State of Maine Offshore Wind Research Array

Maine Update
December 03, 2024

Casey Yanos
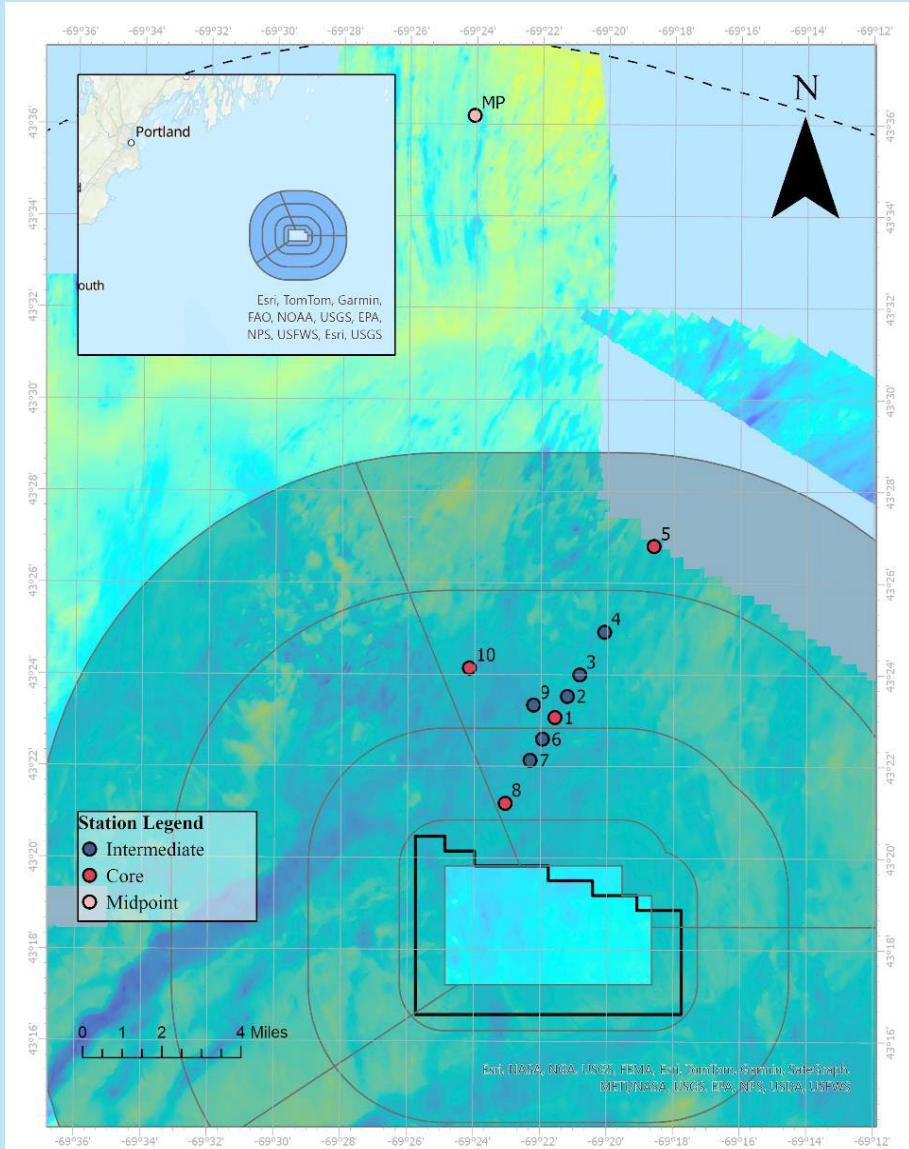Marine Resource Scientist
Maine Department of Marine Resources
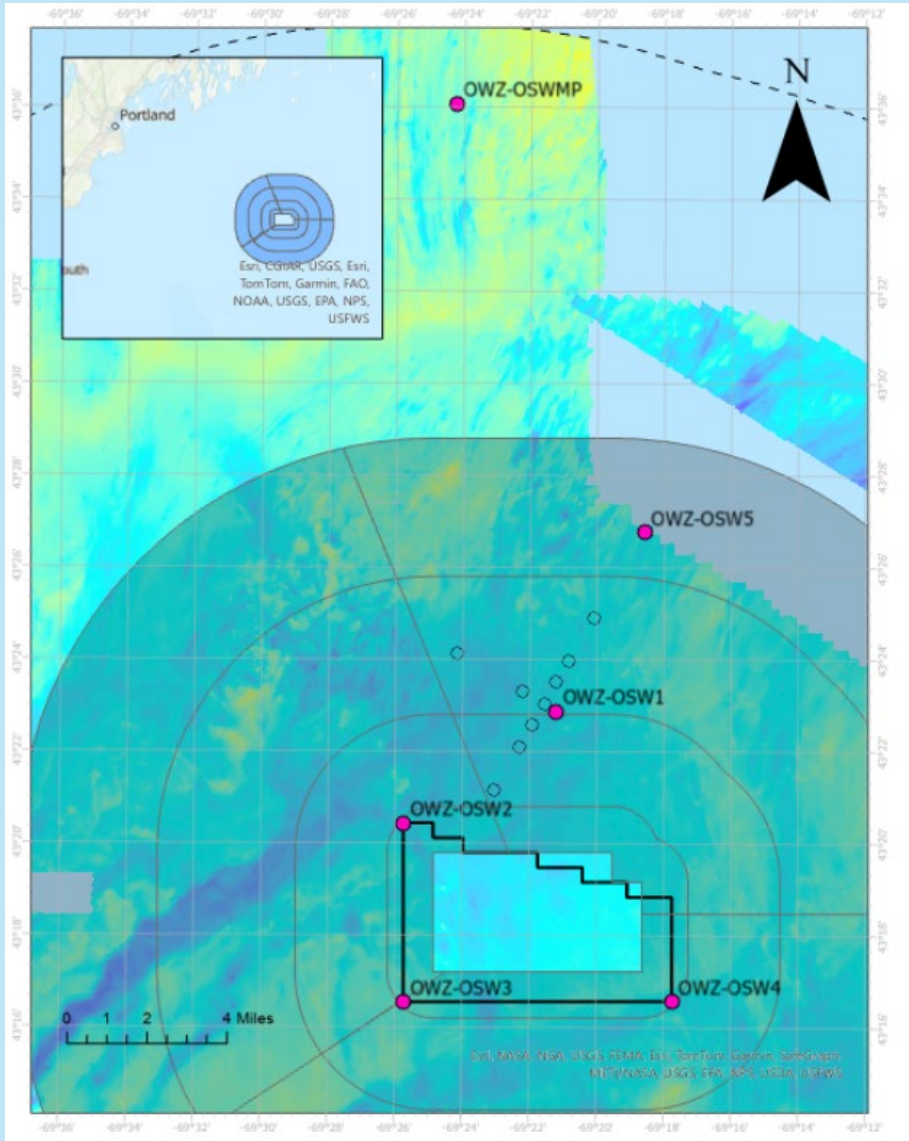
Conceptual Illustration by University of Maine

Zooplankton and Larval Lobster Survey

- Sampling was conducted from September 1, 2023, to August 31, 2024, across the Preferred Area of Interest in order to collect a full year of data and examine spatial heterogeneity.

Zooplankton and Larval Lobster Survey


- Sampling was conducted from September 1, 2023, to August 31, 2024, across the Preferred Area of Interest in order to collect a full year of data and examine spatial heterogeneity.
- Starting September 1, 2024, sampling was conducted across the Finalized Lease Area with some reference sites from the original sampling scheme. This will continue for the foreseeable future.

Active Acoustic Survey
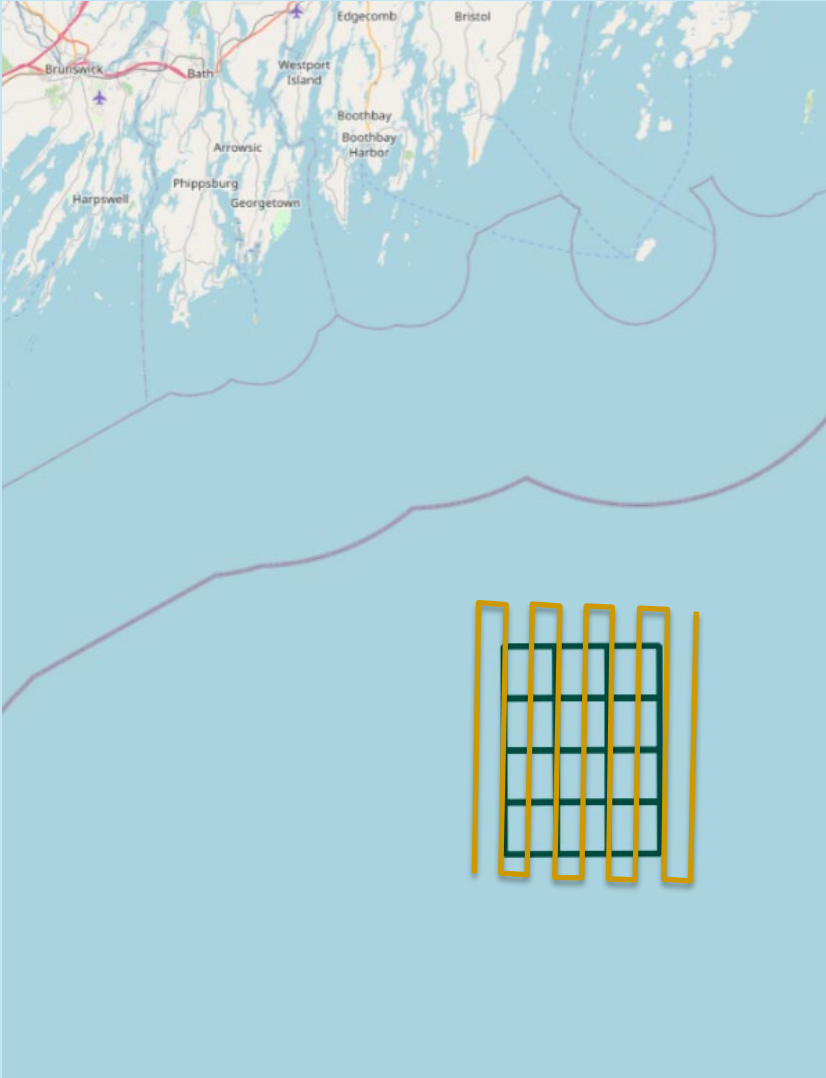
- Starting June 1, 2023, and continuing through the present, surveys take two days and cover north-south transects.

