Real Time Really Works

Success Stories from Real Time Water Quality Monitoring, Newfoundland and Labrador

Presented by:
Grace Gillis
Environmental Scientist

Newfoundland Labrador

Department of Environment and Conservation
Water Resources Management Division

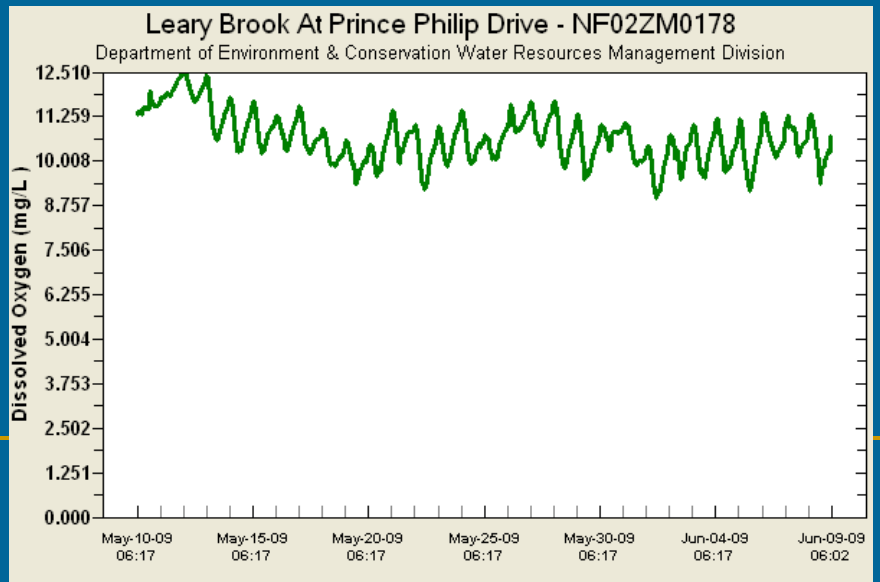
Presentation Outline

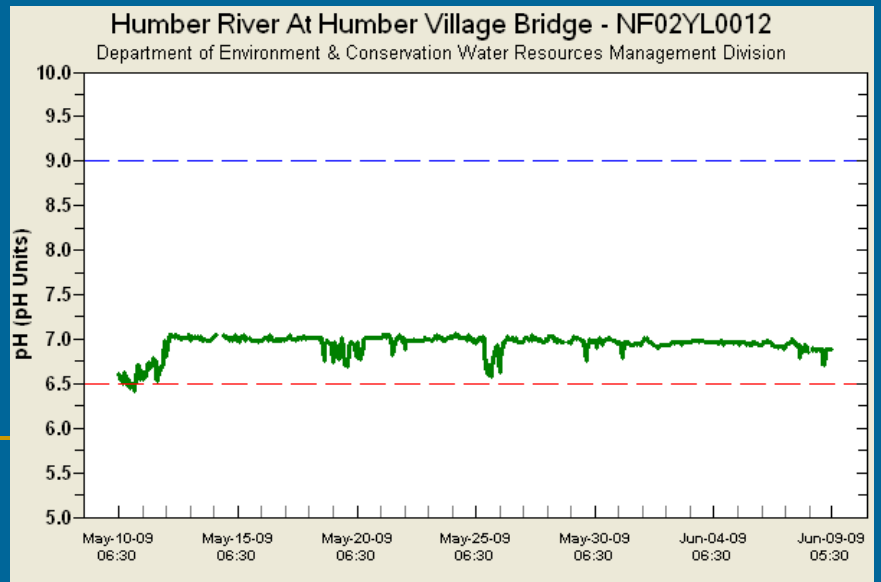
- How we monitor
- Monitoring alerts
- Defining Success
- Examples
  - Leary's Brook
  - Voisey’s Bay
  - Duck Pond

How we monitor: RTWQ Website

- http://www.env.gov.nl.ca/wrmd/RTWQ/RTWQ_Stations.asp

Provincial Network	NL WRMD	NF02ZM0178 - Leary Brook at Prince Philip Drive (St. John's, Newfoundland)	November 2001
		NF02YL0012 - Humber River at Humber Village Bridge (Western Newfoundland)	December 2003
		NF02ZM0009 - Waterford River at Kilbride (St. John's, Newfoundland)	July 2005





Web-Cam

- Real Time photos of stations

Leary Brook WebCam

(Newfoundland Standard Time)

A new image is available every 20 seconds. Click the Refresh button on your browser.

