

Real Time Water Quality Monthly Report For Peter's River May 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 January 6/05, and due to ice conditions, it was not returned for routine monitoring until April 2005. Water quality readings were taken with a Minisonde at the time of removal and reinstallation for QA/QC comparison purposes. The Minisonde and Datasonde instruments were cleaned and calibrated prior to use.
- Water samples were taken from Peter's River for laboratory analysis on April 29/05 as part of QA/QC procedures.

Data Interpretation

- In general, water quality parameters were stable during the period of measure between April 30 and May 31, 2005.
- Environment Canada reported the following daily air temperatures, precipitation and maximum wind gusts for the Central NL region during the month of May 2005, as seen in **Table 1**, below:

Table 1: Climate Data May 2005

Daily Data Report for May 2005					
D a y	Max Temp °C 	Min Temp °C 	Mean Temp °C 	Total Precip mm 	Spd of Max Gust km/h 
01†	15.6	2.5	9.1	T	44
02†	13.8	4.1	9.0	0.6	50
03†	17.1	3.9	10.5	0.0	<31
04†	17.0	4.1	10.6	0.0	46
05†	14.3	2.9	8.6	0.4	<31
06†	12.8	1.9	7.4	0.0	39
07†	17.5	2.3	9.9	0.0	39
08†	12.6	0.2	6.4	0.0	<31
09†	13.3	3.7	8.5	T	32
10†	14.8	5.9	10.4	T	<31
11†	18.0	6.5	12.3	0.2	33
12†	20.2	6.4	13.3	7.0	39
13†	7.7	0.2	4.0	15.6	33
14†	7.6	0.5	4.1	9.8	54
15†	6.0	1.5	3.8	10.4	44
16†	5.9	2.4	4.2	3.0	33

<u>17</u> †	4.6	2.4	3.5	1.2	<31
<u>18</u> †	10.6	2.5	6.6	0.4	<31
<u>19</u> †	9.6	3.7	6.7	0.4	41
<u>20</u> †	6.4	3.0	4.7	29.8	59
<u>21</u> †	11.4	3.2	7.3	0.6	<31
<u>22</u> †	8.9	-0.2	4.4	1.0	33
<u>23</u> †	7.7	-0.9	3.4	T	32
<u>24</u> †	12.3	2.1	7.2	0.0	<31
<u>25</u> †	20.8	2.6	11.7	0.0	<31
<u>26</u> †	23.9	6.5	15.2	0.0	<31
<u>27</u> †	19.1	6.3	12.7	1.6	32
<u>28</u> †	8.7	2.9	5.8	2.0	48
<u>29</u> †	14.4	3.2	8.8	T	<31
<u>30</u> †	20.2	5.1	12.7	0.4	<31
<u>31</u> †	9.8	4.9	7.4	0.0	<31

*T=trace amount; † = daily data has undergone only preliminary checking

- **Stage height** was influenced by increased air temperatures during the first days in May, resulting in significant snow melt. This can be seen in Figure 1, below, with a peak in water level occurring near May 3-4. Light rain fell daily in the region from May 12-16, averaging between 3 and 15.6mm/day, as is reflected in Figure 1 by a small rise in water level occurring between May 13 and May 17. On May 20, 29.8mm of rainfall was recorded in the region, resulting in a sharp rise in water level as seen in Figure 1 below.
- **Water temperature** increased as daily air temperatures increased from May 1-12, as can be seen in Figure 2 below. Air temperature decreased significantly from May 13-23, as is reflected in a decrease in water temperature during the same period. Significant increases in air temperature occurred between May 24-27 and May 29-30. Peaks in water temperature occurred on the corresponding dates. Diurnal water temperature changes are evident in Figure 2, as daily high and nightly low temperatures give the graph a jagged appearance.

