

Real Time Water Quality Monthly Report For Peter's River July 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 removed from Peter's River July 21/05 for routine cleaning and calibration. It was returned to the river on July 22/05. Water quality readings were taken with a minisonde at the time of removal and reinstallation for QA/QC comparison. The minisonde was cleaned and calibrated prior to use.
- The datasonde was again removed from the river July 31 for a performance assessment in St. John's on August 1/05. The DO sensor on the minisonde was replaced at this time as it was showing signs of degradation. The datasonde was not reinstalled in Peter's River until August 16th due to staff annual leave.
- Water samples were taken from Peter's River for laboratory analysis on July 22/05 as part of QA/QC procedures.

Data Interpretation

- In general, water quality parameters were stable during the period of measure between June 30 and July 21, 2005.
- Environment Canada reported the following daily air temperatures and precipitation for the Central NL region (Gander) during the month of July 2005, as seen in **Table 1**, below:

Table 1: Climate Data July 2005

D a y	<u>Max</u> <u>Temp</u>	<u>Min</u> <u>Temp</u>	<u>Total</u> <u>Precip</u>	D a y	<u>Max</u> <u>Temp</u>	<u>Min</u> <u>Temp</u>	<u>Total</u> <u>Precip</u>
	°C	°C	mm		°C	°C	mm
<u>01</u>	24.3	9.0	0.0	<u>16</u>	20.7	11.5	28.2
<u>02</u>	24.7	10.2	0.2	<u>17</u>	21.1	11.3	14.0
<u>03</u>	23.3	12.0	2.4	<u>18</u>	27.5	14.6	T
<u>04</u>	28.3	11.5	0.0	<u>19</u>	30.9	13.8	0.0
<u>05</u>	30.2	13.4	0.0	<u>20</u>	30.2	20.7	9.6
<u>06</u>	24.2	7.7	0.6	<u>21</u>	22.7	15.2	0.4
<u>07</u>	19.9	7.0	0.0	<u>22</u>	27.1	15.2	T
<u>08</u>	28.9	9.6	0.0	<u>23</u>	26.5	14.3	T
<u>09</u>	27.3	10.5	0.0	<u>24</u>	21.3	14.6	14.6
<u>10</u>	24.5	10.0	19.6	<u>25</u>	16.6	11.6	0.2
<u>11</u>	21.6	12.4	8.0	<u>26</u>	17.7	11.8	0.2
<u>12</u>	19.2	12.1	2.0	<u>27</u>	22.7	13.8	3.0
<u>13</u>	24.8	16.9	T	<u>28</u>	25.0	14.4	3.6
<u>14</u>	23.1	13.6	T	<u>29</u>	20.8	12.4	0.4

<u>15</u>	22.6	13.1	5.6	<u>30</u>	24.2	12.1	5.6
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Daily data has undergone only preliminary checking; *T=trace amount

- **Stage height** decreased fairly steadily between June 30th and July 9th, from 0.921m-0.893m, as indicated in **figure1** below. Warm, dry conditions during this period, as seen in **table 1** (above) contributed to decreasing water levels. A sharp rise in stage height occurred between July 16th and July 19th as the stage height increased from 0.908m to 0.947m. The total amount of precipitation recorded during this time was 42.2mm of rainfall. The stage height when the datasonde was installed on June 30th was 0.921m, and measured 0.932 when the datasonde was removed on July 21st.
- **Water temperatures** reflect expected diurnal variations as seen in **figure 2** below. The maximum water temperature was recorded on July 20th as a warm 29.86°C, which corresponded to monthly maximum air temperatures on July 19th and 20th of 30.2°C and 30.9°C respectively (see **table 1** above). The minimum water temperature recorded during this period was 12.86°C, and the average water temperature was 19.76°C.

