

Canadian Ranger Ocean Watch (CROW)

How can DFO & the Canadian Rangers work together to monitor the southern Northwest Passage?

Key messages

- CROW combines the northern transportation and observation skills of the Canadian Rangers with science from Fisheries and Oceans Canada.
- Canadian Rangers conduct year-round observations of ocean conditions near Kitikmeot communities over a long period of time.
- This project contributes to studies on climate change and marine ecosystems.
- By partnering with the community, this project ensures that local concerns and ocean conditions inform ocean science.

Project leaders*:

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Who we are

The team includes scientists and technicians from Fisheries and Oceans Canada (DFO) and Rangers from 1 Canadian Ranger Patrol Group (1CRPG). This project is supported by DFO, Polar Knowledge Canada (POLAR), and the Department of National Defence (DND).

What we do

CROW is a DFO collaboration with 1CRPG to gather baseline data in the southern Northwest Passage. 1CRPG uses specialized instruments supplied by DFO to collect samples of sections of the water, from surface to bottom. Rangers measure temperature, depth, and the amount of salt, oxygen, and plant material in the water. Rangers also measure ice and snow thickness. At a small number of stations, Rangers take zooplankton samples, set up ice temperature buoys, and sample water for dissolved carbon dioxide and nutrients.

How do we do it

DFO supplies scientific equipment, training, and study of ocean information. 1CRPG supplies the services of Canadian Rangers to conduct ocean sampling. The Canadian Rangers provide their on-ice excellence and unmatched observational skills for baseline ocean monitoring.

Baseline monitoring

Although rare, continuous year-round observations are needed in the Arctic to detect changes in the ocean environment that may impact fish, wildlife, and the people that depend on them.



Jimmy Evalik recovers a plankton net through a hole in the ice: Mike Dempsey

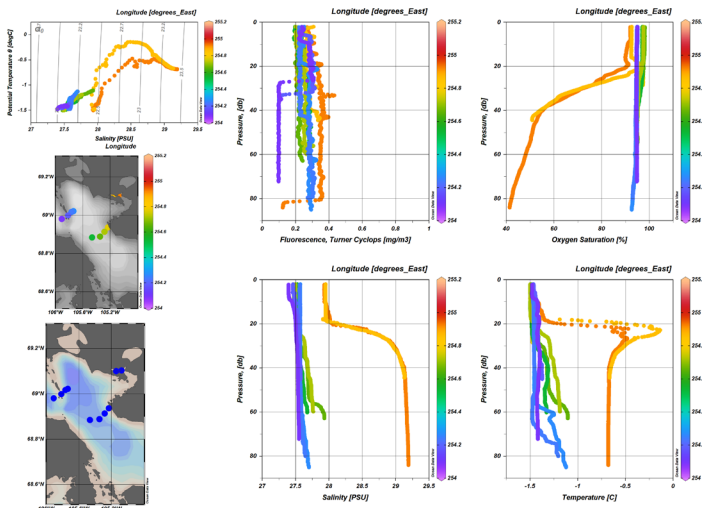


Why this matters

It can be difficult and expensive to conduct observations of ocean conditions in the Canadian Arctic. Until recently, all ocean science was done from large ice-breaking ships in the summer from July to October. CROW enables observations and sampling to continue through the ice-covered months with small projects using snowmobiles. It also enables ocean science to use local and Indigenous Knowledge and expertise.

Year-round observations contribute to studies on climate change and marine ecosystems. 1CRPG members offer their own perspectives on baseline conditions and how things may be changing. Ice and snow measurements are useful for monitoring local conditions. They also help researchers improve their understanding of satellite images according to observations on the ground.

Standard measurements of narrow sections across Dease Strait and Dolphin and Union Strait help researchers understand how ocean water circulates in the Kitikmeot region of the Northwest Passage. Water entering Coronation and Queen Maud Gulfs adds nutrients to the region, which is dominated by freshwater input from mainland rivers.



In 2020, measurements in Cambridge Bay and Dease Strait show how water is well mixed in the strait but layered in the bay. In the deep hole (82 m) in Cambridge Bay, oxygen levels are low, as the water is only lushed out approximately every five years.



Tommy Epakohak (left) and Ryan Angohiatok pull a CTD instrument up from the ice during CROW 2020 near Finlayson Islands: Mike Dempsey

CTD Instruments

Researchers can observe the layers in the ocean using instruments that measure the amount of salt dissolved in water (conductivity), temperature, and depth. These instruments sometimes have extra sensors to measure the oxygen and plant material dissolved in water. By using many profiles across a strait, researchers can model oceanographic profiles. In other words, they can see how ocean layers form from shore to shore.

Community-based science

People living in a study area have an interest in monitoring the ocean that sustains them. Employment and training opportunities are created by involving the community in research activities. In northern locations, observations made by community participants help to reduce travel costs for southern-based research.

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