

1. STATEMENT OF WORK

A. Purpose

This Statement of Work (SOW) describes the tasks that are to be performed in support of the Department of the Interior, Bureau of Ocean Energy Management (BOEM) Environmental Studies Program (ESP) on the project entitled, "NY Bight Fish, Fisheries, and Sand Features." BOEM has identified the need to better understand demersal and benthic organisms' use of habitats and sand features in the Mid-Atlantic for BOEM's Marine Minerals Program (MMP) to inform and evaluate the use of potential sand borrow areas in federal waters.

B. Background

The Bureau of Ocean Energy Management (BOEM) is charged with the environmentally responsible management of Outer Continental Shelf (OCS) resources (e.g., oil and gas, sand and gravel, renewable energy). Federal jurisdiction starts at 3 nautical miles (nm) offshore of most states, with the exception of Texas and the Gulf coast of Florida, where it starts at 9 nm. Public Law 103-426 (43 U.S.C. 1337(k)(2)), enacted 31 October 1994, gave the Minerals Management Service (MMS), now BOEM, the authority to negotiate, on a noncompetitive basis, the rights to OCS sand, gravel, and shell resources for shore protection, beach or wetlands restoration projects, or for use in construction projects funded in whole or part by, or authorized by, the federal government. These authorizations are assessed and issued through BOEM's MMP.

As the demand for OCS sand increases, the BOEM MMP is facing increasingly complex issues, such as resource allocation, cumulative impacts from repeated use, space/use conflicts, protection of archaeological sites, and Essential Fish Habitat (EFH) issues, among others. It is critical that BOEM uses the best available science in their environmental assessments of lease requests, so that all necessary and effective precautions are taken to reduce potential impacts during sand dredging and conveyance to the placement site.

BOEM anticipates that sand resources in federal waters of the New York Bight (NY Bight; waters off of New Jersey and New York) may be needed to address the Army Corps of Engineer's projected sand deficiency for completing vital federally-authorized shore protection projects in the next 5 years. Since dredging on the NYB OCS has been infrequent relative to other regions, research on biological activity, biophysical coupling, and geomorphology will strengthen NEPA analyses that consider the potential effects of dredging.

Limited information exists on the ecological function and biological significance of sand waves, ridges, swales, shoals, and other OCS features in the New Jersey and New York Bight (NYB), especially as it relates to dredge-related disruptions. Dredging activities under BOEM's jurisdiction generally occur in depths of 50 m or less, from 3 to 9 nautical miles (nm) from shore (**Figure 1**).