Active Acoustic Survey
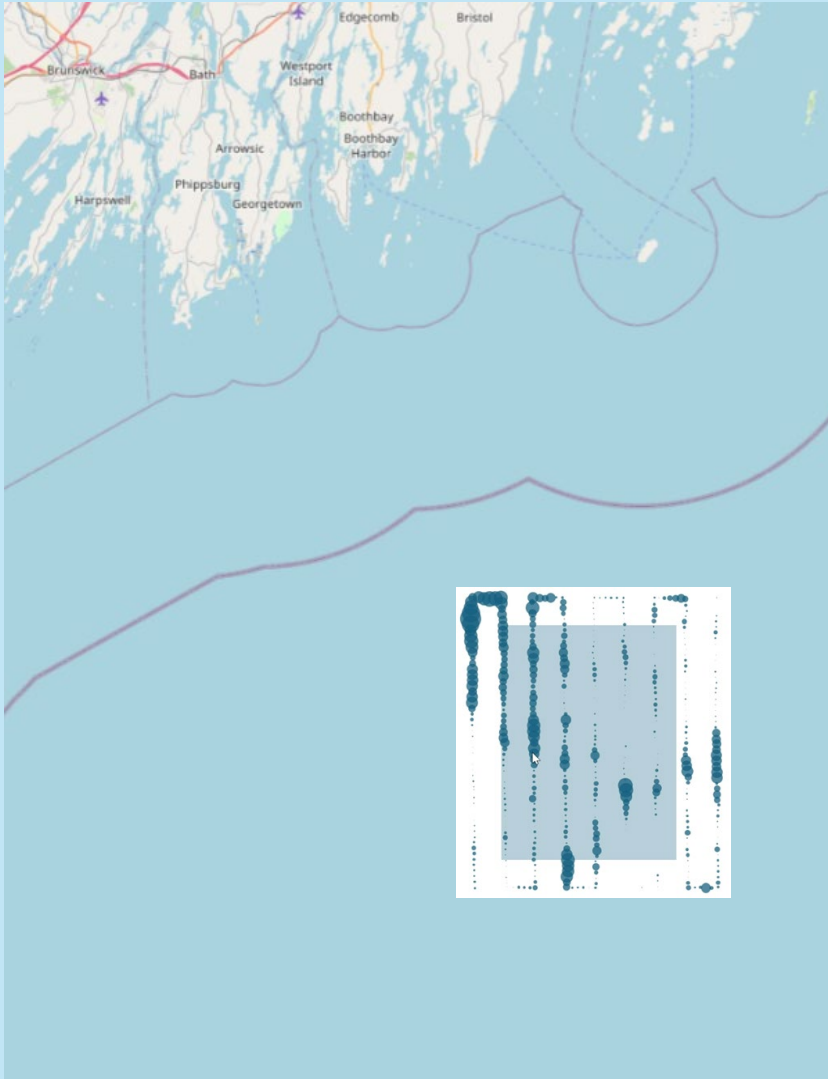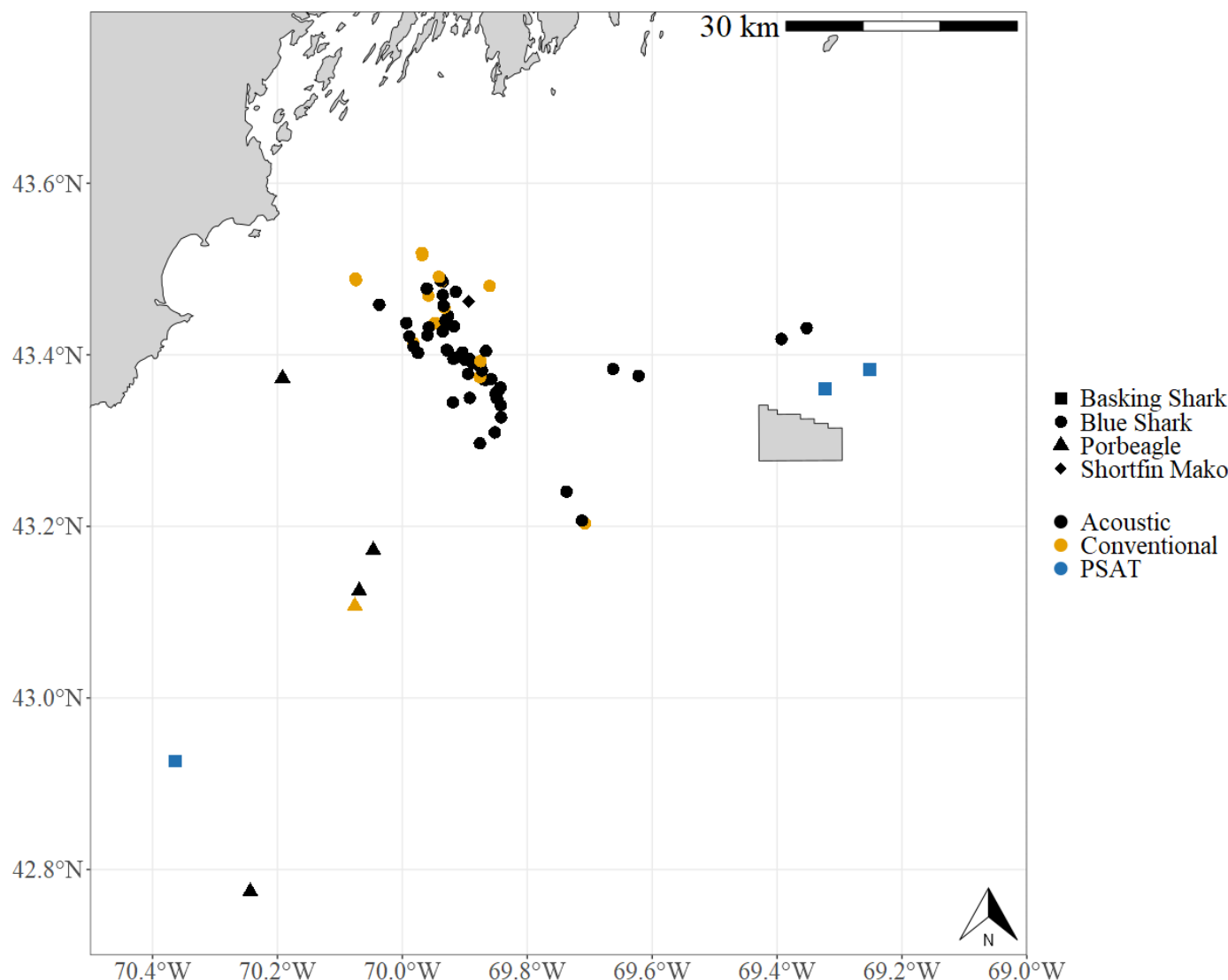

- Starting June 1, 2023, and continuing through the present, surveys take two days and cover north-south transects.
- Transect lines may be shifted further south to center on the Finalized Lease Area once.

Highly Migratory Species Monitoring

- Tagging Effort
  - 3 Basking Sharks
  - 1 Mako Shark
  - 65 Blue Sharks
  - 7 Porbeagle Sharks

Highly Migratory Species Monitoring

Movement of Shark ID 49726: 2023-10-04 11:04:00
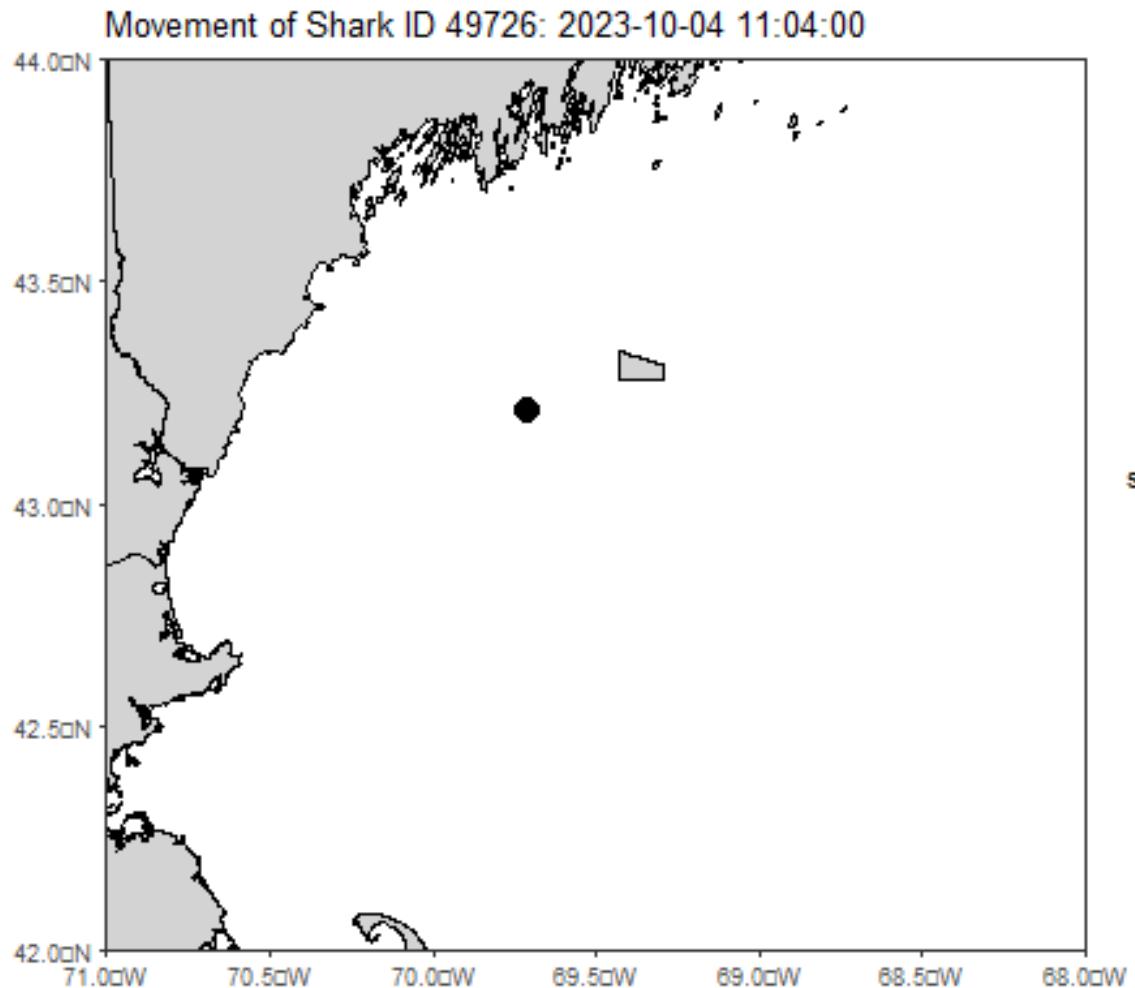
- Existing receiver network has picked up tagged individuals
- Additional receivers will be deployed in 2025

