

**Real Time Water Quality Monthly Report  
 Aur Resources Inc.  
 August - September 2006**

**General**

- The Water Resources Management Division staff monitors the real-time web page on a daily basis.
- Aur Resources Inc. will be informed of any significant water quality events in the future in the form of a monthly report.
- The initial installation of the RTWQ instrumentation at East Pond Brook occurred on August 29<sup>th</sup>, 2006. Pictures of the installation site are in **Appendix A**.

**Maintenance and Calibration of Instrumentation**

- The instrument at Gills Pond Brook was removed on August 16<sup>th</sup>, 2006 for cleaning and calibration and then reinstalled on August 17<sup>th</sup>. The results from comparing the Minisonde values to the Datasonde values during removal and reinstallation on August 16<sup>th</sup>/17<sup>th</sup>, 2006 can be seen in **Table 1**.
- The instrument at East Pond Brook was installed for the initial time on August 29<sup>th</sup>, 2006. The results from comparing the Minisonde values to the Datasonde values during the initial installation on August 29<sup>th</sup>, 2006 can be seen in **Table 1**.

**Table 1: QA/QC Data Comparison Rankings upon removal/reinstallation on August 16<sup>th</sup>/17<sup>th</sup>, 2006**

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Tributary to Gills Pond Brook	August 16 <sup>th</sup> , 2006	Removal	Fair	Excellent	Marginal	Excellent
	August 17 <sup>th</sup> , 2006	Installation	Marginal	Excellent	Good	Excellent
East Pond Brook	** Initial deployment of instrument on August 29 <sup>th</sup> , 2006**					
	August 29 <sup>th</sup> , 2006	Initial Installation	Poor	Excellent	Poor	Excellent

- The Gills Pond Brook instrument was deployed until September 18<sup>th</sup> (32-day deployment period) at which point it was removed for maintenance and calibration. The results from comparing the Minisonde values to the Datasonde values during removal on September 18<sup>th</sup>, 2006 can be seen in **Table 2**.
- The East Pond Brook instrument was deployed until September 21<sup>st</sup>, 2006 (24-day deployment period) at which point it was removed for maintenance and calibration. The results from comparing the Minisonde values to the Datasonde values during removal on September 21<sup>st</sup>, 2006 can be seen in **Table 2**.

**Table 2: QA/QC Data Comparison Rankings upon removal on September 18<sup>th</sup>, 2006**

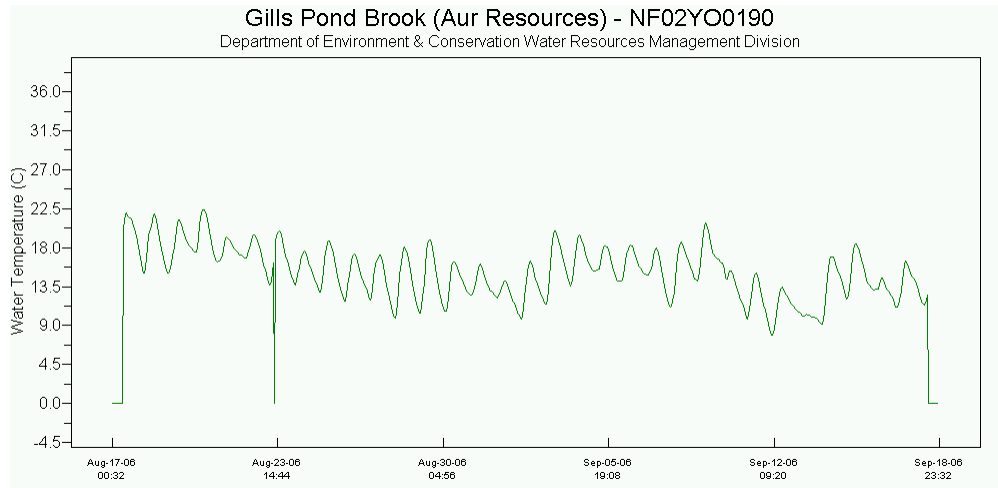
Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Tributary to Gills Pond Brook	September 18 <sup>th</sup> , 2006	Removal	Poor	Good	Good	Poor
East Pond Brook	September 21 <sup>st</sup> , 2006	Removal	Excellent	Excellent	Marginal	Good

