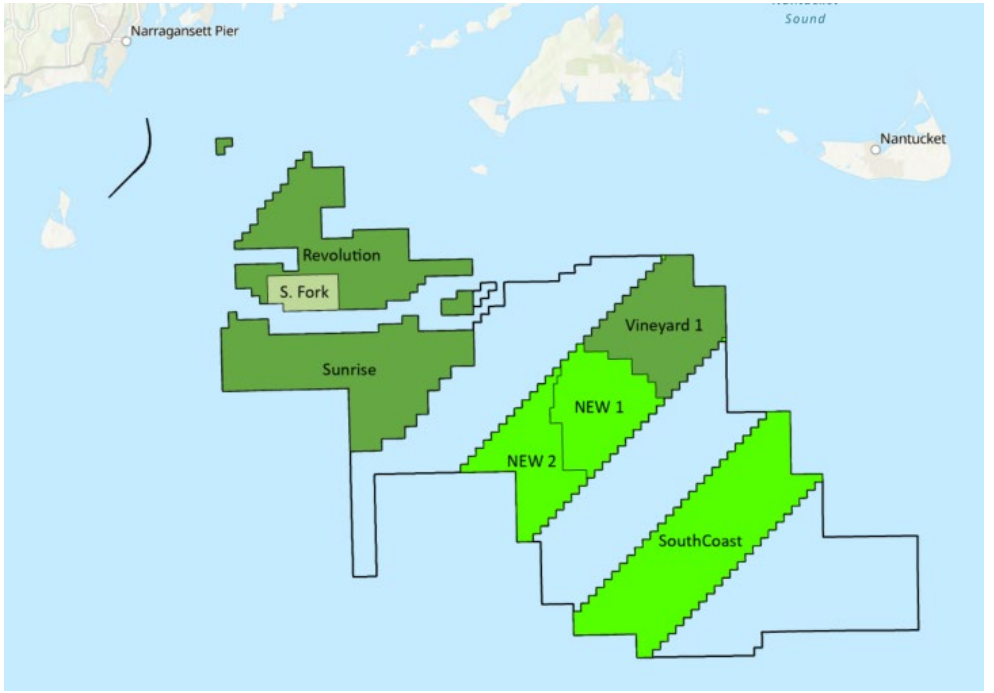
Habitat Working Group – State Updates

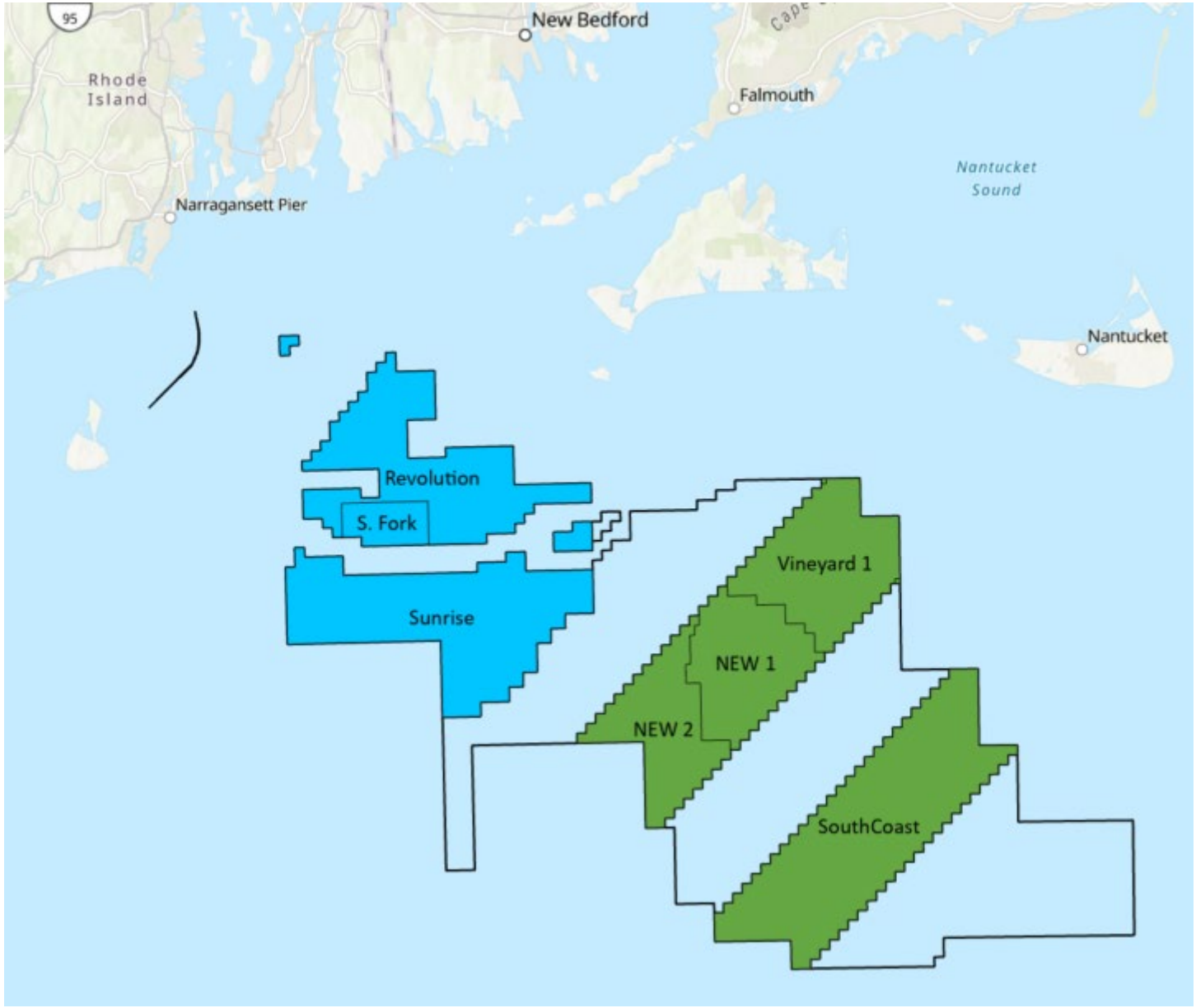
February 26, 2025

- 4 projects are under construction / operating
  - South Fork, Vineyard Wind 1, Revolution, Sunrise
- 7 have signed Fisheries Compensatory Mitigation agreements with MA
  - above + New England Wind 1&2, SouthCoast Wind



- Focus for today:
  - Status of Community and Fisheries Innovation Fund, and Navigation Enhancement and Training Program
  - Boulder relocation plans & reporting
  - MassCEC research announcements
  - Industry and Developer Updates

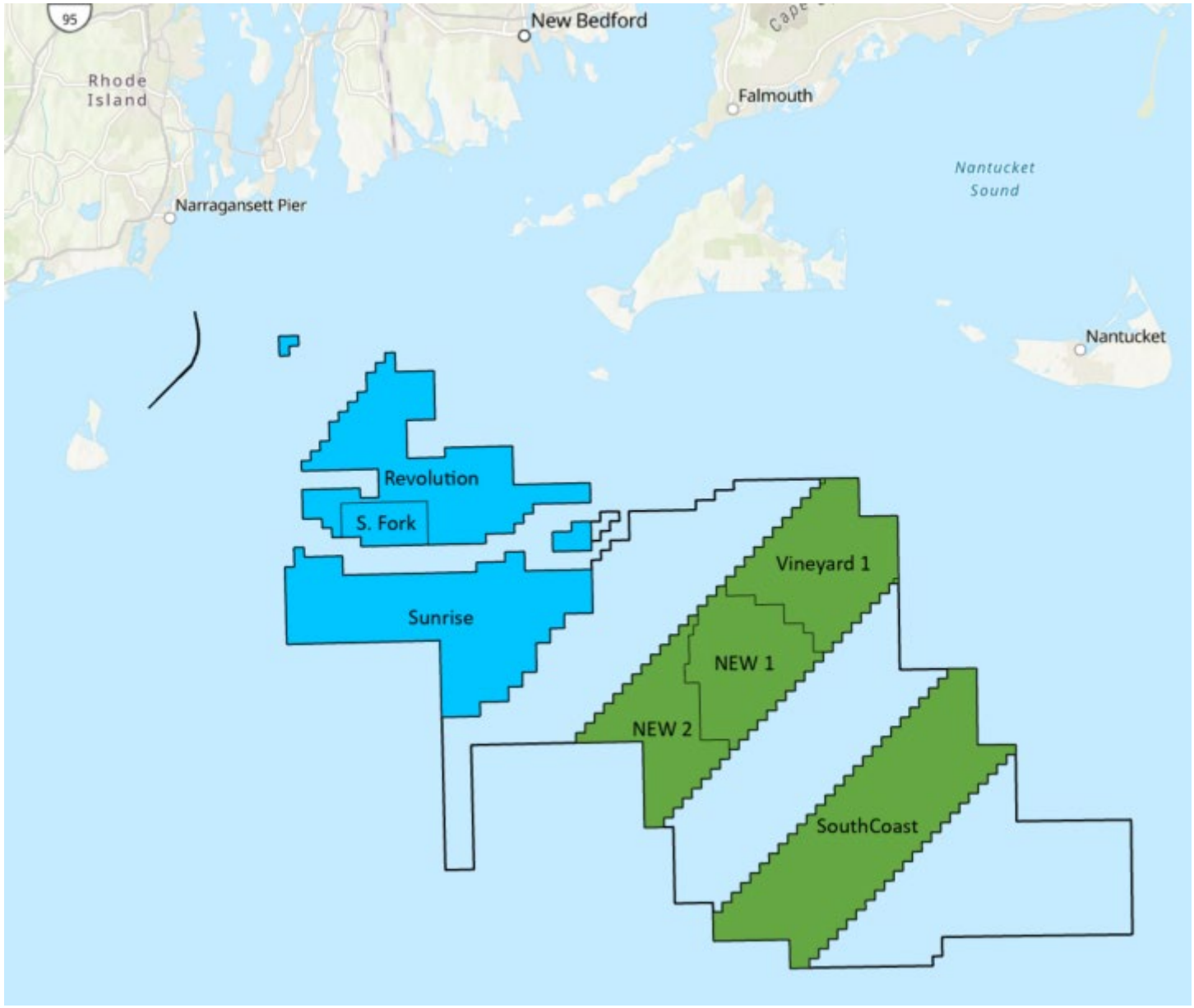
Community Funds and Fisheries Innovation Funds Updates



Community Funds	South Fork	Revolution	Sunrise
Amount	$200k	$400k	$1mil
Oversight Group	Nine member Coastal Community Advisory Council		
Purpose	provide funding for initiatives, research, and projects that will support the co-existence of the fishing and wind sectors		
Status	Advisory Council not yet selected		

