Environmental Studies Program: Ongoing Studies

Study Area(s): Mid-Atlantic (Offshore Virginia)

Administered By: Cornell University

Title: Understanding Whale Presence in the Virginia Offshore Wind Energy Area Using Passive Acoustic Monitoring

BOEM Information Need(s) to be Addressed: The Federal waters off the coast of Virginia are of tremendous interest for offshore wind development and potential oil and gas exploration. However, there are few datasets in this area that provide for a long-term, complete seasonal understanding of the occurrence of marine protected species in these planning areas. Currently there is no sound source verification data for High Resolution Geophysical (HRG) equipment use in the Virginia Offshore Wind Energy Area (WEA). The existing data gaps present regulators and industry with risk due to potential conflicts with the Endangered Species Act, Marine Mammal Protection Act, and the National Environmental Policy Act. This study will assist in BOEM's fulfillment of its requirements to address these statutes.

Total Cost: $1,500,000 **Period of Performance:** FY 2015-2017

Conducting Organization(s): Bioacoustics Research Program, Cornell University

BOEM Contact(s): Desray Reeb

Description:

Background: The coastal Mid-Atlantic waters are part of the home range or migratory corridor of several baleen whale species, including the critically endangered North Atlantic right whale (NARW). The seasonal usage of this area by different whale species is unclear; existing sources suggest that right whale occurrence around Virginia is limited to nearshore locations around the mouth of the Chesapeake Bay during winter months (December-March).

Results from a recent 1-year passive acoustic monitoring pilot study by Cornell University demonstrated year-round occurrence of NARWs within state and federal waters off of Virginia in June 2012- June 2013, a second year of data (June 2013-May 2014) will also become available. Right whales were not confined to nearshore waters, but occurred out to the edge of the outer continental shelf (OCS). Right whales also occurred throughout the year, with peak occurrence in February and March.

Other whale species (humpbacks, fin whales and minke whales), and potentially some fish species, were also acoustically detected, but their seasonal occurrence within Virginia waters was not analyzed. These new data suggest that NARWs and other whale species may be present in the energy exploration and development areas with greater frequency than previous studies indicate, and the current environmental mitigation for energy development may be improved with more complete information about the actual frequency and duration of protected species occurrence in these areas.

During the June 2012-June 2013 acoustic monitoring period, independent HRG surveys were conducted in the area. Analysis of all the acoustic data would provide the first empirical sound source verification data for HRG equipment in a WEA and further the clarification of the occurrence of various protected whale species in and around the Virginia WEA.

Objectives: This study will clarify when baleen whales (primarily NARW, humpback and fin whales) are occurring in the area, where, specifically, they are occurring, how much time the whales are spending in the area, their approximate numbers as they are moving through, and what the ambient noise environment is that they are exposed to. Analyze the existing data in order to obtain real-time, site specific sound source verification levels for HRG equipment.

Methods:

- Establish a multi-year record of baleen whale occurrence in the Virginia wind area lease blocks. It is difficult to assess whether the data collected from June 2012-June 2013 is part of a regular pattern of right whale movements, or represents an anomaly of right whale activity based on above average ocean temperatures.

- Determine spatial and temporal patterns of habitat usage of at least 3 baleen whale species in the area.

- Estimate density and abundance of at least 3 baleen whale species in this area.

- Collect baseline data on the ambient noise of these areas for use of environmental assessment of anthropogenic noise levels from either wind turbine construction or seismic surveys.

- Potentially provide the first empirical data on HRG sound source levels in the Virginia WEA.

Current Status: This project is running according to schedule and has met all relevant milestones, as originally proposed. Data analysis on historical and ambient noise acoustic data (June 2012-January 2015) was completed in December 2015. The acoustic recording units have been successfully deployed and synchronized since July 2015 and, depending on the type of device, have been retrieved for data collection and re-deployed within 5-6 months of each deployment, up until the fourth quarter of 2016. The fourth deployment of the array data was deployed on November 18, 2016.

At least 25% of all available transect data has been manually analyzed for all species of interest. At least 50% of all available array data have been manually analyzed for all species of interest. Automated detectors for minke, fin and right whales have been run on all available data. The detection output is currently being reviewed. The third deployment of array data are currently being extracted and aligned. Improvements in our tool that locates whale calls in the array data have been made. For the approximate 50% of array data that has manually been analyzed, all potential locatable calls from

species of interest have been isolated and are in the process of incorporating detector results into this dataset. We are in the process of interpreting noise analysis results from the available transect units.

Final Report Due: May 31, 2018

Publications Completed: None

Affiliated WWW Sites:

https://marinecadastre.gov/espis/#/search/study/100085

Revised Date: January 4, 2017