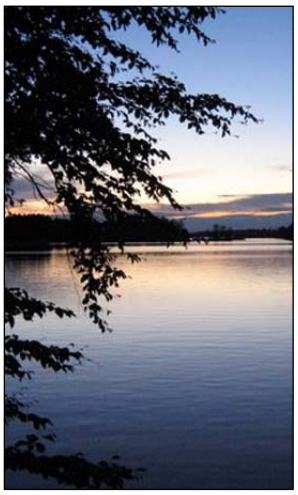

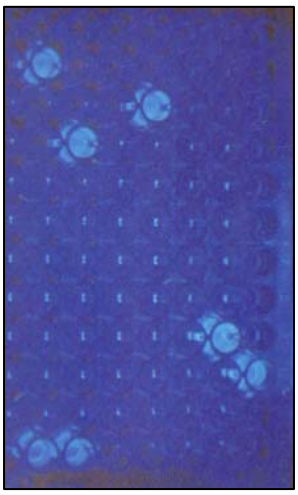

MUSKOKA LAKES ASSOCIATION

Water Quality Initiative

working in co-operation with citizens'environmentwatch

WQI Monitoring Program Summary Report

January 31, 2009

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Summary Report

The 2008 Water Quality Initiative (WQI) monitoring program involved over 110 volunteers in collecting and analyzing lake water samples from 158 sites on 18 lakes and rivers across West Muskoka and South Parry Sound. Volunteers collected samples bi-weekly eight times between May 16 and August 25. Parameters considered were total phosphorus, *E.Coli*, total Coliform and water clarity (measured in secchi depth). This report summarizes the results of the first four parameters, comparing each to acceptable thresholds as well as expected ranges and deviations.

Each of the following pages summarizes the results from one sampling area. Data from previous years are available online at http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes. Detailed information including protocols, quality assurance/quality control measures, conclusions and recommendations can be found in the 2008 WQI Technical Report at the same website. A printed copy is available from the Muskoka Lakes Association.

Water Quality Parameters

The four parameters monitored as part of the WQI are meant to give a good overview of ecosystem health, but not to duplicate monitoring efforts of government agencies. Table 1 summarizes the purpose of monitoring each parameter, what the parameter could indicate and actions that individuals can take to mitigate the problems each parameter might indicate.

Table 1 - Summary of Parameters Reported

Parameter	Type	Sources	Indicates	Actions
Total Phosphorus	Chemical	Fertilizers, soaps, sewage, agriculture	Eutrophication (algae and plant growth), colour, fish habitat	Plant vegetation, do not fertilize, maintain/replace septic systems
Total Coliform	Biological	Wildlife, wetlands	Biologically active ecosystem	
E.Coli	Biological	Sewage, wildlife, agriculture	Faecal contamination, abnormal ecosystem	Maintain/replace septic systems, plant vegetation
Clarity	Physical	Fertilizers, stormwater, sewage, boat traffic, construction, agriculture	Eutrophication, erosion	Plant vegetation, control erosion, avoid destructive behaviour

Further information on each parameter is included in the Glossary.

Understanding the Summaries

Results presented here and online are average seasonal values (arithmetic mean of total phosphorus, clarity and temperature; geometric mean of *E.Coli* and total Coliform). Averages are reported because individual results are not typically significant. Averages are only reported if results from at least six of the sample periods were successfully analyzed. It is noted if less than six results were reported.

More detailed information useful for understanding the summaries is included in Appendix A – *Understanding the Summaries*.

To obtain a copy of some or all of the raw data used to create this report, please contact the Muskoka Lakes Association at 705-765-5723 or http://www.mla.on.ca.

Cox Bay, Lake Joseph

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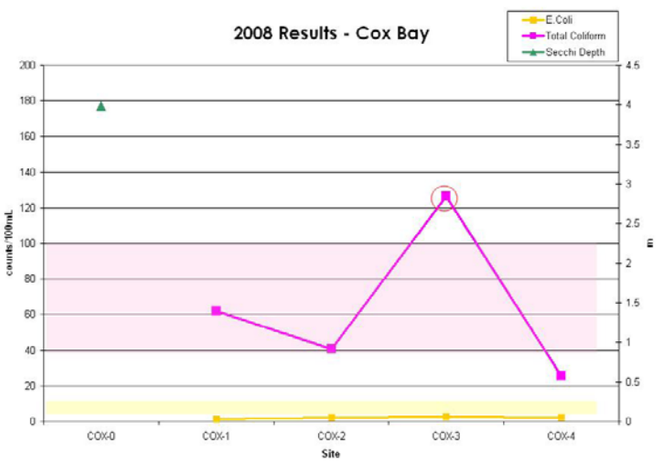
Volunteers monitored five sites at Cox Bay eight times over the summer of 2008. Cox Bay has been monitored since 2002. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

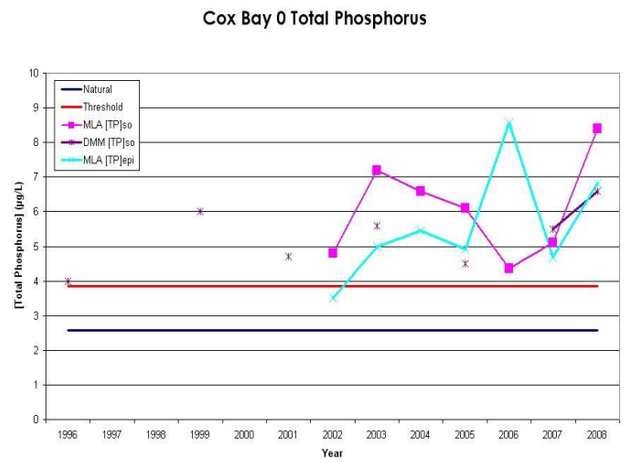
Overall water quality: ♦♦♦
There are no concerns with *E.Coli* or secchi depth, however total coliform was found to be over threshold at a single nearshore site, and above expected standard deviation.

- Ranks 15/24 in level of Total Coliform
- Ranks 3/23 in level of *E.Coli*
- Ranks 10/44 in Secchi depth (clarity)



2008 Results

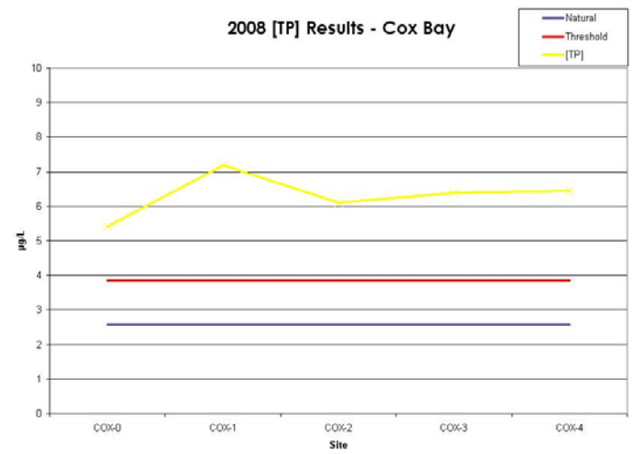
Total coliform measurement at site 3 was the only value above threshold and had a higher than expected standard deviation. All other total coliform and *E.Coli* values were below or within the expected range and expected standard deviation.



Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Cox Bay's threshold is 3.855µg/L.Spring turnover and average phosphorus have remained above the threshold since 2002. In 2008, spring turnover phosphorus was at its highest measure level to date. This is consistent with the District's phosphorus measurements. Cox Bay is classified as over-threshold by the District of Muskoka.



Site-by-site phosphorus

All sites had very similar average phosphorus concentrations - the second year in a row these measurements have been over threshold at Cox Bay.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Gordon Bay, Lake Joseph

Volunteers monitored five sites in Gordon Bay eight times in the summer of 2008. Gordon Bay has been monitored since 2004. 46 areas on 18 lakes and rivers were monitored in 2008.

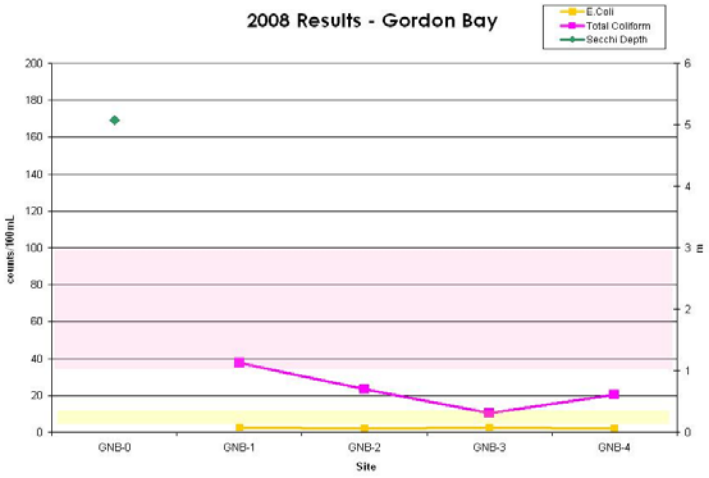
Summary

Overall water quality: ♦♦♦♦♦
There are no concerns with *E.Coli*, total coliform, secchi depth or phosphorus concentration.

- Ranks 6/24 in level of Total Coliform
- Ranks 7/23 in level of *E.Coli*
- Ranks 5/44 in Secchi depth (clarity)

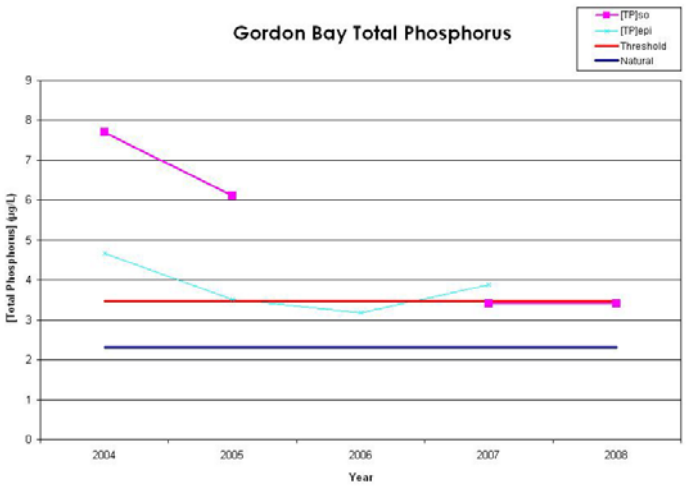
2008 Results

All measurements are within or below the expected range.



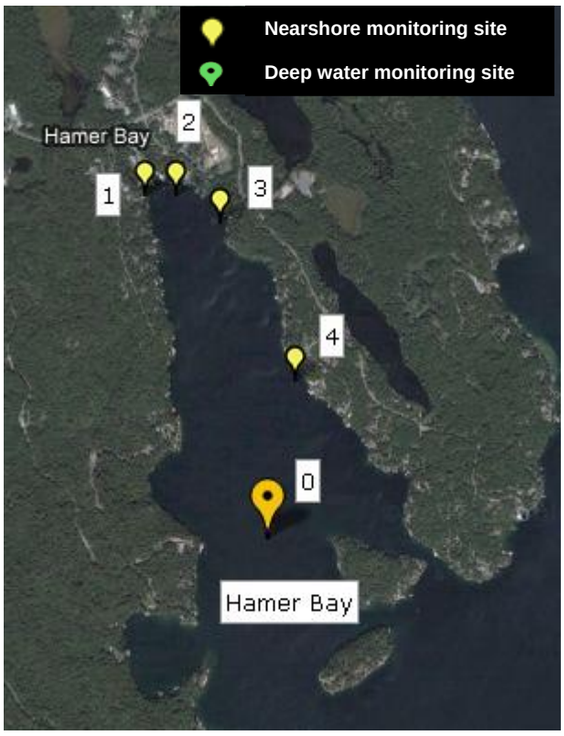
Phosphorus

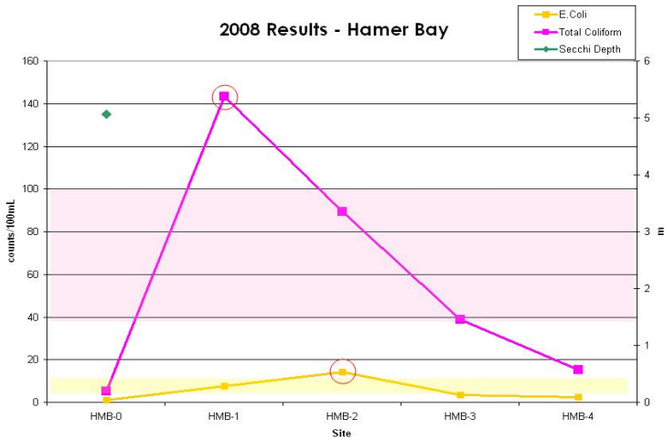
A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

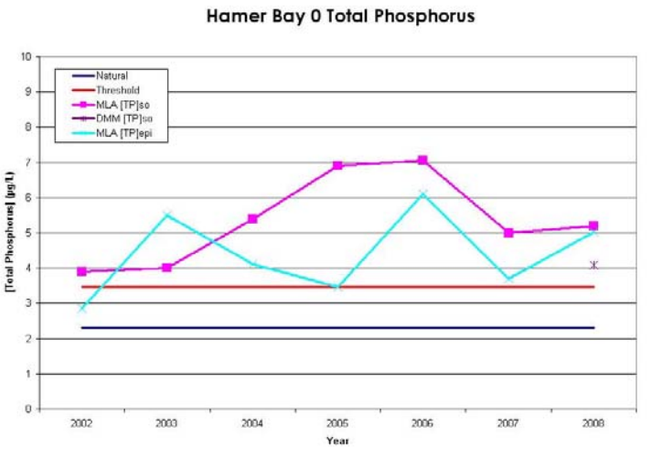


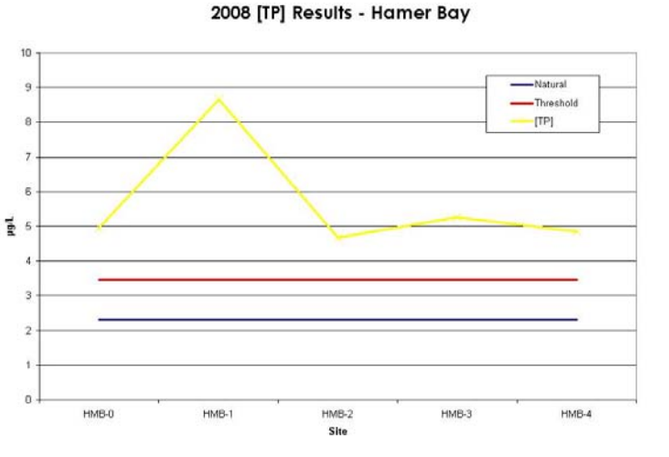
Gordon Bay is not specifically considered by the District of Muskoka. The main basin of Lake Joseph's threshold is 3.465µg/L. Spring turnover phosphorus was below threshold for both 2007 and 2008. Average phosphorus has remained around the threshold since 2004.

Hamer Bay, Lake Joseph









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Volunteers monitored five sites at Hamer Bay eight times over the summer of 2008. Hamer Bay has been monitored since 2002. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦
E.Coli was high at site 2, and total coliform high at site 1. Secchi depth was ranked quite high among all areas, and phosphorus concentration was found over-threshold.

- Ranks 11/24 in level of Total Coliform
- Ranks 13/23 in level of *E.Coli*
- Ranks 6/44 in Secchi depth (clarity)

2008 Results

Although site 1 total coliform values have decreased since 2007, it was still found to be above the expected range with a larger than expected standard deviation. This has been found since 2004 and still warrants further investigation. *E.Coli* values at site 2 were also found to be above the expected range with a larger than expected standard deviation.

All other measurements are below the expected range and have expected standard deviations.

Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

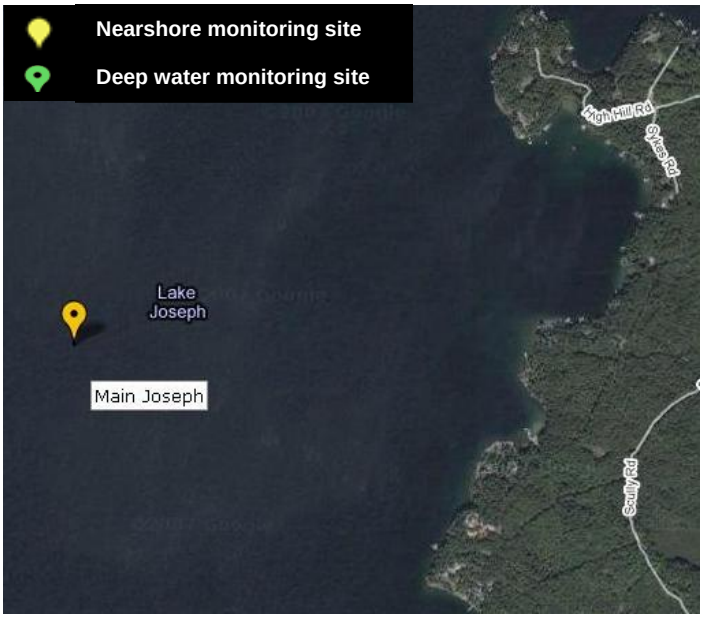
Hamer Bay is not specifically considered by the District of Muskoka. The threshold for the main basin of Lake Joseph is 3.465µg/L. Spring turnover phosphorus measurements have remained above the threshold since 2002 and average phosphorus above threshold since 2003.

Site-by-site phosphorus

All sites had average phosphorus concentrations above the threshold for Lake Joseph. Site 1 had an average far exceeding other sites. These results are consistent with previous years and warrant investigation.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Lake Joseph (main basin)

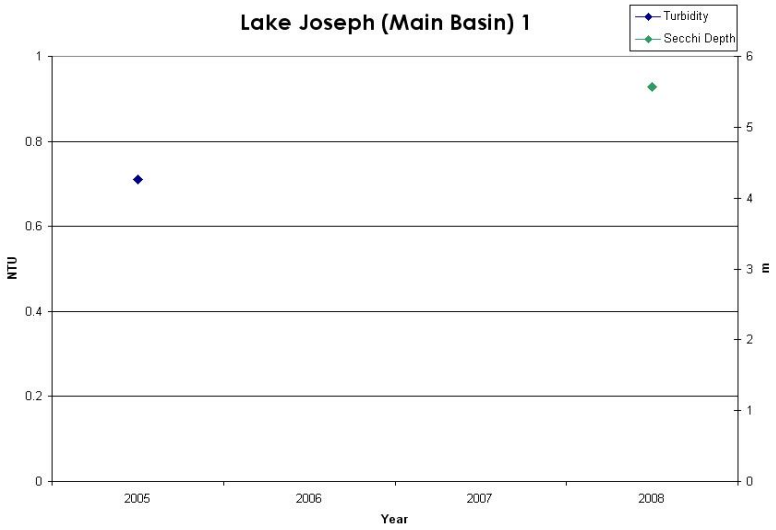


Volunteers monitored a single nearshore site at Lake Joseph (main basin) for spring turnover phosphorus and Secchi depth in the summer of 2008. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

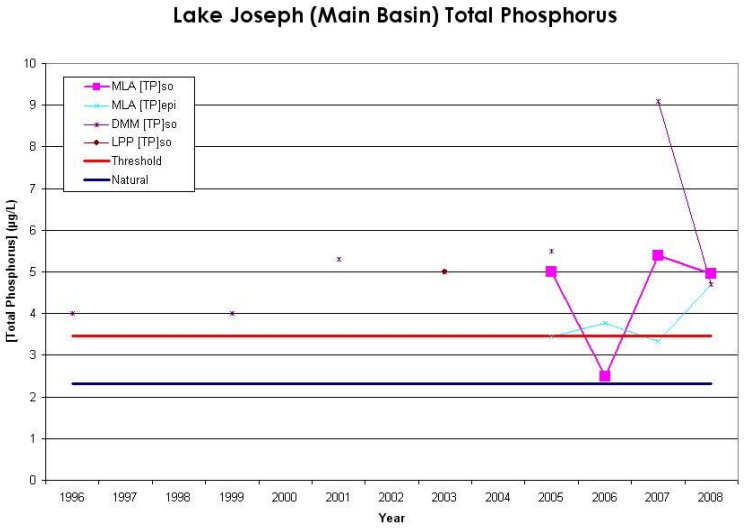
Overall water quality: ♦♦♦
Total coliform and *E.Coli* were not measured at Lake Joseph (main basin) in 2008. All phosphorus levels were found to be above threshold.

- Ranks 2/44 in Secchi depth (clarity)



2008 Results

No previous data exists for secchi depth at Lake Joseph (main basin). In 2005, turbidity was below benchmark levels, which proves consistent with secchi depth as it is ranked very high among all 46 areas. Total coliform and *E.Coli* were not measured at Lake Joseph (main basin) as there was only one nearshore site monitored in 2008.



Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."
Lake Joseph's threshold is 3.465µg/L. With the exception of 2006, phosphorus levels are consistently above threshold. Both the District of Muskoka and MLA spring turnover phosphorus have been over threshold two years in a row and may warrant further investigation.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Stanley Bay, Lake Joseph

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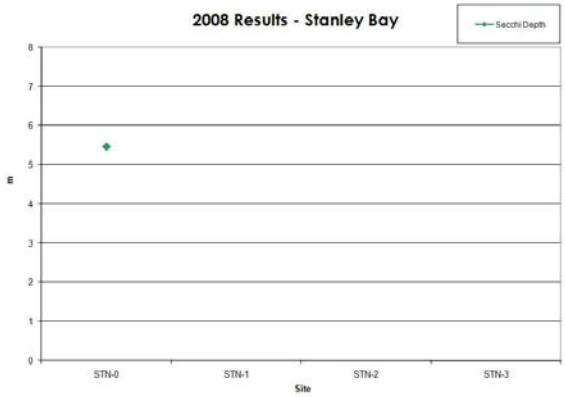
Volunteers monitored four sites in Stanley Bay seven times in the summer of 2008. Stanley Bay has been monitored since 2004. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

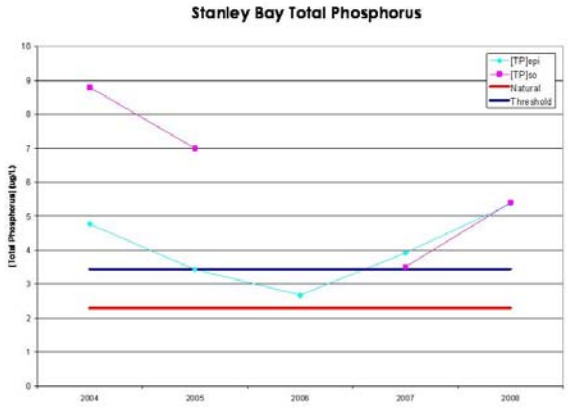
Overall water quality: ♦♦♦
No data was collected for *E.Coli* and total coliform for Stanley Bay in 2008. However Stanley Bay is ranked quite high in terms of secchi depth. Phosphorus levels continue to rise from last years already above threshold values.

- Ranks 3/44 in Secchi depth (clarity)



2008 Results

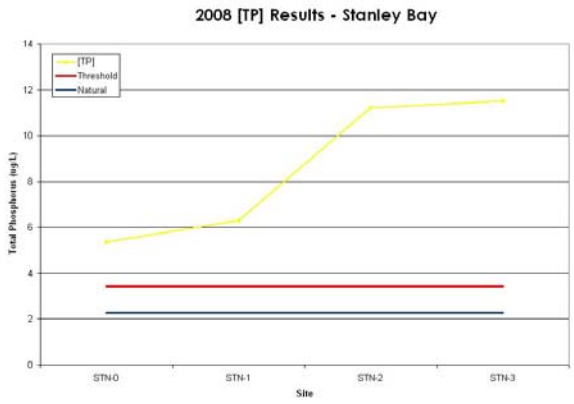
Secchi depth remains within or below the expected range of values. No data was collected for total coliform and *E.Coli*.



Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Stanley Bay's threshold is 3.435µg/L. Spring turnover phosphorus has been above the threshold for all previous measurements. Average phosphorus has been above threshold since 2004 with the exception of 2006 values.

