The State of Hamilton County Lakes

A Statistical Analysis of Water Quality Trends

1993-2003

"A lake is the landscape's most beautiful and expressive feature. It is the earth's eye"
--Henry David Thoreau

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ACKNOWLEDGEMENTS

The Soil and Water Conservation District would like to take this opportunity to thank a few of the many people who have made this program and report possible:

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* Hamilton County Soil & Water Conservation District past/present Board of Directors
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* Michael Martin, president of Cedar Eden Environmental, LLC. for his analysis and preparation of data for this report.
* And especially all the private citizens of this county who have provided equipment, boat launches, and support throughout the years.

The collecting of data, analyzing, writing and editing of this report has been accomplished with the hard work of the following past and present staff of the Hamilton County Soil & Water Conservation District with special acknowledgments to: Candace Ambrosino, Alex Chaucer, Del Cook, Leonard Croote, Ian Drew, Megan Faville, Laura Flanagan, Kevin Hanley, Elizabeth Mangle, Kevin McCarthy, Casey Michasiow, Janice Reynolds and Caitlin Stewart *.

* Cover photo provided by: Caitlin Stewart

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INTRODUCTION

Water is necessary for life, not only for the physical health of Hamilton County, but also for our economic well being. The Thoreau quote once described water bodies as "…the Earth's eye." This is fitting to the situation here. Many of us are drawn to this area because of the abundance of water. Some prefer to paddle canoes, some fish, some like to water ski, others to swim or just gaze at the sparkling reflection of sunlight as it dances across the tops of the waves. Whatever the reason, this attraction to the water has resulted in residential development along the waters edge. While we enjoy the beauty of our lakes, keep in mind that we cannot let the rhythm of the wind swept waves lull us into a false sense of security that these waters are unchanging, healthy and clean. Over the past few decades, industry has developed increasingly complex chemicals used in manufacture and medicines. We have yet to realize the possible side affects these advances may bring to the environment. Regulations on emissions from cars, smokestacks and pipes have been increasing, but the timing of putting controls into effect falls behind the timing of the pollution. It is our duty to keep an eye on our impacts. We need not be remembered as the generation that despoiled our greatest asset.

Report Organization

This report has been organized to first present the history of the water monitoring program and methodologies used to help prepare the reader as to the scope and presentation.

The next section is the statistical analysis of water quality trends in Hamilton County Lakes 1993-2003, as prepared by Michael Martin, CLM of Cedar Eden Environmental LLC (Saranac Lake, NY). The Hamilton County Soil & Water Conservation District has added certain supplemental information for each lake to the statistical analysis section. This report closes with appendices, glossary and references.

> *This entire document is available to be downloaded from our website, www.hamiltoncountyswcd.com, in the Adobe PDF format. You may contact the Hamilton County Soil and Water Conservation District and make arrangements to obtain a copy on CD. Contact the Hamilton County Soil & Water Conservation District office if you have any questions.*

History

Recognizing the need to protect our vital water resources, the Hamilton County Board of Supervisors contracted with the Hamilton County Soil and Water Conservation District in 1993 to conduct a comprehensive water-monitoring program.

With great foresight, the elected officials of Hamilton County decided to keep an eye on the quality of water within their political boundary. This monitoring program follows efforts dating back to the mid-seventies when public management of septic systems became a necessary reality. Increasing development along shorelines and inadequate septic systems were beginning to take their toll on lake water quality. People began to take notice and the County and State took action. Local Law # 1 of 1976 was signed into effect and stated that no sewage could be discharged into the waters of Hamilton County. The enforcement of this law was in everyone's best interest and had a measurable impact on water quality.

Looking back at historical data our present water quality is now closer to data collected in the 1930's than data collected in the 1970's. Changes in lake water quality are expected over time, but they are supposed to happen over geologic time not within 20 years. In this case the change was positive due to the foresight of the local officials. Much is still unknown about the effect of lakefront and watershed growth, highway runoff and even acid precipitation. The monitoring program is in place to detect these changes.

In the beginning, the water-monitoring program had limited resources and equipment. The effort was admirable and relied on volunteers, like Jay Cummings of Raquette Lake and Bob Dechene Sr., to ferry the water monitoring crew out to the sampling locations where the 6 hp outboard on the water monitoring boat would prove to be inefficient.

In 1996, the Hamilton County Soil and Water Conservation District became a member of the Finger Lakes-Lake Ontario Watershed Protection Alliance. State funds are allocated to this group to further water quality efforts in the Finger Lakes and Lake Ontario watersheds. Funds are divided equally among the twenty-five member counties. In 1997, we received the first check and were able to hire additional staff, upgrade computers, equipment, new water monitoring boat and a pro-environmental (4 stroke) 25 hp outboard motor. We have continued to receive this vital funding allowing us to further our mission.

Purpose

The purpose of the water-monitoring program is to collect and record data over an extended period and keep a watchful eye out for any changes. This is called baseline data collection. The standard minimum period necessary to collect baseline data before analyzing for long-term trends is currently considered ten years.

We now have eleven years of data. Within our sampling years, we have had some strange weather, which invariably will increase the time necessary to reduce the "noise" caused by such events so that we might "hear" more clearly what the lakes are trying to tell us. With these facts in mind, please read this report carefully. The data set presented here comprises an eleven-year effort, yet is still considered young and full of "noise" that can only be sorted out by continuing to monitor the water quality over time. Instead of jumping to conclusions that the sky is falling or that all is fine, enjoy instead an insight into what lies ahead in our understanding of the water quality of lakes in Hamilton County.

Lakes are dynamic and complex ecosystems, and each one is different. We will often refer to the water quality of a lake compared to the overall average water quality of Hamilton County. The purpose of this is for reference only and comparison of trends. A little knowledge can be dangerous, and we caution you not to try to draw conclusions that aren't based on statistical analysis.

This report has been designed to be readable while providing a vast amount of technical support information. Realizing that definitions for each technical term would make the report cumbersome, a glossary of terms has been included in the appendix instead. Please refer to the glossary for definitions.

With that in mind we present to the people of Hamilton County this report on "The State of Hamilton County Lakes an Analysis of Water Quality Trends 1993-2003."

METHODOLOGY

Lakes are complex systems containing plants and animals, which interact in an environment created and impacted by geology and geography. The most extensive and expensive studies cannot completely account for all conditions within the lake. By looking at some basic chemical, physical, and biological properties, however, it is possible to gain a greater understanding of the general condition of a lake. The methodology of studying lakes has come from years of research and statistical modeling. Thanks to the effort of researchers, we are better able to understand and classify our lakes so that we have an even better understanding of our lakes and any changes that might occur.

The lakes involved in the study were chosen by the Hamilton County Board of Supervisors except for Fawn Lake in Lake Pleasant which was chosen for inclusion as a control since it has no development within it's watershed. A lake will remain in the study for a minimum time frame of five years before another lake can be "appointed" for monitoring in its place. To date the Soil and Water Conservation District has collected water quality data on 22 lakes and 19 of the 22 have been studied for all eleven years of the data set discussed in this report.

The following lakes have been involved in the study:

Lake	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Blue Mountain Lake	x	x	x	x	x	x	x	x	x	x	x
Eighth Lake	x	x	x	x	x	x	x	x	x	x	x
Fifth Lake	x	x	x	x	x	x	x	x	x	x	x
Fourth Lake	x	x	x	x	x	x	x	x	x	x	x
Indian Lake	x	x	x	x	x	x	x	x	x	x	x
Lake Adirondack	x	x	x	x	x	x	x	x	x	x	x
Lake Algonquin	x	x	x	x	x	x	x	x	x	x	x
Lake Durant	x	x	x	x	x	-	-	-	-	-	-
Lake Eaton	x	x	x	x	x	x	x	x	x	x	x
Lake Pleasant	x	x	x	x	x	x	x	x	x	x	x
Limekiln Lake	x	x	x	x	x	x	x	x	x	x	x
Long Lake	x	x	x	x	x	x	x	x	x	x	x
Morehouse Lake	x	x	x	x	x	x	x	x	x	x	x
Oxbow Lake	x	x	x	x	x	x	x	x	x	x	x
Piseco Lake	x	x	x	x	x	x	x	x	x	x	x
Raquette Lake	x	x	x	x	x	x	x	x	x	x	x
Sacandaga Lake	x	x	x	x	x	x	x	x	x	x	x
Seventh Lake	x	x	x	x	x	x	x	x	x	x	x
Sixth Lake	x	x	x	x	x	x	x	x	x	x	x
Spy Lake	x	x	x	x	x	x	x	x	x	x	x
Fawn Lake (control)	-	-	-	-	x	x	x	x	x	x	x
Lake Abanakee	-	-	-	-	-	x	x	x	x	x	x

("x" indicates the test that were preformed during that year)

At the request of the town of the Indian Lake Supervisor, Lake Durant was dropped from the sampling program schedule after a minimum 5 years of data had been collected. The removal of Lake Durant allowed for the addition of Lake Abanakee (designated a higher priority waterbody) to the lake monitoring schedule.

The water monitoring crew currently launches the water monitoring boat on all but one of these lakes once a month during the months of May to October. State law does not permit motor vehicle access to Fawn Lake. In order to sample Fawn Lake, the water monitoring crew hikes into the lake with a canoe full of equipment on a boat cart.

Standard limnological sampling protocol when gathering general water quality information for a large water body is followed for the water-monitoring program. In order to collect the most representative water quality data for a lake, while minimizing variation from boat traffic, recent rainfall, shoreline activities, and thousands of other variables, water samples are best collected from the deepest part of the lake. The deepest location of the lake has the greatest volume and therefore, represents the most stable water quality. The best picture of the overall water quality of a lake can be painted from data collected in this area. As the water quality data collected will not represent the water quality of each individual bay, any changes to water quality in those bays will eventually impact the overall water quality and be seen in analysis of the water quality data.

To travel to all the lakes in the study and collect samples takes about a week and a day. When you add the time in the laboratory for analysis and the computer data entry and management the entire process takes two to three weeks of time for two staff members.

The Hamilton County water-monitoring program as administered by the Soil and Water Conservation District takes into account chemical, physical and biological parameters. The core parameters that have been sampled for over the entire six years include: secchi disk transparency, pH, alkalinity, total phosphorous, nitrates, temperature and dissolved oxygen. Since our inclusion in the Finger Lakes-Lake Ontario Watershed Protection Alliance, we have added the following parameters: aluminum, calcium, and chlorophyll *a*. Water samples are collected with a bomb sampler or a Kemmerer bottle and brought back to the laboratory in a cooler for analysis for some of the parameters. Other parameters are more easily measured in the field. Equipment for measurement in the field will be described with the parameter specifically being tested.

Data exists for the following parameters in the laboratory data set:

Year	pH	Alk	Nit	Phos	DO	Temp	Secchi	Chl-a	Ca*	Al*
1993	x	x	x	x	x	x	x	-	-	-
1994	x	x	x	x	x	x	x	-	-	-
1995	x	x	x	x	x	x	x	-	-	-
1996	x	x	x	x	x	x	x	-	-	-
1997	x	x	x	x	x	x	x	x	-	-
1998	x	x	x	x	x	x	x	x	x	x
1999	x	x	x	x	x	x	x	x	x	x
2000	x	x	x	x	x	x	x	x	x	x
2001	x	x	x	x	x	x	x	x	x	x
2002	x	x	x	x	x	x	x	x	x	x
2003	x	x	x	x	x	x	x	x	x	x

Note: Samples were also collected during the winter of 1997-1998 on some of the lakes for all 10 parameters.

Transparency (Secchi)

Transparency is measured with a secchi disk, which is a circular plastic disk that is divided into quarters and painted alternately white and black. The disk is lowered into the water until it can no longer be seen and the depth is recorded, then the disk is raised until it returns to view and the depth is recorded. The average of these depths is then recorded as the secchi reading.

The secchi disk transparency relates directly to the depth of the photic zone within a lake. At two times the depth where the secchi disk can no longer be seen, there is only one percent of the light that penetrates the surface of the lake remaining. This is important to the plants of a lake whether rooted, or planktonic like algae or phytoplankton.

Since the depth of light penetration corresponds to particulate matter in the water, the secchi disk transparency is also a measure of the amount of plankton and algae in the water column. Plankton and algae populations are linked to nutrient levels and therefore, secchi disk transparency can be used as a measure of a lake's productivity. Since one simple measurement can provide a wealth of information, the secchi disk is a valuable tool in water quality monitoring.

The Soil & Water Conservation District provides secchi disks to volunteers who want to monitor their own lake.

pH

Measurements of pH are taken to compare lake water to neutral on a 14-point logarithmic scale where pH 7.0 is neutral. A pH less than 7.0 is acidic and a pH greater than 7.0 is basic. Since the scale is logarithmic, a pH change of one point represents a change of ten in the number of hydrogen ions, which determine a liquid's acidity or alkalinity. In plain terms, pH 7 is neutral, pH 5 is approximately 10 times

more acidic than pH 6, pH 4.0 is approximately 100 times more acidic than pH 6.0 and so on. For the purpose of water quality monitoring, pH is important as a measure of a lake's natural state and a measure of any impact of acid rain. The measurement is taken by dipping a probe into water and recording the measurement. For the first five years, the Soil and Water Conservation District used an Orion pH meter and recently switched to a Yellow Springs Instrument (YSI) multi-probe. Both are low ionic strength probes acceptable for measuring waters typical in Hamilton County. The YSI multi-probe gives us the ability to record a pH profile in one-meter increments from the water surface to one meter from the lake bottom. The Orion instrument was limited to a one-meter water sample depth.

Alkalinity (Alk)

Alkalinity is a measurement of the ability of a substance to buffer or neutralize acid. If a lake has a high enough alkalinity, acid rain will not cause the pH of the water body to drop. Inorganic carbon is present in the water column as carbon dioxide (CO_2), bicarbonate (HCO_3^-), and carbonate (CO_3^{2-}). The ever-changing levels between these various forms, is the major pH buffering system for lakes. The underlying geology of a watershed will determine the natural levels of these compounds and each lake will have a unique normal alkalinity. Once a lake's buffering capacity is used up, the lake will become acidic because since acid rain will continue to fall and more easily influence the pH of the lake.

The Hudson Headwaters River Watch Program method is used for testing alkalinity. A digital titrator and the Orion pH meter are used to slowly add acid to a sample of lake water until the pH reaches 4.5. The amount is recorded in digits, more acid is added until the pH reaches 4.2, and the digits are recorded. The digits to 4.5 are multiplied by 2 and the digits to 4.2 are subtracted. This number is multiplied by 0.1 and the result is alkalinity in mg/L.

The following table is used to rank lakes by their alkalinity:

≤0 * mg/L:	Acidified * - and pH less than 5.0
0-2 mg/L:	Critical
2-5 mg/L:	Endangered
5-10 mg/L:	Highly Sensitive
10-20 mg/L:	Sensitive
>20 mg/L:	Not Sensitive

Total Phosphorus (Phos)

Excess concentration of the nutrient phosphorus is the most common cause of water quality problems in New York. However, some phosphorus is essential as a nutrient for plant growth and as a fundamental element in the metabolic reactions of both plants and animals. In New York, phosphorus is the nutrient that most often controls productivity of lake systems. It is often considered the "limiting" nutrient in NYS lakes, since growth is "limited by the amount of phosphorous". In other words, any addition of phosphorous to a lake system would result in more growth. Therefore, many lake management plans are centered on phosphorus controls.

Phosphorus is perhaps the most frequently sampled nutrient in any water-monitoring program. Total phosphorus is a measure of all forms of phosphorus, both organic and inorganic. Total phosphorus concentrations are often directly related to the trophic condition of a lake. Excessive amounts of

phosphorus lead to algae blooms and loss of oxygen in lakes. Epilimnetic total phosphorus concentrations less than 10 micrograms per liter (µg/L) are associated with oligotrophic conditions and concentrations greater than 25 µg/L are associated with eutrophic conditions.

Total phosphorus was tested using a HACH DR/3000 spectrophotometer from 1993-98, which only had a minimum detection limit of 0.010 µg/L +/- 0.010 µg/L. With the purchase of a HACH DR/4000 in 1998, it allowed a lower detection limit of 0.0001-µg/L +/- 0.001 µg/L to receive results that are more accurate. The EPA approved Acid Persulfate Digestion Method test to hydrolyze condensed phosphate forms to reactive orthophosphates. This procedure is followed by an EPA-approved reactive phosphorus (orthophosphate) analysis method (low range 0-0.2 mg/L PO4) test, known as the ascorbic acid (PhosVer 3) method (standard method 425F), to determine the phosphorus concentration in the sample.

Nitrate (Nit)

Nitrogen is much more common than phosphorus so it rarely limits plant growth. Nitrate is an inorganic form of nitrogen that occurs naturally. Ammonia is oxidized biologically to nitrate, the final oxidation state of nitrogen compounds. Plants use nitrate as a nutrient source, but water bodies are not as sensitive to additions of nitrates as they are to phosphorus. In the form of ammonia and nitrates, nitrogen contributes to lake eutrophication. In addition, nitrates are a component of atmospheric pollution and elevated concentrations in lakes and ponds may be associated with acidification. Elevated concentrations of nitrate may also be indicative of wastewater pollution.

> *Nitrate, a form of nitrogen, is an element needed by all living plants and animals to build protein. Nitrogen is one of the three main nutrients of life, along with phosphorus and carbon. In aquatic ecosystems, nitrogen is present in many forms. It is commonly found in its molecular form (N2), which makes up 79 percent of the air we breathe. This form, however, is useless for most aquatic plant growth. Colorimetric analysis was utilized to determine nitrate levels. From 1993-98, a HACH DR/3000 spectrophotometer was used to measure nitrate levels using a low range (0-0.50 mg/L NO3 –N) test. Now with the HACH DR/4000 spectrophotometer, nitrate levels can be read to 0.001-mg/L +/- 0.01 mg/L.*

Dissolved Oxygen (DO)

The amount of oxygen dissolved in a lake can be related to many different factors, and it can provide a useful tool in understanding organic production and decomposition. The main source of oxygen for all aquatic ecosystems is the atmosphere. Much of this atmospheric oxygen readily enters the water when mixing occurs, such as through wave action. Additional oxygen is released during photosynthesis. Hence, higher levels of dissolved oxygen are found in the photic zone and lower levels are found deeper in the water. Since sunlight is needed for photosynthesis at night. The photosynthesis and dissolved oxygen production stops. Plants and animals continue to consume oxygen through respiration at night including bacteria in lake sediment. In the morning dissolved oxygen levels are the lowest.

