

MARINE PLANNING COMMITTEE REPORT ON MARINE PLANNING ISSUES

The Pacific Fishery Management Council’s (Council) Marine Planning Committee (MPC) met online January 30, 2025, for updates and discussion on several topics and to prepare a report for Council consideration. The meeting agenda, materials, and recording can be found on the [meeting webpage](#). This report summarizes the presentations from that meeting and provides additional information.

Federal items of interest related to Offshore Wind Activities

Federal agency representatives from the Bureau of Ocean Energy Management and the National Marine Fisheries Service (NMFS) were not able to attend the January 30 MPC meeting as originally scheduled. We highlight recent publications relevant to OSW energy planning and development.

On January 17, 2025, two documents were published related to transmission needs for offshore wind off the west coast. A brief overview of a presentation given to the MPC by the Pacific Northwest National Laboratory (PNNL) and Department of Energy (DOE) was included in the MPC’s [Report to the Council](#) for its September meeting.

- [West Coast Offshore Wind Transmission Study](#). The study analyzes the costs and benefits of adding floating OSW turbines along the United States’ Pacific coast. It shows that floating OSW could bring 33 GW of energy to the western United States by 2050.
- [Action Plan for Offshore Wind Transmission Development in the U.S. West Coast Region](#). This document addresses OSW transmission challenges on the U.S. West Coast and provides recommendations on how to connect to the Western electric grid.

On January 20, 2025 the White House issued a [Presidential Memorandum](#) entitled Temporary Withdrawal of All Areas on the Outer Continental Shelf from Offshore Wind Leasing and Review of the Federal Government’s Leasing and Permitting Practices for Wind Projects. The Memorandum, among other stipulations, “*temporarily prevents consideration of any area in the [Outer] Continental Shelf (OCS) for any new or renewed wind energy leasing for the purposes of generation of electricity or any other such use derived from the use of wind.*” For existing leases, the memo requires the Secretary of the Interior to “*conduct a comprehensive review of the ecological, economic, and environmental necessity of terminating or amending any existing wind energy leases, identifying any legal bases for such removal, and submit a report with recommendations to the President, through the Assistant to the President for Economic Policy.*” The full text is available through the link above.

California Update

The MPC received a presentation from Danielle Mullany and Rachel MacDonald of the California Energy Commission (CEC) updating their efforts to identify sea space that could be suitable for wave and tidal energy projects in State and Federal waters off California as required under [SB 605](#). This Bill requires the CEC, in coordination and consultation with the California Coastal

Commission, the Department of Fish and Wildlife, the Ocean Protection Council, and the State Lands Commission to “identify suitable sea space for offshore wave energy and tidal energy projects in state and federal waters.” The CEC Report begins at the 1:57 mark of the MPC meeting recording.

The areas identified represent theoretical wave and tidal energy resource potential. There is less tidal energy available than wave energy in California, so there are far fewer suitable tidal areas and those are generally associated with ports and harbors. Sea space suitable for wave energy generally increases as you move up the California coast and technology deployment is most feasible within water depths of 200 meters or less. Constraints/exclusions/factors are then applied to these areas to show other barriers or uses that should be taken into account if a developer is interested in proposing such a project. One of the factors identified is potential conflicts with fisheries. The CEC incorporated information from the recreational fishery datasets as well as the following commercial fisheries: Salmon, Dungeness crab, and market squid. The CEC plans on publishing the Draft Phase 2 Consultant Report on Sea Space, mitigation measures, and monitoring strategies for public review towards the end of March. This will be accompanied by a 30- to 45-day public comment period and a public workshop. It is envisioned that the SB 605 formal report (containing a summary of work along with recommendations) will be submitted to the Governor and legislature during Q3 of this year.

Oregon

Offshore Wind Roadmap with Exit Ramps

The Oregon Department of Land Conservation and Development continues progress on its [Offshore Wind Roadmap with Exit Ramps](#). Four meetings of the Roadmap Roundtable group and three Working Group (WG) meetings have been held since the state started the process in November 2024. The fifth Roundtable meeting is slated for February 20-21 in Lincoln City. The three Working Groups include:

1. Marine spatial planning;
2. Offshore wind research agenda/coordination; and
3. Offshore wind community benefits and other enforceable agreements.