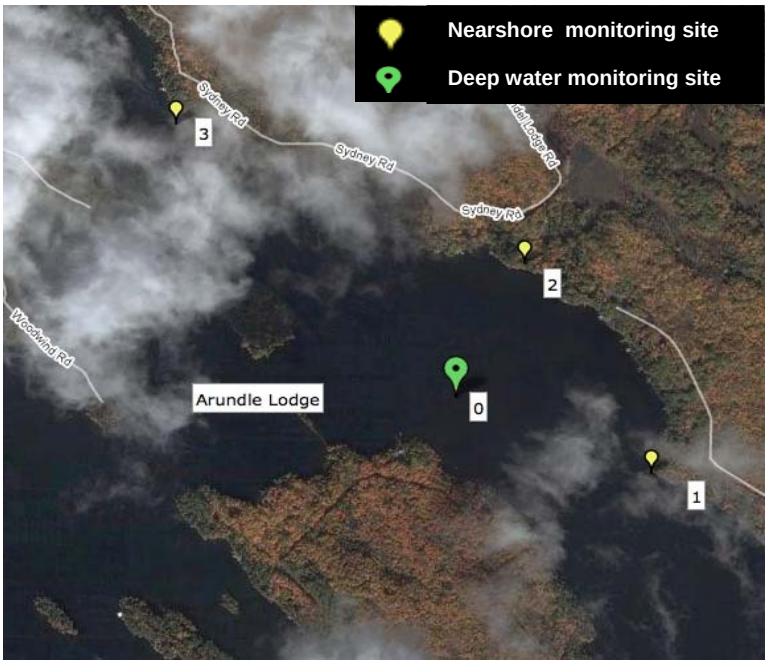


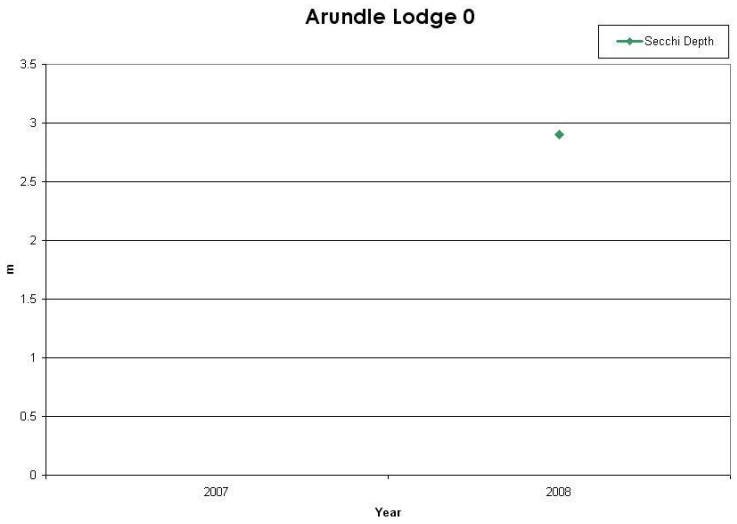
Site-by-site phosphorus

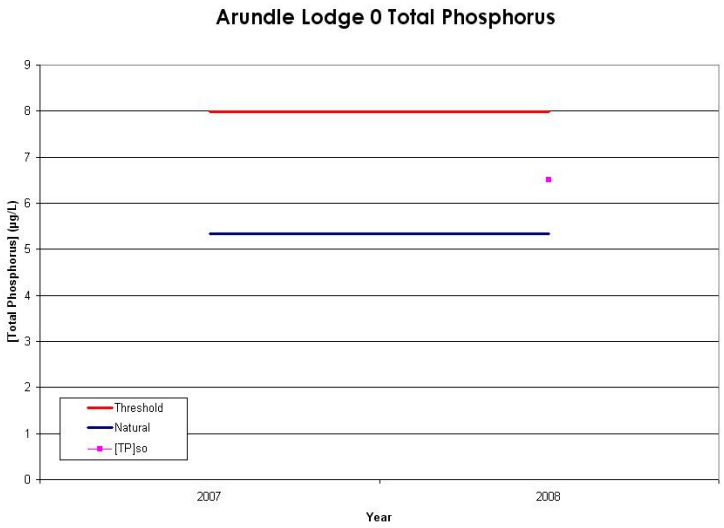
In 2008, all sites had average phosphorus concentrations above the threshold for Stanley Bay. Concentrations at sites 2 and 3 are prominently higher than all other sites.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Arundel Lodge







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CEW monitored one offshore site at Arundel Lodge for spring turnover phosphorus and secchi depth in the summer of 2008 – the first year Arundel Lodge has been monitored since 2002. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦♦♦
Total coliform and *E.Coli* were not measured at Arundel Lodge in 2008. No immediate concerns were found with phosphorus levels or Secchi depth.

- Ranks 32/44 in Secchi depth (clarity)

2008 Results

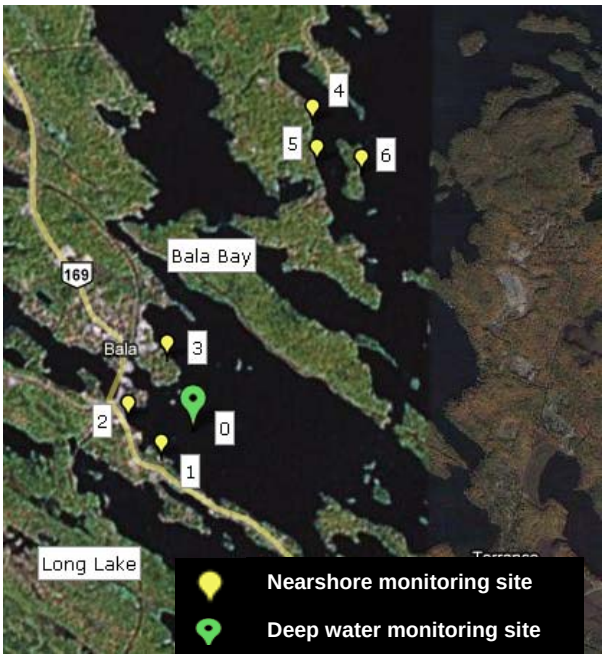
Although secchi depth was not ranked very high among all sites, no previous data exists for comparison, and therefore does not warrant concern. Total coliform and *E.Coli* were not measured at Arundel Lodge as the only site monitored in 2008 was an offshore site.

Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Arundel Lodge's threshold is 7.995µg/L. Spring turnover was found to be below this level and therefore warrants no immediate concern.

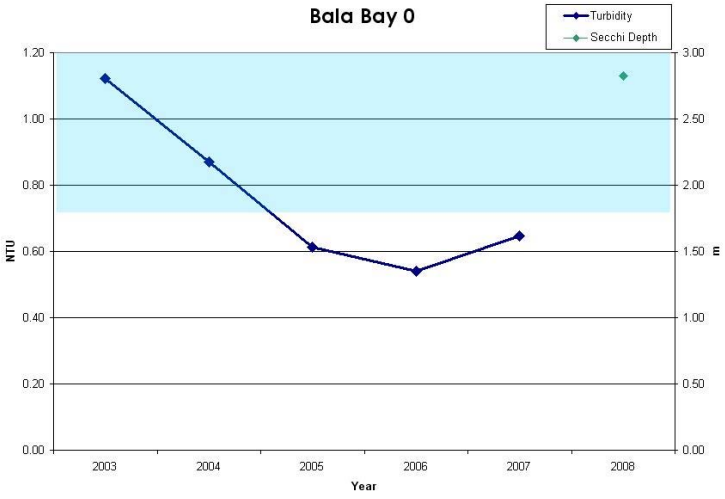
Bala Bay, Lake Muskoka



CEW monitored a single offshore site at Bala Bay for spring turnover phosphorus and secchi depth in the summer of 2008. 46 areas on 18 lakes and rivers were monitored in 2008.

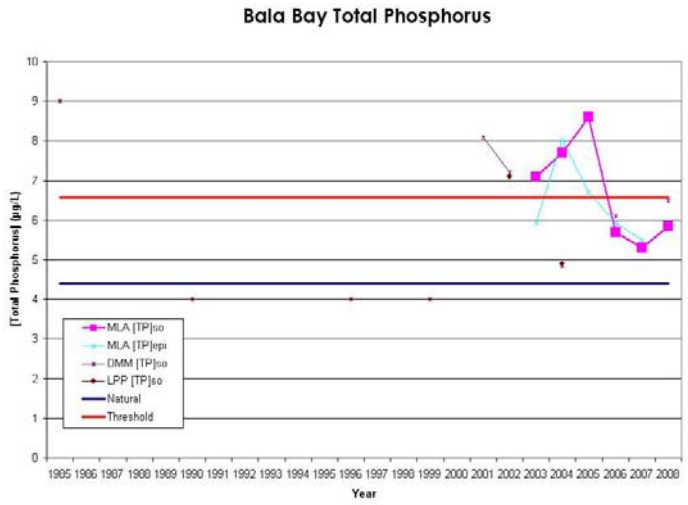
Summary

Overall water quality: ♦♦♦♦♦
Total coliform and *E.Coli* were not measured at Bala Bay in 2008. No immediate concerns were found with phosphorus levels or secchi depth.



2008 Results

No previous data exists for secchi depth at Bala Bay. In 2007, turbidity was below threshold levels, and further monitoring of secchi depth will prove if this trend continues. Present secchi levels do not warrant any concern. Total coliform and *E.Coli* were not measured at Bala Bay as only one offshore site was monitored in 2008.



Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Bala Bay's threshold is 6.58µg/L, and both the District of Muskoka and MLA spring turnover phosphorus have not been over-threshold the past three years.

For more information, please see http://www.citizenenvironmentwatch.org/wqi/muskoka_lakes.

Beaumaris, Lake Muskoka

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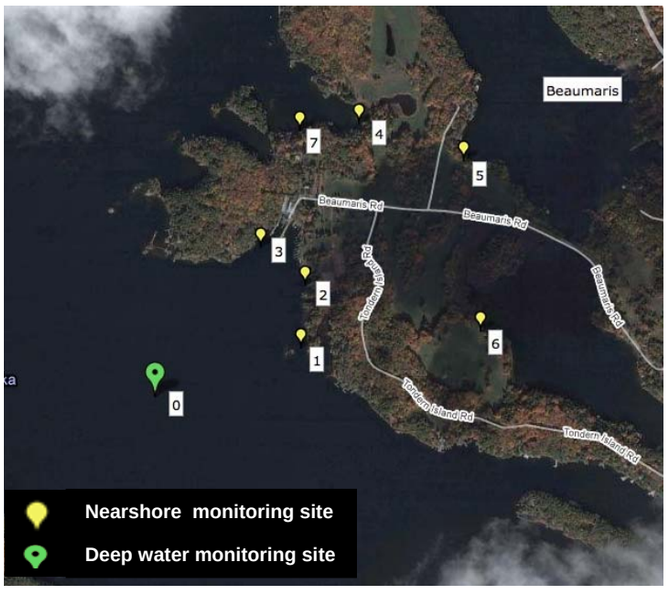
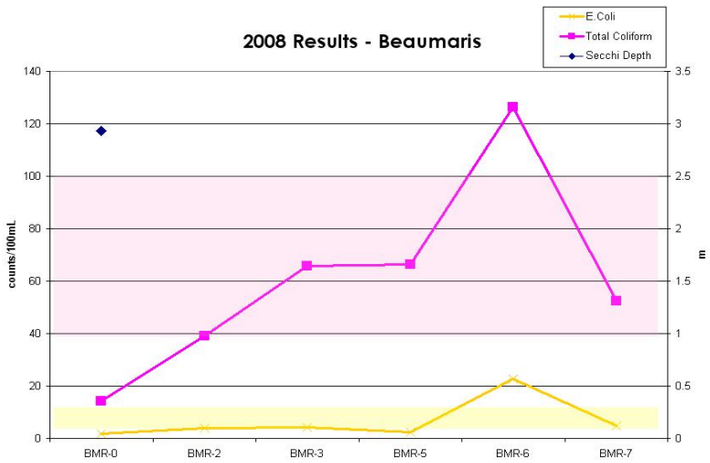


Volunteers monitored six sites (0, 2, 3, 5, 6 & 7) in Beaumaris eight times over the summer of 2008. Beaumaris has been monitored since 2002. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Total coliform and *E.Coli* measurements at site 6 were over threshold. Average phosphorus values were also above threshold values.
Overall water quality: ♦♦♦

- Ranks 14/24 in level of Total Coliform
- Ranks 16/23 in level of *E.Coli*
- Ranks 31/44 in Secchi depth (clarity)

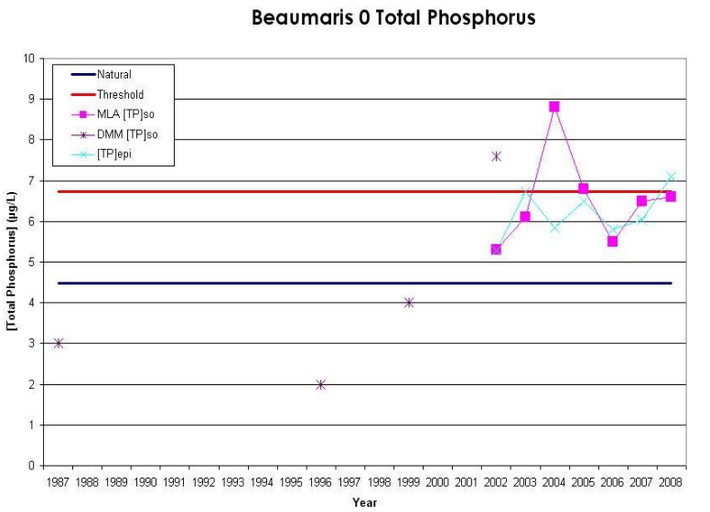


2008 Results

E.Coli and total coliform readings at site 6 were higher than the expected range. This is the second year in a row site 6 has produced higher than normal *E.Coli* and total coliform readings, therefore further investigation may be warranted.

All other measurements are within or below the expected range and standard deviation.

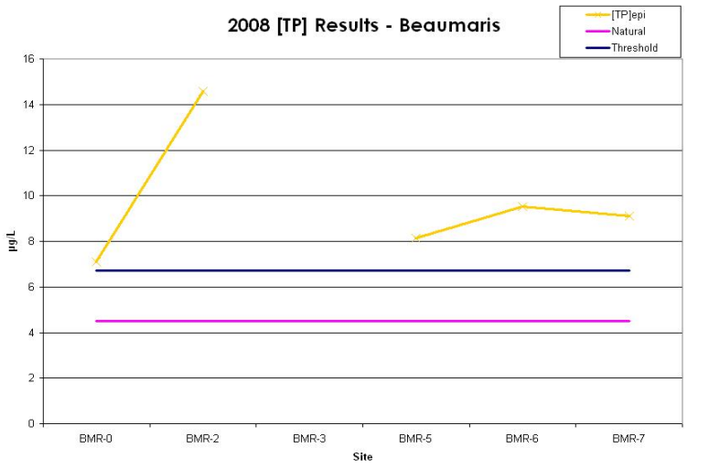
Monitoring at site 4 was discontinued in 2008 due to its proximity to a natural wetland.



Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Beaumaris' threshold is 6.735µg/L. Spring turnover was under threshold, and has been for four years. However, average phosphorus levels have risen above threshold. This is the first time this has been seen since monitoring began in 2002.

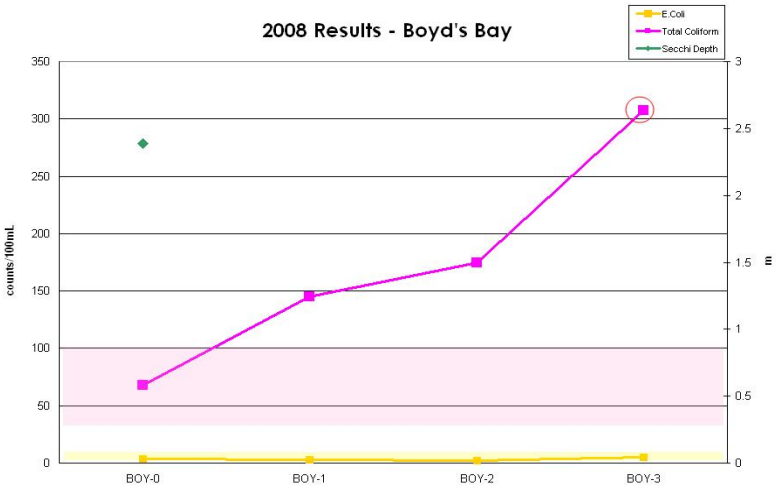


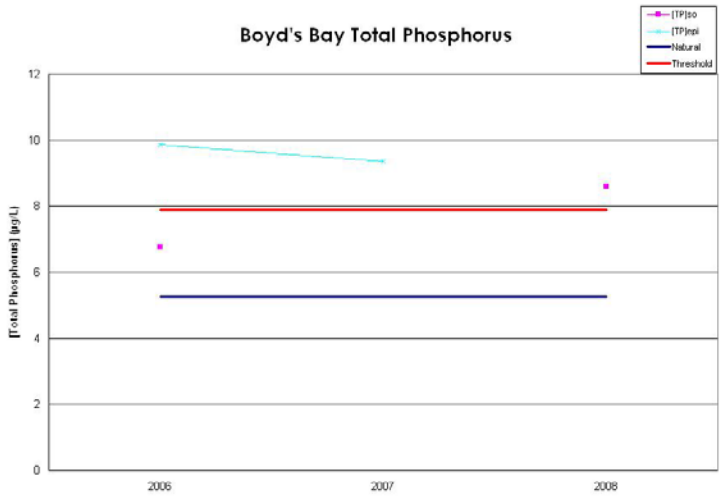
Site-by-site phosphorus

Among the nearshore sites, site 2 had the highest phosphorus reading. Phosphorus readings at sites 5, 6 (near the golf course) and 7 were lower, but still ALL above threshold.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Boyd Bay, Lake Muskoka





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Volunteers monitored four sites in Boyd Bay eight times in the summer of 2008. Boyd Bay has been monitored since 2006. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦
There are no concerns with phosphorus or *E.Coli*.

- Ranks 21/24 in level of Total Coliform
- Ranks 11/23 in level of *E.Coli*
- Ranks 33/44 in Secchi depth (clarity)

2008 Results

Total coliform readings at sites 1, 2 and 3 are currently above the expected range. Readings at site 3 are outside of the expected standard deviation, and have been above the expected range since monitoring began. The 2008 value is higher than last years value, therefore further investigation is required.

All other measurements are within or below the expected range and standard deviation.

Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Boyd Bay's threshold is 7.89µg/L. For the first time since monitoring began, spring turnover phosphorus was found above threshold for 2008, and should be closely monitored from now on.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Dudley Bay, Lake Muskoka

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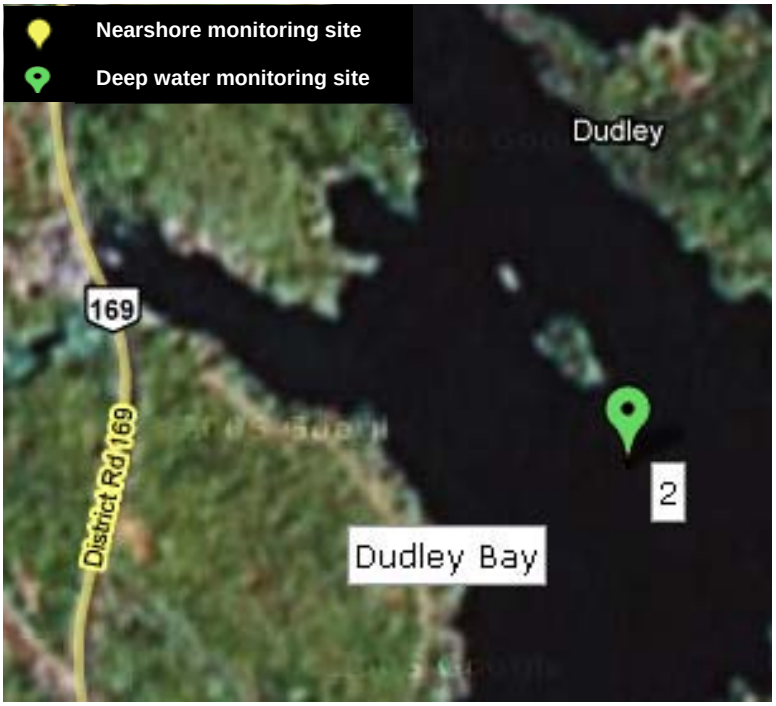
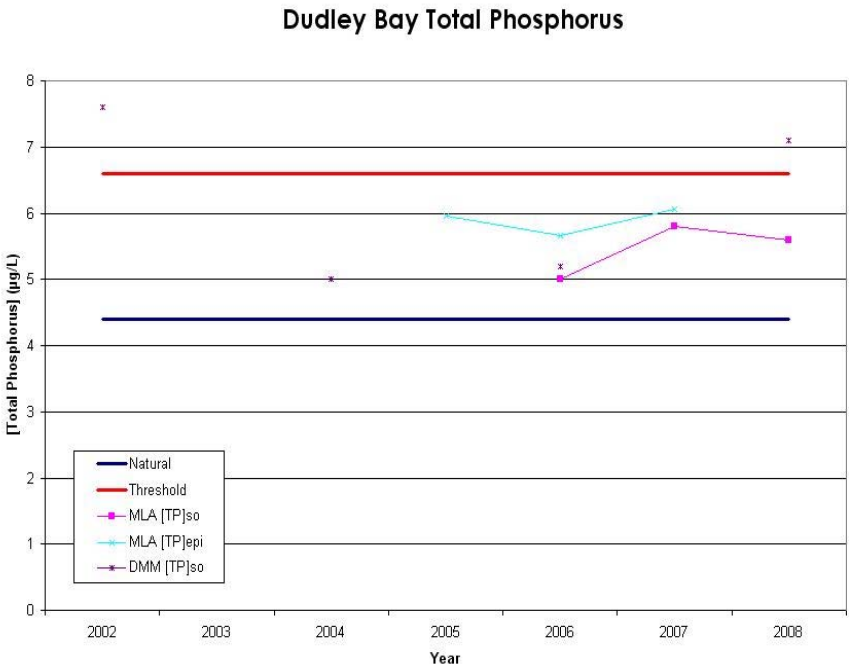


CEW monitored a single nearshore site at Dudley Bay in the summer of 2008. This area has been monitored since 2005. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦♦♦
There are no concerns with phosphorus at the present time.



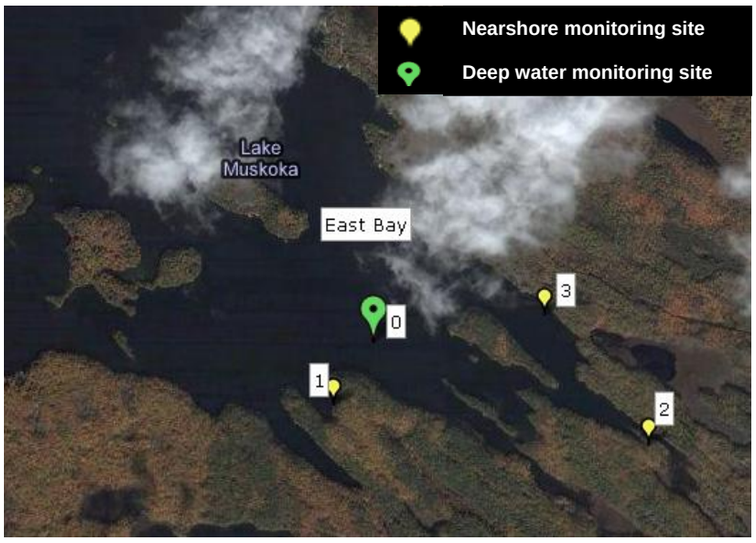
Phosphorus

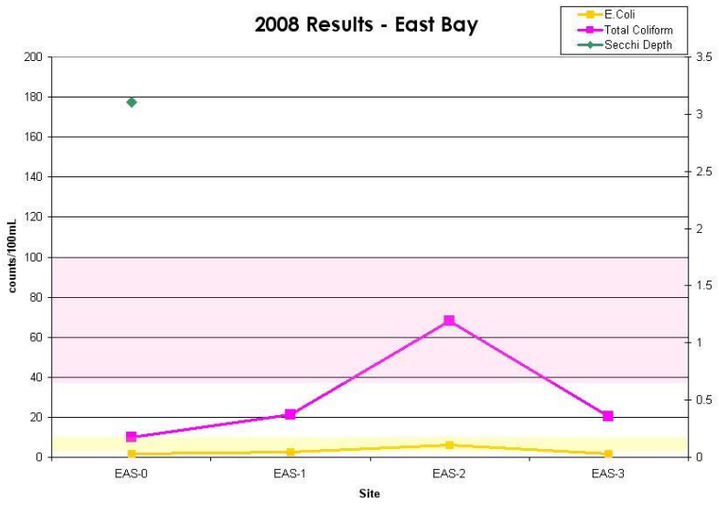
A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

The threshold for Dudley Bay is 6.6µg/L. The District's spring turnover phosphorus measurements were above threshold levels. The MLA spring turnover phosphorus levels are within the expected range.

