

I. 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, "Fish Fry: Frying Pan Shoals Ecosystem Dynamics". BOEM has identified the need to better understand how fish utilize Frying Pan Shoals (FPS) off Bald Head Island, North Carolina for BOEM's Marine Minerals Program (MMP) to inform and evaluate the potential use of FPS as a sand borrow area in federal waters.

B. Background

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, except for 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.

As the demand for OCS sand increases, the MMP is facing increasingly complex use conflict challenges. A better understanding of the use of habitats and sand features by fish is important for MMP in order to evaluate the utilization and management of sand borrow areas in federal waters. Most federal waters serve as Essential Fish Habitat (EFH), which are waters important to fish for growing and reproducing. National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) designates and manages EFH for all federally managed species, meaning fishes that have commercial or recreational interest. In addition, FPS is currently designated by the South Atlantic Fishery Management Council (SAFMC) and NMFS as Habitat Area of Particular Concern (HAPC) for many fish species. Before dredging occurs, BOEM consults with NMFS on potential impacts to EFH and HAPC.

NMFS has expressed concern that long-term and repeated dredging operations at FPS could significantly impact the habitat that supports several important commercial and recreational fisheries. To evaluate existing data, solicit perspectives from relevant stakeholders, and assess the science needs relevant to this concern, the MMP implemented the following study as a first phase of this current effort: "[Workshop and Research Planning to Improve Understanding of the Habitat Value and Function of Frying Pan Shoals, NC on the Atlantic Outer Continental Shelf \(MM-19-x06\)](#)." This

initial study summarized the current physical and biological characteristics of FPS, the potential dredging implications/concerns, and the priority data gaps and research questions that may serve as a long-term science strategy to support future decision making. The literature review and workshop results reinforce prior assumptions regarding the demand for future sand at FPS, limited baseline data set to inform future impact analyses, and need for developing a science strategy to fill data gaps. This SOW outlines the second part of this effort, implementing the field study to assess some of the data gaps and research questions developed in the initial study.

[OCSLA Section 1345](#) authorizes the use of cooperative agreements with affected States to meet the requirements of OCSLA, including sharing of information, joint utilization of available expertise, formation of joint monitoring arrangements to carry out applicable Federal and State laws, regulations, and stipulations relevant to outer continental shelf operations both onshore and offshore. The BOEM is authorized via the OCS Lands Act (OCSLA) to award cooperative agreements to qualified State agencies and State controlled institutions of higher education only. The BOEM MMP is offering a cooperative agreement from qualified organizations in the Piedmont-South Atlantic Coast CESU network only.

C. Study Details

The coastal communities of the Cape Fear Region of North Carolina have experienced rapid population growth, increased economic growth via tourism, and increased land values. Investments in beach nourishment projects in the Cape Fear Region from 2000 to 2019 have exceeded \$137 million and brought > 20 million cubic yards of sand to beaches, including the beaches of Bald Head Island, Caswell Beach, Oak Island, Holden Beach, and Kure Beach (PSDS 2020). These projects are typically constructed utilizing beach-compatible sand resources from various navigation-related dredging projects. This sand has been beneficially placed along the coast in order to reduce risk of damage to infrastructure, restore eroded beaches, and provide improved recreation benefits. Erosion continues to be problematic, and the demand for long-term, beach-compatible sand resources to support future nourishment needs is increasing. The current demand for sand exceeds the available volume and frequency of navigation dredging events. Therefore, additional offshore sand resources would be needed to meet the demand for sand.

The research prioritization and data collection approach for this currently proposed study shall leverage the stakeholder feedback provided in [MM-19-x06](#) along with lessons learned from the BOEM Canaveral Shoals, FL studies evaluating ecological function and recovery of shoal habitat in the South Atlantic Bight ([Ecological Function and Recovery of Biological Communities within Dredged Ridge-Swale Habitats in the South-Atlantic Bight](#); [Natural Habitat Associations and the Effects of Dredging on Fish at the Canaveral Shoals, East-Central Florida](#); [Glider-Based Fish Tracking Along Sand Shoals Off Cape Canaveral, Florida](#)), and a similar study in the Gulf of Mexico ([Ecological Function and Recovery of Biological Communities within Sand Shoal](#)). In addition, the research methodology shall be flexible enough to adjust to stakeholder feedback.