Innovation Funds	Vineyard 1	NEW 1	NEW 2	South Coast
Amount	$1.75mil	$1.5mil		$1.5mil
Oversight Group	VW FIF Advisory Panel	None described		None described
Purpose	facilitate innovation that supports the co-existence of the fishing and wind sectors	support Massachusetts fishers' continued fishing in and around the Development		
Status	Meet/ Finalize RFP	Pending construction		

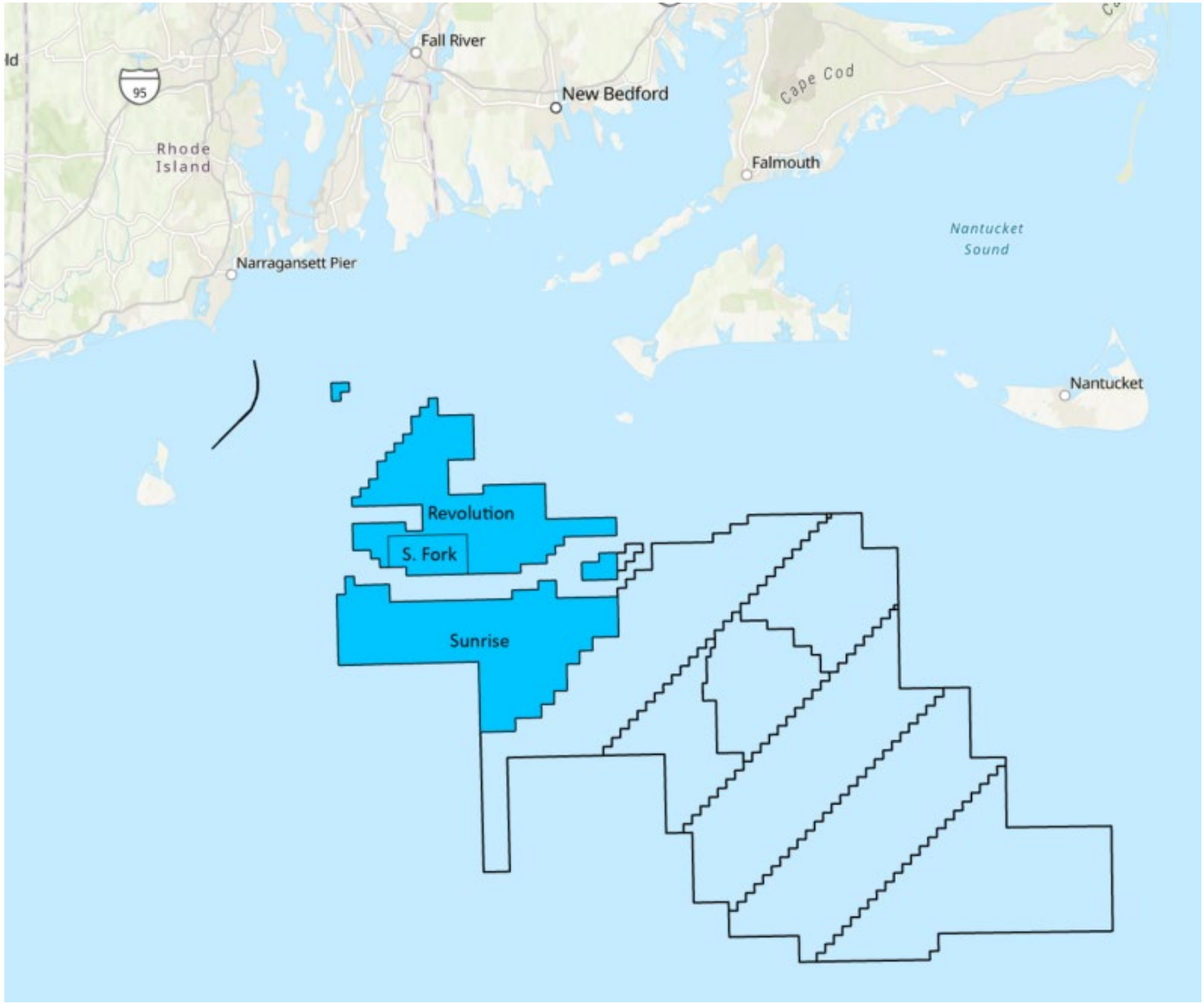
Direct Compensation Fund Updates



Direct Compensation	South Fork	Revolution
Amount	$2.1mil	$6.4mil
Eligibility Requirement	History of operating in area and incurred a direct impact/loss caused by SF/Revolution Wind.	
Third Party Administrator	PKFOD	
Status	SFW: 9 vessels, 1 eligible to date	

Direct Compensation	Vineyard 1
Amount	$19.2mil
Eligibility Requirement	Fishing activity in lease area, three years from 2016-2022
Third Party Administrator	De Maximis, Inc.
Status	Application period closed

Navigation Enhancement and Training Program (NETP) Update



- Threshold for access to program reduced in past year
- MA vessel engagement greatly increased in past month
- Third-party administrator researching vessel eligibility
- Nav simulator (Middletown, RI) will be offered 2x year

NETP Funds	South Fork	Revolution	Sunrise
Nav HW Vouchers	7	15	0
Training Vouchers	4	24	0
Total Spend	$74,000	$174,000	$0
NETP Funds Remain	Up to $226,000	Up to $326,000	Up to $500,000

(as of 2/7/2025)

MassCEC Science and Research Solicitation: Award Portfolio

HWG

Lead Applicant	Project Title	Topic Area	PI
INSPIRE Environmental (Newport, RI)	Promoting Beneficial Colonization of Offshore Wind Infrastructure	Habitat/Ecology	Annie Murphy
National Audubon Society (Washington, DC)	Safe Passage: Mapping Songbird Migration Routes and Altitudes over the Atlantic to Determine Potential Impacts of Offshore Wind	Wildlife	Jill Deppe
New England Aquarium (Boston, MA)	Comparative Analysis of Marine Mammal Density and Detection Rates from Aerial Surveys	Wildlife	Orla O'Brien
Gloucester Marine Genomics Institute (Gloucester, MA)	Evaluating the Effects of Offshore Wind Development on Fisheries Using Environmental DNA (eDNA)	Fisheries	Tim O'Donnell
Gulf of Maine Research Institute (Portland, ME)	Understanding Fishing Interactions: Gulf of Maine Fisheries and Floating Offshore Wind	Fisheries	Hannah MacDonald
New Bedford Port Authority (New Bedford, MA)	Modeling Fishing and Fishing Vessel Behavior and Assessing Access in and Around Wind Energy Areas	Fisheries	Blair Bailey
ORE Catapult (Glasgow, UK)	WINDSENSE – Wireless Intelligent Nano-Devices, a Sensor Network for Sustainable Energy	Climatetech	Dan Allington

Boulder Relocation Policy Implementation Updates

Brad Schondelmeier

Massachusetts Division of Marine Fisheries

Massachusetts Habitat Working Group on Offshore Wind – 2/26/2025

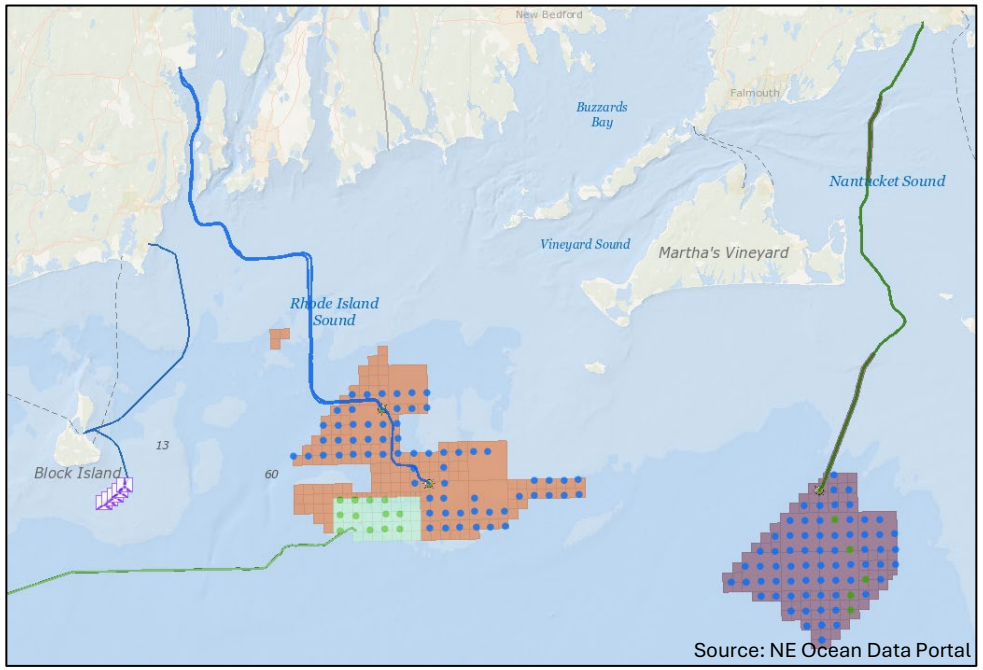
Boulder Relocation Issue Reminder

Fishery Impact

- New hangs creating safety issues,
- Loss of access for some gear types,
- Disparity in access for different gear types,
- Shifts in dominant commercial species

Habitat Impact

- Alter habitat types, increasing complexity,
- Damage/displace boulder dependent species,
- Shifts in predator/prey dynamics,
- Impacts from seabed disturbance



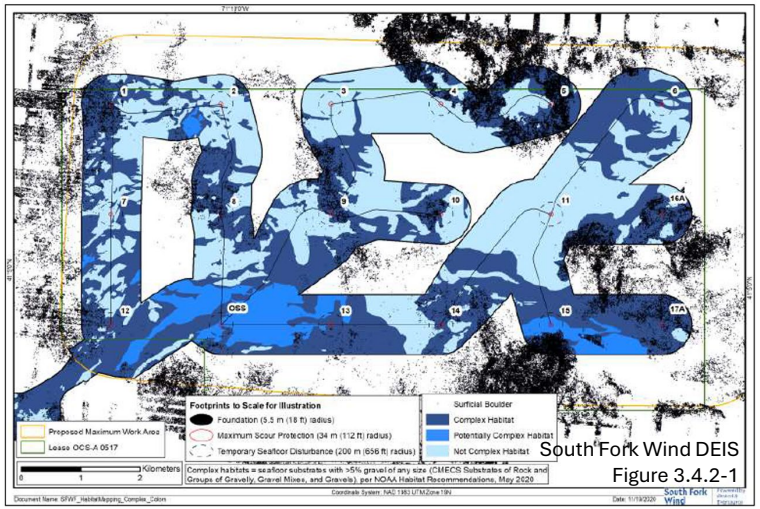
CZM/DMF created Boulder Relocation Framework (late 2024)

