

# Towards a community-based ocean observing system for coastal Labrador

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## 1 Introduction

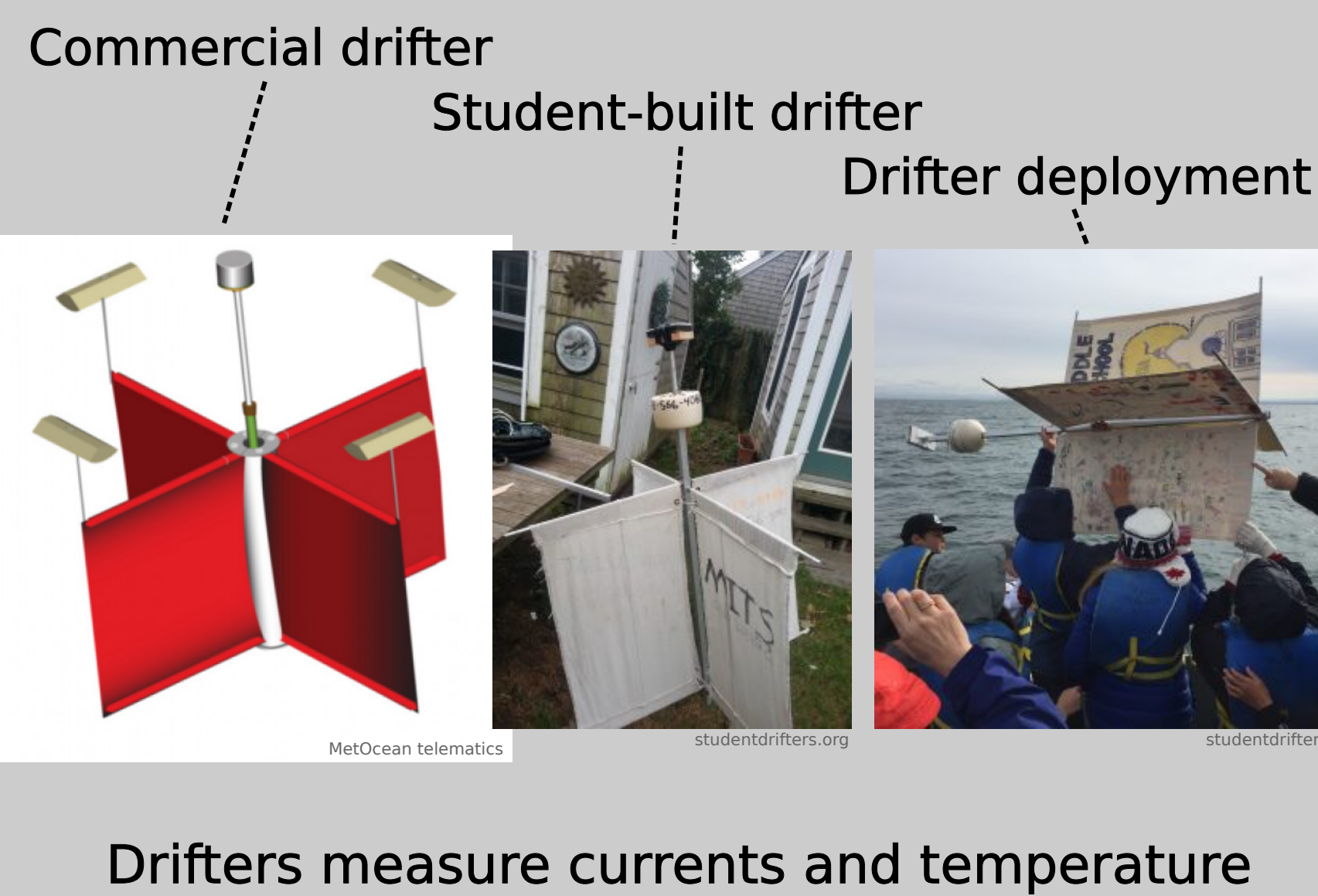
- The ocean and climate in the Labrador region are rapidly changing
- Air temperatures have risen 2°C since 1993, and sea ice has declined nearly 75% since 1968!
- We need to monitor these changes, but ocean observations in coastal Labrador are sparse
- Communities are on the front line, and are ideally placed to monitor climate change