Oceanographic Monitoring
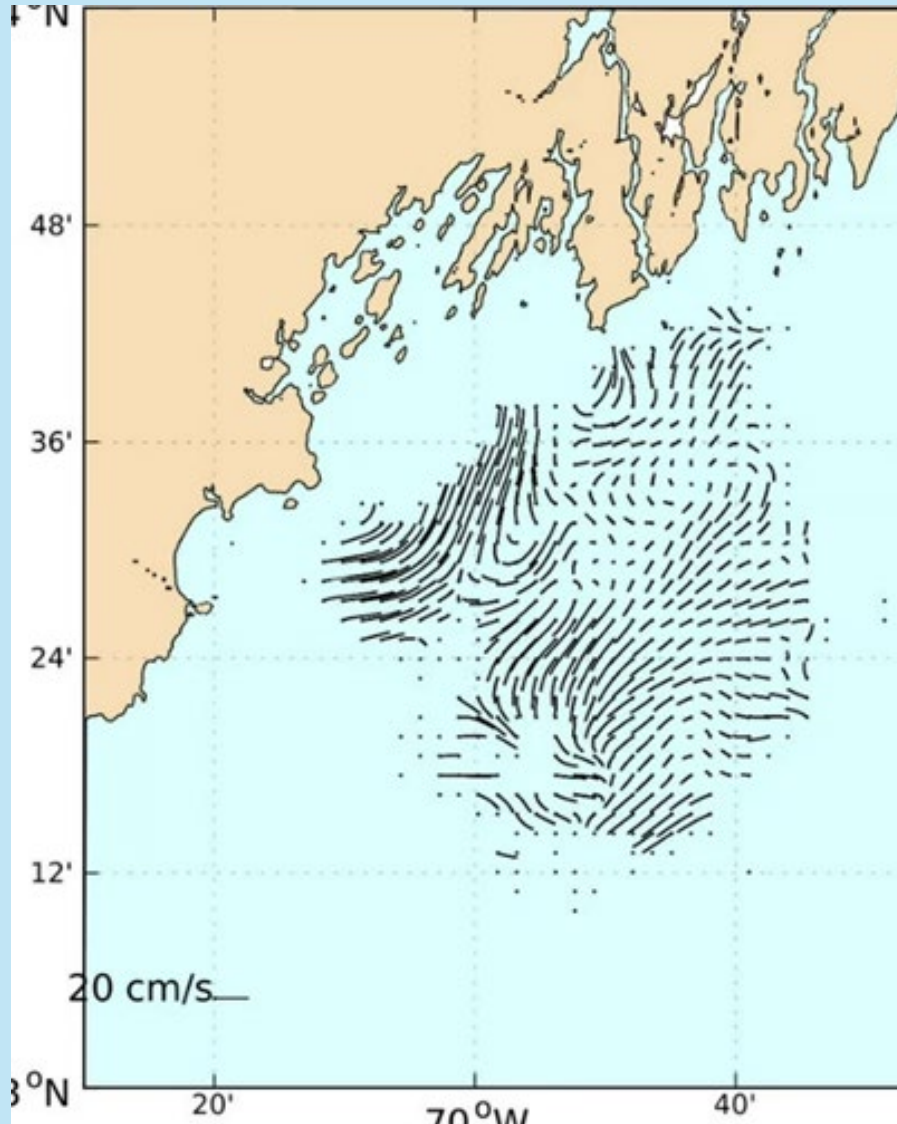
- As of now, there are three shore-based radar stations installed and operating to collect surface wind data.
- Plans are in motion for more stations to be installed in the future.

Oceanographic Monitoring

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
Image U.S. Geological Survey
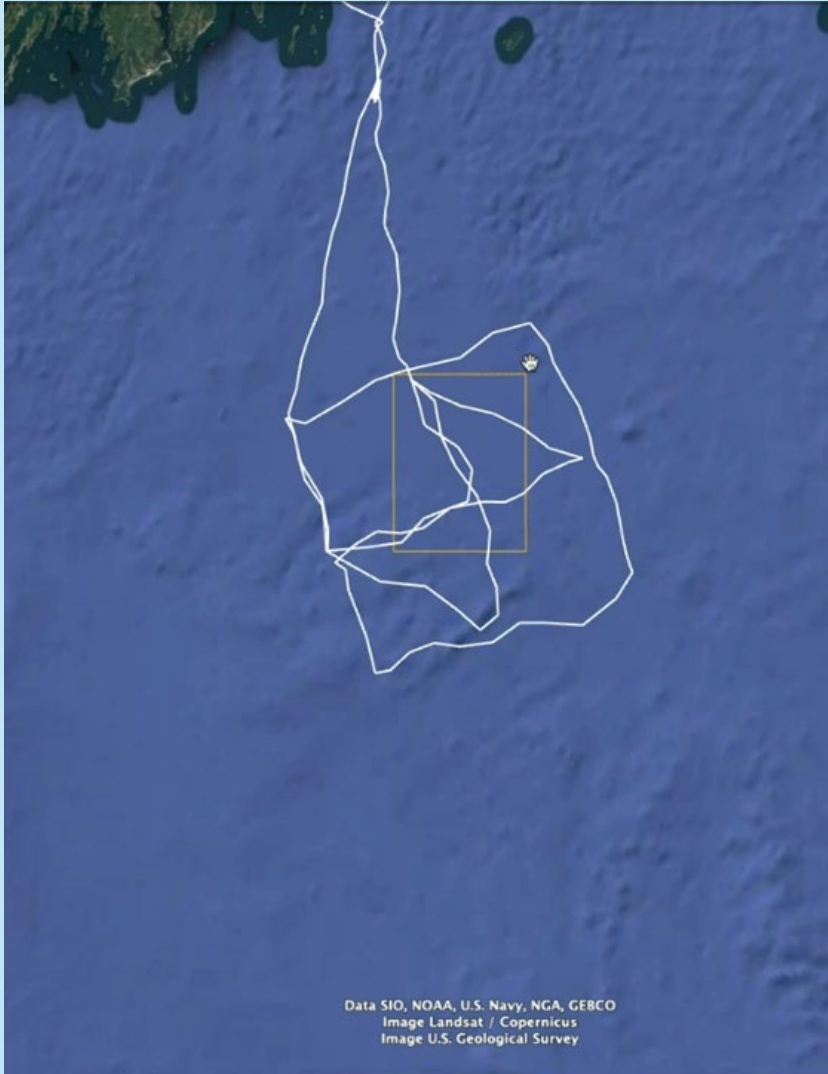
- Five underwater glider deployments have collected oceanographic data around the entire RFCI area.
- Future oceanographic work will be boat-based, plans have not been finalized yet.

