws.gov/library/collections/bald-and-golden-eagle-management

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

PROJECT SUMMARY

Project Code: 2023-0083872
Project Name: BW2 - Waterford
Project Type: Power Gen - Wind
Project Description: Beacon Wind is proposing to develop their offshore wind Lease Area with up to two individual wind farms for BW1 and BW2, with a submarine export cable route for BW2 going to Waterford, Connecticut. The onshore project area will include approximately 9.8 acres of temporary staging yards located in an existing gravel pit and paved parking lot, approximately 3.8 acres used for temporary work space and a construction corridor, and 7.7 acres for a potential onshore substation facility and point of interconnect to the existing electrical grid.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@41.3159797,-72.16930307172109,14z

Counties: New London County, Connecticut

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered

BIRDS

NAME	STATUS
Roseate Tern *Sterna dougallii dougallii* Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: AECOM
Name: Conor Makepeace
Address: 500 Enterprise Drive #1a
City: Rocky Hill
State: CT
Zip: 06067
Email conor.makepeace@aecom.com
Phone: 2036406692

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Bureau of Ocean Energy Management

ATTACHMENT P2-1C
INFORMATION FOR PLANNING AND CONSERVATION (IPAC) REPORT - BW1/BW2 SUBMARINE EXPORT CABLE ROUTES

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To: May 19, 2023
Project Code: 2023-0083973
Project Name: Beacon Wind Lease Area and Submarine Export Cable

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 4/12/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the "**New England Field Office Endangered Species Project Review and Consultation**" website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat - (**Updated 4/12/2023**) The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule went into effect on March 31, 2023. You may utilize the **Northern Long-eared Bat Rangewide Determination Key** available in IPaC. More information about this Determination Key and the Interim Consultation Framework are available on the northern long-eared bat species page:

https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis

For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

Additional Info About Section 7 of the Act
Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/service/section-7-consultations

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to

consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

https://www.fws.gov/program/migratory-bird-permit

https://www.fws.gov/library/collections/bald-and-golden-eagle-management

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Note: IPaC has provided all available attachments because this project is in multiple field office jurisdictions.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

This project's location is within the jurisdiction of multiple offices. However, only one species list document will be provided for all offices. The species and critical habitats in this document reflect the aggregation of those that fall in each of the affiliated office's jurisdiction. Other offices affiliated with the project:

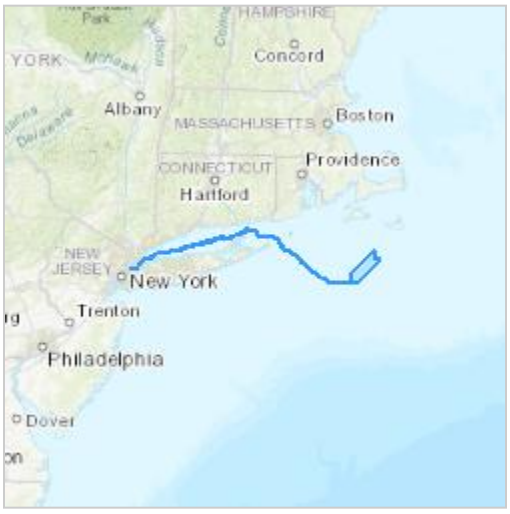
Long Island Ecological Services Field Office
340 Smith Road
Shirley, NY 11967-2258
(631) 286-0485

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
(607) 753-9334

PROJECT SUMMARY

Project Code: 2023-0083973
Project Name: Beacon Wind Lease Area and Submarine Export Cable
Project Type: Power Gen - Wind
Project Description: Beacon Wind Lease Area and Submarine Export Cable
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@40.940377549999994,-70.42776925578907,14z



Counties: New York

ENDANGERED SPECIES ACT SPECIES

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

BIRDS

NAME	STATUS
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Roseate Tern *Sterna dougallii dougallii* Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Oystercatcher *Haematopus palliatus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31
Atlantic Puffin *Fratercula arctica* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/8943	Breeds Apr 15 to Aug 15

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Oct 15 to Aug 31
Black Guillemot *Cepphus grylle* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds May 15 to Sep 10
Black Scoter *Melanitta nigra* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Black Skimmer *Rynchops niger* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15
Black-billed Cuckoo *Coccyzus erythropthalmus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Black-legged Kittiwake *Rissa tridactyla* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Blue-winged Warbler *Vermivora pinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 1 to Jun 30
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Brown Pelican *Pelecanus occidentalis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 15 to Sep 30
Canada Warbler *Cardellina canadensis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Cerulean Warbler *Dendroica cerulea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 29 to Jul 20

NAME	BREEDING SEASON
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Common Eider *Somateria mollissima* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jun 1 to Sep 30
Common Loon *gavia immer* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/4464	Breeds Apr 15 to Oct 31
Common Murre *Uria aalge* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Apr 15 to Aug 15
Cory's Shearwater *Calonectris diomedea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Dovekie *Alle alle* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/6041	Breeds elsewhere
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds elsewhere
Great Shearwater *Puffinus gravis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Gull-billed Tern *Gelochelidon nilotica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9501	Breeds May 1 to Jul 31

NAME	BREEDING SEASON
Hudsonian Godwit *Limosa haemastica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Kentucky Warbler *Oporornis formosus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Long-eared Owl *asio otus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3631	Breeds Mar 1 to Jul 15
Long-tailed Duck *Clangula hyemalis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/7238	Breeds elsewhere
Manx Shearwater *Puffinus puffinus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 15 to Oct 31
Pomarine Jaeger *Stercorarius pomarinus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Prairie Warbler *Dendroica discolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Purple Sandpiper *Calidris maritima* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Razorbill *Alca torda* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jun 15 to Sep 10

NAME	BREEDING SEASON
Red Phalarope *Phalaropus fulicarius* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Red-breasted Merganser *Mergus serrator* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Red-necked Phalarope *Phalaropus lobatus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Red-throated Loon *Gavia stellata* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Ring-billed Gull *Larus delawarensis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Roseate Tern *Sterna dougallii* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds May 10 to Aug 31
Royal Tern *Thalasseus maximus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Apr 15 to Aug 31
Ruddy Turnstone *Arenaria interpres morinella* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Short-billed Dowitcher *Limnodromus griseus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere

NAME	BREEDING SEASON
Sooty Tern *Onychoprion fuscatus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Mar 10 to Jul 31
Surf Scoter *Melanitta perspicillata* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Thick-billed Murre *Uria lomvia* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Apr 15 to Aug 15
White-winged Scoter *Melanitta fusca* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 5
Wilson's Storm-petrel *Oceanites oceanicus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