> *Most aquatic plants and animals require dissolved oxygen for survival. Certain fish require high levels of oxygen to survive, such as trout and pike. Other aquatic organisms, such as carp and catfish, exist in waters of low dissolved oxygen. Some Hamilton County lakes may experience*

anoxic (low oxygen levels) conditions within the bottom few meters during portions of the summer. Phosphorus is released from the bottom sediments during anoxic conditions. Fish can cope with these changes in oxygen by moving up the water column in the lake where they are able to get the oxygen they need, but may be pushed into areas with less desirable temperatures. However, over time, depletion in dissolved oxygen can cause major changes in the aquatic organism populations. Those species that are able to tolerate the low levels may replace species that cannot tolerate low oxygen levels. Dissolved oxygen readings are taken with a YSI multi-probe at one-meter intervals.

Chlorophyll a (Chl-a)

Chlorophyll a is the primary photosynthetic pigment found in green plants, and measuring it provides information on the amount of algae in lakes. Chlorophyll a is the only form of algae that can pass electrons, excited by light energy, to produce chemical energy in photosynthesis. In some eutrophic lakes, most chlorophyll is contained in large clumps of blue-green algae. Other phytoplankton is dispersed throughout the water as individuals or short filaments. Chlorophyll a concentrations can be used to classify a lake's trophic state. Chlorophyll a levels directly correlate with phosphorous and secchi disk readings and can be used to cross check data sets and to determine a lake's trophic level. Chlorophyll a concentrations less than 2 micrograms per liter (µg/L) are associated with oligotrophic conditions, while concentrations greater than 8 µg/L are associated with eutrophic conditions. Water samples are collected by the Soil and Water Conservation District and taken to a contracted outside lab for analysis.

Calcium (Ca*)

Calcium is one of the buffering materials to acidity that occurs naturally. It is often in short supply in Adirondack lakes and ponds, making these bodies of water susceptible to acidification by acid precipitation. A measure of the amount of calcium in a lake provides additional information on the buffering capacity of that lake, and can assist in determining the timing and dosage for acid mitigation (liming) activities. Adirondack lakes containing less than 2.5 mg/L of calcium are considered sensitive to acidification. Calcium is also important to the development of mollusks, especially such as Zebra Mussels. Low calcium levels may keep invasive mollusks, such as Zebra Mussels, from establishing themselves in our lakes. Water samples are collected by the Soil and Water Conservation District and taken to a contracted outside lab for analysis.

Aluminum (Al*)

Aluminum is one of the most abundant elements found in the earth's crust. Acid rainwater leaches the aluminum from the soils, where it then may flow into nearby streams and lakes. Aluminum is also deposited through atmospheric deposition. If a lake becomes acidified, Aluminum may be leached from the sediments in the bottom of the lake as well. Elevated concentrations of aluminum can be toxic to fish in acidified water bodies, depending on the type of aluminum available, the pH, and the amount of dissolved organic carbon available to bind inorganic aluminum. Values are reported as mg/L of total dissolved aluminum. Water samples are collected by the Soil and Water Conservation District Water and taken to a contracted outside lab for analysis.

Aluminum levels over 200 mg/L in waters with a pH less than 6.2 are toxic to fish. At these levels, an aluminum ion precipitates on the fish's gills and interferes with mineral transfers between the blood and water. The fish then produces mucus to remove the toxic aluminum ions from the gills, but this also prevents an efficient transfer of oxygen. The build up of mucus does not allow proper ion transfer between the fish and the water and eventually causes respiratory stress and an imbalance of blood minerals that kills the fish.

Statistical Analysis

Raw sample data for analysis were provided by the Soil and Water Conservation District in digital form (spreadsheets and database files) to Cedar Eden Environmental, LLC.

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PART TWO

A Statistical Analysis of Water Quality Trends In Hamilton County Lakes 1993 - 2003

Prepared for:
Hamilton County Soil & Water
Conservation District

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April 2005

Introduction

The Hamilton County Soil & Water Conservation District has been conducting an ambitious water quality monitoring program of county lakes since 1993. This report presents a statistical analysis of the data collected from 1993 through 2003. The report contains a section that discusses lake trends across the county using a combined water quality data set. In addition, the report examines trends in each lake.

Methodology

Data for these analyses were provided by the Hamilton County Soil & Water Conservation District in digital form (spreadsheets and database files). All data were assumed to be correct and were generally used as is. Corrections were made to data where obvious outliers were observed and a decimal or place error appeared to have been made during data entry. Climate data was extracted from National Climatic Data Center records. Graphical and statistical analyses were prepared using SigmaPlot 8, SigmaStat 2, and Excel 2002. Seasonal averages for each year consist of all data from May through October. Error bars shown represent the 95% confidence intervals for the data. References to "county average" values refer strictly to the lakes in the SWCD program.

The statistical analyses in this section are based upon comparisons of annual datasets gathered from selected lakes in Hamilton County. For each parameter, the datasets from each lake were combined for each year. Descriptive tests were performed to determine basic statistics, and to analyze for skewness, kurtosis and normality. One Way Analysis of Variance (One Way ANOVA) and Pairwise Multiple Comparison Procedures were run to test for significant difference between years and to isolate those years that significantly differ from others.

Units of measure

Results are often presented as concentrations in milligrams per liter (mg/L) or its equivalent of parts per million (ppm) and micrograms per liter (µg/L) or its equivalent of parts per billion (ppb).

1 mg/L = 1 ppm; 1 µg/L = 1 ppb, 1 ppm = 1,000 ppb
0.020 mg/L (ppm) = 20 µg/L (ppb)

Countywide Trends

Climatic Conditions

The annual mean maximum and minimum temperatures from the NCDC weather station at Indian Lake, NY are presented in Figure 1. The annual mean maximum and minimum temperatures for 1993-2003 exhibit a slight warming trend beginning in about 1995, followed by stable temperatures until about 2001 or 2002, when the mean temperatures began to lower.

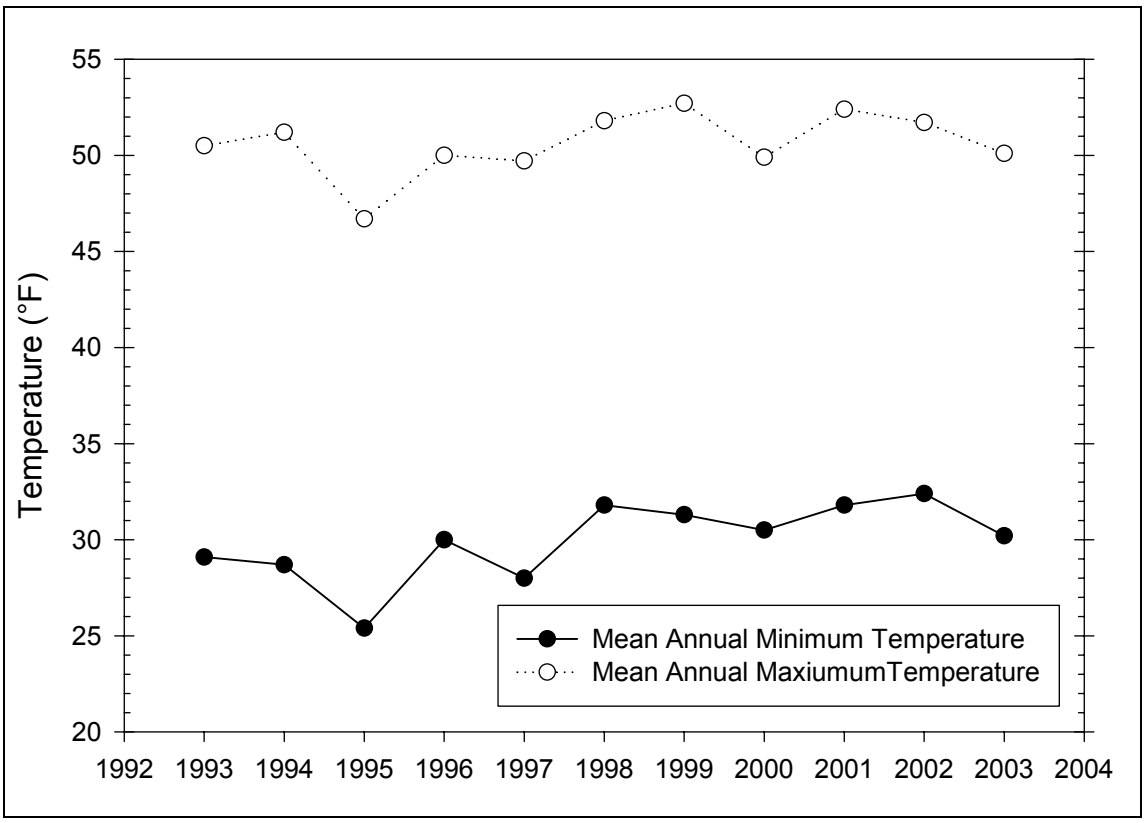

Figure 1 Mean annual minimum and maximum temperature trend at Indian Lake

The seasonal mean daily maximum and minimum temperatures (May through September) for 1993 through 2003 are presented in Figure 2. The seasonal mean daily minimum temperatures exhibited a warming trend beginning in 1998, while the seasonal mean daily maximum temperatures were relatively stable throughout the period.

The annual precipitation and long term average precipitation for the Indian Lake NCDC Station are presented in Figure 3. The long term average precipitation for the period of record (1948 – 2003) was about 39 inches of precipitation per year. In the 1990s to present, wet years appeared to alternate with dry years, and there appears to be a slight trend for increasing wetness overall. For the study period, the following years exhibited lower than average precipitation: 1993, 1995, 1997 – 1999 and 2001. Higher than average precipitation occurred in 1996 and 2000.

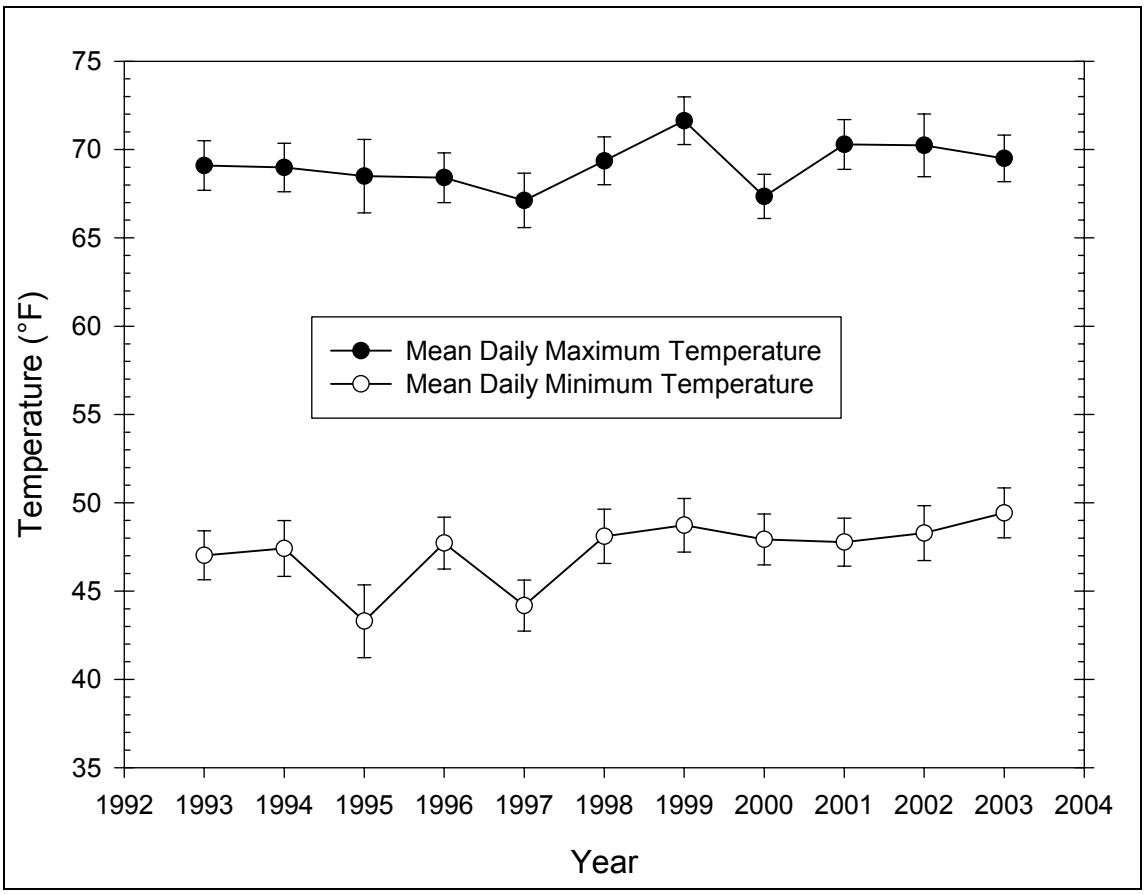

Figure 2 Seasonal mean daily minimum and maximum daily temperature trend at Indian Lake

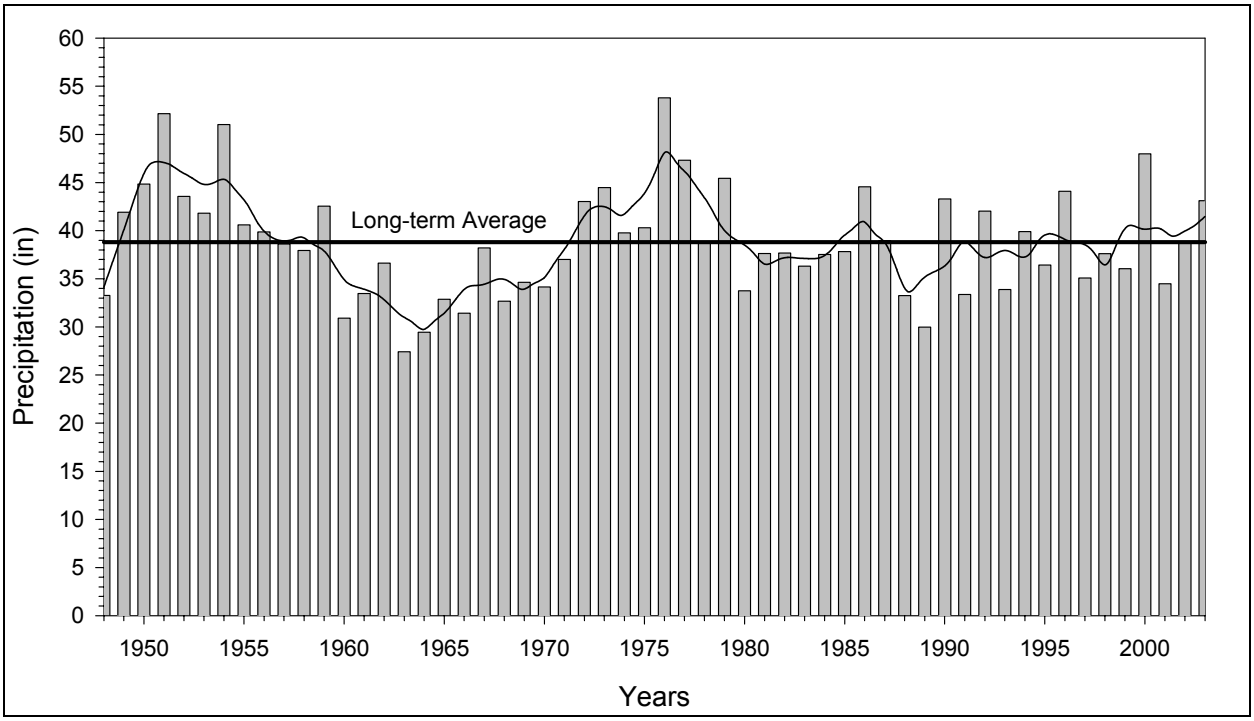

Figure 3 Annual precipitation, long-term average precipitation, and smoothed precipitation trend at Indian Lake

Temperature and Dissolved Oxygen

The amount and distribution of dissolved oxygen in a lake ecosystem can affect the health of aquatic organisms and nutrient cycles. For normal growth and reproduction, adult warm water fish (i.e. bass and pike) require oxygen concentrations of at least 5.0 milligrams per liter (mg/L), and adult cold-water fish (i.e. trout and salmon) require at least 6.5 mg/L of dissolved oxygen (US EPA 1986). Lakes receive most of their oxygen from the atmosphere through gas exchange at the surface. In deeper lakes that stratify, the cold bottom water (hypolimnion) is isolated from the oxygen entering the upper water (epilimnion). If the lake sediments are rich in organic matter, bacterial decomposition uses up the oxygen in the bottom waters and the hypolimnion becomes anoxic (without oxygen). If this occurs, cold water fish habitat is lost, and phosphorus within the sediments may be released into the overlying water.

A countywide mean temperature and dissolved oxygen trend was not determined since the lakes vary so widely in size and morphology. Minimum dissolved oxygen concentrations were examined for all lakes, as was minimum and maximum temperature. In lakes that stratified, the minimum dissolved oxygen concentration would likely occur in the hypolimnia during the summer months, as would minimum water temperatures, while maximum water temperatures would occur near the surface. Low DO values were removed from this analysis in cases where the low DO values were likely caused by sinking the probe into the sediments (for example, one extremely low reading at the bottom below all high readings).

Most of the county lakes exhibited their lowest DO values during the months of August – September, and nearly all lakes exhibited near anoxic conditions at least at the sediment-water interface if not throughout the hypolimnion. Lakes with minimum DO values of greater than 2 mg/L include Piseco Lake (2.7 mg/L), Seventh Lake (4.1 mg/L), Lake Abanakee (5.5 mg/L), and Lake Algonquin (6.0 mg/L).

