

Real Time Water Quality Monthly Report For Peter's River December 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 December 2, after it received routine cleaning, maintenance and calibration. It collected hourly data until it was removed on January 4. A ledge of ice extending approximately 1 meter from shore had formed at the time the hydrolab was removed. The Hydrolab will not be replaced in Peter's River until spring 2006, when ice conditions have dissipated. Comparative water quality readings were taken with a minisonde during removal of the datasonde. This procedure is required as part of QA/QC protocol. The minisonde was 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, precipitation and wind gusts for the Central NL region (Gander) during December 2005, as indicated in **table 1** below:

Table 1: Daily Climate Data December 2005

D a y	<u>Max</u>	<u>Min</u>	<u>Mean</u>	<u>Total</u>	<u>Spd of</u>	D a y	<u>Max</u>	<u>Min</u>	<u>Mean</u>	<u>Total</u>	<u>Spd of</u>
	<u>Temp</u>	<u>Temp</u>	<u>Temp</u>	<u>Precip</u>	<u>Max</u>		<u>Temp</u>	<u>Temp</u>	<u>Temp</u>	<u>Precip</u>	<u>Max</u>
	°C	°C	°C	mm	Gust km/h		°C	°C	°C	mm	Gust km/h
<u>01</u> †	7.9	-0.5	3.7	0.0	32	<u>17</u> †	4.2	-3.9	0.2	1.6	39
<u>02</u> †	5.1	-2.3	1.4	11.0	41	<u>18</u> †	0.2	-3.3	-1.6	T	67
<u>03</u> †	9.7	1.5	5.6	15.8	41	<u>19</u> †	-0.1	-5.6	-2.9	0.0	35
<u>04</u> †	1.8	-2.5	-0.4	T	50	<u>20</u> †	0.7	-4.3	-1.8	T	41
<u>05</u> †	0.8	-3.5	-1.4	6.6	50	<u>21</u> †	-3.4	-14.0	-8.7	0.6	32
<u>06</u> †	-0.2	-3.9	-2.1	0.0	52	<u>22</u> †	-5.3	-13.4	-9.4	0.6	<31
<u>07</u> †	-2.6	-4.7	-3.7	1.4	54	<u>23</u> †	-0.6	-11.2	-5.9	0.4	39
<u>08</u> †	-3.1	-8.1	-5.6	1.0	44	<u>24</u> †	-6.4	-13.0	-9.7	0.0	<31
<u>09</u> †	-2.9	-6.8	-4.9	T	41	<u>25</u> †	0.0	-11.6	-5.8	1.6	<31
<u>10</u> †	-0.1	-3.5	-1.8	16.8	50	<u>26</u> †	-2.1	-9.0	-5.6	16.6	56
<u>11</u> †	0.8	-8.2	-3.7	T	54	<u>27</u> †	0.4	-2.3	-1.0	11.6	63
<u>12</u> †	6.6	0.8	3.7	23.6	63	<u>28</u> †	0.9	-1.3	-0.2	1.8	35
<u>13</u> †	3.7	0.3	2.0	9.0	<31	<u>29</u> †	3.1	-1.5	0.8	0.0	41
<u>14</u> †	2.5	0.8	1.7	38.6	33	<u>30</u> †	8.9	3.0	6.0	2.2	54
<u>15</u> †	8.8	-0.4	4.2	0.4	80	<u>31</u> †	8.7	-2.4	3.2	8.8	56
<u>16</u> †	0.4	-3.9	-1.8	T	56						

†
=data has

undergone only preliminary checking; T=trace amount

- Stage height** fluctuated between 1.017 and 1.608m during the period of measure as seen in **figure 1** below. Stage height was impacted by daily precipitation levels that were recorded for the region, as seen in **table 1** above.
- Water temperatures** periodically fell below 0°C as ice formed near the shore on both sides of Peter's River. A sharp decrease in water temperature is seen below in **figure 2**, as the water

temperature dropped from a high of 4.45°C on December 3 to a low of -0.18°C on December 8. This corresponds with the sharp decline in ambient air temperature seen above in **table 1**, when the daily mean temperature dropped from 5.6°C on December 3 to -5.6°C on December 8.

