ROSA
Responsible Offshore Science Alliance

ROSA Advisory Council Meeting

December 19, 2022

Agenda

9:30 Welcome, Introductions, Agenda Review

9:40 Researcher Updates

Responsible Offshore Development Alliance (RODA)- *Fiona Hogan, RODA*

Coonamessett Farm Foundation – *Tasha O'Hara & Ron Smolowitz, CFF*

Rutgers cooperative clam research - *Daphne Munroe, Rutgers University & Tom Dameron, Overboard Solutions, LLC*

10:35 State Updates

Maine Update – *Casey Yanos, ME DMR*

New Jersey Update – *Colleen Brust, NJ DEP*

11:10 Federal Updates

NOAA Fisheries Update – *Doug Christel, GARFO*

Sea Grant Update – *Jennifer McCann, RI Sea Grant & Gayle Zydlewski, ME Sea Grant*

11:40 ROSA Updates

Status of new website, research priorities data base

Staffing Update

11:55 Summary of Meeting Outcomes and Next Steps

12:00 Adjourn

ROSA

Researcher Updates

Fisheries Knowledge Trust

Annie Hawkins, Fiona Hogan

Responsible Offshore Development Alliance (RODA)

Steven Jacobs

SquareThread

Background

- Fishing Industry see a gap in understanding by fisheries scientists and managers of the current status and dynamics of fisheries
- Cultural natures, historic relationships, and experience of fleet help drive the gap
- Individual fishing business data is unstandardized and confidential
- Government-run data collection systems lack high resolution position, time, and catch economic data
- Fishing industry has in-depth empirical knowledge of the ecology and human social dimensions
- The Fishery Knowledge Trust provides a solution

Concept: Using Industry Knowledge to Advance Best Available Science

A secure, scalable engine for turning fishermen's insights and fishing data into trusted scientifically-defensible products

5 Design Principles for Trust

Persistent Ownership of Information → No Control, No Data

Scientific Objectivity → No Objectivity, No Impact

Common Standards → No Standards, No Efficiency

Transparent Reproducibility → No Transparency, No Trust

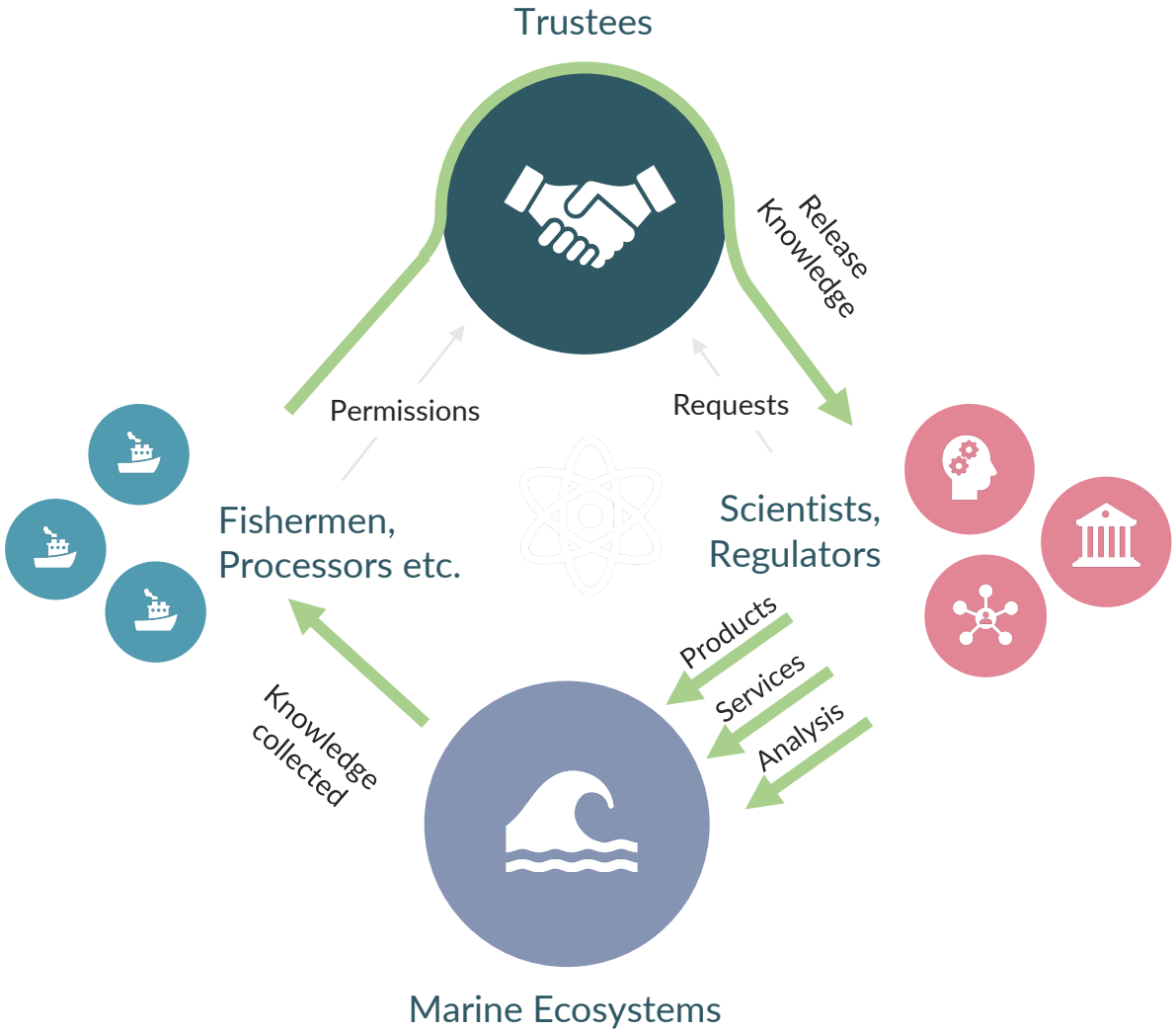
Trusted Collaboration → No Collaboration, No Buy In

Concept: How the Trust Works

A combination of technology and governance allows fishermen and analysts to collaborate effectively

3 COMPONENTS TO KNOWLEDGE TRUST

- Scientific Research
- Data Aggregation & Management
- Common Standards

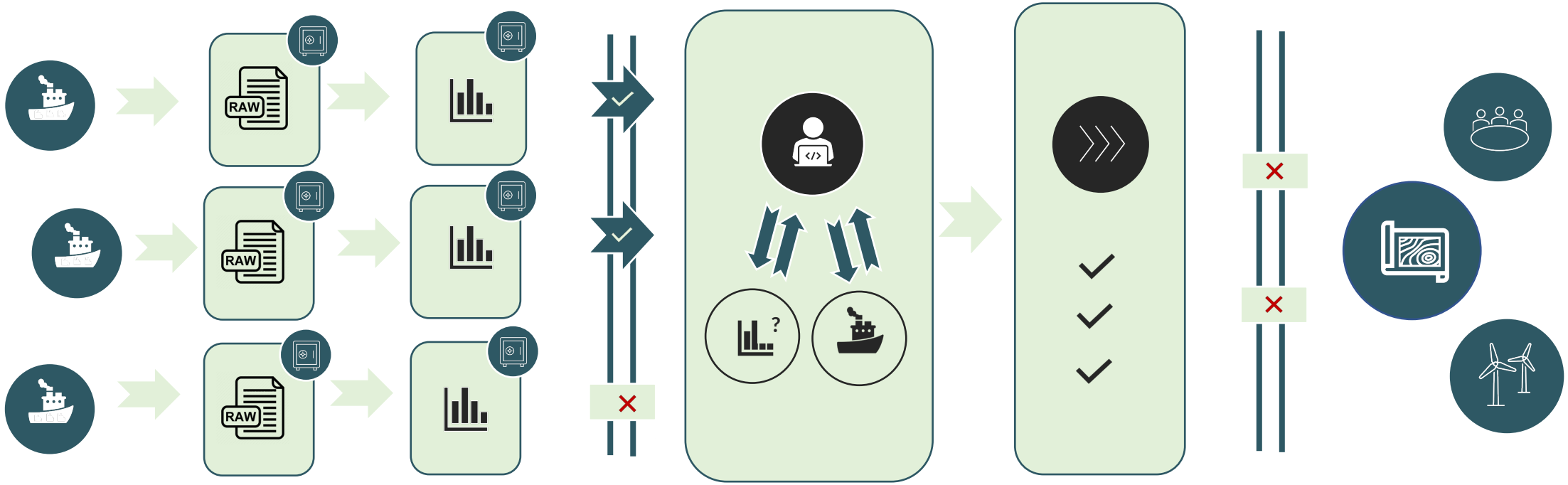


Concept: How Products Are Created in the Trust

Data are processed, cleaned and readied for analyses by the Trust with your input. These data are then made available to specifically-named analysts and only with your approval

Common standards — Data mgmt / governance — Scientific Research

#1: FISHERMEN ADD RAW DATA → #2 TRUST CLEANS DATA → #3 TRUST EXECUTES REQUEST → #4 APPROVED ANALYSTS DEVELOP PRODUCTS → #5 PEER REVIEW CERT → #6 REMOVE PERMISSIONS → #7 DELIVER PRODUCTS



FISHERMEN NEVER LOSE CONTROL OVER THEIR DATA

Pilots: Goal = Test and Inform Design of the Trust

Infrastructure was developed alongside two pilots with members of the clam and herring fleets.

Research Question:

1. Can the Trust successfully aggregate, validate, and integrate proprietary fleet level data and knowledge and create basic, transparent analytical products?

1. What is the scale of the likely financial and harvest impacts that the proposed and existing Wind Planning and Lease Area (WPLAs) would have on historical fishing activity?

Table 19. Key Success Criteria for Trust Pilot Projects

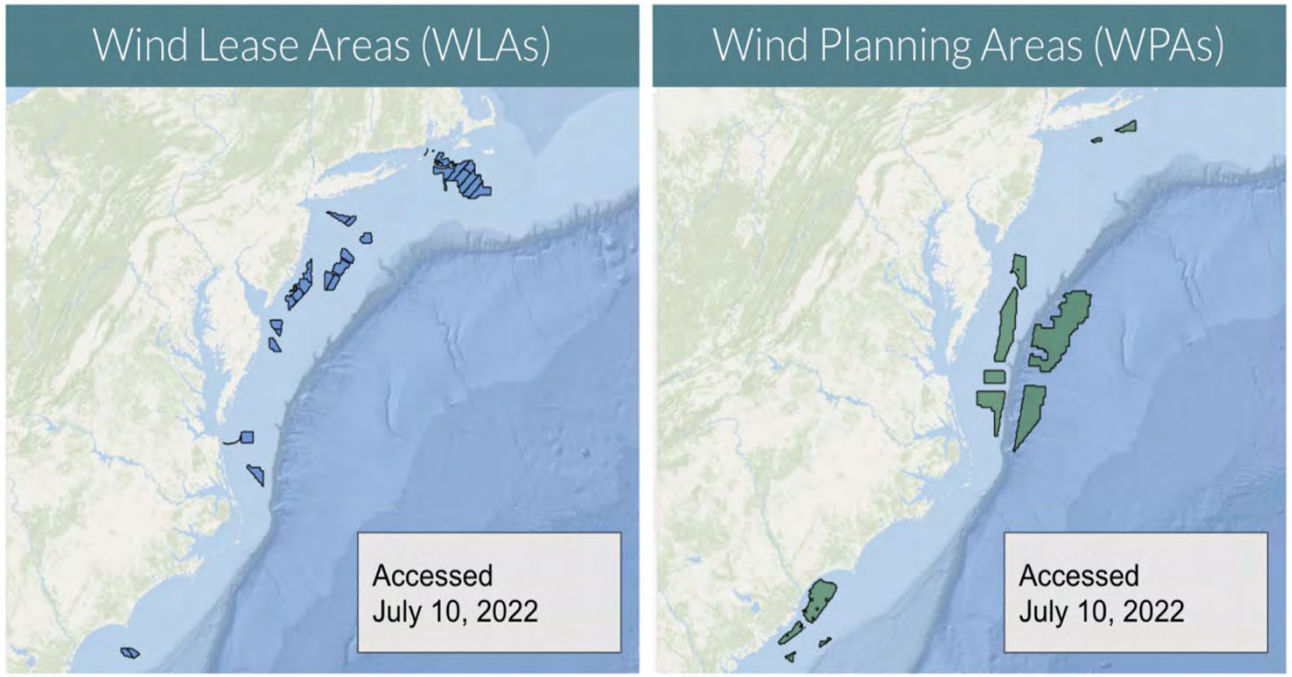
Assumption	Criteria
Motivation	On-water stakeholders are willing to share confidential federally reported data with the Trust
Motivation	On-water stakeholders are willing to share qualitative data (e.g., surveys) with the Trust
Motivation	On-water stakeholders are willing to work with researchers to inform proper interpretation of the data.
Capability	The data necessary to complete the analysis existed in a structured format
Capability	The data could be accessed and collected in a scalable way from the source
Capability	The data could be standardized and aggregated into a standard format.
Capability	The data could be analyzed in a way that met the confidentiality requirements of the on-water
Capability	The data could be analyzed in a way that provided the necessary documentation to
Impact	Stakeholders in the Wind Energy industry trust the credibility of methods used and data collected in the analysis.
Impact	Stakeholders in the on-water community view the products as valuable

Pilots: 2 Fleets in Mid Atlantic

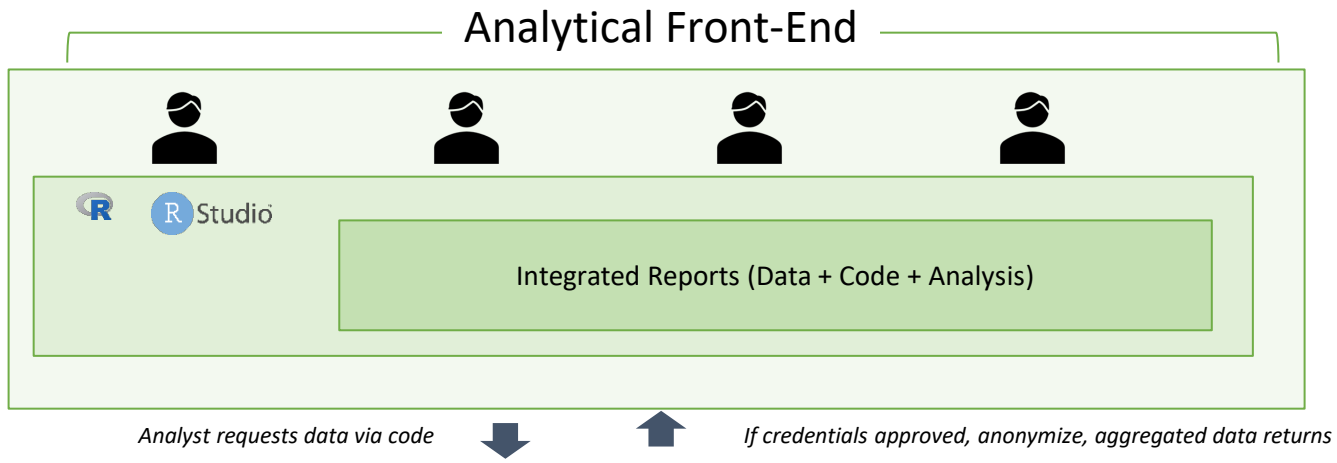
Infrastructure was developed alongside two pilots with members of the clam and herring fleets.

	Herring Fleet	Clam Fleet
Size of fleet in analysis	20+ vessels	90+ vessels
Species	Herring and Mackerel	Ocean Quahogs, Surf Clams
Geo	NJ, NY, NE	NJ, NY, NE
Types of data	Historical VMS data (15+ years) Historical landings data (15+ years) Observer data Structured interviews with fleet	Historical VMS data (15+ years) Historical landings data (15+ years) Structured interviews with fleet

Figure 1. Wind Lease and Planning Areas Included in Analysis



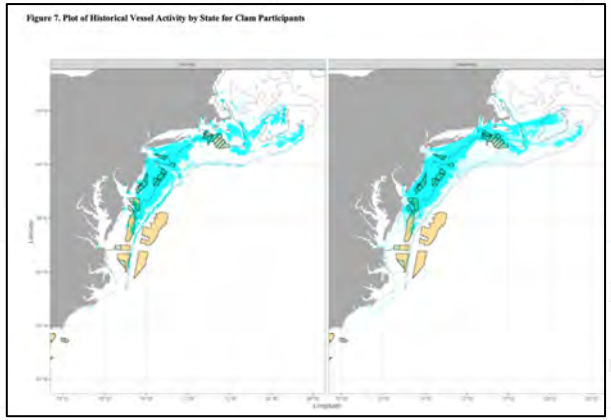
Develop Initial Products

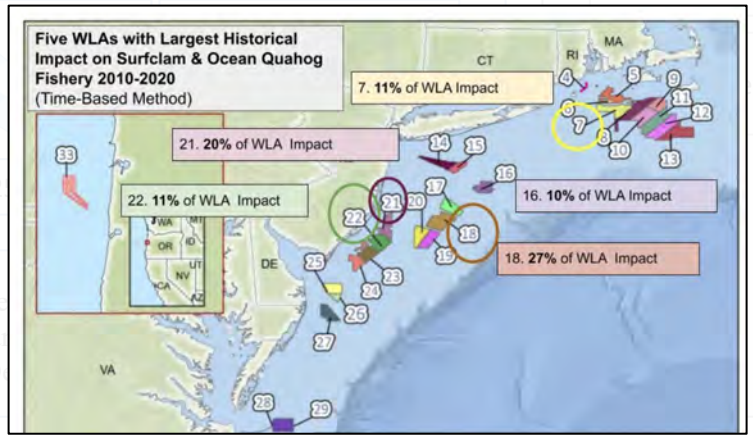


Categorize VMS data into Trips → Classify Vessel Movements by State → Map Vessel Activity Over WPLA Footprint → Calculate Minimum Estimated Impact

Table 35. Summary Statistics for all Trips Taken by Clam Participants per Year

Year	Number of Trips	Mean Annual Time at Sea (Days)	Mean Annual Distance Traveled (NM)
2008	1,607	1.4	117.2
2009	2,013	1.5	130.6
2010	2,013	1.6	145.2
2011	1,969	1.7	147.9
2012	2,149	1.6	158.4
2013	2,227	1.6	157.9
2014	2,208	1.6	163.3
2015	2,271	1.6	165.3
2016	2,294	1.8	178.5
2017	2,181	2.0	189.3
2018	2,258	1.8	169.2
2019	2,018	1.8	168.1
2020	1,653	1.9	186.4





★ *Eventually will migrate code to github*

Review with Advisory & Review Panel

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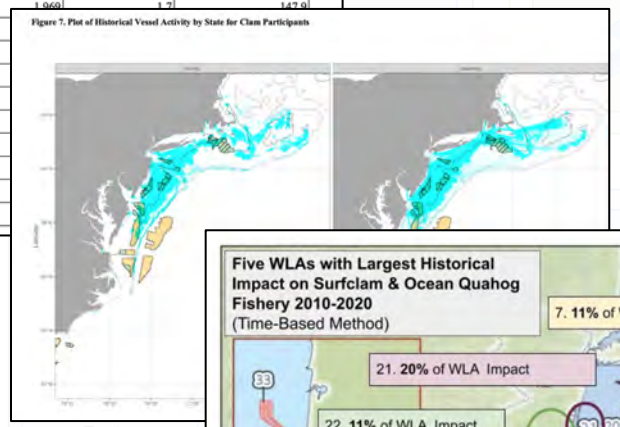

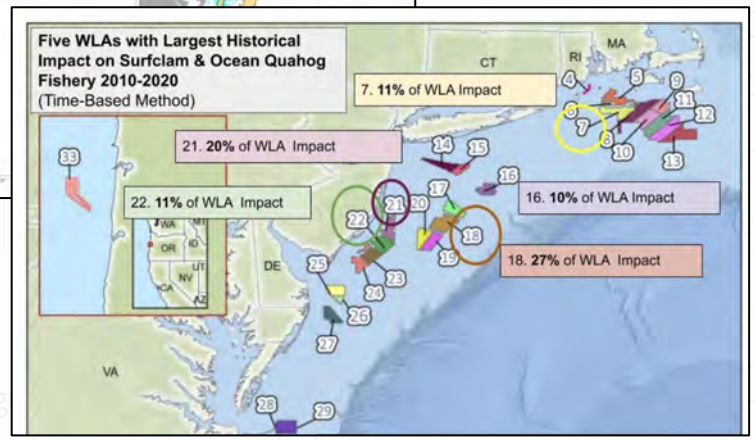

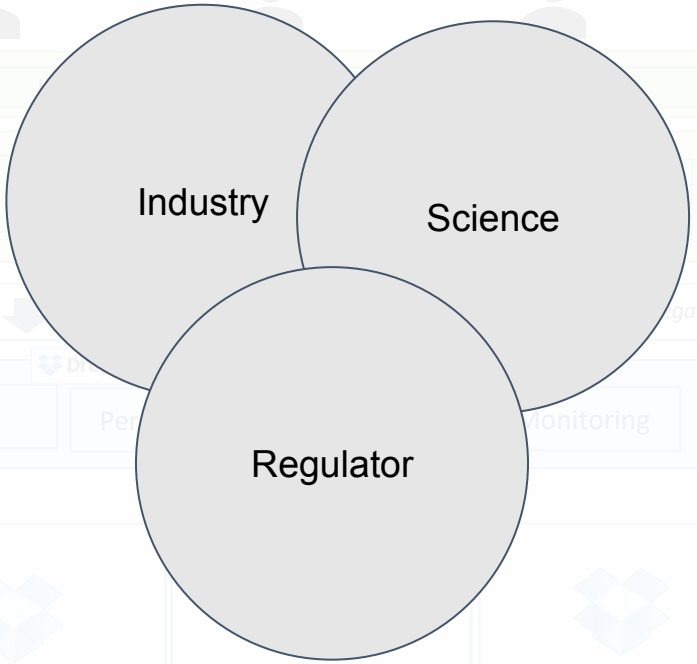

Advisory & Review Panel

- Peer Review Criteria
- Kickoff Review
- Interim Review
- Final Review

Lessons Learned

1. Standardization of data is a meaningful part of the challenge
2. Trust is built through collaboration and communication
3. Get buy in

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Opportunities Moving Forward

What Types of Projects Can The Trust Support?

