



Applied science for informed decision making

May 7, 2014

Welcome to the May edition of *BOEM Science Notes*.

This month we feature three BOEM-funded environmental studies that will collectively expand our knowledge of physical conditions and biological resources offshore Oregon, an area that holds great promise for renewable energy. These collaborative research efforts between BOEM and other scientists will inform BOEM and our stakeholders as we plan for wind and wave energy development, including identifying potential sites and reviewing proposed projects. Thank you for your interest in BOEM's Environmental Studies Program. Your feedback is important to us, so please feel free to contact us at boempublicaffairs@boem.gov.

Sincerely,

William Y. Brown
Chief Environmental Officer

Above and Below - BOEM Science Covers Oregon

Up in the Air - Surveying Seabirds and Marine Mammals

Which species of seabirds and marine mammals occur off the Pacific Northwest coast? Where do they occur, and what is their abundance? Is their distribution affected by seasonal or oceanographic conditions? These are some of the questions that are being addressed in the BOEM-funded study, *Seabird and Marine Mammal Surveys off the Northern California, Oregon and Washington Coasts*, a five-year research project conducted by scientists from the U.S. Geological Survey and coordinated by BOEM avian biologist David Pereksta.



The Sooty Shearwater undertakes the longest known migration of any animal on earth: approximately 38,000 miles! During the summer, they are one of the most abundant seabirds in the offshore waters of the Pacific Northwest, where they build their energy reserves before returning to their sub-Antarctic breeding islands off New Zealand and South America. Photo by David Pereksta.

To collect information about the distribution and abundance of these animals, researchers conducted low-elevation aerial surveys during three oceanographic seasons (summer, fall, and winter) in 2011 and 2012, in a survey area extending from Grays Harbor, Washington, to Fort Bragg, California, and seaward of the federal-state boundary (three miles from shore to beyond the continental slope). In addition to recording the sightings of animals, researchers also collected data about oceanographic conditions (e.g., sea-surface temperature and ocean color) using equipment mounted to the survey aircraft.

A total of 54 species of seabirds and 21 species of marine mammals were observed during the surveys, with Common Murres, Sooty Shearwaters, humpback whales, harbor porpoises and California sea lions among the most frequently sighted. Other findings from the robust dataset, including possible correlations between species abundance and oceanographic conditions, will be discussed in the first report from this study-- *Pacific Continental Shelf*

Environmental Assessment (PaCSEA): Aerial Seabird and Marine Mammal Surveys off Northern California, Oregon, and Washington, 2011 to 2012--to be available soon in BOEM's online Environmental Studies Program Information System, [ESPIS](#). For more information about this study, which will conclude in 2015, see the [study profile](#).



Humpback whales were the most frequently observed cetacean species during the summer and fall surveys. Photo by David Peteksta.

Into the Deep - Surveying Seafloor Habitats

In anticipation of future renewable energy projects offshore the Pacific Northwest and the need to better understand seafloor (benthic) habitats and inhabitants that might be affected by energy activities, BOEM partnered with Oregon State University's Hatfield Marine Science Center in 2010 to characterize the benthic environments and biological communities in the area.

An early goal of the study--*Survey of Benthic Communities near Potential Renewable Energy Sites Offshore the Pacific Northwest*--was to collect information about different seafloor habitats and the invertebrates living in those habitats. To do that, OSU researchers mapped the seafloor and sampled invertebrate species at multiple offshore sites between Grays Harbor, Washington, and Fort Bragg, California. By integrating new habitat information with information from other studies, researchers updated and expanded a regional map of habitat types including sand, mud, gravel and rocky reefs. Researchers found that unique assemblages of invertebrates occur in distinct habitat types and that water depth and sediment size are key factors in differentiating communities. Based on the identified habitat-species relationships, researchers then developed a model to predict which invertebrate communities are likely to occur in unsampled areas.



Basket stars in a marine invertebrate community offshore the Pacific Northwest. Photo by Sarah Henkel, Oregon State University.

As the four-year study nears its conclusion in September 2014, BOEM benthic biologist and study coordinator Lisa Gilbane summed it up: "Because of effective collaborations between the State of Oregon, BOEM and other federal agencies, we were able to map 500 square miles of seafloor (approximately 7% of the Pacific Northwest continental shelf), collect biological information at about 400 sample stations, and turn these data into products that provide a regional understanding of the seafloor and invertebrate communities from northern California to Washington." For more information, see the [study profile](#) or the final report, which will be available in [ESPIS](#) in fall 2014.

The Bottom Line - Mapping the Seafloor off Coos Bay

With the proposal of a wind energy demonstration project in federal waters off Coos Bay, Oregon, BOEM will conduct environmental evaluations of the potential lease area, including how the installation and operation of a renewable energy device might impact the seafloor and associated resources (e.g., archaeological sites). Because knowledge of the depth (bathymetry), shape (topography) and physical conditions of the seafloor is critical to understanding potential impacts, BOEM has partnered with experts at the U.S. Geological Survey to conduct detailed bathymetric mapping.

In this two-year BOEM-funded study--*Oregon OCS Seafloor Mapping: Selected Lease Blocks Relevant to Renewable Energy*--USGS will collect high-resolution, multibeam bathymetric data across a 250-square-mile area on the continental shelf and slope offshore Coos Bay, in water depths from approximately 1,000 to 1,600 feet. Swath sonar and backscatter intensity data will also be collected, along with high-definition video and still photography. The data will be processed and converted into detailed bathymetric maps and other images that will provide insight about the physical conditions of the seafloor.

Data collection is scheduled to take place during a three-week period in August 2014, and final maps will be publicly available in June 2016.

The maps produced from this study will reveal the seafloor in the potential wind-energy lease area in unprecedented detail and will be a critical tool for BOEM's environmental evaluation and decision making. For more information about this study, which will be coordinated by BOEM marine ecologist Donna Schroeder, see the [study profile](#).

To learn more about BOEM's Environmental Studies Program, visit www.boem.gov/studies/.

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R/V Parke Snavely, the USGS ship to be used to map the seafloor offshore Coos Bay. Photo by USGS.

The Bureau of Ocean Energy Management (BOEM) promotes energy independence, environmental protection and economic development through responsible, science-based management of offshore conventional and renewable energy resources.



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