

Environmental Studies Program: Ongoing Study

Field	Study Information
Title	Ancient Landforms off the Washington Coast (PC-22-05)
Administered by	Pacific OCS Regional Office
BOEM Contact(s)	Dave Ball (david.ball@boem.gov), Jimmy Moore (james.moore@boem.gov)
Procurement Type(s)	Cooperative Agreement
Conducting Organization(s)	Oregon State University
Total BOEM Cost	\$550,000
Performance Period	FY 2022–2025
Final Report Due	September 30, 2025
Date Revised	November 21, 2023
Problem	Oral histories from Native American Tribes along the U.S. West Coast tell of places that once existed beyond the current coastline. Now submerged by rising post-glacial sea levels, evidence of these places may remain as submerged cultural landforms within the seafloor of the continental shelf. Offshore energy development and marine mineral extraction have the potential to impact these significant cultural resources.
Intervention	This study will build on similar efforts to more fully understand inundation processes along the U.S. West Coast by synthesizing geological, geophysical, and environmental data from offshore Washington and integrate that information with Tribal oral histories and traditional knowledge to further refine the model for identifying intact submerged landform potential off the Pacific Coast.
Comparison	Results from this study will be compared with a soon-to-be-completed study offshore central Oregon and southern California (BOEM 2021). This type of work has never been undertaken in this area and will fill critical data gaps in our current model. This effort will also provide essential information on the effects of climate change and sea level rise through time.
Outcome	This effort will further improve identification of submerged paleolandforms and provide a model for consultation and incorporation of traditional Tribal knowledge to better describe the affected environment, analyze potential effects, and develop mitigation measures in support of NEPA and NHPA consultations.
Context	Fieldwork for this study will occur offshore Washington; however, the study will be applicable to the entire Pacific OCS Region, except Hawaii. Findings could also have applicability across all BOEM regions and programs.

BOEM Information Need(s): BOEM has received applications for both offshore wind and offshore wave projects on the Pacific OCS. To better understand the potential impacts this development can have on submerged paleolandforms, a holistic assessment of these potential resources that incorporates science-based exploration, research, and traditional Tribal knowledge is necessary. A holistic assessment

of submerged landforms will assist BOEM, individual States, and Tribal communities in evaluating proposed offshore renewable energy projects, and with developing appropriate information-gathering protocols and survey measures to avoid or mitigate adverse effects to National Register (eligible or listed) Native American sites during Pacific OCS development. BOEM will use this information in National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) documents, as well as government-to-government consultations with Native American Tribes. Further, this information will inform decisions regarding lease sales, notices to lessees, and information to lessees, and will be useful in developing mitigation measures.

Background: Investigations of submerged paleolandform features offshore southern California and central Oregon are nearing completion, and the results from that study (BOEM 2021) will improve our understanding of how to identify intact submerged landform features with a high potential for new discoveries using geophysical surveys. However, critical data gaps exist, as no similar surveys have yet been conducted offshore Washington. Oral histories from many West Coast Tribes tell of places that once existed beyond today's current coastline. Integration of traditional Tribal knowledge with geophysical survey data will further and more accurately refine the current model for discovering potential submerged landform features that could be associated with pre-contact archaeological sites. Information acquired from this effort has the potential to inform all BOEM programs across all regions, address stakeholder comments, and support the National Strategy for Ocean Mapping, Exploring, and Characterizing the US EEZ.

Objective(s): The objective of this study is to fill an existing data gap in our regional model of submerged paleolandforms off the U.S. West Coast by integrating industry-standard geophysical survey data with traditional Tribal knowledge.

Methods: Through consultation with coastal Washington Tribes, this study will identify appropriate methods for, and integration of, traditional knowledge and oral histories into the identification of high-probability areas for exploratory survey and develop follow-on research questions, as appropriate. The science team will then evaluate any existing remote sensing data, if available, and review current theories on sea level rise during the Last Glacial Maximum (LGM) to further refine the identification of high-probability areas for further survey. High-resolution sidescan sonar and subbottom profiler surveys offshore Washington will acquire seafloor and subseafloor data in search of submerged and buried terrestrial and archaeological deposits. Finally, researchers will utilize newly acquired survey data and information collected through consultation to further refine and better identify intact submerged paleolandform features, and where possible develop appropriate mitigation measures to address potential impacts from renewable energy development offshore the U.S. West Coast.

Specific Research Question(s):

1. How can traditional Tribal knowledge inform our understanding and identification of submerged landform features offshore coastal Washington?
2. How can we better locate submerged paleolandform features in order to avoid or minimize impacts from BOEM-permitted activities?

Current Status: The cooperative agreement between BOEM and OSU was awarded on September 26, 2022. The post-award meeting was held on October 11, 2022. Quinalt Tribal Historic Preservation Officer hosted a workshop on May 23, 2023, to kick off this study; over 50 Tribal citizens participated. An inter-Tribal workshop that will bring together coastal Tribes in Washington and Oregon, agency

representatives, and the research team to discuss best practices for integrating indigenous knowledge into submerged landforms studies is scheduled for November 30, 2023.

Publications Completed: None

Affiliated WWW Sites: None

References:

[BOEM] Bureau of Ocean Energy Management. 2021. DRAFT Archaeological and Biological Assessment of Submerged Landforms off the Pacific Coast (NSL #PC-14-04). US Department of the Interior, Bureau of Ocean Energy Management.

Orlando L, Allaby R, Skoglund P, Der Sarkissian C, Stockhammer PW, Avila-Arcos MC, Fu Q, Krause J, Willerslev E, Stone AC, Warinner C. 2021. Ancient DNA analysis. Nature Reviews Methods Primers 1, 14.