The ecosystem services (bioenergetics, trophic transfer) of these shoal complexes and the relevance of the habitat to benthic communities, fishes, and trophic structure have been studied extensively in the sub-tropical climate along Canaveral Shoals, Florida (see aforementioned studies). However, despite the relative abundance of such habitat along the inner shelf of the Mid- and South-Atlantic Bight, little is known about the baseline use of these shoals by federally managed fishes. To identify appropriate conservation and mitigation measures, a comprehensive understanding of the quality and function of the habitat and how it may contribute to different ecosystem services over storm, post-disturbance, and seasonal and inter-annual time scales is needed.

D. Goals, Objectives, and Methods

Goals include obtaining field data on how fishes associate with FPS, temporally, spatially, and seasonally. The Study Area extends from the offshore extent of state jurisdiction (3 nm from shore) to up to 10 nm, offshore Bald Head Island, NC, though field work will be focused in water typical of federal borrow areas, <30 m deep (Figure 1). However, data analysis and/or collection in state waters will be accepted if the data is linked to the offshore resource. BOEM will work with the awardee to develop the study area as potential borrow areas are refined. There is the potential for dredging to occur during the four years of this project.

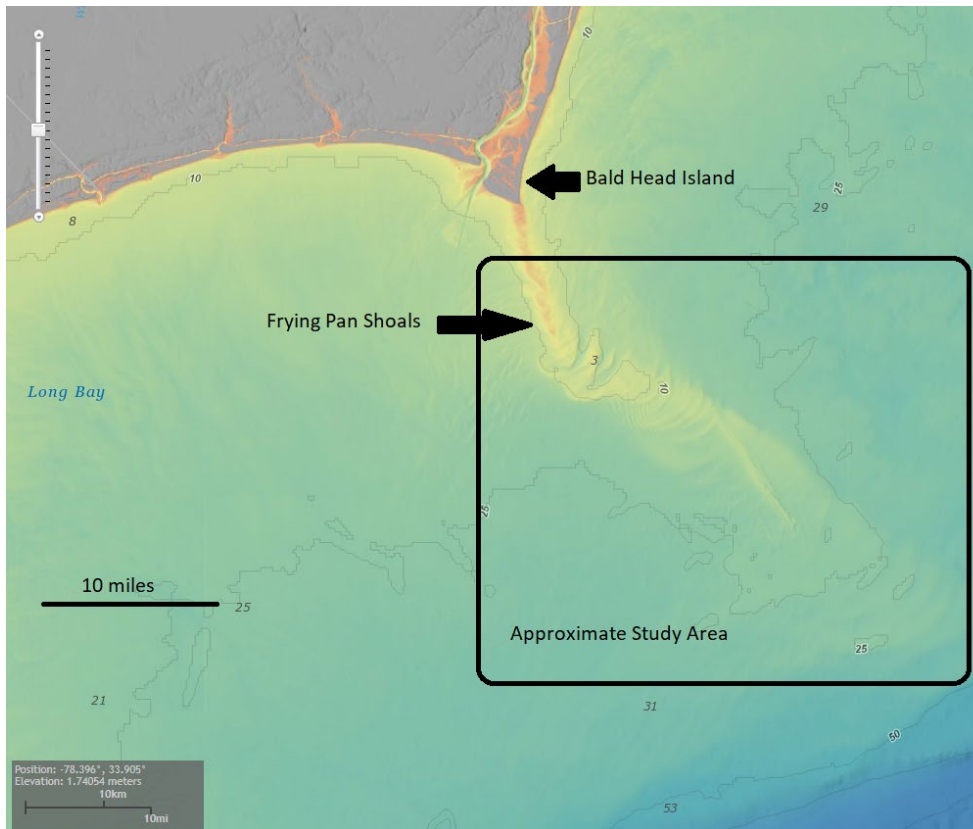


Figure 1. Location of FPS and study area

Specific objectives include studying fish ecology, especially ecologically and economically important species, including protected species (if relevant) and spatial associations of fish and prey species with FPS. Data should be collected on species abundance, size composition, life stage, and distribution across the spatial continuum from the air-sea interface to the sea-sediment interface, to understand processes driving meso- and micro-scale patterns in species assemblages, biodiversity, and habitat associations (see potential methodologies below). Optional objectives include studying the ecology of economically important invertebrate species such as blue crab and shrimp and examining impacts if dredging occurs during study timeline (and funding becomes available).

The overarching hypotheses are that:

- (1) How fish utilize distinct parts of shoal features differs by species and life stage;
- (2) Areas with sand features and relief have habitat value for fishes as determined by species' abundance, distribution, diversity, and assemblages;
- (3) Patterns of fish distribution differ according to season, year, and scale;
- (4) The confluence of the Cape Fear River with the physical attributes of FPS results in a unique environment that can be characterized by measuring the study areas physical parameters (turbidity, tidal regime, hydrodynamics).

Potential methodologies:

- Leverage legacy data or other relevant data from research programs that may contribute to the study objective and foster effective partnerships. This includes relevant physical, hydrodynamic, chemical, biological, or other relevant legacy data to describe and understand the use of FPS habitat (bathymetry, sediment type, water quality parameters, etc.).
