

Environmental Studies Program: Studies Development Plan | FY 2022–2023

Title	National Guide to Deepwater Sensitive Habitats and Associated Fauna (NT-21-x11)
Administered by	Headquarters
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PICOC Summary	
<i><u>Problem</u></i>	The information necessary for BOEM SMEs to accurately identify and evaluate the sensitivity of important benthic habitats and fauna potentially impacted by OCS activities; this information is lacking and/or not easily accessible. Furthermore, 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.
<i><u>Intervention</u></i>	This study will create a national (multi-region) 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. Information collected will also be used to inform where data gaps exist.
<i><u>Comparison</u></i>	N/A. Information for this study is being compiled from existing sources.
<i><u>Outcome</u></i>	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.
<i><u>Context</u></i>	Sensitive benthic habitats and associated fauna, in water depths of approximately 200 m and deeper, 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): Potential conventional energy, renewable energy, and marine mineral development continue to move into deeper waters. Despite the growing national need to more effectively evaluate potential deepwater environmental impacts, there are currently relatively few BOEM subject matter experts (SMEs) with substantial direct knowledge of sensitive deepwater benthic habitats and associated fauna. This guide is intended to support all BOEM’s regions and will be used to inform and streamline a variety of relevant BOEM processes. It will enable SMEs to conduct 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 BOEM's national-scale "State of the Outer Continental Shelf" document that is currently being developed. The compiled knowledge will also inform other ongoing and future federal deepwater studies and partnerships, including tie-ins with the National Strategy for Ocean Mapping, Exploring, and Characterizing the United States Exclusive Economic Zone and usefulness for Deepwater Horizon restoration efforts including the mapping/modeling and habitat assessment teams. This guide will contain information that crosses programmatic boundaries and can also be used by a wide variety of external stakeholders. Overall, it will facilitate improvements to BOEM's national monitoring, assessment, compliance, and consultation functions.

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 (to physical disturbance and contaminants) 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 BOEM SME 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. Data and information from BOEM studies will 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, <https://marinecadastre.gov/espis/#/search/study/100144>). It also can benefit partners like the Smithsonian (see <https://marinecadastre.gov/espis/#/search/study/100073>) by providing photos, descriptions, and DNA barcode information that can be used for a variety of purposes including updating their public-facing database.

Objectives:

1. Compile available known information and data about sensitive deepwater benthic habitats and associated fauna in the U.S. OCS in a single, visually appealing, accessible guide and associated informational database that can be utilized by BOEM SMEs and stakeholders
2. 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. Provide information relevant to sensitivity to potential impacts, including physical disturbance and contaminants, 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: This national guide to sensitive deepwater benthic habitats and their associated fauna will be a “living document” that can be easily updated. Available existing data and information from a wide range of sources will be used, including 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. Subsequent to this study, future versions of the guide may be developed as new needs are identified or new information becomes available. BOEM subject matter experts will 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 and their order of priority for inclusion are: 1) deep-sea corals, 2) chemosynthetic communities, and 3) sponges, all of which provide valuable habitat both on micro and macro scales. Historical shipwrecks will also be included for their archaeological preservation significance and because they often serve as important habitat for sensitive species of interest (Meyer et al. 2017). 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. 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?

References:

BOEM Study 2014-2019. “Continued Archiving Of Outer Continental Shelf Invertebrates By The Smithsonian Institution National Museum Of Natural History”, <<https://marinecadastre.gov/espis/#/search/study/100073>>. Accessed March 5, 2020.

BOEM Study 2015-2020. “Data Synthesis And Advanced Predictive Modeling Of Deep Coral And Hardbottom Habitats In The Southeast Atlantic: Guiding Efficient Discovery And Protection Of Sensitive Benthic Areas”, <<https://marinecadastre.gov/espis/#/search/study/100144>>. Accessed March 5, 2020.

Meyer KS, Brooke SD, Sweetman AK, Wolf M, Young CM. 2017. Invertebrate communities on historical shipwrecks in the western Atlantic: relation to islands. Mar Ecol Prog Ser 566: 17–29.