- Leary's Brook
- Badger

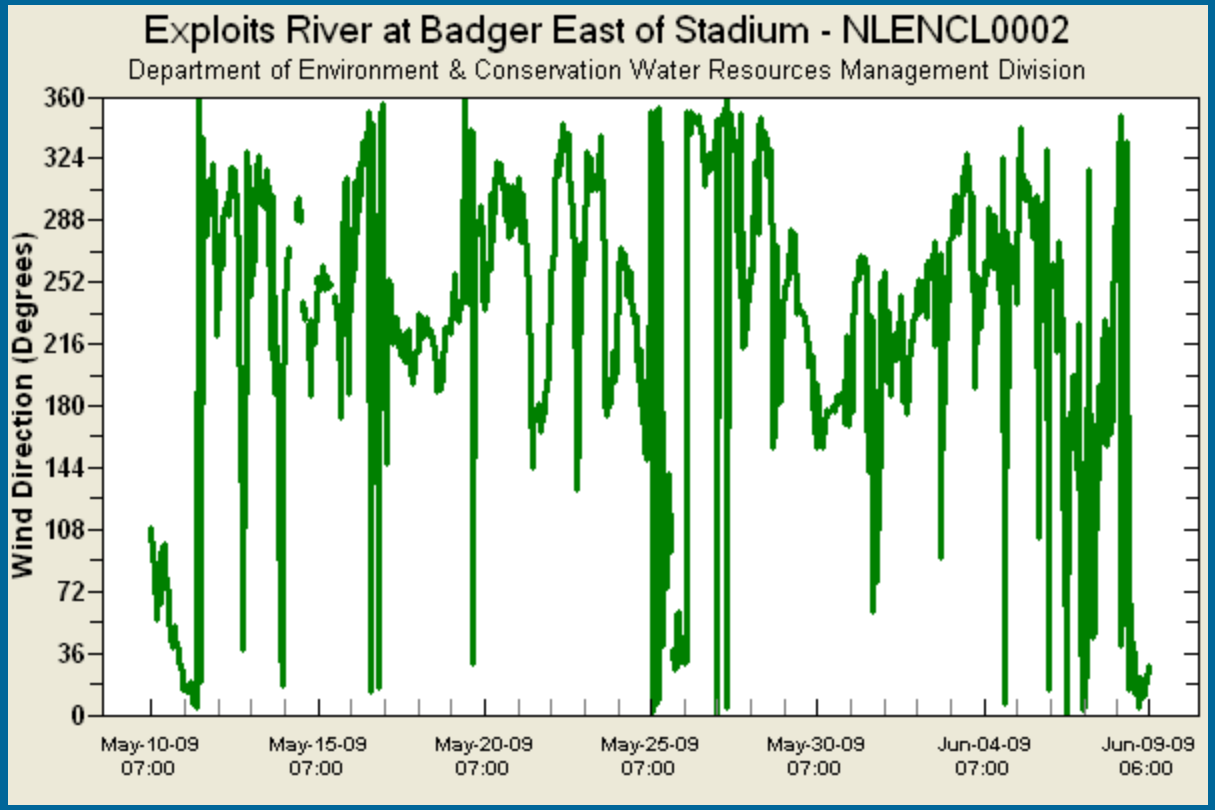
Weather Station

Badger Weather Station

Pippy Park Weather Station

Real Time Weather Data

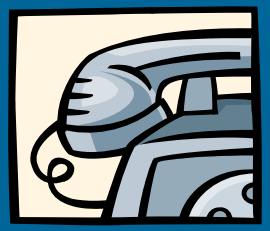
- Compliments hydrometric and water quality data

