

Environmental Studies Program: Ongoing Study

Title	Synthesis of Pacific Platform Research (NSL #PC-15-03)
Administered by	Pacific OCS Region
BOEM Contact(s)	Mark Eckenrode (mark.eckenrode@boem.gov)
Principal Investigators(s)	Dr. Milton Love (milton.love@lifesci.ucsb.edu)
Conducting Organizations(s)	University of California, Santa Barbara
Total BOEM Cost	\$400,000
Performance Period	FY 2015–2019
Final Report Due	October 31, 2019
Date Revised	June 12, 2019
PICOC Summary	
<i>Problem</i>	What is the ecological relationship between the Pacific OCS Region platforms and California coastal and marine ecology?
<i>Intervention</i>	What ecological information will better inform the fate of OCS oil and gas structures during decommissioning of those facilities?
<i>Comparison</i>	How does the site fidelity of offshore oil and gas structures compare to natural reefs within the Southern California Bight?
<i>Outcome</i>	Improve scientific understanding of the ecological value of OCS facilities and their potential impacts from decommissioning operations.
<i>Context</i>	Southern California, Central California, Northern California

BOEM Information Need(s): After three decades of ESP-funded scientific research about the ecology and assemblages of platforms off California, BOEM needs to have the resulting reports and related literature material summarized and synthesized into a single professionally published reference that examines the influence of platform assemblages on the marine ecology of the Pacific coastal region and the implications of the artificial reef effect for renewable energy installations in any region. Given historic investment in interdisciplinary biological and oceanographic research of platforms, reefs, and shorelines in the region, a synthesis of completed and ongoing studies and peer-reviewed papers regarding the influence of Pacific platforms on regional marine ecology would be of value to inform BOEM decision makers and for NEPA analysis of the potential impacts of decommissioning oil and gas facilities and for NEPA analysis of the potential artificial reef effect for renewable energy project installations.

Background: Since 1985, federal agencies have invested nearly \$30 million to conduct research on fishes and mega-invertebrates that live around the platforms and on natural reefs off central and southern California. This present effort proposes a synthesis of research from the past and ongoing studies and journal literature in the Pacific Region that have focused on ecology of the platforms within the larger context of the Pacific coastal region. A brief survey of the peer-reviewed literature has found over

25 major relevant articles, and there are at least an equal number of agency reports. The federal studies include but are not limited to:

- Fisheries Species and Oil/Gas Platforms Offshore California
- Assessing the Fate of Juvenile Rockfish
- Santa Maria Shelf Oceanographic Circulation
- Inner-shelf Surface Currents and Characteristic Flow Patterns in Santa Barbara Channel
- Site-Fidelity and Transplantation Studies of Platform Fish
- The Ecological Role of Oil/Gas Production Platforms and Natural Outcrops on Fishes in Southern and Central California
- Effect of Offshore Oil Platform Structures on the Distribution Patterns of Commercially Important Benthic Crustaceans
- Survey of Invertebrate and Algal Communities on Oil/Gas Platforms in Southern California
- Ecological Performance of OCS Platforms as Fish Habitat off California
- Reproductive Ecology and Body Burden of Platform Resident Fish
- Habitat Value of Shell Mounds to Ecologically and Commercially Important Benthic Species
- Trophic Links: Comparisons Among Platforms and Natural Reefs
- Role of Food Subsidies and Habitat Structure in Influencing Benthic Communities of Shell Mounds at Platform Sites

The 2012 BOEM-funded studies, *Biological Productivity of Offshore Oil and Gas Structures in the Pacific OCS* and *Analysis of Fish Populations at Platforms off Summerland, California*, will be completed with journal submittals well within time to be included in this present effort. The goal is to publish a hardcopy and e-journal release, special issue of a scientific journal regarding the influence of Pacific offshore platforms on regional ecology and the implications for renewable energy based on information obtained through these studies and published papers. Potential chapters could include but are not limited to:

- Origin and Fate of Pacific Offshore Platforms
- Platform Assemblages
- Inter- and Intra-relationships of Oceanographic Circulation and Larval Dispersion to/from Pacific Platforms
- Distribution Patterns of Important Benthic Crustaceans
- Site-Fidelity and Movement of Platform Fish
- Productivity of Pacific Platforms
- *De facto* Marine Preserves and the Artificial Reef Effect
- Influence of Pacific Platforms on Pacific Coast Marine Ecology
- Implications for Renewable Energy Installations.

Objectives:

1. Increase scientific understanding of the inter- and intra-relationships of assemblages at offshore petroleum platforms and the Pacific coastal ecosystem.
2. Determine the extent of influence of platform assemblages on Pacific coast populations of fish and invertebrates.

Methods:

UCSB shall perform and complete a literature search and synthesis of peer-reviewed and grey literature of platforms as reefs, fishes, mega-invertebrates, and corals that may exist around the southern California platforms and on immediately adjacent natural reefs. The search and synthesis of the collected works shall include research examinations at or near these geographic points and will result in the development of a website including the searchable annotated bibliography.

The Principal Investigator (PI) will acquire a professional editor (*Bulletin of Marine Science*) specializing in scientific publication and journal-specific formatting and establish a review board of Chapter leads from a broad range of West Coast universities and agencies. The leads would digest, reanalyze data (if needed), and, as directed by the PI, summarize and reach overarching conclusions and findings to meet the objectives. The PI will work with a publisher of the *Bulletin of Marine Science* to publish a stand-alone journal issue and e-journal release.

Specific Research Question(s):

1. What is the role of California offshore oil and gas platforms in fish and invertebrate site fidelity and productivity?
2. What is the ecology of the offshore platforms and their relationship to California marine and coastal ecology?
3. What is the ecological relationship between the OCS platforms and natural reefs in the southern California Bight?

Current Status: The BOEM-UCSB cooperative agreement was awarded August 20, 2015. The *Bulletin of Marine Science* has agreed to publish a journal issue dedicated to this synthesis study and all manuscripts have been reviewed by BOEM and will be published in late 2019. In addition, the PI submitted a web-based annotated bibliography in May 2017 of all research related to organisms and organism assemblages living around platforms worldwide. A no-cost extension (to October 2019) was granted to help offset issues with the journal's review process. Work continues on developing the final report, which is to be submitted in October 2019.

Publications Completed: UCSB completed a web-based annotated bibliography of all research related to organisms or organism assemblages living around platforms worldwide. This is a global database that contains papers and reports from around the

world and currently contains 953 works. The search and synthesis of the collected works includes research examinations of contaminant loads, oceanography, trophic links, and larval transport at or near these geographic points. The database will be updated as new papers and reports become available.

An Annotated Bibliography of Research Conducted Worldwide on Organisms and Organism Communities Associated with Oil and Gas Platforms.

<http://platformresearch.msi.ucsb.edu/>

Affiliated WWW Sites:

<https://marinecadastre.gov/epis/#/search/study/100091>

<http://platformresearch.msi.ucsb.edu/>

References: None