## Data Interpretation

- This monthly report interprets the data from the Gills Pond Brook station for the period of August 17<sup>th</sup> – September 18<sup>th</sup>, 2006 and East Pond Brook for the period of August 29<sup>th</sup> (initial installation) – September 21<sup>st</sup>, 2006.

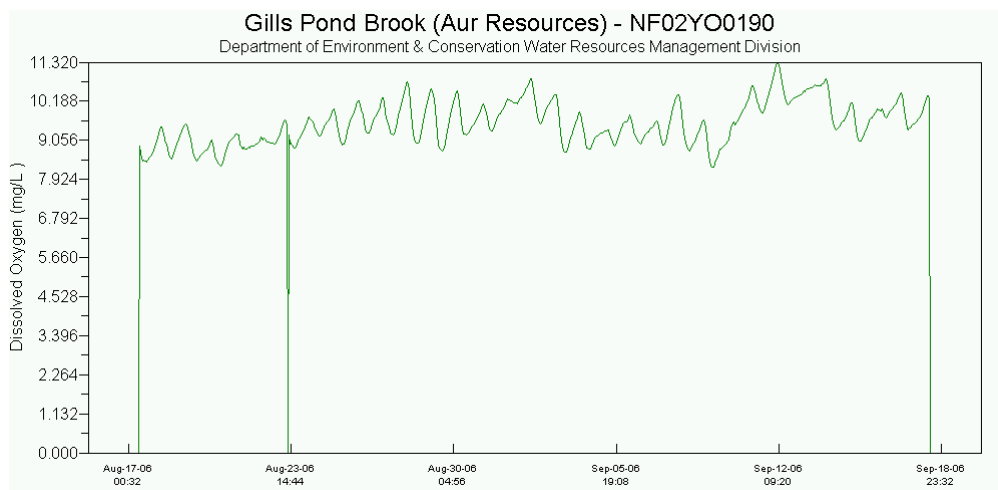
### TRIBUTARY TO GILLS POND BROOK

- The water temperature (**Figure 1**) showed a slight decrease in temperature readings over the deployment period. A very strong diurnal pattern is detected in the data. The temperature ranged from 7.87°C – 22.41 °C.



