

STATEMENT OF WORK

Characterization of water column habitats to understand potential impacts from deepwater energy and mineral development (PC-24-03)

PURPOSE

Environmental analyses on offshore renewable energy and deep ocean mineral development require accurate modeling and effective monitoring. These efforts rely on adequate baseline information to inform the models and against which to measure change. Even today, there are relatively broad existing knowledge gaps of water column habitats that include foundational themes such as what lives in the water column and where, how the water column is structured, natural variability, anthropogenic influences, and likely unknown unknowns (Netburn 2018, Interagency Working Group on Ocean Exploration and Characterization 2022). Unless we begin working now to address some of these fundamental mid-water information gaps, we will likely be unable to address broader issues such as potential impacts to ecological dynamics and oceanographic processes related to offshore energy and mineral development.

The purpose of this proposed study is to collect baseline information about the biological, chemical, and physical mid-water environment through a combination of sampling and imaging approaches to better assess and predict pelagic community structure. At-sea data collection opportunities are associated with known and anticipated research cruises led by NOAA, USGS, and potentially other research organizations. Geographic priorities are areas that could likely be impacted by future offshore energy and mineral development on the Pacific Outer Continental Shelf (OCS) and the Exclusive Economic Zone associated with the U.S. Pacific Island Territories.

The outcome of this study will be to establish a fundamental understanding of midwater pelagic community structure to better predict and assess potential changes related to future offshore wind and critical mineral planning and development on the OCS in the California Current Ecosystem and in the Central and Western Pacific Ocean.

BACKGROUND

Although the pelagic ocean is the largest ecosystem on earth, it remains poorly characterized and understood due to its vast size and three-dimensional, highly dynamic nature (e.g., Perelman et al. 2021). Most oceanographic programs concentrate upon the surface ocean because plankton and larval fish are concentrated there. Very little of the water column below the epipelagic (0–200 m) has been described in any detail (Netburn 2018). However, we know that important processes occur throughout that water column, such as the biological pump (Passow and Carlson 2012), diel vertical migration (Sutton 2013, Kelly et al. 2019), other mechanisms for connectivity (Sutton 2013), and food web dynamics (Choy et al. 2017). As industries move to deeper waters of the OCS, it is imperative to learn more about potential impacts to these habitats, specifically sites of commercial interest.

Water column information can be collected by traditional oceanographic equipment, especially when supplemented by new techniques and technology. In addition to physical and chemical profiles of the water column, Conductivity-Temperature-Depth (CTD) rosette casts can collect water samples to evaluate the biological community through eDNA sampling. Cameras can also be integrated onto CTD rosettes to help image these pelagic environments for which the deeper habitats are rarely visualized. This study is intended to fund the integration of a complementary water column component into planned marine mineral and offshore wind-related research cruises in locations of potential commercial interest.

There are two cost-effective near-term opportunities for at-sea data collection to support the proposed study objectives in the fall of 2024. One is a planned August 26 – September 16 NOAA-led benthic habitats AUV survey on NOAA Ship *Bell M. Shimada* out of Newport, Oregon that is focused on areas of interest for offshore wind in northern California and southern Oregon. The second is a September 10 – October 07 USGS-led multibeam and box core cruise on the R/V *Kilo Moana* out of Honolulu, Hawai'i that will assess the abundance and composition of abyssal manganese nodules at the southern extreme of the OCS south of Hawai'i. There appear to be several substantive outyear opportunities in 2025 and beyond to add a mid-water component to anticipated NOAA cruises in areas of interest for both offshore wind and critical minerals. BOEM will work with the award recipient to secure sample collection opportunities on select outyear opportunities.

The scope of water column operations on each cruise will be designed in consultation with cruise Chief Scientists to address the highest priority mid-water environmental information needs while taking into account any pre-existing science plans and available planning horizon. For example, optical sensors (e.g., high-definition cameras, shadowgraphs) could be deployed when primary science operations are done for the day, or a smaller system could be integrated onto a CTD rosette to simultaneously collect imagery without needing dedicated wire-time.

