







SAMBAS Consulting LLC



Advisory Board

Maine Offshore Wind Research Consortium

May 12, 2025

Maine OSW Research Consortium

Established to better understand the local and regional impacts of floating OSW in the Gulf of Maine

The consortium includes representation from fishing industry, ocean experts, and others to inform research priorities, and will work to align with related regional and national efforts.

GOAL: develop and execute a research strategy to better understand the local and regional impacts of floating offshore wind power projects in the Gulf of Maine, including:

Opportunities and challenges to existing uses in the GOM, including how to best support co-existence with the fishing industry

Methods to avoid and minimize impacts on ecosystems and existing uses

Ways to realize cost efficiencies in commercialization

Conservation actions and projects for impacted species and habitats (NEW from LD 1895)



Meeting Objectives

- Receive brief updates on Research Consortium research and relevant Maine research
- Discuss high priority research projects for Round 3 funding

Meeting Agenda

- 9:00 Welcome & Introductions Terry Alexander, Co-Chair; Katy Bland, Maine Sea Grant
- **9:05 Programmatic Updates –** *Katy Bland, Maine Sea Grant; Meghan Suslovic, Governor's Energy Office*
- **9:35** Relevant Maine Research Updates Celina Cunningham, Governor's Energy Office; Casey Yanos, Department of Marine Resources; Christine Beitl & Julia Hiltonsmith, University of Maine; Anthony Viselli, University of Maine
- **10:05 Consortium Research Updates** Meghan Suslovic, Governor's Energy Office; Jesse Minor, Department of Marine Resources
- 10:25 Break
- **10:40 Project Scoping Discussion –** Olivia Burke, Carbon Trust
- **11:55** Wrap Up and Next Steps Katy Bland, Maine Sea Grant
- 12:00 Adjourn

A Few Guidelines for Today

Advisory Board Members

- 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)



Programmatic Updates

Introducing Invenergy Offshore

May 2025



World's Leading Privately Held **Clean Energy Company**



Wind 119 projects 19,548 megawatts



Solar 53 projects 7,119 megawatts



Storage 22 projects 2,917 megawatt hours 831 megawatts



4 projects 6,000+ megawatts in development



Natural Gas 13 projects

6,071 megawatts

Invenergy Services

We use our 20 years of operations and maintenance experience to help you make the most of your energy center. Whether it's day one or years later, we use our owner's mindset to manage our energy centers and on behalf of our customers.



Transmission

4 projects 4,100+ miles of transmission & collection lines developed



Clean Hydrogen

1 pilot project in construction 40 metric tons will be produced annually



Clean Water

9 water treatment facilities used at our project sites 18 million gallons per day of raw water capacity

Invenergy Offshore Wind Experience

Harnessing the power of abundant offshore wind speeds.



Benefits of offshore wind energy:

- Reliable, domestically produced renewable energy that will reduce dependence on imported energy
- 80% of Americans live near the coast, meaning highest energy demand is located close to offshore wind generation¹
- Energy price stability for decades to come
- Thousands of U.S. jobs will be created
- Millions invested in domestic supply chain growth

¹ "Offshore Wind Power Facts," March 14, 2023, American Clean Power

Invenergy's growing offshore wind portfolio by the numbers



offshore wind leases off the East and West coasts



6+

gigawatts of offshore wind projects in development



375,000+

acres of seabed, equivalent to more than 585 square miles





Acquired the lease from the Bureau of Ocean Energy Management in **early 2022**



Approximately **84,000 acres** of seabed located more than **40 miles** east of the New Jersey coastline and 80 miles south of Long Island



Targeted for operation in 2031+



2,400+ MW generated, enough clean energy to power approximately **1 million homes**



Committed to **responsible development** and **early and often engagement** with interested stakeholders, communities, and Tribal Nations





Acquired provisional lease from the Bureau of Ocean Energy Management in **December 2022;** Named official leaseholder in **June 2023**



The **80,000-acre** lease is located approx. **20 miles** off the coast of Cambria just north of Morro Bay



3,261 – 3,927 feet average water depth across lease area



American-led team with over **20 years** of experience developing clean energy solutions across the U.S. and globally



Committed to **responsible development** and **early and often engagement** with interested stakeholders, communities, and Tribal Nations

Invenergy NE Offshore Wind LLC





Acquired **two** provisional leases from the Bureau of Ocean Energy Management in **October 2024;** Named official leaseholder in **December 2024**



Lease areas total nearly **216,000acres** of seabed; OCS-A 0562 & 0567 are located over **70 miles** off the coasts of Portland and Boston respectively



606 – 670 feet average water depth across both lease areas



American-led team with over **20 years** of experience developing clean energy solutions across the U.S. and globally



Committed to **responsible development** and **early and often engagement** with interested stakeholders, communities, and Tribal Nations

Achieving Responsible Development in the Offshore Environment



MINIMIZE ENVIRONMENTAL RISK

Collect and assess information on ocean resources to design, build, and operate sites in a way that avoids and minimizes risks to species of concern and sensitive habitats.