Figure 1: Stage Height

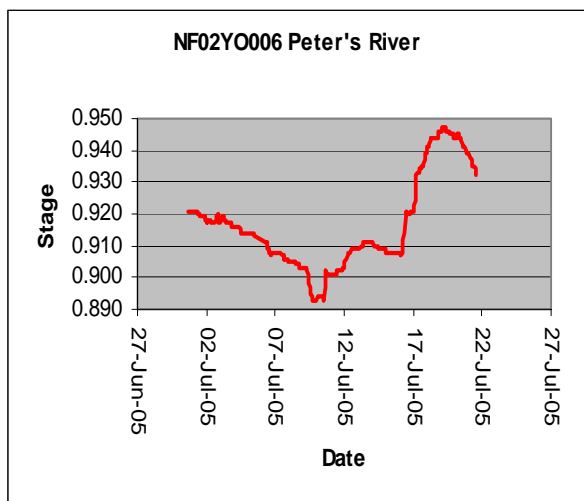
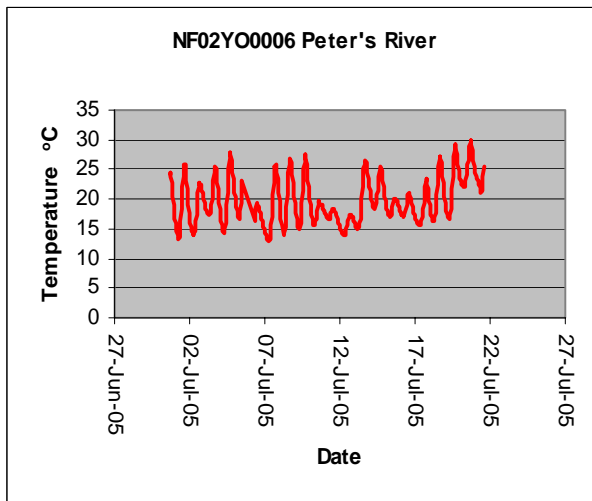


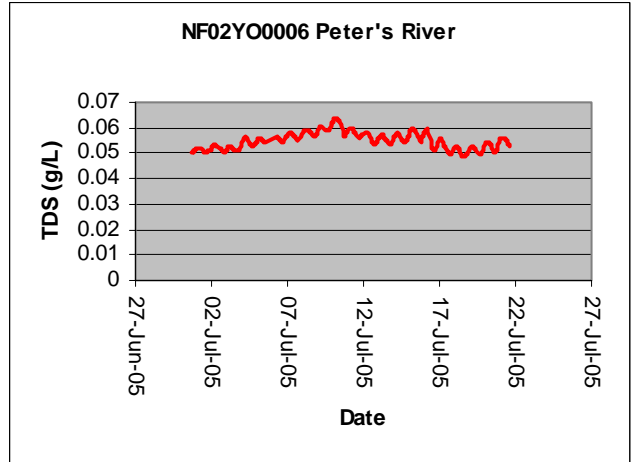
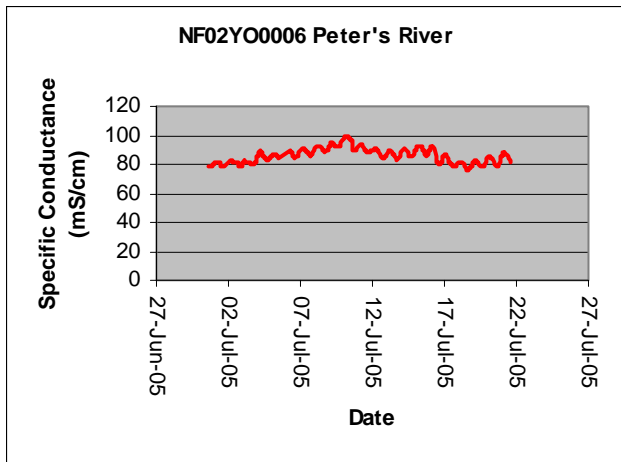
Figure 2: Water Temperature



- **Specific conductivity** remained fairly constant during the month of July, as seen in **figure 3**. Conductivity values ranged from 86- 100uS/cm, which is within the anticipated range for this site at this time of year.
- **Total dissolved solids** levels 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

