Real Time Water Quality Report
Southwest Brook below Southwest Pond
(Conne River)
Deployment Period 2007-12-19 to 2008-04-10

General

- This station is operated cooperatively with the Miawapukek First Nation (Conne River) as a Pilot Project for Drinking Water Source Monitoring. This is the only known application of Real Time Water Quality Monitoring for a drinking water source for any First Nations community in Canada.
- The Water Resources Management Division's (WRMD) staff monitors the real-time web page on a daily basis. Any unusual observations are investigated, with site visits being carried our as warranted.
- Operators at Conne River are informed of any significant water quality events or instrumentation problems by WRMD.
- Site visits for QA/QC purposes are conducted by WRMD approximately four times per year. Monthly calibration and maintenance is undertaken by operators at the Conne River Water Treatment Plant.
- There is no real time water quality data available from December 19, 2007 until January 8, 2008 due to data transmission errors. This problem has been noted with staff of Environment Canada who are actively pursuing a fix to the problem.
- The Real Time Water Quality Data are compared to Real Time Climate Data at Station NF02ZE004 Conne River at the Outlet of Conne Pond, some 40 km to the northeast. Although this is not the ideal location, it is the best available data at this time.
- Raw (uncorrected) data has been used in the preparation of the graphs and subsequent discussion below.

Maintenance and Calibration of Instrumentation

- Following regular cleaning and calibration of the DataSonde at the Water Treatment Plant in Conne River, the instrument was installed in Southwest Brook on December 19, 2007 and remained deployed until February 26, 2008 (69 day period). Subsequently it was cleaned, calibrated and deployed again from February 26, 2008 until April 10, 2008 (44 day period). The vertical line on some of the graphs below corresponds to the servicing of the probe.
- *In-situ* measurements of ambient water quality were undertaken with a freshly calibrated MiniSonde each time a DataSonde was installed or removed.
- The comparative results between the MiniSonde and DataSonde values at the beginning and end of each deployment period are shown in **Table 1**. Due to the data transmission problems, no comparison can be made at the beginning of the first deployment period.

Table 1: QA/QC Data Comparison Ranking During Deployment Period

Station	Date	Action	MiniSonde vs. DataSonde Comparison Ranking				
			Temp.	pH	Conductivity	Dissolved Oxygen	Turbidity
Southwest Brook below Southwest Pond	2007-12-18	Installation	NA	NA	NA	NA	NA
	2008-02-26	Removal	Good	Good	Fair	Fair	Excellent
	2008-02-26	Installation	Excellent	Poor	Fair	Fair	Excellent
	2008-04-10	Removal	Excellent	Good	Fair	Good	Excellent

Data Interpretation

- The water temperature (**Figure 1**) ranged from a minimum of -0.19 ˚C to a maximum of 4.91 ˚C over the deployment period.

