

Iqaluit “Community Fishers” Baseline Ocean Data Collection Program

NRI - SCIENTIFIC RESEARCH LICENCE APPLICATION

Section 4, Plain Language Summary

Lead Researcher’s Name and Affiliation

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What research questions does the project hope to answer? What are the research objectives and why is the study needed?

The project aims to collect a baseline of oceanographic data such that a greater understanding of the seasonal dynamic of water exchange in Frobisher Bay can be established. This project hopes to expand to longer term monitoring such that it can begin to help understand the longer-term fluctuations and changes in the region. Baseline data is meant to be applicable to a wide range of research activities and this project is designed to support answering a number of current and future research questions that the community of Iqaluit may be interested in addressing.

Where, when, and for how long will the field research be undertaken?

The research is conducted in the head of Frobisher Bay (figure 1) and targets a number of established stations which have been determined as areas of interest and also can help characterize the regions water masses. These stations will be sampled periodically throughout the year (with the aim to have ~1-2 sample days a month). Funding for this project currently comes from the Department of Fisheries and Oceans’ Ocean Protection Plan and is only available until 31 March 2023. Ocean Networks Canada and the community members and partners we are working with hope to find further funding to keep the project going for years to come.

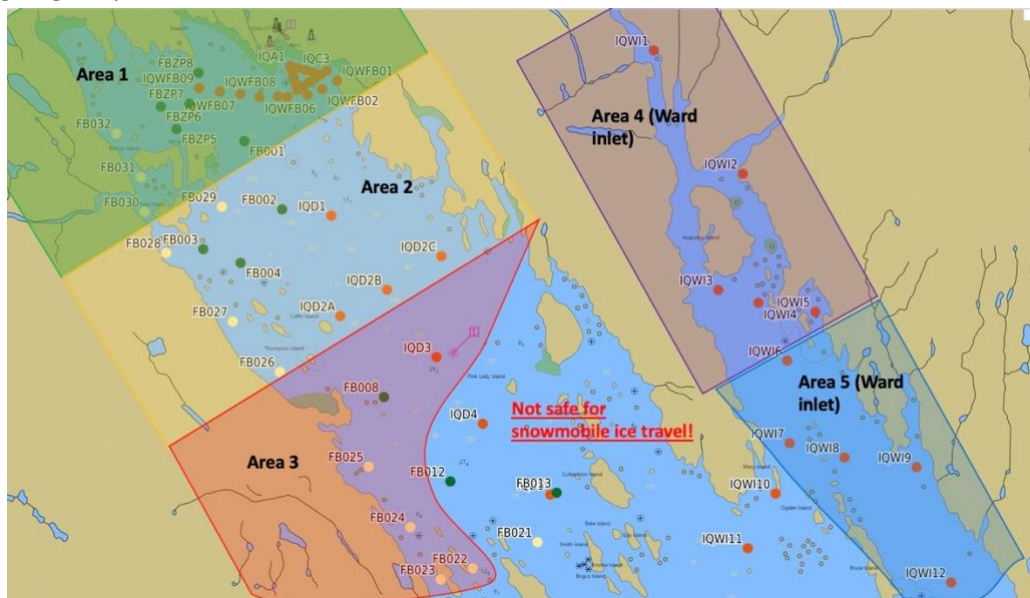


Figure 1: Map of sample sites for Community Fishers sampling locations. Area 1 is the most frequent sampling region, with Areas 2-3 stations sampled as and when weather and time permits. Area 4-5 are proposed areas, however have been out of scope in most recent sampling plans. The sampling stations are indicated by coloured dots, orange represents core stations done most frequently, green indicating areas that DFO sample and are good to duplicate and yellow stations were brought on board for a Nunavut Government project.

What methods will be used to conduct fieldwork?

A multi-parameter oceanographic instrument (“sonde”) is equipped with sensors that are considered the foundational data to study oceanography. The sonde measures temperature, conductivity (salinity), and pressure (depth), and is also known as a conductivity-temperature-depth instrument or “CTD”. Water profiles are collected through “casts” where the sonde is lowered through the water column and records digital measurements of the water properties. Additionally, this sonde is equipped with sensors that measure oxygen, chlorophyll fluorescence, turbidity, and either Coloured Dissolved Organic Matter (CDOM) or crude oil fluorescence; crude oil fluorescence is a new parameter being measured as of 2022. These additional parameters can offer insight into the biological activity (e.g. phytoplankton using oxygen and chlorophyll fluorescence) or riverine runoff (Turbidity/CDOM) and can increase understanding of the seasonal oceanographic fluctuations. With more samples over time, the data can be used to assess changes in the system in reference to a baseline of data. Alongside the use of the sonde, sea-ice thickness will be measured too. No physical samples are collected as part of this project and no hardware or infrastructure is left in place. Community members travel to the established locations, take measurements, and bring all equipment and digital/hand-written data home at the end of the day.

What impacts will the research produce impacts to the environment, wildlife, or people?

The use of a CTD is passive in that it doesn’t take any physical samples out of the environment, it is an optical-based instrument that measures variables *in-situ* (in situation of the environment it’s in). It also does not add anything to the environment. The only alteration to the environment is during the sea-ice season the field team needs to auger a ~10-inch hole through the ice so that the instrument can be lowered in to the water below.

The impacts this will have on the people are positive in that community members are paid for their direct involvement in (and leadership of) the data collection. The project is hoping to pay community members as much as \$80,000 (total) over the course of this sampling year.

How will the data generated by the research be stored and managed?

Data collected by the Community Fishers Iqaluit program will be openly accessible, stored and managed at Oceans 3.0 and easily accessible through the geospatial map: <https://data.oceannetworks.ca/GeospatialMap>.

The data is processed within approximately 48 hrs of being transmitted/submitted (Arctic data sometimes requires more manual labour to meet quality control requirements by ONC Data Specialist).

The data are available in the following formats:

- Quality Assured Quality Controlled (QAQC) water profile data files which are binned and averaged (.cor files)
- RAW data access
- Water profile plots of QAQC data
- New additional prototypes of data display are currently being explored

Efforts are being made to make Community Fishers data available in the Canadian Integrated Ocean Observing System in the next year (CIOOS, <https://www.cioos.ca/>)

How will Nunavut residents be involved in the research?

Community members are key to this project in that they identified the initial questions and concerns that the data is meant to address, they provide ongoing leadership and guidance on how to work within the community and where and how to collect data, and are directly responsible for all data collection activities. The Community members are directly involved in the station and location planning and continue to be consulted on sampling plans.

Ocean Networks Canada provides a University accredited, two-day course to all community members before they take part as part of the field team (see <https://www.oceannetworks.ca/get-involved/training/> for more details); this builds capacity within the community by helping to enable community members to conduct high-quality training in a safe and consistent way. Training also provides an initial insight into interpreting oceanographic data and Ocean Networks Canada aims to continue to foster this capability by holding workshops that will further improve the community's ability to access and use the data.

How, when, and to whom will the research results be shared in Nunavut?

Data from this project along with previously collected baseline data will be incorporated into an oceanographic overview of Frobisher Bay in the sampling region. Results will be presented in data fact sheets in English and Inuktitut along with a concluding community co-produced workshop to disseminate results from the Community Fishers project to the community, and to discuss how findings may be integrated with local Indigenous knowledge and other projects being conducted in the area. This will also be a chance to discuss ways to improve information dissemination and what might be possible for future research. A final report of data and workshop input will be created and shared in both Inuktitut and English