"help inform the development of best practices and regulatory policy for boulder relocation activities connected with offshore wind projects"

Massachusetts Habitat Working Group on Offshore Wind – 2/26/2025

CZM/DMF/Fisheries Working Group

Avoid

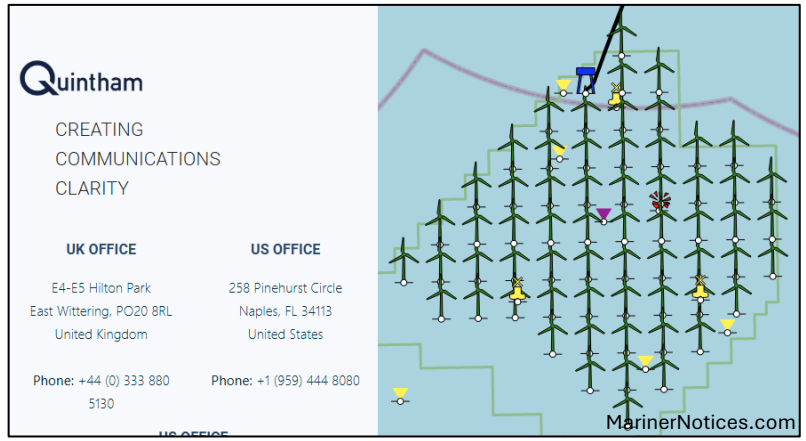


South Fork Wind DEIS
Figure 3.4.2-1

Minimize

Sunrise Wind COP

Mitigate

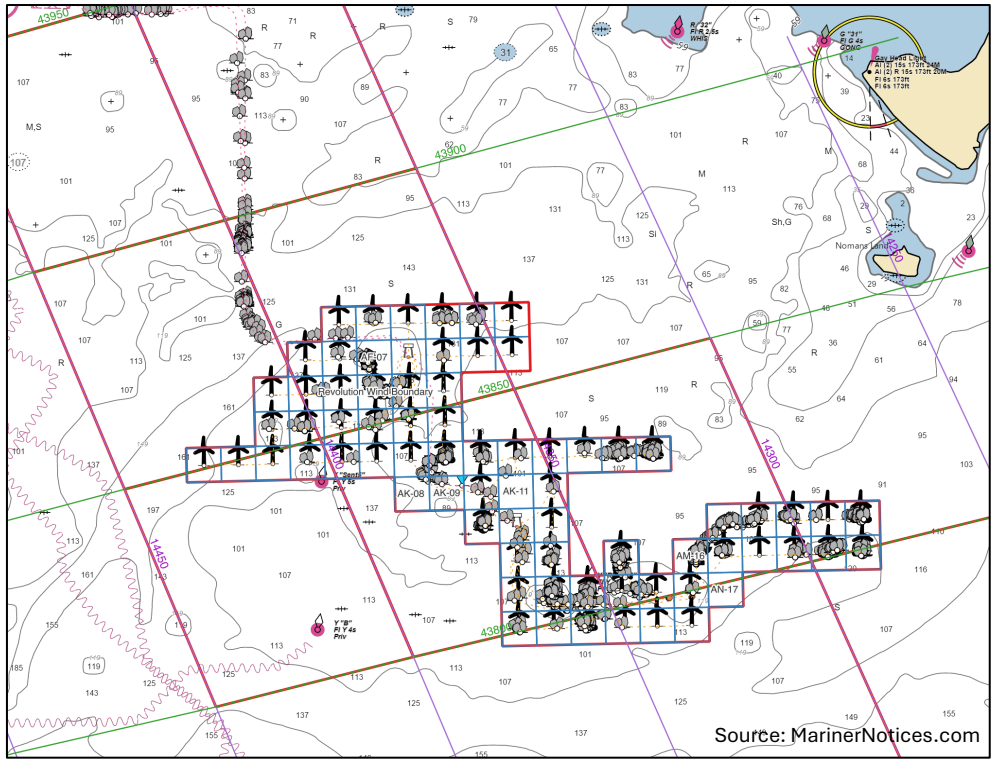


Massachusetts Habitat Working Group on Offshore Wind – 2/26/2025

Boulder Relocation Policy Updates/Progress

Discussions with Developers:

- Engaging more fishermen before relocations
- Maintain/update MarinerNotices plotter files
- Prefer to pick boulders, not plow
- More prescriptive guidance would be helpful



Discussions with Fishermen:

- Open communication is key
- Boulder size matters
- Relocation to hard/complex bottom preferred
- Berms from cable-laying can cause issues for some mobile-gear and survey vessels

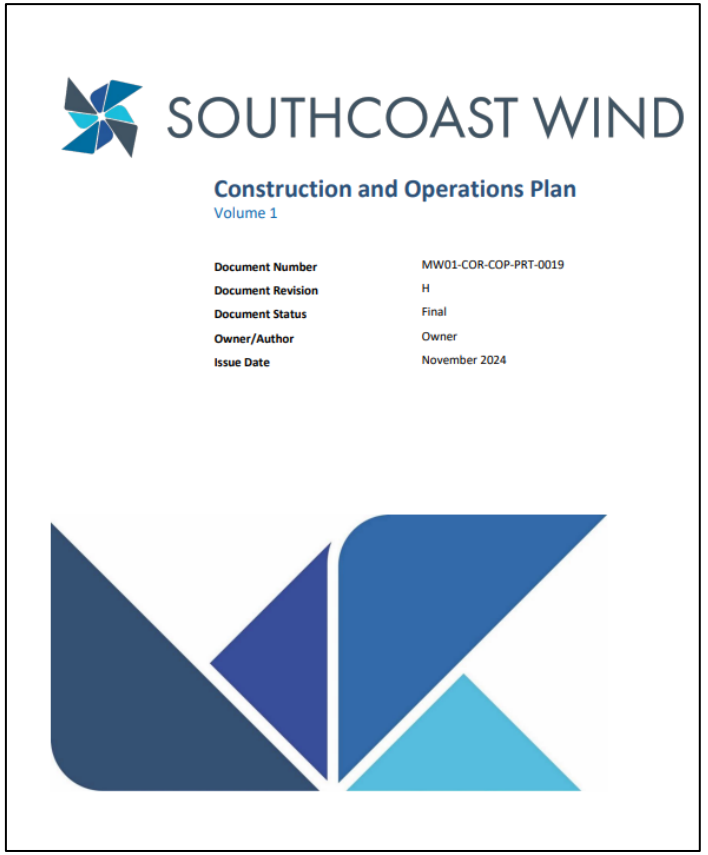
Massachusetts Habitat Working Group on Offshore Wind – 2/26/2025

New Boulder Relocation Guidance from BOEM

Mid-January 2025: SouthCoast Wind COP Terms & Conditions Section 5.3.8/page 48

Boulder Relocation Decision Protocol to be included in developer's Boulder Identification and Relocation Plan(s) such that it will:

1. Ensure safety of vessel and crew, and that boulders are;
2. Not relocated near UXO,
3. Not relocated within Archeological Exclusion Zones,
4. Not relocated within any other exclusion zone (i.e. shellfish, scientific monitoring, research activities in State water),
5. Not relocated in complex benthic hard bottom habitat,
6. Not stacked on top of each other,
7. Grouped together or next to nearby boulders but within similar bottom habitats and/or perimeter of hard/soft bottom interface,
8. Placed as close to original location as possible, within previously surveyed areas, but outside the clearance radius.



RWSC

Regional Wildlife Science Collaborative for Offshore Wind

Habitat Working Group

February 26, 2025

Emily Shumchenia, RWSC Director

Summary of activities since November 2024

Led by RWSC

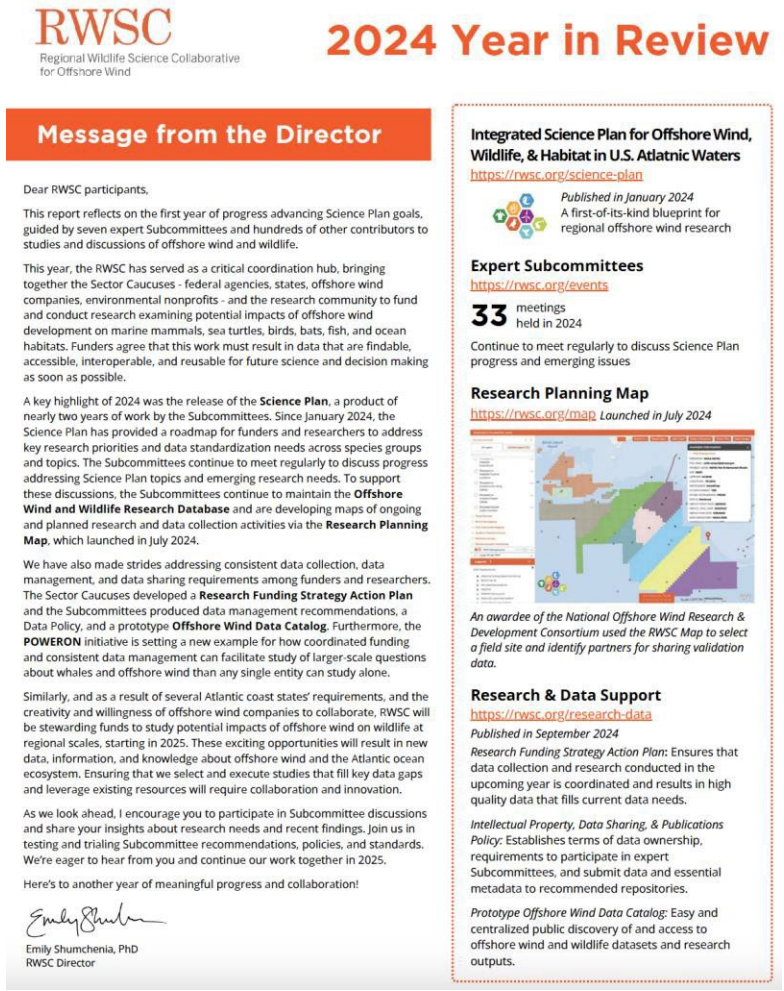
- **November-February meetings of each Subcommittee** (Marine Mammal, Sea Turtle, Bird & Bat, Habitat & Ecosystem, Protected Fish Species, Technology, Data Governance)
    - All meeting recordings and materials can be found here
- **Final Session of three in the Collaborative Technology Workshop Series - November 19**
    - Final report by NREL & PNNL "Evaluating Tools and Technologies for Monitoring Marine Mammals during Offshore Wind Construction Activities"
    - Workshop materials and proceedings can be found here.

