Environmental Studies Program: Ongoing Study

Field	Study Information
Title	National Guide to Deepwater Sensitive Habitats and Associated Fauna (NT-21-x11)
Administered by	Office of Environmental Programs
BOEM Contact(s)	Stephanie Sharuga (stephanie.sharuga@boem.gov), Mark Mueller (mark.mueller@boem.gov)
Procurement Type(s)	Interagency Agreement
Conducting Organization(s)	NOAA Office of Habitat Conservation
Total BOEM Cost	$250,000
Performance Period	FY 2022–2027
Final Report Due	February 2027
Date Revised	August 29, 2024
Problem	The information necessary for BOEM SMEs to accurately identify and evaluate the sensitivity of important benthic habitats and fauna potentially impacted by OCS activities is lacking and/or not easily accessible. Further, BOEM's reviewers currently do not have a resource tailored for their NEPA-related needs, yet still must make judgments about site-specific mitigations or conditions of approval.
Intervention	This study will create a comprehensive guide of important sensitive deepwater benthic organisms and habitats. Information will be compiled from a variety of existing sources on deep sea corals, chemosynthetic communities, and sponges to improve identification and evaluations of sensitivity to potential impacts from OCS activities.
Comparison	N/A: information for this study is being compiled from existing sources.
Outcome	This guide will provide relevant information needed for effective environmental assessments, mitigations, and consultations. It can be used to better inform and streamline relevant BOEM processes, including site-specific benthic impact reviews.
Context	All sensitive benthic habitats and associated fauna from each region where BOEM-regulated activities occur will be considered. The regions with the highest known or anticipated levels of activity (and potential impacts) will be given priority.

BOEM Information Need(s): There is a national need to more effectively evaluate potentially at-risk sensitive deepwater benthic habitats and associated fauna. This comprehensive guide will span BOEM's regions and can be used to inform and streamline a variety of relevant BOEM processes. It will lead to more effective assessments and consultations by providing detailed information and needed training material. The guide will be particularly useful for SMEs performing site-specific benthic reviews and applying mitigations/conditions of approval, especially when reviewing submersible imagery. The

guide's information can also be used in developing the National Program. This includes National Environmental Policy Act-required documents, and especially the Affected Environment and Routine and Accidental Impacts sections. The information will be particularly useful for informing impact analysis assumptions made about distancing mitigations. Further, the guide will inform and complement the national scale "State of the Continental Shelf" document that is currently being developed. The compiled knowledge will also inform other ongoing and future federal deepwater studies and partnerships. This guide will contain information that crosses programmatic boundaries and can be used by a wide variety of external stakeholders as well. Overall, it facilitates the agency better achieving its national monitoring, assessment, compliance, and consultation roles.

Background: The ability to make appropriate environmental protection and mitigation decisions in relation to OCS activities is directly linked to accurately identifying potentially affected habitats and their associated fauna. Considerable information about sensitive habitats and fauna already exists; however, it is currently located across disparate and incomplete sources and is not customized to fit BOEM's needs. No known guides currently exist that include multiple sensitive habitat types and associated fauna across multiple regions, or which include an evaluation of sensitivity and potential types of impact from activities in the OCS. This often makes it difficult and time-consuming to obtain the necessary information to make the most accurate and effective decisions related to these habitats and fauna.

A guide that facilitates easier identification and evaluation of sensitive habitats and fauna, and also increases understanding of their potential sensitivity to OCS activity impacts (from all programs) will enhance assessments and consultations both at the regional and national levels. It also directly ties in with current and future BOEM-funded studies, and will use those previous studies to inform content of the guide. Improved information leads to more accurate identifications of deep sea coral, chemosynthetic, and sponge community presence and absence, which strengthens models (see, for example, Poti et al. 2022). It also can benefit partners like the Smithsonian (see Strong et al. 2018) by providing photos, descriptions, and DNA barcode information that can be used for a variety of purposes including updating their public-facing database.

Objectives: The overall purpose of this study is to:

1. Compile known information and data about sensitive deepwater benthic habitats and associated fauna in the U.S. OCS in a single, visually appealing, accessible comprehensive guide and associated informational database that can be utilized by BOEM SMEs and stakeholders.

2. Significantly improve the ability of BOEM benthic reviewers to make accurate species and habitat type identifications.