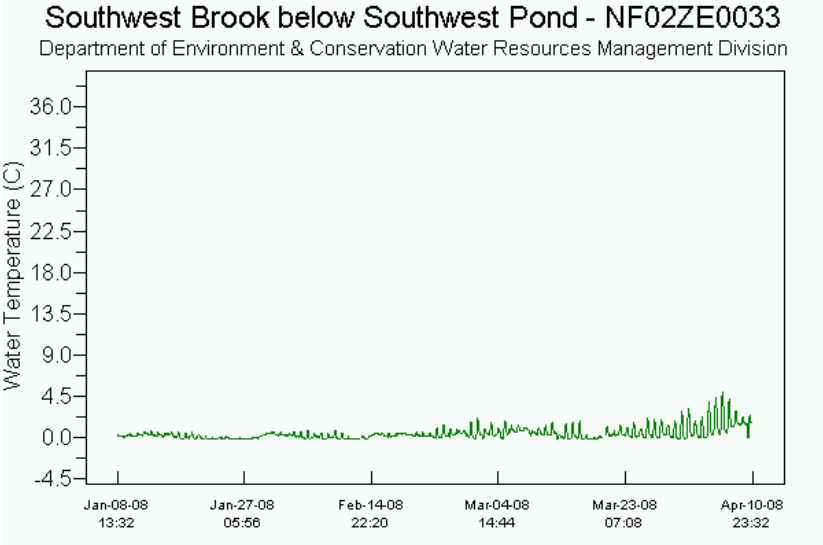

Figure 1

- pH values (**Figure 2**) remained fairly constant throughout the deployment period, ranging from a minimum of 4.44 to a maximum of 5.00. One measurement (immediately following deployment on February 26, 2008) was 3.96. This number can be considered anomalous as it the meter may not have had an opportunity to acclimate. All of the values fall well below the recommended range (6.5 – 9.0) for the CCME *Canadian Water Quality Guidelines for the Protection of Aquatic Life*. The background pH of this stream is normally much lower than the recommended range due to natural effects of the drainage basin. During each deployment period, even under fairly stable conditions, there is a downward trend, indicating that there is some degree of fouling of the probe, thus requiring regular servicing.

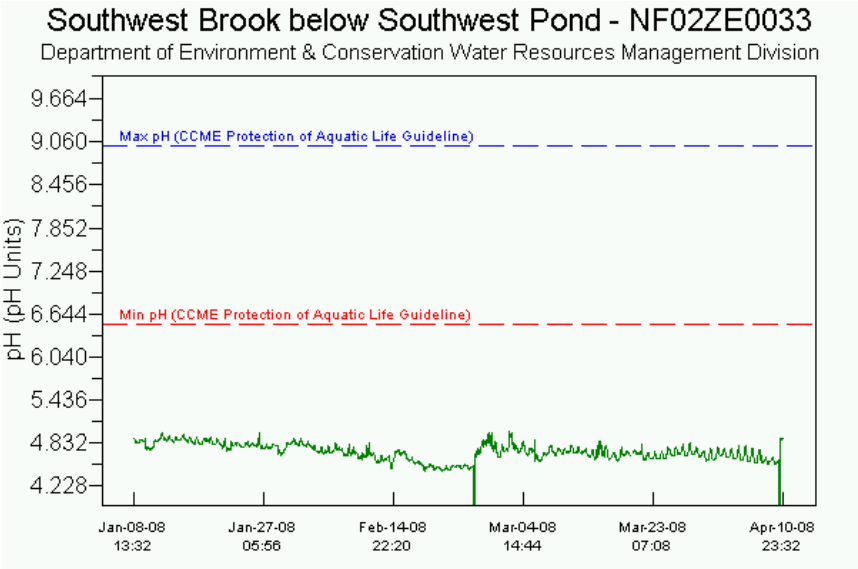

Figure 2

- The specific conductance **(Figure 3)** ranged from a minimum of 16.2 µS/cm to a maximum of 23.0 µS/cm over the deployment period. The specific conductance dropped somewhat following a period of significant precipitation (Figure 7) in mid February. All values are however, within typical ranges.

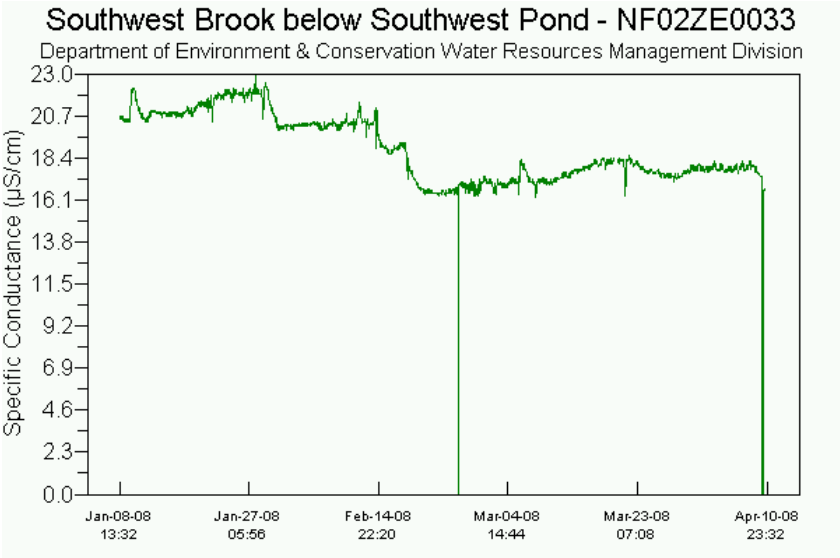

Figure 3

- The dissolved oxygen (**Figure 4**) values ranged from a minimum of 13.84 mg/L to a maximum of 14.39 mg/L over the deployment period. The mean Dissolved Oxygen remained fairly constant over the deployment period. All dissolved oxygen values fall within the recommended CCME *Canadian Water Quality Guidelines for the Protection of Aquatic Life* for dissolved oxygen (cold water/other life stages – above 6.5 mg/L; cold water/early life stages – above 9.5 mg/L).