STAKEHOLDER & TRIBAL ENGAGEMENT

Engage with regulatory agencies, Tribes, and communities such as fisheries at every stage of development to exchange information on environmental risks and identify appropriate strategies to manage those risks.



INDUSTRY COLLABORATION

Engage with industry organizations to advance industry awareness, promote smart policy, and pursue innovative solutions for responsible development and operations.



STRATEGIC PARTNERSHIPS

Establish strategic partnerships with scientific organizations that are studying the impacts of offshore wind development on ocean resources and work to advance innovative approaches to responsible offshore wind development.

Terms of Reference Update

The purpose of the update is to define and clarify roles and responsibilitiesA = Accountablewith respect to the Research Consortium, leading to improvedR = Responsiblecommunication, collaboration, and program deliveryR = Responsible

Action/ Deliverable	State	SC	AB	РМ	Collaborators
Administer Fund	A	С	I	С	I
Develop research strategy	A	R	R	S	Ι
Finalize research projects	A	R	С	S	I
Report to Legislature	А	С	С	С	I
Develop funding plan	А	R	С	S	I

C = Consulted

I = Informed

S = Support

Fishermen's Study Tour

CARBON

This study tour will provide members of the fishing industry in the Gulf of Maine to learn in detail about floating offshore wind development. This tour will focus on:



Establishing a common understanding of floating offshore wind (OSW) technology;



Hearing lessons learned about the interactions between floating OSW development and fishing in Scotland



Exchanging best practices for assessing and mitigating impacts of floating OSW development on the fishing industry and wider coastal communities

Participants will meet with wind industry leaders, fisheries representatives and policy officials with direct experience with floating OSW development and will discuss approaches for co-existence between OSW and fishing activities. This trip will enable participants to make connections, ask questions and visit a floating offshore wind farm in person (Kincardine) to gain a better understanding of how the industry will interact with the fishing industry.





Relevant Maine Research Updates

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State of Maine Offshore Wind Research Array



Conceptual Illustration by University of Maine

Research Array Biological Survey Focus

There is a lot of focus on baseline data gathering at this point.

The Gulf of Maine is understudied – particularly in comparison to other regions like the Gulf of Mexico which has had decades of focused research, survey and monitoring work related to the offshore energy industry.

There are still significant data gaps here on species presence and abundance and environmental conditions. We need to fill these gaps to understand any potential changes.

Surveys Continuing and/or Starting in July 2025

Seafloor mapping and benthic habitat characterization

Passive acoustic monitoring

Highly migratory species monitoring

Active acoustic survey

Oceanographic monitoring

Trawl survey



Seafloor Habitat Characterization and Benthic Sampling

- Multibeam mapping surveys to compile images of bottom habitat of entire area
- Benthic grab sampling data will include:
 - Water column profiles
 - Average seafloor values for temperature, pH, chlorophyll, dissolved oxygen, and salinity
 - Surficial sediment information
 - Seafloor video
 - Benthic species identification





Historical Uses of the Maine Offshore Wind Research Array (MeRA)

Christine Beitl & Julia Hiltonsmith Department of Anthropology, University of Maine

Interviews



Interviews



Benthic Features





Project Update: Demonstration Off Castine, Maine of 2nd Gen Floating Wind Foundation VolturnUS + Damped Concrete Barge



Maine Offshore Wind Research Consortium May 12th, 2025



Dr. Anthony Viselli, PE, Chief Engineer, anthony.Viselli@maine.edu

Outline

- 1. Project overview
- 2. Update on Progress
- 3. Next Steps
- 4. Questions

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MAINE



Demonstration Project Overview

- National competition to advance 2nd generation floating foundation
- Goal is to validate naval new floating concrete foundation
 - 1. Less expensive to build and smaller footprint
 - 2. Requires less port infrastructure
 - 3. High local benefits
- Demonstrate production methods and naval architecture with American Bureau of Shipping
 - 27 partners, local supply chain engaged
 - ¼ scale of 15MW unit
- The turbine will be the second floating wind in the US
- UMaine continues to move ahead at a reduced research level during ongoing Title IX Related DOE suspension as this reduces costs, increases safety, and accommodates vessel traffic constraints.





