Environmental Studies Program: Ongoing Study

Study Area(s): Southern California, Washington-Oregon

Administered By: Pacific OCS Region

Title: BOEM-MARINe (Multi-Agency Rocky Intertidal Network) (NSL #PC-15-02)

BOEM Information Need(s) to be Addressed: Ongoing monitoring of rocky intertidal sites adjacent to OCS production facilities allows BOEM to directly assess potential and/or real impacts to the coastline from OCS operations. With these data, BOEM can directly assess impacts to shoreline resources from OCS activities by differentiating between naturally caused impacts and other anthropogenic impacts, including impacts from OCS oil and gas production and accidental oil spills. The study implements BOEM's OCS Lands Act mandate to monitor the marine and coastal environment adjacent to OCS operations.

Total BOEM Cost: $2,127,000 **Period of Performance:** FY 2015–2020

Conducting Organization(s): University of California, Santa Cruz

Principal Investigator(s): Dr. Peter Raimondi

BOEM Contact(s): Lisa Gilbane

Description:

Background: Potential impacts to the shoreline are of particular concern in the Pacific OCS Region because OCS operations are located very close to shore. Public concern with these impacts has a considerable effect on the program. BOEM and its 45 partners in MARINe biannually monitor over 100 established shoreline rocky intertidal sites using a targeted assemblage protocol from California to British Columbia. MARINe partners also use a bio-diversity protocol to sample an additional 100 plus sites from Alaska to Mexico on a periodic basis. MARINe employs standardized field protocols and a shared database (www.MARINe.gov). This study provides funding to monitor all 32 BOEM long-term monitoring sites adjacent to OCS operations, including 8 sites off the Oregon coast where potential OCS offshore wave and wind energy facilities may be. BOEM continues to participate actively in the management and oversight of MARINe, to access the data critical to our ongoing operations, and to fulfill our responsibility to monitor OCS platforms and pipeline operations.

Objectives: This study provides for the continued monitoring of 32 rocky intertidal sites on the mainland shore immediately adjacent to OCS oil and gas and potential wind and wave facilities. Information generated will provide the basis for evaluating impacts to the shoreline from OCS activities, especially accidental oil spills, and nearshore wave-energy-related effects. A web-based trend analysis of BOEM-funded sites in combination with other MARINe sites in the shared database, along with coordination of MARINe and database tasks are included so that BOEM has access to the data needed

for management decisions. A vouchering effort is ongoing in coordination with the Smithsonian to archive species.

Methods: Sites are monitored by six teams of field biologists, including the BOEM Pacific Rocky Intertidal Survey and Monitoring (PRISM) team. Barnacles, mussels, seastars, black abalone, surfgrass, limpets, turf weed, rock weed, and other algae are either photographed in fixed plots in the field, or measured and counted in irregular, circular, or band plots. This protocol provides a high confidence for detecting a small amount of change in abundances of targeted species. Based on analyses of two decades of continuous monitoring data twice a year, sampling was reduced to once a year starting in fall 2015. In February 2016 teams combined to complete biodiversity or community sampling at four sites, which is a more intensive sampling completed on a five-year rotation. It was developed by MARINe in early 2000 to extrapolate outside fixed plots of the core monitoring program. The biodiversity sampling allows BOEM to evaluate species changes across the site, identify rare species, and provide clues to climate change such as movement of species in relation to elevation and temperature. It has proved especially valuable, in combination with other protocols, in assessing oil spill injury, chronic effects from water pollution, and community changes in response to shoreline protection. The sampling protocols are standardized across MARINe and are used by all MARINe field teams. Work collecting and archiving specimens for submission to the Smithsonian will also be continued during FY 2015-2020.

Data are placed in a common database and are accessible through graphing, downloads, and map visualizations, as well as through specific requests to the database manager.

Current Status: The BOEM-UCSC cooperative agreement was awarded on May 1, 2015 and is in Year 2 of the agreement. In June 2016 the U.S. Navy contributed funds to BOEM to support the management and updates of the MARINe database. The 2017 MARINe Annual Meeting was held on February 17-18, 2017 in Trinidad, California.

Final Report Due: April 30, 2020

Publications Completed:
See http://www.eeb.ucsc.edu/pacificrockyintertidal/publications/index.

Affiliated WWW Sites:
https://marinecadastre.gov/espis/#/search/study/100090
www.MARINe.gov
http://www.eeb.ucsc.edu/pacificrockyintertidal/index.html

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