



Advisory Board

Maine Offshore Wind Research Consortium

Round 2 Research Projects Updates

January 20, 2026

A Few Guidelines for Today

Advisory Board Members

- Please put * in front of your name
- Practice common rules-of-the road: Please raise your hand, share the floor and respect differences of opinion.
- Please use video (if you can) and use hand-raise function (*9 on phone). We'll try to be sure we pause periodically to make sure you can participate fully but shout out if you need to or put ideas in the Chat.

Observers

- Thank you for joining, we are glad you are here. We'll answer Advisory Board questions first but try to make sure we leave time for additional questions as well.
- Please keep video off and so we can focus discussion on the Advisory Board members.
- *Mute unless speaking please (*6 on phone to unmute)*

Meeting Objectives

- Receive brief updates on Research Consortium Round 2 projects
- Provide feedback on work conducted to date on the Baseline secondary entanglement risk assessment and technology feasibility study

Meeting Agenda

- 3:00** **Welcome & Introductions**
- 3:05** **Project Update: Baseline assessment of social, economic, and cultural impacts of FOW development on Maine's fishing industry – *Gulf of Maine Research Institute***
- 3:15** **Project Update: Baseline offshore bat monitoring assessment – *Biodiversity Research Institute***
- 3:25** **Project Update and Feedback Session: Baseline secondary entanglement risk assessment and technology feasibility study – *University of Maine***
- 4:10** **Next Steps and Adjourn**

Baseline assessment of social, economic, and cultural
impacts of floating offshore wind development on
Maine's fishing industry (BOWLINE)

January 2026 Update

Maine Offshore Wind Research Consortium Advisory Board

GMRI, UMaine, URI



Gulf of Maine
Research Institute

Overall Goal:

Baseline assessment of social, economic, and cultural impacts of floating offshore wind development on Maine's fishing industry

Economic Assessment

- Scenario-based assessment
- On the water impacts
 - Fishing ground and landed values, incorporating potential changes in fishing behavior
- Shoreside impacts
 - Shoreside infrastructure
 - Employment & wages

Socio-cultural Assessment

- On the water impacts
 - Collection of "stories from the sea"
- Shoreside impacts
 - Multi-sited case study of select communities, utilizing existing and new interview data and other resources
- Map conversations of OSW impacts



Synthesis: Overall impacts and impacted communities

Engagement

- Inclusive and iterative participation from fishing communities
- Knowledge co-production
- Build stakeholder capacity to understand, critique, and apply the assessment results in their decision making

Economic Assessment



Kanae Tokunaga
Sr. Research Scientist
Coastal and Marine Economics, GMRI



Todd Guilfoos
Associate Professor
Environmental & Natural Resource
Economics, URI

Socio-cultural Assessment



Christine Beitzl
Associate Professor
Anthropology, UMaine

Clea Harrelson (UMaine) - Sociocultural
Ben Cotton and Jay Kim (GMRI) - Economic

Engagement



Hannah MacDonald
Sr. Program Manager
Fisheries Engagement,
GMRI



Chas Van Damme
Project Manager
Energy Solutions GMRI

Maine Coast Fishermen's Association
(Advisor)

External Review

PEER Associates (Project Evaluation)

- Task 1 Literature review
 - Economic impact: federal guidance & guidelines, assessments in Northeast US
 - Spreadsheet and reference list compiled
 - Socio-cultural impacts: social impact assessment methodologies
 - Report drafted, to be sent to DOER for review

- Task 2: Engagement
 - Project Advisory Committee formed
 - Hybrid workshop hosted at the Gulf of Maine Research Institute (GMRI) in Portland, Maine on December 10, 2025.
 - The first half of the workshop was open to the public to listen in via Zoom.
 - The second half was reserved for Project Advisory Committee (PAC) members to engage with the project team.
 - Project webpage
 - Project fact sheet

- What is a “community” (geographic vs. fishery-based vs. relational/at-sea)?
 - Geographic (towns, ports, portsheds)
 - Fishery-based (e.g., groundfish, scallop, lobster)
 - Relational (networks of people operating in similar ways, not tied to place)
 - “Maine fisheries” in federal waters?
- Importance of capturing “ripple effects”
 - Potential disproportionate impacts on smaller fleets and individual fishers
 - Loss of access as an economic and cultural burden, even without total displacement
- Qualitative research helps reveal new and changing relationships and is essential for documenting what truly matters to people

- Harvesters follow the resource; if access is restricted, they must interrupt tows, reroute, or stop fishing, increasing costs and inefficiency
- Displacement could lead harvesters to fish harder elsewhere, causing ripple effects – competition, and pressure on other fisheries.
- Fishing feasibility depends on spacing, cable burial, anchoring systems, and predictability of infrastructure.
 - Preferred conditions for fishing include:
 - Fully buried cables
 - Straight, vertical moorings
 - Adequate spacing between turbines and anchor lines
 - Clear marking, real-time monitoring, and reliable navigation data
- Fishing between turbines may be theoretically possible under ideal spacing (e.g., ~1–1.5 miles), and the design of corridor cables will influence decisions to trawl through

Fishing Footprint (Baseline)

- Identify fishing footprint from VMS and Logbook data
- NOAA Socioeconomic Impacts of Atlantic Offshore Wind Development
 - Describes impacted landings from each wind energy area

Potential Fishery Adaptation

- Elicit potential changes in fishing locations from online/in-person survey using choice experiment

Economic survey using choice experiment

- Geographic Location
- Weather (Wind Speed + Swell)
- Catch Rate/hr
- Inter-array cable design
- Spacing/array density/congestion

Potential Economic Impacts

- Impacts on landings (pounds and value)
- Spillover effects (employment and wages in related economic sectors)

Socio-cultural Impact Assessment Steps

- Review of SIA methodologies done → draft report developed
- Identification of communities
 - Follow up interviews with PAC members
- Goals:
 - Build replicable methodology that can be replicated in the future
 - Gather baseline data



Next steps

- Economic survey development and implementation - feedback on fishing ground labels appreciated
- Socio-cultural assessment interviews
- Project outreach materials

Contact:

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Chas Van Damme
Project Manager, Energy Solutions, GMRI
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Gulf of Maine Bat Research Program

January 2026 Update



January 20, 2025



Project updates—smooth sailing so far!



Study Plan

- Draft Study Plan submitted Dec. 12
 - Received comments from DOER and IFW
- RWSC Bird and Bat Subcommittee to review revised draft
- Advisory Board to review in mid-February
- Developing supplemental section on analytical methods with BCI

Logistics and Equipment

- Working with detector hosts and vessels on spring deployments
- Equipment inventory and purchases –NERACOOS support for buoy equipment
- Testing microphones
- Setting up iNaturalist project with CWS for opportunistic observations
- UMaine site visit on Jan. 23 – buoy detector integration

Gulf of Maine 2025 Acoustic Monitoring Results

- Second year of funding from Maine IFW
 - Mid-summer through late fall
 - Partnership with MCFA, funded by Davis Foundation
 - Acoustic detectors across various sites and platforms: 4 vessels, 1 island, 1 coastal site, 1 buoy
-

Gulf of Maine 2025 Acoustic Monitoring Results

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- Acoustic detectors across various sites and platforms: 4 vessels, 1 island, 1 coastal site, 1 buoy

- ✓ 15 monitoring nights – Sep 16-Oct 1
- ✓ 8 acoustic passes from bats
- ✓ 3 bat species: Eastern Red, Hoary and Silver-Haired

