

Real Time Water Quality Monthly Report For Peter's River September 2005

General

- The Water Resources Management Division staff monitors the real-time web page on a daily basis.

Maintenance and Calibration of Instrumentation

- The datasonde was installed in Peter's River on September 6, where it collected data hourly until it was removed on October 4 for routine cleaning, maintenance and calibration. The datasonde was reinstalled in Peter's River on October 6.
- Comparative water quality readings were taken with a minisonde during each removal and installation of the datasonde. This procedure is required as part of QA/QC protocol. Both instruments were cleaned and calibrated prior to use.
- Water samples were collected for laboratory analysis at the time of installation as part of QA/QC protocol.

Data Interpretation

- All water quality parameters displayed normal behaviour reflective of environmental conditions during the period of measure.
- Environment Canada reported the following daily air temperatures and precipitation for the Central NL region (Badger) during September 2005, as indicated in **table 1** below:

Table 1: Daily Climate Data

Daily Data Report for September 2005

<u>D</u> <u>a</u> <u>y</u>	<u>Max</u> <u>Temp</u> °C	<u>Min</u> <u>Temp</u> °C	<u>Mean</u> <u>Temp</u> °C	<u>Total</u> <u>Precip</u> mm	<u>D</u> <u>a</u> <u>y</u>	<u>Max</u> <u>Temp</u> °C	<u>Min</u> <u>Temp</u> °C	<u>Mean</u> <u>Temp</u> °C	<u>Total</u> <u>Precip</u> mm
<u>01</u>	24.1	15.0	19.6	9.0	<u>16</u>	11.9	10.7	11.3	3.0
<u>02</u>	28.2	19.5	23.9	0.6	<u>17</u>	13.8	4.6	9.2	0.0
<u>03</u>	25.1	8.1	16.6	0.0	<u>18</u>	11.7	4.1	7.9	25.6
<u>04</u>	19.4	9.5	14.5	0.0	<u>19</u>	14.7	6.7	10.7	0.0
<u>05</u>	19.3	1.0	10.2	0.7	<u>20</u>	16.6	8.8	12.7	0.6
<u>06</u>	21.9	0.0	11.0	0.9	<u>21</u>	12.4	-1.5	5.5	16.7
<u>07</u>	27.2	11.2	19.2	0.0	<u>22</u>	12.4	7.3	9.9	0.0
<u>08</u>	28.7	10.2	19.5	0.0	<u>23</u>	14.8	6.9	10.9	2.1
<u>09</u>	24.4	8.1	16.3	14.4	<u>24</u>	14.0	4.5	9.3	0.7
<u>10</u>	14.6	11.1	12.9	0.0	<u>25</u>	14.6	-1.4	6.6	1.6
<u>11</u>	8.9	6.5	7.7	0.0	<u>26</u>	15.9	2.9	9.4	30.9
<u>12</u>	9.4	0.1	4.8	2.8	<u>27</u>	17.1	11.7	14.4	17.7
<u>13</u>	M	6.3E	M	0.0	<u>28</u>	13.8	4.2	9.0	0.6
<u>14</u>	M	M	M	0.0	<u>29</u>	16.7	-2.6	7.1	0.0
<u>15</u>	28.7	M	M	2.7	<u>30</u>	17.7	9.8	13.8	0.6

Daily data has undergone only preliminary checking; T=trace amount;
M=missing data; E=estimated

- Stage height** shows two peaks during the period of measure as indicated in **figure 1** below. The data indicate that stage height increased 0.269meters from September 18 -20, and increased

0.529meters from September 27-30. The Environment Canada daily climate data report in **table 1** (above) indicates 25.6mm of precipitation fell in this region on September 18, and 48.6mm of precipitation occurred from September 26-27, which impacted stage height.

- **Water temperatures** reflect expected diurnal variations as seen in **figure 2** below. Daily water temperatures are gradually decreasing in response to seasonally cooler ambient air temperatures.