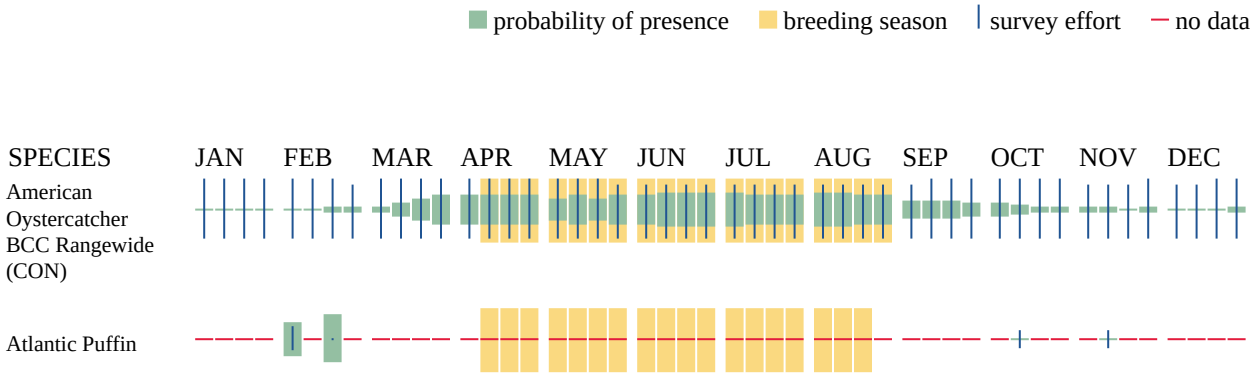
1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

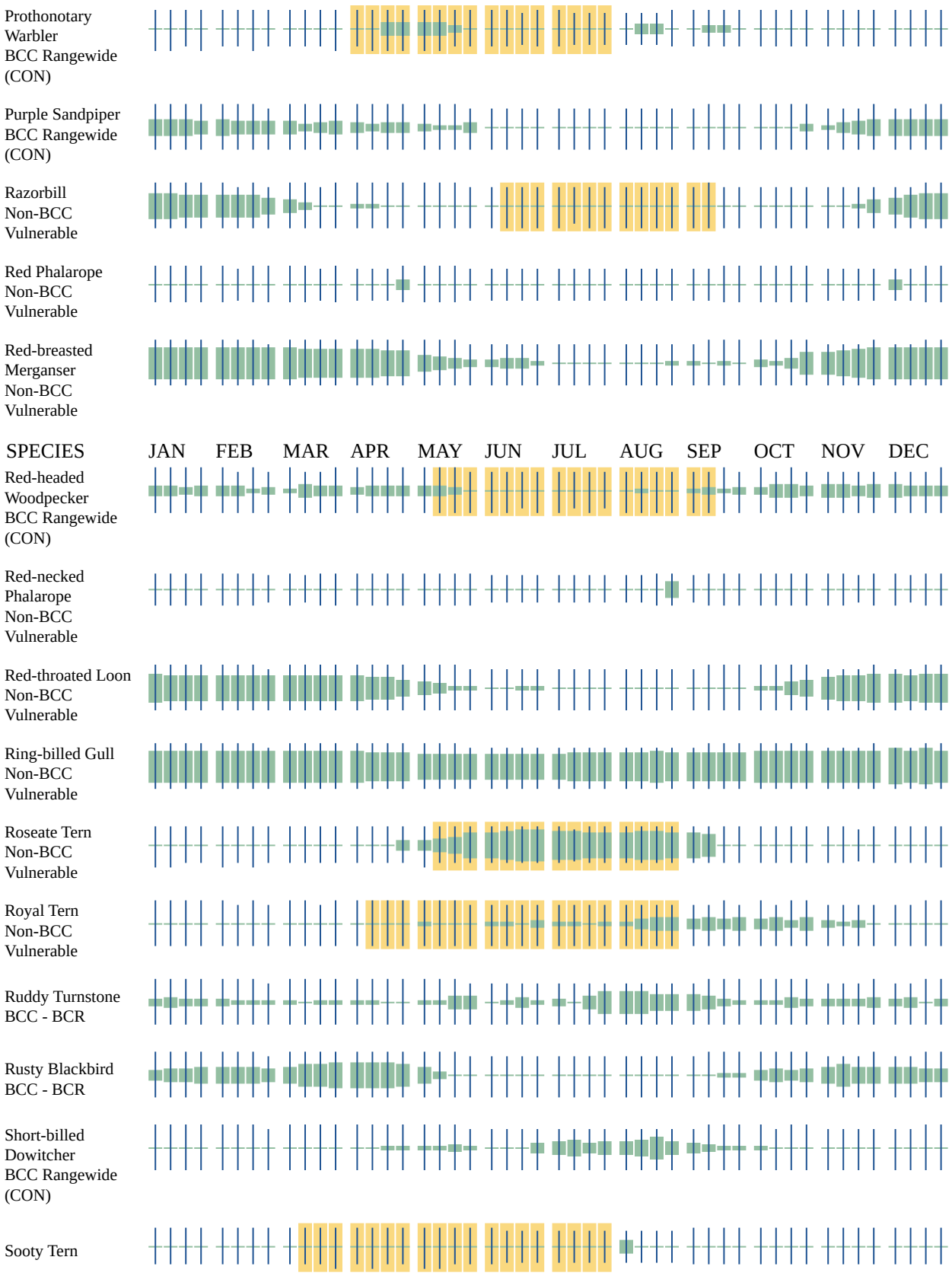
No Data (–)
A week is marked as having no data if there were no survey events for that week.

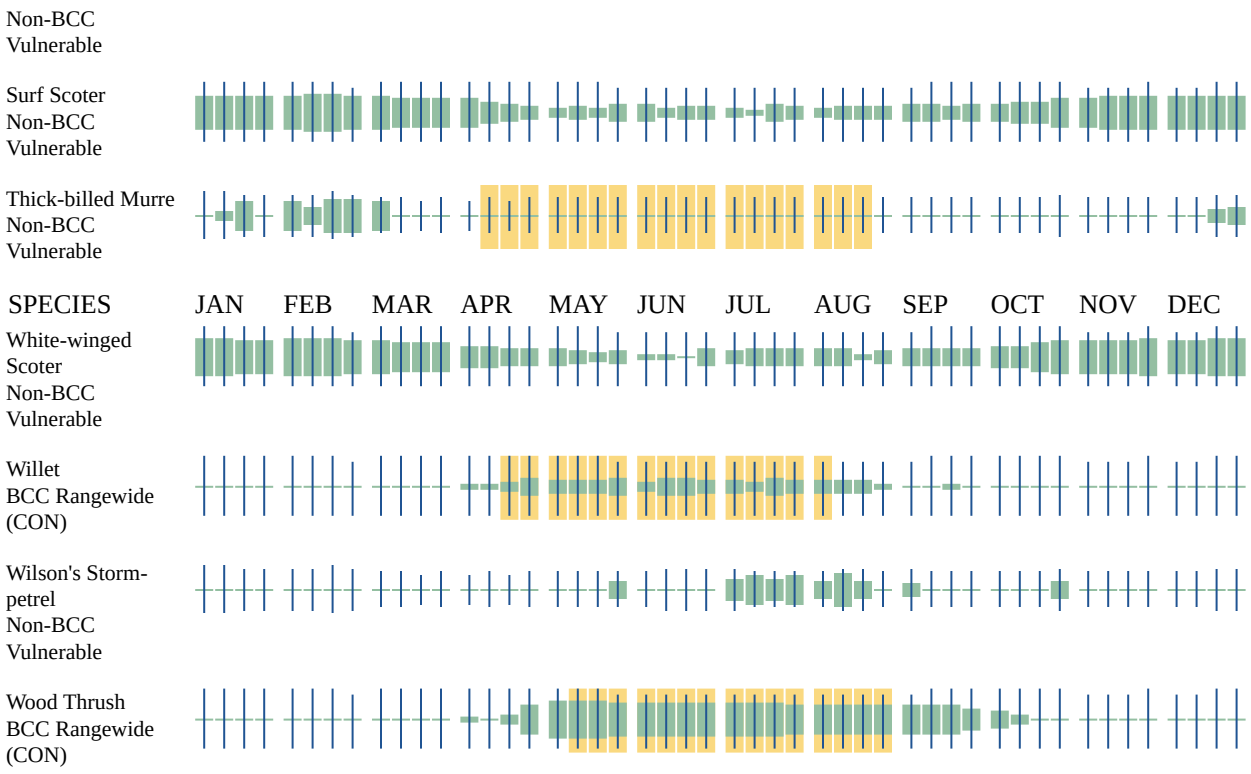
Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.




