General

- The Water Resources Management Division staff monitors the real-time web page on a daily basis.
- This monthly deployment report interprets the data from a water quality monitoring station on Minipi River below Minipi Lake. A water quality monitoring instrument (s/n 43820) was deployed at this station between June 24 and July 21, 2009, a period of 27 days.
- Due to a significant stage drop during the deployment period, the instrument measuring water quality parameters became exposed to air between July 16 (10:30am) and July 19 (12:30am). Data collected during this period is extraneous.

Quality Assurance and Quality Control

- As part of the installation and removal process, parameters are recorded from both the field sonde (in situ) and a similar, newly-calibrated QA sonde (placed side by side). The parameters from both instruments are compared and their variability is ranked as part of the QA/QC protocol (see Table 1).
- All parameters ranked "Excellent" at installation and removal except for pH at removal. The pH sensor sometimes requires several minutes to stabilize its reading for pH. It is likely that QA/QC values were recorded before the instrument had adequate time to stabilize. The pH sensor will be recalibrated and checked before any future deployment.

Table 1: QA/QC Data Comparison Rankings for deployment between June 24 and July 21, 2009.

				Instrument Comparison Ranking				
Station	Date	Action	Instrument Serial Number	Temperature	pH	Conductivity	Dissolved Oxygen	Turbidity
Minipi River below Minipi Lake	24-Jun-09	Installation	47384	Excellent	Excellent	Excellent	Excellent	Excellent
	21-Jul-09	Removal		Excellent	Fair	Excellent	Excellent	Excellent

Data Interpretation

Temperature

The water temperature fluctuates throughout the deployment period (Figure 1). The significant drop near the end of the deployment period occurs during the site visit when the new instrument is being deployed and is extraneous. Water temperature fluctuates to a great extent during the time when the instrument was exposed to air (July 16-19) as the sensor would have been recording air temperature. During the time the instrument was in the water, the maximum reported water temperature is 22.33°C and the minimum is 11.29°C. The average water temperature during this time is 17.95°C.

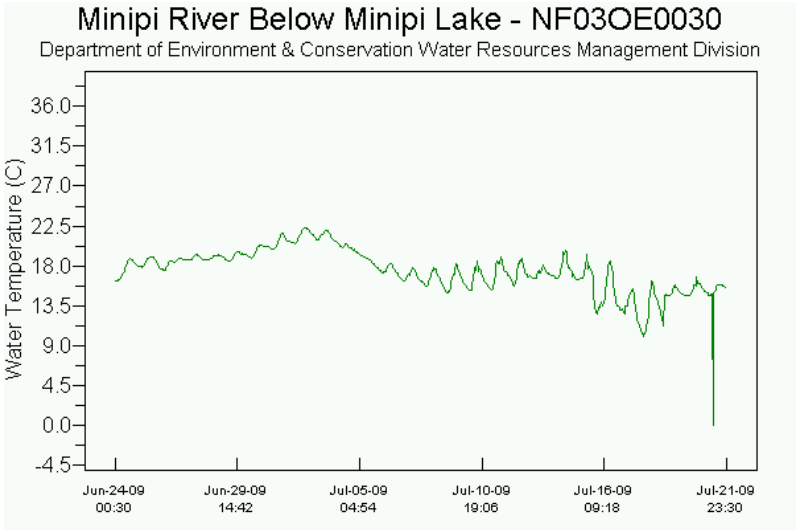

Figure 1: Water Temperature for Minipi River Station, June 24 to July 21, 2009.

pH

pH fluctuates daily throughout the deployment period while the instrument is in the water, with values averaging 6.83 units (Figure 2). The event circled in red indicates when the instrument was exposed to air. The drop at the beginning and the end of the deployment are during site visits. All values collected while the instrument was in the water are within the recommended range for pH as suggested by the CCME Guidelines for the Protection of Aquatic Life (>6.5 and < 9.0).