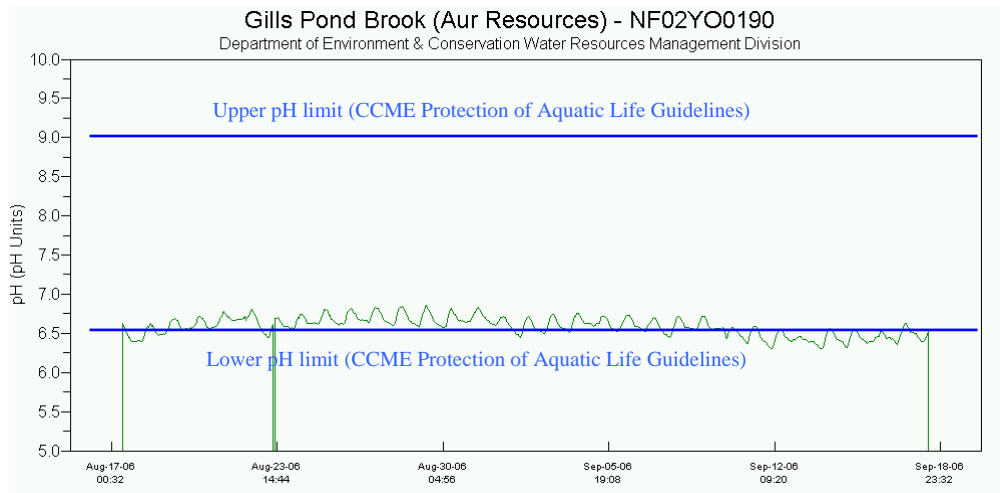
**Figure 1**

- The dissolved oxygen values (**Figure 2**) showed a slight increase throughout the deployment period which is consistent with slight decreasing values seen in temperature in Figure 1. The dissolved oxygen values ranged from 8.27 mg/L to 11.32 mg/L. As is the case in most NL water, these values fall within the recommended CCME Protection of Aquatic Life guidelines for dissolved oxygen in most cases (cold water/other life stages – above 6.5; warm water/other life stages – above 5.5; warm water/early life stages – above 6); however, the lower values during this period fall below the most conservative limit for cold water/early life stages – 9.5 mg/L.



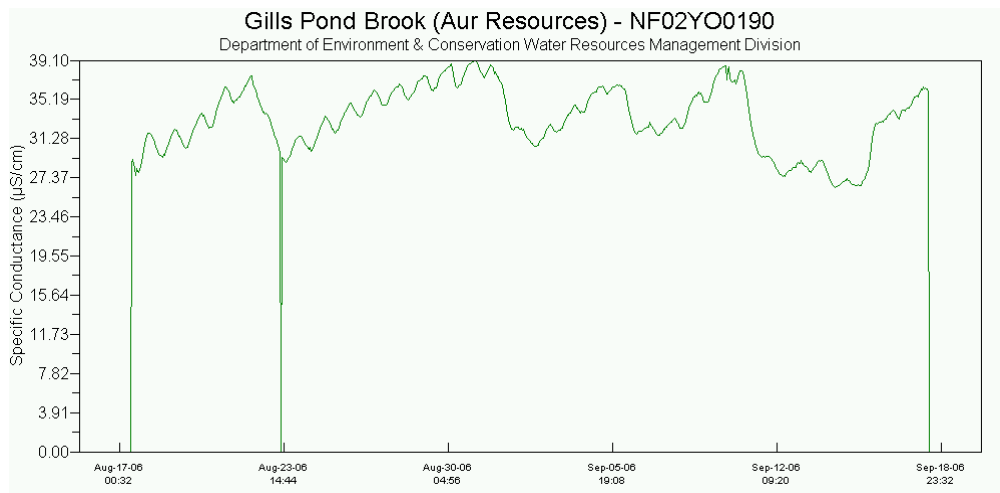
**Figure 2**

- The pH values for the Gills Pond Brook station remained very consistent during the deployment period (**Figure 3**). The pH values ranged from 6.3 – 6.86 with many of the values falling slightly outside the recommended range (6.5 – 9.0) for the CCME Protection of Aquatic Life guidelines due to the naturally acidic nature of NL waters.