RWSC
Regional Wildlife Science Collaborative for Offshore Wind

Summary of activities since November 2024 - continued

Release of the RWSC 2024 Year in Review

Meant to highlight accomplishments in 2024 including Science Plan, Research Planning Map, Research & Data Support and activities/engagement between Sectors and the research community related to research planning and implementation



RWSC
Regional Wildlife Science Collaborative for Offshore Wind

2024 Year in Review

Message from the Director

Dear RWSC participants,

This report reflects on the first year of progress advancing Science Plan goals, guided by seven expert Subcommittees and hundreds of other contributors to studies and discussions of offshore wind and wildlife.

This year, the RWSC has served as a critical coordination hub, bringing together the Sector Caucuses - federal agencies, states, offshore wind companies, environmental nonprofits - and the research community to fund and conduct research examining potential impacts of offshore wind development on marine mammals, sea turtles, birds, bats, fish, and ocean habitats. Funders agree that this work must result in data that are findable, accessible, interoperable, and reusable for future science and decision making as soon as possible.

A key highlight of 2024 was the release of the **Science Plan**, a product of nearly two years of work by the Subcommittees. Since January 2024, the Science Plan has provided a roadmap for funders and researchers to address key research priorities and data standardization needs across species groups and topics. The Subcommittees continue to meet regularly to discuss progress addressing Science Plan topics and emerging research needs. To support these discussions, the Subcommittees continue to maintain the **Offshore Wind and Wildlife Research Database** and are developing maps of ongoing and planned research and data collection activities via the **Research Planning Map**, which launched in July 2024.

We have also made strides addressing consistent data collection, data management, and data sharing requirements among funders and researchers. The Sector Caucuses developed a **Research Funding Strategy Action Plan** and the Subcommittees produced data management recommendations, a Data Policy, and a prototype **Offshore Wind Data Catalog**. Furthermore, the **POWERON** initiative is setting a new example for how coordinated funding and consistent data management can facilitate study of larger-scale questions about whales and offshore wind than any single entity can study alone.

Similarly, and as a result of several Atlantic coast states' requirements, and the creativity and willingness of offshore wind companies to collaborate, RWSC will be stewarding funds to study potential impacts of offshore wind on wildlife at regional scales, starting in 2025. These exciting opportunities will result in new data, information, and knowledge about offshore wind and the Atlantic ocean ecosystem. Ensuring that we select and execute studies that fill key data gaps and leverage existing resources will require collaboration and innovation.

As we look ahead, I encourage you to participate in Subcommittee discussions and share your insights about research needs and recent findings. Join us in testing and trialing Subcommittee recommendations, policies, and standards. We're eager to hear from you and continue our work together in 2025.

Here's to another year of meaningful progress and collaboration!

Emily Shumchenia, PhD
RWSC Director

Integrated Science Plan for Offshore Wind, Wildlife, & Habitat in U.S. Atlantic Waters
https://rwsc.org/science-plan

Published in January 2024
A first-of-its-kind blueprint for regional offshore wind research

Expert Subcommittees
https://rwsc.org/events

33 meetings held in 2024

Continue to meet regularly to discuss Science Plan progress and emerging issues

Research Planning Map
https://rwsc.org/map *Launched in July 2024*

An awardee of the National Offshore Wind Research & Development Consortium used the RWSC Map to select a field site and identify partners for sharing validation data.

Research & Data Support
https://rwsc.org/research-data
Published in September 2024

Research Funding Strategy Action Plan: Ensures that data collection and research conducted in the upcoming year is coordinated and results in high quality data that fills current data needs.

Intellectual Property, Data Sharing, & Publications Policy: Establishes terms of data ownership, requirements to participate in expert Subcommittees, and submit data and essential metadata to recommended repositories.

Prototype Offshore Wind Data Catalog: Easy and centralized public discovery of and access to offshore wind and wildlife datasets and research outputs.

RWSC
Regional Wildlife Science Collaborative for Offshore Wind

Research Funding Coordination

RWSC's coordination around funding

Reviewing proposals and funding selections for partners

- NOAA Fisheries/NFWF Vessel Strike Avoidance Fund
- MassCEC
- Maine Offshore Wind Research Consortium
- New Jersey RMI
- NOWRDC Solicitation 4.0
- ROSA's regional monitoring RFP (Empire Wind 1)

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Two RWSC RFPs to be released tomorrow, 2/27

POWERON RFP

RWSC is seeking an eligible contractor to conduct marine mammal PAM fieldwork, data management, and analysis according to a defined scope of work in support of the POWERON program. Up to $1.2M is available for an 18 month period of performance.

Proposals due 3/27/25

Regional Research RFP (Empire Wind 1 funds)

RWSC will allocate approximately $3.4 million in funding from Offshore Wind Renewable Energy Certificates granted by NYSERDA to Empire Wind 1 for offshore wind and wildlife research along the U.S. East Coast. Focal topics include a vulnerability assessment and power analyses to support marine bird displacement study design; and characterization and assessment of potential effects from offshore wind infrastructure on hydrodynamics and ecology.

- Concept papers due 4/1/25
- Full proposals due 6/2/25

Supporting coordinated research

Data Governance Subcommittee progress

- RWSC Intellectual Property, Data Sharing, and Publications Policy
- Suggested standard language for offshore wind research agreements and contracts to ensure interoperable data
- Data management and governance glossary
- Essential metadata guidelines for offshore wind & wildlife data
- Updates to recommended repositories for publication and long-term storage of data related to offshore wind & wildlife
- A template for Data Management & Sharing Plans on DMPTool.org, customized for the RWSC community (registration required)

Other Subcommittee Work to Implement the Science Plan

Subcommittee progress

- POWERON Field Plan finalization and RFP (Marine Mammals)
- Maintaining active and planned PAM locations (Marine Mammals)

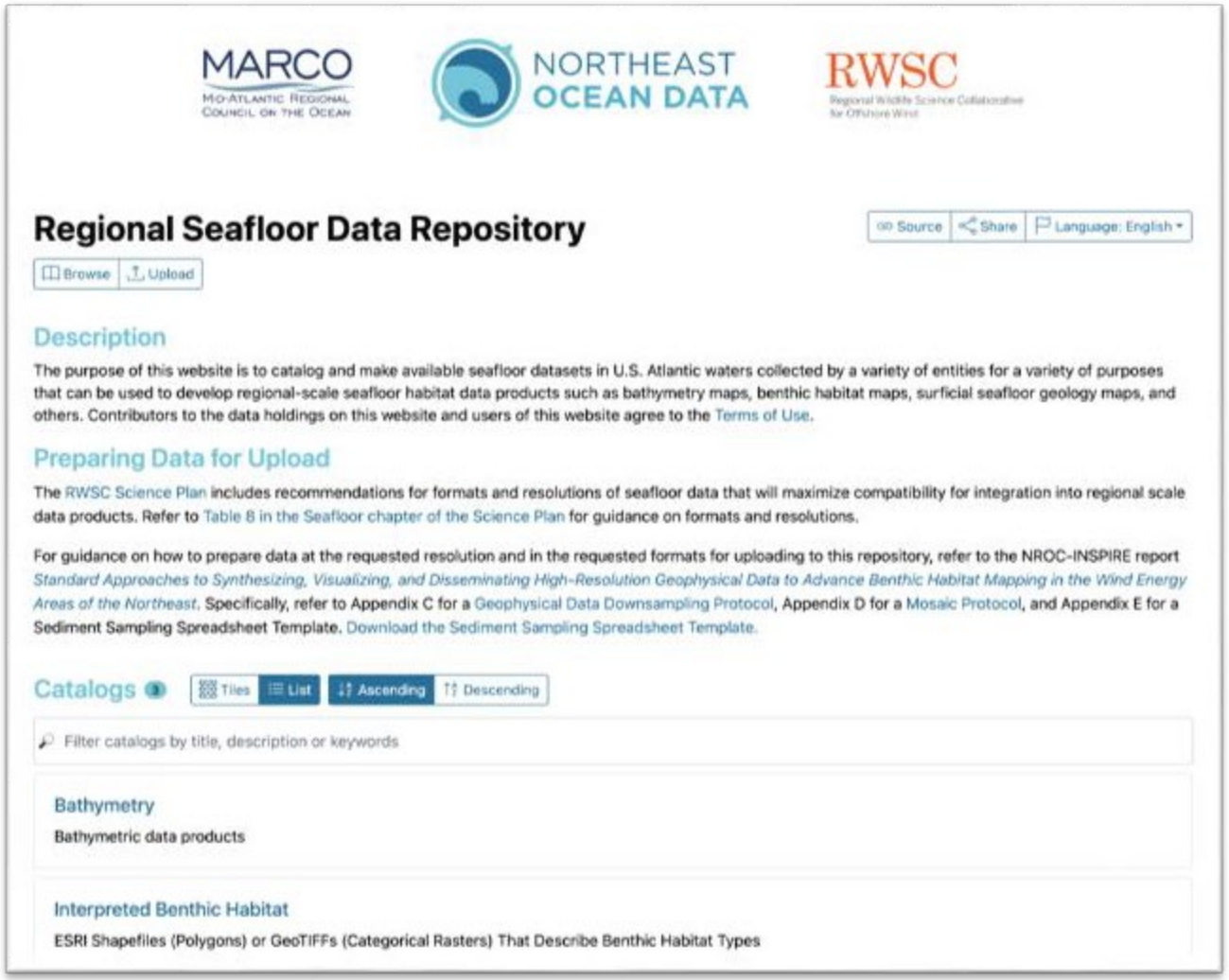
- **Launched Regional Seafloor Data Repository (Habitat & Ecosystem)**

- Working toward first Acoustic Telemetry map layer (Protected Fish)
- Offshore acoustic monitoring for bats: Guidance for deployment on wind turbines (Bird & Bat)
- List of focal bird species in RWSC study area (Bird and Bat)
- Working toward quantifiable ecological/behavioral/physiological baseline
  a turtles (Sea Turtle)

Regional Seafloor Data Repository Origin

- Pilot repository scoped and developed with funding from BOEM, MassCEC, and RIDEM
  - Seafloor data in the northeast aren't standardized or centralized
  - Many researchers are storing seafloor data locally
  - Offshore wind developers are unsure where/how to share parts of their data with the public
- RWSC Habitat & Ecosystem Subcommittee informed the pilot and received demo in fall 2023
- MARCO, NROC, RWSC, NCCOS funding to transition from pilot to functional repository – adding features based on community needs
- RWSC Habitat & Ecosystem Subcommittee will continue guiding development and use of the repository
- Can be used to compile datasets to build regional-scale seafloor products