Oceanographic Modeling of Turbine Scale Processes
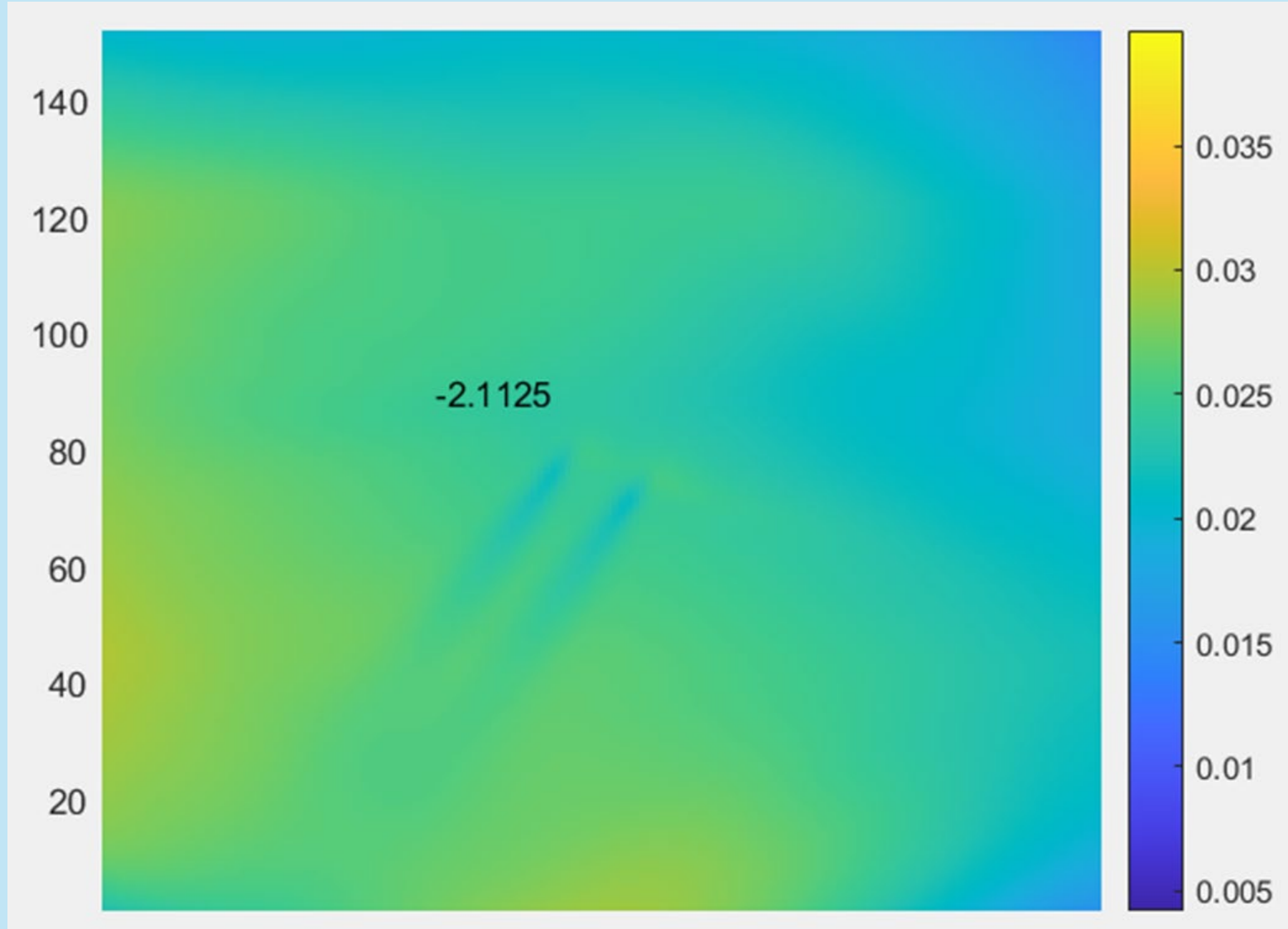
Interviews on Historic Use

- Interviews continue
- Information will be compared to spatial data and catch and landings data

Bottom Trawl Survey
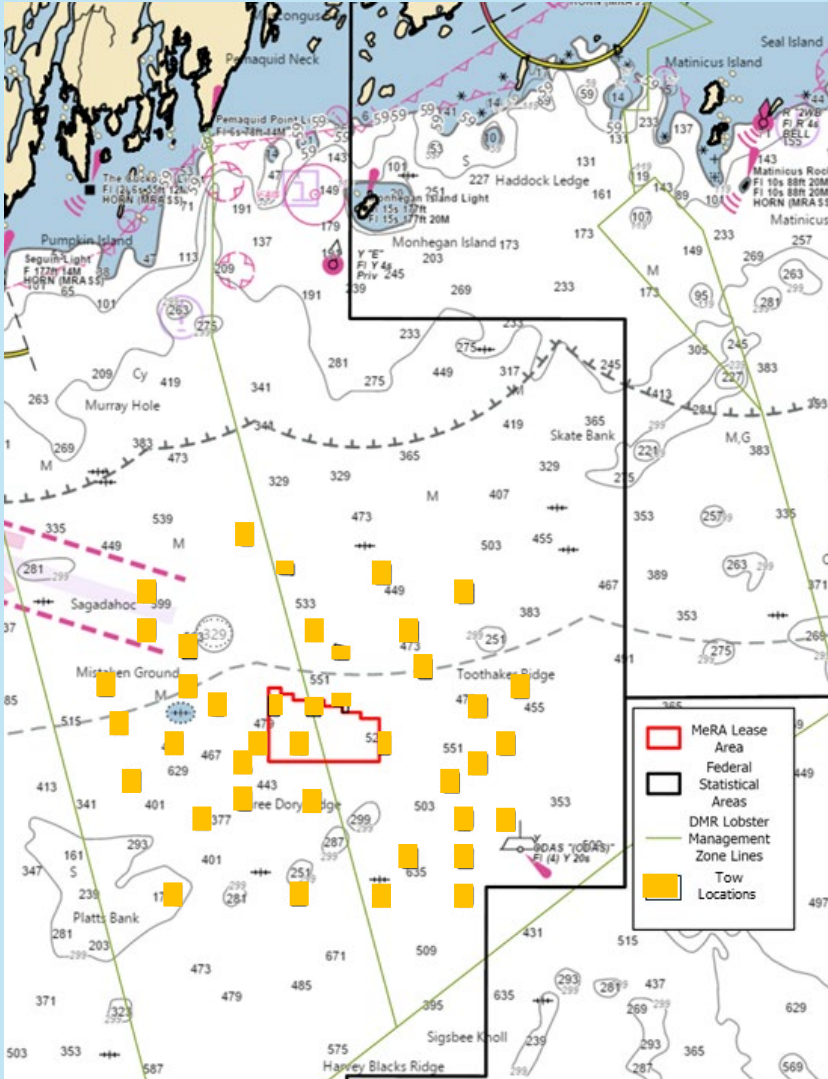
- Planning to start in January 2025
- Tow locations will remain the same for one year (4 seasonal sampling events) to capture seasonal distribution

Topics to be Covered

- Leasing Update
  - Gulf of Maine
  - Central Atlantic: Lease Auctions and Call for Information & Nominations
- BOEM Studies
- Questions and Requests

Managing responsible development of America's offshore energy and mineral resources

BOEM
Bureau of Ocean Energy Management

BOEM.gov
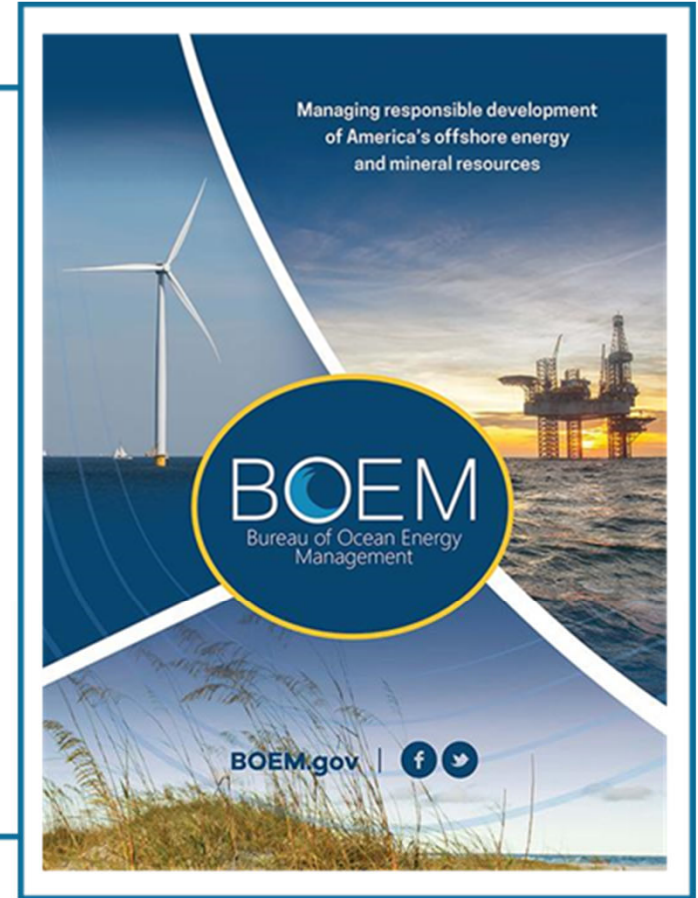
Gulf of Maine Auction

- Auction took place **October 29, 2024**

- Two provisional winners for 4 lease areas and ~$22 million in winning bids.
  - Avangrid Renewables, LLC
  - Invenergy NE Offshore Wind, LLC

- See website for additional details:
  - https://www.boem.gov/renewable-energy/state-activities/maine/gulf-maine