1. Research That Requires More Granular FDD (Upon Fishery Consent)
2. Research That Requires Non-Federally Collected Data
3. Recurrent Projects
4. Developing and Testing Hypotheses Generated by Fishing Industry Members

How Does the Trust Prioritize Projects?

1. Scope and Impact of Proposed Study
2. Type of Data Needed (federally collected or bespoke)
3. Breadth of Fleet (number of stakeholders in project)

Next Up

Can Proprietary Commercial Lobstering Data be Used to Inform Offshore Wind Development?

- Project Lead: Kate Beard-Tisdale, University of Maine, Orono, ME
- Project Partners: Maine Lobstermen's Association, UMaine's Lobster Institute
- Project Objectives:

1. Develop and test a proof of concept that high quality, fine-scale spatial temporal representations of the Maine lobster fishery can be generated from individual fisherman's personal computer (PC)-based navigation and plotter data
2. Assure that the proof of concept addresses the proprietary nature of the individual fisherman's data contributions
3. Develop product specifications and intial sample products that will meet the needs of fisheries management and marine spatial planning

THANK YOU

Fisheries Knowledge Trust

Surveying commercial fish species and habitat in wind farm areas using a suite of non-lethal survey methods

(Award DE-EE0009799)

Coonamessett Farm Foundation – Dr. Liese Siemann, Tasha O'Hara, Farrell Davis, and Luisa Garcia

Coonamessett Farm Foundation

Collaborators

Video trawl survey

UMASS School of Marine Science and Technology – Dr. Kevin Stokesbury

Technology development

Kitware. Inc. – Matthew Dawkins and Dr. Anthony Hoogs

Sexton Corporation – Jeremy Childress and Charley Weller

Commercial fishing companies – research vessels

Arnie's Fisheries

Atlantic Capes Fisheries

Eastern Fisheries

Empire Fisheries

Nordic Inc.

Quinn Fisheries

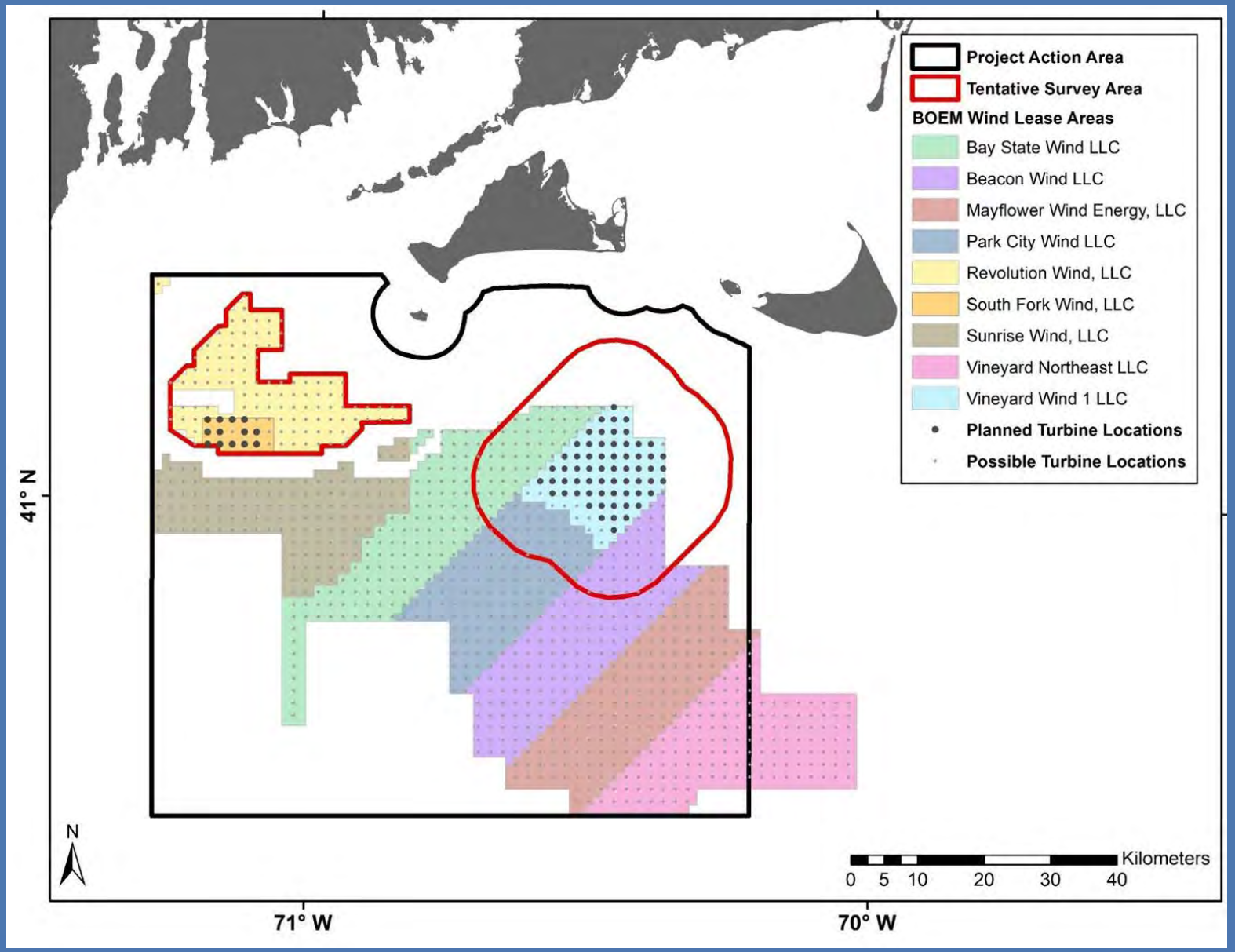
Shamrock Fisheries

Viking Village

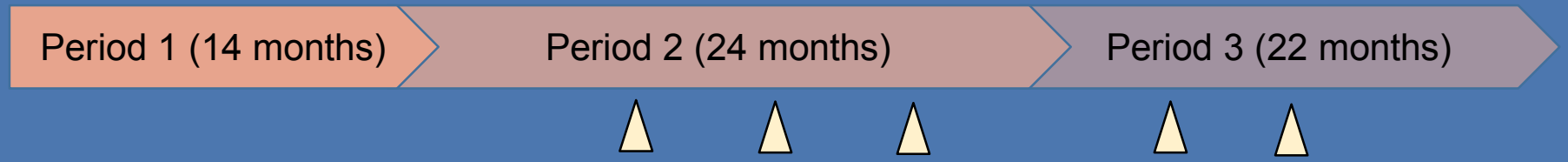
Project Objectives

1. **Develop a methodological framework for monitoring commercial fish and invertebrate species in wind farms using optical surveys**
   - Preferred survey designs
   - Freely available automated detectors and image sets for training new machine learning algorithms
   - Design schematics/technical drawings for any new gear designs (ropeless stationary camera systems)
2. **Evaluate the impacts of offshore wind development on commercial fish and invertebrate species and benthic habitats by conducting spring and fall surveys during pre-construction, construction, and post-construction periods (spring 2024 – fall 2026)**

Project Location



Project Timeline



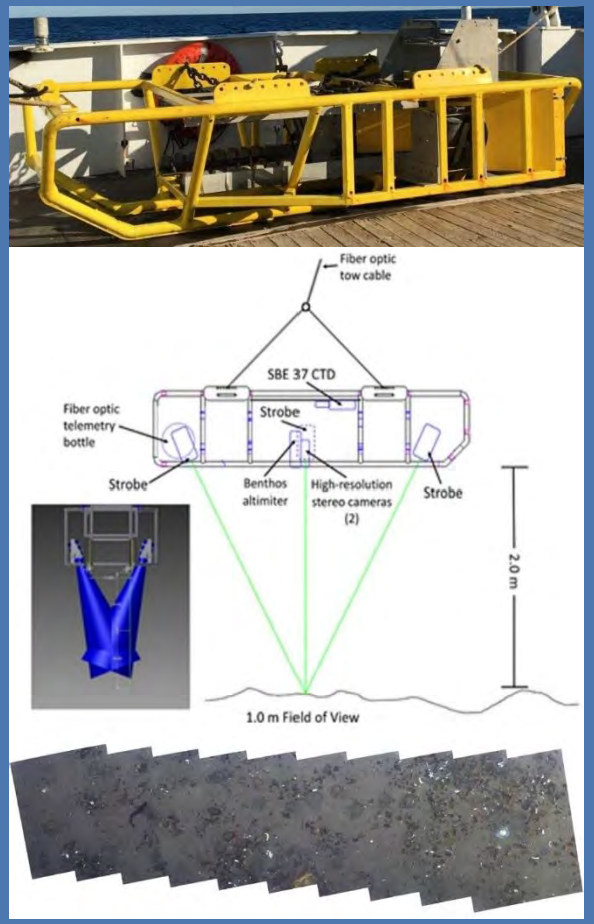
- Establish relationships with project partners
- Complete peer-reviewed survey designs
- Design and test modified video trawl
- Design and test ropeless camera system
- Test front-facing sonar on HabCam v3
- Continue developing automated detector models

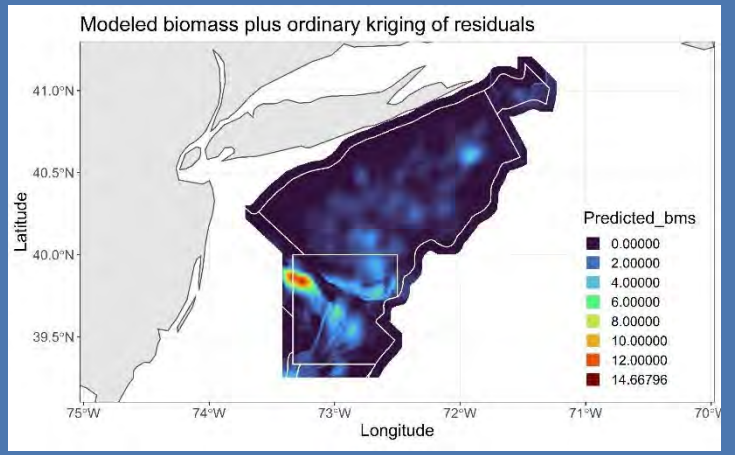
- Conduct three sets of optical surveys (HabCam, video trawl, and stationary cameras) in spring 2024, fall 2024, and spring 2025
- Develop project database
- Upgrade data storage capacity
- Continue developing automated detector models

- Conduct two sets of optical surveys in spring 2026 and fall 2026
- Complete statistical analysis of project data
- Finalize automated detector models and upload to open-source repository

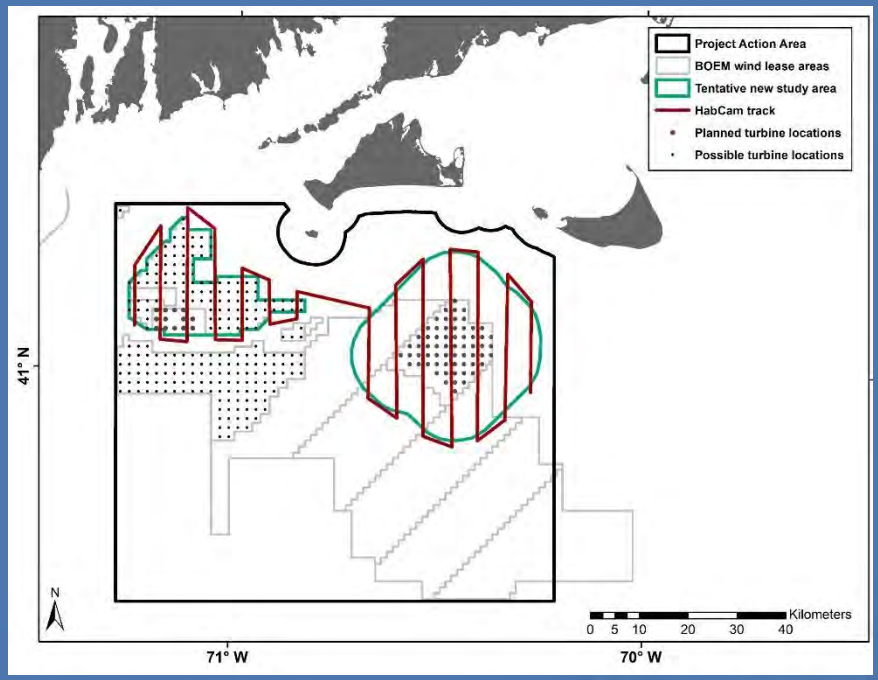
- Stakeholder meetings and public webinars
- Project reports
- Peer-reviewed publications

Optical Survey Tools – HabCam v3





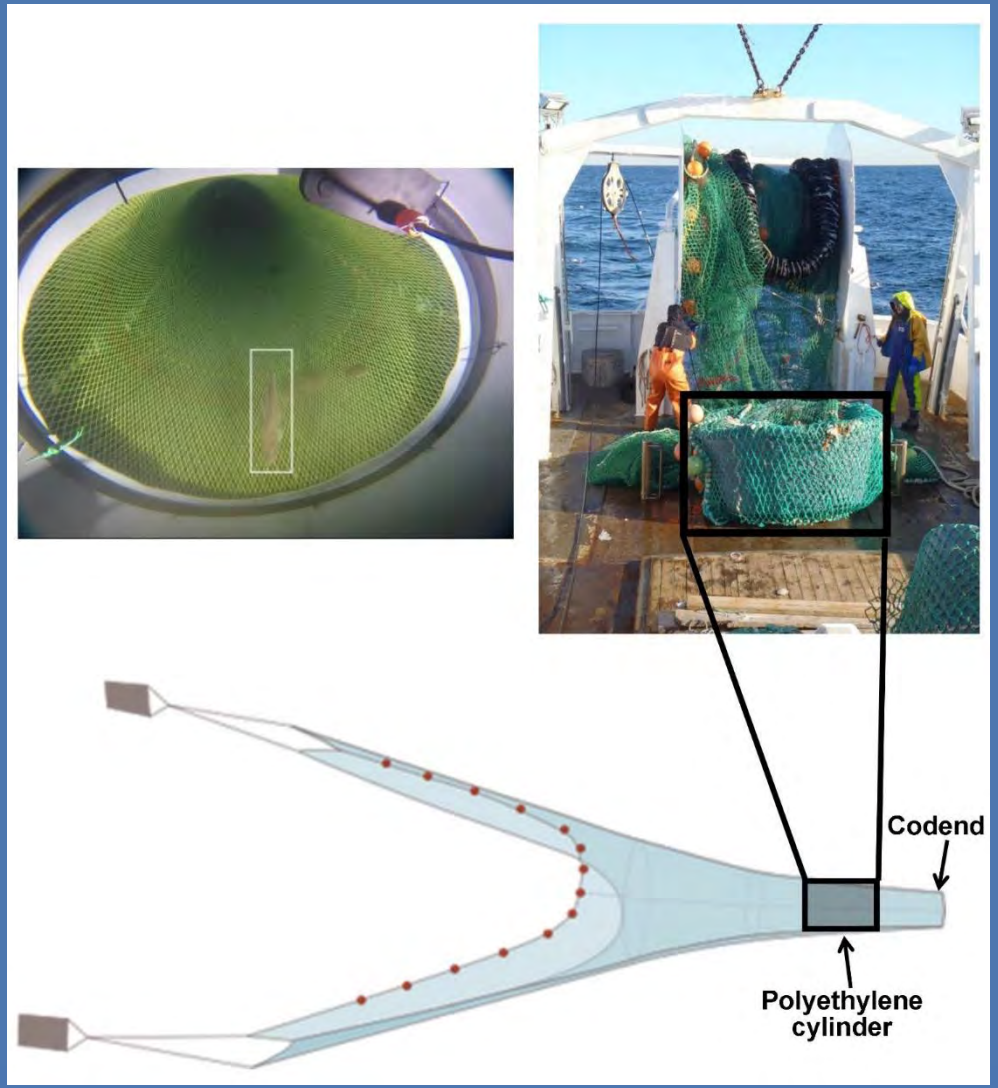
Abundance and biomass maps



Towed off-bottom stereo camera system

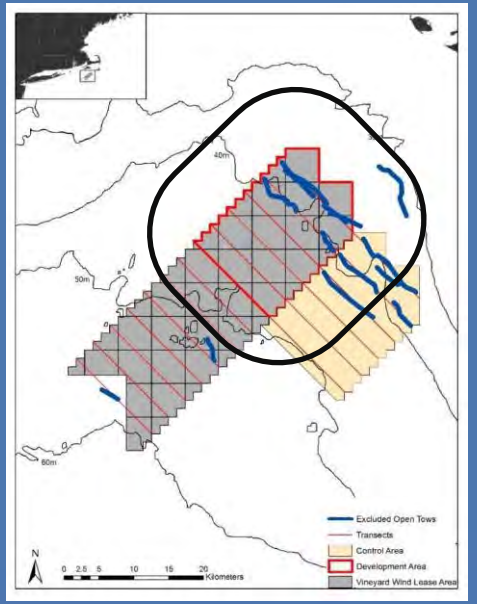
- 24-hr continuous survey tracks
- Overlapping still images
- Typical annotation rate of 1:100 provides data at 40-m intervals along the track

Optical Survey Tools – Video Trawl (SMAST)



SMAST video trawl

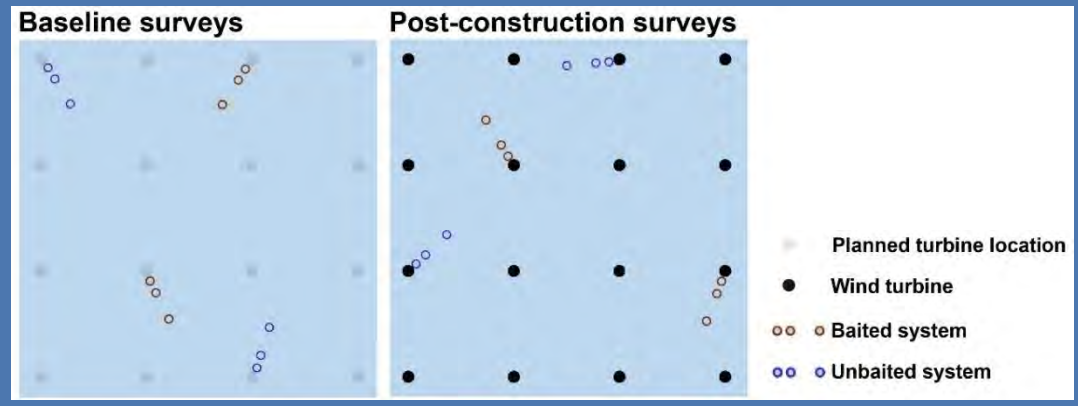
- Cylinder with cameras and lights, and sensors at the leading edge of the cod end in a standard bottom trawl net
- Fish/other are filmed as they pass into the cod end
- Effective tool for fish surveys over hard bottom when mud clouds do not obscure the video



Optical Survey Tools – Stationary Cameras

Anchored systems
- Short deployments
- Mixed of baited and unbaited
- Impacts of lighting
- Custom cameras with hydrophones (Sexton)

Ropeless systems
- Multi-day deployments over full diurnal and tidal cycles
- Edgetech ropeless lobster traps as base
- Custom cameras with hydrophones and long-term batteries (Sexton)



Before-After-Gradient design

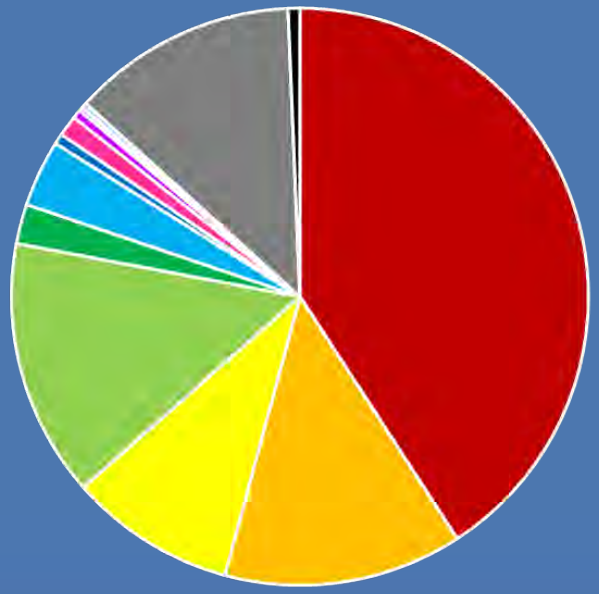
Focal Species and Fisheries

SPECIES	HABCAM SURVEY	VIDEO TRAWL SURVEY	STATIONARY CAMERA SURVEYS	FISHERY MANAGEMENT PLAN (FMP)
LONGFIN SQUID		X	X	Mackerel, Squid, and Butterfish FMP
SHORTFIN SQUID		X	X	Mackerel, Squid, and Butterfish FMP
BUTTERFISH		X	X	Mackerel, Squid, and Butterfish FMP
ATLANTIC MACKEREL		X	X	Mackerel, Squid, and Butterfish FMP
WINTER AND LITTLE SKATE	X	X	X	Skate Complex FMP
BARNDOOR SKATE	X	X	X	Skate Complex FMP
SUMMER FLOUNDER	X	X	X	Summer Flounder, Scup, and Black Sea Bass FMP
SCUP		X	X	Summer Flounder, Scup, and Black Sea Bass FMP
BLACK SEA BASS		X	X	Summer Flounder, Scup, and Black Sea Bass FMP
SILVER AND OFFSHORE HAKE	X	X	X	Small-Mesh Multispecies FMP
RED HAKE	X	X	X	Small-Mesh Multispecies FMP
MONKFISH	X	X	X	Monkfish FMP
JONAH AND ROCK CRAB	X		X	Interstate FMP for Jonah Crab
AMERICAN LOBSTER	X		X	Interstate FMP for American Lobster
YELLOWTAIL FLOUNDER	X	X	X	Northeast Multispecies FMP
WINTER FLOUNDER	X	X	X	Northeast Multispecies FMP
WINDOWPANE FLOUNDER	X	X	X	Northeast Multispecies FMP
WHITE HAKE	X	X	X	Northeast Multispecies FMP
OCEAN POUT	X	X	X	Northeast Multispecies FMP
ATLANTIC COD		X	X	Northeast Multispecies FMP
SPINY DOGFISH	X	X	X	Spiny Dogfish FMP
SEA SCALLOP	X			Sea Scallop FMP
BLUEFISH		X	X	Bluefish FMP

