



Maine Floating Offshore Research Array

Public Work Session



GOVERNOR'S
Energy Office

July 13, 2021

Zoom Meeting Reminders

- MUTE yourself, except when speaking. Press *6 to mute/unmute on phone.
- RAISE HANDS
 - Use the blue "Raise Hand" function in the participants tab for older Zoom version
 - Scroll on "Reactions" icon bottom of Zoom control bar to find hand raise in newer Zoom
 - Press *9 to raise hand on phone.
- CHAT function as needed.

TECHNICAL ASSISTANCE
Cameron Hager - chager@cbi.org

Navigating Our Discussion

- Focus on today's objectives.
- All questions and comments welcome.
- Listen to learn and speak to share expertise.
- Share the floor: Be mindful of your time to allow others to speak
- Be direct and respectful: Express your views and let others do the same
- Participating in giving advice does not constitute approval nor endorsement of OSW development in the Gulf of Maine generally or the Research Array in particular

Objectives of Work Sessions

Provide advice and counsel to the State to help guide its decisions:

1. Siting of the research project area and its configuration
2. Research themes of interest for the research project
3. Other relevant project design elements and concerns to consider

**Research Array
Pre-
application Process
Dec. 2020 - July 2021**

State of Knowledge
Workshop
(January)

- Setting stage
- Building common information

Webinars
(February)

- Build understanding across sectors

Work Sessions
Fisheries
Wildlife
(March & April)

- Detailed dialogue on data, siting, and research approach

Dockside, Zone Mtgs,
and Data Analysis
(May and June)

- Direct engagement with fishermen
- Direct engagement with interested others
- Further refine research framework

Joint Work Session
(July)

- Summarizing analysis to identify Narrowed AOI and soliciting feedback from **wildlife, fisheries and the public**

Public Comments
(by July 30)

- Comments on final site using online form on GEO site

Agenda

4:00 Welcome and Overview

4:10 Update of Legislative Activities

4:25 Review of Data & Information

5:15 Preferred Area for Siting

5:30 Research Review

5:50 Next Steps

6:00 Adjourn

Why a Floating Research Array?

- **Advance** Maine's interests in offshore wind prior to commercial-scale leasing in Gulf of Maine
- **Maximize** 10+ years of research and innovation in floating offshore wind
- **Support** UMaine's public-private partnership
- **Work** with fishing, environmental and other marine interests to answer important questions
- **Research** the effects of multiple floating turbines on marine life, fishing and more
- **Use** the experience to inform the work of the offshore wind roadmap and future projects

Legislative Update:

LD 1619

An Act To Prohibit Offshore Wind Power Development in Territorial Waters and Submerged Lands of the State

1. **Prohibits installation** of offshore wind turbines or towers in state territorial waters, except for:
 - New England Aqua Ventus/UMaine project
 - A pilot-scale limited-duration project
 - Portside infrastructure to support the offshore wind
 - Transmission infrastructure, subject to conditions
2. Requires **strategic plan** by 2023, which will be met through the Roadmap effort.
3. Establishes the **Offshore Wind Research Consortium** as an initiative of the Governor's Energy Office (GEO) to coordinate and support offshore wind research projects in the Gulf of Maine.

Maine's Offshore Wind Research Consortium LD 1619

Requires GEO to *"consult with scientific experts to establish an advisory board, which will oversee a research strategy for floating offshore wind projects in the Gulf of Maine"*.

Required members:

- Two from organizations representing the lobstering industry
- One from organization representing another fishing industry
- Commissioner of DMR (or designee)
- Two at-large fishermen (individuals from the lobstering and other fishing industries)
- One individual from the recreational charter fishing industry

**Maine's Offshore
Wind Research
Consortium
LD 1619**

Research strategy includes identifying:

1. Opportunities and challenges caused by the development of floating offshore wind in the Gulf of Maine
2. Methods to avoid and minimize the impact on ecosystems and existing uses
3. Ways to realize cost efficiencies in floating offshore wind technology

State supplemental budget allocated \$3 million to support offshore wind research.

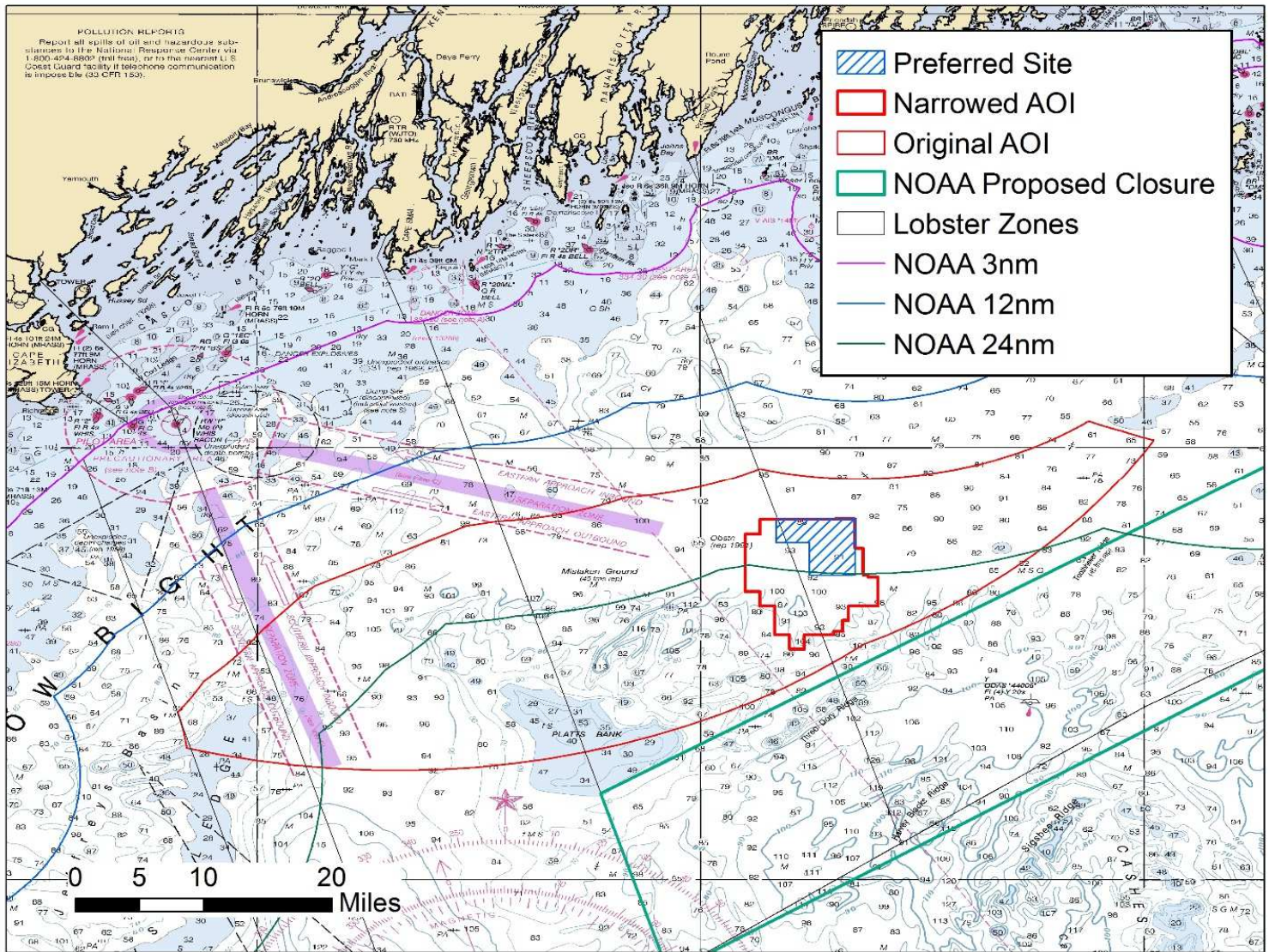
Legislative Update: LD 336

*An Act To
Encourage Research To
Support the Maine
Offshore Wind Industry*

1. Directs the Public Utilities Commission to negotiate a **power purchase agreement** (PPA) for a floating offshore wind research array of up to **144 MW** at the lowest reasonable cost to ratepayers that enables the project to be built.
2. Requires a **study of transmission infrastructure options** for offshore wind, including ways to minimize impacts to the environment and marine users and encourage efficient investment.



Site Selection: Work to Date



Initial Siting Criteria

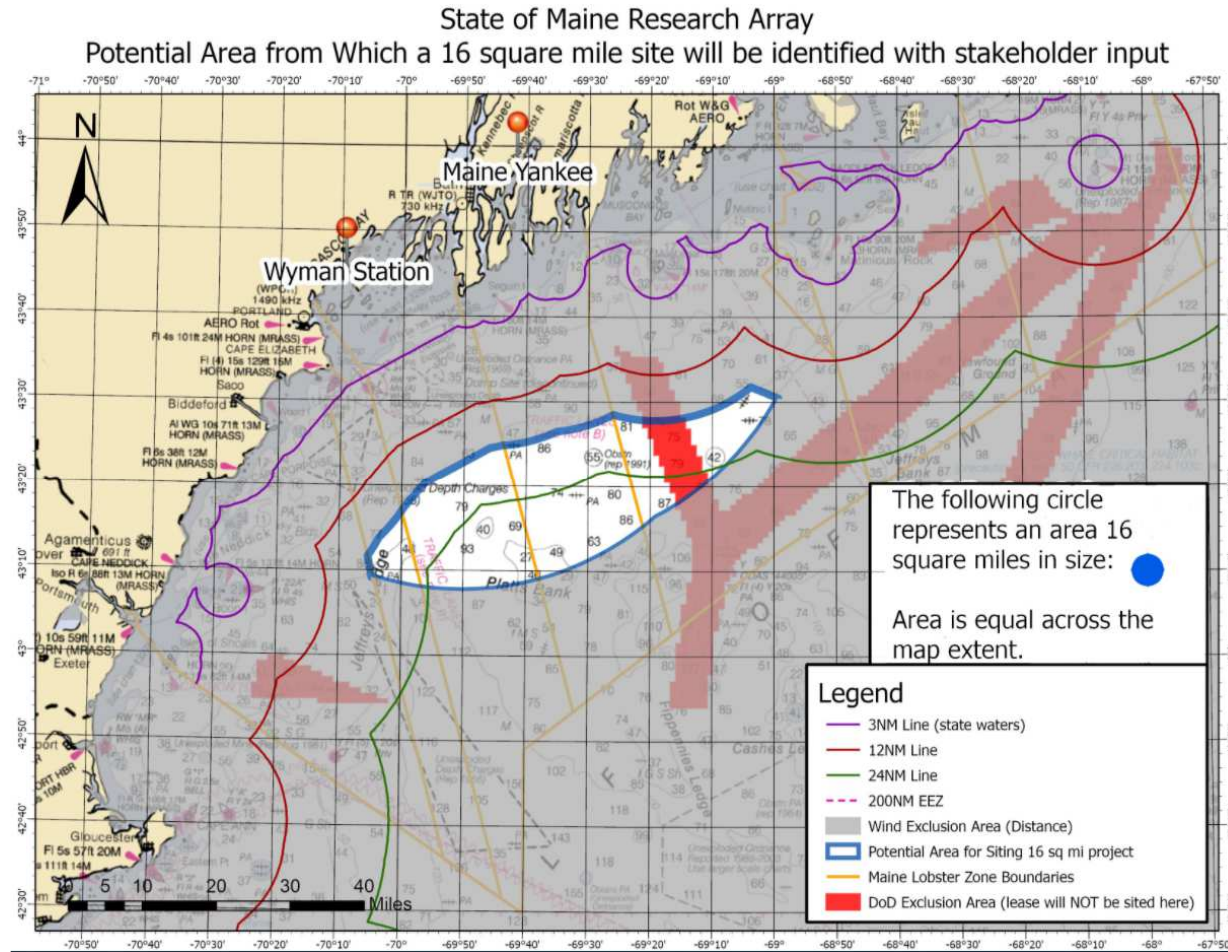
Size and Potential Location

- **12 turbines** or fewer
- **16 square miles** or less
- **20-40 miles** from mainland
- **150 feet of water** minimum
- **Near grid interconnection points** in Wiscasset or Yarmouth
- **Gravel or mud bottom** to anchor platforms