ATLANTIS Aerodynamic Turbines Lighter and Afloat with Nautical Technologies and Integrated Servo-control



VolturnUS + Industrialized Serial Concrete Production









4. Post-tensioning and mechanical outfitting



- Novel damper system used in skyscrapers and ships
- Slipforming production approach
- Floating barge build/ launch options for underdeveloped ports



Construction and Launch of Foundation Completed March 30th

Construction Photo of Concrete Foundation



Completed Turbine



60 nautical mile tow

- Led by Maine Maritime Academy and Penobscot Bay Tractor Tug
- Speed ~2 knots
- Lead vessel and assist vessel.
- Hs 1m, 15 knot winds, 1 knott currents
- Towed from construction site to turbine integration facility
- Validation of towing methods







Turbine Integration Completed





Project Next Steps

- Goal is to moor in Castine this week. Notice to Mariners sent May 2nd. Another notice will be sent 24 hours prior to tow
- 2. Deployment completed once turbine connected to grid (expected in June)
- 3. UMaine welcomes opportunity to complete additional research using asset

Questions?

Contact:

Dr. Anthony Viselli, PE Chief Engineer and Assistant Director

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University of Maine







Consortium Research Updates



2025 DMR Offshore Seafloor Survey





Maine Department of Marine Resources

Bureau of Marine Science

Division of Ecology and the Environment

Jesse Minor, program lead Dane Fegely, lead hydrographer



2024 Survey Results

Thank you to the Governor's Energy Office and the Offshore Wind Research Consortium for funding this ambitious project!

Sonar Survey:

- August 1 October 23
 - 34 days at sea
- 337 nmi² mapped
 - 2,002 linear miles
 - 502 hours of sonar time

Wildlife Observations:

- 98 bat detections
- 314 marine mammals
 - 48 whales; 265 dolphins
- 2,771 seabird observations





2025 Offshore Mapping Survey

Contractors:

- Hired
- Training underway

Vessel Mobilization:

- Sonar mounted
- Waiting on Seapath system from Kongsberg
- Sea trial June 6, begin mapping June 9

Priorities:

- Fill data gaps to create seamless bathymetric surfaces
- 50 day at sea, 503 nmi²

Anticipated Survey







Break (reconvene 10:35)

Project Scoping Discussion

Project prioritization process this year

- Discussion at the Advisory Board and virtual group working sessions, to develop project ideas aligning with the priority research topics
- Follow-up discussions and 1-2-1 calls held with Advisory Board members and Collaborators

<u>Today</u>

- Discuss topics to expand, refine or de-prioritize based on factors such as urgency, collaboration opportunities and interest
- Are there any critical needs not yet considered?

Next steps:

- Develop more detailed one-pager summaries for potential projects
- The more detailed one-pagers will be used to prioritize work for the next GEO RfP and/or as a starting
 point to get external funding. This gives flexibility to apply for funding or develop projects with
 external partners throughout the year

Projects funded or currently out for RFA



	Reduce co-use conflicts	Socio-economic impacts and community benefit	Impact on ecosystems	Technology development
Year 1 (2023)	Exploring approaches to fisheries' coexistence with floating offshore wind	Socioeconomic data inventory	Seafloor Mapping in the Gulf of Maine	
Year 2 (2024)		Baseline assessment of social, economic, and cultural impacts of FOW	Baseline offshore bat monitoring assessment	
			Baseline secondary entanglement risk assessment and technology feasibility study	

Impact on ecosystems

ldea ID	Potential project idea	Project type	ldeal Timeline	Objective	Gap/Relevance to GoM
16	Vulnerability assessment of marine bird displacement in the Gulf of Maine	Risk analysis	2026 (future funding round), as follow on to RWSC study	Build on the work (methodology) of the RWSC study (based on the Atlantic) for the collision and displacement vulnerability analysis of seabirds to include the GoM. This should include simulation-based power analyses at multiple spatial scales.	As a follow-on, this study would consider the level of collision and impact risk posed to seabirds specific to the GoM.
15	Bird tracking study in the Gulf of Maine	Field study/ risk assessmen t	(ASAP	Tracking (not aerial survey) study to examine how specifc bird species move through the Gulf of Maine. Baseline data on the movements of birds helps to evaluate the risks of collision and displacement across the research array and commercial sites. This could be complementary to existing studies on nested birds and could focus on song birds where data gaps exist.	Will gather baseline data of avian movement patterns in the GoM to help evaluate potential risk of collision and displacement.

