

GULF OF MAINE FISHERIES AND
FLOATING OFFSHORE WIND:

A Selection of Images from a Maritime Simulator Experience



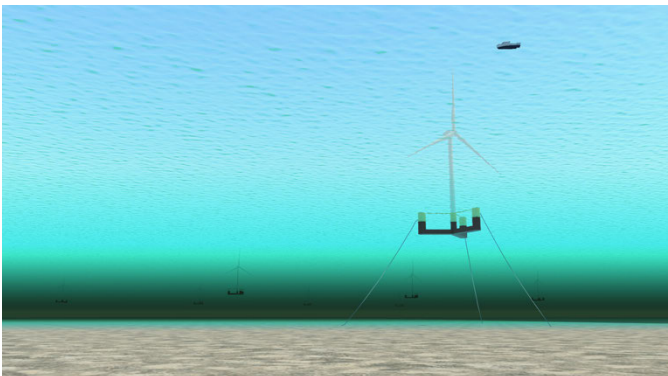
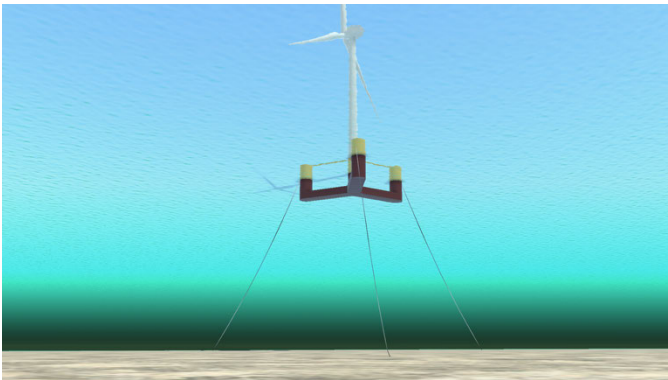
Introduction

In a project funded by the [Mass Clean Energy Center \(MassCEC\)](#) and in partnership with the [United States Maritime Resource Center \(USMRC\)](#), *Understanding Fishing Interactions: Gulf of Maine Fisheries and Floating Offshore Wind*, the Gulf of Maine Research Institute engaged commercial fishermen through research, stakeholder engagement, and hands-on workshops at a maritime simulator facility to better understand how fishing activities and gear types may operate within floating offshore wind arrays.

For this project, USMRC used input from developers, the fishing community, and technical experts to build realistic floating offshore wind simulation environments for participants to engage with. This included a geographic area model of the Gulf of Maine based on NOAA Electronic Navigation Charts with the [Gulf of Maine Offshore Wind Lease Areas](#), as well as three floating offshore wind turbine prototypes – each with unique technology components. In the workshops at the USMRC facility in Middletown, Rhode Island, participants took to the virtual helm, navigating and deploying trawl, purse seine, and longline gear from various vessels within the simulated floating offshore wind environments. These opportunities enabled fisheries stakeholders to build a better understanding of floating wind technology in a new and engaging environment, positioning them to more effectively engage in the offshore wind development process and ensure projects that are built reflect their priorities to the greatest extent possible.

While many fishermen were able to experience this opportunity, the project team captured a selection of images from within the simulator to share with those unable to attend. These visuals highlight the size, scale, and technology of the floating offshore wind prototypes, and illustrate what different fishing gear types may look like around these platforms. While it is difficult to replicate the interactive nature of the simulator, the following images intend to help stakeholders better understand floating offshore wind technologies, and ultimately support more informed, constructive engagement throughout the floating offshore wind development process.

For more details on the project, [explore the project page](#).



Prototype 1

This prototype floating offshore wind model is based on the University of Maine VoltturnUS design. The 15 MW turbine is supported by a semi-submersible foundation with catenary moorings. The mooring radius is roughly 2800 feet wide in water depths of about 530 feet.

