Environmental Studies Program: Ongoing Study

Field	Study Information
Title	Baseline Data Collection on Cetaceans and Seabirds in the Outer Continental Shelf and Slope of Northern California and Oregon to Inform Offshore Wind Energy Development (NT-21-x07c)
Administered by	Office of Environmental Programs
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Procurement Type(s)	Interagency Agreement
Conducting Organization(s)	Oregon State University (through an IA with the Department of Energy)
Total BOEM Cost	$500,000
Performance Period	FY 2022–2026
Final Report Due	December 2026
Date Revised	February 1, 2024
Problem	Updated current conditions data on Pacific marine mammals and seabirds is needed to assess potential impacts to these species from offshore wind development siting through operation phases and is vital to inform BOEM's management decisions.
Intervention	Visual surveys and passive acoustic monitoring of cetaceans and seabirds off the Northern California and Oregon coasts, to compile density maps and models that resolve spatial and temporal variability; multi-year observations will resolve seasonal and interannual variability.
Comparison	Density maps and models will establish a baseline of variability against which future offshore wind impacts can be assessed.
Outcome	Species density maps and models for seasonal and interannual variability will help inform BOEM management decisions.
Context	Pacific region; California; Oregon; offshore wind; renewable energy; marine mammals; cetaceans; seabirds; visual surveys; passive acoustic monitoring

BOEM Information Need(s): BOEM needs to assess the impacts of Pacific offshore wind development on marine mammals and birds, in order to guide management decisions by the Pacific region and headquarters.

Background: BOEM is partnering with the Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (EERE), via Inter-Agency Agreement M21PG00011, to fund three environmental monitoring research projects that will support offshore wind development. This award to Oregon State University and partners is for Topic Area 3.1 under DOE's Funding Opportunity Announcement and aims to collect updated seasonal baseline marine mammal and seabird data from Northern California to the OR/WA border. The project began in 2022 and will take 4 years to complete.

The geographic region of focus is the US West Coast from Cape Mendocino, California, north to the Columbia River mouth (Oregon/Washington border), and seaward to the continental slope at a depth of 3000 m. This region represents a distinct oceanographic province that naturally defines an ecologically meaningful study area in the context of cetaceans and seabirds (Checkley and Barth 2009) and includes BOEM's Humboldt Call Area and Oregon State University's PacWave South Proposed Lease Area.

Objective(s): Combine complementary data streams in synergistic ways to provide spatially and temporally explicit distribution and density maps and models for cetaceans and seabirds.

Methods: Two research components will form the backbone of the project: visual surveys (using distance sampling and strip transect methods for cetaceans and seabirds, respectively) and passive acoustic monitoring (using bottom-mounted hydrophones and echolocation click detectors), to provide complementary data on species occurrence, distribution, and abundance.

Three additional data elements will be strategically added to allow for deeper interpretation: (1) identification photographs (collected during this project) and sighting histories of individual baleen whales (based on comparisons with previously photographed whales in curated catalogs) to characterize movements, site fidelity at the individual and population level, and link humpback whales to Distinct Population Segments (DPS); (2) data from tagged whales (using recoverable, medium-duration archival tags equipped with high-resolution accelerometers) to characterize site fidelity, behavior, and (for blue whales) record call rates (to better interpret acoustic detections from passive acoustic monitoring); and (3) DNA profiles of cetaceans (through mitochondrial haplotype sequencing and nuclear microsatellite genotyping) to provide supporting information on migratory fidelity and individual assignment to DPS. Data will be collected during multiple years and all seasons.

The project will be leveraged with ongoing and currently funded research (visual surveys, collection of large whale identification photographs and biopsy samples) and existing historical data and data products. These data streams will be integrated using state-of-the-art statistical methods to generate species distribution models (SDMs) capable of predicting species density and distribution throughout this region. SDMs will resolve seasonal and interannual variation; a temporally integrated climatological product will also be provided. These density maps provide critical information for siting decisions required for offshore wind energy development, for obtaining necessary permits for moving forward, and for assessing their impacts.

Specific Research Question(s): N/A

Current Status: Fourth quarter surveys completed (04/01/2023-06/30/2023). 10 survey days in April covered approximately 94% of the trackline (707 nm), with 146 sightings of 694 individual cetaceans and 73 sightings of 165 unidentified cetaceans, including 11 species/species groups. 47 species of seabirds, 3532 sightings of 11,412 individuals and 198 sightings of 300 unidentified seabirds. 4 days of small boat surveys were conducted where 41 humpback whales were photographed and 4 were biopsied. Passive acoustic data analysis is underway.

Publications Completed: None

Affiliated WWW Sites:

OSU site: https://mmi.oregonstate.edu/marine-mammals-offshore-wind

DOE Press Release: https://www.energy.gov/articles/doe-announces-135-million-sustainable-development-offshore-wind

References:

Checkley D, Barth JA. 2009. Patterns and processes in the California Current System. Prog. Oceanogr. 83:49–64. doi:10.1016/j.pocean.2009.07.028.