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ENERGY MANAGEMENT
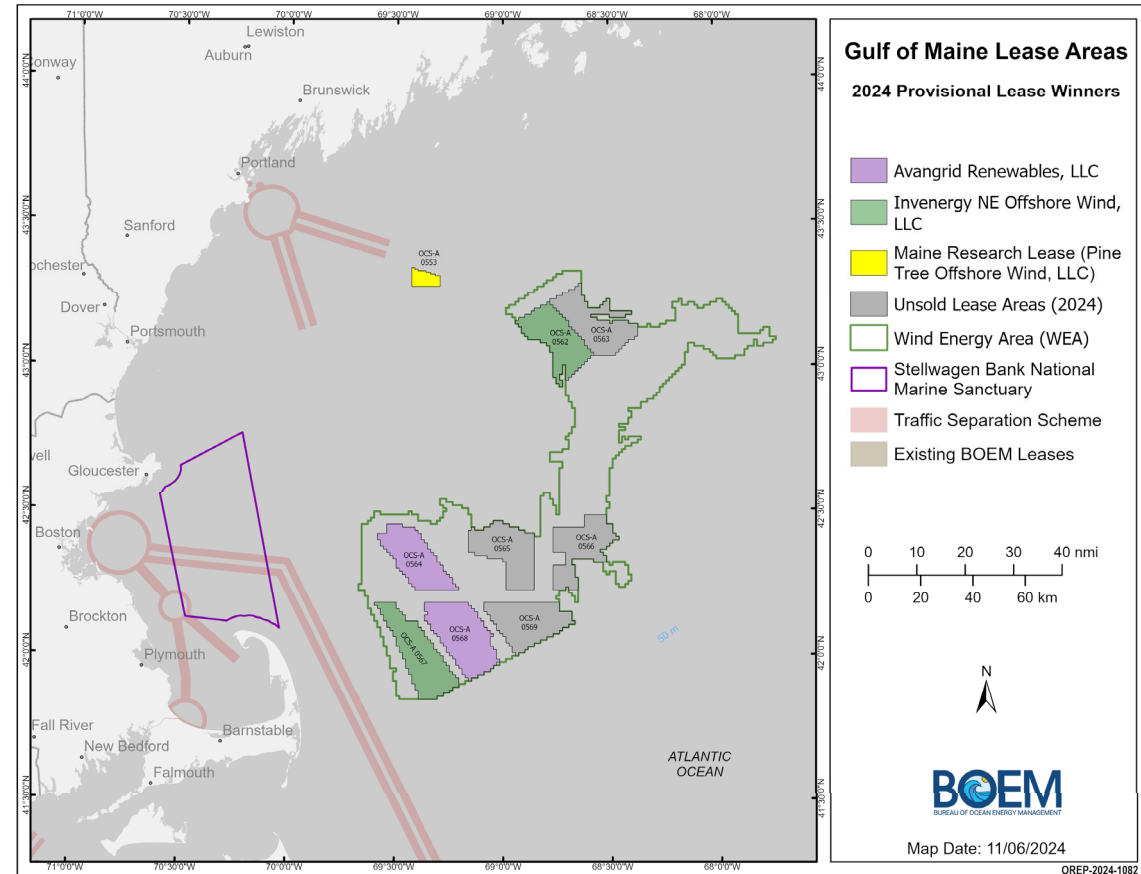
Bidding Credits:

○ 12.5% bidding credit for Workforce Training and/or Supply Chain Development

○ 12.5% bidding credit for a Fisheries Compensatory Mitigation Fund

Lease Area ID	Provisional Winner	Developable Acres	Total Acres	Winning Bid	Workforce/Supply Chain Bidding Credit	Fisheries Compensatory Mitigation Bidding Credit
OCS-A 0562	Invenergy NE Offshore Wind, LLC	97,854	97,854	$4,892,700	$611,588	$611,588
OCS-A 0564	Avangrid Renewables, LLC	93,756	98,565	$4,928,250	$616,031	$616,031
OCS-A 0567	Invenergy NE Offshore Wind, LLC	113,208	117,780	$5,889,000	$736,125	$736,125
OCS-A 0568	Avangrid Renewables, LLC	116,363	124,897	$6,244,850	$780,606	$780,606
Total		**421,181**	**439,096**	**$21,954,800**	**$2,744,350**	**$2,744,350**

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Renewable Energy Authorization Process

[Planning & Analysis]   [Leasing]   [Site Assessment & Characterization]   [Construction]   [Operations & Maintenance]   [Decommission]

BOEM Initiates Leasing Process
(Request for Information/Call for Information)

BOEM Awards Lease

BOEM Issues COP Decision

BOEM Identifies Wind Energy Areas	BOEM Publishes Sale Notices	Preliminary Period	COP Review Period	Construction Period	Operations Period	
~ 6 months	~ 1½ years	up to 5 years	2 years	1 - 2 years	up to 35 years	1 - 2 years

▪ BOEM Environmental Reviews of Leasing Activities

▪ BOEM Reviews Survey Plans
▪ Lessee Studies Lease Area
▪ Lessee Submits COP

▪ BOEM Reviews COP & Determines Sufficiency
▪ BOEM Conducts Environmental & Technical Reviews

▪ Lessee Submits & BSEE Decides on FDR/FIR
▪ Lessee Constructs Project

▪ BSEE Administers Operational Compliance and Ensures Safety & Environmental Enforcement

BOEM Holds Lease Auction

Commercial Operations Begin

BSEE Administers Decommissioning Activities

Formal Stakeholder Engagement

Post-Auction: What's Next?

- Enhanced Engagement
  - **Communication Plans** for fisheries, Tribes, and agencies. Must be completed within <u>6 months</u> of lease effective date.
  - **Progress Report** every <u>6 months</u> providing:
    - Summary of engagement with all affected ocean users, Tribes, stakeholders (including underserved communities)
- Survey & Site Assessment Activities
  - Met buoy deployment
  - Survey vessels
- Unsold Lease Areas

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FLOATING OFFSHORE WIND ENERGY

BOEM AND THE STATE OF MAINE ANNOUNCE
AMERICA'S FIRST FLOATING WIND RESEARCH LEASE

Bureau of Ocean Energy Management
U.S. Department of the Interior

Maine Research Lease - Timeline

○ **October 1, 2021** – Application received from Maine

○ **August 19, 2022** – Request for Competitive Interest (RFCI) issued by BOEM

○ **March 20, 2023** – Determination of No Competitive Interest

○ **July 19, 2023** – Draft Environmental Assessment for the Research Lease RFCI Area is published

○ **May 28, 2024** – Final Environmental Assessment published; lease offered to State

○ **Aug. 19, 2024** – Lease executed

○ **Sept. 1, 2024** – Lease effective date
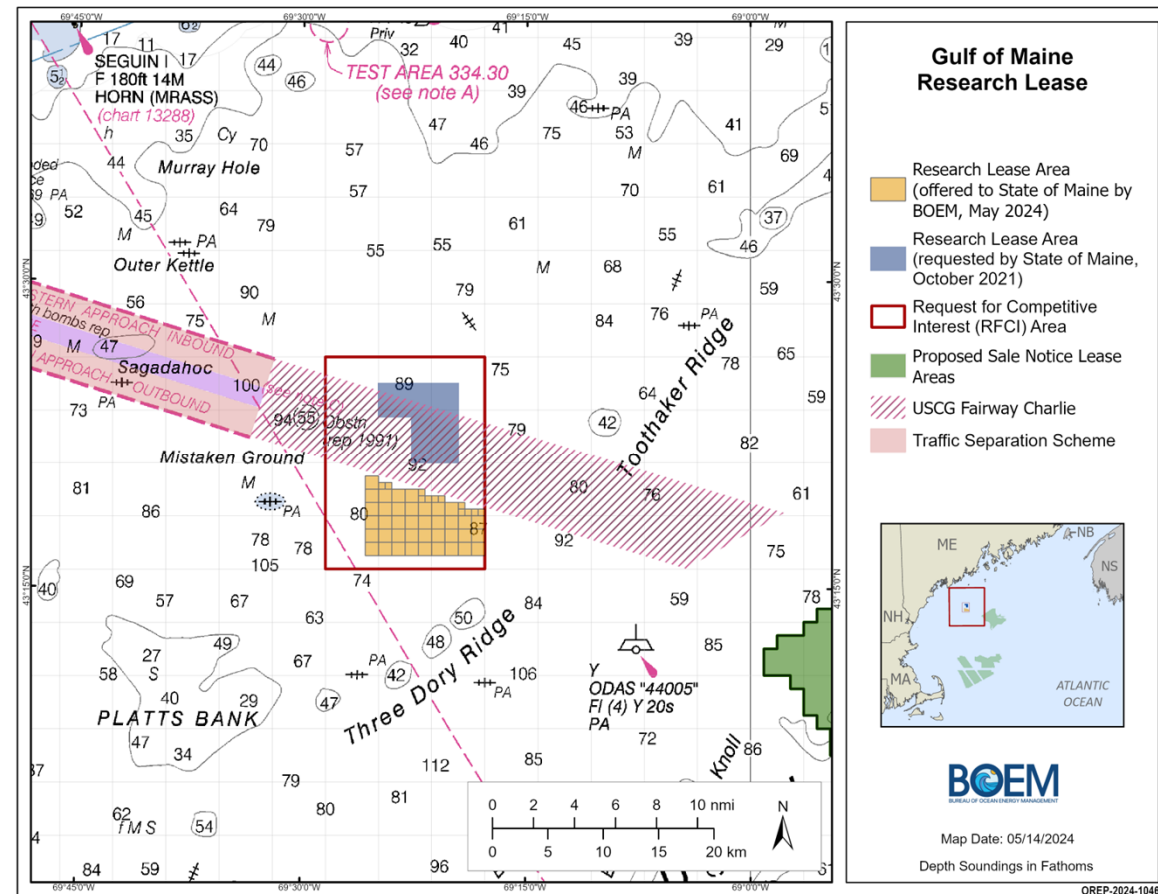
Central Atlantic 1: Recent Lease Auction

