

IRA RFA Topic Area 2 Potential Project of Interest

1.c: Expansion of data management capacity to ingest observations collected in support of offshore wind projects

Goal

This project seeks to expand data management capacity nationally to ingest observations collected in support of offshore wind (OSW) energy projects wherever they are sited in U.S. waters. The outcomes of the proposed work will be to develop a unified data system at the larger scale required for ready access to OSW-relevant ocean observations by agencies, industries, researchers, and other users.

Project Description

The Biden-Harris Administration goal of generating 30 GW of energy from offshore wind (OSW) by 2030 has accelerated what will be perhaps the largest marine industrial development in the history of the United States. The economic benefits of OSW projects throughout the supply chain will be significant, as will the reduction in carbon emissions they can achieve. However, wind farms will affect oceanography, ecology, and the operational environment of other ocean users. Some impacts will be modest, others more significant, and many uncertain. These uncertainties are driving conflict and delays, and risk inequities and unintended consequences, outcomes that could disadvantage OSW developers and other ocean users alike. For example, impacts of OSW on fisheries that are undetected could lead to inequitable compensation to overburdened and frontline communities, whereas impacts on fisheries due to climate change or other stressors that are misattributed to OSW could lead to undue compensation required from OSW developers ([Gill et al., 2020](#)). Likewise, redistribution of marine mammals and adverse effects on their population viability could be driven by OSW facilities, or these changes could be caused by other environmental drivers but incorrectly linked to OSW development ([O'Brien et al., 2022](#)). In many cases, there are likely to be multiple drivers of change, and the relative impacts will need to be partitioned among them.

Absent the right information, it will not be possible to resolve these and a host of other OSW-related issues. Therefore, robust data and analytical systems are essential to developing OSW in ways that reduce uncertainties, increase equitable service delivery, and improve decision making at all levels, including national policy, agency regulations, industry planning, and on-the-water operations. The United States enjoys some of the most developed ocean observing systems in its waters, built over the past few decades by a diverse array of Federal, state, non-profit, academic, and private sector partners ([Snowden et al., 2019](#)). However, the data management systems curating these observations were designed for ocean environments that are very different from those that will be restructured as OSW develops. Achieving this project's goal will adapt those systems to work in concert with OSW to provide the environmental intelligence necessary to improve coastal climate resilience.

As a partnership among 17 federal agencies, many with responsibilities related to OSW, along with numerous Tribal, state, municipal, private sector, non-profit, academic, and community partners, IOOS collectively is in a unique position to develop new partnerships with the OSW sector to create a unified data system at the national scale required for ready access to OSW-relevant ocean observations by agencies, industries, researchers, and other users. At

present, data collected in support of OSW projects are housed in a scattered set of servers and databases that many users find difficult to navigate. Likewise, it would be prohibitively expensive, confusing to users, and impractical to create OSW data ingestion and management pipelines that differ depending on whether an OSW project is located in Atlantic, Pacific, or Gulf of Mexico waters. Instead, IOOS and the RAs will establish an integrated data pipeline that allows the OSW industry and other OSW stakeholders to efficiently share data through all IOOS RAs, whether as a permit requirement, public service, or both.

Efforts related to this goal have already begun at the regional scale. These existing projects will serve to inform the strategy and techniques used to achieve this national goal. Successful implementation of this project will likely require identifying which of the [IOOS Core Variables](#) are particularly relevant to OSW and then determining if there are any additional ocean variables absent from that list that are needed to aid OSW energy development or manage its impacts. For those identified variables, transmission protocols and metadata standards will need to be developed so that both new and existing partners can readily contribute data to a single unified data system. Those protocols and standards will also serve to prevent placing an unsustainable burden on the data system's operators to create data ingestion systems that require changes with each successive OSW development. This may also require specifying certain supported sensor types.

It will also be necessary to define data quality standards, and tests to ensure those standards are met, that complement IOOS Quality Assurance / Quality Control of Real Time Oceanographic Data ([QARTOD](#)) guidance so contributed data can be used with confidence. Further, policies for the acceptance, handling, storage, and distribution of proprietary data contributed to the system will have to be developed in light of any federal open data requirements.

Work on this project's goal will require broad coordination with federal, state, and local agencies with responsibilities related to OSW development, as well as with the OSW developer community, to ensure this project's compatibility with their own data systems, avoid duplication of efforts, and provide data products that clearly serve identified needs. Centralized data management associated with OSW development, and clear guidance on how to contribute and where to locate different types of data, will be an invaluable service to many users navigating the growth of OSW energy.

For More Information or to Ask Questions

Please contact Brian Zelenke at brian.zelenke@noaa.gov with questions on this project theme or to be connected to subject matter experts in NOAA for technical assistance with this project. Please send general questions about the RFA to ioos.regions@noaa.gov.