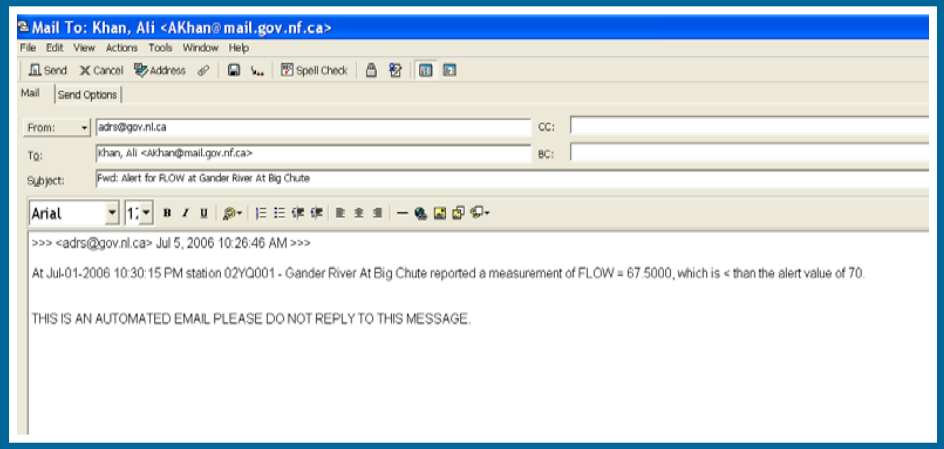


Alerts – Email Notification

Data Logger

DataBase





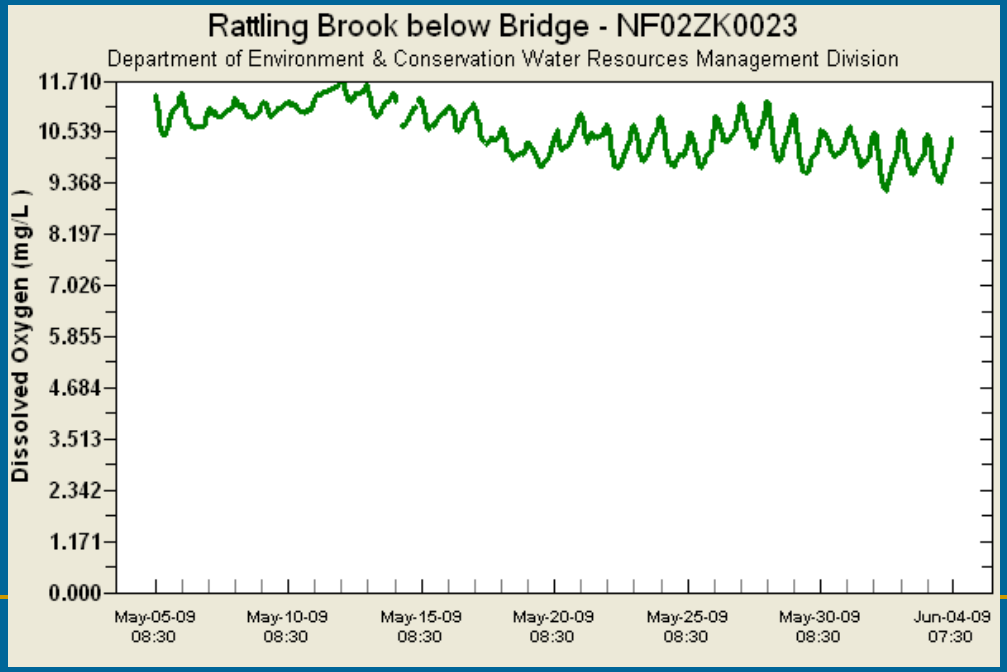
Alerts – Auto Sampler

- **Continue to test/implement automated sampler triggered by real-time instruments**

Data Logger

What is Success?

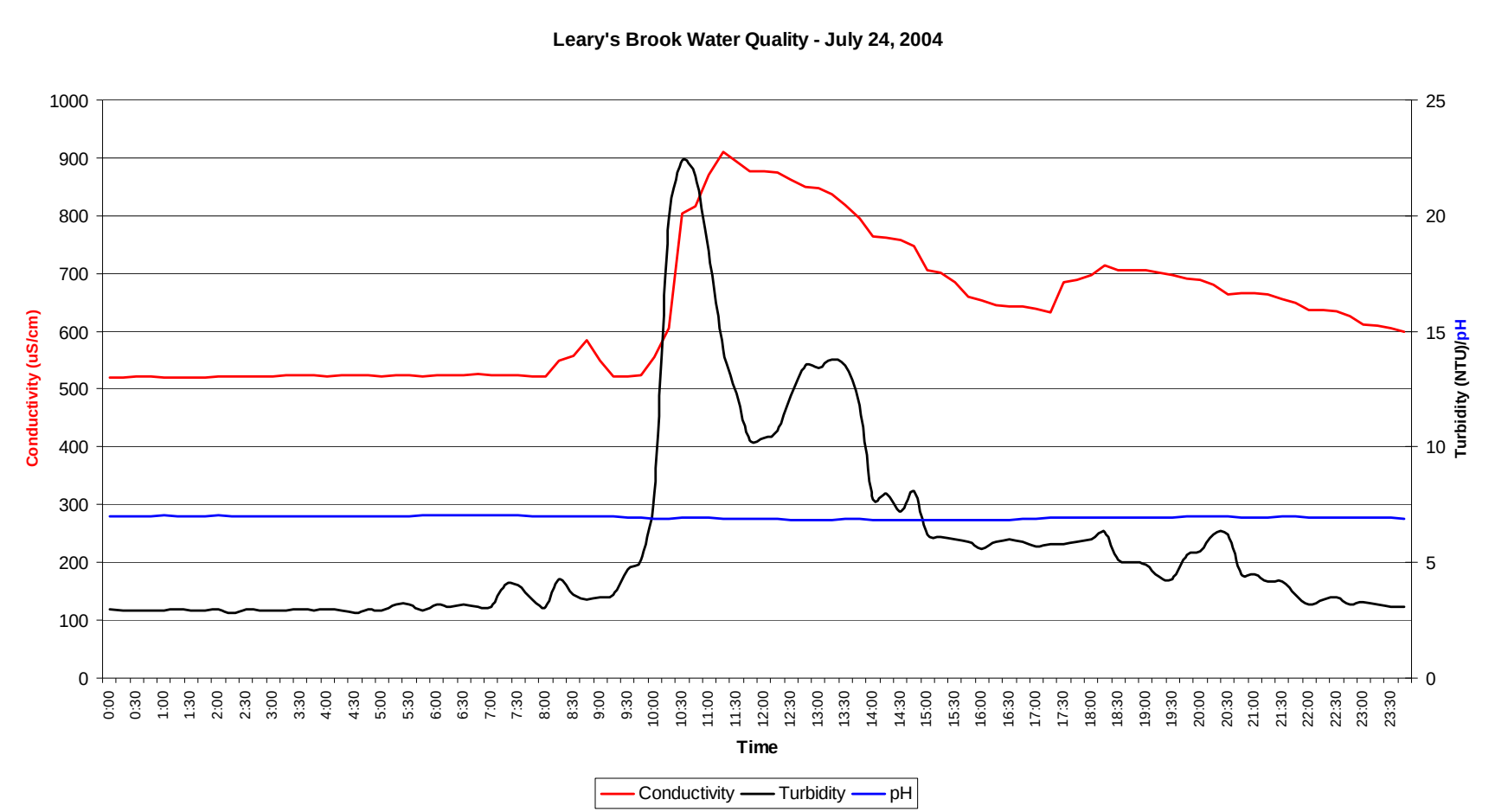
- Objectives of RTWQ:
  - (1) provide near real time water quality information for selected water bodies throughout the province
  - (2) act as an early warning system and catch emerging water quality issues before irreversible effects occur