- Auction: August 14, 2024
  - Six companies participated; 7 rounds
- OCS-A 0557 (Equinor Wind)
  - 26 nmi from Delaware Bay
  - 101,443 acres
  - ~$75 million
- OCS-A 0558 (Virginia Electric and Power Co)
  - 35 nmi from Chesapeake Bay
  - 176,505 acres
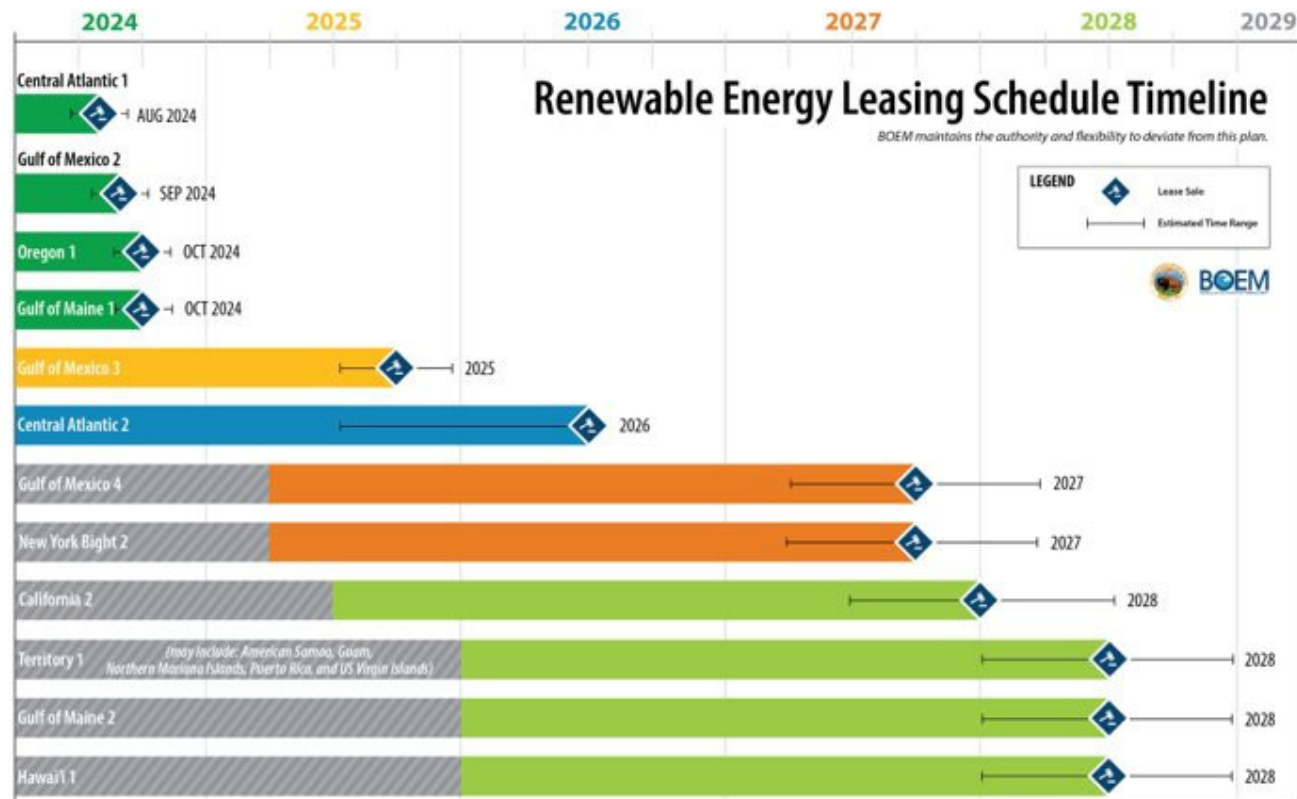 - ~$17.6 million
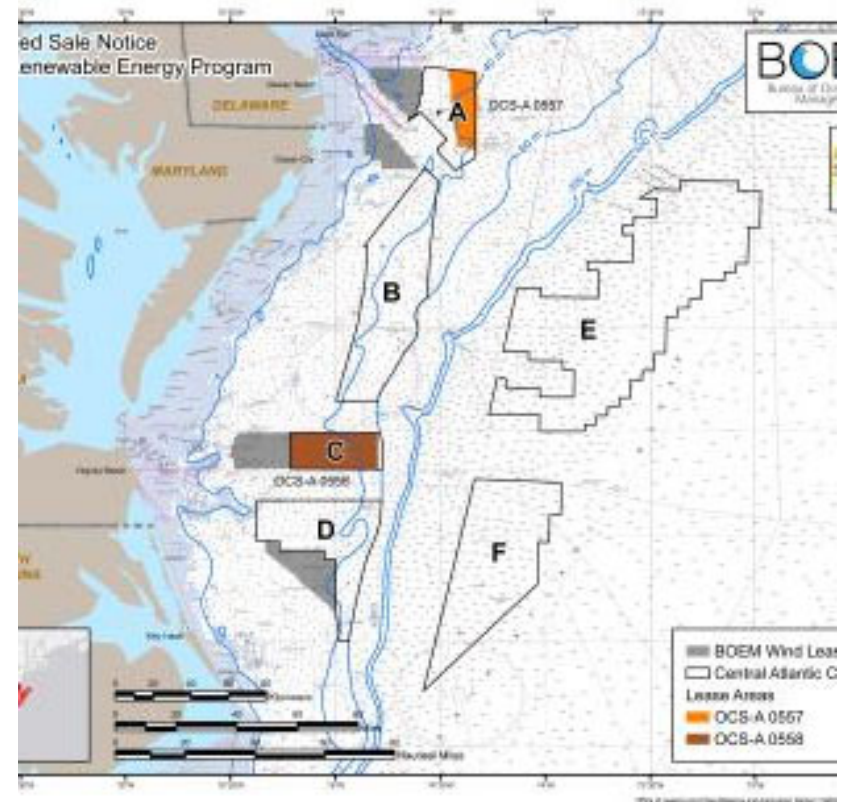
Central Atlantic 2 Call for Information & Nominations

- Overview
  - Leasing Schedule
  - Drivers
- Recent Activities
  - Outreach Events
- Next Steps
  - Leasing Milestones
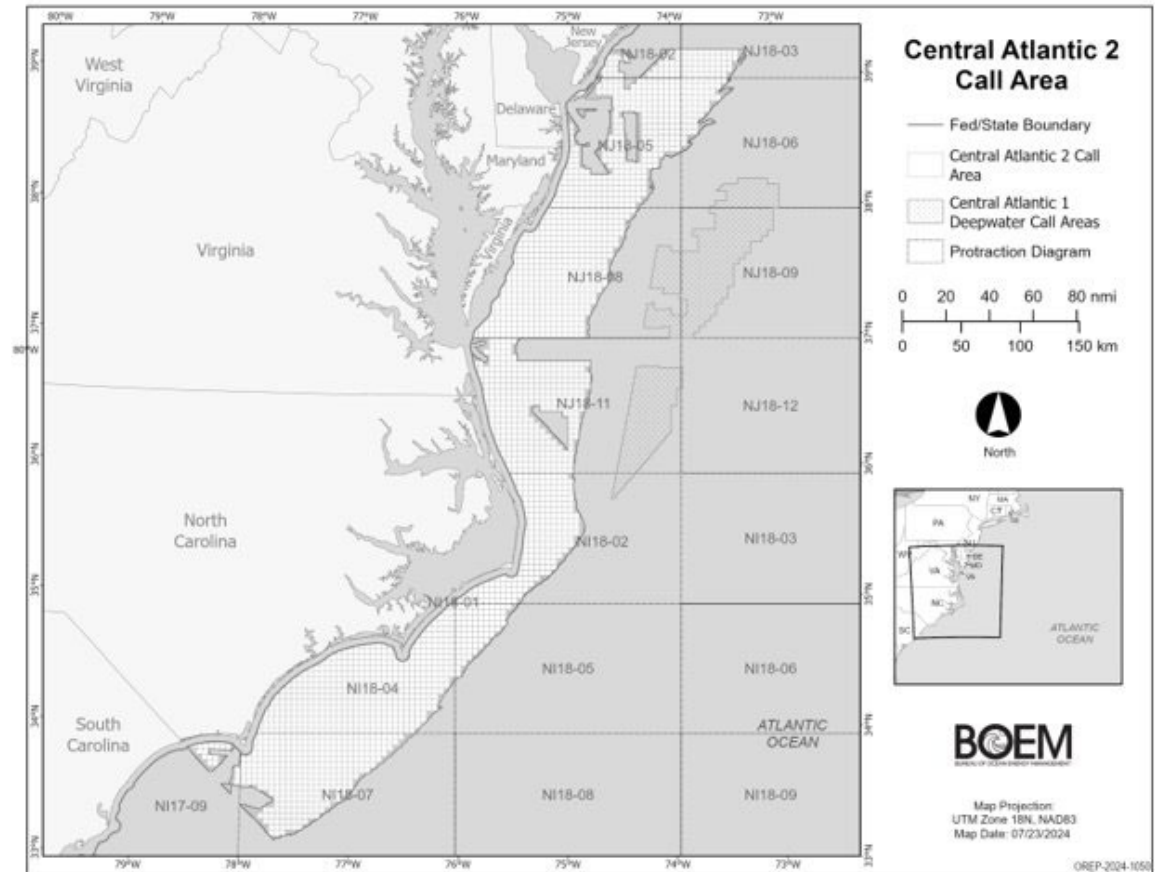
BOEM Five-Year Offshore Wind Leasing Schedule
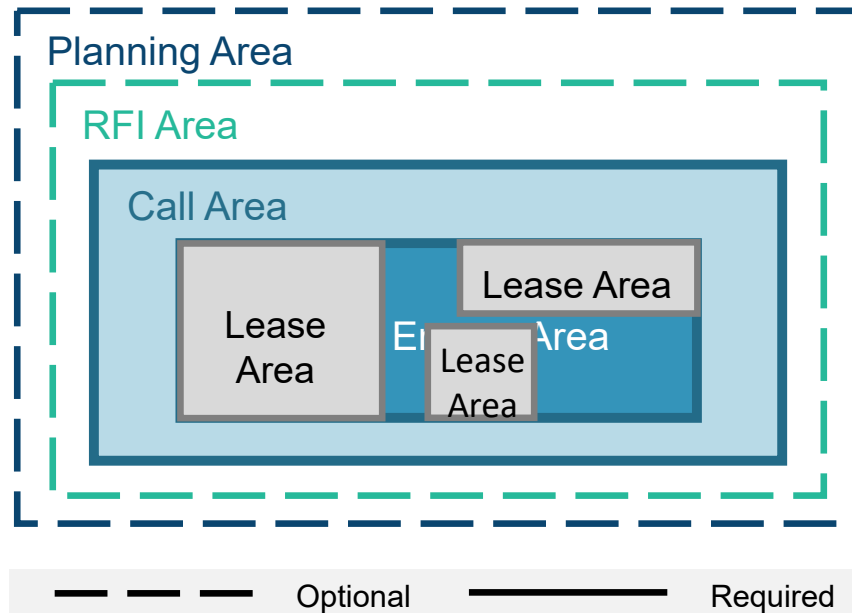
Central Atlantic 2 Drivers (State OSW Goals)

State	Overall Goal	Remaining Goal	Required Acreage*
North Carolina	8 GW by 2040	3 GW	185,000 ac
Virginia	5.2 GW by 2034	0 GW	0 acres
Maryland	8.5 GW by 2031	1.5 – 4GW	95,000 – 250,000 ac
Delaware		1.2 GW	75,000 ac
Total		5.7 – 8.2 GW	355,000 – 510,000 ac

Additional expressed interest:
- State of Maryland interested in areas further north of Central Atlantic 1 Call Area and the deepwater portions of the Central Atlantic 1 Call Area
- State of North Carolina interested in areas further south of Cape Hatteras

*Acreage estimates are based upon power density estimates of 4.0 megawatts (MW) per square kilometer, as described in the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy's Offshore Wind Market Report: 2023 Edition, available at: https://www.energy.gov/sites/default/files/2023-09/doe-offshore-wind-market-report-2023-edition.pdf.