Data from the at-sea efforts will contribute significantly to baseline knowledge of pelagic systems that are highly dynamic and difficult to study. With industries moving into deeper waters further offshore, these water column data are necessary to understand environmental conditions and associated natural variation. For example, baseline environmental data can improve our understanding of environmental risks and potential impacts of floating offshore wind, such as changes in organism behavior and displacement (Maxwell et al. 2022). Additionally, current seabed mining technologies are expected to produce sediment plumes with unknown environmental impacts (Gollner et al. 2017, Gillard et al. 2019). Baseline data for these water column habitats are thus critical for identifying the resources that may be impacted and assessing what those impacts are likely to be.

REFERENCES

Choy CA, Haddock SHD, Robison BH. 2017. Deep pelagic food web structure as revealed by in situ feeding observations. *Proceedings of the Royal Society B*. 284: 20172116.
<http://doi.org/10.1098/rspb.2017.2116>

- Gillard B, Purkiani K, Chatzievangelou D, Vink A, Iversen MH, Thomsen L. 2019. Physical and hydrodynamic properties of deep sea mining-generated, abyssal sediment plumes in the Clarion Clipperton Fracture Zone (eastern-central Pacific). *Elementa: Science of the Anthropocene*. 7:5. <https://doi.org/10.1525/elementa.343>
- Gollner S, Kaiser S, Menzel L, Jones DOB, Brown A, Mestre NC, van Oevelen D, Menot L, Colaco A, Canals et al. 2017. Resilience of benthic deep-sea fauna to mining activities. *Marine Environmental Research*. 129: 76-101. <https://doi.org/10.1016/j.marenvres.2017.04.010>
- Interagency Working Group on Ocean Exploration and Characterization. 2022. Strategic priorities for ocean exploration and characterization of the United States Exclusive Economic Zone. https://www.whitehouse.gov/wp-content/uploads/2022/10/NOMECE_OEC_Priorities_Report.pdf
- Kelly TB, Davison PC, Goericke R, Landry MR, Ohman MD, Stukel MR. 2019. The importance of mesoplankton diel vertical migration for sustaining a mesopelagic food web. *Frontiers in Marine Science*. 13. <https://doi.org/10.3389/fmars.2019.00508>
- Netburn, AN. (Editor). 2018. From surface to seafloor: exploration of the water column (workshop report), Honolulu, HI, 4-5 March 2017. NOAA Office of Ocean Exploration and Research. Silver Spring, MD. NOAA Technical Memorandum OAR OER; 003. 34 pp. DOI: <https://doi.org/10.25923/rmjx-vn79>
- Passow U, Carlson CA. 2012. The biological pump in a high CO₂ world. *Marine Ecology Progress Series*. 470:249–271. doi: 10.3354/meps09985
- Perelman JN, Firing E, van der Grient JMA, Jones BA, Drazen JC. 2021. Mesopelagic scattering layer behaviors across the Clarion-Clipperton Zone: implications for deep-sea mining. *Frontiers in Marine Science*. 10. <https://doi.org/10.3389/fmars.2021.632764>
- Sutton TT. 2013. Vertical ecology of the pelagic ocean: classical patterns and new perspectives. *Journal of Fish Biology*. 83:1508-1527. doi:10.1111/jfb.12263

OBJECTIVES

The proposed study will address the following objectives.

- Develop species inventories throughout the water column in areas of potential commercial interest for floating offshore wind and critical minerals, particularly abyssal manganese nodules
- Assess other recent/ongoing scientific programs that can provide relevant data and meaningfully support the study objectives [e.g., California Current Ecosystem (CCE) Long-Term Ecological Research (LTER)]

- Explain the regional distribution of organisms relative to the physical and chemical oceanographic conditions
- Provide recommendations for a cost-effective and high-value sampling and sensor package or module(s) that can be easily integrated as a mid-water add-on to future research cruises.

Some of the key questions to be addressed are:

- What is the pelagic community structure in current and potential regions of interest for offshore wind development and abyssal nodules in the Pacific OCS?
- What are the physical and chemical drivers in each region, and how do they relate to the pelagic community structure?
- What is a relatively simple and cost-effective standard midwater science component ‘add-on’ that could provide high value to future deepwater Pacific research efforts?