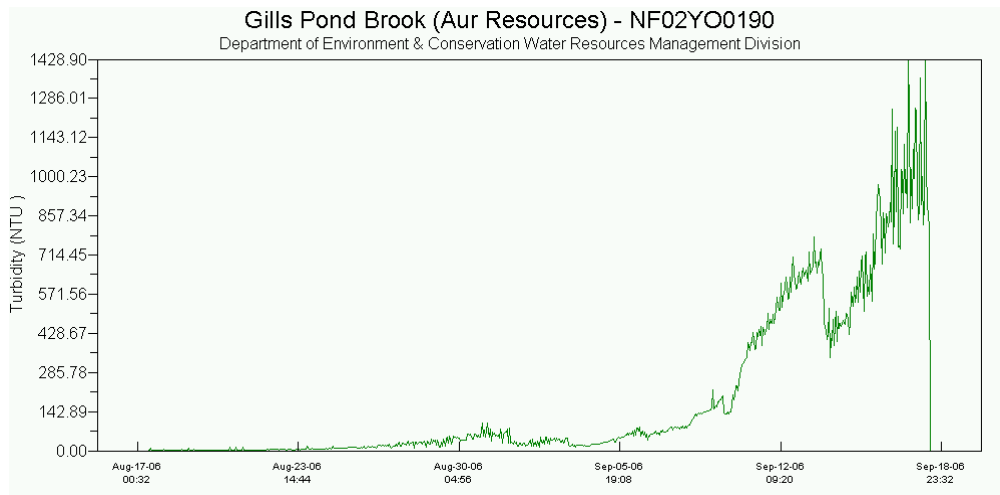
**Figure 3**

- The specific conductivity values (**Figure 4**) fluctuated between 26.4 and 39.1  $\mu\text{S}/\text{cm}$  over the deployment period. The majority of these decreases/increases are associated with periods of heavy rainfall (**Appendix B**). The straight line seen on the Figure 4 for July 21<sup>st</sup> is due to a transmission error and is not an actual water quality event.



**Figure 4**

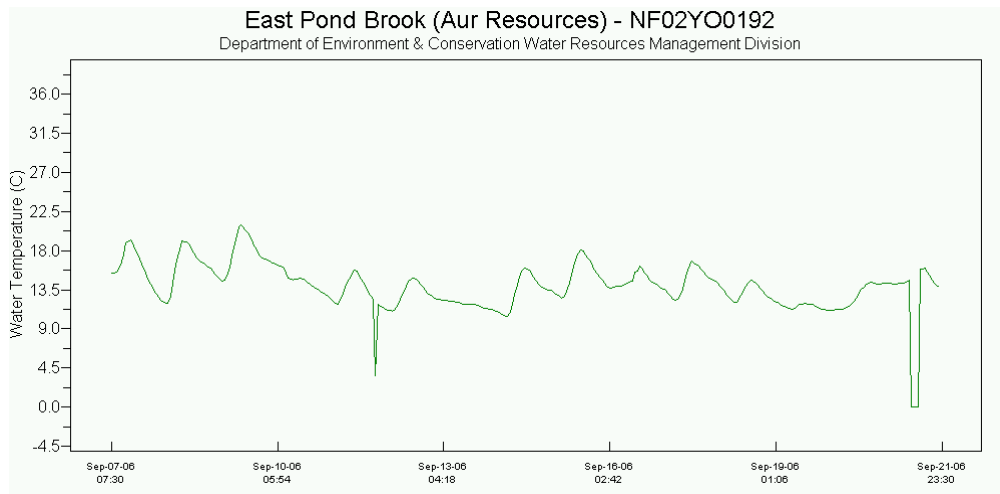
- The turbidity values (**Figure 5**) remained consistent at approximately 0 NTU between August 16<sup>th</sup> and August 26<sup>th</sup>. During the period of August 26<sup>th</sup> to September 4<sup>th</sup> there was an increase and subsequent decrease in turbidity with a maximum value of 102.6 NTU. This is likely due to a heavy rainfall event during that time period (**Appendix B**). The remainder of the deployment after September 4<sup>th</sup> showed turbidity values increasing to a maximum value of 1523.9 NTU at the time of removal. This increase in turbidity has been seen in previous months and was thought to be addressed in August when the deployment casing was removed and retrofitted. This situation will continue to be monitored to determine the cause of the increased turbidity readings during the end of deployment periods.



