NOAA
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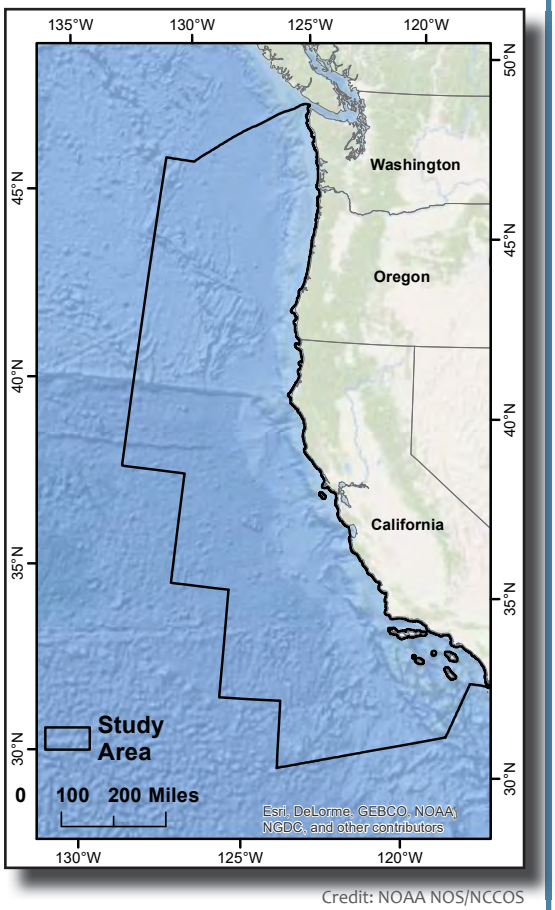
Cross-Shelf Habitat Suitability Modeling: Characterizing Distributions of Macrofauna and Deep-Sea Corals on the Pacific Outer Continental Shelf

Background

The Pacific Outer Continental Shelf (OCS) includes an extensive area offshore California, Oregon, and Washington for which the Bureau of Ocean Energy Management (BOEM) oversees the responsible development of energy and mineral resources. Information about the distribution of sensitive biota in the area, such as benthic macrofauna and deep-sea corals, is critical for making environmentally sound decisions about managing those activities and developing mitigation measures to avoid or minimize impacts on marine environments and organisms.



Credit: NOAA NOS/NCCOS

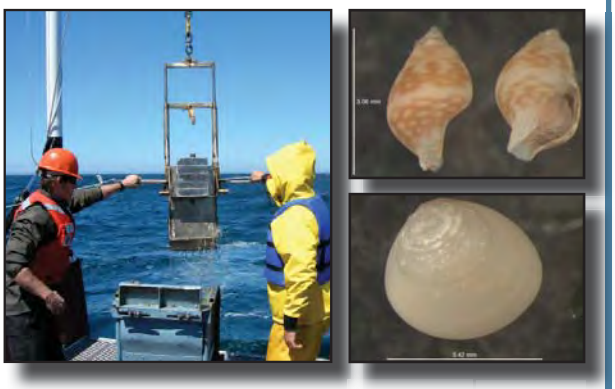
Objectives

BOEM is partnering with Oregon State University (OSU) and NOAA's Northwest Fisheries Science Center (NWFSC), Southwest Fisheries Science Center (SWFSC), and National Centers for Coastal Ocean Science (NCCOS) to:

- Collect and compile survey data for benthic macrofauna and deep-sea corals offshore California, Oregon, and Washington
- Identify physical and environmental characteristics correlated to distributions of benthic macrofauna and deep-sea corals
- Predict and map spatial patterns of habitat suitability for benthic macrofauna and deep-sea corals
- Design and conduct model ground-truthing and accuracy assessment

Approach

OSU is compiling a synthesis of available survey data offshore California, Oregon, and Washington that contains georeferenced presence and absence information for benthic macrofauna and is identifying species of interest with sufficient data for spatial predictive modeling. NCCOS is working with OSU to develop spatial models that predict the probability of occurrence of these species in the area using the presence and absence information and spatial predictor variables, including environmental, oceanographic, and geomorphological datasets.



Macrofauna sampling (left), *Alia gausapata* (top right), and *Nutricola lordi* (bottom right). Credit: Sarah Henkel, OSU

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NCCOS, NWFSC, and SWFSC are compiling a synthesis of available survey data that contains georeferenced spatial information for deep-sea corals. NWFSC and SWFSC are also processing recently acquired field data to include in the synthesis. NCCOS, NWFSC, and SWFSC are identifying taxonomic groups of interest with sufficient data for spatial predictive modeling. They are developing spatial models that predict habitat suitability for these taxonomic groups using the survey data and spatial predictor variables, including environmental, oceanographic, and geomorphological datasets.

Primnoa pacifica, *Lophelia pertusa*, and *Desmophyllum* at 278 m depth observed by the ROPOS ROV in 2008. Credit: NOAA Olympic Coast National Marine Sanctuary

NCCOS is working with OSU, NWFSC, and SWFSC to interpret and assess the accuracy of the predictive models.

Products

- A data package containing the data synthesis of available survey data for benthic macrofauna offshore California, Oregon, and Washington
- A data package containing the data synthesis of available survey data for deep-sea corals
- Maps of the predicted habitat suitability of benthic macrofauna and deep-sea corals specifically tailored for BOEM's environmental assessment, management, and decision-making needs; maps will include measures of model performance and spatial depictions of prediction certainty
- A report and data package describing the results of the model ground-truthing and accuracy assessment

Additional Online Resources

Bureau of Ocean Energy Management, Pacific Region
https://marinecadastre.gov/espis/#/search/study/110171

Stylaster californicus with a blacksmith (*Chromis punctipinnis*) and many squarespot (*Sebastes hopkinsi*) at 41 m depth on Farnsworth Bank. Credit: NOAA SWFSC, Advanced Survey Technologies Group.

More Information

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