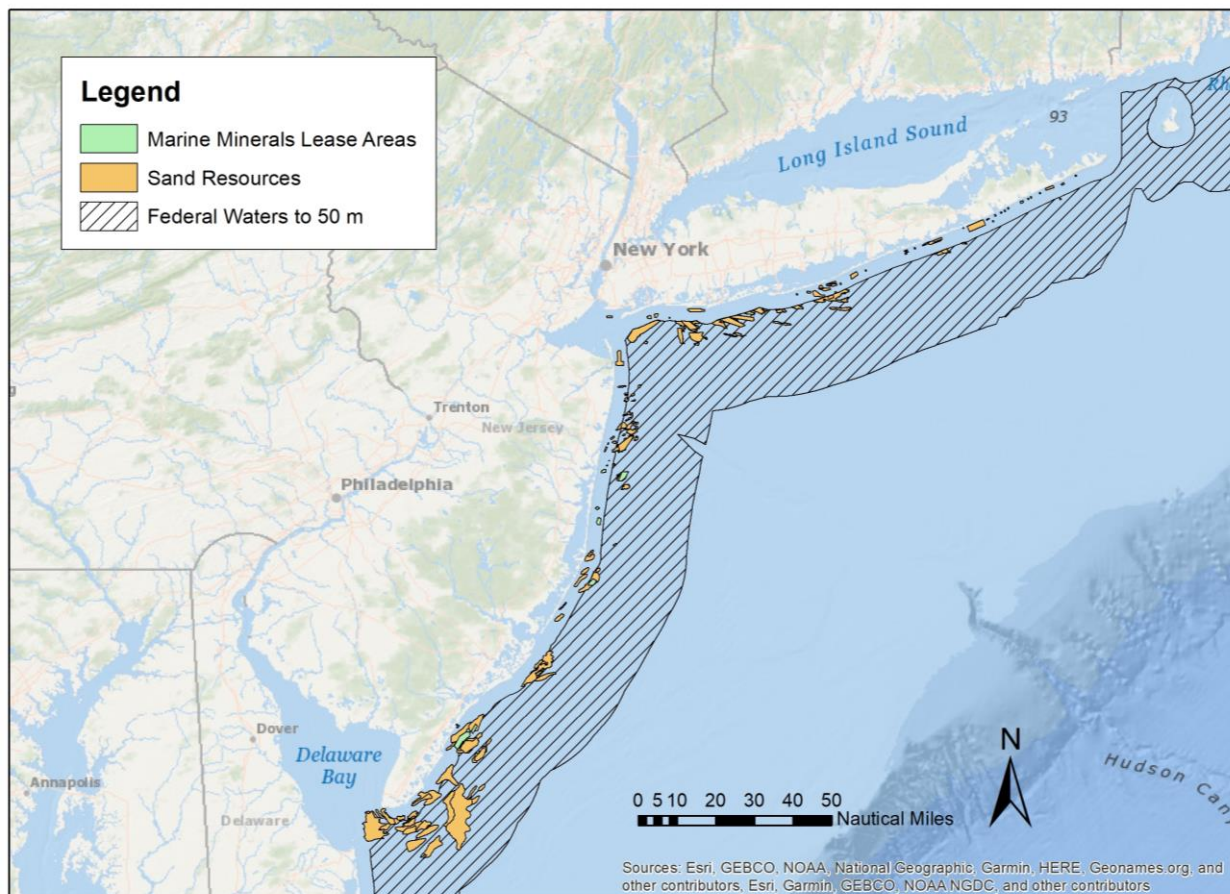


Figure 1. BOEM Marine Minerals Study Area in the New York Bight (NYB)

The NYB is inhabited by a diverse community of fishes and invertebrates, with both resident and transient species. Many of these species are economically important to commercial, recreational, and charter fishing industries. Additionally, strong seasonal fluctuations in abiotic factors are often linked to changes in biological diversity. Therefore the potential effects and recovery of sand dredging on ecosystem health and the abundance of fish and invertebrate communities may vary spatially and temporally. This research also aligns with state and regional research priorities that aim to identify and assess offshore sand resources, and improve sediment resource management strategies.

C. Goals and Objectives

Goals include identifying and obtaining baseline data on the seafloor morphology, seabed and substrate sedimentary texture, and the diversity and abundance of demersal and benthic organisms which rely on sand habitats, specifically around potential sand resources off the NYB, from state waters to 50 m offshore. The results of this effort should also highlight data gaps and inform methodology for future studies.

Specific objectives include:

- Improve understanding of NY Bight ecology
- Compile existing datasets into accessible format
- Identify gaps, as well as recommended methods for filling gaps

Description of Work

This study will identify relevant information and compile available baseline data on the seafloor morphology, seabed and substrate sedimentary texture, and the diversity and abundance of demersal and benthic organisms which rely on sand habitats, specifically around potential sand resources off the NYB, up to 50 m offshore (generally 3-9 nm). Region-specific studies and dataset should be reviewed for relevance and availability, particularly with respect to the potential borrow areas that NY and NJ have identified pursuant to their efforts to characterize sand resources in the NY Bight. The study should review all studies and data collection efforts focused on biological activity and succession in these areas. Datasets of interest include geophysical surveys (e.g., multibeam or sidescan backscatter) and geological sampling that monitor seafloor morphology and characterize benthic substrate; biological data from grab samples, clam dredges, and trawl surveys; vibracore data of substrate; water column profiles that measured current flow and direction and water chemistry (e.g., temperature, salinity, pH, dissolved oxygen, turbidity, chlorophyll); direct observations from video cameras or remotely operated vehicles; acoustic surveys; and tagging.

Once this data is identified (and compiled, when available), the review will provide summaries of ecologically relevant metrics (e.g., community composition, diversity, seasonality). It will also note knowledge gaps and needs to inform potential follow-on field efforts.