Non-BCC
Vulnerable
Bald Eagle
Non-BCC
Vulnerable
Black Guillemot
Non-BCC
Vulnerable
Black Scoter
Non-BCC
Vulnerable
Black Skimmer
BCC Rangewide
(CON)
Black-billed
Cuckoo
BCC Rangewide
(CON)
Black-legged
Kittiwake
Non-BCC
Vulnerable
Blue-winged
Warbler
BCC - BCR
Bobolink
BCC Rangewide
(CON)
Brown Pelican
Non-BCC
Vulnerable
Canada Warbler
BCC Rangewide
(CON)
SPECIES
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Cerulean Warbler
BCC Rangewide
(CON)
Chimney Swift
BCC Rangewide
(CON)
Common Eider
Non-BCC
Vulnerable
Common Loon
Non-BCC
Vulnerable


Common Murre
Non-BCC
Vulnerable
Cory's Shearwater
BCC Rangewide
(CON)
Dovekie
Non-BCC
Vulnerable
Eastern Whip-poor-
will
BCC Rangewide
(CON)
Golden Eagle
Non-BCC
Vulnerable
Great Shearwater
Non-BCC
Vulnerable
Gull-billed Tern
BCC Rangewide
(CON)
Hudsonian Godwit
BCC Rangewide
(CON)
SPECIES
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Kentucky Warbler
BCC Rangewide
(CON)
Lesser Yellowlegs
BCC Rangewide
(CON)
Long-eared Owl
BCC Rangewide
(CON)
Long-tailed Duck
Non-BCC
Vulnerable
Manx Shearwater
BCC Rangewide
(CON)
Pomarine Jaeger
Non-BCC
Vulnerable
Prairie Warbler
BCC Rangewide
(CON)


Prothonotary Warbler BCC Rangewide (CON)
Purple Sandpiper BCC Rangewide (CON)
Razorbill Non-BCC Vulnerable
Red Phalarope Non-BCC Vulnerable
Red-breasted Merganser Non-BCC Vulnerable
SPECIES
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Red-headed Woodpecker BCC Rangewide (CON)
Red-necked Phalarope Non-BCC Vulnerable
Red-throated Loon Non-BCC Vulnerable
Ring-billed Gull Non-BCC Vulnerable
Roseate Tern Non-BCC Vulnerable
Royal Tern Non-BCC Vulnerable
Ruddy Turnstone BCC - BCR
Rusty Blackbird BCC - BCR
Short-billed Dowitcher BCC Rangewide (CON)
Sooty Tern



Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

MIGRATORY BIRDS FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles)

potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE VISIT HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

IPAC USER CONTACT INFORMATION

Agency: AECOM
Name: Conor Makepeace
Address: 500 Enterprise Drive #1a
City: Rocky Hill
State: CT
Zip: 06067
Email conor.makepeace@aecom.com
Phone: 2036406692

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To:
Project Code: 2023-0083898
Project Name: BW2 - Export Cable

May 19, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 4/12/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the "**New England Field Office Endangered Species Project Review and Consultation**" website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat - (**Updated 4/12/2023**) The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule went into effect on March 31, 2023. You may utilize the **Northern Long-eared Bat Rangewide Determination Key** available in IPaC. More information about this Determination Key and the Interim Consultation Framework are available on the northern long-eared bat species page:

https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis

For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

Additional Info About Section 7 of the Act
Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/service/section-7-consultations

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to

consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

https://www.fws.gov/program/migratory-bird-permit

https://www.fws.gov/library/collections/bald-and-golden-eagle-management

Please feel free to contact us at newengland@fws.gov with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Note: IPaC has provided all available attachments because this project is in multiple field office jurisdictions.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

This project's location is within the jurisdiction of multiple offices. However, only one species list document will be provided for all offices. The species and critical habitats in this document reflect the aggregation of those that fall in each of the affiliated office's jurisdiction. Other offices affiliated with the project:

Long Island Ecological Services Field Office
340 Smith Road
Shirley, NY 11967-2258
(631) 286-0485

PROJECT SUMMARY

Project Code: 2023-0083898
Project Name: BW2 - Export Cable
Project Type: Power Gen - Wind
Project Description: Beacon Wind is proposing to develop their offshore wind Lease Area with up to two individual wind farms for BW1 and BW2, with a submarine export cable route for BW2 going to Waterford, Connecticut.
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@41.274053699999996,-72.1847866,14z

Counties: Connecticut and New York

ENDANGERED SPECIES ACT SPECIES

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

BIRDS

NAME	STATUS
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Roseate Tern *Sterna dougallii dougallii* Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Black Scoter *Melanitta nigra* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Black-legged Kittiwake *Rissa tridactyla* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere

NAME	BREEDING SEASON
Brown Pelican *Pelecanus occidentalis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 15 to Sep 30
Common Eider *Somateria mollissima* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jun 1 to Sep 30
Common Loon *gavia immer* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/4464	Breeds Apr 15 to Oct 31
Common Murre *Uria aalge* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Apr 15 to Aug 15
Cory's Shearwater *Calonectris diomedea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Great Shearwater *Puffinus gravis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Long-tailed Duck *Clangula hyemalis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/7238	Breeds elsewhere
Pomarine Jaeger *Stercorarius pomarinus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Razorbill *Alca torda* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jun 15 to Sep 10
Red Phalarope *Phalaropus fulicarius* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere

NAME	BREEDING SEASON
Red-breasted Merganser *Mergus serrator* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Red-throated Loon *Gavia stellata* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Ring-billed Gull *Larus delawarensis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Roseate Tern *Sterna dougallii* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds May 10 to Aug 31
Royal Tern *Thalasseus maximus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Apr 15 to Aug 31
Surf Scoter *Melanitta perspicillata* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Thick-billed Murre *Uria lomvia* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Apr 15 to Aug 15
White-winged Scoter *Melanitta fusca* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Wilson's Storm-petrel *Oceanites oceanicus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the

FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

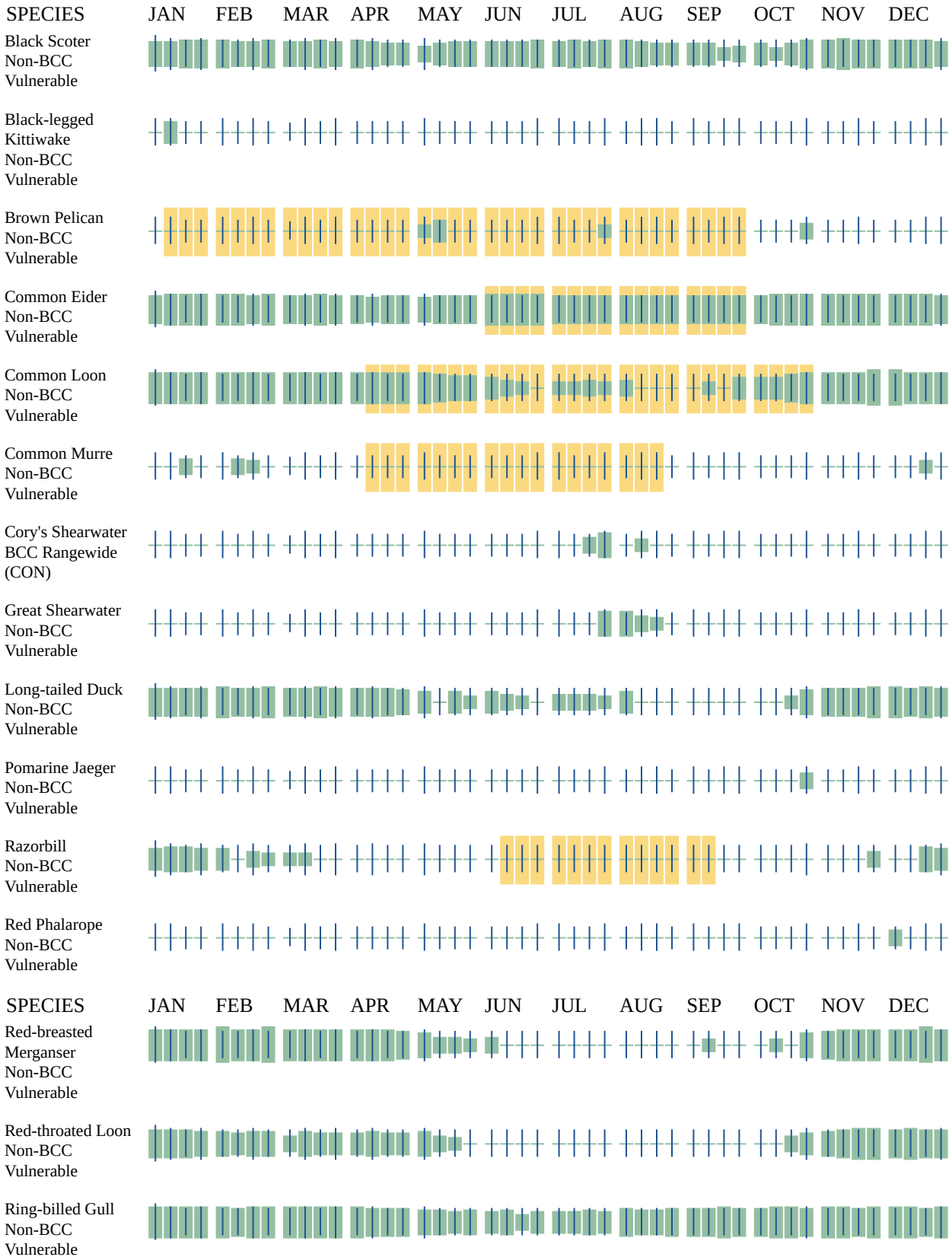
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

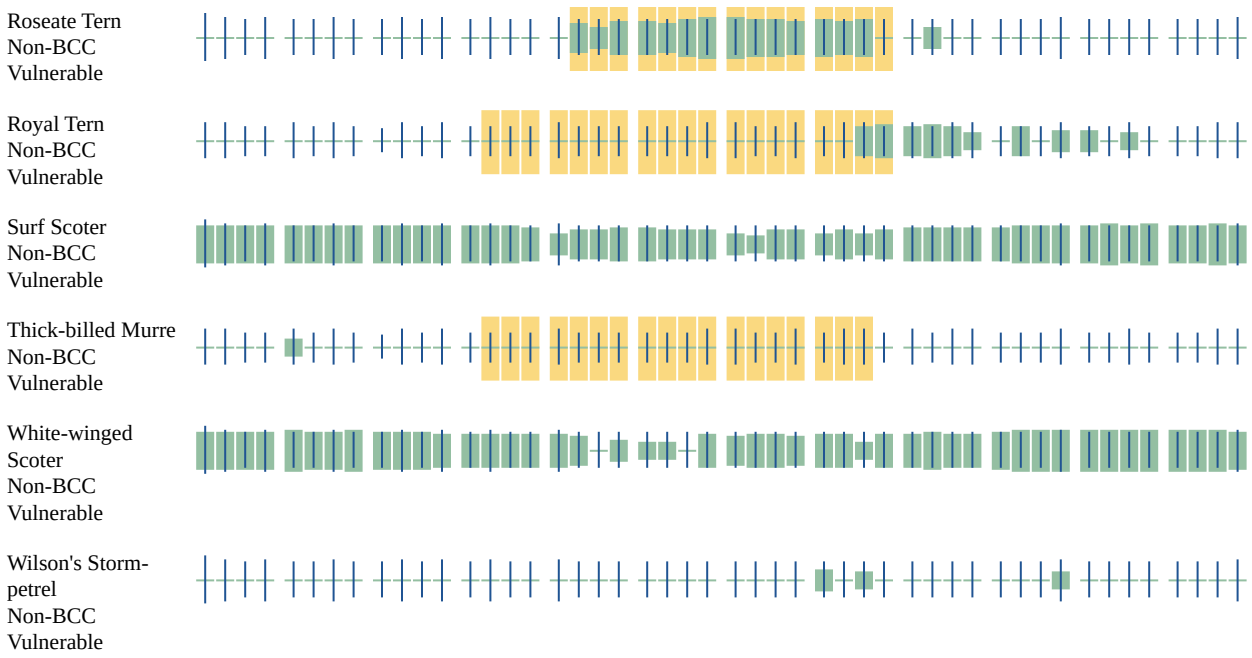
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort – no data


