

Mai 2006

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**Follow-up on Lake Louisa's trophic status**  
**Final Report**  
2005

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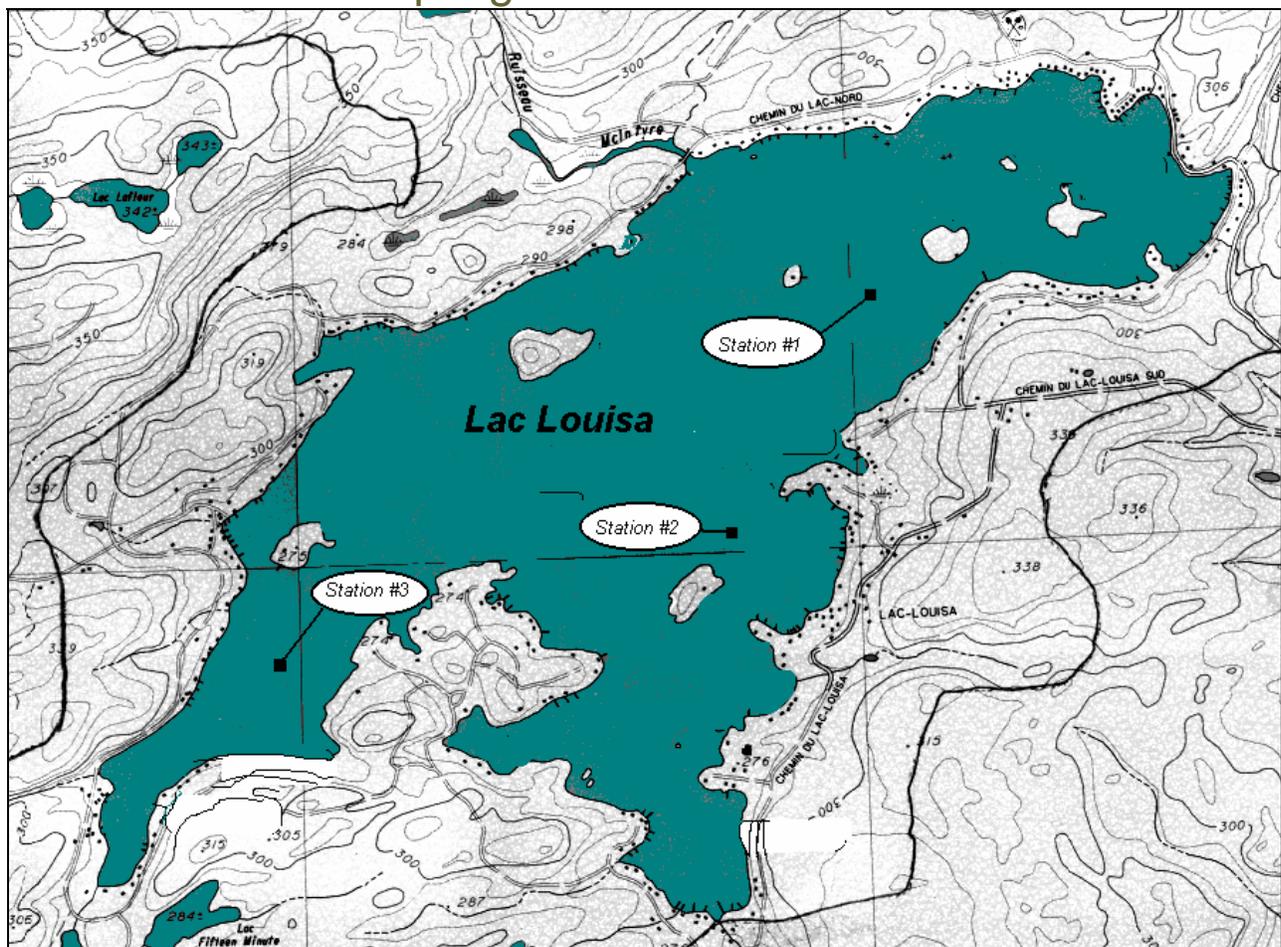
**Final report**  
Lake Louisa September 1<sup>st</sup> 2005

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## Sampling plan

3 sampling stations; 1 summer visit.  
Sampling dates: September 1<sup>st</sup> 2005.  
Sampled by: Dany Boudrias & Isabelle Arshoun

## Localization of sampling stations



# Parameters

- Dissolved oxygen / temperature ;
- pH (surface);
- Total phosphorous;
- Chlorophylle-a;
- Secchi transparency