Task 1: Project management

The recipient shall hold a kickoff meeting with BOEM at the BOEM Sterling office or via webinar within thirty (30) days of award. Personnel present at this meeting shall include the Project Manager and Study Principal Investigators (PIs). An agenda for the meeting and draft PMP shall be provided to the Contracting Officer's Representative (COR) at least ten (10) days before the meeting, or 20 days after award, to allow for review. An agile development project management approach is needed for this study, and the draft Project Management Plan (PMP) detailing this approach shall be presented at the kickoff meeting and shall be reviewed and, if any, remaining technical or managerial issues shall be resolved. Within two (2) weeks following the meeting, the recipient shall prepare and distribute to the parties listed in Section 7 a summary detailing the discussions and any mutually agreed to decisions along with the final PMP. Any agreed-to changes that might affect the agreement are subject to approval in writing by the BOEM Contracting Officer (CO) via an IA modification. BOEM and the recipient shall conduct weekly to bi-monthly calls, as needed to support the agile development approach; and the recipient shall submit quarterly status reports summarizing work conducted via e-mail to the BOEM contacts listed in Section 7. These shall be letter reports in BOEM's format and shall include a summary of work completed, overall project status, and any issues.

Task 2: Complete a literature synthesis of fish habitat, distribution, and associations with sand features in the NY Bight

The recipient shall identify regional studies, along with those funded by BOEM, on fish habitat and use in the NY Bight in potential project areas (up to 50 m depths). Since BOEM's jurisdiction begins at the state/federal boundary (i.e., 3 nm), this review should focus on resources in federal waters but also consider how resources use State waters. If BOEM-funded studies are directly relevant, BOEM will provide to the recipient additional information as possible. After completing searches, the recipient will compile and summarize research in a report. As needed, the recipient should seek additional input from other state or local agencies, and academic institutions. Gaps in the literature shall be identified in this literature analysis. The literature synthesis shall include research needs and recommended methods to further ongoing research or fill in gaps.

BOEM expects the recipient to review studies focused on invertebrates, especially ecologically and economically significant shellfish, both demersal and pelagic fish species, and the presence of basal autotrophs. Of interest are data on species abundance, size composition, and distribution across the spatial continuum from the air-sea interface to the sea-sediment interface, in order to understand mesoscale and microscale habitat use, species assemblages, biodiversity, and habitat associations. Data collected through time should be identified, so that seasonal changes might be observed. Finally, gaps in knowledge and recommendations for study prioritization should be included. Sources of information include NOAA – Sandy Hook, NOAA New England Fisheries Science Center (NEFSC) (e.g., trawl surveys), NJ Department of Environmental Protection (DEP), NY Department of Environmental Conservation (DEC), Monmouth University, Rutgers University, and SUNY – Stony Brook University, and the Atlantic Cooperative Telemetry (ACT) Network among others; source types include technical reports from government agencies or scientific research groups, working papers from research groups or committees, white papers, preprints, and published peer reviewed literature.

Task 3: Compile and analyze fish and habitat data in the NY Bight

With the input from the COR and BOEM SMEs, relevant and desirable variables will be identified. In the course of searching for literature (Task 2), as well as during independent searches, the recipient shall catalog, organize, and compile datasets of these relevant variables when feasible. The recipient shall then analyze ecologically meaningful metrics, such as community composition, lifestage distribution, evenness, diversity, and seasonality, as data allows. These metrics will be determined by the recipient, with input from the COR and BOEM SMEs, and based on the availability of data.

Data management will be performed to include procedures to handle data collection/acquisition, data storage and backup, dataset selection (external sources), model results (if applicable), Quality Assurance/Quality Control (QA/QC) procedures, dissemination and distribution protocols, and archival procedures. Metadata development will also include description of each applicable data type, definitions, acceptable data formats, file naming convention, processing steps to be documented, dataset storage locations, specific tools and technology utilized, and metadata generated in accordance with applicable ISO and FGDC standards, and with BOEM input. All deliverables will be compatible with Microsoft and

ArcGIS formats. Data shall be submitted to the BOEM COR and the Environmental Studies Program, after all QA/QC procedures have been completed.

