

UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Ocean Energy Management
Office of Renewable Energy Programs

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Guidelines for Providing Benthic Habitat Survey Information for Renewable Energy
Development on the Atlantic Outer Continental Shelf
Pursuant to 30 CFR Part 585

I. Introduction to Guidelines

Before the U.S. Department of the Interior, Bureau of Ocean Energy Management (BOEM) will approve the siting of a facility, structure, or cable proposed for a renewable energy project on the Atlantic Outer Continental Shelf (OCS), an applicant must submit with its Site Assessment Plan (SAP), Construction and Operations Plan (COP), or General Activities Plan (GAP), as applicable, the results of its site characterization surveys, with supporting data, to BOEM.

BOEM requires the results of site characterization studies to evaluate the impact of proposed activities on physical, biological, and socioeconomic resources as well as the seafloor and sub-seafloor conditions which could be affected by the construction, installation, and operation of meteorological towers, buoys, cables, wind turbines, and supporting structures. The information will be used by BOEM, other Federal agencies, and potentially affected states in the preparation of National Environmental Policy Act (NEPA) documents, for consultations, and other regulatory requirements. Early communication with BOEM as well as adherence to these guidelines should ensure BOEM's information needs are met, and BOEM is confident that survey results obtained through procedures consistent with these guidelines will be sufficient for BOEM's decision-making process. BOEM recommends that this early communication include a preliminary benthic habitat survey plan (as part of an overall biological resources survey plan) and a pre-survey meeting. Please note, BOEM may require through lease and grant terms that lessees and grantees submit a SAP, COP, or GAP survey plan, and schedule a pre-survey meeting with BOEM to discuss the plan prior to conducting survey activities in the leased or granted area.

These guidelines for benthic habitat surveys provide recommendations for complying with information requirements of BOEM's renewable energy regulations at 30 CFR Part 585 Subpart F. Site characterization activities in this document refer only to benthic habitat surveys. BOEM provides recommendations for conducting and reporting the results of other baseline collection studies in separate guidelines (http://www.boem.gov/Renewable-Energy-Program/Regulatory-Information/Index.aspx#Notices_to_Lessees,_Operators_and_Applicants). These guidelines may be updated periodically, as new information or methodologies become available, and this version supersedes previous versions.

The overall purpose of the information required in 30 CFR Part 585 Subpart F is to characterize benthic habitat within the survey area which may be affected by the proposed operations. The benthic habitat survey plan should achieve the following:

- Identify and confirm dominant macrofaunal and macrofloral communities and substrate within the project site where development is proposed;
- Establish a pre-construction baseline that may be used to assess whether detectable changes occurred in post-construction benthic habitat associated with proposed operations;
- Collect additional information aimed at reducing uncertainty associated with baseline estimates and/or to inform the interpretation of survey results; and
- Develop an approach to quantify any substantial changes in the benthic community composition associated with proposed operations.

The benthic habitat survey plan should describe a program to collect sufficient information on the biology and seafloor morphology of the survey area allowing BOEM and other agencies with jurisdiction to make well-founded decisions in context with the regional biology and physical habitat. The applicant should employ the appropriate equipment and analytical techniques for all surveys. BOEM encourages the applicant to review “Developing Environmental Protocols and Modeling Tools to Support Renewable Energy and Stewardship” (McCann, 2012) to assist in determining the most appropriate protocols for the proposed project: (<http://www.data.boem.gov/PI/PDFImages/ESPIS/5/5208.pdf>).

II. Authority and Regulations

BOEM has statutory obligations under the Outer Continental Shelf Lands Act (43 USC §1337) as amended by the Energy Policy Act of 2005 to ensure any activities it authorizes protect the environment and conserve natural resources. BOEM also has statutory obligations under the National Environmental Policy Act (NEPA, 42 USC § 4321), the Endangered Species Act (ESA, 16 USC §§ 1531 - 1544), and the Magnuson-Stevens Fishery Conservation and Management Act (MSA, 16 USC §§ 1801-1884). Under BOEM’s regulations, a plan (SAP, COP, or GAP) must describe biological, social, and economic resources that could be affected by the activities proposed in the plan (see SAP – 30 CFR 585.610(b)(5), 585.611(a),(b)(3), (5) and (7); COP – 30 CFR 585.626(a)(3), 585.627(a)(3), (5), and (7); and GAP – 30 CFR 585.645(a)(5), 585.646(c), (e) and (g)).