SPECIES
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Black Scoter
Non-BCC
Vulnerable
Black-legged
Kittiwake
Non-BCC
Vulnerable
Brown Pelican
Non-BCC
Vulnerable
Common Eider
Non-BCC
Vulnerable
Common Loon
Non-BCC
Vulnerable
Common Murre
Non-BCC
Vulnerable
Cory's Shearwater
BCC Rangewide
(CON)
Great Shearwater
Non-BCC
Vulnerable
Long-tailed Duck
Non-BCC
Vulnerable
Pomarine Jaeger
Non-BCC
Vulnerable
Razorbill
Non-BCC
Vulnerable
Red Phalarope
Non-BCC
Vulnerable
SPECIES
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Red-breasted
Merganser
Non-BCC
Vulnerable
Red-throated Loon
Non-BCC
Vulnerable
Ring-billed Gull
Non-BCC
Vulnerable



Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

MIGRATORY BIRDS FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

ESTUARINE AND MARINE DEEPWATER

- E1UBL

IPAC USER CONTACT INFORMATION

Agency: AECOM
Name: Conor Makepeace
Address: 500 Enterprise Drive #1a
City: Rocky Hill
State: CT
Zip: 06067
Email conor.makepeace@aecom.com
Phone: 2036406692

ATTACHMENT P2-2
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION NATURAL HERITAGE - QUEENS, NEW YORK BW1/BW2 ONSHORE SUBSTATION FACILITIES

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Fish and Wildlife, New York Natural Heritage Program
625 Broadway, Fifth Floor, Albany, NY 12233-4757
P: (518) 402-8935 | F: (518) 402-8925
www.dec.ny.gov

November 8, 2021

Scott Egan
AECOM
250 Apollo Drive
Chelmsford, MA 01824

Re: Equinor Wind US, LLC, Beacon Wind Project -- AECOM #60653939
County: Bronx, Queens Town/City: City Of New York

Dear Scott Egan:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities that our database indicates occur in the vicinity of the proposed submarine cable route.

Regarding the portion of this project in New York offshore waters: The New York Natural Heritage Program database does not include full information on the rare and listed species occurring in New York's offshore marine waters. For information on the presence of rare and listed whales and other marine species in the vicinity of your project, on potential impacts and permit considerations regarding these species, and on other marine natural resources, please contact the NYSDEC Division of Marine Resources at (631) 444-0462, marineprotectedresources@dec.ny.gov.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our database. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

The presence of the plants and animals identified in the enclosed report may result in this project requiring additional review or permit conditions. For further guidance, and for information regarding other permits that may be required under state law, please consult with the NYSDEC Division of Environmental Permits.

Sincerely,

Nicholas Conrad
Information Resources Coordinator
New York Natural Heritage Program

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NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

The following state-listed animals have been documented in the vicinity of the proposed submarine export cable route.

The following list includes animals that are listed by NYS as Endangered, Threatened, or Special Concern; and/or that are federally listed.

For information about any permit considerations for the project, contact the NYSDEC Division of Environmental Permits.

The following species have been documented nesting on the Throgs Neck Bridge.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*FEDERAL LISTING*	
Peregrine Falcon *Breeding*	*Falco peregrinus*	Endangered		362

This report only includes records from the NY Natural Heritage database.

Information about many of the listed animals in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, and from NYSDEC at www.dec.ny.gov/animals/7494.html.

New York Natural Heritage Program

Report on Rare Animals, Rare Plants, and Significant Natural Communities

The following rare animals have been documented in the vicinity of the proposed submarine export cable route.

We recommend that potential impacts of the proposed project on these species or communities be addressed as part of any environmental assessment or review conducted as part of the planning, permitting and approval process, such as reviews conducted under SEQR. Field surveys of the project site may be necessary to determine the status of a species at the site, particularly for sites that are currently undeveloped and may still contain suitable habitat. Final requirements of the project to avoid, minimize, or mitigate potential impacts are determined by the lead permitting agency or the government body approving the project.

The following animals, while not listed by New York State as Endangered or Threatened, are rare in New York and are of conservation concern.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS*
The following birds have been documented, at least as recently as 2007, nesting in trees on South Brother Island, a saltwater, non-barrier island.			
Glossy Ibis	*Plegadis falcinellus*	Protected Bird	Imperiled in NYS
Cattle Egret	*Bubulcus ibis*	Protected Bird	Imperiled in NYS
Little Blue Heron	*Egretta caerulea*	Protected Bird	Imperiled in NYS
Snowy Egret	*Egretta thula*	Protected Bird	Imperiled in NYS
Yellow-crowned Night-Heron *also on North Brother Island*	*Nyctanassa violacea*	Protected Bird	Imperiled in NYS
North and South Brother Islands are also recoginized as a state-significant **Colonial Waterbird Nesting Area**.			
The following bird was documented in 1984 nesting in the upper stories and attics of abandoned buildings on North Brother Island.			
Barn Owl	*Tyto alba*	Protected Bird	Critically Imperiled in NYS

This report only includes records from the NY Natural Heritage database. For most sites, comprehensive field surveys have not been conducted, and we cannot provide a definitive statement as to the presence or absence of all rare or state-listed species. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the rare animals and plants in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, from NatureServe Explorer at www.natureserve.org/explorer, and from USDA's Plants Database at http://plants.usda.gov/index.html (for plants).

ATTACHMENT P2-3
CONNECTICUT NATURAL DIVERSITY DATABASE (NDDB) CORRESPONDENCE – WATERFORD, CONNECTICUT BW2 ONSHORE PROJECT AREA.

Connecticut Department of

ENERGY &
ENVIRONMENTAL
PROTECTION

August 5, 2022

Mr. Scott Eagan
AECOM Environment, Inc.
500 Enterprise Drive
Rocky Hill, CT 06067
scott.eagan@aecom.com

Project: Preliminary Assessment for a Beacon Wind BW2 Landfall Site (Submarine Cables from Offshore Wind to Onshore Substation, Interconnection and Staging Area) on Millstone Power Station property, 314 Rope Ferry Rd, Waterford, Connecticut
NDDB Preliminary Assessment No.: 202205104
Effective Date: August 5, 2023

Dear Scott Eagan,

I have reviewed Natural Diversity Database maps and files regarding the area delineated on the map provided for Beacon Wind BW2 Landfall Site (Submarine Cables from Offshore Wind to Onshore Substation, Interconnection and Staging Area) on Millstone Power Station property, 314 Rope Ferry Rd, Waterford, Connecticut.

According to our records there are known extant populations of State Listed Species that occur within or close to the boundaries of this property. I have attached a list of species known from this area. Please be advised that this is a preliminary review and not a final determination. A more detailed review will be necessary to move forward with any environmental permit applications submitted to DEEP for the proposed project. **This preliminary assessment letter cannot be used or submitted with permit applications at DEEP**. This letter is valid for one year.