Buoy Station E01, ~4 miles from
Monhegan Island

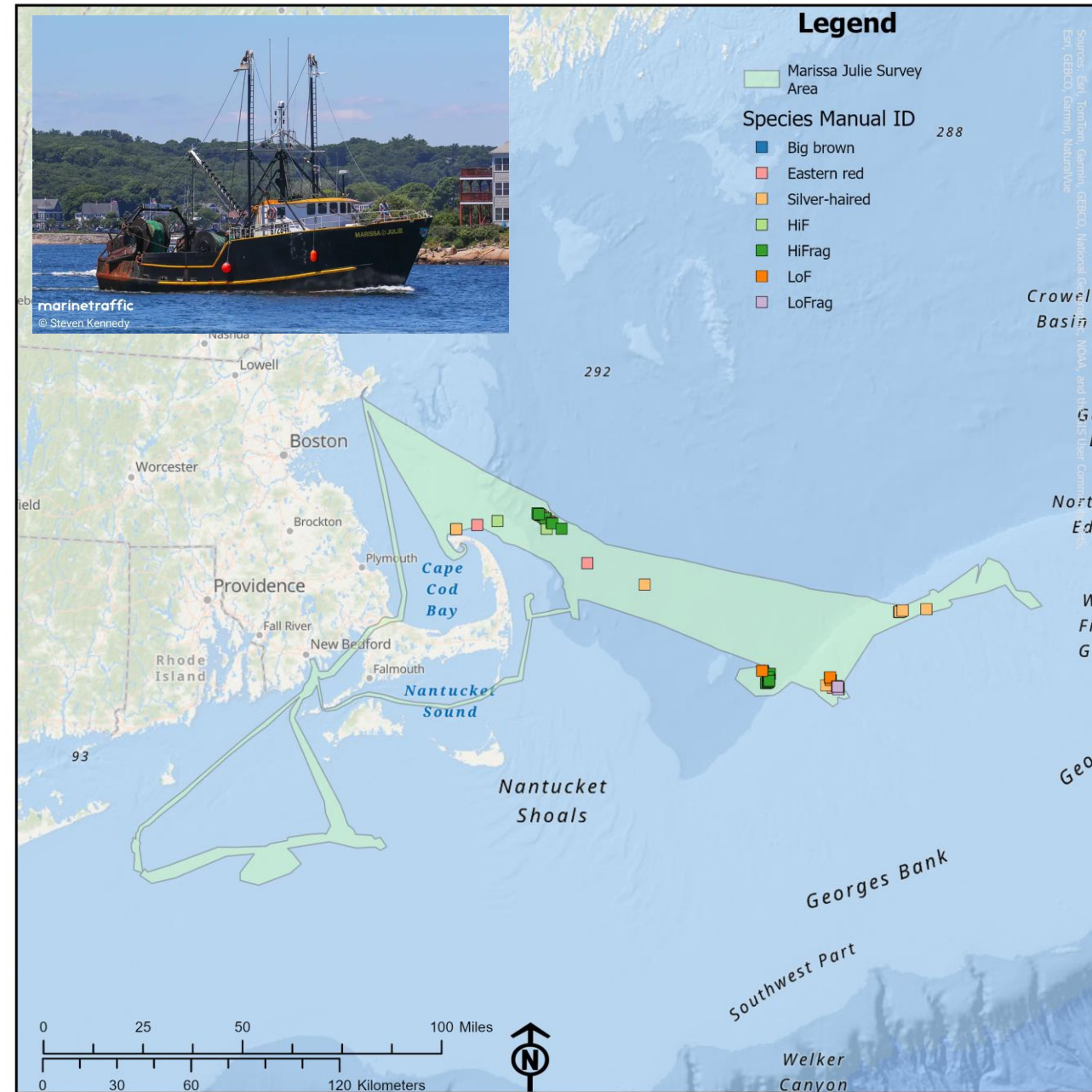


Gulf of Maine 2025 Acoustic Monitoring Results

F/V Marissa Julie, Gloucester, MA



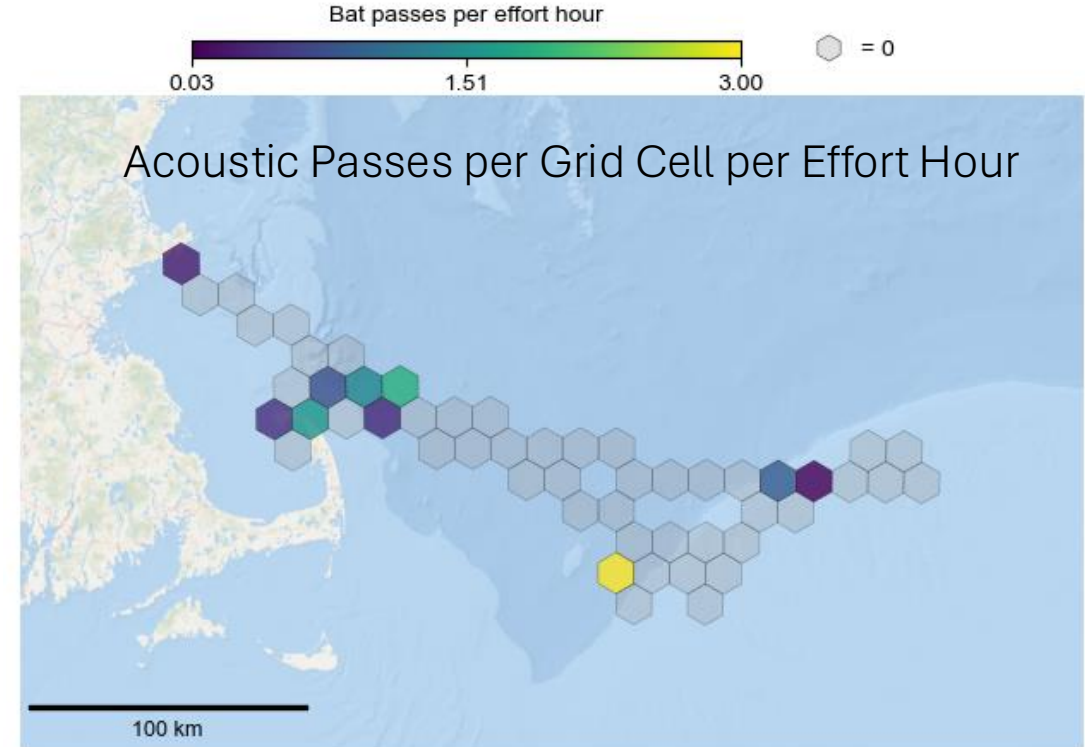
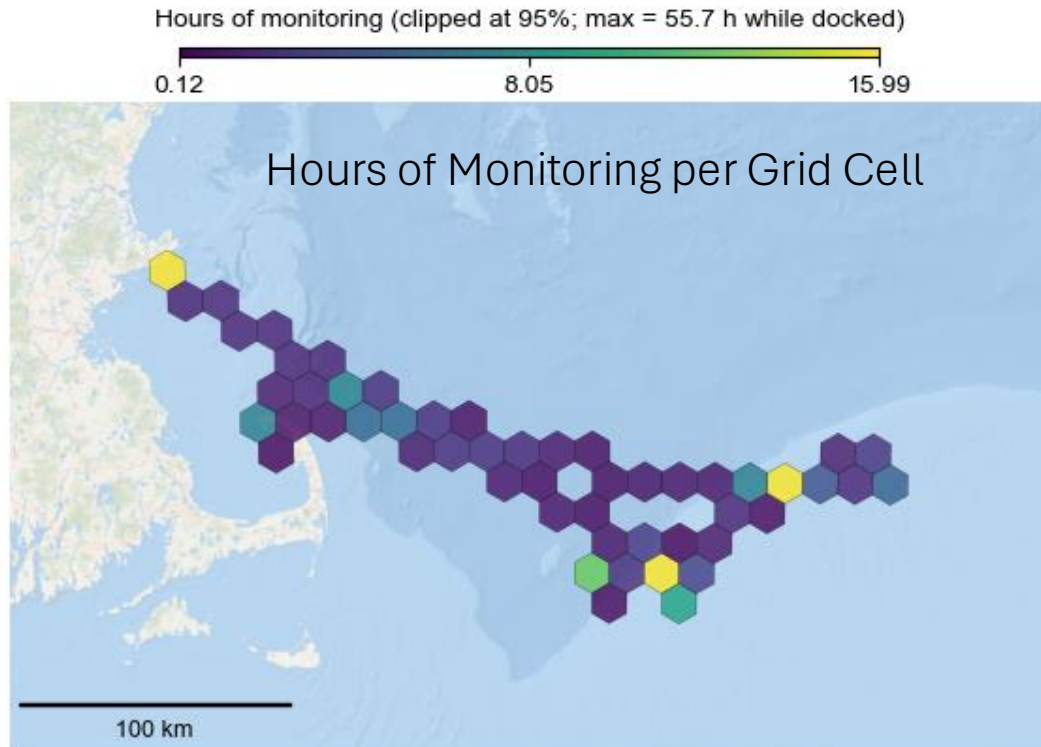
- ✓ 38 offshore monitoring nights – Aug 26-Nov 5
- ✓ 143 acoustic passes from bats offshore
- ✓ 3 bat species: Eastern Red, Big Brown, and Silver-Haired
- ✓ Furthest pass 168 km from shore



F/V Marissa Julie, Gloucester, MA, Aug 26 – Sep 8

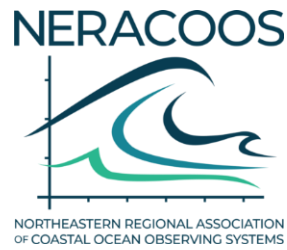
Spatial effort unit: 13 km x 13 km hex grid

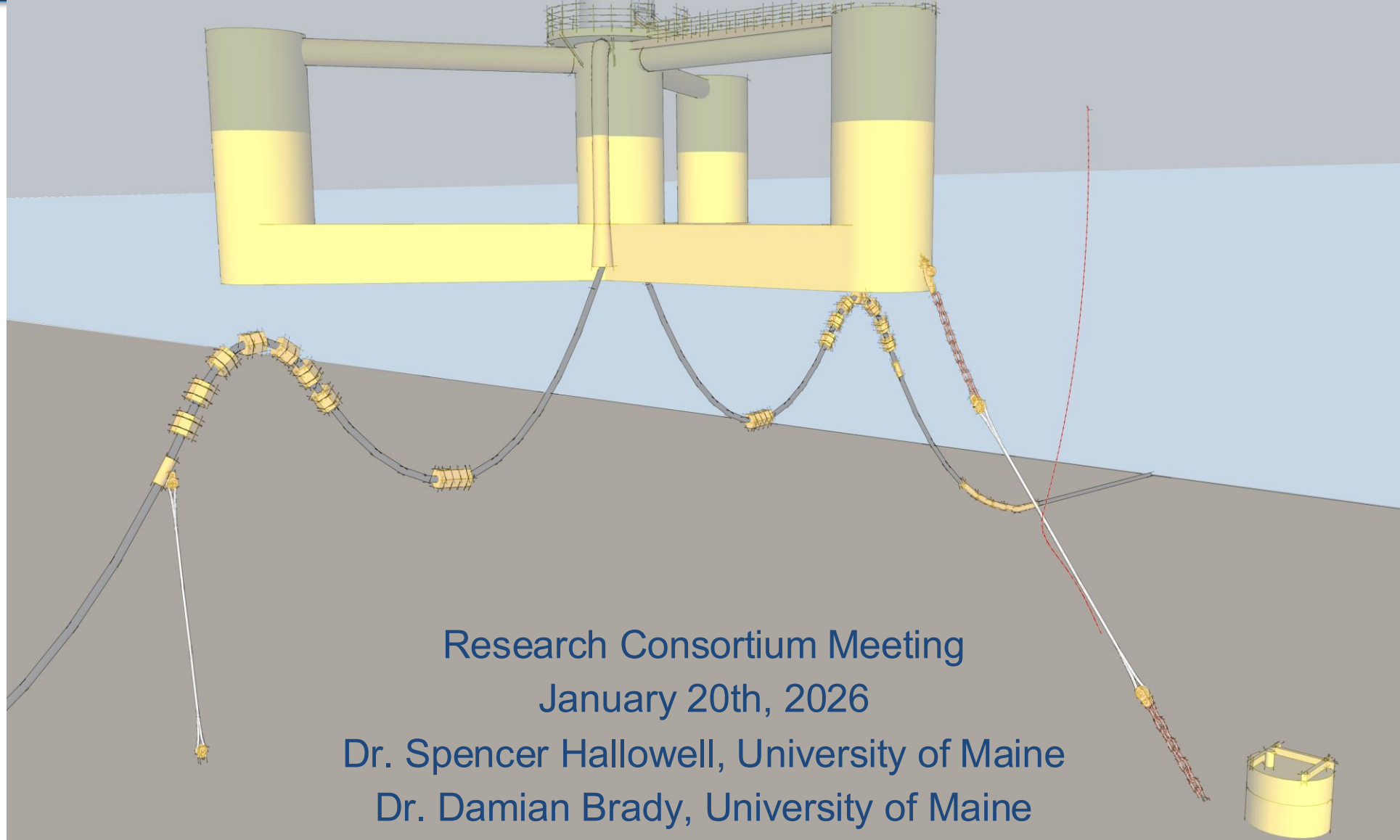
Temporal effort unit: Mean hourly bat acoustic passes



- Developing scripts to generate “snapshot” and compiled data products by site and across sites – spatial, temporal and species trends
- Use 2024-2025 IFW data as test sets for these scripts and to trial occupancy methods

Many thanks to our funders, partners and detector hosts for making this work possible:





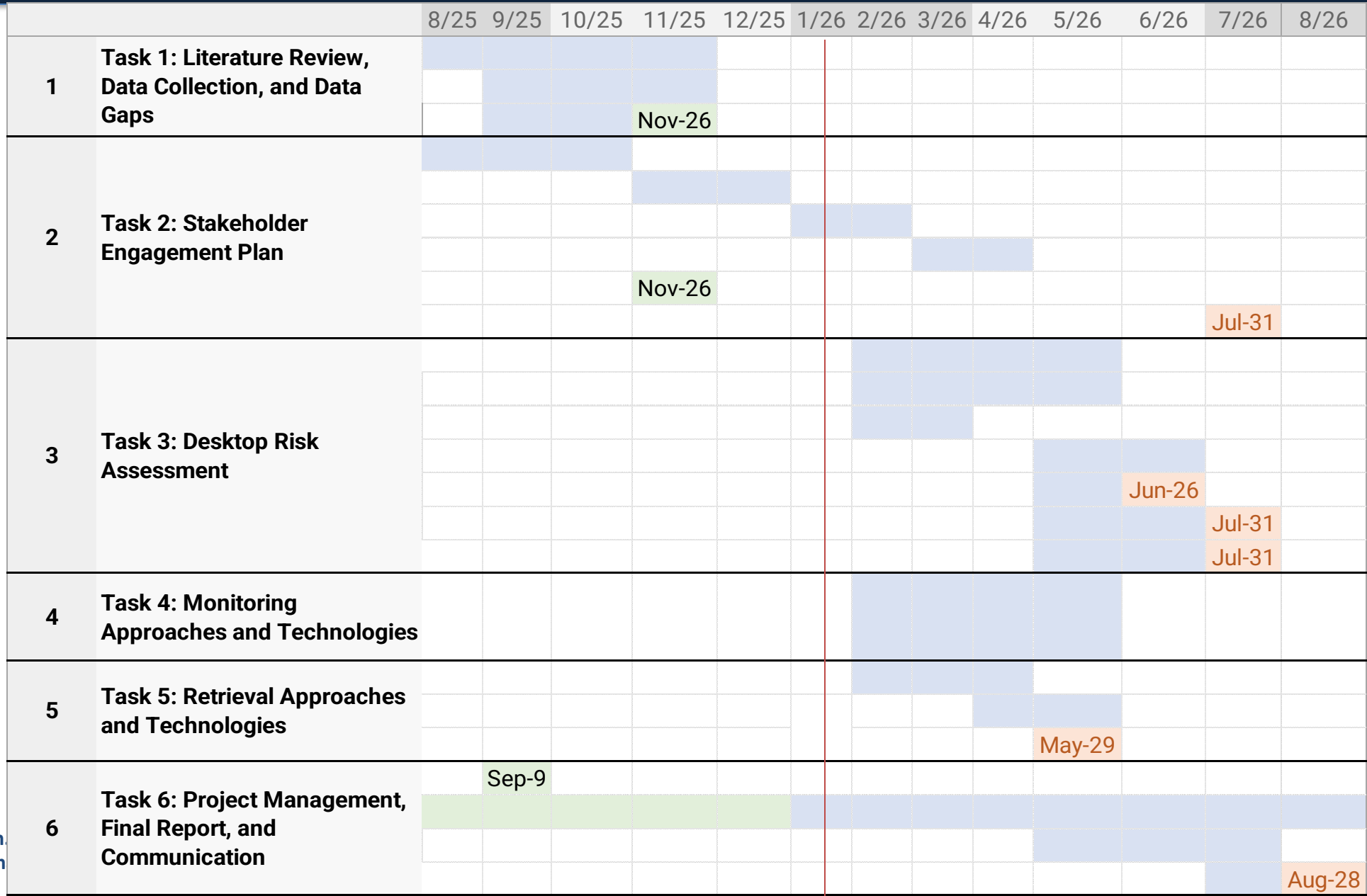
Research Consortium Meeting
January 20th, 2026

Dr. Spencer Hallowell, University of Maine
Dr. Damian Brady, University of Maine
Dr. Everett Rzeszowski, University of Maine

- Research Plan and Timeline
- Progress thus far
 - Literature review
 - Stakeholder engagement plan complete
 - Model setup
 - Global GOME model
 - FOWT/Array model



