

# 23 Years of Newfoundland and Labrador's Real-Time Monitoring Network

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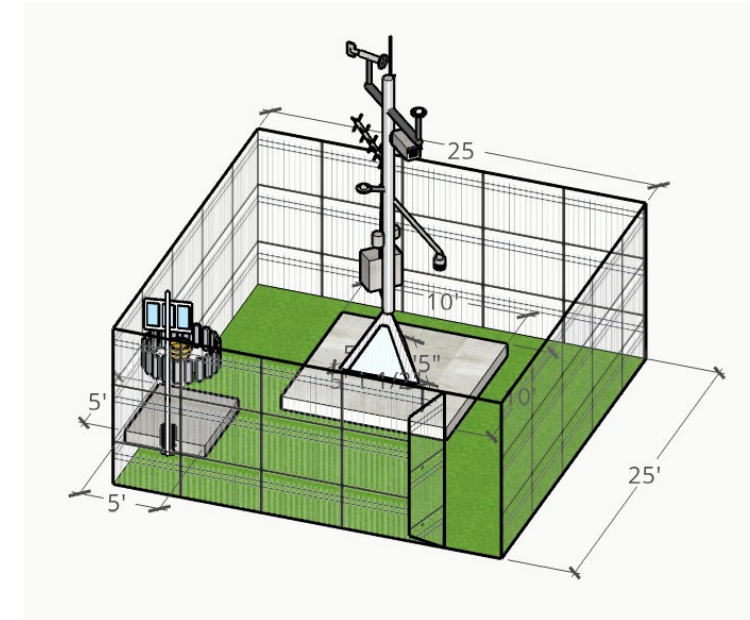
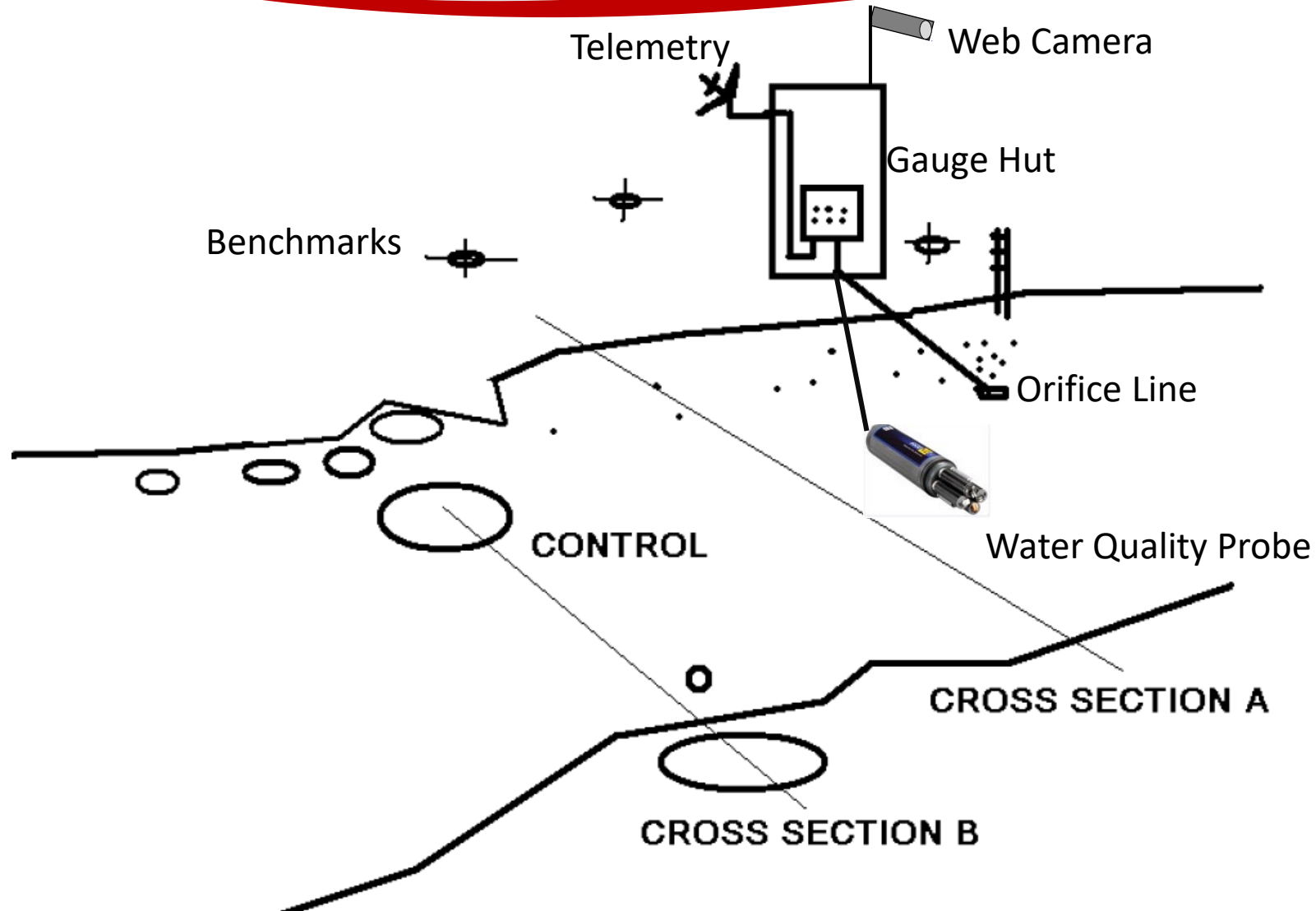


