Real-Time Water Quality Deployment Report

Paddy's Pond

July 24, 2014 to August 14, 2014

Newfoundland Labrador

Government of Newfoundland & Labrador
Department of Environment and Conservation
Water Resources Management Division
St. John's, NL, A1B 4J6 Canada

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2014-07-24 to 2014-08-14

General

- Department of Environment and Conservation staff monitors the real-time web pages consistently.
- Paddy's Pond is a Research and Development test site used to trial atypical instrumentation and deployment techniques. During this period, the field sonde deployed was a YSI 6600 multi-parameter sonde.
- Dissolved oxygen and turbidity probes were non-functional during this deployment period due to failure.

Maintenance and Calibration of Instrument

- As part of the Quality Assurance and Quality Control protocol (QAQC), an assessment of the reliability of data recorded by an instrument is made at the beginning and end of the deployment period. The procedure is based on the approach used by the United States Geological Survey.
    - Upon deployment, a QA/QC Sonde is temporarily deployed *in situ*, adjacent to the Field Sonde. Depending on the degree of difference between each parameter from the Field and QAQC sondes a qualitative rank is assigned (See Table 1). The possible ranks, from most to least desirable, are: Excellent, Good, Fair, Marginal, and Poor. A grab sample is also taken for additional confirmation of conditions at deployment and to allow for future modelling studies.
    - At the end of a deployment period, a freshly cleaned and calibrated QAQC Sonde is placed *in situ*, adjacent to the Field Sonde. Values are compared between all parameters and differences are ranked for placement in Table 1.

Table 1: Qualitative QAQC Ranking

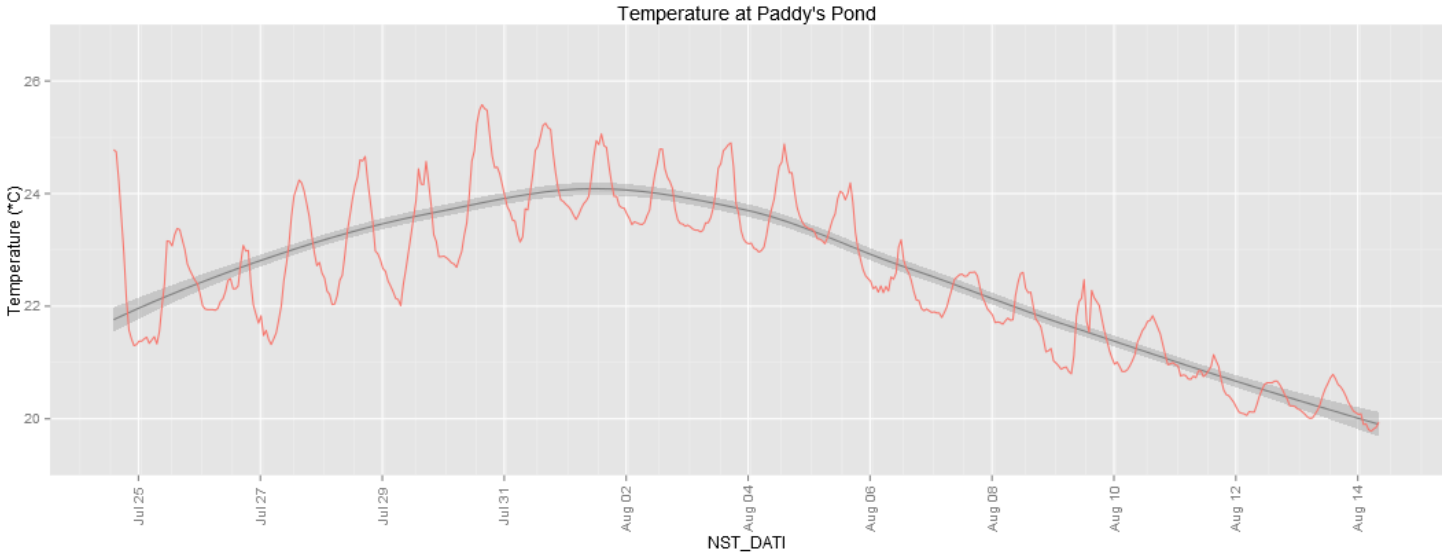
Station	Date	Action	Comparison Ranking				
			Temperature	pH	Conductivity	Dissolved Oxygen	Turbidity
Paddy's Pond	July 24, 2014	Deployment	Good	Poor	Excellent	NA	NA
	August 14, 2014	Removal	Excellent	Excellent	Fair	NA	NA