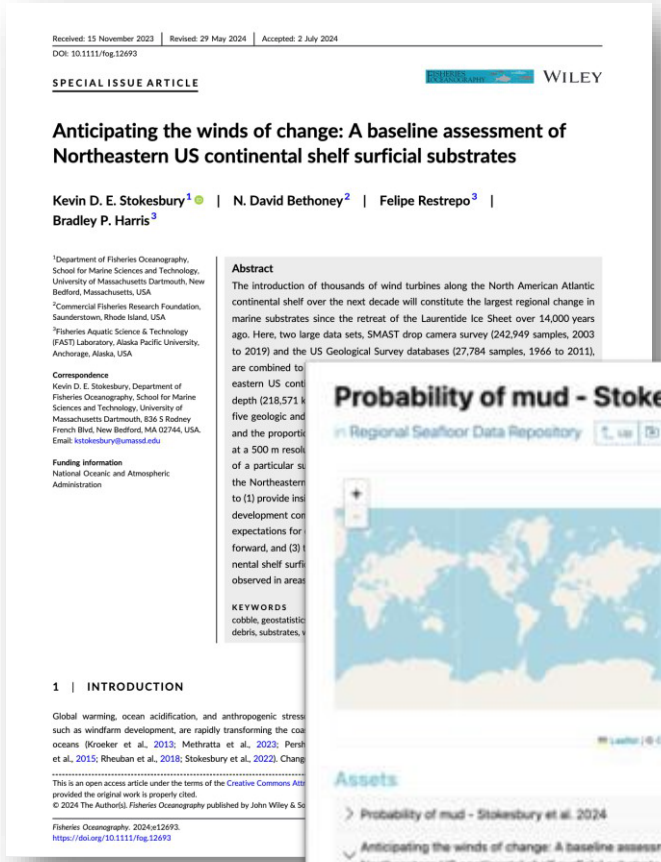
Regional Seafloor Data Repository



- Support from NROC and MARCO
- Established back-end storage (AWS S3 bucket)
- Currently accepts four file types
  - Tiff/Geotiff
  - BAG
  - ESRI Shapefile
  - CSV
- Minimum metadata collected via click-through tool consistent with Subcommittee recommendations (including dataset authorship, use license/restrictions, funder)

Idealized workflow:

Published paper > Upload data to Seafloor Repo > Maps on NE Portal



Received: 15 November 2023 | Revised: 29 May 2024 | Accepted: 2 July 2024

DOI: 10.1111/fog.12693

SPECIAL ISSUE ARTICLE

WILEY

Anticipating the winds of change: A baseline assessment of Northeastern US continental shelf surficial substrates

Kevin D. E. Stokesbury[1] | N. David Bethoney[2] | Felipe Restrepo[3] | Bradley P. Harris[3]

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[2]Commercial Fisheries Research Foundation, Saunderstown, Rhode Island, USA

[3]Fisheries Aquatic Science & Technology (FAST) Laboratory, Alaska Pacific University, Anchorage, Alaska, USA

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Funding information
National Oceanic and Atmospheric Administration

Abstract

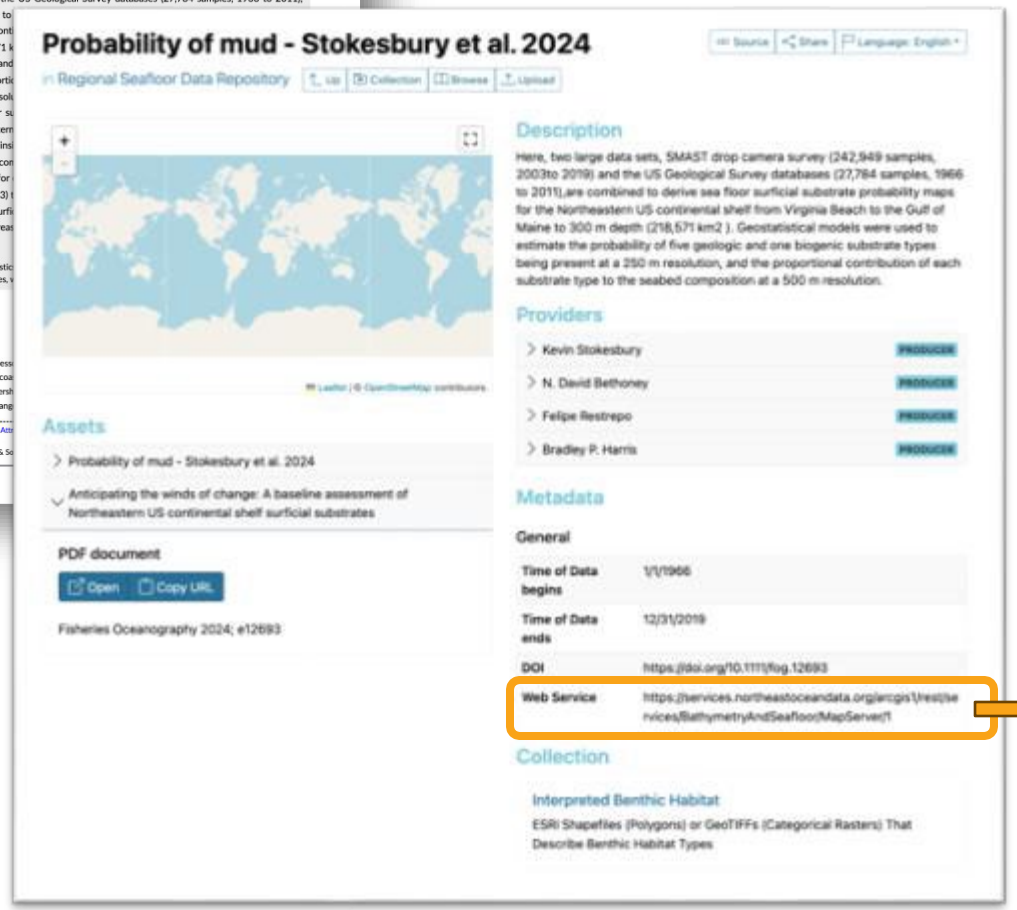
The introduction of thousands of wind turbines along the North American Atlantic continental shelf over the next decade will constitute the largest regional change in marine substrates since the retreat of the Laurentide Ice Sheet over 14,000 years ago. Here, two large data sets, SMAST drop camera survey (242,949 samples, 2003 to 2019) and the US Geological Survey databases (27,784 samples, 1966 to 2011), are combined to

KEYWORDS

1 | INTRODUCTION

Global warming, ocean acidification, and anthropogenic stress

Fisheries Oceanography. 2024;e12693.
https://doi.org/10.1111/fog.12693



Probability of mud - Stokesbury et al. 2024

in Regional Seafloor Data Repository

Source | Share | Language: English

Description

Here, two large data sets, SMAST drop camera survey (242,949 samples, 2003to 2019) and the US Geological Survey databases (27,784 samples, 1966 to 2011),are combined to derive sea floor surficial substrate probability maps for the Northeastern US continental shelf from Virginia Beach to the Gulf of Maine to 300 m depth (218,571 km2). Geostatistical models were used to estimate the probability of five geologic and one biogenic substrate types being present at a 250 m resolution, and the proportional contribution of each substrate type to the seabed composition at a 500 m resolution.

Providers

- Kevin Stokesbury — PRODUCER
- N. David Bethoney — PRODUCER
- Felipe Restrepo — PRODUCER
- Bradley P. Harris — PRODUCER

Assets

- Probability of mud - Stokesbury et al. 2024
- Anticipating the winds of change: A baseline assessment of Northeastern US continental shelf surficial substrates

PDF document

Open | Copy URL

Fisheries Oceanography 2024; e12693

Metadata

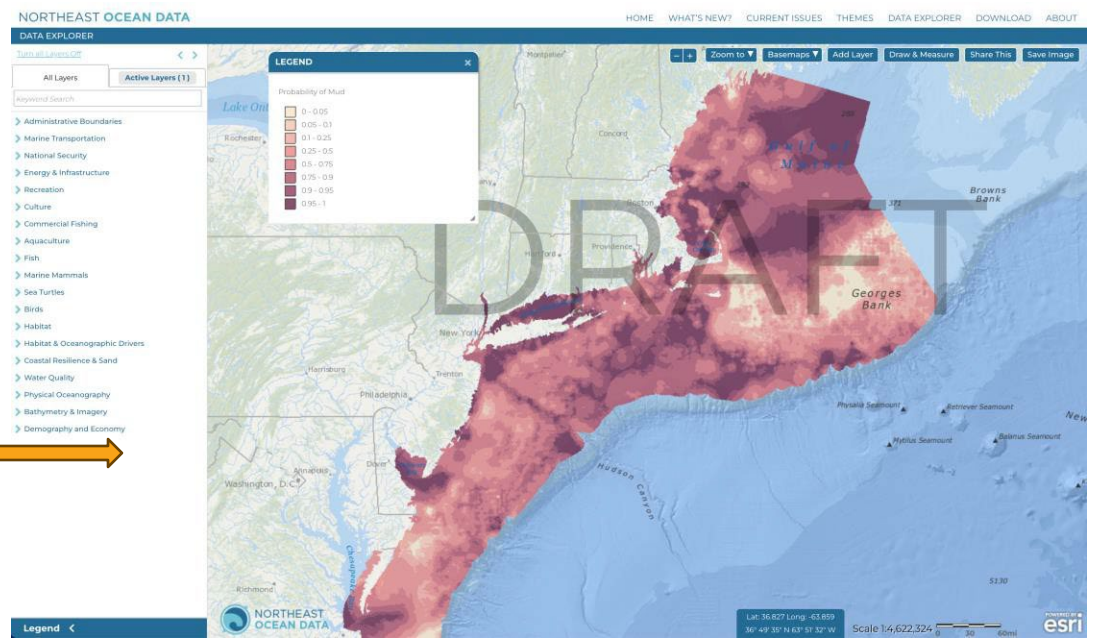
General

Time of Data begins	1/1/1966
Time of Data ends	12/31/2019
DOI	https://doi.org/10.1111/fog.12693
Web Service	https://services.northeastoceandata.org/arcgis1/rest/services/BathymetryAndSeafloorMapServer/1

Collection

Interpreted Benthic Habitat

ESRI Shapefiles (Polygons) or GeoTIFFs (Categorical Rasters) That Describe Benthic Habitat Types



How to receive updates

RWSC
Regional Wildlife Science Collaborative for Offshore Wind

All RWSC Subcommittee meetings are open to the public: visit https://rwsc.org/events

Monthly e-newsletter: meeting invites and other news

Contact information

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2025 Subcommittee Workplans

Links to each 2025 Subcommittee Workplan can be found in the "Shared Files" here

Topic	Lead Subcommittee	Other Subcommittees
Continue to update and maintain the Offshore Wind & Wildlife Research Database; begin adding and tracking developer required monitoring activities	All	N/A
Continue to update and maintain the Research Planning Map of ongoing offshore wind research activities	All	N/A
Provide forum and tools to support coordination:		
POWERON; Long-term archival passive acoustic monitoring deployment, data analysis, and data management	Marine Mammal	
Support ongoing species distribution and habitat suitability modeling	Marine Mammal	Habitat & Ecosystem
List of focal bird species in each RWSC subregion (update quarterly)	Bird & Bat	
Acoustic telemetry receiver network and tagging	Protected Fish	Sea Turtle
Plankton data collection, synthesis, and data product development	Habitat & Ecosystem	Marine Mammal, others?