# How Did the Program Begin?

How do we balance water resources management with industry?



# Real-time Monitoring Networks





# 2001 – Real-time Water Quality Pilot Project

- Pilot station initiated in September 2001 at Leary's Brook, St. John's co-located with an existing hydrometric station
- Older model of Hydrolab (H20) loaned from Environment and Climate Change Canada
- Partnered and established a station that had:
  - Real-time water installation
  - Sutron hookup
  - SDI-12
  - Measured pH, temperature, conductance in 15 minute intervals





# 2003 - Addition of Industry Partnerships

- First industry partnership was with Vale – Voisey's Bay, Labrador in 2003
- Four surface water quality and quantity stations were installed





# 2004 - Addition of Climate Monitoring

- Climate monitoring is critical in water resources management and allows for:
  - interpretation of water quality changes
  - study of meteorological parameters
  - climate change research and adaptation





# 2009 - Addition of Web Cameras

- The addition of web cameras allow for real-time viewing of:
  - flood monitoring
  - ice monitoring
  - conditions at a monitoring station





# 2010 - Addition of the Mobile Environmental Monitoring Platform (MEMP)

- Allows for site specific monitoring for:
  - Flood forecasting
  - Drinking water supplies
  - Blue green algae
  - Rapid response to:
    - Floods
    - Spills





