Environmental Studies Program: Ongoing Study

Title	Anticipating Shifts in Marine Bird Distributions for Planning, Leasing, and Assessment of Energy Development on the Outer Continental Shelf (AT 20-03)
Administered by	Office of Renewable Energy Programs
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Conducting Organization(s)	National Oceanic & Atmospheric Administration (NOAA), National Centers for Coastal Ocean Science
Total BOEM Cost	$499,639
Performance Period	FY 2020–2022
Final Report Due	July 2022
Date Revised	August 18, 2020
PICOC Summary	
Problem	Marine bird distributions may shift within a 30-year lease due to regional changes in oceanographic conditions and could make certain species more vulnerable to energy-related activities.
Intervention	This effort would combine predicted changes in oceanographic conditions to predict marine bird range shifts
Comparison	Current species distributions will be compared to future predicted distributions.
Outcome	Time series predictions illustrating shifts in marine bird distributions over the next 30 years; and an approach that is repeatable using other taxa from other BOEM regions.
Context	Atlantic OCS

BOEM Information Need(s): To assist in the environmental review and evaluation of sites for new offshore energy development projects (including oil, gas, and renewables), BOEM uses maps illustrating the seasonal distribution patterns of bird species that use the Atlantic OCS. Predictions of future shifts in seabird distributions over the coming decades are needed to inform no-action alternative for National Environmental Policy Act (NEPA) analyses and risk assessments for the Endangered Species Act (ESA) consultation.

Background: Knowledge of marine bird distributions on the Atlantic OCS is important to planning, leasing, and environmental assessments related to offshore energy development. Predictive maps of marine bird occurrence and abundance, based on statistical models fit to large observational data syntheses (Winship et al., 2018), have proven extremely useful in BOEM's energy planning and assessment efforts on the Atlantic OCS over the past five years. To date, modeling of marine bird distribution and abundance on the Atlantic OCS has focused on

predicting the long-term average (multidecadal average) distribution of marine birds based on the syntheses of historical and contemporary wildlife survey and environmental/oceanographic data. To inform cumulative effects analyses for NEPA, information is needed to describe the impacts of past, current, and future activities on a natural resource. BOEM, with its partners (U.S. Fish & Wildlife Service and NOAA), is working to conduct field surveys and use advanced modeling techniques to describe the current distribution and abundance of dozens of marine bird species on the OCS. Yet, it is common knowledge that marine bird distributions do change regionally over decades (e.g., northern gannets on the Atlantic OCS have shifted more inshore since the 1970's [Viet et al., 2015]). Given that BOEM's leases for offshore energy development can be up to 30 years, the distribution of some marine bird species may shift into or out of existing or future lease areas. Knowing when and where these shifts in species distributions are likely to happen will help inform analyses for NEPA and biological assessments for ESA.

Objectives: Describe how the distribution of several marine bird species may shift in or out of existing and potential lease areas within the next 30 years. Update marine bird distribution maps (see Winship et al 2018). Provide access to and update the Northwest Atlantic Seabird Catalog to support energy siting decisions as well as other seabird research activities along the Atlantic coast and OCS.

Methods: The study will use similar methods used to create seasonal distribution and abundance maps of key marine bird species along the Atlantic (Winship et al., 2018). These models use a combination of habitat and oceanographic variables and other information to predict the seasonal distribution of almost 50 marine bird species on the Atlantic OCS (similar models are being used in other BOEM regions). There are now a substantial number of marine bird survey data for the Atlantic OCS from the year 2000 onward contained in the Northwest Atlantic Seabird Catalog and other sources (Winship et al., 2018), and new survey data are continuing to be collected (e.g., aerial surveys off New York and the Carolinas). The data from the intensive surveys conducted by developers would be a substantial contribution to this effort. Many environmental datasets are available throughout this same time period (Winship et al., 2018), which would allow a contemporaneous dynamic habitat-based modeling framework (Mannocci et al., 2017). Several marine bird species will be selected based on the strength of the relationship to oceanographic conditions and their distribution relative to leasing areas. This effort would combine predicted changes in oceanographic conditions to predict marine bird range shifts. The output will be a time series prediction illustrating shifts in seabird distributions over the next 30 years (the life of a lease). The timescale matches the predicted timeline of offshore energy development on the OCS. The information products will be specifically tailored to be incorporated into future NEPA analyses of energy development on the Atlantic OCS. The final map/data products will be made available through the Marine Cadastre and regional ocean data portals.

Specific Research Question: How do predicted changes in oceanographic variables change the distribution of marine bird species on the Atlantic OCS?

Current Status: Kickoff meeting and summary delivered to BOEM on August 14, 2020.

Publications Completed: N/A

Affiliated WWW Sites: N/A

References:

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Winship, A.J., B.P. Kinlan, T.P. White, J.B. Leirness, and J. Christensen. 2018. Modeling At-Sea Density of Marine Birds to Support Atlantic Marine Renewable Energy Planning: Final Report. U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs, Sterling, VA. OCS Study BOEM 2018-010. 67 pp. https://espis.boem.gov/final%20reports/BOEM_2018-010.pdf