DESCRIPTION OF WORK

Methods: The proposed study would leverage existing science cruises and deploy a combination of traditional sampling techniques (e.g., towed nets, CTD rosette casts) as well as *in situ* imaging (e.g., shadowgraph, HD imagery). Samples collected with nets will be used for morphological identification and genetic sequencing. Water samples may be used for eDNA sampling and chemical analyses. Physical oceanographic data will be collected by a combination of shipboard systems and sensors deployed over-the-side.

TASKS

Task 1: Conduct a post-award project kick-off meeting.

- a. Schedule a post-award online project kick-off meeting that includes the Contracting Officer (CO), Project Officer (PO), BOEM Environmental Studies Program Representative (ESPR), principal investigator (PI), and other key personnel involved in the study.
- b. Discuss with BOEM experts the project scope, timeline, and draft study plan.

Deliverable 1: Provide a draft study plan to BOEM experts for discussion and approval.

Deliverable 2: Provide a summary of the post-award project kick-off meeting to BOEM.

Task 2: Develop a final study plan that focuses on scientific operations, analyses, and staffing for the fall 2024 NOAA Ship *Bell M. Shimada* (offshore wind) and R/V *Kilo Moana* (abyssal nodules) cruises. To the degree possible, the same operations and analyses will be repeated on future cruises and consistent among cruises of the same resource type (e.g., offshore wind, minerals). While a similar suite of operations are planned for offshore wind-related and abyssal nodule-related cruises, some differences between the operations and analyses associated with each resource type is expected due to logistical constraints.

- a. Work with BOEM experts and coordinate with Chief Scientists, members of the science party, technicians, and ship operators who are planning and executing the scientific cruises to develop cruise-specific plans for at-sea operations.
- b. Identify appropriate taxonomic experts (both domestic and international) with complementary expertise to expand identifications.
- c. Work with experts to build voucher and genetic libraries of midwater species, e.g., gelatinous organisms that are difficult to sample by nets, to help with post-cruise taxonomic identification.
- d. Work with BOEM experts to develop a data processing plan for data analyses.
- e. Work with BOEM experts to develop a plan for data and result dissemination, presentation, and publication.

Deliverable 3: Final study plan presented to BOEM experts for discussion and approval.

Task 3: Collect at-sea data.

- a. Work with BOEM experts, scientists, technicians, and ship operators to coordinate and conduct sampling and in situ imaging.
- b. Work with BOEM experts on initial QA/QC of collected raw data.

Deliverable 4: Data collected at-sea and associated metadata that is compliant with BOEM requirements for each dataset (see below).

Task 4: Analyze physical samples, imagery, and physical and chemical oceanographic parameters.

- a. Develop midwater species inventories using imagery, morphological analyses, and genetic analyses.
- b. Characterize vertical distribution of the pelagic community.
- c. Characterize the physical and chemical environment using environmental sensors

Deliverable 5: An output of results to be shared with BOEM experts and be made publicly available.

Task 5: Interpret results. The analysis and interpretation of the results would emphasize the following area(s):

- a. Results and interpretation of physical oceanographic conditions in relation to the pelagic community structure.
- b. Compare and contrast the pelagic community structure of the study regions (e.g., California Current Ecosystem, Central Pacific).

Deliverable 5: A summary of analysis and interpretation of the results on regional oceanographic processes and marine species detection through the study period.

Task 6: Work with BOEM experts on future directions on studies of pelagic community structure to inform prospective offshore wind and critical mineral development.

- a. Work with BOEM experts on recommendations for developing a standard cost-effect and high-value sampling and sensor package/module that could be easily integrated as an additional component on future scientific cruises. Recommendations should consider what is needed to monitor for potential environmental impacts of floating offshore wind and abyssal nodule development.

Deliverable 6: A summary report (or report chapter, see below) of recommendations for future research using a combination of traditional sampling and emerging technologies to better understand pelagic community structure and assess the potential impacts on pelagic community structure of prospective energy and mineral development.

Task 7: Submit reports, presentation(s), and publication(s).

- a. Work with BOEM experts on quarterly reports that summarize progress of this study.
- b. Work with BOEM experts on the draft and final synthesis reports and technical summaries that detail all the tasks and results listed above.
- c. Work with BOEM experts on presentation(s) at scientific conferences on the study.
- d. Work with BOEM experts on at least one peer-reviewed publication on the results from this study.

