

Real Time Water Quality Monthly Report for Minipi River, Labrador August 20th, 2008 to October 23rd, 2008

General

- The Water Resources Management Division staff monitors the real-time web page on a daily basis.
- This monthly deployment report interprets the data for the Minipi River Real Time Water Quality Monitoring Station between August 20th and October 23rd, 2008.

Maintenance and Calibration of Instrumentation

- Department of Environment and Conservation (DOEC) staff cleaned and calibrated the Datasonde for the Minipi River RTWQ site before installation of the instrument on August 20th.
- The Datasonde was deployed for an extended period of 64 days before being removed on October 23rd, 2008. This extended deployment period was due to transportation availability. Although the sensors are prone to drift during an extended deployment (>30 days), resulting in potentially inaccurate data, a significant water quality event would still be captured by the instrument.
- Minisonde readings were taken for QA/QC purposes at the time of installation and at the time of removal. The results from comparing the Minisonde values to the Datasonde values at the time of installation and removal for the deployment period August 20th, to October 23rd, 2008 can be found in **Table 1**.

Table 1: QA/QC Data Comparison Rankings upon initial installation (August 20th) and removal (October 23rd).

			Datasonde vs. Minisonde QA/QC readings			
Station	Date	Action	Temperature	pH	Conductivity	Dissolved Oxygen
Minipi	20-Aug-08	Installation	Excellent	Good	Excellent	Good
	23-Oct-08	Removal	Excellent	Fair	Excellent	Good

- For the most part, there was little difference between the Datasonde and Minisonde readings taken at installation resulting in excellent to good QA/QC rankings.
- Even with an extended deployment period, the sensors do not seem to experience significant drift as the QA/QC ranking are still in the excellent to fair range.

Data Interpretation

TEMPERATURE

- The water temperature at Minipi River remains relatively stable during the latter half of August at about 16.5°C (**Figure 1**). In September and throughout the remainder of the deployment period, the water temperature is decreasing which is expected due to decreasing average ambient air temperature (**Appendix A**).
- At Minipi River, between August 20th and October 23rd, the water temperature ranged from 19.3°C to 3.5°C, averaging at 11.4°C.

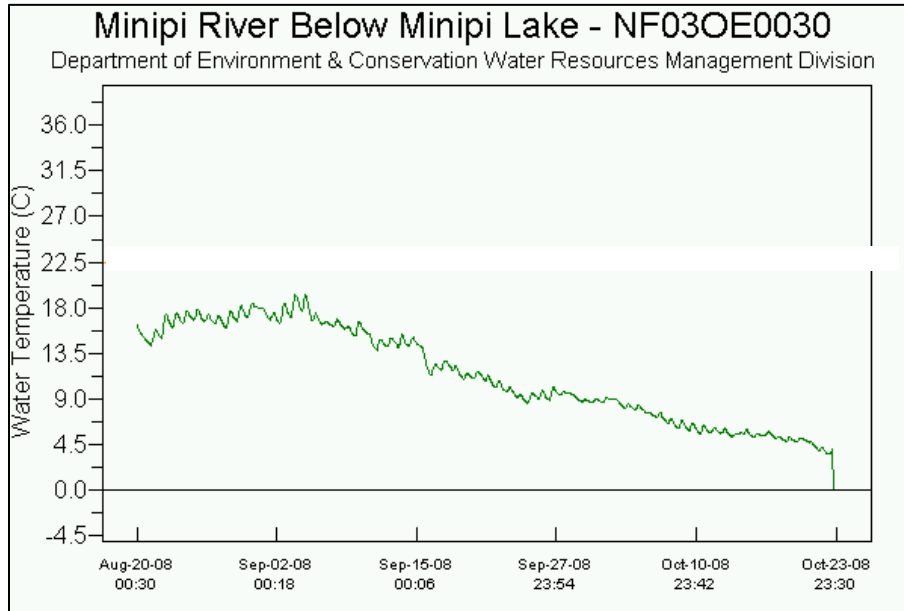


Figure 1: Datasonde temperature readings for August 20th to October 23rd, 2008 for Minipi River RTWQ Station.