Fishery 12-year Landings

Revolution Wind

Vineyard Wind 1



Most impacted Fishery Management Plans

- Also fisheries with highest revenue
- Based on data from commercial landings, Vessel Trip Reports, and surfclam/ocean quahog logbooks
- Not likely to be observed includes Atlantic herring and surfclam/ocean quahog
- Does not include species targeted primarily by recreational fisheries (striped bass) or abundant species not targeted in any fisheries (sea robins)

- Mackerel, Squid, and Butterfish FMP
- Skate Complex FMP
- Summer Flounder, Scup, and Black Sea Bass FMP
- Small-Mesh Multispecies FMP
- Monkfish FMP
- Interstate FMP for Jonah Crab
- Interstate FMP for American Lobster
- Northeast Multispecies FMP
- Spiny Dogfish FMP
- Sea Scallop FMP
- Bluefish FMP
- Not likely to be observed with survey tools
- Other

Data Collection by Survey

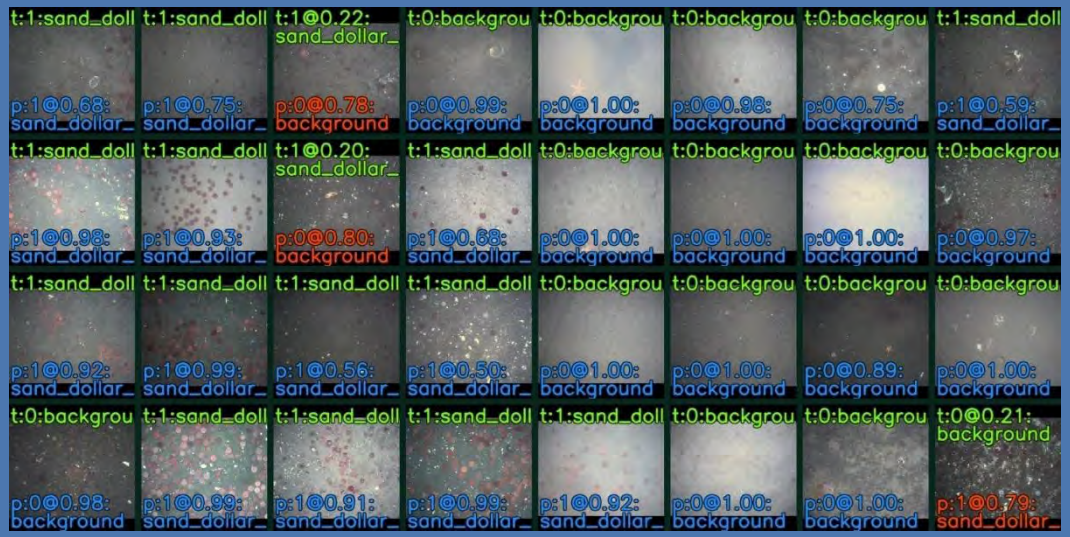
DATA TYPE (ALL LINKED TO LOCATION)	HABCAM SURVEY	VIDEO TRAWL SURVEY	STATIONARY CAMERA SURVEYS
STILL IMAGES	X		X
VIDEO		X	X
SOUND LEVELS			X
DEPTH	X	X	X
BOTTOM/NEAR-BOTTOM TEMPERATURE	X	X	X
TEMPERATURE PROFILES			X
NEAR-BOTTOM SALINITY	X	X	
TRADITIONAL FISHERIES CATCH DATA		X	
SPECIES COUNTS (DERIVED)	X	X	X
SPECIES LENGTHS (DERIVED) COASTAL AND MARINE ECOLOGICAL CLASSIFICATION STANDARD (CMECS)	X	X	X
SPECIES BIOMASS (DERIVED)	X	X	X
SUBSTRATE/HABITAT TYPE (DERIVED)*	X		X

*Simplified Coastal and Marine Ecological Classification Standard (CMECS) categories

Automated Detection and Classification (Kitware)

- Develop automated detector models for important commercial fish species and benthic habitat types
- Models will be available through the open-source application Video and Image Analytics for Marine Environments (VIAME)

Scallop detector



Substrate classification (sand dollar bed)

Calibration Experiments for a Novel Clam Survey Dredge & Monitoring Carbonate Chemistry of Surfclam Habitat

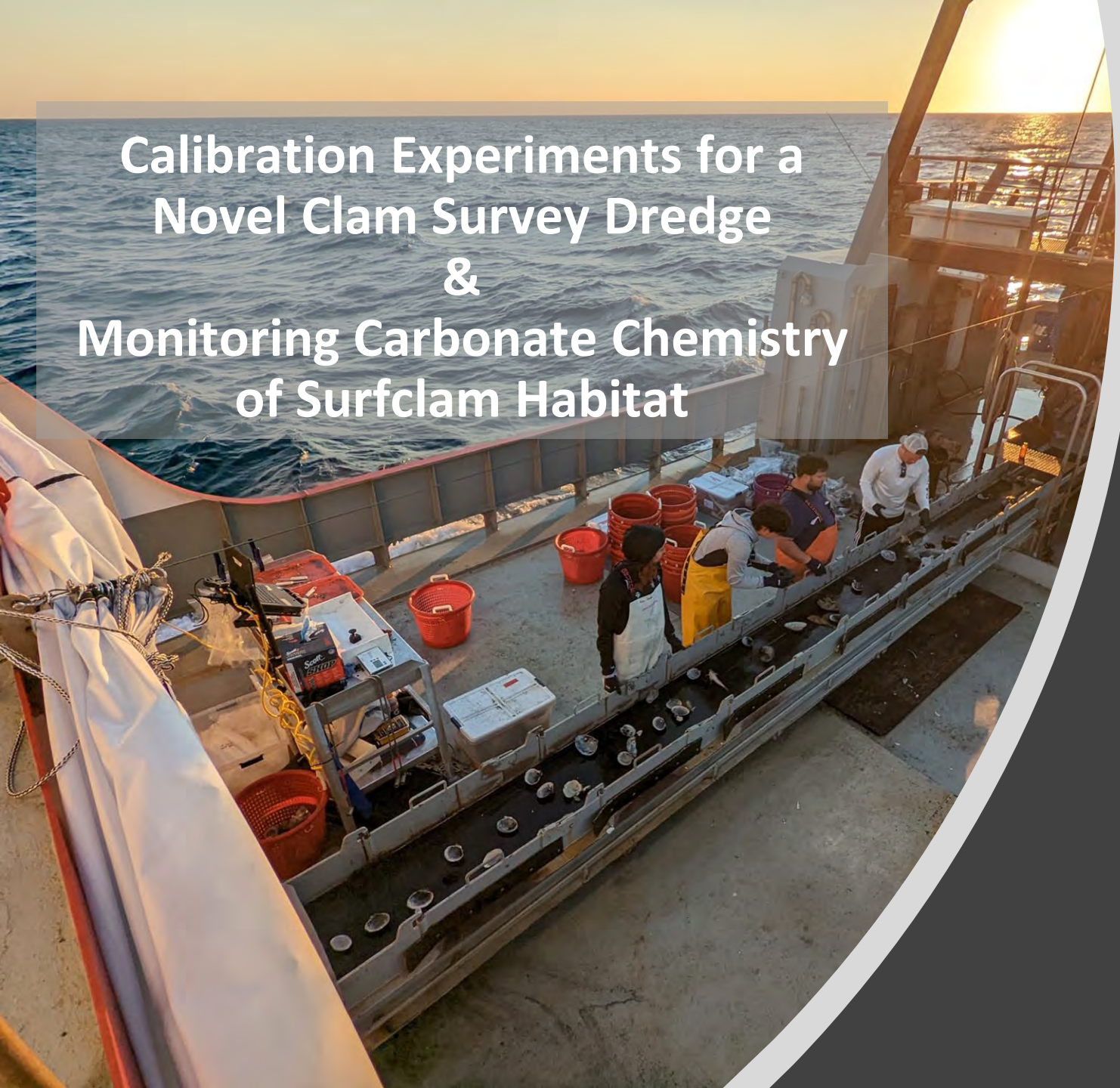
Drs. Daphne Munroe, Jason Morson
Rutgers University, Haskin Shellfish Research Lab

Dr. Grace Saba
Rutgers University, Department of Marine & Coastal Sciences

Mr. Tom Dameron
Surfside Seafood Products LLC

Dr. Daniel Hennen
NOAA Northeast Fisheries Science Center

Reneé Reilly & Colleen Brust
NJ DEP



Calibration Experiments for a Novel Clam Survey Dredge & Monitoring Carbonate Chemistry of Surfclam Habitat

Goals of the Project

- **Obj1:** Construction of a scientific surfclam dredge
  - Smaller bar spacing
- **Obj2**: Dredge calibration
  - Federal Survey Stations
  - Size Selectivity Experiments
  - Dredge Efficiency Experiments
- **Obj3**: Ocean Acidification Data
  - Profile carbonate saturation.
  - Benthic grabs (early recruits)
  - Shell strength testing

•**Goals of the Project**

- **Obj1:** Construction of a scientific surfclam dredge
  - Smaller bar spacing
  - Relied heavily on industry support and collaboration
  - Likewise in vessel preparation for other survey efforts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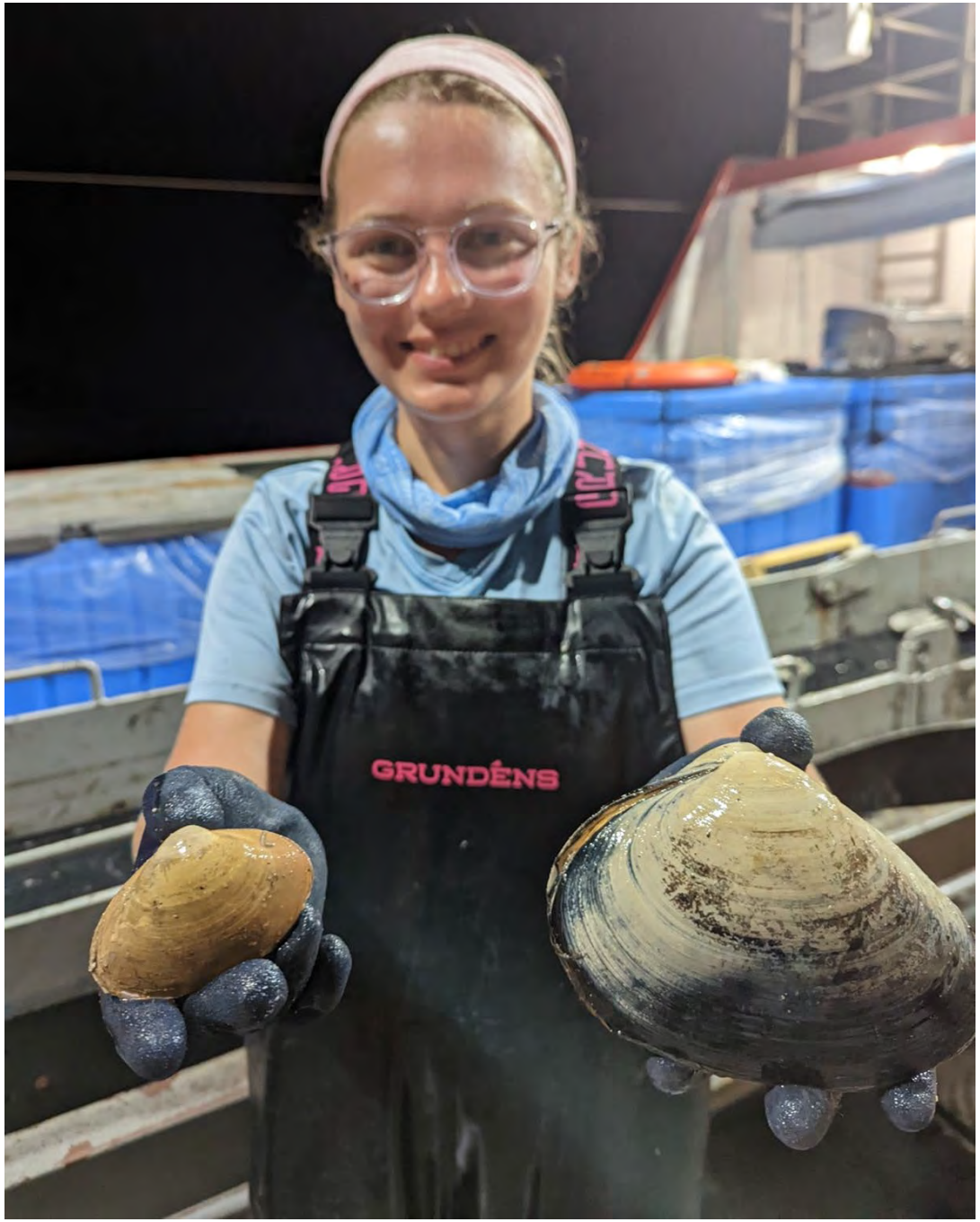
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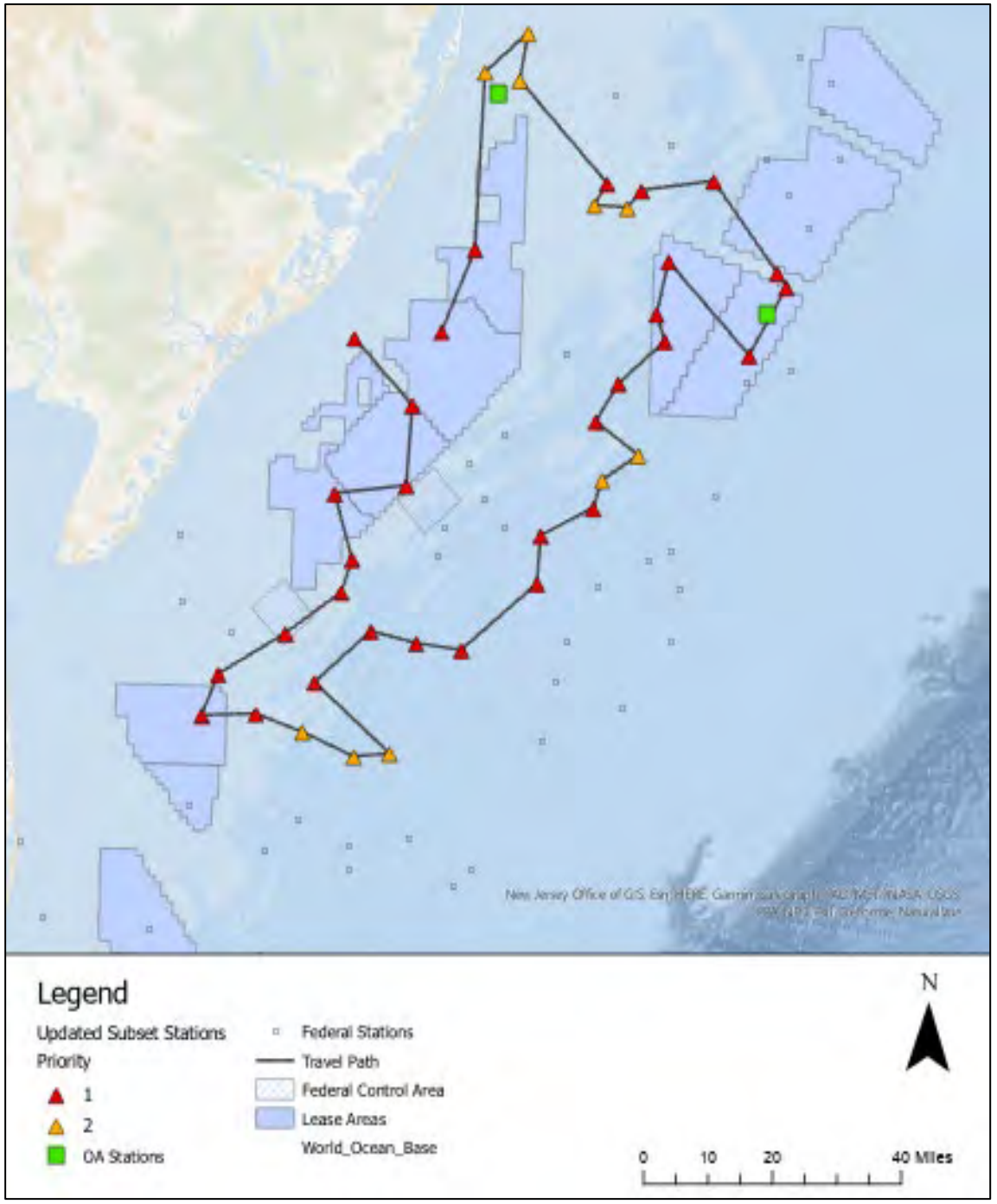
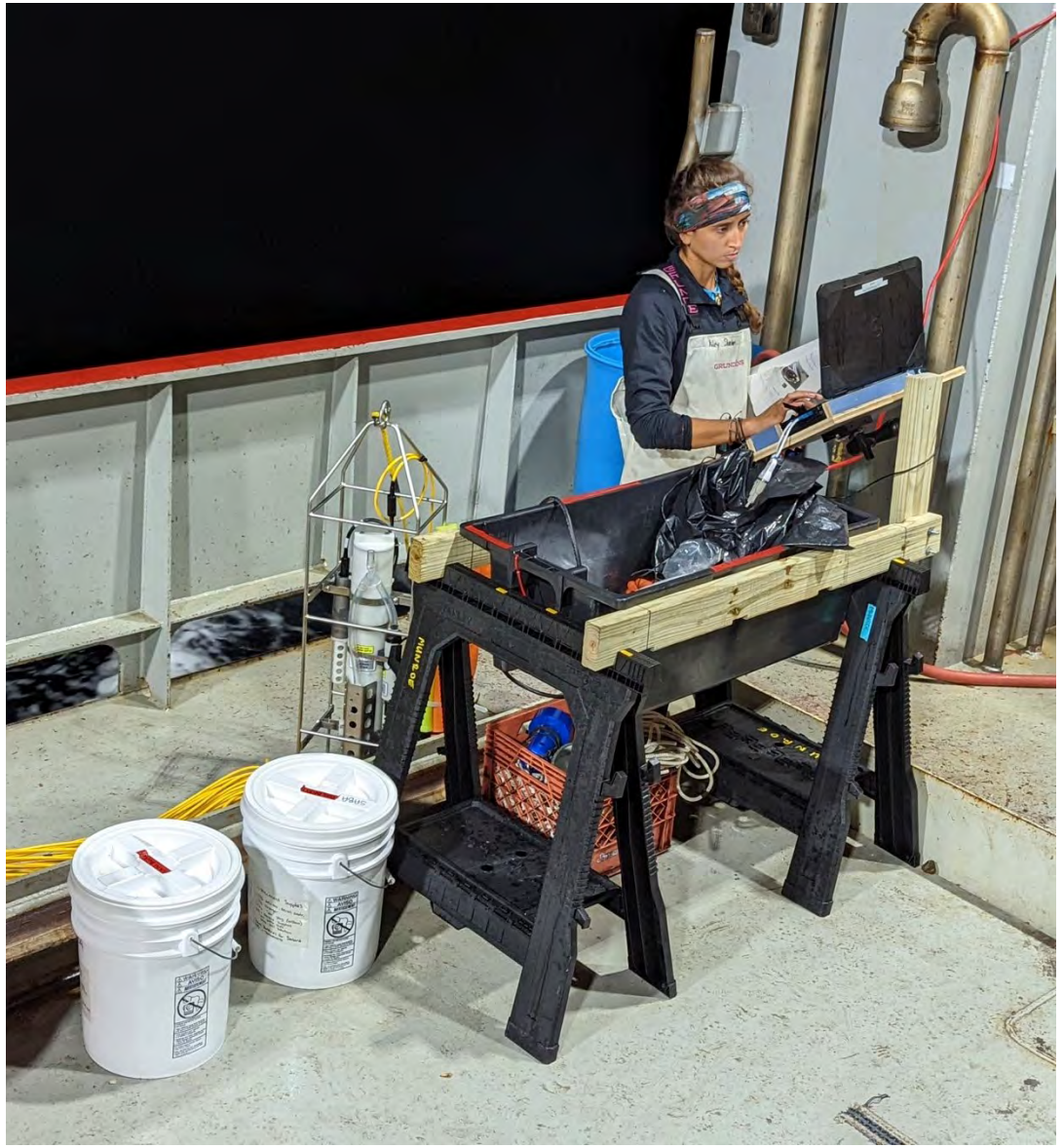