Deliverable 7: Quarterly reports, draft synthesis report and technical summary, final synthesis report and technical summary, presentation(s), and peer-reviewed publication(s).

ESPIS Data Deliverables Requirements

- 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, following the ESP Report Specifications.
- Study Footprint: The geographic information that enables the referencing of the study using a GIS, following the study footprint specifications.
- 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.

- Study Map: The study area map embedded in the Final Report and Technical Summary that depicts the study footprint and that is cited in the study footprint metadata.
- Federal Geographic Data Committee (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.
- Include boilerplate language in every ESP contract/agreement.
 - 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.”
 - Bibliographic information for related publications: “The information on each related publication needed for formatting CSE [Council of Science Editors] bibliographies using the name-date system

Data Management Plan

- All data (including shipboard data, raw datasets, associated metadata, and genetic barcodes) from this study will be delivered to BOEM and shared at a specific public repository (e.g., National Center for Environmental Information).
-

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 or State law.

AWARD INFORMATION

Total project allocation for this study is \$820,000 from FY24 to FY26. This includes a total of approximately \$520,000 for offshore wind related sampling and analysis and approximately \$300,000 for abyssal nodule-related sampling and analysis. A preliminary breakout of funding amount is listed below but can be amended as needed per BOEM approval. Matching contributions from the applicant are strongly recommended. BOEM anticipates that there would be a single award as part of this project. While individuals representing non-U.S.-based organizations cannot submit proposals, they can collaborate on projects with eligible U.S.-based organizations as sub-awardees.

FY24: \$474,000

FY25: \$173,000

FY26: \$173,000

DELIVERABLES

MEETINGS, REPORTS, AND OTHER DELIVERABLES

The Awardee is responsible for editing and proofreading all material in order to prepare products as error free as possible prior to their delivery to the BOEM. All reports shall be written as non--proprietary, releasable by BOEM to the public either through posting on the BOEM webpage or by other means unless stipulated elsewhere in the agreement.

Post-Award Meeting Agenda and Draft Study Plan

The Recipient will hold a *Post-Award Meeting* (PAM) via a video or hybrid in-person/video conference call approximately two (2) weeks, but no longer than one (1) month after Award begins on a date and time that is mutually agreeable to BOEM and the Recipient. The purpose of the PAM is to discuss roles, responsibilities, working relationships, major milestones, and task order deliverables. The Recipient will provide a *Meeting Agenda* and a *Draft Study Plan* one (1) week prior to the *PAM* to allow for review by all key team members involved. The *Draft Study Plan* shall specify details concerning schedule, work assignments, project methodology (details on data collection and analyses), project management, and communications so that transparency, monitoring, and substantial government involvement by BOEM is enhanced. The Study Plan may be updated periodically during the period-of-performance.

Post-Award Meeting Summary and Final Study Plan

The Recipient will prepare and distribute a *Meeting Summary* including a *Final Study Plan* which shall include action items such as suggested changes, modifications, and other items of discussions along with suggested actions or remedies within one (1) week after adjourning the meeting to the Contracting Officer (CO), Project Officer (PO), and Environmental Studies Program Representative (ESPR). Any agreed to changes that might affect the Agreement are subject to approval in writing by the CO.

Quarterly Progress Reports

Submit *Quarterly Progress Reports* within one week of the end of the quarter of the fiscal year to the CO, PO, and ESPR as email or email attachment. The *Quarterly Progress Reports* will include:

- A summary of work accomplished, and overall progress made in each task of the Agreement which shall include a list of datasets prepared, scientific presentations given (including a pdf submission of any presentation), and scientific manuscripts prepared

and/or submitted for publication

- A summary of any significant problems encountered during the preceding three (3) months, including an assessment of their probable impact on the Recipient's performance and statements of corrective actions taken or proposed
- A summary of any major technical findings and interpretations during the preceding three (3) months
- A list of any meetings held or other contacts made in connection with the Agreement during the preceding three (3) months, including a brief summary which outlines the subject, participants, date, location, and outcome of each such contact or meeting
- A summary of major work activities scheduled for the next three (3) months
- A summary of any questions or problems regarding the Recipient's work requiring discussion or resolution with BOEM

Quarterly Progress Meetings

Meeting invitations will be distributed to the PO, ESPR, and PI, and other key project team members as mutually agreed upon between the PO and the PI. The CO may also attend Quarterly Progress Meetings if desired. Meetings shall discuss Quarterly Progress Reports and be an opportunity where BOEM can provide real time direction or re-direction on data analysis (that is within the purpose and scope of the study) based on early results and discuss other matters that may be important to the progress of the study. Immediately after each Meeting, the Recipient will send an email to CO, PO, and ESPR that summarizes key Meeting discussion points. Additional Progress Meetings beyond those planned on a quarterly basis may be scheduled as needed.

