

STUDY TITLE: Inventory and Analysis of Coastal and Submerged Archaeological Site Occurrence on the Pacific Outer Continental Shelf.

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CONTRACT NUMBER: M11PD00123

SPONSORING OCS REGION: Pacific

APPLICABLE PLANNING AREA(S): Washington-Oregon, Northern California, Central California, Southern California.

FISCAL YEAR(S) OF PROJECT FUNDING: 2011, 2012, 2013, 2014.

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COSTS: FY 2011: \$25,711; FY 2012: \$417,619; FY 2013: \$67,338; FY 2014: \$131,561
CUMULATIVE PROJECT COST: \$642,229

PROJECT MANAGER(S): K. Crawford

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KEY WORDS: Pacific Outer Continental Shelf; Pacific OCS; Pacific Ocean; Pacific Coast; Pacific Northwest; Washington; Oregon; California; early human migration; prehistoric site formation; offshore modeling; submerged site potential; sea level rise; cultural resources; archaeological resources; built resources; shipwrecks; submerged prehistoric resources; traditional cultural properties; prehistory; history; ethnography; National Register of Historic Places; historic properties; visual impacts; maps; databases; geographic information system.

BACKGROUND: It has been over 20 years since a cultural resources study has been completed on the Pacific Outer Continental Shelf (OCS) for the Bureau of Ocean Energy Management (BOEM). BOEM is charged with considering what effects the installation of offshore energy facilities on the Pacific OCS would have on cultural resources. While impacts on underwater cultural resources on the Pacific OCS have traditionally been the primary focus of BOEM's historic preservation program, other potential impacts on cultural resources are also of concern. In addition to potential impacts on underwater cultural heritage from seafloor disturbance associated with offshore development, placement of offshore facilities has the potential to create an adverse visual impact on coastal properties. BOEM has concluded that identifying the location of known and reported submerged cultural resources, potential inundated prehistoric sites, coastal properties that are listed or eligible for listing on the National Register of Historic Places (NRHP), or traditional cultural properties is a critical step in the fulfillment of this responsibility.

OBJECTIVES: (1) Assess areas of the Pacific OCS for prehistoric site potential by developing a GIS-based model locating culturally sensitive submerged landforms most likely to have survived marine transgressive processes and predicting the potential distribution of submerged prehistoric sites.

- (2) Identify significant coastal cultural resources that may be subject to visual impacts by future offshore energy development and develop a GIS-linked Microsoft Access database of coastal properties.
- (3) Develop a Microsoft Access database of known, reported, and potential historic shipwrecks on the Pacific OCS using primary sources.

DESCRIPTION: The study area consists of the Pacific OCS from the U.S./Canada border to the U.S./Mexico border; and a 1-mile wide swath of coastline from the U.S./Canada border to the U.S./Mexico border. The study was conducted in three parts: (1) assessment of potential submerged prehistoric sites; (2) inventory of coastal properties; and (3) inventory of underwater cultural heritage. (1) The goal of assessing the potential for submerged prehistoric sites on the Pacific OCS included the following methods: modeling modern bathymetry, calculating crustal deformation, modeling ancient stream systems, and analyzing eustatic sea level history and relative sea level curves. This information was used to construct GIS-based models in a two-part process wherein coastal paleolandscape reconstructions are first created, and associated prehistoric site location predictions are then made. The first part of the process consisted of creating a GIS-based paleolandscape model that shows the extent of emergent lands on the Pacific OCS during the last glacial maximum (LGM) (19,000 BP). The second part of the process projected the positions of eustatic shorelines at each millennium since the LGM onto this maximum paleolandscape extent model. (2) The inventory of coastal properties included research to assemble a database of known archaeological sites, traditional cultural properties, and historic built resources along the coasts of California, Oregon, and Washington that have the potential to be visually impacted by future offshore development. These methods included the following: research at state repositories for archaeological and built environment cultural resources, and outreach to Native American tribes and individuals, experts in the archaeology and ethnography of the Pacific coast, and historical interest and preservation groups. Online research was conducted to identify additional sensitive landscapes along the coast, such as state and national parks, preserves, national monuments, and tribal reservations. Locational and basic descriptive data for each resource were entered into a GIS-linked database. (3) The inventory of underwater cultural heritage included research to collect information on shipwrecks that occurred in the waters off California, Oregon, and Washington. This information was obtained from primary and secondary sources, as well as from contacting maritime archaeologists, historians, shipwreck researchers, and other interested individuals. The data collected from this research were compiled into a database system of identified shipwrecks within the study area that could possibly be impacted by the construction of offshore energy facilities.