Figure 1: Stage Height

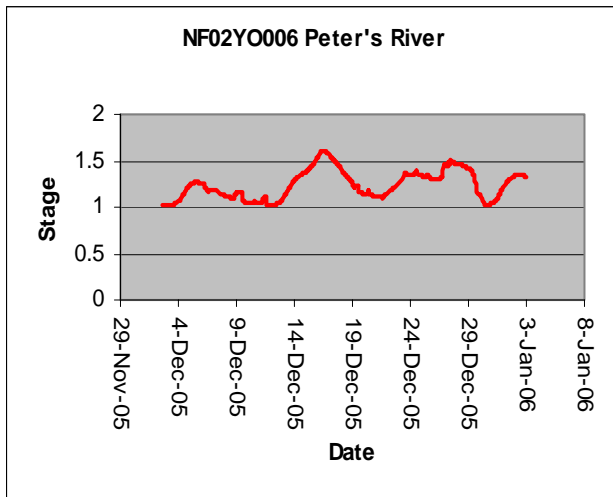
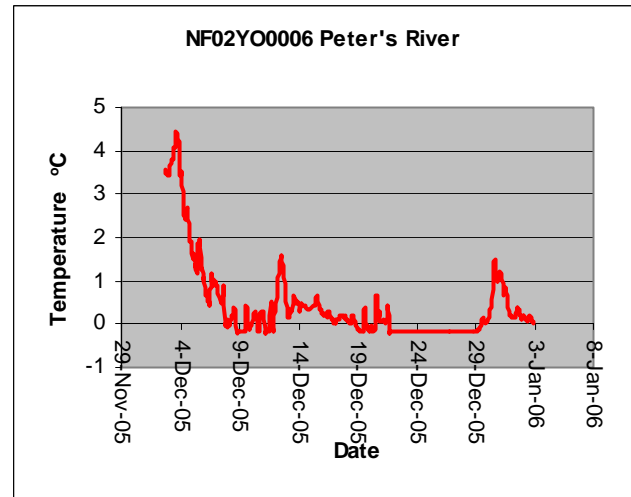


Figure 2: Water Temperature



- **Specific conductivity** levels ranged from 18-50µS/cm during the period of measure, as indicated in **figure 3** below. This range is reflective of natural background conditions in Peter's River.
- **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

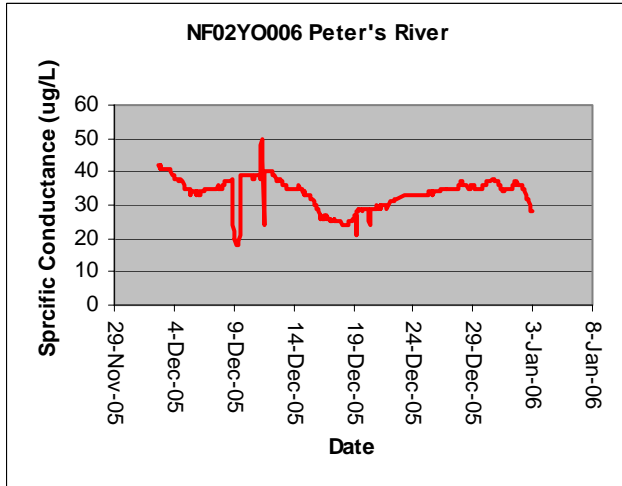
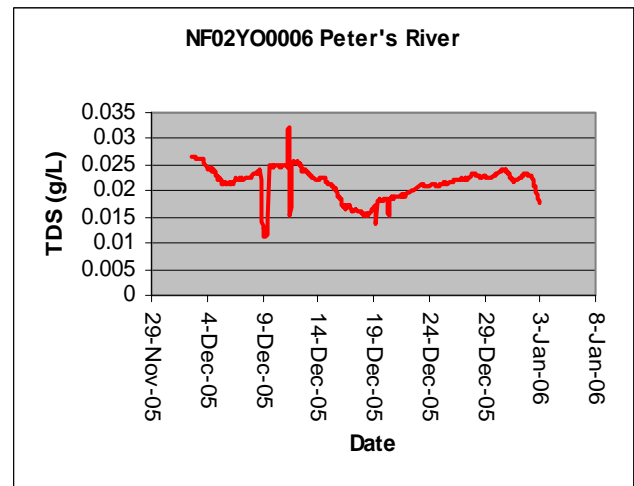


Figure 4: Total Dissolved Solids



- **pH** levels were fairly constant and fluctuated near the minimum recommended CCME guideline of 6.5 pH units for the protection of freshwater aquatic life, as seen in **figure 5**, below. These values are within the expected natural background pH range for Peter's River.
- **Dissolved oxygen (DO)** levels were fairly constant during this period of measure, ranging from 12.23-14.06mg/L, as seen in **figure 6**, below. DO levels continue to increase as water temperatures decrease.

