An Analysis of Offshore Wind on the Oregon Coast

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Introduction to Offshore Wind

Offshore wind **(OSW)** has been expanding rapidly over the last few decades as the transition to renewable energy sources is stressed globally. In the U.S., recent federal and state mandates require reduced reliance on fossil fuels. OSW farms harness the power of the ocean's winds for electricity generation, benefiting from consistent wind levels while minimizing conflicts with existing land use. However, OSW presents some environmental risks that will have to be mitigated, such as the spread of invasive species and use of antifouling agents.

Figure 1: Floating OSW turbines are secured by mooring lines and anchors running on the ocean floor[1].

Floating OSW farms are being explored by the Bureau of Ocean and Energy Management (BOEM) for implementation off the Oregon coast[1] (Figure 1).

To investigate this issue, our team:

- Is conducting a literature review to **identify needed infrastructure and potential environmental impacts** from OSW along the west coast of North America.
- Is focusing on the **ecological disturbance risks** from OSW developments and the potential **vectors for the introduction of harmful, non-native species (NNS)** during construction, operation, and maintenance.
- Is creating a **story board that will inform policy makers** and other stakeholders about important mitigation strategies for OSW.

Proposal for Offshore Wind in Oregon

In the U.S., OSW farms have a capacity of 42 MW and more than 28 GW of OSW projects are in various stages of development worldwide. For every 1 MW, about 750 homes can be powered simultaneously[2].

In the U.S., OSW has gained momentum. The West Coast has tremendous wind energy potential in deep waters, with areas for development in various stages[2] (Figure 2).

U.S. goals set by the Biden-Harris Administration:

- Develop 30 MW OSW energy by 2030; enough energy to power 10 million homes[3].
- Deep water (50-1000meters) development will cover 2/3 of the development goals[3].
- West Coast and Gulf of Maine will house deep water floating turbines[3].

BOEM and the Oregon Department of Land Conservation and Development are spearheading the process in Oregon. Call Areas, or designated development zones, are Coos Bay and Brookings (Figure 2). California is in the early stages of OSW development[4].

BOEM collected feedback from the public to identify issues that may be problematic for offshore wind leasing projects[4].

Concerns posed by local stakeholders during public outreach include:

- Loss of commercial and recreational fishing areas
- Impacts on distribution, migration, behavior, and habitat conditions of marine species
- Contributions to climate change
- Effects on culturally significant marine species and sites
- Taxpayer burdens[4]

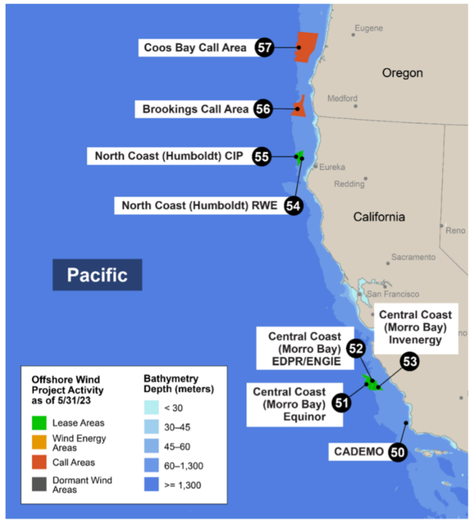

Figure 2: Proposed OSW activity on the West Coast as of 2023[5].

Potential Impacts From Offshore Wind

Construction, maintenance, and operations of OSW would have intense interactions with biotic communities and the surrounding environment.

- Cables and anchors provide artificial substrate vulnerable to NNS introductions[6].
- Construction and operations generate sound pollution[7].
- Anchors scour the seafloor, creating a disturbed environment more vulnerable to NNS introductions[8].

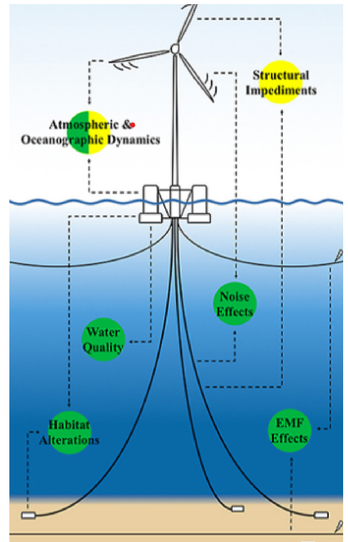

Figure 3: Offshore wind turbines have myriad detrimental consequences to be considered[9].

Mitigation Measures

NNS pose a risk to economic, cultural, and ecological resources in Oregon. Effective methods must be used to reduce the risk of harmful NNS from establishing due to OSW farms[10 11 12].

Shipping Mitigation Measures

- Limit ballast exchange: Ships exchanging their held ballast water mid-ocean, or solely using local shipping, reduces the likelihood of a NNS introduction[10 13].
- Ballast Water Treatment: Conducting treatments to kill NNS before they reach OSW farms reduces risk of establishment[10].

Offshore Wind Farm Mitigation Measures

- Anti-fouling Measures: Treatments deter the attachment and growth of NNS on mooring ropes and turbine structures. but risk polluting waters[13].
- Social and Economic: Continued meaningful engagement with coastal communities who will benefit from the power generation and are at risk from the damage posed by NNS will encourage an equitable distribution of those benefits and risks[4].

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