PERCENT SATURATION AND DISSOLVED OXYGEN

- At Minipi River, percent saturation fluctuates day to day, but generally remains stable throughout the deployment period. Percent saturation ranges between 88.7% and 95.4%, averaging at 91.5% (**Figure 2**).
- Dissolved oxygen content also fluctuates day to day but generally shows an increasing trend (**Figure 3**). This is expected as dissolved oxygen content will increase as water temperature decreases (see **Figure 1**). Dissolved oxygen content ranges from about 8.3mg/L to 12.3mg/L, averaging at 10.1mg/L.

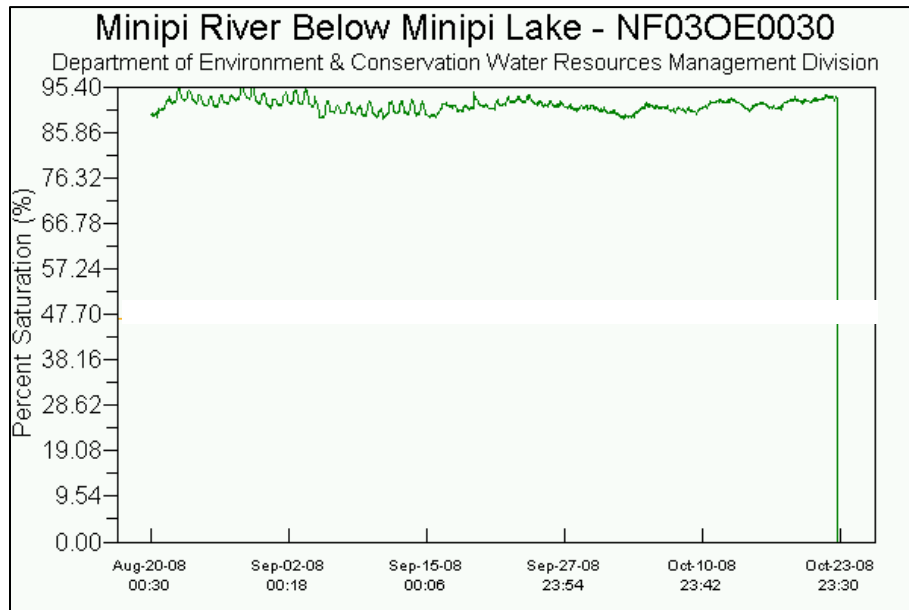


Figure 2: Datasonde percent saturation readings for August 20th to October 23rd, 2008 for Minipi River RTWQ Station.

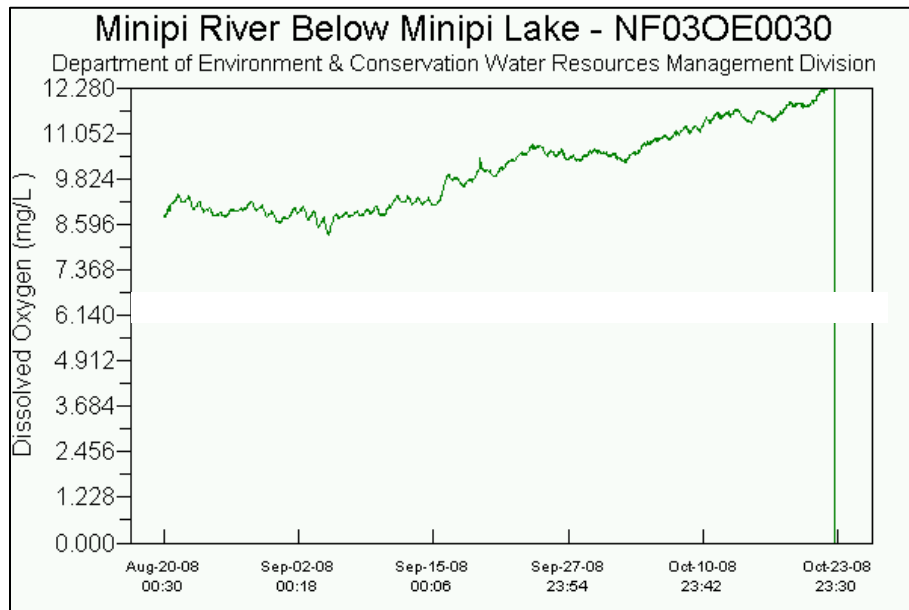


Figure 3: Datasonde dissolved oxygen readings for August 20th to October 23rd, 2008 for Minipi River RTWQ Station.

