

## **The influence of sea ice and topography on the wind regime of the Beaufort Sea coast**

M.D. Shulski, A.E. Klene, J. Zhang, X. Fan, J.R. Krieger,  
and D.J. Morton

The North Slope region of Alaska exhibits an Arctic climate and is bounded to the south by the southwest to northeast oriented Brooks Range and to the north by the Beaufort Sea. Winds are consistently high and most often come from an easterly direction. As is typical for an Arctic region, precipitation is light and snow cover is present for much of the year. This area is of high economic significance because of resource extraction and development in the nearshore and offshore portions of the North Slope.

A study has recently been funded to investigate the wind field throughout this region, specifically in relation to the documented sea breeze and topographic effects. Data from meteorological observing stations were compiled from the various networks available, including the National Weather Service, Federal Aviation Administration, University of Alaska Fairbanks, and the Minerals and Management Service. These data include inland, coastal, and offshore stations in this region and cover a time period of at least five years, with some more than 30 years. Wind speed and direction components were viewed in relation to distance from the coast to determine the magnitude and strength of the sea breeze effect, which is primarily confined to the ice and snow-free period. The variability of sea ice cover may also impact sea breeze frequency and magnitude. In addition, the wind field was shown to exhibit influences from the Brooks Range, which is dependent on the prevailing direction. These results will further be used to evaluate forecasts generated by mesoscale meteorological models, such as the Weather Research and Forecasting (WRF) model, with the ultimate goal of improved forecasts in this region.