The analysis and summary of data, along with the general catalog, will be provided to BOEM as an appendix to the literature review within nine (9) months of award. This report shall also include the methods and techniques used to search, acquire, and manage all data, including any datasets that were identified as useful but unavailable to access. BOEM will review within 30 days, or within 10 months of award. In addition the recipient shall provide a copy of all source data used in the analysis and an inventory as a final deliverable of this study, with additional metadata needed to inventory the data used in the analysis, and metadata on scientific parameters in the data needed to interpret and use them.

No originals shall be mailed without prior backups. Reports and products will remain secure within the recipient and BOEM, with any public release or access approved by BOEM. If distributed, the recipient shall include language to the data recipient that ensures that the data are not distributed further, and that no publication is done without opportunity for PIs to be co-authors and/or giving acknowledgement to BOEM. The preferred format of files shall be determined based on an agreement between the COR and the recipient at the kickoff meeting; any changes in data formats during the contract period of performance must be agreed upon in advance by BOEM and the recipient.

The recipient shall ensure that all data are processed, validated, and made available as needed to study participants and other ongoing BOEM studies. The data must be retrievable, as necessary or desirable, for future analysis.

The recipient shall provide a method for the safe storage and easy retrieval of all results, acquired data, photographs, and video. The recipient shall take precautions to ensure that no unintentional loss of information should occur at any stage of the study, which may require the recipient to redo work. The recipient will provide BOEM a complete data inventory and all necessary documentation as part of the final data deliverable of this study. The recipient shall retain a copy of the information collection logs and information delivered to the BOEM for a period of one year from the award completion date. The recipient shall be responsible for the submission of the data to BOEM according to the schedule in Section 7.

All materials shall be considered proprietary until BOEM releases the report to the public.

Task 4: Gap Analysis and Recommendations for Research

The recipient shall analyze existing data and identify gaps in knowledge that, if filled, would improve BOEM's analysis of dredging impacts. This may include impacts on the physical setting, biological features, or human environment. Gaps may relate to something like a region, species group, or temporal scale. The scope of this gap analysis may be further defined once data compilation is underway. Therefore, BOEM will provide additional feedback during scheduled calls (either weekly or bi-monthly). The recipient will provide a written summary of data gaps for BOEM's review. Additionally, the recipient will provide written recommendations for methods to fill data gaps, based on historical/current methods used and standard industry practice. The gap analysis and recommendations will be integrated into the final report.

Citations

Placeholder

6. DELIVERABLES

A. Deliverable - Quarterly Reports

Quarterly reports will be provided at the end of each Fiscal quarter beginning in FY–2020, as noted in the Schedule of Deliverables, to include work completed (both as tasks and percentage), budget spent, and any areas of concern. The 4th quarter report will summarize information from work and preliminary analysis of the respective year.

B. Deliverable - Project Management Plan

Based on this SOW, a draft Project Management Plan (PMP) will be prepared for review ten (10) days before the kickoff meeting, or within 20 days. A final PMP, with any edits incorporated, will be available within 2 weeks after the kickoff meeting.

C. Deliverable – Literature Review

A draft of this literature synthesis should be provided for BOEM review and approval within six (6) months of award in an editable format (i.e., Microsoft Word document). The report is a cumulative document that is primarily composed of the literature synthesis (task 2) and also details all methodologies, techniques, interpretations, analyses, data, and characterization employed or generated in fulfillment of the SOW, and gap analysis and research recommendations (task 4), along with any recommended methodologies. Methods and analyses used in the data compilation (Task 3) will not be included in this report, but rather, will be included in the data appendix. The recipient shall follow the guidelines provided by the BOEM Environmental Studies Program (ESP), available at: <http://www.boem.gov/Environmental-Studies-Program-Report-Specifications/>.

BOEM will review the draft report and provide any necessary written comments or suggested edits within 30 days of receipt of the document, or within 7 months of award. The review will evaluate all documents for completeness, content, general structure, and compliance to the terms of the task order. If necessary, BOEM may require that authors participate in a teleconference to discuss any remaining questions or concerns prior to the submission of the final report. The final report, with comments addressed, will be due within 12 months of award.

D. Deliverable – Data Methods and Summary

Relevant data will be cataloged, organized, and compiled. Based on available data, the recipient will analyze and summarize data into relevant metrics. A draft of the data review will be provided for BOEM review and approval within eight (8) months of award. The finalized review will be incorporated as an appendix to the final literature review. A technical summary will accompany final deliverables.