SPECIFIC CONDUCTIVITY

- The specific conductivity remains stable throughout the deployment period (**Figure 4**). Values range from 14.0µS/cm to 17.0µS/cm, averaging at 15.3µS/cm.

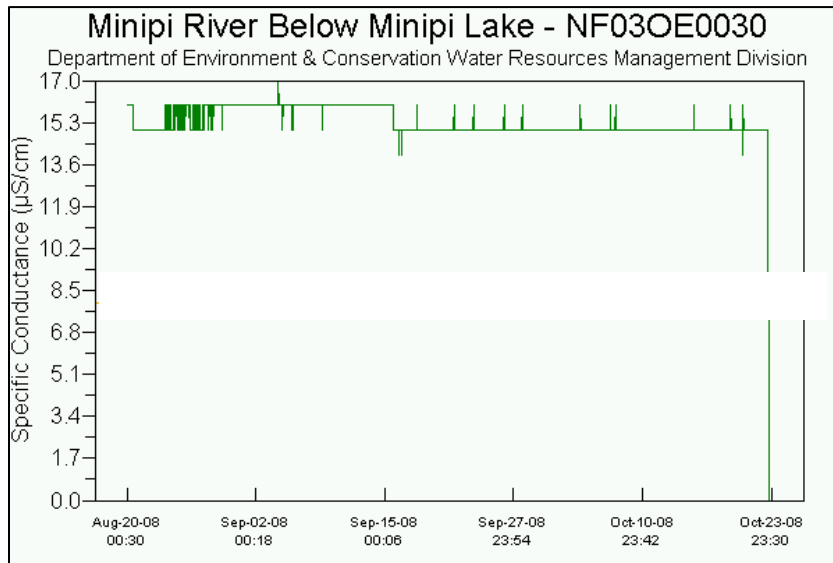


Figure 4: Datasonde specific conductivity readings for August 20th to October 23rd, 2008 for Minipi River RTWQ Station.

pH

- pH values at Minipi River (**Figure 5**) remain stable throughout the first half of the deployment period at just over 6.5. During the second half of the deployment period, it appears as though because of the extended deployment period, the data collected was subjected to instrument drift as pH values are gradually decreasing until final winter removal.
- During the first half of the deployment period when the sensor appears to be working well, all values are just within the CCME Guidelines for the protection of Aquatic Life (between 6.5 and 9.0 as indicated by the red and blue line on figure 5). When the sensor begins to drift, the data collected is below the guideline however is most likely caused by the instrument and therefore is not highlighted as a water quality event. A ‘fair’ ranking is given to pH at the time of removal, therefore it is expected that the sensor could be experiencing drift.

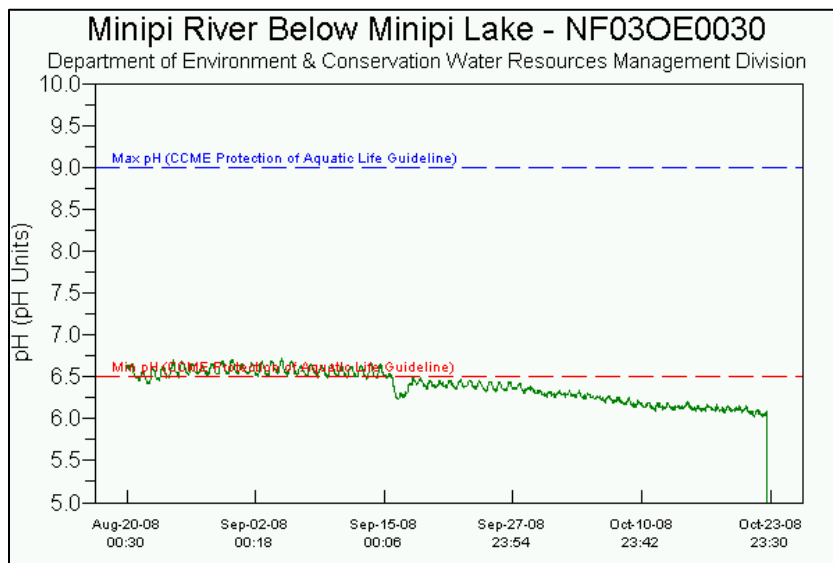


Figure 5: Datasonde pH readings for August 20th to October 23rd, 2008 for Minipi River RTWQ Station.