Siting Priorities

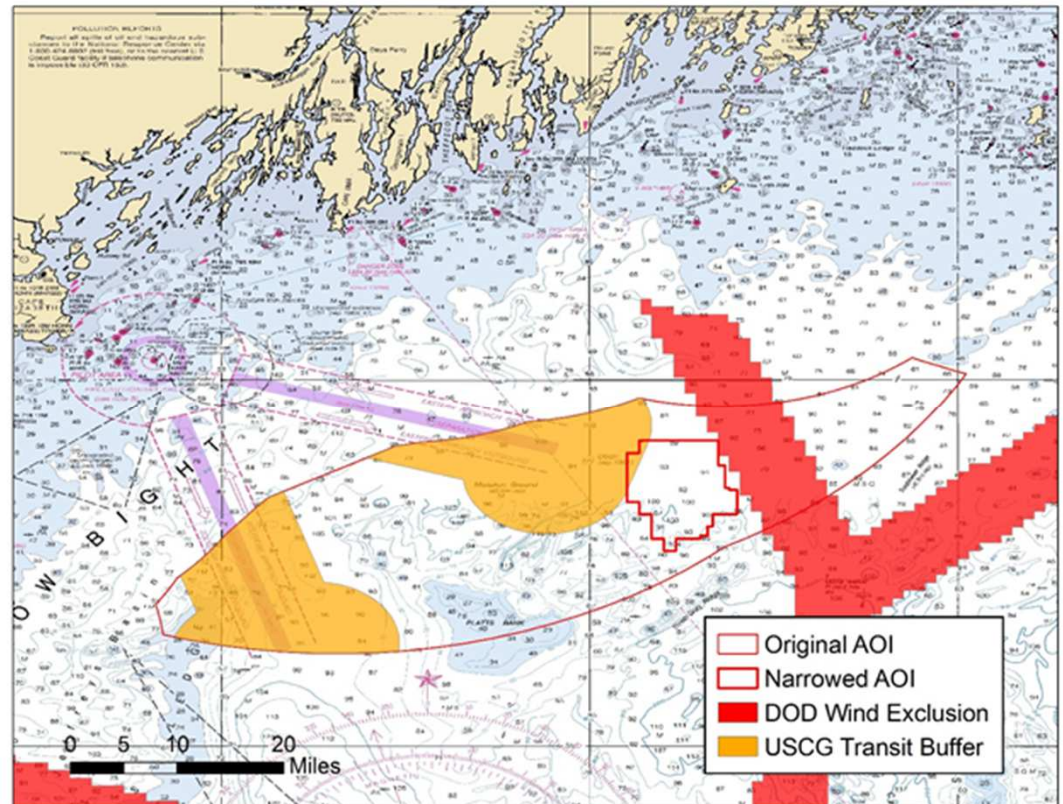
- **Minimize conflicts** with fishing grounds
- **Avoid highly trafficked** areas
- **Limit visibility** from shore

Research Array Initial Area of Interest (AOI)



Other Siting Considerations

- Vessel traffic and navigation
- Department of Defense

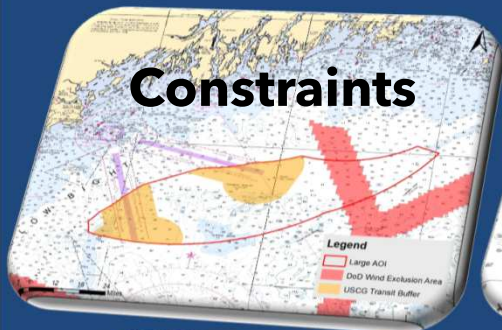




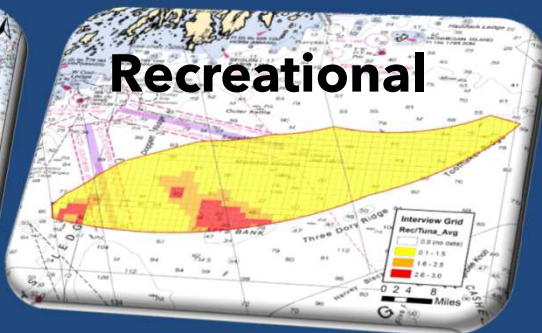
Fisheries

DMR's Assessment Process

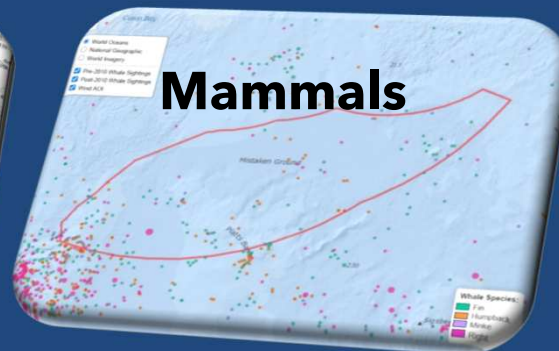
Constraints



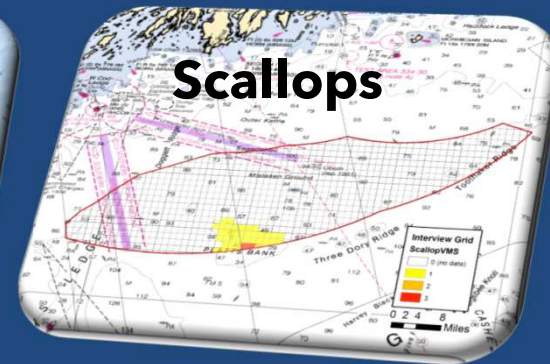
Recreational



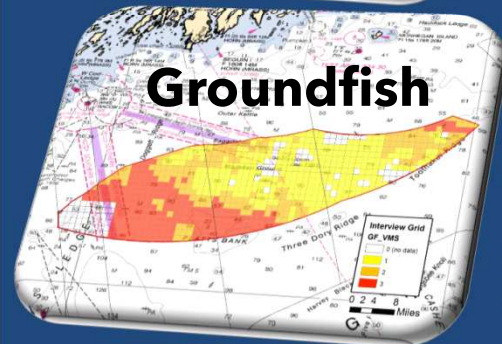
Mammals



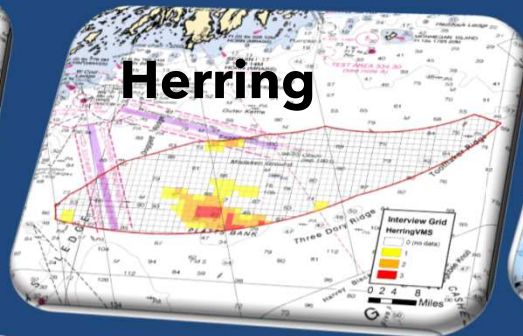
Scallops



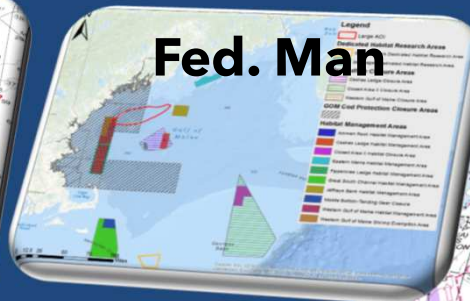
Groundfish



Herring

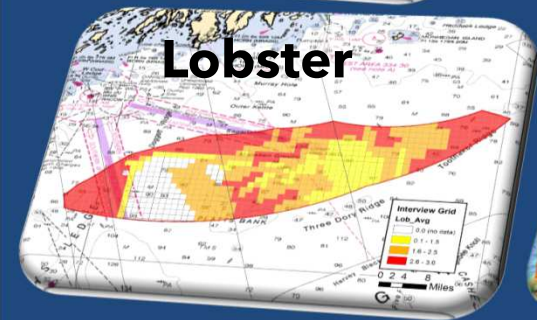


Fed. Man

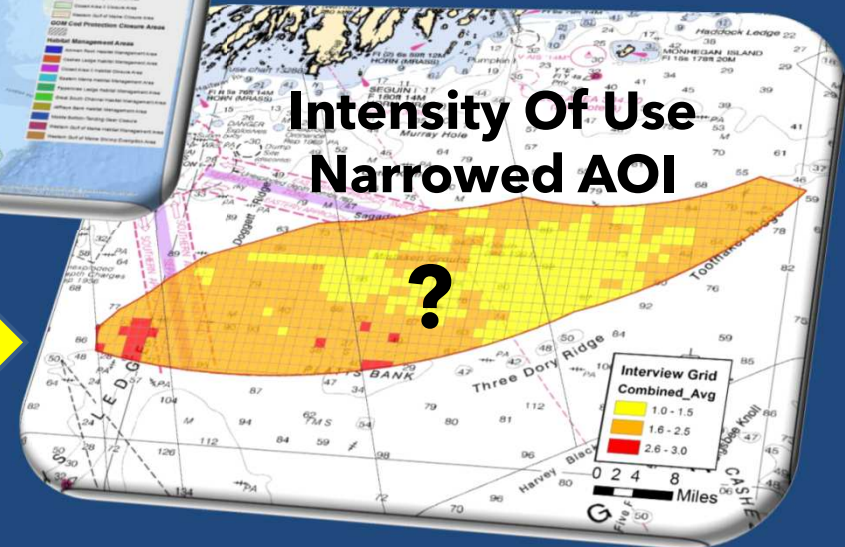
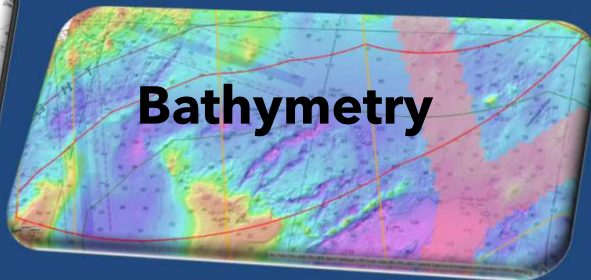