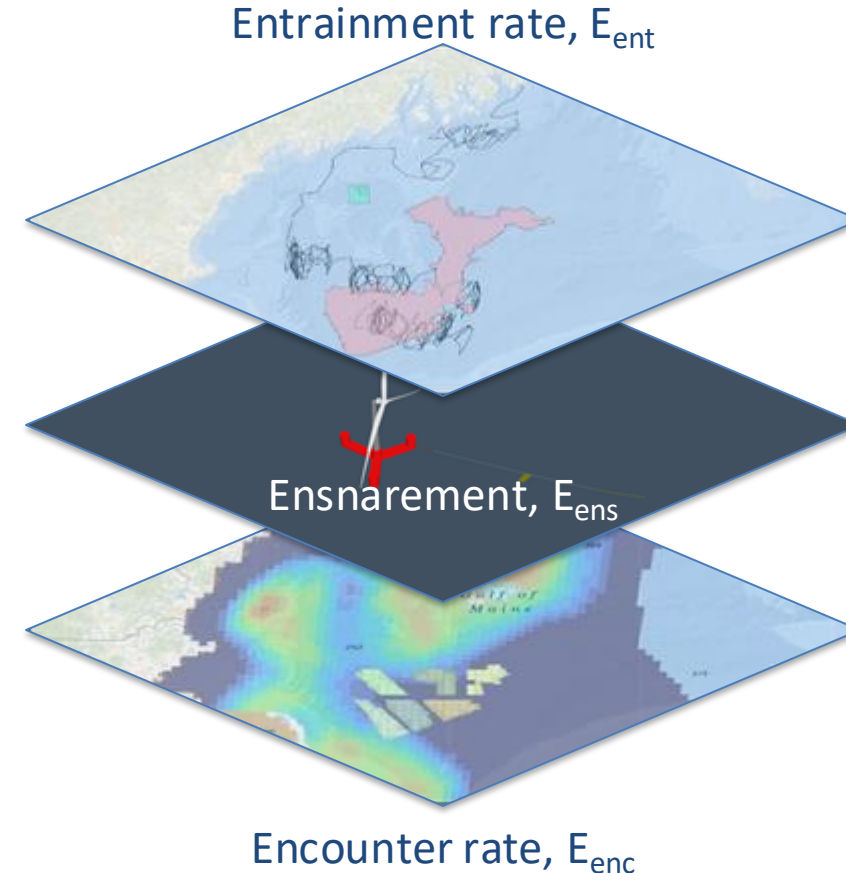
**Please provide your
input, experience, or
feedback when you see
this question mark!**



- Probability of secondary entanglement, P_{SE} :

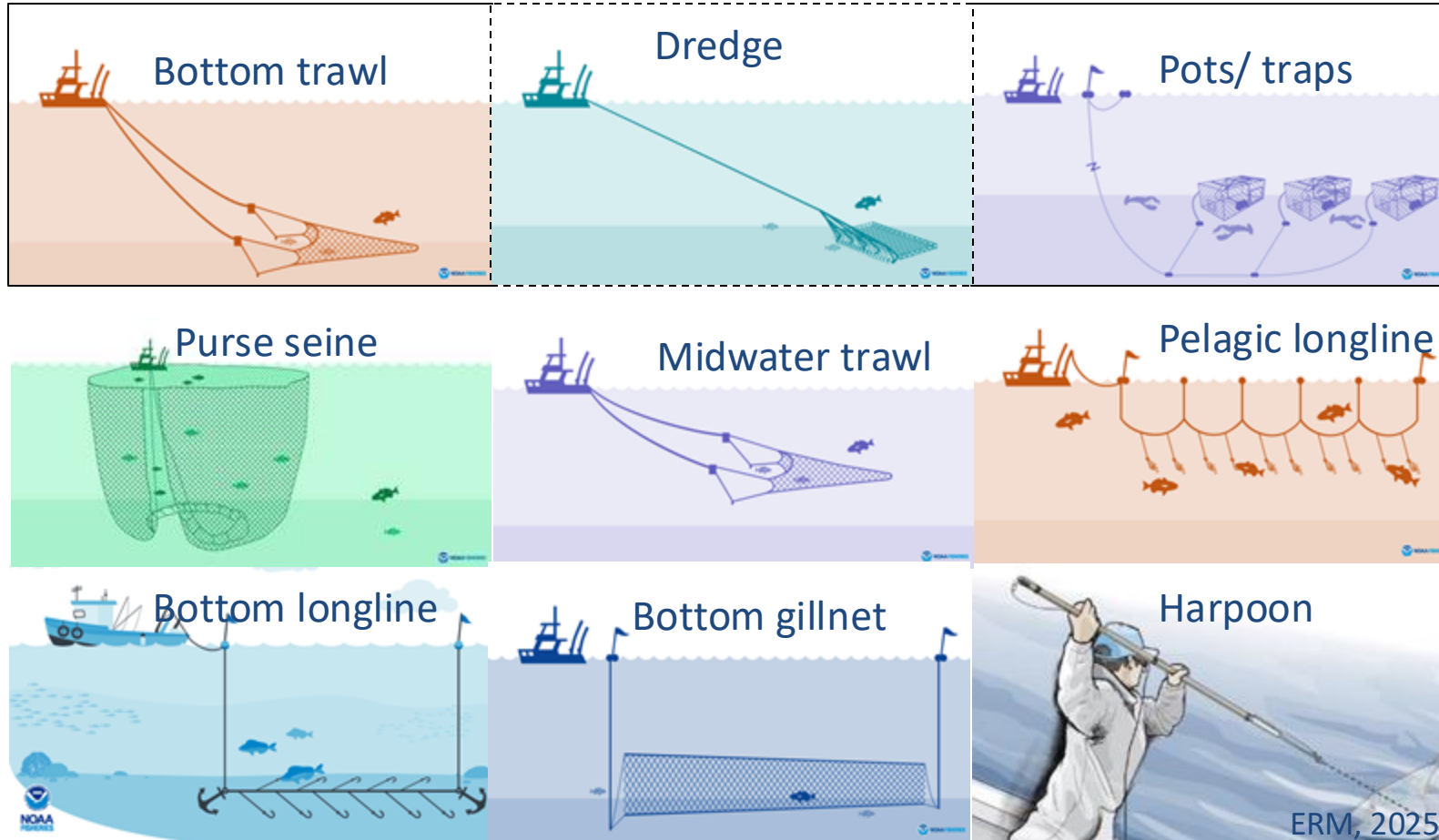
$$P_{SE} = \int E_{ent} E_{enc} E_{ens}$$

- Allows decoupling
- Borrowed from seismic and hurricane risk
- Secondary risk metrics are not portable to other locations however, the framework is
 - Changes in fisheries, weather, ocean currents, FOWTs all lead to site specificity
- Literature review reflects building components of the framework

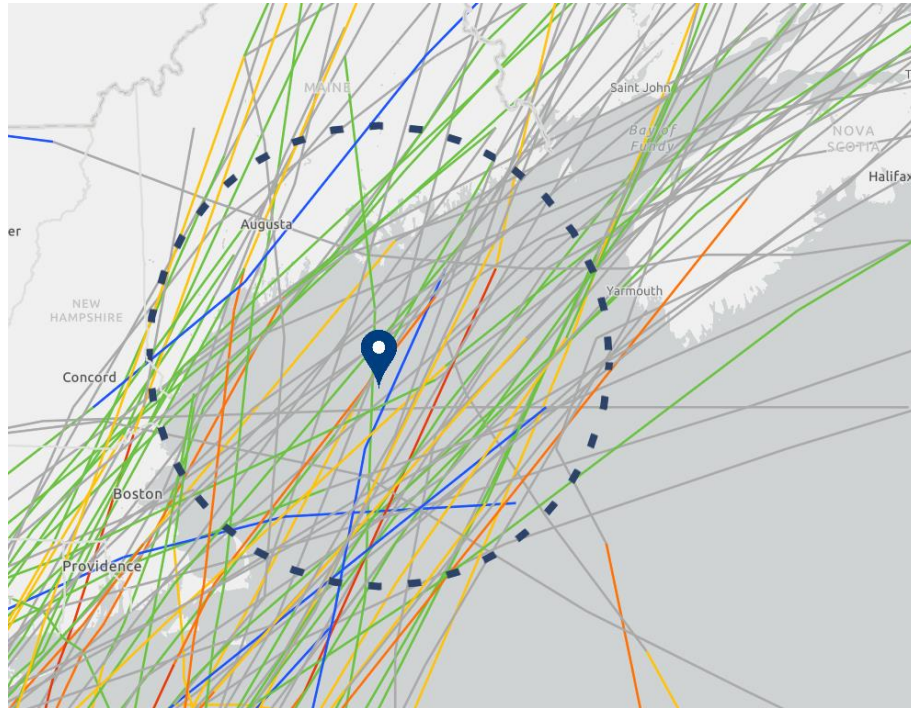


Authors	Type of Study	Findings
Barlow and Cameron, 2003	Mitigation avoidance	Acoustic ping devices reduced entanglement rates in gill net fisheries by 2/3 for cetacean and pinniped species.
Benjamins et al., 2014	Lit review, synthesis qualitative assessment	Relative risks assessed between mooring systems. Baleen whales are at highest risk of entanglement, with catenary moorings having higher impact than taut.
Kraus et al., 2014	Mitigation avoidance	Red and orange colored rope detected at greater distances than green ones by NARW
Bailey et al, 2014	Lit review definition	Primary entanglement considered low risk
Farr et al., 2021	Lit review	Mitigation may be species specific and subject to regulatory challenges. Siting of FOWTs may be most effective way to reduce risk
Maxwell et al, 2022	Lit review qualitative assessment mitigation suggestions	Secondary entanglement defined, low scientific knowledge identified, monitoring and cleaning recommended as mitigation.
Iza et al, 2022	Lit review	Entanglement identified as risk, however no sources to expand on the claim
Courbis et al, 2024	Technology needs	Need for sensors to detect debris on FOWT moorings, with potential for using existing sensors.

- Relevant fishing gear types for the Gulf of Maine were identified via Communities-at-sea data (2011-2015), NEFSC fishing footprints (2016-2020) and the ERM-GMRI Fisheries Coexistence Report (2025).



	Richardson et al (2022)	Richardson et al (2018)	Smolowitz (1978)	ICES (2000)	NOAA (2015)
Gillnets	0.81%	5.8%			0-2%
Purse seine nets	1.51%	6.6%	<p>In a meta-analysis of gear loss studies, weather is the most reported cause of gear loss (69%), gear conflict the second most common (57%), and ensnarement on bottom obstructions 3rd most common (31%).</p> <p>Richardson, Kelsey, Britta Denise Hardesty, and Chris Wilcox. "Estimates of fishing gear loss rates at a global scale: A literature review and meta-analysis." <i>Fish and Fisheries</i> 20.6 (2019): 1218-1231.</p>		
Trawl nets: All	3.57%	12%			
Bottom trawl nets	3.94%	18%			
Midwater trawl nets	0.76%	7%			
Longlines: Mainlines	3.33%	20%			
Longlines: Branchlines	3.58%				
Longlines: Hooks	2.86%	17%			
Pots and traps	0.74%	19%	20-30%	5-10%	



N.H. lobster industry says it was hit hard

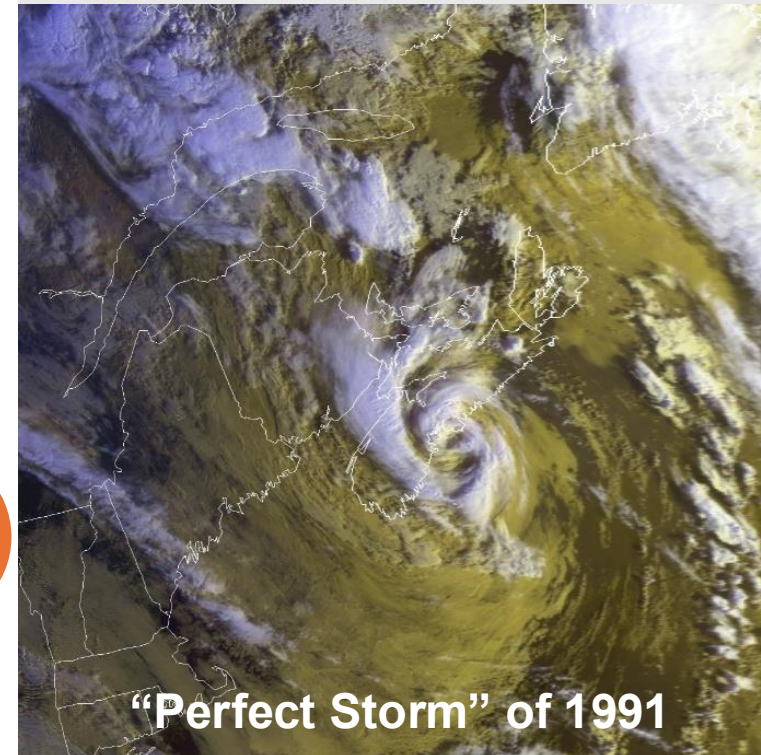
HAMPTON (AP) — In addition to wrecking roads, homes and beaches, the ocean storm that ripped New England also pounded New Hampshire's lobster industry.

Herbert Drake, chairman of the House Fish and Game Committee, said at least 50,000 lobster traps either were carried away or destroyed along the state's 18-mile coast. At \$40 a piece, they would cost \$2 million to replace.

