

## Real Time Water Quality Monthly Report Come by Chance River June - July 2008

### General

- The Water Resources Management Division staff monitors the real-time web page on a daily basis.
- Newfoundland and Labrador Refining Company will be informed of any significant water quality events in the form of a monthly report.
- This monthly report interprets the data from the Come by Chance River RTWQ station for the period of June 13 to July 9, 2008.

### Maintenance and Calibration of Instrumentation

- The Come by Chance instrument was deployed on June 13, 2008. A second set of data readings was collected at the time of installation, using a similar, freshly calibrated instrument. Data readings from both instruments were compared and their variability was ranked, as part of QA/QC protocol.
- The QA/QC rankings from comparing water quality data from both instruments at the time of installation are indicated in **Table 1**. Rankings of “excellent” for temperature, conductivity and dissolved oxygen and “good” for pH were achieved when comparing parameter values of the two instruments indicating a high degree of confidence in the accuracy of the sensors at the beginning of the deployment period.

**Table 1: QA/QC Data Comparison Rankings upon reinstallation on June 13, 2008**

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Come by Chance River	June 13	Installation	Excellent	Good	Excellent	Excellent

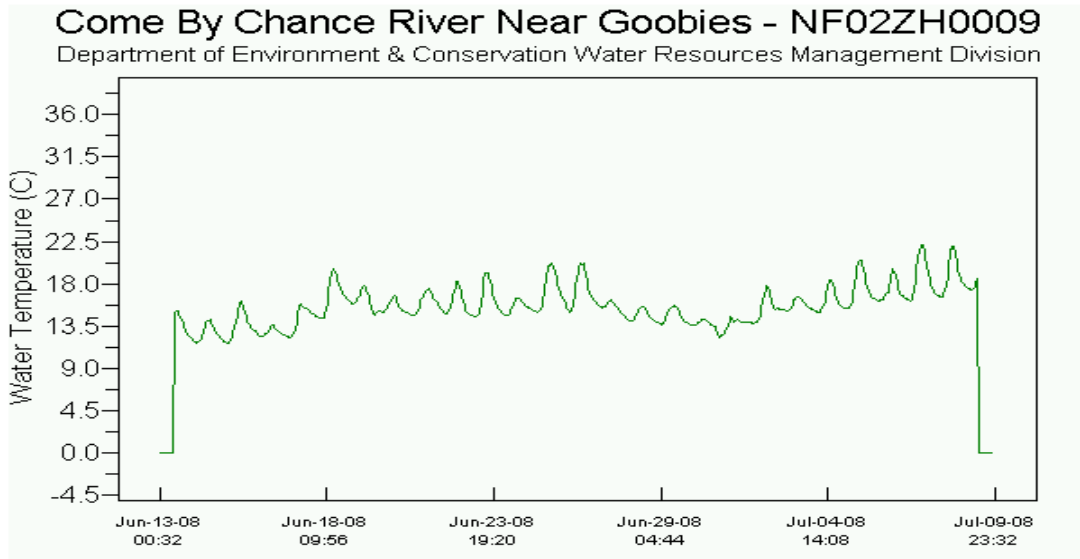
- The Come by Chance instrument was deployed for 26 days. The instrument was removed on July 9, 2008 for routine maintenance and calibration. A second set of data readings was collected at the time of removal, using a similar, freshly calibrated instrument. Data readings from both instruments were compared and their variability was ranked, as part of QA/QC protocol.
- The QA/QC rankings from comparing water quality data from both instruments at the time of removal are indicated in **Table 2**. Rankings of “excellent” and “good” on installation for temperature and pH respectively were “good” and “fair” on removal indicating some drift and fouling of these sensors while “excellent” rankings were maintained over the deployment period for conductivity and dissolved oxygen, indicating a high degree of accuracy in the data.

**Table 2: QA/QC Data Comparison Rankings upon removal on July 9, 2008**

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Come by Chance River	July 9	Removal	Good	Fair	Excellent	Excellent