Draft WG charters and recordings for the first WG meetings can be found on the Roundtable [webpage](#). The Roundtable must finish its work by June to inform the state’s development of a Roadmap, which is due to the legislature by September 2025.

PacWave Project

Oregon State University hoped to complete construction of the [PacWave Energy](#) test facility off Newport by the end of 2024. However, construction of its onshore facility is ongoing through spring 2025, at which time all project components will likely be in place. Operations are forecast to begin in spring 2026.

Washington

Following on the policy perspective described in his [September 8, 2024 letter](#), Governor Inslee included three OSW related provisos in his proposed budget as well as a related proviso to aid tribal capacity to engage in the activities called for by the provisos. The proposed budget is under consideration by the Washington State Legislature as [House Bill 1198](#). The relevant provisos are:

- [Sec. 131\(13\), p. 49](#), would provide \$750K for the state’s Dept. of Commerce “to contract with a nonregulatory coalition located in Seattle that supports the strategic development and activation of Washington state’s participation in the West Coast wide-floating offshore wind supply chain through a collaborative approach.”
- [Sec. 302\(8\), p. 225](#), would provide \$24.5 million to the Dept. of Ecology for capacity grants to federally recognized tribes for a number of activities including for “participation on a science advisory panel and other associated work on offshore wind.”
- [Sec. 302\(16\), p. 227](#), would provide \$816K to the Dept. of Ecology to coordinate with relevant state agencies and consult with federally recognized tribes on an evaluation of the state’s authorities for floating OSW projects and associated infrastructure. This evaluation would be required to involve at least two scenario planning exercises.
- [Sec. 302\(17\), p. 228](#), would provide \$731K to the Dept. of Ecology “to convene a tribal-state science advisory 8 panel to guide the advancement of our scientific understanding of 9 potential ecological impacts of floating offshore wind projects.”

Please see the detailed language for more specifics on what each would require. All four of these provisos would be funded from the state’s Climate Commitment Account.

Governor Bob Ferguson was sworn in on January 15 and issued [a document announcing his budget priorities](#). As stated there, the state is facing a projected budget deficit of at least \$12 billion over the next four years. The Legislative session is expected to end on April 27.

The [Washington Coastal Marine Advisory](#) Council (WCMAC) is continuing its marine spatial planning/offshore wind discussions. The group last met on [December 3](#) and discussed the budget provisos and the transition to the new Governor as part of its larger agenda. The next full meeting of the WCMAC is scheduled for March 19.

Green Hydrogen from Renewable Wave Energy Technology Demonstration Project (ROWET)

Scott McMullen shared slides from a presentation made by Allied Ocean Energy Company to the Port of Grays Harbor on Allied’s proposed Green Hydrogen from Renewable Ocean Wave Energy Technology (ROWET) Demonstration Project. The project is proposed to be located in federal waters about five statute miles offshore Grayland, WA, and will occupy approximately one square nautical mile. Deployment is planned for between May and October 2027. The project proposes to demonstrate the production of Hydrogen and Oxygen by using a wave energy converter to power an electric generator. Electricity from the generator would power an electrolyzer, producing hydrogen and oxygen, which would be stored on the barge. The barge is planned to be moored for six months between May and October but may be towed to Grays Harbor for maintenance one week per month or for sheltering during extreme storms. The MPC discussed the project and felt it could impact Council-managed fisheries and economically important state managed fisheries. There are concerns the project may be inconsistent with the Pacific Port Access Route Study prohibitions on fixed structures in designated Fairways, and concerns about safety protocols for near shore anchoring of large commercial vessels. The MPC does not see a need to follow up at this point, as the project developers have not started the permitting process. The WCMAC could be an effective forum to consider ROWET or other similar projects.

Cumulative Impacts Framework (CIF) Document

At the November 2024 Council meeting, the Council reviewed draft content of the Council's Cumulative Impacts Framework (CIF) document and tasked the MPC to continue working on it. The MPC discussed the CIF document and whether it was premature to submit it to the Briefing Book. The MPC has made progress on the document; but agreed that additional work would be necessary to complete the document, if the Council were to adopt it. The MPC also agreed it is important for the MPC to show the Council its progress and seek additional guidance. The MPC requests Council guidance on the draft CIF and potential next steps. Guidance could include direction to prioritize or rank the research priorities, to seek further AB review and input into the CIF, to continue engaging with agencies and organizations pursuing this work, and/or to report back at a future Council meeting.

