



Real Time Water Quality Monthly Report Waterford River February 2006

General

- Data from the Waterford River monitoring station is monitored by the Water Resources Management Division staff on a monthly basis.

Maintenance and Calibration of Instrumentation

- The following table displays the dates when the Datasonde was removed for routine cleaning, maintenance and calibration and when it was redeployed during the month of February.

Table 1: Table of Datasonde removal and installation dates

Date Installed	Date Removed
	February 8, 2006
February 9, 2006	February 16, 2006
February 17, 2006	February 23, 2006
February 24, 2006	

- Water quality readings were taken with a Minisonde at the time of removal for comparison purposes. The Minisonde was calibrated prior to use.

Data Interpretation

- Areas in the graphs where the data lines go abruptly down to the x axis and show no readings occur when the datasonde is removed for routine cleaning, maintenance and calibration. The dates where this occurs correspond to Table 1 above.
- In general, water quality parameters were stable during the month of February with expected daily/nightly (diurnal) and seasonal changes occurring.
- Water temperatures fluctuated in response to daily maximum and minimum air temperatures. This is demonstrated by comparing the graph in **Figure 1** to the air temperature data in **Table 2**.

Table 2: Weather information for St. John's, NL provided by Environment Canada for February 2006

Daily Data Report for February 2006											
Day	Max Temp	Min Temp	Mean Temp	Heat Deg Days	Cool Deg Days	Total Rain	Total Snow	Total Precip	Snow on Grnd	Dir of Max Gust	Spd of Max Gust
	°C	°C	°C	C	C	mm	cm	mm	cm	10's Deg	km/h
01†	-0.4	-6.4	-3.4	21.4	0	0	38.4	38.4	11	8	83
02†	-0.5	-2.1	-1.3	19.3	0	0	11.2	8.6	55	2E	102E
03†	-1.8	-9.1	-5.5	23.5	0	0	0	0	55		<31
04†	3.6	-8.4	-2.4	20.4	0	0.2	0	0.2	55	17	76
05†	3.6	-2.5	0.6	17.4	0	2.6	0	2.6	55	14	37
06†	7.6	-2.4	2.6	15.4	0	6.4	0	6.4	50	15	56
07†	2.8	-2.1	0.4	17.6	0	0	0.4	0.4	40	35	39
08†	0.4	-5.1	-2.4	20.4	0	0	0.2	T	36		<31
09†	-1.5	-5.9	-3.7	21.7	0	0	0.2	T	34		<31
10†	-1.5	-5.4	-3.5	21.5	0	0	28.2	25.8	34	36	56
11†	-3.1	-8.4	-5.8	23.8	0	0	9	7	64	29	65
12†	-2.9	-8.4	-5.7	23.7	0	0	9.8	9.6	64	12	83
13†	5.3	-3.2	1.1	16.9	0	5.4	1	6.4	68	25	122
14†	-1	-4.1	-2.6	20.6	0	0	2.2	1.4	63	26	59
15†	-0.6	-4.4	-2.5	20.5	0	0	0.6	T	63	28	59
16†	3	-4.8	-0.9	18.9	0	0	T	T	58	25	46
17†	3.5	-7.8	-2.2	20.2	0	T	0	T	52	17	59
18†	7.3	-5.4	1	17	0	9.2	1	10	40	24	70
19†	-4.8	-10.4	-7.6	25.6	0	0	4.1	3.6	41	24	46
20†	-5.2	-10.4	-7.8	25.8	0	0	T	T	40	28	46
21†	-3.1	-12	-7.6	25.6	0	0	0.4	0.2	40	16	41
22†	-2.7	-9.4	-6.1	24.1	0	0	2.2	1.6	41	32	59
23†	-6.4	-10.9	-8.7	26.7	0	0	T	T	40	30	69
24†	-3.9	-10.4	-7.2	25.2	0	0	0.8	0.8	38	35	70
25†	-1.6	-5.8	-3.7	21.7	0	0	54	54	66	32	104
26†	-3.6	-9.8	-6.7	24.7	0	0	3.2	3.2	85	27	87
27†	-3.6	-12.8	-8.2	26.2	0	0	3.2	2.4	80	28	44
28†	-2.3	-16	-9.2	27.2	0	0	0.2	0.2	82	26	41
Sum				613	0	23.8	170.3	182.8			

