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 July 21 and September 2, 2009, a period of 43 days.
- There was a short transmission error between 9:30am and 11:30 on Aug 18, 2009 which prevented data from being sent to the real-time web page.

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" or "Good" at installation and removal.

Table 1: QA/QC Data Comparison Rankings for deployment between July 21 and September 2, 2009.

				Instrument Comparison Ranking				
Station	Date	Action	Instrument Serial Number	Temperature	pH	Conductivity	Dissolved Oxygen	Turbidity
Minipi River below Minipi Lake	21-Jul-09	Installation	43820	Excellent	Excellent	Excellent	Excellent	Excellent
	02-Sep-09	Removal		Excellent	Good	Excellent	Excellent	Excellent

Data Interpretation

Temperature

The water temperature fluctuates diurnally throughout the deployment period and overall begins to decrease in the latter half of the deployment as ambient air temperatures are beginning to decrease as well (Figure 1, Appendix 1). The significant drop at the beginning and the end of the deployment period occurs during the site visit when the new instrument is being deployed. Water temperatures range between 19.49°C and 11.64°C, averaging 16.23°C.

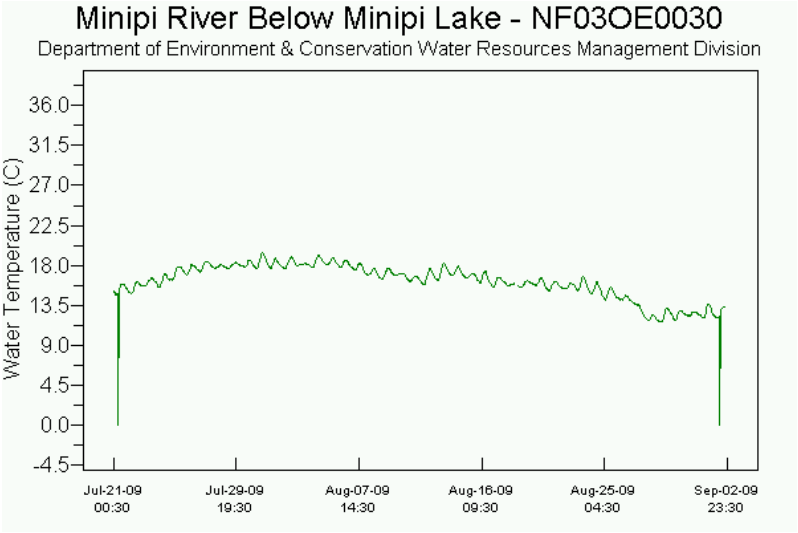

Figure 1: Water Temperature for Minipi River Station, July 21 to September 2, 2009.

pH

pH remains stable throughout the deployment period with values ranging between 6.38 and 6.63 units (Figure 2). All values collected are at the minimum guideline for pH level as suggested by the CCME Guidelines for the Protection of Aquatic Life (>6.5 and < 9.0).

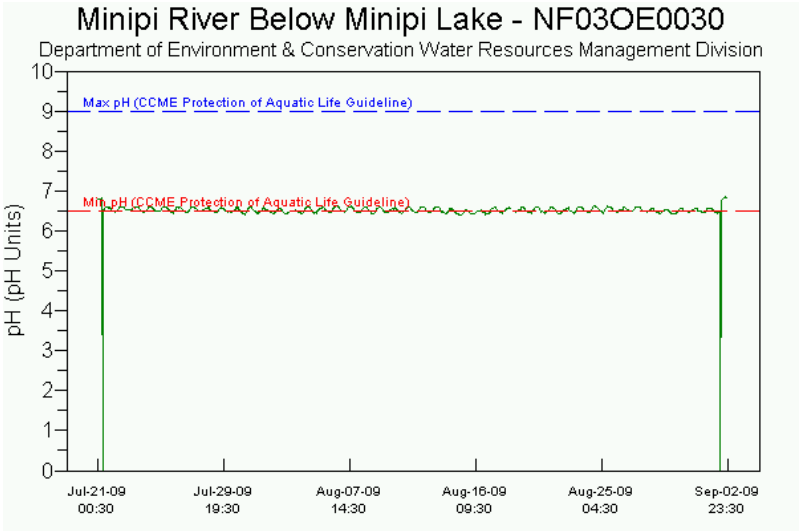

Figure 2: pH for Minipi River Station, July 21 to September 2,

Specific Conductivity

Specific conductance remains relatively stable throughout the deployment period with values ranging between 15µS/cm and 16µS/cm (Figure 3).