Figure 1: Stage Height

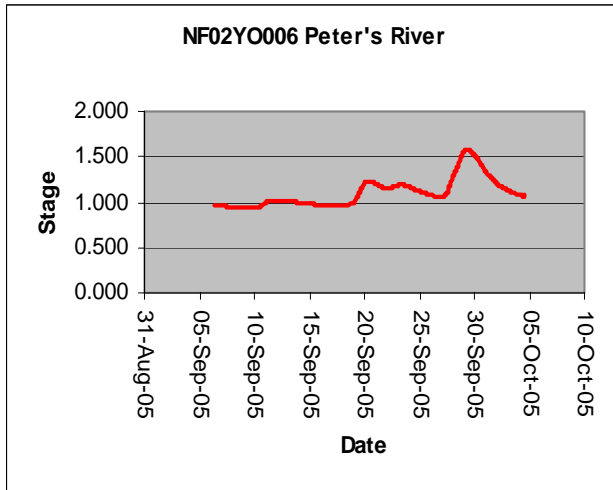
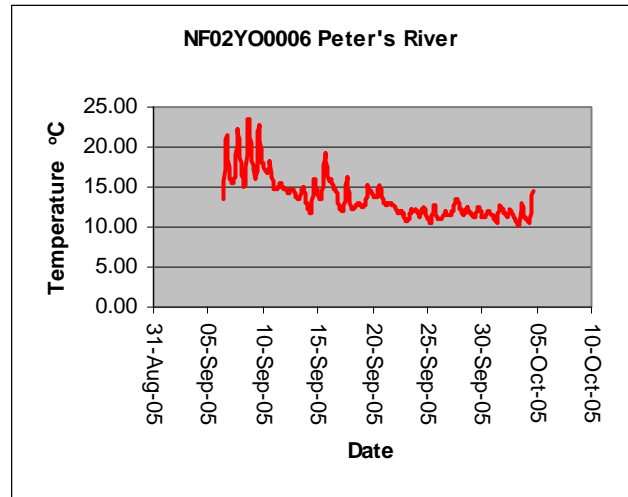


Figure 2: Water Temperature



- **Specific conductivity** levels decreased fairly steadily during the period of measure, ranging from 79-30uS/cm, as indicated in **figure 3** below. Rainfall during this period may have had a dilution effect on the dissolved ion concentration, and cooling water temperatures may also be influencing the decrease in conductivity.
- **Total dissolved solids** reflect the close relationship between specific conductance and total dissolved solids, as seen in **figure 4**. Conductivity measurements are a good indication of total dissolved solids and total dissolved ion concentrations, although this is not an exact linear relationship.

Figure 3: Specific Conductance

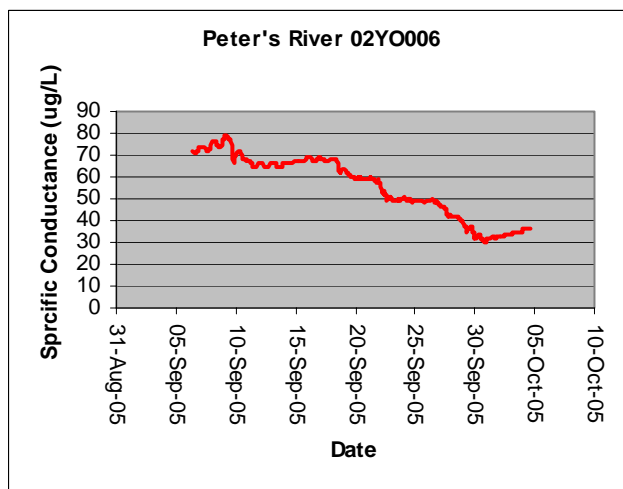
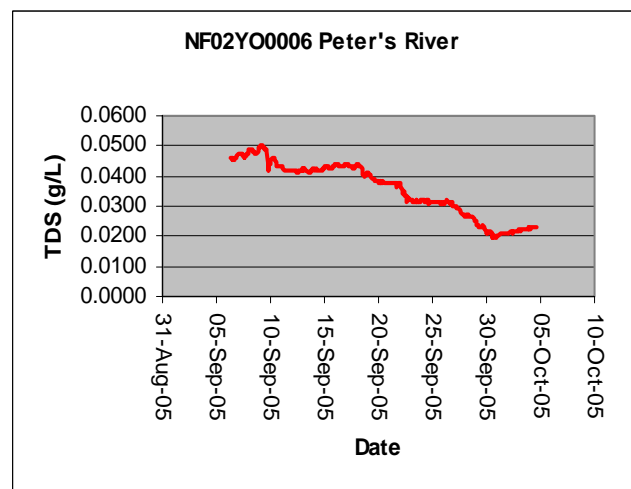


Figure 4: Total Dissolved Solids



- **pH** levels fluctuated near, and slightly exceeded, the CCME maximum recommended pH level of 9.0 for the protection of freshwater aquatic life, as seen in **figure 5** below. The mean pH reading for this period was 7.78, which is higher than typically expected. However, a comparison of the minisonde and datasonde readings for pH at the end of this period of measure indicates that the minisonde was 2.8 units lower (6.94) than the datasonde reading (9.20), thus the higher pH values may be caused by fouling of the pH sensor. pH levels will continue to be closely monitored.