# 2010 - Addition of Groundwater Monitoring

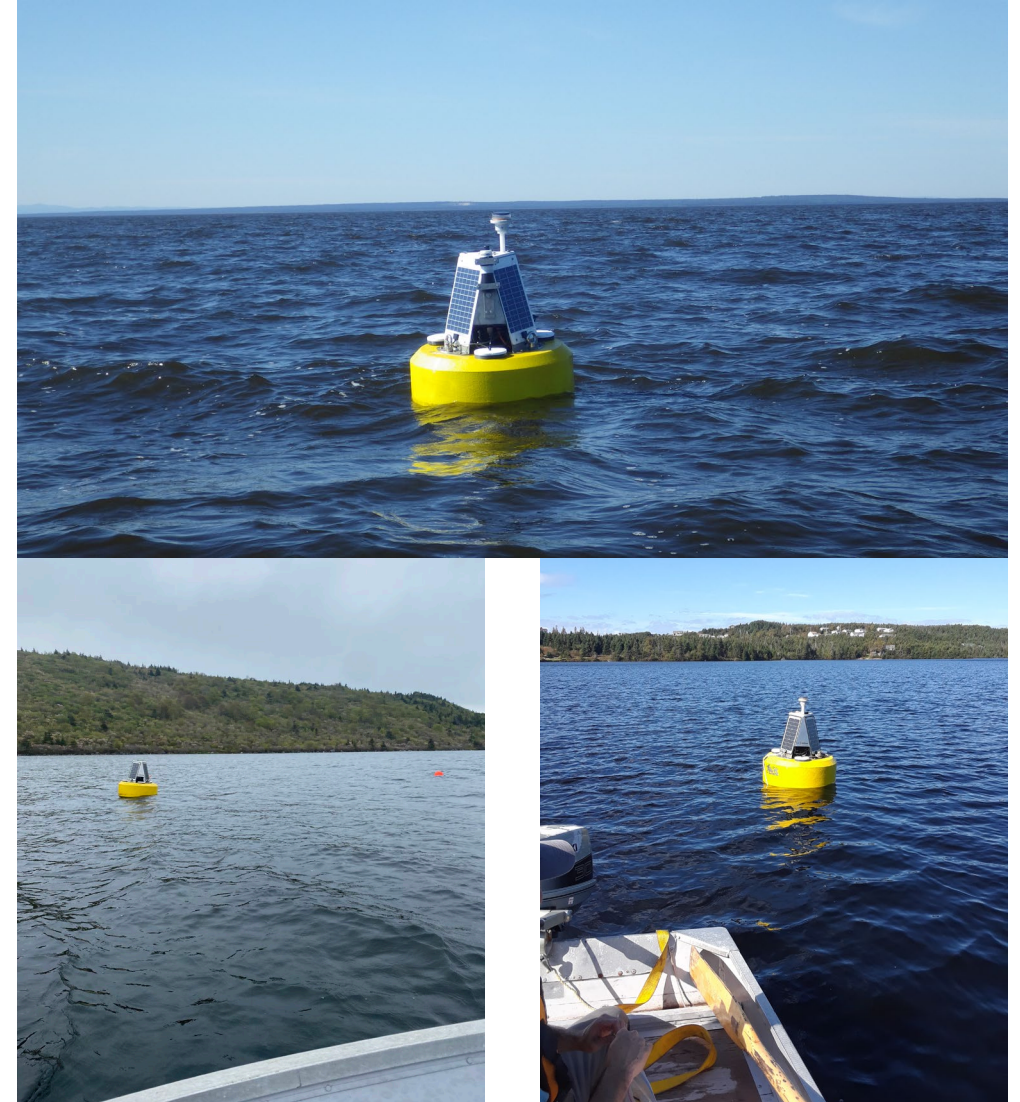
- Allows for the study of how groundwater can be impacted by industries such as mining and aquaculture





# 2015 - Addition of Buoy

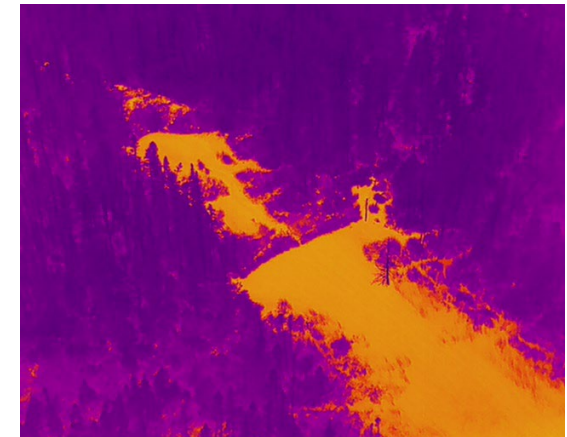
- Buoy allows for deployment of instrumentation in a pond, lake or bay.
- Initially installed in Lake Melville (brackish) but weather conditions were not conducive to this technology.
- Has been installed in freshwater ponds for a number of research initiatives:
  - Pond turnover
  - Blue-green algae