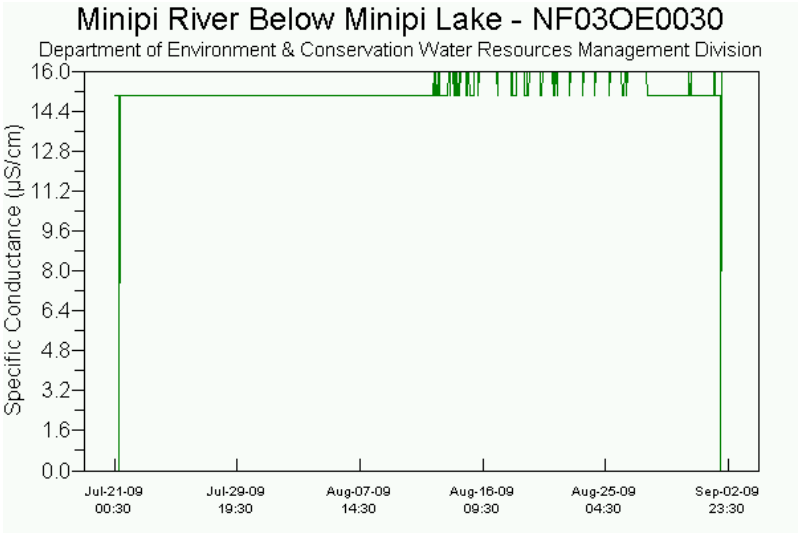

Figure 3: Specific Conductivity for Minipi River Station, July 21 to September 2, 2009.

Dissolved Oxygen and Percent Saturation

Dissolved Oxygen decreases slightly during the beginning of the deployment period before increasing slightly during the latter half (Figure 4). Dissolved oxygen values range between 8.88mg/L and 10.49mg/L, averaging at 9.46mg/L. For more than 98% of the measurements, 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).

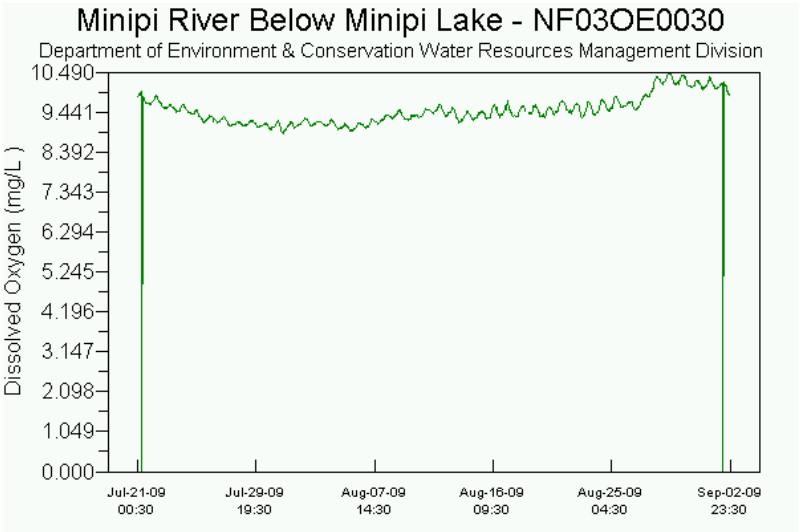

Figure 4: Dissolved Oxygen for Minipi River Station July 21 to September 2, 2009.

Percent saturation values are derived from dissolved oxygen and water temperature values. During the deployment period between July 21 and September 2, percent saturation values range between 92.2% and 99.9% (Figure 5).