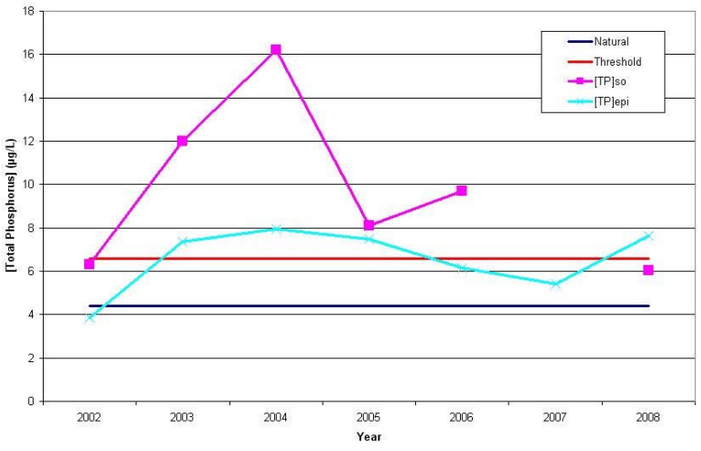
For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

East Bay, Lake Muskoka

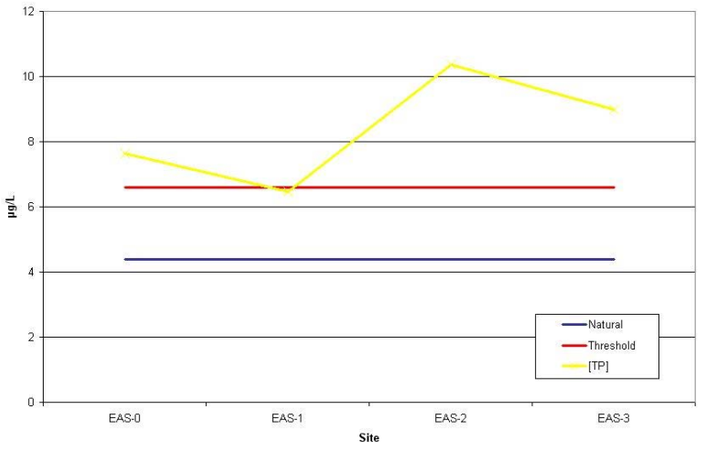




East Bay 0 Total Phosphorus



2008 [TP] Results - East Bay



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Volunteers monitored four sites in East Bay seven times over the summer of 2008. 46 areas on 18 lakes and rivers were monitored in 2008.

East Bay has been monitored since 2002. The bay acts as the "benchmark" sampling area, as it is the only sampling area where there is no development.

Summary

Overall water quality: ♦♦♦
There are no concerns with *E.Coli,* total coliform, or secchi depth.

- Ranks 8/24 in level of Total Coliform
- Ranks 10/23 in level of *E.Coli*
- Ranks 26/44 in Secchi depth (clarity)

2008 Results

All values were found below or within the expected range and expected standard deviation.

Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

East Bay is not specifically considered by the District of Muskoka. The threshold for Bala Bay (the closest area) is 6.585µg/L.

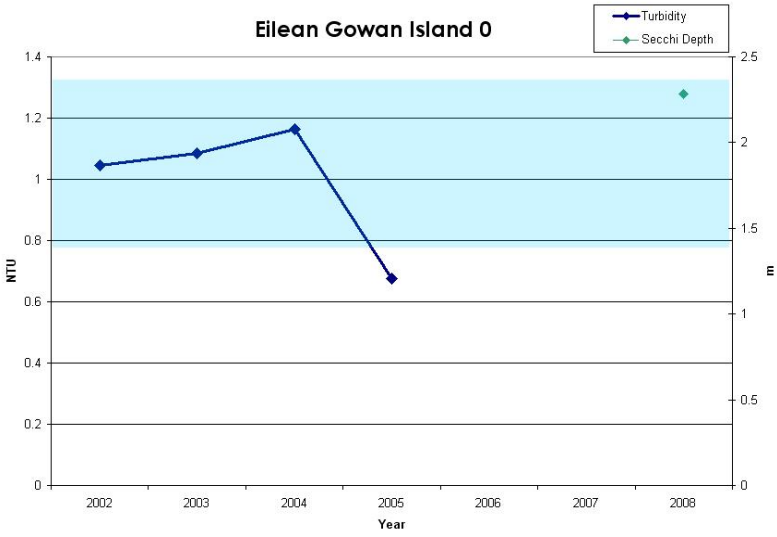
This is the first year since monitoring began that spring turnover phosphorus has been under threshold, however average phosphorus was found above threshold.

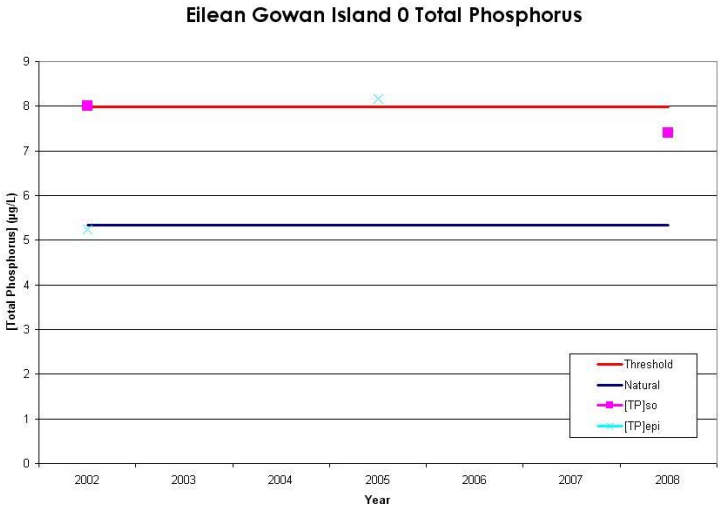
Site-by-site phosphorus

Average phosphorus concentration at site 1 was the only measurement below the threshold; all other sites were found above with Site 2 having the highest average in 2008.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Eilean Gowan Island,
Lake Muskoka





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CEW monitored one offshore site at Eilean Gowan Island for spring turnover phosphorus and secchi depth in the summer of 2008 – the first year Eilean Gowan Island has been monitored since 2005. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦♦♦
Total coliform and *E.Coli* were not measured at Eilean Gowan Island in 2008. No immediate concerns were found with phosphorus levels.

- Ranks 40/44 in Secchi depth (clarity)

2008 Results

No previous data exists for secchi depth at Eilean Gowan Island. In 2005, turbidity was found to be below benchmark levels. Secchi level is ranked quite low and should be monitored closely to see if any trends occur in the coming years. Total coliform and *E.Coli* were not measured at Eilean Gowan Island as the only site monitored in 2008 was an offshore site.

Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Eilean Gowan Island's threshold is 7.995µg/L. Spring turnover was found to be below this level and therefore warrants no immediate concern.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Lake Muskoka (south/main basin)

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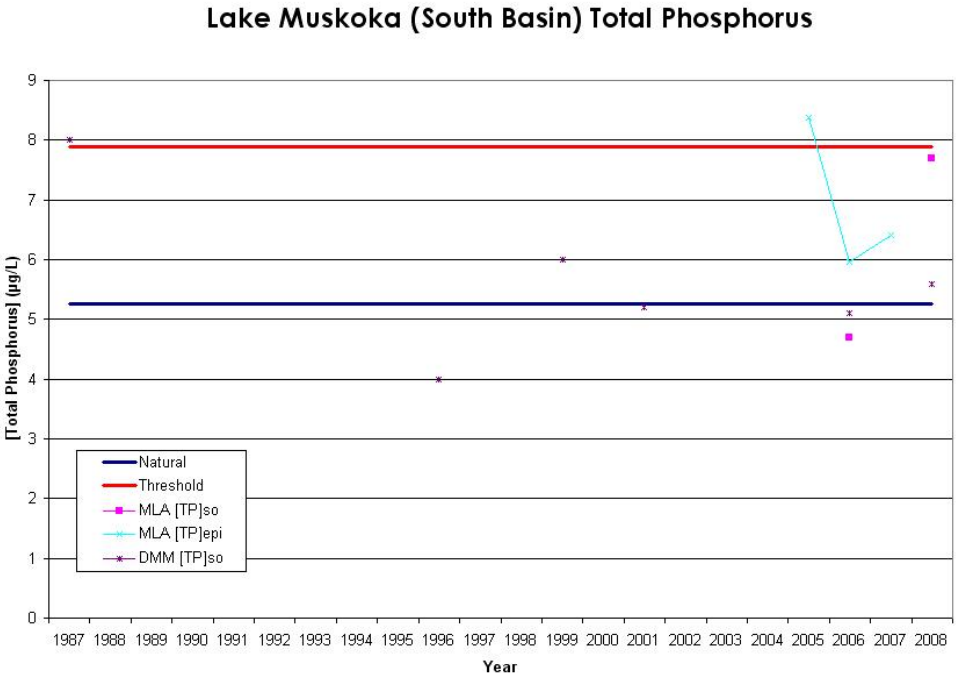
CEW monitored a single nearshore site at Lake Muskoka (south basin) in the summer of 2008 – site 3. The south basin area has been monitored since 2005. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality:

♦♦♦♦♦

There are no concerns with phosphorus at the present time.

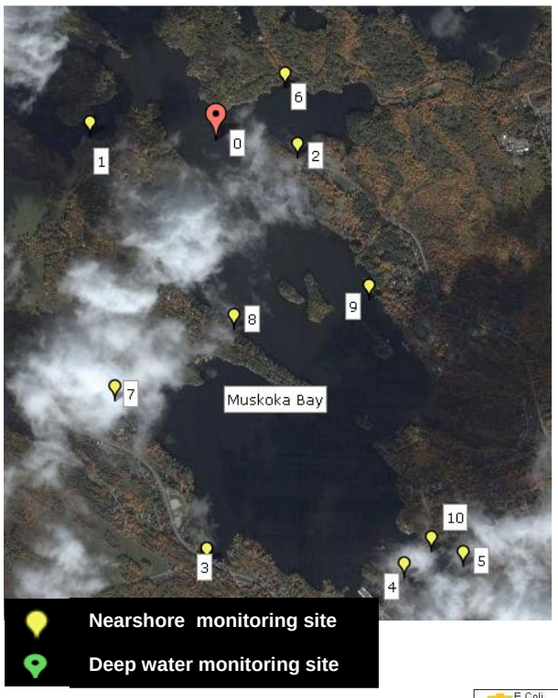


Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy." The threshold for Lake Muskoka (south basin) is 7.89µg/L. MLA spring turnover phosphorus measurements were found to be above the DMM measurements. However, both are within the expected range.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Muskoka Bay, Lake Muskoka



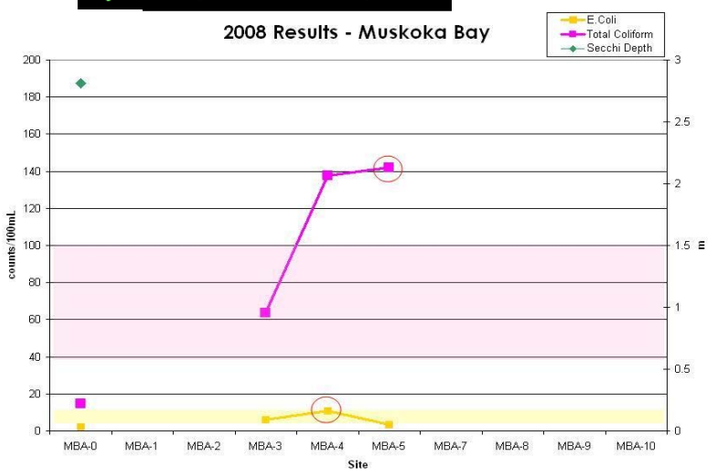
Volunteers monitored nine sites (0, 2, 3, 4, 5, 7, 8, 9 & 10) in Muskoka Bay eight times over the summer of 2008. Muskoka Bay has been monitored since 2002. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦

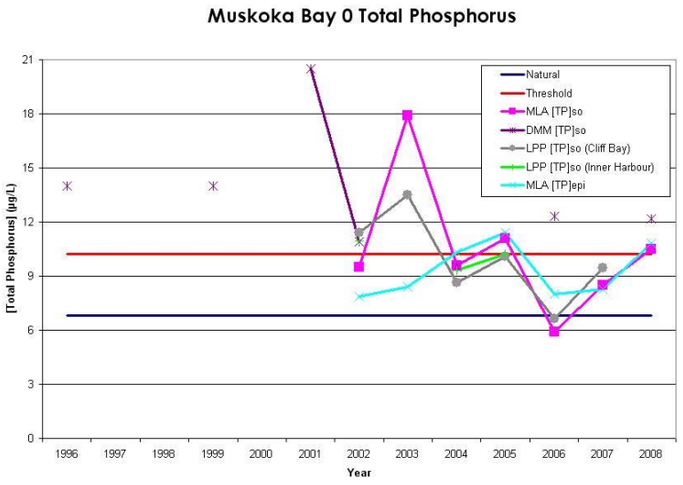
A larger than expected standard deviation was found for *E.Coli* and total coliform and at sites 4 & 5 respectively. Spring turnover and average phosphorus were just over the threshold.

- Ranks 16/24 in level of Total Coliform
- Ranks 17/23 in level of *E.Coli*
- Ranks 34/44 in Secchi depth (clarity)



2008 Results

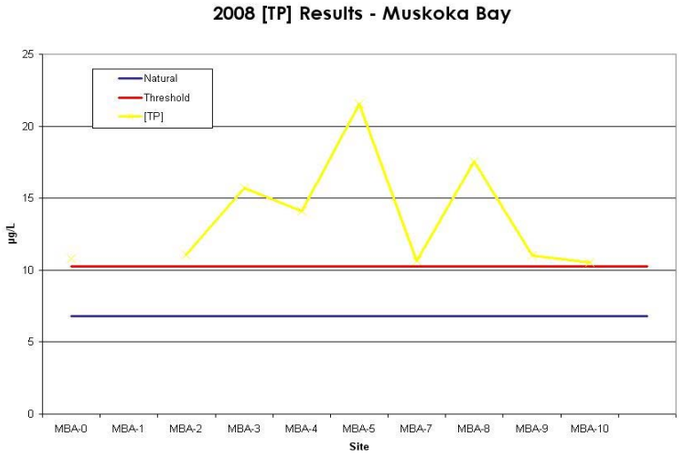
Sites 4 & 5 have a higher than expected total coliform counts, with site 5 having a larger than expected standard deviation. Site 5 has had high total coliform counts three years in a row, and remains to be investigated further. *E.Coli* at site 4 had a larger than expected standard deviation, but were all within the expected range.



Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Muskoka Bay's threshold is 10.245µg/L. Spring turnover phosphorus levels have been increasing since 2006. This is the first year since then that spring turnover phosphorus has been above threshold. The MLA findings were consistent with the District of Muskoka's spring turnover data in 2008.



Site-by-site phosphorus

All sites monitored for phosphorus at Muskoka Bay were found to be above threshold. Site 5 was found to be double the threshold value, and further investigation into this site is needed.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Muskoka Sands & Hoc River, Lake Muskoka

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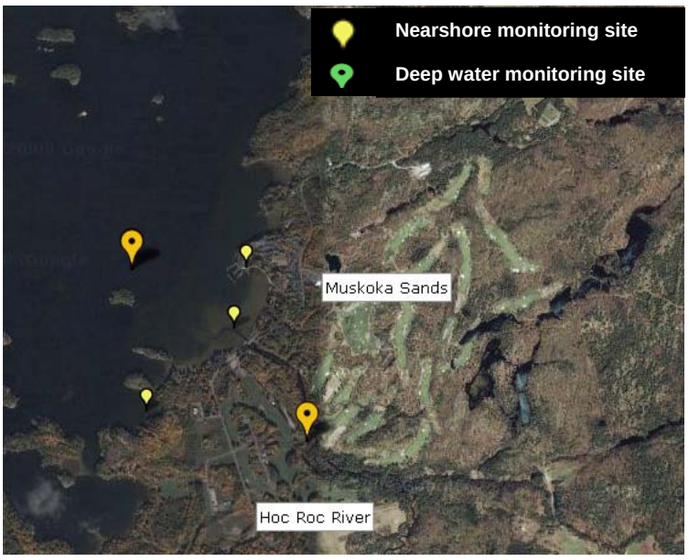
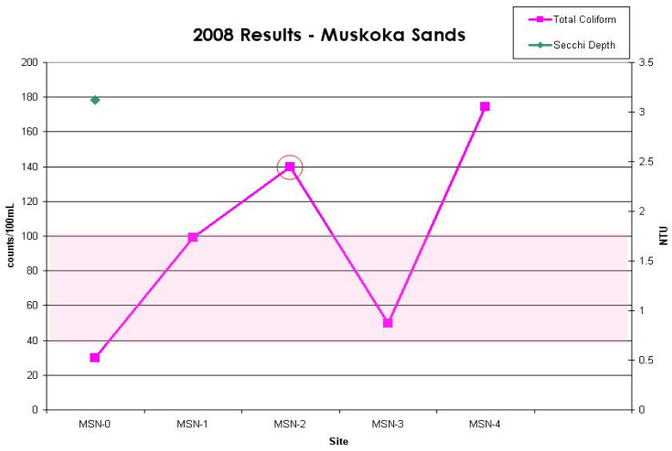


Volunteers monitored five sites at Muskoka Sands and Hoc River seven times over the summer of 2008. Muskoka Sands has been monitored since 2003. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦
Total coliform and phosphorus concentration are all high. Hoc Roc River is potentially over-threshold.

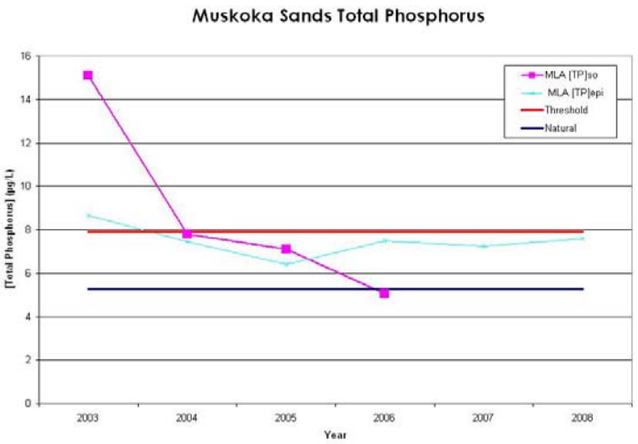
- Ranks 18/24 in level of Total Coliform
- Ranks 25/44 in Secchi depth (clarity)



2008 Results

Total coliform counts were above the expected range at sites 2 & 4, with site 2 having a higher than expected standard deviation. *E.*Coli was not measured in 2008.

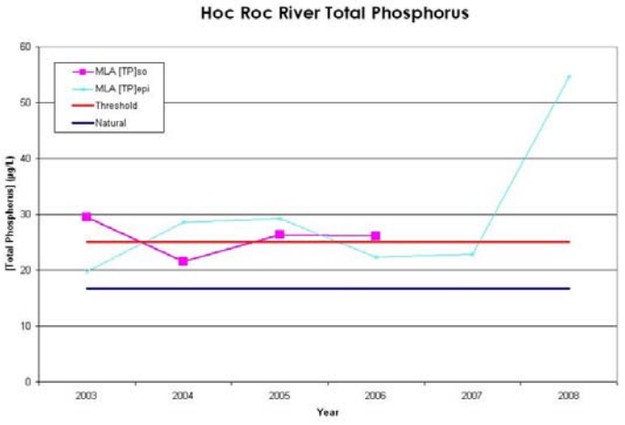
Although total coliform levels have dropped from 2007, they remain unpredictable and should be investigated further.



Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

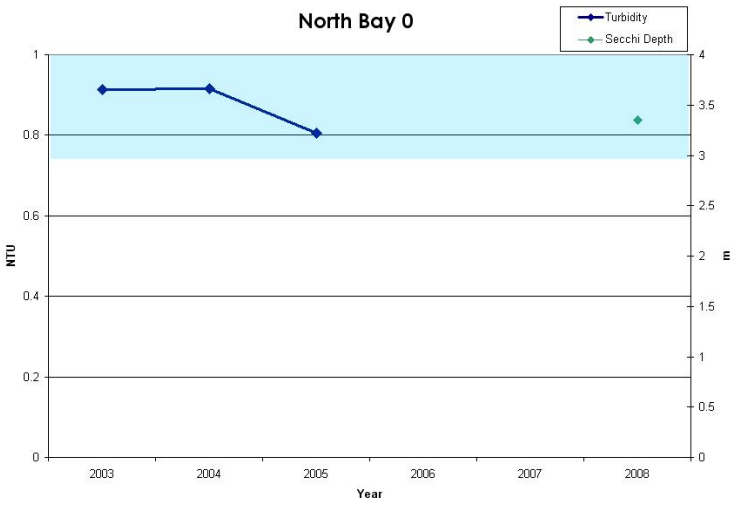
The Muskoka Sands is not specifically considered by the District of Muskoka. The threshold for the south basin of Lake Muskoka is 7.89µg/L. Spring turnover and average phosphorus measurements have remained below this threshold since 2004.

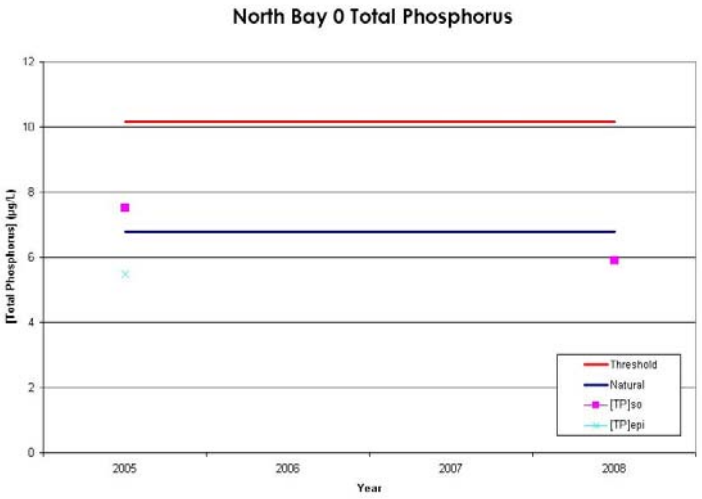


The Hoc Roc River's threshold is 25.065µg/L. Average phosphorus measurements have soared in 2008 and therefore warrant further investigation.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

North Bay, Lake Muskoka





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CEW monitored an offshore site at North Bay for spring turnover phosphorus and secchi depth in the summer of 2008 – the first year North Bay has been monitored since 2005. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦♦♦
Total coliform and *E.Coli* were not measured at North Bay in 2008. No immediate concerns were found with phosphorus levels or clarity.

- Ranks 21/44 in Secchi depth (clarity)

2008 Results

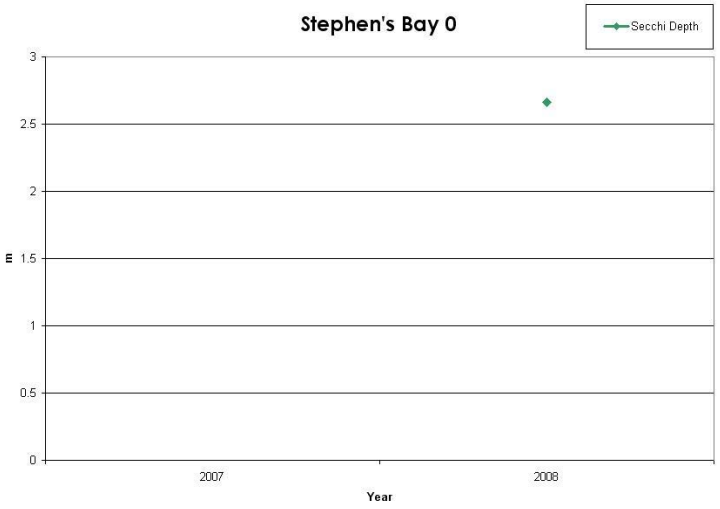
No previous data exists for secchi depth at North Bay. However, present secchi levels do not warrant any concern. Total coliform and *E.Coli* were not measured at North Bay as there an offshore site monitored in 2008.

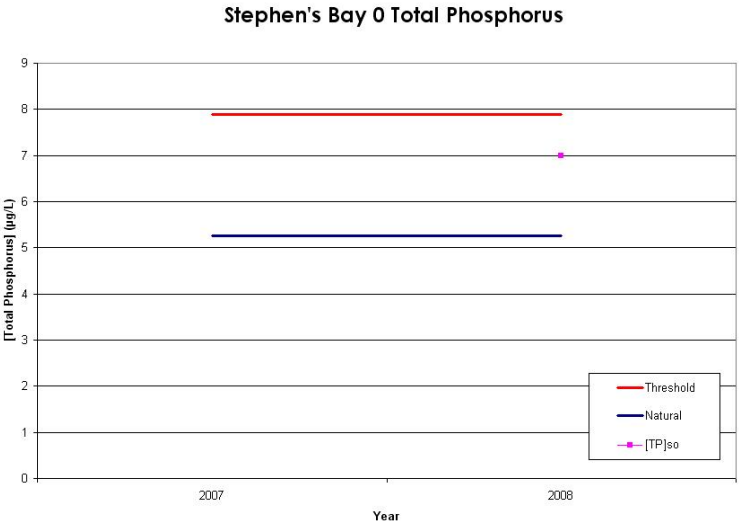
Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

North Bay's threshold is 10.155µg/L. Spring turnover was found to be below this level and the Natural level, and could possibly be deemed oligotrophic, or 'nutrient poor'.

Stephen's Bay, Lake Muskoka





CEW monitored an offshore site at Stephen's Bay for spring turnover phosphorus and secchi depth in the summer of 2008. This is the first year Stephen's Bay has been monitored. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦♦
Total Coliform and *E.Coli* were not measured at Stephen's Bay in 2008. No immediate concerns were found with phosphorus levels or clarity.