- Implement additional bathymetric and physical data collection as needed to better understand the coupling of the physical and biological environment. Possibly to include wave/current data, bathymetry, and sediment classification (among others). This analysis should recognize the importance of understanding the unique features and dynamics of cape associated shoal features that may drive productivity and form habitat.
- Develop and define the key federally managed and ecologically important fish species to be studied in cooperation with BOEM. Proposal of key species may be submitted with study proposal. Species of particular interest include: king mackerel, Spanish mackerel, pinfish, grouper, blacknose shark, sandbar shark, tiger shark, red snapper, and black seabass – among others.

- Develop an appropriate study design and sampling strategy for baseline characterization of the federally managed fish usage of FPS. Factor in spatial gradients and temporal and seasonal differences.
- Identify and implement appropriate field, laboratory, and analytical methods. Possible field methods include:
 - Benthic grabs – epifauna/infauna composition, sediment grain size
 - Turbidity – water quality, natural fluctuations/background conditions, influence of riverine system to ecosystem
 - Acoustic telemetry, glider-based fish tracking (potentially utilizing the BOEM ASV Melvin), or other tagging methods – fine-scale fish distribution and seasonal occurrence of various species
 - Fish surveys possibly to include hook and line, pot traps, trawls, longlines, side scan sonar, and/or eDNA. Consider [SEAMAP trawling methodologies](#).
 - Fisher interviews – engage local shrimpers and fishermen about species use of the area
 - Food web dynamics – understand the connection between benthic resources and fish that may be transiting the area via isotope testing and diet studies.
- Determine the baseline seasonal variability of benthic community species composition and distribution relative to the geomorphological features of FPS, and how the variability relates to the interannual variability of the Cape Fear River plume.
- To examine the habitat and spatial distribution of key species, including pelagic fish and sharks and determine the relative importance of shoal habitat to these species. Relevant attributes to characterize may include density, distribution, movements, foraging/spawning behavior, etc. Consider the use of the shoal in larval transport and methodologies need to better understand transport and distribution. Must include key federally managed fish species.
- An optional task (Task 7) is offered to the recipient to include economically important invertebrates (such as shrimp and blue crab). This is optional due to differences in collection methods. These data may also be used to investigate how scale affects results and interpretation.
- An optional task (Task 8) is offered to monitor the recovery of the shoal if a dredging event does occur.
- Characterize the linkages between benthic and higher trophic levels and the role each linkage contributes to overall ecosystem productivity.