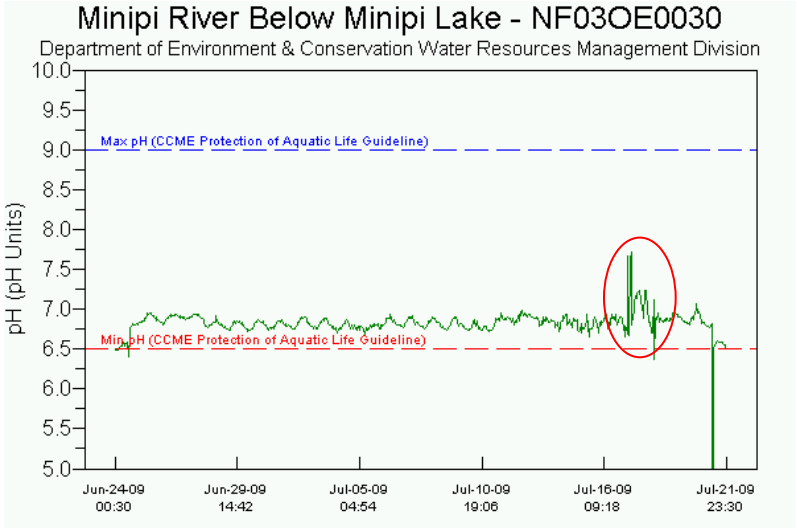

Figure 2: pH for Minipi River Station, June 24 to July 21, 2009.

Specific Conductivity

Specific conductance increases slightly throughout the deployment while the instrument remains in the water (Figure 3). When instrument became exposed on July 16, specific conductance dropped to 0µS/cm. While the instrument is in the water, specific conductance ranges between 12µS/cm and 17µS/cm.

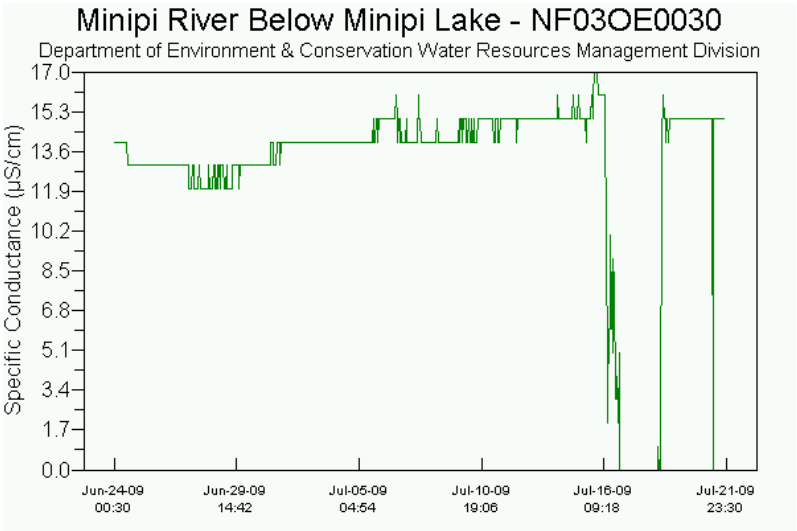

Figure 3: Specific Conductivity for Minipi River Station, June 24 to July 21, 2009.

Dissolved Oxygen and Percent Saturation

Dissolved Oxygen remains stable throughout the deployment period while the instrument was in the water (Figure 4). Dissolved Oxygen values range from 8.68mg/L to 11.11mg/L, averaging at 9.38mg/L. During the period when the instrument was out of the water (July 16 to 19), values fluctuated significantly. 85% of the time the instrument in water, dissolved oxygen content is within the recommended values for fresh (cold) water as stated by the CCME Guideline for the Protection of Aquatic Life (>9.0mg/L). During the other 15% of the time, values are just slightly below this guideline.

