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FE = Fates & Effects

HE = Habitat & Ecology

IM = Information Management

IN = Interdisciplinary

MM = Marine Mammals & Protected Species

PO = Physical Oceanography

SE = Social & Economic Sciences



Discipline	Title	Rank
HE	Year-round and Diel Patterns in Habitat-use of Seabirds off Oregon	9
<p>Needed now to fully understand distribution and abundance of avian species off the Oregon coast prior to renewable energy installation</p>		



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BOEM Information Need:

BOEM needs quantitative information for seabirds off Oregon including year-round, diurnal/nocturnal, and weather-related patterns in movements; behaviors; residence time and migration corridors.



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Relationship to Previous BOEM-Supported Research:

- This study builds on avian studies funded through the Pacific OCS Region to determine seabird baselines in the Pacific northwest
- Results will provide capability for comprehensive, spatially explicit vulnerability models for seabirds potentially impacted by wave- and wind-energy conversion device siting
- Complements BOEM-supported study in Hawaiian waters and adds new data for the *California Current System Seabird Telemetry Atlas*



BOEM Objectives:

- 1) Conduct multi-species and multi-scale quantification of at-sea habitat utilization and ranging behaviors for breeding and non-breeding seabirds off the Oregon coast;
- 2) Compare and integrate results with existing transect survey data; and
- 3) Compile and provide an analysis of remotely sensed and model-derived habitat data to examine habitat relationships that can predict species' distributions and improve spatial vulnerability maps.



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Study Methods:

- 1) Newly available micro-electronic tracking devices will be used to quantify at-sea movements and range behavior of breeding seabirds on the Oregon coast
 - Fine-scale, short-term (GPS) and coarse-scale, long-term (Argos, GLS) tracking devices
 - Non-breeding/migratory species that use the CCS will also be tracked;
- 2) Spatially explicit habitat modeling to combine seabird utilization with oceanographic habitat will be used to generate mapped species probability distributions and community-level hotspot areas
- 3) To evaluate three-dimensional risk, numerical models that relate flight behavior with fine-scale (2-6 km) winds and waves will be generated
 - Supplemented using direct observations during peak migrations
 - New telemetry data will be integrated with existing telemetry-based data on at-sea utilization and behavior of non-breeding, migratory species





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Results will include:

- 1) Raster-based maps of species utilization distributions within state and federal waters off Oregon (and throughout the CCS and U.S. exclusive economic zone); and
- 2) Numerical models that relate environmental variables, including wind speed and direction, to seabird flight speed, direction, and altitude above the sea surface.