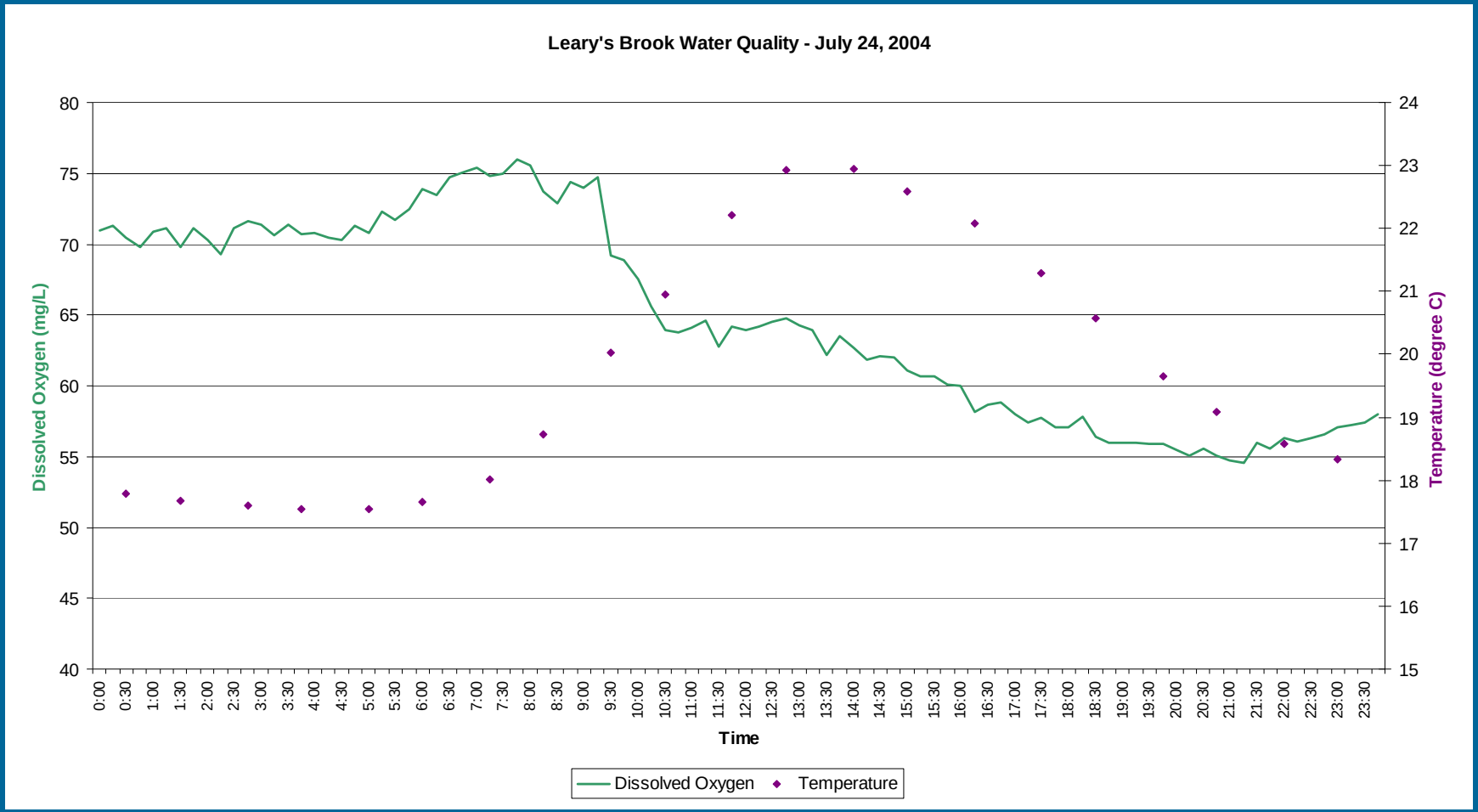
Leary's Brook RTWQ

- Original RTWQ Site, since 2001
- Urban Steam with urban interference
- Current test site for multiple probes (Hydrolab, S::can, YSI), web cam
- Fish Kill 2004
- Flood in 2008

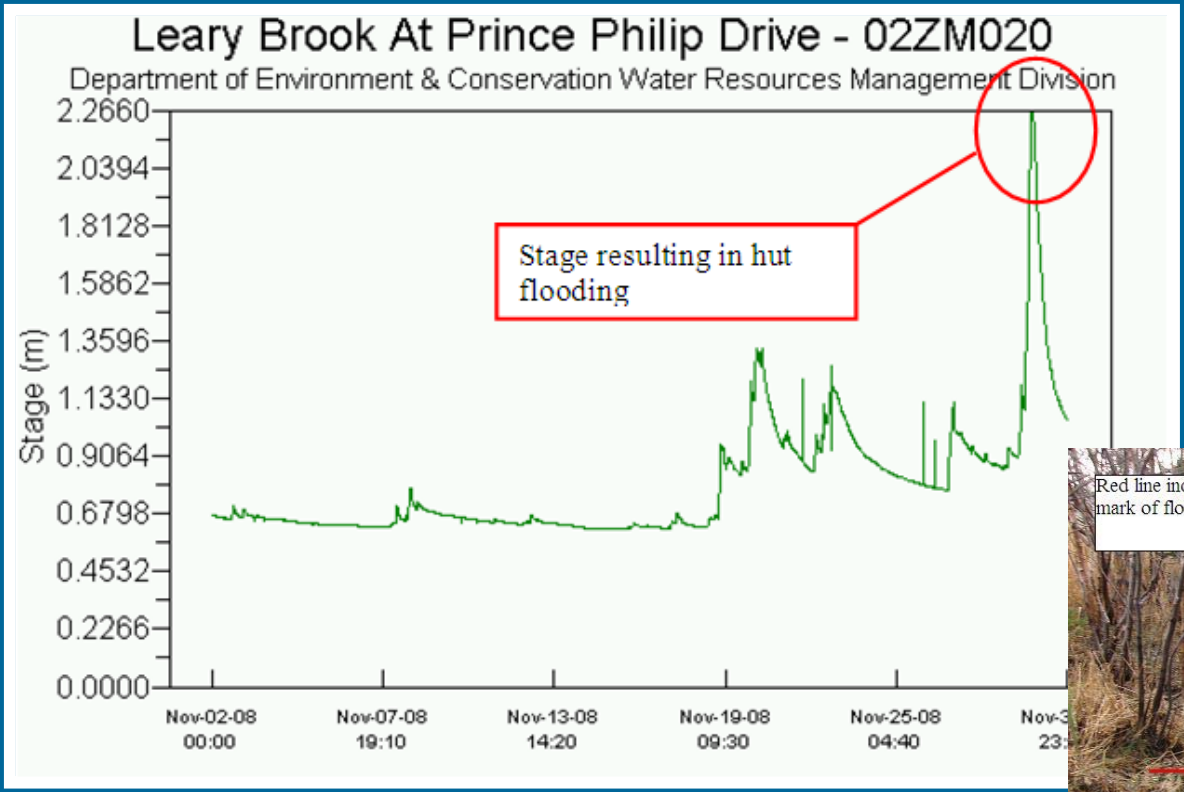
Leary's Brook – July 24, 2004 Conductivity, Turbidity, and pH