We are attaching the current draft of the CIF with the following caveats:

- The change in Administration and its perspective on offshore wind is not yet fully understood. As noted earlier in our report, the Presidential Memorandum requires an Assessment of OSW's impacts on the environment, and identifies a number of concerns previously identified by the Council;
- Filling the data gaps and scientific needs identified in the Framework will allow more informed decision-making about the trade-offs associated with offshore wind; and
- The Framework document would benefit from additional opportunities for the MPC to engage with NMFS, particularly about implementation of NMFS West Coast Offshore Wind Energy Strategic Science Plan.

Attachment 1: Cumulative Impacts Framework

The goal of this high-level document is to provide guidance to research entities on the Council’s research and information priorities for understanding the cumulative, coastwide impacts of offshore wind development on Council fisheries and fishery resources at the anticipated scope and scale of development on the West Coast.

At the November meeting, the MPC [reported to Council](#) that the newly released [NMFS West Coast Offshore Wind Energy Strategic Science Plan](#) (Science Plan), with its Focus Area research priorities, could help shape the structure and content of the Council’s Framework document, and that the MPC would need additional time to consider the Science Plan in the context of the Framework. This report is the result of the additional review.

Many of the data deficiencies and research priorities identified by NMFS reflect the Council’s priorities and are well-captured in the Science Plan. Accordingly, the MPC recommends integrating the Science Plan’s research priorities directly into the Framework along with the data deficiencies and fisheries management benefits discussed under each Focus Area of the Science Plan. The Framework presents these three features of the Science Plan in table format (Table 1 below). The Council could choose to prioritize or rank the listed research needs identified. The table format is also useful for identifying any missing topics, should the Council or ABs wish to include other research priorities or data gaps not reflected in the Science Plan. For example, the MPC identified two fishery-specific concerns/priorities not identified in the Science Plan (data gaps for recreational fishing and impacts on ports due to displaced fishing).

Background

The Council has repeatedly expressed the need for a comprehensive cumulative impacts analysis for OSW development at a regional scale that identifies the potential short-term and long-term impacts to the marine ecosystem, natural resources, habitats, fisheries, and communities under the different processes and different development scenarios. The Council conveyed this need in multiple letters to the Bureau of Ocean Energy Management (BOEM) (for example [July 2024](#), [June 2024](#), [February 2024](#), [November 2023](#), and [May 2023](#)), highlighting the importance of a holistic, West Coast-wide perspective on potential impacts.

As part of the [Council’s FEP vision](#) for the California Current Large Marine Ecosystem (CCE), the Council “*envisions a thriving and resilient CCE that continues to provide benefits to current and future generations and supports livelihoods, fishing opportunities, and cultural practices that contribute to the wellbeing of fishing communities in the nation*”. As OSW is developed as a mechanism to address effects of climate change, the Council must have the information needed to understand and recommend how the Council views responsible OSW development along the CCE that balances energy needs with the known and potential impacts to fisheries, coastal communities, and the CCE. Moreover, addressing known informational and data needs could also inform future fishery management decisions in addition to OSW planning.

Purpose and Objectives

The purpose of this document is to guide the integration of research and data needs into the evaluation of cumulative impacts from OSW development along the West Coast, with a focus on

informing decision-making processes that consider a broad range of potential future development scenarios. The Council recommends that the research efforts identified in this document be applied to inform cumulative impact analyses by considering the full geographic scope and range of build-out scenarios, as these factors will play a key role in identifying pathways forward that minimize potential risks to marine ecosystems, fisheries, fishing communities, and sensitive ocean habitats.

This document aims to identify gaps in research that need to be addressed to enhance cumulative impact assessments and identify ongoing and planned scientific efforts (see Appendix 2 of MPC Report 2, Agenda Item D.2.a, November 2024). A key objective is to ensure that research efforts are aligned with the scope of the Council's evaluation framework, which considers a diverse array of potential OSW development scenarios. As such, agencies and researchers conducting these analyses are encouraged to consider both the geographical range of OSW projects and the scale of development, as these dimensions are crucial to understanding the full extent of cumulative impacts.

