



Applied science for informed decision making

January 6, 2014

Welcome to the January 2014 edition of *BOEM Science Notes*.

Happy New Year, and with the start of 2014, I am pleased to send you my first BOEM Science Note since joining the bureau in November. We hope to continue keeping our community of stakeholders informed on our ongoing research as it is taking place in the field. Each *Science Note* will feature a BOEM study or other item of interest. As always, thank you for your continued interest in our programs. Your feedback is important to us, so please feel free to contact us at boempublicaffairs@boem.gov.

Sincerely,

William Y. Brown
Chief Environmental Officer

Science team member describes U.S. Arctic research experience

Gathering data to understand the Beaufort Sea, Mackenzie Canyon ecosystem

For the dozens of BOEM scientists involved in the Environmental Studies Program, the chance to join an extensive excursion at sea with fellow scientists for hands-on research is an opportunity they cherish, even in frigid Arctic waters.

So it was for BOEM fisheries oceanographer Kate Wedemeyer just a few months ago, before winter ice started to overtake the United States-Canadian waters of the eastern Beaufort Sea, northeast of Alaska. This was the second field season for the U.S-Canada Transboundary Fish and Lower Trophic Communities study, and Kate's first excursion for this project, aboard the research vessel *Norseman II*. Kate joined principal investigators from the University of Alaska Fairbanks School of Fisheries and Ocean Science, and the Canadian Department of Fisheries and Oceans.

This year, the scientists documented which fish species were present, their abundance and geographic distribution, along with other fish species and plankton that fish feed upon in the far eastern U.S. waters of the Beaufort and near the Mackenzie River across the border into Canada.

Over the study's five years, researchers will collect and analyze baseline data for fish, invertebrates and organisms lower on the ecosystem food web. The missions will also document the habitat and oceanography of the eastern Beaufort, including everything from the temperature and salinity of the waters to how the Mackenzie Canyon in Canada may affect the biological productivity and circulation of the U.S. Beaufort. In March, further research will be conducted under the ice to better understand the



Kate Wedemeyer, a fisheries oceanographer with BOEM's Anchorage office, gathers fish samples during a Beaufort Sea study mission.

ice-covered season that fish and other creatures live in for nine months of the year.

What were some of the preliminary research findings? Ms. Wedemeyer and her colleagues had expected the nutrients to move east along the 1,000 foot contour of the sharp slope off the edge of the Mackenzie Canyon, then periodically wash up onto the 30-300 foot deep shelf where most of the potential offshore oil and gas development would happen. She had expected that there would have been many more fish and increased biological productivity as they neared the Mackenzie Canyon where the Mackenzie River, Canada's longest, empties in the eastern Beaufort Sea. But the data accumulated so far requires statistical analysis to verify whether or not it supports the expectation that the Mackenzie is a major source of both fish and nutrients flowing onto the U.S. Beaufort Sea shelf.

While one season of data is not conclusive, Kate anticipates gathering additional data for more understanding. She is also reevaluating plans for the 2014 summer mission to select the most important locations to collect repeat samples. This will help measure normal year-to-year variability, another important factor in our quest to protect the fish and bottom creatures during offshore oil and gas development.

Despite sometimes challenging conditions during the three weeks at sea - they battled 40-knot winds while heading back to Prudhoe Bay, Alaska - Kate is looking forward to the upcoming summer mission.

Ultimately, the research she and BOEM's study partners are doing will contribute to a better understanding of the drivers of biological productivity offshore and the assessment of potential effects of offshore oil and gas development in this region. The findings will be integrated into environmental reviews for future lease sales, exploration, development and production plans in both the U.S. and Canada.

For more information about this project, see the study [profile](#). Visit www.boem.gov/studies/ to learn more about BOEM's Environmental Studies Program.

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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.



Map of Beaufort Sea for study