A. Pre-Cruise Planning, Cruise Plans, Logs, and Post-Cruise Reports

This award includes funding for opportunistic at-sea data collection and post-cruise analysis. Cruises The PI and the PO will participate in discussions with other organizations regarding at-sea opportunities for data collection. Once the PI and PO agree on a substantive and appropriate at-sea opportunity, the PI will lead detailed planning for participation in the cruise opportunity. As planning proceeds, the PI will provide the PO and ESPR with brief summaries of key take-aways and major actions items associated with the cruise planning process. The PI will also provide copies of draft and final cruise plans and post-cruise reports. Though the PI will provide input to these reports, the cruise Chief Scientist will have the final say in content. The PI is encouraged to supplement the official reports with additional information about BOEM-relevant cruise successes and challenges. These reports will help inform consideration of future cruise opportunities.

B. Directions on Future Research:

The PI shall include future directions and recommendations on how best to integrate midwater biological surveys in future offshore wind and critical mineral related resource evaluation and environmental cruises in the Draft and Final Synthesis Reports submitted to BOEM at the end of

the project.

C. *Draft Final Report Including Draft Technical Summary*

The Recipient shall prepare a draft *Final Report* including a draft *Technical Summary* according to scheduling in Table 1 using clear, concise writing at a level suitable to a technical audience familiar with the various facets of the marine sciences and offshore development. A table of contents shall be agreed upon between the PM and PO prior to preparation. The *Final Report* shall contain an Executive Summary section that highlights the major points of the research, and describe any results, conclusions, or recommendations from the research relevant to BOEM's mission and information needs (including Deliverables 4 and 5).

A draft *Final Report* shall be submitted to the PO and ESPR for review before preparation of the final document, by the end of the period of performance (POP) of the Agreement. Within thirty (30) days after BOEM has received the draft *Final Report*, BOEM will review the document for accuracy and scientific validity and will provide the Recipient with written comments based on the review. Upon reviewing BOEM comments on this material, the Recipient shall correct all omissions or deficiencies resulting from nonconformance to the Agreement. The Recipient shall also make additions, revisions, or corrections relating to data interpretation, judgments, or recommendations that have been mutually agreed upon with BOEM. If the Recipient does not agree with BOEM findings, discussions shall be held with the PO and ESPR to resolve the disagreements. When all issues have been resolved, the Recipient shall submit a written response to the PO and ESPR as to how the Recipient will address the findings in the final material submitted. This response shall be submitted within seven (7) days from the date BOEM's written comments were received. BOEM will then have seven (7) days to either approve or disapprove the response.

The Recipient shall not provide copies of the draft or *Final Reports*, nor any subsequent revisions prepared during the review process, nor data contained within, nor any portions thereof, to any parties not specifically designated in Table 1 prior to final acceptance by BOEM of the *Final Report*. If a need arises to do so, the PM must obtain the written approval of the CO.

The *Technical Summary* summarizes the key points of the *Final Report* and should conform to the template provided by BOEM. It should restate the purpose of the study, highlight the major points of the research, and describe any results, conclusions, or recommendations from the research relevant to BOEM's mission and information needs. The *Technical Summary* shall also include a map of the study area. It should include enough information so the reader can understand what is discussed in the *Final Report*, without having to read it.

D. *Final Report including Technical Summary*

The *Final Report* including *Technical Summary* is due within 90 days of the end of the agreement. The *Final Report* shall be submitted. The Recipient shall submit the report in a single MS Word file (docx) and an Adobe Portable Document Format (pdf) file.

