

Environmental Studies Program: Ongoing Study

Study Area(s): Southern California

Administered By: Pacific OCS Region

Title: California Deepwater Investigations and Groundtruthing
(Cal DIG) I (NSL #PC-17-02)

BOEM Information Need(s) to be Addressed: BOEM Pacific Region received an application for a commercial lease of 100+ turbines within an area of about 200 square miles using floating wind energy conversion devices offshore south-central California. The general ecology of the shoreline/beach and nearshore kelp bed areas of south-central California has been characterized. However, farther offshore the oceanic area of interest, 20-35 miles, 500-1000 m water depth, on the continental slope remains an unmapped and unstudied expanse. Specifically, mapping and sampling of slope and canyon communities as well as exploration for other areas of potential significance is needed for informed decisions regarding potential wind turbine siting, distribution of habitats and historic sites, and the sensitivity of associated biological communities to impacts. The results of this study will help to define mitigations and identify hard bottom areas, archaeological sites, and any associated sensitive deep shelf and slope communities that energy development should avoid. Results will be used in potential NEPA documents and to fulfill consultation and analysis requirements under the Migratory Bird Treaty Act, Magnuson-Stevens Fisheries Conservation and Management Act, Endangered Species Act, and Marine Mammal Protection Act for a wind energy commercial lease off south-central California.

Total BOEM Cost: \$1,500,000

Period of Performance: FY 2017–2020

Conducting Organization(s): U.S. Geological Survey

Principal Investigator(s): [Dr. Guy Cochrane](#)

BOEM Contact(s): [Lisa Gilbane](#)

Description:

Background: Dynegy retired an obsolete power plant located on the shore at Morro Bay, but retained the fully operational connection to the California electrical utility. The grid connection is sufficient to flow the proposed Trident Winds' and/or other wind energy facilities' electrical production at maximum capacity into the California Central-Valley electrical backbone. Trident Winds and other potential wind energy generating companies are discussing potential paths to power purchasing from offshore wind with the California Energy Commission. California's Governor has set a goal to meet 50% of the state's energy needs with clean, renewable energy by 2030. Offshore wind power is set to play an important role in meeting this goal. This offshore area may prove to be a region of competitive interest for renewable energy.

Early studies from the late 1970s and through the early 1980s were completed in locations both south and north of the area of interest, where oil and gas potential existed. Those studies were 60-80 miles away from the area of interest and did not include the region directly offshore San Luis Obispo County and the coastal city of Morro Bay. Thus, there are no geophysical or surface anomaly maps or habitat characterizations for the area of interest. Other areas that were surveyed prior to oil and gas leasing off California, in the general bathymetric range of 300-1000 m, documented hard bottom reefs, potential archaeological and shipwreck sites, and canyon areas that included significant boulders and rock outcrops, some with high relief and a high diversity of associated attached communities (Hixon, Tissot and Percy 1991). The offshore habitats nearest to the area of interest that have been mapped include significant populations of both low and high-relief hard bottom reefs, corals, gorgonians, and canyon/canyon-wall habitats (Greene et al. 2003). Gross bathymetry of the Cal DIG I study area suggests depth changes within the 300-1000 m range that could support similar habitats. Megafauna associated with slope reefs and canyons are different and more diverse than on surrounding continental slope habitats (Huff et al. 2013). The Cal Dig I study is the first step in the process to define mitigations and identify hard bottom areas, archaeological sites, potential shallow hazards, and any associated sensitive deep shelf and slope communities that energy development should avoid.

Objectives: The goal of study is to conduct a reconnaissance survey of the outer continental shelf of south central California for the purpose of improving regional models of seafloor (benthic) habitats, geologic hazards and sedimentary processes in anticipation of commercial wind energy installations. Specific objectives are as follows:

- Collect data for surficial geology “benthic habitats” and sub-bottom faults and other geologic structures
- Collect samples designed to ground-truth or improve the classifications for geologic and habitat maps
- Create integrative mapping and modeling products

Methods: This project will require the use of sophisticated submerged instrumentation capable of high-resolution bottom imagery and sub-bottom profiling at depths of 500-1200 m. This could include ship-based devices or autonomous underwater vehicles (AUVs) or towed fish for mapping. Large-scale mapping will be required to define substrate type and distribution of potential hard bottoms associated with canyons as well as more distinct slope areas.

References:

Greene, H.G., J.J. Bizzarro, D.M. Erdey, H. Lopez, L. Murai, S. Watt, and J. Tilden. 2003. Essential fish habitat characterization and mapping of California continental margin. Moss Landing Marine Laboratories Technical Publication Series No. 2003-01, 29 p., 2 +CDs.

Hixon, M.A., B.N. Tissot, and W.G. Percy. 1991. Fish assemblages of rocky banks of the Pacific northwest, Heceta, Coquille, and Daisy Banks. U.S. Department of the Interior, Minerals Management Service. OCS Study MMS 91-0052. 410 p.

Huff, D.D., M.M. Yoklavich, M.S. Love, D.L. Watters, F. Chai, and S.T. Lindley. 2013. Environmental factors that influence the distribution, size, and biotic relationships of the Christmas tree coral *Antipathes dendrochristos* in the Southern California Bight. Marine Ecology Progress Series, Vol. 494: 159-177.

Current Status: The BOEM-USGS interagency agreement was awarded on June 5, 2017. Planning for collection of surficial habitat and sub-bottom data (Task 1) is underway.

Final Report Due: June 5, 2020

Publications Completed: None

Affiliated WWW Sites: <https://marinecadastre.gov/epis/#/search/study/100222>

Revised Date: July 13, 2018