## Results

September 1<sup>st</sup> 2005

Stations	1	2	3
Total phosphorous	0,038 mg P/L	0,031 mg P/L	0,034 mg P/L
Chlorophylle-a	2,3 µg/L	1,9 µg/L	1,4 µg/L
Transparency	7,1 m	7,0 m	6,9 m
pH	7,60 (surf) 7,12 (15m)	7,55 (surf)	7,68

### Station no.1

Depth (m)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Temperature °C	22,0	22,0	22,0	22,0	22,0	21,3	20,5	18,5	16,0	13,0	11,0	10,5	10,0	9,5	9,0	8,5
Oxygen (ppm)	8,0	8,0	8,1	8,1	8,0	8,2	8,6	9,3	10,8	10,2	10,4	9,2	9,0	8,4	8,0	7,8

### Station no.2

Depth (m)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Temperature °C	22,0	22,0	22,0	22,0	22,0	21,5	20,0	18,5	15,5	12,5	11,0	10,0	10,0	9,0	9,0	8,5
Oxygen (ppm)	8,2	8,1	8,1	8,0	8,2	8,4	8,7	8,9	10,2	10,4	10,0	9,1	8,9	8,2	7,8	7,7

### Station no.3

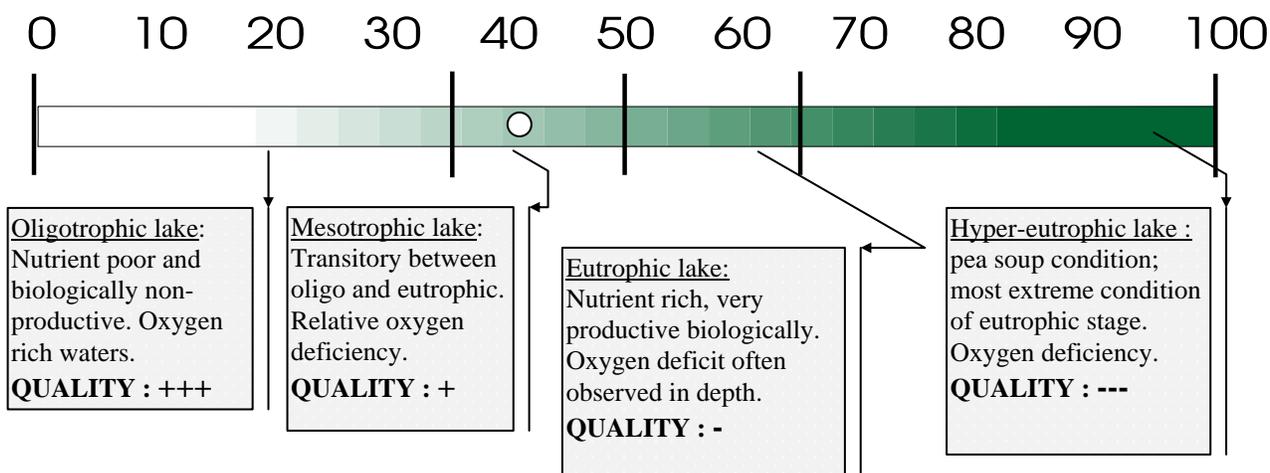
Depth (m)	0	1	2	3	4	5	6	7	8	9	10	11	12
Temperature °C	22,5	22,5	22,0	22,0	21,5	21,5	20,5	19,0	16,5	13,0	11,5	11,0	10,5
Oxygen (ppm)	8,1	8,1	8,0	8,0	8,1	8,3	8,8	9,2	9,8	9,0	8,8	5,4	1,3

