Environmental Studies Program: Ongoing Study

Title	Movement Patterns of Fish in Southern New England (AT-19-08)
Administered by	Office of Renewable Energy Programs
BOEM Contact(s)	Brandon Jensen (brandon.jensen@boem.gov)
Procurement Type(s)	Inter-agency Agreement
Conducting Organization(s)	National Oceanographic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS)
Total BOEM Cost	$1,841,000
Performance Period	FY 2019–2025
Final Report Due	August 30, 2025
Date Revised	March 23, 2022
PICOC Summary	
Problem	Need to document distribution of commercially important fish in the area given future wind energy area development.
Intervention	This study would identify important spatial and temporal use of habitat by soniferous fish (e.g., cod, haddock, weakfish, croaker, and black sea bass) in BOEM lease areas. The study could potentially coincide with offshore wind construction activity as well.
Comparison	This initial phase of the study is proposed as a baseline study against which future studies can be compared post construction of offshore wind energy facilities. Depending on timing of construction this study could include comparisons to when construction occurs and post construction.
Outcome	The outcome will be a better understanding of soniferous fish usage of BOEM lease areas, potential change in fish behavior during construction, and further refinement of passive monitoring systems for monitoring fishery resources.
Context	The principal target for the investigation is commercially and recreationally important soniferous fish in the North and Mid-Atlantic Planning Areas.

BOEM Information Need(s): BOEM-permitted renewable energy activities may result in the temporary behavior modification (e.g., displacement, feeding, spawning, communication) of fish due to noise and construction activities as well as the modification of fish habitat from the construction of offshore wind facility foundations and installation of power cables. Studies of fish movement in lease areas can help BOEM identify important habitat over multiple seasons in order for BOEM to understand habitat usage and potential impacts to fish habitat from authorized activities. These assessments are necessary pursuant to obligations under the Outer Continental Shelf Lands Act, the Endangered Species Act, the National Environmental Policy Act, and the Magnuson-Stevens Fishery Conservation and Management Act.

Background: Although other lease areas are not excluded from consideration, the priority area for this study is southern New England. Construction and Operations Plans for projects in Southern New England are being submitted in 2018. Southern New England is a very important area for fishing and fish,

specifically soniferous fish (e.g., cod, haddock, weakfish, croaker, and black sea bass). The Atlantic cod is of critical importance due to its overfished status and need to rebuild the stock. Although there is some information on the fish utilization and fish movement on Cox Ledge, there is still a lot that is not known. This study would help fill information gaps. Whereas there have been four fish telemetry projects awarded in the mid-Atlantic, there have not been any fish telemetry studies awarded in the important southern New England area where three offshore wind projects are currently being proposed. This information will aid in baseline evaluation and monitoring of construction impacts.

Objectives: The objective of this is to provide baseline information about important commercial fish species in the Southern New England area to address potential changes as a result of offshore wind development. Specifically:

- Identify important spatial and temporal use of habitat by soniferous fish (e.g., cod, haddock, weakfish, croaker, and black sea bass) in BOEM lease areas.

- Evaluate efficacy of autonomous vehicles as a real-time detection and monitoring tool.

Methods: This study would utilize autonomous underwater vehicles (AUVs) with a hydrophone tuned to acoustically detect soniferous fish in BOEM lease areas continuously (one deployment per month) over an initial 12-month period. The second and third 12-month periods would focus AUV activity over areas identified in the first year of surveys to further resolve spatial and temporal use of biologically active areas. By having the study extend into 2021 there are increased chances that the study will coincide with offshore wind construction activities. This study could be expanded to include an acoustic tagging program, or at a minimum include an acoustic tag receiver in addition to the hydrophone on the AUV to detect previously tagged fish. This would likely benefit information on Atlantic sturgeon which are actively tagged with long-lived transmitters. Very little is known about Atlantic sturgeon use of the Cox Ledge area. Half of the fourth year would be for analyzing and developing a final report.

Specific Research Question(s): This study answers important questions regarding the location and timing of fish aggregations and general movement patterns in BOEM lease areas in order to understand the spatial and temporal resolution of impacts from offshore wind energy construction and operation.

Current Status: This project was awarded in September 2019. A Slocum G3 glider was deployed with both a passive acoustic (DMON) recorder on board as well as a real time VEMCO telemetry recorder in December 2019 for first 3-month deployment. An additional two years of field work was added in 2022.

Publications Completed: None

Affiliated WWW Sites: Autonomous Real-time Detections:
http://dcs.whoi.edu/cox1219/cox1219_we16.shtml

References:

McGuire et al. 2016. Ecosystem Studies of Atlantic Cod Spawning Aggregations in Relation to Fisheries Interactions Using Novel Active and Passive Acoustic Approaches. NOAA Satonstall Kennedy Grant Program Award Number: NA14NMF4270027.

Urazghildiiev IR, Van Parijs SM. 2016. Automatic grunt detector and recognizer for Atlantic cod (Gadus morhua). Journal of the Acoustical Society of America. 139(5): 2532-2540.