Community-Driven Monitoring of Sea Ice and Eider Duck Populations around the Belcher Islands, Nunavut

Project Description

This long-term ongoing research and monitoring project was initiated by the community of Sanikiluaq in 1998 in partnership with Environment Canada, and has been administered through the Arctic Eider Society, a Sanikiluaq-based charity, in partnership with the Sanikiluaq Hunters and Trappers Association, Municipality of Sanikiluaq, Environment and Climate Change Canada and other collaborators since 2011. It focuses on the Hudson Bay Common Eider as a key resource for the community and indicator species of environmental change in the region, while also working to more holistically and systematically document key indicators of environmental change and cumulative impacts identified by Inuit, including changing sea ice and oceanographic conditions.

The Hudson Bay eider (*Somateria mollissima sedentaria*) breeds on the east and west coasts of Hudson and James Bay, and on the Belcher, Sleeper, and Ottawa Islands. The harvest of adult Hudson Bay eiders occurs in all months by residents of the Belcher Islands, with an annual harvest of approximately 2000-5000 birds. Eiders are most important to residents during freeze-up in the fall when other bird and mammal species are often inaccessible to hunters. The Municipality of Sanikiluaq is also establishing a commercial eider down harvest. These factors make the eider one of the most economically important species to the community of Sanikiluaq and a key indicator species for the local ecosystem.

Eiders breeding within Hudson Bay spend the winter in open water leads and polynyas near the Belcher Islands and off the west coast of Quebec. In doing so, the Hudson Bay eider is vulnerable to mass die-offs in winter when eiders are concentrated in open-water leads that freeze. In the 1990's the eider population was 70% lower than surveys from the 1980's, due to extreme sea ice conditions that caused a large starvation event. In recent years Inuit have reported changing sea ice and oceanographic conditions, including rapid freeze-ups at polynyas and floe edges that are important habitat for eider ducks and other wildlife including seals and beluga. These factors emphasize the need for sound information on the possible changes occurring in the sea ice habitats and how they influence populations of eider ducks and other wildlife. Our objective is to understand how changing sea ice and oceanographic conditions influence the marine food web as a key resource for the community of Sanikiluaq. This work is now documenting these indicators and wildlife distribution/abundance through more holistic year-round monitoring as a part of regular harvesting activities, and will contribute to baseline data for the proposed Qikiqtait protected areas project that will provide long term stewardship for the region and its wildlife including eiders as priority species.

Methods

The community of Sanikiluaq has driven this program since its inception in 1998. This long-term effort was formalized through creation of the Arctic Eider Society as a Sanikiluaq-based community-driven charity in 2011. The program is based on priorities identified as outcomes of ongoing joint meetings with the Sanikiluaq Hunters and Trappers Association and Municipal Council of Sanikiluaq, held multiple times each year. All work is conducted independently by, or in direct collaboration with, experienced

Inuit hunters and in close consultation with the local Hunters and Trappers Association, whom also rely on project outcomes for local co-management efforts. All results are made accessible to the community in near-real time through our SIKU online interactive platform which also provides long-term ownership, access and control of data stewardship for the community and regional Inuit organizations.

All research is non-invasive and observational. Inuit monitoring teams work independently or in partnership with researchers to document observations including the abundance and distribution of eider populations, other wildlife species and their sea ice habitats (e.g. size and dynamics of polynyas and floe edges) using a variety of photography, video and timelapse monitoring techniques and take additional observational notes using field notebooks or mobile devices (i.e. SIKU app). Observations take place at key habitats around the Belcher Islands identified as priority sites for monitoring by the community. Oceanographic indicators are measured using CTD casts (salinity, temperature depth profilers) and moorings (salinity/temperature probes) and aquadopp current meters to track changes over the winter and open water seasons. Ice core samples and water samples are also taken to document water characteristics over time. Salinity profiling and water sampling is conducted by local hunters deploying a CTD or water sampler (kemmerer) through a small hole in the ice, letting it sink, then immediately pulling it up.

The community of Sanikiluaq, and the Arctic Eider Society recognize the continued need for vigilance regarding the COVID-19 pandemic, particularly as it relates to research practices and Arctic travel. This project will at all times adhere to the public health directives provided by all responsible Municipal, Territorial and Federal health authorities and will continue to follow the guidelines and recommendations of the relevant Inuit Organizations as the pandemic evolves. As the project is driven and led by the community and is primarily based around documenting observations as a part of regular subsistence activities, it has supported food security and monitoring during the pandemic even while researchers were not visiting the community. The project will continue to draw on these strengths in 2021, and researchers will only visit the community if travel restrictions and health guidelines allow.

Camp

Most work will take place as a part of day trips from the community. Infrequent overnight trips may be made to the Environment Canada research camp (55° 49.361 N, 79° 53.925 W) to facilitate travel to nearby polynyas and floe edge by snowmachine. We will have a small amount of white gas for cooking and gasoline for the snow machines. We have a spill response plan and will have a spill kit with us at all times.

Melted snow is used for drinking and washing purposes only. Human waste will be buried in a sump away from all water sources and backfilled before leaving camp. All other waste will be transported back to Sanikiluaq and disposed of properly.

Outings will only take place if COVID-19 related health directives allow. In the case that outings are permitted, all relevant health and safety protocols will be strictly adhered to by outing participants.