The maximum temperature in the lakes ranged from 23.5°C to 26.3°C, while the minimum temperature ranged from 4.0°C to 11.5°C. The greater range on minimum temperatures is due to the difference in lake depths, since some lakes were only several meters deep while others were 30 meters deep or more.

pH

The pH level is a measure of acidity (concentration of hydrogen ions in water), reported in standard units on a logarithmic scale that ranges from one to fourteen. On the pH scale, seven is neutral, lower numbers are more acid, and higher numbers are more basic. In general, pH values between 6.0 and 8.0 are considered optimal for the maintenance of a healthy lake ecosystem. Many species of fish and amphibians have difficulty with growth and reproduction when pH levels fall below 5.5 standard units. Lake acidification status can be assessed from pH as follows:

pH less than 5.0	Critical (impaired)
pH between 5.0 and 6.0	Endangered (threatened)
pH greater than 6.0	Satisfactory (acceptable)

The pH trend for the Hamilton County lakes is shown graphically in Figure 4. Descriptive statistics for the pH data set is presented in Table 1. Hamilton County lake pH declined from 1993 to 1995, followed by a significant increase from 1996 until 1999. The pH of Hamilton County lakes appears to have stabilized since 1999, with some evidence that pH is still increasing slightly.

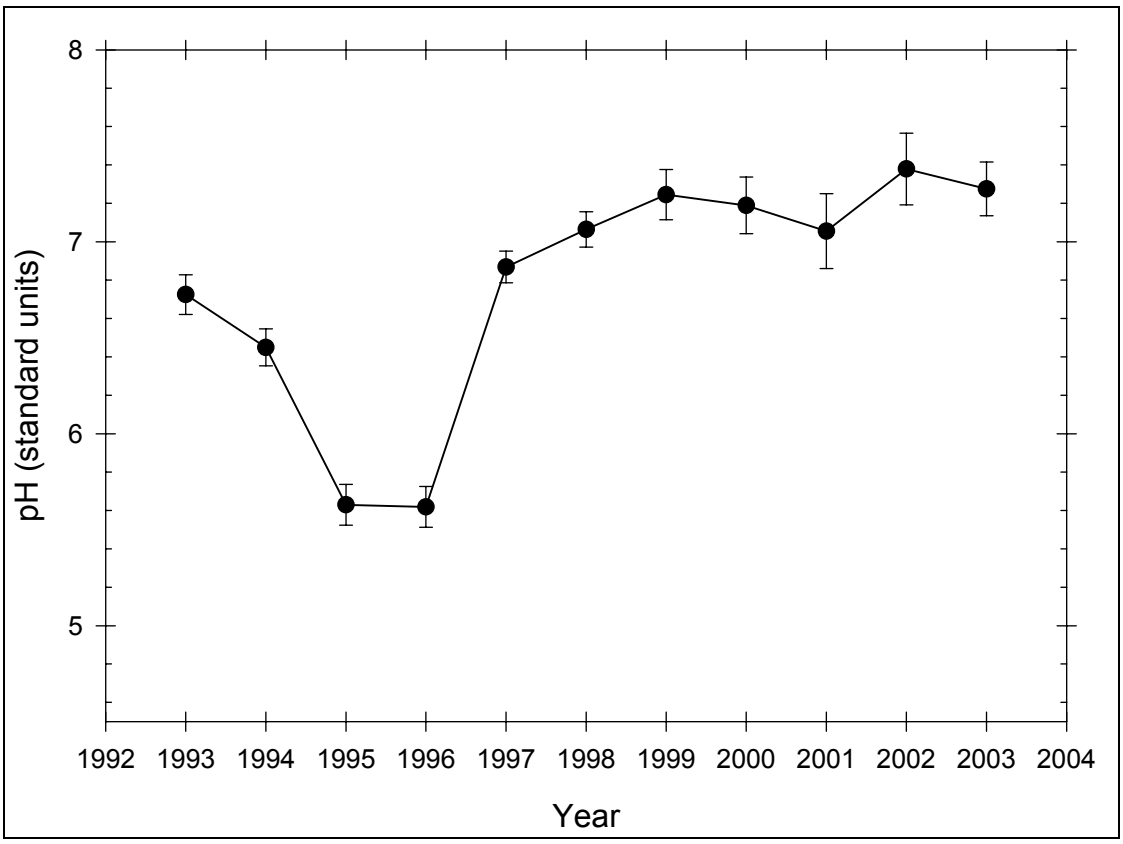

Figure 4 Seasonal mean pH trend in Hamilton County Lakes

A Kruskal-Wallis One Way ANOVA on Ranks was performed on the pH dataset since the annual groups failed a normality test. The differences in the median values among the years were greater than would be expected by chance and there was a statistically significant difference (H = 571.065 with 10 degrees of freedom, P = <0.001). A Pairwise Multiple Comparison Procedure (Dunn' Method) was used to determine which years were significantly different. Based upon this test, the median values for following years are significantly different from each other with a P value < 0.05, meaning that the likelihood of being incorrect in concluding that there is a significant difference is less than 5 percent. The Difference of Ranks and Q values are reported to provide a gauge of the size of the difference between years.

Years	Diff of Ranks	Q
02 vs. 96	663.604	13.422
02 vs. 95	661.086	13.418
02 vs. 94	388.169	7.879
02 vs. 93	251.923	4.894
02 vs. 97	184.304	3.784
03 vs. 96	647.773	13.454
03 vs. 95	645.255	13.451
03 vs. 94	372.338	7.762
03 vs. 93	236.092	4.699
03 vs. 97	168.473	3.554

Based upon these analyses, it can be stated that there was a significant trend of increasing pH in the Hamilton County Lakes between 1993 and 2003 (P < 0.05 level). The pH values in 2002 and 2003 were significantly higher than those in 1993 – 1997.

Table 1 – Descriptive Statistics for pH in Hamilton County Lakes

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	132	34	6.725	0.514	0.0520	0.103
1994	132	12	6.450	0.533	0.0487	0.0964
1995	132	12	5.630	0.590	0.0539	0.107
1996	132	14	5.619	0.583	0.0537	0.106
1997	132	5	6.869	0.470	0.0417	0.0825
1998	131	9	7.064	0.514	0.0465	0.0921
1999	131	28	7.246	0.670	0.0660	0.131
2000	132	13	7.190	0.814	0.0746	0.148
2001	131	37	7.056	0.953	0.0983	0.195
2002	130	47	7.379	0.855	0.0939	0.187
2003	130	39	7.275	0.673	0.0705	0.140
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	2.860	7.910	5.050	6.795	6.370	7.110
1994	2.910	7.830	4.920	6.520	6.220	6.825
1995	3.130	7.200	4.070	5.680	5.270	6.050
1996	3.300	7.070	3.770	5.645	5.330	5.920
1997	3.250	8.340	5.090	6.920	6.602	7.155
1998	3.420	8.640	5.220	7.050	6.760	7.360
1999	3.810	9.350	5.540	7.200	6.802	7.735
2000	4.440	9.310	4.870	7.140	6.672	7.840
2001	8.410	8.410	0.000	7.090	6.780	7.540
2002	3.790	9.300	5.510	7.420	6.760	8.045
2003	4.000	9.400	5.400	7.190	6.910	7.688
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.535	0.259	0.0878	0.060	659.050	4457.782
1994	-0.732	0.828	0.113	<0.001	773.960	5025.646
1995	-0.359	-0.138	0.0946	0.010	675.560	3844.604
1996	-0.405	0.859	0.0754	0.096	663.020	3765.207
1997	-0.683	2.305	0.0710	0.116	872.360	6020.013
1998	0.0132	1.102	0.0470	0.674	861.850	6120.350
1999	0.293	0.486	0.0756	0.153	746.310	5453.331
2000	-0.0766	-0.0622	0.0484	0.654	855.590	6229.663
2001	-4.418	31.951	0.181	<0.001	663.250	4764.191
2002	-0.0716	-0.525	0.0617	0.566	612.470	4579.494
2003	0.245	0.855	0.0847	0.105	662.060	4857.489

See Appendix for parameter definitions

Alkalinity

Alkalinity (or acid neutralizing capacity) is a measure of the water's buffering capacity, the ability of a lake to absorb or withstand acidic inputs. In the northeast, most lakes have low alkalinities, which means they are sensitive to the effects of acidic precipitation. This is a particular concern during the spring when large amounts of low pH snowmelt runs into lakes with little or no contact with the soil's natural buffering agents. Alkalinity is reported in milligrams per liter (mg/L) or microequivelents per liter (μeq/L). Typical summer concentrations of alkalinity in northeastern lakes are around 10 mg/L (200 μeq/L). Lake acidification status can be assessed from alkalinity as follows:

Alkalinity less than 0 mg/L	acidified
Alkalinity between 0 and 2 mg/L	extremely sensitive

Alkalinity between 2 and 10 mg/L	moderately sensitive
Alkalinity between 10 and 25 mg/L	low sensitivity
Alkalinity greater than 25 mg/L	not sensitive

The alkalinity trend for the Hamilton County Lakes is shown graphically in Figure 5. Descriptive statistics for the alkalinity data set is presented in Table 2. Alkalinity has been variable throughout the study period, and variable between lakes, as evidenced by the relatively large error bars in the trend figure.

A Kruskal-Wallis One Way ANOVA on Ranks was performed on the alkalinity dataset since the annual groups failed a normality test. The differences in the median values among the years were greater than would be expected by chance and there was a statistically significant difference (H = 42.358 with 10 degrees of freedom, P = <0.001). A Pairwise Multiple Comparison Procedure (Dunn' Method) was used to determine which years were significantly different. Based upon this test, the median values for following years are significantly different from each other with a P value < 0.05, meaning that the likelihood of being incorrect in concluding that there is a significant difference is less than 5 percent. The Difference of Ranks and Q values are reported to provide a gauge of the size of the difference between years.

Years	**Diff of Ranks**	**Q**
03 vs. 96	173.791	3.678
03 vs. 00	161.577	3.401
99 vs. 96	171.057	3.723
99 vs. 00	158.843	3.437

Based on these analyses, there appears to be a steady trend of increasing alkalinity beginning in 2000, with alkalinity in 2000 significantly higher than alkalinity in 2000. An alkalinity peak also occurred between 1997 and 1999. Several more years of data are necessary to see if this latest observed trend represents a permanent improvement in lake alkalinity.

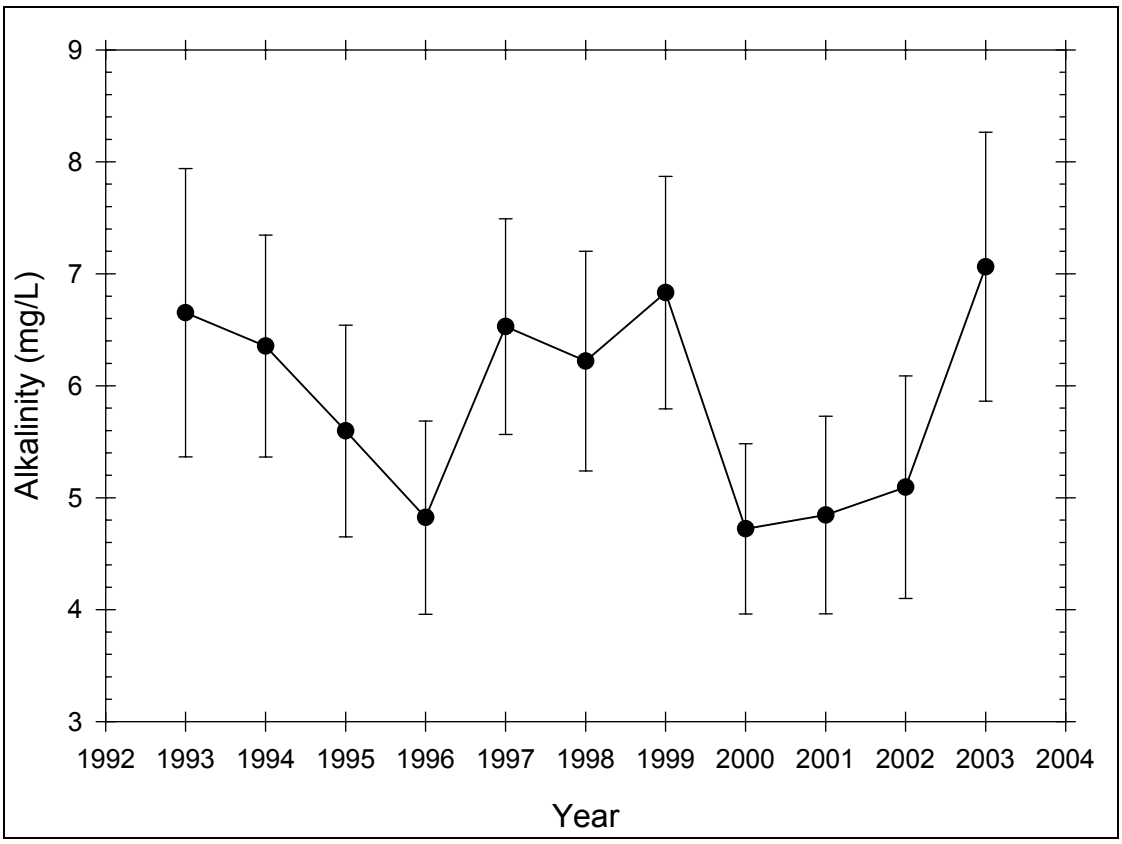

Figure 5 Seasonal mean alkalinity trend in Hamilton County Lakes

Table 2 – Descriptive Statistics for Alkalinity in Hamilton County Lakes

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	131	42	6.653	6.110	0.648	1.287
1994	131	11	6.354	5.484	0.501	0.991
1995	131	11	5.596	5.229	0.477	0.945
1996	131	12	4.823	4.754	0.436	0.863
1997	131	6	6.528	5.439	0.486	0.963
1998	130	7	6.220	5.498	0.496	0.981
1999	131	28	6.832	5.311	0.523	1.038
2000	131	15	4.722	4.133	0.384	0.760
2001	131	39	4.845	4.262	0.444	0.883
2002	131	49	5.094	4.522	0.499	0.994
2003	131	38	7.062	5.832	0.605	1.201
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	42.500	25.700	-16.800	5.500	3.400	8.400
1994	27.600	26.800	-0.800	5.300	2.800	8.050
1995	26.300	24.500	-1.800	4.150	2.200	7.550
1996	25.500	23.100	-2.400	3.500	1.600	6.550
1997	25.300	25.300	0.000	5.200	2.800	8.025
1998	27.800	26.700	-1.100	5.400	2.525	7.975
1999	25.400	25.500	0.1000	5.100	3.300	8.475
2000	21.800	21.000	-0.800	3.900	2.150	6.000
2001	22.300	21.500	-0.800	3.700	2.050	6.100
2002	20.700	20.200	-0.500	4.250	2.000	6.600

2003	26.800	27.000	0.200	5.700	3.225	8.775
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.718	4.151	0.160	<0.001	592.100	7224.770
1994	1.866	4.249	0.152	<0.001	762.500	8423.890
1995	1.532	2.984	0.121	<0.001	671.500	7010.970
1996	1.805	3.798	0.135	<0.001	573.900	5434.070
1997	1.715	3.199	0.154	<0.001	816.000	8995.400
1998	1.808	3.961	0.151	<0.001	765.100	8446.950
1999	1.513	2.565	0.155	<0.001	703.700	7684.990
2000	2.019	5.319	0.153	<0.001	547.700	4550.690
2001	1.870	4.007	0.156	<0.001	445.760	3812.986
2002	1.451	2.064	0.138	<0.001	417.700	3784.230
2003	1.775	3.461	0.148	<0.001	656.800	7767.940

See Appendix for parameter definitions

Total Phosphorus

Phosphorus is one of the three main nutrients of life, along with nitrogen and carbon. In the northeast, phosphorus is the nutrient that most often controls productivity of lake systems. Total phosphorus is a measure of all forms of phosphorus, both organic and inorganic. Total phosphorus concentrations are directly related to the trophic condition (water quality status) of a lake. Excessive amounts of phosphorus lead to algae blooms and loss of oxygen in lakes. Epilimnetic (surface water) total phosphorus concentrations less than 10 micrograms per liter (µg/L) are associated with oligotrophic (clean, clear water) conditions and concentrations greater than 25 µg/L are associated with eutrophic (nutrient-rich) conditions.

The total phosphorus trend for the Hamilton County Lakes is shown graphically in Figure 6. Descriptive statistics for the total phosphorus data set is presented in Table 3. Total phosphorus was relatively stable between 1994 through 2000, with a dramatic decrease between 2000 and 2001 through 2003.