TURBIDITY

- Turbidity values up until September 24th should be disregarded due to a data logger programming error. EC staff visited the site on this date and repaired the error. There is one reading for turbidity reaching 53.5 NTU which is mostly likely during the repair and should also be disregarded. After this, all values recorded for turbidity are 0.

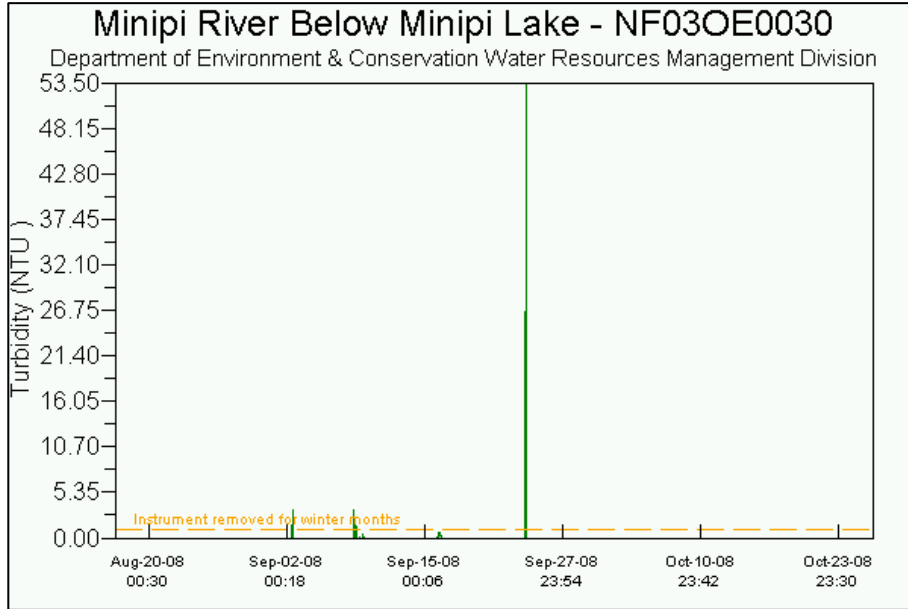


Figure 6: Datasonde turbidity readings for August 20th to October 23rd, 2008 for Minipi River RTWQ Station.

STAGE

- Stage levels at Minipi River show a monthly fluctuating trend throughout the deployment period (**Figure 7**). This is expected for this time of year as flow is expected to be decreasing in the late summer drying period and then increasing again in the autumn when the number of rainfall events increases (See **Appendix A** for meteorological data recorded by Environment Canada).