- Species distribution models and/or network analysis may be used to identify statistical correlations among taxa, as well as correlations of taxa with environmental variables.
- Develop appropriate methodologies for post-dredging monitoring of the FPS ecology. Including a standardized template for post-construction monitoring that is succinct and may rely on clear tables and graphs to relay the relevant data to BOEM and stakeholders.
- The final report must be user friendly and succinct in nature for use by MMP and our stakeholders. In addition, the report must include a discussion on the importance of the study outcome to the MMP and the implications of the baseline knowledge to future use of FPS.

E. Detailed Description of Tasks

Task 1: Project and data management

This study shall have a dedicated Project Manager (PM) to organize and maintain all aspects of the research, and act as the primary communicator with BOEM COR. The PM should consider using a shared online software for all study participants to access (e.g., Microsoft Teams, Monday.com). The PM must have proven skills in facilitation, schedule management, report writing and editing, and project planning. The PM may be a designated role for someone who is not a part of the research team. The PM is responsible for a cohesive final report which has one voice and clearly explains how the project goals and objectives were met.

The recipient shall hold a kickoff meeting with BOEM 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. At the kickoff meeting, the draft Project Management Plan (PMP) 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 H 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 a modification. BOEM and the recipient shall conduct bi-monthly or monthly calls, with the frequency determined by the PM and BOEM COR. The recipient shall submit quarterly status reports summarizing work conducted via e-mail to the BOEM contacts listed in Section H. These shall be letter reports in BOEM's format and shall include a summary of work completed, overall project status, any issues, and itemized expenditures that match invoices.

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 prior to completion of this study, 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 review the analysis and be potential co-authors if they add value to those derived research efforts. 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 provide a method for the safe storage and easy retrieval of all results, acquired data, photographs, and video. The recipient shall ensure that no loss of information occurs in any processing step taking place prior to archiving. The Project Manager shall inventory the data and verify the presence of all necessary documentation prior to archiving. 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 H.

Task 2: Complete a Field Survey Plan

The recipient shall develop a Field Survey Plan outlining the approach and methods of field work for monitoring biological associations with FPS (Task 3). Details of methodology will be informed by results of the [Workshop and Research Planning to Improve Understanding of the Habitat Value and Function of Frying Pan Shoals, NC on the Atlantic Outer Continental Shelf \(MM-19-x06\)](#) as well as additional aforementioned study results. BOEM will provide all relevant data and literature as needed. In addition, any legacy data (from both state and federal surveys) will be obtained and reviewed prior to development of the Field Survey Plan in order to inform where the gaps are that need to be examined through the plan. In addition, the plan should include the key federally managed fish species to be studied which have been determined in cooperation with BOEM. Proposal of key species may be submitted with study proposal. Species of particular interest include: king mackerel, Spanish mackerel, pinfish, grouper, blacknose shark, sandbar shark, tiger shark, red snapper, and black seabass – among others.

The Field Survey Plan shall also describe relevant personnel and contact information, schedule, equipment, and safety measures. The intent is that this Plan would be a helpful resource to all field personnel. The recipient shall submit a draft Field Survey Plan to BOEM within five (5) months, which BOEM will review within two (2) weeks, with the recipient finalizing in two (2) more weeks.

Task 3: Execute FPS Field Work

Field work should aim to identify factors that influence distribution of economically or ecologically important fish species on all facets of FPS (including both the northeastern side and the southwestern side of the shoal). While field efforts will focus on biological associations with sand resources, they must also consider other environmental factors that may drive distribution. Factors include biological, chemical, and physical drivers, like

prey distribution, temperature and salinity, and geomorphology. Existing datasets should be leveraged when possible. Data should be collected and analyzed such that it can be modeled with any known or measured abiotic factors to identify any correlations among taxa, as well as correlations among taxa occurrence and environmental factors (Task 4). Further, data should be collected that will allow for an analysis of species abundance, size composition, and distribution through time and at various scales for comparison (Task 4).

