

"MINI" STATEMENT OF WORK

AT-22-07

Exploring the Connectivity Among Offshore Wind Turbines

BACKGROUND

Offshore wind turbines along the U.S. Atlantic Outer Continental Shelf (OCS) introduce hard substrate into an environment that is usually composed of soft sediment. These structures also provide vertical habitat through the entire water column. As has been observed for all artificial structures introduced in the marine environment, marine growth is rapid, and a complex habitat is formed. Specifically for wind facilities, researchers in Belgium have observed a rapid succession of marine life over a ten-year period (Kerckhof et al. 2019). Besides the reef effect from encrusting organisms, fish species are often attracted to these structures.

One concern raised is whether the proximity of structures is additive and, as such, results in a restructuring of the ecosystem at larger scales than just the immediate vicinity of the turbine. In other words, is there connectivity between the turbines for mobile species such as fish? Although the Gulf of Mexico has thousands of oil and gas structures, and in some locations, there are clusters or large groupings of structures, changes to the environment have focused on alterations at individual structures. In the Pacific, oil and gas structures are studied in relation to nearby natural reefs for comparisons. Unlike solitary oil and gas wells or artificial reefs created with a single vessel, offshore wind facilities are composed of large groups of structures (100s of structures) within close proximity. The purpose of this study is to determine if there is an additive effect on fish from multiple structures in an offshore wind facility. Is there connectivity for some species between turbines and does this result in a larger impact to ecosystems than if impacts are localized to an individual turbine? Answering this question will improve our understanding regarding the ecosystem interactions with offshore wind facilities on fish resources.

OBJECTIVES

There are several objectives that may be addressed through a study proposal submitted under this announcement of financial assistance. The total project allocation for FY22 is \$400,000 with another \$400,000 in FY23, subject to the availability of funds. Matching contributions from the applicant are strongly recommended. Eligible institutions are limited to state academic institutions adjacent to current project areas along the U.S. Atlantic coast from Maine to North Carolina. The study awarded under this program must address the following objectives:

- The Contractor will collect data that will help determine if there is an additive effect on fish from multiple structures in an offshore wind facility.
- Research proposed in this study seeks to answer the following questions

- o Is there connectivity for some species between turbines and does this result in a larger impact to ecosystems than if impacts are localized to an individual turbine?
 - o Does the vertical reef effect enhance local or regional marine fish and invertebrate productivity?
- This project will build upon a limited body of existing research on the biological and ecological connectivity of offshore wind facilities within the U.S. Atlantic Ocean. These results will benefit coastal resources planners and managers with an increased understanding of the potential interactions of offshore structures on fish and fish habitat.
- The findings from the proposed research will improve our scientific understanding of ecosystem impacts from offshore wind energy development. This effort supports the Bureau's mission to manage the development of the U.S. OCS energy resources in an environmentally responsible manner and aligns with our values for environmental stewardship and science-informed decision making.

METHODS

BOEM is soliciting proposals that would accomplish the objectives listed above. Generally, BOEM envisions project proposals that demonstrate an ability to characterize the benthic and oceanographic environment selected for the study and the characterization of species movements between turbines and nearby natural reef habitats. For this study, telemetry and tagging of fish species of important commercial value (e.g., black sea bass), would be used to examine whether these fish show high fidelity to a single turbine or move between turbines. Study proposals may assess fish distributions and habitat use around natural and artificial habitat features within a wind energy area and at larger resolutions such as the occurrence across an entire wind energy area. This study could be conducted at Block Island Wind Farm. Fishery resource users should be involved in the project where appropriate. BOEM staff will have the opportunity to join the Contractor's field studies to observe data collection activities.

TASKS

The project applicants will describe the tasks necessary to accomplish the listed objectives and within the general methodology described above.

DELIVERABLES

Deliverable products shall be submitted to the e-mail addresses shown below. Schedule of deliverables will be determined based upon the proposals. It is generally anticipated that projects will not be longer than 30 months in duration. Deliverables may be added or subtracted based upon the proposals received and accepted.

Deliverable	Distribution	Due Date
Project Management Plan/Post Award Meeting with BOEM	Chief, DES-One (1) electronic copy ESP Representative COR-One (1) electronic copy CO-One (1) electronic copy	Within 3 weeks of award.
Quarterly Status Reports	Chief, DES-One (1) electronic copy ESPR- One (1) electronic copy COR-One (1) electronic copy	The first report shall be due thirty (30) days after submission of the Post award meeting summary. Subsequent reports are due within 2 weeks of the end of each quarter of the Federal budget calendar.
Draft Journal Article or Oral Presentations	Chief, DES, ESPR-One (1) paper copy and One (1) electronic copy of the Draft Journal Article or Oral Presentation (abstract and if created MS PowerPoint presentation) COR-One (1) electronic copy of draft manuscript(s) or oral presentation abstract(s) in MS Word format including associated tables and figures, two (2) paper copies and one (1) electronic copy of journal publications, one (1) electronic copy of final oral presentation(s) CO-One (1) copy of transmittal letter only	Draft oral presentation abstract(s) or draft manuscript(s) including associated tables and figures to be sent to COR for courtesy review prior to formal submission, and may be done at any point in the contract, or at the conclusion Journal publication(s) to be sent to Chief, DES and COR at any point in the contract, or at the conclusion Final electronic copies of oral presentation(s) and associated abstract(s) to be sent to the COR within 14 days of the presentation
Draft Outline for Final Report	Chief, DES, ESPR-One (1) electronic copy COR-One (1) electronic copy	TBD months after contract award

Deliverable	Distribution	Due Date
Final Outline for Final Report	Chief, DES,ESPR-One(1) electronic copy COR-One (1) electronic copy	TBD months after contract award
Draft Report	Chief, DES, ESPR-One (1) electronic copy (MS Word), and one (1) paper copy COR-Six (6) paper copies, and one (1) electronic copy (MS Word)	TBD months after contract award
Final Report	Chief, DES, EPSR-Two (2) electronic copy (MS Word), and one (1) paper copy COR-Six (6) paper copies, and one (1) electronic copy (MS Word) CO-One (1) copy of transmittal letter only	TBD months after contract award

ADDRESSES FOR DELIVERABLES

Contracting Officer (CO) Dominique Bruce-Morton, Bureau of Safety and Environmental Enforcement 45600 Woodland Road, VAE-AMD Sterling, VA 20166 E-mail: Dominique.Bruce-Morton@bsee.gov	Project Officer (PO)
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BOEM Chief, Division of Environmental Sciences Bureau of Ocean Energy Management Division of Environmental Sciences 45600 Woodland Road Sterling Virginia 20166 E-mail: environmentalstudies2@boem.gov	BOEM, Environmental Studies Program Representative (ESPR)
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REFERENCES

Kerckhoff, Rumes B, Degraer S. 2019. About "mytilisation" and "slimeification": A decade of succession of the fouling assemblages on wind turbines off the Belgian coast. Pp. 73-84 in Environmental Impacts of Offshore Wind Farms in the Belgian Part of the North Sea: Marking a Decade of Monitoring, Research and Innovation. S. Degraer, R. Brabant, B. Rumes, and L. Vigin, eds., Royal Belgian Institute of Natural Sciences, OD Natural Environment, Marine Ecology and Management, Brussels.