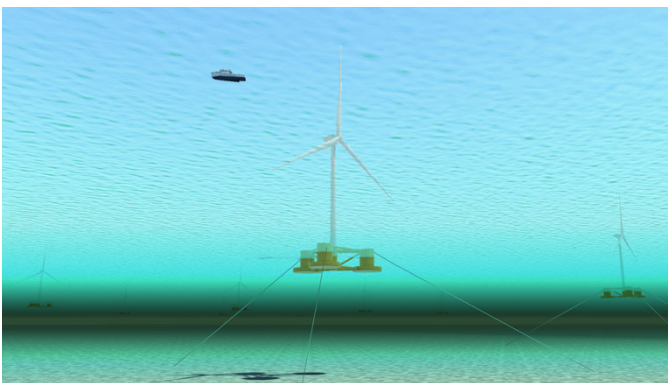
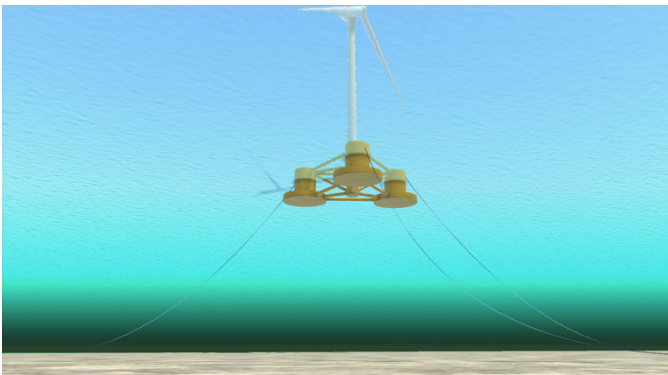
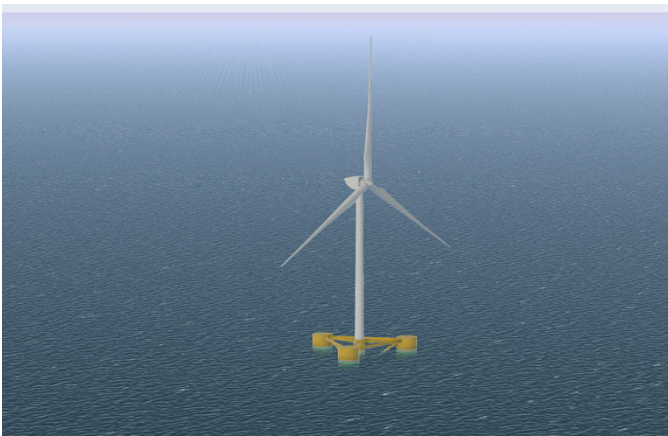
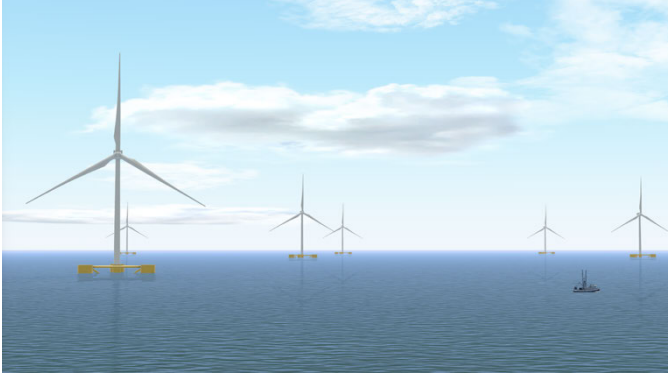
Foundation dimensions:
~335 feet x 296 feet

Nacelle height:
494 feet

Blade diameter:
780 feet

Blade tip to water:
104 feet

Array spacing:
1 NM East-West x
1.5 NM Northeast-Southwest



Prototype 2

The second prototype is based on a Principle Power WindFloat/DeepCwind OC-4 design. The 20 MW turbine is supported by a semi-submersible foundation with semi-taut moorings. The mooring radius is roughly 1250 feet wide in water depths of about 550 feet.