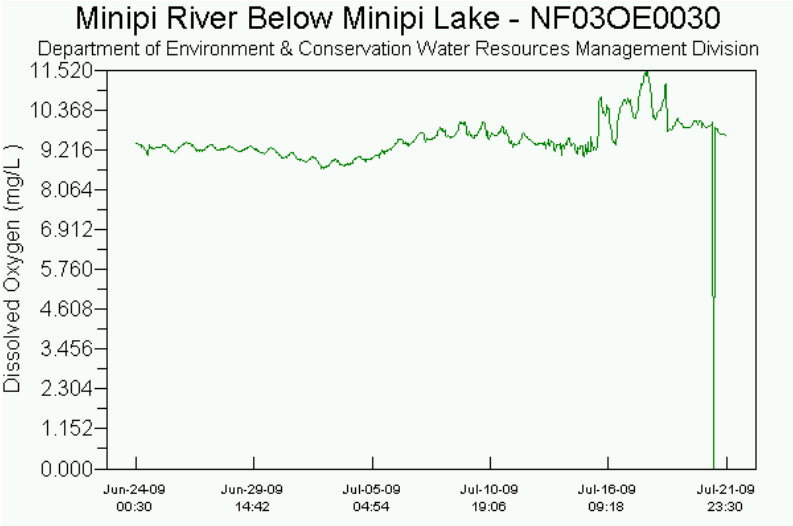

Figure 4: Dissolve Oxygen for Minipi River Station June 24 to July 21, 2009.

Percent saturation values are derived from dissolved oxygen and water temperature values. During the deployment period when the instrument was in the water, percent saturation is fluctuating daily between 92.5% and 106.6% (Figure 5).

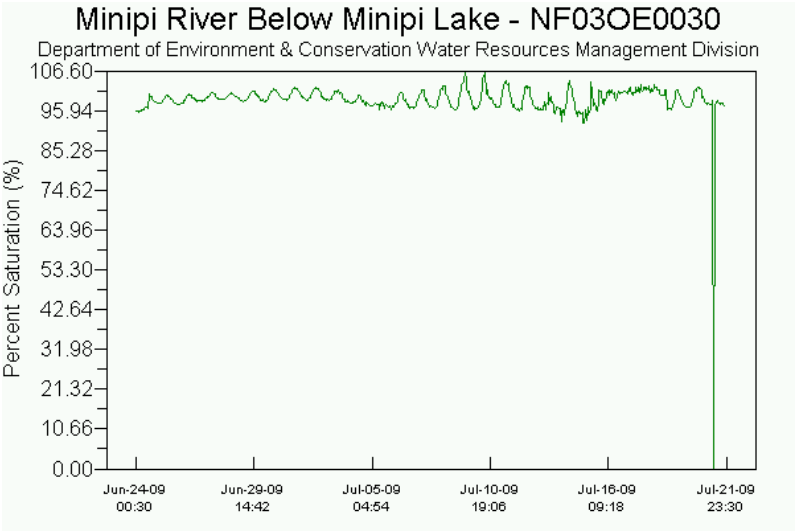

Figure 5: Percent Saturation for Minipi River Station June 24 to July 21, 2009.

Turbidity

Turbidity values primarily remain at 0 NTU for the majority of the deployment period except for a couple of events on July 14 and July 16 (Figure 6). This is during the time when the instrument would have partially exposed therefore these values are extraneous.

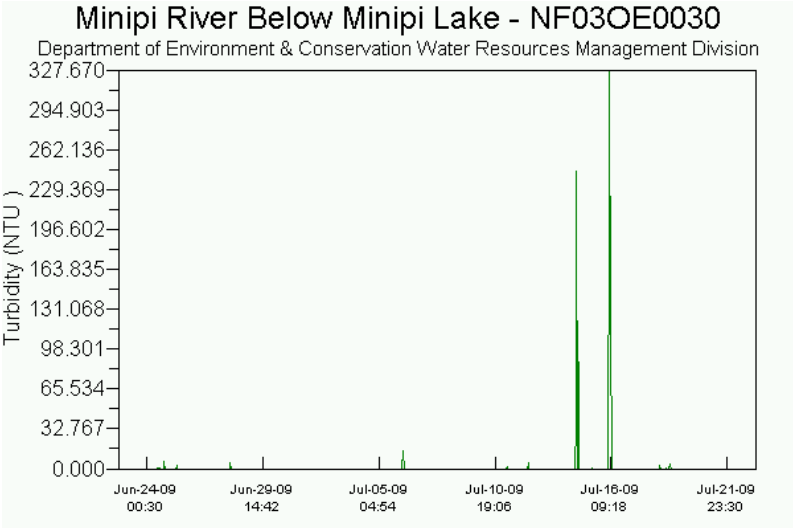

Figure 6: Turbidity for Minipi River Station June 24 to July 21, 2009.

Stage

Stage levels are decreasing throughout the deployment period between June 24 and July 21 (Figure 7). When the instrument was deployed, stage level was at 5.213m. When the instrument became exposed, stage level had dropped nearly 1m to 4.217m. Stage continued to drop to as low as 4.196m before increasing again to 4.371m when the instrument was retrieved on July 21.