## 2 Philosophy

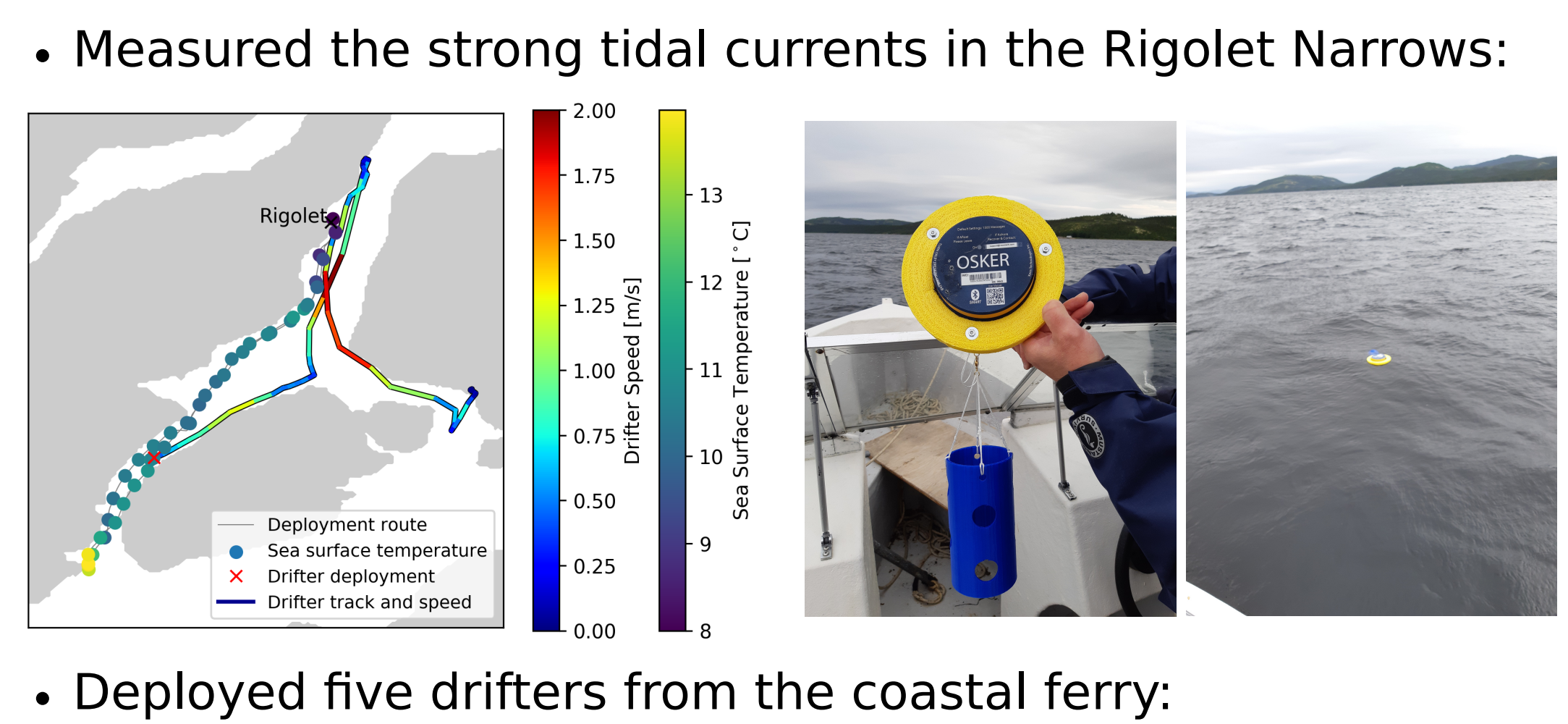
- Community-based monitoring, supported by external funds and equipment
- Increasing density of observations in the region:
  - Data Gap 1: The Coastal and inner shelf zones
  - Data Gap 2: During the ice-covered season
- Two-way exchange of knowledge and experience for (i) capacity building in communities and (ii) challenging the traditional way in which science is done
- Help efforts to record traditional knowledge (TK)
- Foster inter-generational knowledge transfer
- Co-development of research to maximise benefit, ensure respect, and build relationships
- Combine TK and scientific measurements to be complementary and on equal ground
- **Research should address community concerns, interests and priorities**