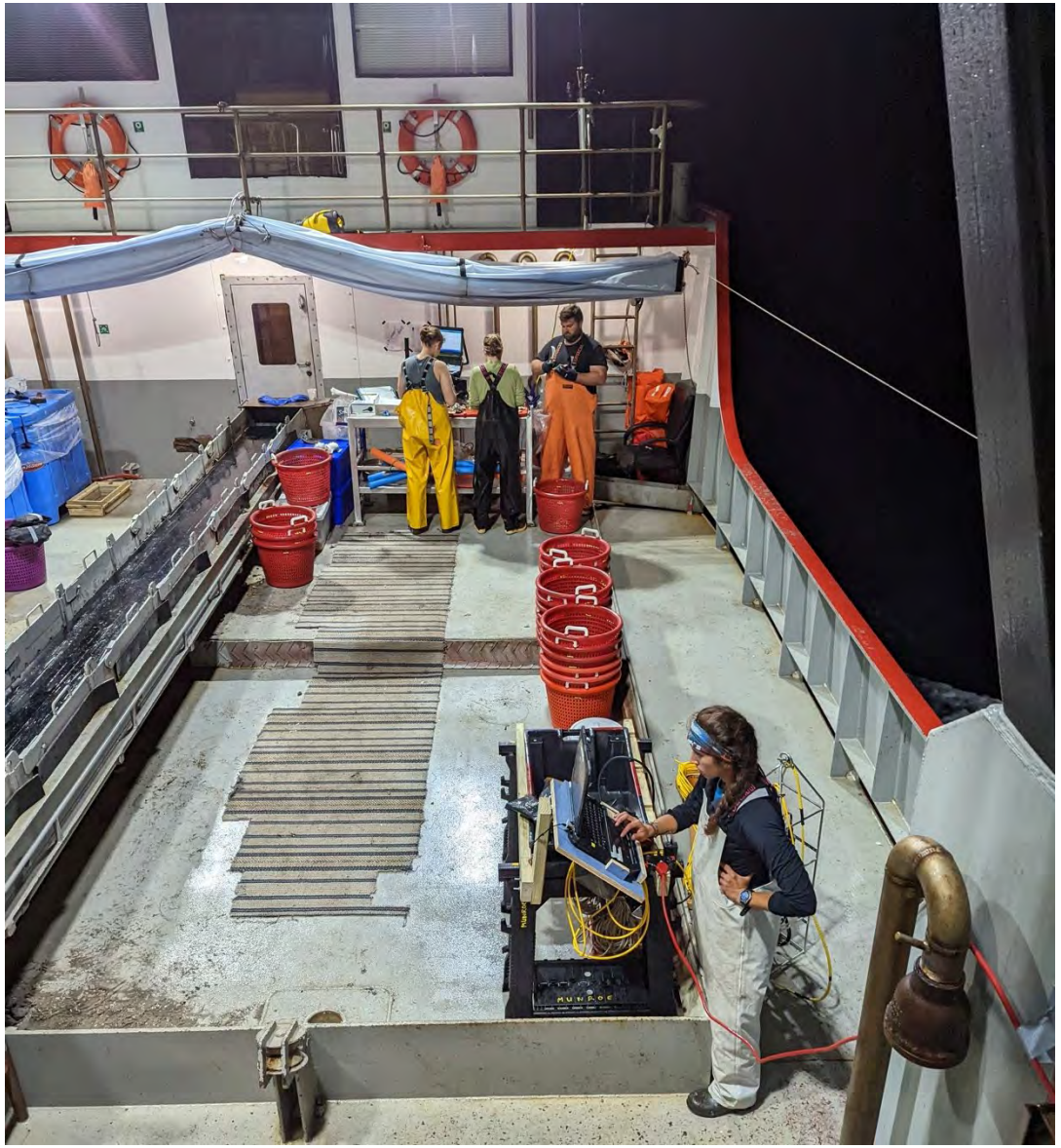
Obj2: Dredge calibration

- Federal Survey Stations

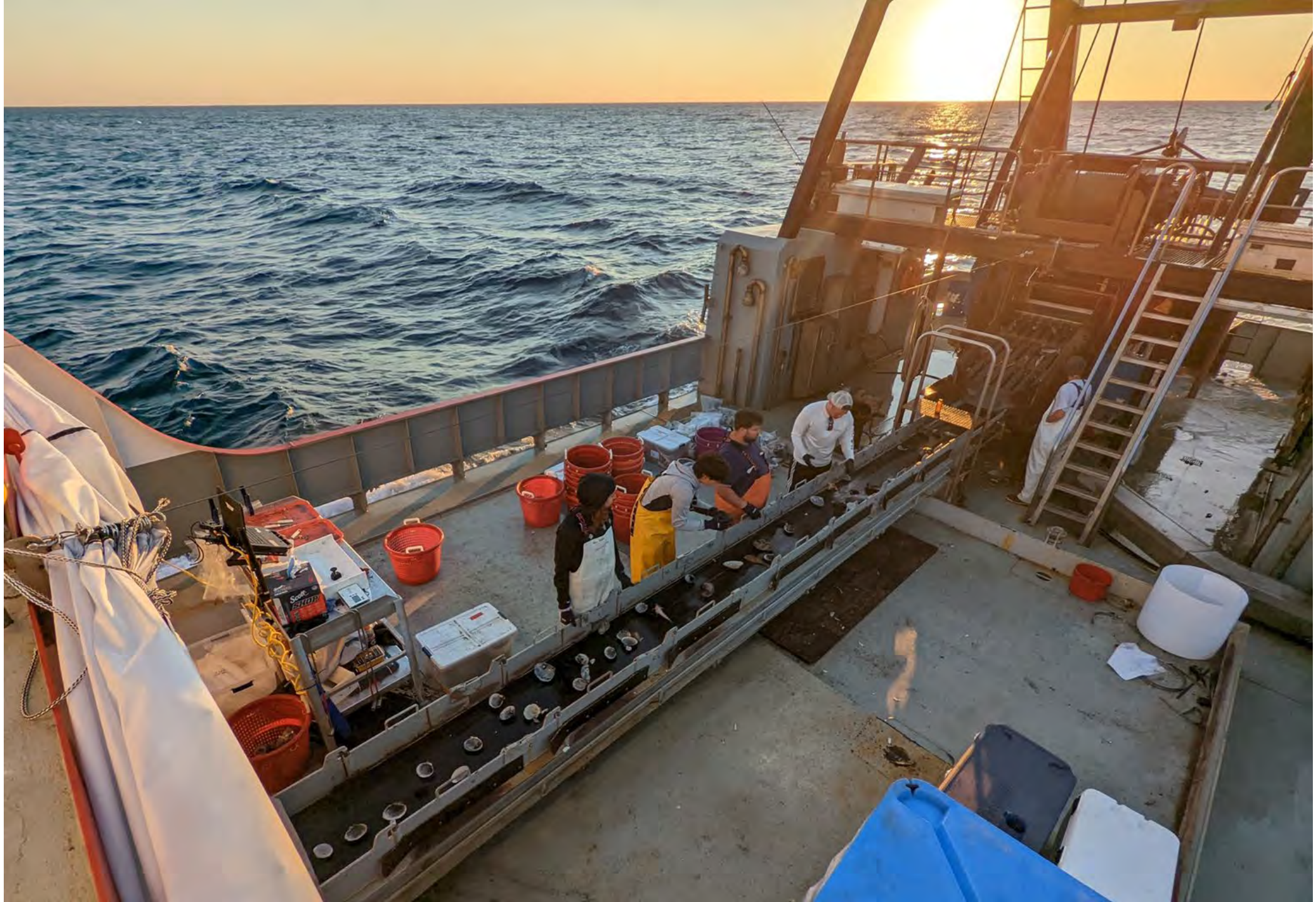
At each station:

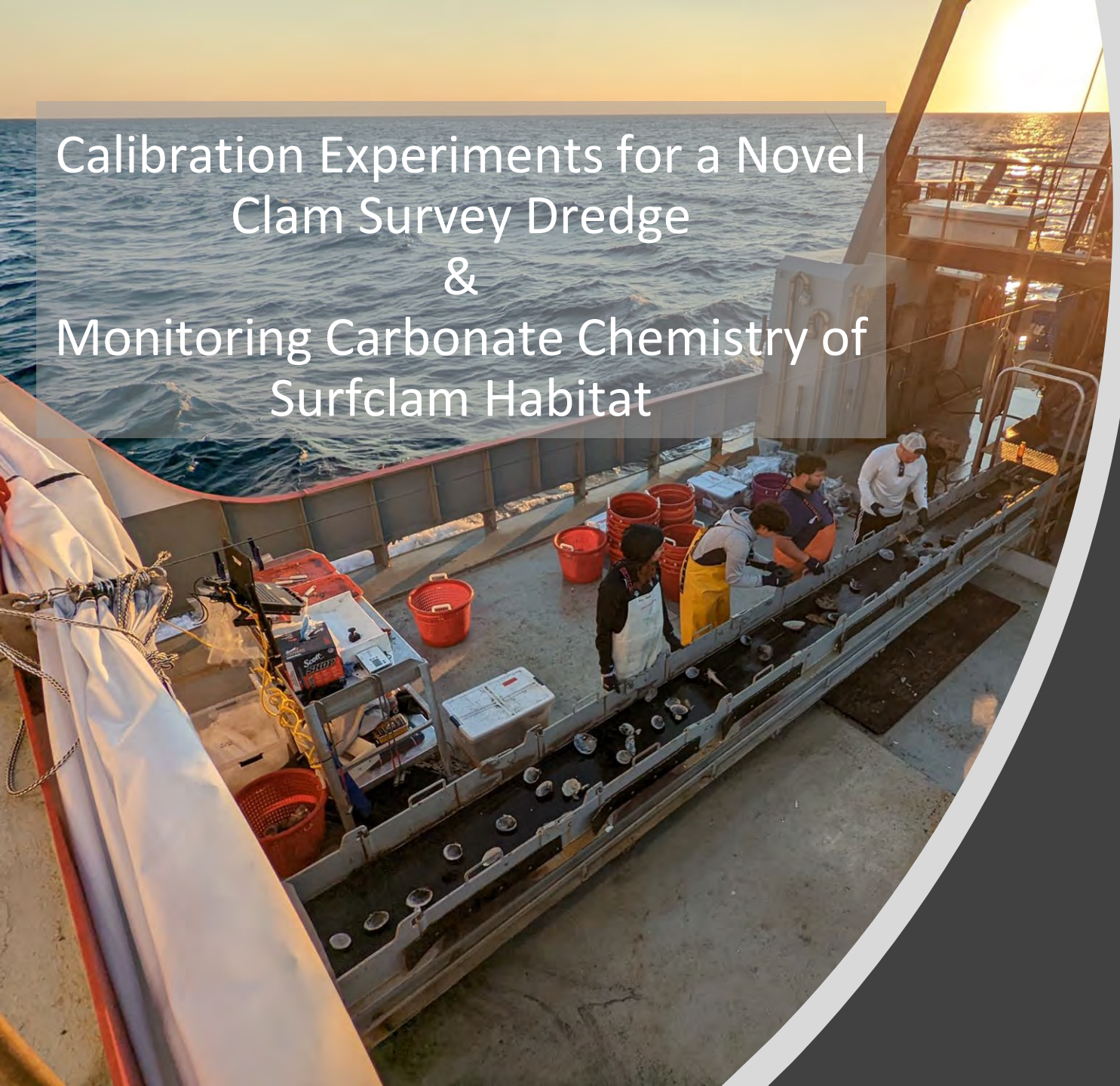
- Benthic grab
  - Links with long-term state survey
- CTD & pCO2 sensor cast
  - Oceanographic profile & bottom water chemistry
- Standardized dredge tow
  - Clam abundance, size & age frequency, shell strength






2mm x 2mm mesh

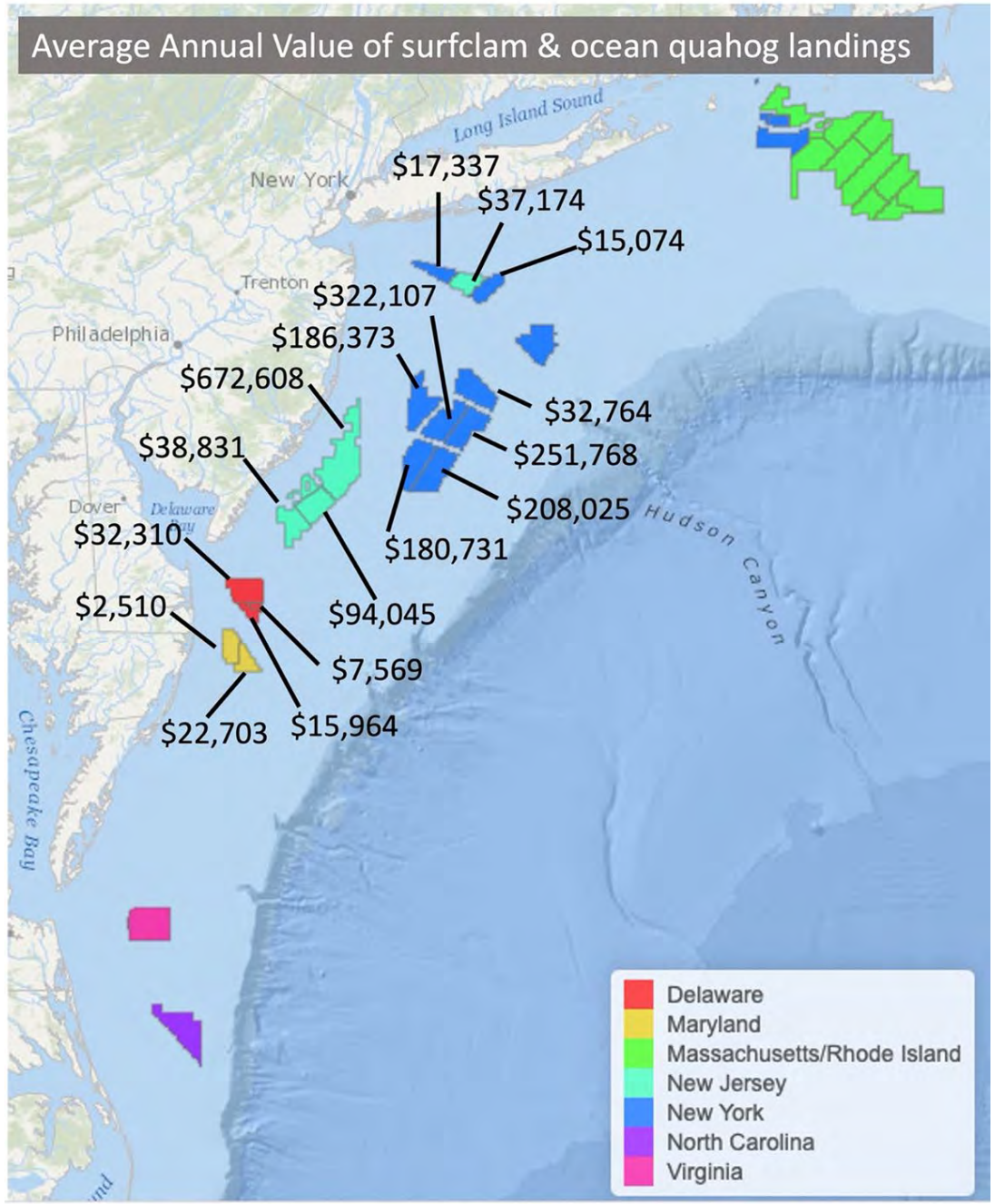




Calibration Experiments for a Novel Clam Survey Dredge & Monitoring Carbonate Chemistry of Surfclam Habitat

Next Steps

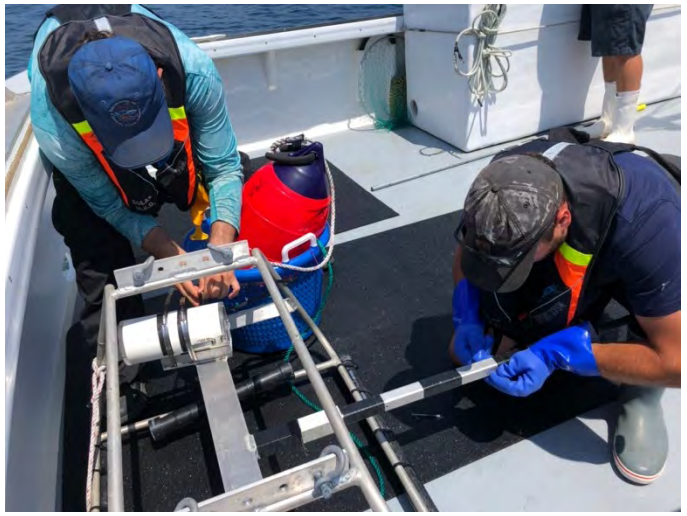
- **Obj2**: Dredge calibration
  - Size Selectivity Experiments
  - Dredge Efficiency Experiments
- **Obj3**: Ocean Acidification Data
  - Oceanographic data processing
  - Shell ages
  - Shell strength testing



Annual average values from each lease area over 2015-2019. Data from NOAA Socioeconomic Impacts of Atlantic Offshore Wind Development, GARFO online data resource. Accessed June 30, 2022.
https://www.fisheries.noaa.gov/resource/data/socioeconomic-impacts-atlantic-offshore-wind-development

Fisheries Monitoring Of An Offshore Windfarm
Ocean Wind 1






Jason Morson, Jason Adolf, Kaycee Coleman, Gregory Decelles, Keith Dunton, Thomas Grothues,
Josh Kohut, Daphne Munroe, Grace Saba, Kevin Wark, and Douglas Zemeckis

RUTGERS
THE STATE UNIVERSITY
OF NEW JERSEY

MONMOUTH
UNIVERSITY

Ørsted

Ocean Wind 1

Location: Approximately 15 miles off the coast of southern New Jersey

Timeline: Construction is planned to start in the early 2020's, with the wind farm expected to provide first power in late 2024

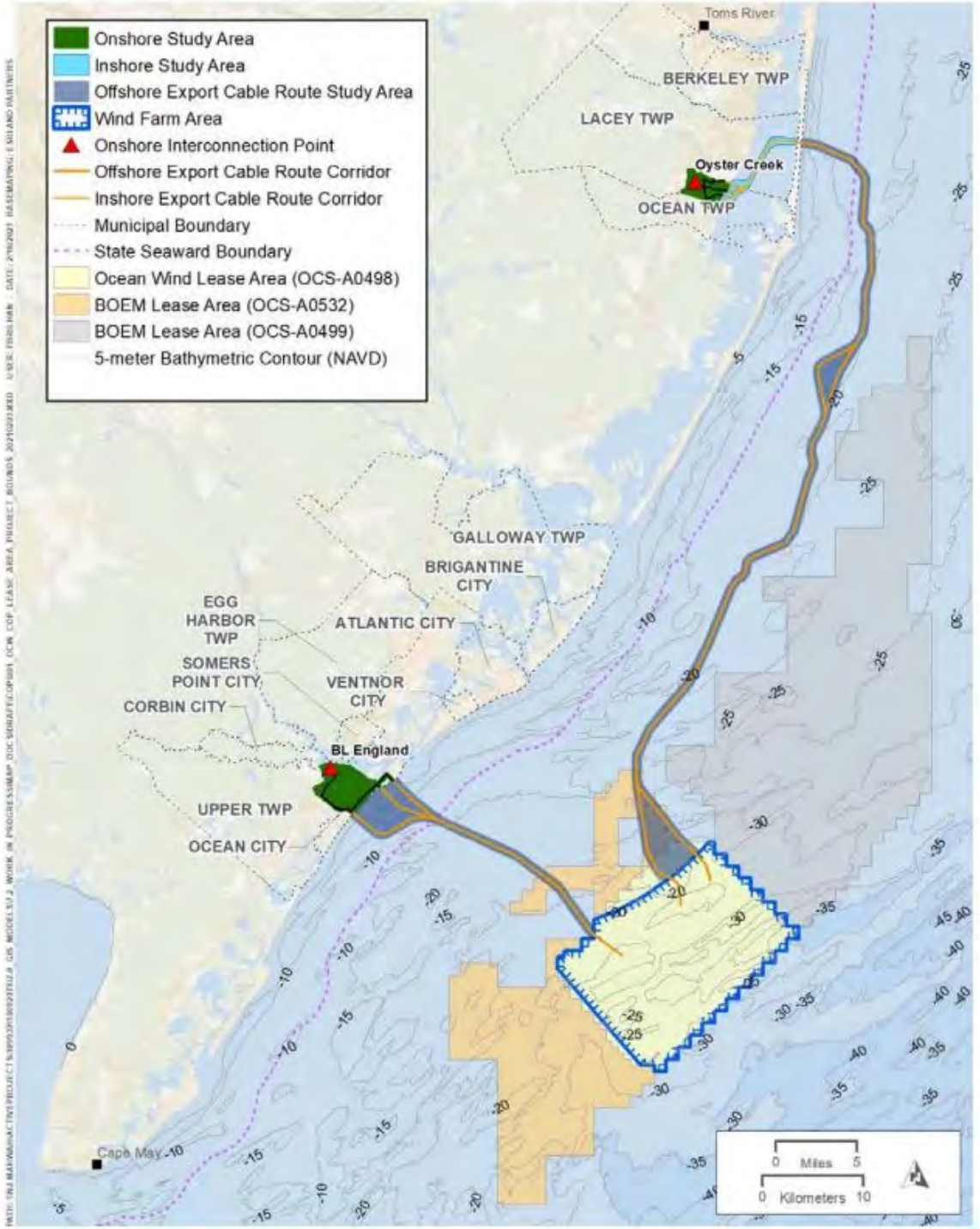
Turbine: GE Haliade X 12 MW turbine

Capacity: 1,100 MW

Annual Production: Enough to power more than 500,000 homes

Owner & Developer: 75% Ørsted, 25% PSEG

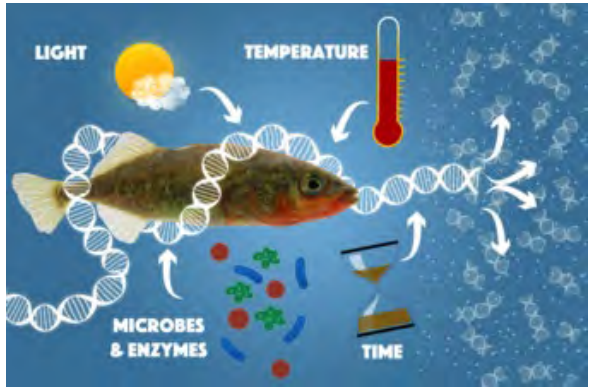
oceanwindone.com



Ocean Wind 1 Fishery Monitoring Plan

Trawl Survey (Extractive)

eDNA (Non-Extractive)

