Government of
Newfoundland
and Labrador

Real Time Water Quality Monthly Report
Leary's Brook
January 2006

General

- Data from the Leary's Brook 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 January.

  Table 1: Table of Datasonde removal and installation dates

Date Installed	Date Removed
	January 3, 2006
January 4, 2006	January 11, 2006
January 12, 2005	January 25, 2006
January 26, 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 January with expected daily/nightly (diurnal) and seasonal changes occurring.
- **Stage height** (water level) rose and fell in response to daily precipitation as seen in **Figure 1**. Increases in stage height correspond to precipitation events as seen in Table 2.
- **Water temperature** fluctuated in response to daily maximum and minimum air temperature. This is demonstrated by comparing the graph in **Figure 2** to the air temperature data in **Table 2**. Warmer water temperatures correspond to warmer air temperatures experienced from January 14th to January 16th.

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

Daily Data Report for January 2006

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†	0	-2.8	-1.4	19.4	0	0	T	T	T	6	39
02†	-0.4	-3.6	-2	20	0	0	4.2	4	2	18	54
03†	-1.6	-8.9	-5.3	23.3	0	0	T	T	4	30	32
04†	0.1	-13.6	-6.8	24.8	0	1	0	1	4	13	37
05†	1.7	-4.6	-1.5	19.5	0	37.8	7.4	45.2	4	35	67
06†	2.4	-2.2	0.1	17.9	0	0.4	0	0.4	4	34	46
07†	12.3	2.1	7.2	10.8	0	15.2	0	15.2	2	17	59
08†	2.5	-2.1	0.2	17.8	0	0	0	0		26	43
09†	-0.9	-5.7	-3.3	21.3	0	0	2.8	2.4	2	27	39
10†	3.4	-5.7	-1.2	19.2	0	1.8	3	4.8	2	29	63
11†	-0.7	-5.1	-2.9	20.9	0	0	T	T	2	28	74
12†	7.6	-7.9	-0.2	18.2	0	10.4	0.8	12.8	1	26	80
13†	2.9	-4.5	-0.8	18.8	0	T	0	T	T	28	87
14†	8	-1.8	3.1	14.9	0	0	0	0		21	46
15†	15.7	5.4	10.6	7.4	0	1	0	1		19	78
16†	12.2	1.9	7.1	10.9	0	10.8	0	10.8		18	78
17†	2	-4.3	-1.2	19.2	0	0	3.8	3.8	T	24	95
18†	-1.9	-6.4	-4.2	22.2	0	0	0	0		18	59
19†	5.4	-2.5	1.5	16.5	0	8.6	1.2	9.8	T	17	102
20†	-0.4	-3.5	-2	20	0	0	0.8	0.4	T	28	70
21†	1.1	-2.5	-0.7	18.7	0	1.2	5.4	5.2	5	17	59
22†	6	-11.9	-3	21	0	6.4	1.8	8	T	29	107
23†	-8.8	-13.3	-11.1	29.1	0	0	0	0	T	28	96
24†	-4.9	-11.3	-8.1	26.1	0	0	T	T	T		<31
25†	-1.1	-5.7	-3.4	21.4	0	0	3.2	2.6	T	6	44
26†	4.3	-2.7	0.8	17.2	0	9.7	11.1	19	11	28	59
27†	-2.7	-5.5	-4.1	22.1	0	0	1.2	1	11	28	65
28†	-1.1	-5.4	-3.3	21.3	0	0	T	T	11	28	63
29†	-1.1	-3.5	-2.3	20.3	0	0	0.8	0.6	10	28	46
30†	-1.9	-6.9	-4.4	22.4	0	0	0.8	0.6	11		<31
31†	-3.2	-6.4	-4.8	22.8	0	0	0.4	0.4	11	8	37
Sum				**605.4**	**0**	**104.3**	**48.7**	**149**			
Avg	**1.8**	**-4.9**	**-1.5**								