Leary's Brook – July 24, 2004 Temperature and Dissolved Oxygen

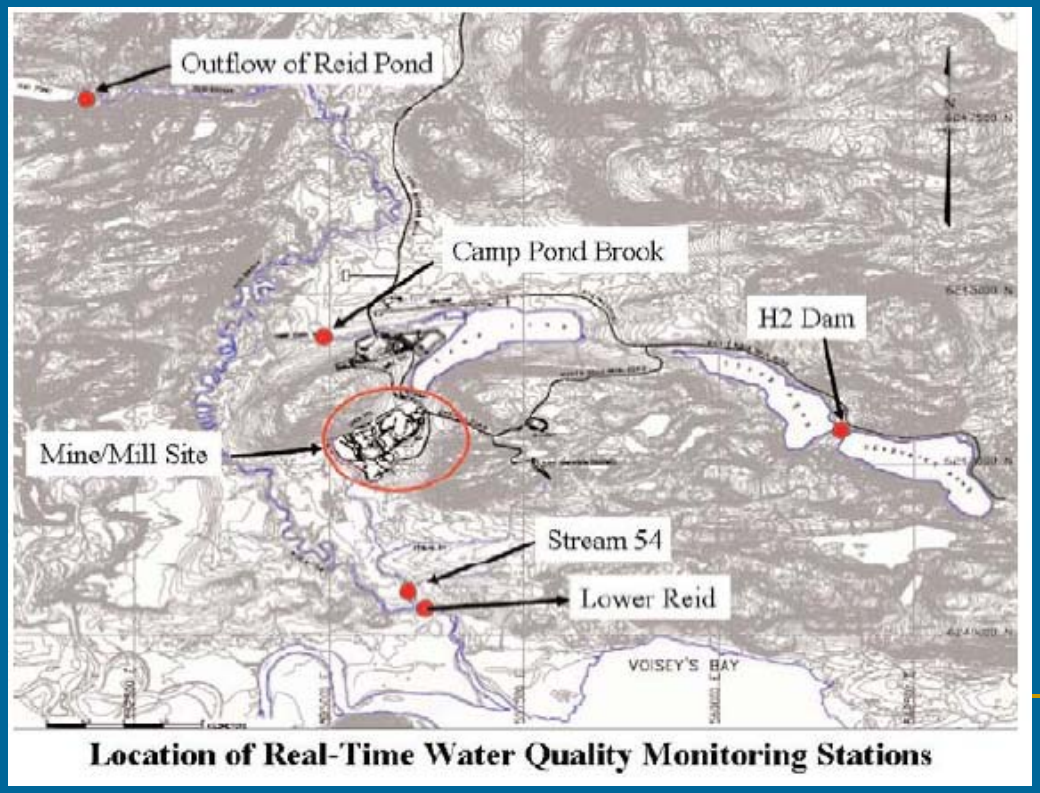


Leary's Brook Flood
November 29-30, 2008



Voisey's Bay – Vale Inco, RTWQ

- RTWQ since 2003
  - Able to identify and address water quality issues much more quickly, minimizing the damage to the aquatic ecosystem.
- 5 stations, Hydrolabs and Quanta G