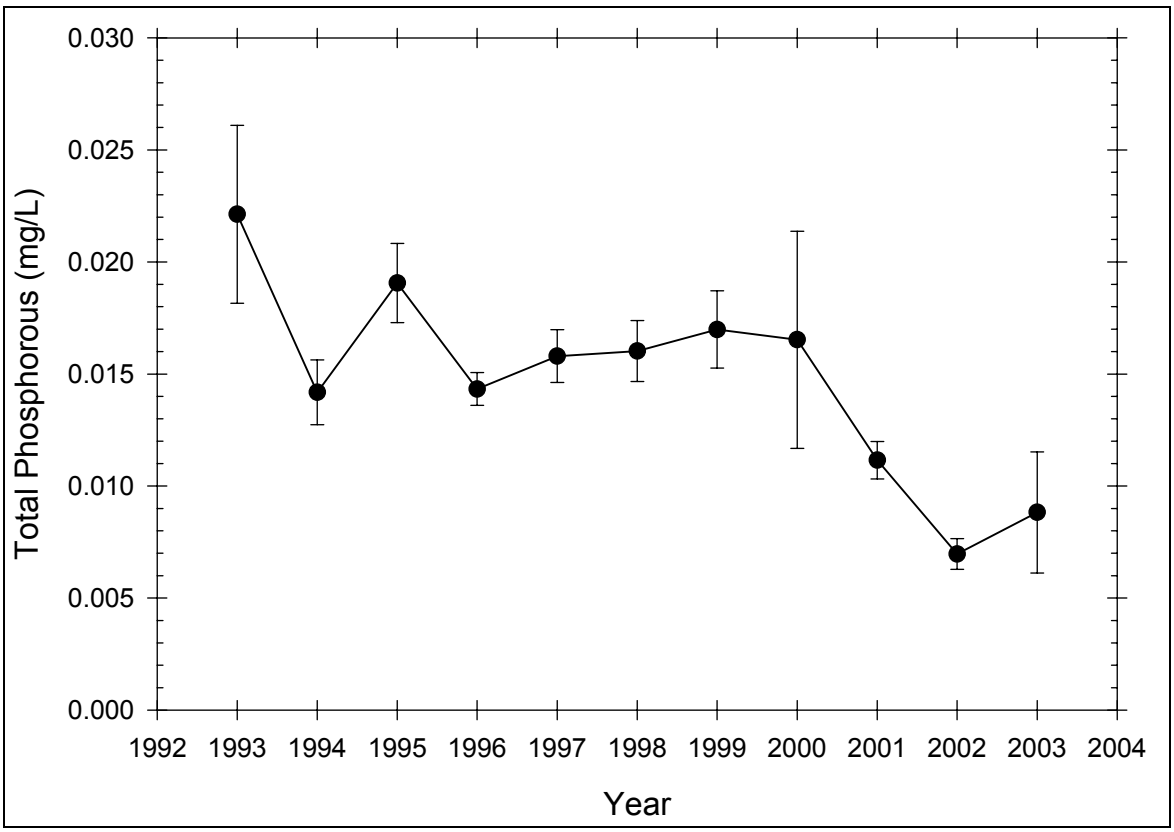

Figure 6 Seasonal mean total phosphorus trend in Hamilton County lakes

A Kruskal-Wallis One Way ANOVA on Ranks was performed on the total phosphorus dataset since the annual groups failed a normality test. The differences in the median values among the years were greater than would be expected by chance and there was a statistically significant difference (H = 318.539 with 10 degrees of freedom, P = <0.001). A Pairwise Multiple Comparison Procedure (Dunn' Method) was used to determine which years were significantly different. Based upon this test, the median values for following years are significantly different from each other with a P value < 0.05, meaning that the likelihood of being incorrect in concluding that there is a significant difference is less than 5 percent. The Difference of Ranks and Q values are reported to provide a gauge of the size of the difference between years.

Years	Diff of Ranks	Q
95 vs. 02	559.713	11.473
95 vs. 03	508.938	10.816
95 vs. 01	325.899	6.905
95 vs. 00	267.954	5.986
95 vs. 94	196.871	4.475
99 vs. 02	541.447	10.804
99 vs. 03	490.673	10.132
99 vs. 01	307.634	6.334
99 vs. 00	249.689	5.403
99 vs. 94	178.606	3.929

Based upon these analyses, it can be stated that total phosphorus concentrations in the Hamilton County Lakes during 2001 – 2003 were significantly lower than in 1999, representing a trend of decreasing phosphorus concentration in the county lakes.

Table 3 – Descriptive Statistics for Total Phosphorus in Hamilton County Lakes

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	132	37	0.0221	0.0195	0.00200	0.00397
1994	132	12	0.0142	0.00802	0.000732	0.00145
1995	132	14	0.0191	0.00968	0.000891	0.00176
1996	132	14	0.0143	0.00404	0.000372	0.000736
1997	132	5	0.0158	0.00670	0.000595	0.00118
1998	131	17	0.0160	0.00735	0.000688	0.00136
1999	126	22	0.0170	0.00888	0.000871	0.00173
2000	126	14	0.0165	0.0259	0.00245	0.00485
2001	126	34	0.0112	0.00404	0.000421	0.000837
2002	126	44	0.00696	0.00312	0.000344	0.000685
2003	126	33	0.00882	0.0131	0.00136	0.00270
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0960	0.0970	0.001000	0.0170	0.0113	0.0250
1994	0.0520	0.0550	0.00300	0.0120	0.01000	0.0160
1995	0.0490	0.0550	0.00600	0.0170	0.0120	0.0250
1996	0.0230	0.0310	0.00800	0.0140	0.0120	0.0170
1997	0.0520	0.0550	0.00300	0.0150	0.0120	0.0170
1998	0.0520	0.0580	0.00600	0.0140	0.0110	0.0190
1999	0.0550	0.0630	0.00800	0.0153	0.0130	0.0180
2000	0.220	0.221	0.001000	0.0110	0.00465	0.0170
2001	0.0289	0.0299	0.001000	0.0105	0.00850	0.0140
2002	0.0131	0.0149	0.00180	0.00640	0.00440	0.00940
2003	0.116	0.116	0.000500	0.00630	0.00380	0.00980
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	2.056	4.526	0.211	<0.001	2.102	0.0822
1994	2.656	9.322	0.201	<0.001	1.702	0.0318
1995	1.120	1.440	0.115	<0.001	2.249	0.0538
1996	1.191	2.251	0.143	<0.001	1.691	0.0261
1997	2.709	10.964	0.206	<0.001	2.006	0.0373
1998	2.560	9.897	0.171	<0.001	1.827	0.0354
1999	3.919	16.731	0.272	<0.001	1.767	0.0381
2000	5.396	37.023	0.274	<0.001	1.851	0.105
2001	1.073	4.408	0.102	0.019	1.026	0.0129
2002	0.562	-0.392	0.107	0.021	0.571	0.00476
2003	6.518	50.463	0.263	<0.001	0.820	0.0231

See Appendix for parameter definitions

Nitrate

Nitrogen is one of the three main nutrients of life, along with phosphorus and carbon. Nitrate is an inorganic form of nitrogen that occurs naturally. It is a component of atmospheric pollution and elevated concentrations in lakes and ponds may be associated with acidification. Total nitrogen is a measure of all forms of nitrogen, including both organic (ammonia) and inorganic (nitrate) forms. Elevated concentrations of nitrogen may also be indicative of wastewater pollution. Excessive nitrogen is often associated with agricultural activities and wastewater influence.

The nitrate trend for the Hamilton County Lakes is shown graphically in Figure 7. Descriptive statistics for the nitrate data set is presented in Table 4. Nitrate concentrations exhibited a marked decline from 1997 to 2002.

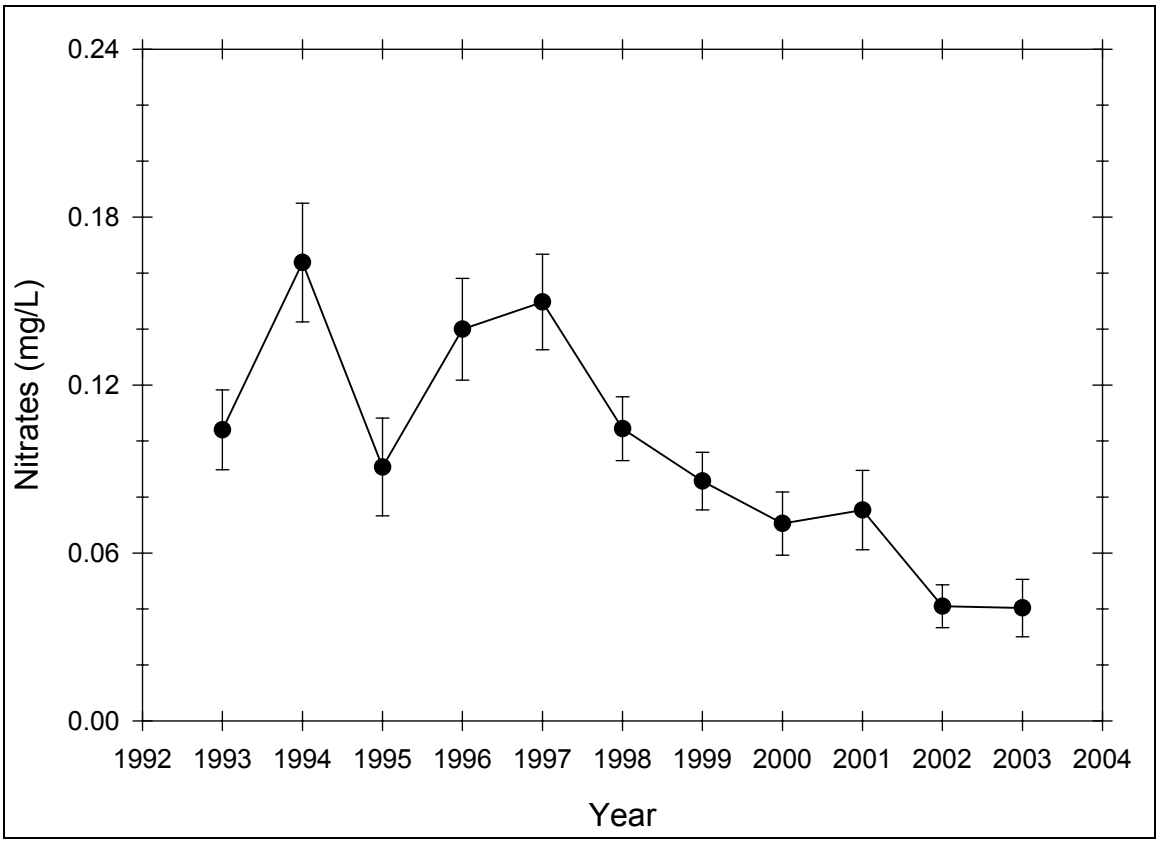

Figure 7 Seasonal mean nitrate trend in Hamilton County lakes

A Kruskal-Wallis One Way ANOVA on Ranks was performed on the nitrate dataset since the annual groups failed a normality test. The differences in the median values among the years were greater than would be expected by chance and there was a statistically significant difference (H = 259.582 with 10 degrees of freedom, P = < 0.001). A Pairwise Multiple Comparison Procedure (Dunn' Method) was used to determine which years were significantly different. Based upon this test, the median values for following years are significantly different from each other with a P value < 0.05, meaning that the likelihood of being incorrect in concluding that there is a significant difference is less than 5 percent. The Difference of Ranks and Q values are reported to provide a gauge of the size of the difference between years.

Years	Diff of Ranks	Q
97 vs. 03	496.630	10.476
97 vs. 02	464.122	9.463
97 vs. 00	309.189	6.997
97 vs. 01	291.261	6.144
97 vs. 95	284.683	6.456
97 vs. 99	186.837	4.080
94 vs. 03	495.868	10.351
94 vs. 02	463.359	9.355
94 vs. 00	308.427	6.897
94 vs. 01	290.498	6.064
94 vs. 95	283.921	6.362
94 vs. 99	186.074	4.018

Based upon these analyses, it can be stated that nitrate concentrations in the Hamilton County Lakes have declined significantly since 1997.

Table 4 – Descriptive Statistics for Nitrate in Hamilton County Lakes

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	132	32	0.104	0.0719	0.00719	0.0143
1994	132	12	0.164	0.117	0.0107	0.0212
1995	132	12	0.0907	0.0966	0.00882	0.0175
1996	132	13	0.140	0.100	0.00917	0.0182
1997	132	6	0.150	0.0969	0.00863	0.0171
1998	131	8	0.104	0.0637	0.00574	0.0114
1999	126	22	0.0857	0.0530	0.00519	0.0103
2000	126	7	0.0705	0.0622	0.00571	0.0113
2001	126	34	0.0753	0.0685	0.00714	0.0142
2002	126	44	0.0410	0.0348	0.00385	0.00766
2003	126	34	0.0403	0.0495	0.00516	0.0102
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.270	0.290	0.0200	0.0800	0.0400	0.155
1994	0.420	0.430	0.01000	0.145	0.0550	0.250
1995	0.440	0.440	0.000	0.0600	0.01000	0.155
1996	0.400	0.410	0.01000	0.120	0.0500	0.200
1997	0.360	0.380	0.0200	0.140	0.0500	0.210
1998	0.260	0.280	0.0200	0.0800	0.0500	0.140
1999	0.220	0.240	0.0200	0.0700	0.0400	0.115
2000	0.290	0.300	0.01000	0.0500	0.0200	0.108
2001	0.330	0.340	0.01000	0.0400	0.0300	0.120
2002	0.160	0.170	0.01000	0.0300	0.0200	0.0500
2003	0.230	0.230	0.000	0.0200	0.01000	0.0500
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.801	-0.414	0.180	<0.001	10.400	1.593
1994	0.487	-0.885	0.154	<0.001	19.650	4.858
1995	1.116	0.723	0.174	<0.001	10.885	2.099
1996	0.732	-0.309	0.119	<0.001	16.650	3.510
1997	0.503	-0.743	0.124	<0.001	18.860	3.996
1998	0.882	-0.0795	0.161	<0.001	12.840	1.835
1999	0.965	0.109	0.167	<0.001	8.910	1.052
2000	1.454	1.891	0.209	<0.001	8.390	1.049
2001	1.690	3.043	0.219	<0.001	6.930	0.949
2002	1.733	2.885	0.221	<0.001	3.360	0.236
2003	2.242	5.023	0.246	<0.001	3.710	0.372

See Appendix for parameter definitions

Chlorophyll a

Chlorophyll *a* is the green pigment in plants used for photosynthesis, and measuring it provides information on the amount of algae (microscopic plants) in lakes. Chlorophyll *a* concentrations can also be used to classify lake trophic state. Chlorophyll *a* concentrations less than 2 micrograms per liter (µg/L) are associated with oligotrophic conditions, while concentrations greater than 8 µg/L are associated with eutrophic conditions.

The chlorophyll *a* trend for the Hamilton County Lakes is shown graphically in Figure 8. Descriptive statistics for the chlorophyll *a* data set is presented in Table 5. Chlorophyll *a* values were low in 1997, higher in 1998 through 2001. Following a peak in 2001, chlorophyll *a* has declined. A Kruskal-Wallis One Way ANOVA on Ranks was

performed on the chlorophyll a dataset since the annual groups failed a normality test. The differences in the median values among the years were greater than would be expected by chance and there was a statistically significant difference (H = 181.515 with 10 degrees of freedom, P = < 0.001). A Pairwise Multiple Comparison Procedure (Dunn' Method) was used to determine which years were significantly different. Based upon this test, the median values for none of the years were significantly different from each other at a P value < 0.05.

Based on these analyses, it can be stated that chlorophyll *a* in Hamilton Country lakes appears to have decreased since 1991, although the differences were not statistically significant at P < 0.05.

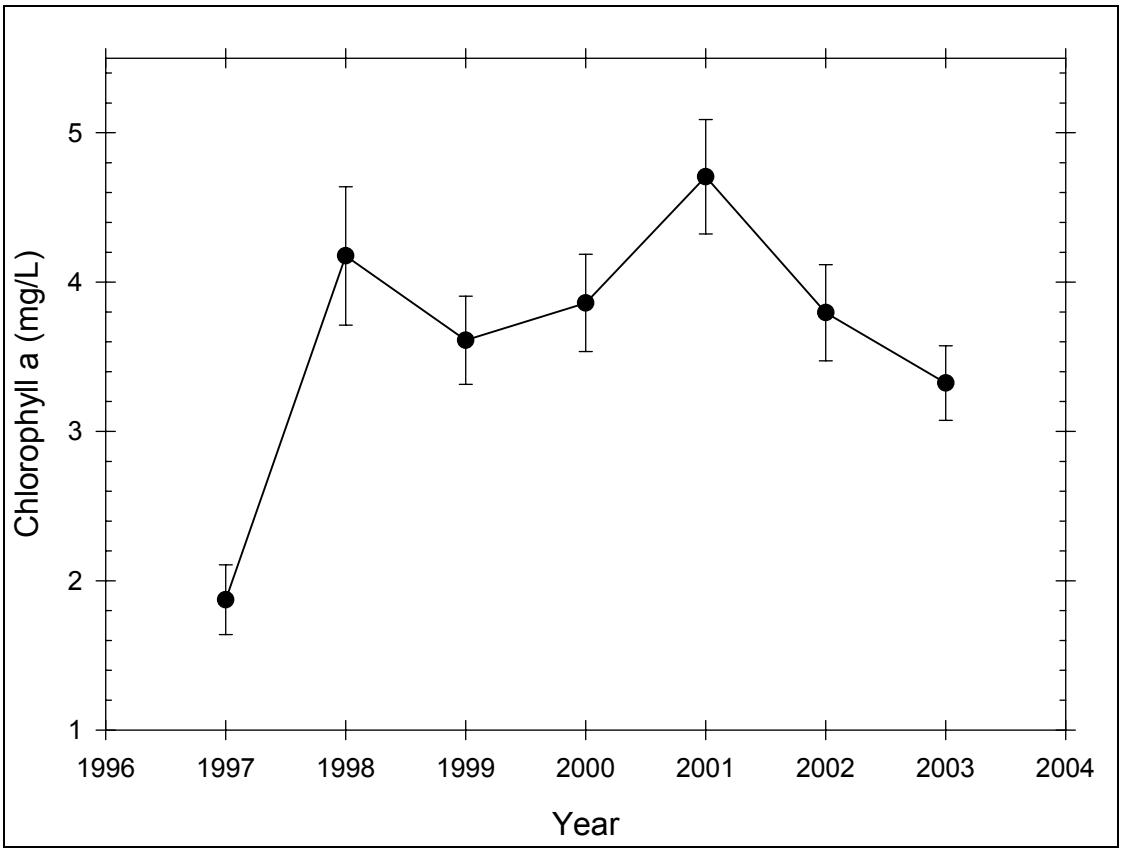

Figure 8 Seasonal chlorophyll a trend in Hamilton County lakes

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Table 5 – Descriptive Statistics for Chlorophyll a in Hamilton County Lakes

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	1	0	0.000	--	--	--
1994	1	0	0.000	--	--	--
1995	1	0	0.000	--	--	--
1996	1	0	0.000	--	--	--
1997	132	7	1.873	1.318	0.118	0.233
1998	131	8	4.176	2.597	0.234	0.463
1999	126	23	3.611	1.511	0.149	0.295
2000	126	13	3.861	1.751	0.165	0.326
2001	126	34	4.707	1.850	0.193	0.383
2002	126	44	3.796	1.466	0.162	0.322
2003	126	44	3.324	1.134	0.125	0.249

Year	Range	Max	Min	Median	25%	75%
1993	0.000	0.000	0.000	0.000	0.000	0.000
1994	0.000	0.000	0.000	0.000	0.000	0.000
1995	0.000	0.000	0.000	0.000	0.000	0.000
1996	0.000	0.000	0.000	0.000	0.000	0.000
1997	8.740	9.130	0.390	1.630	1.055	2.228
1998	11.060	11.690	0.630	3.400	2.032	6.372
1999	6.890	8.180	1.290	3.370	2.433	4.465
2000	8.770	9.960	1.190	3.490	2.313	4.893
2001	8.520	10.240	1.720	4.600	3.260	5.885
2002	6.340	7.780	1.440	3.715	2.750	4.570
2003	5.390	6.920	1.530	3.230	2.280	4.150
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	--	--	--	--	0.000	0.000
1994	--	--	--	--	0.000	0.000
1995	--	--	--	--	0.000	0.000
1996	--	--	--	--	0.000	0.000
1997	2.157	7.423	0.148	<0.001	234.100	653.706
1998	0.658	-0.649	0.143	<0.001	513.690	2967.910
1999	0.706	-0.192	0.0962	0.020	371.900	1575.764
2000	0.838	0.404	0.101	0.006	436.260	2027.496
2001	0.679	0.264	0.0836	0.112	433.000	2349.343
2002	0.579	-0.202	0.0869	0.127	311.240	1355.413
2003	0.587	-0.0242	0.0844	0.154	272.550	1010.145

See Appendix for parameter definitions

Transparency

Transparency is a measure of water clarity in lakes and ponds. It is determined by lowering a 20 cm black and white disk (Secchi disk) into a lake to the depth where it is no longer visible from the surface. Since algae are the main determinant of water clarity in non-stained lakes that lack excessive amounts of inorganic turbidity (suspended silt), transparency is used as an indicator of lake trophic state. Transparencies greater than 4.6 meters (15.1 feet) are associated with oligotrophic conditions, while transparencies, less than 2 meters (6.6 feet) are associated with eutrophic conditions (DEC & FOLA 1990).