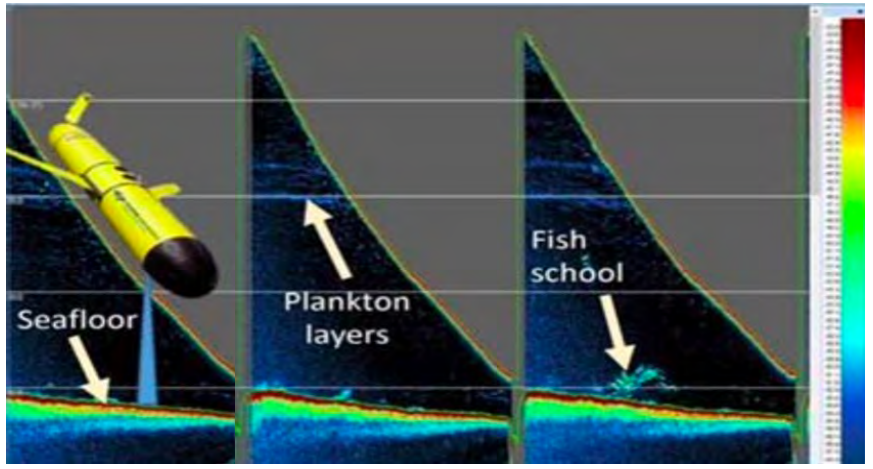


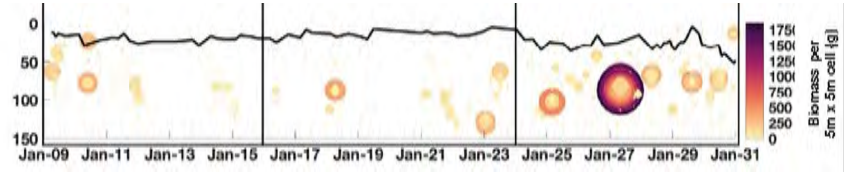
Clam Dredge Survey (Extractive)

Acoustic Telemetry
(Extractive/Non-Extractive)

Stuctured Habitat Survey:
-BRUV(Non-Extractive)
-Chevron Traps (Extractive)
-Hook-and-Line Fishing (Extractive)

Acoustic Glider-Based Surveys (Non-Extractive)





Towed Camera Surveys (Non-Extractive)


Sorting bushels of clams

Processed clam shells

Atlantic Surfclam Cooperative Fishery Survey

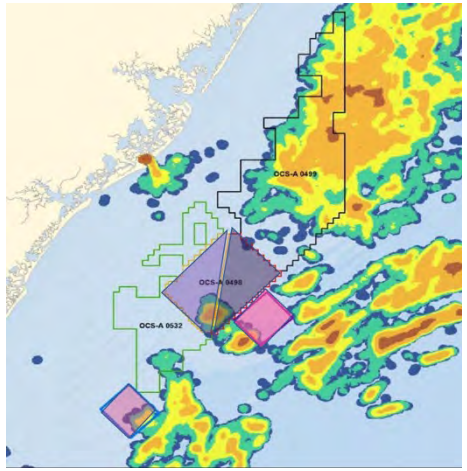
Aim: Quantify dynamic abundance, distribution, age of surfclams.

Methods:

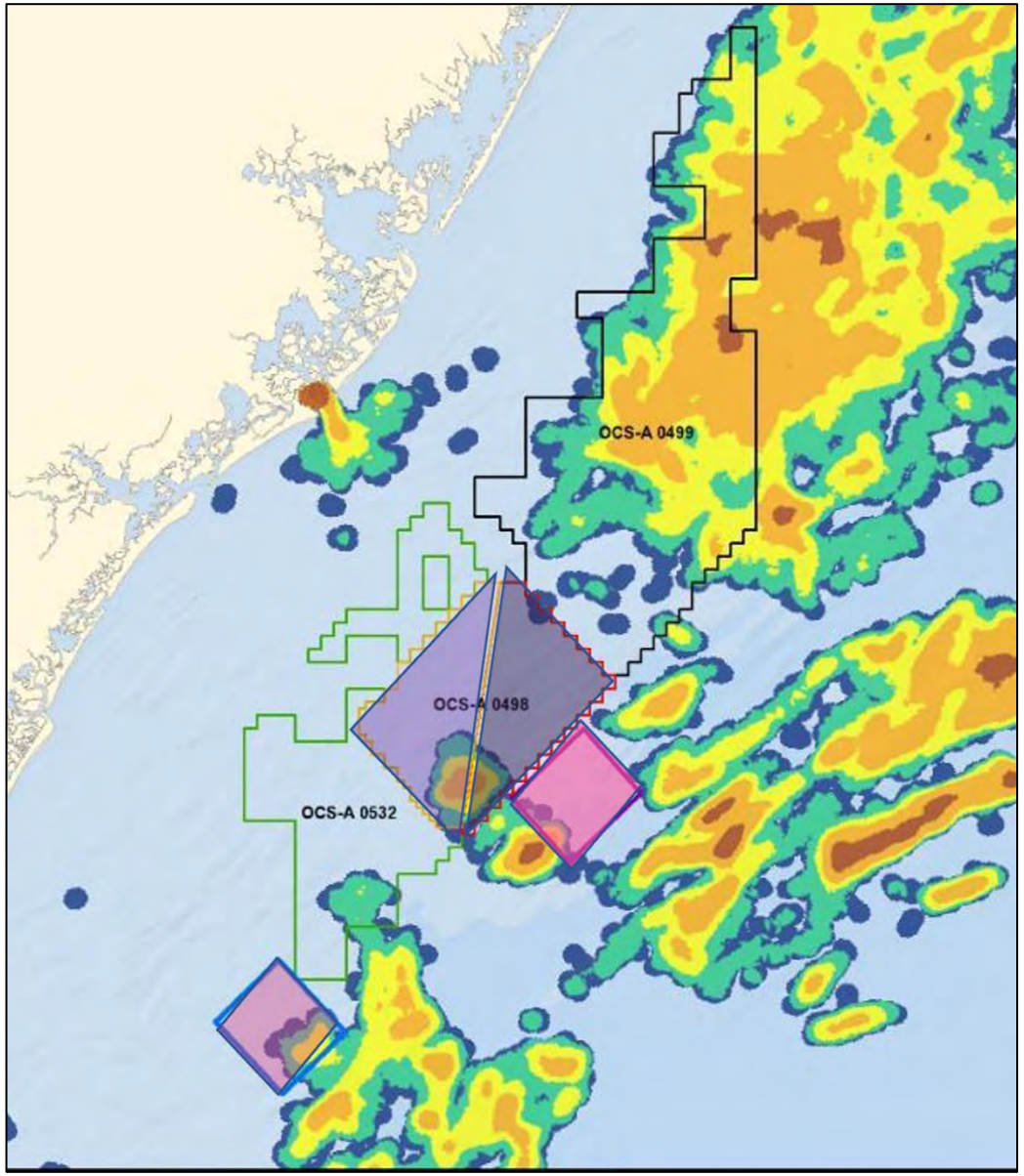
- Survey Vessel: FV Joey D, commercial clam boat
- Samples collected with a modified commercial hydraulic dredge
- Ten tows in wind lease area, ten tows in control area, per year
- Before-After-Control-Impact (BACI) design

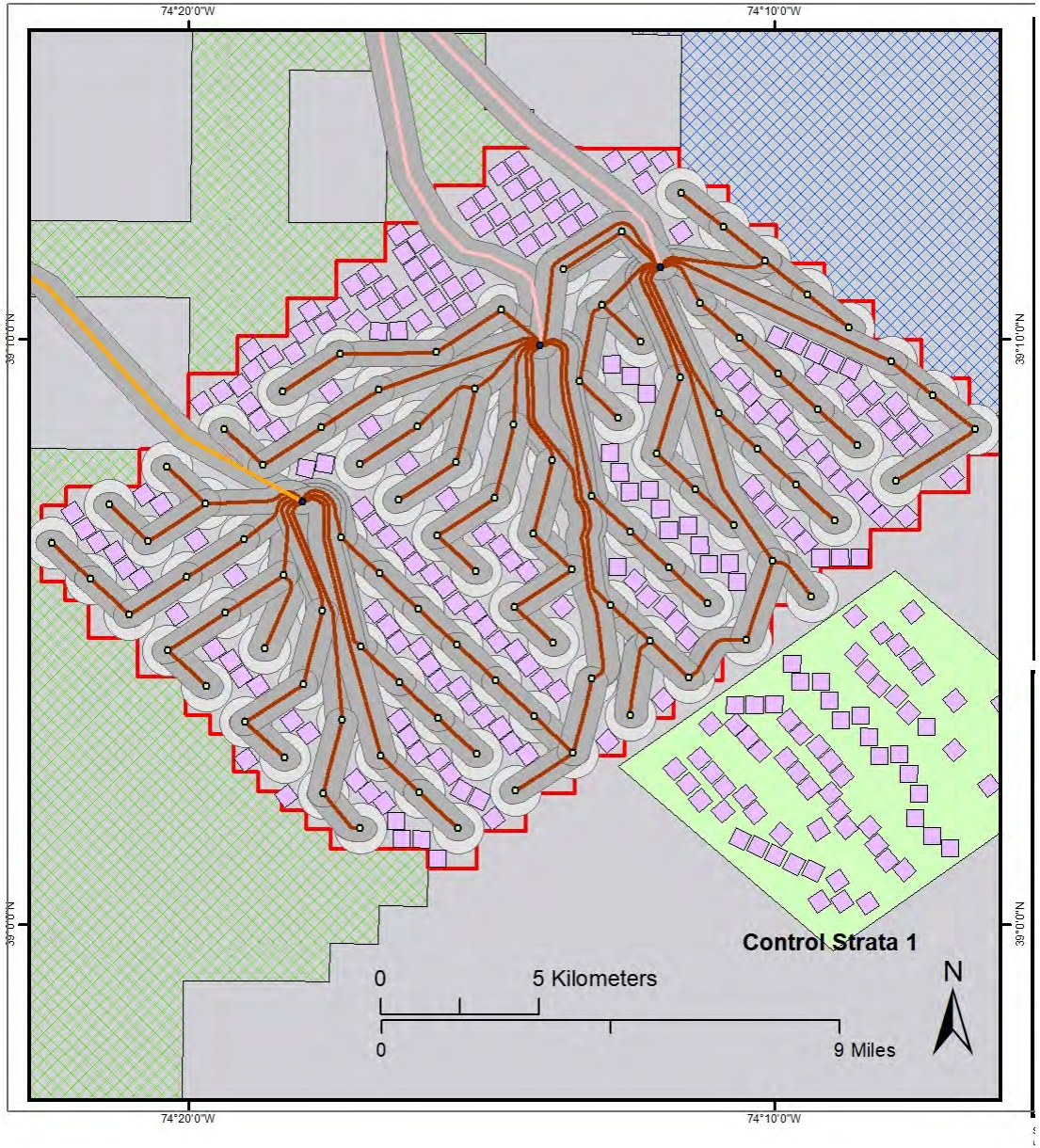
Anticipated Outcome: document the commercial clam resource within the wind lease and evaluate any changes to the stock over time or due to wind farm construction.

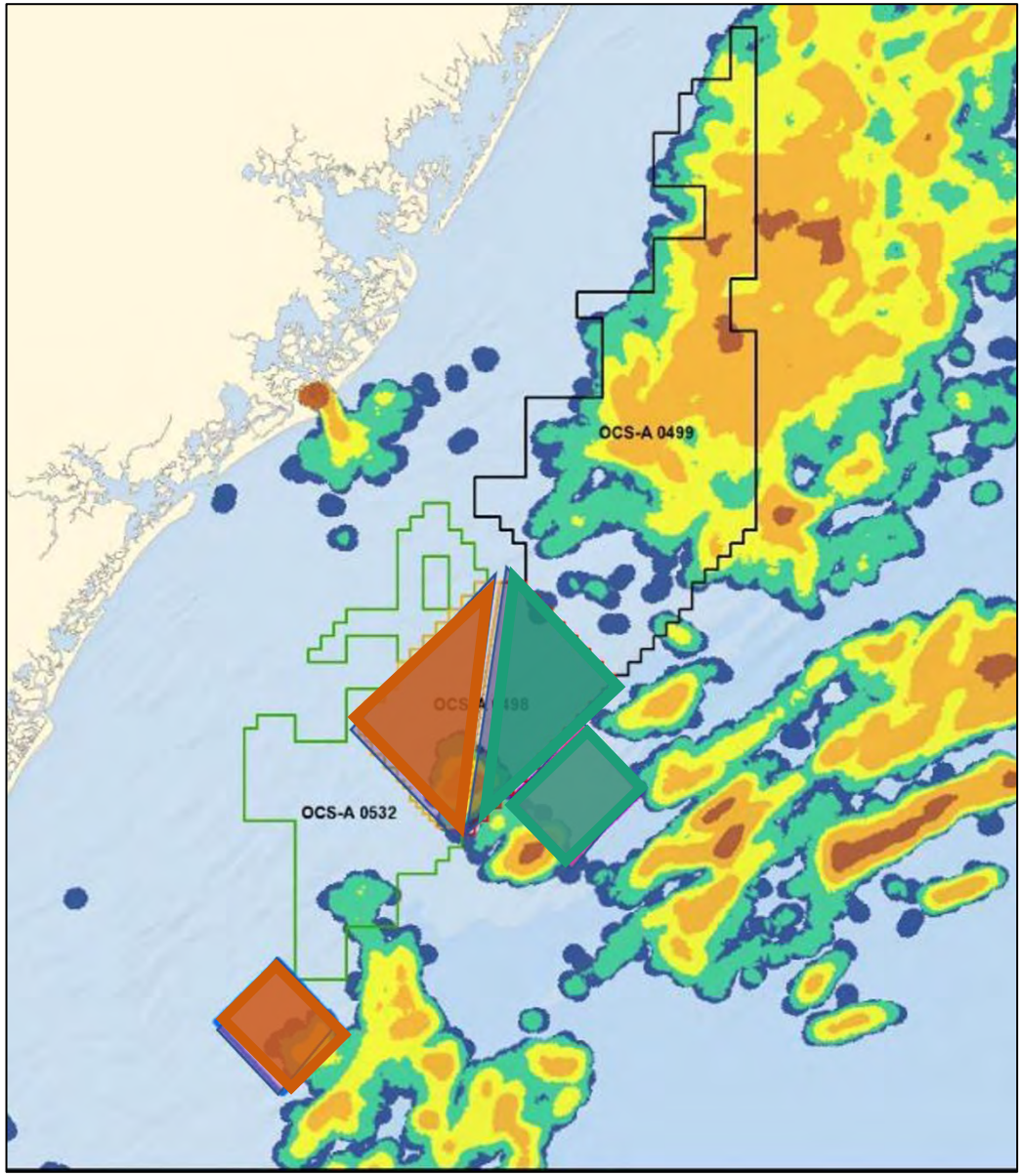

Survey Vessel

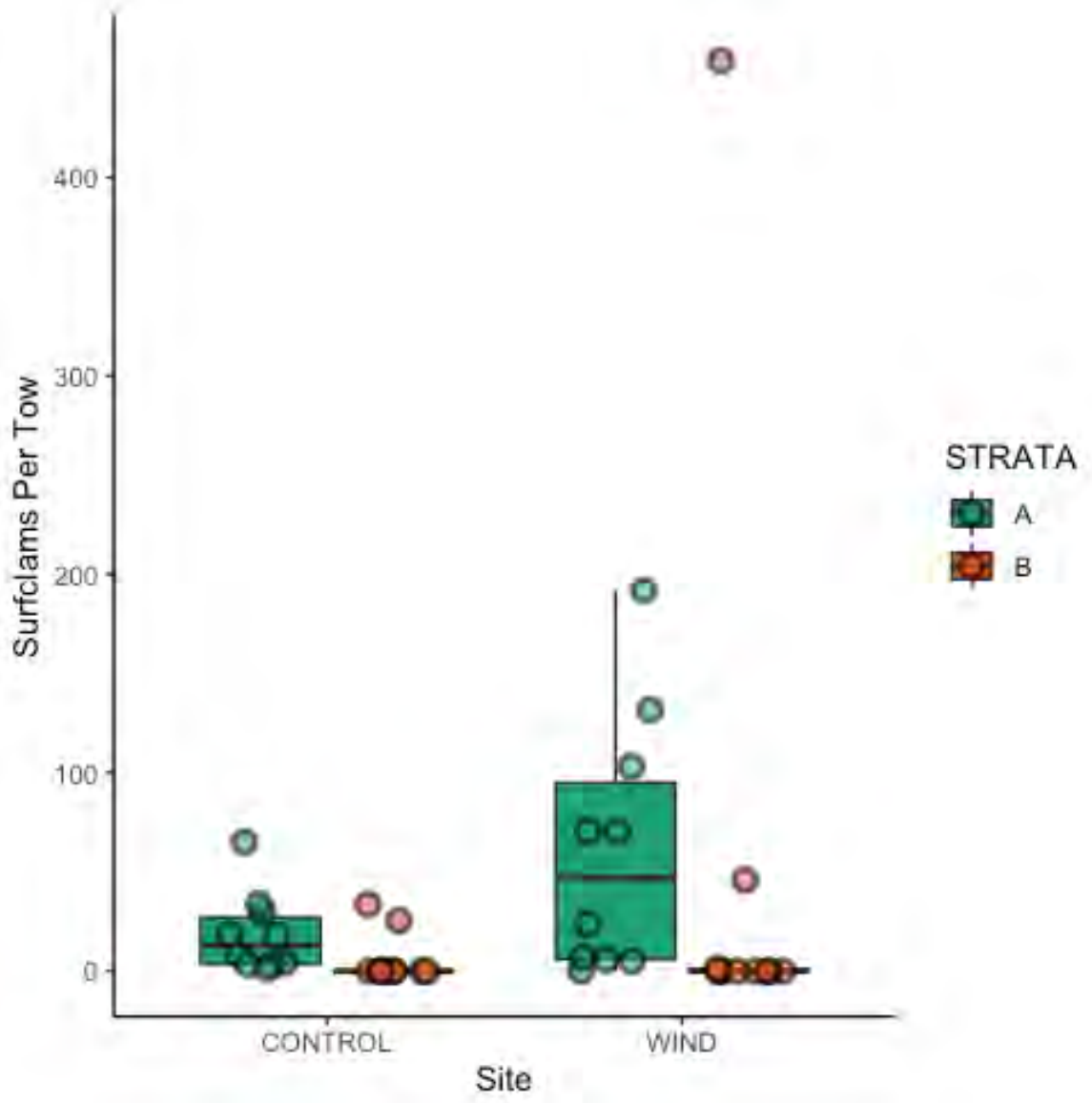


Survey strata (purple) and controls (pink) with heatmap of fishing activity.


OCS-A 0499
OCS-A 0498
OCS-A 0532


74°20'0"W
74°10'0"W
39°10'0"N
Control Strata 1
0
5 Kilometers
0
9 Miles
N


OCS-A 0499
OCS-A 0532


Surfclams Per Tow
400
300
200
100
0
CONTROL
WIND
Site
STRATA
A
B

Acknowledgements

- Thanks to all of the collaborating Captains and Crews among our fishing industry collaborators.

- Thank you to all of the technicians and staff from Rutgers University who participated in projects.

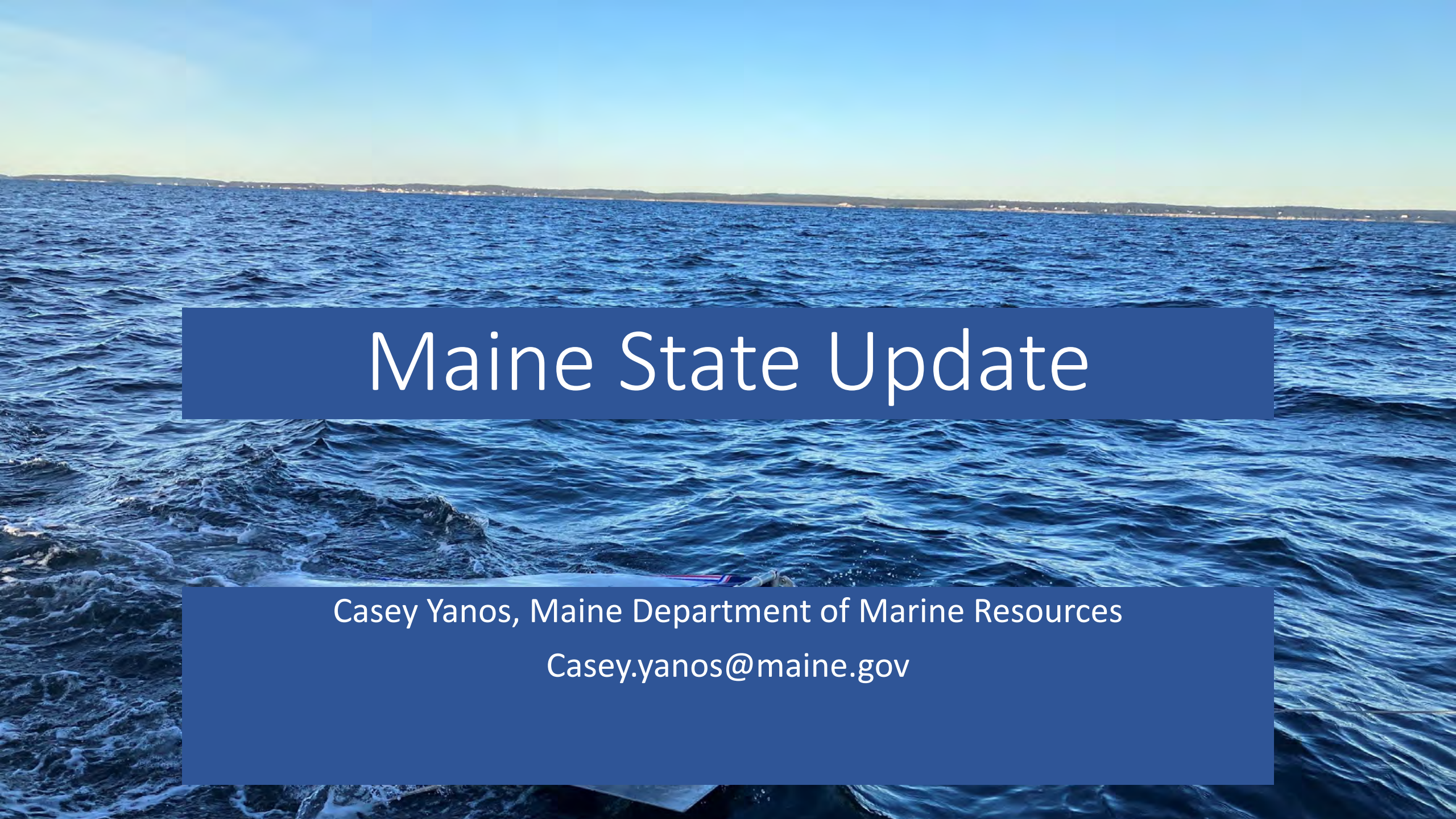
- Funding for the fisheries monitoring plan of Ocean Wind 1 has been provided by Ørsted North America, LLC.