Figure 1

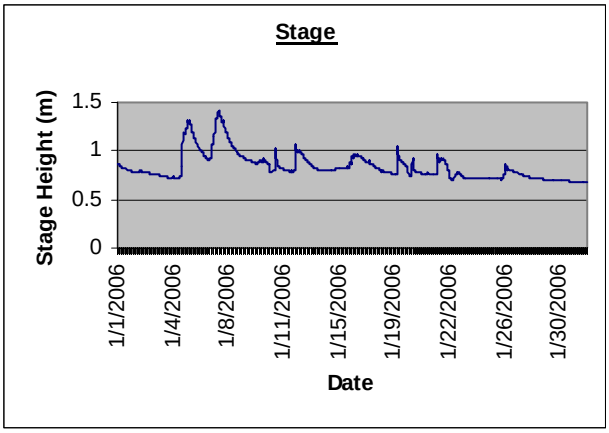
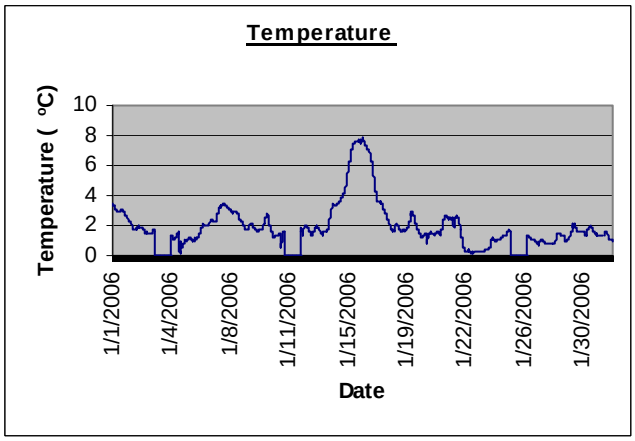


Figure 2



- **Conductivity** levels fluctuated throughout the month with several notable spikes as observed in Figure 3. These spikes usually occurred in response to precipitation events.

- **Total dissolved solids** (**Figure 4)** levels reflected the changes in conductivity. 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

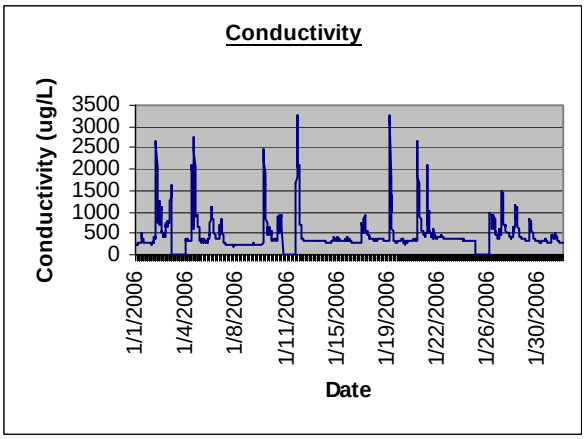
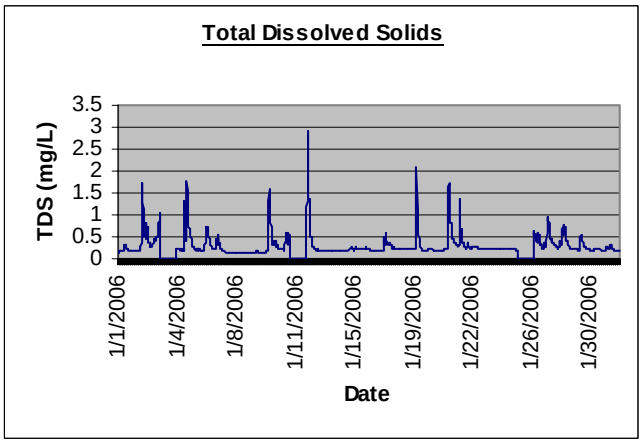


Figure 4



- The **pH** levels for the month of January ranged from 6.46 to 8.57. There were some instances where the pH was outside the CCME recommended Canadian Water Quality Guidelines for the Protection of Aquatic Life of 6.5 to 9 (see **Figure 5**). The average pH level for January was 7.57. (see **Table 3**).

- **Dissolved oxygen** levels ranged between 9.0 mg/L to 13.7 mg/L during the period of measurement (see **Figure 6**). During the month of January, dissolved oxygen measurements went above the CCME recommended maximum guideline of 9.5 mg/L. The average DO level for the period of measure was 11.92 mg/L (see **Table 3**).