2025 Subcommittee Workplans - continued

Topic	Lead Subcommittee	Other Subcommittees
Develop recommended practices for data collection, management, and storage:		
Bird and Bat Tracking and Research Framework	Bird & Bat	
Quantifiable ecological/behavioral/physiological baseline measurements for sea turtles	Sea Turtle	
Sea turtle data collection, sharing, and archiving	Sea Turtle	Data Governance
Regional seafloor habitat data products + covariates for species distribution modeling	Habitat & Ecosystem	Marine Mammal, Bird & Bat, Sea Turtle, Protected Fish
Hard bottom and sensitive seafloor habitats	Habitat & Ecosystem	
Oceanographic and atmospheric data products + covariates for species distribution modeling	Habitat & Ecosystem	Marine Mammal, Bird & Bat, Sea Turtle, Protected Fish
Maintain and update RWSC recommended data practices:		
Bat acoustics monitoring guidance	Bird & Bat	
Acoustic Telemetry Data Management & Storage Recommended Practices	Protected Fish	
PAM Data Management and Best Practices (with POWERON)	Marine Mammal	

Synthesis of State and Federal Monitoring and Mitigation Requirements

- **Purpose:** The RWSC Caucuses have expressed the need to understand the various requirements around wildlife/environmental monitoring and mitigation activities in state solicitations for offshore wind and in federal permit approvals.
- **Process:**
  - Compiled required environmental monitoring and mitigation activities in available COP Condition of Approval.
  - Compiled required environmental monitoring and mitigation activities in most recent State solicitations/RFPs from NY, NJ, CT, and MA. Activities pulled from required Environmental Mitigation Plans, Data Sharing Plans, and Adaptive Plans.
  - Compiled requirements in State laws from ME and MD.
  - Compared requirements in a 2024-25 State and Federal Requirements Synthesis spreadsheet
- **Goal:** Understand what states and federal agencies are currently requiring in terms of monitoring and mitigation activities that generate environment or wildlife data.

Synthesis of Offshore Wind Project Monitoring Plans

Based on the various requirements discussed on the previous slide, the RWSC Subcommittees have started to track the specific required data collection activities in the wildlife/environment monitoring plans associated with each approved offshore wind project.

Progress to date: A spreadsheet or document was developed to track this information for each RWSC Subcommittee:

- Birds and Bats
- Habitat and Ecosystem
- Marine Mammals
- Protected Fish Species
- Sea Turtles

Next steps:

- Add profiles of data collection activities and required monitoring plans to RWSC Database (https://database.rwsc.org)
- Track the development of individual datasets, data products, and monitoring plan results as they are collected and made public.

ThayerMahan

TRANSIT CORRIDOR ACOUSTIC MONITORING PILOT - THAYERMAHAN AND VINEYARD WIND

February 2025

VINEYARD OFFSHORE

Advancing Technology for Detecting North Atlantic right whales

- $3 million Wind and Whales fund
  - Seapicket: ThayerMahan's 32-hydrophone beamforming array. Test application for use in real-time acoustic monitoring of a transit corridor.
  - Awarion: Charles River Analytics' Artificial Intelligence whale blow detection technology. Testing Awarion enabled cameras alongside expert observers.
  - Project Ocean W'aKEs. An in situ hydrodynamic study using Vineyard Wind 1 as a base case to contextualize the potential impact foundations may have on stratification typical of the Nantucket Shoals region.

About ThayerMahan

600+ Years
of maritime operating experience

15 PATENTS

FACILITIES GROWTH
400sf → 80,000sf
2016 – 2023

375+ Years
of acoustic detection and classification experience

200+ EMPLOYEES

IN BUSINESS since 2016

ISO 9001 CERTIFIED

ISO 45001 CERTIFIED

Coherently Beamformed Arrays

Redefining the State of the Art

Arrays provide spatial noise rejection and the ability to spatially resolve vocalizing baleen whales from anthropogenic noise due to transiting vessels and offshore operations

Arrays possess a 3-10x detection range advantage (10-100x area coverage advantage) over omni directional hydrophones in a continental shelf environment

Embedded processor performs DCL of vocalizing North Atlantic right whales in real-time and transmits reports via satellite

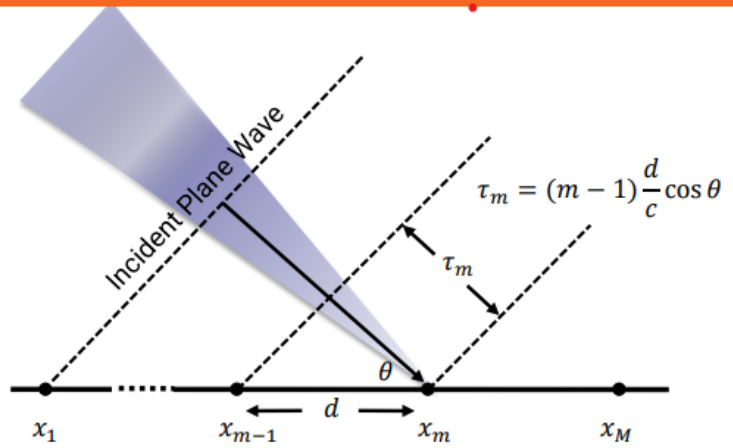
Localization of vocalizing baleen whales is possible with concurrent detections on two or more arrays

Beamforming

Plane Wave Beamforming: Why Arrays Work

ThayerMahan
oasis
A ThayerMahan Company

Delay and sum beamforming allows emphasis of one "look" direction over all others

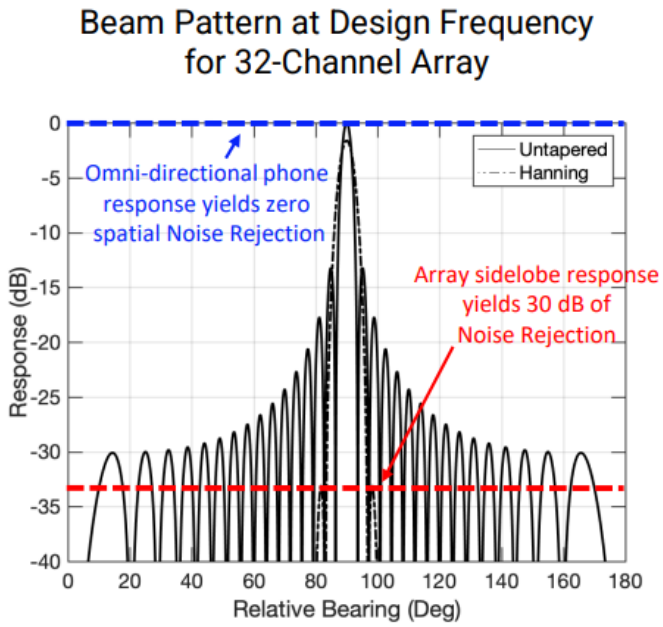


Time Domain

$$y(t) = \sum_{m=1}^{M} x_m(t - \tau_m)$$

Frequency Domain

$$Y(\omega) = \sum_{m=1}^{M} X_m(\omega) e^{-j\omega\tau_m}$$

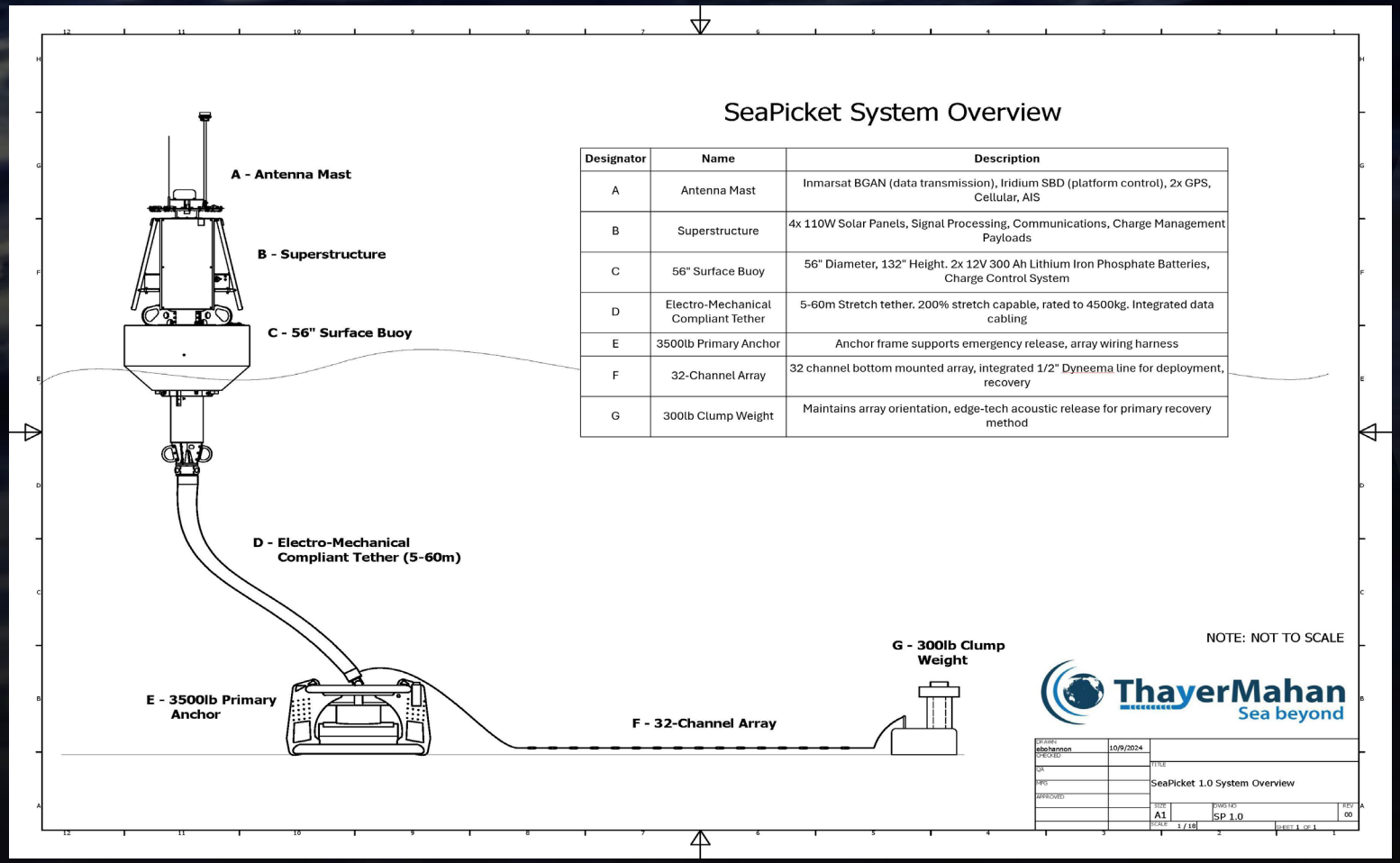


Fast beamformer implementation steers beams to all look directions simultaneously in real-time

BEAMFORMING ALLOWS FOR LONG RANGE DETECTION, LOCALIZATION, TRACKING AND FILTERING OF INTERFERING BACKGROUND NOISES (SNR ENHANCEMENT).