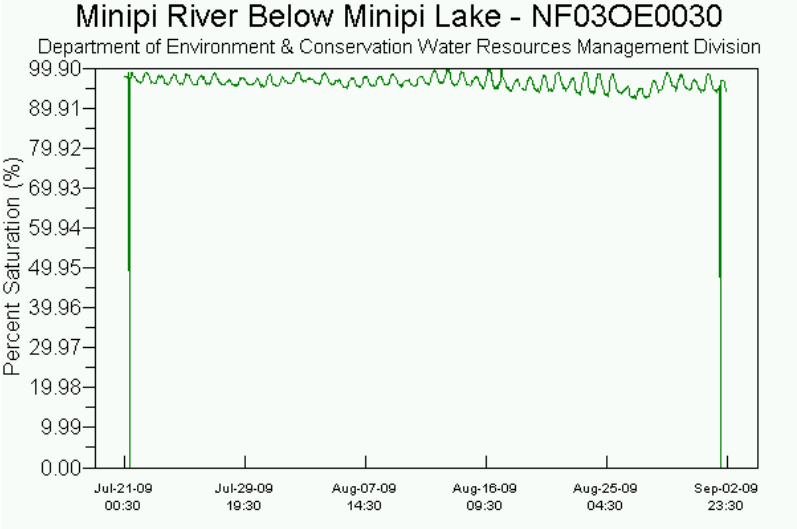

Figure 5: Percent Saturation for Minipi River Station July 21 to September 2, 2009.

Turbidity

Turbidity values primarily remain at 0 NTU for the majority of the deployment period except for a couple of events on August 27 and August 28 (Figure 6). These spikes reach values up to 37.7NTU and 57.7NTU respectively. Each event is sustained for about 2 hours. A rainfall event corresponds with this spike in turbidity. Between August 26 and 28, nearly 65mm of rain was recorded in the Goose Bay area (Appendix 1).

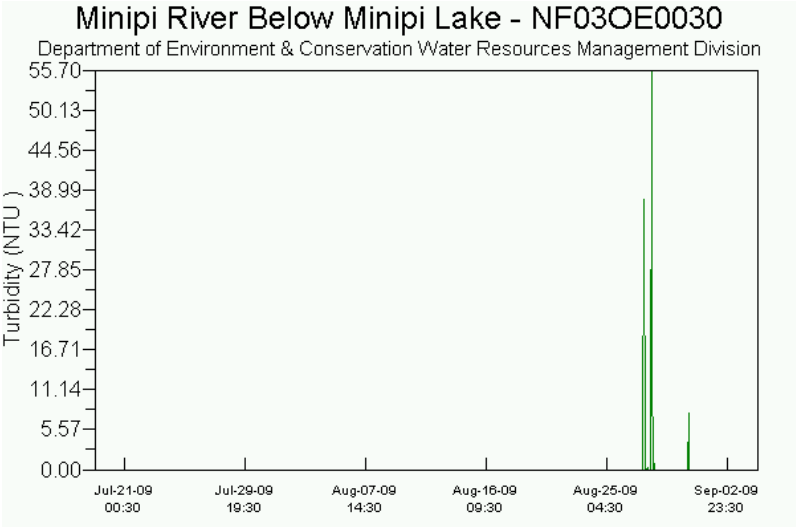

Figure 6: Turbidity for Minipi River Station July 21 to September 2, 2009.

Stage

Stage levels are stable throughout the first part of the deployment before beginning to decrease slightly in the last three weeks of the deployment (Figure 7). When the instrument was deployed, stage level was at 4.388m. Stage level dropped to as low as 3.981m before being retrieved on September 2, when the stage level was 4.061m.