# 2016 - Addition of UAV/Drones

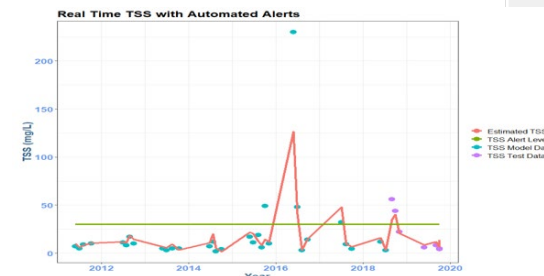
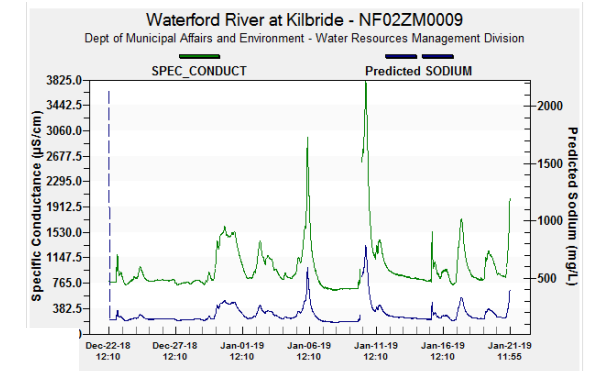
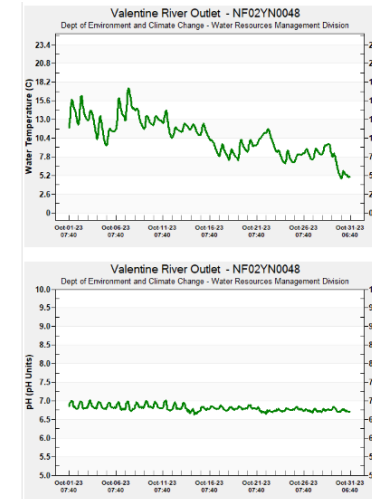
- Applications of UAV for water resources monitoring:
  - Blue-green algae bloom extent mapping
  - River ice mapping and product confirmation
  - Flood event emergency response
  - Dam inspections
  - Watershed surveillance and change detection





# Real-time Monitoring Products

- Data displayed online for stakeholders & public
- Deployment/Annual/Multi-Year Reports
- In-house Equipment Proficiency Program
- Calculating Parameters through Regression Modeling
- Calculating TSS using Turbidity Values





# It Hasn't Been All Successes

Two steps forward and one step back is still progress



Bartlett's River: hit by a car



Labrador West: slowly eaten by porcupines



Piper's Hole: washed into trees by floodwaters



Torbay: caught on fire by vandals

Churchill River: erosion





# Current Status of Monitoring Networks



- 6 provincial network stations
- 40 industry network stations (12 Partnerships)
  - 26 surface water
  - 14 groundwater
  - 25 on the Island
  - 15 in Labrador