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BOEM Renewable Energy Planning Process: *Lease Areas*

Identifying Draft Wind Energy Areas

Planning Area → RFI Area → Call Area → Draft Wind Energy Areas → Final Wind Energy Areas → Proposed Lease Areas → Final Lease Areas
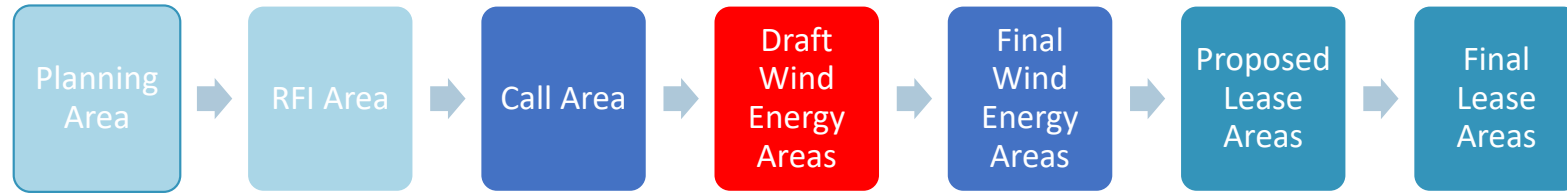
- BOEM has partnered with NOAA NCCOS to utilize best available science and data through spatial modeling to inform WEA identification.

- Public input will inform spatial modeling and decisions on draft WEAs.

- BOEM is committed to ensuring draft WEAs will be made available for public review.

NCCOS | NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE

MARCO Mid-Atlantic Ocean Data Portal

- Review of input from Central Atlantic 1:
    - Recreational and Commercial Fisheries
    - Marine Habitats
    - Protected Species
    - Industry and Navigation
- The currently open comment period provides an opportunity for new feedback and/or updates, revision, or expansion of past feedback

A Wind Energy Area Siting Analysis for the Central Atlantic Call Area

Alyssa L. Randall[1], Jonathan A. Jossart[1], Brandon M. Jensen[2], Bridgette H. Duplantis[3], and James A. Morris, Jr.[4]

[1] CSS, Inc. under contract to the National Centers for Coastal Ocean Science, National Ocean Service, NOAA, 101 Pivers Island Rd., Beaufort, North Carolina 28516

[2] Department of Interior, Bureau of Ocean Energy Management, 45600 Woodland Road, Sterling, Virginia 20166

[3] Department of Interior, Bureau of Ocean Energy Management, 1201 Elmwood Park Blvd., New Orleans, Louisiana 70123

[4] Marine Spatial Ecology Division, National Centers for Coastal Ocean Science, National Ocean Service, NOAA 101 Pivers Island Rd. Beaufort, North Carolina 28516

SUMMARY

This report provides the background, methods, and results for the development of the Central Atlantic Wind Energy Areas (WEAs) which includes an ecosystem-wide spatial suitability model developed to inform selection of wind energy areas in U.S. federal waters. Spatial suitability models have long been applied to terrestrial and marine environments for the purpose of assessing the relative potential for development or conservation. The National Oceanographic and Atmospheric Administration's (NOAA), National Centers for Coastal Ocean Science (NCCOS) and the Bureau of Ocean Energy Management (BOEM) used similar methods to complete suitability modeling for siting of wind energy in the Gulf of Mexico. To develop the Central Atlantic suitability model, 77 data layers were selected from over 200 data layers that represent major ocean characteristics for the Central Atlantic Call Area. Data were organized into categories (submodels) representing the major ocean sectors including national security, natural and cultural resources, wind, fishing, and industry and operations. All data layers were assigned scores of relative compatibility allowing the calculation of an overall suitability score for each 10 acres grid cell of the study area. Using a cluster analysis, five draft WEAs were identified representing the most suitable areas within the call area. The Central Atlantic draft WEAs were announced in November, 2022 and open for review and public comment. In response to comments received as well as data provided by the Department of Defense (DOD) as well as the National Aeronautics and Space Administration (NASA); six WEA options were identified.

The work presented here is the result of a WEA Siting Suitability model (Model) developed by expert marine spatial scientists, marine ecologists, project coordinators, policy analysts, and subject matter experts (SMEs) at both BOEM and NCCOS. Collectively, this team provided input during the model construction process, reviewed data layers, assigned weights, and informed

https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Central%20Atlantic%20Appendix%20B%20WEA%20Final%20Report%20NCCOS.pdf

Central Atlantic 2 Call for Information & Nominations

o Recent Activities
- o September 2024
  - o Task Force Meeting (September 10-11)
  - o Public Meetings in North Carolina – New Jersey (September 17-26)

- o October 2024
  - o Virtual Meeting (Oct 2)
  - o Data Workshop (October 16-17; Columbia, MD)

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Leasing Milestones

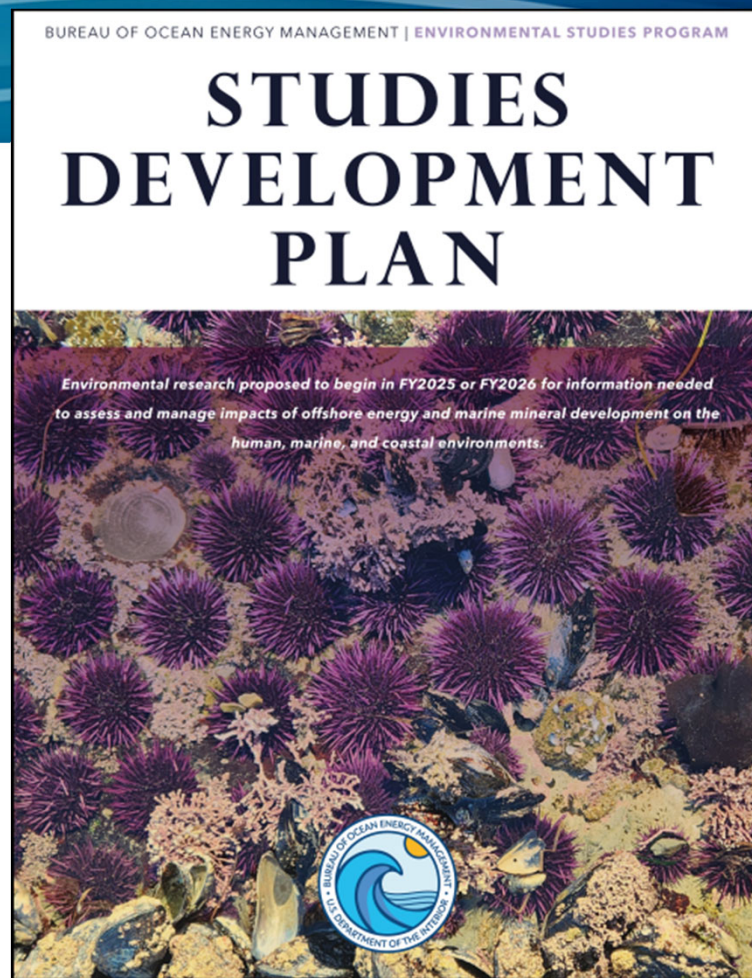| Milestone*	Action	Target Date**
Publish Call for Information & Nominations	**Publish Call** *60-Day Comment Period*	**August 22, 2024**
Area Identification	**Draft Wind Energy Areas (WEAs)**	**Q1 2025**
	Designate Final Wind Energy Areas	**Q3 2025**
Lease Sale	**Proposed Sale Notice (PSN)** *60-Day Comment Period*	**Q4 2025**
	Final Sale Notice (FSN)	**Q1 2026**
	Hold auction	**Q2 2026**

* Task Forces are incredibly valuable tools in the leasing process and **additional meetings** can be expected, likely to be scheduled around significant process milestones.

** Dates of planning/leasing milestones are all tentative.

BOEM Protected Species Studies

o Recently Completed Studies

    o Electromagnetic Fields: Background and Potential Impacts of Offshore Wind Farms on Marine Organisms (BOEM, 2024)

    o Using Advanced Population Genomics to Better Understand the Relationship Between Offshore and Spawning Habitat Use for Atlantic Sturgeon (White et. al, 2024)

    o Impulsive pile driving sound does not induce hearing loss in the longfin squid (*Doryteuthis pealeii*) (Jézéquel & Mooney 2024)

    o Linking multiple data sources to better describe fishing vessel activity on the Atlantic OCS (Report under review)

BUREAU OF OCEAN ENERGY MANAGEMENT | ENVIRONMENTAL STUDIES PROGRAM

STUDIES DEVELOPMENT PLAN

Environmental research proposed to begin in FY2025 or FY2026 for information needed to assess and manage impacts of offshore energy and marine mineral development on the human, marine, and coastal environments.