Photographic Work Documentation

Performance of work during some tasks will be documented through photography and may include videography. The quality of the images and video shall be good to very good and shall be free of copyright restrictions and suitable for BOEM's use in printed material and Microsoft (MS) PowerPoint (ppt) presentations, or for duplication. The submitted images or video shall be identified by task, location, date, subject matter, photographer, and include the names of people that are clearly depicted. The documentation shall be considered part of the *Final Report*

E. Data Submission

Concurrent with submission of the *draft Final Report*, the recipient shall submit all databases, metadata, and other information relevant to the analyses conducted in the *draft Final Report*, and sensitive or confidential data shall be clearly marked.

Final Report Specifications and Data Delivery

- **General.** Using the acquired data, analytical results, and conclusions from the study, the Recipient shall evaluate the acquired information, interpret the results, and generate tables and graphics as needed to fulfill the study objectives.
- **Report specifications and BOEM report number.** The Recipient will synthesize the evaluated information into a report that meets the objectives of this study. This report will be submitted to BOEM and contain a unique BOEM numbered identifier. This report will conform to the Environmental Studies Program (ESP) Report Specifications: <http://www.boem.gov/Environmental-Studies-Program-Report-Specifications/>.
- **Geographic data.** Where applicable, geographic data will be delivered in geodatabases (compatible with the most recent version of ArcGIS) on an external hard drive or other media acceptable to both parties. At a minimum, the geodatabases will include feature classes (shapefiles) for the detection data and grids (rasters) displaying the results of analyses and models. All detection feature classes will be in the WGS_1984 Geographic Coordinate System. For areas displayed, rasters will be created in an appropriate Cartesian Coordinate System agreed upon by BOEM and the Recipient, and will likely be UTM zones 4, 5, 9, 10, or 11. All geographic data products will be adequately described with detailed metadata conforming to either Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata, or the International Organization for Standards (ISO) Geographic Information – Metadata Standard 19115. Metadata will include detailed explanation of how the data were collected and analyzed
- **Study footprint.** A study footprint that geographically references the study area will be delivered. The footprint should be developed in accordance with BOEM's ESP Data and Information Specifications and ESP Study Footprint Guidance (<https://www.boem.gov/environment/environmental-studies/esp-study-footprint-guidance>).
- **Data and image delivery to BOEM.** All data and images will be submitted to BOEM on an external hard drive or other media acceptable to both parties.

Journal Publication(s) and/or Oral Presentation(s)

The Recipient shall require of all investigators that all manuscripts intended to be published in journals, and all abstracts or summaries prepared for oral and/or poster presentations, based on this study be submitted to BOEM for courtesy review and comment prior to submittal to the journal or conference authority. All such publications and oral (and/or poster) presentations shall contain an acknowledgement of support from BOEM under this Cooperative Agreement.

An acknowledgement page shall be incorporated into the PowerPoint slides for oral presentations. Publication of scientific results in peer-reviewed journals is strongly encouraged. PowerPoint and poster presentations shall include BOEM's logo that the PO will provide upon request.

F. Final Oral Presentation

The PI will provide an oral presentation to BOEM personnel about the study results.

G. Scientific Communication Products

Recipient shall work with the PO, ESPR, and BOEM's Public Affairs Officer (PAO) to generate the following scientific outreach products: (1) a webpage for BOEM Ocean Science News (<https://www.boem.gov/newsroom/ocean-science/ocean-science-news>); (2) a Note to Stakeholders – BOEM Quarterly Reports (https://www.boem.gov/newsroom/news-items?news_type=13); (3) one DOI NewsWave media product (cover article, news release, Feature, or science news described in <https://www.doi.gov/sites/doi.gov/files/newswave-guidelines-for-submission-2022.pdf>). These *Scientific Communication Products* shall be completed two (2) weeks before the end of the period of performance (POP).

At the time of a significant scientific publication during or after the Award POP, Recipient shall work with BOEM's Public Affairs Officer and the PO to generate a mutually agreed upon Press Release (PR) that recognizes BOEM's contribution to the published work.

List of Purchased Equipment

If applicable, the Recipient shall submit a list of purchased equipment and provide a statement that equipment was purchased in accordance with 2 CFR 200.318–326 and managed in accordance with 2 CFR 200.313.