By applying research to this broad scope, more comprehensive insights into the potential cumulative effects of OSW development would be available to the Council, decision-makers, stakeholders, and the public. This will enable a clearer understanding of how to minimize risk to the health and function of California Current marine ecosystems, sustainable fisheries, dependent fishing communities, protected resources, and sensitive ocean habitats.

This document is intended to 1) define the scope and scale for which cumulative impact analyses should be conducted and 2) identify gaps in research that need addressing to enhance cumulative impact assessments and 3) identify ongoing and planned scientific efforts. The MPC envisions this document as a collaborative tool to engage West Coast entities working in the OSW space, promote the Council's information priorities, and ensure that individual and cumulative impacts of OSW development are comprehensively considered at a regional level.

Scope of Potential Development Scenarios

The Council believes that "reasonably foreseeable" OSW future should include all the infrastructure necessary to meet, the state's offshore wind energy goals, while acknowledging that infrastructure needs may increase in the future as wind energy targets evolve.

A reasonably foreseeable OSW development scenario would at a minimum meet each West Coast state's energy goals.

- Oregon: Up to 3 GW off Oregon (Combined capacity of Coos Bay and Brookings proposed leases of 3.1 GW)
- California: Between 2-5 GW by 2030 for which five leases with combined nameplate capacity of 4.6 GW were designated, with an additional 20 GW by 2045 goal (AB 525).
- Washington: unsolicited lease requests totaling roughly 4GW have been submitted to BOEM

A cumulative impacts analysis for the West Coast should consider the total spatial extent of development scenarios (including all transmission infrastructure) in marine waters off all three

states, so that impacts are evaluated at both the CCE and regional scale. Ecological subregions for the CCE are well-described in the Council’s [Fishery Ecosystem Plan \(FEP\)](#):

- [Northern subregion](#) extending from the northern extent of the CCE off Vancouver Island to a southern border occurring in the transition zone between Cape Blanco, Oregon and Cape Mendocino, California;
- [Central subregion](#) extending southward from that transition zone to Point Conception, California; and
- [Southern subregion](#) from Point Conception to Punta Baja, on the central Baja California Peninsula

Considering these different spatial scales in a cumulative impacts analysis ensures that these assessments are ecologically meaningful and able to capture complex spatial dynamics of the CCE to better ensure that conservation benefits of OSW are not undermined by negative impacts resulting from development.

Scale of Potential Development Scenarios

While floating OSW continues to evolve, NREL’s report on the [Representative Project Design Envelope for Floating Offshore Wind Energy: A Focus on the California 2023 Federal Leases](#) provides the first glimpse at a practical range of technology options that may be deployed, accounting for major physical constraints and technical readiness. This representative project design envelope (RPDE) provides estimates of the scale and number of components in a floating offshore wind facility when there is a need to describe impacts. Therefore, it will be important to understand the cumulative impacts for the scale of potential development scenarios included in the RPDE. The Council would recommend that for any cumulative impacts analysis that alternatives or sub-alternatives include an impact analysis of both the minimum and maximum values for the design element ranges when evaluating impact scenarios (see table 1 in the RPDE).

- No action (no development)
- Alternative 1 (development needed to meet state goals see section above)
 - Sub-alternative 1.1: Minimum range of design element impacts
 - Sub-alternative 1.2: Maximum range of design element impacts
- Alternative 2 (development needed to meet state goals see section above with mitigation measures)
 - Sub-alternative 2.1: Minimum range of design element impacts
 - Sub-alternative 2.2: Maximum range of design element impacts

In January 2025, PNNL and NREL published *The West Coast Offshore Wind Transmission* which analyzes transmission options to support offshore wind development in the Pacific Ocean. Subsequently, DOE and BOEM published *An Action Plan for Offshore Wind Transmission Development in the U.S. West Coast Region*. These two publications should be used in combination to inform the scale of potential impacts of the entire project (installation of turbines and transmission) to the marine environment and the associated dependent fisheries and fishing communities.