- Ranks 36/44 in Secchi depth (clarity)

2008 Results

Secchi depth was not ranked very high among all sites, and therefore does not warrant concern. However, no previous data exists for comparison. Total coliform and *E.Coli* were not measured at Stephen's Bay as there was only one offshore site monitored in 2008.

Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Stephen's Bay's threshold is 7.89µg/L. Spring turnover was found to be below this level and therefore warrants no concern.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Walker's Point,
Lake Muskoka

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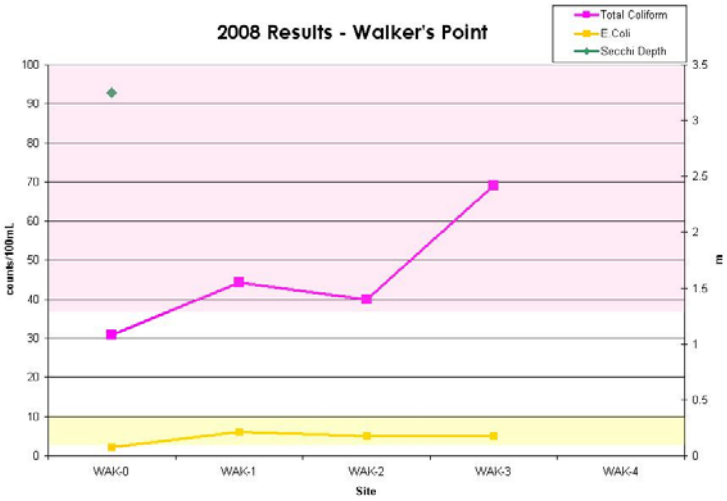
Volunteers monitored five sites at Walker's Point eight times in the summer of 2008. Walker's Point has been monitored since 2002. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

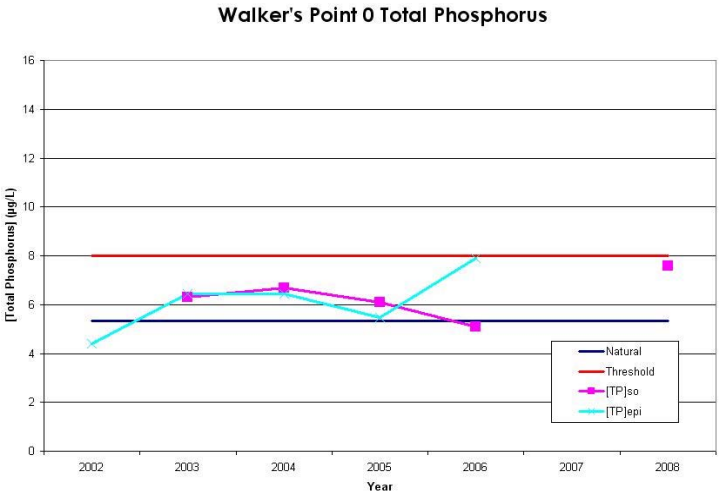
Overall water quality: ♦♦♦♦♦
There are no concerns with phosphorus, *E.Coli*, total coliform or clarity.

- Ranks 13/24 in level of Total Coliform
- Ranks 14/23 in level of *E.Coli*
- Ranks 23/44 in Secchi depth (clarity)



2008 Results

All measurements are within or below the expected range, and all have expected standard deviations.



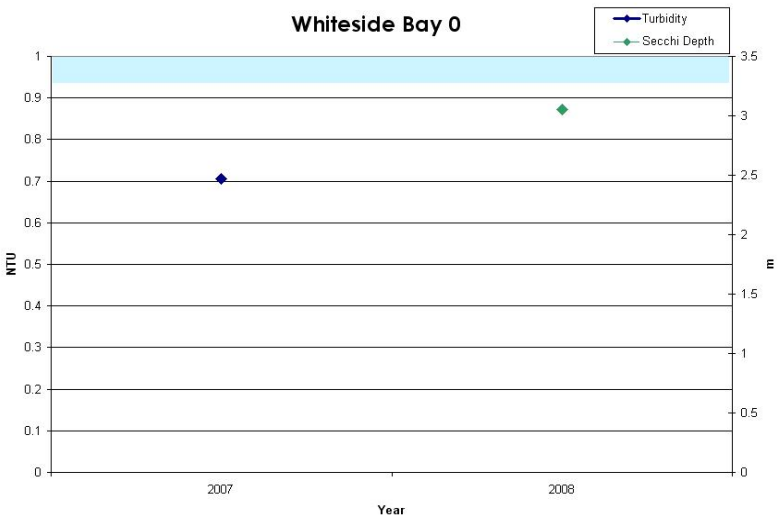
Phosphorus

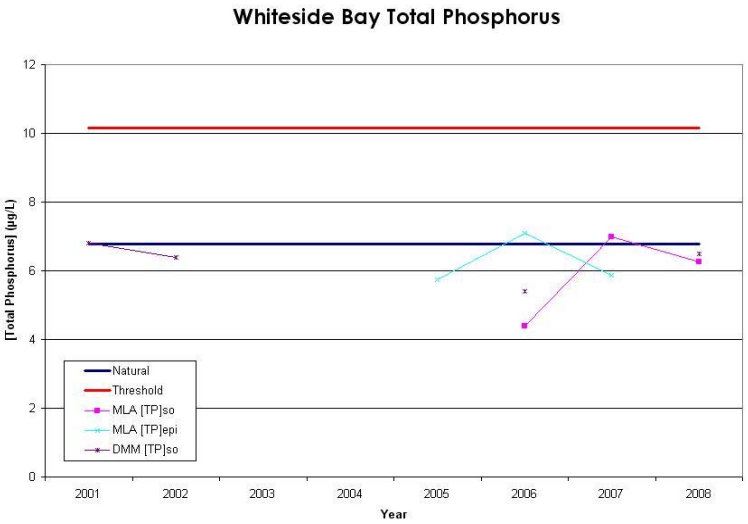
A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Walker Point's threshold is 7.995µg/L. Spring turnover phosphorus was below this threshold in 2008, and has been since 2003.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Whiteside Bay, Lake Muskoka





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CEW monitored the offshore site at Whiteside Bay for spring turnover phosphorus and secchi depth in the summer of 2008. 46 areas on 18 lakes and rivers were monitored.

Summary

Overall water quality: ♦♦♦♦♦
Total coliform and *E.Coli* were not measured at Whiteside Bay in 2008. No immediate concerns were found with phosphorus levels or clarity.

- Ranks 28/44 in Secchi depth (clarity)

2008 Results

No previous data exists for secchi depth at Whiteside Bay. In 2007 turbidity was below threshold levels. Present clarity levels do not warrant any concern. Total coliform and *E.Coli* were not measured in 2008.

Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Whiteside Bay's threshold is 10.155µg/L. Spring turnover phosphorus was below threshold and natural values, and was consistent with the District of Muskoka's spring turnover data.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Willow Beach, Lake Muskoka

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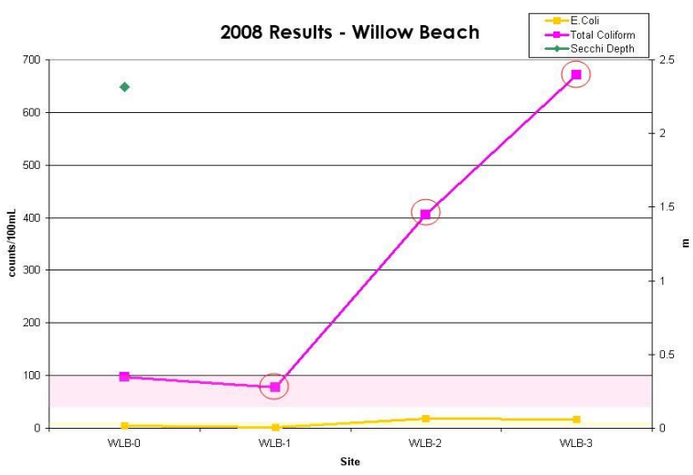
working in co-operation with citizensenvironmentwatch

Volunteers monitored four sites at Willow Beach eight times over the summer of 2008. Willow Beach has been monitored since 2004. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦
E.Coli and total coliform counts at sites 2 & 3 were high, and phosphorus concentration was found to be over-threshold.

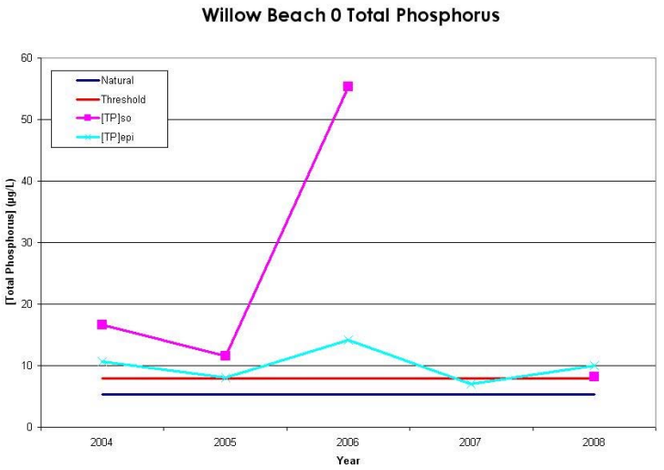
- Ranks 23/24 in level of Total Coliform
- Ranks 21/23 in level of *E.Coli*
- Ranks 39/44 in Secchi depth (clarity)



2008 Results

E.Coli and total coliform counts are higher than the expected range at sites 2 & 3; Total coliform counts at sites 1, 2 & 3 also have a larger than expected standard deviation. These results are quite consistent with previous years and warrant further investigation.

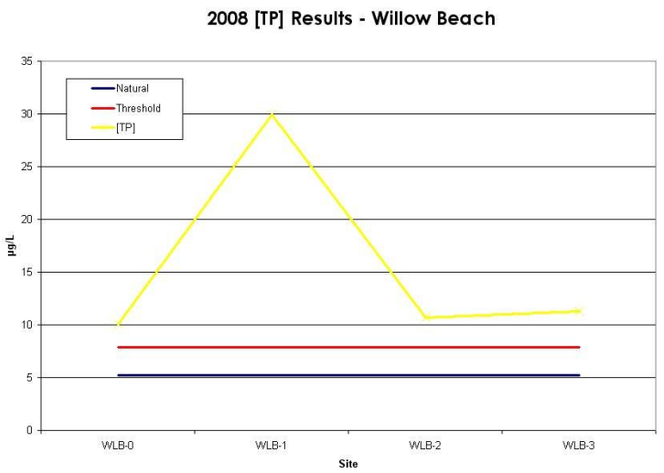
All other results are below or within expected ranges and had expected standard deviations.



Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Willow Beach is not specifically considered by the District of Muskoka. The south basin of Lake Muskoka's threshold is 7.89µg/L. 2008 spring turnover and average phosphorus concentration was found to be just above threshold.

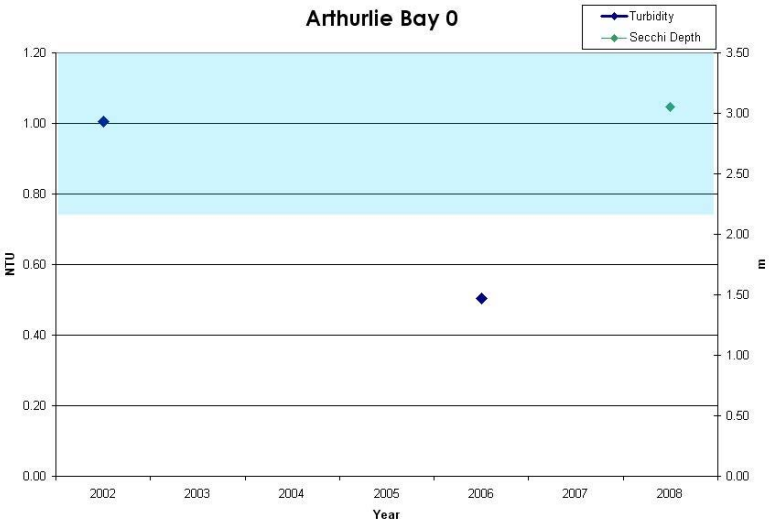


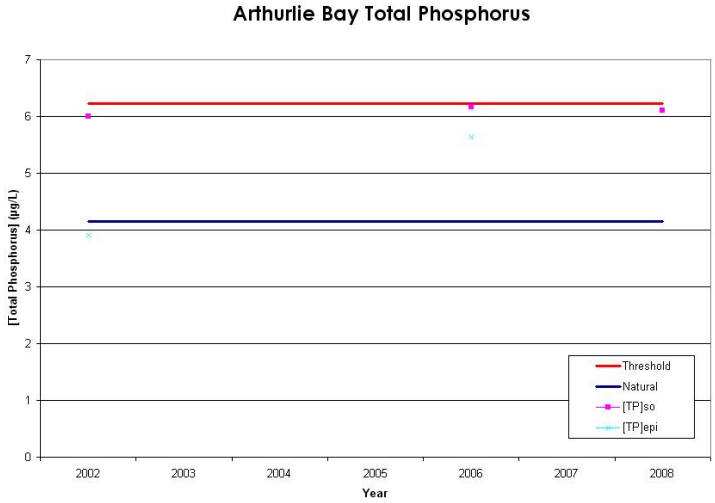
Site-by-site phosphorus

In 2008, all sites had phosphorus concentrations that were higher than the threshold. Site 1 had values that were nearly 4 times greater than the threshold for Lake Muskoka's South Basin. This site's reading warrants further investigation.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Arthurlie Bay, Lake Rosseau





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CEW monitored the deep water site at Arthurlie Bay for spring turnover phosphorus and secchi depth in the summer of 2008 – the first year Arthurlie Bay has been monitored since 2006. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦♦♦
Total coliform and *E.Coli* were not measured at Arthurlie Bay in 2008. No immediate concerns were found with phosphorus levels or secchi depth.

- Ranks 30/44 in Secchi depth (clarity)

2008 Results

No previous data exists for secchi depth at Arthurlie Bay. In 2006, turbidity was below threshold levels, and continued monitoring of this site will prove if this trend continues. Present secchi levels do not warrant any concern. Total coliform and *E.Coli* were not measured at Arthurlie Bay as only one offshore site monitored in 2008.

Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Arthurlie Bay's threshold is 6.22µg/L. Spring turnover was found to be below this level and therefore warrants no concern.

Brackenrig Bay,
Lake Rosseau

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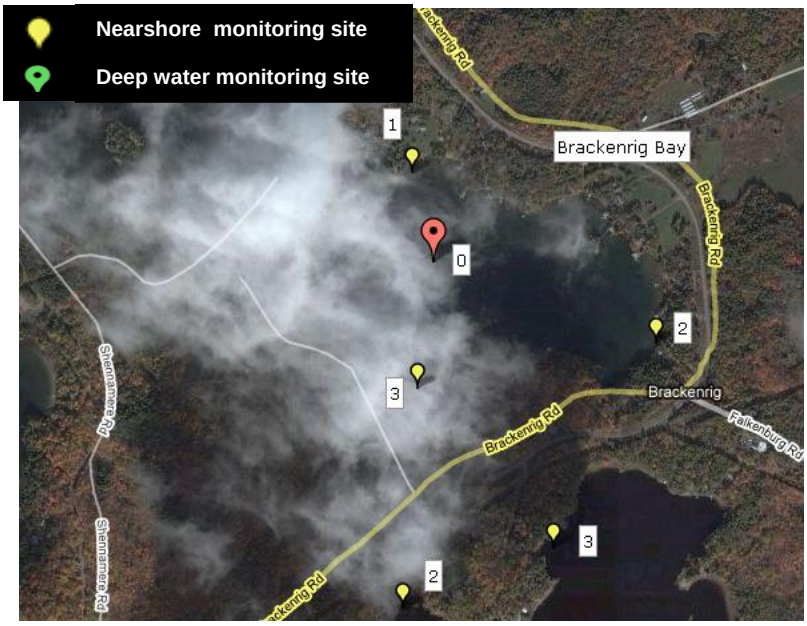
Water Quality Initiative
working in co-operation with citizensenvironmentwatch



Volunteers monitored four sites in Brackenrig Bay eight times over the summer of 2008. Brackenrig Bay has been monitored since 2002. 46 areas on 18 lakes and rivers were monitored in 2008.

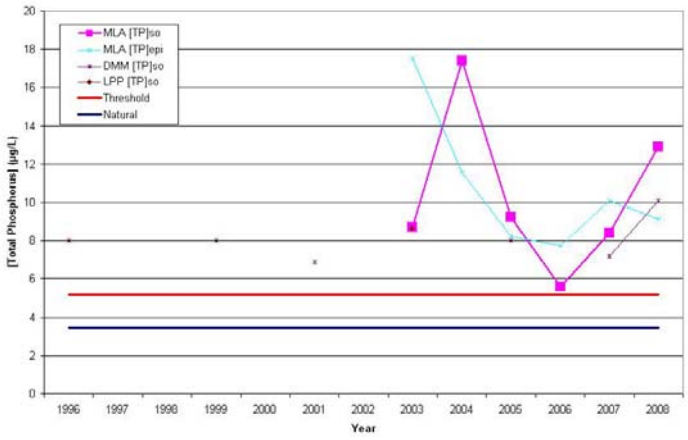
Summary

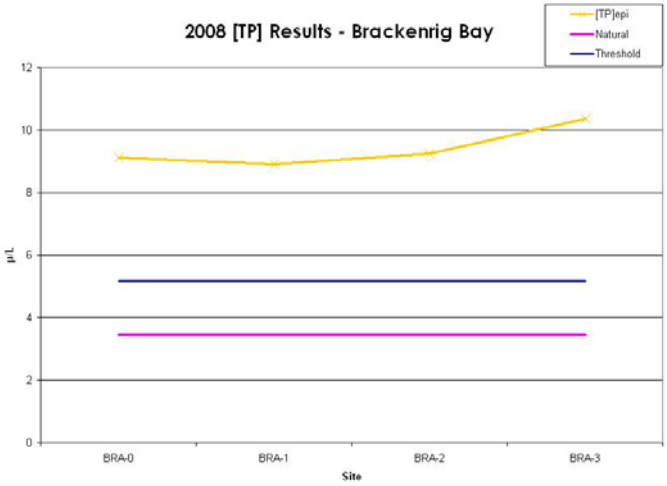
Overall water quality: ♦♦♦
All phosphorus concentrations are over-threshold, and have been since 2003.

2008 Results

Total coliform, *E.Coli* and secchi depth were not measured in 2008.

Brackenrig Bay 0 Total Phosphorus





Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."
Brackenrig Bay's threshold is 5.175µg/L. Spring turnover and average phosphorus have remained above the threshold since 2003.

Brackenrig Bay remains classified as over-threshold by the District of Muskoka, and is consistent with MLA average and spring turnover phosphorus measurements.

Site-by-site phosphorus

All sites (including the deep water site) had very similar average phosphorus concentrations that were above the threshold, with site 3 reaching over 10µg/L. Similar results were seen last year.

Lake Rosseau (Main Basin)

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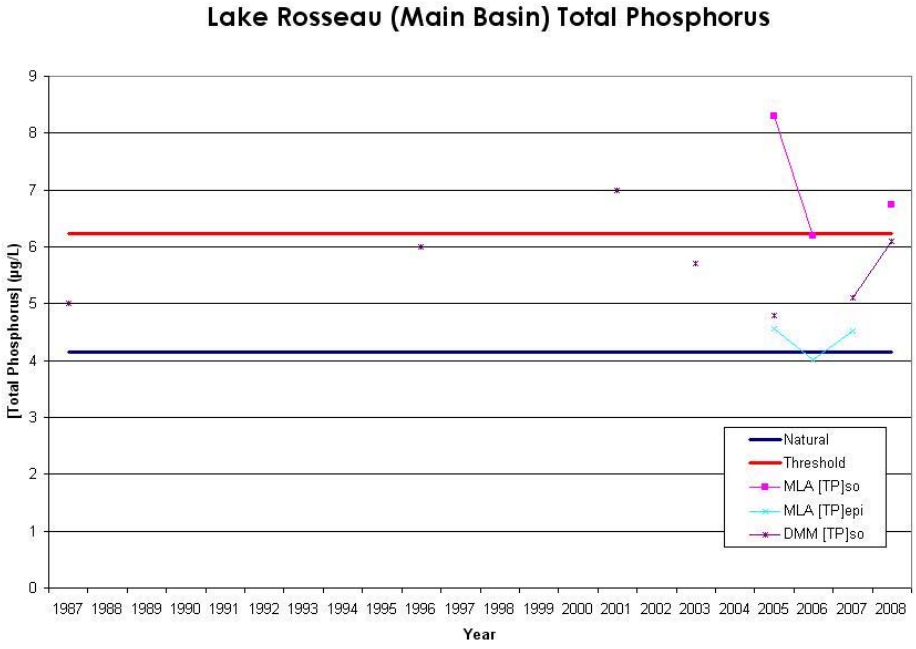
CEW monitored one offshore site at Lake Rosseau (main basin) in the summer of 2008. This area has been monitored since 2005. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦
Spring turnover phosphorus was found to be over threshold values.



Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy." The threshold for Lake Rosseau (main basin) is 6.225µg/L. MLA spring turnover phosphorus measurements were found to be above the threshold value in 2005 and 2008, and at the threshold value in 2006. The District's spring turnover phosphorus was found to be just under threshold in 2008.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Minett, Lake Rosseau

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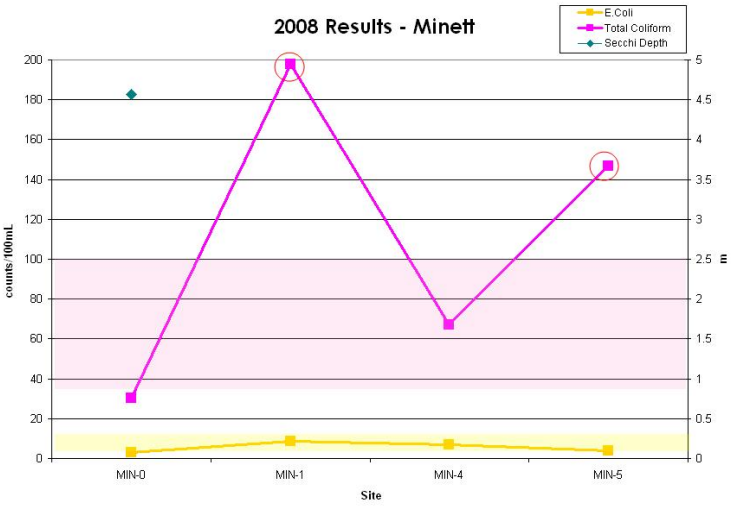
Water Quality Initiative
working in co-operation with citizensenvironmentwatch

Volunteers monitored four sites (0, 1, 4 & 5) in Minett six times over the summer of 2008. Minett has been monitored since 2002. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦♦
There are no concerns with *E.Coli*, clarity or phosphorus concentration, but there were some high total coliform counts.

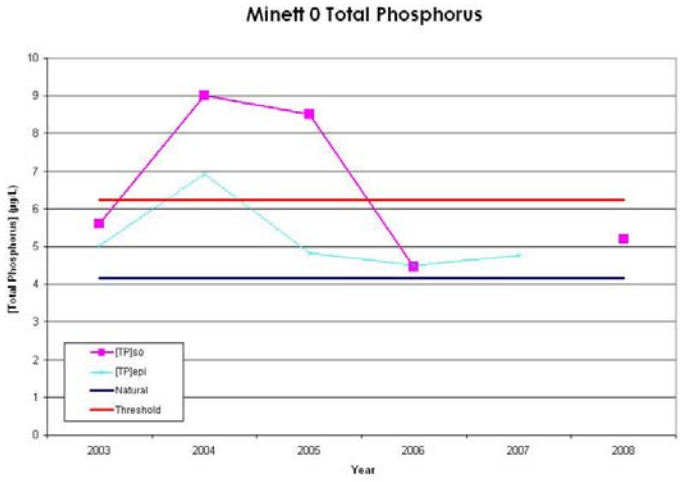
- Ranks 19/24 in level of Total Coliform
- Ranks 18/23 in level of *E.Coli*
- Ranks 8/44 in Secchi depth (clarity)



2008 Results

Total coliform counts at site 1 and 5 were higher than expected and outside the expected standard deviation. This is the second year in a row that site 1 has shown high total coliform levels.

All other results were below or within expected ranges and had standard deviations smaller than expected.