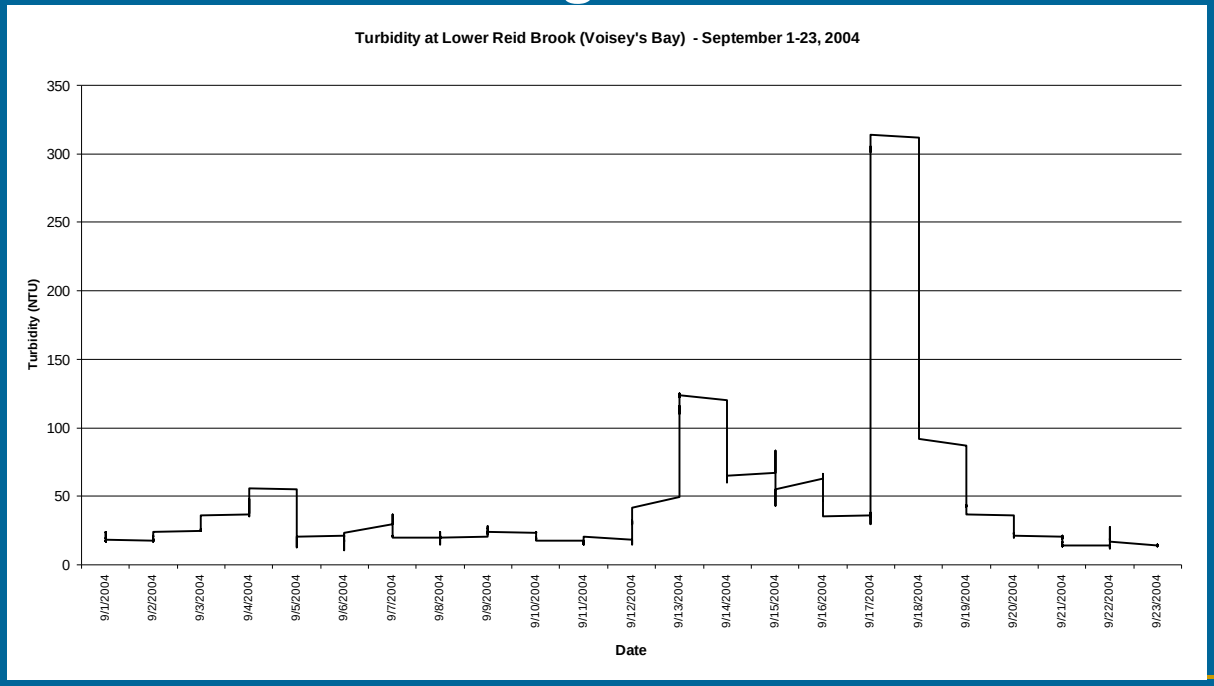


Location of Real-Time Water Quality Monitoring Stations

Lower Reid Brook, Voisey's Bay

September 2004

- Increased turbidity (September 2004)
- Surface runoff from construction,
- Instituted mitigation measures