The recipient shall arrange for BOEM scientists to assist in field efforts when possible. During field surveys, the recipient will capture high-resolution photos (i.e., at least 300 dpi) and high-definition videos (i.e., at least 1080p) of the field work for BOEM marketing and outreach materials.

Field surveys should be complete within two years, six months of project award (i.e., two years after the Field Survey Plan is complete). Updates on field progress will be provided on regularly scheduled phone calls and quarterly progress reports; no additional deliverables are required for this task.

Task 4: Data Analysis

The recipient will analyze the results of the field survey, and leverage existing/historical data as applicable, to identify how factors influence species distribution around FPS sand resources. Recipient should include analysis aimed at understanding the mesoscale and microscale habitat use, species assemblages, biodiversity, and habitat associations of fishes on FPS.

The recipient shall analyze ecologically meaningful metrics, such as community composition, life stage occurrence, reproduction, water column distribution, trophic interactions, 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.

Biological data shall be coupled with physical data for a more comprehensive description of habitat. This characterization should follow the Coastal and Marine Ecological Classification Standard (CMECS), refining any existing habitat classifications for the region (e.g., Battista et al., 2019, Pickens et al., 2020).

Species distribution models and/or network analysis may be used to identify statistical correlations among taxa, as well as correlations of taxa with environmental variables. If used, these should be compared to existing species distribution models (e.g., Friedland et al., 2021 and Breece et al., 2018), investigating model differences and implications of scale (e.g., size, spacing, and concentration of habitat features) and its effects on the distribution of important species or communities (e.g., Mashintonio et al., 2014).

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al., 2021 and Breece et al., 2018), investigating model differences and implications of scale (e.g., size, spacing, and concentration of habitat features) and its effects on the distribution of important species or communities.

As feasible, ecological metrics, model outputs, and/or fisheries data should be presented such that decision-makers may quantify or visualize trade-offs (e.g., simultaneously assess impacts to multiple resources from dredging in different seasons or areas).

Task 5: Draft and Final Report

The final report will include the field methods, data analyses, modeling, summary of results, and conclusions. Additionally, it shall summarize potential impacts and vulnerabilities of FPS species and fisheries from dredging, considering seasonality, spatial extent, and frequency of events. If data analysis enabled a trade-off comparison (Task 4), the utility and limitations of this should be explained. If other factors may interact with dredging effects (e.g., changes in prey distribution or cable-laying activities), these shall also be described in terms of activity and potential impact.

This Report shall also integrate inventive ways to present data to make it more effective and accessible. Graphics, tables, and photos should illustrate research findings. The draft Final Report will be delivered to BOEM within two years, nine months of project award. BOEM will provide comments within 30 days. The recipient will make edits and return a final report 30 days after that. All compiled literature, both formatted citations and PDFs, will be provided in an EndNote X20 library.

The final deliverables will be published by BOEM in the ESP Information System available at: <http://www.boem.gov/ESPIS/> and <http://marinecadastre.gov/espis/#/>. All materials shall be considered proprietary until BOEM releases the report to the public. The recipient shall deliver one electronic copy of each deliverable (i.e., report and field data), containing both editable and non-editable formats (i.e., Microsoft Word documents and PDFs).

Task 6: Presentation of Results

The recipient will present the results of this study at three or more professional conferences. The results shall also be shared to relevant stakeholders, for example through peer-reviewed publications, webinars, and workshops. An abstract and any content will be developed in concert with the BOEM project manager.

Optional Task 7: Target Economically Important Invertebrates

The recipient may choose to include economically important invertebrates (e.g., blue crab and shrimp) in field surveys. Since these species often require different collection methods than many fishes, BOEM is not requiring they be targeted as part of this study but recognizes that information on distribution would be valuable to decision-makers.