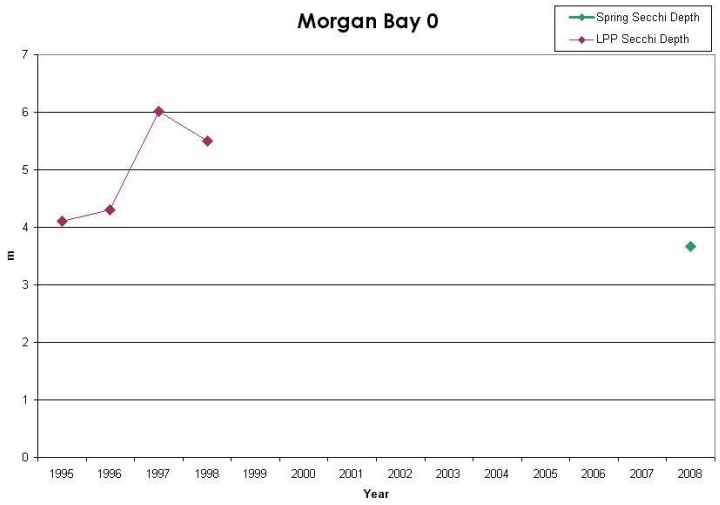
Phosphorus

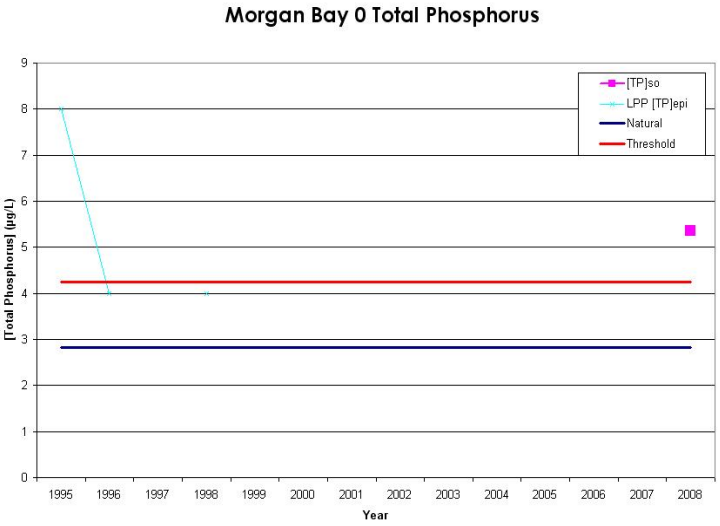
A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Minett is not specifically considered by the District of Muskoka. The threshold for the main basin of Lake Rosseau is 6.225µg/L. Spring turnover and average phosphorus measurements from 2006 have remained below the threshold.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Morgan Bay, Lake Rosseau





CEW monitored an offshore site at Morgan Bay for spring turnover phosphorus and secchi depth in the summer of 2008. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦
Total coliform and *E.Coli* were not measured at Morgan Bay in 2008. Spring turnover phosphorus levels were found to be above threshold.

- Ranks 14/44 in Secchi depth (clarity)

2008 Results

Secchi depth was last monitored from 1995 to 1998 by the MOE's Lake Partner Program. MLA's 2008 values are lower and warrant no concerns at this time. Total coliform and *E.Coli* were not measured at Morgan Bay as there was an offshore site was monitored in 2008.

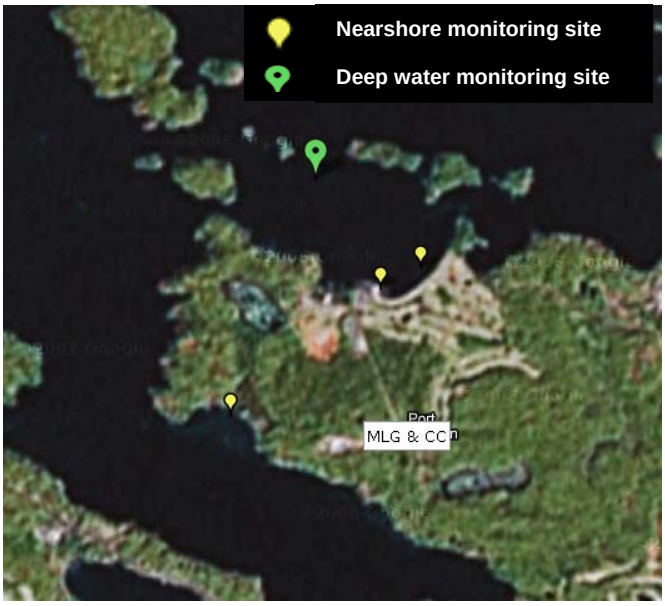
Phosphorus

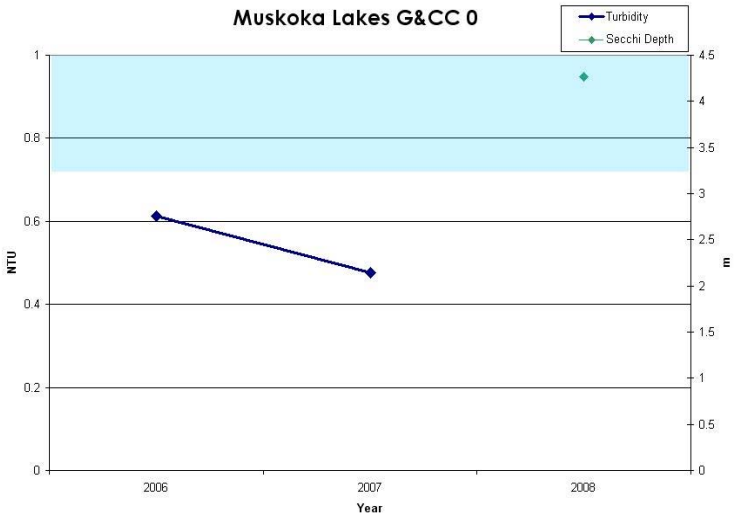
A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

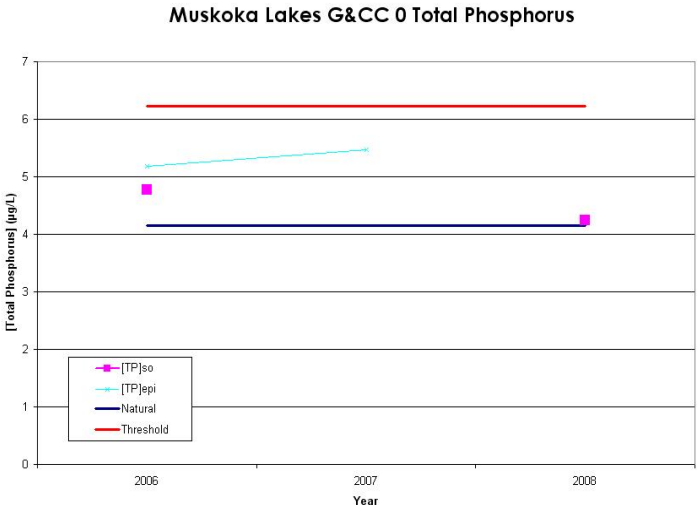
Morgan Bay's threshold is 4.24µg/L. Spring turnover is over-threshold, the first time phosphorus was measured since 1996.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Muskoka Lakes G&CC,
Lake Rosseau







CEW monitored an offshore site at Muskoka Lakes Golf & Country Club for spring turnover phosphorus and secchi depth in the summer of 2008. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦♦♦
Total coliform and *E.Coli* were not measured at Muskoka Lakes G&CC in 2008. Spring turnover phosphorus levels were found to be at an acceptable level.

- Ranks 9/44 in Secchi depth (clarity)

2008 Results

Secchi depth was ranked quite high among all the areas, and therefore shows no concerns at this time. Total coliform and *E.Coli* were not measured at Muskoka Lakes G&CC as there was only one offshore site monitored in 2008.

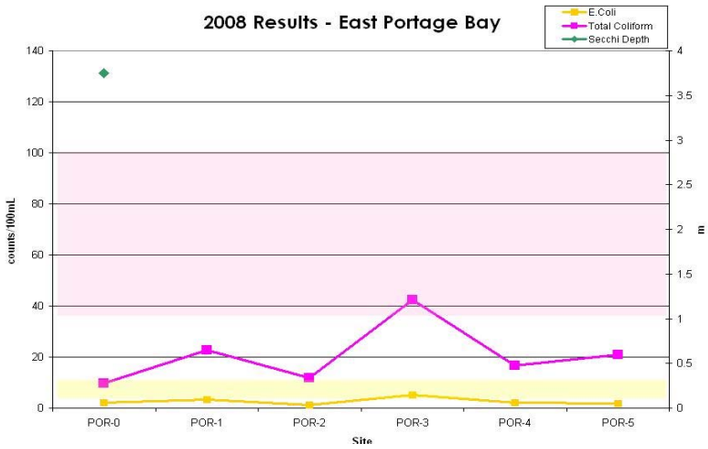
Phosphorus

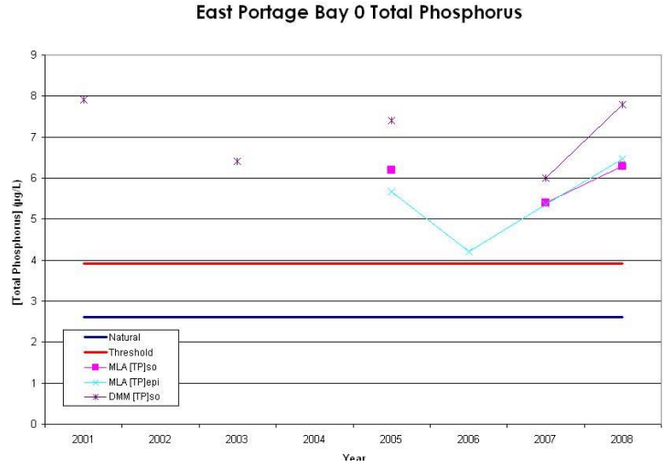
A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

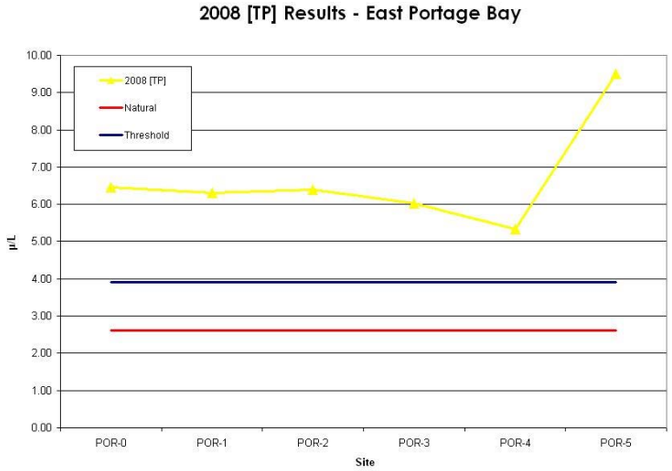
Muskoka Lakes G&CC's threshold is 6.225µg/L. Spring turnover phosphorus has remained below threshold since monitoring began in 2006.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

East Portage Bay,
Lake Rosseau







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Volunteers monitored six sites in East Portage Bay seven times over the summer of 2008. East Portage Bay has been monitored since 2005. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦
Phosphorus concentrations are over-threshold and both *E.Coli* and total coliform counts are within the expected range.

- Ranks 3/24 in level of Total Coliform
- Ranks 9/23 in level of *E.Coli*
- Ranks 12/44 in Secchi depth (clarity)

2008 Results

Total coliform and *E.Coli* results were below or within expected ranges and had expected standard deviations. There are no concerns with clarity.

Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

East Portage Bay's threshold is 3.915µg/L. Spring turnover and average phosphorus measurements have remained above the threshold since 2005. East Portage Bay is classified as over-threshold by the District of Muskoka.

Site-by-site phosphorus

In 2008, all sites had average phosphorus concentrations above the threshold for East Portage Bay. Concentrations at site 5 are considerably higher than all other sites.

Rosseau (north),
Lake Rosseau

Volunteers monitored six sites at Lake Rosseau six times over the summer of 2008. Lake Rosseau has been monitored since 2002. 46 areas on 18 lakes and rivers were monitored in 2008.

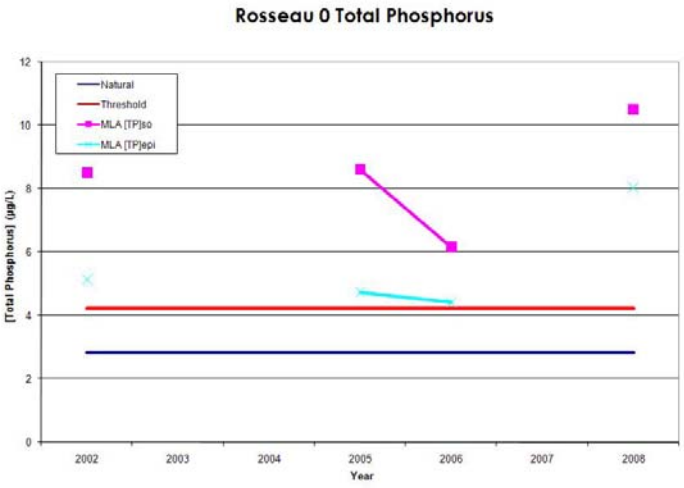
Summary

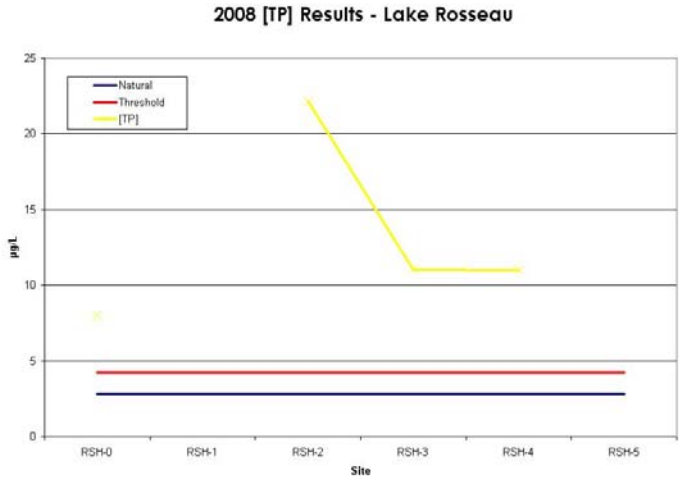
Overall water quality: ♦♦♦
E.Coli and total coliform were not measured in 2008. Phosphorus concentration remains over-threshold.

- Ranks 18/44 in Secchi depth (clarity)

Results

E.Coli and total coliform were not measured in 2008. This was the first years secchi depth was measured at Lake Rosseau, with a reading of 3.43 meters.





Phosphorus

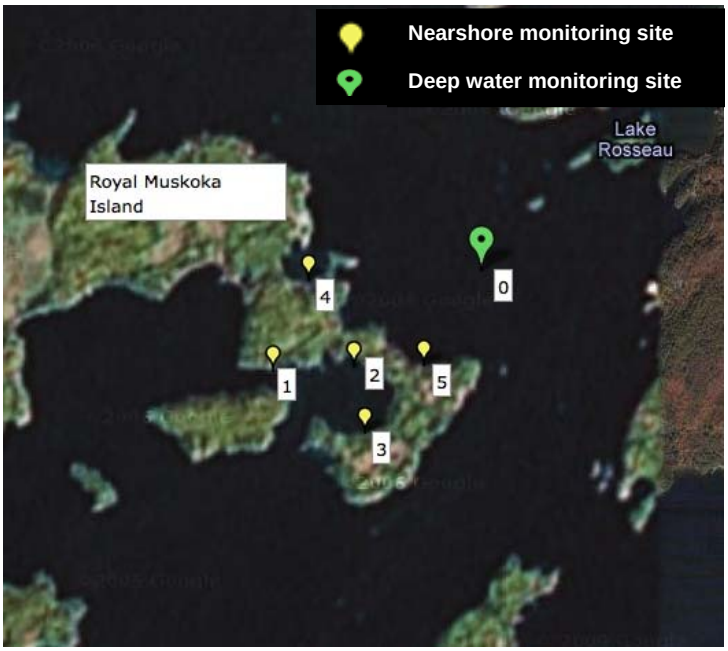
A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."
Lake Rosseau's threshold is 4.23µg/L. Spring turnover and average phosphorus measurements were above this threshold in 2008, and have been since monitoring began in 2002. Further investigation remains.

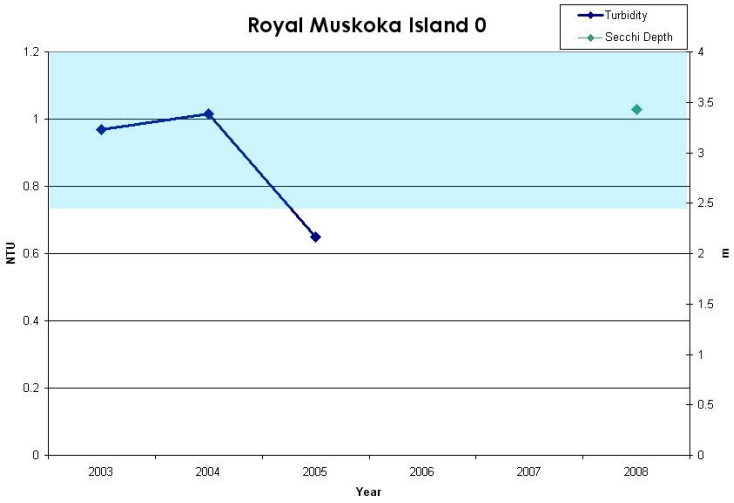
Site-by-site phosphorus

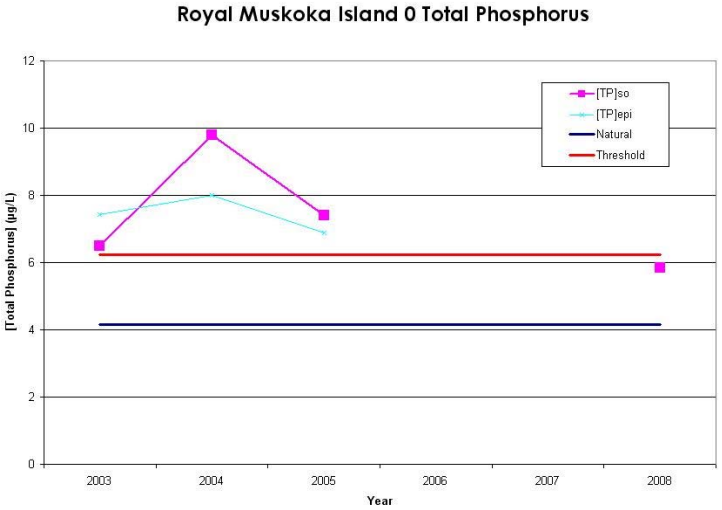
All sites had average phosphorus concentrations well above the threshold for Lake Rosseau. Site 2 had the highest average. Phosphorus was not measured in 2007.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Royal Muskoka Island,
Lake Rosseau







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CEW monitored an offshore site at Royal Muskoka Island for spring turnover phosphorus and secchi depth in the summer of 2008 – the first year Royal Muskoa Island has been monitored since 2005. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦♦♦
Total coliform and *E.Coli* were not measured at Royal Muskoka Island in 2008. No immediate concerns were found with phosphorus levels or clarity.

- Ranks 19/44 in Secchi depth (clarity)

2008 Results

No previous data exists for secchi depth at Royal Muskoka Island. In 2005, turbidity was below threshold levels. Present secchi levels do not warrant any concern. Total coliform and *E.Coli* were not measured at Royal Muskoka Island as an offshore site monitored in 2008.
All other measurements are within or below the expected range and had expected standard deviations.

Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Royal Muskoka Island's threshold is 6.225µg/L. Spring turnover was found to be below this level and therefore warrants no concern at this point.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Skeleton Bay, Lake Rosseau

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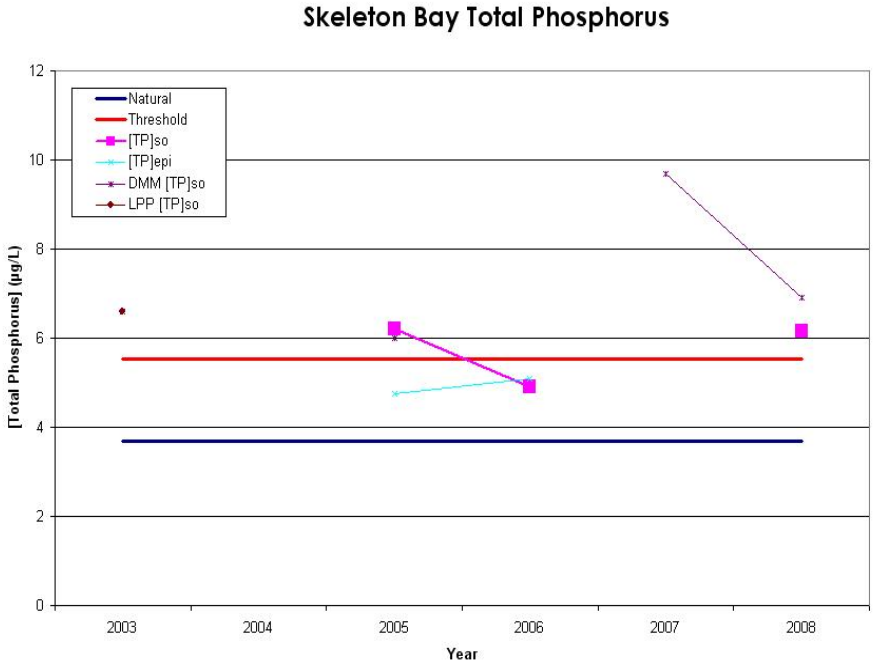
CEW monitored an offshore site at Skeleton Bay in the summer of 2008. This area has been monitored since 2003. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦
Spring turnover phosphorus was found over threshold values.



Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

The threshold for Skeleton Bay is 5.535µg/L. Both the District's spring turnover phosphorus and MLA spring turnover phosphorus measurements were found to be above the threshold value.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Tobin's Island, Lake Rosseau

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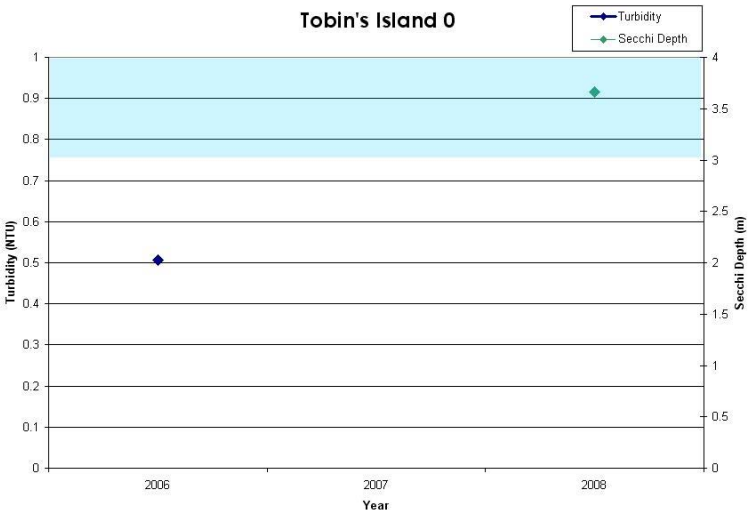
working in co-operation with citizensenvironmentwatch

CEW monitored the offshore site at Tobin's Island for spring turnover phosphorus and secchi depth in the summer of 2008 – the first year Tobin's Island has been monitored since 2006. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

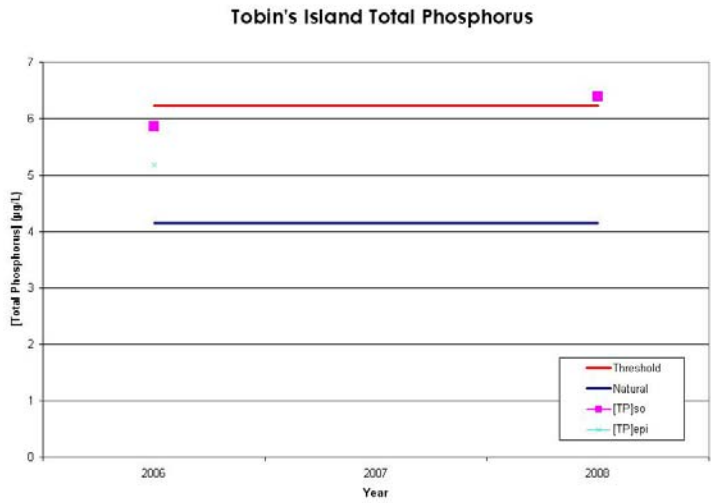
Overall water quality: ♦♦♦
Total Coliform and *E.Coli* were not measured at Tobin's Island in 2008. No immediate concerns were found with phosphorus levels or clarity.

- Ranks 13/44 in Secchi depth (clarity)



2008 Results

No previous data exists for secchi depth at Tobin's Island. In 2006 turbidity was below threshold levels. Present secchi depth values do not warrant any concern. Total coliform and *E.Coli* were not measured in 2008.