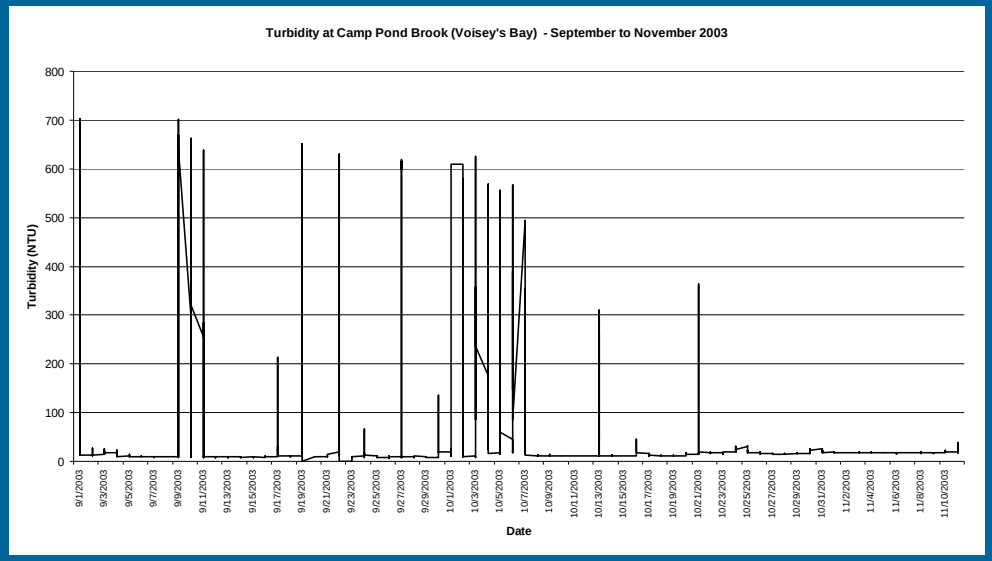


http://www.cbc.ca/gfx/images/news/photos

Camp Pond Brook, Voisey's Bay

September – November 2003

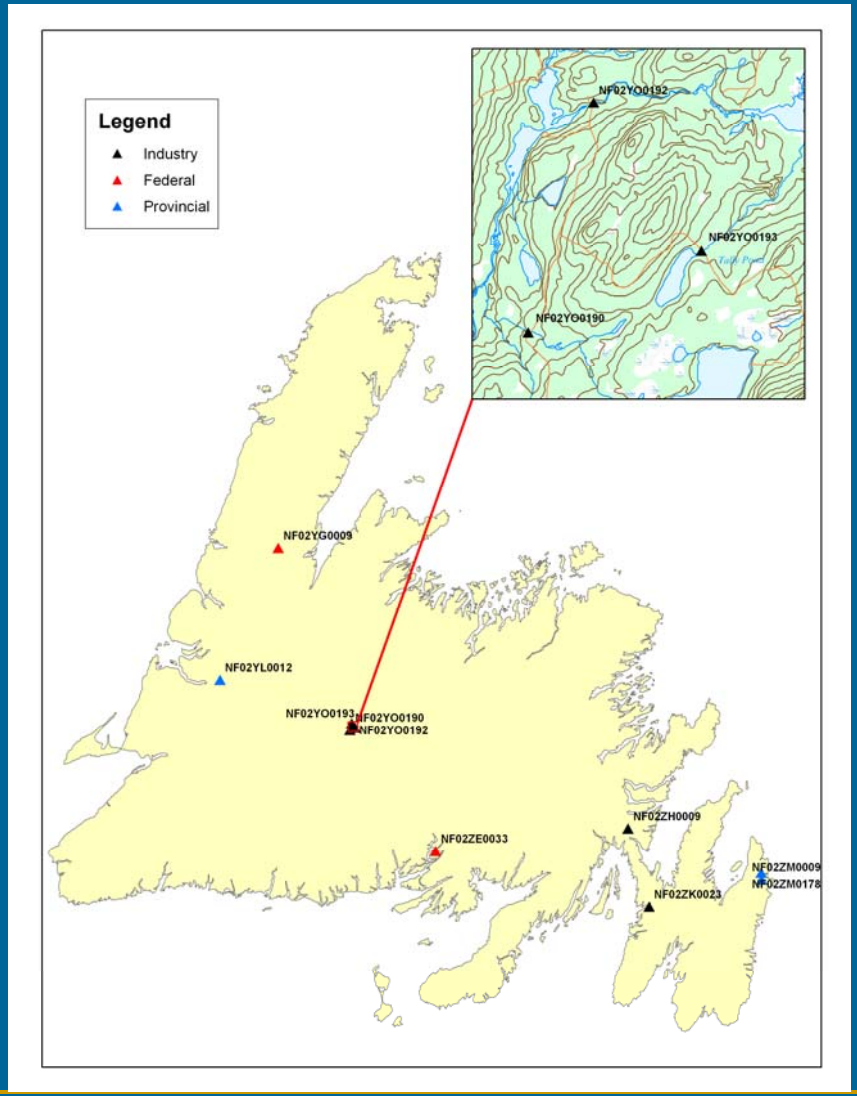
- Increased turbidity (Sept. to Nov. 2003)
- Failure of settling pond pump during mine construction activities
- Instituted mitigation measures



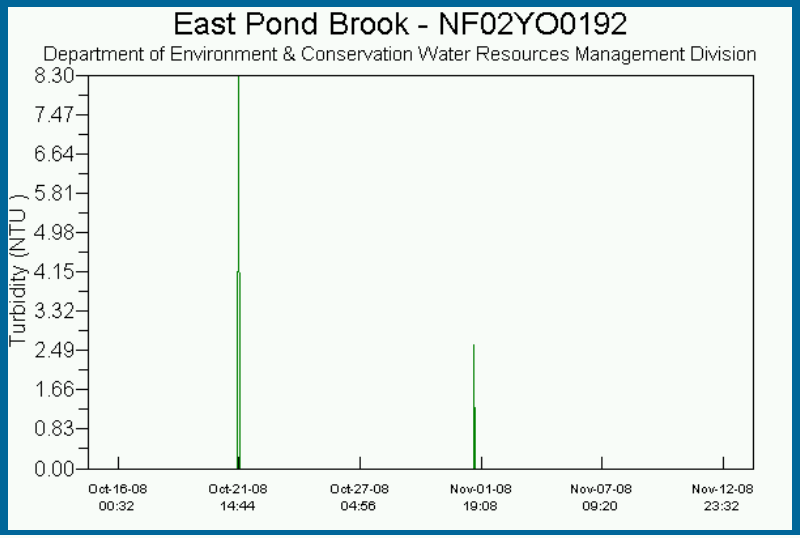
http://vinl.valeinco.com/Reports/2006EnvironmentalProgressReport.pdf

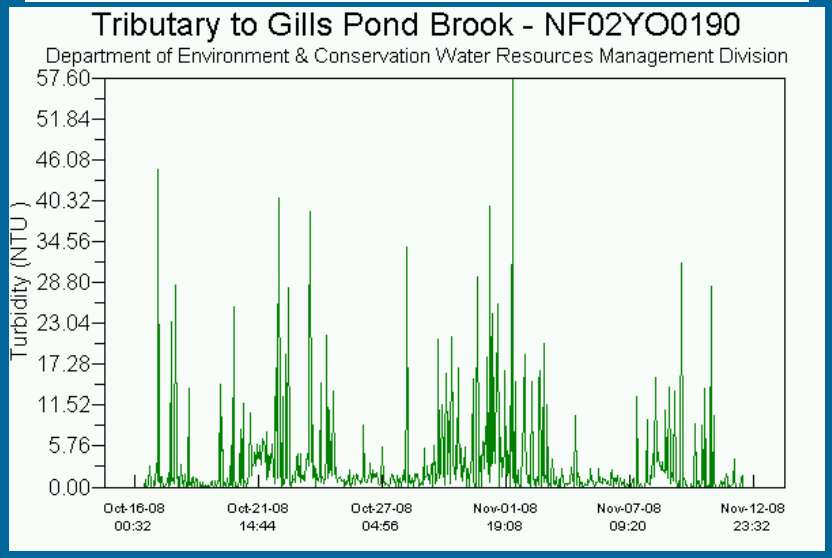
Duck Pond Operations-Teck

- RTWQ since 2006
- 2 surface water stations, (Hydrolab)
- 1 ground water Station, (Quanta G)