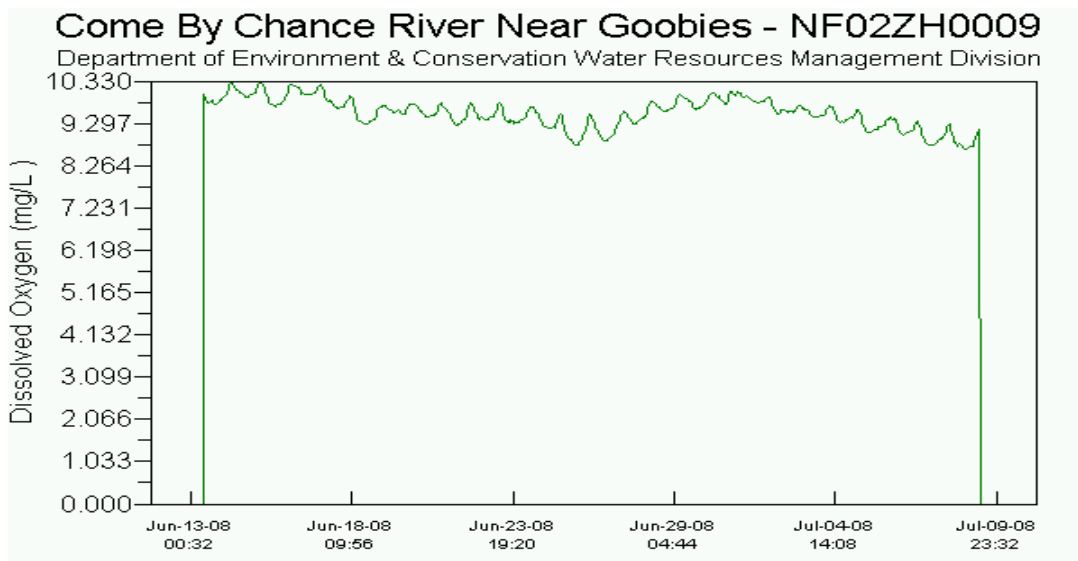
## Data Interpretation

- Water temperature values (**Figure 1**) for the deployment period display diurnal fluctuations and generally increased which is typical for the start of the summer season. Water temperature values ranged between 11.69 and 22.14°C.



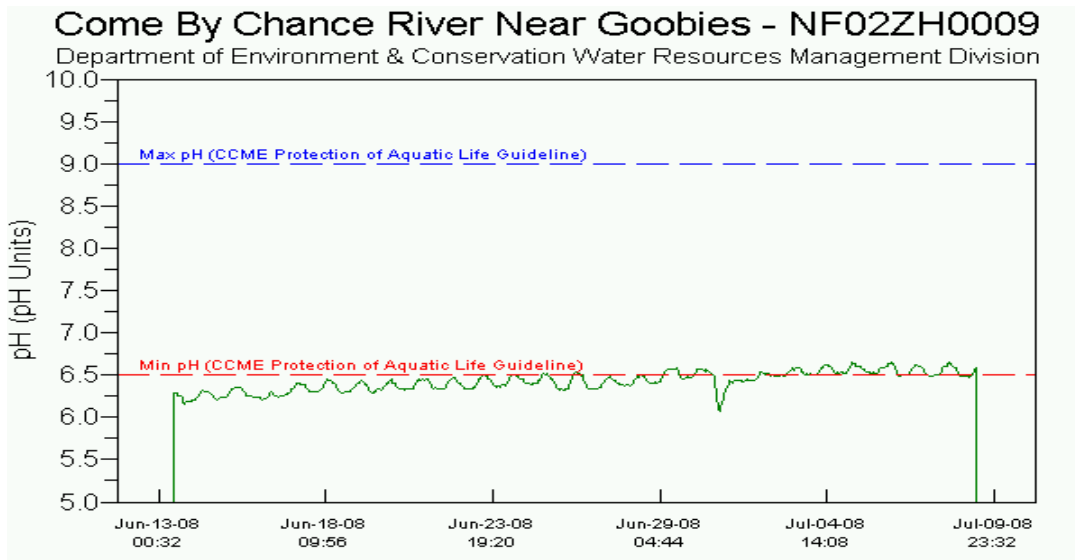
**Figure 1**

- Dissolved oxygen (DO) values (**Figure 2**) for the deployment period generally decreased, corresponding with the increase in water temperature. DO values ranged from 8.67 to 10.33 mg/L, some values were below the minimum DO concentrations recommended by the Canadian Council of Ministers of the Environment (CCME) Protection of Freshwater Aquatic Life Guidelines (cold water/other life stages – above 6.5; warm water/other life stages – above 5.5; warm water/early life stages – above 6; cold water/early life stages – above 9.5 mg/L).