Figure 1: Stage Height

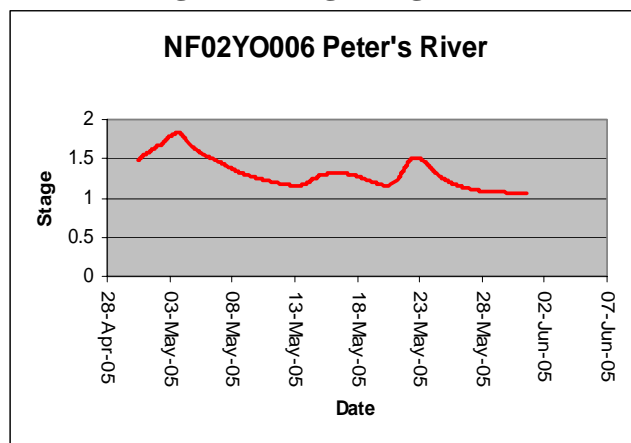
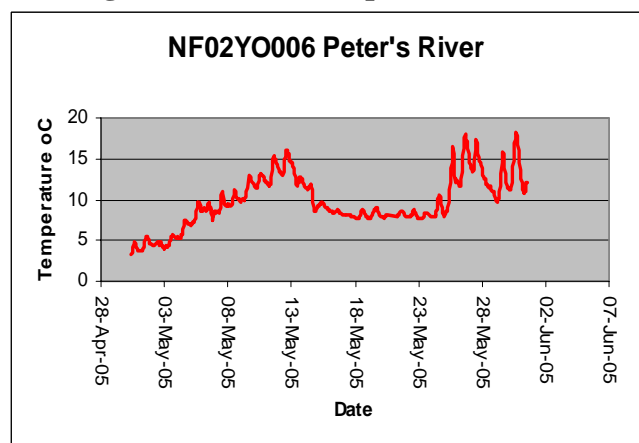


Figure 2: Water Temperature



- **Specific Conductivity** is directly influenced by water temperature. This relationship is evident when comparing Figures 2 and 3: as water temperature increased during May 1-13 (Figure 2), conductivity levels also increased during that time (Figure 3). Daily maximum water temperatures spiked from May 24-30, and conductivity increased steadily during this period. All conductivity values fell within the expected range for this site during May 2005.
- **Total dissolved solids** levels reflected the changes in conductivity, 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

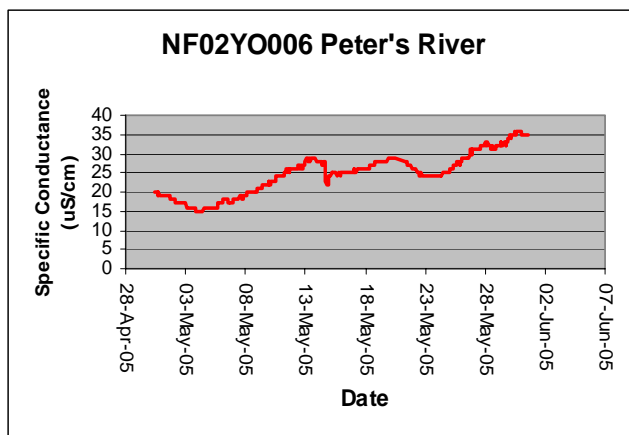
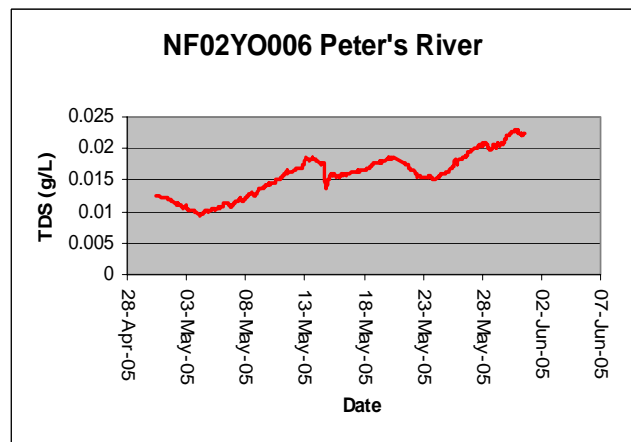


Figure 4: Total Dissolved Solids



- **pH** levels increased steadily from 6.47 at the time the Datasonde was reinstalled in Peter's River on April 30, to a peak of 9.47 on May 13 (see Figure 5). pH levels stayed fairly constant, in the range of 9.4- 8.7 from May 14-18, however, all of these levels were higher than the expected range for this site. A quick QA/QC check was conducted by measuring the pH with a Minisonde on May 18, giving a Minisonde pH value of 6.8. The Datasonde was immediately re-calibrated on-site for pH, at which time pH readings fell to the more expected range of 6.19-7.4 for the remainder of the month. This quick drop in pH, due to re-calibration of the pH sensor, can be seen corresponding to May 18 in Figure 5 below.
- **Dissolved oxygen (DO)** levels ranged from 8.49-10.59mg/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, thus some of the measured values exceeded the recommended range. This may be attributed to the seasonally high water levels and flows that are occurring during this spring run-off period. It is expected that DO levels will decrease over the next couple of months as water temperatures are expected to increase and flows are expected to decrease during the summer period.