**Intensity Of Use
Narrowed AOI**

Lobster

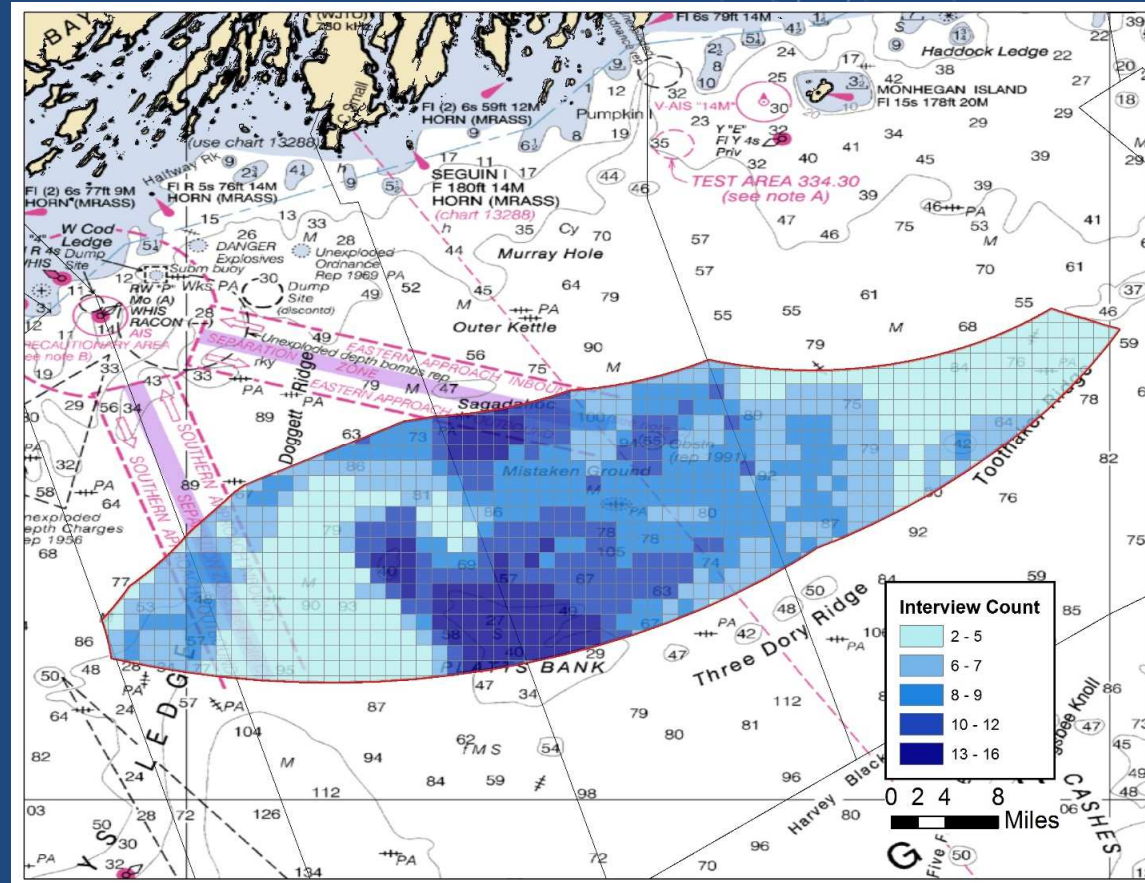


Bathymetry



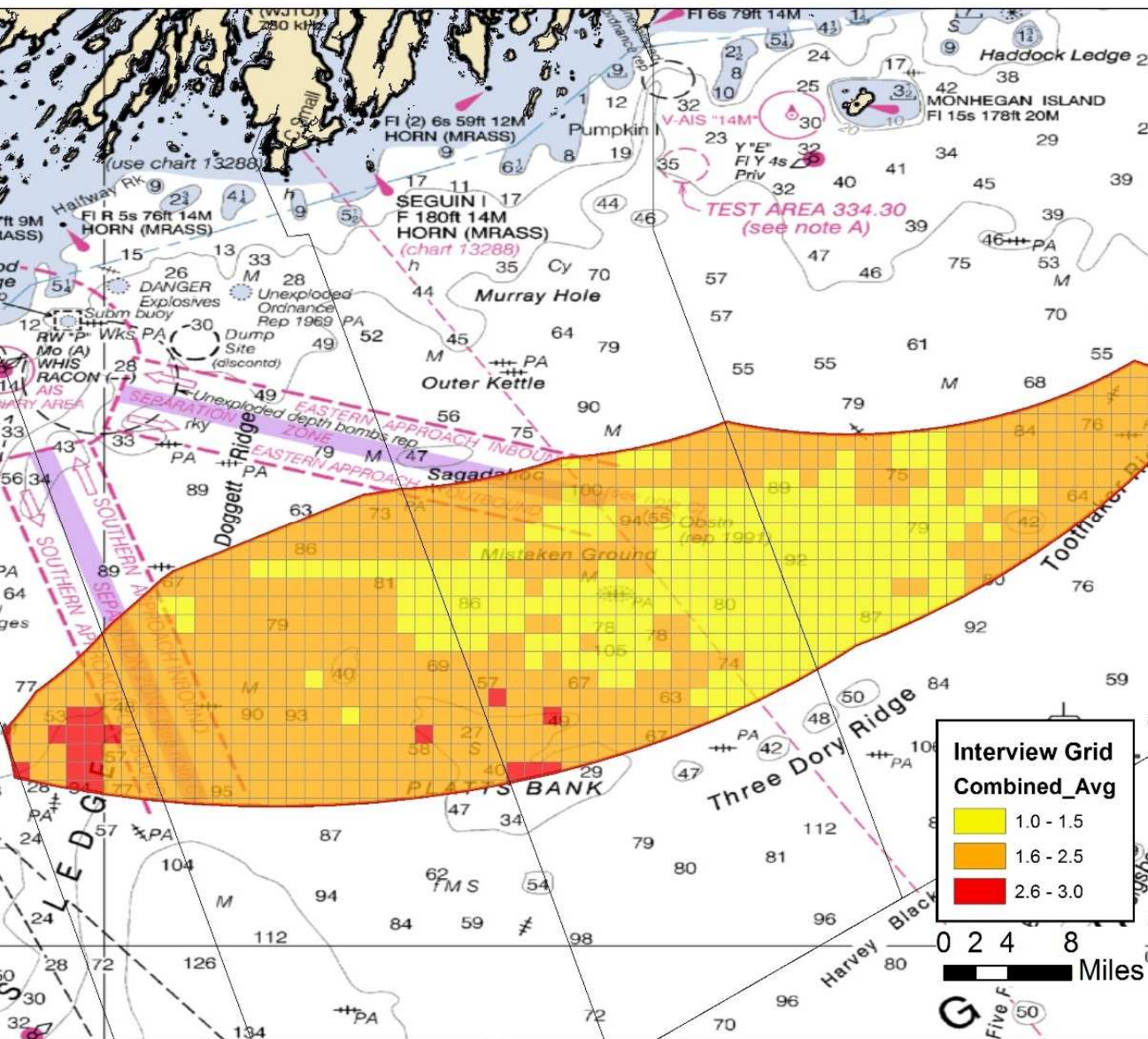
INTERVIEW PROCESS

- Deeper understanding of fishing activity
- Provided context to available data
 - Landings, VTR, VMS, Logbooks
- Broad initial survey largely unsuccessful.
- Attempted to cover all areas within AOI
- 26 Interviews



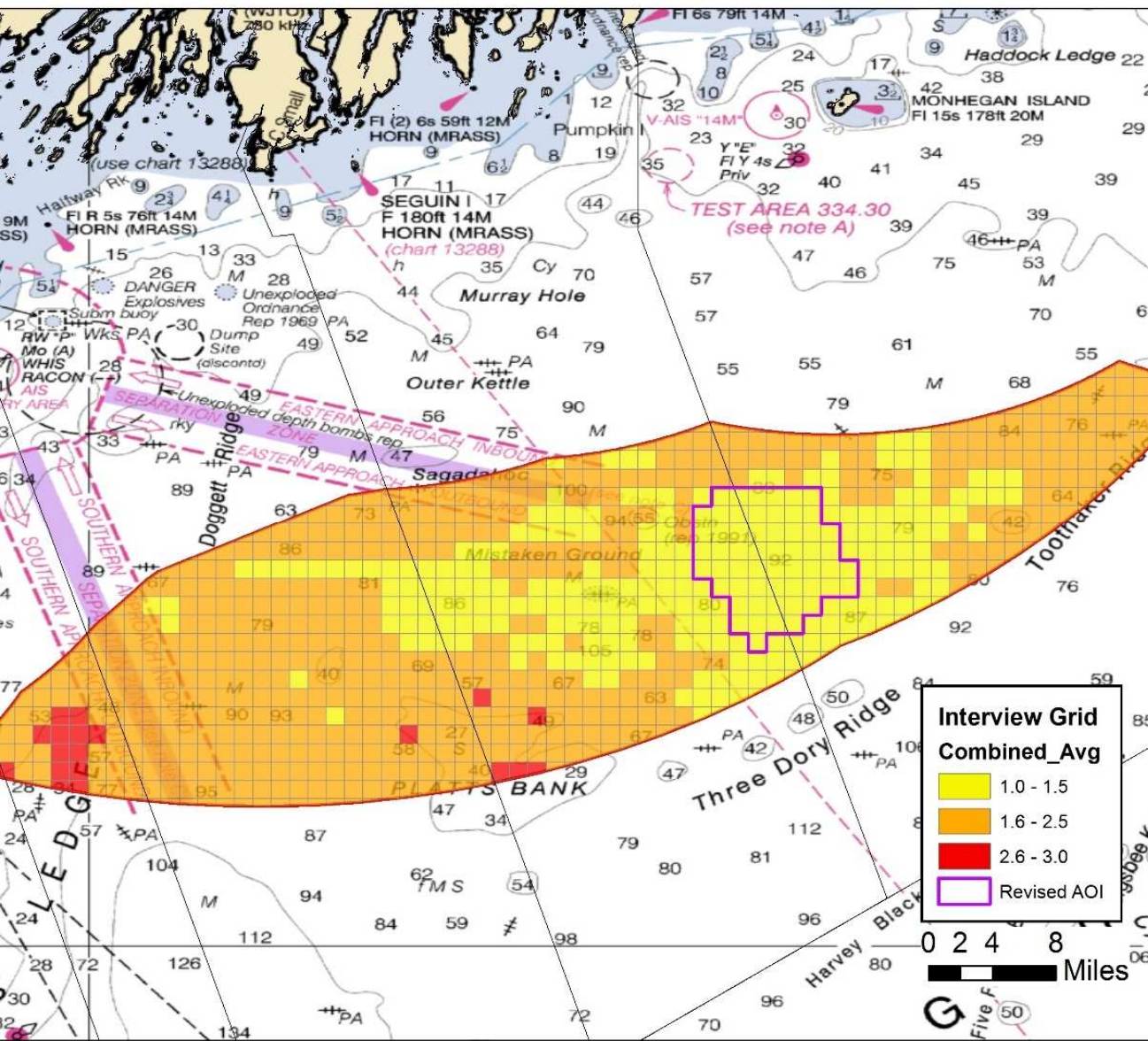
Combined Fishing Intensity

- Each grid was averaged across all fisheries
- The color ramp de-emphasizes Platts Bank, but the importance for the areas can not be understated.