**Figure 5**

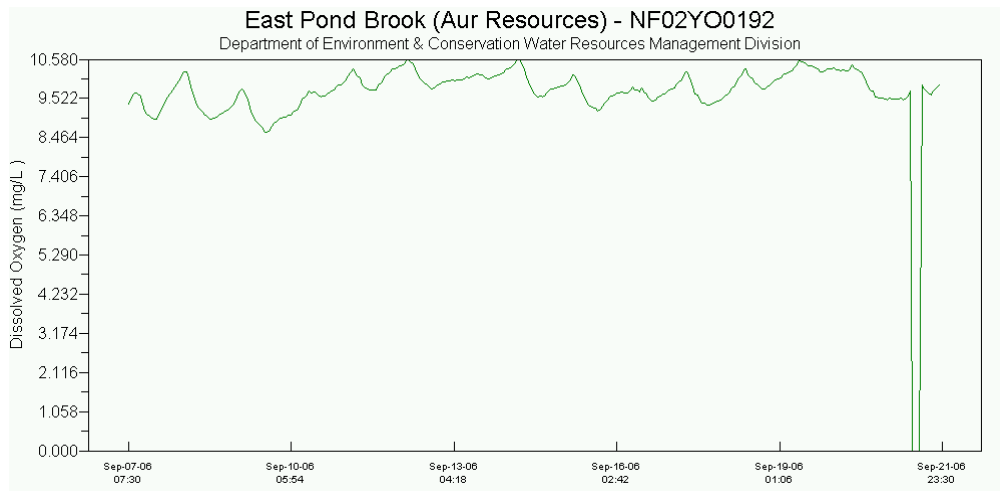
### **EAST POND BROOK**

- East Pond Brook station was installed on August 29<sup>th</sup>; however, data transmission began on September 7<sup>th</sup>.
- Water temperatures (**Figure 6**) in East Pond Brook decrease slightly over the deployment period with a very strong diurnal pattern being detected in the data. The temperature ranged from 3.59°C – 21.01 °C. The temperature reading of 3.59°C occurred in just one reading on September 11, 2006 at 23:29 NST. Review of the line data indicated that this is an erroneous reading (not a water quality event). The next lower temperature is 10.43°C which appears to portray a more accurate range (10.43°C – 21.01 °C) for this time period.



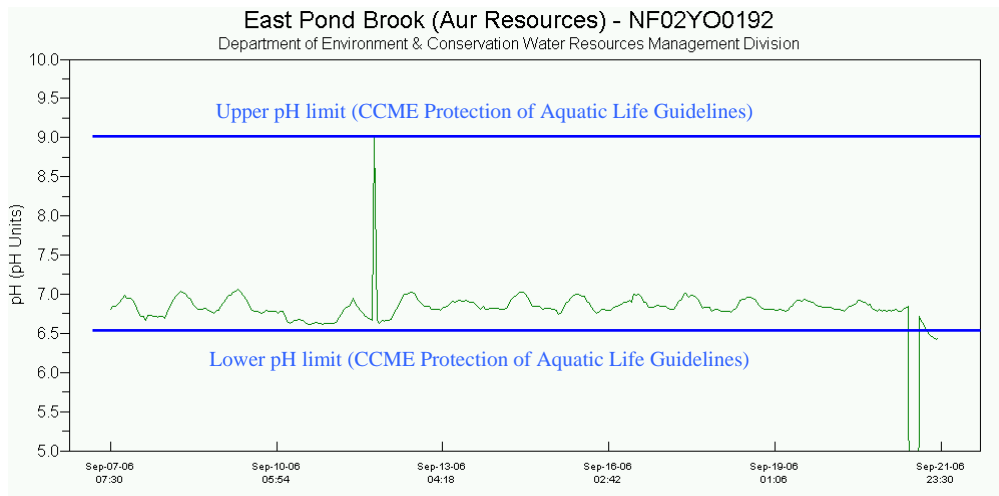
**Figure 6**

- The dissolved oxygen values (**Figure 7**) show a slight increase over the deployment period. This is consistent with the slight decrease of temperature values in Figure 8. The dissolved oxygen values ranged from 10.58 mg/L to 8.61 mg/L. As is the case in most NL waters, these values fall within the recommended CCME Protection of Aquatic Life guidelines for dissolved oxygen in most cases (cold water/other life stages – above 6.5; warm water/other life stages – above 5.5; warm water/early life stages – above 6); however, the lower values during this period fall below the most conservative limit for cold water/early life stages – 9.5 mg/L.