Deliverables, Due Dates, and Distribution

Deliverable products described above, shall be submitted in accordance with the Cooperative Agreement as shown in the schedule below. To the maximum extent practicable, deliverables

shall be submitted in electronic form using the latest version of MS Word as the primary word processing software. Files should also be readily convertible using the latest version of Acrobat software to a PDF file. Any physical data storage media (*e.g.*, hard drives) shall be formatted for reading and writing by the current Microsoft Windows® computer operating system.

Deliverable	Distribution	Due Date
A. Post-Award Meeting, Meeting Agenda, and Draft Study Plan	Program Officer (PO) —One (1) electronic copy Environmental Studies Program Representative (ESPR) —One (1) electronic copy Contracting Officer (CO) —One (1) electronic copy All other participants in the teleconference—One (1) electronic copy	As soon as practical after BOEM funding award. Draft Study Plan and Meeting Agenda due one (1) week before Post-Award Meeting.
B. Post-Award Meeting Summary and Final Study Plan	CO, PO, ESPR	Within one (1) week after Post-Award Meeting
C. Quarterly Progress Reports	CO, PO, ESPR	Within 1 week of the end of each quarter
D. Quarterly Progress Meetings and follow-up summary of key	PI, PO, and ESPR	Meeting to be scheduled within 2 weeks of the end of each quarter; additional Progress Meetings may be scheduled as needed

discussion points		
E. Cruise Planning, Logs, and Post-Cruise Reports	PO, ESPR	As needed
F. Directions on Future Research	Chief, DES—One (1) electronic copy ESP Rep—One (1) electronic copy PO—One (1) electronic copy CO—One (1) electronic copy OREP Science Coordinator—One (1) electronic copy	Due two (2) months prior to the end of the period of performance, to be included in the Draft and Final Reports and Technical Summaries
G. Draft Final Report including Technical Summary (electronic copy using BOEM template as a MS Word document)	PO, ESPR	Due on the date the agreement expires
H. Final Report including Technical Summary	PO, ESPR, CO, DES Chief	Within ninety (90) days of the end of the period of performance on the agreement
I. Photographic Work Documentation (using format agreed upon between Recipient and BOEM)	PO, ESPR	Concurrent with Draft and Final Report, or earlier

J. Data Submission (using format agreed upon between Recipient and BOEM)	PO, ESPR	Concurrent with Draft and Final Report
K. Electronic copies of Abstracts, Journal Publication(s), Posters, Outreach Materials, and Oral Presentation(s)	PO, ESPR	Draft versions to be sent for courtesy review to PO and ESPR prior to submission to the publisher, conference, or presented to the public; Final versions (if different) sent to PO and ESPR within one (1) week of completion
L. Final Oral Presentation	PO, ESPR	Within one (1) month to two (2) weeks before the end of the POP
M. Scientific Communication Products	PO, ESPR, Public Affairs Officer (PAO)	Two (2) weeks before the end of the POP Scientific Publication(s) Press Release(s): As needed
N. List of Purchased Equipment, if applicable (electronic copy as a MS Word document)	PO, ESPR, CO	Concurrent with Final Report

CONTACT INFORMATION FOR DELIVERABLES

Contracting Officer (CO) for BOEM

Deja Bracey
Lead Contract Specialist
U.S. Department of the Interior
Bureau of Safety and Environmental Enforcement
Acquisition Policy and Financial Assistance Branch

45600 Woodland Rd., VAE-AMD
Sterling, Virginia 20170
Email: Deja.Bracey@bsee.gov
Phone: 703-787-1057

Project Officer (PO), BOEM

Jeremy Potter
Bureau of Ocean Energy Management
760 Paseo Camarillo, Suite 102
Camarillo, CA 93010
Email: jeremy.potter@boem.gov
Phone: 805-384-6343

Chief, DES, BOEM

Chief, Division of Environmental Sciences
U.S. Department of the Interior
Bureau of Ocean Energy Management (BOEM)
45600 Woodland Road, MS VAM-OEP
Sterling, Virginia 20166
Environmentalstudiesprogram2@boem.gov

ESP Representative (ESP Rep), BOEM

Mark Mueller
Bureau of Ocean Energy Management (BOEM)
Division of Environmental Sciences
45600 Woodland Road, MS VAM-OEP
Sterling, VA 20166
Office phone: 703-787-1089
Email: mark.mueller@boem.gov