DEVELOPED AND PERFECTED BY THE US NAVY SUBMARINE FORCE OVER 7 DECADES!

SeaPicket – Acoustic Monitoring



Designator	Name	Description
A	Antenna Mast	Inmarsat BGAN (data transmission), Iridium SBD (platform control), 2x GPS, Cellular, AIS
B	Superstructure	4x 110W Solar Panels, Signal Processing, Communications, Charge Management Payloads
C	56" Surface Buoy	56" Diameter, 132" Height. 2x 12V 300 Ah Lithium Iron Phosphate Batteries, Charge Control System
D	Electro-Mechanical Compliant Tether	5-60m Stretch tether. 200% stretch capable, rated to 4500kg. Integrated data cabling
E	3500lb Primary Anchor	Anchor frame supports emergency release, array wiring harness
F	32-Channel Array	32 channel bottom mounted array, integrated 1/2" Dyneema line for deployment, recovery
G	300lb Clump Weight	Maintains array orientation, edge-tech acoustic release for primary recovery method

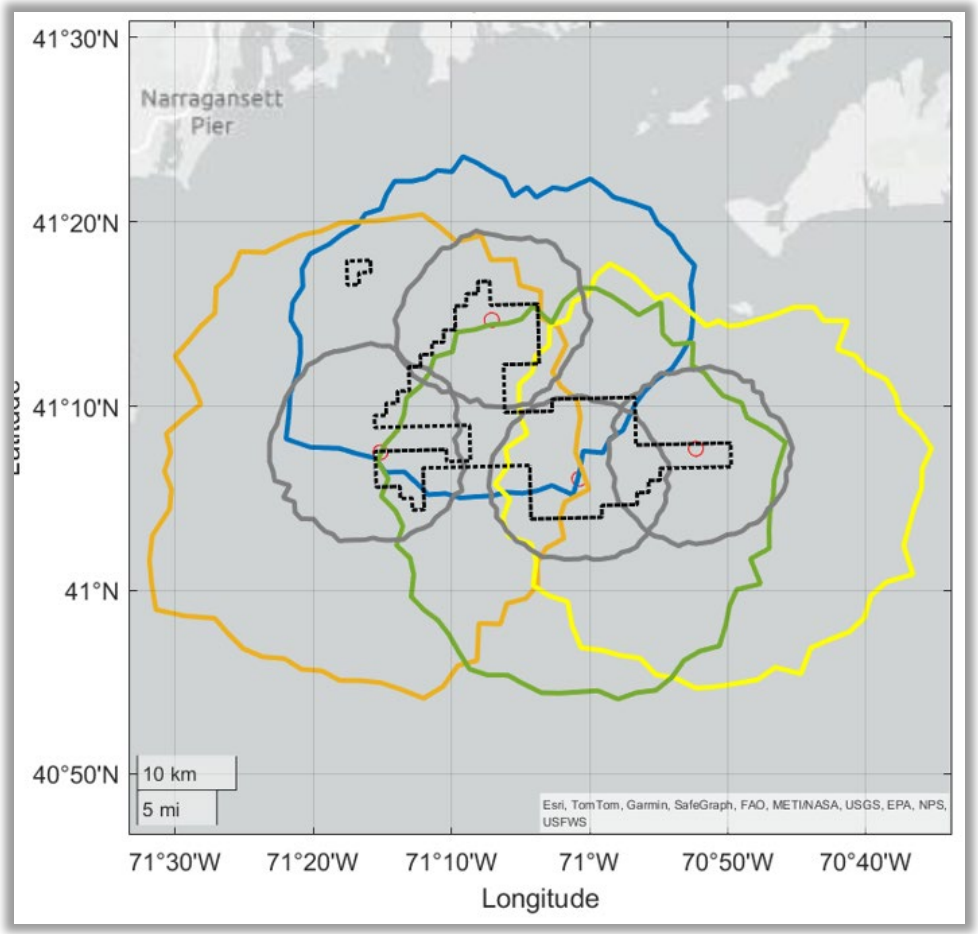
SeaPicket Deployment in Long Island Sound for Testing

Major components:

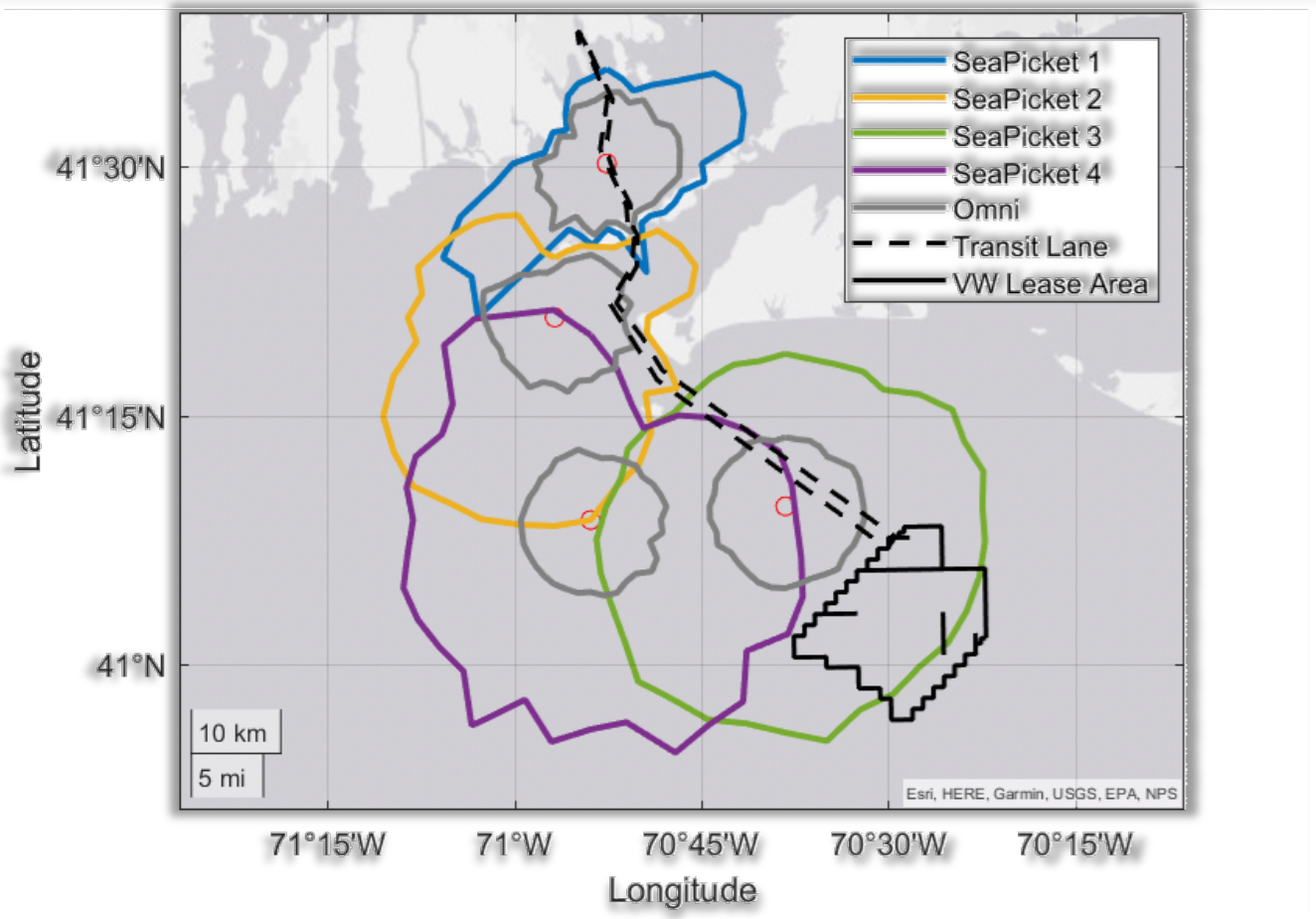
1. Sea Buoy – Reliable, Autonomous
2. Mooring – Flexible, Resilient
3. Linear Array – 32 Channel
4. NARW Classifier - Accurate

