



Regulatory Applications of Real-time Water Quality Data in Newfoundland and Labrador

8th National Monitoring Conference
Portland, Oregon
April 30th – May 4th, 2012

Presented by: Ryan Pugh

Newfoundland and Labrador ... most days are beautiful!!!!



Water Resources
Management
Division

Department of
Environment &
Conservation

Newfoundland and Labrador.....

when Andy Zeigler
visited in June 2011!!



Expanding Development in Newfoundland and Labrador



Photo from Teck webpage



Photo from Vale Newfoundland & Labrador webpage




Photo from Labrador Iron Mines webpage



Photo from IOC webpage



Photo from Tata Steel Minerals Canada webpage

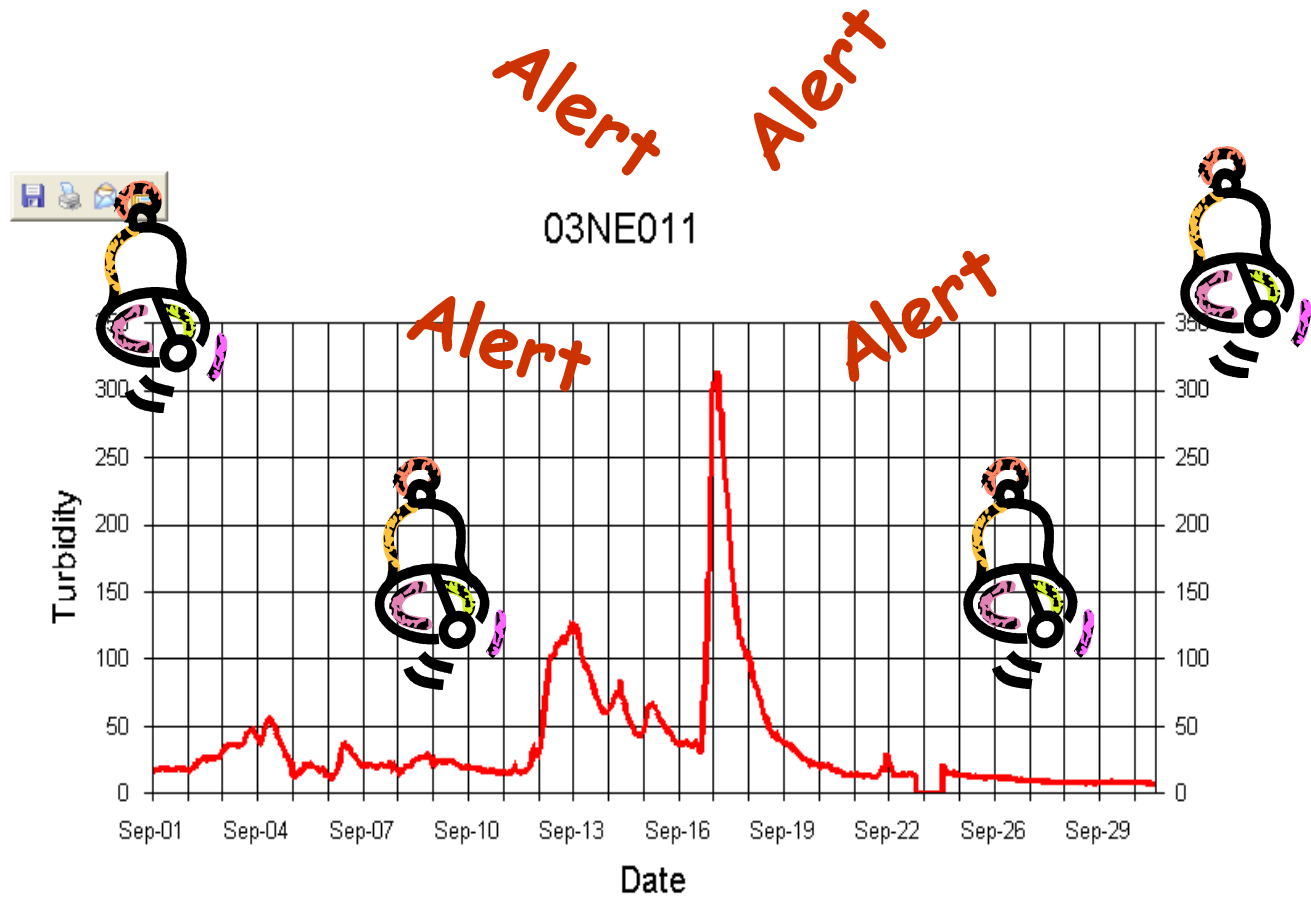


If you cannot measure
you cannot manage



Partnership and Collaboration

Early Warning System

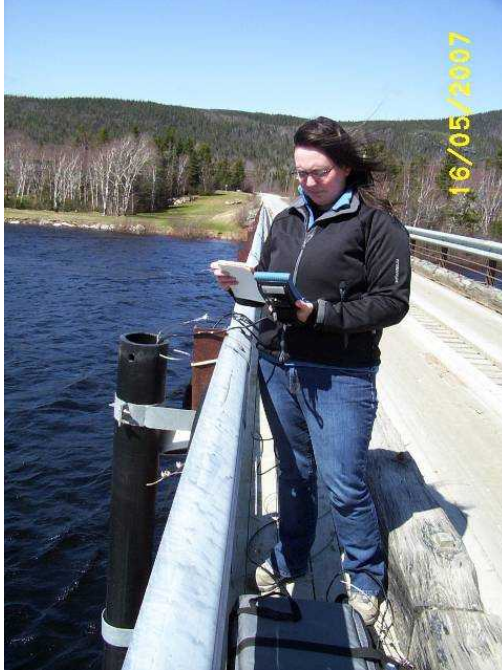


Regulatory Tools

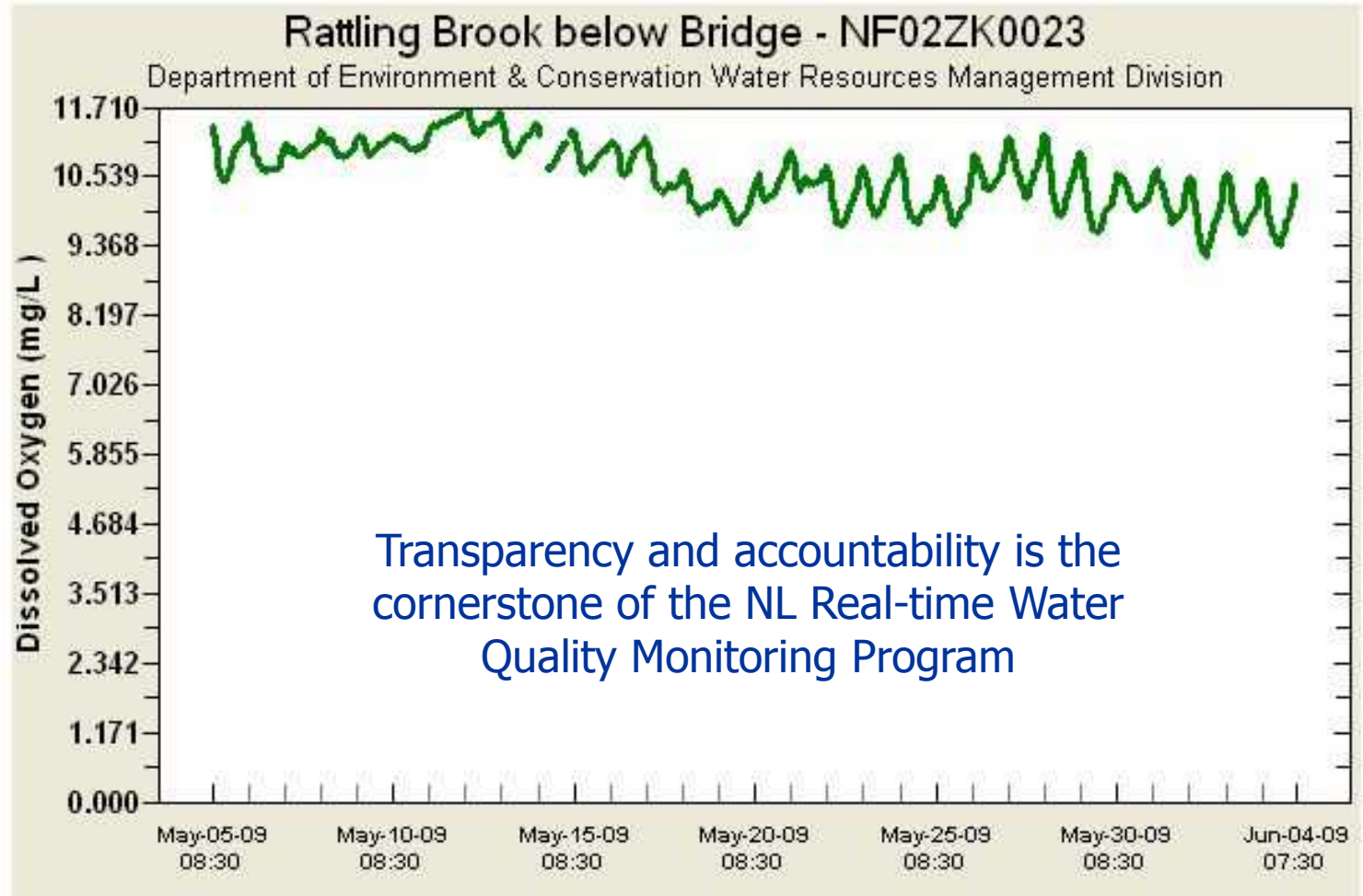
- ▶ Systematic QA/QC Program
- ▶ Transparent Web-based Reporting
- ▶ Automated Email Alert System
- ▶ Categorization of Risk Associated with Alerts
- ▶ Prediction of Non-measured Parameters (Turbidity vs. TSS)
- ▶ Calculation of Site-specific Guidelines for pH
- ▶ Compliance Monitoring around Tailing Impoundment Areas