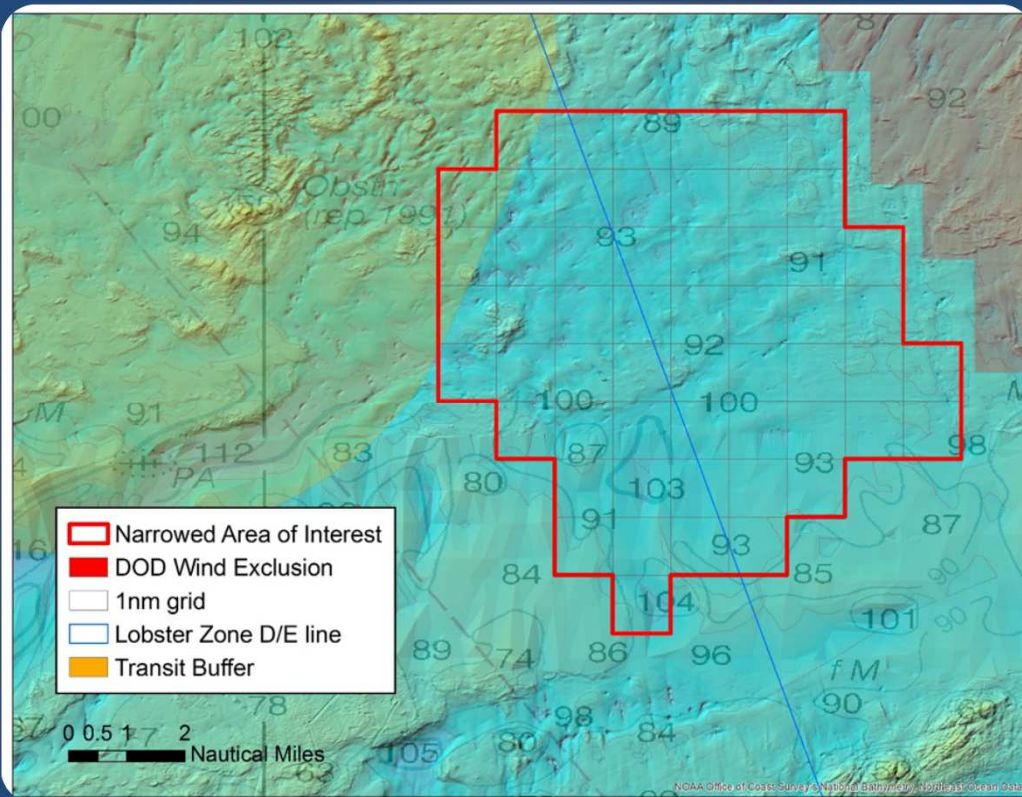


Narrowed Area Of Interest

- Minimizes but does not eliminate impact
- Highest likely impact on GF vessels targeting species in greater than 90 fathoms on mud (Dabs, Monkfish, Witch Flounder)



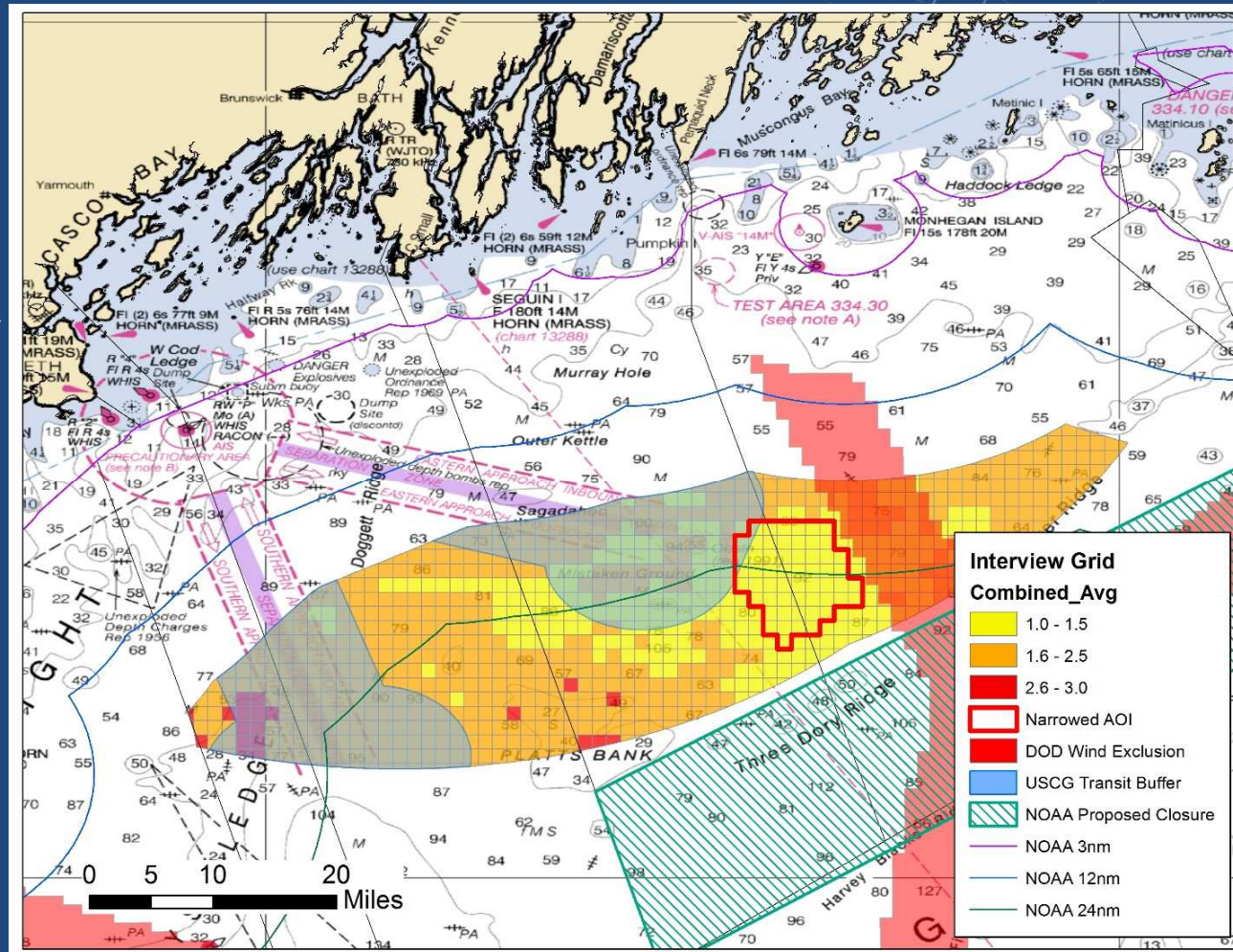
Characteristics of the Narrowed AOI



- 54 square miles (41 square nautical miles, or 34,596 acres)
- 90-100 Fathoms
- Likely soft sediments with a few bedrock outcroppings
- Polychaetes (worms) dominant infauna
- Flatfish (dabs, grey sole, monkfish)
- Inshore groundfish fleet target flatfish
- Smaller than the resolution of the available trawl survey and economic data

Narrowed AOI Conclusions

- All areas have fishing activity
- Attempted to minimize the conflict within development criteria
- Preferred anchoring habitat impacts species/gear
- Trawl gear activity, perhaps localized impacts
- Synergy wildlife/fisheries
 - Ecosystem and Fisheries Impacts





Wildlife

Wildlife Information in the Gulf of Maine

- GOM hosts an impressive list of over 300 species
- More nearshore population information than offshore (e.g. nesting seabird colonies)
- Offshore population information inherently more difficult to acquire
- No comprehensive GOM-wide distribution surveys for all species



Photo Credit: Brad Allen, MDIFW



Photo Credit: Brad Allen, MDIFW



Photo Credit: Clive Harris

Wildlife – Stakeholder Input

- GEO, DMR, and MDIFW met with state and federal agencies/stakeholders over several meetings
 - Stakeholders identified over 20 potentially applicable datasets relevant to offshore wind energy
- Many datasets not directly applicable:
 - Lacked data applicable to offshore wind
 - Lacked spatial information
 - Did not overlap with Area of Interest