- Dissolved Oxygen and Turbidity Sensor data was not available during this deployment period.

Data Interpretation

Temperature

Water Temperature is a major factor used to describe water quality. Temperature has major implications on both the ecology and chemistry of a water body, governing processes such as the metabolic rate of aquatic plants and animals and the degree of dissolved oxygen saturation.

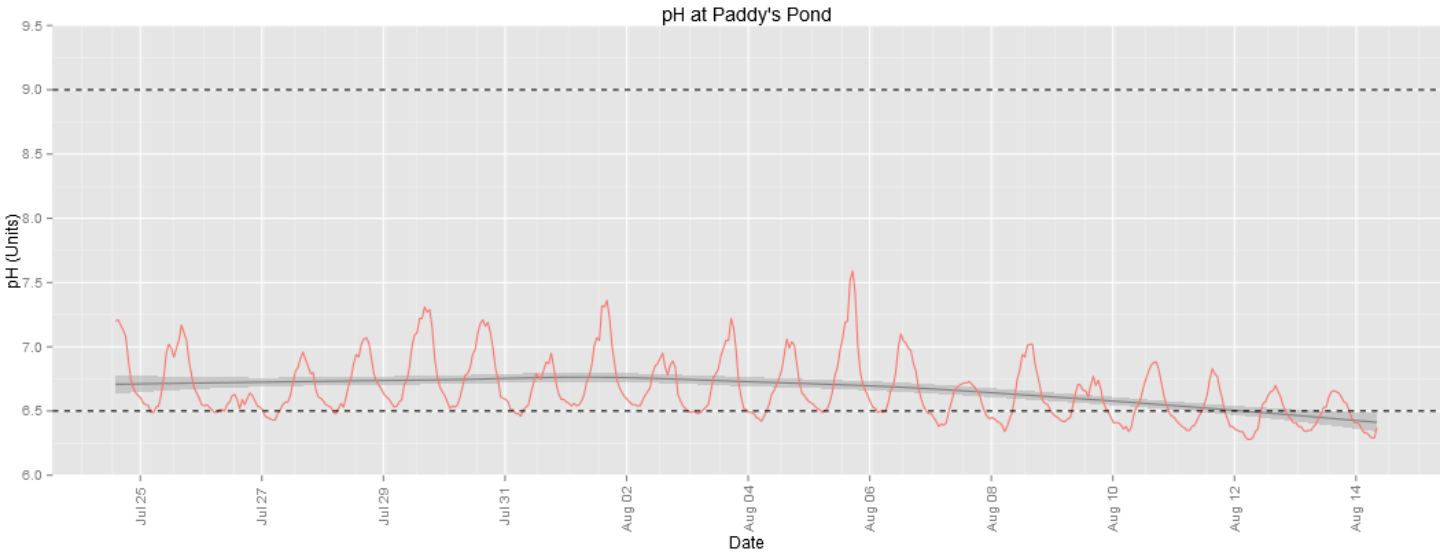


Mean	Median	Min	Max
22.53	22.54	19.78	25.58

- Annual maximum water temperatures generally occur near the end of July – in this case, July 30th with a temperature of 25.58°C. A decline is observed after this date.

pH

pH is used to give an indication of the acidity or basicity of a solution. A pH of 7 denotes a neutral solution while lower values are acidic and higher values are basic. Technically, the pH of a solution indicates the availability of protons to react with molecules dissolved in water. Such reactions can affect how molecules function chemically and metabolically.

