

Projecting the effects of Offshore Wind mediated benthic changes on U.S. marine ecosystems

Benthic (or seafloor) communities can be highly reactive to disturbance. More information is needed to understand how Offshore Wind (OSW) farms will impact benthic marine communities in the northwest Atlantic, where a majority of U.S. OSW development is underway. Addressing this need, the Biodiversity Research Institute has teamed up with collaborators from Rutgers University, Duke University, the University of St. Andrews, and the Royal Belgian Institute of Natural Sciences (RBINS) to assess OSW-mediated benthic change, project subsequent changes to higher trophic level species, and a develop research and monitoring plan for assessing the extent of these impacts.

Understanding the benthos and impacts from OSW: OSW structures promote the colonization of benthic filter feeders, such as mussels and barnacles, that can attach themselves to hard substrates. This increase in select benthic species can attract an abundance of demersal fishes and other higher trophic level animals to the area, thus altering ecosystem structure and functioning. As OSW development expands across the U.S., it is critical to anticipate consequential marine ecosystem changes in order to implement effective monitoring and management plans.

Study Area: This project will study benthic and ecosystem change within three wind energy development areas off Long Island, New York and Massachusetts/Rhode Island that are at or near project completion. These oceanic areas are highly biodiverse, supporting a variety of marine animal populations and fisheries resources. Due to their ecological importance, a large amount of data already exists on benthic, fish, and higher trophic level species in these regions, providing a rich dataset to draw from and effectively assess OSW-mediated change.

Developing a Research Plan: Studying benthic communities can be challenging due to the variation in seasonality and mobility across organisms. This project takes an ecosystem-focused approach to gain a more holistic understanding of potential impacts, both positive and negative, of OSW on benthic communities and the broader marine ecosystem to help guide future monitoring efforts. Specifically, this project's objectives are:

- Describe benthic food webs and their connections to higher trophic level species
- Synthesize current knowledge of OSW impacts from other countries to help identify key drivers of benthic change
- Project changes to northwest Atlantic food webs in response to OSW development
- Assess potential OSW-mediate changes to the behavior, distribution, and abundance of higher trophic level species
- Develop research and monitoring plans for scientists, developers, and regulatory agencies

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Web page: <https://briwildlife.org/benthic-changes-on-us-marine-ecosystems/>