## 3 Ocean Drifters

- Drifters move with ocean currents and report their position via satellite in real-time
- Simple yet effective way to measure the ocean
- Available commercially, or can be built from basic materials (wood, aluminum bars, sheets, etc)
- 3-year project will (i) deploy commercial drifters from ferry, (ii) build drifters with community youth and deploy locally, and (iii) run TK sessions to record knowledge about coastal currents and foster inter-generational transfer

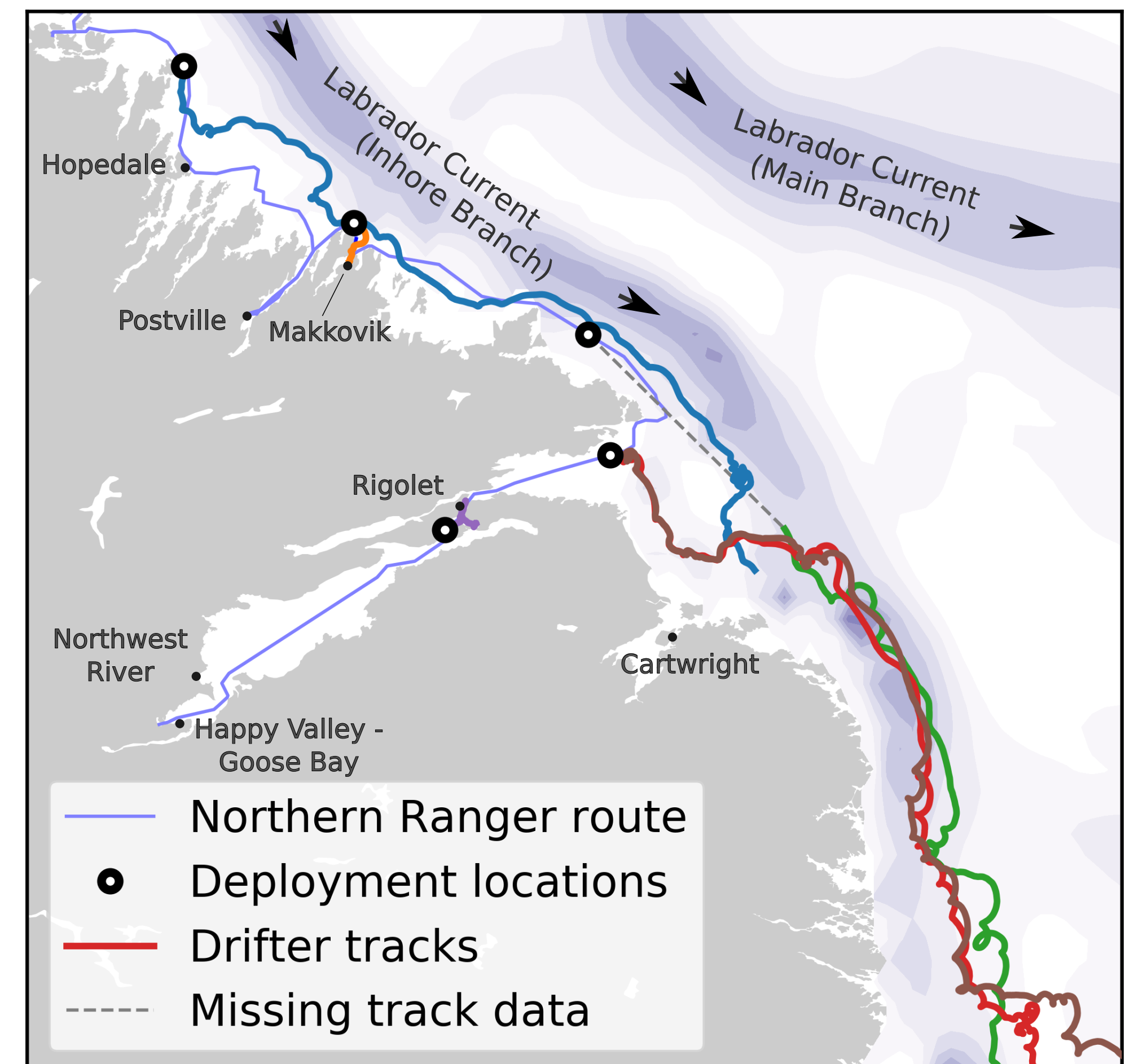
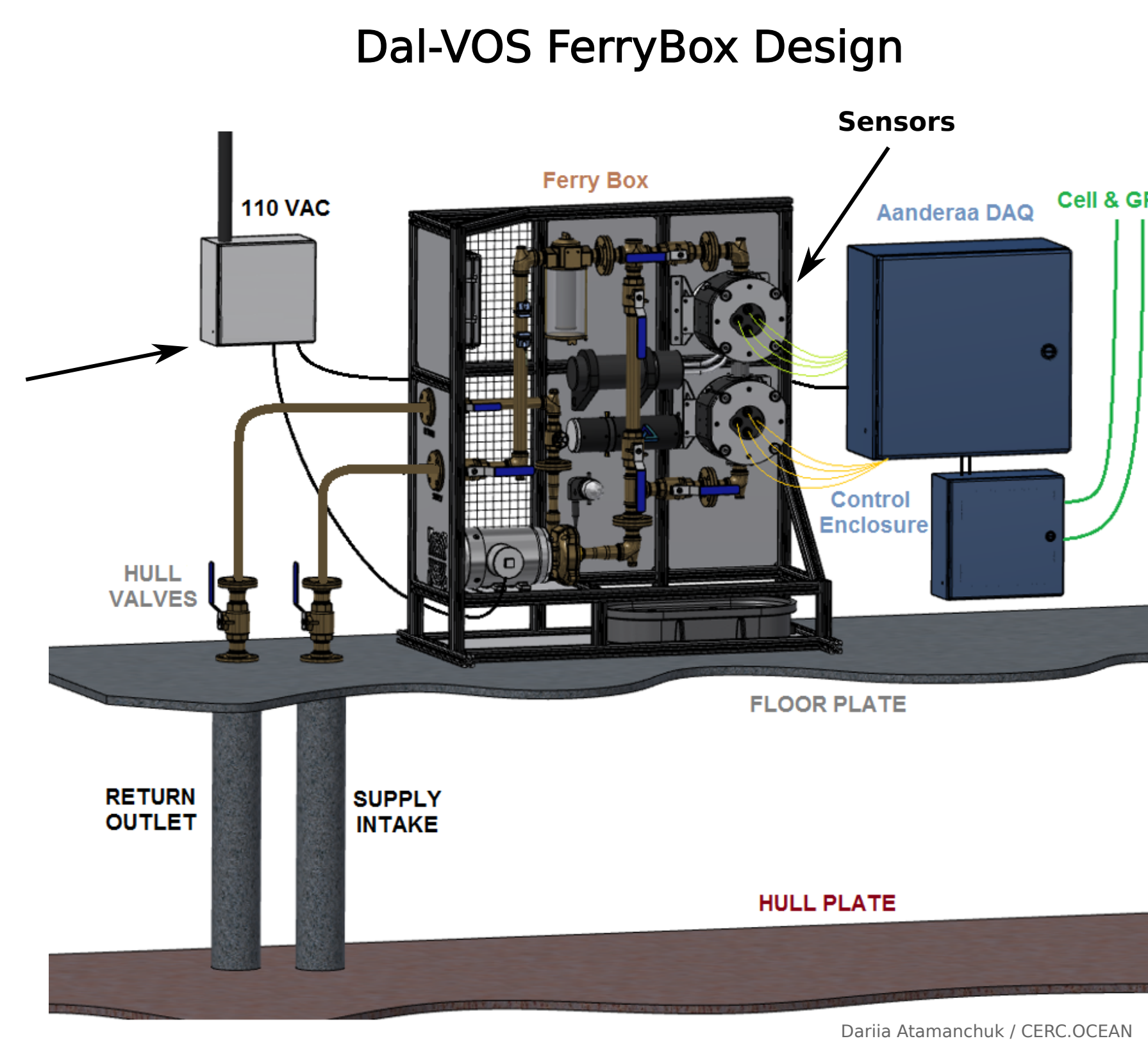


