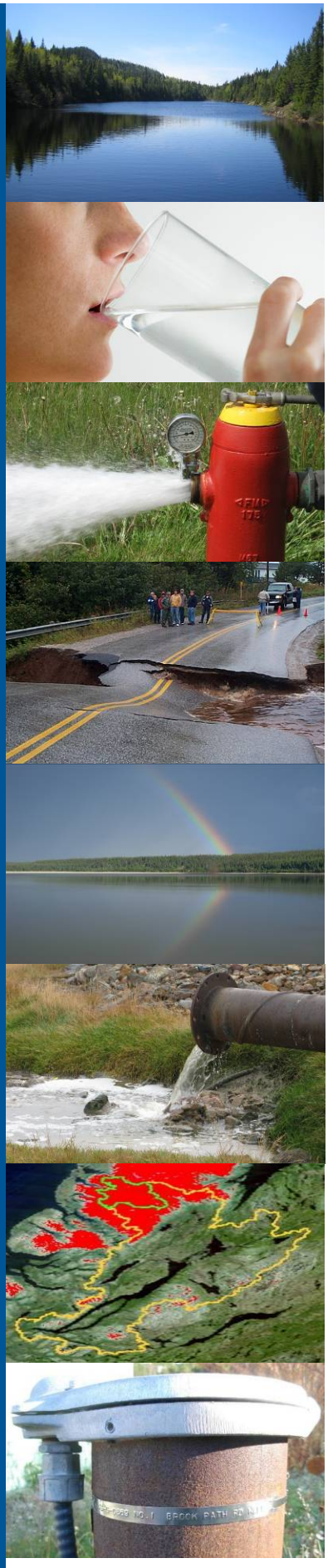


Waterford River @ Kilbride

NF02ZM0009

February 2011

Newfoundland Labrador

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

Real Time Water Quality Monthly Report
Waterford River - St. John's NL
February 2011

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 Waterford River water quality probe was installed and removed during this deployment period for routine cleaning, maintenance and calibration.
- The instrument at Waterford River does not include a turbidity sensor, thus turbidity will not be recorded at this station until further notice.

Table 1: Table of Water Quality Probe Installation and Removal

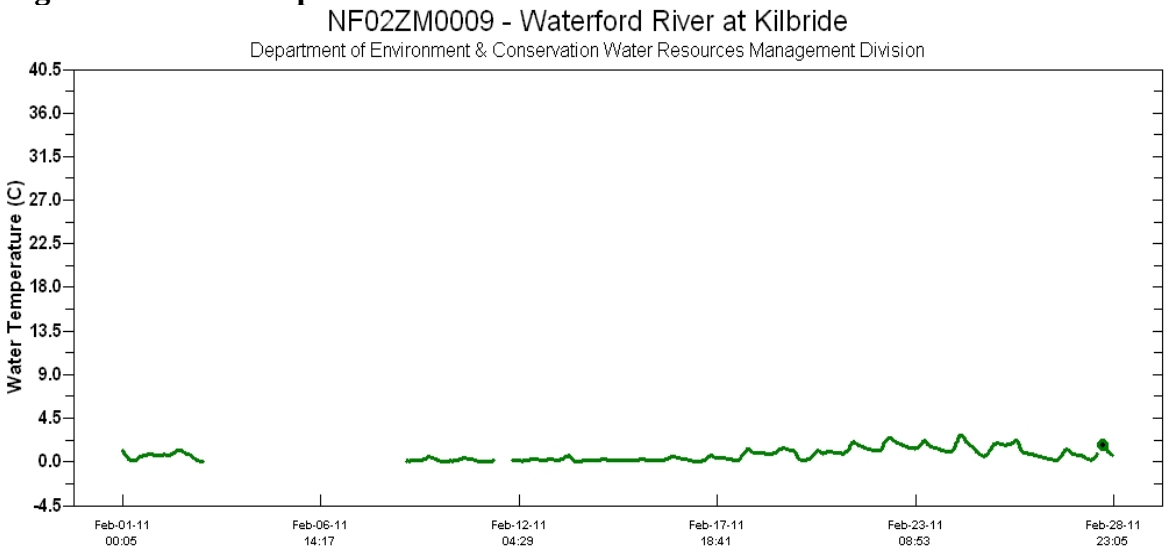
Date Installed	**Date Removed**
January 27, 2011	February 28, 2011

- Water quality readings were taken with a second water quality instrument at the time of installation and removal for QAQC comparison. The QAQC instrument was calibrated prior to each use.
- There was a data gap during this deployment, from February 3 at 7:05AM to February 9 at 11:05AM.