The transparency trend for the Hamilton County Lakes is shown graphically in Figure 9. Descriptive statistics for the transparency data set is presented in Table 6. Transparency exhibits an overall trend of slight decline, although the values were jumpy from year to year until 2001.

A Kruskal-Wallis One Way ANOVA on Ranks was performed on the Transparency dataset since the annual groups failed a normality test. The differences in the median values among the years were greater than would be expected by chance and there was a statistically significant difference ($H = 42.320$ with 10 degrees of freedom, $P = < 0.001$). A Pairwise Multiple Comparison Procedure (Dunn' Method) was used to determine which years were significantly different. Based upon this test, the median values for following years are significantly different from each other with a P value < 0.05, meaning that the likelihood of being incorrect in concluding that there is a significant difference is less than 5 percent. The Difference of Ranks and Q values are reported to provide a gauge of the size of the difference between years.

Years	Diff of Ranks	Q
93 vs. 00	226.802	4.828
95 vs. 00	207.029	4.651

Based on these analyses, it cannot be stated that transparency in recent years is significantly lower than when the study began in 1993. Although transparency in 2000 was significantly lower than in 1993, this represents one low seasonal average.

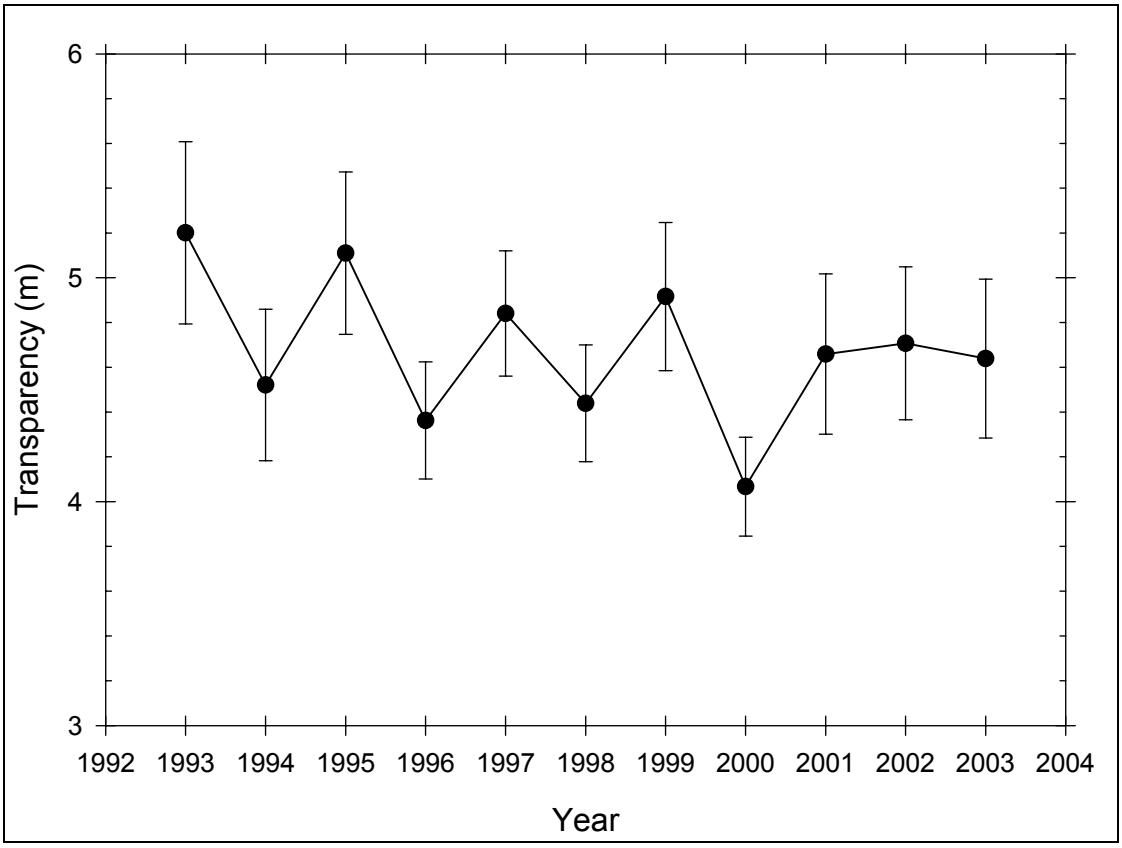


Figure 9 Seasonal transparency trend in Hamilton County lakes

Table 6 – Descriptive Statistics for Transparency in Hamilton County Lakes

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	132	35	5.201	2.021	0.205	0.407
1994	132	13	4.521	1.864	0.171	0.338
1995	132	13	5.109	1.997	0.183	0.363
1996	132	13	4.363	1.442	0.132	0.262
1997	132	5	4.840	1.596	0.142	0.280
1998	131	9	4.439	1.456	0.132	0.261
1999	131	28	4.916	1.691	0.167	0.331
2000	132	13	4.067	1.217	0.112	0.221
2001	131	39	4.659	1.727	0.180	0.358
2002	130	49	4.707	1.544	0.172	0.341
2003	131	40	4.639	1.704	0.179	0.355
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	13.180	15.000	1.820	5.150	3.753	6.400
1994	10.500	11.800	1.300	4.300	3.500	5.275
1995	10.200	12.100	1.900	4.850	3.672	6.300
1996	6.400	8.050	1.650	4.250	3.363	5.400

1997	8.780	10.000	1.220	4.720	3.730	5.940
1998	7.910	9.710	1.800	4.100	3.500	5.070
1999	8.550	10.750	2.200	4.820	3.657	5.950
2000	6.650	8.500	1.850	3.900	3.225	4.588
2001	9.200	11.100	1.900	4.450	3.550	5.115
2002	6.500	8.700	2.200	4.450	3.600	5.638
2003	9.950	12.150	2.200	4.400	3.412	5.358
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.290	4.505	0.0771	0.163	504.500	3015.853
1994	1.278	2.663	0.134	<0.001	538.000	2842.103
1995	0.899	1.352	0.0702	0.157	608.030	3577.359
1996	0.296	-0.288	0.0565	0.439	519.170	2510.406
1997	0.404	-0.0201	0.0598	0.313	614.720	3296.296
1998	1.048	1.504	0.111	<0.001	541.540	2660.409
1999	0.884	0.916	0.0780	0.123	506.350	2781.024
2000	1.084	1.994	0.107	0.002	484.010	2143.433
2001	1.394	2.421	0.165	<0.001	428.660	2268.802
2002	0.661	-0.0708	0.109	0.019	381.290	1985.559
2003	1.515	3.773	0.111	0.008	422.160	2219.670

See Appendix for parameter definitions

Trophic State Index

Trophic state is a term used in limnology to describe the amount of algae and macrophytes (aquatic plants) found in a lake. Oligotrophic lakes have few algae and macrophytes and appear clean and clear, while eutrophic lakes show an overabundance of growth and often have a pronounced green color due to algae. Eutrophication is a natural process whereby lakes increase in trophic state over long periods. However, the process of eutrophication can be greatly accelerated by human activities (such as watershed development and sewage disposal), which introduce additional nutrients, organic matter and silt into the lake system. This cultural eutrophication can be reversed by controlling human inputs, but in many cases, additional in-lake treatments are required in order to accelerate this rehabilitation process.

The Carlson (1977) Trophic State Index (TSI) is an extremely valuable tool for the evaluation of lakes. This index can be calculated using summer averages for total phosphorus, chlorophyll *a*, and/or transparency (Secchi depth) data. To calculate this index each seasonal average is logarithmically converted to a scale of relative trophic state ranging from 1 to 100. This index was constructed such that an increase in ten units represents a doubling in algal biomass. For example, a lake with chlorophyll TSI of 40 has twice as much algae as a lake with a TSI value of 30. Generally, TSI values less than 38 are considered oligotrophic, while TSI values greater than 51 are considered eutrophic (DEC & FOLA 1990).

The Carlson Trophic State Index trend for Hamilton County lakes is shown in Figure 10. It is notable that chlorophyll *a* TSI values were consistently within the eutrophic range, while TSI, values for total phosphorus and transparency were along the oligotrophic-mesotrophic boundary. It appears that total phosphorus TSI has moved more towards the oligotrophic range in recent years, while transparency hovered at the mesotrophic-oligotrophic boundary.

The disparity between total phosphorus TSI and chlorophyll *a* TSI indicates that algal growth is being spurned on by other factors than just total phosphorus in the Hamilton County lakes. In fact, the *Relationship between Trophic Variables* section shows that chlorophyll *a* concentrations are more related to nitrate concentrations than to phosphorus concentrations.

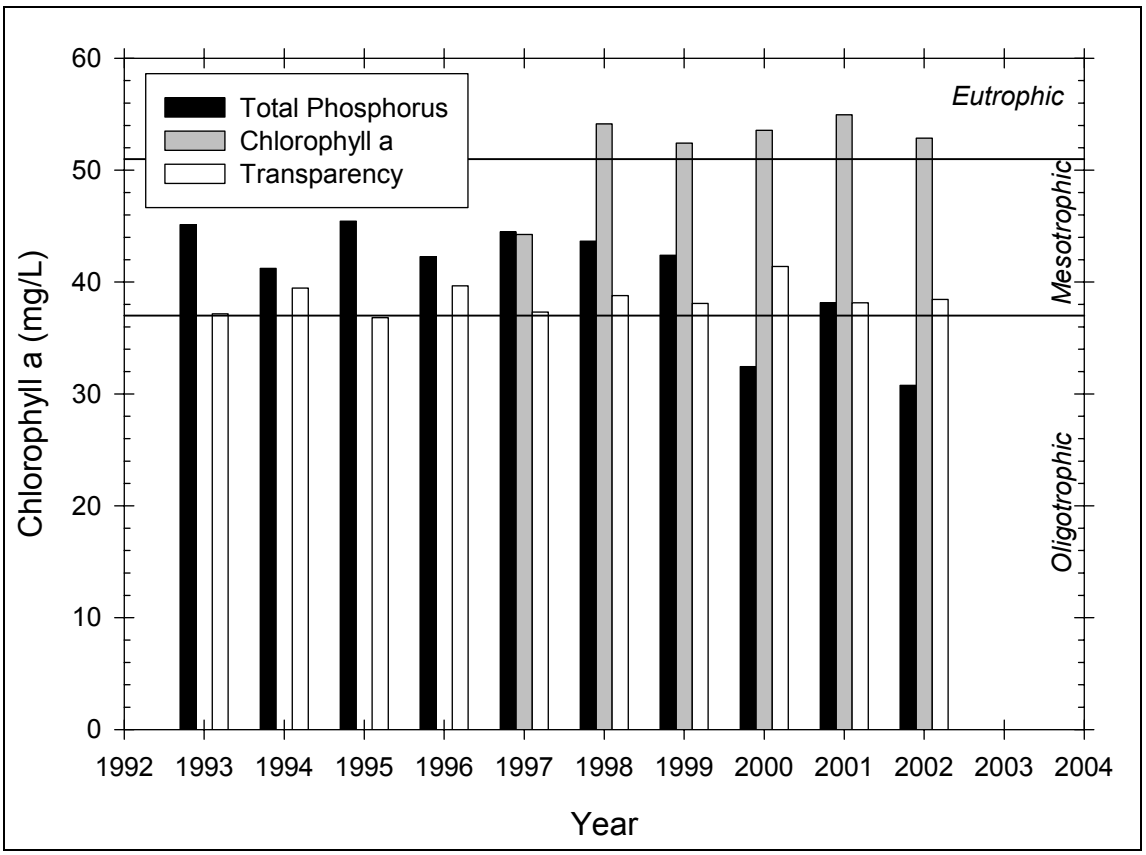


Figure 10 Carlson TSI trend in Hamilton County lakes

Aluminum

Aluminum is one of the most abundant elements found in the earth's crust. Acid rainwater leaches the aluminum from the soils, where it then may flow into nearby streams and lakes. If a lake becomes acidified, aluminum can also be leached from the sediments in the bottom of the lake. Low concentrations of aluminum can be toxic to fish in acidified water bodies, depending on the type of aluminum available, the pH, and the amount of dissolved organic carbon available to bind inorganic aluminum. Values are reported as mg/L of total dissolved aluminum.

The aluminum trend for the Hamilton County Lakes is shown graphically in Figure 11. Descriptive statistics for the aluminum data set is presented in Table 7. Aluminum concentrations have been relatively stable, with the exception of a few high years.

A Kruskal-Wallis One Way ANOVA on Ranks was performed on the calcium dataset since the annual groups failed a normality test. The differences in the median values among the years were greater than would be expected by chance and there was a statistically significant difference ($H = 61.196$ with 10 degrees of freedom, $P = <0.001$). A Pairwise Multiple Comparison Procedure (Dunn' Method) was used to determine which years were significantly different. Based upon this test, however, the median values for none of the years were significantly different from each other at a P value < 0.05.

Based upon these analyses, no statistical trends in aluminum are evident, even though it appears that aluminum concentrations have declined slightly in recent years.

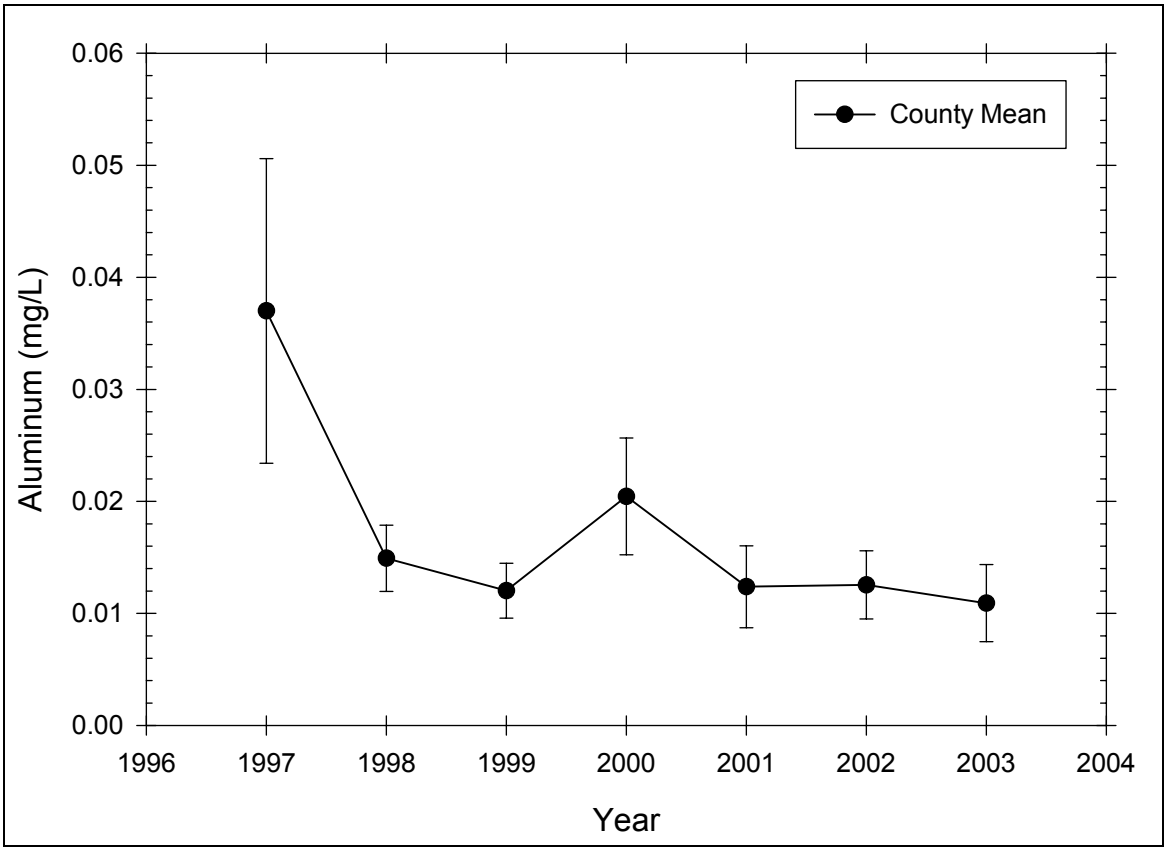


Figure 11 Seasonal aluminum trend in Hamilton County lakes

Table 7 – Descriptive Statistics for Aluminum in Hamilton County Lakes

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	--	--	--	--	--	--
1994	--	--	--	--	--	--
1995	--	--	--	--	--	--
1996	--	--	--	--	--	--
1997	126	106	0.0370	0.0290	0.00650	0.0136
1998	125	2	0.0149	0.0166	0.00149	0.00296
1999	126	22	0.0120	0.0126	0.00124	0.00245
2000	126	7	0.0204	0.0287	0.00263	0.00521
2001	126	34	0.0124	0.0177	0.00184	0.00366
2002	126	45	0.0125	0.0138	0.00153	0.00304
2003	126	43	0.0109	0.0157	0.00173	0.00343
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	--	--	--	--	--	--
1994	--	--	--	--	--	--
1995	--	--	--	--	--	--
1996	--	--	--	--	--	--
1997	0.113	0.123	0.01000	0.0255	0.0160	0.0500
1998	0.0870	0.0870	0.000	0.01000	0.00500	0.0180
1999	0.0860	0.0870	0.001000	0.00900	0.00450	0.0150
2000	0.186	0.186	0.000	0.0130	0.00700	0.0200
2001	0.110	0.110	0.000	0.00750	0.00300	0.0130

2002	0.0660	0.0660	0.000	0.00800	0.00500	0.0150
2003	0.121	0.121	0.000	0.00600	0.00400	0.0137
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	--	--	--	--	--	--
1994	--	--	--	--	--	--
1995	--	--	--	--	--	--
1996	--	--	--	--	--	--
1997	1.695	2.931	0.232	0.006	0.740	0.0434
1998	2.526	7.293	0.204	<0.001	1.835	0.0608
1999	3.059	13.186	0.195	<0.001	1.251	0.0314
2000	3.769	16.845	0.279	<0.001	2.432	0.147
2001	3.413	13.962	0.258	<0.001	1.139	0.0425
2002	2.402	5.645	0.240	<0.001	1.016	0.0279
2003	4.736	29.696	0.244	<0.001	0.906	0.0302

See Appendix for parameter definitions

Calcium

Calcium is one of the buffering materials that occur naturally. It is often in short supply in Adirondack lakes and ponds, making these bodies of water susceptible to acidification by acid precipitation. A measure of the amount of calcium in a lake provides additional information on the buffering capacity of that lake, and can assist in determining the timing and dosage for acid mitigation (liming) activities. Adirondack lakes containing less than 2.5 mg/L of calcium are considered sensitive to acidification.