Optional Task 8: Survey Biological Response to Dredging

If dredging occurs during the survey period, the recipient and BOEM may change the Field Survey Plan to accommodate different timing or increased surveys to capture changes to physical or biological communities. These changes would be proposed and approved by both the recipient and BOEM. Any funding changes would be coordinated by BOEM.

F. References

Battista, T. W. Sautter, M. Poti, E. Ebert, L. Kracker, J. Kraus, A. Mabrouk, B. Williams, D.S. Dorfman, R. Husted, and C.J. Jenkins. 2019. Comprehensive Seafloor Substrate Mapping and Model Validation in the New York Bight. OCS Study BOEM 2019-069 and NOAA Technical Memorandum NOS NCCOS 255. 187 pp. doi:10.25923/0hw8-gz28

Breece, M.W., Fox, D.A., and M.J. Oliver. 2018. Environmental drivers of adult Atlantic Sturgeon movement and residency in the Delaware Bay. *Mar Coast Fish*, 10: 269-280. <https://doi.org/10.1002/mcf2.10025>

Friedland, KD, Bachman, M, Davies, A, et al. Machine learning highlights the importance of primary and secondary production in determining habitat for marine fish and macroinvertebrates. *Aquatic Conserv: Mar Freshw Ecosyst*. 2021; 1– 17. <https://doi.org/10.1002/aqc.3527>

Mashintonio AF, Pimm SL, Harris GM, Van Aarde RJ, Russell GJ. Data-driven discovery of the spatial scales of habitat choice by elephants. *PeerJ*. 2014 Aug 19;2:e504.

Pickens B.A., Finkbeiner M., and J.C. Taylor. 2020. Volume 2: Shoal identification and a new classification system for sand resources. In: Pickens, BA, Taylor JC, editors. Regional Essential Fish Habitat geospatial assessment and framework for offshore sand features. Sterling (VA): US Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2020-002 and NCCOS Technical Memorandum 270, <https://doi.org/10.25923/akzd-8556> 47 pp.

Pickens BA (Kearns & West and CSS-Inc). 2021. Assessment of Frying Pan Shoals as a potential sand source in the Cape Fear Region of North Carolina. Sterling (VA): US Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2021-028. 81 p.

PSDS. 2020. Program for the Study of Developed Shorelines, Beach Renourishment Database, Western Carolina University. <http://beachnourishment.wcu.edu/>.

G. Deliverables

A. Quarterly Reports

Quarterly reports will be provided at the end of each Fiscal quarter beginning in FY–2021, 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. Project Management Plan (Task 1)

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 meeting.

C. Animal Telemetry Network Data Deliverable (Task 1) (if telemetry data is collected)

BOEM ESP requires the best scientific quality animal telemetry data from its research efforts to be curated and made publicly accessible through the Animal Telemetry Network (ATN). The ATN is the authoritative data service for animal telemetry data of the Integrated Ocean Observing System of the United States subsystem for Data Management and Communications (US-IOOS-DMAC), which is implemented in partnership with the Global Ocean Observing System's Ocean Tracking Network International Data Management Committee (GOOS-OTN-IDMC). This requirement addresses BOEM ESP's obligations to provide public access to scientific research results, enhance the integrity of BOEM's scientific findings, maximize the benefits of its research contributions to the broader scientific community, and support a shared data infrastructure for biological oceanographic observing that is part of BOEM's cumulative effects assessment and long-term monitoring goals. This requirement also satisfies BOEM ESP's continued commitment to archive its best scientific quality observational data at the NOAA National Centers for Environmental Information.

