Environmental Studies Program: Ongoing Studies

Study Area(s): Atlantic

Administered By: Office of Renewable Energy Programs

Title: Integrative Statistical Modeling and Predictive Mapping of Seabird Distribution and Abundance on the Atlantic Outer Continental Shelf (AT 13-03)

BOEM Information Need(s) to be Addressed: To assist in the environmental review of wind energy areas and in the evaluation of sites for new offshore projects, BOEM needs maps illustrating the seasonal distribution patterns of bird species that are using the Atlantic Outer Continental Shelf (OCS).

Total Cost: $599,500 **Period of Performance:** FY 2013-2018

Conducting Organization(s): National Oceanic Atmospheric Administration National Ocean Service National Centers for Coastal Ocean Science

Principal Investigator(s): John Christensen, john.christensen@noaa.gov

BOEM Contact(s): David Bigger, david.bigger@boem.gov

Description:

Background: Experience from onshore wind development and wind development offshore in Europe suggests that siting of facilities is an important consideration for minimizing impacts to bird species. Discussions during the FWS Marine Bird Science and Offshore Wind Workshop and the BOEM Atlantic Wind Energy Workshop in 2011 emphasized the importance of identifying bird "hot spots" and "cold spots." BOEM is funding a study by USGS (Compendium of Avian Information: Part 2) to create maps of predicted distributions for dozens of seabird species on the mid-Atlantic OCS. Given that there is also interest in leasing for wind energy development in the North and South Atlantic, geographical expansion of this effort is warranted. This effort will create maps that span the entire Atlantic OCS, update the mid-Atlantic maps, and develop a process for updating the maps as new data becomes available. In addition, these maps will be made available through the Marine Cadastre, a tool used for viewing and sharing geographic data related to offshore renewable energy development (http://www.marinecadastre.gov).

Objectives: The objective of this study is to provide easily understandable information about the distribution of birds to aid offshore wind development siting decisions and reduce the risk of impacts to birds.

Methods: This study will incorporate all available science-quality seabird survey data (including data derived from ships, planes, telemetry, and other emerging platforms) into high-resolution predictive maps of seabird occurrence and abundance along the Atlantic OCS. The statistical modeling effort will use data on available environmental

features (e.g., oceanography, geomorphology, prey distribution) to predict probabilities of seabird occurrence and abundance between survey locations. Predictive accuracy will be assessed with a variety of diagnostic and validation statistics and the effort will also generate maps to illustrate areas of uncertainty which will facilitate interpretation of the predictive maps and can be used to guide future survey efforts. The final product will support updating of these maps as new data becomes available.

Current Status: Phase I was completed in May 2016 (see below). Phase II is underway and includes an update of modeling and map products.

Final Report Due: February 28, 2018

Publications Completed:

Kinlan, B.P., A.J. Winship, T.P. White, and J. Christensen. 2016. Modeling At-Sea Occurrence and Abundance of Marine Birds to Support Atlantic Marine Renewable Energy Planning: Phase I Report. U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs, Sterling, VA. OCS Study BOEM 2016-039. xvii+109 pp. (http://www.data.boem.gov/PI/PDFImages/ESPIS/5/5512.pdf; Appendices and Digital Data: https://coastalscience.noaa.gov/projects/detail?key=279); Interactive Bird Maps: http://www.northeastoceandata.org/data-explorer/?birds http://midatlanticocean.org/data-portal/

Kinlan, B., A. Winship, R. Rankin, P. Miller, J. Christensen. 2015. Applications of a Model-based U.S. Atlantic Coast-wide Synthesis of At-sea Marine Bird Distributions to Ocean Energy Spatial Planning. Pacific Seabird Group 42nd Annual Meeting, San Jose, CA.

Winship, A. J., R. W. Rankin, B. P. Kinlan, and C. Caldow. 2014. Predictive habitat modeling of marine bird distributions to inform spatial planning and risk assessment. Ocean Sciences Meeting, Honolulu, Hawaii.

Affiliated WWW Sites:

https://coastalscience.noaa.gov/projects/detail?key=279

Revised Date: June 29, 2017