Recent Literature on Offshore Wind Energy Impacts on Fisheries

Digest of subset of syntheses on Offshore Wind Farm (OWF) impacts on fisheries and fishery resources published in the 2020 issue of Oceanography. Public access to full articles are available at https://tos.org/oceanography/issue/volume-33-issue-4

Methratta, E.T., Hawkins, A., Hooker, B.R., Lipsky, A., Hare, J.A., 2020. Offshore wind development in the Northeast US Shelf Large Marine Ecosystem ecological, human, and fishery management dimensions. Oceanography, 33(4): 16-27.

Methratta et al. focus on development in the US Mid-Atlantic and Gulf of Maine from regulatory and regional (ecosystem perspective). Key gaps identified and future challenges include lack of threshold fishery impacts in guiding OWF siting and development, evaluating larger regional scale and cumulative impacts, lack of forecasts on lost fishery revenues, and low statistical power in some type of impact assessment designs. The article presents substantive review of impacts to commercial fisheries, coastal communities, and lists affected stock assessment surveys; and makes recommendations specific to regional integrated monitoring.

Gill, A.B. et al., 2020. Setting the context for offshore wind development effects on fish and fisheries. Oceanography, 33(4): 118-127.

Gill et al. provides helpful frameworks to understand OWF impacts, generalizing four effects: (1) reef; (2) fishery exclusion; (3) fishery displacement; and (4) changed physical and sensory seascapes. The review forecasts that impact science must be relevant to societal endpoints such as effects on fished stocks at large regional scales. This emphasis could come at expense of important mechanistic understanding of impacts, which in turn can curtail development of impact science. MPAs are developed as an analogue leading to interesting predictions such as changed mortality sources within OWF projects as fish concentrate — resulting in increased predation and accessibility to recreational fishers. Both negative (changed shoreline infrastructure, navigation and radar interference, increased transit times) and possible positive outcomes (increased local investment and employment opportunities) for commercial fisheries are included. A helpful diagram includes the iterative approach for integrating stakeholders into decision making regarding impact assessment (their Figure 1).

Carey, D.A. et al., 2020. Effects of the Block Island Wind Farm on Coastal Resources LESSONS LEARNED. Oceanography, 33(4): 70-81.

A retrospective on the Block Island Wind Farm monitoring experience presented by Carey et al. is forthright and very helpful in learning from this initial US experience. A strong emphasis in the adaptive monitoring program is apparent including stakeholder engagement from the start, particularly with commercial fishers. Indeed the program shifted midstream to evaluate a stakeholder concern that increased predation on lobsters by black sea bass could be an important impact. Four very different surveys were deployed, each with strengths and weaknesses. The trawl survey design, which in design seemed well justified, in practice provided poor sensitivity to apparent increases in black sea bass, perhaps a limitation to trawl-based designs. Lessons learned and design elements in this paper will be very helpful in developing future impact assessments.

Degraer, S. et al., 2020. Offshore wind farm artificial reefs affect ecosystem structure and functioning A Synthesis. Oceanography, 33(4): 48-57.

Degraer et al. provide a very comprehensive synthesis on the “reef effect.” Concepts of vertical zonation, colonization and succession, creation of patchy seascapes, and a more nuanced discussion of production

v. attraction debate. Included is a fairly exhaustive literature review. The discussion of the multi-scaled consequences of the reef effect (Figure 4) will be helpful in designing monitoring programs.

Perry, R.L., Heyman, W.D., 2020. Considerations for offshore wind energy development effects on fish and fisheries in the United States A Review of existing studies, new efforts, and opportunities for innovation. Oceanography, 33(4): 28-37.

Perry and Heyman present a snapshot of progress in the US in OWF projects, comparison with petro platform reef effects, ongoing research projects, data portals, and incipient ROSA (NGO Responsible Offshore Science Alliance) activities.