Impact on ecosystems

ldea ID	Potential project idea	Project type	ldeal Timeline	Objective	Gap/Relevance to GoM
35	Review of scour risks from moorings and anchors on the benthic environment	Literature review	2025-26	A literature review exploring how mooring and anchoring systems associated with offshore infrastructure impact the seabed, with a focus on scour formation and effects on benthic habitats. This should focus on the types of anchors most suited for the seabed conditions in the GoM. It will explore the ecological consequences of scour on benthic habitats and identify knowledge gaps for mitigation strategies.	Will address how mooring & anchoring systems impact the unique seabed and benthic habitats of the GoM
25	High-resolution metocean model development	Modeling		Develop a high-resolution metocean model to simulate key environmental conditions across spatial and temporal dimensions. The model will be calibrated and validated with real-world data from the research array and 1/4 scale test area and/or other areas as appropriate.	High resolution ocean model of MERA would be fully location specific
30	Desktop assessment of the potential hydrodynamic impacts of offshore wind on the Gulf of Maine marine mammal prey availability and movement dynamics	Desktop study and modeling	Follow-on (?) to RWSC study (RFP out now)	Desktop assessment of the potential hydrodynamic impacts of offshore wind on the GoM. Examine how floating offshore wind could affect oceanic physical processes and in turn impact ecosystem dynamics.	

Impact on ecosystems

ldea ID	Potential project idea	Project type	ldeal Timeline	Objective	Gap/Relevance to GoM
21	Integrating metocean conditions in groundfish distribution forecasting	Modeling & analysis?		Develop a spatial modelling framework that uses existing ecological and environmental data to map current groundfish distributions. Additionally, forecast future shifts driven by oceanographic conditions and climate change. This will provide a dynamic fish distribution model to examine how populations will change as a result of climate change	Will develop a dynamic groundfish distribution model that examines how impacts of climate change effect groundfish populations in the GoM
11	Methods to reduce risks of secondary entanglement including design and technologies for removal.	Simulation/ modeling?	After completio n of Round 2 project	[seeking more specific input from AB and Collaborators]	
24	Characterising EMF in the water column from subsea power cables to build knowledge and understanding of potential EMF exposure on marine life in the Gulf of Maine	Desktop study		Desk-based study to investigate the characteristics and spatial distribution of electromagnetic fields (EMF) emitted by subsea cables in offshore wind farms, focusing on how EMF propagates vertically and horizontally through the water column and in the sediment, specifically in relation to floating offshore wind and typical sediments in the Gulf of Maine. Findings will be compared with existing research on EMF from buried subsea cables with recommendations for future research. A communication and dissemination strategy should be developed and implemented.	

Socio-economic impacts and community benefit

ldea ID	Potential project idea	Project type	ldeal Timeline	Objective	Gap/Relevance to GoM
	Job creation potential and	Desktop		Offshore wind development will bring temporary and long-term jobs	Will assess the
	skill set required linked to	study		which may positively or negatively impact communities. Existing	economic and workforce
58, 59	offshore wind development			research suggests that potential negative impacts will be localised, while positive impacts (e.g. type, level) may be more wide-spread. NEPA work will look at existing studies which would avoid this being duplicative	impacts that offshore wind development in the GoM may have on local communities
	Regional coordination to	Desktop		Undertake a desktop analysis of different scenarios of regional	
	communicate the potential	study		offshore wind deployment, with a strong emphasis on outreach and	
	economic impacts under			communication of the outputs to decision makers. Scenarios could	
	different scenarios of			include "what if analysis" on key economic drivers (e.g. jobs, revenue)	
	offshore wind deployment			associated with large investments e.g. ports, training	
51					

Technology development

Idea	Detential project idea	Project	ldeal	Objective	Gap/Relevance to
60	Demonstrator site/ technology test bed- 1/4 scale testing of sensors and	type	Timeline	[seeking more specific input from AB and Collaborators]	Will utilize Maine-based technology to monitor [tbd priorities]
	monitor potential impacts				