### Pilot deployment of commercial drifters in August 2018



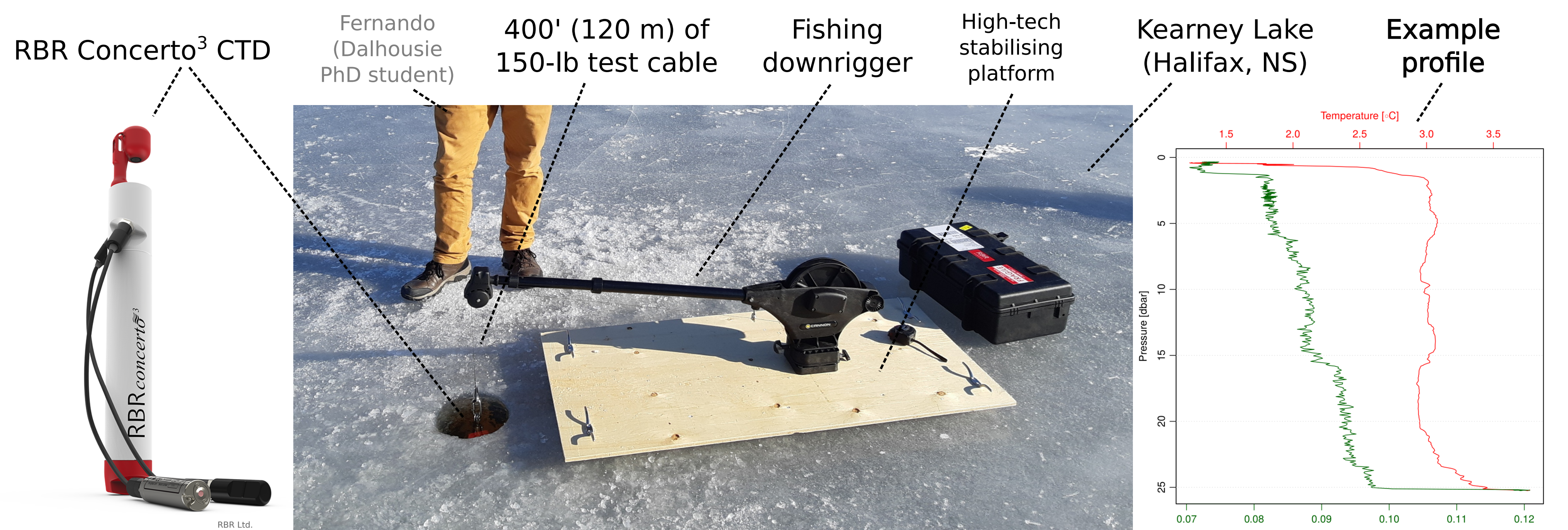
## 4 Volunteer Observing Ship

- A Volunteer Observing Ship (VOS) is a vessel outfitted with equipment to automatically measure the ocean and the atmosphere
- Dal-VOS FerryBox takes seawater directly through the hull and runs it through a series of sensors, and the data are stored along with the ship's position
- Starting in June 2019 the Kamutik W, serving the North Coast, will be outfitted as a VOS
- Will provide unprecedented weekly to bi-weekly measurements of temperature, salinity, oxygen, chlorophyll, etc all along the coast
- The data will link changes in the coastal zone and the inner shelf with the well-observed offshore, and inform management and adaptation plans