Data Interpretation

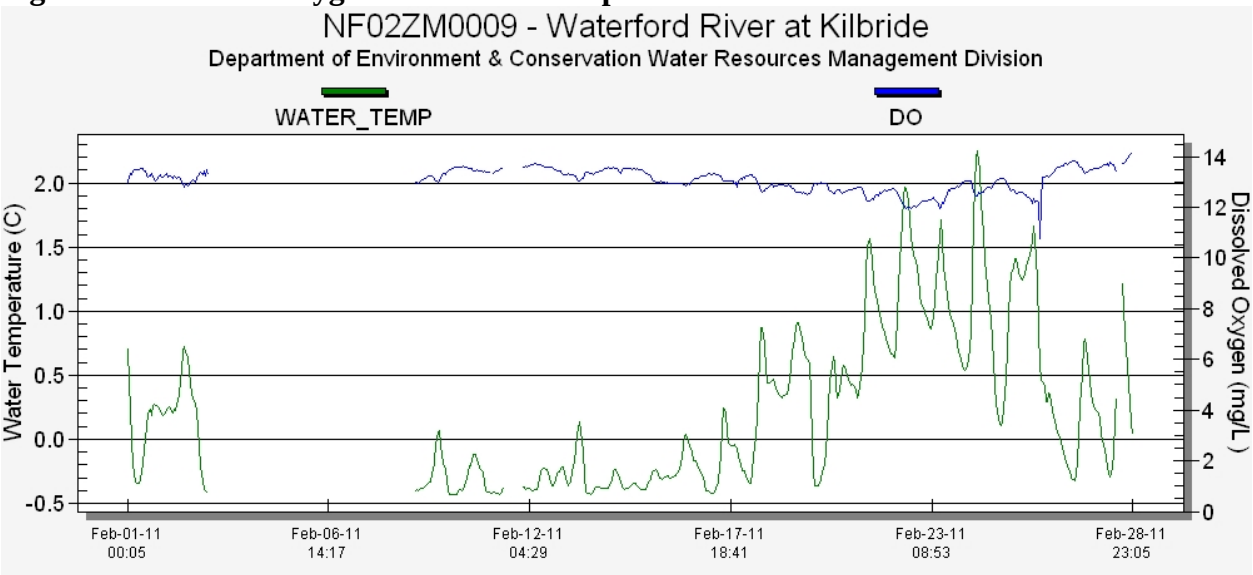
- **Water temperatures** were fairly constant during this deployment, ranging between -0.43 and 2.25^{o}C, which is within the expected temperature range for this time of year. There was no ice cover on Waterford River at the time of instrument deployment and removal, though water temperatures frequently hovered near the freezing point. Water temperature data is shown in **Figure 1** below. The gap in the graph represents the period from February 3 – 9 when the data logger was not receiving water quality information from the sonde.