The calcium trend for the Hamilton County Lakes is shown graphically in Figure 12. Descriptive statistics for the calcium data set is presented in Table 8. Calcium concentrations appear to have been relatively constant between 1997 and 2003, with perhaps a slight increasing trend.

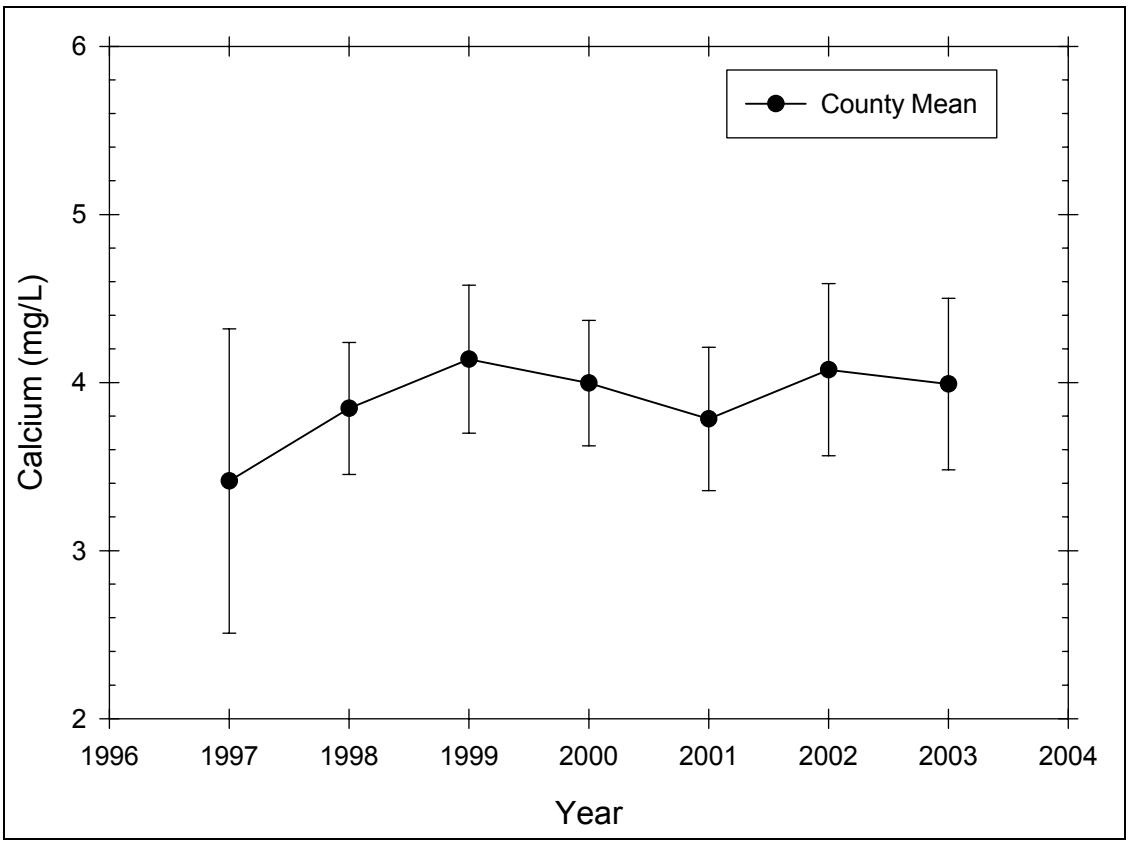


Figure 12 Seasonal calcium trend in Hamilton County lakes

A Kruskal-Wallis One Way ANOVA on Ranks was performed on the calcium dataset since the annual groups failed a normality test. The differences in the median values among the years were greater than would be expected by chance and there was a statistically significant difference (H = 19.373 with 10 degrees of freedom, P = 0.036). A Pairwise Multiple Comparison Procedure (Dunn' Method) was used to determine which years were significantly different. Based upon this test, however, the median values for none of the years were significantly different from each other at a P value < 0.05.

Based upon these analyses, it can be stated that calcium in Hamilton County lakes exhibits no statistical trend and has remained relatively constant for the period of record.

Table 8 – Descriptive Statistics for Calcium in Hamilton County Lakes

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	--	--	--	--	--	--
1994	--	--	--	--	--	--
1995	--	--	--	--	--	--
1996	--	--	--	--	--	--
1997	120	101	3.414	1.878	0.431	0.905
1998	120	2	3.846	2.154	0.198	0.393
1999	120	21	4.139	2.204	0.222	0.440
2000	120	7	3.997	2.003	0.188	0.373
2001	120	33	3.783	1.999	0.214	0.426
2002	120	42	4.076	2.274	0.257	0.513
2003	120	41	3.991	2.278	0.256	0.510

Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	--	--	--	--	--	--
1994	--	--	--	--	--	--
1995	--	--	--	--	--	--
1996	--	--	--	--	--	--
1997	7.880	9.550	1.670	3.100	1.980	4.180
1998	10.590	11.550	0.960	3.700	1.980	4.670
1999	10.450	12.100	1.650	3.980	2.377	5.018
2000	9.840	11.550	1.710	4.070	2.175	4.942
2001	9.320	11.030	1.710	3.670	2.127	4.578
2002	10.740	12.400	1.660	3.900	2.280	4.910
2003	10.710	12.500	1.790	3.610	2.140	4.862
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	--	--	--	--	--	--
1994	--	--	--	--	--	--
1995	--	--	--	--	--	--
1996	--	--	--	--	--	--
1997	2.040	5.675	0.177	0.120	64.870	284.986
1998	1.703	3.641	0.154	<0.001	453.820	2288.434
1999	1.734	3.945	0.137	<0.001	409.740	2171.926
2000	1.483	3.263	0.133	<0.001	451.640	2254.576
2001	1.799	4.158	0.150	<0.001	329.130	1588.909
2002	1.814	4.219	0.163	<0.001	317.940	1694.082
2003	1.772	3.942	0.167	<0.001	315.310	1663.098

See Appendix for parameter definitions

Calcite Saturation Index:

The calcite saturation index (CSI) is another method to determine the sensitivity of a lake to acidification. Higher CSI values indicate increasing sensitivity to acid inputs. CSI is calculated using the following formula:

Lake acidification status can be assessed from CSI as follows:

$$CSI = -\log_{10}\frac{Ca}{40000} - \log_{10}\frac{Alkaliity}{50000} - pH + 2$$

CSI nc (negative alkalinity)	extremely vulnerable/acidified
CSI greater than 4	very vulnerable to acid deposition
CSI between 3 and 4	moderately vulnerable to acid deposition
CSI less than 3	low vulnerability to acid deposition

The Calcite Saturation Index for Hamilton County Lakes is presented in Figure 13. The countywide CSI has decreased slightly over the period of record, moving from moderately vulnerable to low vulnerability to acid deposition.

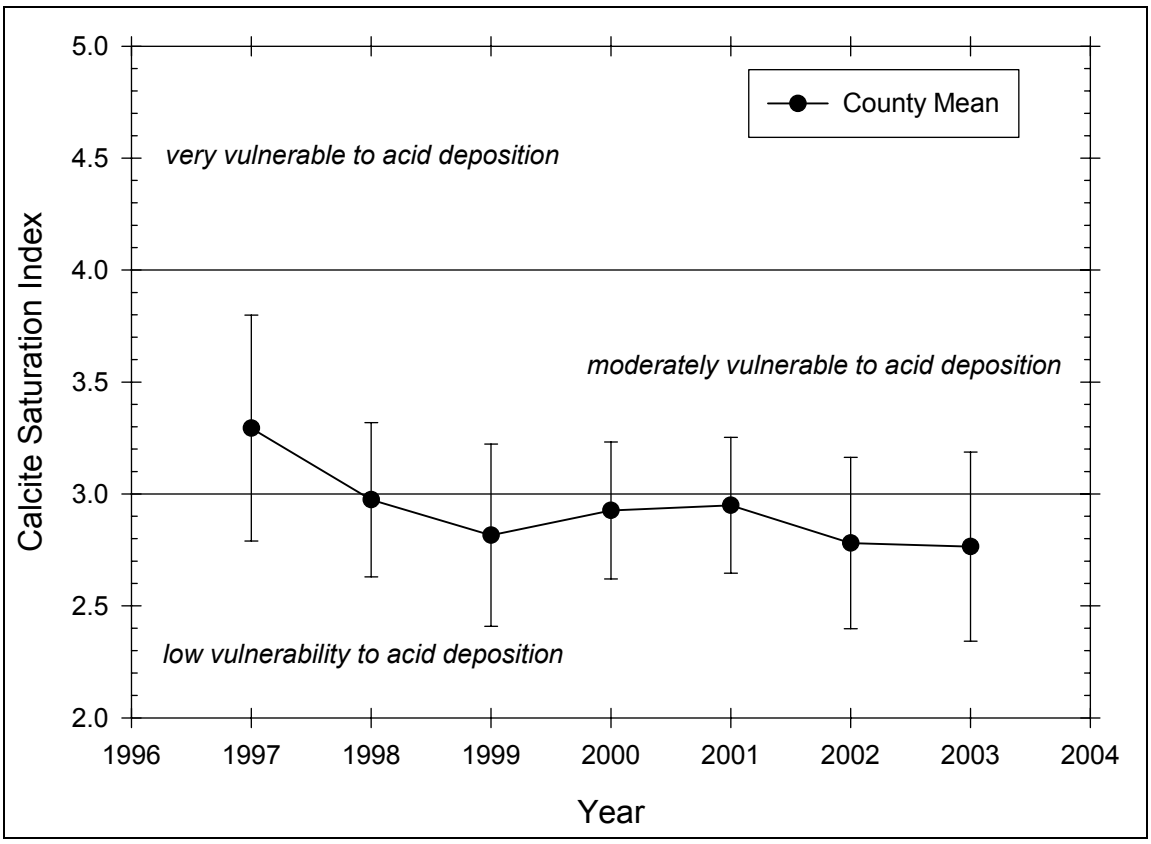


Figure 13 CSI trend in Hamilton County Lakes

A Kruskal-Wallis One Way ANOVA on Ranks was performed on the CSI dataset since the annual groups failed a normality test. The differences in the median values among the years were not great enough to exclude the possibility that the difference is due to random sampling variability (H = 7.803 with 6 degrees of freedom, P = 0.253). The larger error bars and lack of significance is also due to the way CSI was calculated. For each lake, the average pH, average alkalinity and average calcium values for each year were used to calculate an average CSI value for that lake for that year. This results in a smaller sample size; however the number of permutations necessary to calculate a CSI for each sampling event would have been excessive and provide little additional value.

Based upon these analyses, the Hamilton County lakes exhibited a slight trend of decreasing, though not statistically significant, vulnerability to acid deposition from 1997 to 2003.

Relationship between Trophic Variables (SD and TP, CHL and NO_3)

An examination of the relationship between transparency (SD), total phosphorus (TP), nitrate nitrogen (NO_3), and chlorophyll *a* (CHL) concentrations was performed using linear and multiple regression techniques and by determining the Pearson product-moment correlation.

Correlation of Variables

Secchi transparency was significantly related to TP, CHL, and NO_3 ($P < 0.05$), although the correlations were weak. SD was negatively correlated to TP ($r = -0.0958$, $P = 0.00103$) and CHL ($r = -0.392$, $P = 1.229E^{-027}$), and positively correlated to NO_3 ($r = 0.233$, $P = 3.635E^{-016}$).

The correlation coefficient r quantifies the strength of the association between the variables. r varies between -1 and +1. A correlation coefficient near +1 indicates there is a strong positive relationship between the two variables, with both always increasing together. A correlation coefficient near -1 indicates there is a strong negative relationship between the two variables, with one always decreasing as the other increases. A correlation coefficient of 0 indicates no relationship between the two variables. The P value is the probability of being wrong in concluding that there is a true association between the variables (i.e., the probability of falsely rejecting the null hypothesis, or committing a Type I error). The smaller the P value, the greater the probability that the variables are correlated. Traditionally, you can conclude that the independent variable can be used to predict the dependent variable when $P < 0.05$. The pairs of variables with positive correlation coefficients and P values below 0.050 tend to increase together. For the pairs with negative correlation coefficients and P values below 0.050, one variable tends to decrease while the other increases. For pairs with P values greater than 0.050, there is no significant relationship between the two variables.

Linear Regression of Variables

A multiple linear regression was used to determine the variables (TP, CHL, NO_3) that best predicted SD. The dependent variable SD can be predicted from a linear combination of the independent variables. However, TP and CHL alone appeared to account for the ability to predict SD ($P < 0.05$). Although this relationship is significant, the correlation is weak. The formula for predicting SD in Hamilton County Lakes using TP and CHL is:

$$SD = 5.929 - (9.764 * TP) - (0.327 * CHL)$$

N = 698.000 Missing Observations = 670
R = 0.402 $R^2 = 0.162$ Adj $R^2 = 0.159$
Standard Error of Estimate = 1.471

A multiple linear regression was used to determine the variables (TP, SD, NO_3) that best predicted CHL. The dependent variable CHL can be predicted from a linear combination of the independent variables. However, SD and NO^3 appeared to account for the ability to predict CHL ($P < 0.05$). Although this relationship is significant, the correlation is weak. The formula for predicting CHL in Hamilton County Lakes using SD and NO^3 is:

$$CHL = 6.140 - (0.405 * SD) - (8.122 * NO3)$$

N = 713.000 Missing Observations = 655
R = 0.497 $R^2 = 0.247$ Adj $R^2 = 0.245$
Standard Error of Estimate = 1.703

SD is not truly an independent variable for CHL (SD does not "cause" CHL), so the linear relationship between CHL and NO^3 was examined. Again, the relationship was significant although the correlation was weak. The formula for predicting CHL in Hamilton County Lakes using NO^3 was:

CHL = 4.421 - (9.895 * NO3)

N = 719.000 Missing Observations = 649
R = 0.379 R^2 = 0.143 Adj R^2 = 0.142
Standard Error of Estimate = 1.811

Relationship between Acidity Parameters (pH, Alk, Ca, and Al)

An examination of the relationship between pH, Alkalinity (Alk), Calcium (Ca), and Aluminum (Al) concentrations was performed using linear and multiple regression techniques and by determining the Pearson product-moment correlation.

Correlation of Variables

All of the acidity parameters were significantly related to one another. The lowest correlation was between pH and Ca (r = 0.107, P = 0.00761). Alkalinity was positively correlated to pH (r = 0.214, P = $1.356E^{-013}$; when pH is up, alkalinity is up) and negatively correlated to aluminum (r = -0.244, P = 0.000000000769; when pH increases, aluminum decreases). The highest correlation was between alkalinity and calcium (r = 0.909, P = $8.541E-^{235}$), as one would expect, since calcium is the main measure of alkalinity. Like pH, alkalinity was negatively correlated with aluminum (r = -0.331, P = $3.742E^{-017}$), as was calcium (-0.358, P = $2.767E^{-020}$).

