

Mid-Depth Wave Energy Device Feasibility Documentation

Who owns the data?

Oregon Wave Energy Trust
PO Box 8626, Portland OR 97207
(503) 224-1966
info@oregonwave.org

Who should I contact with questions about the data?

Parametrix
700 NE Multnomah Ave., Suite 1000, Portland OR 97232
(503) 416-6199
waveenergyinfo@parametrix.com

Who should I contact if I want to use the data for a purpose that is different than the data's original purpose?

Oregon Wave Energy Trust
PO Box 8626, Portland OR 97207-8626
(503) 224-1966
info@oregonwave.org

Summary

To support the Oregon Wave Energy Trust's (OWET's) Industry Advisory Group (IAG), Parametrix and Aquatera were asked to develop a series of mapping products to inform the Territorial Sea Plan (TSP) process. To accomplish this, the team combined existing information on wave energy device types, conducted interviews with inventor and developer representatives to better understand device-specific parameters, and developed case studies based on international experiences siting and operating wave energy devices. These inputs were used to populate a database of device suitability parameters, which were then used to develop models and map spatially explicit areas suitable for wave energy development.

The technology types incorporated in the models included attenuators, point absorbers, surge, coastal wave generation, and mid-depth pressure plate type devices. These devices are believed to represent the core device types anticipated to be commercially-viable in Oregon. Generally, different wave energy device technologies require a unique suite of conditions to operate. To develop suitability models that represent a broad suite of developer perspectives and a range of technologies, three distinct wave energy device suitability models were developed based on similar requirements for technology classes: coastal, mid-depth and offshore wave energy device feasibility models.

The Mid-Depth Wave Energy Device Feasibility data layer reflects technology constraints for mid-depth devices, including oscillating water column, offshore pressure devices, and mid-depth surge devices. Mid-depth offshore oscillating water column devices generate energy via an above-surface turbine powered by the surge generated by waves within a below-surface chamber. Mid-depth offshore pressure devices generate energy via a seabed-based flexible reservoir that cyclically compresses and expands as wave peaks and troughs pass over. Mid-depth offshore surge devices generate energy via the pressure differential created by two proximal arms moved by passing waves. This data layer delineates the top 6%, 11%, 19% and 42% of all Mid-Depth Device Feasibility Scores. The Mid-Depth Wave Energy Device Feasibility Conceptual Model identifies the landscape attributes and scoring used to model suitability in an economically-constrained environment. In this pre-commercial context, wave energy devices do

not generate significant revenue, and as a result, the suitability scoring reflects the financial importance of proximity to shore and a potential grid connection. Additional information on the methodology followed to develop wave energy device feasibility models is provided in the Technical Memorandum titled “Industry Area Mapping for TSP Process”.

- [The Industry Area Mapping for TSP Process Technical Memorandum and Conceptual Models.](#)

Description

The data layer identifies the area most suitable for siting and operating mid-depth wave energy devices based on the economically-constrained mid-depth device feasibility model results. Device feasibility model results are driven entirely by engineering and technical criteria, including practical assumptions of economic viability based on cabling, anchoring, and access.

How should the data be credited/cited in a report or publication?

Oregon Wave Energy Trust Industry Area Mapping for the Territorial Sea Plan Process

Limitations on Use

Designation of areas suitable for wave energy development is a difficult task requiring careful consideration of environmental, socioeconomic, and regulatory constraints. The data identifies areas suitable for wave energy that, if developed, may create conflict with existing uses.

Currently, the data available to populate the wave energy device suitability models does not capture the possible interaction of many offshore islands and rock formations that may alter the wave regime in the southern extent of the Oregon Coast. As a result, the area offshore between Port Orford and the California border requires further study to accurately assess the suitability of siting and operating wave energy devices in this area.

How is the data intended to be used?

The data is intended to illustrate the most suitable areas for siting and operating mid-depth wave energy devices. This assessment of wave energy device suitability is intended to satisfy questions regarding engineering and technical suitability. This data does not attempt to reconcile opportunities to site and operate wave energy devices with alternative existing or future uses.