PIs will adequately format and document data to specifications of the US-IOOS-DMAC and/or GOOS-OTN-IDMC, and submit the data by visiting the DAC portal at <http://atn.ioos.us/>. If standards are not available, extramural researchers will have the option to format their data according to the developing DAC standards and conventions. PIs can opt for additional services provided by any node of the ATN in lieu of DAC data submission, but the node must have a publication service that the DAC has approved for harvest. Invoices for any additional expenses for comparable services by any other organization or institution that is not recognized on the DAC website as an approved node will be scrutinized before being approved by the BOEM COR.

1) Animal Telemetry Metadata

BOEM requires telemetry metadata to be submitted to the ATN, documenting the scientific, technical, and administrative information for each coherent unit of scientific data, including the physical medium, file information, volume, and access URL, if applicable. For example, the Platform transmitter terminal (PTT) numbers assigned to individual satellite tags are required as part of a metadata submission for satellite tag data.

Metadata must be submitted to the DAC or through an approved node. Proof of submission including details on when data were submitted and their status (whether they are in good standing) in the ATN systems, must be available to BOEM via the DAC before invoices and payments will be approved for this deliverable, as indicated by the milestones and deliverables table below. BOEM may also withhold payments subject to review of the metadata in order to ensure planned availability of the scientific dataset (see deliverable on Availability of the Scientific Dataset below), and to verify any measures that have been taken or are planned for archiving datasets at NCEI, including links to archived data and associated discovery metadata, if available.

2) Availability of the Scientific Dataset

All animal telemetry data will be made publicly accessible through data submission to the DAC or approved node of the Animal Telemetry Network. The PI will initiate data submission on a schedule detailed in the agreement. Periodic submission of tag data may be required prior to the release of incremental funding of multi-year projects. Complete data submission is required prior to the completion of the study, as final invoicing/ payment for this deliverable may be withheld until the DAC or the approved node has signed off on the dataset's completeness. The PI is entitled to require that access to the data that is uploaded to ATN DAC be initially restricted (i.e. password protected) to only individuals who are approved by that contractor/grantee at their sole discretion. These data are referred to as 'restricted data', and can remain restricted for a period of 18 months after the completion of the study unless otherwise agreed upon by the PI and the Contracting Officer's Representative (COR). Even though restricted access prohibits the public from downloading the data, restricted access data are still open data and therefore cannot be kept from disclosure in all cases.

Summaries of track and detection data for satellite, archival and acoustic tags will be displayed on the DAC web portal to enable public discovery and anticipate the public availability of publicly funded open data.

D. BOEM Data Deliverable (Task 1)

All data collected or used during the conduct of this study, including data collected during this study as well as data sourced from partners and collaborators shall be made available to BOEM for the purposes of the Marine Minerals Program assessment activities, and for broader allied information needs in the region, including renewable energy OCS development interests. To the extent allowable and as required under federal law, these data shall be transferred to BOEM under open license so that BOEM can disseminate these data that it requires under this award and make these data available to the public, and hold them in the public domain.

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) 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;
- 6) 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.
- 7) 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/>

E. Field Survey Plan (Task 2)

A draft of the Field Survey Plan will be provided for BOEM review and approval within six (6) months of award. BOEM will provide comments within two (2) weeks. The recipient will finalize within two (2) additional weeks.

F. Data Analyses and Models (Task 4)

Relevant data will be cataloged, organized, and compiled. Based on available data, the recipient will analyze and summarize data into relevant metrics. Final data analytical outputs and model results will be submitted with the Report, 3 years, and 9 months from

project kick-off. BOEM will provide comments within thirty (30) days. The recipient will then finalize within thirty (30) days, within four years from project start.

Unless specifically approved by BOEM, only non-proprietary, open-source software shall be used and all code developed as part of this contract, which will be publicly available in repositories such as GitHub. Raw data from the field work will be provided, as needed. Spatial results will also be provided as GIS layers within two years, nine months.

G. Final Report (Task 5)

The recipient will submit the Draft Report within 3 years and 9 months from project kick-off.