Systematic QA/QC Program



Transparent Web-based Reporting



Automated Email Alert System

- ▶ Implemented an auto-alert system (through email) that notifies industry and government personnel when turbidity values have risen above a specified trigger.

Date and Time

Station Number & Name

Alert for TURBIDITY at Rattling Brook below Bridge

adrs@gov.nl.ca

This message was sent with High importance.

To: Paterson, Renee

Cc: Pugh, Ryan; Clinton, Tara M.

At Jan-05-2010 2:30:09 AM station NFO2ZK0023 - Rattling Brook below Bridge reported a measurement of TURBIDITY = 113.9000, which is > than the alert value of 100.

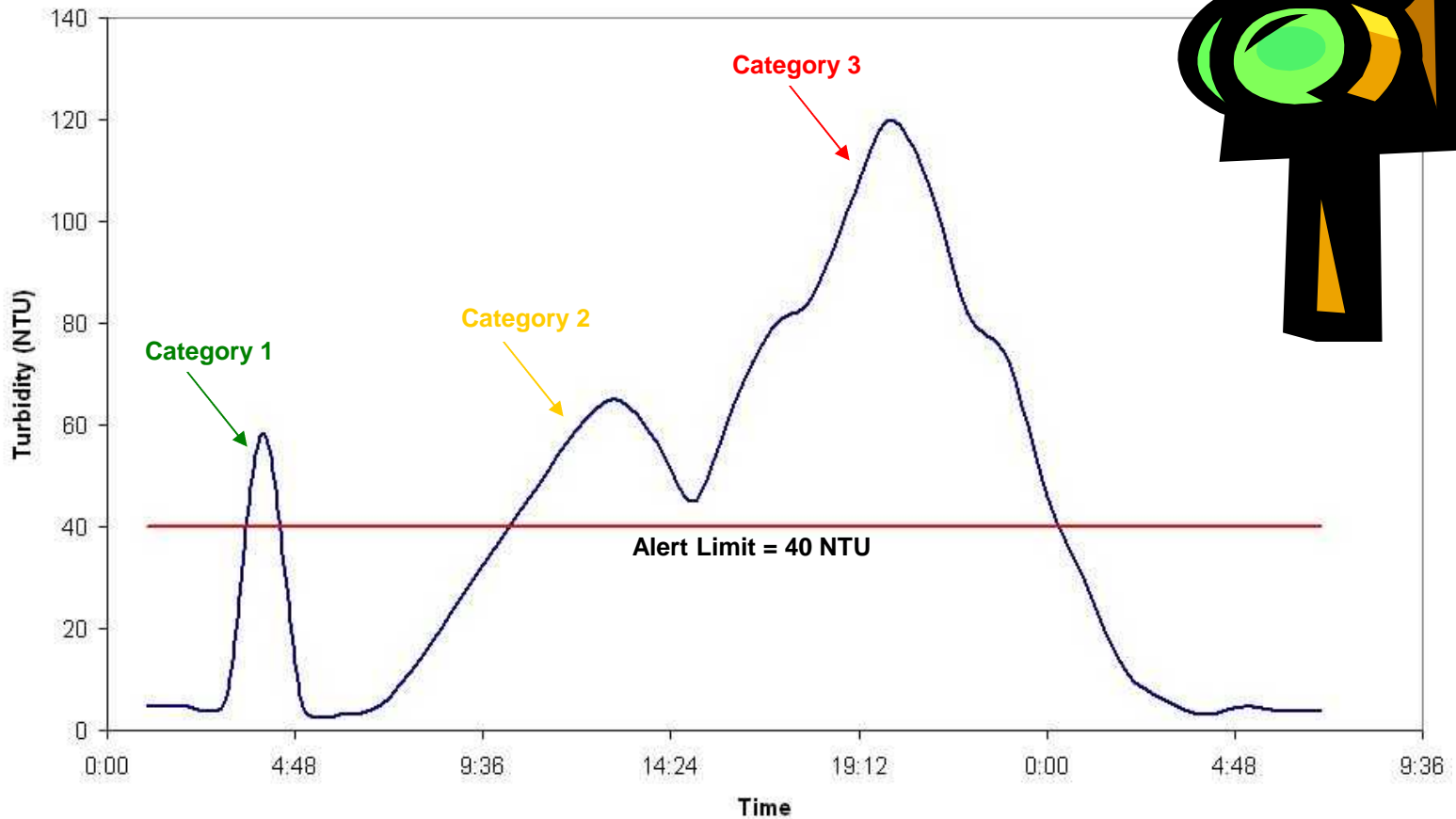
THIS IS AN AUTOMATED EMAIL PLEASE DO NOT REPLY TO THIS MESSAGE.