Tributary to Gills Pond Brook, Duck Pond



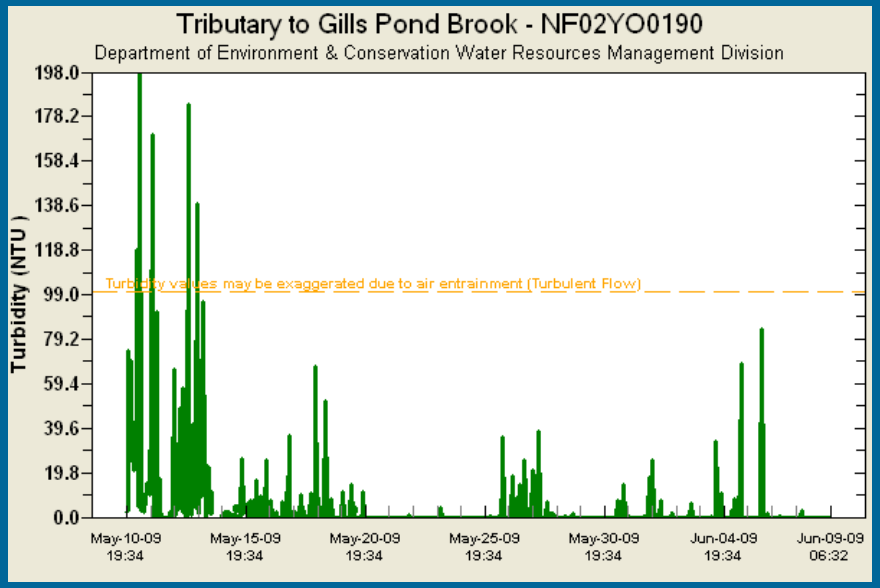


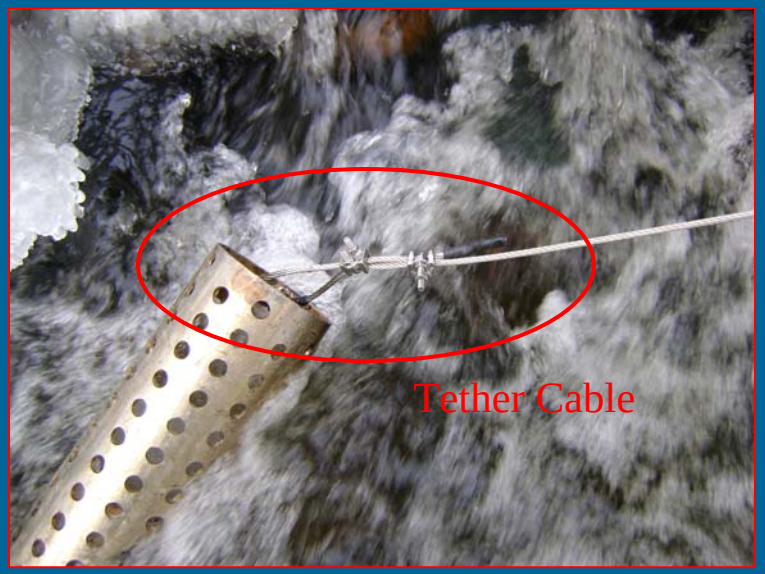
False Positive Turbidity

- Investigated thoroughly on October 16, 2008.
- Turbidity higher in middle of deep pool where Datasonde was deployed.
- Air entrainment, not a water quality event

Tributary to Gills Pond Brook, Duck Pond

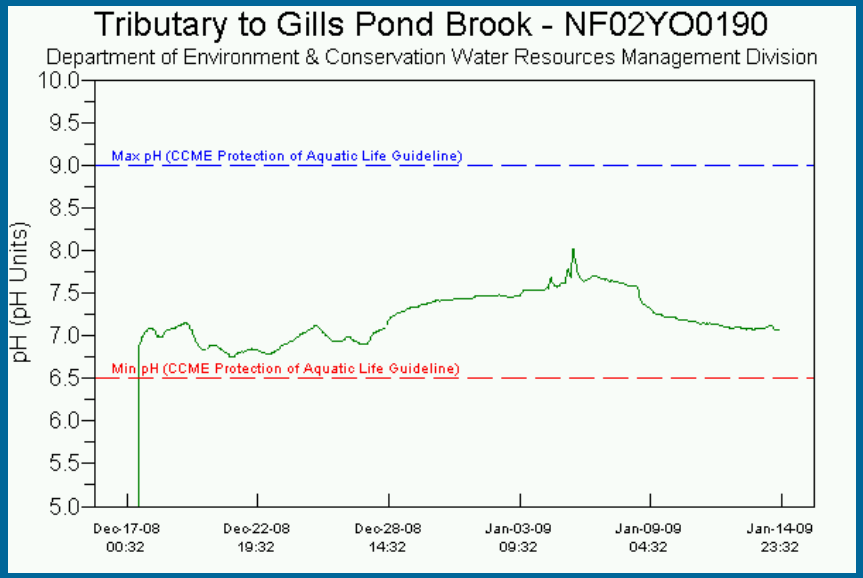
False Positive Turbidity





Tributary to Gills Pond Brook, Duck Pond

pH Increase



- Any abnormalities in data values can be seen in real time by Duck Pond staff.
- Used as a decision making tool to ensure discharge is environmentally compliant.
- Will adjust discharge amounts if necessary

Conclusions

- RTWQ has proven to work as an early warning system
- RTWQ can provide important insight into water quality events as they occur through time and space
- Automated alerts to provide efficient response times to problems before irreversible damage occurs
- Continue to get industry partners involved so they too can benefit and become efficient in their mitigation efforts