3. Develop a map of known habitat sites and areas with high likelihood of having these habitats.

4. Evaluate sensitivity to potential impacts caused by OCS activities to deepwater habitats and associated fauna.

5. Improve the accuracy and efficiency of environmental assessment and consultation processes associated with regulation of OCS activities.

Methods: A comprehensive guide to sensitive deepwater benthic habitats and their associated fauna will be created using existing data and information from a wide range of sources. Sources will include literature and other less comprehensive guides and databases, some of which NOAA Office of Exploration and Research, National Centers for Coastal Ocean Science, and Deep Sea Coral Research and Technology Program have already been working on for their own mission-driven purposes. BOEM

subject matter experts will also be consulted throughout development of the guide to provide expertise and BOEM-specific needs and recommendations. In order of relative BOEM mission priority, the sensitive habitats and fauna that will be the focus of the guide are: 1) deep-sea corals, 2) chemosynthetic communities, and 3) sponges, all of which provide valuable habitat both on micro and macro scales. The guide will include information available for the relevant habitats and fauna in water depths of approximately 200 m and deeper, wherever BOEM has jurisdiction.

The following will be included for each species, depending on availability of information:

- Pictures (i.e, photos and/or diagrams and including links to specimen collections, as available), including a wide variety of in situ images collected by submersibles and/or other cameras.

- Physical description, in enough detail to identify a specimen from imagery (e.g., approximate sizes, color, shape, and/or other distinguishing characteristics). DNA barcode (where available).

- Typical habitat description and geographic distribution.

- Analysis of the sensitivity of the species and/or habitats to likely OCS activities. Types of activities that might cause impacts will also be included.

In addition to species-specific information, general habitat characterizations will be provided for each habitat type and will be consistent with the Coastal and Marine Ecological Classification Standard (CMECS) where possible. These will include descriptions of typical geological and geophysical characteristics and community structures. Non-proprietary imagery, including from remote sensing, will also be included where available to provide an overall descriptive characteristic signature for each habitat type. A simple GIS application or digital map will also be created to help visualize species and habitat distributions. Additionally, there will be a section that will address data gaps and assess future needs. This section will be created in close coordination with BOEM's regional SMEs, and potentially with external stakeholder input where appropriate.

The guide will be designed as a "living document" that can be easily updated as new needs are identified or new information becomes available. It may be expanded in the future to include other benthic fauna in areas affected by OCS activities as the need for this information arises. Information in the guide can be used to evaluate variability in communities within and between regions, assess species vulnerability, evaluate potential connectivity and recruitment, and better identify keystone species. The guide will help users delineate important geographic areas. Further, it will help provide baseline environmental information and inform spatio-temporal assessments of habitat types and fauna.

Specific Research Question(s):

1. What/where are the various sources of existing information on sensitive deepwater benthic habitats, such as deep-sea coral, chemosynthetic, and sponge, in the OCS?

2. What are the characteristics that define "sensitive" fauna and benthic habitats in the OCS?

3. What are the relevant characteristics of fauna associated with sensitive benthic habitats that could be potentially impacted by OCS activities?

4. What is the relative level of sensitivity of the different deepwater benthic habitats and associated fauna?

Current Status: NOAA has been compiling and sorting relevant taxon imagery and developing descriptions for potentially important benthic fauna of concern (i.e., corals, sponges, chemosynthetic

community fauna) for BOEM resource management activities. Where possible, location information has also been captured for distribution mapping. This information has been collected for all BOEM regions and an extension of the project will include information for the territories as well.

Publications Completed: None

Affiliated WWW Sites: None

References:

Poti M, Goyert HF, Salgado EJ, Bassett R, Coyne M, Winship AJ, Etnoyer PJ, Hourigan TF, Coleman HM, Christensen J. 2022. Data synthesis and predictive modeling of deep-sea coral and hardbottom habitats offshore of the southeastern US: guiding efficient discovery and protection of sensitive benthic areas. New Orleans (LA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 224 p. Report No.: OCS Study BOEM 2022-038.

Strong E, Moser B, Meyer C, Ahlfeld K, Barnes V, Boyd M, Bush S, O'Mahoney M, Pecnik S. 2018. Sample strategy plan; Outer Continental Shelf (OCS) genomic sample strategy for the Bureau of Ocean Energy Management (BOEM) to archive OCS invertebrates. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 16 p. Report No.: OCS Study BOEM 2019-003.