To prevent impacts to State-listed species, field surveys of the site should be performed by a qualified biologist with the appropriate scientific collecting permits at a time when these target species are identifiable. For plants, the survey areas should not be mowed for 8 weeks prior to the survey for the target plants; the applicant shall provide photographs documenting the condition of the survey areas at the time of the survey for the target plant. A report summarizing the results of such surveys should include:

1. Survey date(s) and duration.
2. Site descriptions and photographs.
3. List of component vascular plant and animal species within the survey area (including scientific binomials).
4. Data regarding population numbers and/or area occupied by State-listed species. Include special plant and/or animal forms found at:
https://www.ct.gov/deep/cwp/view.asp?a=2702&q=323460&deepNav_GID=1628
5. A discussion of the identifying characters that distinguish each listed plant from other similar species. This discussion should demonstrate a thorough understanding of all the salient identifying characters of each target species.
6. Detailed maps of the area surveyed including the survey route and locations of State listed species.

7. Conservation strategies or protection plans that indicate how impacts may be avoided for all state listed species present on the site.

8. Statement/résumé indicating the biologist's qualifications. Please be sure when you hire a consulting qualified biologist to help conduct this site survey that they have the proper experience with target taxon and have a CT scientific collectors permit. The list I provided includes several taxonomic groups and to provide a complete site assessment of this property, consider hiring experts in each taxonomic group (birds, plants, invertebrates, etc.).

The site surveys report(s) should be sent to our CT DEEP-NDDB Program (deep.nddbrequest@ct.gov) for further review by our program biologists along with an updated request for another NDDB review. Incomplete reports may not be accepted.

The conservation strategies should specifically address how to avoid adverse impacts to the State Listed Species. The conservation strategies must be developed by qualified taxonomic experts with experience with these specific taxa in Connecticut. Submit these best management practices or conservation/protection plans with a new request for an NDDB review. After reviewing your new NDDB request form and the documents describing how you will protect this species from project impacts we will make a final determination and provide you with a letter from our program to use with DEEP-Permits.

Natural Diversity Database information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey, cooperating units of DEEP, landowners, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the NDDB should not be substitutes for onsite surveys necessary for a thorough environmental impact assessment. The result of this review does not preclude the possibility that listed species may be encountered on site and that additional action may be necessary to remain in compliance with certain state permits.

Please contact me if you have further questions at (860) 424-3592, or deep.nddbrequest@ct.gov
Thank you for consulting the Natural Diversity Data Base.

Sincerely,

Dawn M. McKay

Dawn M. McKay
Environmental Analyst 3

Species List for NDDB Request

Scientific Name	Common Name	State Status
Coastal/Marine Community - Other Classification		
Saltwater intertidal beaches and shores		
Subtidal saltwater aquatic bed		
Terrestrial Community - Other Classification		
Coastal sand dunes		
Vascular Plant		
Carex bushii	Bush's sedge	SC
Honckenya peploides	Seabeach sandwort	SC
Pityopsis falcata	Sickle-leaved golden aster	E
Vertebrate Animal		
Caretta caretta	Loggerhead	T
Charadrius melodus	Piping plover	T
Chelonia mydas	Atlantic green turtle	T
Dermochelys coriacea	Leatherback	E
Falco peregrinus	Peregrine falcon	T
Lepidochelys kempii	Atlantic ridley	E
Malaclemys terrapin terrapin	Northern diamondback terrapin	SC
Progne subis	Purple martin	SC
Thamnophis sauritus	Eastern ribbon snake	SC
Carcharias taurus	Sand tiger shark	SC
Ulvaria subbifurcata	Radiated shanny	SC
Invertebrate Animal		
Liparis atlanticus	Atlantic seasnail	SC

E = Endangered, T = Threatened, SC = Special Concern, * Extirpated

Connecticut Department of
Energy & Environmental Protection
Bureau of Natural Resources
Wildlife Division

CPPU USE ONLY
App #:_____
Doc #:_____
Check #: No fee required
Program: Natural Diversity Database Endangered Species
Hardcopy _____ Electronic _____

Request for Natural Diversity Data Base (NDDB) State Listed Species Review

Please complete this form in accordance with the instructions (DEEP-INST-007) to ensure proper handling of your request.
There are no fees associated with NDDB Reviews.

Part I: Preliminary Screening & Request Type

Before submitting this request, you must review the most current Natural Diversity Data Base "State and Federal Listed Species and Significant Natural Communities Maps" found on the DEEP website. These maps are updated twice a year, usually in June and December.

Does your site, including all affected areas, fall in an NDDB Area according to the map instructions:

☐ Yes ☐ No **Enter the date** of the map reviewed for pre-screening: _____

This form is being submitted for a :

☐ *New* NDDB request ☐ *Renewal/Extension* of a NDDB Request, ***without*** *modifications and within* ***two years*** *of issued NDDB determination* (no attachments required)	☐ *New* **Safe Harbor Determination** (optional) must be associated with an application for a GP for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities ☐ *Renewal/Extension* of an existing Safe Harbor Determination ☐ With modifications ☐ Without modifications (no attachments required) [*CPPU Use Only - NDDB-Safe Harbor Determination #* 1736]
Enter NDDB Determination Number for Renewal/Extension:	Enter Safe Harbor Determination Number for Renewal/Extension:

Part II: Requester Information

If the requester is a corporation, limited liability company, limited partnership, limited liability partnership, or a statutory trust, it must be registered with the Secretary of State. If applicable, the name shall be stated **exactly as it is registered with the Secretary of State. Please note, for those entities registered with the Secretary of State, the registered name will be the name used by DEEP. This information can be accessed at the Secretary of the State's database CTData SOTS Portal.* (http://searchctbusiness.ctdata.org/)

If the requester is an individual, provide the legal name (include suffix) in the following format: First Name; Middle Initial; Last Name; Suffix (Jr, Sr., II, III, etc.).

If there are any changes or corrections to your company/facility or individual mailing or billing address or contact information, please complete and submit the Request to Change company/Individual Information to the address indicated on the form.

1. Requester*

Company Name:

Contact Name:

Address:

City/Town: State: Zip Code:

Business Phone: ext.

**E-mail:

**By providing this email address you are agreeing to receive official correspondence from the department, at this electronic address, concerning this request. Please remember to check your security settings to be sure you can receive emails from "ct.gov" addresses. Also, please notify the department if your e-mail address changes

a) Requester can best be described as:

☐ Individual ☐ Federal Agency ☐ State agency ☐ Municipality ☐ Tribal

☐ *business entity (* if a business entity complete i through iii):

i) Check type ☐ corporation ☐ limited liability company ☐ limited partnership ☐ limited liability partnership ☐ statutory trust ☐ Other:

ii) Provide Secretary of the State Business ID #: This information can be accessed at the Secretary of the State's database (CONCORD). (www.concord-sots.ct.gov/CONCORD/index.jsp)

iii) ☐ Check here if your business is **NOT** registered with the Secretary of State's office.

b) Acting as (Affiliation), pick one:

☐ Property owner ☐ Consultant ☐ Engineer ☐ Facility owner ☐ Applicant

☐ Biologist ☐ Pesticide Applicator ☐ Other representative:

2. List Primary Contact to receive Natural Diversity Data Base correspondence and inquiries, if different from requester.