Figure 1

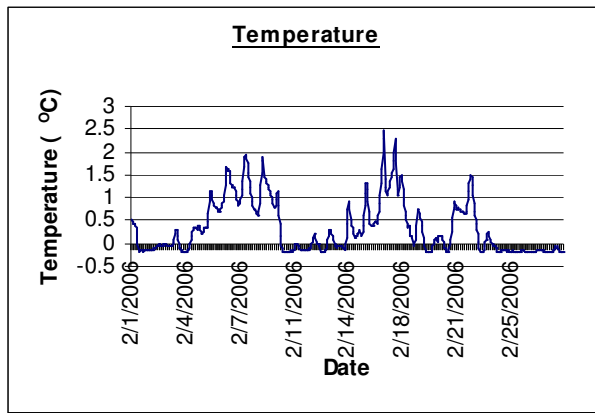
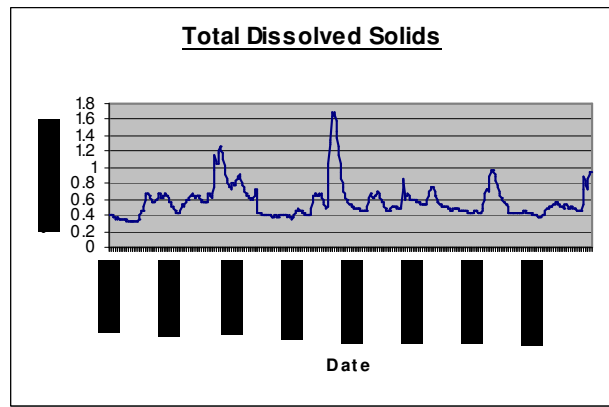


Figure 2



- Total dissolved solids levels reflected the changes in conductivity as observed in Figure 2. Conductivity measurements are a good indication of total dissolved solids and total dissolved ion concentrations, although this is not an exact linear relationship.

Figure 3

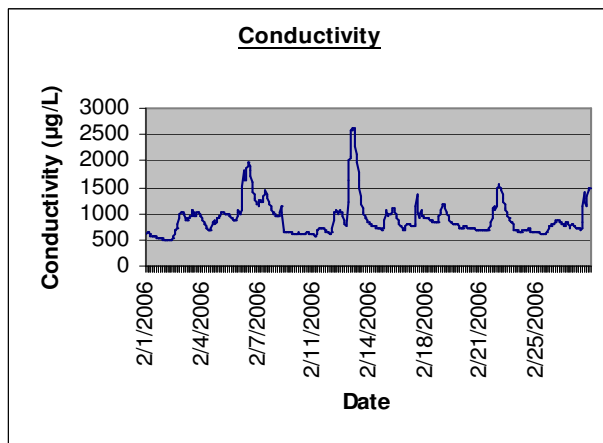
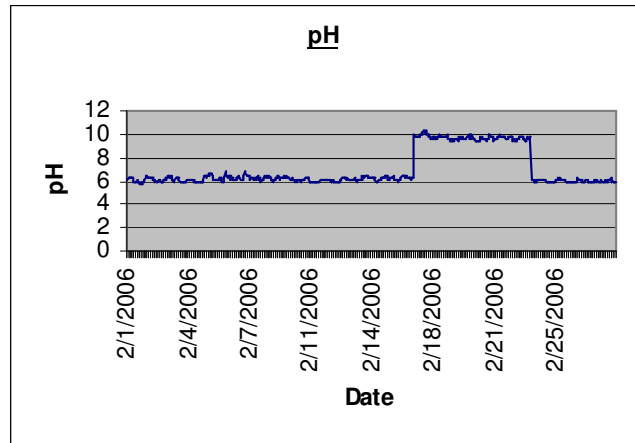


