Environmental Studies Program: Ongoing Study

Study Area(s): Hawaii

Administered By: Pacific OCS Region

Title: A Marine Biogeographic Assessment of the Main Hawaiian Islands (PC-13-06)

BOEM Information Need(s) to be Addressed: BOEM has received unsolicited requests for wind leases in Hawaii and is currently considering competitive leasing of specific areas offshore Oahu. While BOEM has completed more than 300 studies in the Pacific, none of these has addressed resources around the main Hawaiian Islands (MHI). BOEM needs an assessment of available baseline information on a variety of biological and physical resources offshore of the MHI to determine knowledge gaps and study needs, and assess what information is available to conduct environmental analyses and inform the decisionmaking process for the review of offshore renewable energy project submittals. A marine biogeographic assessment of the MHI will expand BOEM's assessment capabilities, define study needs, and contribute greatly toward ecosystem-based management of the marine resources of the MHI.

Total BOEM Cost: $500,000 **Period of Performance:** FY 2013–2017

Conducting Organization(s): National Oceanic and Atmospheric Administration, National Centers for Coastal Ocean Science

Principal Investigator(s): Bryan Costa

BOEM Contact(s): Greg Sanders

Description:
Background: Defining biogeographic patterns off the MHI is an effective way to synthesize existing information about biological and physical resources. A marine biogeographic assessment will assemble and synthesize readily available existing georeferenced data describing the physical oceanography, and the distribution and abundance of benthic habitats, cetaceans, seals, seabirds, reptiles, fish, and invertebrates (including corals) in the MHI. Collectively, these GIS datasets would be used by BOEM to understand what information exists on the marine resources found within state and federal waters, identify knowledge gaps, and inform renewable energy siting and development in and around the MHI.

The study includes broad-based characterization of the physical and biological environments (e.g., oceanography and benthic habitats) that structure the spatial and temporal distribution of living marine resources off the coast of the MHI. Readily available existing information on the distribution of living marine resources, including key species of interest identified by BOEM staff, will be integrated with available biophysical information using various spatial analysis techniques. This study was awarded through an interagency agreement with NOAA, who has produced similar

biogeographic assessments for other regions including the Northwestern Hawaiian Islands.

Objectives: The objectives of this project are to (1) characterize the distribution of marine resources found within state and federal waters (with an emphasis on federal waters), (2) identify spatial and temporal data gaps, and (3) support spatial planning for development of offshore renewable energy by BOEM in the MHI.

Methods: The specific tasks for this project include: (1) identification and acquisition of existing relevant, readily available physical, biological, and ecological datasets for the study area including information about benthic habitats, cetaceans, seals, seabirds, reptiles, fish, and invertebrates (including corals); (2) organization of data into a common spatial framework within GIS, and identification of information gaps in existing datasets and research activities; (3) synthesis of GIS data and development of maps depicting the spatial distribution of physical, biological, and ecological data sets for the study area; (4) biogeographic analysis of available data to identify ecologically significant regions, based on species distributions, abundances, associated benthic habitats, and other datasets, if appropriate; and (5) preparation of a report summarizing methods and key findings, including relevant maps, figures, tables, and appendices.

Readily available existing physical, biological, and ecological data sets are being obtained from groups actively working in the Pacific Islands region (i.e., academic, government, consulting, nonprofit, and other groups). Relevant datasets will be formatted and organized into a preliminary database management system (DBMS) to assess their quality and content. Once the datasets have been formatted and organized, maps will be developed depicting the spatial distribution of the physical, biological, and ecological data. If the data allows, species abundances will also be mapped. The GIS data used to create these maps will be delivered to BOEM, along with metadata describing source, derivation, and limitations of each GIS data layer, when possible. The quality of the final maps will depend on the quality, quantity, and availability of data for analysis. Key ecologically important areas will be identified based on the following criteria: (1) the availability, completeness, and limitations associated with specific datasets; (2) maps denoting the distribution and abundance of specific species; and (3) the distribution of bio-physical habitats. All data will be integrated into a spatially explicit index in an attempt to evaluate overall spatial patterns. A final report will be prepared describing key ecological patterns, linkages, and locations highlighted by the project's quantitative and qualitative analyses.

Current Status: The interagency agreement was signed July 30, 2013. Existing databases were identified and initial data products were created, reviewed, and vetted with data partners for the project, and synthesis of data was completed. The final report was delivered to BOEM. Data products were prepared for upload to publically available web sites. The report and associated data products are available to the public ahead of the projected schedule. BOEM is awaiting NOAA's final invoicing, after which closeout will be requested.

Final Report Due: December 31, 2016 (Received July 2016)

Publications Completed:

Costa, B.M. and M.S. Kendall (eds.). 2016. Marine Biogeographic Assessment of the Main Hawaiian Islands. Bureau of Ocean Energy Management and National Oceanic and Atmospheric Administration. OCS Study BOEM 2016-035 and NOAA Technical Memorandum NOS NCCOS 214. 359 pp.

Affiliated WWW Sites:

https://marinecadastre.gov/espis/#/search/study/26983
http://coastalscience.noaa.gov/projects/detail?key=163

Revised Date: February 3, 2017