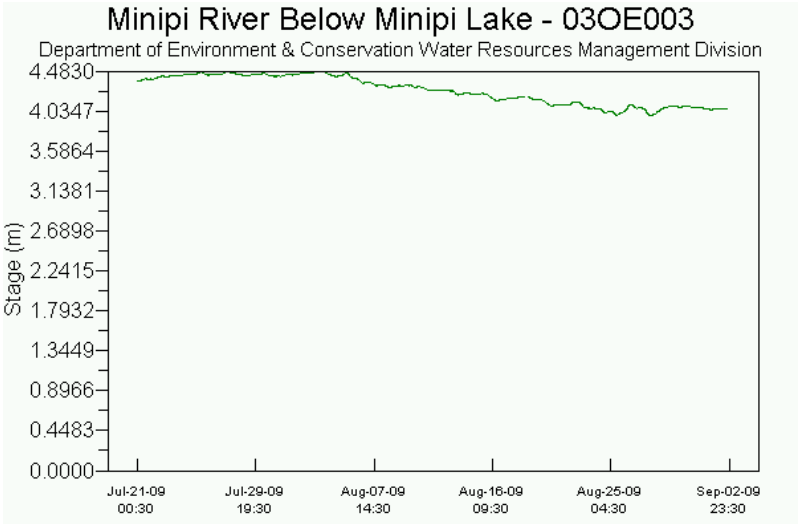

Figure 7: Stage level for Minipi River Station July 21 to September 2, 2009.

Conclusions

The water quality monitoring instrument was deployed at the station on Minipi River below Minipi Lake between July 21 and September 2. During this deployment period, no water quality events were recorded at the Minipi River Station below Minipi Lake during the period between July 21 and 24, 2009. A spike in turbidity can be attributed to a heavy precipitation event recorded by Environment Canada in the area. pH level was around the minimum recommended pH level for fresh water 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, more than 98% of the time.

Appendix 1 – Weather Data

Table A-1 : Weather for Happy Valley Goose Bay – July 21 to September 2, 2009

Date	Max Temp ℃	Min Temp ℃	Mean Temp ℃	Total Precip mm	Dir of Max Gust 10's Deg	Spd of Max Gust km/h
20-Jul-09	13.9	9.5	11.7	0.8		<31
21-Jul-09	15.9	10.7	13.3	3		<31
22-Jul-09	17.1	10.3	13.7	T		<31
23-Jul-09	21.1	10.6	15.9	0		<31
24-Jul-09	21.4	9.3	15.4	0		<31
25-Jul-09	23.8	8.2	16	0.2		<31
26-Jul-09	25.5	11	18.3	0		<31
27-Jul-09	28.3	11	19.7	0		<31
28-Jul-09	21.7	14.8	18.3	0		<31
29-Jul-09	21.2	14	17.6	6.2		<31
30-Jul-09	26.6	17.2	21.9	1.2	25E	32E
31-Jul-09	29.4	15.2	22.3	18.6	25E	72E
1-Aug-09	17	12.1	14.6	0.4		<31
2-Aug-09	21.5	11.9	16.7	0		<31
3-Aug-09	19.7	15.1	17.4	9.6		<31
4-Aug-09	26.5	12.6	19.6	0	24	33
5-Aug-09	25.1	12.9	19	3.2	27	95
6-Aug-09	22.5	12.2	17.4	0	26	48
7-Aug-09	21.8	13.3	17.6	0	25	41
8-Aug-09	19.8	11.9	15.9	T		<31
9-Aug-09	24.6	9.9	17.3	0.4	25	56
10-Aug-09	19.3	9.8	14.6	7	25	37
11-Aug-09	16.7	8.3	12.5	T		<31
12-Aug-09	23.8	8.1	16	0	25	33
13-Aug-09	31.1	14.8	23	2.2	25	57
14-Aug-09	25.3	14.8	20.1	0.4		<31
15-Aug-09	20.4	10.2	15.3	0.2		<31
16-Aug-09	19.9	8.7	14.3	0	29	46
17-Aug-09	14.8	6.5	10.7	T		<31
18-Aug-09	13.7	9.2	11.5	2.6		<31
19-Aug-09	18.4	11.9	15.2	14		<31
20-Aug-09	20.8	12.1	16.5	1.4	27	32
21-Aug-09	19.5	12.4	16	T		<31
22-Aug-09	20.5	13.9	17.2	5.2	25	39
23-Aug-09	21.6	9.3	15.5	0	29	41
24-Aug-09	18.3	6.7	12.5	0	29	46
25-Aug-09	15.2	4.4	9.8	0	34E	32E
26-Aug-09	11.3	3.3	7.3	43.4	4	35
27-Aug-09	8.2	4.1	6.2	16.6	32	54
28-Aug-09	9.9	4.7	7.3	4.2	30	41

29-Aug-09	17.2	5.2	11.2	T		<31
30-Aug-09	13.6	2.8	8.2	1		<31
31-Aug-09	13.6	8.2	10.9	2.6		<31
1-Sep-09	17.5	5.5	11.5	0.2	29	33