And Drake said the widespread

damage he's seen from this week's storm will prompt him to introduce a bill to set up a program to help protect New Hampshire's shoreline. He said erosion problems have to be taken care of with better maintenance and repairs. He is thinking about trying to set up a state erosion control board.

A team from the federal emergency management agency is in the state this weekend to assess storm damage.



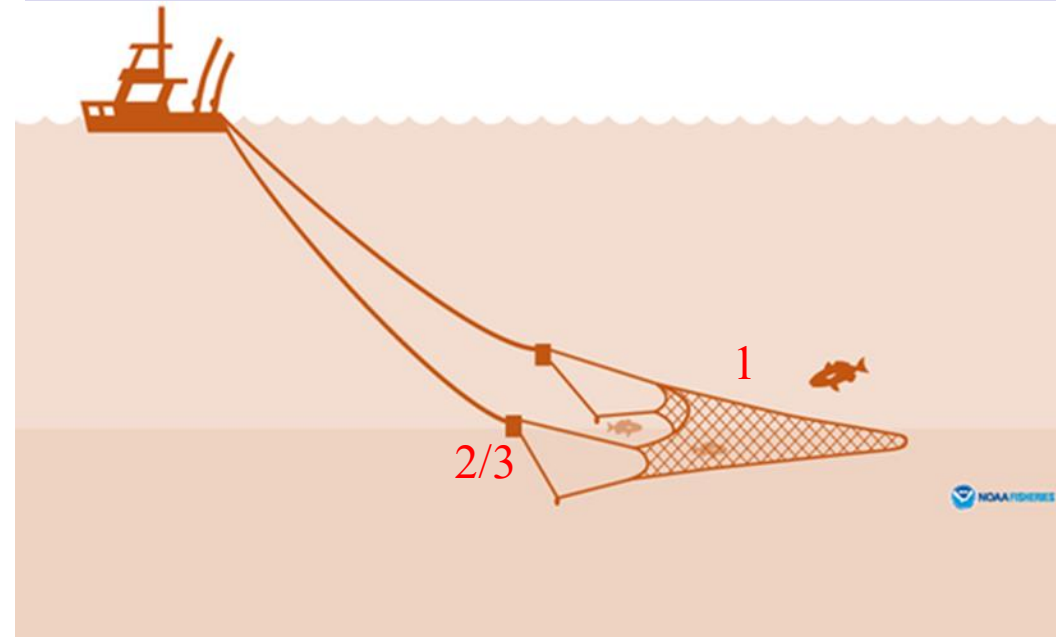
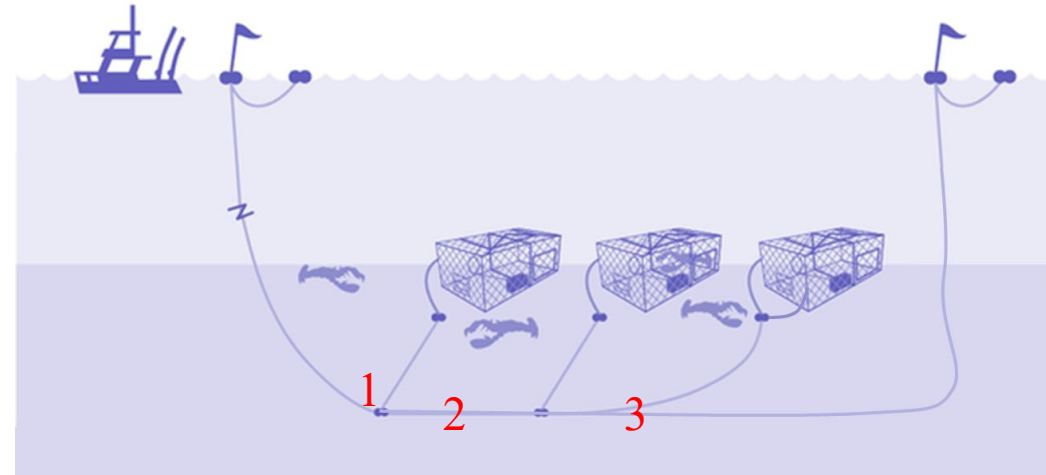
“Perfect Storm” of 1991

Is there any experience that can be shared on gear loss rates specific to GOME fisheries?

Are there other common causes that have not been identified?



- Pots
 1. At the bottom of the float line near the anchor
 2. Groundline near first couple of traps
 3. Groundline in the middle of a trawl
- Trawls
 1. The net and body panel is susceptible to snagging and tearing
 2. Wear on trawl doors/otter boards/bridles



Are there other sensitive loss areas from your experience?



Has anyone found evidence of other gear types being transported through the GOME?

Component	Material Construction	Diameters/ Sizes (in)
Buoy	Wood/Foam/Plastic	5"x11" to 8"x15"
Buoy line/ Sink line	Synthetic rope (nylon, poly) , sometimes with steel core	3/8"-1/2"
Float Line	Synthetic rope	3/8"-1/2"
Groundline	Synthetic rope, sometimes with steel core	11/32"-1/2"
Gangion	Synthetic rope	11/32"-1/2"
Becket/Bridal	Synthetic rope	11/32"-1/2"
Trap/Pot	Coated steel	48"x21"x13"



Figure 5. Zone A inshore trawl configuration

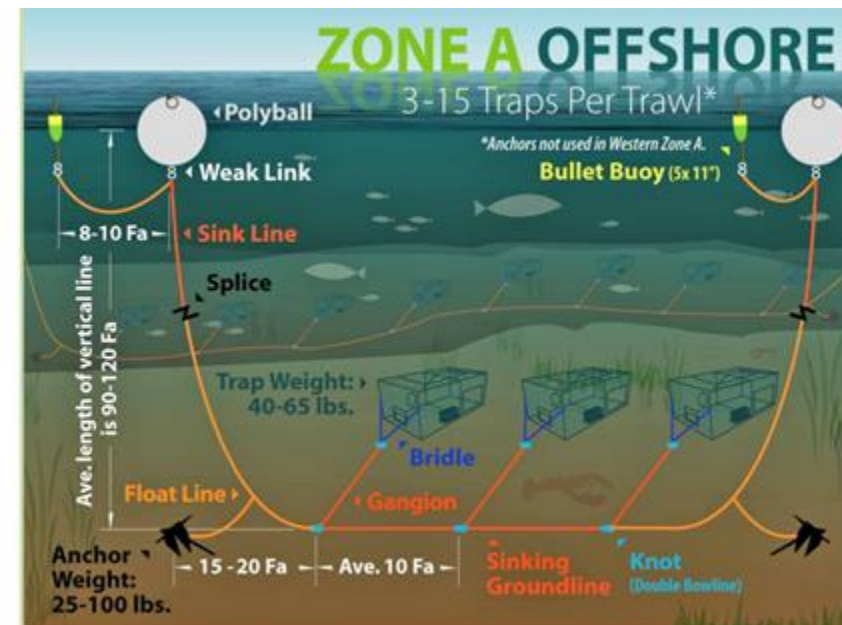
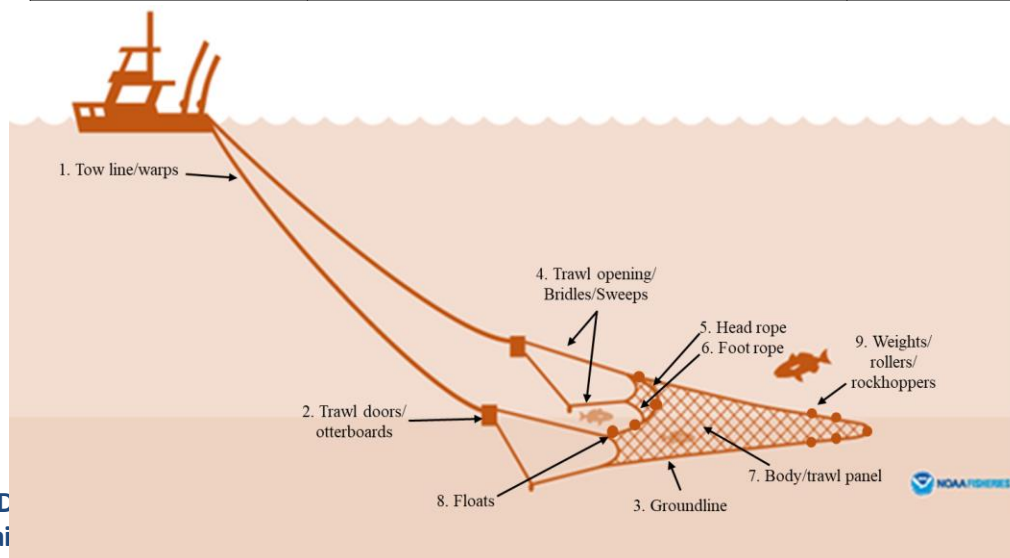


Figure 3. Zone A offshore gear configuration

Component	Name	Material Construction	Buoyancy
1	Tow line, warps	Steel wire	Negative
2	Trawl doors/ otter boards	Wood, steel	Negative to Positive
3	Groundline	Rope	Negative to Neutral
4	Bridles	Rope	Neutral to Positive
5	Head line, head rope	Rope, nylon, polyester	Neutral to Positive
6	Foot rope, ground rope	Weighted rope, nylon, polyester or chain	Negative to Neutral
7	Body, Trawl net, panels, cod-end	Rope	Neutral to Positive
8	Floats	Foam	Positive
9	Weights/ Rollers	Steel, Rubber, Plastic	Negative



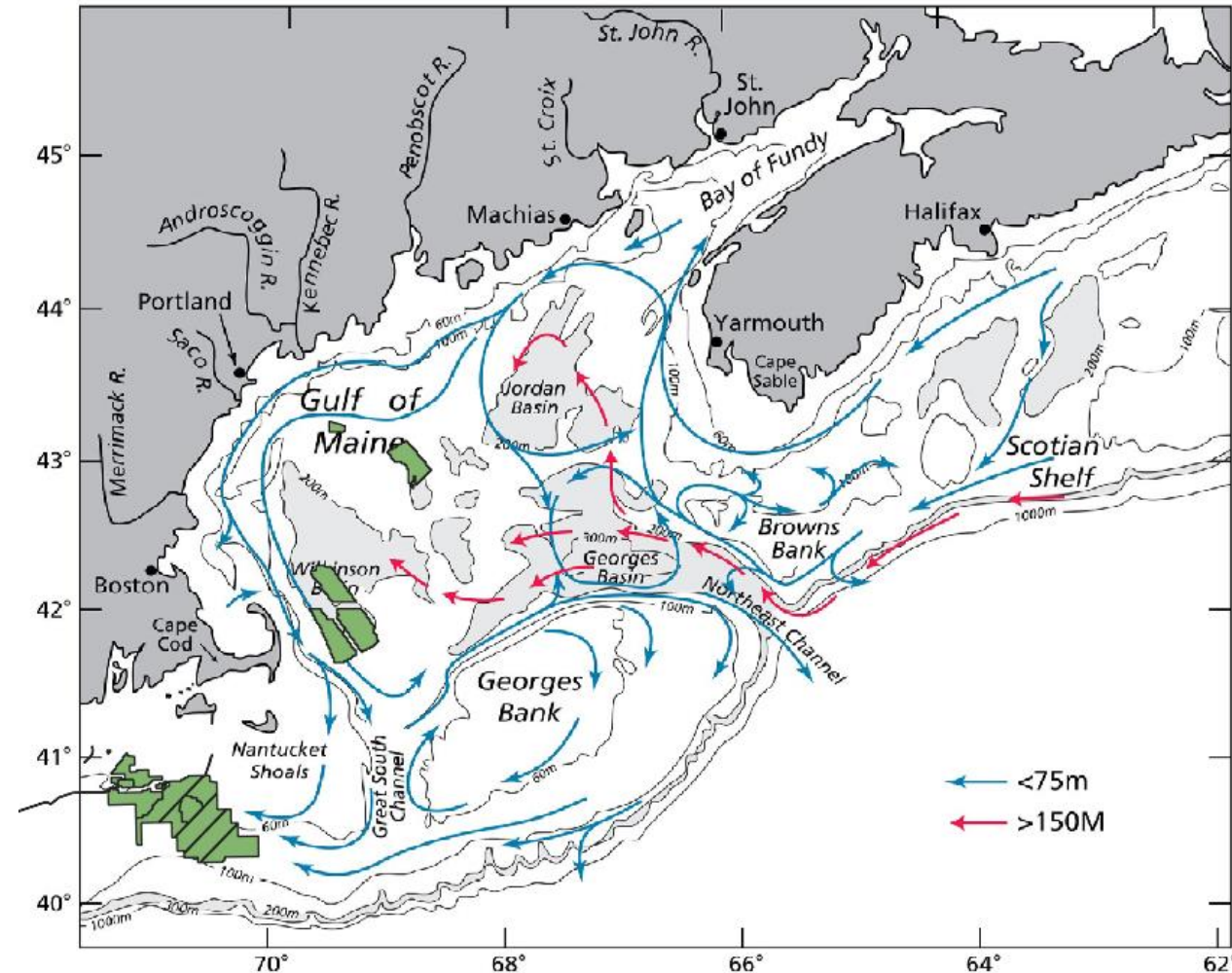
Are gear construction assumptions appropriate?