Turbidity Value Recorded

Categorization of Risk Associated with Alerts



Categorization of Turbidity Alerts



Prediction of Non-measured Parameters

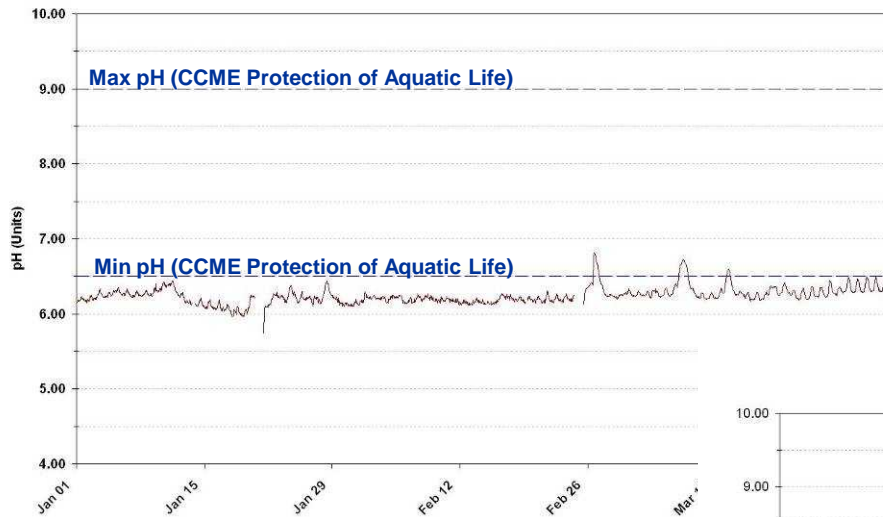
Turbidity vs. TSS

- ▶ There is no regulatory limit established in NL for turbidity, however there is a compliance limit in receiving waters for total suspended solids (TSS) – 30 mg/L
- ▶ Using statistical analysis, turbidity measured from the continuous monitor can be used to predict the approximate TSS concentration.
- ▶ This work has led to a new policy being implemented on select industrial sites whereby Environmental staff are required to investigate and collect additional grab samples when predicted TSS values are approaching the regulatory limit.