Figure 5: pH

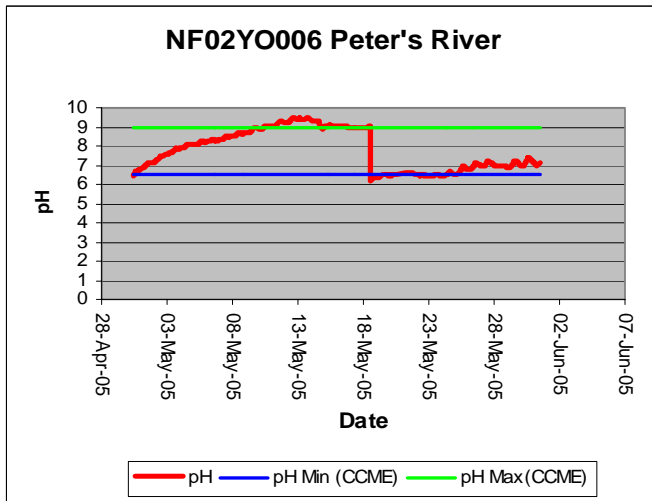
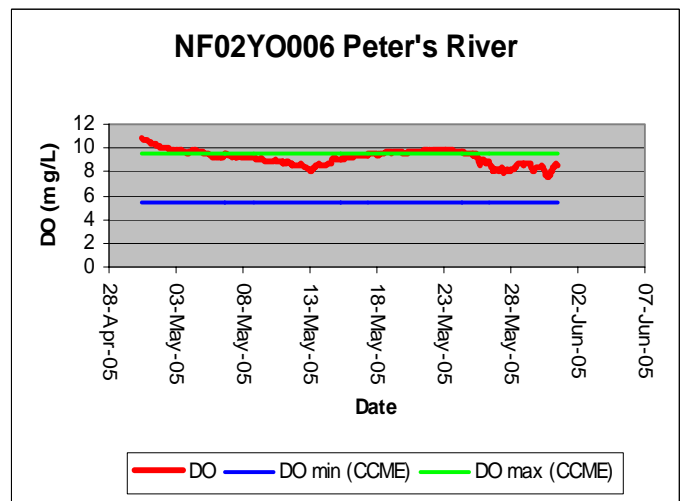
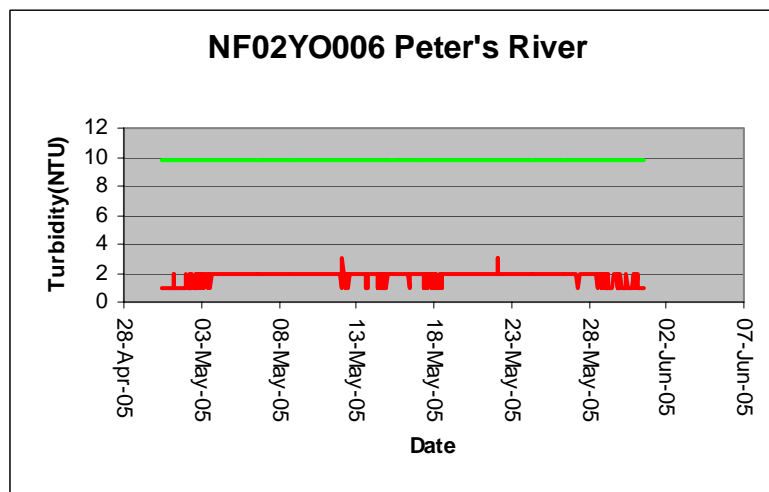


Figure 6: DO



- **Turbidity** values ranged between 1-3 NTUs during the period of measure. Thus, all turbidity values fell within the CCME recommended guideline of no change greater than 8 NTUs above background levels.

Figure 7: Turbidity



Additional Information

- Table 2 provides summary statistics on water quality parameters for Peter’s River from April 30-May 31, 2005.

Table 2

	Temp-Water	pH	Conductance	Diss-Solids	Percent-Saturation	Diss-Oxy	Turbidity
Max	18.30	9.47	28.70	0.0183	95.77	10.59	3
Min	3.71	6.19	14.10	0.0089	75.82	8.49	1
Average	9.85	7.82	20.92	0.0133	85.97	9.66	1.8121547
Standard Deviation	3.12	1.05	3.64	0.0023	3.98	0.53	0.3978730

***Turbidity stats are taken from raw data; stats for all other parameters are taken from corrected data.**

Report prepared by: Joanne Sweeney
Dept of Environment
Grand Falls-Windsor NL
Ph. 292-4220