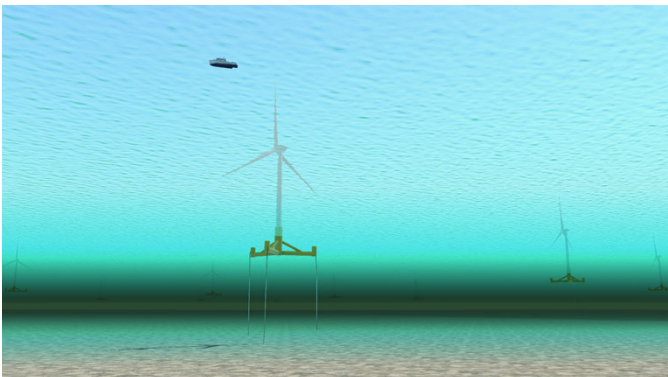
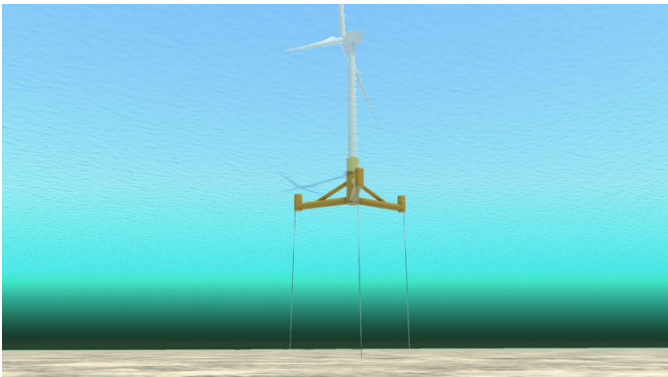
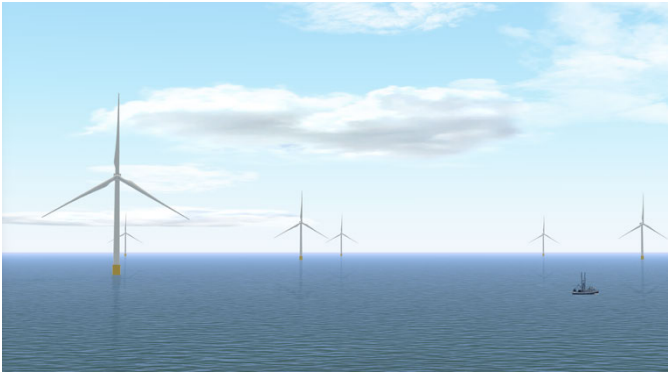
Foundation dimensions:
~1439 feet x 1310 feet

Nacelle height:
578 feet

Blade diameter:
997 feet

Blade tip to water:
79 feet

Array spacing:
1 NM East-West x
1.5 NM Northeast-Southwest



Prototype 3

The third prototype developed as a part of this project is based on a National Laboratory of the Rockies tension-leg platform reference design. The 15 MW turbine is fastened to a tension-leg platform with taut moorings running vertically from the platform to the seabed. The mooring radius for this prototype is approximately the same as the foundation dimensions.

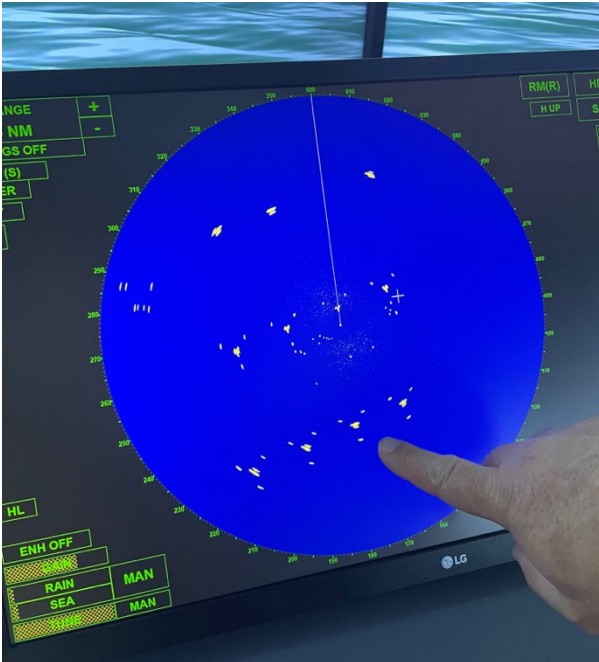
Foundation dimensions:
~322 feet x 368 feet

Nacelle height:
478 feet

Blade diameter:
811 feet

Blade tip to water:
73 feet

Array spacing:
1 NM East-West x
1.5 NM Northeast-Southwest



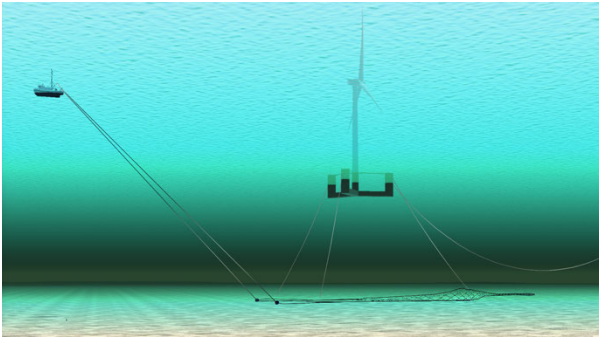
Maritime Simulator: Operator Perspective

When at the helm of USMRC's maritime simulator, operators used a range of instruments they might expect to have available in their own vessels. Whether it be radar, depth sounders, or throttle controls, the full-mission wheelhouse ensured fishermen were able to experience fishing and navigation activities in a familiar environment.

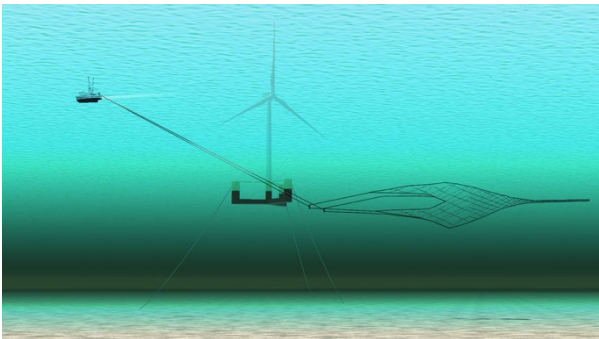


Maritime Simulator: Fishing Module

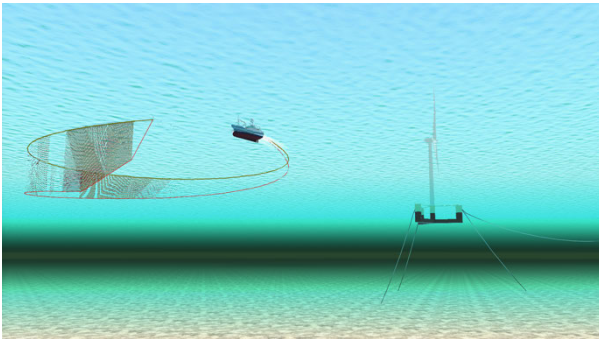
Workshop participants were able to use the simulator's "fishing module," which provides a realistic representation of the effects of towed fishing gear on boat handling and enables users to view several fishing gear types around the floating offshore wind prototypes, including bottom trawl, midwater/pelagic trawl, purse seine, and pelagic longline gear. These images illustrate different gear types deployed within the simulator.



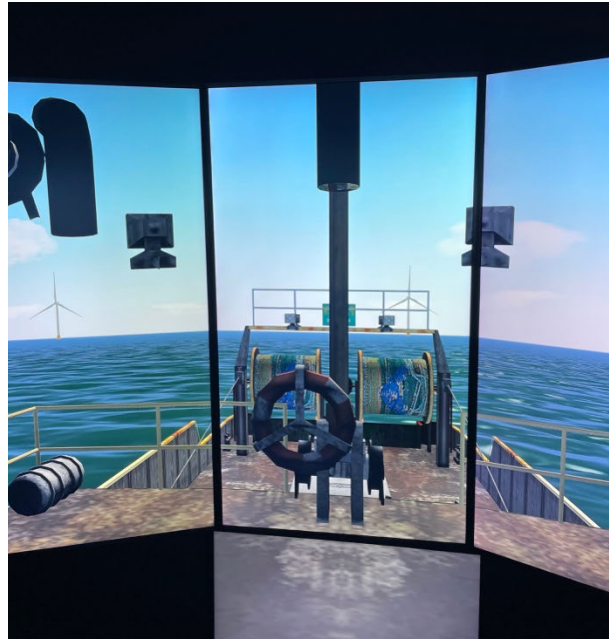
Bottom Trawl



Midwater/Pelagic Trawl



Purse Seine



Adjusting the Simulated Experience

Throughout the workshops, fishermen were able to adjust the simulated experience to answer questions that they may have had about floating offshore wind technology. Whether it be “can you simulate gale force winds while I navigate a vessel through a floating offshore wind array?” or “can you show me what vessel congestion would look like here?”, the answer from the USMRC staff who facilitated the workshop experience, was typically yes. The following images show scenarios that participants requested during the workshops.



Conclusion

In all, the simulator workshops at the USMRC facility were a success. They provided a new environment for fishermen and other stakeholders to engage in the offshore wind development process and learn first-hand what it may be like to operate a vessel in these environments. Outcomes from this project highlight the value of maritime simulation as a tool for supporting effective engagement in the floating offshore wind development process. Simulation tools can foster common understanding, streamline communication, and play an important role in convening various stakeholders around the planning, siting, and construction of floating offshore wind arrays. GMRI and USMRC hope to continue this work by collaboratively advancing practical solutions that can reduce potential conflicts before projects are built.