For BOEM to evaluate impacts to biological, social, and economic resources, BOEM, and its Federal consulting partners (U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS)), under the aforementioned statutes will need sufficient baseline information on the area of the proposed activity. These guidelines are meant to clarify and provide a general understanding of the information which BOEM, in consultation with USFWS and NMFS, requires to adequately address biological, social, and economic impacts resulting from offshore renewable energy projects. BOEM will review the submitted SAP, COP, or GAP and additional information to determine if it contains the information necessary to conduct BOEM’s technical and environmental reviews. Upon completion of BOEM’s technical and environmental reviews, and other reviews required by Federal laws, BOEM may approve, disapprove, or approve with modifications the SAP, COP, or GAP.

According to 30 CFR 585.610(a)(8) (SAP) and 30 CFR 585.626(b)(15) (COP), applicants must submit with SAPs and COPs “proposed measures for avoiding, minimizing, reducing, eliminating, and monitoring environmental impacts.” Proposed measures include a description of the methods an applicant will use to avoid or minimize adverse environmental effects and any potential incidental take of protected species before the applicant conducts activities on a lease. The applicant must specify how any environmental impacts from the proposed activities will be mitigated, including a description of the measures the applicant will use to minimize impacts to protected species and critical habitat as designated under the ESA and to essential fish habitat (EFH) as designated under the MSA (see 30 CFR 585.610(a)(8), 585.626(b)(15), and 585.801 and 50 CFR 600.810). Applicants should consider these monitoring and mitigation requirements when developing a benthic habitat survey plan.

Elements of these guidelines may be required under the terms and conditions of a specific lease or grant. A lease or grant may also have requirements that are different from the regulatory requirements and recommendations discussed in these guidelines. Lessees or grantees should note that while these guidelines and conditions in their lease or grant may be similar, they must comply with the terms of their lease or grant.

III. Pre-Survey Coordination with BOEM

BOEM has found that development of a pre-survey strategy allows BOEM to discuss common goals and expectations with the applicant before the applicant mobilizes for a biological survey. BOEM firmly believes that maintaining an early and open dialogue with the applicant is critical to the timely, comprehensive execution of a biological survey. BOEM recommends that the applicant work closely with BOEM staff to arrive at a strategy that meets overall requirements and tailors the benthic habitat survey to site-specific needs of the area (e.g., determination of the location of sensitive benthic habitats within the leasehold and the identification of the ecological question to be answered by long-term monitoring). Engaging in discussions with other agencies (e.g., USFWS, NMFS, National Park Service [NPS]) and concerned parties will also help resolve any issues that may arise as early as possible. It is the applicant’s obligation to resolve any items and issues that may be in dispute. BOEM may determine that it is necessary for a developer to resurvey some or all of the lease area in the event survey results are insufficient.

A benthic habitat survey plan that meets all parties’ reasonable needs is thus an important first step toward a successful survey. In developing a benthic habitat survey plan, a review of previous investigations, such as other physical and biological survey efforts of the area, can be helpful in selecting equipment and in choosing the sampling and analytic approaches.

BOEM strongly recommends a pre-survey meeting. This meeting may include, but is not limited to the following discussions:

- survey logistics (proposed survey area, dates, times, survey period length, weather limitations, etc.);
- field techniques and equipment to be utilized/specifications of data acquisition systems;
- data to be acquired;
- data processing and analysis; and

- data and information to be submitted.

IV. Potential Adverse Effects

Potential adverse effects are generally defined as impacts from all phases of the proposed action that may reduce the quality and/or quantity of the benthic habitat, and the area of potential adverse effect is the geographic area or areas within which such activity may cause adverse changes in the character or use of any natural resources present. Areas of potential adverse effect may include staging areas that are used in the course of construction, installation, and operation of a wind energy facility. In practice, the applicant should identify the reasonably foreseeable effects associated with their proposed activity and ensure that the habitats that could be affected are included in their surveys. For example McCann (2012) identified the following major to moderate effects to benthic habitats resulting from offshore wind facility construction: scour and/or deposition of sediments; re-suspension of pollutants in sediments; increased turbidity and decreased water clarity due to sediment transport; chemical spills; disturbance from cable installation and cable sweep; changes to ocean currents or wave regimes; and changes in the characteristics of the benthic habitat in the footprint of the project.