Company Name:

Contact Person: Title:

Mailing Address:

City/Town: State: Zip Code:

Business Phone: ext.

**E-mail:

Part III: Site Information

This request can only be completed for one site. A separate request must be filed for each additional site.

1. SITE NAME AND LOCATION

Site Name or Project Name:

Town(s):

Street Address or Location Description:

Size in acres, or site dimensions:

Latitude and longitude of the center of the site in decimal degrees (e.g., 41.23456 -71.68574):

Latitude: Longitude:

Method of coordinate determination (check one):

☐ GPS ☐ Photo interpolation using CTECO map viewer ☐ Other (specify):

2a. Describe the current land use and land cover of the site.

b. Check all that apply and enter the size in acres or % of area in the space after each checked category.

☐ Industrial/Commercial _____ ☐ Residential _____ ☐ Forest _____

☐ Wetland _____ ☐ Field/grassland _____ ☐ Agricultural _____

☐ Water _____ ☐ Utility Right-of-way _____

☐ Transportation Right-of-way _____ ☐ Other (specify): _____

Part IV: Project Information

1. PROJECT TYPE:

Choose Project Type: Choose Type From Dropdown List , If other describe: _____

2. Is the subject activity limited to the maintenance, repair, or improvement of an existing structure within the existing footprint? ☐ Yes ☐ No If yes, explain.

Part IV: Project Information (continued)

3. Give a detailed description of the activity which is the subject of this request and describe the methods and equipment that will be used. Include a description of steps that will be taken to minimize impacts to any known listed species.

4. If this is a renewal or extension of an existing Safe Harbor request *with* modifications, explain what about the project has changed.

5. Provide a contact for questions about the project details if different from Part II primary contact.

   Name:

   Phone:

   E-mail:

Part V: Request Requirements and Associated Application Types

Check *one* box from either Group 1, Group 2 *or* Group 3, indicating the appropriate category for this request.

Group 1. If you check one of these boxes, complete Parts I – VII of this form and submit the required attachments A and B.

- ☐ Preliminary screening was negative but an NDDB review is still requested
- ☐ Request regards a municipally regulated or unregulated activity (no state permit/certificate needed)
- ☐ Request regards a preliminary site assessment or project feasibility study
- ☐ Request relates to land acquisition or protection
- ☐ Request is associated with a *renewal* of an existing permit or authorization, with no modifications

Group 2. If you check one of these boxes, complete Parts I – VII of this form and submit required attachments A, B, *and* C.

- ☐ Request is associated with a *new* state or federal permit or authorization application or registration
- ☐ Request is associated with modification of an existing permit or other authorization
- ☐ Request is associated with a permit enforcement action
- ☐ Request regards site management or planning, requiring detailed species recommendations
- ☐ Request regards a state funded project, state agency activity, or CEPA request

☐ **Group 3.** If you are requesting a **Safe Harbor Determination**, complete Parts I-VII and submit required attachments A, B, and D. Safe Harbor determinations can only be requested if you are applying for a GP for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

If you are filing this request as part of a state or federal permit application(s) enter the application information below.

Permitting Agency and Application Name(s): _____

Related State DEEP Permit Number(s), if applicable: _____

State DEEP Enforcement Action Number, if applicable: _____

State DEEP Permit Analyst(s)/Engineer(s), if known: _____

Is this request related to a previously submitted NDDB request? ☐ Yes ☐ No

If yes, provide the previous NDDB Determination Number(s), if known: _____

Part VI: Supporting Documents

Check each attachment submitted as verification that *all* applicable attachments have been supplied with this request form. Label each attachment as indicated in this part (e.g., Attachment A, etc.) and be sure to include the requester's name, site name and the date. **Please note that Attachments A and B are required for all new requests and Safe Harbor renewals/extensions with modifications.** Renewals/Extensions with no modifications do not need to submit any attachments. Attachments C and D are supplied at the end of this form.

☐ Attachment A:	**Overview Map:** an 8 1/2" X 11" print/copy of the relevant portion of a USGS Topographic Quadrangle Map clearly indicating the exact location of the site.
☐ Attachment B:	**Detailed Site Map:** fine scaled map showing site boundary and area of work details on aerial imagery with relevant landmarks labeled. (Site and work boundaries in GIS [ESRI ArcView shapefile, in NAD83, State Plane, feet] format can be substituted for detailed maps, see instruction document)
☐ Attachment C:	**Supplemental Information, Group 2 requirement (attached, DEEP-APP-007C)** ☐ Section i: Supplemental Site Information and supporting documents ☐ Section ii: Supplemental Project Information and supporting documents
☐ Attachment D:	**Safe Harbor Report Requirements, Group 3 (attached, DEEP-APP-007D)**

Part VII: Requester Certification

The requester *and* the individual(s) responsible for actually preparing the request must sign this part. A request will be considered incomplete unless all required signatures are provided.

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief."

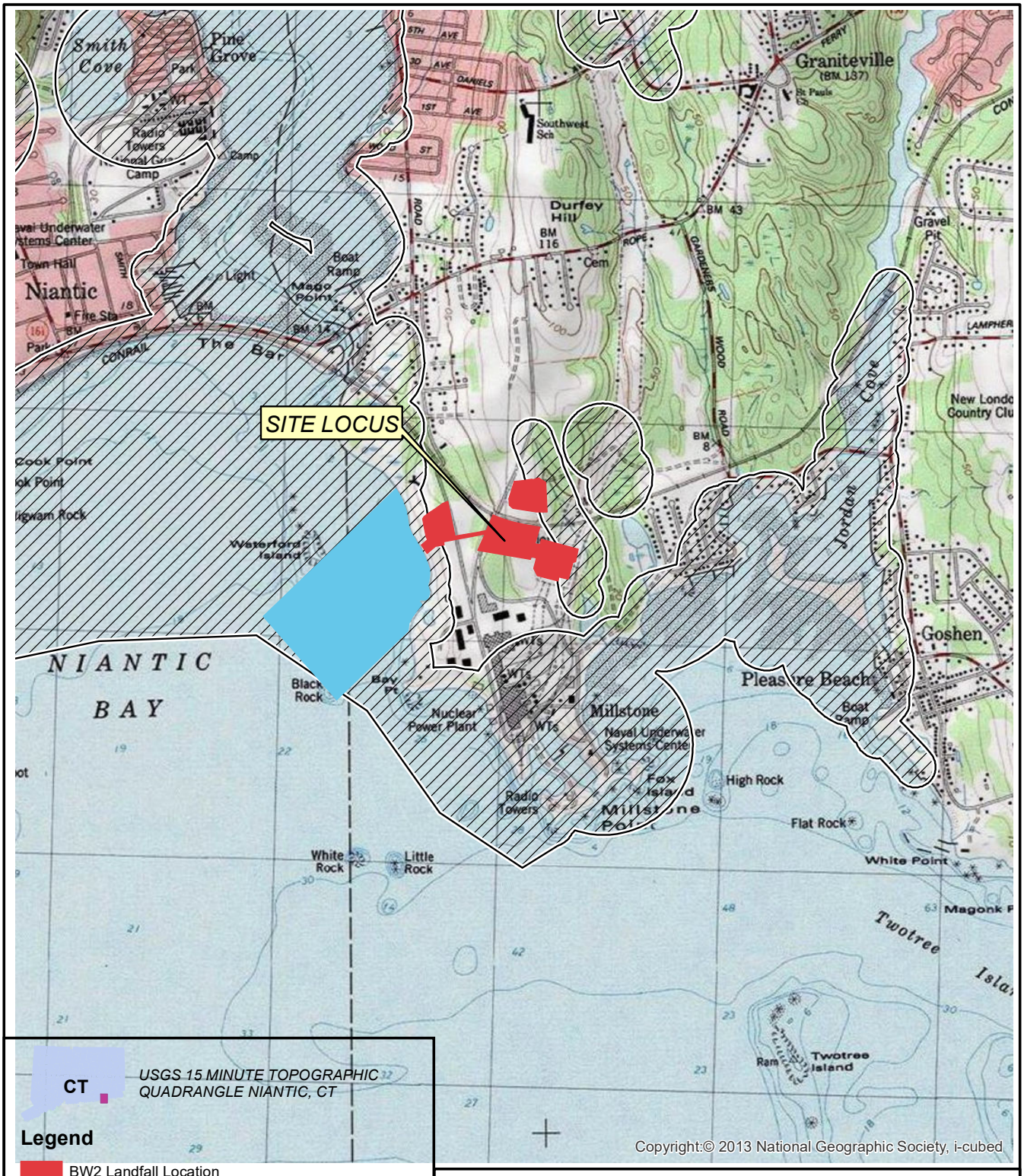
Signature of Requester (a typed name will substitute for a handwritten signature)	Date
Name of Requester (print or type)	Title (if applicable)
Signature of Preparer (if different than above)	Date
Name of Preparer (print or type)	Title (if applicable)

