Lessons learned from operating Remote Automated Weather Stations (RAWS) in coastal Labrador

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Introduction

Inuit and other northerners use observations of current conditions and their knowledge of **weather, water, ice and climate (WWIC**) indicators to predict safe travel on land, on water and on sea ice (Bishop et al., 2025). However, the number of Environment and Climate Change Canada weather stations in northern Canada reporting multiple climate variables has fallen since the 1980s (Way, 2022). Northern communities and researchers have rushed to fill these gaps created by service cuts.

In partnership with communities, governments and local organizations, six satellite-based remote automated weather stations (RAWS) were established by the Northern Environmental Geoscience Laboratory (NEGL) in summer 2019 near the communities of **Black Tickle, North West River, Postville, Red Bay,** and **Rigolet**, with another station along the Trans Labrador Highway **(Cartwright Junction)** to support fire weather forecasts. In operation for over 5 years, these RAWS have been a key source of weather information for community members.

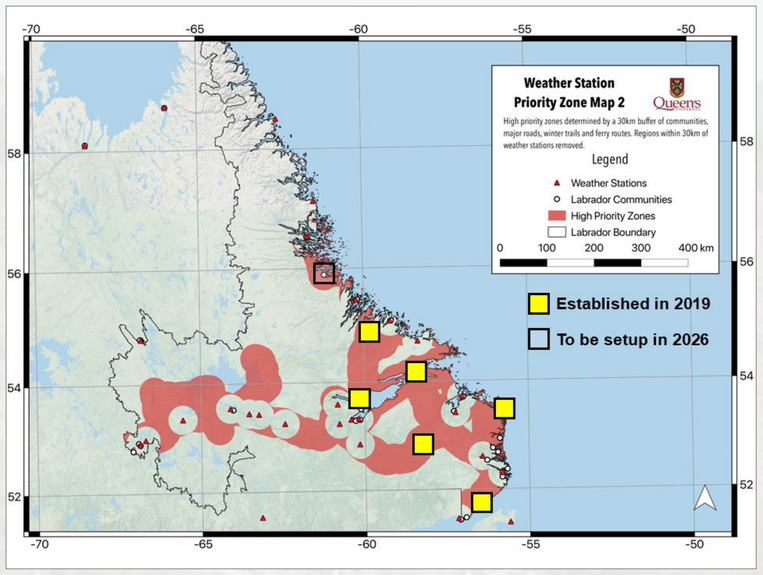


Figure 1: RAWS network established by the Coastal Labrador Climate Weather Monitoring Program in 2019.

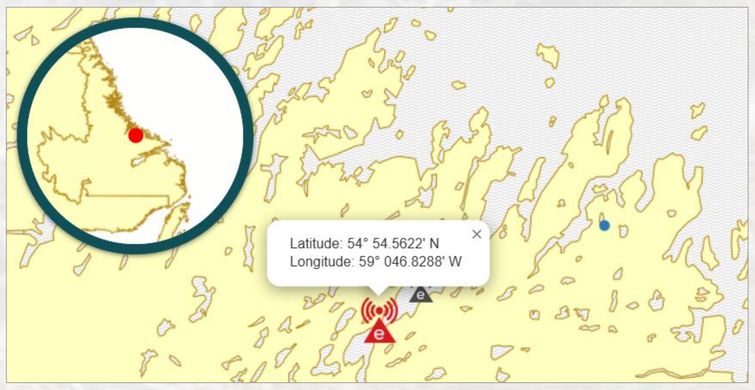
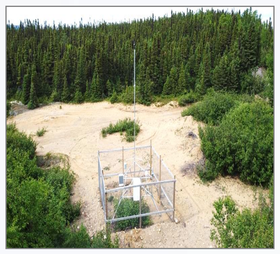


Figure 2: Postville, Nunatsiavut RAWS via SmartAtlantic.ca.

Acknowledgements

Water Resources Management Division and Department of Fisheries, Forestry and Agriculture of the Government of Newfoundland and Labrador (logistical support). Nunatsiavut Government (permitting & logistical support), Rigolet Inuit Community Government (permission), Postville Inuit Community Government (permission), community of Black Tickle (permission), community of North West River, community of Red Bay (permission), NunatuKavut Community Council (permitting), SmartAtlantic Alliance (website support), Centre for Applied Ocean Technology (CTec) (website support) and Centre for Ocean Ventures and Entrepreneurship (COVE) (website support). Indigenous Community Based Monitoring Program (financial support), Natural Sciences and Engineering Council of Canada (financial support), Queen's University (financial support) and Canada Research Chairs Program (financial support). Community members: Eldred Allen (Rigolet), Jeffrey Keefe (Black Tickle) and Steven Michelin (North West River).

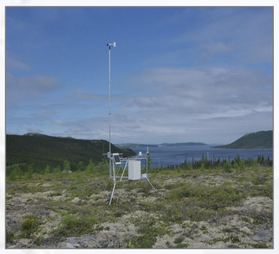
RAWS in Black Tickle, NL established on 2019-07-28.



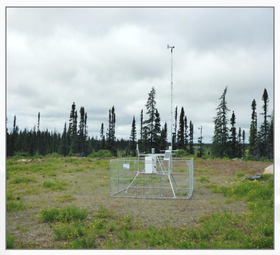
RAWS in North West River, NL established on 2019-08-16.

RAWS in Postville, Nunatsiavut established on 2019-07-17.

RAWS near Red Bay, NL established on 2019-08-06.