- Dissolved oxygen (DO)** levels ranged from 7.94 -10.44mg/L during this period of measure, as seen in **figure 6** below. The CCME recommends minimum DO levels of 5.5-9.5mg/L, for the protection of freshwater aquatic life.

Figure 5: pH

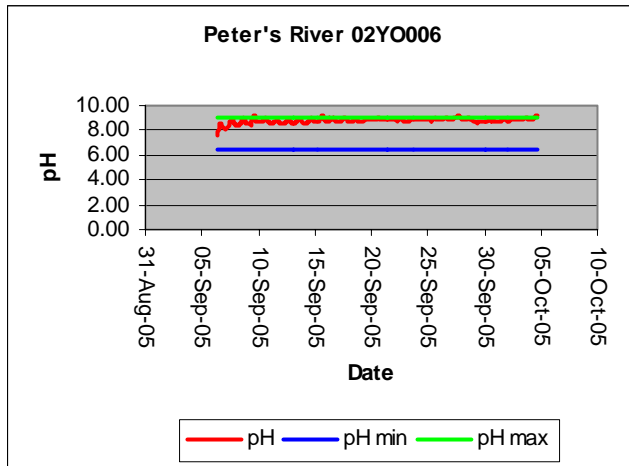
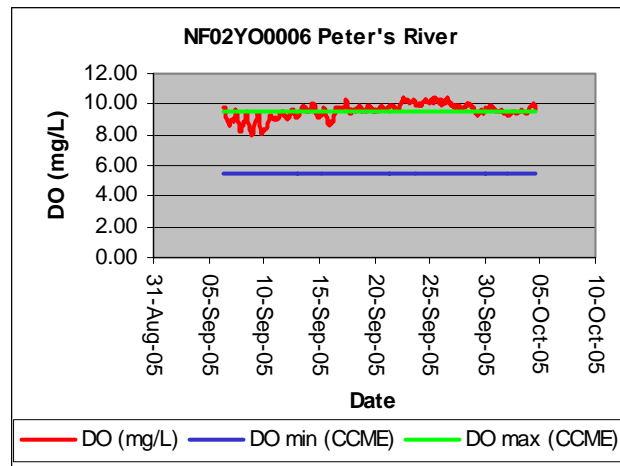
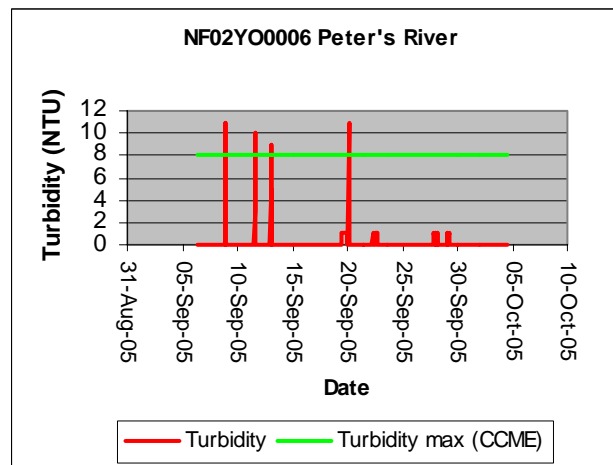


Figure 6: DO (mg/L)



- Turbidity** values ranged between 0-11 NTU during this period, as seen in **figure 7** below. The CCME guideline for turbidity allows for an increase of 8 NTU above background levels. Exceedences appear to correspond with weather events seen in **table 1**, above.

Figure 7: Turbidity (NTU)



Additional Information

- Table 2** provides summary statistics on water quality parameters for Peter's River during September, 2005.

Table 2: Summary Statistics

Statistics	Temp-Water	pH	Conductance	Diss-Solids	Percent-Satur	Diss-Oxy	Turbidity
	oC		uS/cm	g/L	%	mg/L	NTU
Min	10.29	7.59	30.00	0.02	85.20	7.94	0.00
Max	23.50	9.20	79.00	0.05	103.20	10.44	11.00
Average	13.64	8.78	55.65	0.04	92.65	9.56	0.10
St Dev	2.62	0.19	14.12	0.01	3.59	0.47	0.84

Report prepared by: Joanne Sweeney
 Dept of Environment
 Grand Falls-Windsor NL

Ph. 292-4220