Government of Newfoundland and Labrador
Department of Environment and Conservation
Water Resources Management Division

Real Time Water Quality Monthly Report
Waterford River - St. John's NL
April-May 2008

General

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

Maintenance and Calibration of Instrumentation

- The following table displays the dates when the freshly calibrated Datasonde was installed and when it was removed at the end of the deployment period for routine cleaning, maintenance and calibration.

Table 1: Table of Datasonde installation and removal:

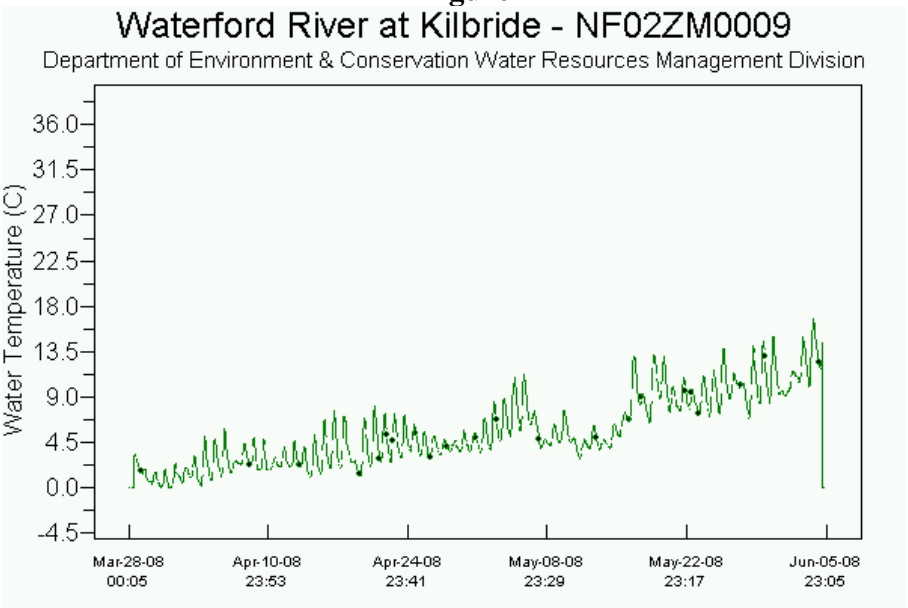
Date Installed	Date Removed
March 25, 2008	June 5, 2008

- Water quality readings were taken with a second, freshly calibrated Datasonde instrument at the time of installation and removal for QAQC comparison.

Data Interpretation

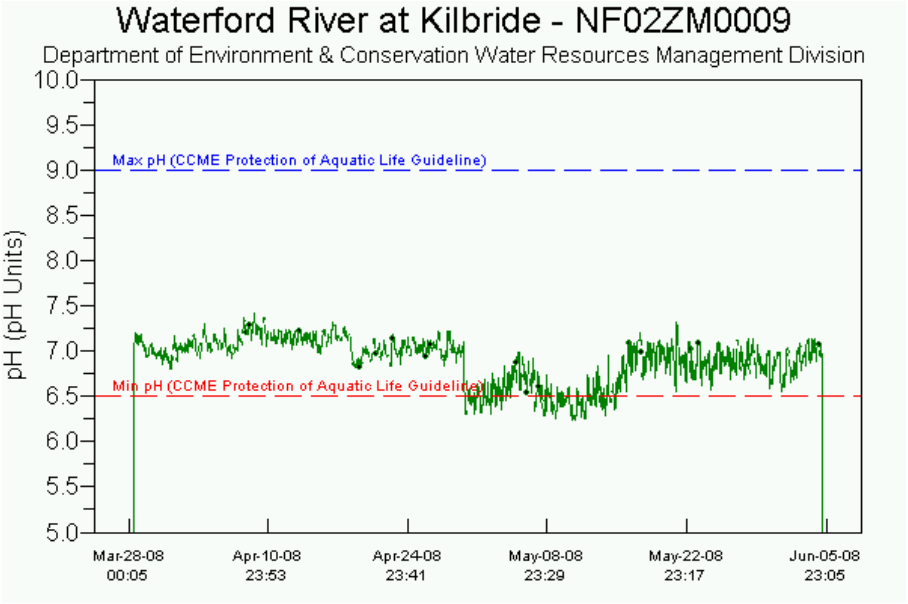
- In general, water quality parameters were stable during the deployment period with expected daily/nightly (diurnal) and seasonal changes occurring, particularly during periods of snow-melt and spring run-off.
- Water temperatures displayed a gradual and consistent increase during the deployment period (see **Figure 1** below), in response to seasonally increasing air temperatures. Daily air temperatures for the deployment period are found in two Daily Climate Data charts found in **Appendix 1** at the end of this report.