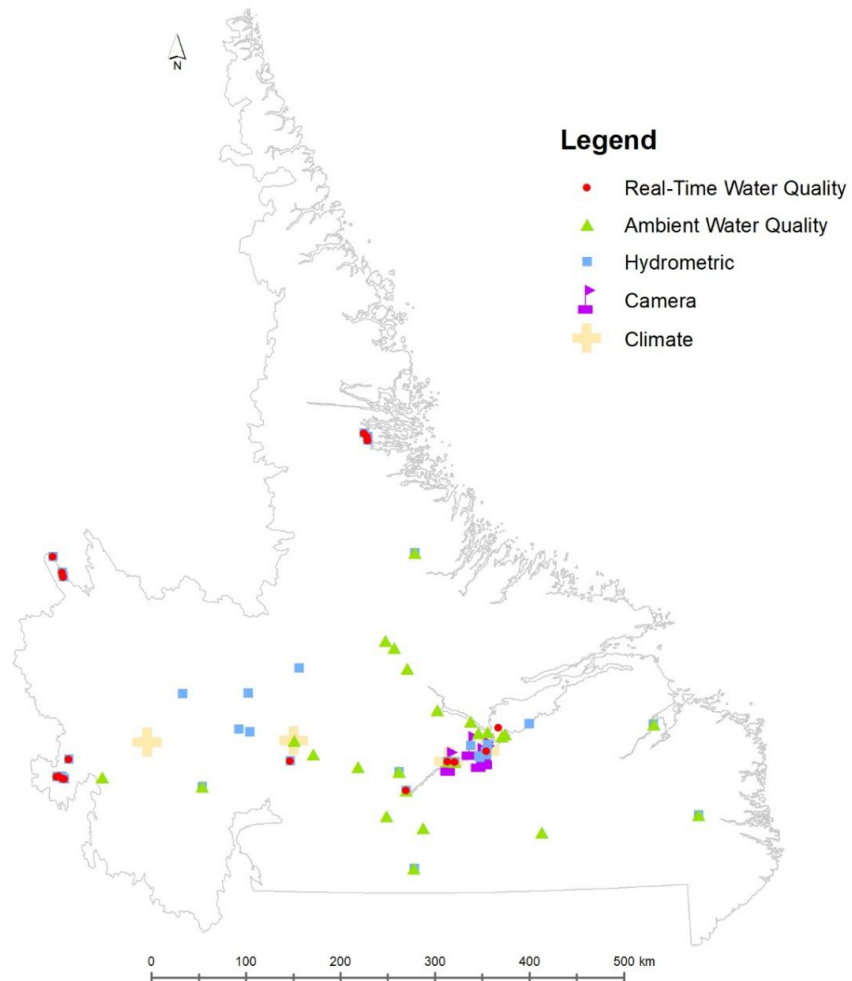
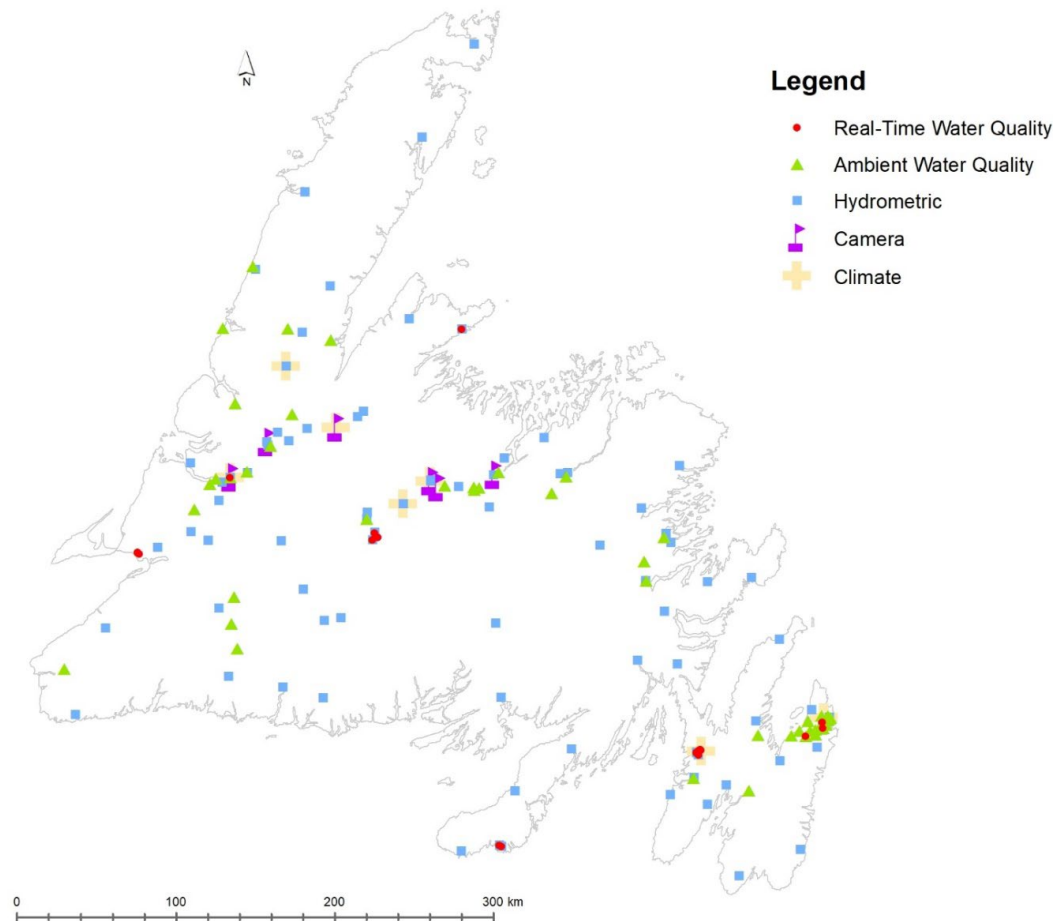
- 116 hydrometric stations operated by ECCC
- 10 hydrometric stations operated by WRMD

- 16 web cameras
- 1 rapid-deploy web camera for emergencies

- 13 climate stations operated by WRMD



# Water Monitoring Networks in NL





# Education and Information Sharing

## Canadian Perspective:

- First Real-Time Monitoring Workshop in 2007
- Educational Institutes (MI)
- Display at Fluvarium
- National and International Conference Presentations

## International Perspective:

- Share real-time monitoring knowledge with Egypt, Jordan





# Strength of the Program is Partnership!

Current Real-Time Network Partners in NL:

- Mining industry



**Teck**



- Hydroelectric industry



- Aquaculture



Partnership between federal government, provincial government and industry can minimize the impact to aquatic ecosystems due to surrounding development







# Questions?