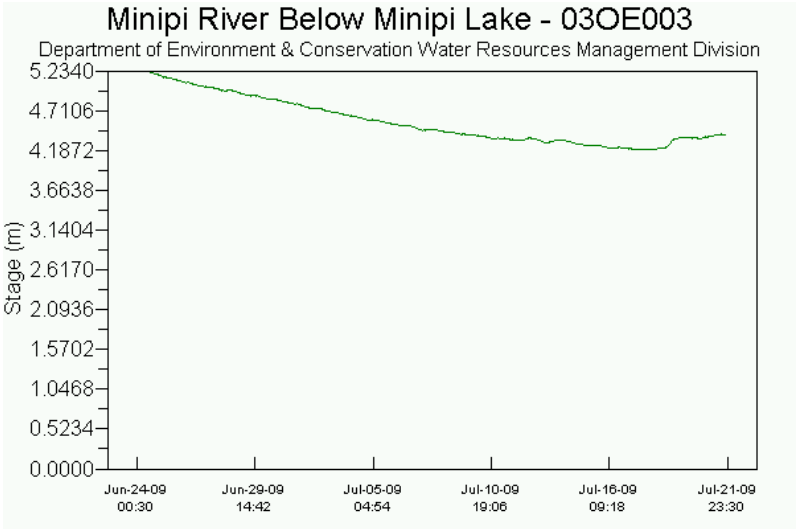

Figure 8: Stage level for Minipi River Station June 24 to July 21, 2009.

Conclusions

A water quality monitoring instrument was deployed at the station on Minipi River below Minipi Lake between June 24 and July 21. Due to a significant stage level drop during the deployment period of more than 1m, the instrument became exposed to air between July 16 and July 19. During this time, data collected is erroneous.

During the time the instrument was in the water, no water quality events were recorded at the Minipi River Station below Minipi Lake. pH level was within the recommend range according to the CCME Guidelines for the Protection of Aquatic life. Dissolved oxygen levels were within the recommended CCME Guidelines for the Protection of Aquatic Life, 85% of the time.

Appendix 1 – Weather Data

Table A-1 : Weather for Happy Valley Goose Bay – June 24 to July 21, 2009

	Max Temp (C)	Min Temp (C)	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Wind Dir	Wind Speed (km/h)
24-Jun-09	32.7	11.1	21.9	0	0	0	20E	35E
25-Jun-09	31.3	17.9	24.6	0	0	0		<31
26-Jun-09	17.9	9.1	13.5	0	0	0	9E	41E
27-Jun-09	17.6	8.6	13.1	0	0	0		<31
28-Jun-09	24.2	10.1	17.2	0	0	0		<31
29-Jun-09	30.4	13.2	21.8	0	0	0		<31
30-Jun-09	32.1	13.2	22.7	0	0	0		<31
1-Jul-09	17.3	10.6	14	0	0	0	7	33
2-Jul-09	23.7	9.4	16.6	0	0	0		<31
3-Jul-09	31.2	10.1	20.7	5.2	0	5.2	10	48
4-Jul-09	10.3	7	8.7	0.8	0	0.8	5	48
5-Jul-09	8.8	3.3	6.1	2.2	0	2.2	6	56
6-Jul-09	12.1	3.3	7.7	1.2	0	1.2	8	37
7-Jul-09	17.2	2.8	10	0	0	0	1	32
8-Jul-09	19.5	2.5	11	0	0	0		<31
9-Jul-09	24.4	4.7	14.6	0	0	0		<31
10-Jul-09	26.6	9.8	18.2	T	0	T		<31
11-Jul-09	28.3	13.7	21	0.2	0	0.2		<31
12-Jul-09	29.1	17.4	23.3	T	0	T	21	57
13-Jul-09	23.7	16	19.9	5	0	5	21	37
14-Jul-09	24	13.7	18.9	0	0	0	20	44
15-Jul-09	20.5	11.1	15.8	0.8	0	0.8		<31
16-Jul-09	16.5	10	13.3	0.4	0	0.4		<31
17-Jul-09	11	9.4	10.2	16.8	0	16.8	5	46
18-Jul-09	17.7	9.4	13.6	0.8	0	0.8	12	35
19-Jul-09	12.7	8.2	10.5	31	0	31	9	35
20-Jul-09	13.9	9.5	11.7	0.8	0	0.8		<31