Figure 1



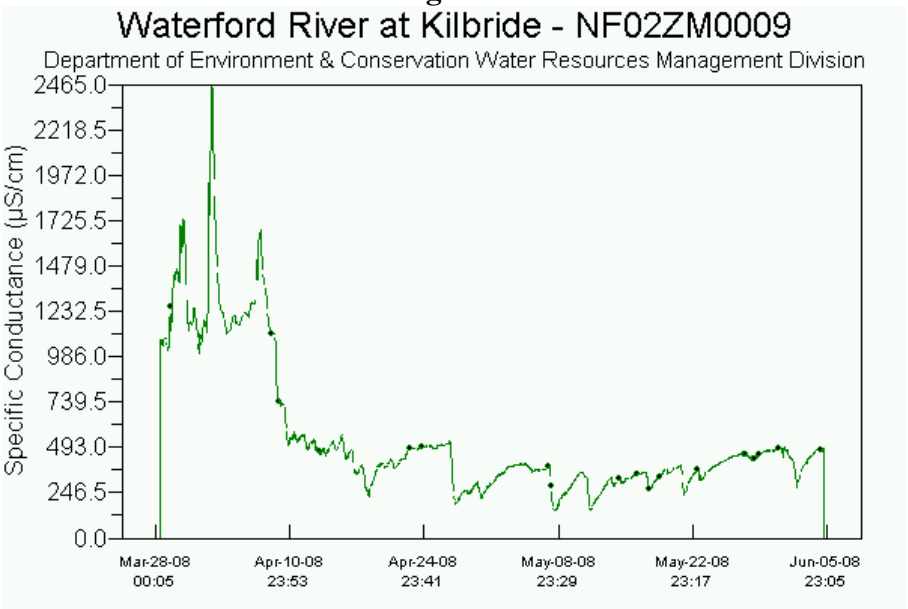
- pH levels were fairly constant during the deployment period, with the exception of a period lasting from April 30th to May 15, when pH values decreased and frequently fluctuated below the minimum level recommended by the Canadian Water Quality Guidelines for the Protection of Aquatic Life of 6.5 pH units. This period corresponded with a period of significant snow melt which may have resulted in slightly acidic surface run-off draining into the river system. pH values for the deployment period are shown in **Figure 2** below.

Figure 2



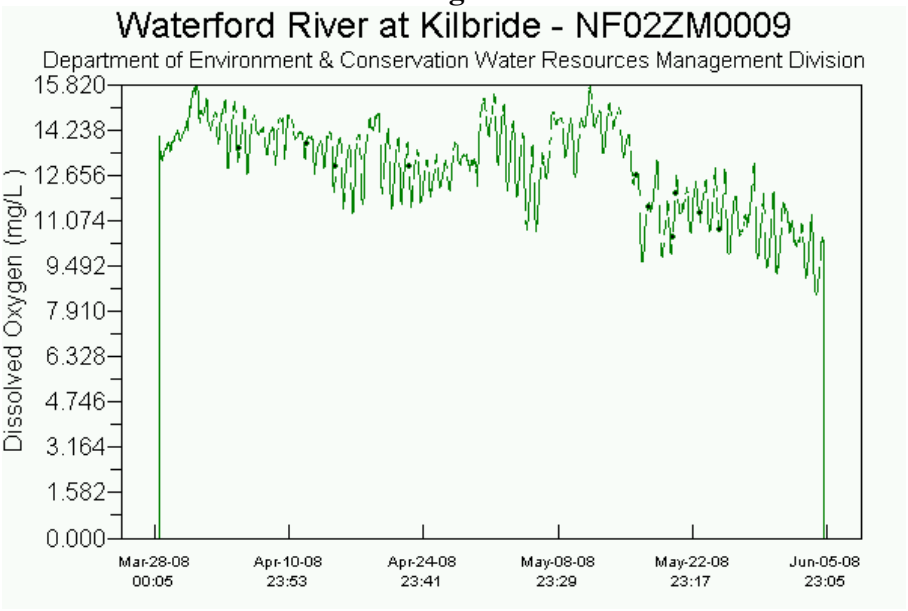
- Specific conductance levels were significantly higher during the first 12 days than they were for the remainder of the deployment period (see **Figure 3** below). Road salt was consistently used for ice control on residential streets early in the deployment. Surface run-off carried the salt into the watercourse resulting in increased conductivity levels. Higher air temperatures during April (see climate data, **Appendix 1**) led to significant snow-melt, which had a dilution effect as conductivity returned to expected levels for this station for the remainder of the deployment period.