Figure 4



- Conductivity levels fluctuated throughout the month as observed in Figure 3. These higher conductivity readings usually occurred in response to precipitation events and warmer temperatures causing runoff from melting snow.
- The pH levels for the month of February ranged from 5.77 to 10.33. A problem occurred with the pH sensor after it was reinstalled on February 17, 2006. The pH readings from February 17 to February 21, 2006 are shown to be much higher than normal. Readings returned to normal levels after routine maintenance and calibration was conducted on the datasonde on February 23rd. There were some instances where the pH measurements were outside the CCME recommended Canadian Water Quality Guidelines for the Protection of Aquatic Life of 6.5 to 9 (Figure 4). The average pH level for February was 6.99. (Table 3).

Figure 5

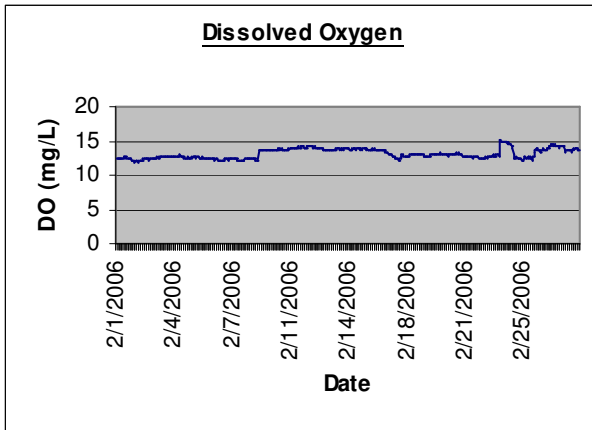
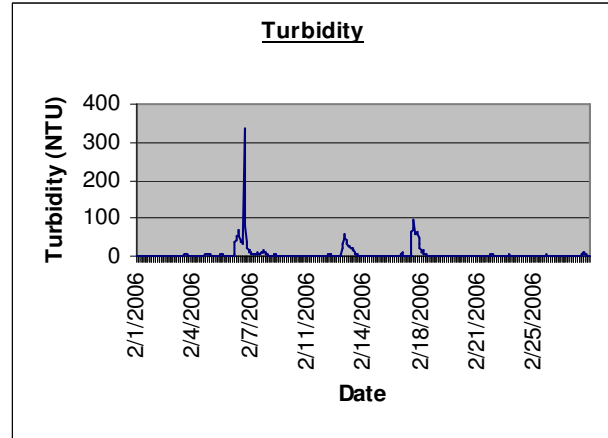


Figure 6



- Dissolved oxygen levels ranged between 11.89 mg/L to 15.17 mg/L during the period of measurement (Figure 5). During the month of February, dissolved oxygen measurements were consistently above the CCME recommended maximum guideline of 9.5 mg/L. The average DO level for the period of measure was 13.13 mg/L (Table 3).
- Turbidity levels fluctuated and had several spikes noted throughout the month. The turbidity spikes (Figure 6) are normally in response to precipitation events. The high turbidity readings can be attributed to warm air temperatures causing snow melt and subsequent runoff and precipitation events. Several turbidity spikes exceeded the CCME recommended maximum of 8 NTU above background levels.

Additional Information

- Table 3 provides summary statistics on water quality parameters for Waterford River during the month of February 2006.

Table 3: Summary statistics for February 2006.

	Water Temperature	pH	Conductance	Dissolved Solids	% Saturated	Dissolved Oxygen	Turbidity
Max	2.47	10.33	2638.00	1.69	104.70	15.17	336.80
Min	-0.21	5.77	493.00	0.32	81.10	11.89	0.00
Average	0.34	6.99	899.59	0.58	90.93	13.13	4.87
Standard Deviation	0.58	1.54	333.60	0.21	4.48	0.70	18.26

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