What diameter wires and ropes are most commonly used in bottom trawl construction?

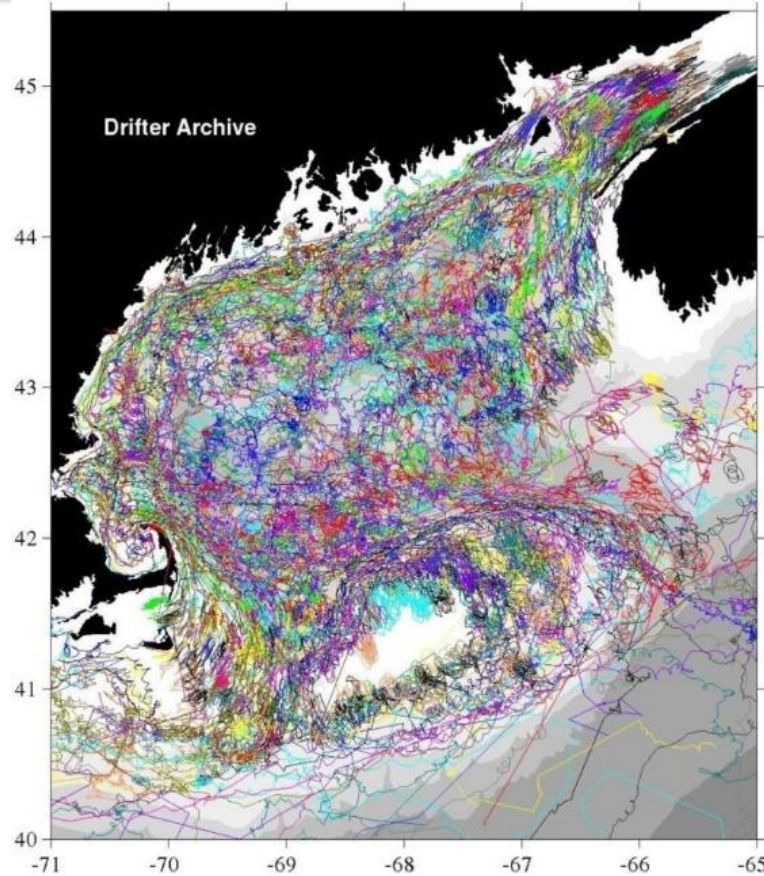
- GOME currents are dominated by a CCW coastal flow, with a CW gyre over George's Bank and a CCW gyre over Jordan Basin
- Lost gear from EMCC or WMCC can be transported to WEAs

General Circulation During Stratified Season

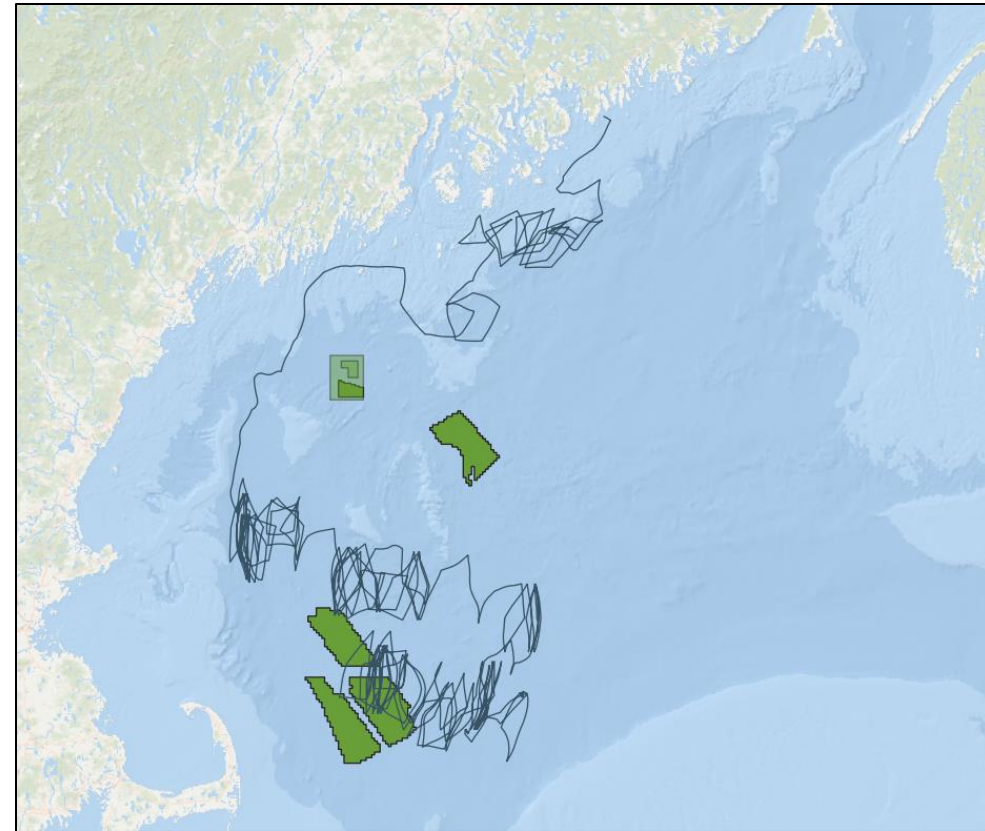


Currents from Pettigrew (2005) and Jack Cook, WHOI, and Lease Areas from BOEM

Research, Education, and Economic Development



Manning et al (2017)

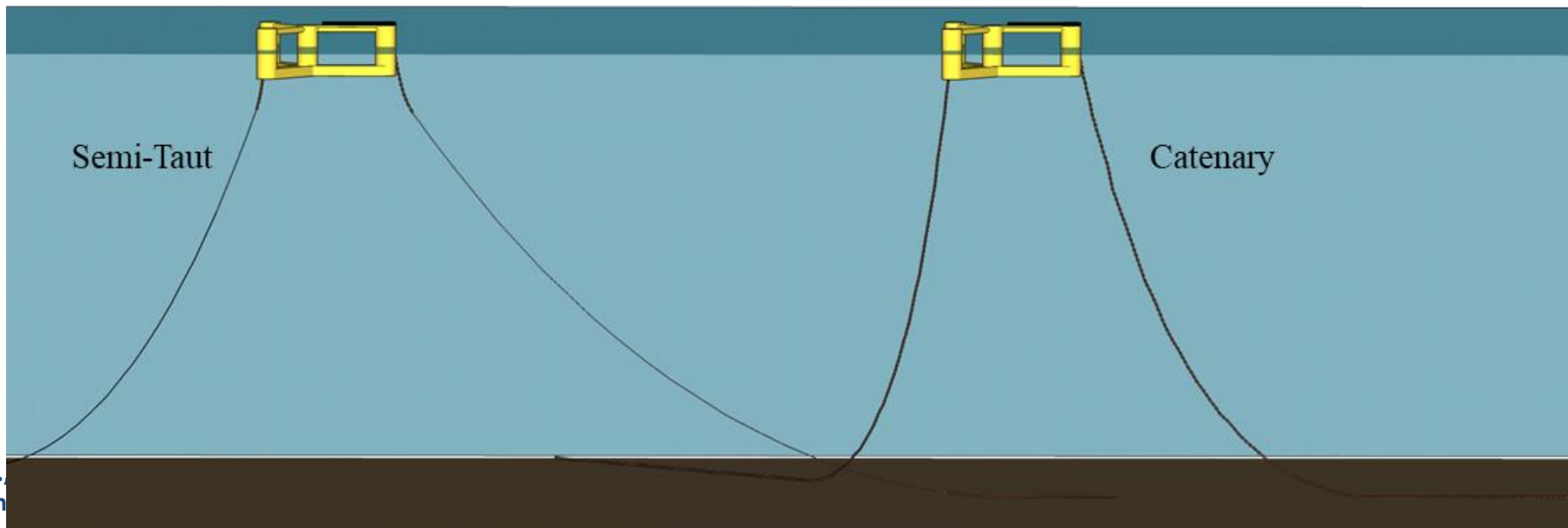
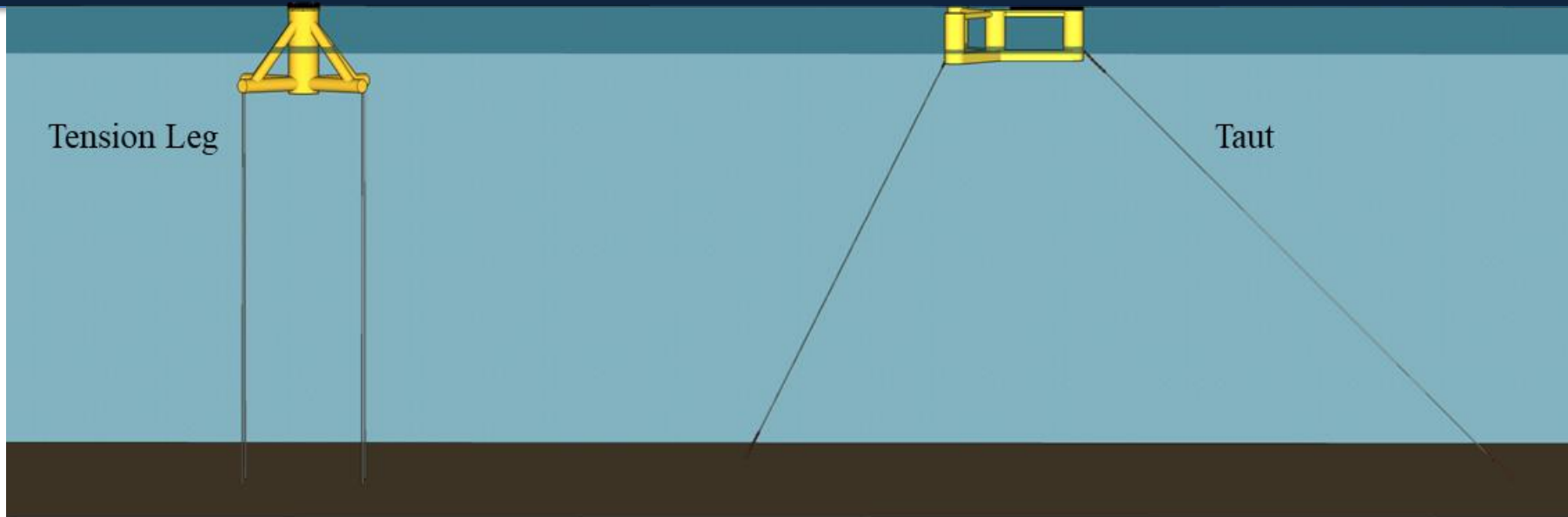