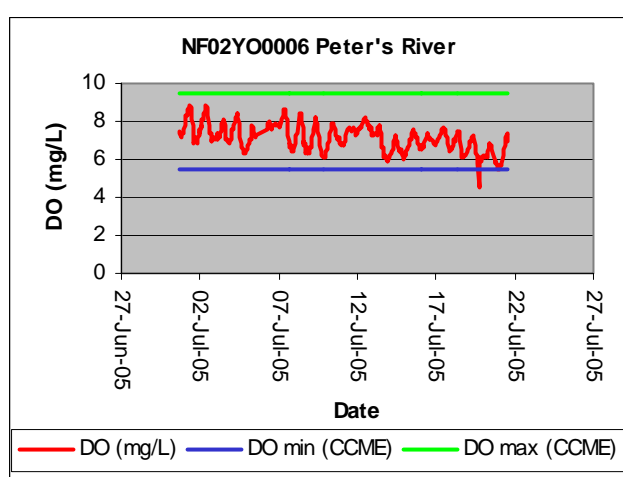
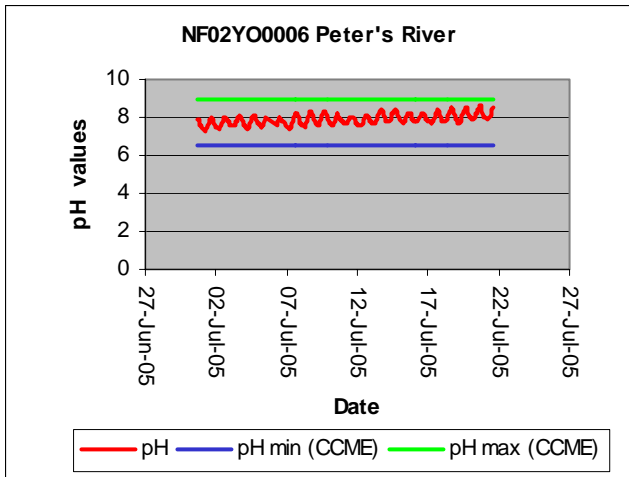
Figure 4: Total Dissolved Solids



- pH** levels were fairly constant during the period of measure, ranging from 7.31 to 8.58, as can be seen in **figure 5**. All pH values were between the CCME recommended range of 6.5 - 9.0, for freshwater aquatic life.
- Dissolved oxygen (DO)** levels ranged from 4.54– 8.82mg/L during the period of measure (see **figure 6**). The optimum DO range for freshwater aquatic life, as recommended by CCME Guidelines, is 5.5-9.5mg/L. DO levels dropped below the recommended minimum for a short period of time on July 19th and 20th. Maximum water temperatures on July 19th and 20th, increased algae growth and floating debris near the DO sensor may all have contributed to the low DO readings recorded at this time.

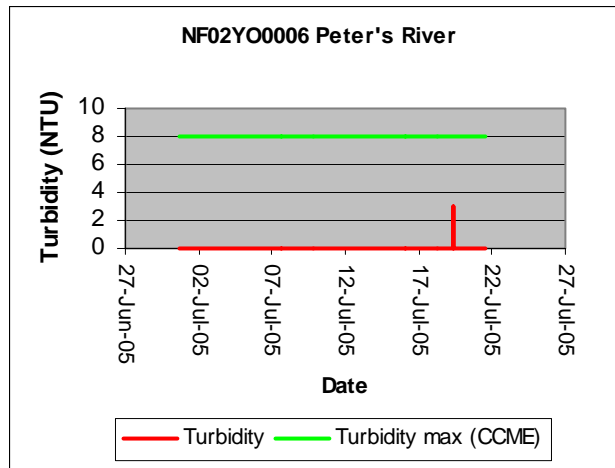
Figure 5: pH

Figure 6: DO (mg/L)



- Turbidity** values remained constant at 0 NTU for most of July, with the exception of 1 spike, occurring July 19 (3 NTUs), as seen in **figure 7**. The data indicate that the spike occurred over duration of less than 1 hour, and thus can likely be attributed to debris passing in front of the turbidity sensor at the time of measure.
- The CCME guideline for turbidity allows for an increase of 8 NTU above background levels.

Figure 7: Turbidity (NTU)



Additional Information

- Table 2 provides summary statistics on water quality parameters for Peter's River from June 30 to July 21, 2005:

Table 2

	Stage	Temp-Water (°C)	pH	Conductance (uS/cm)	TDS (g/L)	Percent-Saturation	Diss-Oxy (mg/L)	Turbidity (NTU)
Minimum	0.893	12.75	7.31	76.00	0.0486	59.00	4.54	0.00
Maximum	0.947	29.86	8.58	100.00	0.0640	91.40	8.82	3.00
Average	0.917	19.76	7.89	85.92	0.0550	78.09	7.11	0.01
St Dev	0.015	3.87	0.27	5.15	0.0033	5.32	0.70	0.14

*Statistics are taken from raw data

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