Figure 1: Water Temperature



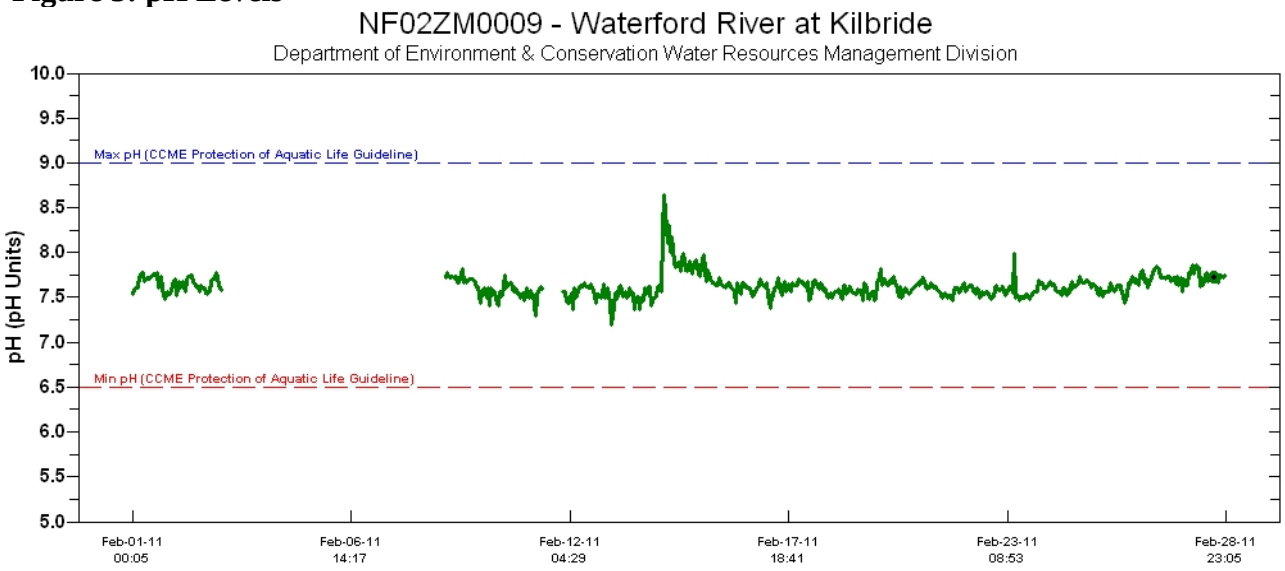
- **Dissolved oxygen (DO)** levels ranged between 10.75 and 13.85 during this deployment period, indicative of the capacity of cold water to hold more dissolved oxygen than warmer water. Dissolved oxygen is shown in blue and water temperature is shown in green in **Figure 2**, below. The gap in the graph represents the period from February 3 – 9 when the data logger was not receiving water quality information from the sonde.

Figure 2: Dissolved Oxygen and Water Temperature



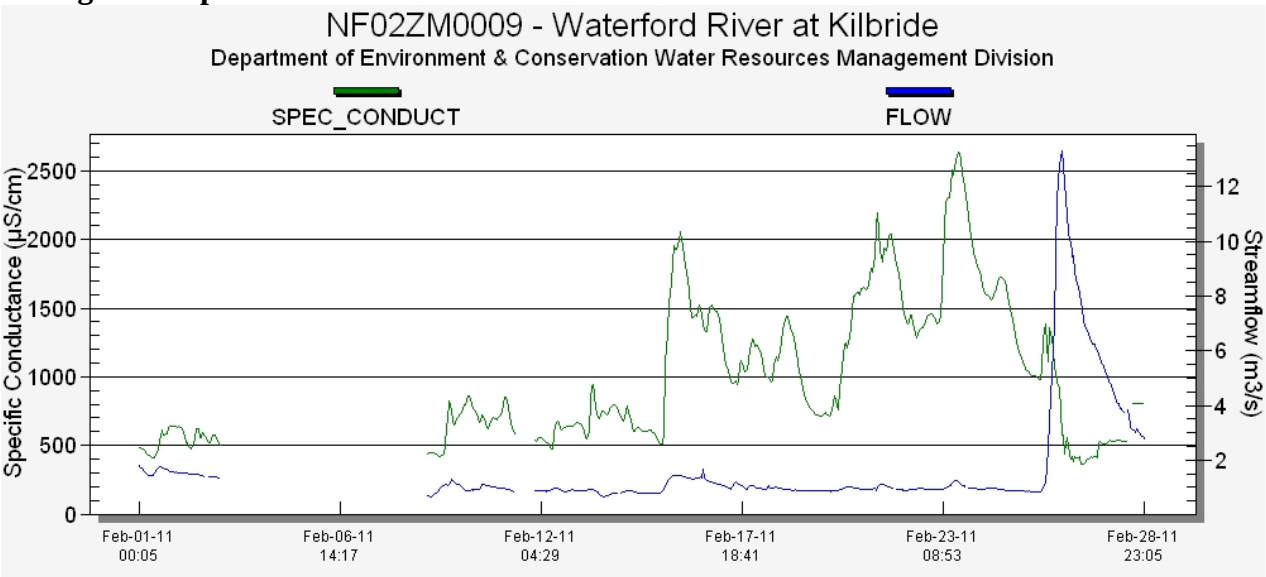
- **pH** levels were fairly constant and within the expected range for this station throughout the deployment, ranging from 7.19 to 8.64 pH units, as seen in **Figure 3** below. All pH values were within the range recommended by the Canadian Water Quality Guidelines for the Protection of Aquatic Life of 6.5 to 9.0 pH units. The gap in the graph represents the period from February 3 – 9 when the data logger was not receiving water quality information from the sonde.

