

Environmental Studies Program: Ongoing Study

Study Area(s): Southern California

Administered By: Pacific OCS Region

Title: Disturbance Index Development for the Pacific OCS
(NSL #PC-16-04)

BOEM Information Need(s) to be Addressed: This study implements BOEM's Outer Continental Shelf Lands Act mandate to monitor the marine environments adjacent to OCS operations and to have some measure of evaluating cumulative impacts from past and ongoing operations. Information on seafloor invertebrate species and abundances in the vicinity of existing federal platforms in the Pacific OCS was last collected over 17 years ago, yet is still the basis of ongoing current environmental assessments. The proposed study will develop an index to regionally assess and rank the degree of anthropogenic disturbance for outer shelf and slope soft-sediment biological communities in areas surrounding platforms in the southern California OCS. By doing this we can assess the degree of disturbance and impact on the seafloor regionally and compare to OCS projects that will impact the soft-bottom habitat. This information will be used in all environmentally based planning, from current biological assessments of critical habitat for white abalone to regional-level decommissioning decisions. Developing a quantitative index for disturbance of seafloor areas is a tool that can be applied to other regions on the Pacific OCS, where there is current interest in renewable energy development.

Total BOEM Cost: \$230,000

Period of Performance: FY 2016–2019

Conducting Organization(s): Southern California Coastal Water Research Project

Principal Investigator(s): [Dr. David Gillett](#) and [Kenneth Schiff](#)

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

Description:

Background: Invertebrates found in the seafloor sediments (infauna) are often used to assess sediment quality because they are adapted to site-specific conditions such as grain size or total organic carbon. They integrate the cumulative effects of multiple co-occurring contaminants and stressors over time. A well-established method for evaluating impacts from offshore platforms is to conduct community-level analysis of the benthic invertebrates near and far from a platform. A preferable method is to use regional reference conditions, far from the source, instead of a single site. A regional reference condition captures the full range of natural variability, enables a more robust analysis, and prevents potential false-positive findings from a single site comparison.

To assess cumulative impacts from multiple sources and to improve capacity for regional assessments, the Southern California Coastal Water Research Project (SCCWRP) facilitates a regional seafloor sampling effort every five years. Local, state,

and federal agencies partner through SCCWRP to sample over 350 locations in southern California, from estuaries to beyond the continental slope (SCCWRP 2014).

The southern California seafloor is a patchwork of distinct biogeographic communities that separate generally by depth. As a result, infauna communities around federal platforms are different depending on their depth. The last four regional sampling efforts have focused analyses and reporting more on areas up to 400 meters of the mid and inner continental shelf and therefore have not fully described these biogeographic differences in deeper waters of the outer shelf and slope habitats. An improved understanding of what is “normal” or considered unimpacted habitat at these different depths is the first step in assessing the cumulative seafloor impacts from the nine platforms and infrastructure on the outer shelf and slope.

Objectives: A question to be answered by this study is: What is the ecological condition of the outer continental shelf and slope in southern California? More specifically for BOEM: What are the sediment and benthic communities near the nine outer shelf and slope platforms? Can the tools developed through this study be applied to future renewable energy activities on the Pacific OCS?

Methods: Taxonomic and chemical data were collected by multiple state agencies for almost 20 years and analyzed, but need to be synthesized in a report for the outer continental shelf and slope areas. Statistical analyses will include processed data for organismal, physical, toxicology (including PAHs), and location data in the depth regions of federal platforms. Analyses will utilize multivariate statistical testing and correlations among biological, physical, and chemical parameters to test for similarities and differences among infauna samples. A separate analysis incorporating historic samples will be conducted to determine temporal trends. A regional reference condition termed “Benthic Response Index” is used regularly for inner and mid-shelf impact studies. This study will establish a baseline condition and attempt to develop the Benthic Response Index for outer shelf and slope depths. A report will be written that describes the analysis and has complete GIS products including a map of distinct seafloor communities in the Southern California Planning Area at shelf and slope depths. There will be particular focus on evaluating the application of this index for evaluating sedimentary changes associated with floating wind and wave energy facilities.

Reference:

SCCWRP. July 23, 2014. *Regional Monitoring*. Retrieved January 21, 2015 from Southern California Coastal Water Research Project, Research Theme: Regional Monitoring: <http://www.sccwrp.org/ResearchAreas/RegionalMonitoring>.

Current Status: The BOEM-SCCWRP cooperative agreement was awarded July 20, 2016 and \$30,000 was added to the total funding in 2017. Separate datasets were analyzed and compiled into one database. The definition of natural background benthic communities is complete and determinations of impact are being assessed.

Final Report Due: January 31, 2019

Publications Completed: None

Affiliated WWW Sites: <https://marinecadastre.gov/epis/#/search/study/100115>

Revised Date: July 13, 2018