Linear Regression of Variables

A multiple linear regression was used to determine the variables (pH, Alk) that best predicted Al concentrations. The dependent variable Al can be predicted from a linear combination of both independent variables. Although this relationship is significant, the correlation is weak. The formula for predicting Al in Hamilton County Lakes using pH and Alk is:

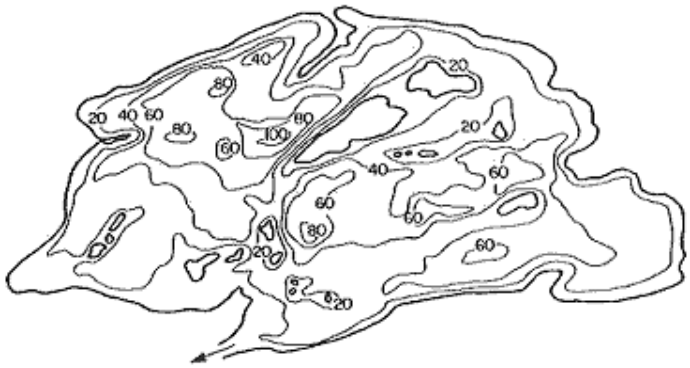
Al = 0.0520 - (0.00428 * pH) - (0.00113 * Alk)

N = 611.000 Missing Observations = 757
R = 0.366 R^2 = 0.134 Adj R^2 = 0.131
Standard Error of Estimate = 0.017

Lake by Lake Trends

Blue Mountain Lake

Location
Pond Number: 060307
Watershed: St. Lawrence River
County: Hamilton
Topographic Quadrangle: Blue Mountain
Sample Site
Latitude: 43o 51.955'
Longitude: 74o 27.654'
Morphometry
Surface Area: 1,334 A.
Mean Depth: 46 Ft.
Maximum Depth: 100 Ft.
Volume: 61,364 Ac./F.
Watershed Area: 7,130 Ac.
Hydraulic Retention Time: 3.5 Yr.
Shoreline Length: 7.7 Mi.
Elevation: 1,789 Ft.
Water Quality Classification: B(T)
Trophic State: Oligotrophic



Temperature and Dissolved Oxygen

Blue Mountain Lake had a minimum DO of 0.4 mg/L (October 1995), with a minimum temperature of 5.2°C and a maximum temperature of 23.5°C. In general, the lowest DO values occurred during the months of August through October.

pH

Figure 14 presents the seasonal mean pH trend in Blue Mountain Lake, while Table 9 presents descriptive statistics for pH in Blue Mountain Lake. The pH in Blue Mountain Lake exhibits a trend of increasing pH from 1996 to 2001, with stable pH values from 2001 – 2003. The pH in Blue Mountain Lake was slightly higher than the county average, though this difference was not statistically significant.

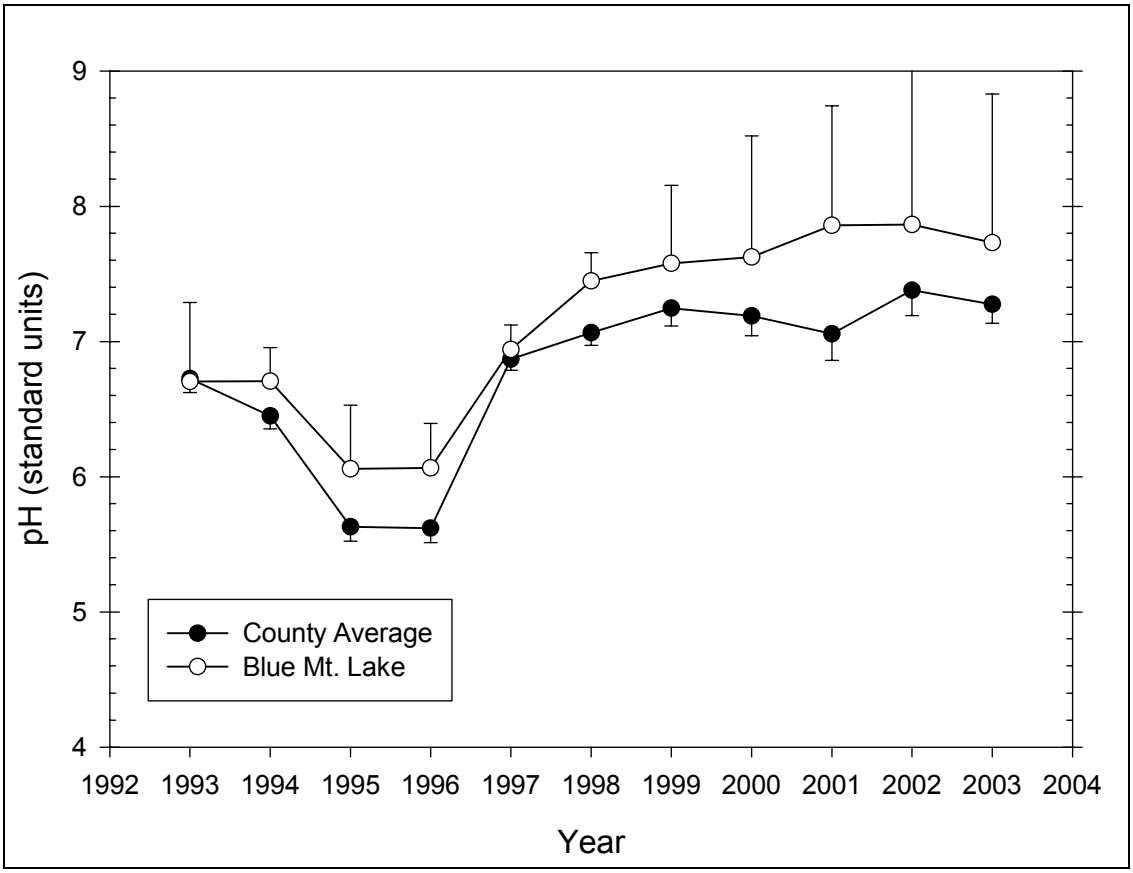


Figure 14 Seasonal mean pH trend in Blue Mountain Lake

Table 9 – Descriptive Statistics for pH in Blue Mountain Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	6.704	0.472	0.211	0.586
1994	6	0	6.707	0.237	0.0967	0.249
1995	6	0	6.058	0.449	0.183	0.472
1996	6	0	6.065	0.313	0.128	0.329
1997	6	0	6.940	0.174	0.0709	0.182
1998	6	0	7.448	0.198	0.0807	0.208
1999	5	0	7.578	0.465	0.208	0.577
2000	6	0	7.625	0.854	0.349	0.896
2001	4	0	7.860	0.555	0.278	0.883
2002	4	0	7.865	0.776	0.388	1.235
2003	4	0	7.730	0.692	0.346	1.100
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.220	7.170	5.950	6.740	6.467	7.057
1994	0.640	6.950	6.310	6.740	6.580	6.920
1995	1.150	6.470	5.320	6.195	5.740	6.430
1996	0.740	6.510	5.770	5.985	5.790	6.350
1997	0.460	7.140	6.680	6.945	6.820	7.110
1998	0.580	7.790	7.210	7.395	7.360	7.540
1999	1.120	8.150	7.030	7.660	7.150	7.933
2000	2.040	8.920	6.880	7.470	6.910	8.100

2001	1.310	8.410	7.100	7.965	7.480	8.240
2002	1.780	8.530	6.750	8.090	7.370	8.360
2003	1.670	8.660	6.990	7.635	7.290	8.170
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-1.174	1.584	0.246	0.369	33.520	225.609
1994	-0.908	0.553	0.206	0.509	40.240	270.157
1995	-0.996	-0.1000	0.204	0.522	36.350	221.230
1996	0.536	-1.807	0.254	0.254	36.390	221.196
1997	-0.365	-0.714	0.169	0.691	41.640	289.133
1998	1.014	1.536	0.263	0.212	44.690	333.062
1999	-0.0533	-1.942	0.198	0.606	37.890	287.995
2000	0.579	-1.347	0.299	0.097	45.750	352.488
2001	-1.027	1.500	0.250	0.432	31.440	248.043
2002	-1.506	2.607	0.314	0.180	31.460	249.240
2003	0.799	1.781	0.279	0.307	30.920	240.446

Alkalinity

Figure 15 presents the seasonal mean alkalinity trend in Blue Mountain Lake, while Table 10 presents descriptive statistics for alkalinity in Blue Mountain Lake. The alkalinity in Blue Mountain Lake exhibits no distinct trend over the period of study. The alkalinity in Blue Mountain Lake was slightly lower than the county average, though this difference was not statistically significant.

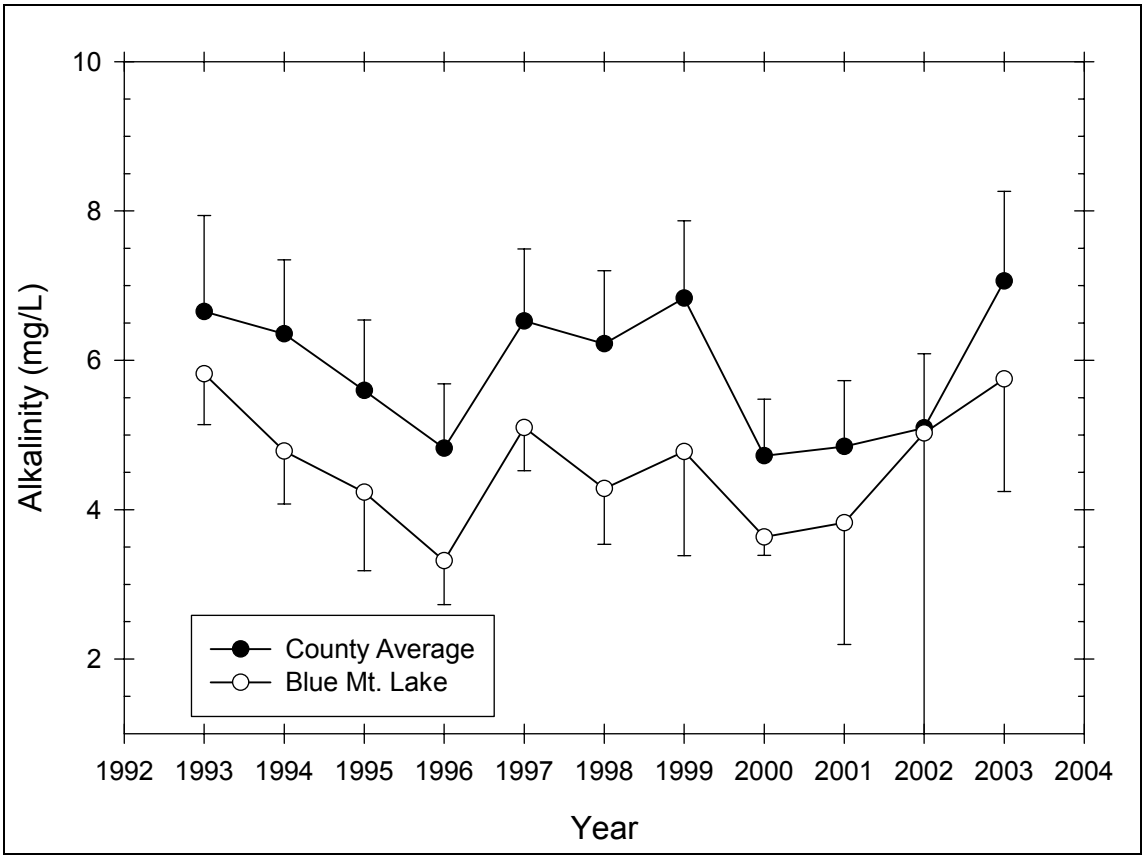


Figure 15 Seasonal mean alkalinity trend in Blue Mountain Lake

Table 10 – Descriptive Statistics for Alkalinity in Blue Mountain Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	5.820	0.550	0.246	0.682
1994	6	0	4.783	0.674	0.275	0.707
1995	6	0	4.233	1.001	0.409	1.051
1996	6	0	3.317	0.560	0.229	0.588
1997	6	0	5.100	0.551	0.225	0.579
1998	6	0	4.283	0.711	0.290	0.746
1999	6	1	4.780	1.123	0.502	1.395
2000	6	0	3.633	0.234	0.0955	0.245
2001	6	2	3.825	1.024	0.512	1.630
2002	6	2	5.025	3.046	1.523	4.846
2003	6	2	5.750	0.947	0.473	1.507
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.500	6.600	5.100	5.800	5.475	6.150
1994	2.000	5.600	3.600	4.800	4.700	5.200
1995	2.700	5.200	2.500	4.400	3.800	5.100
1996	1.500	4.000	2.500	3.500	2.800	3.600
1997	1.500	5.700	4.200	5.300	4.700	5.400
1998	2.000	5.400	3.400	4.100	3.900	4.800
1999	2.800	5.600	2.800	5.200	4.525	5.300
2000	0.600	3.900	3.300	3.600	3.500	3.900
2001	2.500	5.100	2.600	3.800	3.150	4.500
2002	6.700	9.500	2.800	3.900	3.150	6.900
2003	2.300	6.900	4.600	5.750	5.100	6.400
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.242	0.803	0.172	0.702	29.100	170.570
1994	-1.021	2.035	0.284	0.137	28.700	139.550
1995	-1.101	1.073	0.167	0.699	25.400	112.540
1996	-0.542	-0.935	0.226	0.397	19.900	67.570
1997	-0.934	0.0186	0.239	0.328	30.600	157.580
1998	0.635	-0.0547	0.213	0.467	25.700	112.610
1999	-2.066	4.475	0.412	0.006	23.900	119.290
2000	-0.0365	-0.915	0.223	0.410	21.800	79.480
2001	0.144	1.323	0.221	0.558	15.300	61.670
2002	1.762	3.206	0.344	0.102	20.100	128.830
2003	0.000	1.007	0.187	0.669	23.000	134.940

Total Phosphorus

Figure 16 presents the seasonal mean total phosphorus trend in Blue Mountain Lake, while Table 11 presents descriptive statistics for total phosphorus in Blue Mountain Lake. The total phosphorus in Blue Mountain Lake exhibits a slight decreasing trend, particularly from 1997 to 2003. The total phosphorus in Blue Mountain Lake was slightly lower than the county average, though this difference was not statistically significant.

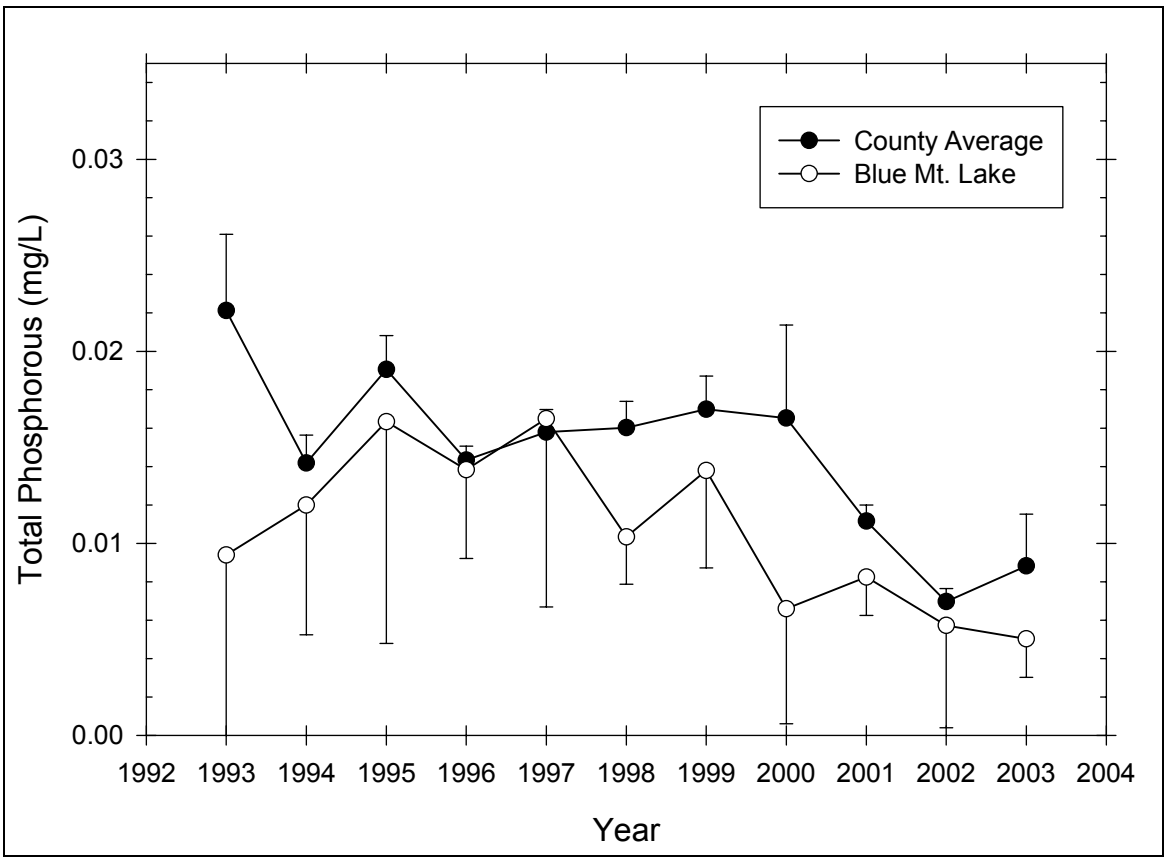


Figure 16 Seasonal mean total phosphorus in Blue Mountain Lake

Table 11 – Descriptive Statistics for Total Phosphorus in Blue Mountain Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.00940	0.00974	0.00435	0.0121
1994	6	0	0.0120	0.00645	0.00263	0.00677
1995	6	0	0.0163	0.0110	0.00449	0.0115
1996	6	0	0.0138	0.00440	0.00180	0.00462
1997	6	0	0.0165	0.00935	0.00382	0.00982
1998	6	0	0.0103	0.00234	0.000955	0.00245
1999	6	1	0.0138	0.00409	0.00183	0.00507
2000	6	1	0.00660	0.00483	0.00216	0.00599
2001	6	2	0.00825	0.00126	0.000629	0.00200
2002	6	2	0.00573	0.00335	0.00168	0.00534
2003	6	2	0.00503	0.00126	0.000629	0.00200
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0200	0.0210	0.001000	0.00300	0.00250	0.0195
1994	0.0190	0.0240	0.00500	0.0105	0.00900	0.0130
1995	0.0300	0.0360	0.00600	0.0140	0.00800	0.0200
1996	0.0120	0.0200	0.00800	0.0145	0.01000	0.0160
1997	0.0250	0.0350	0.01000	0.0135	0.0110	0.0160
1998	0.00700	0.0130	0.00600	0.0110	0.01000	0.0110
1999	0.01000	0.0190	0.00900	0.0120	0.0113	0.0175
2000	0.01000	0.0110	0.001000	0.00800	0.00175	0.0110
2001	0.00300	0.01000	0.00700	0.00800	0.00750	0.00900
2002	0.00810	0.0101	0.00200	0.00540	0.00345	0.00800

2003	0.00250	0.00630	0.00380	0.00500	0.00395	0.00610
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.600	-3.141	0.345	0.053	0.0470	0.000821
1994	1.509	3.149	0.272	0.179	0.0720	0.00107
1995	1.311	1.717	0.203	0.526	0.0980	0.00221
1996	-0.00196	-0.904	0.189	0.602	0.0830	0.00125
1997	2.124	4.744	0.355	0.018	0.0990	0.00207
1998	-1.445	3.208	0.279	0.154	0.0620	0.000668
1999	0.312	-1.780	0.270	0.258	0.0690	0.00102
2000	-0.370	-2.970	0.230	0.452	0.0330	0.000311
2001	1.129	2.227	0.329	0.138	0.0330	0.000277
2002	0.557	1.252	0.229	0.523	0.0229	0.000165
2003	0.0378	-5.231	0.269	0.349	0.0201	0.000106

Nitrate

Figure 17 presents the seasonal mean nitrate trend in Blue Mountain Lake, while Table 12 presents descriptive statistics for nitrate in Blue Mountain Lake. The nitrate in Blue Mountain Lake exhibits a marked trend of decreasing concentration, particularly between 1994 - 2002. The nitrate in Blue Mountain Lake was slightly lower than the county average, though this difference was not statistically significant.