Figure 3



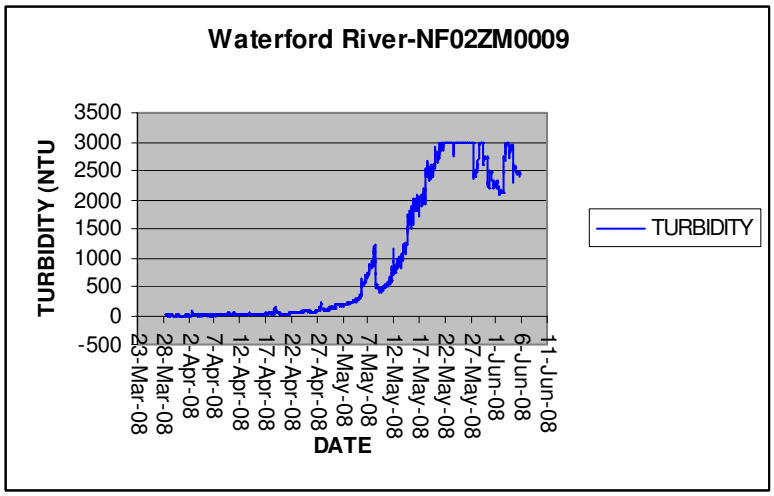
- Dissolved oxygen levels displayed diurnal fluctuations (**see Figure 4**) in response to changes in water temperatures from daytime highs to night time lows (**see Figure 1**). Dissolved oxygen displayed an overall decreasing trend during the deployment period in response to the seasonally increasing water temperature (**Figure1**).Warmer water typically holds less dissolved oxygen than colder water, so as water temperatures increase, dissolved oxygen levels typically decrease. All dissolved oxygen levels were above the CCME minimum guideline for the Protection of Aquatic Life of 6.5-9.5mg/L dissolved oxygen.

Figure 4



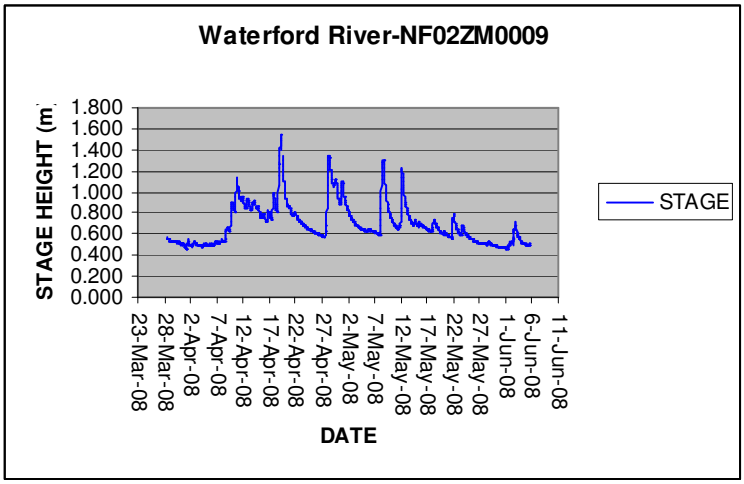
- Turbidity levels were within the expected range for this site from March 25th-April 18th, but then turbidity quickly and steadily increased until the sensor was saturated at 3000 NTU by May 21st, at which point the sensor was non-functional for the remainder of the deployment (see **Figure 5** below). It is quite probable that increased turbidity levels were experienced in Waterford River during the period of heavy snow melt in April, which may have caused fouling of the turbidity sensor to the point of saturation. All turbidity data collected after April 18th will be treated as "suspect."