SIGNIFICANT CONCLUSIONS: (1) Although the predictions of potential submerged prehistoric site locations made by the GIS model can be used to make initial decisions about where ground disturbance activities associated with development projects could be conducted on the Pacific OCS, the model's predictions are not final assessments of whether submerged archaeological sites exist on the Pacific OCS. A final archaeological assessment of whether any particular location on the Pacific OCS is suitable for conducting developer-based ground disturbance activities can only be made from remotely sensed data and stratigraphic core samples. In the event that pre-development remote sensing and coring studies reveal the presence of buried deposits containing cultural materials, the lateral and vertical extent of the archaeologically relevant stratigraphic units should be established in order to determine its geometric form. Once the geometry of submerged prehistoric site-bearing deposits is known, the associated area can be excluded from development-related impacts. The information produced from this intensive assessment of submerged site-bearing deposit stratigraphy and geometry can be used to evaluate remote sensing and coring data collected from any future Pacific OCS development projects. (2) This study identified a total of 2,383 coastal cultural resources with the potential to be impacted by future offshore development. Of these, 683 archaeological resources, 1,719 built environment resources, and 78 culturally significant properties were identified. Many of the identified cultural resources consist of multicomponent sites that contain two or more resources in each of these categories. Many archaeological resources and traditional cultural properties, however, may not be listed in a state or

national register. The study also identified areas where sensitive property types are concentrated. No fieldwork was conducted; consequently, the ocean view from these resources has not been confirmed, their current condition has not been verified, and properties not previously determined to be historic have not been surveyed and evaluated. There may also be resources beyond the one-mile-wide study area that have ocean views for which the viewshed is significant. When future offshore development projects are identified, it is recommended BOEM initiate a Section 106 review and follow the guidelines set forth in 36 CFR 800 and consult with Native American tribes following the Department of the Interior Policy on Consultation with Indian Tribes. During the course of future projects, once the historic, prehistoric, and traditional cultural properties that have been determined to be adversely affected are established, the resolution of the effects needs to be cooperatively agreed upon and memorialized in an agreement document between relevant agencies and interested parties. (3) The study identified 5,813 vessel records. Some duplication of records may exist due to multiple sources and variations in spelling. Duplicates will be addressed as quality control continues. As additional sources of information become available, it is likely the number of records will increase. Many data fields within records remain empty due to lack of available information during the research phase of the project. Continued research efforts and future information will populate some of these fields. There are 574 records (approximately 10 percent) that provide either verified or reported spatial data. Vessels without available spatial data are included in the database to facilitate future data entry, should spatial information become available. This will negate the need to create and populate a new record, and only the additional spatial data will need to be appended. The Pacific OCS database is compatible with GIS applications. Those records that have available spatial data, whether it is verified or reported, can be integrated into a GIS.

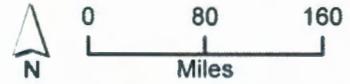
STUDY RESULTS: Models for the prehistoric Pacific OCS paleolandscape and its foraging potential can be used to make initial predictions of potential submerged prehistoric site locations and can be used by BOEM to make initial decisions about where ground disturbance activities associated with offshore development projects could be conducted on the Pacific OCS. The study identified a total of 2,383 coastal cultural resources, along the coast from the U.S./Canada border to the U.S./Mexico border, with the potential to be visually impacted by future offshore development. The study also identified 5,813 vessel records located on the Pacific OCS, of which 574 records provide either verified or reported spatial data.

STUDY PRODUCT(S): ICF International, Davis Geoarchaeological Research, and Southeastern Archaeological Research. 2013. Inventory and Analysis of Coastal and Submerged Archaeological Site Occurrence on the Pacific Outer Continental Shelf. Final report for the U.S. Department of the Interior, Bureau of Ocean Energy Management, Pacific OCS Region, Camarillo, CA. Contract No. M11PD00123. xxiii + 280 pp. + app.

* P.I.'s affiliation may be different than that listed for Project Manager(s).

Study Area

- Coastline to 1 Mile Inland
- Coastline to 3 Miles Offshore
- Outer Continental Shelf to 3 Miles Offshore
- Offshore Planning Area (EEZ)



Source: BOEM (2006); ESRI (2009)