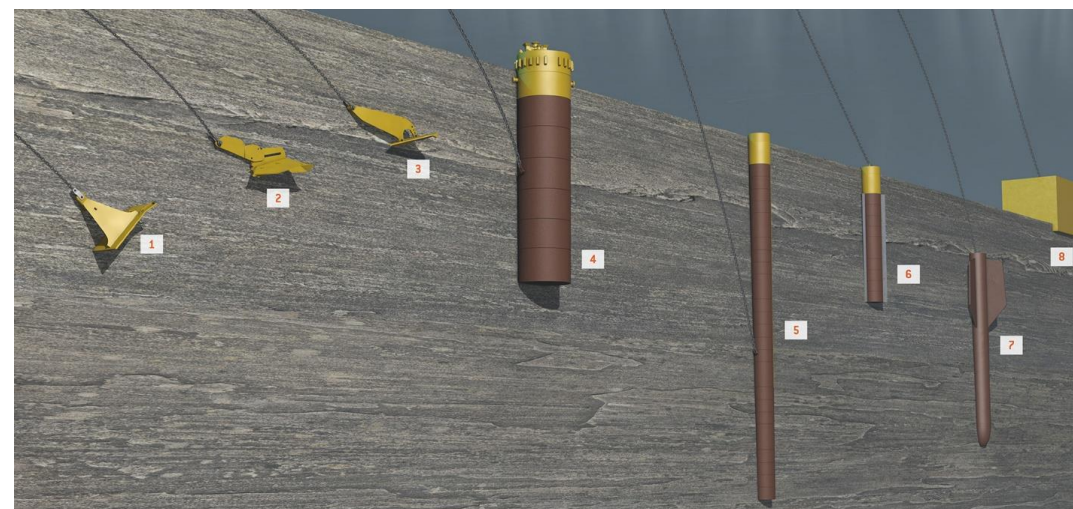
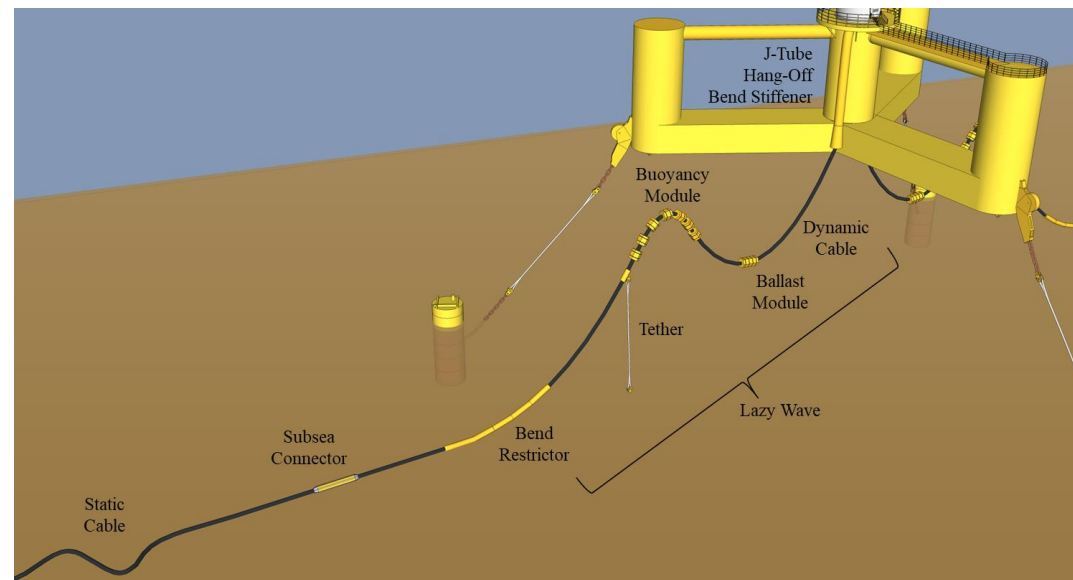
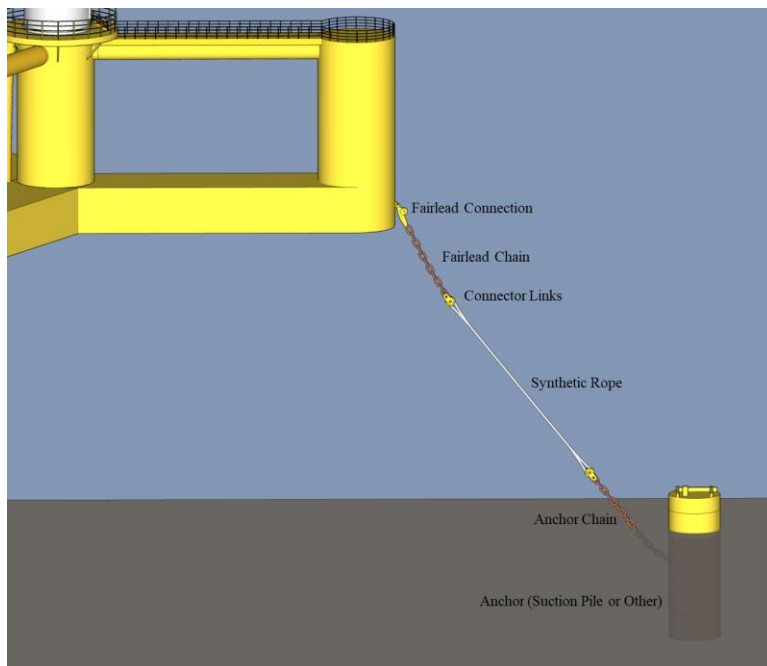
Present Study:

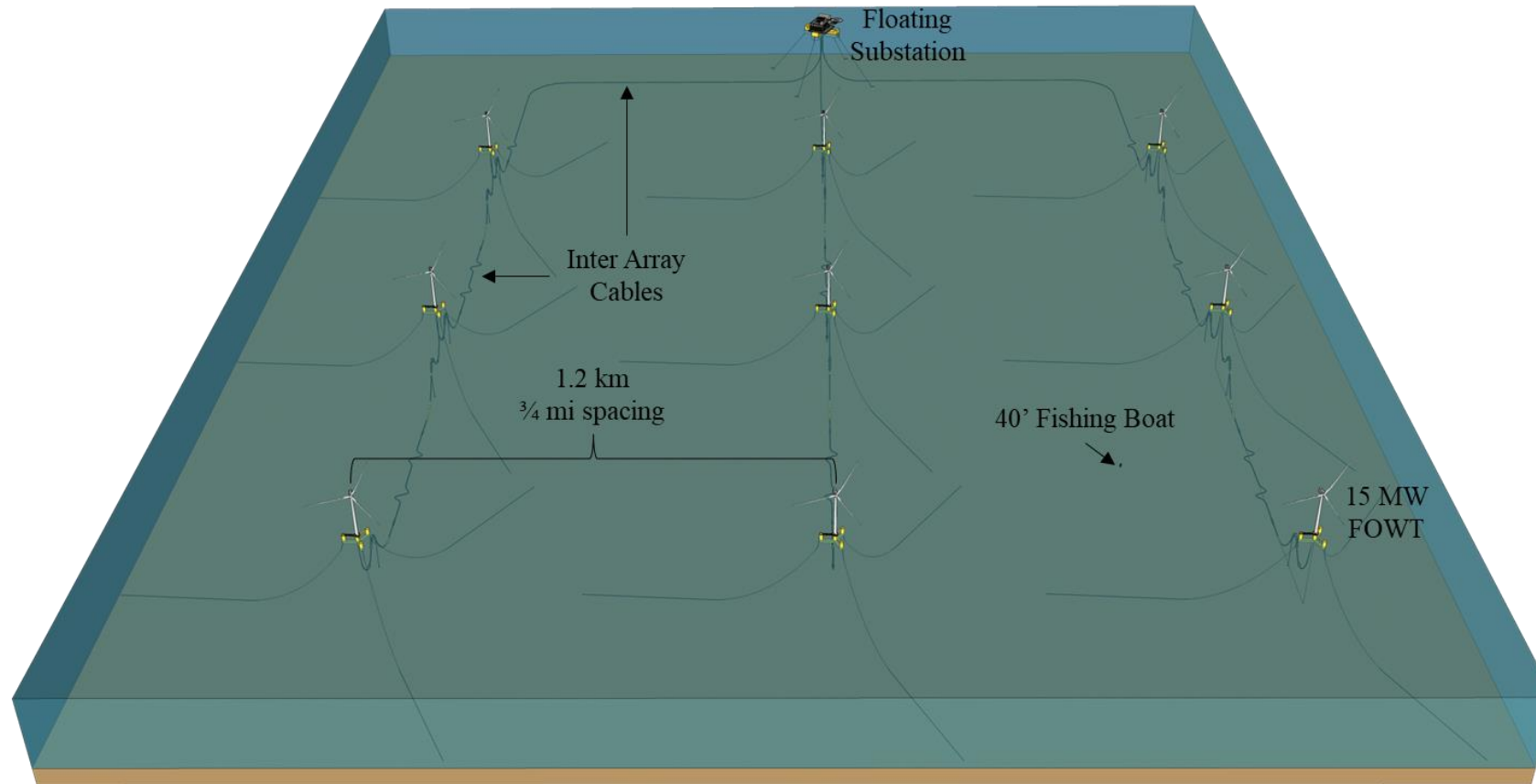
A buoy and endline lost near Winter Harbor follows the EMCC and WMCC to the wind lease areas in a surface current transport model

Have you experience any areas that could be considered a “sink” for ALDFG? If so, where?

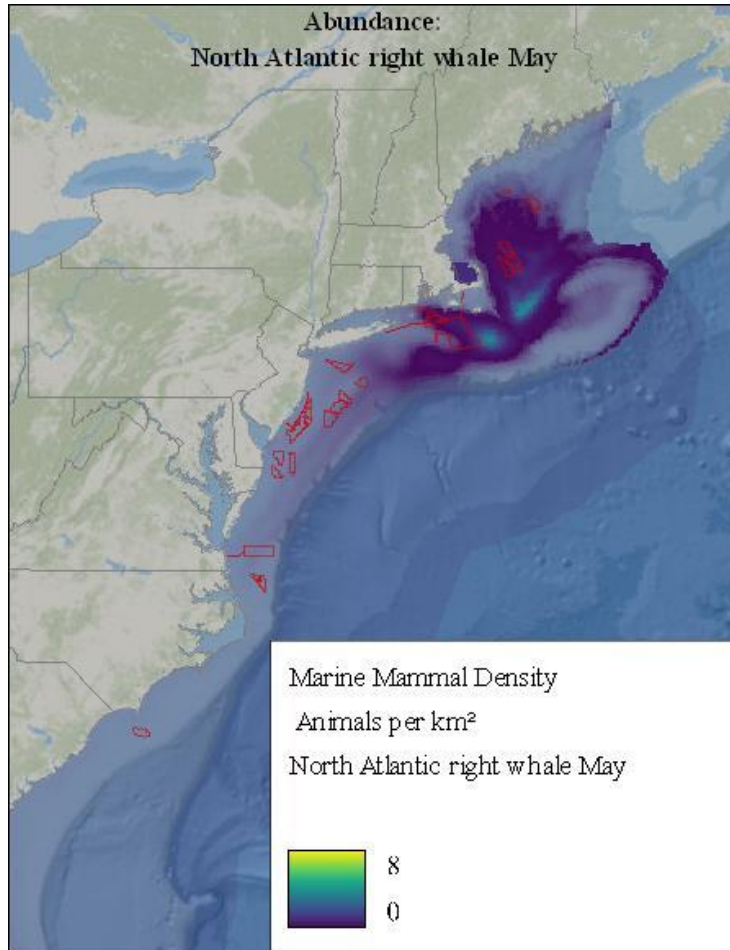








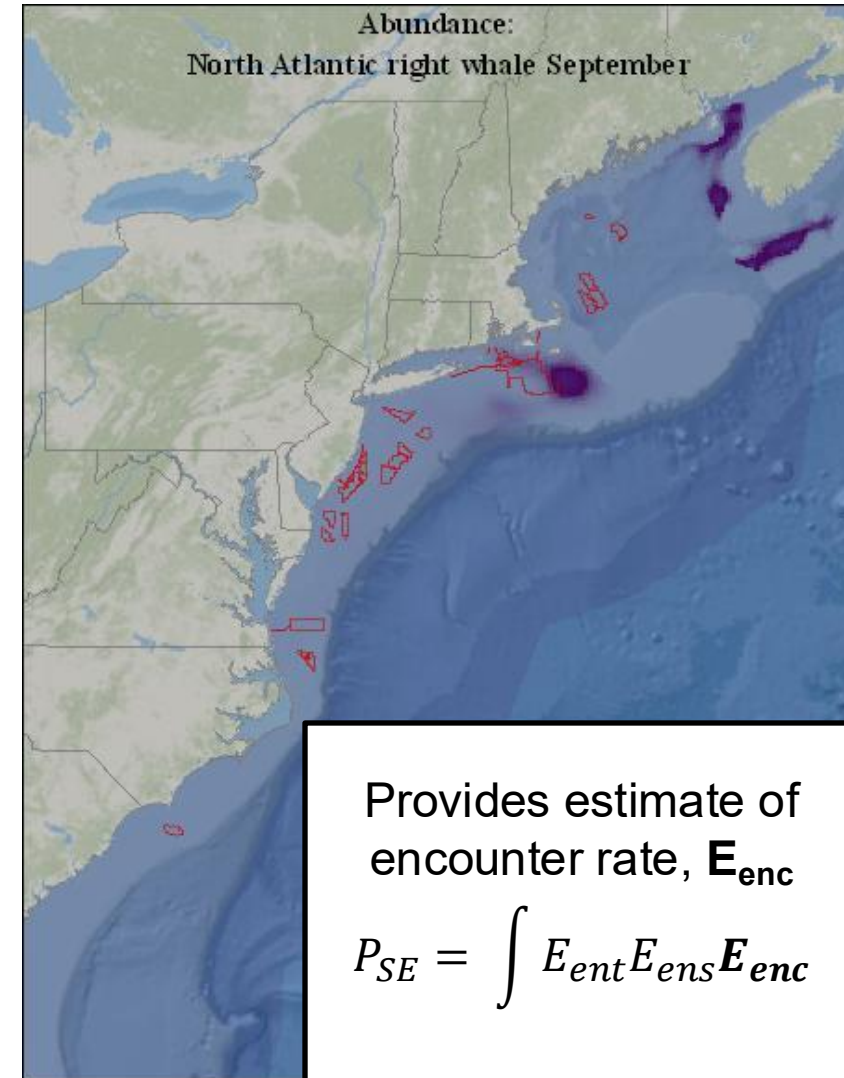
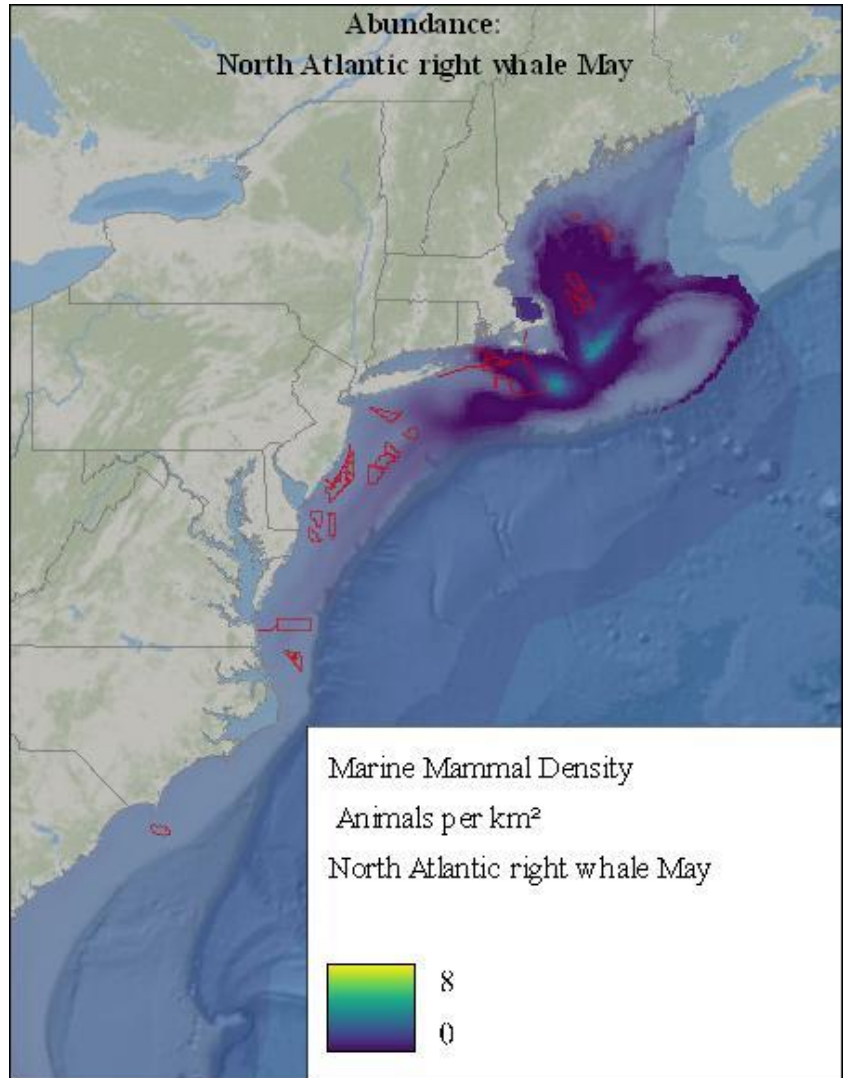
FOWT infrastructure near seabed could act as a sink to ensnare ALDFG, or as a source if fisheries experience gear loss due to interaction with moorings, anchors or cables.