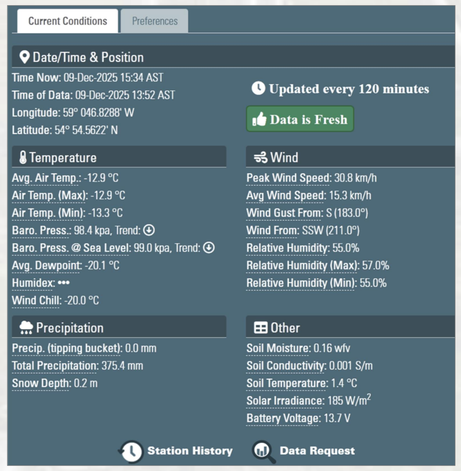


RAWS in Rigolet, Nunatsiavut established on 2019-07-18.

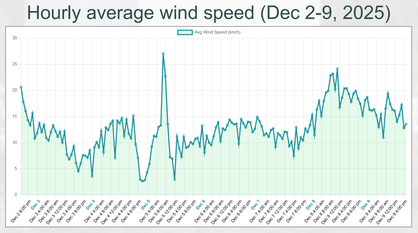


RAWS near Cartwright Junction, NL established on 2019-08-06.

Data visualization via SmartAtlantic



Hourly average wind speed (Dec 2-9, 2025)



Hourly average air temperature (Dec 2-9, 2025)

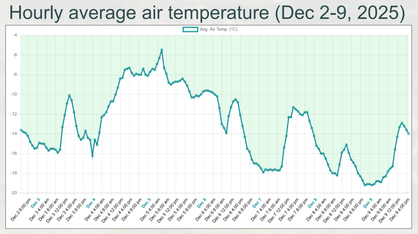
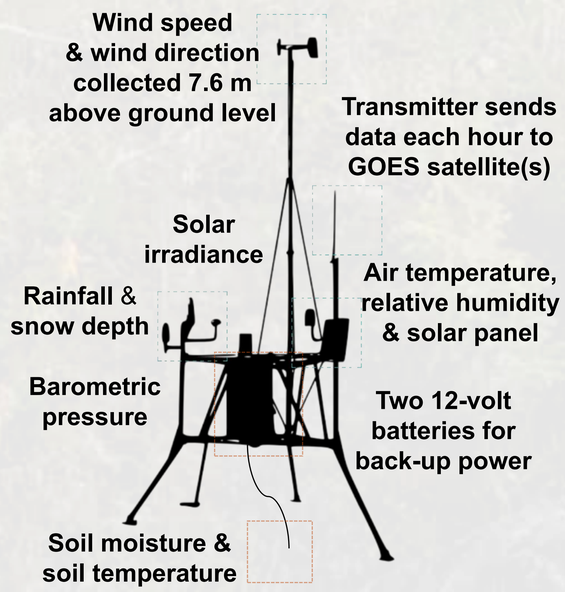


Figure 3: SmartAtlantic data portal and example interactive graphics for RAWS in Postville, Nunatsiavut. Images retrieved on December 10th, 2025.

Configuration of deployed RAWS (FTS Inc.)



Successes

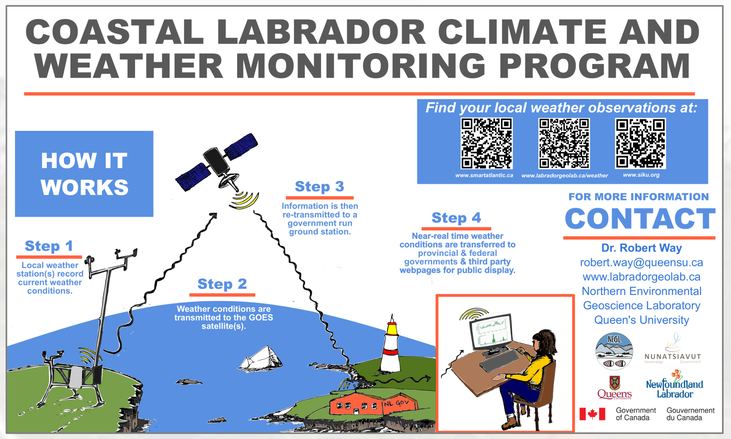
RAWS have been **kept operational for over 5 years** during a challenging period which included major travel restrictions.

Data from RAWS has been incorporated into fire weather forecasting and allowed the **creation of a new 'northern' fire forecast zone** in Labrador.

Interest from communities has resulted in the **calculation of additional metrics** including windchill, which are used by local schools in Nunatsiavut to decide on closures.

The project team supported the Innu Nation and Parks Canada in **establishing their own RAWS** in Akami-Uapishkᵁ-KakKasuak Mealy Mountains National Park Reserve in 2022.

RAWS data have been used by local weather observers, television weather forecasters and Environment and Climate Change Canada staff.



Challenges

Multi-year **delay in establishment** of RAWS in the Mushuau Innu community of Natuashish, Nitassinan, northern Labrador.

Failure of multiple SR50A snow sensors between 2020 and 2023 led to **significant snow data loss** at a variety of stations.

The Meteorological Service of Canada has been **slow to incorporate data** from non-government RAWS into operational forecasting products used by community members.

Closure of three Government of Canada weather stations in Nunatsiavut since 2017 has left the region even more reliant on the NEGL RAWS network.

Continued operation of RAWS in Labrador **requires additional long-term funding** for maintenance and community employment, which is difficult to acquire for non-research focused projects.

Engage with Local Weather

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See the story behind the **Labrador RAWS network**