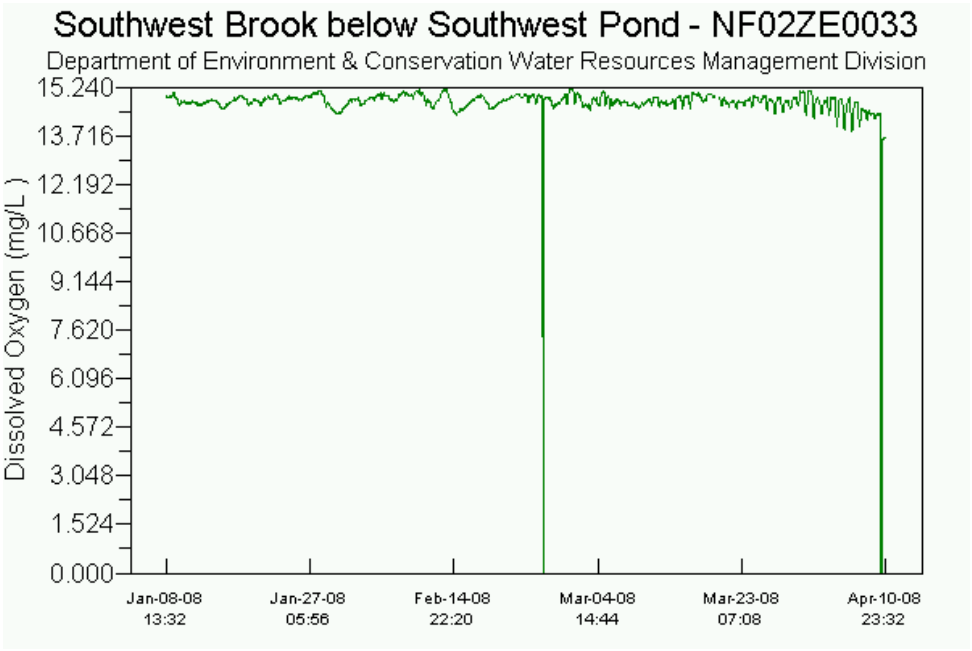

Figure 4

- The turbidity values **(Figure 5)** ranged from a minimum of 0.0 NTU to a maximum of 61.8 NTU on March 7, 2008. All the peaks in turbidity are associated with measurable precipitation events (Figure 7) and increases in streamflow (Figure 6).

