

BOEM ENVIRONMENTAL STUDIES PROGRAM: Ongoing Studies

Region: Alaska

Planning Area(s): Chukchi Sea

Title: Initiating an Arctic Marine Biodiversity Observing Network (AMBON) for Ecosystem Monitoring (AK-15-01)

BOEM Information Need(s) to be Addressed: BOEM needs a more rigorous monitoring system to improve information about the health of biodiversity in the Chukchi Sea as a means to enhance environmental impact assessments and develop better metrics for cumulative impact analysis. Biodiversity measures for the marine environment need to be acquired through systematic and comprehensive methodology.

Total Cost: \$1,750,000
plus Joint Funding (~\$4,200,000)

Period of Performance: FY 2015-2020

Conducting Organization: NOPP Partnership with NOAA-IOOS

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Description:

Background: Biological diversity is defined as the variety of life, encompassing variation at all levels of complexity – genetic, species, ecosystems, and biomes – and including functional diversity and diversity across ecosystems. A growing body of research demonstrates that: (1) the maintenance of marine biodiversity (including coastal biodiversity) is critical to sustained ecosystem and human health and to resilience in a globally changing environment; and (2) the condition of marine biodiversity offers a proxy for the status of ocean and coastal ecosystem health and the ability to provide ecosystem services. Thus, managing our marine resources in a way that conserves existing marine biodiversity would help address other ocean management objectives. For example, it would provide information to enhance management against threats such as invasive species and infectious agents, enable predictive modeling, better inform decision-making, and allow for adaptive monitoring and Ecosystem-Based Management.

As stated in the final recommendations of the Interagency Ocean Policy Task Force, it is the policy of the United States to protect, maintain, and restore the health and biological diversity of ocean, coastal, and Great Lakes ecosystems and resources (http://www.whitehouse.gov/files/documents/OPTF_FinalRecs.pdf). The Census of Marine Life, which concluded in 2010, greatly enhanced our understanding of the status of marine biodiversity. It also made clear the importance of systematic and sustainable approaches to observing and monitoring biodiversity across different levels and at a national scale. In May 2013, a paper published in BioScience (<http://dx.doi.org/10.1525/bio.2013.63.5.8>) described the feasibility of establishing a Marine Biodiversity Observing Network (BON) to help meet these information needs.

Through the National Oceanographic Partnership Program (NOPP), multiple agencies including NOAA, NASA, BOEM, and the USGS sent-out a request for proposals to initiate an integrated Marine BON demonstration project. The bureaus have requested proposals for one or more broadly coordinated demonstration projects in U.S. coastal waters that demonstrate how an end-to-end marine BON can be developed. “End-to-end” refers to integration of observations and historical data across multiple scales of diversity (genetic to ecosystem, microbes to whales), time (instants to centuries), and space (in situ to satellite remote sensing). Special consideration will be given to proposals that demonstrate potential for establishing long-term, sustainable monitoring through partnerships.

The assessment of possible adverse risk from OCS energy development hinges on being able to differentiate human-induced effects from natural variability. Given the complexity of marine ecosystems and the possible effects of global climate change, this often requires making observations over large ocean areas, seasonally, and over multiple years and even decades to acquire reasonable statistical confidence.

Objectives: The objective of this study for the Alaska Region is to build on emerging Distributed Biological Observatories (DBOs) by developing a prototype ecosystem-based marine biodiversity network over the Chukchi Sea Planning Area, monitoring multiple trophic levels and species. Informed by historical data and past modeling efforts, such a network will: expand upon planned and recently-launched observing sites, systems, and programs; employ innovative techniques for data discovery and methods that dynamically interrelate data sets to add value to existing monitoring data; and collaborate with the U. S. Integrated Ocean Observing System (IOOS) participants and funding agencies to optimize data management and modeling capabilities.

Methods: Through the National Oceanographic Partnership Program (NOPP), requests for proposals have been broadly distributed. In response, research proposals have been submitted and will be evaluated by a panel of scientists with relevant research experience. BOEM and other co-funding agencies will be able to select which of the better-evaluated proposed projects they want to fund based upon their value to the agencies’ missions.

Current Status: Ongoing

Final Report Due: September 2019

Publications Completed: None

Affiliated WWW Sites: <http://www.boem.gov/akstudies/>

Revised Date: August 2016

ESPIS: Environmental Studies Program Information System

All *completed* ESP studies can be found

here: http://www.data.boem.gov/homepg/data_center/other/espis/espisfront.asp