Note: Please submit the completed Request Form and all Supporting Documents to:

CENTRAL PERMIT PROCESSING UNIT
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

Or email request to: **deep.nddbrequest@ct.gov**

Attachment A



CT

USGS 15 MINUTE TOPOGRAPHIC QUADRANGLE NIANTIC, CT

Legend

- BW2 Landfall Location
- Export Cable Corridor
- NDDB Area (December 2021)

CONFIDENTIAL

0 1,000 2,000 4,000 Feet

Site Locus

Beacon Wind Offshore Wind Farm Project
BW2 Landfall Location, Waterford, CT

SCALE	DATE	PROJECT NO.
1:24,000	4/20/2022	60653939

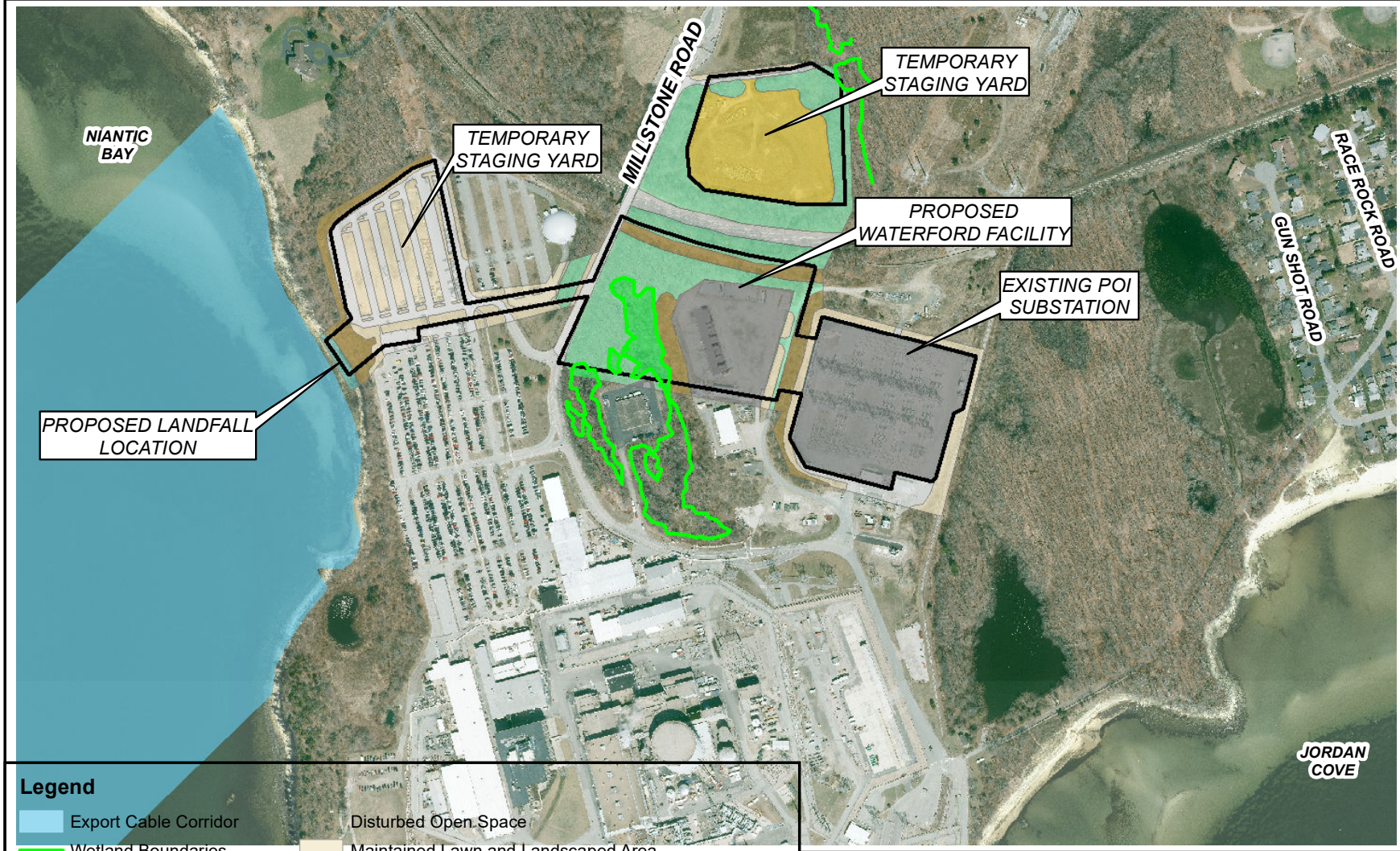
AECOM

Figure Number

1

AECOM

Attachment B



CONFIDENTIAL

Landuse-Land Cover

Beacon Wind Offshore Wind Farm Project
BW2 Landfall Location, Waterford, CT

SCALE	DATE	PROJECT NO.
1:6,000	4/20/2022	60653939

AECOM

Figure Number

2

Photo credit: Matt Goldsmith, Equinor