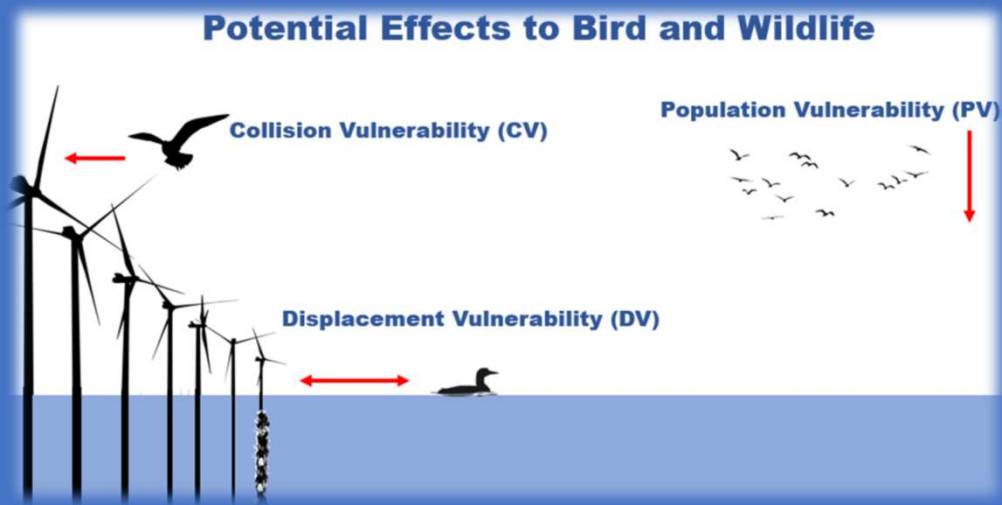


MDAT

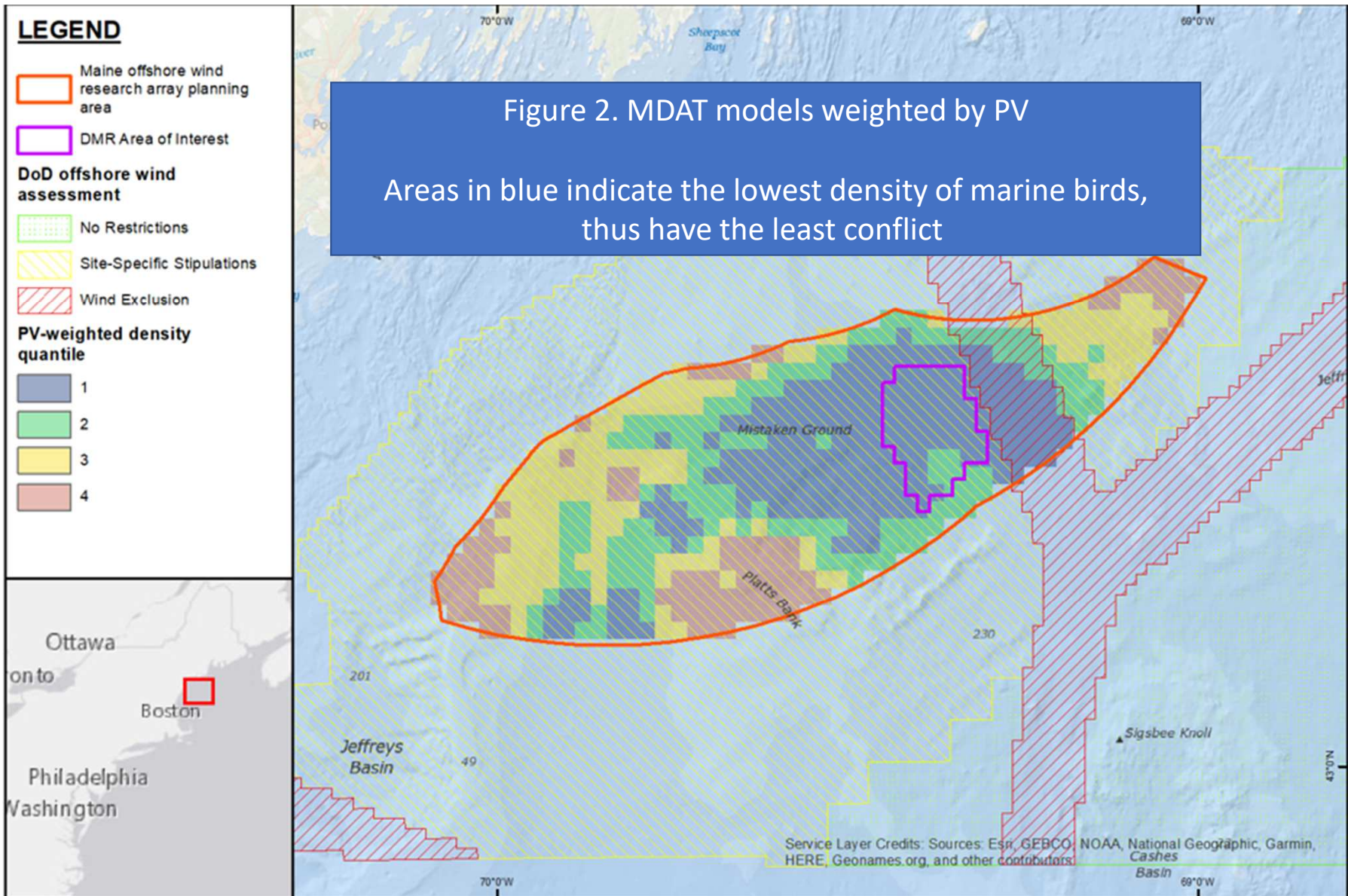


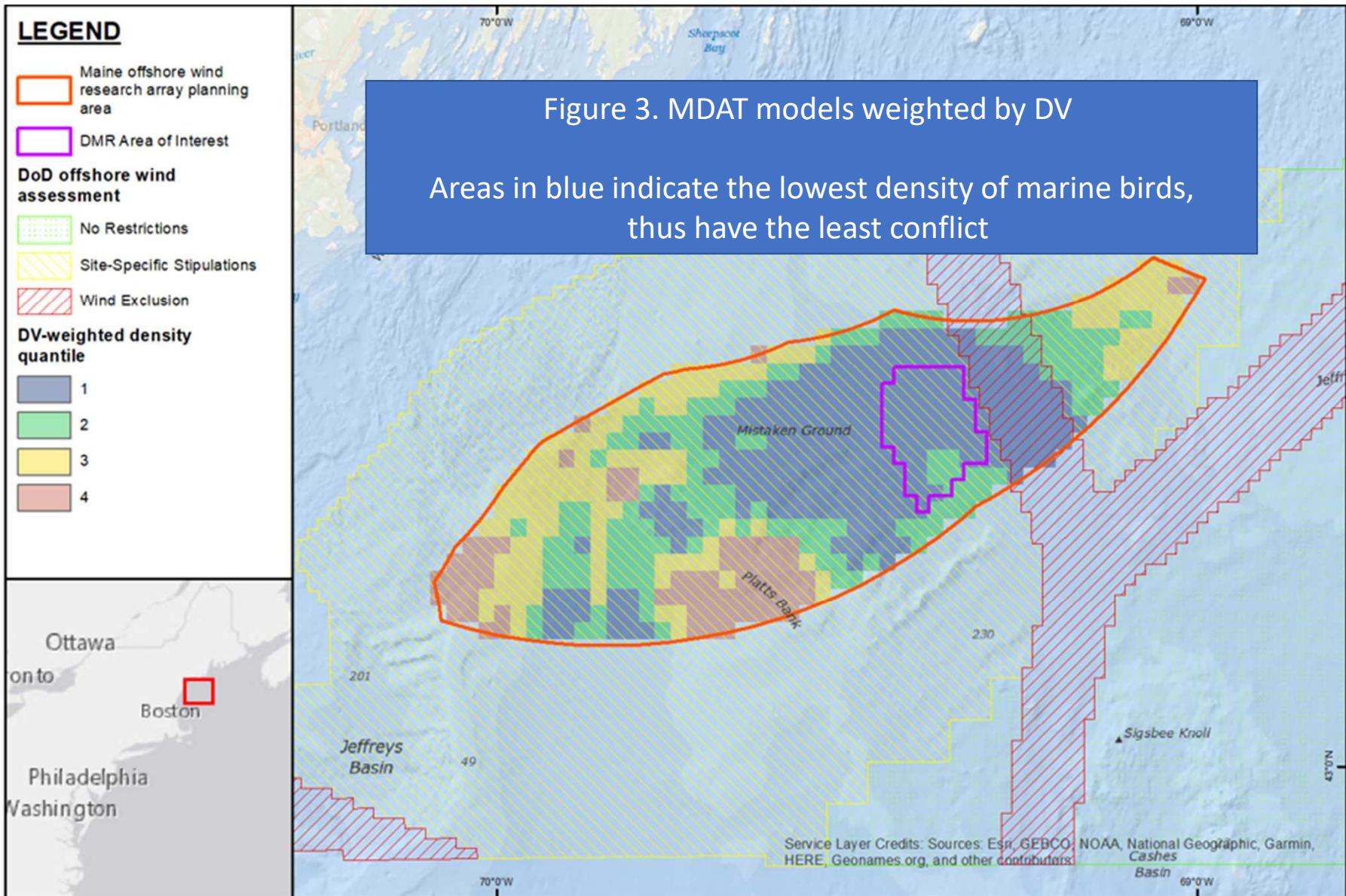
- Due to limited site-specific data, NOAA Marine-life Data Analysis Team (MDAT) models identified as most comprehensive for the AOI
- MDAT useful for:
 - Regional spatiotemporal use patterns
 - Relative abundance
 - Regional distribution
 - Regional seasonal changes
- Downside:
 - MDAT covers Maine to Florida
 - GOM information in AOI is coarse

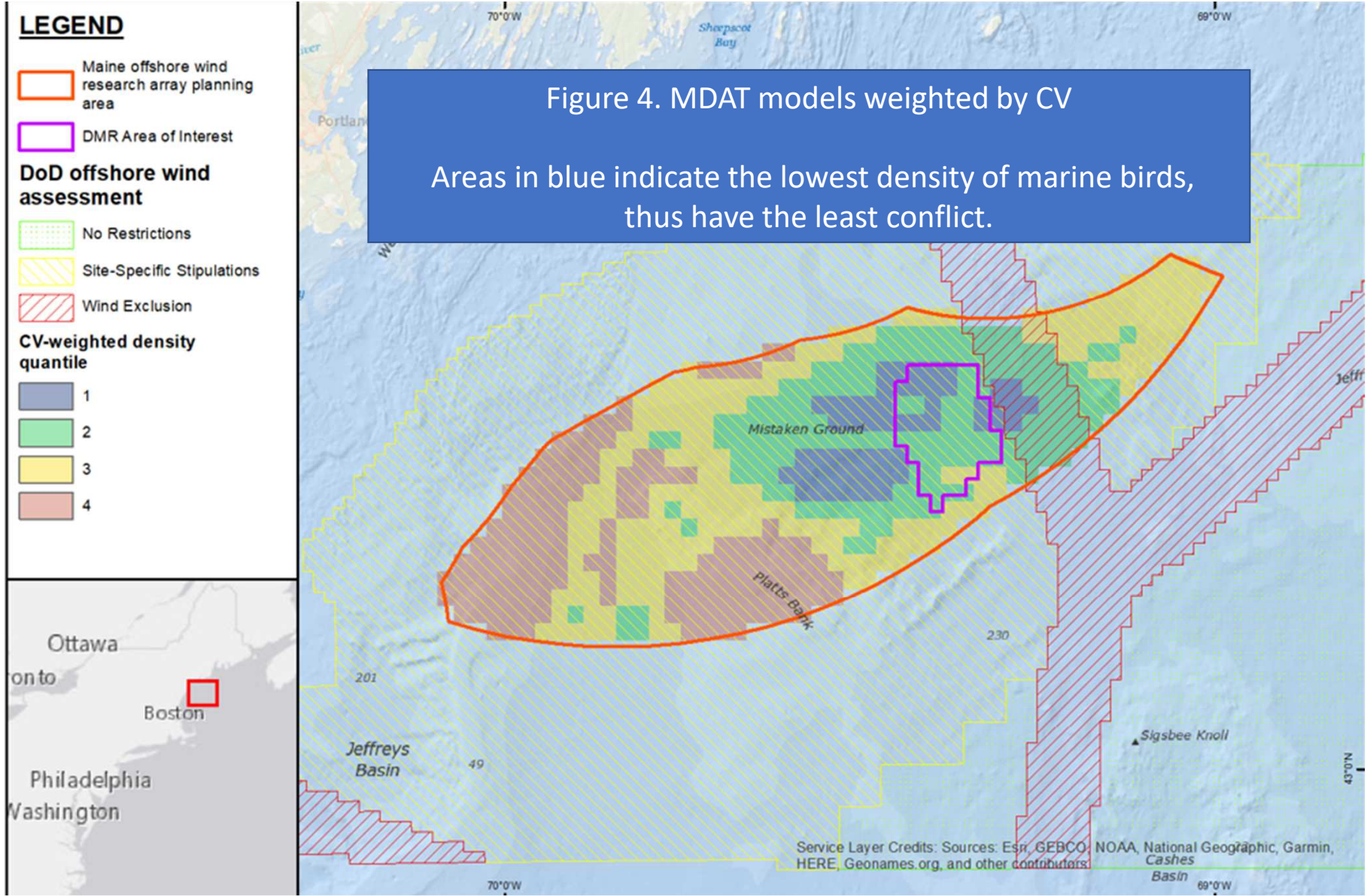
- BRI created a series of three maps depicting spatial avian risk for 36 species likely to be present in Research Array area based on:



- Population Vulnerability (PV): determined using regional and state vulnerability rankings
- Collision Vulnerability (CV): nocturnal flight activity, diurnal flight activity, avoidance, proportion of time within the rotor swept zone, maneuverability in flight, and percentage of time flying
- Displacement Vulnerability (DV): accounts for disturbance vulnerability to ship/helicopter traffic, wind facility structures, and species' abilities to use multiple habitats