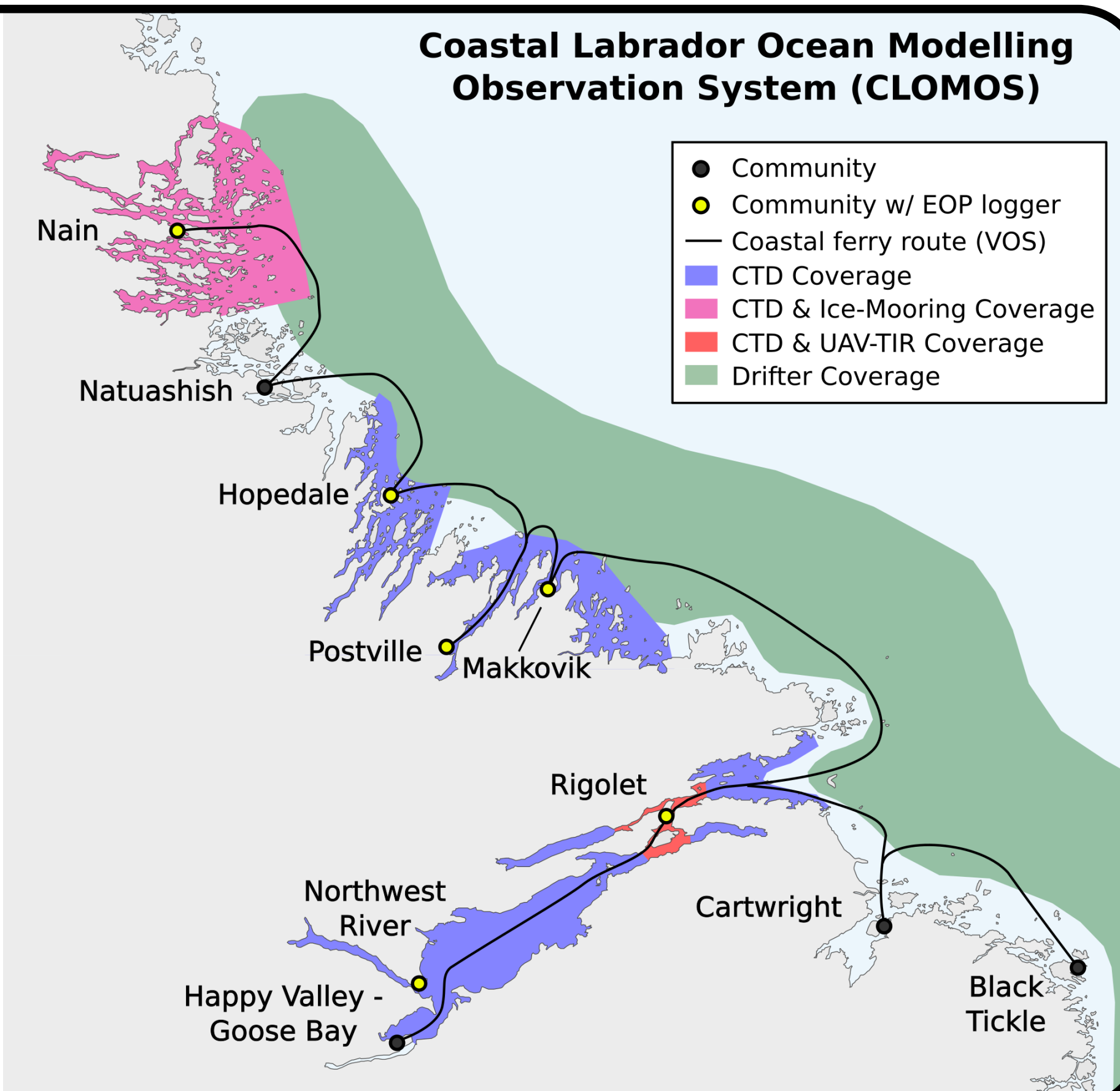
## 5 Under-ice Profiling

- The ice-covered season represents a huge data gap, as it is typically seen as a "shipping hazard"
- For Labradorians, the ice facilitates travel, and the climate during the ice season is of great importance
- We will take advantage of the sea ice as a platform to make under-ice measurements of the ocean
- A Conductivity-Temperature-Depth (CTD) instrument can be lowered through an ice hole, measuring water properties from the ice to the ocean bottom
- Modern CTDs are light (2 kg), can run off AA batteries, and transfer data via wifi in the field!



## 6 Future Plans...

- Funding is being sought to expand the observing system to include:
  - CTDs with sensors for biology and chemistry e.g. productivity, oxygen, pH, etc...
  - Temperature and Temp.-Depth loggers for "End of Pier" (EOP) monitoring
  - Thermister strings and Acoustic Doppler Current Profilers (ADCP) for measuring temperature and currents under the ice
  - Drone-based temperature (UAV-TIR) monitoring



## 7 Acknowledgements & Funding

- For more information including maps & data please visit:

[www.conoc.ca](http://www.conoc.ca)

Community-based Observation of Nunatsiavut Ocean Circulation (CONOC)

- Funding & Partners:

