

From Human Safety to Ecosystems: Integrated Ocean Data Systems as a Keystone for Robust Research and Safe Offshore Wind Operations

Capitalizing on the considerable economic value and climate change mitigation benefits of offshore wind energy (OSW) while minimizing and mitigating its impacts on other ocean users and the marine environment requires a robust foundation of information. The Massachusetts/Rhode Island Wind Energy Area (MA/RI WEA) on the Southern New England Shelf is the first site of industrial-scale OSW development in the United States, and therefore where these challenges are first being confronted. Several sustained ocean observing buoys in the region provide valuable information for mariners, policymakers, and scientists, but additional data streams are needed in light of the forthcoming changes in use of the ocean.

Therefore, we are investigating end-user data needs related to OSW development to inform the working design of a purpose-built buoy network structured around five priority issues: Navigation Safety, Marine Pollution, Fisheries Management, Wildlife Conservation, and Climate Tracking. Following discussions with key users, we identify an initial set of nine priority locations for ecosystem-scale observations. Observing in nearshore areas will be particularly important given the prevalence of vessel traffic, sensitive habitats, and human use close to shore. Priority measurements included a modest set of variables that characterize sea state conditions and weather to support Navigation Safety, along with a broader suite of ecosystem variables measured throughout the water column to inform other issues. As our research continues the working design will evolve, with the process ultimately aiming to provide lessons and precedent for how to build a robust information base for OSW development across the nation.

A planned workshop for the 2024 International Partnering Forum will unite experts from the offshore wind industry to further discuss metocean data needs for safe operation, and understand how thoroughly those needs could be met through this network design. In addition to enabling safe operations, these same data have the potential to contribute to robust ecosystem science. Our proposed side meeting at the NYSERDA State of the Science will build on the industry workshop by convening scientists to groundtruth the network design and provide further input on proposed variables and locations. Participants will hear and contribute ideas to the design of a MA/RI WEA buoy network as a case study in multi-stakeholder co-design of integrated solutions.

Tentative side-meeting agenda:

Introduction (15 minutes)

Presentation of Design and Rationale (30 minutes)

Breakout Session I, by expertise (60 minutes)

Group Discussions and Synthesis (30 minutes)

Break (15 minutes)

Breakout Session II, by geography (30 minutes)

Group Discussions and Synthesis (30 minutes)

Wrap-Up and Feedback (15 minutes)