Figure 5: pH

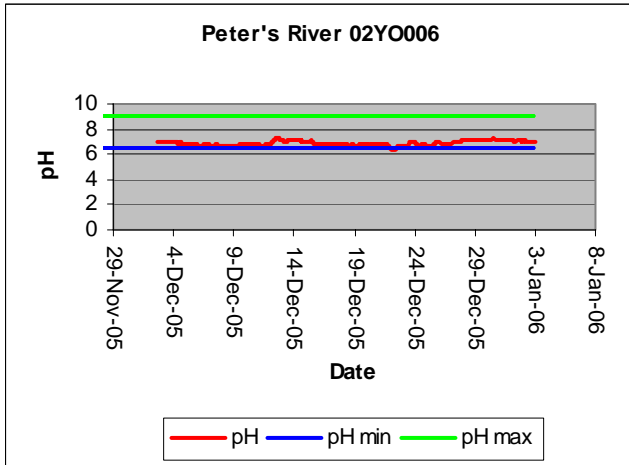
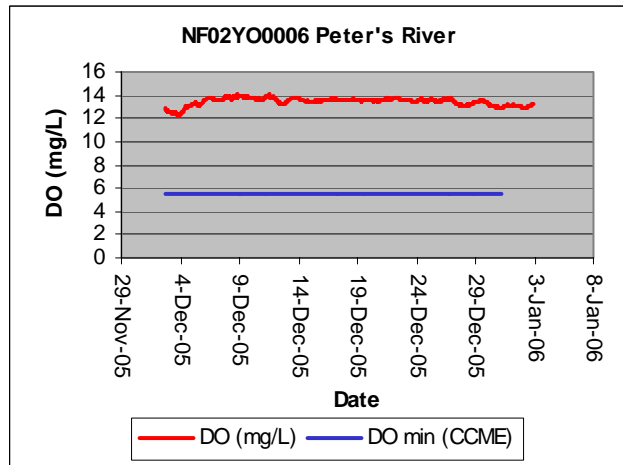
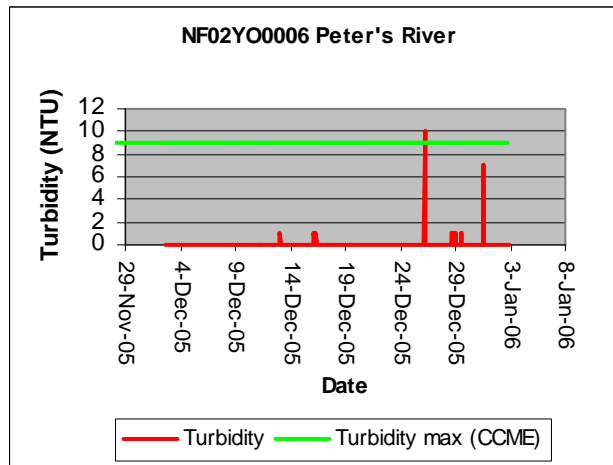


Figure 6: DO (mg/L)



- **Turbidity** levels were constant at 0-1NTU for most of the period of measure, as seen below in **figure 7**. Turbidity spikes occurred on December 26 and 31, but each spike was short in duration, and is probably the result of suspended matter that passed near the turbidity sensor just as a reading was being taken.

Figure 7: Turbidity (NTU)



Additional Information

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

Table 2: Summary Statistics

	Stage	Temp°C	pH	SpC	TDS	DO%	DOmg/L	Turbidity
Min	1.017	-0.220	6.270	18.000	0.011	89.300	12.230	0.000
Max	1.608	4.450	7.290	50.000	0.032	98.100	14.060	10.000
Average	1.243	0.468	6.894	33.672	0.022	93.805	13.436	0.034
St Dev	0.157	0.947	0.183	4.845	0.003	1.779	0.338	0.464

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