Information Needs and Data Gaps

The Council recognizes the need for effective coordination and collaboration with the National Marine Fisheries Service (NMFS) in addressing the evolving challenges associated with OSW development. The NMFS West Coast Offshore Wind Energy Strategic Science Plan (Science Plan) identifies research priorities necessary to address overarching data deficiencies and impact concerns; many of which reflect the Council's priorities. In this regard, the Council is adopting the Science Plan as the foundation for its framework to guide research efforts that are critical to both offshore wind development and fisheries management.

This alignment allows the Council to integrate its research and data needs priorities relative to offshore wind development with those identified by NMFS so that the best available science supports informed decision-making and sustainable resource management.

By using the NMFS Science Plan as a guiding document, the Council can prioritize its research and data needs where the potential for mutual benefit between offshore wind development and fisheries management is greatest. This approach enables more focused allocation of limited research resources, directing efforts to address the Council's identified priorities that contribute to scientific understanding of OSW and its impacts. Through this coordinated effort, research and data collection would not only support OSW development but also contribute to the health and sustainability of fisheries along the West Coast.

Accordingly, Table 1 integrates the Science Plan research priorities along with the data deficiencies and fisheries management benefits as discussed under each Focus Area of the Science Plan. The table includes a few additional research priorities identified by the Council's MPC that were not in the Science Plan. For example, data gaps for recreational fishing and impacts on ports due to displaced fishing. Additional priorities may be forthcoming. Table 1 also includes a field for the Council to prioritize (rank) the listed research priorities to help direct research efforts.

This table should be reviewed periodically, with the potential for updates to align with the five-year review of the Council's research and data needs. As the state of knowledge surrounding OSW evolves, and as the Council's priorities may shift, this dynamic approach will ensure that research efforts remain relevant and responsive to the most pressing needs of both offshore wind development and fisheries management. The periodic review process will also allow for the incorporation of new research findings and emerging issues in the field of offshore wind energy. A draft table is included below for review by the Council and its advisory bodies. The Council may wish to prioritize those data needs with an emphasis on those that meet fisheries management and OSW research and data need priorities.

Information Gap: These are broad categories where there is information missing.

Data Deficiencies: Identifies the general need to address the information gap.

Potential Benefit to Fisheries Management: Generally describes how the information gained could assist OSW decisions in relation to fisheries management.

Impact Category: These are the specified categories where impacts would be informed by answering the data needs portion of the table. They include those categories under the Council authority:

- Habitat

- Species
- Protected Resources (MSA, ESA, MMPA, etc.)
- Fisheries
- Fishing Communities
- Ecosystem (upwelling, ocean dynamics, primary productivity)
- Fisheries Science and Management

Data Needs: These are the questions and information that is needed to address the OSW Information Gaps.

Source: Where the data needs originated from (NMFS OSW Plan, Council OSW letters, AB Recommendations, etc.).

TABLE 1

Information Gap	Data Deficiencies	Potential Benefit to Fisheries Management	Impact Category	Data Needs	Source
<p>NMFS OSW Plan Research Focus 1: Habitat Impacts</p>	<p>Limited understanding of how OSW development affects benthic habitats and ecosystem dynamics.</p>	<p>Provides information on potential shifts in habitat suitability and use by managed species and potential impacts to ecosystem services.</p>	<p>Habitat, Protected Resources, Natural Resources, Ecosystem, Fisheries, and Fishing Communities</p>	<p>Create atlases and other data products of U.S. West Coast habitats that are important for NMFS trust resources that can be used in marine spatial planning and to inform plans for new data collection.</p>	<p>NMFS OSW Plan</p>
			<p>Ecosystem</p>	<p>Understand the potential impacts on atmospheric wind fields and related oceanographic and ecosystem processes, including upwelling, surface currents, formation of mesoscale fronts and eddies, nutrient supply, temperature, and primary productivity.</p>	<p>NMFS OSW Plan</p>
			<p>Habitat</p>	<p>Quantify the risks to biogenic habitats (e.g., corals and sponges), methane seeps, carbonate pavements, and other sensitive habitats during the construction or operation phases of offshore wind energy development to identify appropriate conservation buffers.</p>	<p>NMFS OSW Plan</p>
			<p>Habitat</p>	<p>Determine whether the addition of artificial structure alters the suitability of pelagic or benthic habitats (e.g., via changes in water column or bottom-type characteristics) and</p>	<p>NMFS OSW Plan</p>

