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ARCTIC SEA ICE MONITORING AND RESEARCH THROUGH INDIGENOUS AND COMMUNITY-BASED OBSERVATIONS

Mette Kaufman *(University of Alaska Fairbanks, United States)*
Hajo Eicken *(International Arctic Research Center, United States)*
Peter Pulsifer *(National Snow and Ice Data Center, United States)*
Irene Holak *(Antioch University New England, United States)*
Betsy Sheffield *(National Snow and Ice Data Center, United States)*

hajo.eicken@gi.alaska.edu

Indigenous communities in Alaska's Arctic are keenly aware of changes happening in their local environments, from shifting weather patterns and changing animal migration routes to shorter ice travel seasons and less predictable trail conditions. In an effort to document environmental changes and to better understand local scale ice dynamics, Indigenous experts in communities along the Alaskan Arctic coast are collaborating with academic researchers by providing daily observations of local ice and weather conditions and subsistence activities. These observations are publicly available through an online application developed through a partnership between the Seasonal Ice Zone Observing Network (SIZONet) and the Exchange for Local Observations and Knowledge of the Arctic (ELOKA). The SIZONet application provides a robust interface for working with, archiving and disseminating observational data, including photographs, and in the near future, video and mapping tools.

Local observers monitor shorefast sea ice, bay ice and river ice throughout the season to better anticipate and identify potential hazards. Deformation events and the distribution of key features such as grounded ridges or multiyear ice floes are critical in the assessment of the stability of the ice. There is great scientific value in the observational data that is analyzed in parallel with geophysical research methods. The observations provide better insights and understanding of coastal sea ice processes than can be gained through remote sensing or brief field campaigns alone.

Community members are interested in tracking environment change both in their own and other communities; their feedback suggests that the SIZONet online reporting website can serve this important function. For example, observers have expressed concern over their ability to safely navigate trails over ice to reach hunting grounds and camps. Unusual fall freeze-up conditions with intermittent warm temperatures between freezing periods result in unpredictable trail conditions. Falls through ice appear to be more frequent and even the most experienced hunters are finding themselves in dangerous situations, sometimes requiring rescue. By sharing their knowledge of conditions preceding particularly dangerous situations expert observers can spread awareness to others. Key concerns for community members are 1) the limited geographic coverage of the observations program, which they would like to see expanded to additional communities and, 2) the inclusion of Inupiat and Yupik translations. Work toward implementing these changes is underway.

Current work with school teachers in Barrow, AK shows promise for using the SIZONet application as a resource for place-based learning. While direct contributions to the SIZONet application by students is not yet possible, we are exploring ways to partition the database such that students and others can contribute observations, photographs and videos using mobile devices and software applications.