Figure 5



- Stage height displayed spikes on April 9th, 19th and 28th, and on May 8th and 12th (see **Figure 6** below). Those dates correspond to dates where there was significant snow melt and/or significant rainfall (see **Appendix 1**).

Figure 6



APPENDIX 1:

Weather information for St. John's, NL provided by Environment Canada for April and May 2008:

Daily Data Report for April 2008					
Day	Max Temp °C	Min Temp °C	Mean Temp °C	Total Precip mm	Spd of Max Gust km/h
01	-1.7	-14.1	-7.9	0.0	<31
02	3.4	-4.1	-0.4	8.2	63E
03	-0.8	-5.5	-3.2	T	74E
04	1.7	-4.2	-1.3	T	67E
05	1.9	-6.2	-2.2	0.0	<31
06	1.4	-4.3	-1.5	T	41E
07	0.7	-2.1	-0.7	5.6	52E
08	4.4	0.5	2.5	0.8	<31
09	8.3	0.7	4.5	0.0	<31
10	11.0	3.3	7.2	0.0	<31
11	4.0	1.2	2.6	3.6	<31
12	4.8	0.9	2.9	0.4	32E
13	6.4	0.0	3.2	6.4	<31
14	3.4	-1.4	1.0	T	72E
15	4.8	-2.5	1.2	T	72E
16	8.8	-2.7	3.1	0.0	59E
17	13.4	2.1	7.8	0.0	67E
18	15.9	2.4	9.2	20.8	52E
19	4.8	-4.1	0.4	12.6	39E

20	7.2	-5.0	1.1	0.0	37E
21	10.7	-2.3	4.2	0.0	39E
22	4.4	-5.2	-0.4	T	37E
23	4.4	-6.8	-1.2	0.0	32E
24	6.9	-2.7	2.1	T	<31
25	-0.2	-2.8	-1.5	0.2	<31
26	0.9	-2.9	-1.0	T	37E
27	3.8	-0.9	1.5	21.2	52E
28	3.9	1.9	2.9	16.0	46E
29	4.3	1.1	2.7	4.2	32E
30	3.6	0.8	2.2	9.2	48E

Daily Data Report for May 2008					
Day	Max Temp °C	Min Temp °C	Mean Temp °C	Total Precip mm	Spd of Max Gust km/h
01†	3.9	-0.7	1.6	T	37
02†	1.7	-1.2	0.3	T	33
03†	5.1	-1.8	1.7	0.2	32
04†	6.4	-0.3	3.1	T	<31
05†	17.5	0.9	9.2	0.0	<31
06†	8.7	-0.4	4.2	0.0	<31
07†	3.3	-0.6	1.4	2.0	41
08†	3.1	0.4	1.8	31.0	63
09†	3.4	1.1	2.3	0.8	35
10†	6.2	-0.7	2.8	0.3	33E
11†	2.0	-0.7	0.7	14.4	57
12†	2.5	0.6	1.6	26.4	52
13†	3.4	-0.5	1.5	0.2	50
14†	2.0	-0.7	0.7	2.6	46
15†	3.8	0.4	2.1	3.8	<31
16†	8.4	1.7	5.1	3.0	33
17†	19.6	4.3	12.0	5.2	33
18†	8.4	4.3	6.4	3.8	57
19†	21.5	3.8	12.7	0.0	44
20†	16.6	3.3	10.0	2.4	48
21†	14.3	3.2	8.8	11.4	63
22†	10.9	4.1	7.5	0.0	59
23†	11.1	3.2	7.2	8.4	37
24†	12.8	3.1	8.0	T	44
25†	11.9	2.2	7.1	0.0	46
26†	18.0	2.4	10.2	0.0	57
27†	15.0	8.9	12.0	1.4	67

28†	11.1	3.4	7.3	3.6	65
29†	16.3	2.5	9.4	0.0	44
30†	14.9	5.1	10.0	0.0	61
31†	17.3	4.6	11.0	0.0	52

Report prepared by:

Joanne Sweeney
Environmental Scientist
Water Resources Management Division
Department of Environment and Conservation
Confederation Building West Block 4th Floor
PO Box 8700
St. John's NL A1B 4J6

Ph. (709) 729-0351
Fax (709) 729-0320