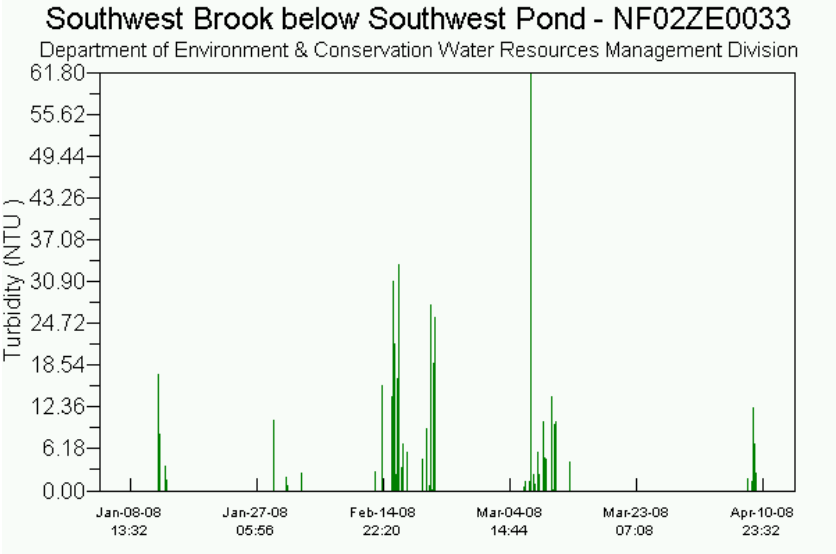

Figure 5

- The stage (**Figure 6)** or water level ranged from a minimum of 0.80 m to a maximum of 9.06 m. A number of vertical lines deviate from the trend line to zero on the graph. These would be data transmission errors. The maximum value measured on March 19, 2008 is an anomalous value likely due to backwater effects of an ice jam in the stream. It is reported that there was significant flooding in the valley following a precipitation event on March 19, 2008, however, water levels over 9 meters would be all but impossible. Based upon historical flows for this station, high water is not likely to be above 2 meters. Increases in water level are closely correlated with precipitation events.

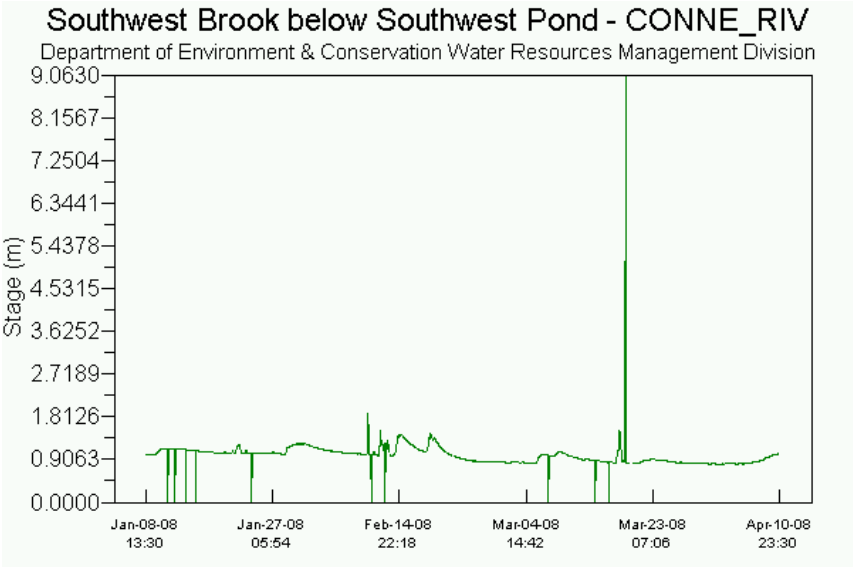

Figure 6

- Precipitation (**Figure 7)** is measured at Conne River at the Outlet of Conne Pond (Station NF02ZE004), some 40 km to the northeast. This graph indicated that all the precipitation was as snowfall, however, during some mild (above 0 ^{o}C) periods, there was obviously some rainfall.

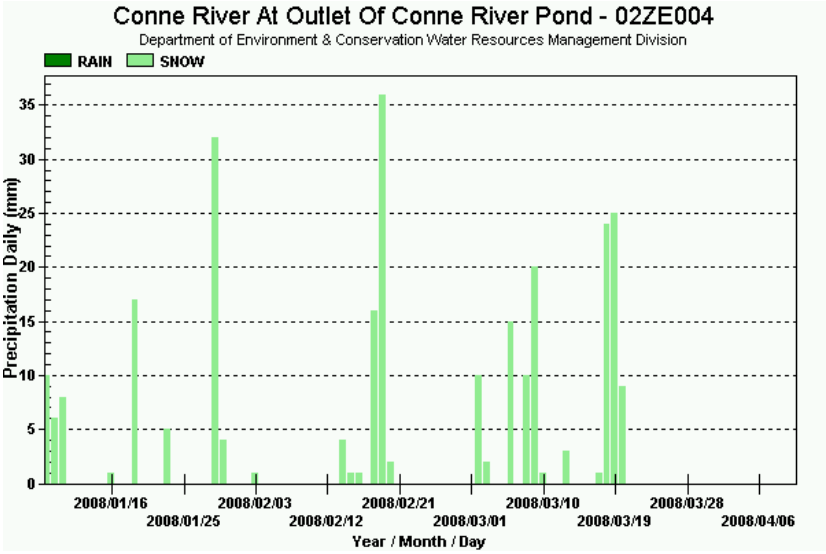

Figure 7

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