Data Collection NCCOS_ Modeling At-Sea Occurrence and Abundance of Marine Birds to Support Atlantic Marine Renewable Energy Planning Phase I Report _Datasets.pdf	
Data Collection Title	**DigitalDataDeliverable_IAA_M13PG00005_OCS_Study_BOEM_2016_039**
Data Collection URL	TBD (insert link when available)

Data Set	
Data Set Title	**DigitalDataDeliverable_IAA_M13PG00005_OCS_Study_BOEM_2016_039**
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Abstract	Marine birds have the potential to be affected by human activities in the marine environment such as offshore wind energy development. This report describes the first phase of a project aimed at producing maps of the spatial distributions of marine bird species in U.S. Atlantic Outer Continental Shelf (OCS) waters that can be used to inform marine spatial planning in the region. Visual sighting survey data from over three decades, contained in the 'Compendium of Avian Occurrence Information for the Continental Shelf waters along the Atlantic Coast of the U.S.' database, were analyzed to derive seasonal and annual maps of the spatial distributions of 40 marine bird species in U.S. Atlantic OCS waters from Florida to Maine. Spatial predictive modeling was applied to the survey data to account for spatial and temporal heterogeneity in survey effort, platform, and protocol. An ensemble machine-learning technique, component-wise boosting of hierarchical zero-inflated count models, was used to relate the relative occurrence and abundance of each species to multiple spatial and temporal environmental predictor variables while accounting for survey heterogeneity and the aggregated nature of sightings. Dynamic spatial environmental predictor variables were formulated as long-term climatologies. The modeling technique allowed for complex non-linear relationships between response and predictor variables and interacting effects among predictors. Bootstrapping was used to derive estimates of the uncertainty in model predictions.

	Model predictions are presented as seasonal and annual maps of the relative probability of occurrence and relative abundance of study species throughout the U.S. Atlantic OCS. These maps indicate where species are more or less likely to occur and where species are likely to be more or less abundant. The analysis was not designed to estimate the absolute probability of occurrence or the absolute number/density of individuals of a given species that would be expected in any location, so the maps should not be interpreted that way. Also, the maps represent the spatial distributions of birds averaged over time (e.g., across days within a season and across years for a given season). The analysis was not designed to provide predictions of the number of birds that would be expected in a specific location at a specific date or time, so the maps should also not be interpreted that way. Furthermore, large variations in predicted long-term relative occurrence and abundance at the 2-km spatial resolution of the study grid are not necessarily realistic. Interpretation of the maps is probably more reliable at the regional scale (i.e., 10-100 km). The maps presented here provide preliminary broad-scale spatial information that can be used to guide future data collection efforts and aid marine spatial planning in the region. Four types of supplementary information are provided along with the maps of predicted relative occurrence and abundance to indicate the quality of those predictions. First, the distribution of survey effort is presented as a series of isopleths to indicate where the majority of the survey data were collected. Model predictions in areas with few or no data should be interpreted with caution. Second, for each species-season combination a ‘badge’ is included on the maps, representing the statistical fit of the model to the data in terms of several performance metrics. The badge indicates the quality of model predictions in areas with survey data but not in areas without survey data. Third, estimates of the precision of model predictions are presented as maps of the variability, quantiles, and confidence interval width of the bootstrapped distributions of model predictions. Less precise predictions should be interpreted with more caution. Fourth, we present an expert assessment of how well the predictions for each species match what is known about the species’ distribution. These four supplementary sources of information should be considered in conjunction with the maps of predicted relative occurrence and abundance. The relative importance of different predictor variables is presented, indicating which variables most influenced the predicted distributions for each species in each season. While the primary objective of this study was not to determine the ecological drivers and mechanisms behind the spatial distributions of marine bird species in the study area, our model results may provide useful hypotheses for future studies aimed more at ecological inference. A second phase of this project is currently underway that will expand, refine, and improve the modeling and results presented here. The second phase is projected to be completed by the fall of 2017.
Purpose	The Bureau of Ocean Energy Management (BOEM) partnered with NOAA's National Centers for Coastal Ocean Science (NCCOS) to develop maps of the spatial distributions of marine bird species in U.S. Atlantic Outer Continental Shelf (OCS) waters that can be used to inform marine spatial planning in the region.

	NCCOS compiled and synthesized readily-available spatial information describing the environment and seabird distribution and abundance in the OCS. This assessment was conducted to inform BOEM's renewable energy policy decisions in the OCS. Having the most up-to-date and comprehensive biogeographic information is an important part of BOEM's process to identify and fill critical data gaps, and to assess the potential direct and indirect impacts of offshore renewable energy development on marine birds. Products from this assessment may also support coastal and ocean management efforts by other local, state and federal agencies working in the OCS region.
Methods	See Kinlan et al. 2016. Section 2: Methods. Pp. 2-9. 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+113 pp.
Citations	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+113 pp.
Data Start Date	1978-01-01
Data End Date	2014-04-27
Data Northern Boundary	44.8 degrees N
Data Southern Boundary	23.8 degrees N
Data Western Boundary	-83.0 degrees E
Data Eastern Boundary	-63.1 degrees E
Datasets	Listed in Appendix N of Kinlan et al. 2016
Resource Provider	*NCCOS Data Manager <NCCOS.data@noaa.gov> - US DOC; NOAA; NOS; National Centers for Coastal Ocean Science (NCCOS)*
Comment	*This data documentation describes numerous geospatial datasets archived together as a data collection, and is intended to provide dataset-level metadata for the purposes of discovery, use, and understanding.*
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