

Title: Ocean Measurements in Frobisher Bay for Ecosystem Science and Spill Response

Who: Integrated Marine Response Planning (IMRP) program, Science Sector, Arctic Region, Fisheries and Oceans Canada (DFO). Ryan Galley (ryan.galley@dfo-mpo.gc.ca) is the planning coordinator for the DFO-IMRP program in the Arctic Region. David Capelle (david.capelle@dfo-mpo.gc.ca) is a DFO research scientist and oceanographer in the Arctic Region.

What: We propose an oceanographic mooring in Frobisher Bay to measure ocean currents throughout the water column, tides, sea ice motion and thickness, wave height and frequency in open water conditions, and the salinity and temperature of the water at depth. The mooring will consist of an anchor (usually one or two train wheels), a release, an RBR CTD, a Nortek 250 khz acoustic doppler current profiler and associated floatation. We envision a multi-year deployment beginning in autumn 2025 from a Canadian Coast Guard (CCG) ship-of-opportunity. There are currently five people involved in this project.

Why: In their 2019 final report for the strategic environmental assessment in Baffin Bay and Davis Strait (Volume 2), the Nunavut Impact Review Board (NIRB) pointed out a gap in chemical and physical oceanographic knowledge in Davis Strait, Baffin Bay, and Frobisher Bay. This lack of oceanographic data in Frobisher Bay makes it challenging to create reliable oceanographic model results for the region. The objective of this proposal is to gather ocean data in Frobisher Bay to enhance scientific knowledge of the physical environment and the regional ecosystem. These data are necessary to improve models of marine petroleum product spill trajectories and project likely impacts of marine spills over the entire annual cycle. Knowledge and understanding of ocean properties in Frobisher Bay will also improve comprehension of fate and behaviour of a wide variety of other potential pollutants in the region. Our goal is to accurately estimate where pollutants will end up, how fast they will get there. In addition, we will work with the Canadian Hydrographic Service (CHS) to provide information on surface currents for their navigational charts to improve navigational safety in Frobisher Bay. All while ship traffic in the region continues to increase annually.

Where: We propose to moor oceanographic instrumentation in the water column northwest of Pike-Resor Channel in or near the shipping lane to Iqaluit. The depth of the proposed location is approximately 115 m. This location is about 46 km from Iqaluit, and from the Iqaluit Kuunga (Sylvia Grinnell) and Qaumaarviit Territorial Parks at the northwest end of Frobisher Bay.

When: Ideally this oceanographic mooring would be initially deployed in autumn 2025. This ship-borne operation performed by 3-4 personnel is anticipated to take a couple of hours. The mooring is designed to be retrieved and replaced once per year in the autumn so the data can be downloaded from the instrumentation and analyzed. The proposed activity is multi-year.