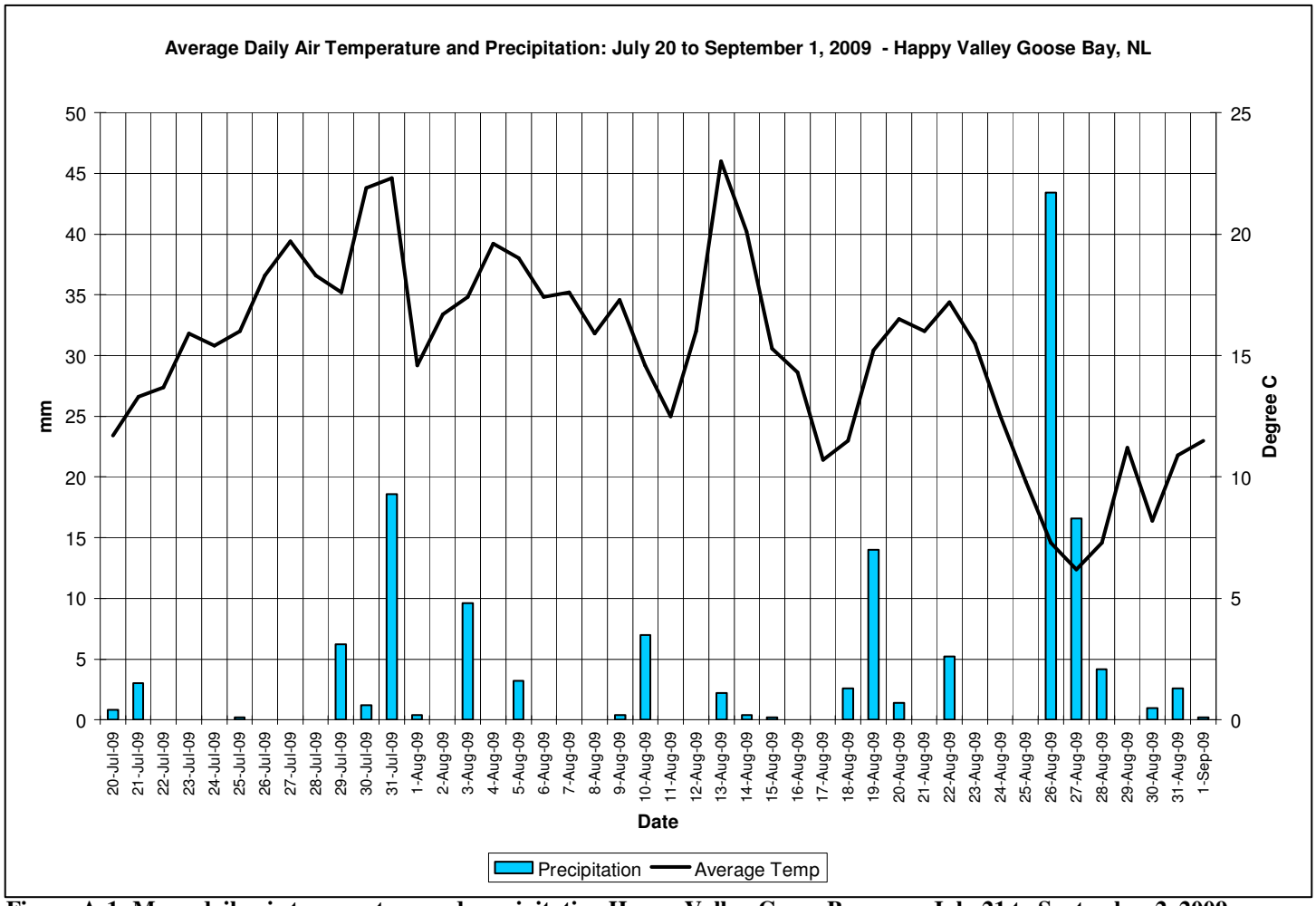

Figure A-1: Mean daily air temperature and precipitation Happy Valley-Goose Bay area, July 21 to September 2, 2009.

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