Wrap Up and Next Steps

- AB member survey
- Co-Chair poll
- Add ideas to Muro Board







SAMBAS Consulting LLC

Contact

Program manager: Katy Bland - katy@neracoos.org
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Program advisor: Laura Singer - laura@SAMBASconsulting.com
Program advisor: Olivia Burke - Olivia.i.burke@carbontrust.com

https://www.maine.gov/energy/initiatives/offshorewind/researce/ hconsortium



Passive Acoustic Monitoring

• Data will include:

6

5)

• Presence of cetaceans

(3

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9

• Ambient noise levels



- Tracking of Highly Migratory Species and Large Pelagics
- Data will include:

777

- Tracking movement patterns
- Stable isotope analysis to infer trophic interactions





Active Acoustic Survey

- Data will include:
 - Pelagic fish schools
 - Demersal fish biomass
 - Invertebrate biomass
 - Depth of the biological maximum
 - Size-spectral analysis of pelagic community
 - Water samples for eDNA to groundtruth acoustic signals







Active Acoustic Survey



• Surveys take two days and cover north-south transects.



Oceanographic Surveys

- Continuous data collected by shore-based radar stations to include:
 - Surface water velocity
 - Winds
- Opportunistic data on water characteristics to include:
 - Physical oceanographic, biogeochemical, and biological data
 - Temperature
 - Salinity
 - Velocity
 - Chlorophyll concentration
 - Suspended particulate concentration

Oceanographic Monitoring



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

Plankton and Larval Lobster Survey

- Data to include:
 - CTD (temperature, salinity, DO, PAR, fluorescence, turbidity) & Secchi disk depth
 - Inorganic nutrients and chlorophyll a
 - Jelly abundance (volumetric)
 - Zooplankton
 - Gut pigment, lipid content
 - FlowCam zooplankton ID & enumeration
 - Taxonomic abundances
 - Larval lobster (by larval stage)
 - Non-copepod (phylum-level)
 - Copepod (Genus+)
 - Calanus stage analysis



Zooplankton and Larval Lobster Survey



- Sampling was conducted from September 1, 2023, to August 31, 2024, across the Preferred Area of Interest in order to collect a full year of data and examine spatial heterogeneity.
- Sampling will be conducted across the Finalized Lease Area with some reference sites from the original sampling scheme.
- Additional sites may be added once turbine locations are identified.

Bottom Trawl Survey

- Will possibly be used to groundtruth active acoustic survey
- Data to include:
 - Species composition
 - Biomass

(1)

- Abundance
- Stomach contents
- Stable isotope analysis to infer trophic interactions



Bottom Trawl Survey



- Tow locations will remain the same for one year (4 seasonal sampling events) to capture seasonal distribution
- Sampling will likely take 7-10 days per season

Terms of Reference (link)

2. Role of the Advisory Board

The Advisory Board serves to create an open forum for dialogue among a broad crosssection of stakeholders and allow for co-generation of ideas, prioritization of research and joint learning to support responsible development of this nascent industry in the Gulf of Maine.

The specific objectives include:

- Advise the state on the development and execution of the components of the research strategy for the Consortium.
- Understand and identify which data gaps and research questions are most important to address for Maine and prioritize projects accordingly.
- Identify projects that are most likely to address data gaps and research priorities in a suitable way.
- Support and clearly influence the project selection and prioritisation process.

Terms of Reference (link)

Role of the Advisory Board, continued...

- Ensure projects meet one or more of the Consortium objectives, including supporting co-existence with the fishing industry, avoiding and minimizing impacts to Maine's ecosystem and ocean users, and/or contributing to the cost reduction of floating offshore wind in Maine.
- Provide advice on defining the scope and requirements of studies.
- Share knowledge, data or outcomes of existing studies in order to have an accurate reference for the Consortium's work.
- Offer input and guidance on ways to communicate research findings, data and outcomes of Consortium-supported research to key constituencies and the public.
- Guide projects by providing review and comments on project deliverables.

Terms of Reference (link)

7. Steering Committee

The Research Consortium will be guided by a Steering Committee to provide overall direction and oversight to the Consortium based on the input of the Advisory Committee. The Steering Committee provides general guidance to the Consortium consultants and/or staff in support of the objectives.

Specific functions include:

- Review budget and any associated changes, in accordance with fiduciary responsibilities for public funds.
- Ensure research portfolio meets Consortium's objectives.
- Approve final research portfolio.
- Be responsible for the effective operation including providing or hiring project management services.
- Provide advice and guidance on state, federal and private fundraising efforts for the Consortium.