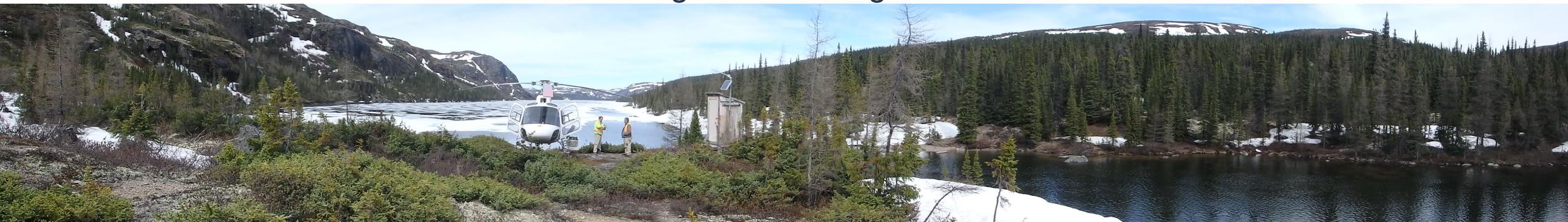


23 Years of **Newfoundland and Labrador's Real-Time Monitoring Network**

Annette Tobin, P. Eng.

Manager – Water Agreements



How Did the Program Begin?

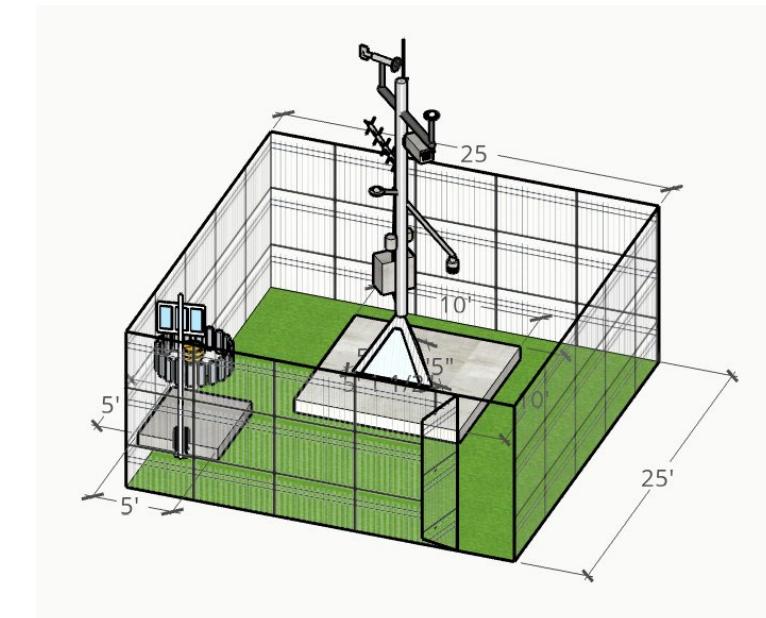
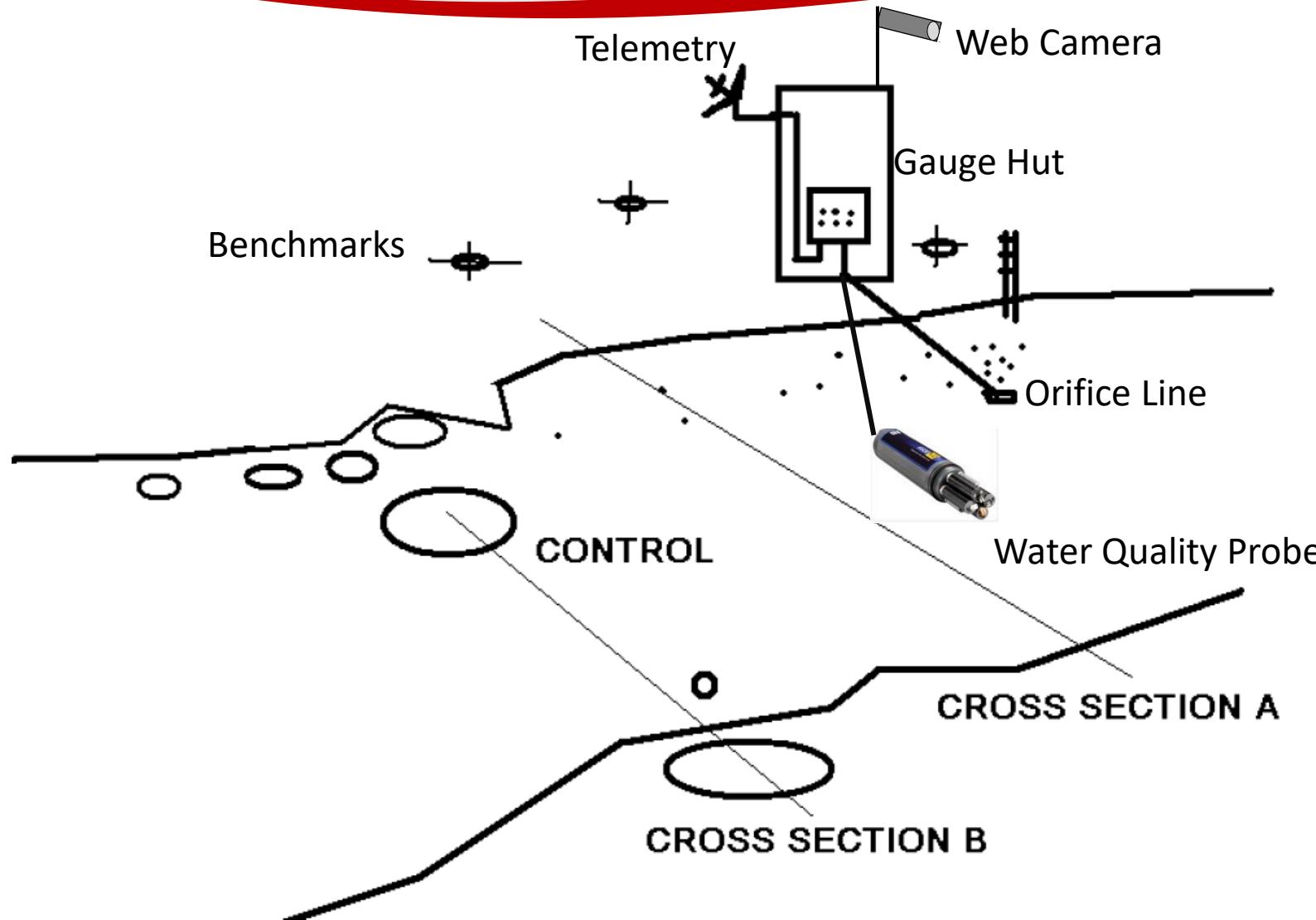
How do we balance water resources management with industry?