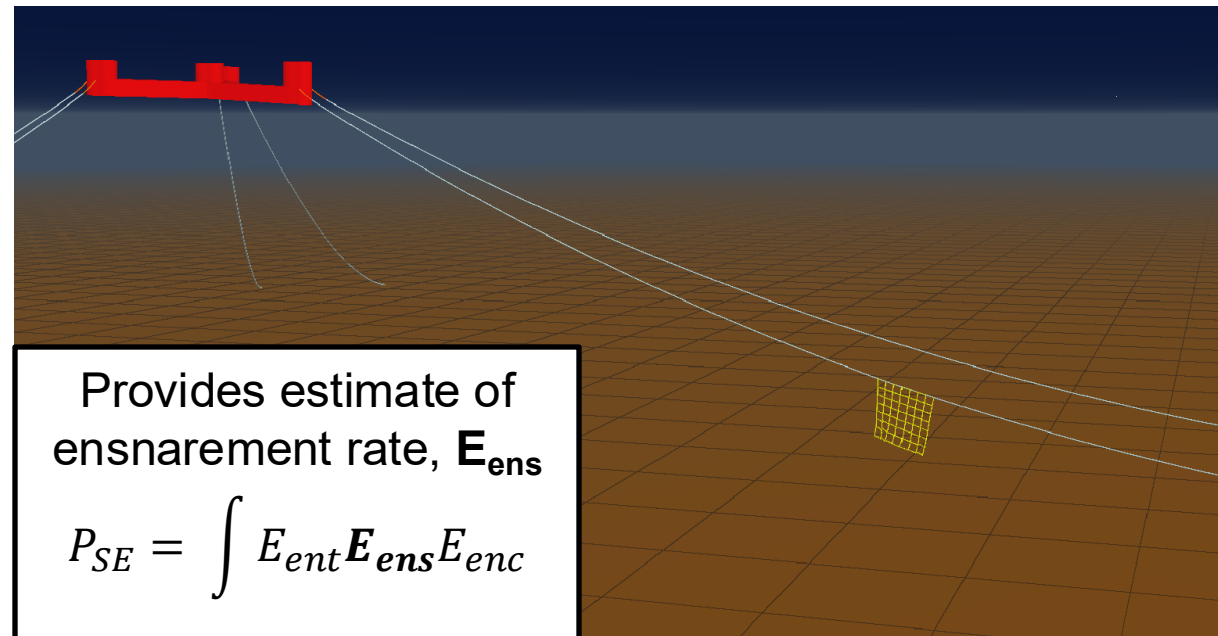
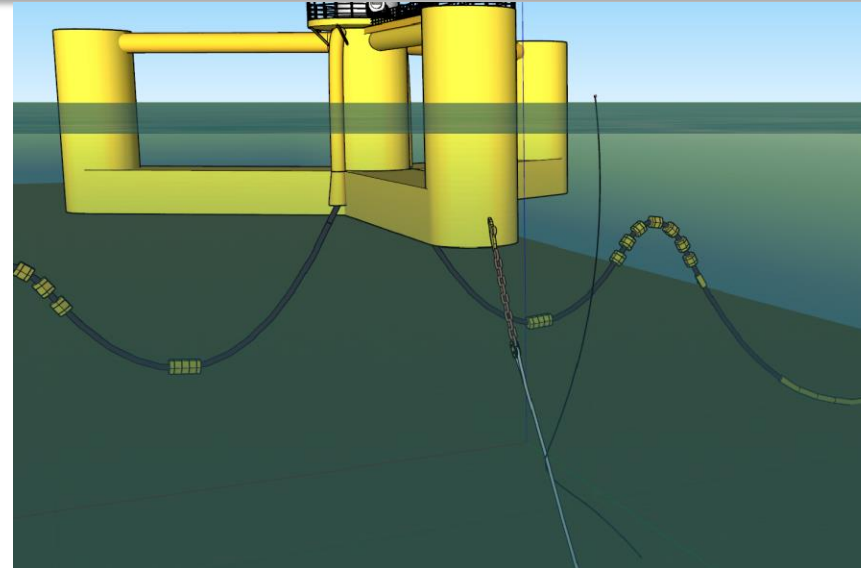
Roberts, Jason J., et al. "North Atlantic right whale density surface model for the US Atlantic evaluated with passive acoustic monitoring." *Marine Ecology Progress Series* 732 (2024): 167-192.

Raster from Northeast Ocean Data Portal.

Common name	Abundance Estimate	Entanglement Rate
Fin whale	6,802	1.45
Sei whale	6,292	0.40
Blue whale	402	0
North Atlantic right whale	368	10.8
Minke whale	21,968	8.6
Humpback whale	1,396	7.75
Atlantic white-sided dolphin	93,233	
Bottlenose dolphin	62,851	
Harbor porpoise	95,543	
Sperm whale	4,349	0
Harbor seal	61,336	
Gray seal	27,300	
Harp seal	760,000	
Hooded seal	unknown	
<p>Green sea turtle, Kemp's Ridley sea turtle, Loggerhead sea turtle, Leatherback sea turtle, Atlantic sturgeon, Shortnose sturgeon, Basking shark, and Ocean sunfish are present, but abundance and entanglement rate are unknown.</p>		



- 2 types of gear modeled
 - Trap/pot with buoy, sinker line, and float line
 - Bottom trawl gear panel
- Simulation of full WEA to get drift characteristics, then simulation of local FOWT/mooring interaction

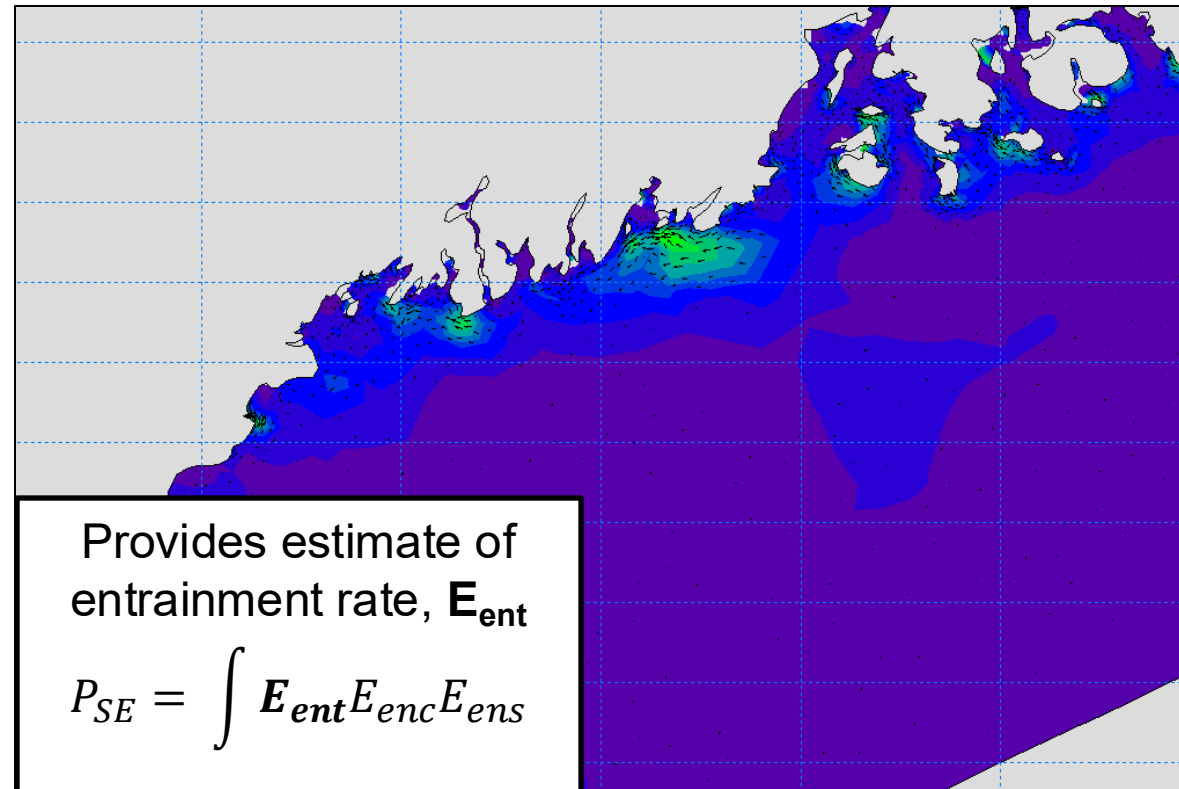


Provides estimate of
 ensnarement rate, E_{ens}

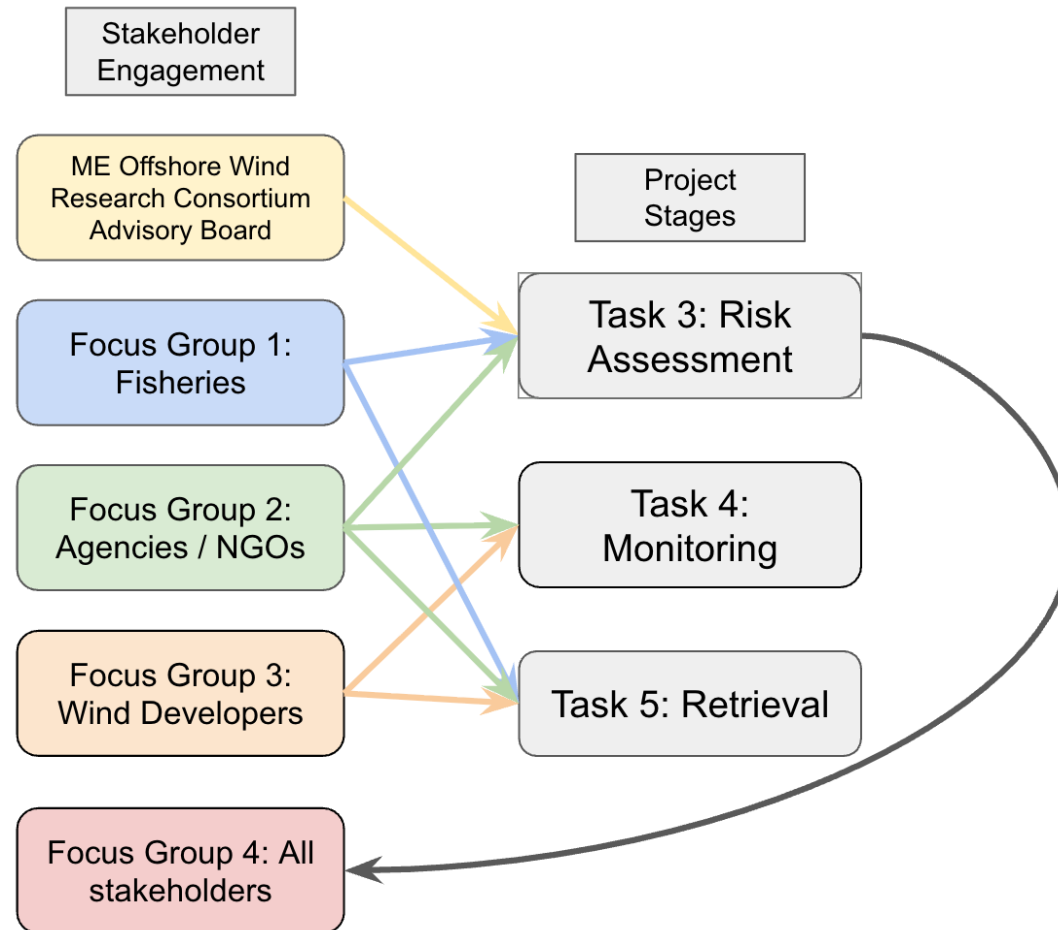
$$P_{SE} = \int E_{ent} E_{ens} E_{enc}$$