Figure 5

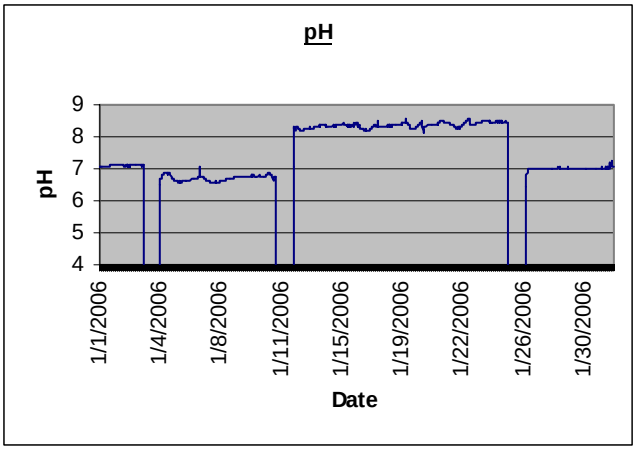
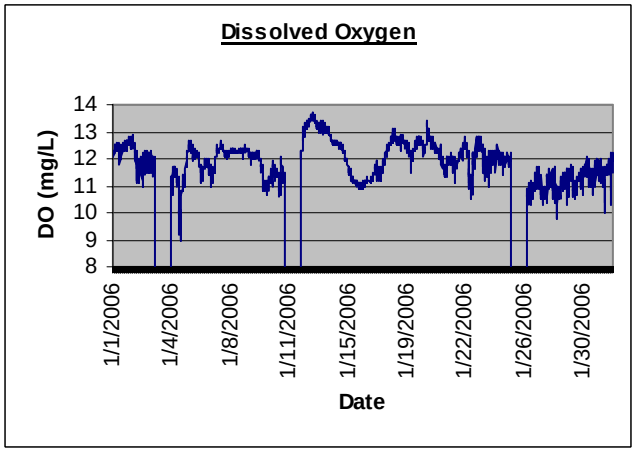
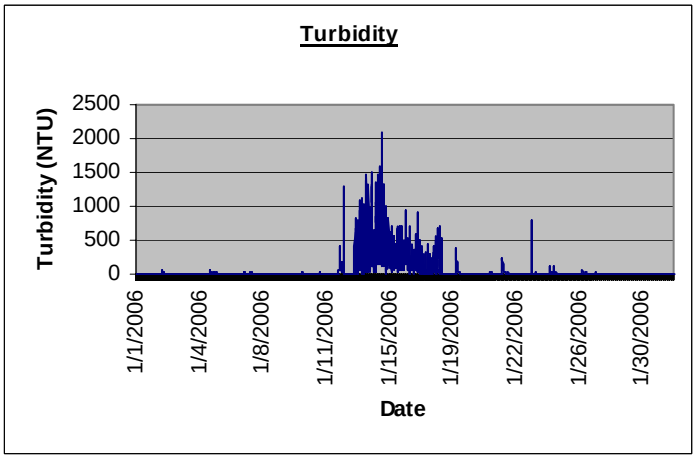


Figure 6



- **Turbidity** levels fluctuated and had several minor spikes noted throughout the month. The turbidity spikes (see **Figure 7**) are normally in response to precipitation. Turbidity levels were high from January 12th to January 18th. These high turbidity readings can be attributed to warm air temperatures causing snow melt and subsequent runoff and a precipitation event on January 16th. Many turbidity spikes exceeded the CCME recommended maximum of 8 NTU above background levels.

Figure 7



Additional Information

- Table 3 provides summary statistics on water quality parameters for Leary's Brook during the month of January 2006.

Table 3: Summary statistics for January 2006.

	Water Temperature	pH	Conductance	Dissolved Solids	Percent Saturated	Dissolved Oxygen	Turbidity
Max	7.83	8.57	3276.7	2.92	97.6	13.7	2082
Min	0.08	6.46	210	0.14	62.4	9	0
Average	2.097844892	7.57123788	471.5142058	0.302871	86.54135	11.91872	65.98587
Standard Deviation	1.507577323	0.74802196	354.833834	0.233198	5.679602	0.684626	191.8292

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