Figure 3: pH Levels



- **Specific conductivity** levels were fairly high, but within the expected range for Waterford River during this deployment. Specific conductivity levels ranged between 362-2640µS/cm and showed sudden increases despite that fact that water flow remained fairly constant for most of the deployment, as shown in **Figure 4** below. The Environment Canada Daily Climate Data, shown below in **Appendix 1**, indicates that maximum daily air temperatures were above 0^{o}C almost every day from February 15-23, resulting in increased run-off containing significant amounts of road salt entering the river.

Figure 4: Specific Conductance and Flow



APPENDIX 1: Weather information for St. John's, NL provided by Environment Canada for February 2011:

Day	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days °C	Cool Deg Days °C	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's Deg	Spd of Max Gust km/h
01†	-5.3	-11.7	-8.5	26.5	0.0	0.0	1.4	0.8	18	30	54
02†	-4.7	-10.8	-7.8	25.8	0.0	0.0	12.8	11.0	23	36	33
03†	-5.4	-12.2	-8.8	26.8	0.0	0.0	10.2	7.6	40	11	46
04†	-2.5	-12.6	-7.6	25.6	0.0	0.0	T	T	41	26	54
05†	-1.5	-4.3	-2.9	20.9	0.0	0.0	T	T	38		<31
06†	2.7	-3.5	-0.4	18.4	0.0	0.8	10.6	7.2	37	31	85
07†	-0.9	-8.7	-4.8	22.8	0.0	0.0	T	T	38	33	70
08†	-2.1	-8.9	-5.5	23.5	0.0	0.0	25.4	21.8	38	8	74
09†	-0.5	-8.8	-4.7	22.7	0.0	0.0	9.6	6.6	62	30	76
10†	-5.0	-9.4	-7.2	25.2	0.0	0.0	13.8	10.2	62	29	63
11†	-6.9	-12.8	-9.9	27.9	0.0	0.0	6.2	4.8	70	32	57
12†	-3.3	-11.9	-7.6	25.6	0.0	0.0	T	T	72	31	41
13†	-1.7	-10.7	-6.2	24.2	0.0	0.0	4.0	2.0	75	29	89
14†	-5.6	-12.5	-9.1	27.1	0.0	0.0	T	T	74	29	59
15†	4.1	-6.3	-1.1	19.1	0.0	1.2	12.4	13.6	76	14	65
16†	0.1	-4.7	-2.3	20.3	0.0	0.0	2.8	2.4	70	36	95
17†	-0.4	-5.0	-2.7	20.7	0.0	0.0	0.4	0.4	70	30	74
18†	0.8	-3.4	-1.3	19.3	0.0	0.0	0.0	0.0	70	31	70
19†	-0.6	-2.9	-1.8	19.8	0.0	0.0	5.0	3.8	70	8	56
20†	0.1	-0.6	-0.3	18.3	0.0	0.0	7.6	5.6	75	8	56
21†	0.6	-1.4	-0.4	18.4	0.0	0.0	1.2	1.2	73	34	44
22†	0.0	-2.0	-1.0	19.0	0.0	M	3.4	2.4	68		<31
23†	0.5	-2.2	-0.9	18.9	0.0	0.0	5.6	5.6	69	2	65
24†	-1.5	-5.4	-3.5	21.5	0.0	0.0	T	T	71	35	41
25†	2.1	-5.1	-1.5	19.5	0.0	0.8	T	0.8	71	19	59
26†	4.6	-7.9	-1.7	19.7	0.0	27.0	0.2	27.2	61	29	104
27†	-4.7	-9.6	-7.2	25.2	0.0	0.0	T	T	50	29	52
28†	-6.1	-12.3	-9.2	27.2	0.0	0.0	T	T	50	35	35
Sum				**629.9**	**0.0**	**29.8***	**132.6**	**135.0**			
Avg	**-1.5**	**-7.4**	**-4.48**								
Xtrm	**4.6**	**-12.8**								**29**	**104**

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