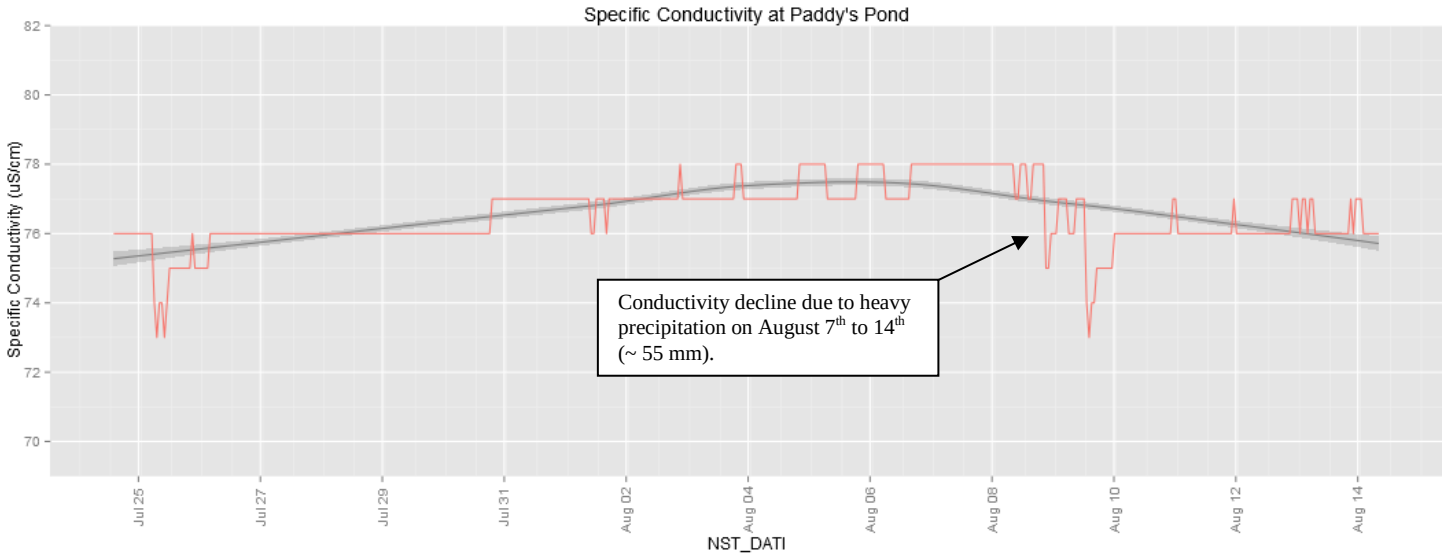


Mean	Median	Min	Max
6.66	6.61	6.28	7.59

- CCME Guidelines for the protection of aquatic life are indicated by dashed lines at 6.5 and 9.0 pH units. Most values fall within those guidelines; however waters in Newfoundland and Labrador tend to be more acidic than the nationally-derived guidelines.
- A slight decline is seen in pH over the course of this deployment period as pH moved from more alkaline to more acidic.