V. Survey Results and Supporting Data

To ensure the accuracy and quality of survey results, the following data elements should be provided with the benthic habitat surveys. However, individual benthic survey plan elements should be discussed with BOEM on a case-by-case basis. Benthic habitat data should be classified according to the Coastal and Marine Ecological Classification Standard (CMECS) to the lowest taxonomic unit practicable.

- All data should be processed, validated and made available as needed. BOEM also encourages uploading survey data to National Oceanic and Atmospheric Administration (NOAA) National Oceanographic Data Center (NODC) for public availability and archival.
- Identify and confirm which benthic species (flora and fauna) inhabit the proposed project development site. NMFS-designated EFH for eggs, larvae, juveniles, adults, and spawning adults must be identified within the action area. The NMFS EFH mapper tool may be used for species identification and habitat characteristics at a particular location and to identify any NMFS-designated EFH Areas of Particular Concern: <http://www.habitat.noaa.gov/protection/efh/habitatmapper.html>
- Characterize and delineate the surficial sediment layers in the area. This includes a particle size analysis, and classification according to the CMECS. Details of this protocol are in Table 1.
- Characterize benthic community composition. Characterization includes documentation of abundance, diversity, percent cover, and community structure. Details of this protocol are in Table 2. Examples include the following characterizations:
 - a. characterization and delineation of any submerged aquatic vegetation (seagrass or macro-algae) that occurs within the area of potential adverse effect;
 - b. characterization and delineation of any hard bottom gradients of low to high relief such as coral (heads/reefs), rock or clay outcroppings, or other shelter-

- forming features;
 - c. identification of communities of sessile and slow-moving marine invertebrates (clams, quahogs, mussels, polychaete worms, anemones, sponges, echinoderms) that may be within the area of potential adverse effect; and
 - d. characterization of seasonal and inter-annual variability of the benthic community.
- Characterize the physical hydrodynamic properties of the surrounding water column (e.g., seasonal water-column salinities and temperatures, flow rates, turbidity, prevailing ocean circulation patterns).
 - Characterize both manmade and natural physical bottom disturbance typical for the action area. For example, identify if the area is heavily fished by bottom-tending mobile fishing gear, or if it is a natural high-energy environment regularly impacted by storms and hurricanes, etc.
 - Identify area(s) of similar physical and biological characteristics outside the action area which may be used as a baseline reference to monitor construction and operation effects of the proposed action to the benthic environment.

VI. Survey Methodology

Developers are encouraged to use existing data where applicable to their proposed activities and associated areas of potential adverse effect to characterize the natural resources present. BOEM will consult with supporting agencies to evaluate existing data and determine if any data gaps exist. Furthermore, applicants are encouraged to collaborate with other developers, research institutions, and state and Federal natural resource agencies to accomplish their site characterization objectives for SAPs, COPs, and GAPs.

Benthic habitat surveys may be conducted simultaneously with other survey requirements. Areas of high variable relief (ridges, troughs, escarpments, etc.) identified through high resolution geophysical surveys of the action area should be validated via protocols outlined in Table 2. Geotechnical borings and/or cone penetrometer testing activity in support of engineering studies may further inform surficial sediment and biological information. Project-specific ocean monitoring equipment at the site or publically available information from regional ocean observation systems may provide relevant temperature and salinity data. Publically available commercial fishing data can further characterize existing site disturbances as well as characterize biological habitat information.

BOEM recommends applicants submit survey specifications with a SAP, COP, or GAP survey plan. BOEM will coordinate with appropriate natural resource agencies to ensure data and analyses adequately meet regulatory requirements. However, BOEM is not responsible for designing the survey. The survey specifications should state the issues to be investigated, hypotheses, assumptions, data collection techniques, standards, analytical and statistical techniques, and quality control.

Tables 1 and 2 outline the protocols for the type of recommended benthic habitat surveys described in this document.

Table 1. Pre-Construction Site Characterization: Sediment Scour and/or Deposition Survey Protocol.