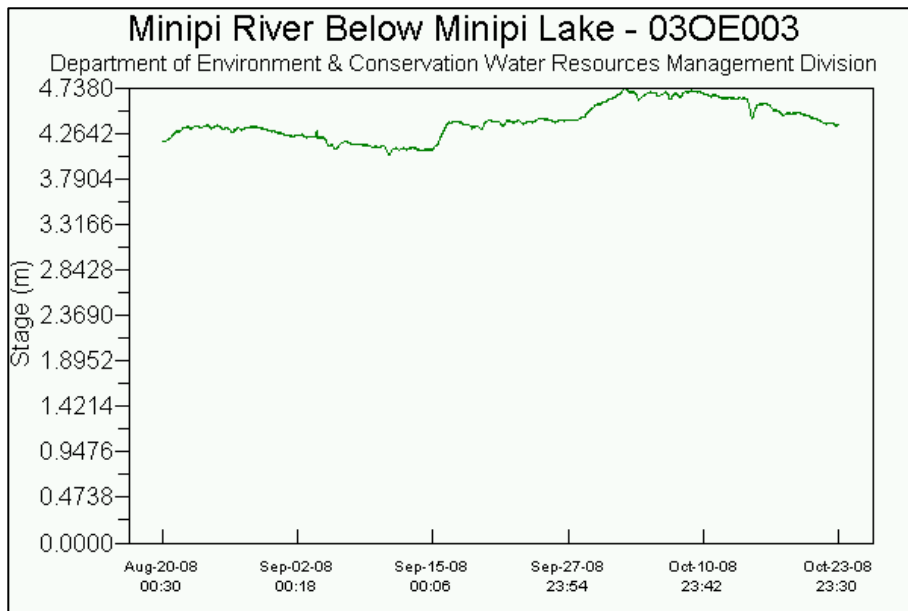


Figure 7: Datasonde stage level readings for August 20th to October 23rd, 2008 for Minipi River RTWQ Station.

Conclusions

No significant water quality events were captured at the Minipi River RTWQ station during the deployment period between August 20th and October 23rd, 2008. Average ambient air temperature and rainfall amounts recorded by Environment Canada could be used to explain most of the data recorded for temperature, specific conductivity, pH and percent saturation and dissolved oxygen. Turbidity data is not valid until after September 24th, when EC staff visited the site to repair the data logger.

Because the sensors were left in for 64 days due to transportation availability and weather conditions, data can be considered suspect due to instrument sensor drift (as seen with pH, **Figure 5**). Frequent cleaning and calibration of instruments is necessary for accurate data collection. During an extended deployment, the sensor would still work to capture any water quality event which is why the gradual decrease in pH during the second half of the deployment period (**Figure 5**) is attributed to sensor drift and not a change in the water quality. A dramatic drop in pH could possibly be a cause for concern.

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Appendix A

ENVIRONMENT CANADA METEOROLOGICAL DATA: AUGUST 20TH TO OCTOBER 23RD, 2008

Table A-1: Meteorological Data for Happy Valley Goose Bay*, August 20th to October 23rd, 2008