Specific Conductivity

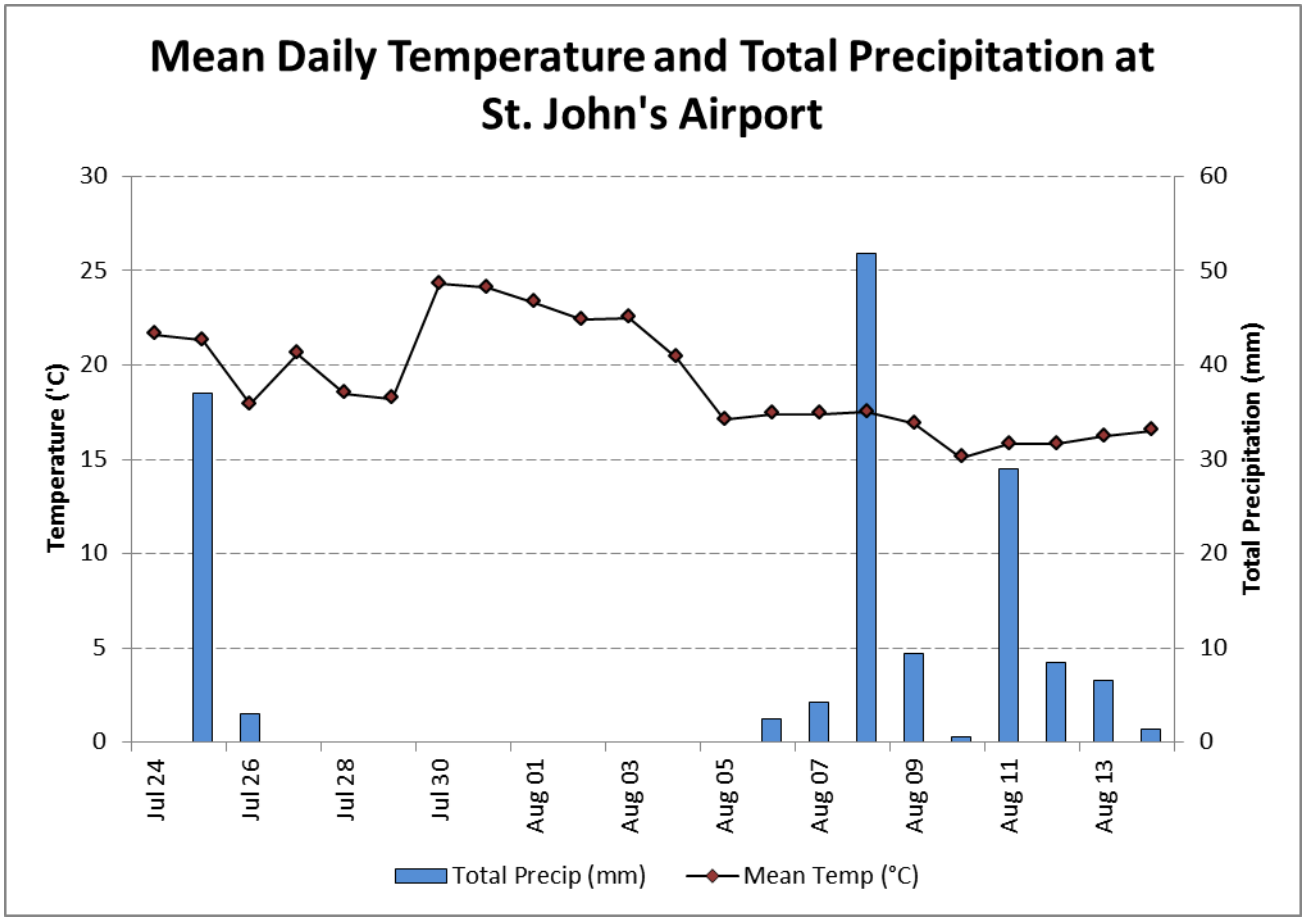
Conductivity relates to the ease of passing an electric charge – or resistance – through a solution. Conductivity is highly influenced by the concentration of dissolved ions in solution: distilled water has zero conductivity (infinite resistance) while salty solutions have high conductivity (low resistance). Specific Conductivity is corrected to 25°C to allow comparison across variable temperatures.



Mean	Median	Min	Max
77	76	73	78

- Specific conductivity increased slightly into early August until a spell of heavy precipitation on August 8th lead to a decline due to dilution effect of dissolved solids.

Appendix



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