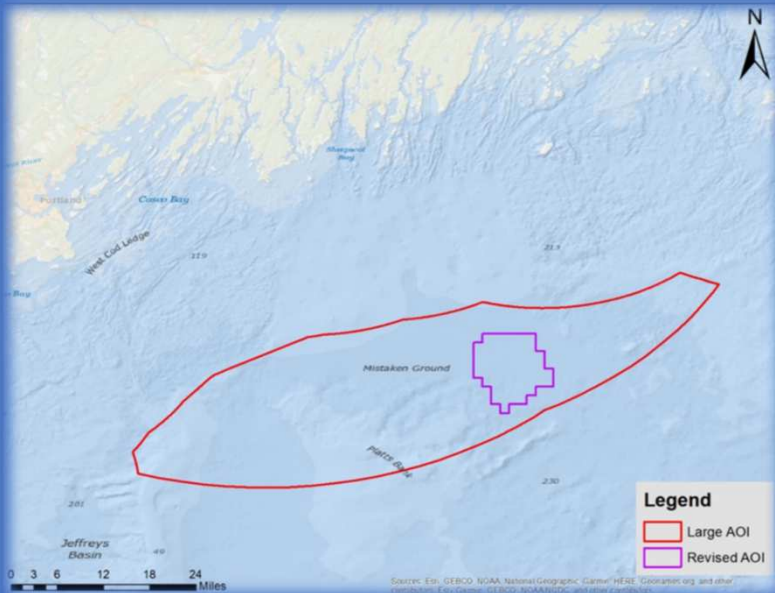






Wildlife – Results

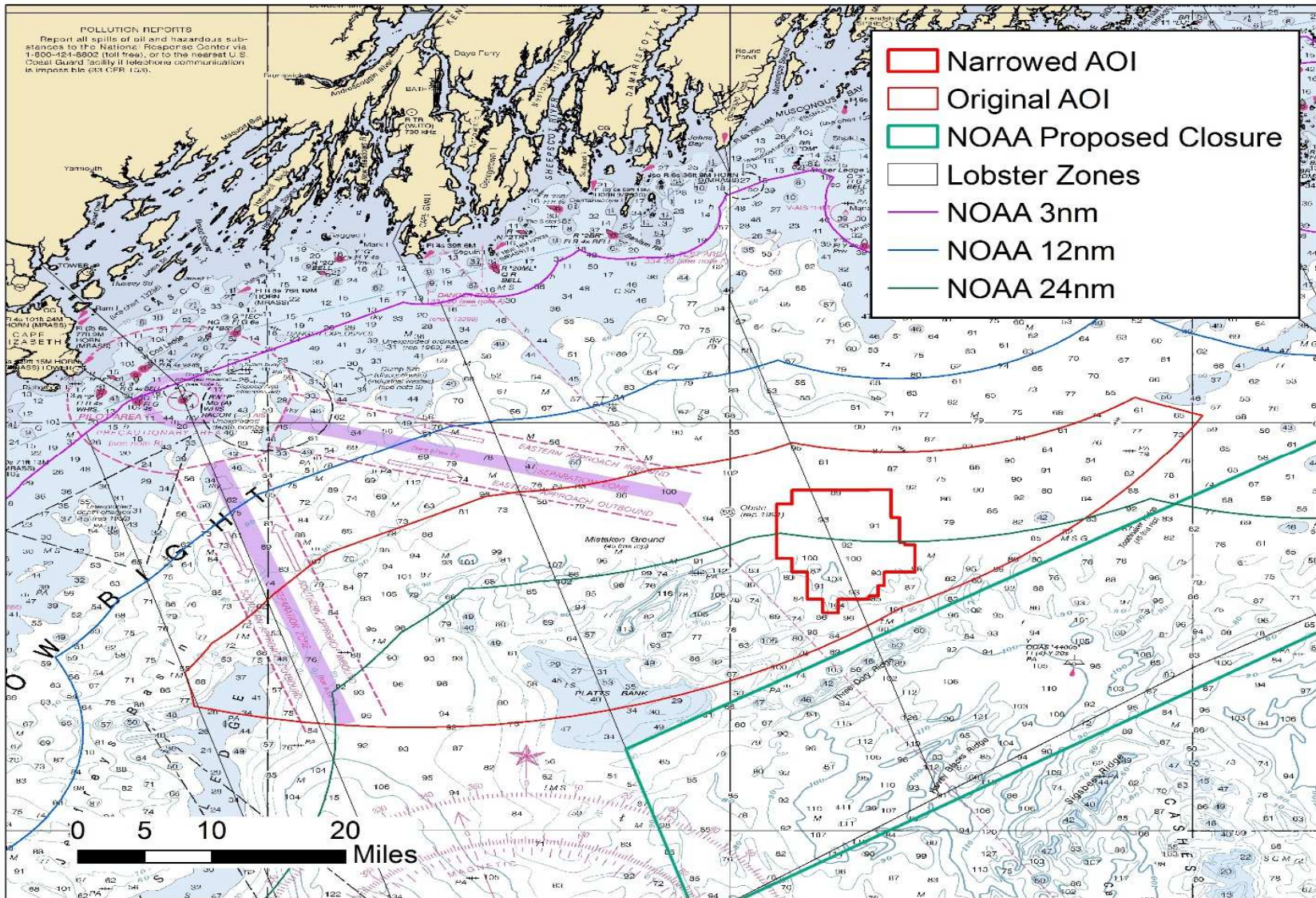
- Lack of data within the Gulf of Maine at a fine scale makes it difficult to draw specific conclusions, especially for rare species
 - Areas to the south of the Gulf of Maine have benefited from substantial large surveys (e.g. MA, NJ, NY, Mid-Atlantic, South Atlantic bight)
- BRI's results suggest lowest potential risk to marine birds around the deeper waters of “Mistaken Ground” and extending east through Platts Basin for about 25–30 miles (40–50 km) likely due to the area's:
 - distance from shore
 - water depth
 - lack of significant underwater features



Wildlife – Results

- DMR's Narrowed AOI overlaps with portions of the blue and green areas in BRI's analysis
 - indicates lower potential risk for both terrestrial and marine wildlife species compared to some other areas of the AOI
- Because other mammalian species are likely to be associated with similar environmental characteristics (e.g., underwater features or distance from shore), the Maine-specific MDAT models currently provide the best available comprehensive information to inform siting in areas that minimize impacts generally to wildlife.

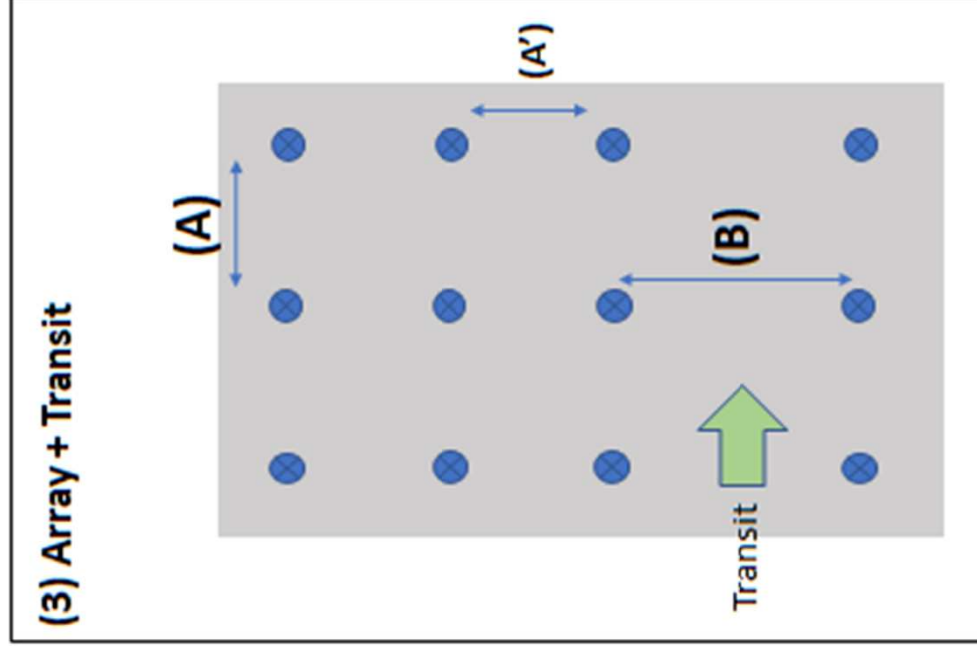
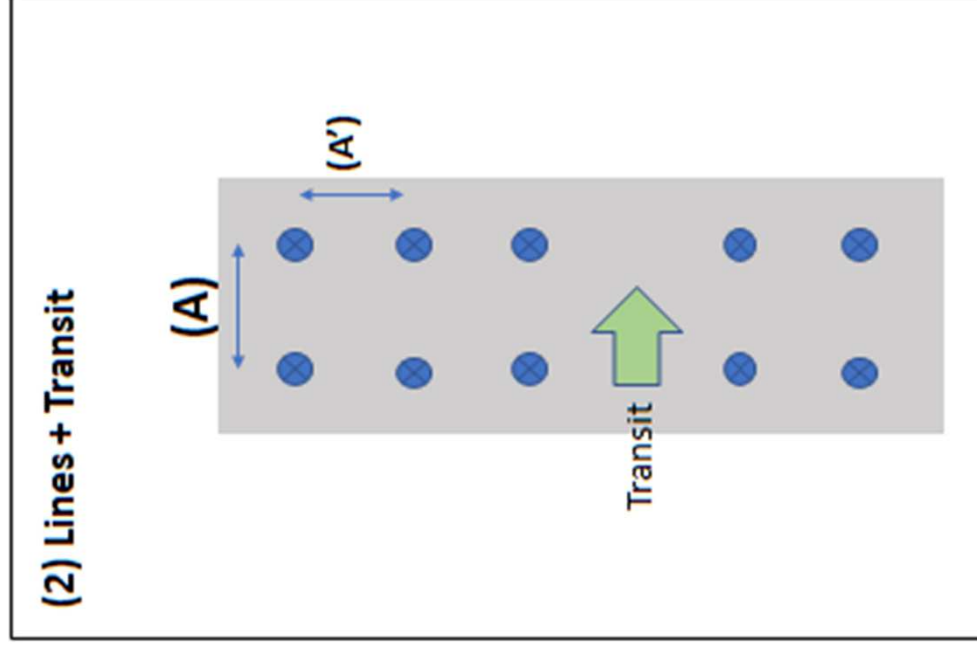
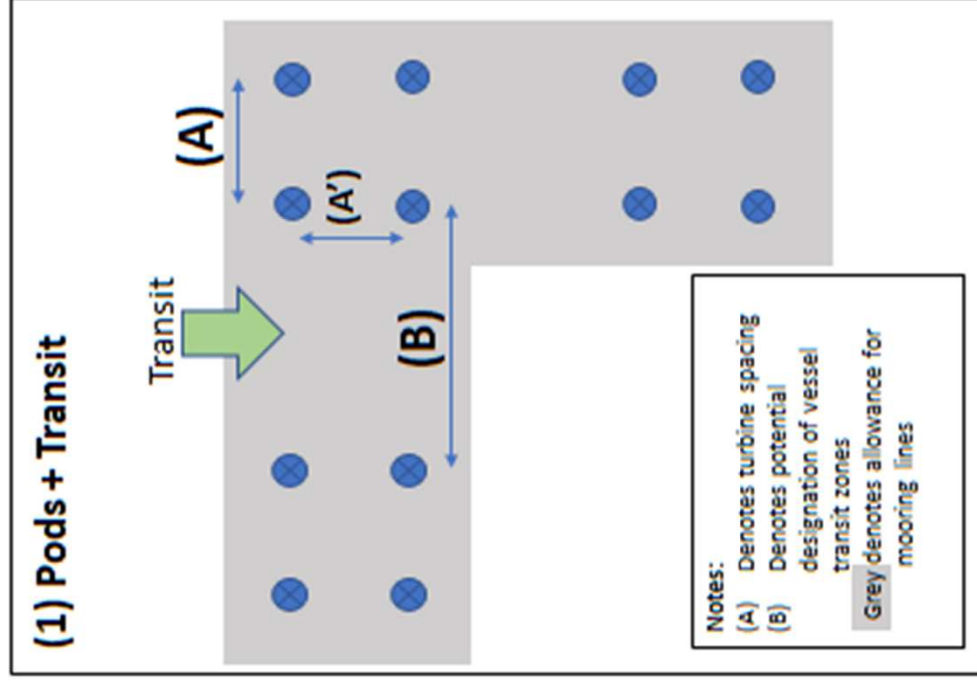