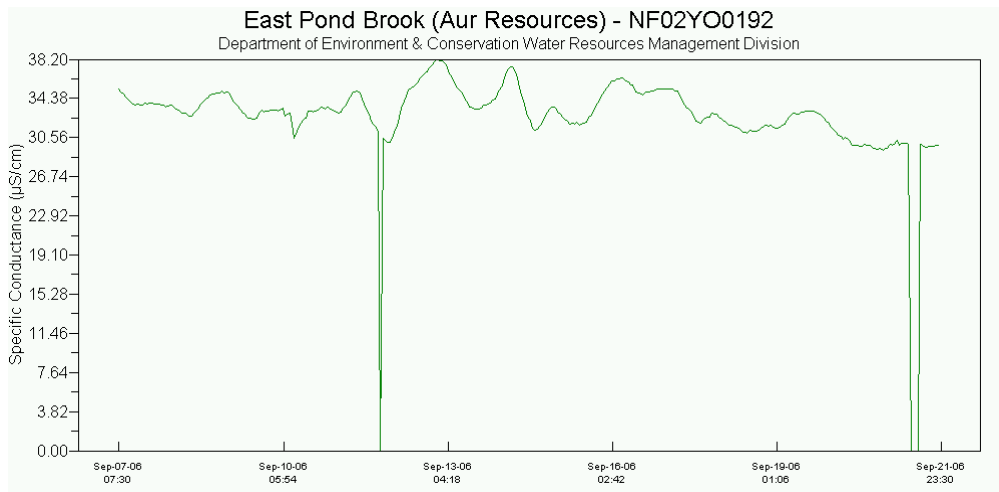
**Figure 7**

- The pH values for the East Pond Brook station remained fairly stable over the deployment period (**Figure 8**). The pH values ranged from 6.61 – 9.01 with some of the values falling slightly outside the recommended range (6.5 – 9.0) for the CCME Protection of Aquatic Life guidelines due to the naturally acidic nature of NL waters. The pH reading of 9.01 occurred in just one reading on September 11, 2006 at 23:29 NST. As discussed previously, review of the line data indicated that this is an erroneous reading (not a water quality event). The next lower pH is 7.06 which appear to portray a more accurate range (6.61 – 7.06) for this station.



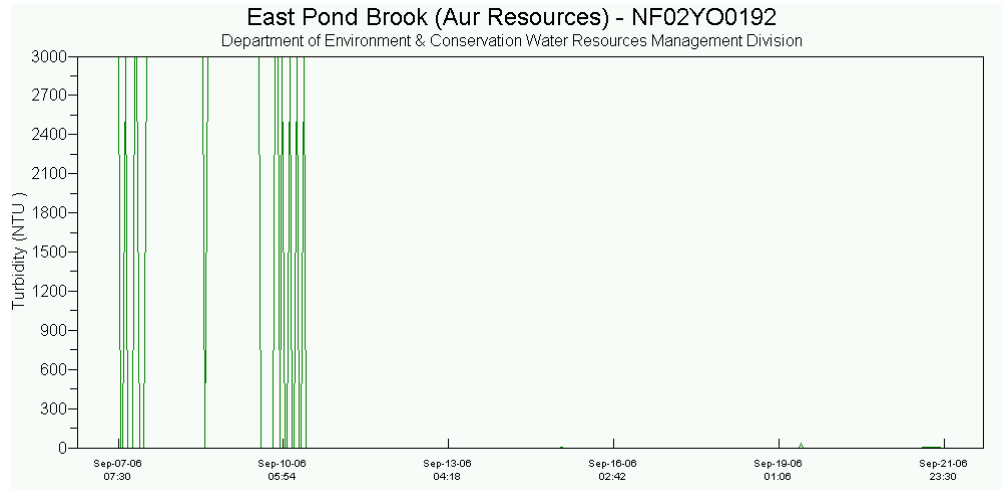
**Figure 8**

- The specific conductivity values fluctuated between 29.3 and 38.2  $\mu\text{S}/\text{cm}$  over the deployment period (**Figure 9**). As discussed previously, review of the line data indicated that the specific conductivity reading of 0.089 is an erroneous reading (not a water quality event) that occurred on September 11, 2006 at 23:29 NST.



