

Science Planning for Offshore Wind Development in the Southeastern United States and U. S. Caribbean

Planificación Científica para el Desarrollo de la Energía Eólica Marina en el Sudeste de los Estados Unidos y el Caribe de EE. UU.

Planification Scientifique pour le Développement Eolien Offshore dans le Sud-est des États-Unis et Caraïbes Américaines

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EXTENDED ABSTRACT

Current federal climate policy in the United States (U.S.) calls for significant expansion of offshore wind energy in the coming years. The most immediate goal of 30 gigawatts of new offshore wind energy by 2030 will require rapid development of this clean, renewable energy source in U.S. marine waters. While achieving these objectives, it is paramount that natural resources and associated user groups are not adversely impacted by site assessment, construction and operations. NOAA Fisheries' Southeast Fisheries Science Center (SEFSC) provides data, science products and advice in support of effective fisheries management, conservation and recovery of protected species, and advancement of Blue Economy initiatives. Aquaculture and offshore wind development are two primary federal priorities currently supported by the SEFSC, with the latter being an emergent planning effort. Summarized herein are recent actions taken by the SEFSC to identify concerns and science needs necessary to sustain and conserve trust resources in marine waters of the U.S. southern Atlantic, Gulf of Mexico and Caribbean regions.

To conceptualize biological, environmental and societal conditions associated with offshore wind development, we applied the Driver-Pressure-State-Impact-Response (DPSIR; Smeets & Weterings, 1999) framework to define pressures and states of offshore wind development (driver) and identify possible impacts. Key components identified for offshore wind development in the northeastern U.S. region (Hogan et al., 2023) served as guidance in producing the SEFSC conceptual design. We also drew from products and recommendations of the *U.S. Offshore Wind - Synthesis of Environmental Effects Research* collaborative (SEER; <https://tethys.pnnl.gov/us-offshore-wind-synthesis-environmental-effects-research-seer>). The final conceptual diagram (Figure 1), which served as the basis for evaluating potential impacts of offshore wind energy development, presents two overarching categories of pressures (habitat modification, increased anthropogenic activity) and two state levels (spatial, temporal). Potential impacts were considered within four topical areas (managed fisheries, protected species, ecosystem, human dimensions), as were cumulative impacts, for the purposes of: (a) identifying concerns and knowledge gaps; (b) generating research recommendations; and (c) guiding marine spatial planning. Research recommendations were required to be informative to actionable decision making.

Two primary products of this SEFSC effort were developed collaboratively with NOAA Fisheries' Southeast Regional Office. The *Comprehensive Science Strategy for Offshore Wind – Southeast Region* represents an all-inclusive summary of wind-related science needs for the U.S. southern Atlantic, Gulf of Mexico and Caribbean regions. This document outlines four broad SEFSC goals for offshore wind development:

- Goal 1.** Ensure NOAA trust resources are effectively considered in the regulatory process and that decisions of the lead federal agency (Bureau of Ocean Energy Management) incorporate protections (avoid, minimize, and mitigate) for NOAA trust resources;
- Goal 2.** Maintain the integrity of NMFS scientific survey programs and related scientific advice;
- Goal 3.** Understand and predict impacts of offshore wind energy development on the marine ecosystems and fishing communities of the U.S. southern Atlantic, Caribbean and Gulf of Mexico regions; and
- Goal 4.** Promote an integrated regional approach: identify, avoid and minimize, mitigate and compensate for adverse impacts while enhancing positive impacts to existing and future ocean uses.