Focus	Establish baseline surficial sediment composition throughout the project area in order to evaluate sediment scour and/or deposition impacts, as well as potential for contaminant re-suspension and exposure post construction and during operations.
Methodology	Particle size analysis or sediment-profile imaging (SPI) and multibeam/interferometric bathymetry (with backscatter data)
Timing	Once, prior to submittal of SAP, GAP, or COP. Data should not be more than 10 years old.
Scope/Scale	Baseline survey should include entire area of potential adverse effect. Control sites for post-construction monitoring should be identified. Remote acoustic surveys should cover 100% of the area. Other sampling resolution is site-dependent but generally not more than 1 sample per 1-2 km along a proposed line of potential impact or 1 sample per 1 – 2 km ² within a proposed area of potential adverse effect.
Technical Requirements	Side scan sonar data should be of optimal quality resulting in the displays automatically corrected for slant range, lay-back and vessel speed. Mosaic the recorded data to provide a true plan view that provides 100 percent coverage of the area of potential adverse effect. Tow the sonar instrument above the seafloor at a distance that is 10 to 20 percent of the range of the instrument. Ensure line spacing and display range are appropriate for the water depth and data obtained are of such quality as to permit detection and evaluation of seafloor objects and features 0.5m – 1m in diameter within the survey area. Calibrate the instrument to enhance echo returns from small nearby objects and features without sacrificing the quality of echo returns from more distant objects and features. Completion of any necessary permit requirements (e.g. Marine Mammal Protection Act if harassment of marine mammals may occur from the activity).
Presentation of Results	Tabular and geospatial datasets. Spatial data should be submitted according to the Spatial Data Submission Guidelines found on BOEM’s Offshore Renewable Energy Program website at: http://www.boem.gov/Renewable- Energy-Program/Regulatory-Information/Index.aspx . When relying on pre-existing data, provide justification for how those data are appropriate for the project’s area of effect.

Table 2. Pre-Construction Site Characterization: Benthic Community Composition Survey Protocol.

Focus	<p>Characterization and delineation of the abundance, diversity, percent cover, and multivariate community composition of the seafloor in the area of potential adverse effect.</p> <p>Control sites for post-construction monitoring should be established.</p>
Methodology	<p>Physical sampling</p> <ul style="list-style-type: none"> • Hamon grab (hard bottom), • Van Veen grab (soft sediment), and/or • Benthic sled <p>Benthic imagery (i.e., underwater video or still imagery (soft and hard bottom) and/or sediment profile imaging (SPI)).</p>
Timing	<p>Once each season for two years, prior to submittal of SAP, GAP, or COP.</p> <p>Data should not be more than 10 years old.</p>
Scope/Scale	<p>Baseline survey should include an appropriate sample size from the entire area of potential adverse effect, generally not less than 1 sample per 1-2 km along a proposed line of potential adverse effect or 1 sample per 1 – 2 km² within a proposed area of potential adverse effect. Sampling should address seasonal and inter-annual variability of anticipated benthic communities. Control sites for post-construction monitoring should be identified.</p>
Technical Requirements	<p>Special attention should be given to the presence of sensitive benthic habitats. These include areas where information suggests the presence of exposed hard bottoms of high, moderate, or low relief; hard bottoms covered by thin, ephemeral sand layers; seagrass patches; or kelp and other algal beds, as well as the presence of anthozoan species.</p>
Presentation of Results	<p>Tabular and geospatial datasets.</p> <p>Spatial should be submitted according to the Spatial Data Submission Guidelines found on BOEM’s Offshore Renewable Energy Program website.</p> <p>When relying on pre-existing data, provide justification for how those data are appropriate for the project’s area of potential adverse effect.</p>

Guidance Document Statement

BOEM issues guidance documents to clarify, supplement, and provide more detail about certain regulatory requirements, and to recommend methods addressing those requirements. An applicant may use an alternate approach for compliance. However, early and frequent coordination with BOEM will be even more critical in that case to ensure the work conducted will meet BOEM's regulatory requirements.

Paperwork Reduction Act Statement

The information collection provisions of this document are intended to provide clarification, description, or interpretation of requirements contained in 30 CFR 585 Subpart F. The Office of Management and Budget (OMB) has approved the information collection requirements for these regulations and assigned OMB Control Number 1010-0176.

Contact Information

For further information or inquiries regarding these guidelines please contact the Office of Renewable Energy Programs at (703) 787-1340 or renewable_reporting@boem.gov.

References

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