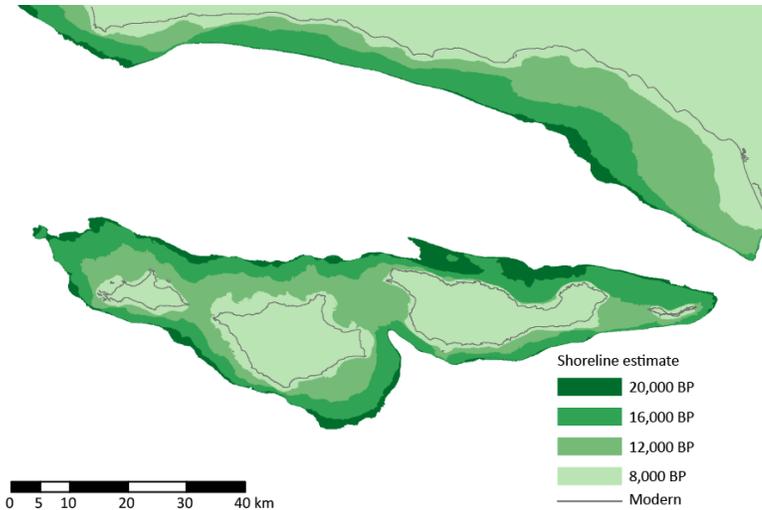


Purpose and Goals

Off the Pacific Coast of North America, rising postglacial sea levels have submerged a vast paleolandscape that almost certainly contains inundated terrestrial archaeological resources. It is likely that many of these areas are also associated now with important marine biological features. Few submerged sites have been identified and little ground-truthing has been done. This study will synthesize specific geological and geophysical data from offshore southern California and central Oregon, conduct field investigations, refine local sea-level models, and determine if these features are associated with ecologically sensitive areas.



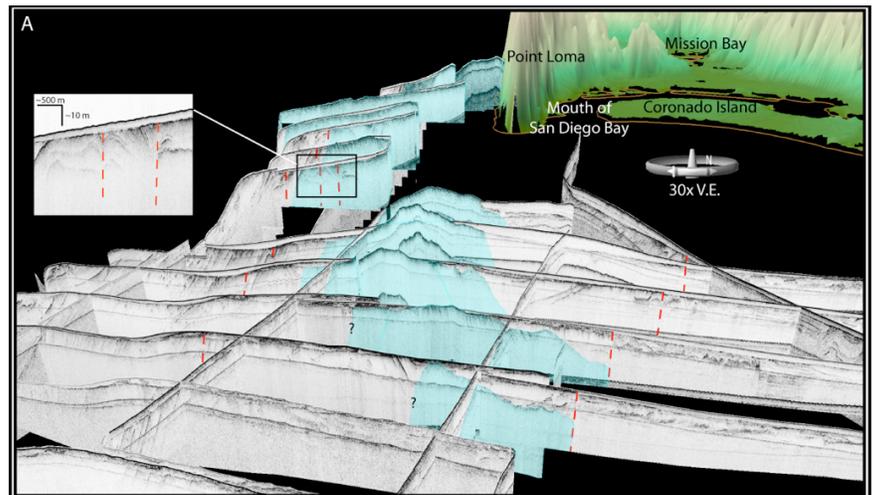
Reconstruction of shorelines of the Northern Channel Islands through time.

The Bureau of Ocean Energy Management (BOEM) has the responsibility to evaluate and monitor effects from offshore energy development and is required under multiple laws to consider the impacts of Outer Continental Shelf (OCS) activities on archaeological and biological resources. The project will further improve identification of submerged cultural and natural resources on the continental shelf by evaluating the geophysical survey guidelines for biological, pre-contact archaeological, and paleontological resources.

An Integrative Approach

This project will:

- Synthesize existing geological and geophysical data sets from offshore southern California and central Oregon;
- Develop and field test a new geospatial model that will aid in identification and classification of potential submerged landforms;
- Conduct field investigations of areas identified as having high potential to be associated with sensitive features;
- Improve models of submerged archaeological resources by incorporating archaeological and biological sampling data; and
- Quantify the trophic subsidy provided by hydrocarbon features to the benthic community, and explore the spatial extent of this subsidy and its effects on composition, abundance, and food web structure.



Fence diagram of interpreted Chirp profiles from offshore San Diego (gray scale profiles). Blue color shows extent of Cretaceous hardgrounds that provide substrate for kelp forest. Dashed red lines mark faults. Green and tan colors show onshore topography. Image created using IVS Fledermaus software.



Archaeological and Biological Assessment of Submerged Landforms



This project will involve:

- Outreach with Native American groups in Oregon and California;
- GIS predictive modeling of high probability landforms;
- Terrestrial archaeological surveys on the Northern Channel Islands focused on finding Paleocoastal sites;
- Identification of four target areas for high-resolution data collection in southern California and central Oregon;
- Geophysical surveys of submerged landscapes along target areas (e.g., high-resolution sub-bottom and sidescan sonar);
- Seafloor coring and sampling of each target area for archaeological and biological indicators;
- All fieldwork has concluded and the project is scheduled for completion in Feb. 2021

The absence of a scientific standardized, “best practices” methodology for identifying submerged relict landscapes off the west coast, and the ancient tribal archaeological resources these landscapes may potentially contain, has long been a concern among Federal, State, and Tribal historic preservation officers (THPO), and has made environmental decision-making problematic for BOEM. Beyond assisting BOEM to evaluate the potential for encountering cultural resources on the Pacific Outer Continental Shelf (POCS) during future energy development, our study results will contribute to Pacific marine spatial planning efforts, and a better understanding of the submerged landscape. Detailed geophysical surveys and ground-truthing of submerged landscape features have not been conducted in the POCS. The high-resolution surveys and sampling conducted as part of this

effort should enhance regional landscape models of submerged archaeological resources and sensitive biological features, and assist BOEM in decision making related to these resources and offshore activities.

Additional Information Can Be Found at:

Braje, Todd J. et al. 2019. Working from the Known to the Unknown: Linking the Subaerial Archaeology and Submerged Paleogeography of Santarosae Island, California. *Open Quaternary* 5(10):1-15.

Laws, Alexander W. et al. 2019. Submerged Paleoshoreline Mapping Using High-Resolution Chirp Subbottom Data: Northern Channel Islands Platform, California, USA. *Quaternary Research* 1-22 <http://doi.org/10.1017/qua.2019.34>.

Skakan, Matthew et al. 2020. Controls on Paleodrainage Incision Versus Bypass on the Continental Shelf Offshore Central Oregon, USA. *Continental Shelf Research* in press

<https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-Studies/Pacific-Region/Studies/PC-14-04.pdf>

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