

The B.I.G. (Before It's Gone) Expedition

A 5-woman ski expedition from Borden Island to Isachsen on Ellef Rignes Island across the Prince Gustaf Adolf Sea, camping on sea ice and collecting small-volume surface snow, surface ice and water samples, as well as data for two citizen science studies. The expedition route is approximately 150km and is expected to take 10 days of ski travel. While acknowledging the impact our presence will have, the design of the expedition is intended to ensure minimal possible negative impact to environment, wildlife and people.

Date of Expedition:

10th April – 22nd April 2024

Fieldwork to be undertaken:

- Sampling

At five locations along the expedition route across the Prince Gustaf Adolf Sea the expedition will collect surface snow, surface ice and (where possible) water samples in 500ml containers. No motorized or power tools are used to collect the samples – only a scoop, an ice axe and a hand augur. Weather and snow conditions will be recorded at each sample location.

- Data collection for citizen science studies

At regular intervals throughout the expedition snow characteristics will be recorded and contributed to the Snow Scope platform to an open access, citizen science database. Data will also be gathered for the citizen science Globe Observer platform, an open access database recording Arctic cloud cover.

Analysis:

The snow, ice and water samples collected by the expedition team will be analysed at the University of Colorado in the US and at the National Oceanography Centre in the UK. The samples will be analysed for black carbon, microplastic and heavy metal content to explore the distribution by the atmosphere across the Arctic region of these materials generated in northern Europe and North America. Similar expedition projects have been completed in Svalbard, Greenland and Iceland.

Output:

- Dr Ulyana Horodyskyj Pena will be analysing samples for black carbon and the results will form part of a dataset she is compiling from remote regions across the world including K2 and Antarctica. The dataset will be made freely available online. Dr Horodyskyj Pena intends to use this dataset to generate published literature and it is hoped others working in this area of scientific investigations may also use this data in published literature.
- Felicity Aston will be analysing the samples for microplastic and heavy metal content as part of her PhD studies at the University of Southampton. Her PhD project seeks to answer two questions: a) What are the source regions of microplastic and lead contaminants deposited via the atmosphere across the Arctic and what are the possible routes of transport from North America and Northern Europe? and b) What can be discovered about the cycling and incorporation of atmospheric deposition within sea ice? The results will be published as part of her thesis and associated literature. The results will be made freely available online and efforts are being made to identify ways in which any results and data may be shared usefully within Nunavut specifically.