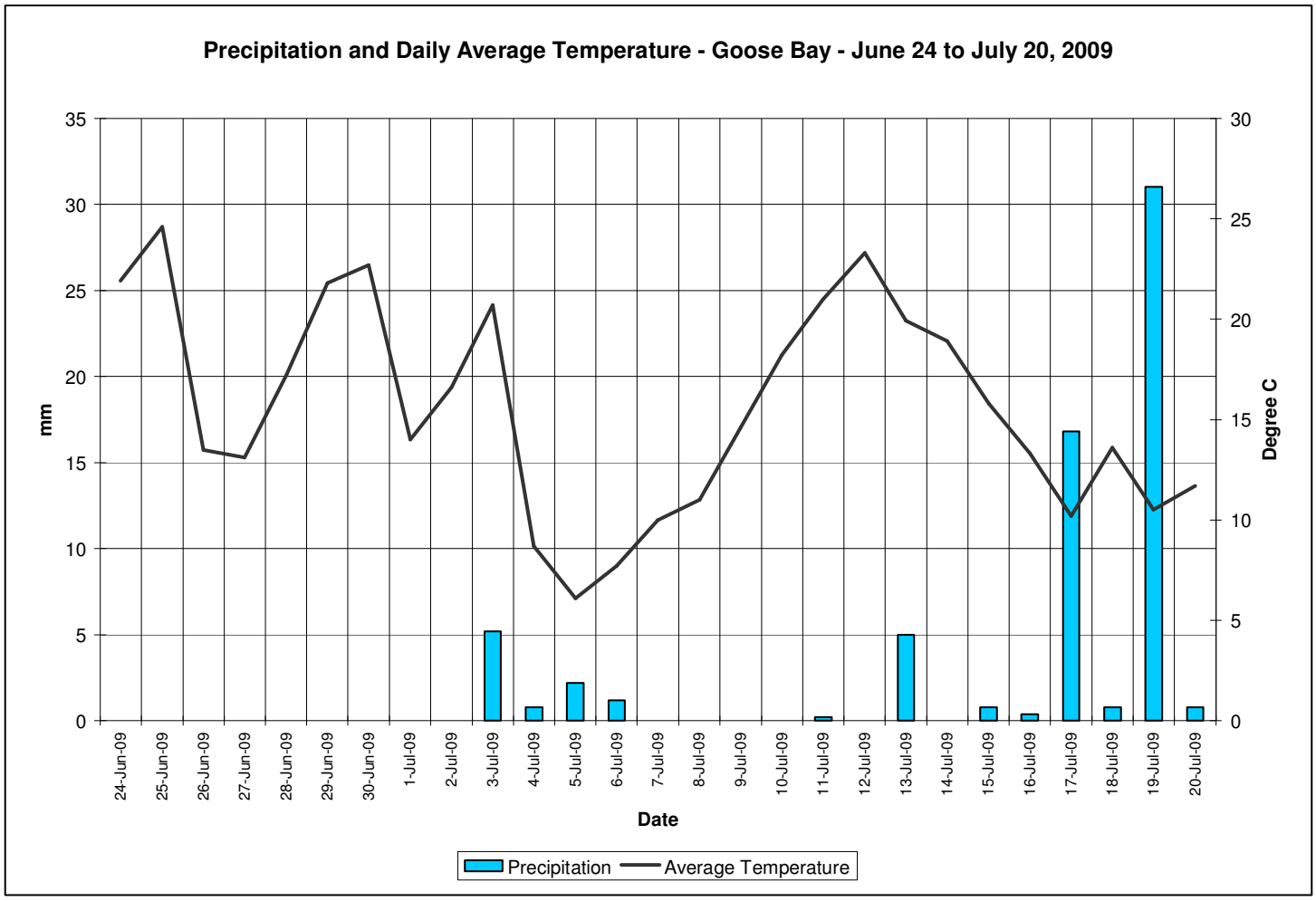

Figure A-1: Mean daily air temperature and precipitation Happy Valley-Goose Bay area, June 24 to July 21, 2009.

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