Monitoring



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



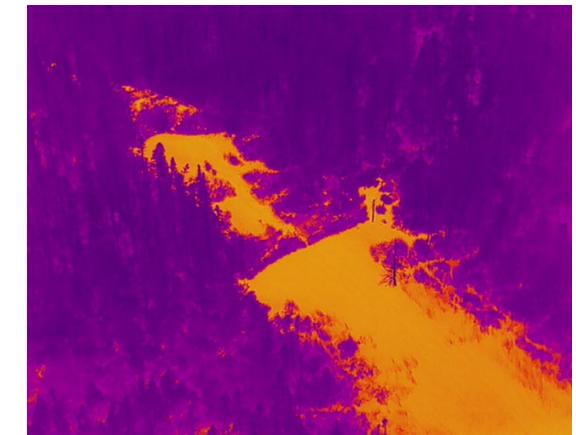
2015 - Addition of Buoy

- 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



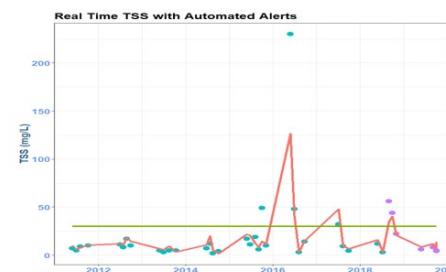
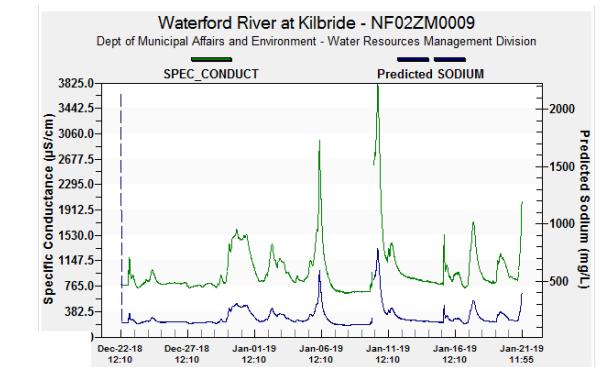
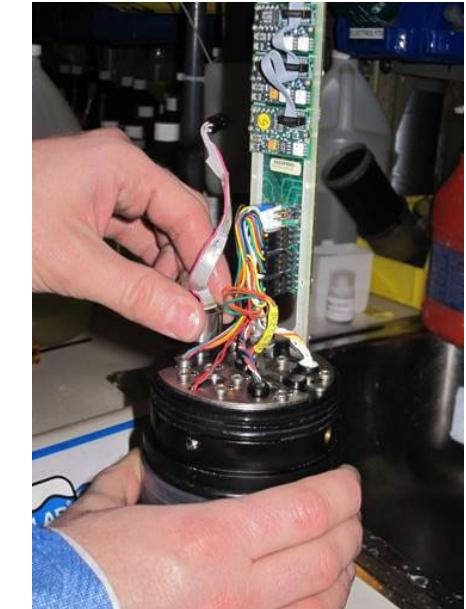
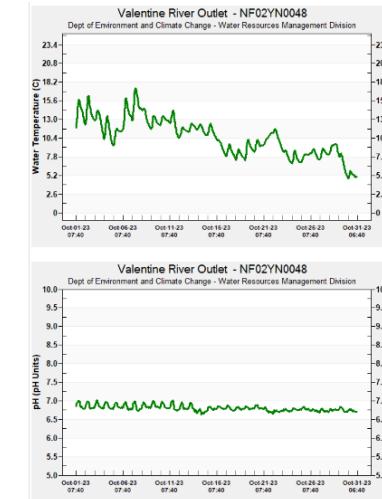
2016 - Addition of UAV/Drones