- Funding for construction and calibration of the dredge, and carbonate chemistry studies provided by the New Jersey Research &Monitoring Initiative (RMI)

RUTGERS
New Jersey Agricultural Experiment Station
Cooperative Extension

Rutgers Offshore Wind Living Resources Studies (ROWLRS)
https://rowlrs.marine.rutgers.edu/

State Updates



Maine State Update

Casey Yanos, Maine Department of Marine Resources

Casey.yanos@maine.gov

Maine's Climate and Clean Energy Targets

REDUCE MAINE'S GREENHOUSE GAS EMISSIONS

45%
BELOW 1990 LEVELS BY 2030

80%
BELOW 1990 LEVELS BY 2050

RENEWABLE PORTFOLIO STANDARD REQUIREMENTS

80%
BY 2030

100%
BY 2050

ACHIEVE CARBON NEUTRALITY BY

2045

Maine Offshore Wind Initiative

GOVERNOR'S Energy Office

Stephanie.Watson@maine.gov

Offshore Wind is an Opportunity for Maine to:

Fight Climate Change

Harness Renewable Energy

Create Jobs & Economic Growth

Sustain Maine's Maritime Heritage

Economic Impact of Maine's Commercial Fishing Industry

- 2021 Landings: $890M
- 2021 Lobster Landings: $733M
- Licensed Maine Fishermen: 16,000+
- Total Economic Impact: $3 billion

Lobster landings are 82% of Maine's total and represent 80% of the total U.S. lobster catch.
It is the second most valuable ocean species harvested in the U.S.

About the Initiative

Planning & Stakeholder Engagement

- Maine Offshore Wind Roadmap
- Ports Studies & Stakeholder Group
- BOEM Gulf of Maine Task Force

Research & Innovation

- University of Maine Demonstration Project
- Gulf of Maine Research Array
- Maine Offshore Wind Research Consortium

Policy & Legislation

- Bipartisan legislation supporting Research Array, Research Consortium, and prioritizing federal waters for commercial OSW

Partnerships

- University of Maine
- Regional Wildlife Science Consortium for OSW
- National Offshore Wind R&D Consortium
- Responsible Offshore Science Alliance
- Business Network for Offshore Wind
- MOU with United Kingdom

Maine
Offshore Wind
Initiative

Maine Offshore Wind Roadmap

Led by Governor's Energy Office with Support from Other State Agencies

Advisory Committee

GEO, Working Group Co-Chairs and Other Public, Private and Non-governmental Leaders

Working Groups:

Technical knowledge and subject matter expertise

- Supply Chain, Workforce, Ports & Marine Transportation
- Renewable Energy Markets & Strategy
- Fisheries
- Environment & Wildlife

Focus on Economic Opportunities and Socioeconomic Impacts

Focus on Research/Data Gaps and BOEM Process

Maine Offshore Wind Roadmap

Led by Governor's Energy Office with Support from Other State Agencies

The Maine Offshore Wind Roadmap is supported by a $2.16 million federal Economic Development Agency Grant awarded to GEO in 2020. The Roadmap supports the State's 10-Year Economic Development Plan.

96

Members of Working Groups and the Advisory Committee building the Roadmap

75+

Public Working Group and Advisory Committee meetings from July 2021 - Present

Technical Studies

- Supply Chain Opportunity Assessment
- Maine and New England Energy Analysis
- Ports Infrastructure Studies
- Workforce Development
- Socioeconomic Analysis
- Transmission Analysis

maineoffshorewind.org

Key Themes and Cross-Cutting Topics from the Working Groups

- Advance renewable energy markets to reach climate goals
- Foster economic development opportunities through investments in supply chain, infrastructure, and workforce
- Support and sustain Maine's fisheries and coastal communities
- Preserve the Gulf of Maine environment and wildlife
- Advance Maine-based innovation

Cross-cutting topics:

- Regional coordination and collaboration
- Ongoing stakeholder engagement and communications
- Equity
- Transparency and data-driven decision-making

https://www.maineoffshorewind.org/working-group-recommendations/

Notable Recommendations from the Working Groups

Environment and Wildlife Working Group

- Map Existing Data:
  - Conduct a mapping exercise in mid-2022 that collates existing data available in the GoM to identify where areas of greatest conflict between offshore wind energy development and wildlife may currently exist in GoM federal waters and identify data gaps that need to be filled in to inform offshore wind leasing.

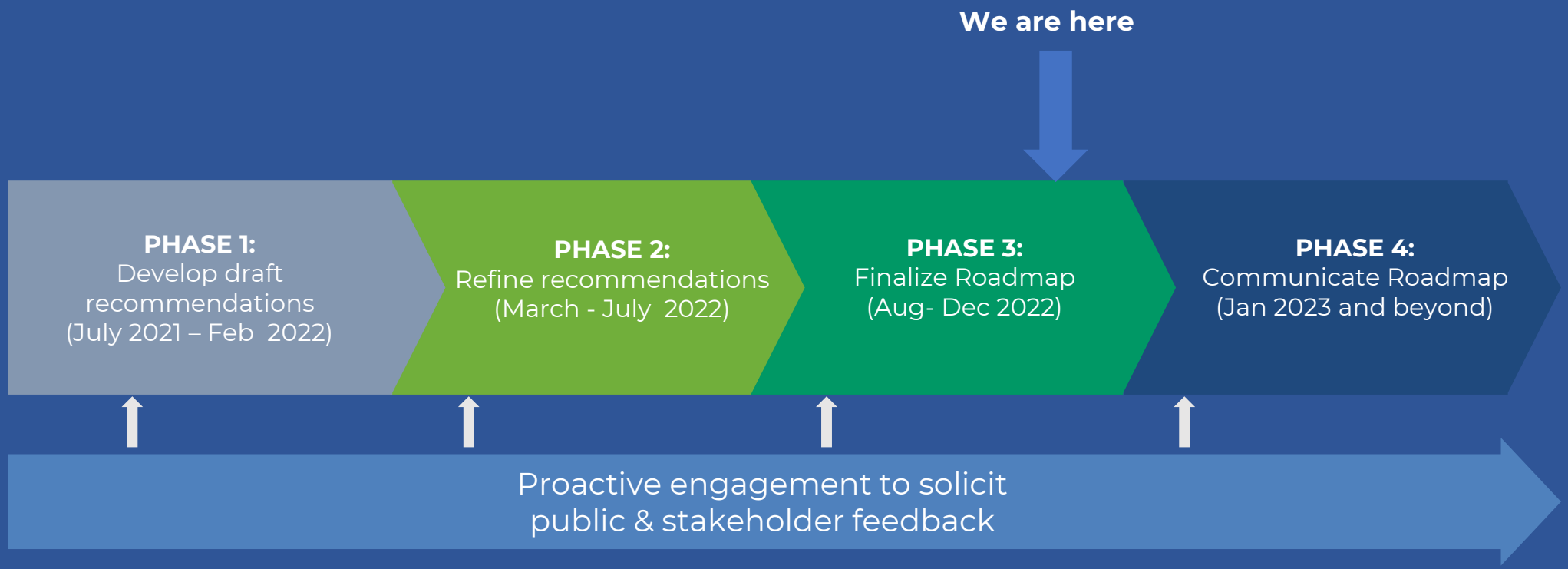
Fisheries Working Group

- In the near term and ongoing, the State should engage with fishermen, scientists, and other stakeholders with expertise in fisheries, wildlife, and the environment to compile and map the areas of known concentration of priority species and habitat and fishing activity in order to appropriately site wind energy lease areas in the Gulf of Maine.

https://www.maineoffshorewind.org/working-group-recommendations/

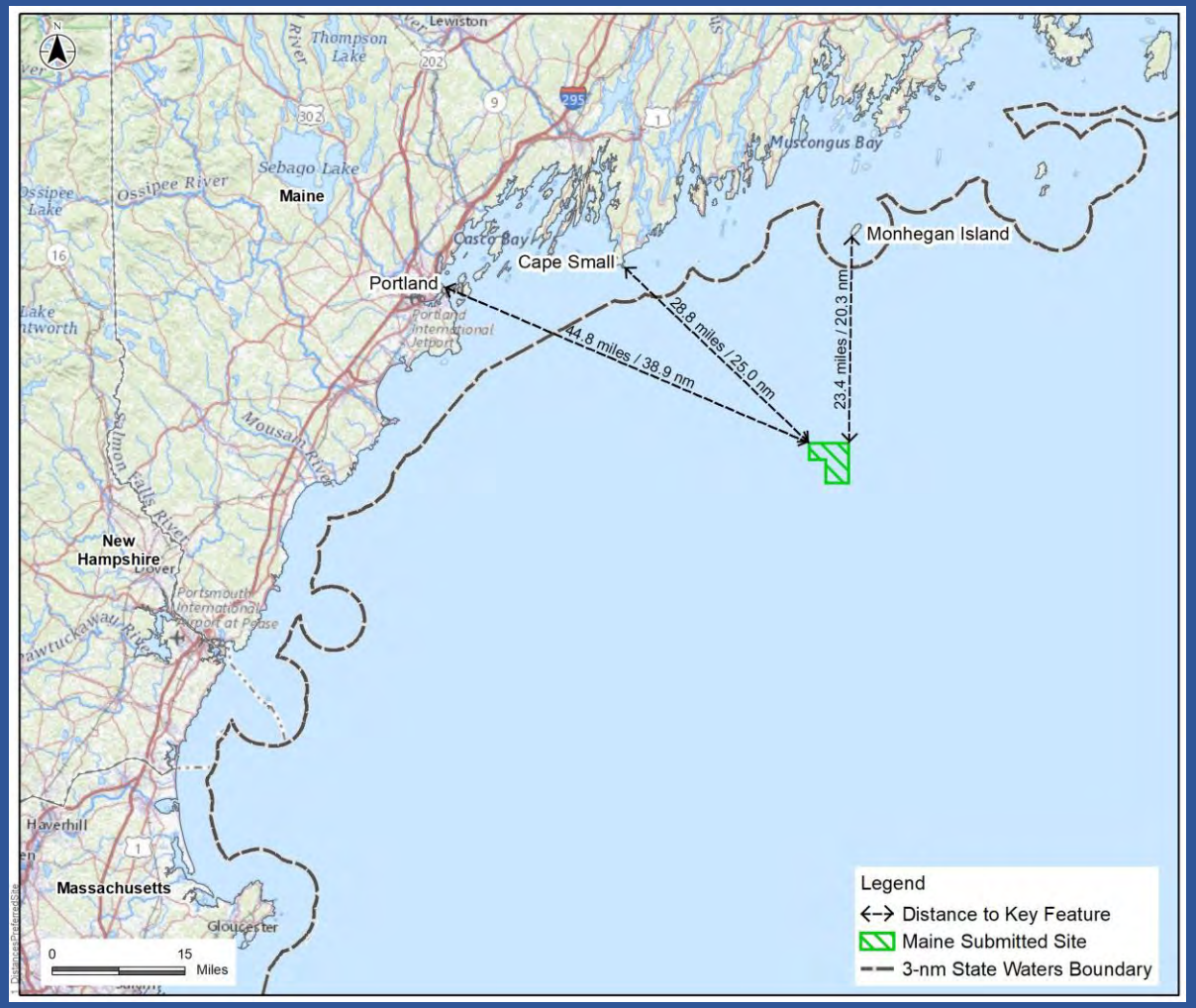
Where we are in the Process

Roadmap Timeline and Milestones



maineoffshorewind.org

Gulf of Maine Floating Offshore Wind Research Array



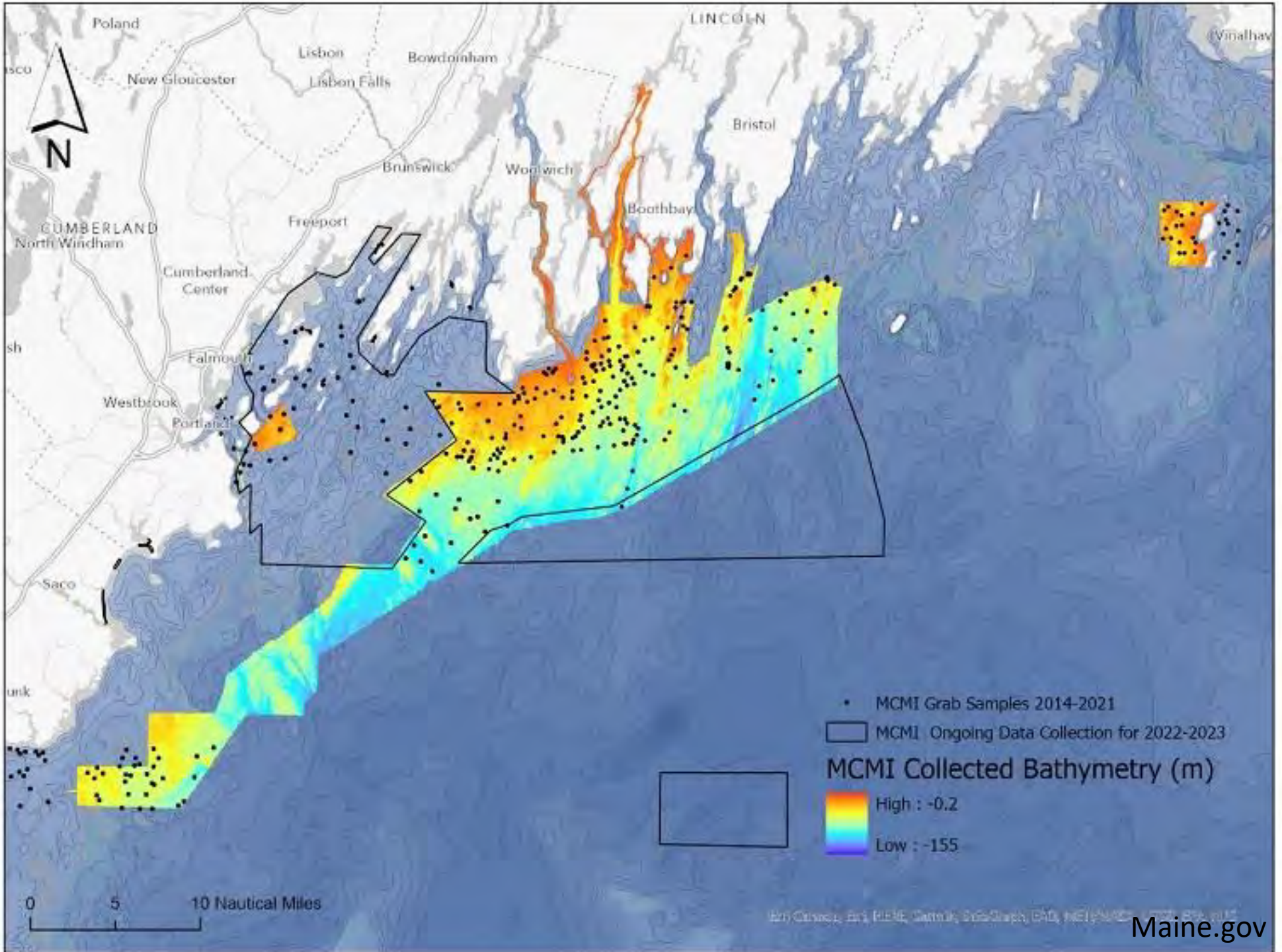
Why A Floating Research Array?

- **Advance** phased approach to floating technology as seen worldwide
- **Research** the effects of multiple floating turbines on marine life, fishing, and more
- **Maximize** research and innovation in floating offshore wind to help grow U.S. floating supply chain
- **Support** UMaine's public-private partnership
- **Work** with fishing, environmental, and other marine interests to answer important questions
- **Use** the experience to inform the work of the offshore wind roadmap and future projects, including lowering the cost of floating wind in the Gulf of Maine

Maine Research Array

- **Located in the “Petterson Mud”, fine grain mud**
- **Upper boundary approximately 43 km offshore**
- **Area of approximately 40 km^2**
- **Depth between 165 and 182 m**
- **Up to 12 turbines**

Survey	Collaborating Agency	Data
Active Acoustic Survey	Gulf of Maine Research Institute (GMRI)	Pelagic fish schools, demersal fish biomass, invertebrate biomass, depth of biological maximum, size-spectral analysis of pelagic community
eDNA Sampling	GMRI	Ground truth acoustic signals, identify species
Zooplankton Survey	Bigelow Lab	Zooplankton distribution and aggregation, community characterization, abundance and seasonal timing of lobster larvae
Bottom Trawl Survey		Fish and invertebrate species composition, biomass, abundance
Lobster Survey		Characterization of lobster population
Passive Acoustic Monitoring		Presence of marine mammals, ambient noise levels
Seafloor Habitat Characterization	University of Maine	Seafloor and water column samples, multibeam sonar surveys
Large Pelagic and Benthic Fish Monitoring	University of Maine	Distribution and habitat use of large pelagic and benthic fishes, species assemblage, small-scale movement of individuals
Oceanography	University of Maine and WHOI	Physical oceanographic, biogeochemical, and biological data
Ecosystem Modeling	Various	Ecosystem connectivity, cascading effects
Local Historical Knowledge and Mapping	University of Maine and Maine Coast Fishermen's Association	Current and past use of area, fisheries support mechanisms, potential impacts on culture, identity, economic growth, and/or ecological changes, general attitude towards OSW


Poland
LINCOLN
Lisbon
Bowdoinham
New Gloucester
Lisbon Falls
Bristol
N
Brunswick
Woolwich
Boothbay
Freeport
CUMBERLAND
North Windham
Cumberland
Center
Falmouth
Westbrook
Portland
Saco
MCMI Grab Samples 2014-2021
MCMI Ongoing Data Collection for 2022-2023
MCMI Collected Bathymetry (m)
High : -0.2
Low : -155
0
5
10 Nautical Miles

Maine.gov

Contributed Comments to BOEM Documents and Regulations

- Fisheries Compensatory Mitigation
- 2024 Environmental Studies Program Recommendations
- Guidance for Submission of Offshore Wind Project Plans
- RFI for Commercial Lease Areas

Overarching themes of comments:

- Cumulative impact assessments
- Increased communication with fishing industries

- BOEM will have meetings with fishers in Maine January 2023

Starting the Planning Process in the Gulf of Maine: First Steps

BOEM
Bureau of Ocean Energy Management

Commercial Track

Request For Interest (RFI)

Non-Competitive Leasing Process: Commercial Lease

Comment Period → Determination of Competitive Interest → NO → Environmental Assessment → Non-Competitive Lease Issuance

YES → Competitive Commercial Leasing Process

Call for Information
Area Identification (Wind Energy Areas)
Proposed Lease Areas
SALE
Final Lease Areas

Comment Period → Determination of Competitive Interest → NO → Environmental Assessment → Non-Competitive Research Lease Issuance

Request For Competitive Interest (RFCI)