E. Deliverable – Data Compilation

Copies of data with an accompanying inventory of datasets will be provided on USB hard drive to the COR. This will be available for QA/QC by BOEM within eight (8) months of award, with the final compilation provided along with final deliverables (deliverable F below).

F. Final Deliverables

ESPIS data will be submitted to the COR as a final deliverable of the study to include the:

- 1) Final Report and Technical Summary: the copies of the narratives of study results in both the MS Word and Adobe Acrobat (PDF/A) formats, without any password protections for open access by BOEM staff and the public, following the ESP Report Specifications.
- 2) Study Footprint: the geographic information that enables the referencing of the study using a GIS, following the study footprint specifications;
- 3) Study Footprint Metadata: the scientific attribution information required to enhance discoverability of the study in the ESPIS system and third party sites (such as data.gov), following the study footprint metadata specifications;
- 4) Study Map: the study area map embedded in the i. Final Report, and ii. Technical Summary that depicts the study footprint and that is cited in the study footprint metadata;
- 5) All scientific data used in the study copied to USB hard drive and mailed to the BOEM COR.
- 6) A data inventory to include FGDC compliant metadata for each scientific dataset: the scientific, technical, and administrative information for each coherent unit of scientific data, including the physical medium, file information, volume, and access URL, when applicable;
- 7) All literature (i.e., formatted citations and PDFs) shall be compiled in an EndNote X8 library, formatted according to BOEM ESP specifications.
- 8) Copy of related publications: the manuscripts of scholarly publications and conference presentations for research funded by this [contract/ agreement] for free and unlimited use by BOEM staff, which may take the form of a full-text, final, pre-publication copy of the related publication in cases that the publisher enforces pay for access or copyright restrictions.
- 9) Bibliographic information for related publications: the information on each related publication needed for formatting CSE bibliographies using the name-date system, including the URL and Digital Object Identifier to access the publication on the publisher's website, when applicable.

Please refer to the BOEM website for more guidance on the ESPIS

requirements: <https://www.boem.gov/ESP-Data-and-Information-Specifications/>

G. Deliverable – Presentation of Results

In collaboration with the BOEM principal investigator, the recipient may present the results of this study at an appropriate scientific conference before the end of the agreement, if applicable. An abstract and content would be developed together with the BOEM COR.

External communications: All external communications will be coordinated with each agencies staff.

Scientific Integrity: Scientific integrity is vital to Department of the Interior (DOI) activities under which scientific research, data, summaries, syntheses, interpretations, presentations, and/or publications are developed and used. Failure to uphold the highest degree of scientific integrity will result not only in potentially flawed scientific results, interpretations, and applications but will damage DOI's reputation and ability to uphold the public's trust. All work performed must comply with the DOI Scientific Integrity Policy posted to <http://www.doi.gov>, or its equivalent as provided by their organization.

7. DELIVERABLES SCHEDULE AND DISTRIBUTION

Deliverable products shall be submitted to the e-mail addresses shown below in accordance with the following schedule. In the event that NCCOS encounters or anticipates difficulty in meeting the delivery schedule, the COR will be notified in writing of the reasons for the delay and the projected revised delivery dates. Any other related effects of project delay will also be summarized.

Deliverable	Distribution	Due Date
A. Quarterly Progress Reports	One electronic copy to: COR CO Chief, DES DES Contact	At the end of each fiscal quarter.
B. Project Management Plan	One electronic copy to: COR	Draft within 20 days Final within 44 days
C. Literature Review	One electronic copy to: COR, DES Contact	Within 6 months
D. Data Methods and Summary	One electronic copy via hard drive mailed to: COR	Within 8 months

E. Data Compilation	One electronic copy via hard drive mailed to: COR	Within 8 months
F. Final Report (literature review, data methods and summary, data compilation appendix, data gaps and recommendations, and technical summary)	CO Transmittal letter only electronic copies emailed to: COR Chief, DES DES Contact	Within 12 months
G. Presentation of Results	Presentation at Scientific Meeting (coordination with COR; paper sent electronically to COR, CO, Chief, DES, DES Contact)	Before end of agreement