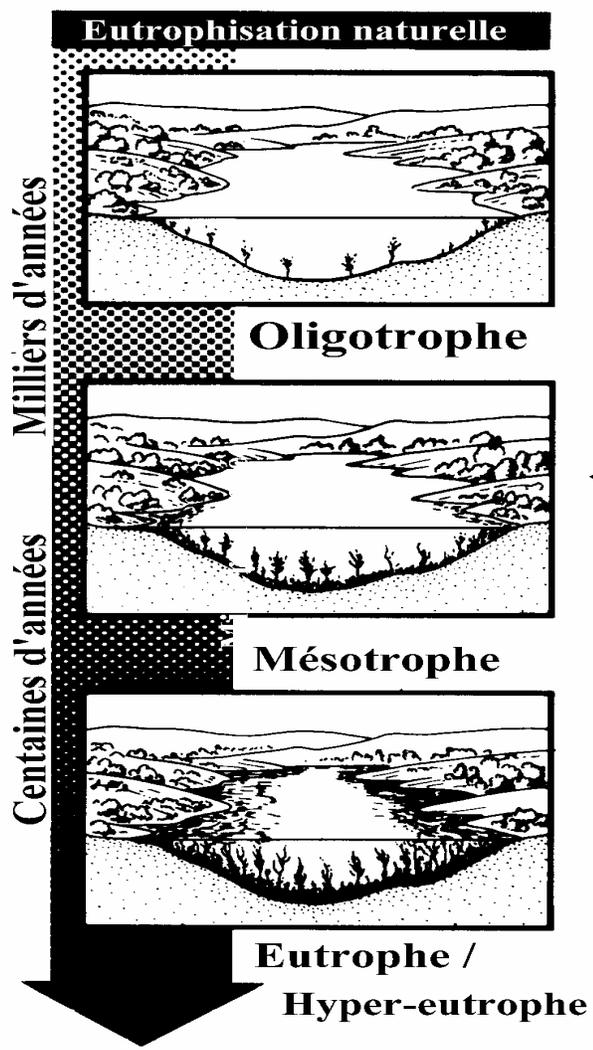
# Eutrophication index

Data TRANSFERT to eutrophication index (using the mean of the three sampling stations per sampling period)

September 1 <sup>st</sup> 2005	Results	Trophic values
Total Phosphorous ( $\mu\text{g P/L}$ )	34,3	55
Chlorophylle-a ( $\mu\text{g /L}$ )	1,9	36
Secchi transparency (m)	7,0	32

MOYEN / AVG: 41



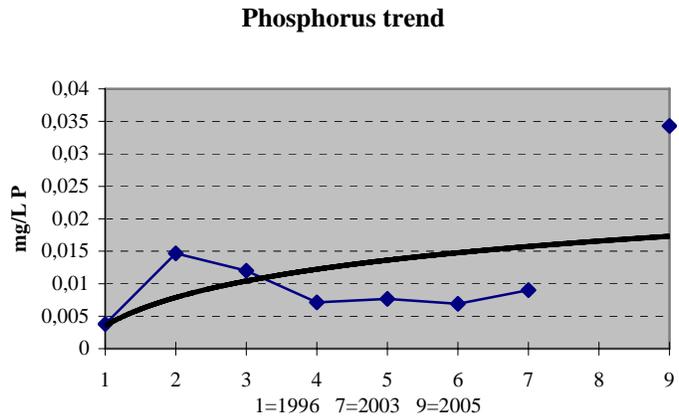


← Lake Louisa status, September 2005

# Water quality tendancies

## Phosphorous

How should we interpret the high levels of total phosphorous obtained in 2005? Many calls were made to the laboratory in order to verify the results and have a second analysis of the samples done. The results were all similar to the first analysis. We have to take these numbers as being possible and try to interpret them.



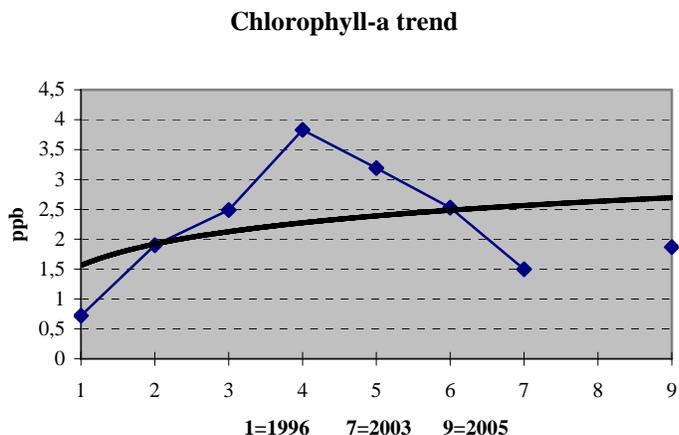
We came across several cases in 2005 that helped us consider these results. Lake Barron (Gore), which is a deep lake with a large surface area, is one of these cases. This lake, which always showed proof of low nutrient levels (oligotrophic) suffered from algae blooms in the summer of 2005. We believe that climatic factors that occurred that summer might be the cause. Spring of 2005 (month of April) was very cold with frequent precipitations. During this period, many septic installations believed to be more or less compliant may have leached into the lake and enriched its superficial waters. In the beginning of May, atmospheric temperatures rose rapidly and remained high all summer, often breaking records of temperature and sunshine. This would have caused the nutrient rich spring waters to be imprisoned at the thermocline, i.e. at limit of the photic zone of the lake. This condition would have allowed the algae to multiply and create blooms as seen in August 2005.

The 2005 season also affected many shallower lakes such as Lake Chevreuil (Gore). It suffered from its first filamentous algae bloom that same year. An environmental septic installation compliance study demonstrated that 35% of the septic installations around the lake were outdated, which permitted us to put forward and also reinforce the above hypothesis.