**Figure 9**

- The turbidity values (**Figure 10**) indicated turbidity readings reaching the instrument's maximum value (3000 NTU) between September 7<sup>th</sup> – September 10<sup>th</sup>. The remainder of the deployment period showed turbidity readings close to zero with a range of 0 NTU – 32 NTU. The cause of the 3000 NTU values experienced at the beginning of the deployment period is unknown at this time. This station will be monitored closely for similar events in the future.



**Figure 10**

**Prepared by:** Joanne Sweeney & Annette Tobin & Renee Paterson  
Environmental Scientists  
Department of Environment and Conservation  
PH: (709) 292-4220 / (709) 637-2431 / (709) 729-1159  
FX: (709) 292-4365 / (709) 637-2541 / (709) 729-0320  
[joannesweeney@gov.nl.ca](mailto:joannesweeney@gov.nl.ca) / [annettetobin@gov.nl.ca](mailto:annettetobin@gov.nl.ca) / [reenepaterson@gov.nl.ca](mailto:reenepaterson@gov.nl.ca)

**Appendix A - Pictures of East Pond Brook RTWQ Station during Initial Installation**



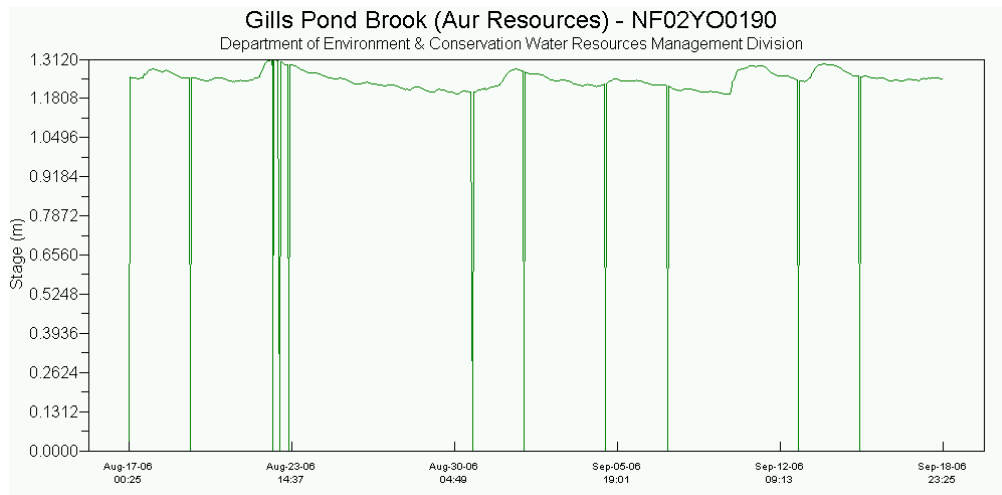
**Picture 1: East Pond Brook RTWQ Station Location (looking downstream)**