August 2- to October 23, 2008											
	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
20-Aug-08	11.2	7.2	9.2	8.8	0	6.4	0	6.4	0	36E	33E
21-Aug-08	22.2	4.4	13.3	4.7	0	0	0	0	0	26E	37E
22-Aug-08	32.4	17.4	24.9	0	6.9	0	0	0	0	23E	44E
23-Aug-08	30.4	19.6	25	0	7	0	0	0	0	23E	39E
24-Aug-08	30.4	20.2	25.3	0	7.3	0.4	0	0.4	0	23E	54E
25-Aug-08	23.4	11.6	17.5	0.5	0	0	0	0	0	23E	33E
26-Aug-08	19.8	10.9	15.4	2.6	0	0	0	0	0	27E	33E
27-Aug-08	17.2	3.6	10.4	7.6	0	T	0	T	0	35E	39E
28-Aug-08	24.9	3.3	14.1	3.9	0	0	0	0	0	18E	33E
29-Aug-08	28.7	12.8	20.8	0	2.8	0	0	0	0		<31
30-Aug-08	26	9	17.5	0.5	0	0.2	0	0.2	0		<31
31-Aug-08	18.4	10.5	14.5	3.5	0	13.2	0	13.2	0		<31
1-Sep-08	19.8	10.5	15.2	2.8	0	T	0	T	0		<31
2-Sep-08	30.6	12.2	21.4	0	3.4	0	0	0	0	24E	44E
3-Sep-08	33.6	20.1	26.9	0	8.9	0	0	0	0	24E	35E
4-Sep-08	28.4	9.9	19.2	0	1.2	2	0	2	0	29E	46E
5-Sep-08	17.2	7.9	12.6	5.4	0	0	0	0	0	25E	44E
6-Sep-08	14.4	8.9	11.7	6.3	0	T	0	T	0		<31
7-Sep-08	16.2	8.8	12.5	5.5	0	0	0	0	0		<31
8-Sep-08	11.5	4.9	8.2	9.8	0	0.6	0	0.6	0		<31
9-Sep-08	21.2	5.6	13.4	4.6	0	1	0	1	0	18E	41E
10-Sep-08	13.4	6.6	10	8	0	12	0	12	0	32E	61E
11-Sep-08	16.6	5.1	10.9	7.1	0	T	0	T	0	23E	44E
12-Sep-08	14.8	9.6	12.2	5.8	0	1	0	1	0		<31
13-Sep-08	20.4	9.8	15.1	2.9	0	0	0	0	0	23E	32E
14-Sep-08	21.2	10.6	15.9	2.1	0	3.8	0	3.8	0	22E	50E
15-Sep-08	12.4	3.5	8	10	0	57.6	0	57.6	0	35E	41E
16-Sep-08	14.2	3.2	8.7	9.3	0	0	0	0	0	23E	32E
17-Sep-08	17.6	3.8	10.7	7.3	0	2.2	0	2.2	0	20E	61E
18-Sep-08	8.9	1.9	5.4	12.6	0	0.2	0.2	0.4	0	27E	52E
19-Sep-08	10.8	1.3	6.1	11.9	0	0	0	0	0	26E	52E
20-Sep-08	17.2	7.2	12.2	5.8	0	0.8	0	0.8	0	21E	56E
21-Sep-08	10.5	1.6	6.1	11.9	0	0	0	0	0	26E	37E
22-Sep-08	9.7	1.1	5.4	12.6	0	T	0	T	0	25E	35E
23-Sep-08	8.5	-1.6	3.5	14.5	0	T	0	T	0	28E	35E
24-Sep-08	5.6	-1.6	2	16	0	0	T	T	0		<31
25-Sep-08	16.2	-3.3	6.5	11.5	0	T	0	T	0		<31
26-Sep-08	19.5	7.7	13.6	4.4	0	0	0	0	0	23E	44E
27-Sep-08	24.3	8.8	16.6	1.4	0	0	0	0	0	25E	35E
28-Sep-08	16.5	7.1	11.8	6.2	0	4.4	0	4.4	0		<31
29-Sep-08	7.2	3	5.1	12.9	0	23	0	23	0	3E	54E
30-Sep-08	6.2	2.8	4.5	13.5	0	11.4	0	11.4	0	3E	54E
1-Oct-08	8.1	6.1	7.1	10.9	0	7.6	0	7.6	0		<31
2-Oct-08	13.2	7.4	10.3	7.7	0	1	0	1	0	M	M
3-Oct-08	12.5	5.7	9.1	8.9	0	2.6	0	2.6	0	22E	67E
4-Oct-08	9.3	2.6	6	12	0	T	0	T	0	31E	44E
5-Oct-08	10.3	2.9	6.6	11.4	0	0.4	0	0.4	0	32E	37E
6-Oct-08	6	2.9	4.5	13.5	0	T	T	T	0	25E	39E
7-Oct-08	9.2	0.4	4.8	13.2	0	T	T	T	0	31E	52E
8-Oct-08	7.3	-1.9	2.7	15.3	0	0	0	0	0	33E	46E
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10-Oct-08	8.9	-4.7	2.1	15.9	0	0	0	0	0		<31
11-Oct-08	12.4	-2	5.2	12.8	0	0	0	0	0		<31
13-Oct-08	5.9	-2.4	1.8	16.2	0	0.4	0	0.4	0		<31
14-Oct-08	10.4	-2.8	3.8	14.2	0	0.8	0	0.8	0	20E	46E

	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
16-Oct-08	6.5	0.1	3.3	14.7	0	2.4	0	2.4	0		<31
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19-Oct-08	5.1	-4	0.6	17.4	0	0	0	0	0	25E	46E
20-Oct-08	9.5	0.5	5	13	0	1.2	0.8	2	0	24E	39E
21-Oct-08	0.6	-5.4	-2.4	20.4	0	0	1.6	1.6	1	1E	37E
22-Oct-08	1.3	-8.4	-3.6	21.6	0	0	0	0	T		<31
23-Oct-08	6.4	-3	1.7	16.3	0	0	0	0	T	26E	37E

* Happy Valley Goose Bay is located at sea level about 100km North East of the RTWQ Station at Minipi River. The RTWQ station is at 297m ASL. Weather conditions may vary from data collected at Happy Valley Goose Bay.