- 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



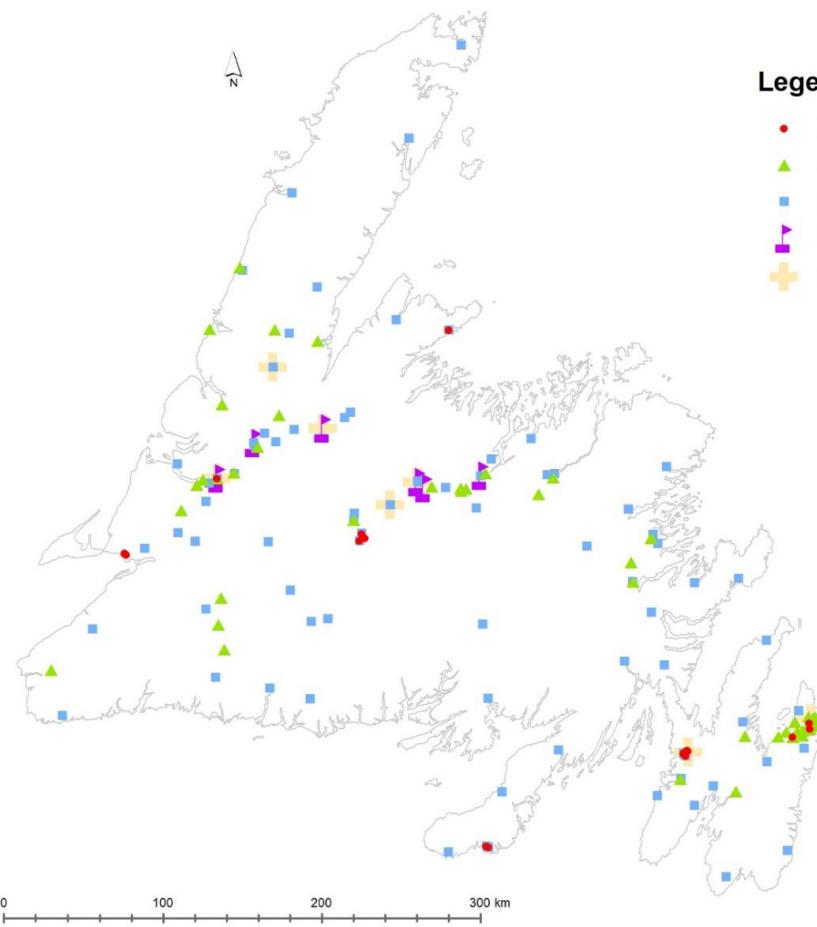
Churchill River: erosion

Current Status of Monitoring Networks



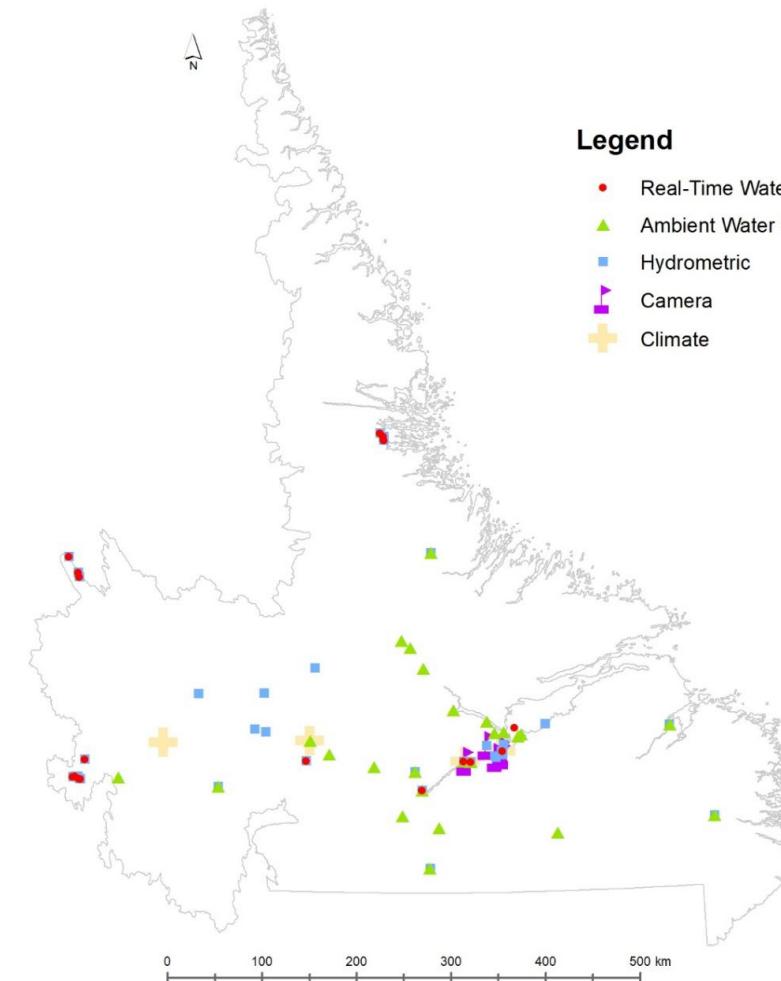
- 6 provincial network stations
- 40 industry network stations (12 Partnerships)
 - 26 surface water
 - 14 groundwater
 - 25 on the Island
 - 15 in Labrador
- 116 hydrometric stations operated by ECCC
- 10 hydrometric stations operated by WRMD
- 16 web cameras
- 1 rapid-deploy web camera for emergencies
- 13 climate stations operated by WRMD

Water Monitoring Networks in NL



Legend

- Real-Time Water Quality
- ▲ Ambient Water Quality
- Hydrometric
- ▲ Camera
- ⊕ Climate



Legend

- Real-Time Water Quality
- ▲ Ambient Water Quality
- Hydrometric
- ▲ Camera
- ⊕ Climate

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



- Hydroelectric industry



- Aquaculture



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





Questions?