- Mike 21 modelling provides current and wind forcing for gear transport modelling
- Hindcasts of ocean conditions and multiple seed points for gear allow tracking of most crucial loss areas

Mike 21 Model of coastal currents



- Engagement via groups discussion with experts to check and supplement work appropriate to tasks.
 - Fisheries
 - Agencies / NGOs
 - Wind developers

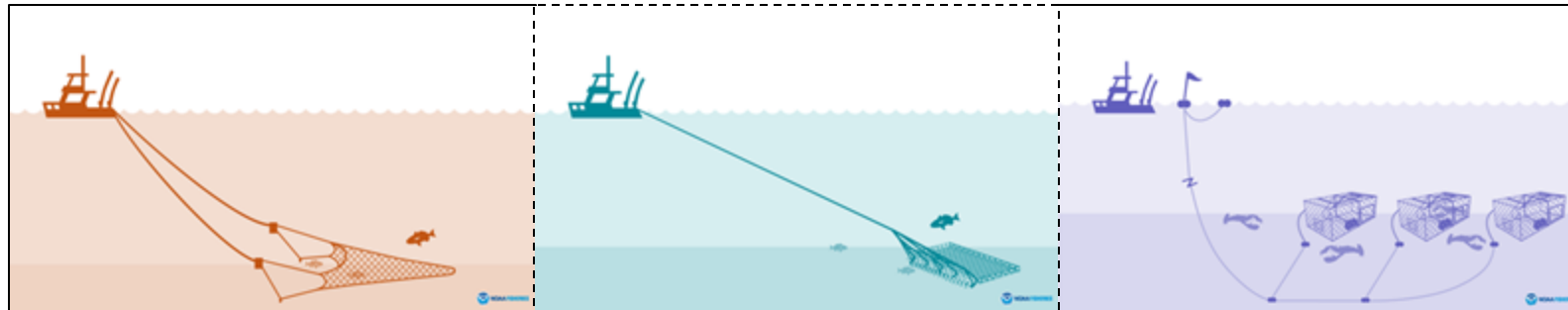


- **Today: ME OSW Research Consortium**
 - Project communication, checking fishing gear assumptions.
- **March 2026: Fisheries**
 - Fishery organizations, research consortium members
- **April 2026: Agencies and NGOs**
 - Representatives from Gulf of Maine groups with gear loss or marine mammal entanglement risk work
- **June 2026: Wind developers**
 - Representatives from relevant developers in the Gulf of Maine and Southern New England
- **End of summer 2026: Final Meeting, All previous individuals.**

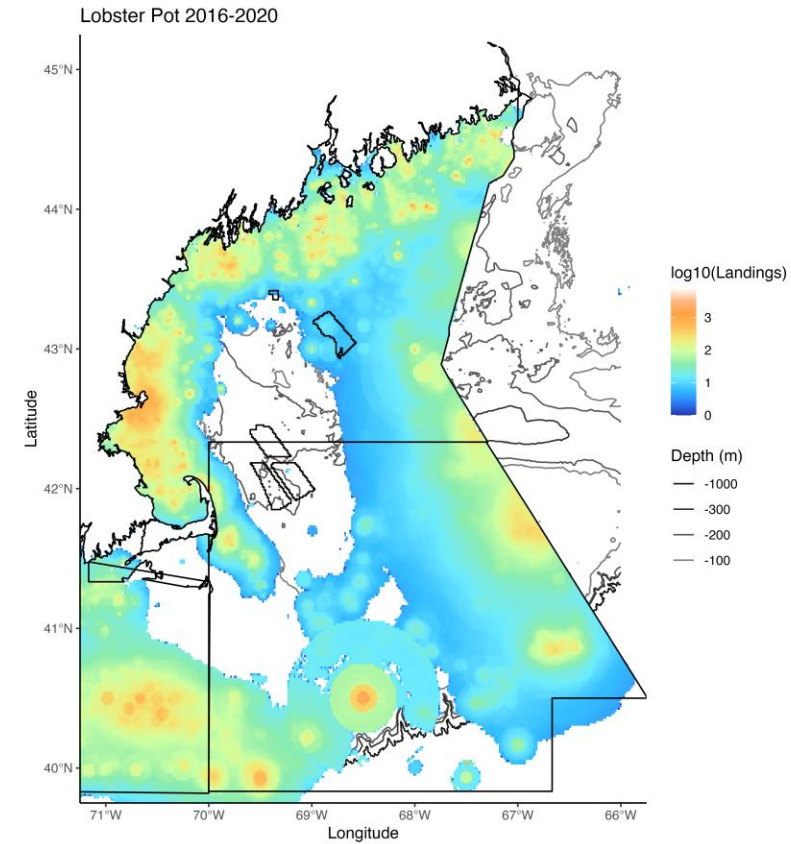
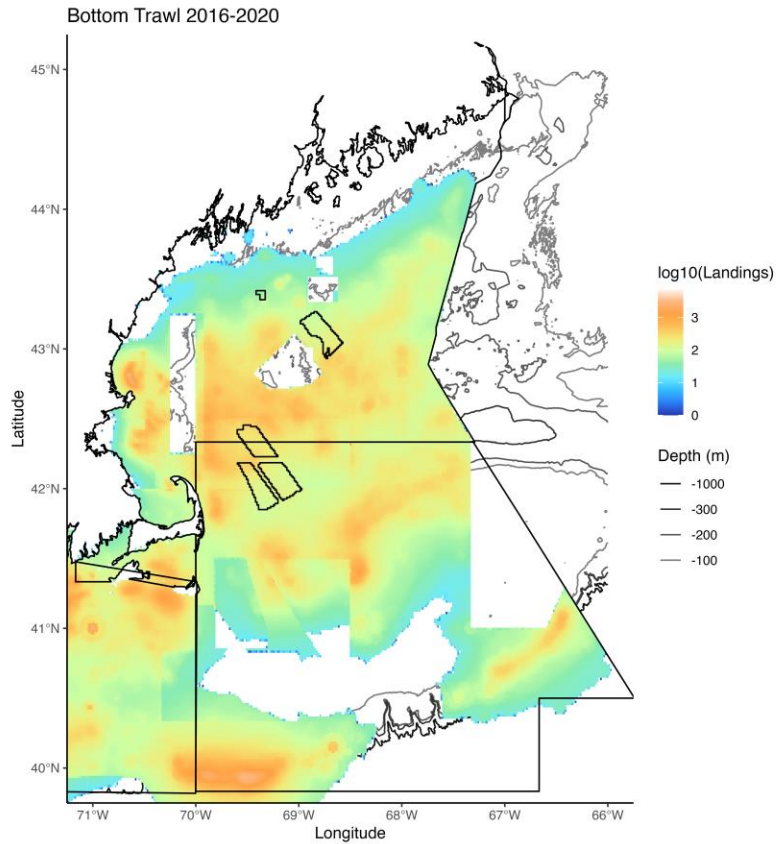


Are there groups we have not named that should be included in this project?

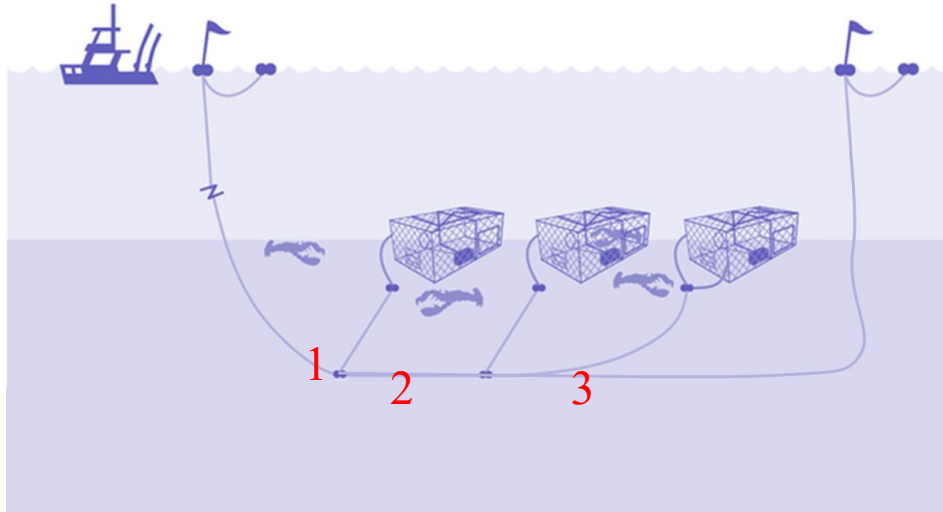
Current Focus: Bottom Trawl, Lobster Pot and Dredge (low transport probability)



Are these appropriate gear types to focus on characterizing?

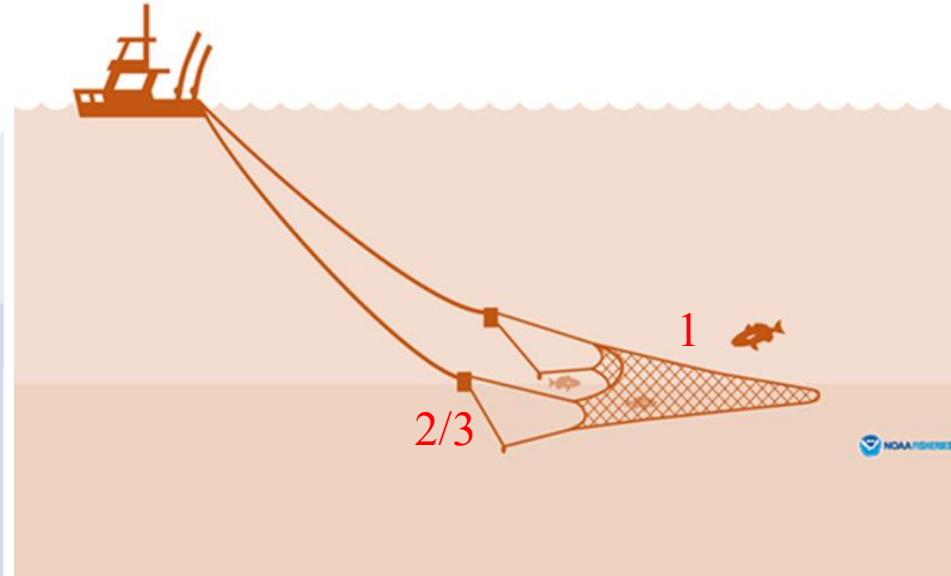


Are the characterizations of focal fisheries overlap with lease areas acceptable? Data from NESFC Fishing Footprints Landings previously used in lease siting



- Pots

1. Breakage is likely to transport the endline.
2. Breakage may transport a trap.
3. Breakage in middle of the trawl will not transport traps



- Bottom trawl

1. Snagging may transport the net
2. Wear and loss at the doors will not transport the net
3. Wear through the bridles may transport.



Are the characterizations of fishing gear transportability and subcomponents acceptable for focal gear types?

- Literature review is complete, with online repository and executive summaries to be shared
- Stakeholder engagement task has begun, with first meetings planned for March
- Modelling begins next month, with a focus on the macro scale model of the Gulf of Maine, and smaller scale modelling of a FOWT array



Contact

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Program advisor: Olivia Burke – Olivia.i.burke@carbontrust.com

<https://www.maine.gov/energy/initiatives/offshorewind/research-consortium>