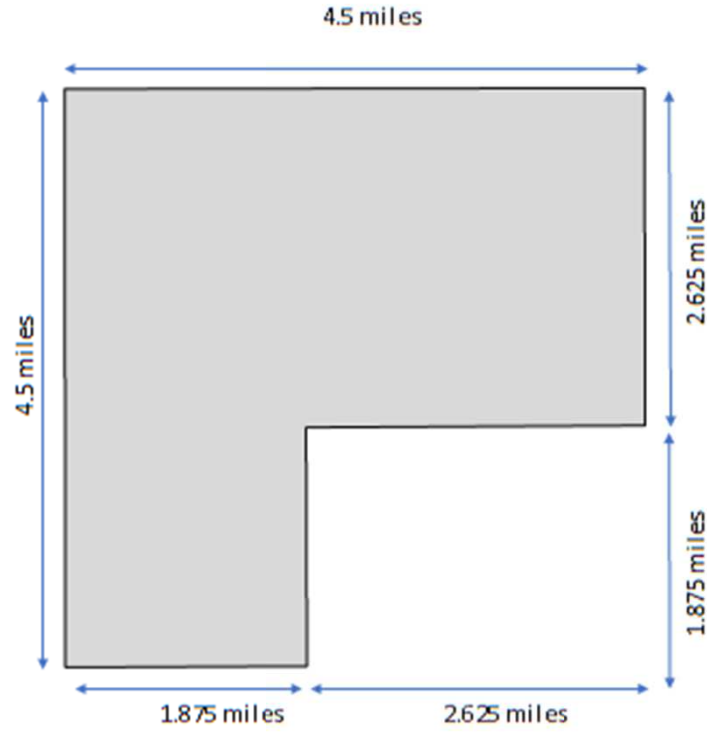


Configuration and Preferred Site

Potential Array Layouts

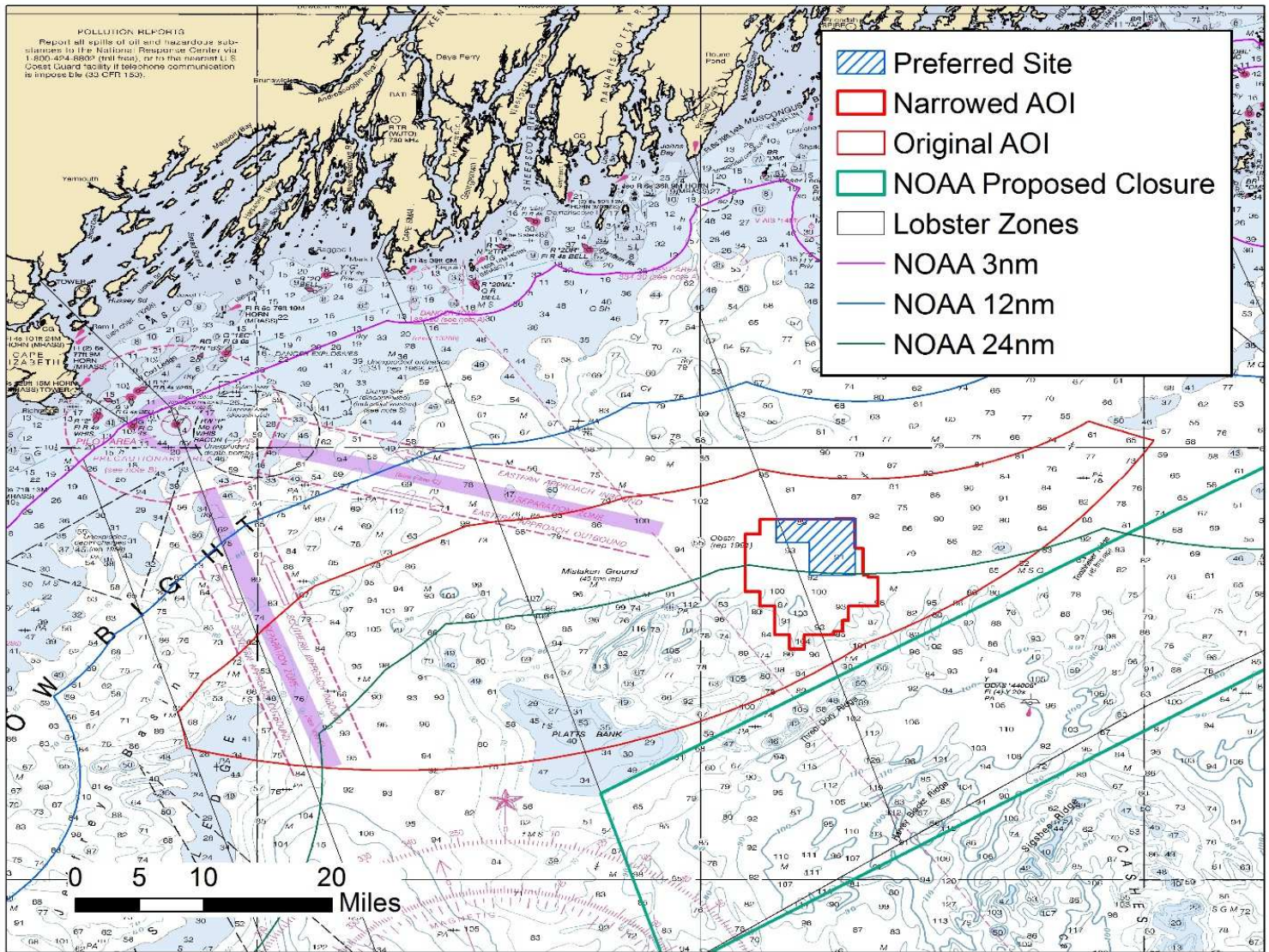


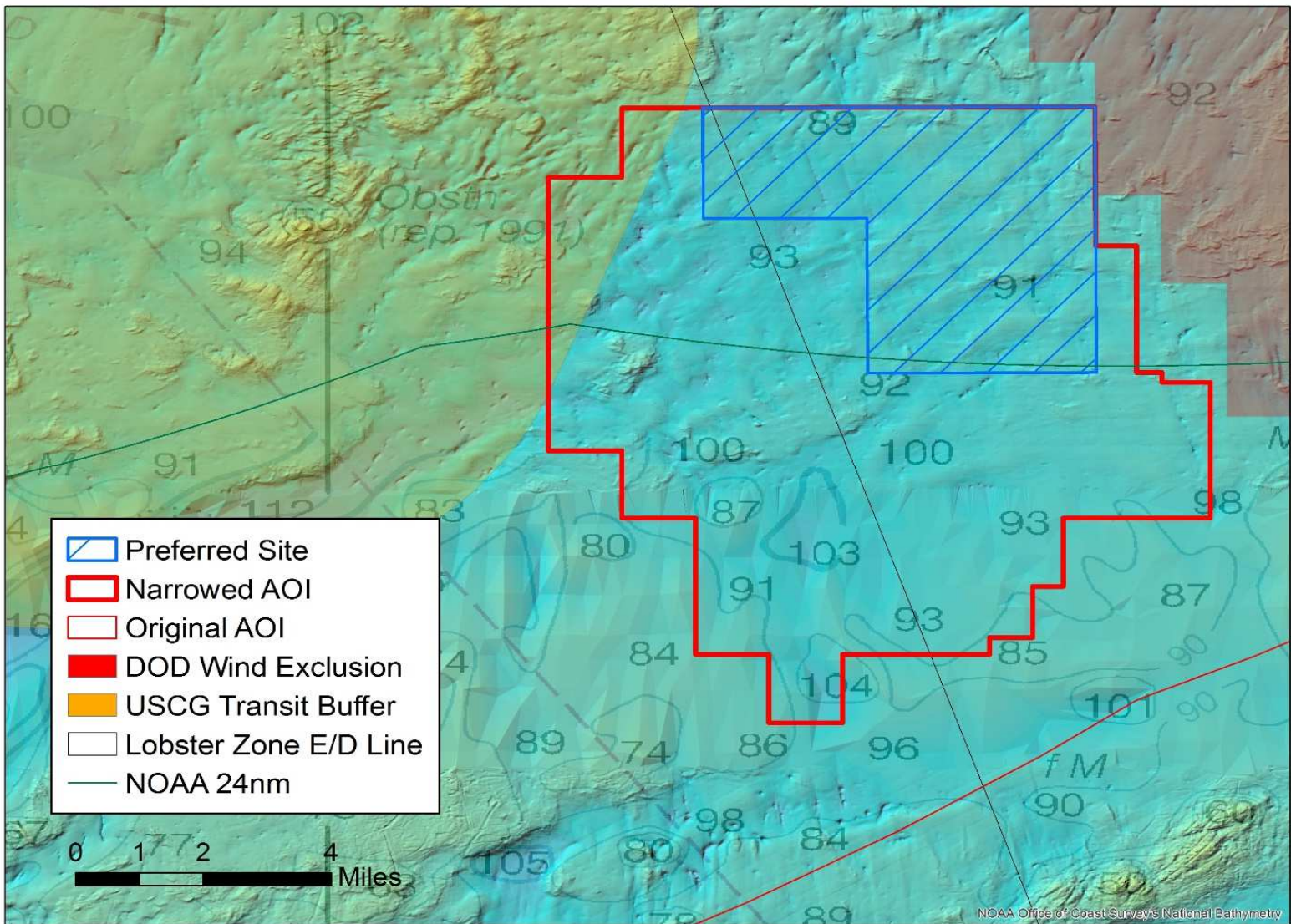
Flexible Lease Shape that allows multiple potential layouts



Other Siting Considerations

- Fishing
- Wildlife
- Bathymetry
- Navigation
- Defense
- Cost







Research Framework



Research Approach

- Research is the key driver for the array.
- Research objectives will inform:
 - Siting process and decision
 - Project design, layout and operations

Initial Key Research Themes Identified:

- Environment and ecological interactions
- Interactions with fishing activity
- Navigation
- Technology research and demonstration, including mooring systems
- Workforce education and training
- Socio-economic and community impacts



Research Framework

- Process: Input gathered from past sessions, stakeholder conversations, and expert input.
- Research framework is broad umbrella that captures scope of questions that may be explored.

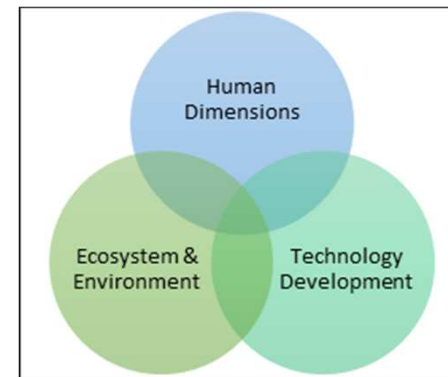
Key objectives:

- Reduce conflicts with existing ocean uses
- Maintain coastal community culture and heritage while creating socioeconomic opportunities.
- Monitor ecosystem change
- Support education/workforce/supply chain development.
- Inform future projects by providing recommendations for socially and environmentally responsible development.
- Advance floating wind technology and reduce the levelized cost of offshore wind energy.



Research Framework

- Research framework is a broad summary of key areas of potential research, broken into themes:



- Examples of potential research questions, framework does not make decisions
- Research does not include monitoring and survey work required for permitting
- Additional funding will be required to undertake research



Research Framework: Human Dimension

Understanding where both human conflicts and opportunities exist:

- Fisheries
- Socioeconomic impacts
- Vessel traffic and navigation
- Supply chain and workforce development

Example questions for **navigation/supply chain workforce**:

- Does the research array have any effects on navigation?
- How do maintenance vessels interact with other vessels within the area?
- Which existing industries can transition to the offshore wind supply chain, particularly for floating?
- What jobs skills and training programs are needed?