Offshore Wind Scopes of Work

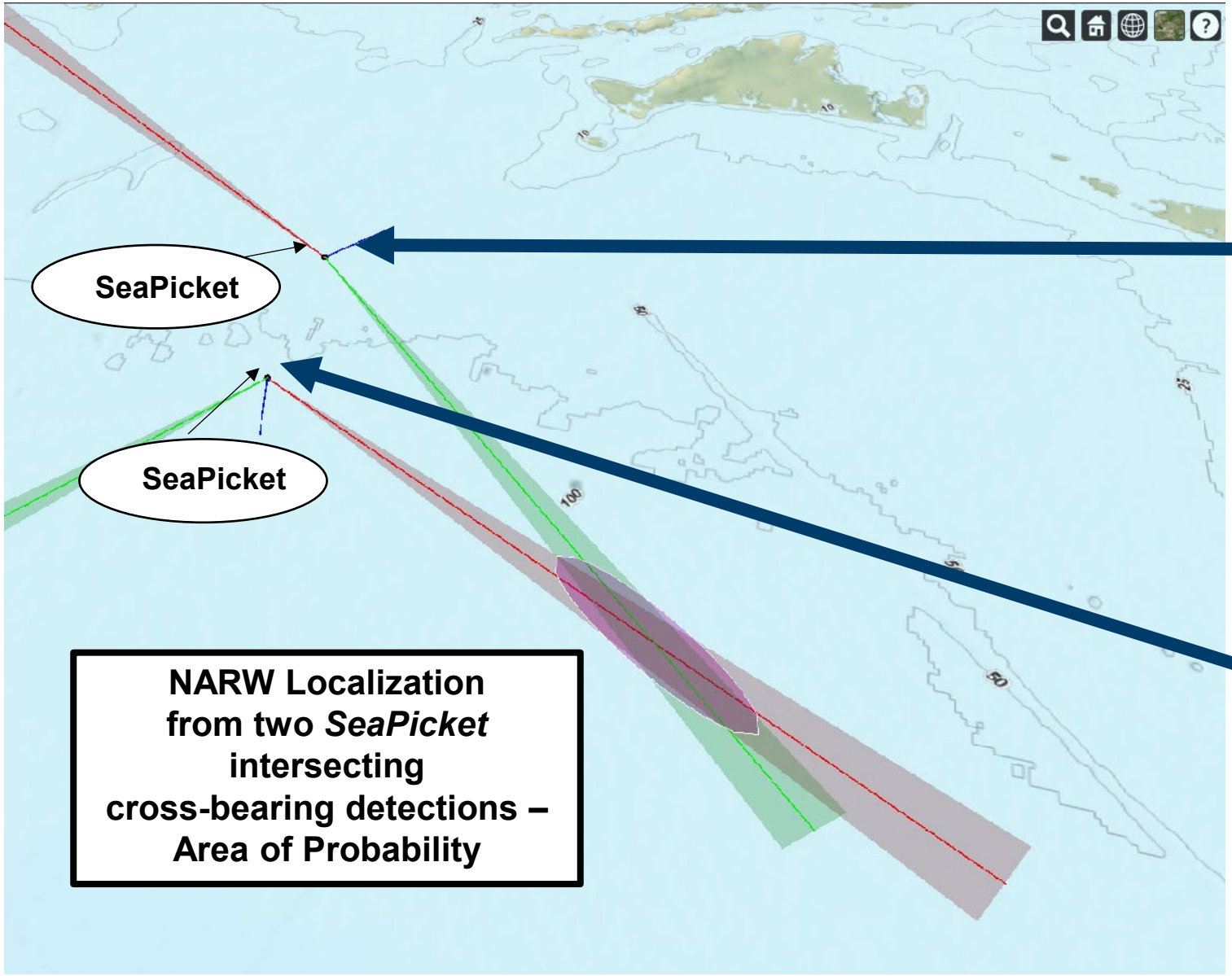
Construction Monitoring

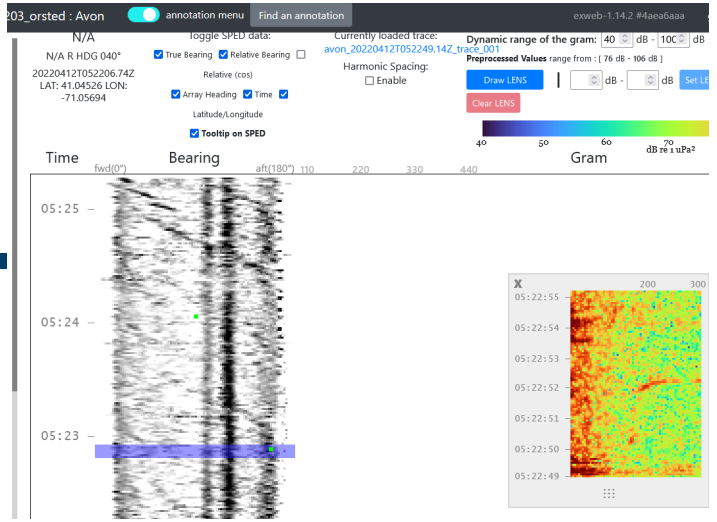


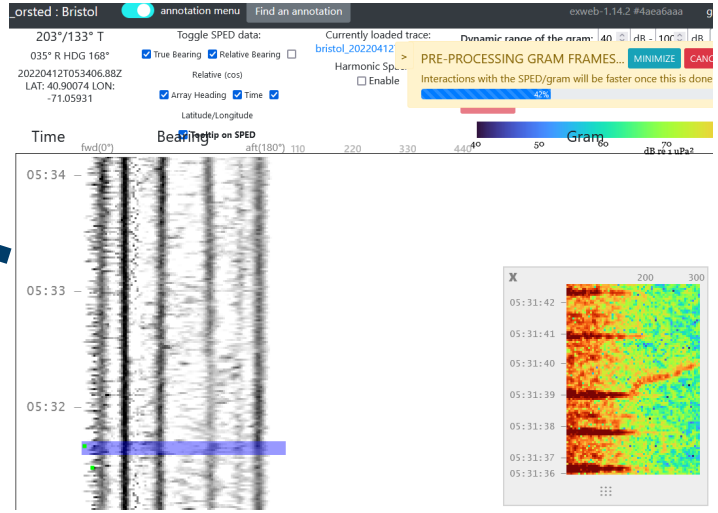
Route Monitoring



Detection and Localization

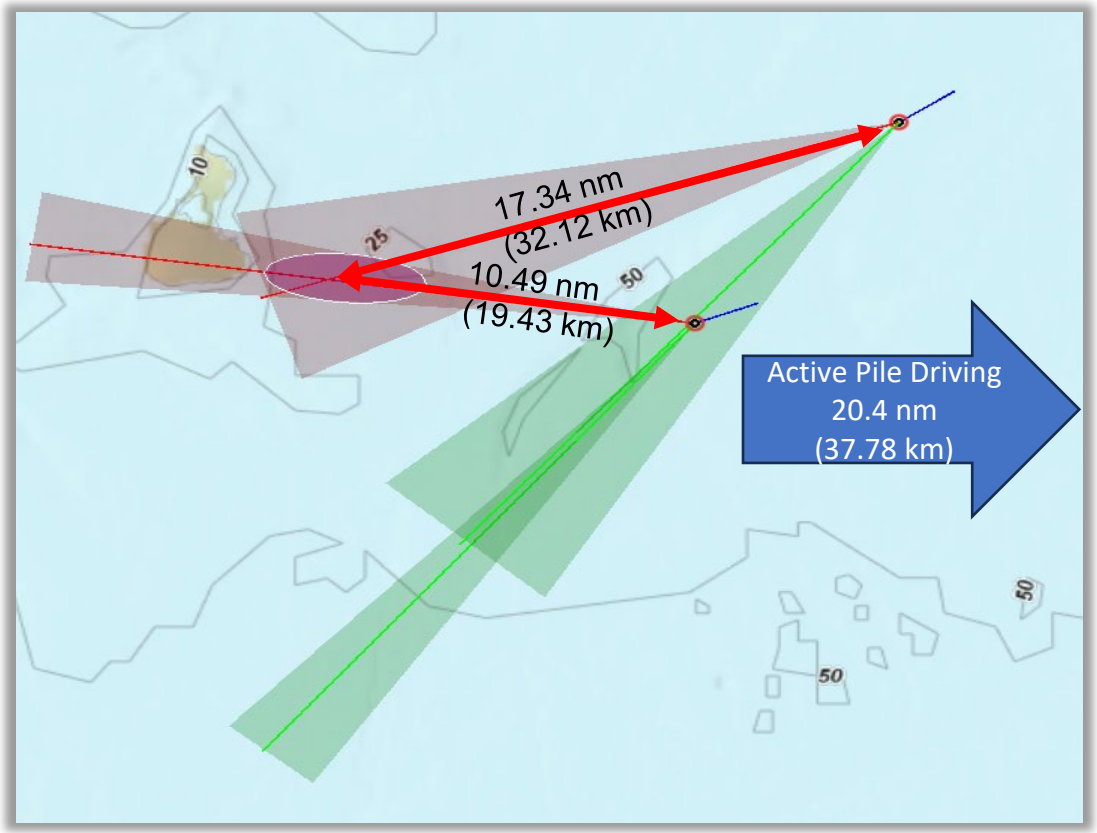




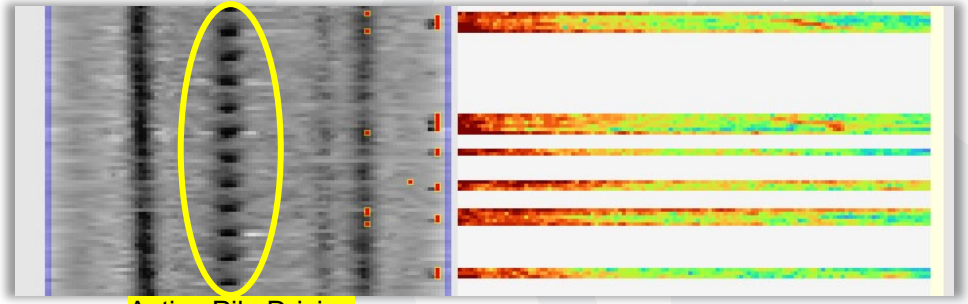


Humpback Localization, During pile driving

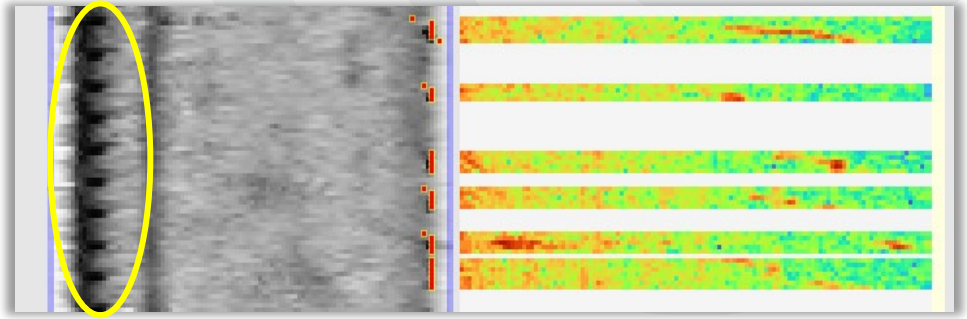
18 June 2024



- Exeter: North Buoy 17.34 NM



- Goshen: West Buoy 10.49 NM



Detections by the numbers

Parameter	Detections
All biological sources	11,385
North Atlantic Right Whales (NARWs)	3,343
Humpback Whales	7,990
False detections of NARWs	0.1%
Sources acoustically localized to a coordinate	21
Sources visually localized to a coordinate	4

ThayerMahan's NARW Monitoring Key Takeaways

1. **Effective Acoustic Monitoring:** SeaPicket bottom-mounted arrays successfully detected and reported North Atlantic right whales (NARWs) during a pilot project funded by Vineyard Wind construction.
2. **Expands Detection Capabilities:** SeaPicket detected **11,385 biological vocalizations** and **3,343 NARW upcalls**.
3. **Strong Detection Performance:** Detection ranges exceeded **20 km in most cases**, with some reductions in shallow waters (Vineyard Sound, Buzzards Bay, Muskeget Channel).
4. **Accurate Classification:** Independent review confirmed **98.2% accuracy**, with only **0.1% of NARW** and **0.2% of humpback whale** detections rejected as false.
5. **Conservative Estimates:** Detection modeling used **moderate-high shipping noise levels** and isotropic noise assumptions, ensuring reliable and realistic results.
6. **Critical for Marine Mammal Protection:** SeaPicket **greatly enhanced monitoring capabilities**, providing greater capabilities safeguarding NARW when combined with visual observations