We believe that the same phenomenon happened at Lake Louisa but with lesser impacts than at the above-mentioned lakes, probably due to its higher natural buffering capacity.

## Chlorophyll-a

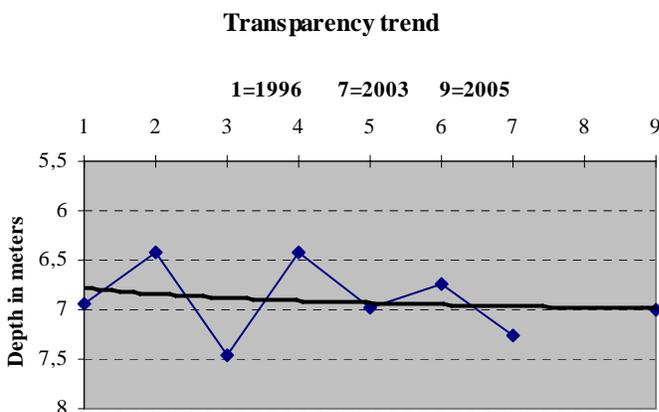
The chlorophyll-a results were slightly above the ones obtained in 2003, which is surprising considering the total phosphorous results. This had an effect on the tendency curve i.e., the water quality shifted towards waters richer in nutrients.



## Secchi Transparency

The water transparency results remained quite stable despite the increase in lake productivity trends.

It would be interesting to observe the lake's reaction in 2006 considering these results. The reaction period may vary from one lake to another and it is possible that these nutrients may have a real impact only the following year, i.e. summer of 2006. It would be important to do an exhaustive follow-up using the same physical-chemical parameters that have been used since 1996 in order to verify the possible effects and the general status of the lake.



The dissolved oxygen readings were similar to previous years.

We looked at previous studies of Lake Louisa, such as the ones performed by Vanier College, in order to see if similar results in terms of nutrient levels were obtained. Unfortunately these parameters were never measured. However, using the water transparency readings along with the Carlson eutrophication index we could estimate approximate measures.

The water transparency readings for 1984 were maintained between 2.0 and 5.4m on 12 sampling points. The equivalent of a 2.0m Secchi transparency reading is about

0.024mg of total Phosphorous/L. The average of the 12 readings was 4.3m, equivalent to 0.010mg of total Phosphorous/L.

The total Phosphorous average for September 2005 was 0.034mg/L, a lot higher than all the readings obtained in the previous years.

Hopefully this event was unique and it will not reoccur repeatedly as this could cause us to go back to the same conditions as seen in the 1980's. Back then, many septic installations were completely obsolete, the cause of the observed water quality problems. Could it be possible that the present septic installations at Lake Louisa are commencing to show signs of pollution into the lake? More and more residents around Lake Louisa are becoming year-round residents, whereas the majority were seasonal in the 1980's. A lake will always be the reflection of it's watershed, so it may be possible that Lake Louisa is starting to show signs of eutrophication, despite all the lake protection efforts.

The lake capacity study that we previously suggested would allow us to better understand the phenomenon presently observed and above all see Lake Louisa's real capacity.

## Recommendations for 2006 season

### ACTIONS TO HELP SAVE LAKE LOUISA

We allow ourselves to make the same recommendations as in 2002 and 2003, along with the one of conducting a complete study of the status of the septic installations at Lake Louisa, including Wentworth and Wentworth North. We are conducting more and more septic installation status studies and have noticed that septic installations ARE the biggest contributors in terms of lake eutrophication.

The following data comes from environmental septic installation conformity studies that we have conducted in the region:

- Study of Lake Clair: 25% of the installations
- Study of Lake Bixley: around 35%
- Study of Lake Chevreuil: 35%
  
- Lake Louisa: ????????????

If Lake Louisa shows similar results to other lakes, this could help us better understand the total phosphorous results obtained in 2005. We believe that the Lake Association should consider the results of the other lakes studied as being possibly similar, so the faulty septic installations at Lake Louisa HAVE to be identified and corrected as soon as possible. Wentworth has an environmental compliance verification program in progress since 2005. 2006 should be devoted to studying septic installations of many houses in the Grace Park development, which would bring to 2007 the possibility of verifying the installations at Lake Louisa.

The Lake Association should put pressure on the Municipality of Wentworth in order to have them conduct the same studies. It is now clear that the average of septic installations identified as non-compliant or obsolete are similar from one lake to another or from one municipality to another.

A handwritten signature in black ink, appearing to read "Dany Boudrias". The signature is fluid and cursive, with a large initial "D" and "B".

**Dany Boudrias**  
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