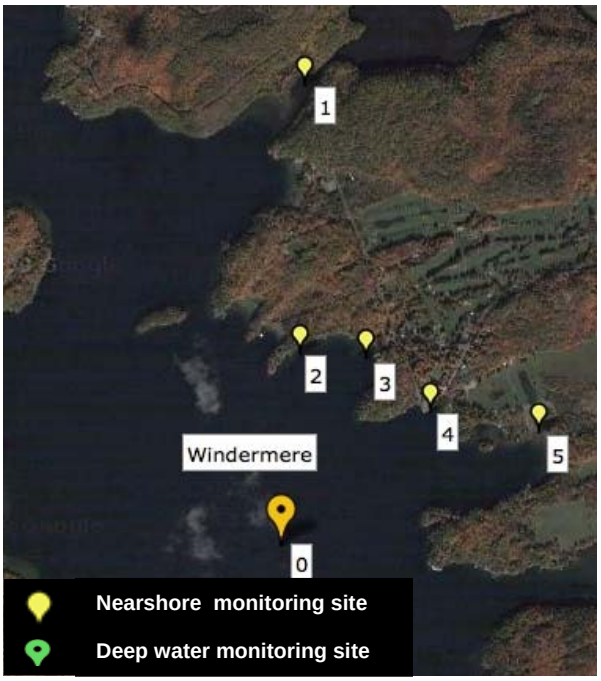
Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Tobin's Island's threshold is 6.225µg/L. Spring turnover phosphorus was found to be just above threshold for the first time since monitoring of this area began in 2006.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Windermere, Lake Rosseau

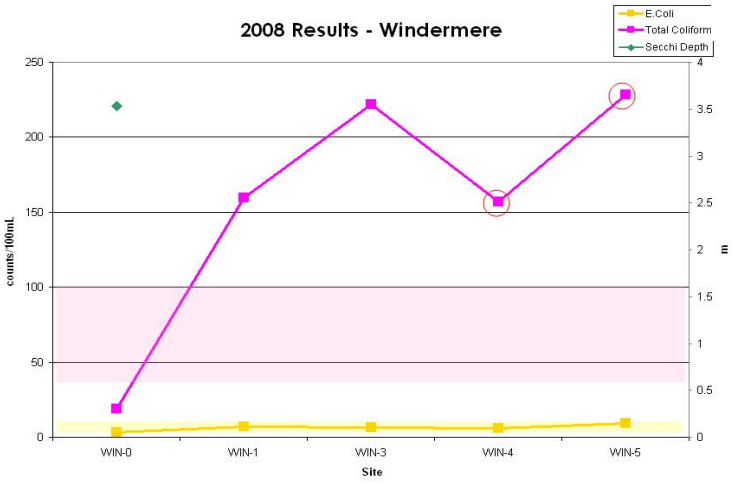


Volunteers monitored five sites (0, 1, 3, 4 & 5) at Windermere seven times in the summer of 2008. Windermere has been monitored since 2003. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦
There are no concerns with secchi depth and *E.Coli*, but total coliform counts are high at sites 1, 3, 4 & 5. Spring turnover phosphorus has also risen above threshold.

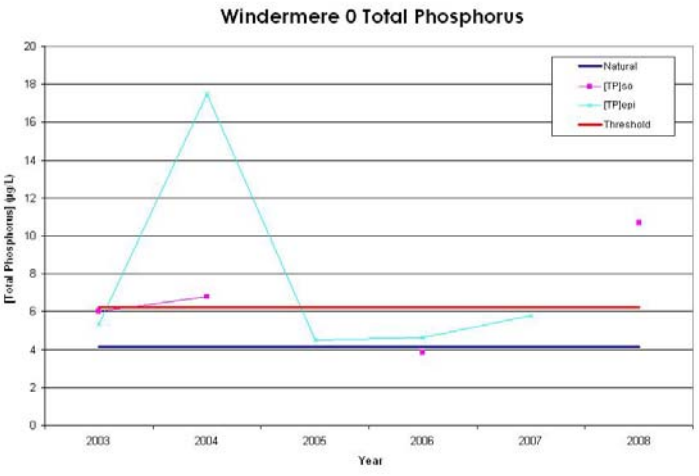
- Ranks 20/24 in level of Total Coliform
- Ranks 20/23 in level of *E.Coli*
- Ranks 16/44 in Secchi depth (clarity)



2008 Results

Total coliform counts were above the expected range at the nearshore sites (1, 3, 4 & 5), with sites 4 & 5 being outside the expected standard deviation. Counts at site 3 & 5 have risen considerably since last year, while site 4 seems to be more consistent with previous years. These values warrant further investigation.

All other measurements are within or below the expected range and had expected standard deviations.



Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."
Windermere is not specifically considered by the District of Muskoka. The main basin of Lake Rosseau's threshold is 6.225µg/L. Spring turnover phosphorus has risen above threshold- the first time since 2004.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Brandy Lake

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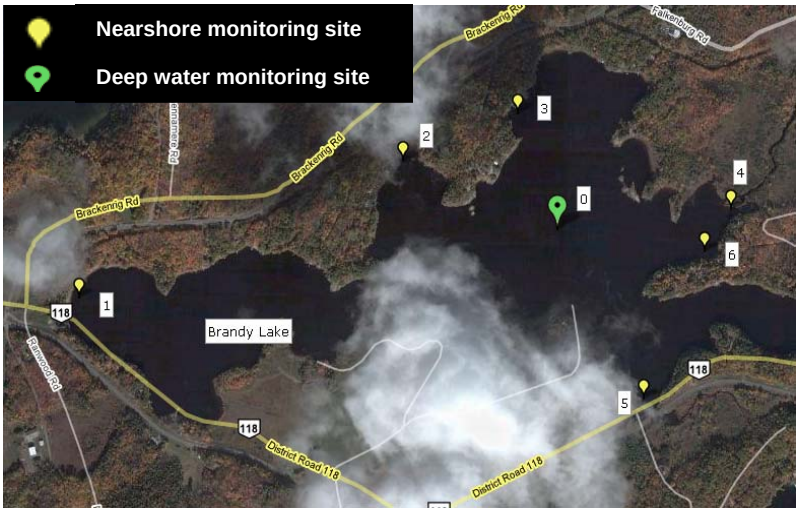
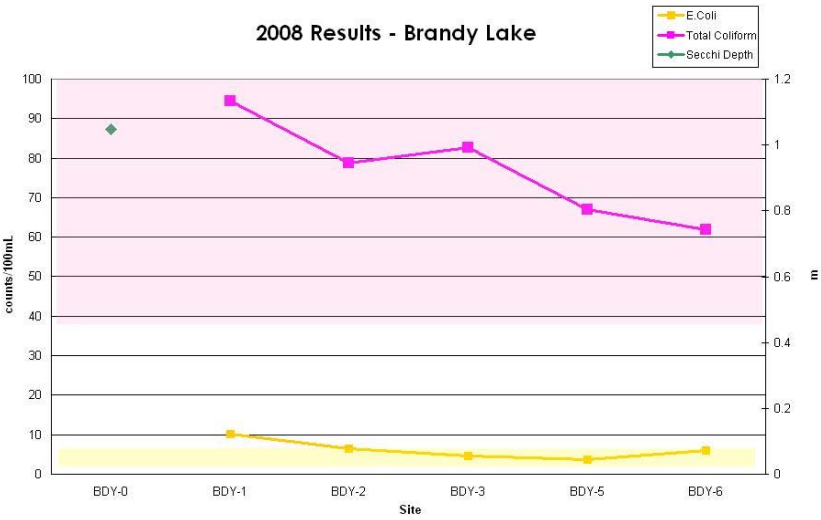
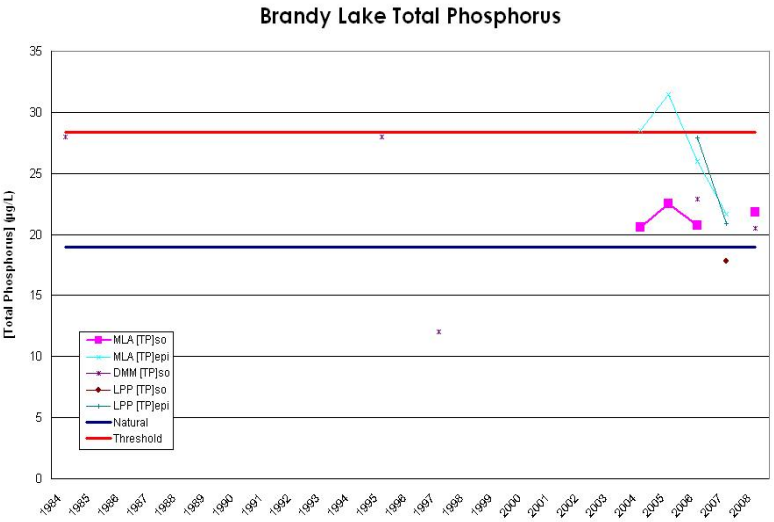






Volunteers monitored six sites (0, 1, 2, 3, 5 and 6) in Brandy Lake eight times over the summer of 2008. Brandy Lake has been monitored since 2002. 46 areas on 18 lakes and rivers were monitored (Brandy Lake is the only dystrophic or "tea coloured" lake, naturally rich in nutrients and organic carbon).

Summary

Overall water quality: ♦♦♦♦
There are no major concerns with total coliform. *E.Coli* at site 1 was above expected range and secchi depth was ranked the worst out of all areas monitored in 2008.

- Ranks 17/24 in level of Total Coliform
- Ranks 19/23 in level of *E.Coli*
- Ranks 44/44 in Secchi depth (clarity)

2008 Results

E.Coli at site 1 was found to be above the expected range. All remaining measurements were currently within or below their expected range and standard deviation.

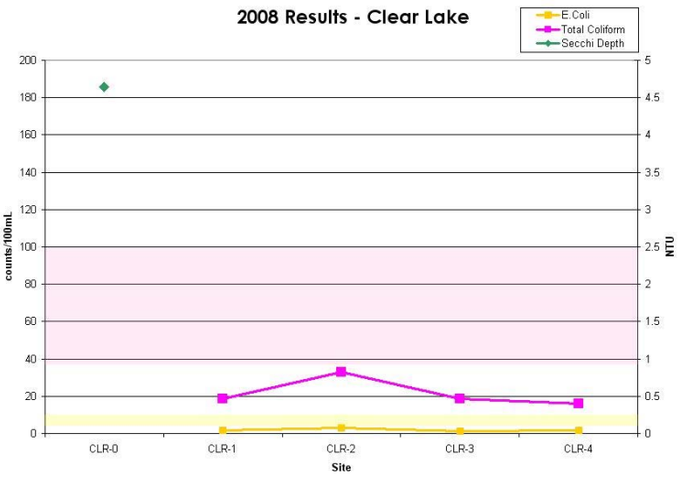
Phosphorus

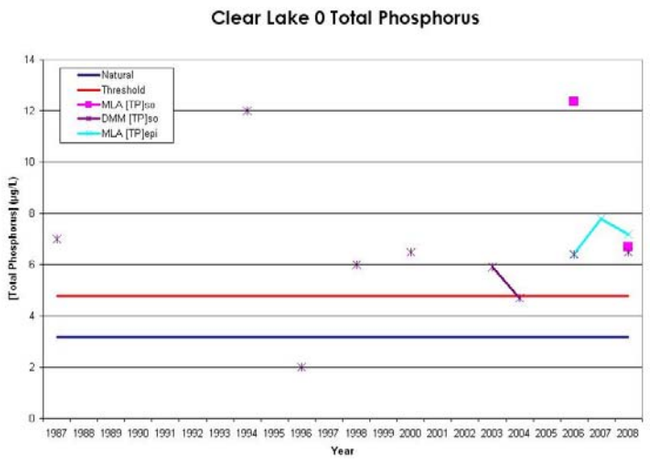
A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

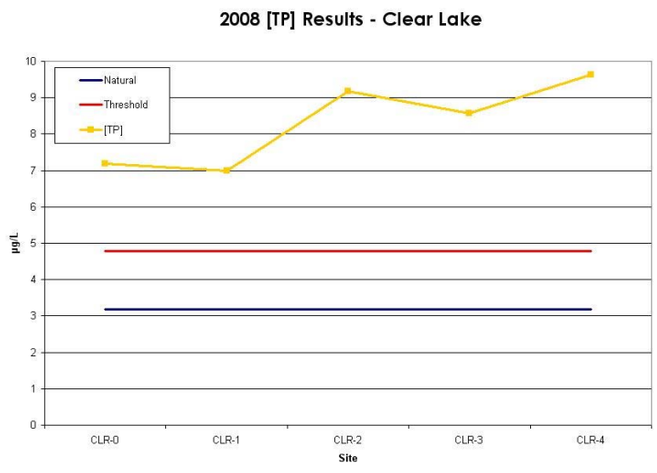
Brandy Lake's threshold is 28.39µg/L. Spring turnover phosphorus remains under the threshold, and is consistent with the District of Muskoka's spring turnover data for 2008.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Clear Lake (TML)







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Volunteers monitored five sites at Clear Lake eight times in the summer of 2008. Clear Lake has been monitored since 2005. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦
There are no concerns with *E.Coli*, total coliform or clarity, but phosphorus concentration is over-threshold.

- Ranks 7/24 in level of Total Coliform
- Ranks 1/23 in level of *E.Coli*
- Ranks 7/44 in Secchi depth (clarity)

2008 Results

All measurements are within or below the expected range.

Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Clear Lake's threshold is 4.785µg/L. Spring turnover and average phosphorus have been above threshold since 2006.

Clear Lake is classified as over-threshold by the District of Muskoka.

Site-by-site phosphorus

This is the first year all sites have been monitored for phosphorus. All sites were measured to be above threshold, and further investigation into phosphorus levels at Clear Lake is warranted.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Indian River

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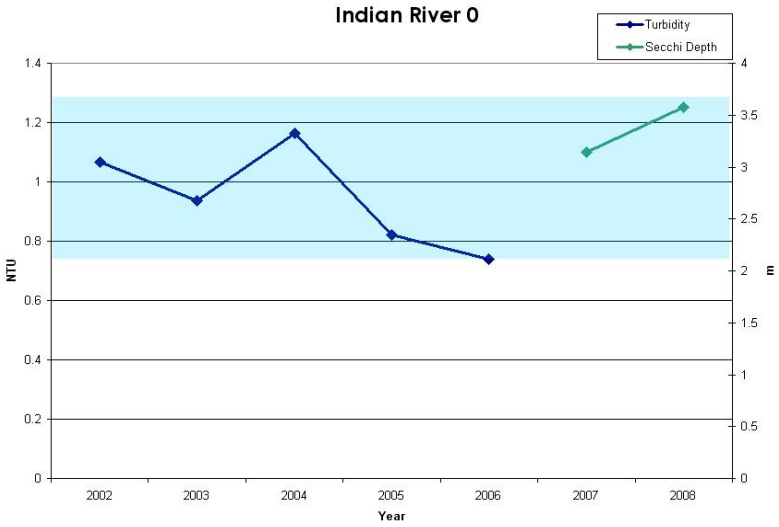
Water Quality Initiative
working in co-operation with citizensenvironmentwatch

CEW monitored one offshore site at Indian River for spring turnover phosphorus and secchi depth in the summer of 2008. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

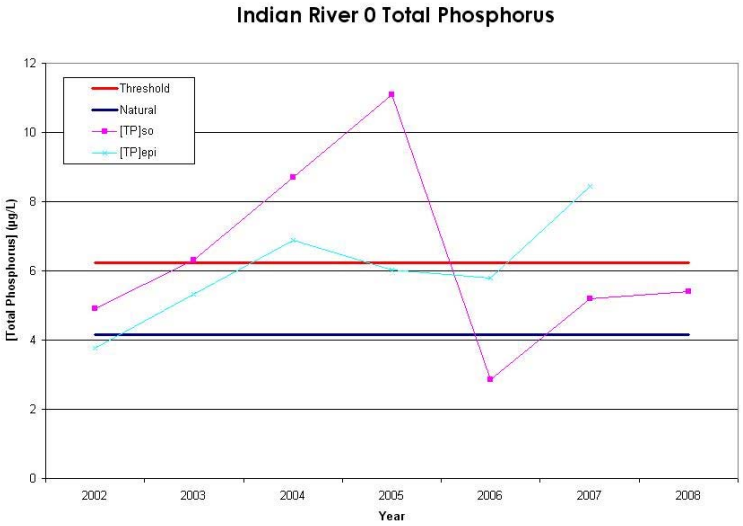
Overall water quality: ♦♦♦♦♦
Total coliform and *E.Coli* were not measured at Indian River in 2008. No immediate concerns were found with phosphorus levels or secchi depth.

- Ranks 15/44 in Secchi depth (clarity)



2008 Results

Secchi depth has improved since last year at Indian River. Total coliform and *E.Coli* were not measured at Indian River as the site monitored in 2008 was an offshore site.



Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Indian River's threshold is 6.225µg/L. Spring turnover was found to be below this level, and has been now since 2006.

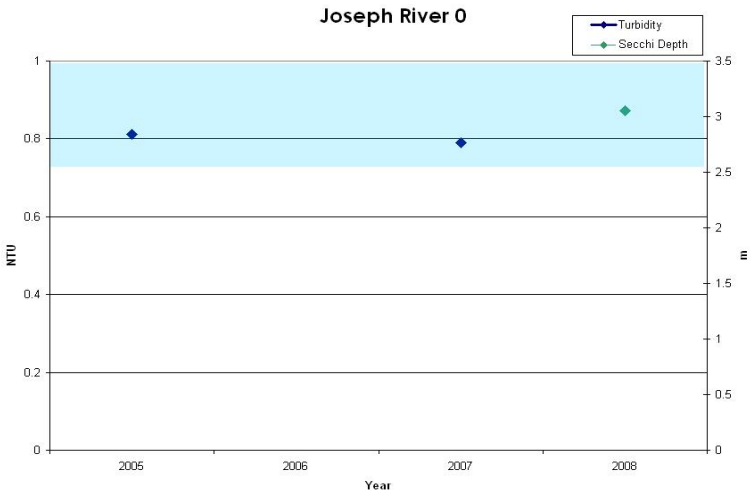
Joseph River

CEW monitored one offshore site at Joseph River for spring turnover phosphorus and secchi depth in the summer of 2008. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

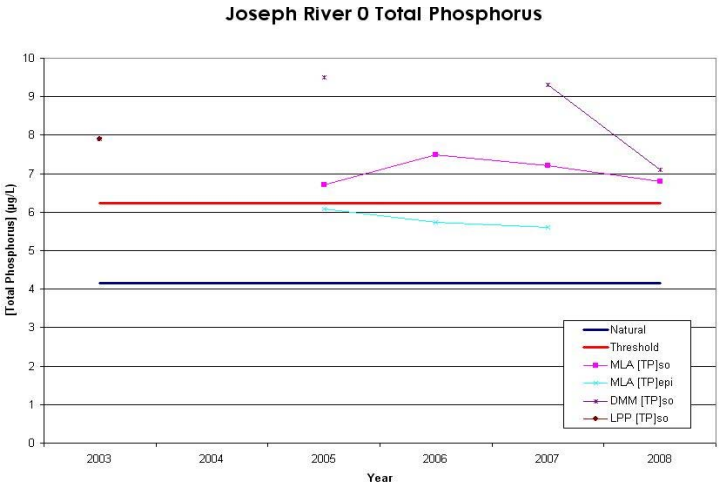
Overall water quality: ♦♦♦
Total coliform and *E.Coli* were not measured at Joseph River in 2008. Phosphorus levels were found to be above threshold.

- Ranks 29/44 in Secchi depth (clarity)



2008 Results

No previous data exists for secchi depth at Joseph River. In 2007 turbidity was below threshold levels. Present secchi levels do not warrant any concern. Total coliform and *E.Coli* were not measured at Joseph River as there was only one offshore site monitored in 2008.



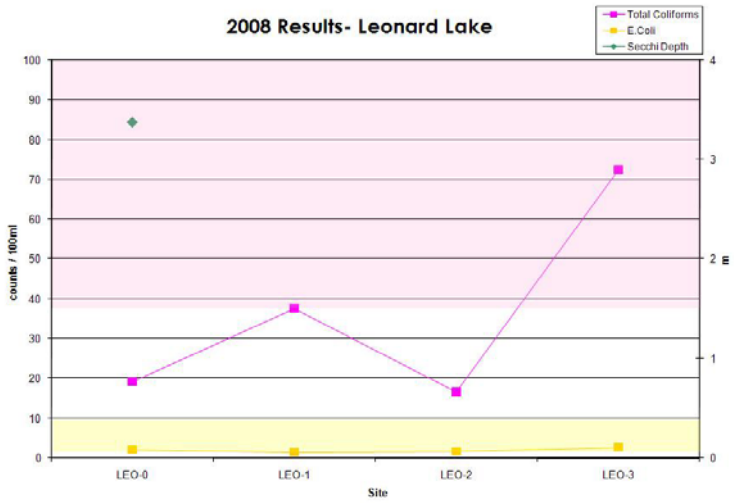
Phosphorus

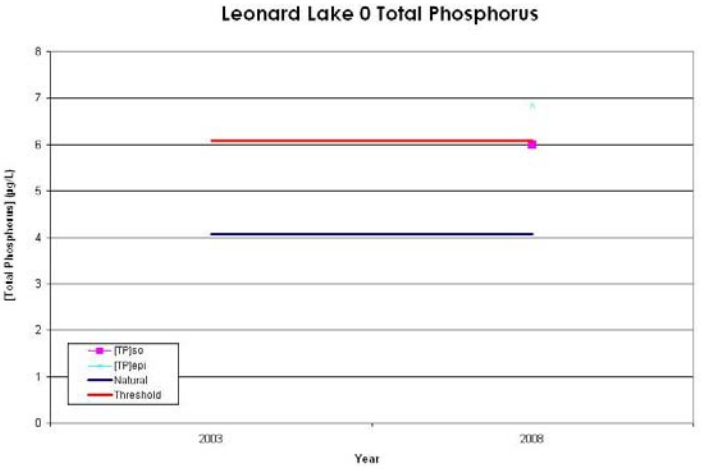
A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Joseph River's threshold is 6.225µg/L. Both the District and MLA spring turnover values for phosphorus are above threshold, and have been since 2003.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Leonard Lake





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Volunteers monitored four sites at Leonard Lake seven times in the summer of 2008. Leonard Lake was last monitored in 2003. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦
There are no concerns with *E.Coli*, total coliform or phosphorus concentration.

- Ranks 10/24 in level of Total Coliform
- Ranks 2/23 in level of *E.Coli*
- Ranks 20/44 in Secchi depth (clarity)

2008 Results

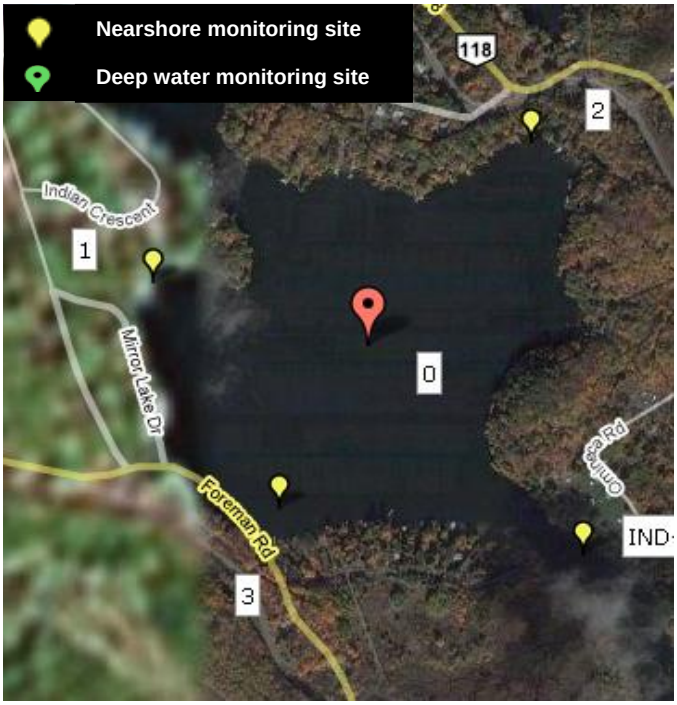
All measurements are within or below the expected range.

Phosphorus

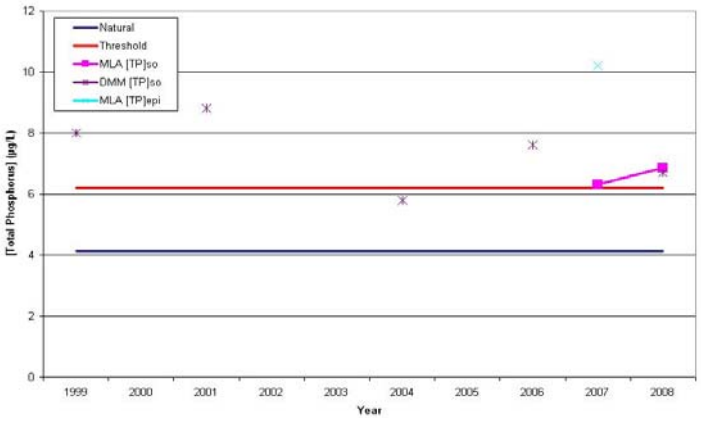
A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Leonard Lake's threshold is 6.09µg/L. Spring turnover phosphorus was just below threshold, but the average phosphorus values were found to be over threshold. This is the first time phosphorus data has been collected for Leonard Lake.

