

Environmental Studies Program: Studies Development Plan | FY 2021–2022

Title	Using high-resolution imagery to describe fishing vessel activity on the Atlantic OCS
Administered by	Office of Renewable Energy Programs
BOEM Contact(s)	David Bigger (David.bigger@boem.gov)
Conducting Organization(s)	TBD
Total BOEM Cost	TBD
Performance Period	FY 2021–2023
Final Report Due	TBD
Date Revised	April 9, 2020
PICOC Summary	
<i><u>Problem</u></i>	Fishing activity within areas planned for renewable energy development is underestimated.
<i><u>Intervention</u></i>	Using existing high-resolution images from aerial surveys throughout the Atlantic OCS to identify fishing gear (e.g., crab pots, lobster buoys) to estimate fishing activity.
<i><u>Comparison</u></i>	Fishing activity across multiple spatial and temporal scales.
<i><u>Outcome</u></i>	Estimates of activity by fishery within lease areas, Wind Energy Areas (WEAs), and call areas.
<i><u>Context</u></i>	Atlantic OCS

BOEM Information Need(s): BOEM is responsible for the approval of a construction and operations plan (COP) submitted by developers for wind facilities on the Outer Continental Shelf (OCS). Describing fishing activity in areas with identified wind development is a high priority. The results from this study will inform assessments under the National Environmental Policy Act and Coastal Zone Management Act for areas under consideration for wind energy development and permitting COPs in existing leases on the Atlantic OCS.

Background: Assessments regularly use Fishing Vessel Trip Reports, Automatic Identification System (AIS) and Vessel Monitoring Systems (VMS) data to describe commercial fishing activity. Yet, fishing activity within areas planned for energy development is underestimated due to some fisheries not having a Federal reporting requirement (e.g., lobster and conch) where only 10% of Lobster/Johan crab landings in the New England lease areas are from vessels equipped with VMS (NMFS, pers. Comm). This negative bias is because small fishing vessels (<65 feet) are usually not outfitted with transponders. Other metrics, like counts of buoys used for lobster pots, could be used to help fill this information gap. For example, fishing gear is readily observable (e.g. lobster traps, crab pots, buoys) in aerial imagery. Federal and state agencies

and developers are using high-resolution imagery from aerial surveys to identify and estimate the abundance of seabirds, turtles, fish, and mammals. These efforts have amassed tens of thousands of images (hundreds of terabytes of data) that span the Atlantic OCS where there is a potential for offshore wind development. This rich source of imagery could be searched (manually or perhaps more efficiently with AI) for fishing gear used to assess the activity of underrepresented fisheries.

Objectives:

- Identify fishing gear from existing high-resolution imagery from aerial wildlife surveys.
- Estimate fishing effort (by fishery, year, and season within lease areas, WEAs, call areas, regions, and other appropriate spatial or temporal scales).

Methods: This study will focus on using existing imagery from the BOEM funded seasonal [baseline surveys in the south Atlantic](#) and New York State Energy Research and Development Authority (NYSERDA) seasonal [wildlife surveys](#) in the NY Bight. In addition, BOEM will work with offshore wind developers to obtain data from their monthly wildlife aerial surveys. The existing imagery is readily accessible and standardized in its collection, format, and storage. The imagery will be inspected for fishing gear using existing AI and visual validation processes. . Types of gear will be identified and grouped by identifying marks and counted to estimate fishing activity by fishery within lease areas, WEAs, and call areas by season by year. Information on fishery and its management and fishing vessel trip reports will help interpret the counts based on images and relate to local and regional fishing efforts. Data layers produced from this effort will be distributed to the regional planning bodies (e.g., <http://midatlanticocean.org/> and <http://devel.northeastoceandata.org/>) and <http://marinecadastre.gov/>.

This effort could be expanded to include other forms of imagery from other sources like the seasonal [mid-Atlantic baseline study](#) that was funded by Department of Energy or MASSCEC seasonal whale surveys. Using imagery from these efforts will likely increase the cost (not included in approx. cost), because the imagery are in different formats and are at lower resolution than the BOEM, NYSERDA and developer surveys.

Specific Research Question(s): How does fishing activity within areas planned for renewable energy development compare to other areas?

References: None