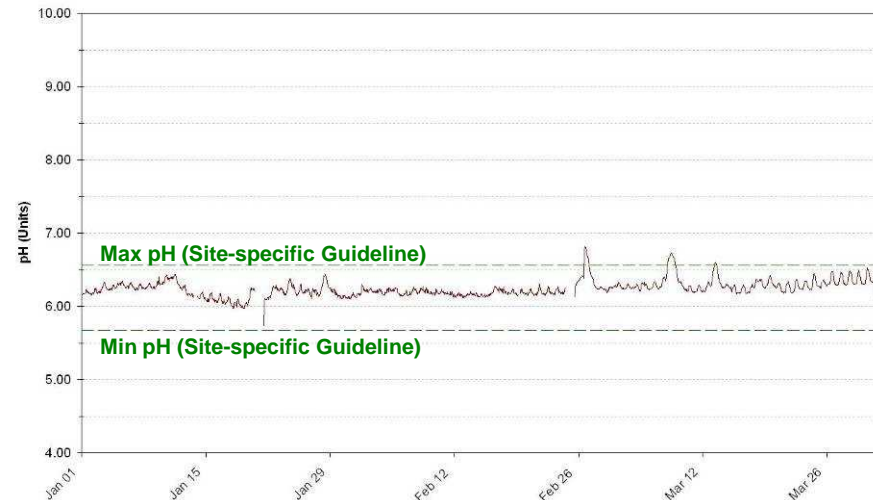


Calculation of Site-specific Guidelines for pH

pH at Rattling Brook below Bridge Jan-Mar 2011



pH at Rattling Brook below Bridge Jan-Mar 2011



- ▶ NL water bodies are naturally acidic thus site-specific guidelines were calculated and applied to the reporting mechanism to better understand when water quality events are occurring.

Compliance Monitoring around Tailings Impoundment Areas



- ▶ Groundwater wells that monitor water quality and level in real-time are being installed around Tailings Impoundment Areas associated with major industrial operations.




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

Path forward



Water Resources
Management
Division

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Conservation

A scenic landscape photograph of a large, winding lake or fjord surrounded by dense green forests and rolling hills under a clear blue sky.

4th Real-Time Water Quality Workshop
to be hosted in
St. John's Newfoundland & Labrador
in June 2013

All Are Welcome!!!

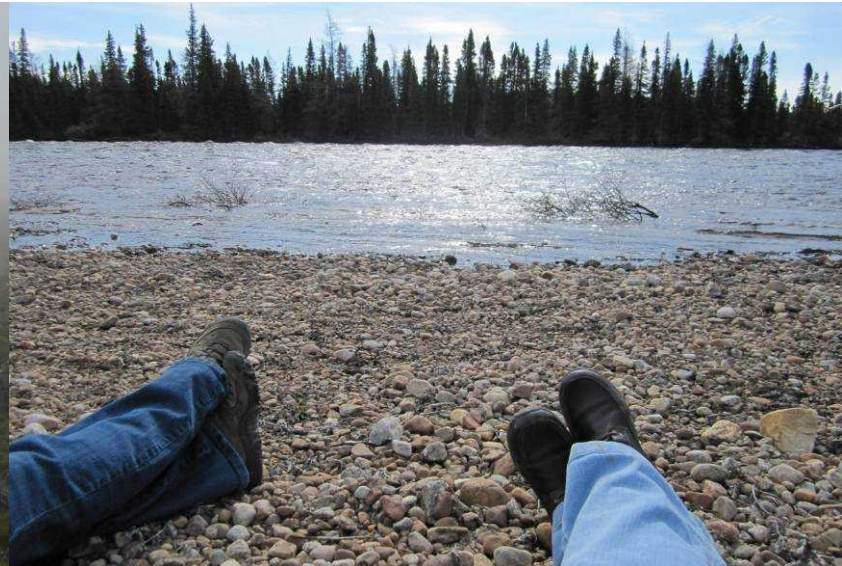
**Previous workshop proceedings
can be viewed at:**

<http://www.env.gov.nl.ca/env/waterres/rti/rtwq/workshops.html>

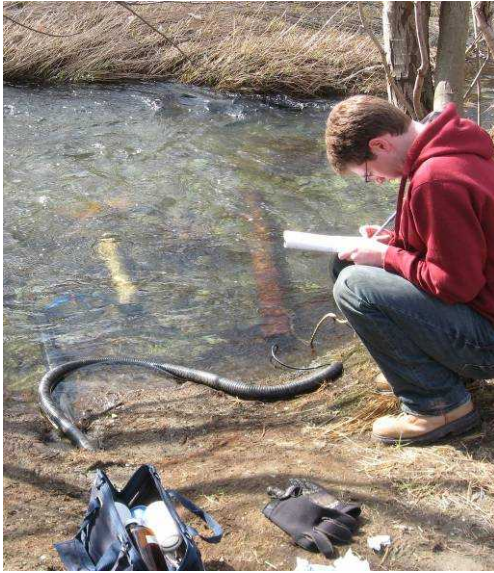
In Newfoundland and Labrador you never know what you will encounter in the field...



Some days are brighter than others...



...but the work continues!!!



It's a team effort!!!!



Thank You

Various program supplementary documentation is currently in preparation and will be posted to the following webpage as they become available:

<http://www.env.gov.nl.ca/env/waterres/rti/rtwq/index.html>