

Environmental Studies Program: Ongoing Study

Field	Study Information
Title	The Environmental Status of Artificial Structures Offshore California (PC-20-02)
Administered by	Pacific OCS Regional Office
BOEM Contact(s)	Donna Schroeder (donna.schroeder@boem.gov), Mark Mueller (mark.mueller@boem.gov)
Procurement Type(s)	Cooperative Agreement
Conducting Organization(s)	Southern California Marine Institute (SCMI)
Total BOEM Cost	\$750,000
Performance Period	FY 2021–2024
Final Report Due	September 23, 2024
Date Revised	October 31, 2023
Problem	Decision makers need information about how offshore projects that contribute significant amounts of hard substrate into the marine environment may be evaluated managed, and decommissioned.
Intervention	Field surveys of natural and artificial habitats and analyses of existing video data.
Comparison	Comparisons among natural and artificial habitat types according to depth and biogeographic zone.
Outcome	Evaluation criteria that can be used to inform decommissioning decisions by the State of California, BOEM, and Bureau of Safety & Environmental Enforcement (BSEE); information about potential artificial reef consequences of offshore wind in the California Current System.
Context	Southern California Planning Area, Northern California Planning Area

BOEM Information Need(s): Offshore energy development changes the distribution and abundance of local marine habitats and species via the introduction of artificial substrate (Schroeder and Love, 2004; Boehlert and Gill 2010). This “artificial reef” effect potentially modifies a variety of local and regional processes, including those that drive the ecological dynamics of managed, sensitive, or non-native species. Decision makers must therefore understand how offshore projects that contribute noteworthy amounts of hard substrate into the marine environment may be evaluated managed, and decommissioned. In the Pacific Region, habitat issues are of particular importance due to (1) the imminent decommissioning of oil and gas platforms, pipelines, and submarine cables, and (2) the introduction of new artificial habitat from floating offshore platforms and associated marine infrastructure. Information produced from this study will be used in NEPA and consultation documents when reviewing offshore projects that add or remove marine infrastructure in the offshore environment.

Background: The National Fishing Enhancement Act of 1984 (NFEA; 33 U.S.C. 2101) was enacted to promote and facilitate efforts to establish artificial reefs in U.S. waters. The NFEA calls for the use of the

best scientific information available to site, construct, and subsequently monitor and manage artificial reefs in a manner which will enhance fishery resources to the maximum extent practicable, minimize environmental risks, and avoid conflicts with other stakeholders. To accomplish these goals the NFEA directed the formation of a National Artificial Reef Plan (NARP).

On the outer continental shelf (OCS), a departure from complete platform removal during decommissioning may be granted to a lessee if the remaining structure is incorporated into a state artificial reef program that complies with the NARP and satisfies the U.S. Coast Guard navigational requirements. In southern California, it remains undetermined to what extent platform habitat (including shell mounds) and other similar man-made structures (such as pipelines, cables, and metal-hulled shipwrecks) contribute to regional scale ecological dynamics compared to natural substrates. This is due in part to the lack of a comprehensive understanding of the extent of man-made habitat available and variation in the quality of these habitats across and nearby the Southern California Bight (SCB). Because of the necessity of the State of California's acceptance of a reefed platform into their artificial reef program, current information needs include understanding the status of the current network of artificial habitats in California and determining how these artificial habitats are functioning in reference to nearby natural areas.

Objectives: The overall objective of this study is to evaluate the current status of artificial reef habitat to inform future National Environmental Policy Act (NEPA) analyses regarding the ongoing and proposed changes to marine habitats from offshore energy activities, and to provide guidance to assess and manage future artificial reef proposals and projects at a regional scale. Due to the lack of information regarding the artificial reef effect of pipelines and cables, the initial focus of analysis will be on these structures.

Methods: Two types of data will be analyzed to quantify the biotic communities associated with offshore structures (e.g., pipelines and submarine cables). The first type will be existing videos of pipeline integrity performed by industry across multiple years. Data from these surveys can provide coarse taxonomic resolution of marine life over an extended temporal scale. The second type of data will be new field work that surveys pipelines, cables, natural habitats, and potentially other artificial substrates (e.g., shipwrecks or marine debris), across a broad spatial scale and which will collect data on physical, geological, and biological characteristics of the environment. These data will provide greater taxonomic resolution and enable a comparison of communities across habitat types. The data collected will be analyzed using multivariate and other statistical methods to describe the characteristics of natural and artificial reefs. Ecosystem services, including cultural components, will also be analyzed.

Specific Research Question(s):

1. What is the environmental status of artificial structures and nearby natural habitats associated with offshore energy areas in California?
2. What criteria are available to evaluate, manage, and decommission marine infrastructure?

Current Status: The cooperative agreement between BOEM and University of Southern California (fiduciary agent of Southern California Marine Institute) was awarded September 23, 2021. The post-award meeting will be held in October 2021. Fieldwork has been conducted.

Publications Completed: None

Affiliated WWW Sites: None

References:

Boehlert GW and Gill AB. 2010. *Environmental and ecological effects of ocean renewable energy development: a current synthesis*. *Oceanography* 23: 68-81.

National Oceanic and Atmospheric Administration (NOAA). 1997. *National Artificial Reef Plan (as Amended): Guidelines for Siting, Construction, Development, and Assessment of Artificial Reefs*. 60 p. http://www.nmfs.noaa.gov/sfa/management/recreational/documents/narp_cover_3.pdf, downloaded January 24, 2017.

Schroeder DM and Love MS. 2004. *Ecological and political issues surrounding decommissioning of offshore oil facilities in the Southern California Bight*. *Ocean & Coastal Management* 47:21–48.