BOEM will provide comments within thirty (30) days. The recipient will then finalize within thirty (30) days. An EndNote library will be submitted with the final report. The final report supporting data will be submitted as specified above under the models and data deliverable, and otherwise if not specified above on DVD or hard drive media and mailed to the BOEM Sterling HQ office for sharing with other program areas and the public, as appropriate and required under federal law. A technical summary will accompany final deliverables.

The high-resolution photos (i.e., at least 300 dpi) and high-definition videos (i.e., at least 1080p) captured during the field work must accompany the final deliverables (at the latest) and the photos must include a description of what is included in the photo and who the photo should be credited to.

H. Presentation of Results (Task 6)

In collaboration with the BOEM COR, the recipient must present the results of this study at an appropriate scientific conference before the end of the agreement.

External communications: All external communications will be coordinated with each agency's 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.

H. 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 the awardee 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/CO	Draft within 20 days Final within 44 days
C. ATN Data Deliverable	Period data submission directly to the ATN *CO	Within 90 days of data collection
D. BOEM Data Deliverable	DVD or Hard Drive medium mailed to BOEM Sterling, VA office to the care of the ESP Representative *CO	Within 3 years, 9 months
E. Field Survey Plan	One electronic copy to: COR *CO	Within 6 months
F. Data analyses and Models	One electronic copy to: COR	Within 3 years, 9 months
G. Final Report for BOEM review	One electronic copy to: COR CO Chief, DES DES Contact	Within 3 years, 9 months
H. Presentation of Results	Presentation at Scientific Meeting (coordination with COR; paper sent electronically to COR, Chief, DES, DES Contact) * CO	Before end of agreement
*Transmittal Letter Only		

<u>Contracting Officer (CO)</u> Dominique Bruce-Morton Bureau of Safety and Environmental Enforcement 45600 Woodland Road Sterling, Virginia 20166 E-mail: dominique.bruce-morton@bsee.gov	<u>Contracting Officer's Representative (COR)</u>
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<u>ESP Representative</u>	<u>Chief, DES</u>
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II. Award Information:

The total amount of funding available in Fiscal Year 2022 is not to exceed \$2 Million over four years. Work performance under the cooperative agreement award will start from time of award. All awards are premised on receipt of an acceptable proposal. The award will be a cooperative agreement (with the exception of any tasks performed by Federal partners). This award involves substantial involvement by BOEM scientists in various aspects of study development and/or study conduct. The substantial involvement includes the engagement of BOEM subject matter experts in developing the study design and/or any alterations to the proposed study design. This also includes BOEM participation in field work, data collection, data processing and the writing of any peer-reviewed papers stemming from this study.

- This is not an open solicitation for proposals. This Program Announcement describes specific objectives for projects within one cooperative agreement. This agreement will be awarded to a qualified recipient within the Piedmont-South Atlantic Coast CESU network only. This award is premised on receipt of an acceptable proposal.
- This announcement is specifically to announce intent to undertake the following project: *Fish Fry: Frying Pan Shoals Ecosystem Dynamics*.
- No other proposals are requested at this time, although additional opportunities may be announced in the future.
- The award will be a cooperative agreement (with the exception of tasks performed by Federal partners (awarded separately as Inter-agency Agreements) – see Eligibility Information below) with qualified partners in the Piedmont-South Atlantic Coast Cooperative Ecological Study Units (<http://www.cesu.psu.edu>). BOEM encourages the applicant to involve various other institutions, private companies or State and federal agencies who may have expertise in the field of study. This agreement involves substantial involvement by BOEM scientists in various aspects of study development and/or study conduct.

Multi-Year Proposals:

At this time funding is available for up to four years from the date of award, but proposals shall clearly define the work to be accomplished each year. BOEM reserves the option to fund only the first year of a two-year proposal. Funding for the second year is contingent upon the satisfactory progress demonstrated by the recipient. Progress will be determined through technical review of quarterly and annual progress reports and other work identified by the BOEM project officer.