Research Framework: Human Dimension

Example questions for **fisheries and socioeconomic impacts**:

- What portion of mooring lines will become buried over time and will this enable greater use of mobile or fixed gear operations within the array?
- To what extent will effort be displaced? Will landings be impacted within and nearby the windfarm?
- If fishing gear becomes entangled with the mooring system, how can it be detected and removed efficiently?
- How does the research array directly and indirectly impact employment, and what type of jobs are impacted?
- What impact does the research array have on fishing opportunities, shoreside infrastructure and coastal communities?

What We Need to Know to Understand the Interactions of Ecosystems with Floating Offshore Wind Energy

Species Occurrence
& How it Changes
Through Time



Stressors Introduced by
the Turbines &
Research Array and How
They Can be Minimized

How to
Optimize Co-Existence
With Ecosystems



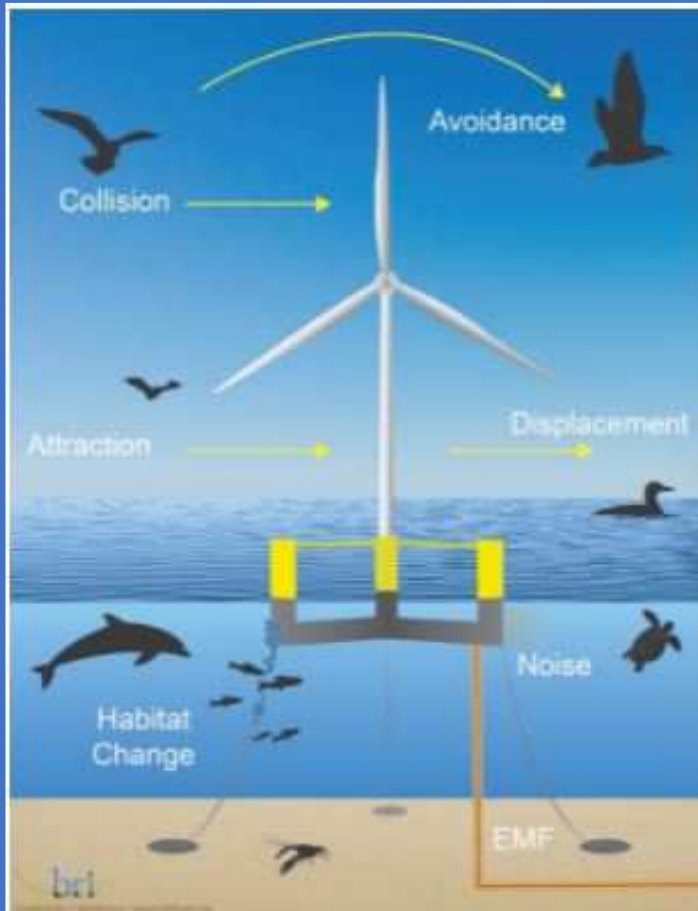


Figure 1. The potential effects of floating offshore wind on ecosystems, which can occur above and below water.

Example questions for **ecosystem and environment**:

- **Occurrence:**

- Do cetaceans avoid or swim through research array?
- Are bats present at the array and how does use relate to weather and time of year?
- How do fish and wildlife distribution and abundance change?

- **Optimizing co-existence with ecosystem:**

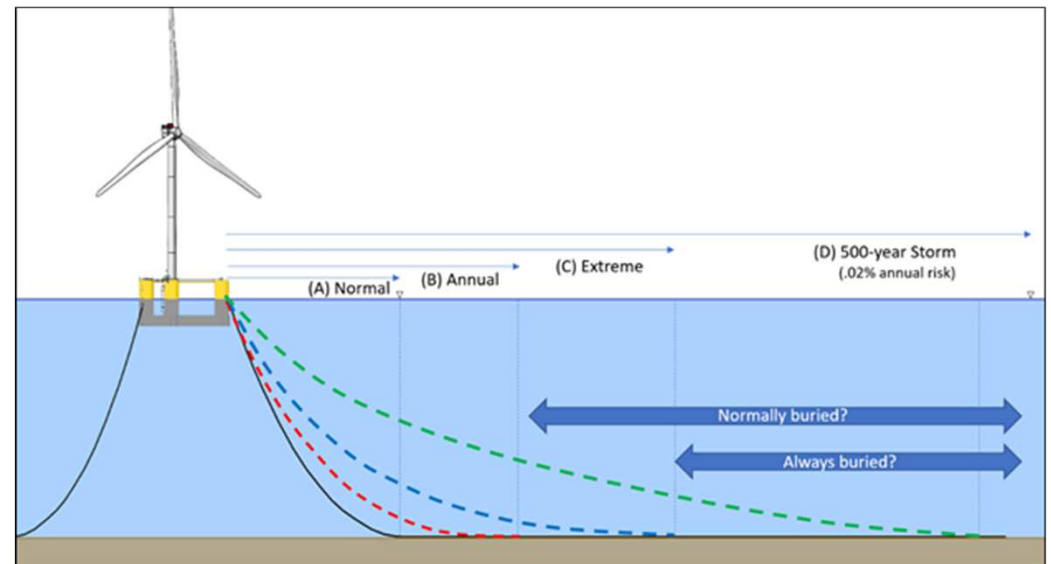
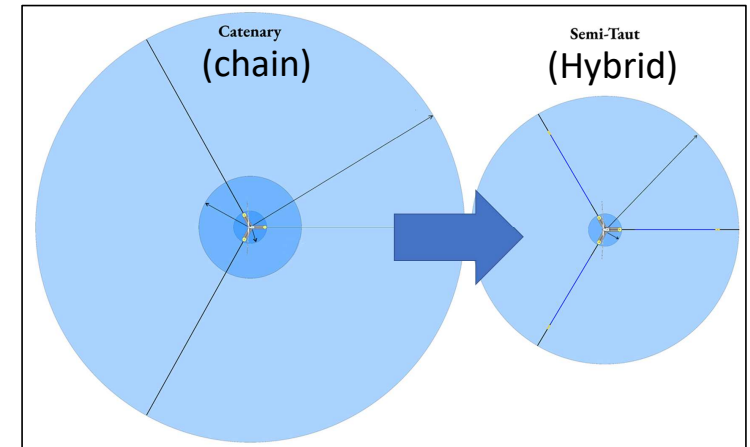
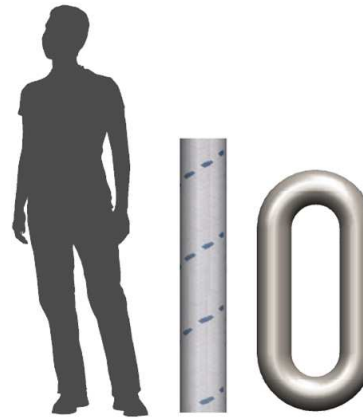
- Are there surface current changes that impact larval/plankton community due to these structures?
- Are marine birds attracted to the turbines because of increased foraging opportunities?

- **Turbine and research array:**

- How does the research array change baseline noise levels and, if so, what are the potential effects to marine species?
- Are whales at risk of secondary entanglement with derelict fishing gear caught on array cables?
- Does EMF of dynamic or buried cables alter the behavior of benthic resources?

Examples of Technical Research

- Anchor line optimization for Gulf of Maine where bedrock may be encountered
- Behavior of mooring/anchor systems over time and how changes can be communicated to fishermen
- Best apparatus to launch a completed foundation – one that can accommodate multiples uses
- How to create a local serial production facility so that the foundations can be built predominantly in Maine, creating local jobs



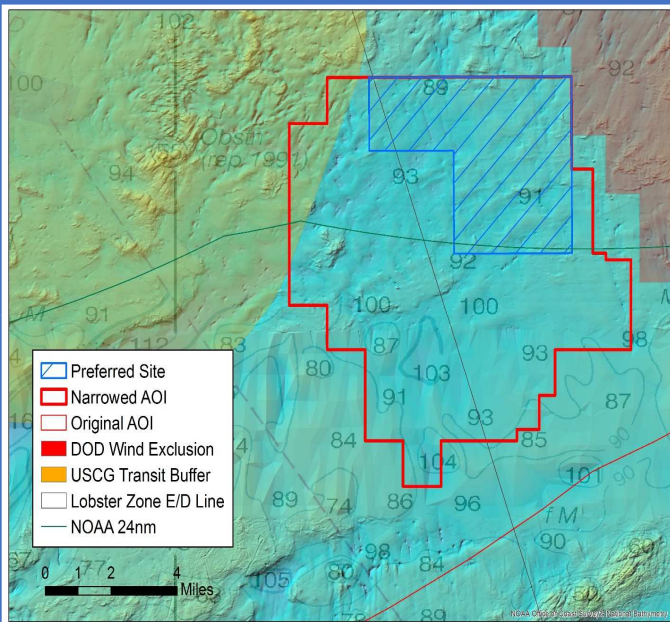
Research Framework Next Steps

- Finalize research framework for BOEM application.
- Determine timing of monitoring beyond what is required for permitting.
- Work on standing up legislatively-directed research consortium.
- Develop research plan and seek additional funding.



Steps to Finalize Proposal

Next Steps: Final Site



- GEO will consider public feedback received by **July 30th** via online form: <https://www.maine.gov/energy/initiatives/offshorewind/researcharray/siting>
- GEO seeks input on the preferred site and any additional information to inform its final decision on a 16-square-mile site within the Narrowed Area of Interest.
- GEO will identify a final site and research framework based on:
 - Additional data/information by the 30th and
 - Known data and information gathered to date.

Next Steps: Application

Steps to finalize State Application for Federal Research Lease:

- Finalize site and research framework
- Submit application to BOEM in summer

Substance of Application:

- Specific lease area requested:
 - Approx. 16 sq mile site
 - Will include map/outline of lease
 - Will not include turbine locations
- General description of project and objectives
- Available site characteristics
- Research framework

Next Steps: Post Submittal

BOEM Review:

1. Public notice
2. NEPA review, including public comment
3. Decision on final research lease issuance

Work Ahead on Research Array:

1. Gather site specific information to inform construction and operations plan (cop);
2. State/developer submits detailed project plan (cop) to BOEM;
3. NEPA review on plan, including public comment, and consultations with other agencies, including incidental take authorization (MMPA) and ESA consultation.

Surveys and permitting expected to take a few years and will include interaction with researcher/public through official public comment and additional stakeholder outreach.



Next Steps

Links to the Roadmap

Roadmap to the Research Array

The Roadmap Working Groups will:

- Provide input pre-survey priorities, research priorities, and inform creation of future state consortium
- Anticipate and help fulfill needs for Maine's supply chain, workforce, ports, and interconnection to support the research array
- Identify priority considerations for Maine's input to BOEM's future leasing process

Multiple Ways to Engage

- *Thank you* for your participation and engagement.
- Respond to feedback form by July 30th
<https://www.maine.gov/energy/initiatives/offshorewind/researcharray/siting>
- Review materials and sign up for interested parties list on GEO webpage:
www.maine.gov/energy/initiatives/offshorewind
- Follow the Roadmap effort – July 14th Advisory Committee meeting



Thank you