				provides additional settling habitat for fouling organisms and algae.	
NMFS OSW Plan Research Focus 2: Physiological & Physical Effects	Limited understanding on the effects of noise, electromagnetic fields, aggregating devices, and species physical interactions with installations.	Provides information to inform species conservation strategies and inform siting of OSW installations to avoid impacts.	Natural Resources	Evaluate the impacts of noise on deep-sea communities that will be impacted by cable foundation-driving activities.	NMFS OSW Plan
			Natural Resources, Fisheries, Protected Resources	Review the literature and articulate our baseline understanding of the potential effects of large-scale EMFs on U.S. West Coast marine species, including sea turtles, sunflower sea stars, salmon, elasmobranchs, green sturgeon, and euphausiids, as well as diurnal migratory behavior. Identify areas of need for new and updated research.	NMFS OSW Plan
			Natural Resources, Fisheries	Evaluate the potential for floating offshore wind energy platforms to act as fish aggregating devices, haul out structures for pinnipeds, and substrate for invertebrates.	NMFS OSW Plan
			Natural Resources, Protected Resources, Fisheries	Evaluate the probability of physical interactions between migrating marine species and offshore wind energy infrastructure, including floating platforms, anchor cables, offshore substations, transmission lines, entangled marine debris, and vessel traffic.	NMFS OSW Plan
NMFS OSW Plan Research Focus 3: Species Abundance & Distribution			Protected Resources	Evaluate the risk of direct and indirect entanglement mortality on protected species.	NMFS OSW Plan
			Natural Resources, Ecosystem	Evaluate the risks and effects of plankton entrainment at substations.	

<p>Limited understanding on how movement and behavior of species will be affected by OSW development.</p>	<p>Natural Resources, Protected Resources, Fisheries</p>	<p>Evaluate how offshore wind energy development will affect the migratory and/or movement patterns of marine mammals, seabirds, sea turtles, and fish species.</p>	<p>NMFS OSW Plan</p>
	<p>Natural Resources, Protected Resources, Fisheries, Ecosystem</p>	<p>Determine whether spatial distribution and population dynamics could be altered by floating offshore wind energy development.</p>	<p>NMFS OSW Plan</p>
	<p>Natural Resources, Ecosystem</p>	<p>Assess whether the transport, dispersal, settlement, and/or distribution of fish and shellfish larvae is altered.</p>	<p>NMFS OSW Plan</p>
	<p>Natural Resources, Habitat</p>	<p>Identify whether the addition of artificial habitat (e.g., mooring lines and anchors, transmission cables, platforms, substations) or modification/destruction of natural habitat modifies the suitability of these areas or alters the connectivity of populations across these regions.</p>	<p>NMFS OSW Plan</p>
	<p>Ecosystem, Natural Resources</p>	<p>Determine whether offshore wind infrastructure aggregates species-of interest and/or their predators/prey, subsequently affecting spatial distribution, natural mortality, and productivity.</p>	<p>NMFS OSW Plan</p>
	<p>Natural Resources</p>	<p>Produce species distribution models using results from oceanographic modeling identified in Research Focus 1.</p>	<p>NMFS OSW Plan</p>

			Natural Resources, Fisheries, Fishing Communities	Determine if spatial closures to fishing activities within offshore wind farms alter the distribution and abundance patterns or the demographic structure of harvested populations.	
			Natural Resources, Protected Species, Fisheries, Fisheries Science and Management	Assess how spatial variation or changes in biological rates and population characteristics will affect population estimates and uncertainty calculated by NMFS stock assessments for fisheries stocks and protected species.	NMFS OSW Plan
NMFS OSW Plan Research Focus 4: Socioeconomic Impacts to Fisheries & Fishing Communities	Provide information on how OSW development might affect local fisheries and fishing economies.	Aids in developing strategies to avoid, minimize, and mitigate negative impacts from OSW on fisheries and fishing communities.	Fisheries and Fishing Communities	Develop web portals for spatial revenue and fishing effort data for commercial and recreational fishing.	NMFS OSW Plan
			Fisheries and Fishing Communities	How will OSW impact recreational fisheries and what is the best method for filling this data gap?	PFMC
			Fisheries and Fishing Communities	Assess the distribution of different types of fishing effort, the potential redistribution of different types of fishing effort or changes to transit due to closed areas, and changes in fishing effort distribution and/or catch composition due to species distribution shifts.	NMFS OSW Plan
			Fishing Communities	Improve and customize economic impact modeling tools to be useful for analysis of the impacts of offshore wind energy on the seafood industry, tourism, local labor, and regional welfare.	NMFS OSW Plan