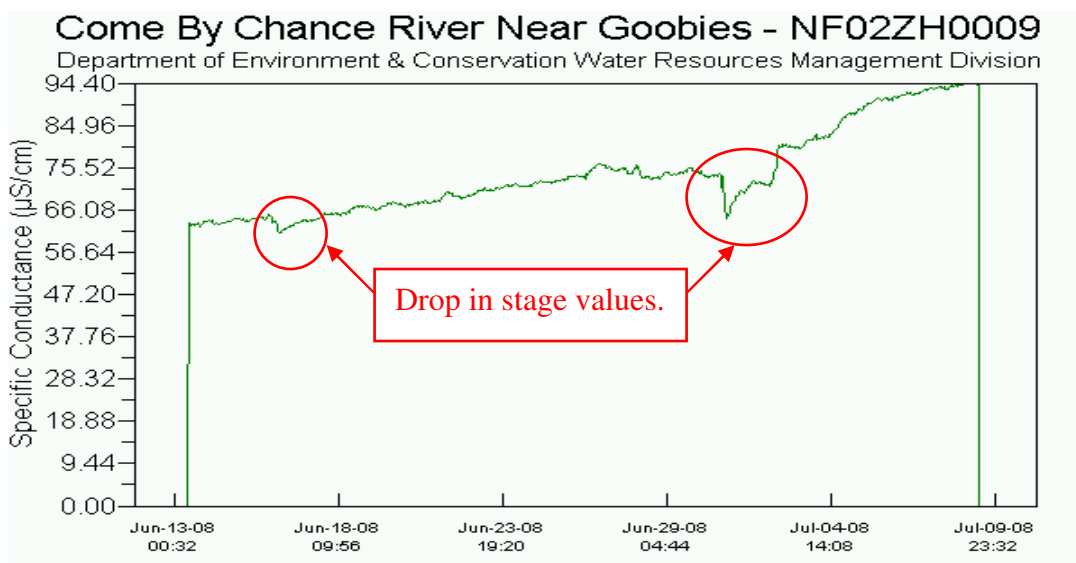
**Figure 2**

- pH values (**Figure 3**) increased over the deployment period with some influence attributed to sensor drift and fouling as seen in the “fair” comparison ranking at removal (**Table 2**). pH values ranged between 6.07 to 6.66, most below the minimum pH level of 6.5 recommended by the CCME Guidelines for the Protection of Freshwater Aquatic Life (due to the naturally acidic nature of NL waters).



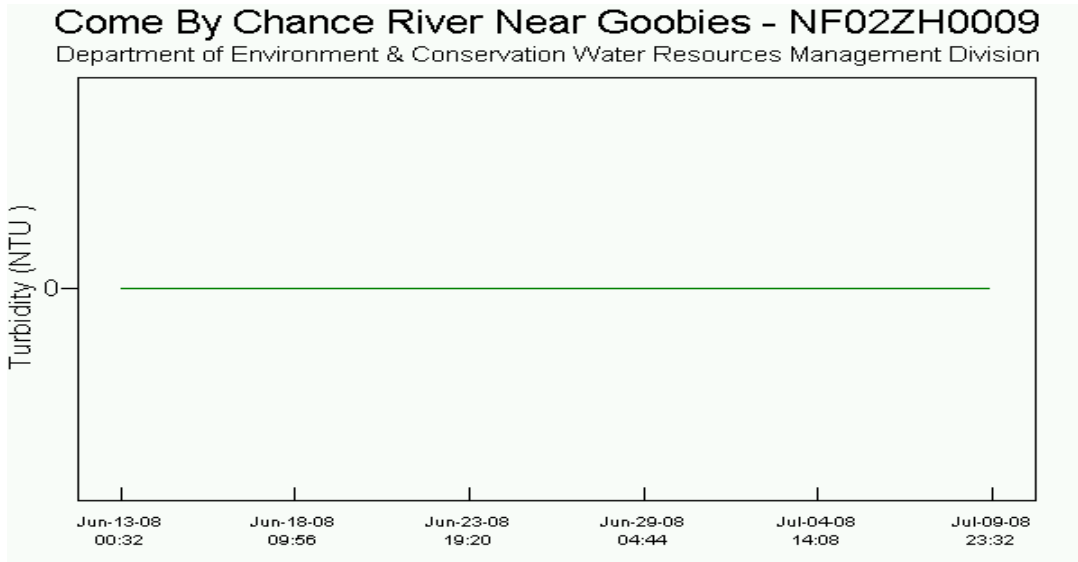
**Figure 3**

- Specific conductance values (**Figure 4**) generally increased over the deployment period, attributed to a drop in stage. Decreased in specific conductance values were due to increased in stage at the same time. Specific conductance ranged from 61.1 to 94.9  $\mu\text{S}/\text{cm}$