The *Federal Survey Mitigation Strategy – Southeast Region* specifically addresses Goal 2 above. It provides an overview of potential impacts to SEFSC fishery-independent surveys vital for informing fisheries management and identifies a

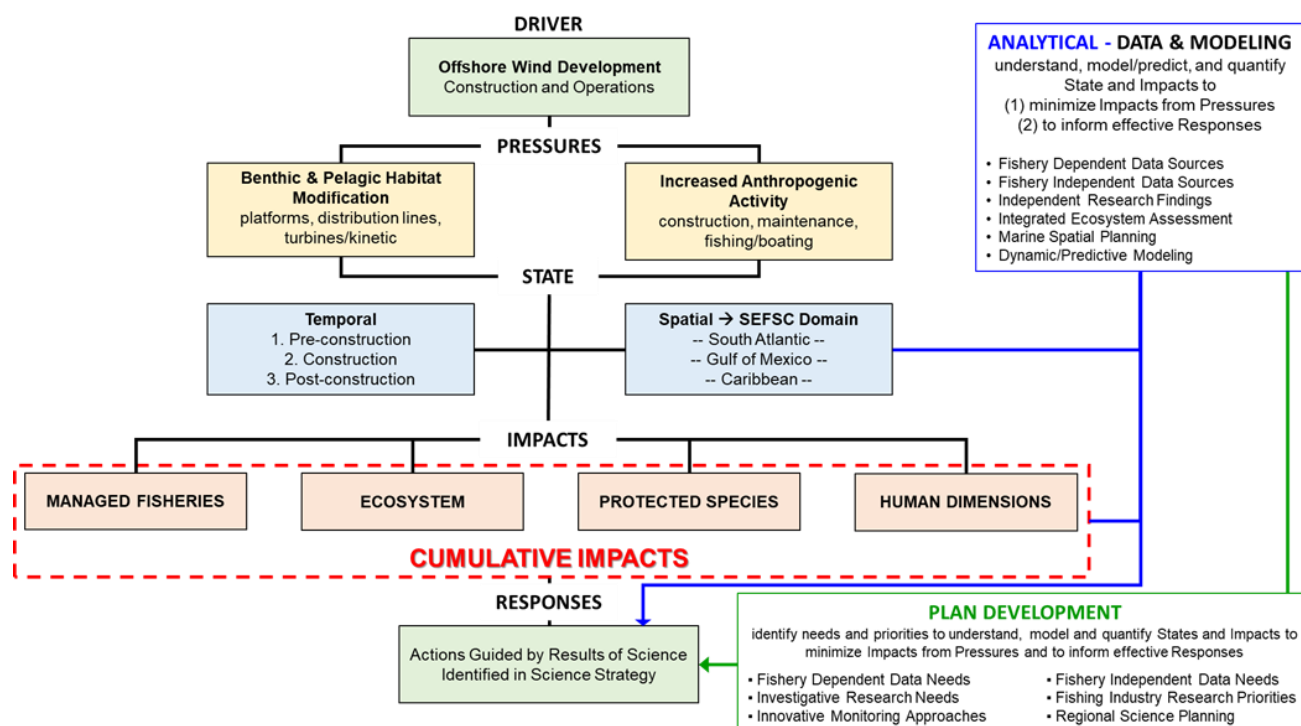


Figure 1. Driver-Pressure-State-Impact-Response (DPSIR) conceptualization of SEFSC considerations for offshore wind development.

process for mitigating such impacts. Fishery-dependent data considerations (i.e., how introduction of offshore wind infrastructure may alter data collection and analyses) will be addressed as a next step in the planning process.

Final drafts of the *Comprehensive Science Strategy for Offshore Wind* and the *Federal Survey Mitigation Strategy* are presently in agency review and will be released as technical memoranda in the near future. Once finalized, both documents will be posted to the SEFSC website (<https://www.fisheries.noaa.gov/about/southeast-fisheries-science-center>). Near-term SEFSC activities pertaining to offshore wind will include: (a) science support for the regulatory processes in the U.S. southern Atlantic and Gulf of Mexico regions; (b) marine spatial planning and dynamic biophysical modeling for the U.S. Caribbean region; (c) stakeholder engagement across regions; (d) implementation of research and monitoring to address needs identified in the *Science Strategy*; and (e) adaptive responses, as necessary, to mitigate impacts to scientific surveys.

KEYWORDS: offshore wind energy, marine fisheries, ecosystem, human dimensions

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