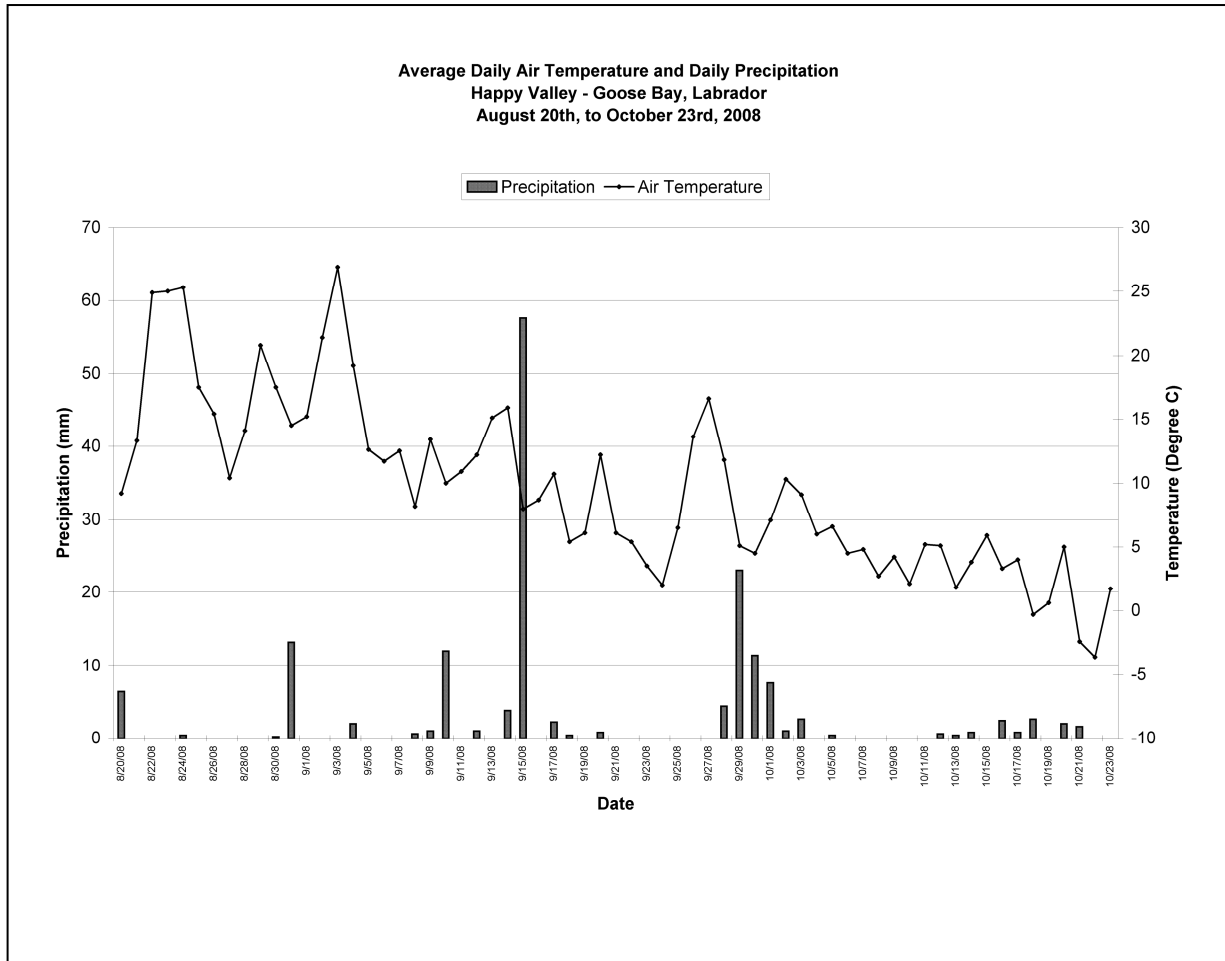


Figure A-1: Average daily air temperature and daily precipitation from August 20th, to October 23rd, 2008 as recorded by Environment Canada at Happy Valley Goose Bay.