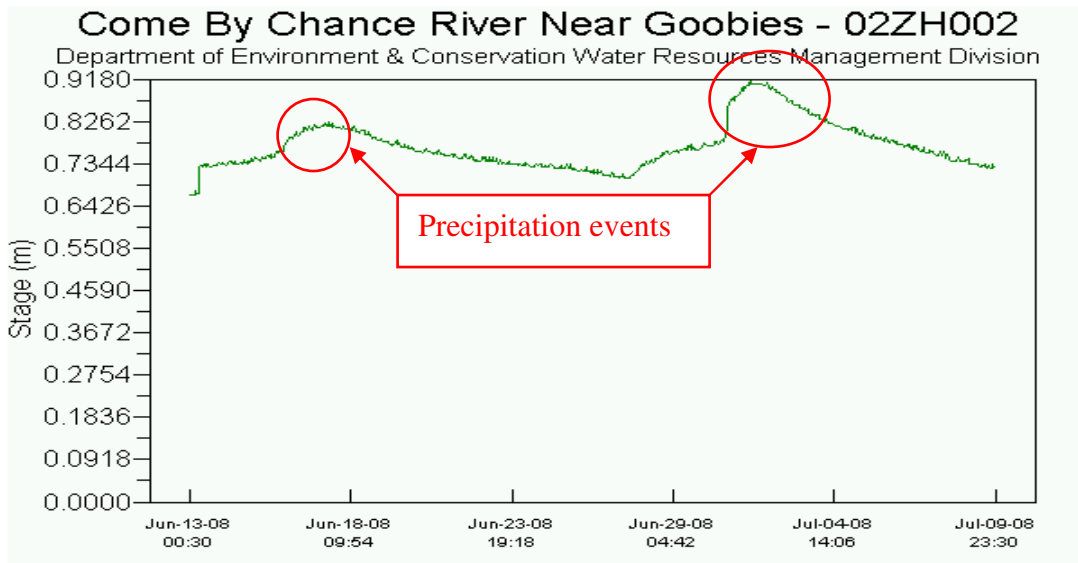
**Figure 4**

- Turbidity values (**Figure 5**) remained constant at 0 NTU for the deployment period.



**Figure 5**

- Stage values (**Figure 6**) fluctuated during the deployment period, attributed to precipitation events on June 13-16 and June 30, 2008 (**Appendix A**) which resulted in stage increases. Stage values had a range of 0.703 to 0.918 meters.



**Figure 6**

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## Appendix A – Climate Data for Argentia, NL (June 13 to July 9, 2008)

Daily Data Report for June 2008											
D a y	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
13†	15.0	6.9	11.0	7.0	0.0	M	M	8.3		2	44
14†	13.2	7.0	10.1	7.9	0.0	M	M	5.9		4	41
15†	14.6	6.6	10.6	7.4	0.0	M	M	4.6		4	44
16†	11.3	5.9	8.6	9.4	0.0	M	M	6.1		1	39
17†	17.7	5.5	11.6	6.4	0.0	M	M	0.0			<31
18†	14.5	7.3	10.9	7.1	0.0	M	M	0.0			<31
19†	15.4	9.3	12.4	5.6	0.0	M	M	0.0			<31
20†	15.7	8.9	12.3	5.7	0.0	M	M	2.4			<31
21†	14.8	6.9	10.9	7.1	0.0	M	M	0.0		21	32
22†	11.8	6.8	9.3	8.7	0.0	M	M	0.0		20	37
23†	12.5	7.5	10.0	8.0	0.0	M	M	0.0		21	39
24†	16.8	9.2	13.0	5.0	0.0	M	M	3.1		22	33
25†	13.5	9.5	11.5	6.5	0.0	M	M	0.0		26	46
26†	13.9	9.3	11.6	6.4	0.0	M	M	0.7		25	48
27†	12.9	9.7	11.3	6.7	0.0	M	M	8.3			<31
28†	12.4	8.5	10.5	7.5	0.0	M	M	1.2		5	37
29†	15.0	8.5	11.8	6.2	0.0	M	M	0.0		11	33
30†	12.9	8.4	10.7	7.3	0.0	M	M	11.4		12	67

Daily Data Report for July 2008											
D a y	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†	13.1	9.8	11.5	6.5	0.0	M	M	2.3		20	46
02†	12.9	9.3	11.1	6.9	0.0	M	M	0.0		21	33
03†	14.2	9.9	12.1	5.9	0.0	M	M	4.8		21	44
04†	12.3	9.8	11.1	6.9	0.0	M	M	0.0		19	44
05†	14.9	9.7	12.3	5.7	0.0	M	M	0.0		22	32
06†	13.4	9.5	11.5	6.5	0.0	M	M	0.7		19	39
07†	15.5	9.8	12.7	5.3	0.0	M	M	0.0		20	33
08†	14.2	10.8	12.5	5.5	0.0	M	M	0.0		20	35
09†	15.7	11.8	13.8	4.2	0.0	M	M	0.0		22	33