**Picture 2: East Pond Brook RTWQ Station Location (looking upstream)**



# Appendix B – Stage & Climate Data for Badger, NL (August & September 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	19.0	7.0	13.0	5.0	0.0			6.6E	0		
02	22.0	5.7	13.9	4.1	0.0			0.6E	0		
03	14.5	10.8	12.7	5.3	0.0			0.0	0		
04	19.0	2.5	10.8	7.2	0.0			0.0	0		
05	22.1	12.3	17.2	0.8	0.0			0.6E	0		
06	22.9	7.9	15.4	2.6	0.0			0.0	0		
07	26.5	5.0	15.8	2.2	0.0			0.7E	0		
08	20.7	16.7	18.7	0.0	0.7			11.1E	0		
09	12.9	11.8	12.4	5.6	0.0			0.0	0		
10	23.1	10.0	16.6	1.4	0.0			0.0	0		
11	22.9	9.6	16.3	1.7	0.0			2.6E	0		
12	18.7	13.6	16.2	1.8	0.0			3.0E	0		
13	20.3	7.3	13.8	4.2	0.0			0.0	0		
14	19.1	2.4	10.8	7.2	0.0			0.0	0		
15	21.5	5.8	13.7	4.3	0.0			0.0	0		
16	26.9	17.3	22.1	0.0	4.1			0.0	0		
17	24.2	14.2	19.2	0.0	1.2			0.0	0		
18	25.6	9.8	17.7	0.3	0.0			0.0	0		
19	25.5	7.8	16.7	1.3	0.0			0.0	0		
20	25.4	13.2	19.3	0.0	1.3			0.6E	0		
21	23.0	7.1	15.1	2.9	0.0			2.1E	0		
22	18.9	15.6	17.3	0.7	0.0			0.0	0		
23	23.6	6.8	15.2	2.8	0.0			0.0	0		
24	21.1	6.1	13.6	4.4	0.0			0.0	0		
25	20.9	2.8	11.9	6.1	0.0			1.6E	0		
26	15.5	1.2	8.4	9.6	0.0			0.0	0		
27	16.7	3.0	9.9	8.1	0.0			0.0	0		
28	18.4	-0.9	8.8	9.2	0.0			0.0	0		
29	22.3	0.2	11.3	6.7	0.0			0.0	0		
30	19.1	2.0	10.6	7.4	0.0			7.7E	0		
31	14.8	9.2	12.0	6.0	0.0			9.5E	0		
Sum				118.9	7.3			46.7E			
Avg	20.9	7.9	14.4								
Xtrem	26.9	-0.9									

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	12.2	9.6	10.9	7.1	0.0			0.0	0		
02	18.7	2.9	10.8	7.2	0.0			0.0	0		
03	27.5	2.3	14.9	3.1	0.0			0.0	0		
04	20.1	5.2	14.2	3.0	0.0			7.4E	0		
05	18.7	12.7	15.7	2.3	0.0			0.0	0		
06	21.7	8.4	15.1	2.9	0.0			0.0	0		
07	19.5	10.9	15.2	2.8	0.0			0.0	0		
08	23.4	-0.1	11.7	6.3	0.0			0.6E	0		
09	24.0	0.0	16.0	1.2	0.0			3.2E	0		
10	10.8	9.8	10.3	7.7	0.0			5.7E	0		
11	15.2	2.4	8.8	9.2	0.0			0.0	0		
12	17.4	-1.1	8.2	9.8	0.0			0.0	0		
13	15.3	6.8	11.1	6.9	0.0			2.4E	0		
14	23.9	7.5	15.7	2.3	0.0			0.0	0		
15	24.7	4.2	14.5	3.5	0.0			0.0	0		
16	18.0	11.6	14.8	3.2	0.0			0.6E	0		
17	18.9	3.4	11.2	6.8	0.0			7.3E	0		
18	10.7	4.6	7.7	10.3	0.0			0.0	0		
19	12.9	5.1	9.0	9.0	0.0			0.6E	0		
20	19.5	8.5	14.0	4.0	0.0			3.1E	0		
21	19.2	16.8	18.0	0.0	0.0			0.0	0		
22	15.1	2.5	8.8	9.2	0.0			0.0	0		
23	16.5	2.1	9.3	8.7	0.0			0.0	0		
24	17.6	4.5	11.1	6.9	0.0			3.3E	0		
25	19.4	11.0	15.2	2.8	0.0			0.0	0		
26	15.8	1.1	8.5	9.5	0.0			0.0	0		
27	16.4	-0.1	8.2	9.8	0.0			0.0	0		
28	18.1	-1.5	8.3	9.7	0.0			0.6E	0		
29	18.3	-1.3	8.5	9.5	0.0			0.6E	0		
30	19.0	8.5	13.8	4.2	0.0			0.0	0		
Sum				179.7	0.0			35.4E			
Avg	18.4	5.6	12.0								
Xtrem	27.5	-1.5									

Days when heavy precipitation was recorded during the deployment period