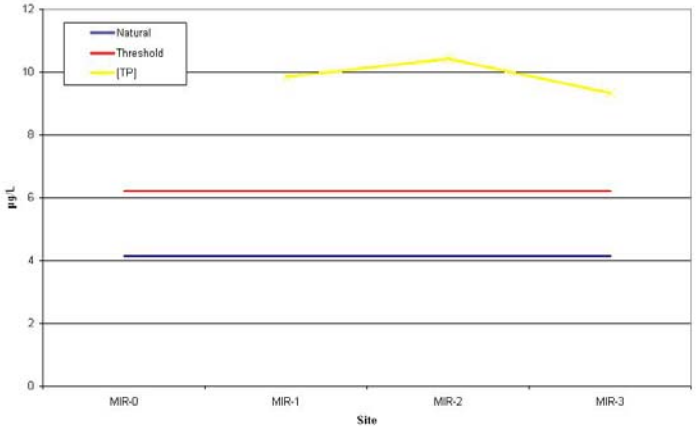
Mirror Lake



Mirror Lake 0 Total Phosphorus



2008 [TP] Results - Mirror Lake



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Volunteers monitored four sites in Mirror Lake six times over the summer of 2008. Mirror Lake has been monitored since 2003. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦
E.Coli and total coliform were not measured in 2008. Phosphorus concentration remains over-threshold.

- Ranks 35/44 in Secchi depth (clarity)

Results

E.Coli and total coliform were not measured in 2008. This was the second year secchi depth was measured at Mirror Lake. It ranked quite low among all areas with a reading of 2.41m.

Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Mirror Lake's threshold is 6.21µg/L. Spring turnover and average phosphorus measurements were above this threshold in 2008. Mirror Lake has been classified as over-threshold by the District of Muskoka since 2003.

Site-by-site phosphorus

All sites had average phosphorus concentrations well above the threshold for Mirror Lake. Sites 1 & 2 had the highest averages. These results are consistent with last year.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Moon River

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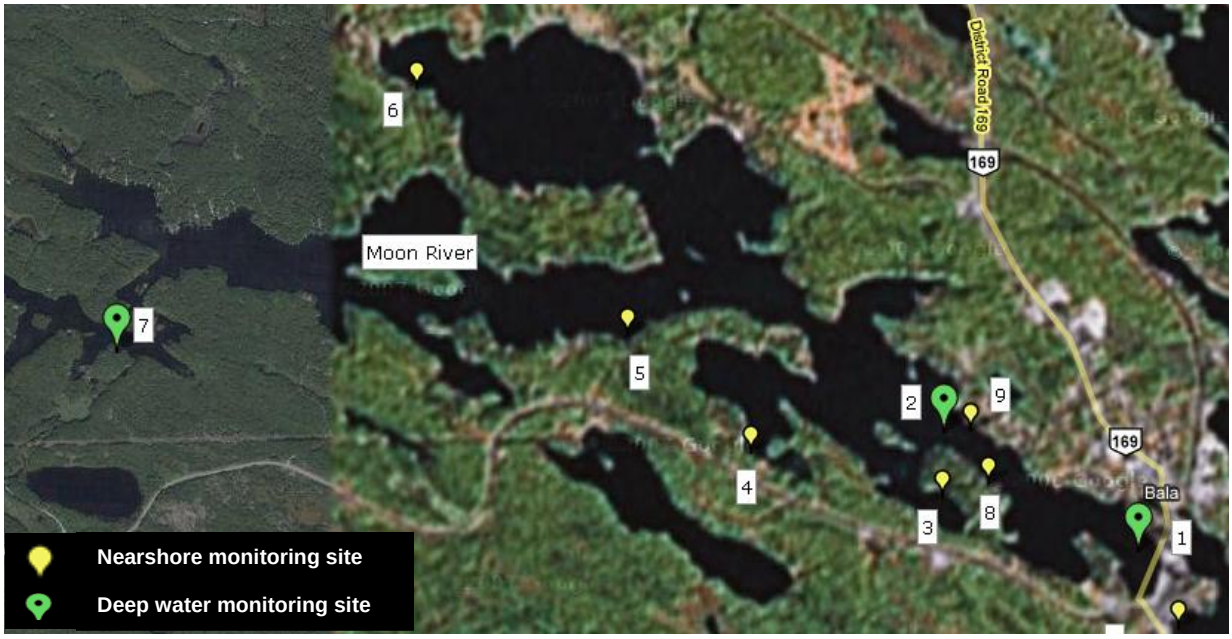

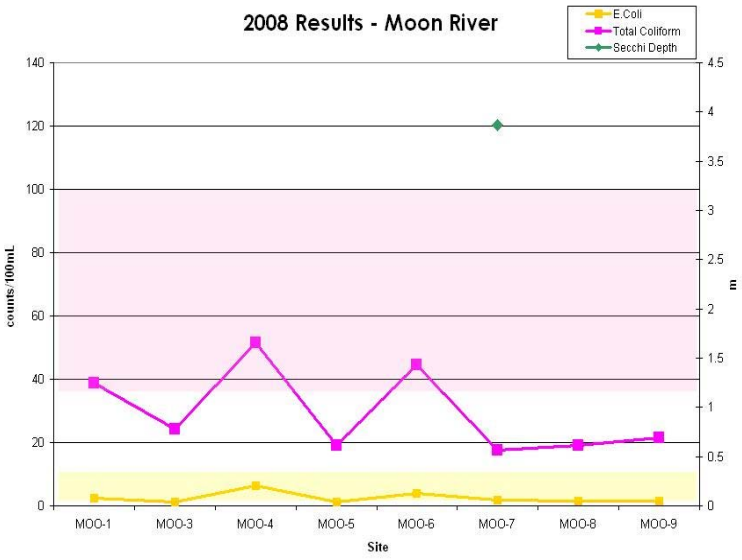

2008 Results

Much the same as the results of 2007, all measurements were found within or below the expected range.

Volunteers monitored eight sites (1, 3, 4, 5, 6, 7, 8 & 9) at the Moon River eight times in the summer of 2008. Moon River has been monitored since 2005. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦♦♦
There are no concerns with *E.Coli*, total coliform or clarity. Total phosphorus was not monitored.

- Ranks 9/24 in level of Total Coliform
- Ranks 4/23 in level of *E.Coli*
- Ranks 11/44 in Secchi depth (clarity)

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Muldrew Lakes

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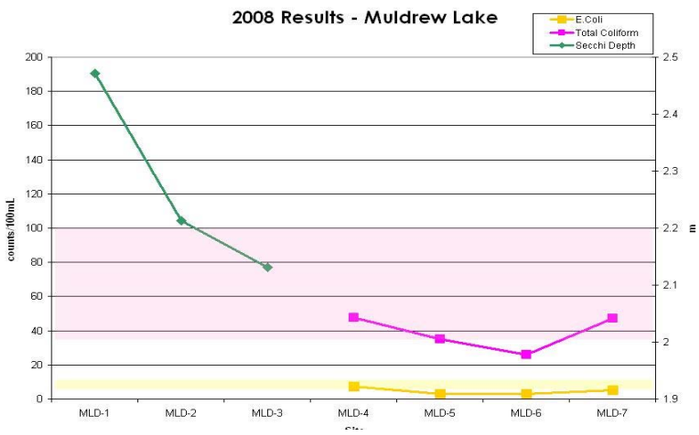
Volunteers monitored seven sites in the Muldrew Lakes seven times over the summer of 2008. Muldrew Lakes were monitored for the first time in 2007. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

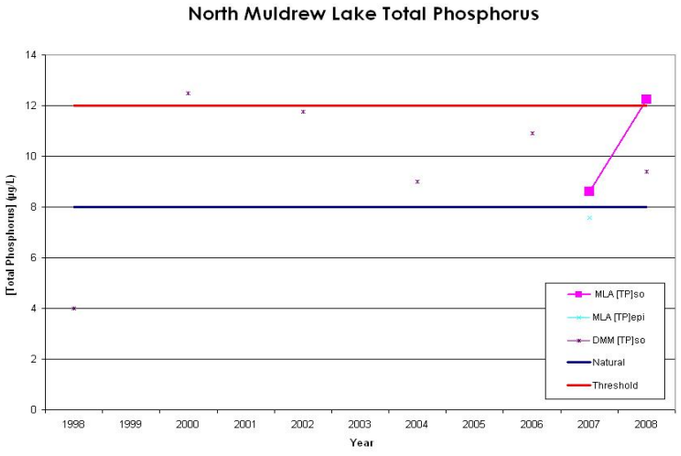
Overall water quality: ♦♦♦
There are no concerns with *E.Coli* or total coliform. Spring turnover phosphorus data was just over threshold.

- Ranks 12/24 in level of Total Coliform
- Ranks 15/23 in level of *E.Coli*
- Ranks 42/44 in Secchi depth (clarity)



2008 Results

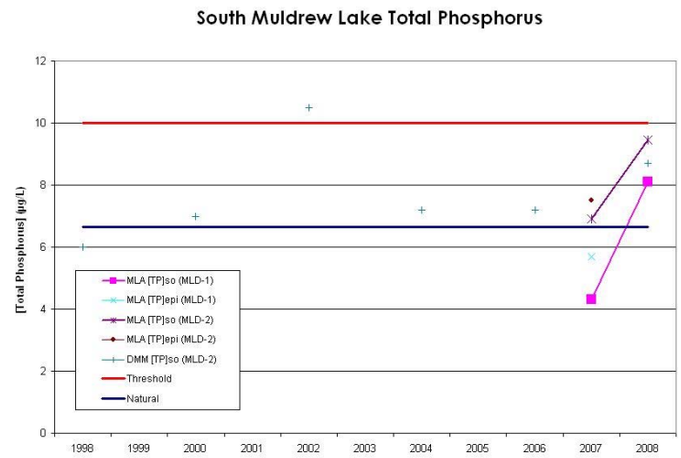
All *E.*Coli and total coliform counts are within or below the expected range with expected standard deviation values. The Muldrew Lakes ranked poorly in clarity, but still remains to have no concerns.



Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

North Muldrew Lakes's threshold is 11.985µg/L. Spring turnover phosphorus in 2008 is just above the threshold, and higher than the District of Muskoka's (DMM) spring turnover phosphorus data.



South Muldrew Lakes's threshold is 9.99µg/L. MLA and DMM Spring turnover phosphorus levels at sites 1 & 2 were found to be consistent and below threshold.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Muskoka River

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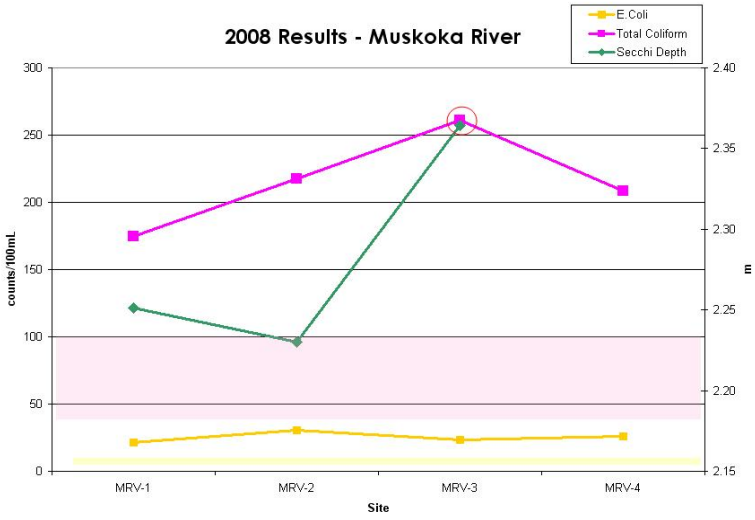

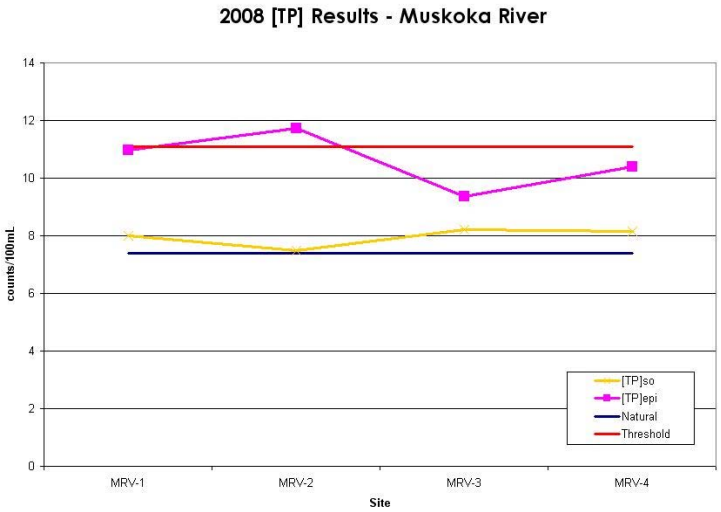

For more information, please see
http://www.citizensenvironmentwatch.org/wqi/muskoka

Volunteers monitored four sites on the Muskoka River eight times in the summer of 2008. The Muskoka River has been monitored since 2003. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦
There are no concerns with phosphorus, but *E.Coli* and total coliform are high.

- Ranks 24/24 in level of Total Coliform
- Ranks 23/23 in level of *E.Coli*
- Ranks 41/44 in Secchi depth (clarity)

2008 Results

All measurements for both *E.Coli* and total coliform remain above the expected range. Site 3 has a total coliform count higher than the expected standard deviation. Secchi depth was ranked very low, and produced a reading worse than in 2007.
These results are consistent with observations from previous years, but further investigation is not warranted because these sites are located in an urban area on a complex river ecosystem.

Site-by-site phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."
The Muskoka River's threshold is 11.085µg/L. All sites except site 2 remained below this threshold.

Silver Lake (Muskoka Lakes)

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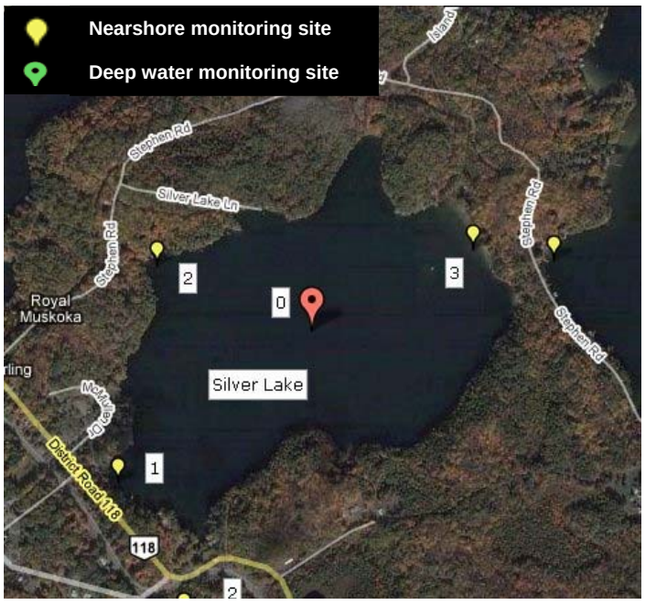
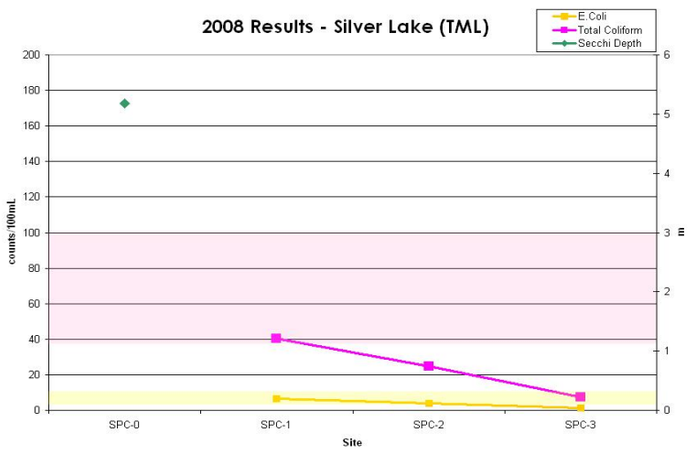


Volunteers monitored four sites at Silver Lake eight times over the summer of 2008. Silver Lake has been monitored since 2002. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

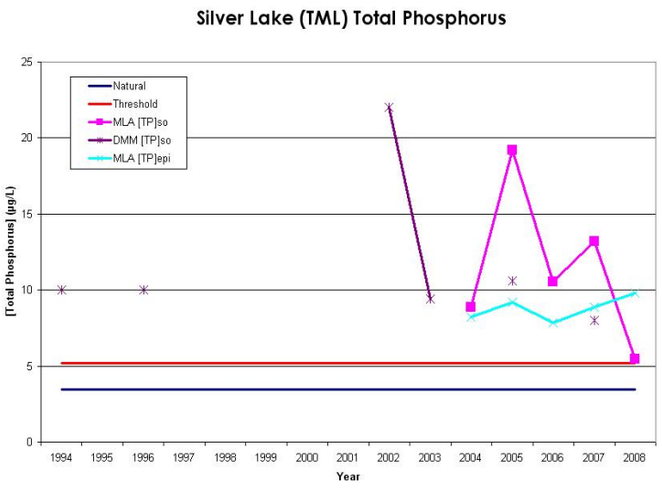
Overall water quality: ♦♦♦
There are no concerns with *E.Coli*, secchi depth or total Coliform; all were found to be within range and expected standard deviation. Phosphorus was found to be above threshold.

- Ranks 4/24 in level of Total Coliform
- Ranks 12/23 in level of *E.Coli*
- Ranks 4/44 in Secchi depth (clarity)



2008 Results

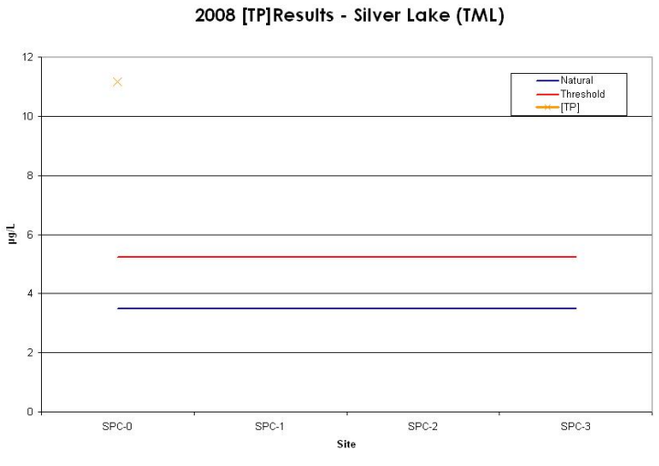
All values were found below or within the expected range and expected standard deviation.



Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Silver Lake's threshold is 5.22µg/L. Spring turnover and average phosphorus have remained above the threshold since 2004. This District has also classified Silver Lake as being over-threshold.



Site-by-site phosphorus

Total phosphorus results were very high at the offshore site for Silver Lake in 2008, with a value of 11.15µg/L, and further investigation is warranted.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Skeleton Lake

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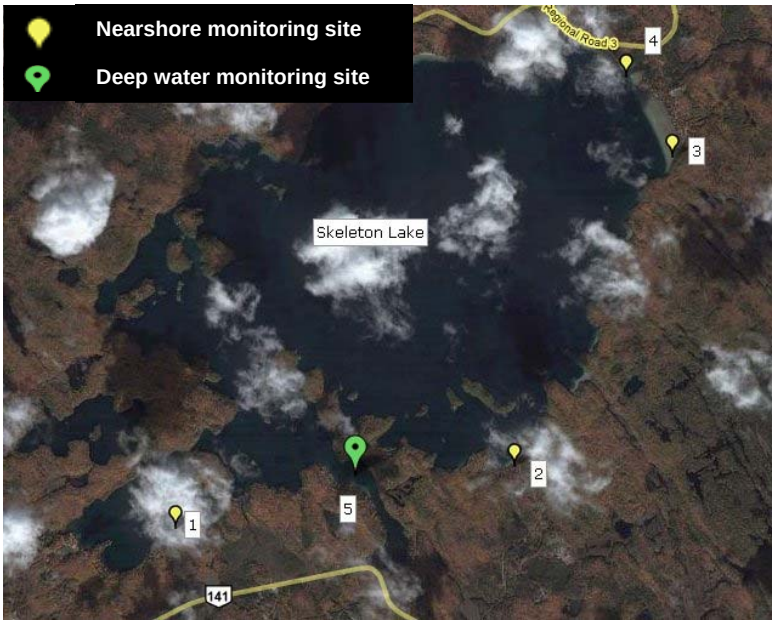
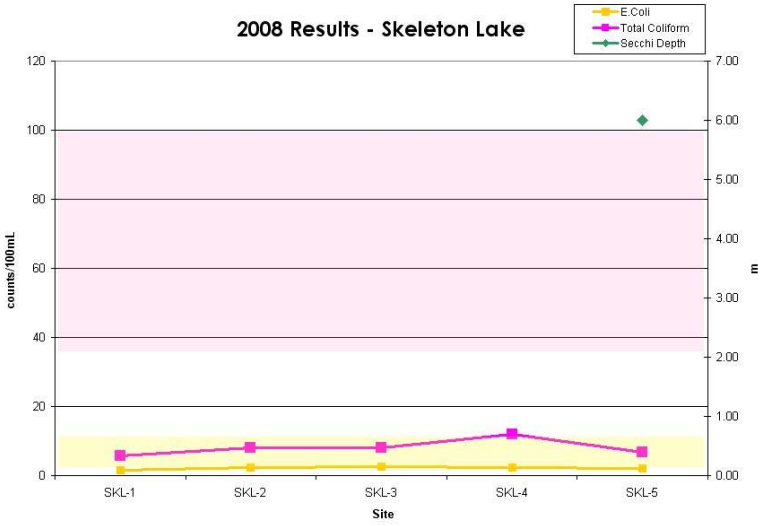


Volunteers monitored five sites on Skeleton Lake eight times in the summer of 2008. Skeleton Lake has been monitored since 2006. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

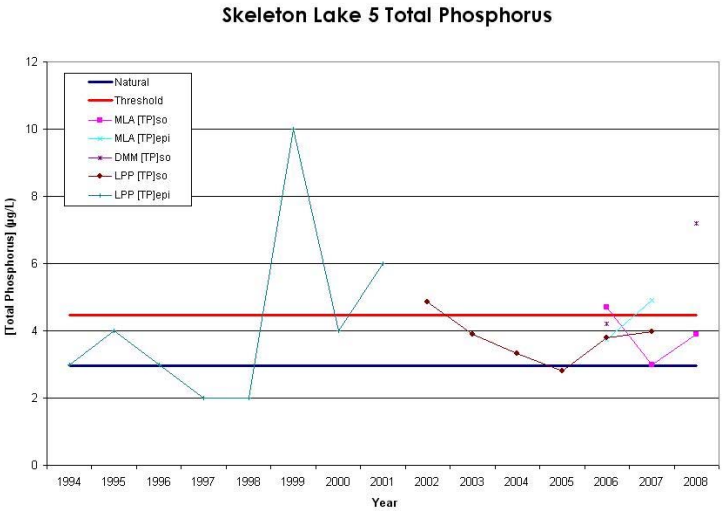
Overall water quality: ♦♦♦♦♦
There are no concerns with phosphorus, *E.Coli*, total coliform or clarity.

- Ranks 1/24 in level of Total Coliform
- Ranks 5/23 in level of *E.Coli*
- Ranks 1/44 in Secchi depth (clarity)



2008 Results

All measurements are within or below the expected range, and all have expected standard deviations.