			Fishing Communities	Understand how port infrastructure development will affect different types of fishing activities.	NMFS OSW Plan
			Fisheries and Fishing Communities	Evaluate strategies that decrease impacts on fisheries-related operations and assess the effectiveness of proposed mitigation efforts.	NMFS OSW Plan
			Fishing Communities	Integrate NMFS' community vulnerability indices for the U.S. West Coast with the national NMFS Social Indicators for Coastal Communities, and assess whether additional inputs would improve their relevance to offshore wind energy.	NMFS OSW Plan
			Fishing Communities	How resilient are ports to OSW development (i.e. if fisheries are displaced/lose access to fishing grounds how does that impact the coastal ports that depend on those fisheries)?	PFMC
			Fishing Communities	What are the differential impacts on people of color and historically underrepresented workers from OSW?	PFMC
			Fishing Communities	Evaluate and describe the potential for offshore wind energy development to affect the cultural identity and fishing heritage of fishing communities.	NMFS OSW Plan
			Fisheries and Fishing Communities	Understand how changes in stock assessment uncertainty may affect fisheries management decisions, as well as any resulting effects on fishery economics.	NMFS OSW Plan
			Ecosystem	Valuate nonmarket ecosystem services and existence values	NMFS OSW Plan

			Fisheries and Fishing Communities	Identify if fishery impacts vary depending on scale (specific port/fishery compared region-wide)	PFMC
			Fisheries and Fishing Communities	Explore if there is a potential diminution in permit values attributable to OSW developments	PFMC
			Fisheries and Fishing Communities	How do OSW installations affect navigation and transit to fishing areas?	PFMC
NMFS OSW Plan Research Focus 5: Ecosystem & Climate Interactions	Limited models assessing the cumulative impacts of OSW development on fisheries and ecosystems now and in relation to climate variability.	Provides more understanding of cumulative impacts and informs long-term sustainability of fisheries.	Ecosystem	Collaborate with interested tribal nations and other partners to develop methods to identify changes in ecosystem structure and function, including conceptual models and suites of ecosystem indicators across physical, biological, and human-dimension components.	NMFS OSW Plan
			Ecosystem	Identify and fill gaps in our understanding of trophic interactions across the food web, and use these new estimates to evaluate how impacts may cascade throughout the ecosystem.	NMFS OSW Plan
			Ecosystem	Develop frameworks for quantifying cumulative effects of multiple offshore wind farms on ecosystem processes and components.	NMFS OSW Plan
			Ecosystem	Develop risk assessment tools that can quantify changes in relevant ecosystem indicators and distinguish the effects due to offshore wind energy development from the effects of climate variability and change.	NMFS OSW Plan

NMFS OSW Plan Research Focus 6: Impacts to NMFS' Scientific Surveys	Need for evaluation to quantify and address the impacts of OSW installations on fisheries management dependent scientific surveys.	Provides a more complete understanding on methods for continued collection of data used in fisheries management decisions.	Fisheries Science and Management	Evaluate and quantify the impacts of proposed project-related wind development activities on scientific survey operations and provision of scientific advice to management.	NMFS OSW Plan
			Fisheries Science and Management	Evaluate or develop appropriate new statistical designs, sampling protocols, and methods while maintaining data-quality standards for the provision of management advice	NMFS OSW Plan
			Fisheries Science and Management	Design and carry out necessary calibrations and analyses to integrate existing and new survey approaches by addressing both operational and analytical needs to ensure continuity, interoperability, precision, and accuracy of data products.	NMFS OSW Plan
			Fisheries Science and Management	Develop interim indices from existing datasets to partially bridge the gap in data availability between pre-construction and operational periods while new approaches are being identified, tested, or calibrated.	NMFS OSW Plan

PFMC
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