Non-Competitive Leasing Process: Research Lease

Research Track

August 2022

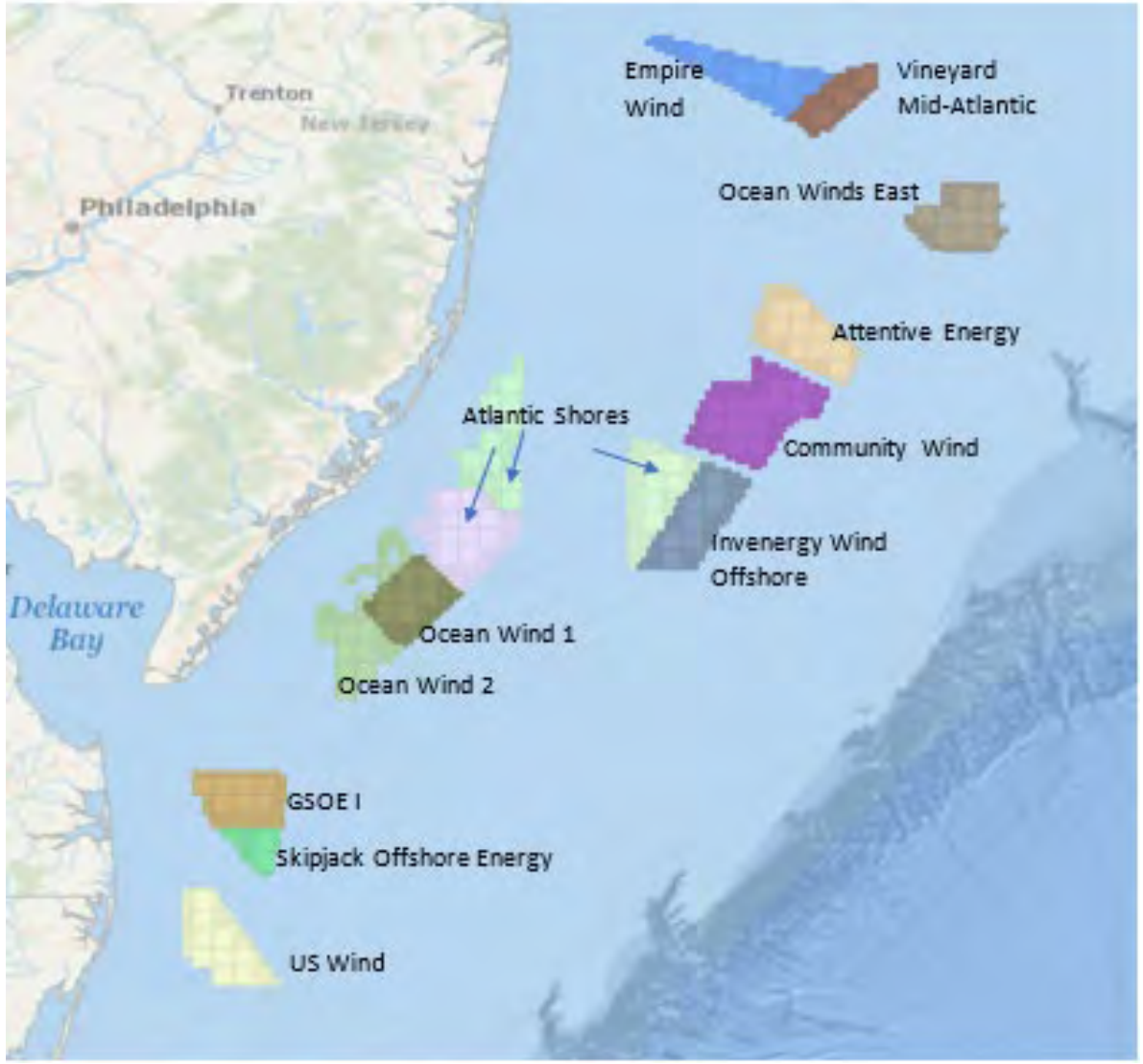
boem.gov

Regional Research Updates from New Jersey

December 19, 2022

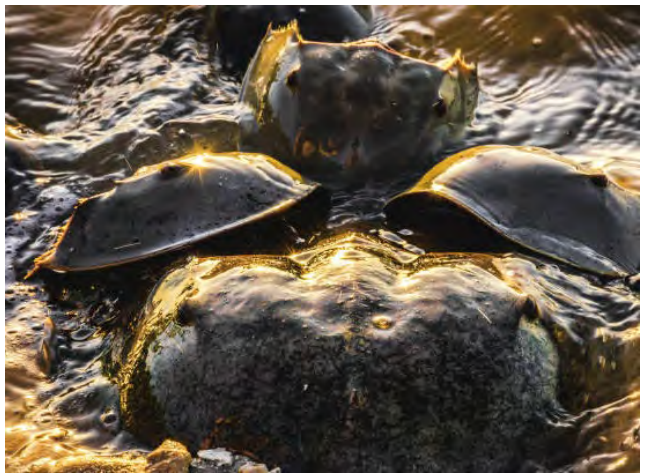
NJ's Offshore Wind (OSW) Goals

- The state's offshore wind target is 11 GW by 2040.
- Three projects in development with a 3rd solicitation draft guidance currently out for comment.
- Goal is OSW development with minimal impacts to natural resources.



New Jersey's Offshore Wind Research & Monitoring Initiative (RMI)

- Initial funding through NJ's 2nd Offshore Wind Solicitation
- $10K/MW for research and monitoring on wildlife and fisheries
- Research priorities developed in house and stakeholdered
- Projects developed in collaboration with subject matter experts
- Project funding awarded through contracts with state universities, NJ Sea Grant Consortium members, and through RFPs



Identifying Resources of Concern

- Stakeholder Concerns, including findings of Regional Groups (i.e., RWSC & ROSA)
- Species that are threatened, endangered, or protected
- Species sensitive to a particular effect
- Habitats likely to be significantly altered
- High-value habitats
- Fisheries that operate in or travel through WEA
- Fisheries with high social or economic value
- Fisheries likely to be affected by presence of turbines or cables

Regional Wildlife Science Collaborative Support

Responsible Offshore Science Alliance Support

Novel Clam Survey Dredge & Carbonate Chemistry

Socioeconomics of recreational fisheries pre-OSW

Using OSW structures as monitoring platforms

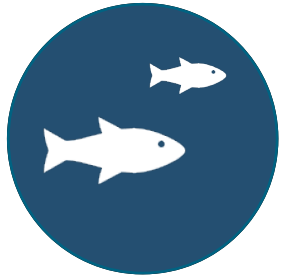
Gliders for ecological & oceanographic monitoring

Passive acoustic monitoring for baleen whales

Acoustic telemetry for commercial & recreational fish

Harbor seal tracking & health assessment

Projects approved for funding



eDNA for commercially- & recreationally-important fishes

Whale satellite tagging

Benthic habitat mapping

Near real-time passive acoustic monitoring of whales

GIS tool for research & monitoring efforts

New Jersey Ocean Trawl Mitigation

Sea turtle tagging

Expansion of the Motus network for birds & bats

Projects in development

Challenges

- Stakeholder fatigue
- Research capacity
- Data standardization and accessibility
- Accessibility of science
- Not enough information on how to mitigate fisheries losses
- Loss of access for surveys

Next Steps: Phase II

- 3rd party process review
- Move beyond pre-construction
- Seek innovations in mitigation

Joe.Cimino or Colleen.Brust@dep.nj.gov

Marine Resources Administration

https://dep.nj.gov/offshorewind/rmi/

Federal Updates

NMFS Update

NOAA FISHERIES

Greater Atlantic Regional Fisheries Office

Northeast Fisheries Science Center

Douglas W. Christel
Andy Lipsky
Lisa Methratta

December 19, 2022

Source: www.workboat.com

Survey Mitigation Strategy

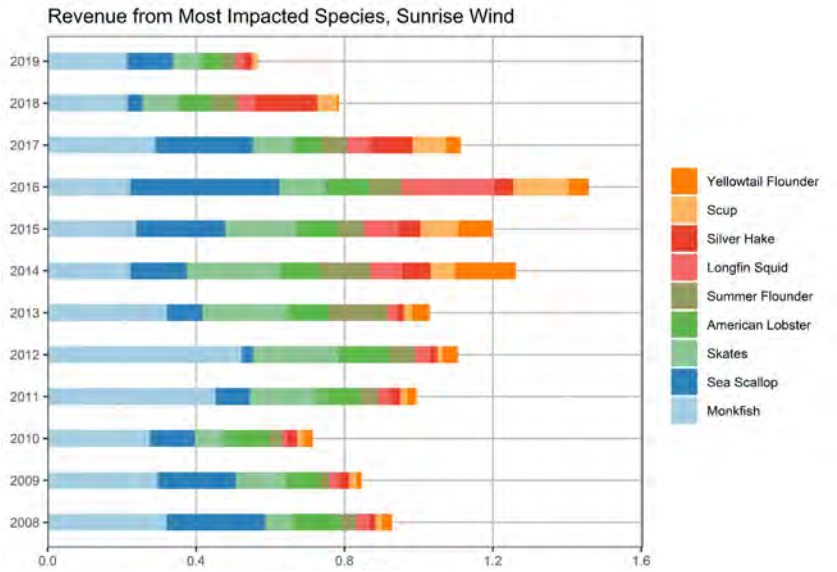
Final strategy published December 5

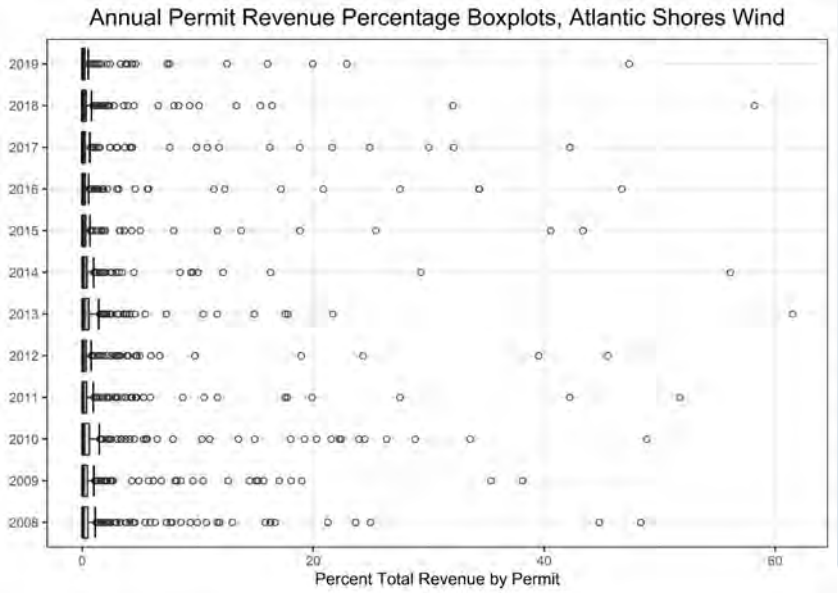
Five goals of the strategy:

1. **Mitigate wind project impacts on NOAA surveys**
2. **Evaluate and integrate monitoring studies**
3. **Collaboratively plan/implement survey mitigation**
   - Integrate partners, stakeholders, and other ocean users
   - Use the principles of best scientific information available and co-production of knowledge
4. **Adapt the strategy, as needed, recognizing:**
   - Dynamic nature of wind energy development
   - Evolution of survey technology/approaches, marine ecosystems, and human uses
5. **Advance coordination between NOAA Fisheries and BOEM**
   - Share lessons learned with other regions/nations

NOAA FISHERIES

Wind Socioeconomic Impacts





- Commercial and party/charter
- Annual landings/revenue
- FMP, species, gear, port, state
- Species/area dependence
- Vessel/trip and small/large entity counts
- Yearly regional % totals

2020 and 2021 Data Now Available

NOAA FISHERIES

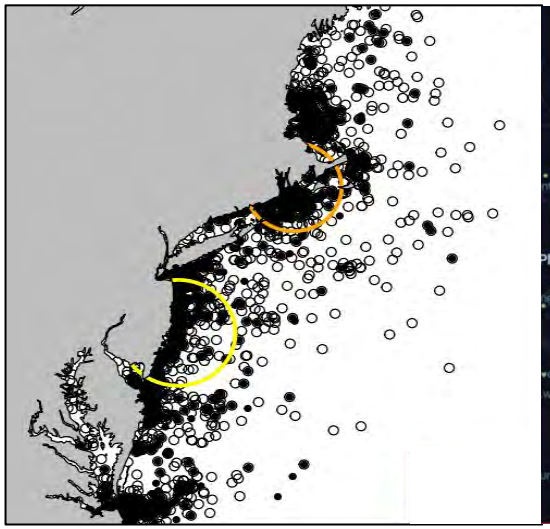
Pending Research Publications

Allen-Jacobson et al. 2023

- Compared study fleet data to fishing footprint data

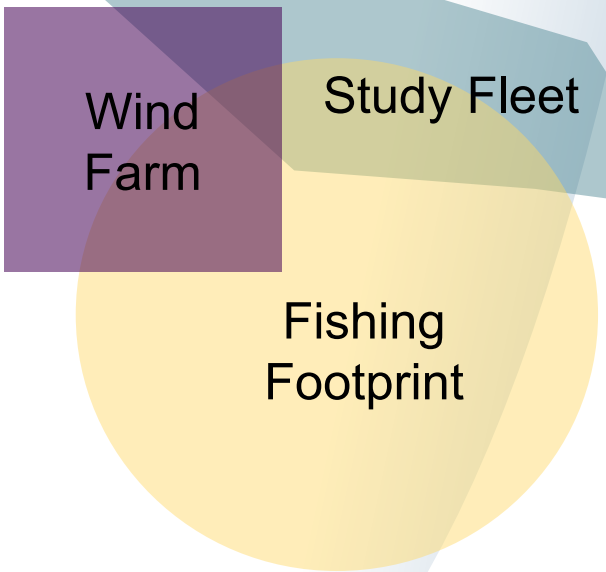
DePiper et al. 2023

- Mapping alternative private recreational fishing data sources



FishRules App Data - Black Sea Bass

FishBrain App Data - Black Sea Bass



NOAA FISHERIES

Pending Research Publications

Methratta et al., 2023

- Identifies NMFS GAR research priorities and includes:
  - Research questions under each priority
  - Temporal scale and resolution
  - Need for baseline data
  - Available methods/approaches
  - Importance to NMFS and management implications

Hogan et al., 2023

- RODA, NMFS, BOEM Synthesis of the Science on fisheries interactions with offshore wind

Friedland et al., 2023

- Uses species distribution models to explore preferential use of wind energy areas by forage fish

Chaji and Werner, 2023

- Evaluates scallop effort displacement from proposed wind projects

NOAA FISHERIES

Pending Research Publications

Jech, et al. 2023

- Observations of 3D biomass within the Block Island Wind Farm using conventional and volumetric echosounders

Van Hoeck et al., 2023

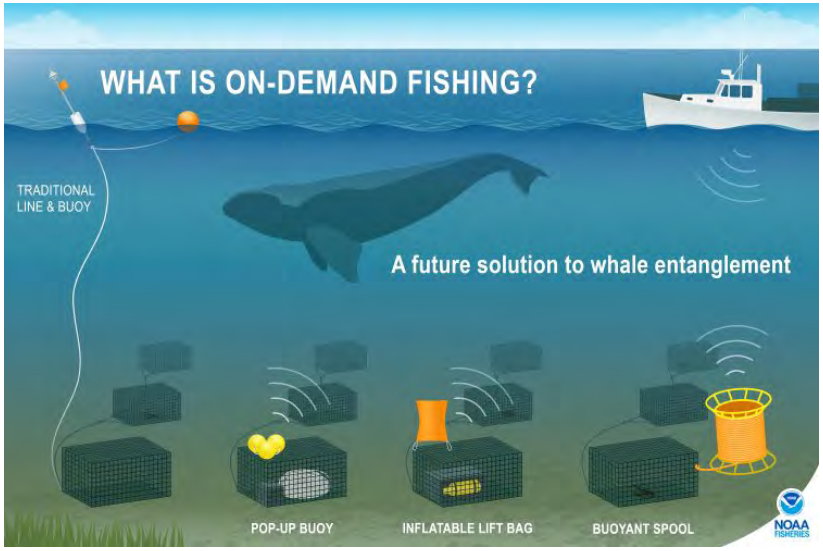
- Compares Atlantic cod temporal spawning dynamics across a biogeographic boundary using passive acoustic monitoring (PAM) methods

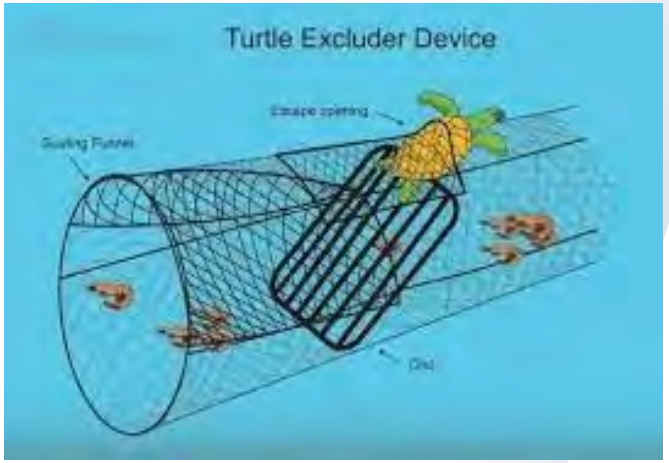
McCandless et al., 2023

- Synthesizes information, knowledge gaps, and research recommendations for pelagic highly migratory finfish

Protected Species Guidance

- Intended to assist researchers and developers
- Outlines protected species permitting issues for fisheries surveys and monitoring activities
- Includes guidance for work conducted during fishing operations or scientific research activities
- Will be posted on the GARFO wind website soon





NOAA FISHERIES

Integrated Ecosystem Assessment

- Science-based process for conducting Ecosystem-Based Management
- Provides decision-support information
- Initial scoping underway for offshore wind and fisheries interactions in the Gulf of Maine

NOAA FISHERIES

Other Initiatives

On-Demand/Ropeless Lobster Fishing EFP

- Operations will occur February 1 through April 30 in the South Island and the Massachusetts Restricted Areas (pink area)

- **Lobster trawls buoys will not be visible on the surface**
- Trawl locations can be identified via the EdgeTech TrapTracker App available (subscription required)
- Please contact Brian Galvez for more information (brian.galvez@noaa.gov)

Fisheries Survey/Monitoring Plans

Project	Trawl	Trap & Pot	Dredge	Gillnet	Telemetry	Rod & Reel	Camera/ BRUV	eDNA	Plankton
Vineyard Wind 1	x	x			x		x		x
South Fork	x	x		x	x				
Ocean Wind 1	?	x	x			x	x	x	
Revolution Wind	x	x			x		?		
CVOW		x							
Empire Wind	x				x		x	x	
Sunrise Wind	x				x		x		
Mayflower Wind	x	x					x		x
Atlantic Shores S	x	x	x						
US Wind		x							
New England Wind	x	x					x		x

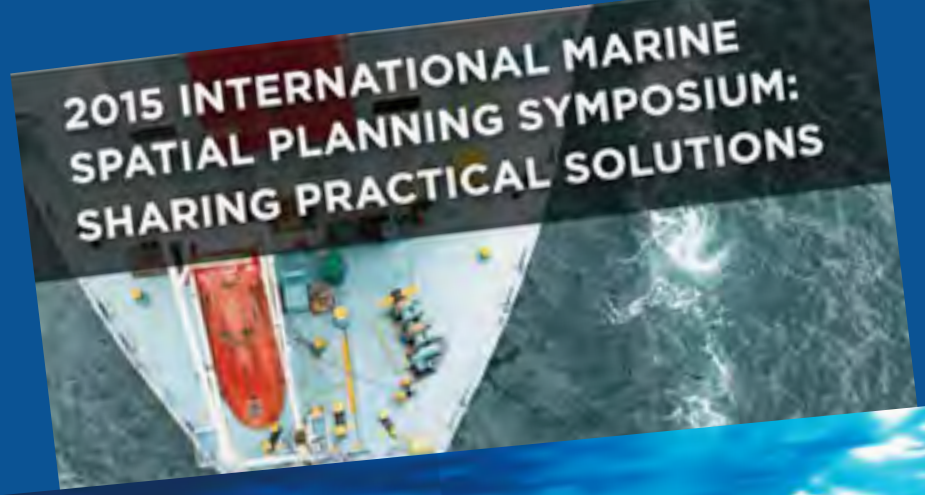
NOAA FISHERIES

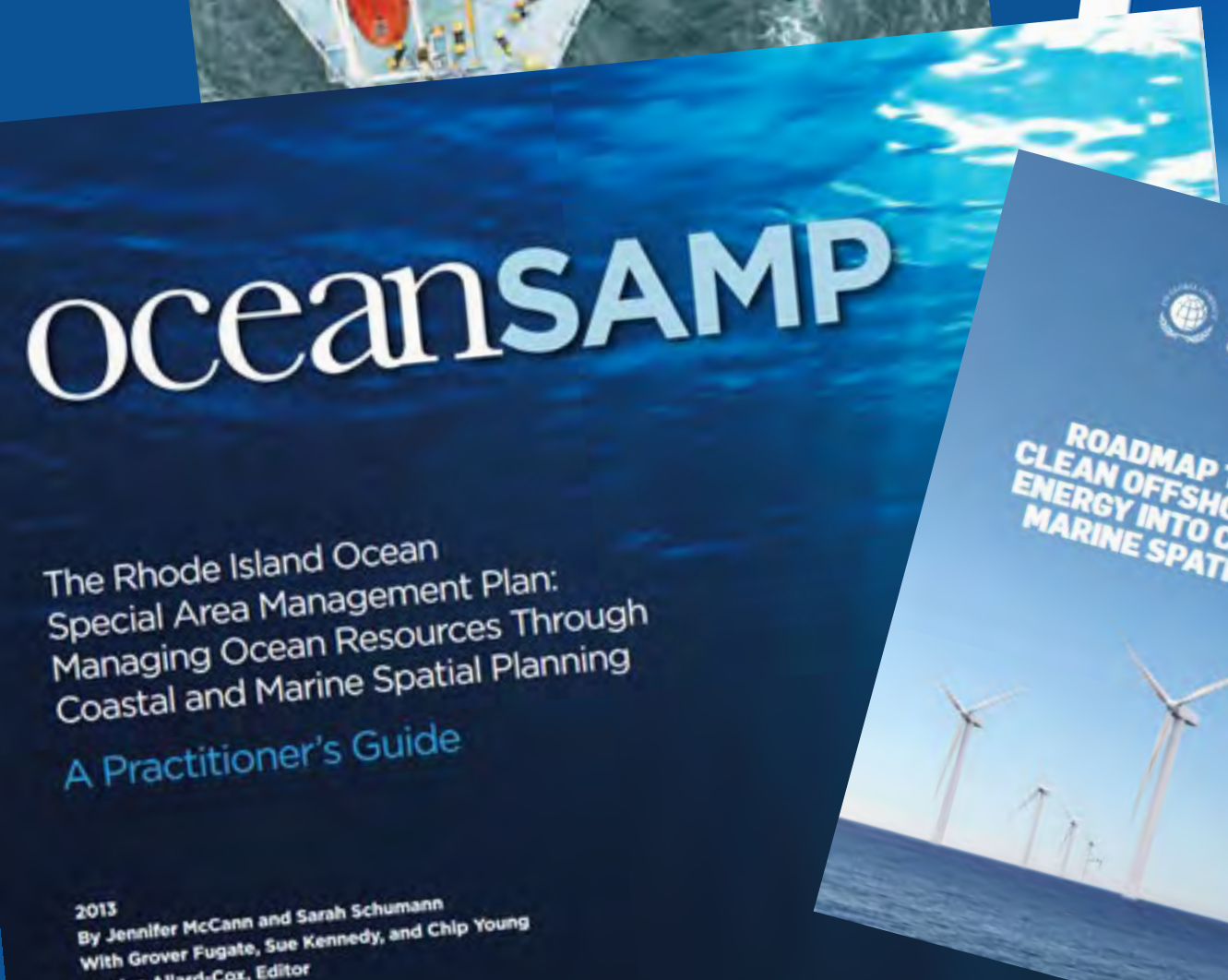
Fisheries Survey/Monitoring Plans

Issues and concerns:

- Lack of regional coordination and standardization
- Clearly defined study questions/hypotheses, linked to methods with and that have a well defined rationale
- Absence of studies of specific impact producing factors
- Inconsistent approaches and methods/gear
- Adequate baseline data collection (1 vs. 3 years)
- Appropriate sampling design (e.g., BACI, BAG)
- Adequate sample size and power analyses
- Appropriate analytical methodologies
- Accounting for likely sources of variation
- Data storage, sharing, and access

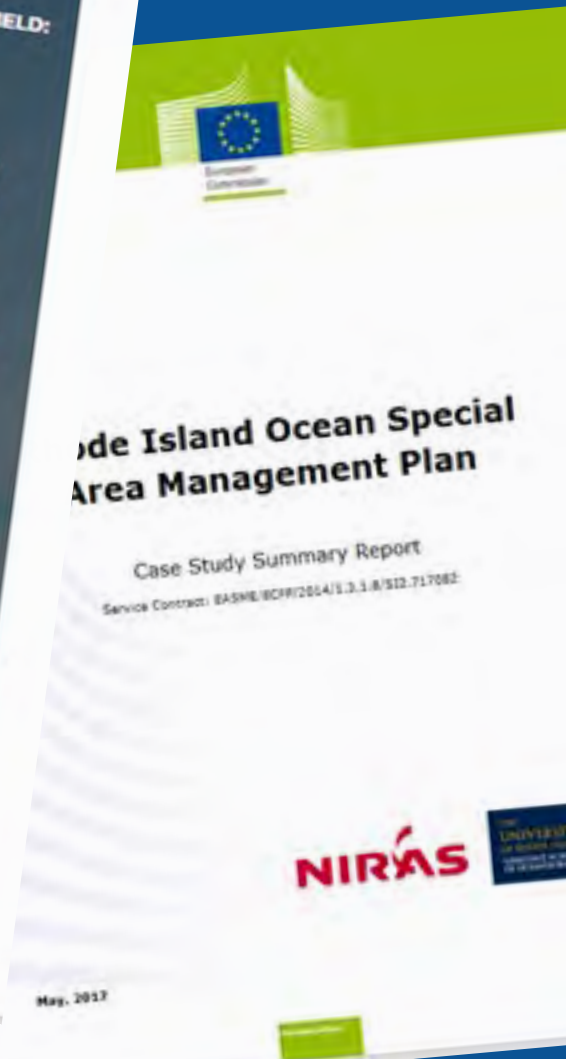
NOAA FISHERIES


2015 INTERNATIONAL MARINE SPATIAL PLANNING SYMPOSIUM: SHARING PRACTICAL SOLUTIONS


oceanSAMP
The Rhode Island Ocean Special Area Management Plan: Managing Ocean Resources Through Coastal and Marine Spatial Planning
A Practitioner's Guide
2013
By Jennifer McCann and Sarah Schumann
With Grover Fugate, Sue Kennedy, and Chip Young


OCEAN STEWARDSHIP COALITION
ROADMAP TO INTEGRATE CLEAN OFFSHORE RENEWABLE ENERGY INTO CLIMATE-SMART MARINE SPATIAL PLANNING


MARINE SPATIAL PLANNING
ADVICE FROM THE FIELD:
Tools and Techniques for Facilitating a Realistic and Effective Marine Spatial Planning (MSP) Process


ode Island Ocean Special Area Management Plan
Case Study Summary Report
NIRAS
May. 2017

OWE Liasion: Expected Outcomes

- Sea Grant programs will have the **capacity to provide assistance** to stakeholders
- Stakeholders' abilities to make **informed decisions** will increase
- Project partners will both see an **increase in the use** of their research and outreach information & be able to use the Sea Grant network to understand additional information and research needs, etc.

Steering Committee

- NOAA Sea Grant
- US DOE, Office of Energy Efficiency and Renewable Energy, Wind Energy Technologies Office
- Northeast Fisheries Science Center (NOAA)
- BOEM
- Responsible Offshore Science Alliance (ROSA)
- Northeast Regional Ocean Council (NROC)
- Northeast Sea Grant Consortium

Onshore Routing in Portsmouth

Routing Analysis

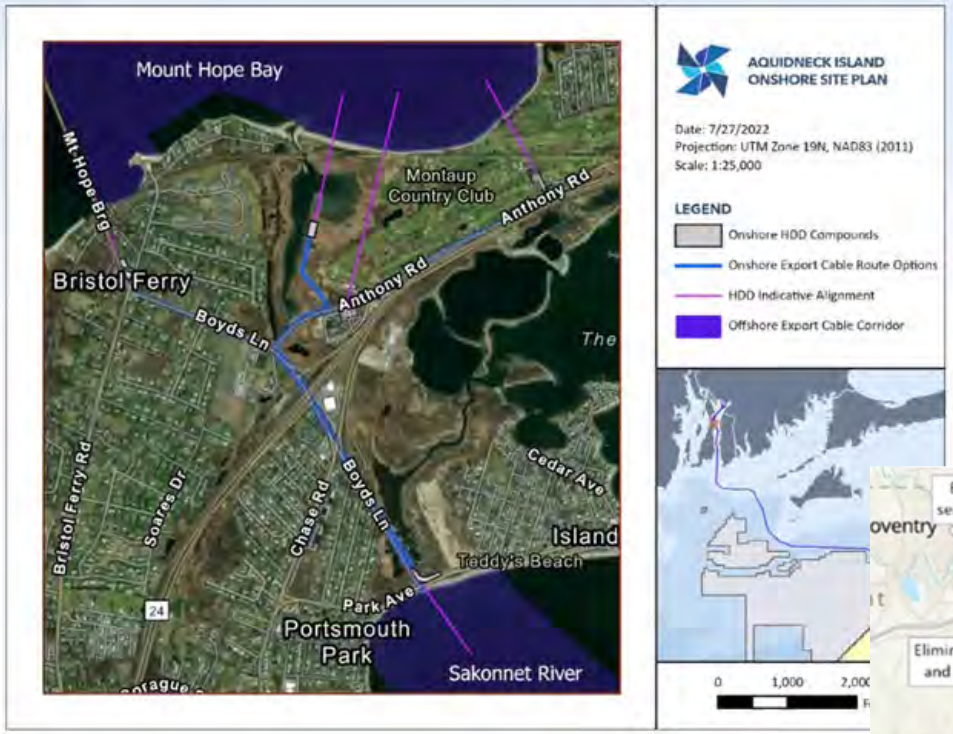
- Designed for the least possible onshore impact
- Follows existing roads
- Prioritizes routes to the northeast to avoid passage through dense residential neighborhoods

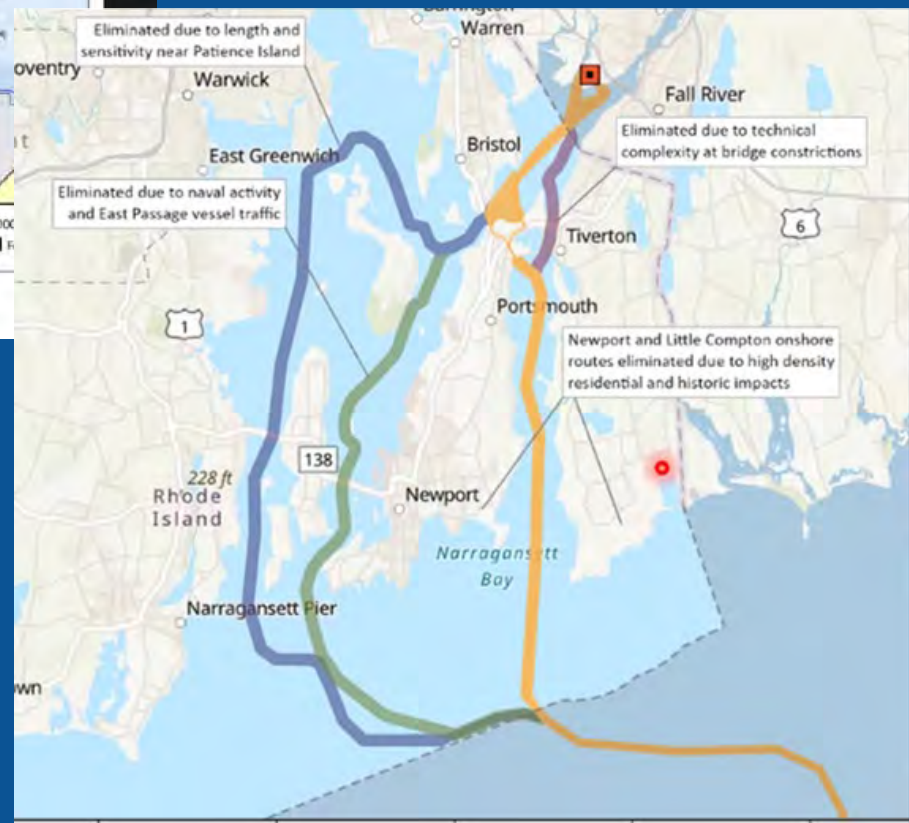
Sea-to-Shore Transitions via HDD

- HDD length ~0.3 mi each

Portsmouth Cable Landing Locations

- From Sakonnet River:
  - **Boyd's Lane** at Park Ave
- Into Mount Hope Bay:
  - **Four options** under consideration





Sea Grant is Boots on the Ground

- Science-based information
- Access to experts

Fishers NGOs OWE DEI

Sea Grant brings people together to:

✓ discuss difficult topics

✓ identify/implement innovative solutions

Thank You!

Jennifer McCann
Sea Grant Offshore Wind Energy Liaison
jmccann@uri.edu

Sea Grant
Rhode Island

Northeast Sea Grant Consortium

Regional research and extension update

- Ocean Renewable Energy
- American Lobster Initiative

Sea Grant Northeast

https://www.northeastseagrant.com/

Gayle Zydlewski, Maine Sea Grant
gayle.zydlewski@maine.edu

Northeast Sea Grant Consortium

UMaine
UNH
MIT
WHOI
URI
UConn
SUNY and Cornell

Regional Initiatives

Sea Grant Northeast

https://www.northeastseagrant.com

Northeast Sea Grant Consortium

2022-2023 – American Lobster Initiative

Scan for ALI StoryMap

American Lobster Research Program

- Currently 24 affiliated projects
- Researchers from 40+ institutions across the Northeast
- Students, industry members, non-profits, government, academia

Northeast Regional Lobster Extension Program

- The 7 Northeast Sea Grant Programs (ME, NH, MIT, WHOI, RI, CT, and NY)
- Adds value to state-specific projects, addresses emerging regional needs
- Informed by a Regional Steering Committee

Sea Grant Northeast

https://seagrant.umaine.edu/extension/american-lobster-initiative/

Northeast Sea Grant Consortium 2022-2023 – American Lobster Initiative

2 Newly Funded Research Projects:

- **PI: Kevin Staples – Maine Department of Marine Resources**
  The purpose of this award is the testing and evaluation of various gear modification technologies aboard commercial vessels, including spring-tag and timed release systems and subsea gear location integrations with chart plotting systems, and will collect information on the performance of these systems and how time spent fishing and trap retrieval success are affected.
- **PI: Erin Pelletier– Gulf of Maine Lobster Foundation**
  The purpose of this award is to provide lobstermen the necessary data imaging tools to navigate a changing environmental and regulatory landscape. The researchers propose new sensor deployments, model development, and data products that will effectively deliver critical information to the fleet.

Northeast Sea Grant Consortium

2022-2023 – Offshore Renewable Energy Partnership with DOE and NEFSC

- **PI: Heather Leslie – University of Maine - Building Capacity for Participatory Approaches to Community Resilience and Ocean Renewable Energy Siting -**
  - characterize values and beliefs in three communities to understand where ocean renewable energy is a good fit for people and place, and develop a community toolkit with maps, surveys, and participatory practices that can be applied across the Northeast.

Sea Grant Maine | The University of Maine Cooperative Extension | NOAA

Marine Science for Maine People

Northeast Sea Grant Consortium

2022-2023 – Offshore Renewable Energy Partnership with DOE and NEFSC

- **PI: Kate Beard-Tisdale – University of Maine - Can Proprietary Commercial Lobstering Data be Used to Inform Offshore Wind Development?** -
  - create a standardized procedure for constructing representations of the Maine lobster fishery using data and knowledge from individual fishermen, and develop data product models and sample products that will inform fisheries management and marine spatial planning.

Sea Grant Maine | The University of Maine Cooperative Extension | NOAA

Marine Science for Maine People

Northeast Sea Grant Consortium

2022-2023 – Offshore Renewable Energy
Partnership with DOE and NEFSC

PI: Alison Bates - Colby College - **Community Engagement and Stakeholder Perceptions of Floating Offshore Wind** -

- develop a stakeholder database, survey tools, and holistic outreach strategy to evaluate community perceptions of offshore wind, identify the capacity and necessary conditions for stakeholders to coexist with offshore wind, and present recommendations for equitable solutions.

Sea Grant Maine | The University of Maine Cooperative Extension | NOAA

Marine Science for Maine People

Northeast Sea Grant Consortium

2022-2023 – Offshore Renewable Energy Partnership with DOE and NEFSC

- **PI: Emily Diamond - University of Rhode Island** - **Evaluating Messaging, Communication Networks, and Public Engagement on Offshore Wind Development in Southern New England** -
  - analyze public engagement strategies, messages, networks, and sources used to communicate and engage communities and stakeholders in decision-making for proposed offshore wind projects, and incorporate community perspectives to make recommendations for effective and equitable messaging and strategies.

Sea Grant Maine | The University of Maine Cooperative Extension | NOAA

Marine Science for Maine People

Northeast Sea Grant Consortium

2022-2023 – Offshore Renewable Energy Partnership with DOE and NEFSC

- **PI: David Bidwell, University of Rhode Island** - **Regional Community Attitudes Regarding Procedural and Distributive Justice Dimensions of Southern New England Offshore Wind Development** -
  - assess community concerns and research questions regarding procedural, distributive, and recognitional justice dimensions of offshore wind projects in southern New England, and work to address barriers within and among communities to ensure equity and well-being for a just energy transition.

Marine Science for Maine People

Northeast Sea Grant Consortium

2022-2023 – Offshore Renewable Energy
Partnership with DOE and NEFSC

- **PI: Maha Haji, Cornell University** - **Achieving Community Resilience by Optimizing Symbiotic Offshore Renewable Energy and Food Systems**
  - develop a mapping tool for spatial planning allowing for the integration of multiple ocean uses in the same area.
  - The goal is to enable symbiosis between renewable energy and food systems and empower stakeholders, fishers, aquaculture farmers, and developers to make informed decisions for long-term resilience.

Marine Science for Maine People

Sea Grant Biennial Research Funding

2024-2026 RFPs open

For more information:

- NY: https://nyseagrant.org/proposals/
- CT: https://seagrant.uconn.edu/funding/grants/
- RI: https://seagrant.gso.uri.edu/research/#funding
- WHOI: https://seagrant.whoi.edu/funding-2/funding/
- MIT: https://seagrant.mit.edu/funding-opportunities-core-rfp/
- NH: https://seagrant.unh.edu/research/funding
- ME: https://seagrant.umaine.edu/funding-opportunities/

New/Continuing Initiatives

- **National**
  - Aquaculture
  - Marine Debris (Infrastructure Bill - $50M over 5 years)
  - Coastal Resilience - *since 2021 working on this focused initiative across the network - Coastal communities are more resilient to **weather and climate hazards** with Sea Grant support through coastal **research, education, engagement, and outreach** that informs and helps improve **planning and risk assessment, disaster preparedness and recovery, resilience design and project implementation**, and by addressing long-standing economic and social inequities that cause some communities to be more vulnerable to the impacts of hazards.*
    - Building off internal and partner discussions about needs/opportunities

National Initiatives - DEIJA

Reaching Outward and Looking Inward
Building Sea Grant Resilience from the lens of
Diversity, Equity, Inclusion, and Justice
10 year vision

Sea Grant Diversity, Equity, Inclusion, and Justice

Community of Practice and Resources page

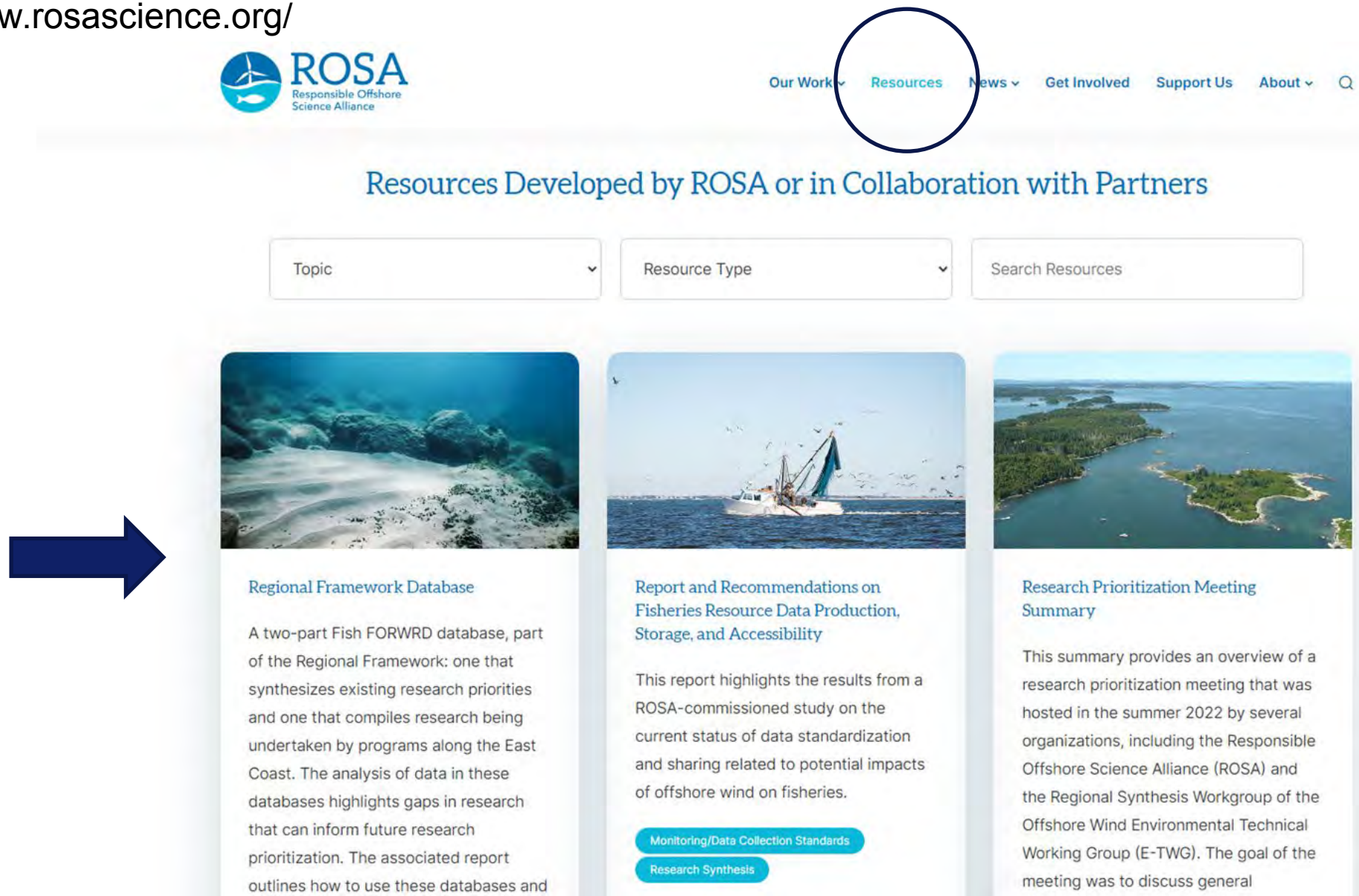
ROSA Updates

New ROSA Website!

https://www.rosascience.org/

New ROSA Website!

https://www.rosascience.org/



Regional Items of Interest

- NYSERDA PON 5226
  - $2.5 million to support environmental & fisheries research
  - Proposals due March 13, 2023 by 3pm ET
- Fisheries Mitigation RFI
  - Comments due by January 31, 2023 by 5pm ET
- NJ OSW Solicitation #3
  - Comments on draft solicitation guidance due December 29, 2022

ROSA

Upcoming Meetings

- **NOAA Cooperative Research Summit**
  - January 31, 2023- Newport News, VA
  - February 15, 2023- Providence, RI

- **AFS Southern Division annual meeting**
  - February 2-5, 2023- Norfolk, VA
  - Session on “Offshore wind and fisheries: monitoring interactions and assessing impacts“

Other Updates

- **Next Quarterly meeting:**
  - Late Spring 2023
  - Focus TBD

- **ROSA Staffing updates**

- Please reach out with topics of interest for meetings or sector-specific calls (mike@rosascience.org)