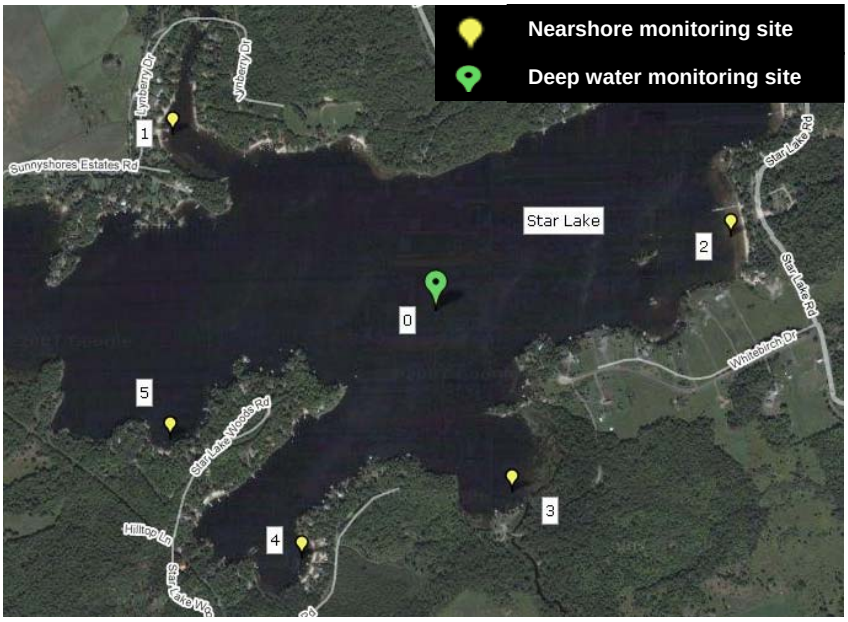
Phosphorus

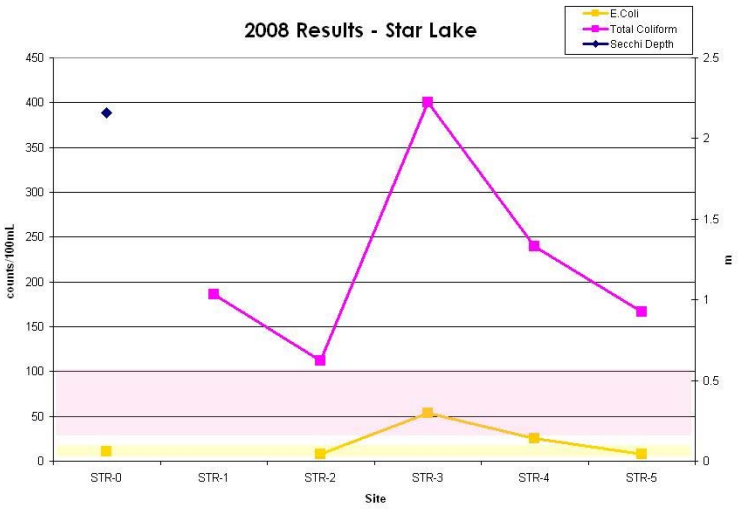
A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

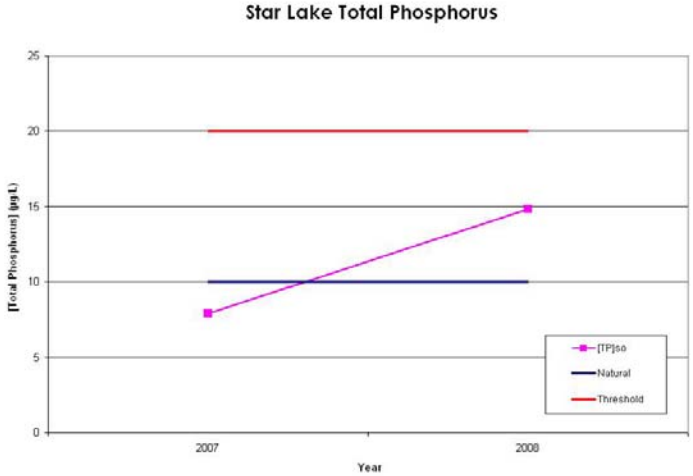
Skeleton Lake's threshold is 4.455µg/L. Spring turnover phosphorus was below this threshold in 2008. This is in contrast to the District of Muskoka's spring turnover measurement, which was over threshold.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Star Lake







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Volunteers monitored six sites at Star Lake eight times in the summer of 2008. Monitoring of this lake began in 2007. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦♦
There were no concerns with phosphorus concentration, but total coliform levels have greatly increased since last year at all sites. Sites 3 and 4 for *E.Coli* are above normal. Water clarity has also decreased.

- Ranks 22/24 in level of Total Coliform
- Ranks 22/23 in level of *E.Coli*
- Ranks 43/44 in Secchi depth (clarity)

2008 Results

All total coliform counts were above the expected range with an exceptionally high count at site 3. Values at each site have risen since last year, and should be monitored closely to see if this trend continues. *E.Coli* at sites 3 & 4 were also above the expected range. All other measurements are within or below the expected range and had expected standard deviations.

Phosphorus

Lake-specific phosphorus thresholds have yet to be defined for Star Lake since this is only the second year phosphorus data has been collected. Spring turnover phosphorus has risen above its oligotrophic ('nutrient poor') state from last year but is below the threshold value.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Sucker Lake

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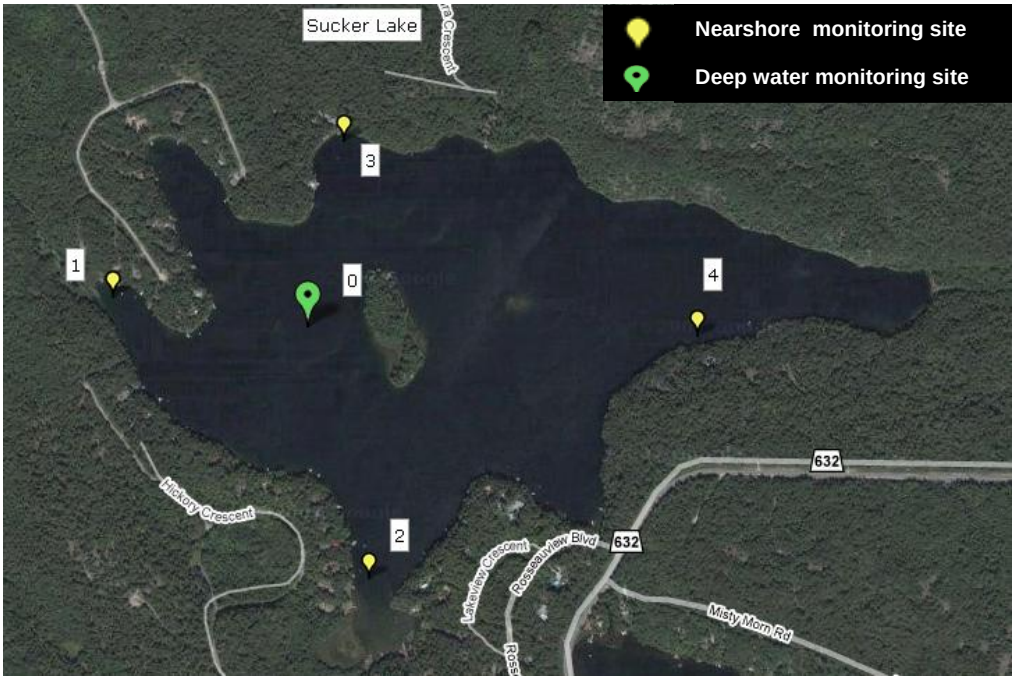

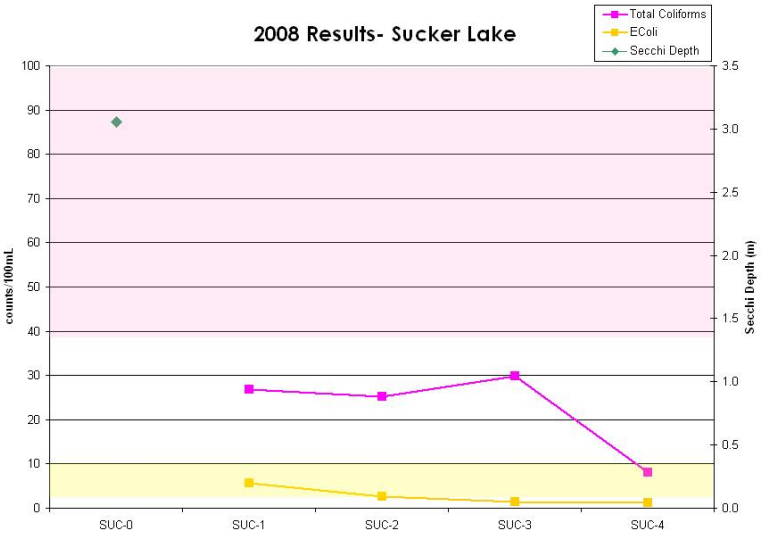

Volunteers monitored five sites at Sucker Lake seven times in the summer of 2008. Sucker Lake has been monitored since 2003. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

Overall water quality: ♦♦♦♦
There are no concerns with *E.Coli*, total coliform or secchi depth. Phosphorus was not monitored.

2008 Results

All measurements are within or below the expected range.

- Ranks 5/24 in level of Total Coliform
- Ranks 6/23 in level of *E.Coli*
- Ranks 27/44 in Secchi depth (clarity)

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

Sunny Lake

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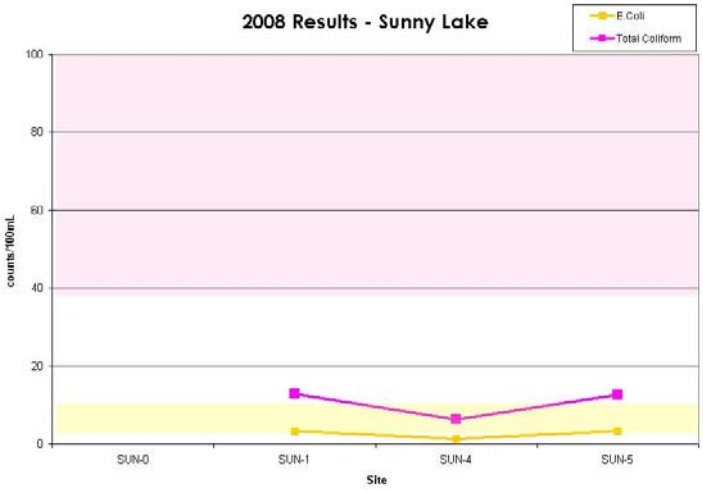
Water Quality Initiative
working in co-operation with citizenenvironmentwatch

Volunteers monitored four sites on Sunny Lake eight times in the summer of 2008. This is the first year Sunny Lake has been monitored. 46 areas on 18 lakes and rivers were monitored in 2008.

Summary

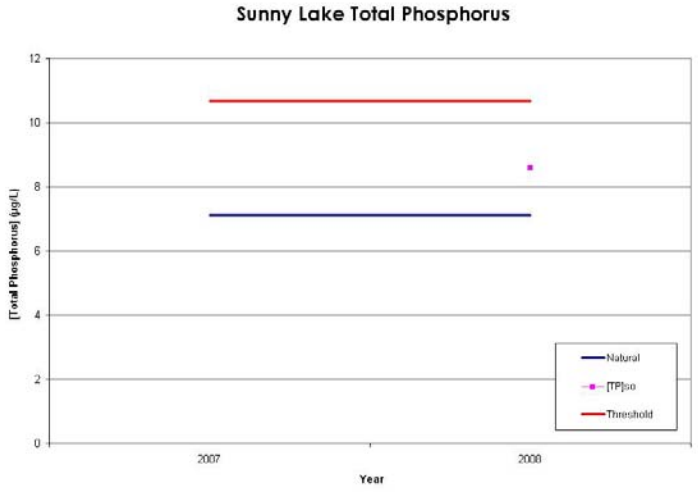
Overall water quality: ♦♦♦♦♦
There are no concerns with phosphorus, *E.Coli*, total coliform.

- Ranks 2/24 in level of Total Coliform
- Ranks 8/23 in level of *E.Coli*



2008 Results

All measurements are within or below the expected range, and all have expected standard deviations.



Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Sunny Lake's threshold is 10.68µg/L. Spring turnover phosphorus was below this threshold in 2008. This is the first year phosphorus was measured at Sunny Lake and has no prior data for comparison.

For more information, please see http://www.citizenenvironmentwatch.org/wqi/muskoka_lakes.

Appendix A - Understanding the Summaries

- Sampling Area
- Classification
- Map
- Ranks
- 2008 Averages
- Unexpected Standard Deviation
- *E.Coli* & Total Coliform scale
- Clarity scale
- Expected Ranges
- Deep water phosphorus
- Average phosphorus
- Spring turnover phosphorus
- Phosphorus threshold
- Natural phosphorus
- Site-by-site average phosphorus

Cox Bay, Lake Joseph

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Volunteers monitored five sites at Cox Bay eight times over the summer of 2008. Cox Bay has been monitored since 2002. 44 areas on 18 lakes and rivers were monitored in 2008.

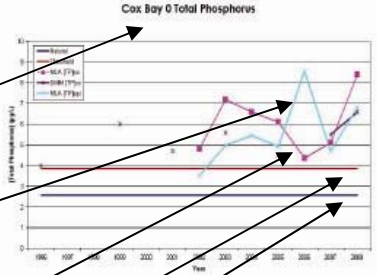
Summary

Overall water quality ♦♦♦♦
There are no concerns with *E.Coli* or Secchi depth, however Total Coliform was found to be over threshold at a single near shore site, and above expected standard deviation.

- Ranks 15/24 in level of Total Coliform
- Ranks 3/23 in level of *E.Coli*
- Ranks 10/44 in Secchi depth (clarity)

2008 Results

Total Coliform measurement at site 3 was the only value above threshold, and contained an unexpected standard deviation. All other values were found below or within the expected range and expected standard deviation.

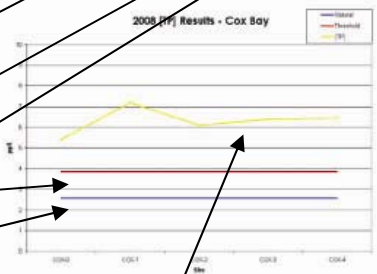


Phosphorus

A lake's phosphorus threshold is the concentration at which this nutrient may cause an ecological imbalance. Below this threshold, the lake is "healthy."

Cox Bay's threshold is 3.855 µg/L. Spring turnover and average phosphorus have remained above the threshold since 2002, and have increased to its highest level yet. This is consistent with the districts phosphorus measurements.

Cox Bay is classified as Over-threshold by the District of Muskoka, and remains the subject of a community-based RCAP to reduce phosphorus concentration.



Site-by-site phosphorus

All sites had very similar average phosphorus concentrations- the second year in a row these measurements have been over threshold at Cox Bay.

For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes.

2008 Averages

2008 results (*E.Coli*, Total Coliform and Secchi depth) are presented on a graph entitled "2008 Results – Sampling Area." The graph shows each parameter in units (y-axis) for each site (x-axis). *E.Coli* and Total Coliform units are shown on the primary y-axis and secchi depth and turbidity (clarity) units are shown on the secondary y-axis. This graph is accompanied by brief explanatory text.

The geometric mean (see glossary) ***E.Coli*** is shown on the graph in yellow, and reported in counts/100mL (that is, the number of organisms observed in 100 mL of lake water). Expected range is shown in light yellow. Circled results have standard deviations that are higher than expected.

The geometric mean (see glossary) **Total coliform** is shown on the graph in pink, and reported in counts/100mL (that is, the number of organisms observed in 100 mL of lake water). Expected range is shown in light pink. Circled results have standard deviations that are higher than expected.

The arithmetic mean (see glossary) **clarity** (either turbidity or secchi depth) is shown on the graph in blue or green respectively. Turbidity is reported in Nephilometric Turbidity Units (NTU) and secchi depth is reported in metres (m). Expected range for turbidity is shown in light blue. Circled results have standard deviations that are higher than expected.

Average Phosphorus

The "average" or total epilimnetic total phosphorus ($[TP]_{epi}$) shown is the arithmetic mean (see glossary) of all phosphorus concentrations at the deep water site reported over the sampling season for each year and is shown in light blue.

Clarity Scale

The secondary y-axis on the 2008 Results graph is either in units of Nephilometric Turbidity Units (NTU), if clarity is measured using turbidity, or metres (m), if clarity is measured using secchi depth.

Classification

The water quality in each sampling area is assigned a ranking between one and five diamonds (♦). While this classification is based on a rough synthesis of all parameters and takes local knowledge into consideration, the following table generally describes what the classifications mean. Note that "standard deviations" are discussed in the glossary.

Classification	Meaning
♦♦♦♦♦	All readings for all parameters are within the expected range of averages and standard deviations
♦♦♦♦	A between one and 50% of the average *E.Coli,* total Coliform or clarity readings are higher than expected or a have larger than expected standard deviations
♦♦♦	Phosphorus concentration is higher than threshold (or it is classified as over-threshold) **or** concerns exist with the remaining parameters for the majority of sites
♦♦	Phosphorus concentration is higher than threshold (or it is classified as over-threshold) **and** concerns exist with at least two of the remaining parameters for the majority of sites
♦	There has been significant evidence of impairment, such as algae blooms, water usage warnings etc.

Deep Water Phosphorus

Deep water total phosphorus results for all years are presented on a second graph entitled "Sampling Area Total Phosphorus." The graph shows both spring turnover and average (total epilimnetic) total phosphorus concentration in µg/L (y-axis) at the deep water site for each year (x-axis). This graph is accompanied by brief explanatory text.

The spring turnover total phosphorus concentration ($[TP]_{so}$) shown is the value of sample number 1 for each year, and is comparable to the concentration that the District of Muskoka uses to classify lakes for planning and development purposes and is shown in pink. The "average" or total epilimnetic total phosphorus ($[TP]_{epi}$) shown is the arithmetic mean (see glossary) of all phosphorus concentrations at the deep water site reported over the sampling season for each year and is shown in light blue.

The "Natural" phosphorus concentration is the baseline concentration calculated by the District of Muskoka to represent the expected phosphorus concentration within the lake or bay without any development. The "Threshold" phosphorus concentration is 50% more than the baseline concentration, and is the threshold calculated by the District of Muskoka to classify lakes and bays as suitable for a higher level of development control as a precautionary action to protect the long-term health of the lake.

The $[TP]_{so}$ reported here should agree with the classification that the District of Muskoka has given the lake or bay. If the classification does not agree as noted in the text, the MLA and local residents should bring this to the attention of the District. The District may then calculate a threshold value for this area, or classify it as over-threshold. The $[TP]_{epi}$ reported here should be similar to the $[TP]_{so}$; if large or systematic discrepancies occur, there may be an unnatural influence sometime during the summer and further investigation is warranted.

E.Coli & Total Coliform Scale

The primary y-axis on the 2008 Results graph is in units of counts/100mL.

Expected Ranges

Expected ranges shown on graphs are based on the water quality data collected as part of the WQI monitoring program between 2002 and 2008.

Minimum expected *E.Coli* and Total Coliform are equal to the six-year geometric mean *E.Coli* and Total Coliform readings from the three nearshore undeveloped reference sites located in East Bay, Lake Muskoka respectively. Maximum expected *E.Coli* and Total Coliform are 10 counts/mL and 100 counts/mL respectively, equal to the "MLA Water Quality Objective" defined in previous years.

Expected ranges for turbidity are different for deep water and nearshore monitoring sites. In both cases, the minimum expected turbidity is the six-year arithmetic mean of the corresponding deep water or nearshore turbidity from the undeveloped reference sites in East Bay, Lake Muskoka. The maximum expected turbidity is equal to the minimum expected turbidity plus the two times the six-year standard deviation for the corresponding reference sites.

No expected range for secchi depth has been calculated due to lack of data.

In all cases, reported averages should fall within the expected range. If the value falls below the expected range, water quality at that site is better than the undeveloped reference sites and there is no concern. If the value falls above the expected range, there may be a concern. Further investigation should be made if values fall above the expected range for multiple consecutive years. In this case, the explanatory text will indicate that there may be a problem to investigate.

Maps

Maps appearing on summary pages show all monitoring sites documented. Not all sites were monitored in 2008. If not all sites were monitored, monitored sites are listed in the page's preamble. Small, yellow markers indicate nearshore sites, whereas larger markers with a black dot indicate deep water sites. Green large markers indicate that a sample area is healthy. Yellow large markers indicate that WQI data suggests the sample area is over-threshold for phosphorus concentration. Red large markers indicate that the sample area is officially designated by the District of Muskoka as over-threshold. Maps are not to scale.

Natural Phosphorus

The "Natural" phosphorus concentration is the baseline concentration calculated by the District of Muskoka to represent the expected phosphorus concentration within the lake or bay without any development.

Phosphorus Threshold

The "Threshold" phosphorus concentration is 50% more than the baseline concentration, and is the threshold calculated by the District of Muskoka to classify lakes and bays as suitable for a higher level of development control as a precautionary action to protect the long-term health of the lake.

Ranks

46 sample areas were monitored in 2008. A rank reported on a summary page as "16/46" indicates that this sample area was 16th best (lowest bacteria count; clearest) out of 46 sample areas monitored for that parameter. Water clarity is reported as a rank out of 46.

Sampling Area

This title indicates which sampling area (e.g. bay, lake) is summarized.

Site-by-site Average Phosphorus

Some summaries include a third graph entitled "2008 [TP] Results – Sampling Area." This graph and text is included when phosphorus concentration is collected in the nearshore zone. Reasons for collecting nearshore phosphorus concentration may include the investigation of sources of phosphorus loading in an over-threshold lake or bay or proximity to known sources of phosphorus loading such as a golf course or major construction site. If included, the graph shows total phosphorus concentration in µg/L (y-axis) for each nearshore site where phosphorus data was collected (x-axis). This graph is accompanied by brief explanatory text.

Phosphorus concentration shown is the arithmetic mean of all phosphorus concentrations reported for each site. These results are plotted against the natural and threshold levels calculated by the District of Muskoka, which provide a context for concentrations to be expected, even though nearshore averages are not directly related to natural or threshold levels. If one or more sites have concentrations that are significantly higher than the threshold value or the other sites, sources of phosphorus loading around that site should be investigated.

Spring Turnover Phosphorus

The spring turnover total phosphorus concentration ($[TP]_{so}$) shown is the value of sample number 1 for each year, and is comparable to the concentration that the District of Muskoka uses to classify lakes for planning and development purposes and is shown in pink.

Unexpected Standard Deviations

Expected standard deviations (see glossary) for *E.*Coli, Total Coliform and clarity (turbidty and secchi depth) were calculated based on the water quality data collected as part of the WQI monitoring program between 2002 and 2008. If the standard deviation of a one-year set of results from one site exceeds twice the six-year standard deviation of the undeveloped reference sites at East Bay, Lake Muskoka, the result is circled on the graph.

High standard deviations may indicate an unnatural influence on bacteria or clarity levels at a particular site. Further investigation should be made if values fall above the expected standard deviation for multiple consecutive years. In this case, the explanatory text will indicate that there may be a problem to investigate.

Glossary

Arithmetic mean: This type of average is calculated by adding together a group of numbers and dividing the sum by the number of numbers.

Clarity: Water clarity is influenced both by dissolved and suspended matter. Clarity often indicates a lake's overall water quality, especially the amount of algae present. Algae are natural and essential, but too much of the wrong kind can cause problems (http://www.dnr.state.wi.us/org/water/fhp/lakes/under/wclarity.htm).

***E.Coli*:** Fully known as *Escherichia Coli,* it is a subset of total coliforms, and is exclusively associated with faecal waste (Schiefer, 2001) making it a good indicator of faecal contamination. There are several different strains of *E.Coli*; most waterborn strains are themselves not harmful, but some (such as *E.Coli* O157:H7) can cause serious illness (OMH, 2001). For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes/waterquality.php#bact.

Geometric Mean: This type of average is calculated by multiplying together a group of n numbers and then taking the n^{th} root of the resulting product. Geometric mean is used to indicate the central tendency or typical value of a set of numbers (http://en.wikipedia.org/wiki/Geometric_mean). It is typically used to calculate average bacteria counts because as a living organism, bacteria counts are highly sporadic and inconsistent.

Phosphorus: Phosphorus is a component of DNA and RNA and an essential element for all living cells (http://en.wikipedia.org/wiki/Phosphorus). It is found in fertilizers, soaps, and in human waste. Typically phosphorus is not removed from waste streams by conventional private treatment systems (septic systems) or by some municipal treatment systems.

Lakes on the Canadian Shield are typically oligotrophic, meaning poor in nutrients. Phosphorus is usually the limiting nutrient, that is, phosphorus is in short supply so every bit of phosphorus added to the lake system is directly used to create biological matter such as algae. This makes phosphorus the most important indicator of human-based environmental impacts on our lakes. For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes/waterquality.php#eutro.

Sampling Area: A geographic location named in supporting documentation and encompassing a group of sites.

Secchi Depth: An expression of water clarity, measured using a secchi disk - a small disk attached to a rope. Alternating quarters of the top side of the disk are coloured white and black. The secchi depth is the depth of water whereby the sampler can no longer distinguish the white and black quarters of the disk.

Site: The discrete and unique location as identified in supporting documentation where samples are to be collected on each sample date.

Spring Turnover Phosphorus $[TP]_{so}$: A single phosphorus concentration measurement taken in a stratified lake during the spring turnover period. This measurement has been shown to adequately represent the overall phosphorus concentration in a lake. Typically the spring turnover lasts for a few days when the surface water reaches 4˚C and the entire water column is able to mix. In practice, measurements taken anytime in May are considered to be adequate by Ontario's Ministry of the Environment (http://www.ene.gov.on.ca/envision/water/lake_partner/index.htm).

Standard Deviation: The most common measure of statistical dispersion, measuring how widely spread the values in a data set are (http://en.wikipedia.org/wiki/Standard_deviation). The smaller the standard deviation, the more consistent and predictable are the numbers making up a data set. In the WQI, a large standard deviation within a year suggests that water quality is much different at different times throughout the sampling period, which could mean that specific conditions or influences are affecting water quality at a given site over the course of the season.

Total Epilimnetic Phosphorus $[TP]_{epi}$: The arithmetic mean of phosphorus concentration measurements taken above a stratified water column's thermocline over the ice-free period. Average phosphorus concentration as reported by the WQI is not a true $[TP]_{epi}$ as samples are not collected over the entire ice-free period.

Total Coliform: Coliform include a variety of bacteria. In practice, detectable coliform are usually enteric, found in the intestinal tracts of humans and other warm-blooded species. For more information, please see http://www.citizensenvironmentwatch.org/wqi/muskoka_lakes/waterquality.php#bact.

Turbidity: The cloudiness of a liquid (in this case lake water) caused by suspended particles. Turbidity is reported in Nephilometric Turbidity Units (NTU), an accurate measurement of the dispersion of light shone through the water column.