BOEM BUREAU OF OCEAN ENERGY MANAGEMENT

BOEM Protected Species Studies

o Recently Completed Studies

    o **Assessing Population Effects of Offshore Wind Development on North Atlantic Right Whales** (Prep for Peer Review)

    o **Transparent modeling of collision risk for three federally-listed bird species to offshore wind development** (SCRAM 2.0) (Prep for Posting Online)

    o **Offshore Wind Impacts on Oceanographic Processes: North Carolina to New York** (a and b; b report in Review)

NOAA under permit

SCRAM

BOEM Protected Species Studies

o Ongoing studies

- o **Understanding Atlantic Sturgeon Migratory Patterns** – Integrating Telemetry and Genetics (AT-19-06): *Final Report end of 2024*

- o **Movement Patterns of Fish in Southern New England** (AT-19-08): *Final Report end of 2025*

- o Development of a Strategy to Evaluate Impacts of Offshore Wind Energy on the NOAA NMFS NEFSC Multi-Species Bottom Trawl Survey (AT-20-07): *Final Report end of 2024*

- o **Exploring the Connectivity Among Offshore Wind Turbines** (AT-22-07): *Final Report end of 2024*

- o Evaluating Effectiveness of Nature Inclusive Design Materials (AT-22-09): *Final Report Sept 2025*

BOEM Protected Species Studies

o Ongoing studies

- o Mapping Abundance, Distribution, and Foraging Ecology of Gray Seals in the North Atlantic: *Final Report Sept 2025*

- o Tracking Movements of Common Terns Staging on Muskeget Island: *Final Report January 2025*

- o A Comprehensive Assessment of Existing Gulf of Maine Ecosystem Data and Identification of Data Gaps to Inform Future Research: *Final Report July 2025*

- o Ecological Baseline Study of the U.S. Outer Continental Shelf Off Maine: *Final Report Jan 2025*

- o **Investigating Persistent Super Aggregations of Right Whales and Their Prey Near Nantucket Shoals**: *Final Report Sept 2025*

NEFSC under permit

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BOEM Protected Species Studies

o Ongoing studies

- o Passive Acoustic Monitoring in the Massachusetts and Rhode Island Wind Energy Areas in Support of the Partnership for an Offshore Wind Energy Regional Observation Network (POWERON): *Final Report July 2025*

- o Marine Species Surveys in Support of Massachusetts Offshore Wind Development: Final Report Sept 2027

- o Ocean Environmental Monitoring and Sound Propagation Study at Mid-Atlantic Shelfbreak Offshore Wind Area: *Final Report Sept 2028*

- o Risk Assessment to Model Encounter Rates Between Large Whales and Vessel Traffic from Offshore Wind Energy – PHASE II: *Final Report Jan 2026*
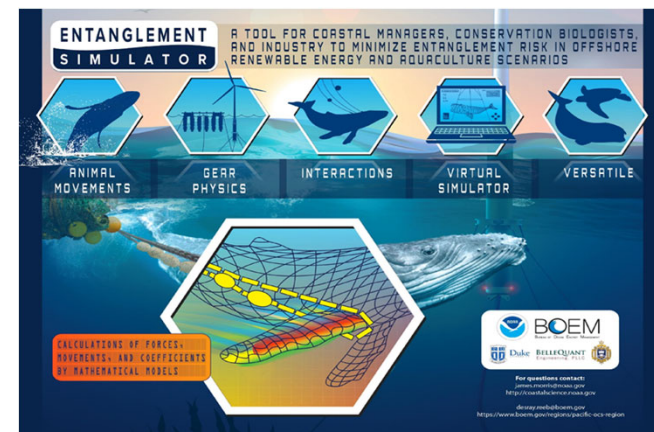

NEAq under permit

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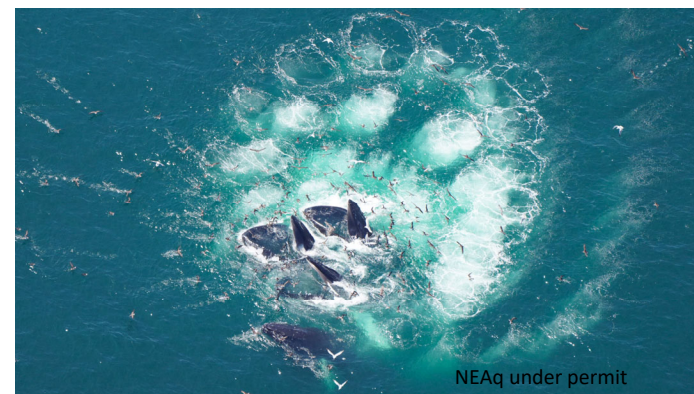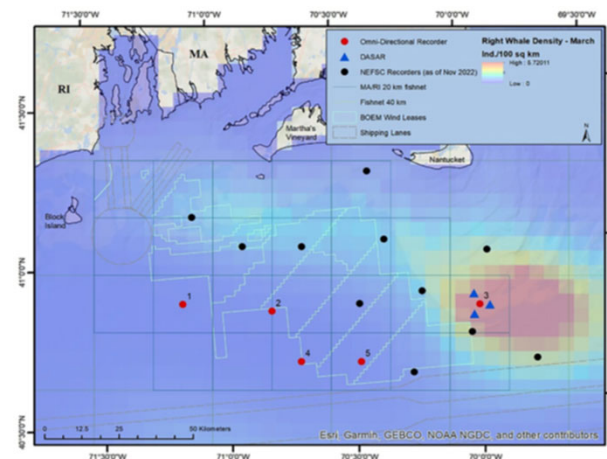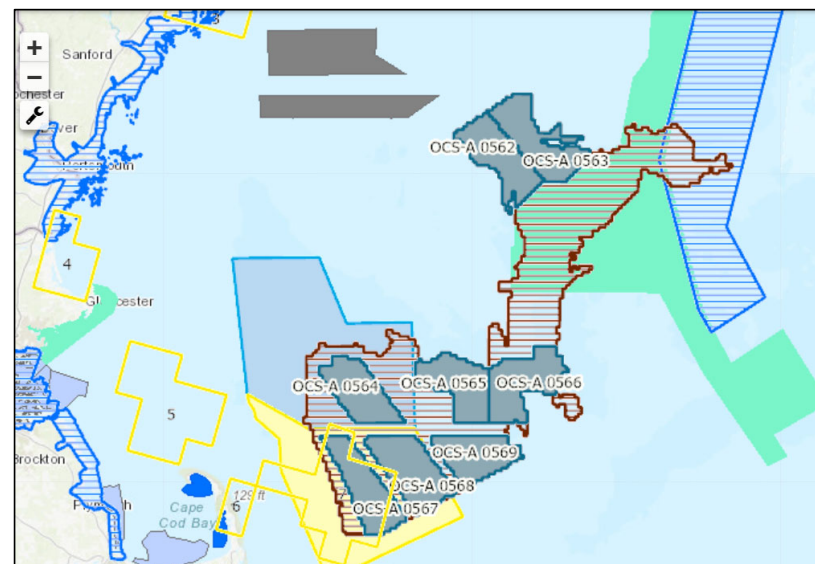
BOEM Protected Species Studies

o Ongoing studies

- o Development of Computer Simulations to Assess Entanglement Risk to Whales and Leatherback Sea Turtles in Offshore Floating Wind Turbine Moorings, Cables, and Associated Derelict Fishing Gear Offshore California – includes NARW model: *Final Report Sept 2025*

- o Addressing Key Information Gaps in Acoustic Ecology of North Atlantic Right Whales: *Final Report 2025*

- o Qualitative Risk Assessment Approach Refining Acoustic Processes and to Explore the Inclusion of Cumulative Effect Analysis for Offshore Windfarm Construction and Operations: *Final Report 2026*

- o Zooplankton Ecology of the western Gulf of Maine: trends in abundance and diversity: *Final Report 2025*

BOEM Protected Species Studies

o Upcoming Opportunities
  o Gulf of Maine Fishery Physical Habitat and Epibenthic Invertebrate Baseline Data Collection (AT-23-05): *Recent IAA USGS*
  o Collecting Fisheries Ecological Knowledge (FEK) for Use in Gulf of Maine Offshore Wind Planning (AT-24-04): *In Procurement*
  o Gulf of Maine Socioeconomic Impacts of OCS Wind Development on Fishing: *FY25 Procurement*
  o Maintenance of the Northwest Atlantic Seabird Catalog: FY25 *Procurement*

BOEM Protected Species Studies

o Upcoming Opportunities

    o Integrating High-quality Movement Data from Proxy Species into SCRAM: FY25 Procurement

    o Applying Distributed Acoustic Sensing Technology to Monitor Large Whales at Atlantic Offshore Wind Areas: FY25 Procurement

    o **Behavioral Response Workshop for North Atlantic Right Whales**: FY25 Procurement

    o Baleen Whale Behavior and Biological Sampling During Construction of Offshore Wind Farms: FY25 Procurement

    o Nantucket Shoal Hydrodynamic modeling (with NOAA/CINAR): FY25 Procurement

Photo by Amy Engelhaupt collected under NMFS scientific research permit No. 21482 issued to Dan Engelhaupt, HDR

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BOEM Studies

○ Upcoming Opportunities

Environmental Studies Plan solicitation for FY2026-2027

BOEM Now Accepting Environmental Study Ideas for Fiscal Years 2026 and 2027

- Suggestions should be submitted in a short paragraph by Dec. 9 - BOEMEnviroStudies@BOEM.GOV

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BOEM.gov

Luke Feinberg | luke.Feinberg@boem.gov
Kyle Baker | kyle.baker@boem.gov