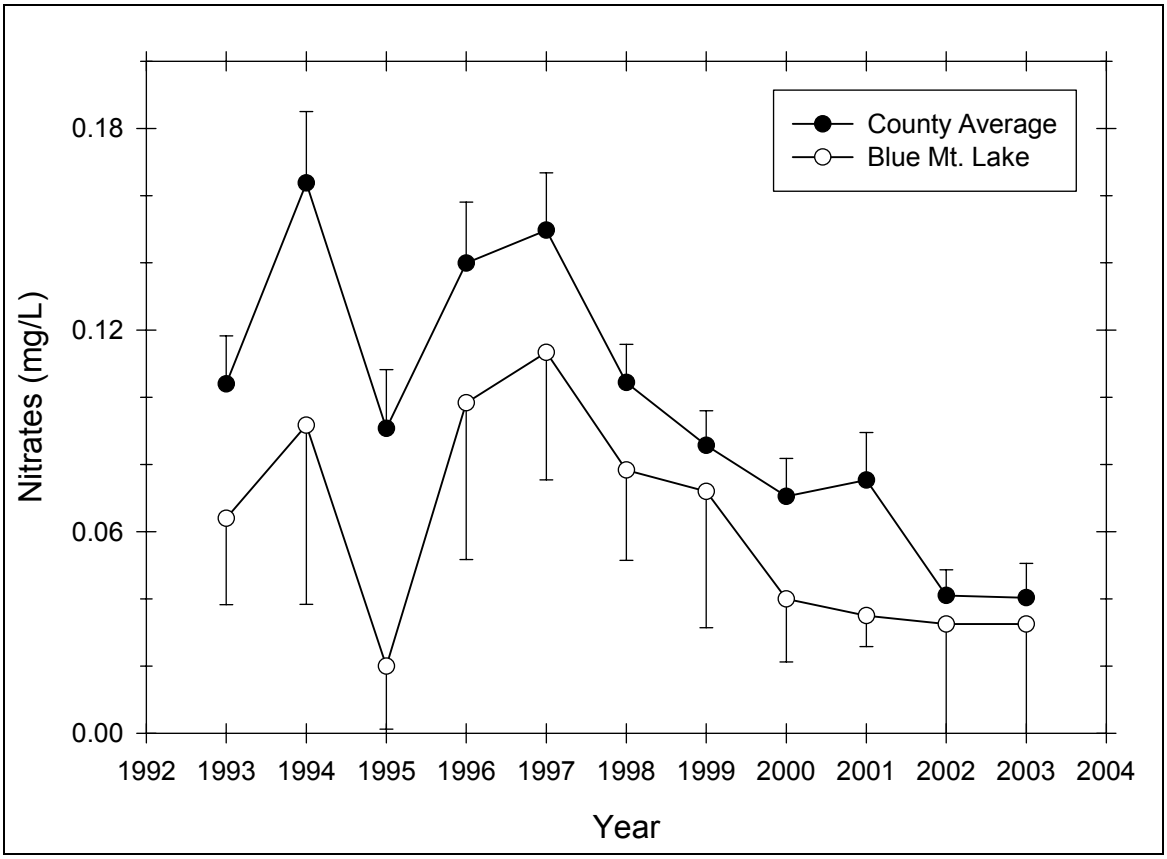


Figure 17 Seasonal mean nitrate trend in Blue Mountain Lake

Table 12 – Descriptive Statistics for Nitrate in Blue Mountain Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0640	0.0207	0.00927	0.0257
1994	6	0	0.0917	0.0508	0.0207	0.0533
1995	6	0	0.0200	0.0179	0.00730	0.0188
1996	6	0	0.0983	0.0445	0.0182	0.0467
1997	6	0	0.113	0.0361	0.0148	0.0379
1998	6	0	0.0783	0.0256	0.0105	0.0269
1999	6	1	0.0720	0.0327	0.0146	0.0406
2000	6	0	0.0400	0.0179	0.00730	0.0188
2001	6	2	0.0350	0.00577	0.00289	0.00919
2002	6	2	0.0325	0.0206	0.0103	0.0328
2003	6	2	0.0325	0.0263	0.0131	0.0418
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0500	0.1000	0.0500	0.0600	0.0500	0.0700
1994	0.120	0.160	0.0400	0.0850	0.0400	0.140
1995	0.0500	0.0500	0.000	0.0150	0.01000	0.0300
1996	0.120	0.170	0.0500	0.0950	0.0600	0.120
1997	0.0900	0.160	0.0700	0.105	0.0900	0.150
1998	0.0600	0.120	0.0600	0.0650	0.0600	0.1000
1999	0.0800	0.1000	0.0200	0.0900	0.0500	0.0925
2000	0.0500	0.0700	0.0200	0.0350	0.0300	0.0500
2001	0.01000	0.0400	0.0300	0.0350	0.0300	0.0400
2002	0.0400	0.0500	0.01000	0.0350	0.0150	0.0500
2003	0.0500	0.0600	0.01000	0.0300	0.01000	0.0550
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.918	3.878	0.376	0.020	0.320	0.0222
1994	0.336	-1.849	0.179	0.650	0.550	0.0633
1995	0.943	0.586	0.212	0.475	0.120	0.00400
1996	0.698	-0.0963	0.160	0.724	0.590	0.0679
1997	0.282	-1.875	0.241	0.317	0.680	0.0836
1998	1.131	-0.441	0.294	0.108	0.470	0.0401
1999	-1.294	0.906	0.309	0.124	0.360	0.0302
2000	0.943	0.586	0.212	0.475	0.240	0.0112
2001	-3.701E-015	-6.000	0.307	0.203	0.140	0.00500
2002	-0.200	-4.858	0.302	0.219	0.130	0.00550
2003	0.124	-5.290	0.304	0.212	0.130	0.00630

Chlorophyll a

Figure 18 presents the seasonal mean chlorophyll *a* trend in Blue Mountain Lake, while Table 13 presents descriptive statistics for chlorophyll *a* in Blue Mountain Lake. The chlorophyll *a* in Blue Mountain Lake was relatively constant over the period of study. The chlorophyll *a* in Blue Mountain Lake was significantly lower than the county average, particularly since 1999.

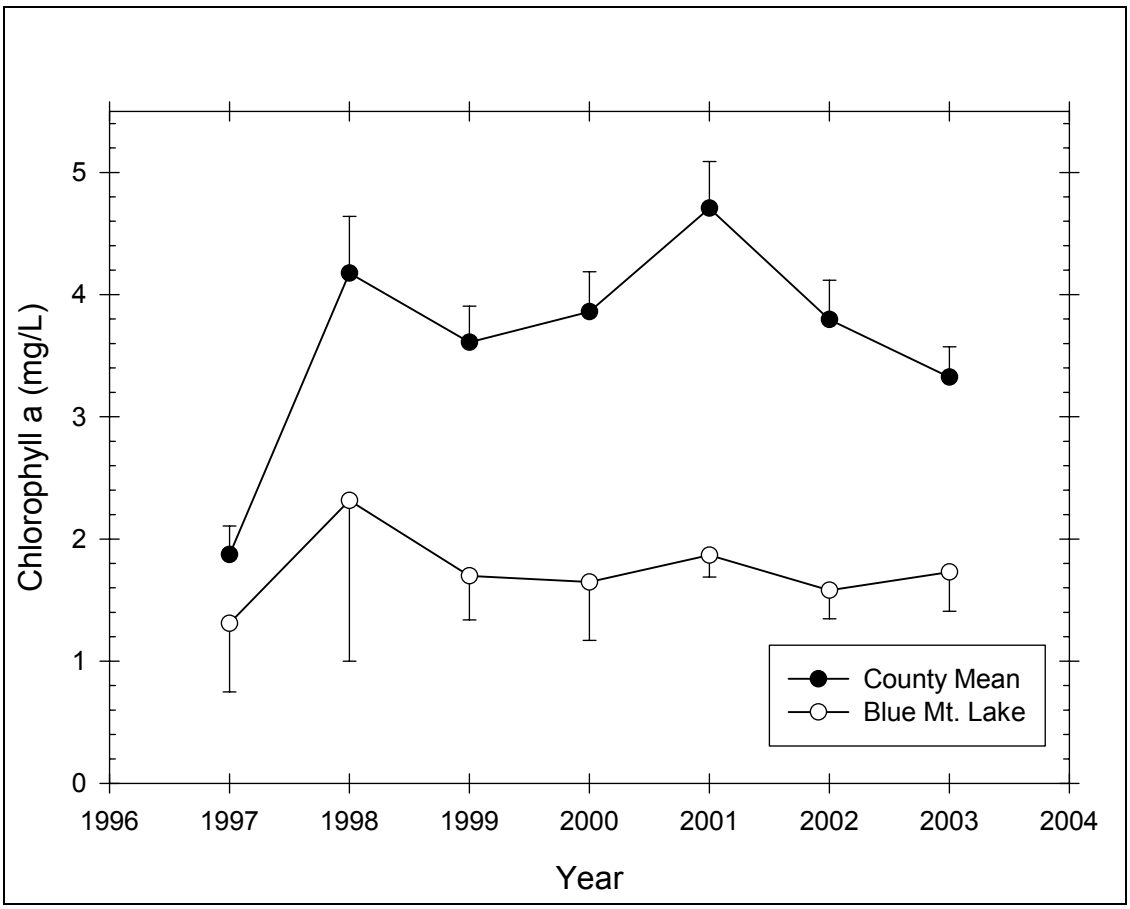


Figure 18 Seasonal mean chlorophyll a trend in Blue Mountain Lake

Table 13 – Descriptive Statistics for Chlorophyll a in Blue Mountain Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	1.310	0.535	0.218	0.561
1998	6	0	2.315	1.253	0.511	1.315
1999	6	1	1.698	0.290	0.130	0.360
2000	6	1	1.648	0.385	0.172	0.478
2001	6	2	1.868	0.113	0.0565	0.180
2002	6	2	1.580	0.146	0.0731	0.233
2003	6	2	1.730	0.202	0.101	0.321
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	1.390	1.800	0.410	1.425	1.070	1.730
1998	3.380	4.490	1.110	1.810	1.580	3.090
1999	0.800	2.090	1.290	1.710	1.530	1.865
2000	0.950	2.140	1.190	1.520	1.385	1.990
2001	0.250	1.970	1.720	1.890	1.780	1.955
2002	0.290	1.730	1.440	1.575	1.455	1.705
2003	0.480	2.010	1.530	1.690	1.600	1.860
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	-0.993	0.294	0.250	0.273	7.860	11.727
1998	1.271	0.939	0.299	0.100	13.890	40.002
1999	-0.129	1.089	0.181	0.674	8.490	14.753

2000	0.278	-1.642	0.230	0.449	8.240	14.172
2001	-0.820	-0.969	0.240	0.478	7.470	13.989
2002	0.0639	-5.225	0.274	0.327	6.320	10.050
2003	1.111	2.038	0.289	0.265	6.920	12.094

Transparency

Figure 19 presents the seasonal mean transparency trend in Blue Mountain Lake, while Table 14 presents descriptive statistics for transparency in Blue Mountain Lake. The transparency in Blue Mountain Lake, although quite variable from year to year, exhibits a slight trend of decreasing transparency from 1994 through 1998 and increasing transparency from 1998 to 2003. The transparency in Blue Mountain Lake was significantly higher than the county average, though this difference was not statistically significant in all years.

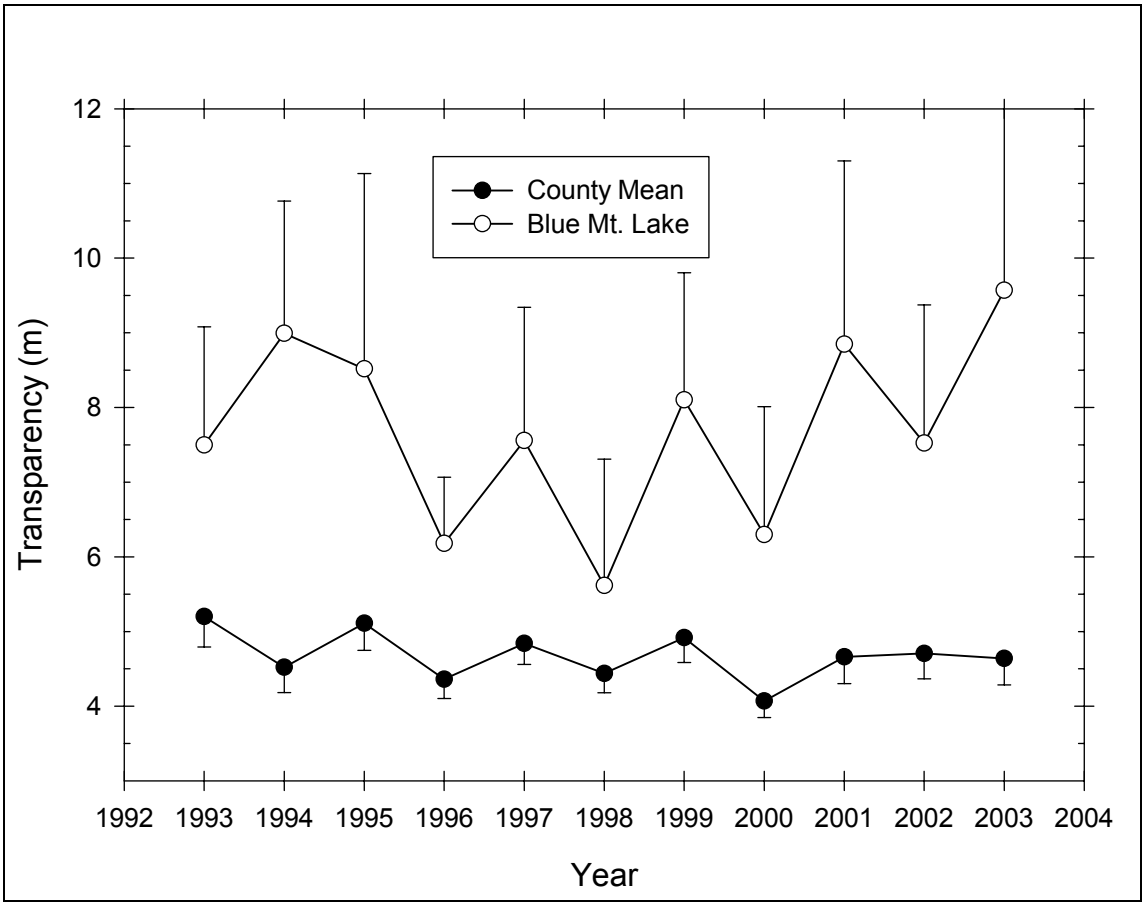


Figure 19 Seasonal mean transparency trend in Blue Mountain Lake

Table 14 – Descriptive Statistics for Transparency in Blue Mountain Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	7.500	1.273	0.569	1.580
1994	6	0	8.992	1.689	0.690	1.773
1995	6	0	8.517	2.493	1.018	2.616

1996	6	0	6.178	0.848	0.346	0.890
1997	6	0	7.557	1.701	0.694	1.785
1998	6	0	5.617	1.611	0.658	1.691
1999	5	0	8.104	1.370	0.613	1.702
2000	6	0	6.298	1.632	0.666	1.713
2001	4	0	8.850	1.542	0.771	2.453
2002	4	0	7.525	1.162	0.581	1.848
2003	4	0	9.570	1.900	0.950	3.024
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	3.300	9.400	6.100	7.600	6.475	8.200
1994	4.530	11.800	7.270	8.940	7.300	9.700
1995	6.450	11.550	5.100	8.275	7.000	10.900
1996	2.250	7.620	5.370	6.040	5.400	6.600
1997	5.200	10.000	4.800	7.750	6.890	8.150
1998	4.390	7.890	3.500	5.905	4.050	6.450
1999	3.030	9.460	6.430	8.150	6.895	9.438
2000	3.640	7.940	4.300	6.750	4.300	7.750
2001	3.500	11.100	7.600	8.350	7.950	9.750
2002	2.600	8.500	5.900	7.850	6.700	8.350
2003	4.070	12.150	8.080	9.025	8.140	11.000
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.690	0.353	0.207	0.566	37.500	287.730
1994	0.781	0.581	0.175	0.667	53.950	499.365
1995	-0.0673	-1.512	0.194	0.573	51.100	466.275
1996	1.010	0.733	0.170	0.688	37.070	232.624
1997	-0.392	1.593	0.197	0.559	45.340	357.080
1998	-0.0675	-0.711	0.217	0.447	33.700	202.260
1999	-0.168	-2.486	0.233	0.433	40.520	335.886
2000	-0.560	-1.927	0.223	0.413	37.790	251.336
2001	1.670	3.143	0.365	0.067	35.400	320.420
2002	-1.300	1.304	0.241	0.470	30.100	230.550
2003	1.100	-0.00822	0.265	0.368	38.280	377.171

TSI

Figure 20 presents the Carson Trophic State Index trend in Blue Mountain Lake.
Chlorophyll TSI was in the mesotrophic range, while total phosphorus and transparency were well within the oligotrophic range.

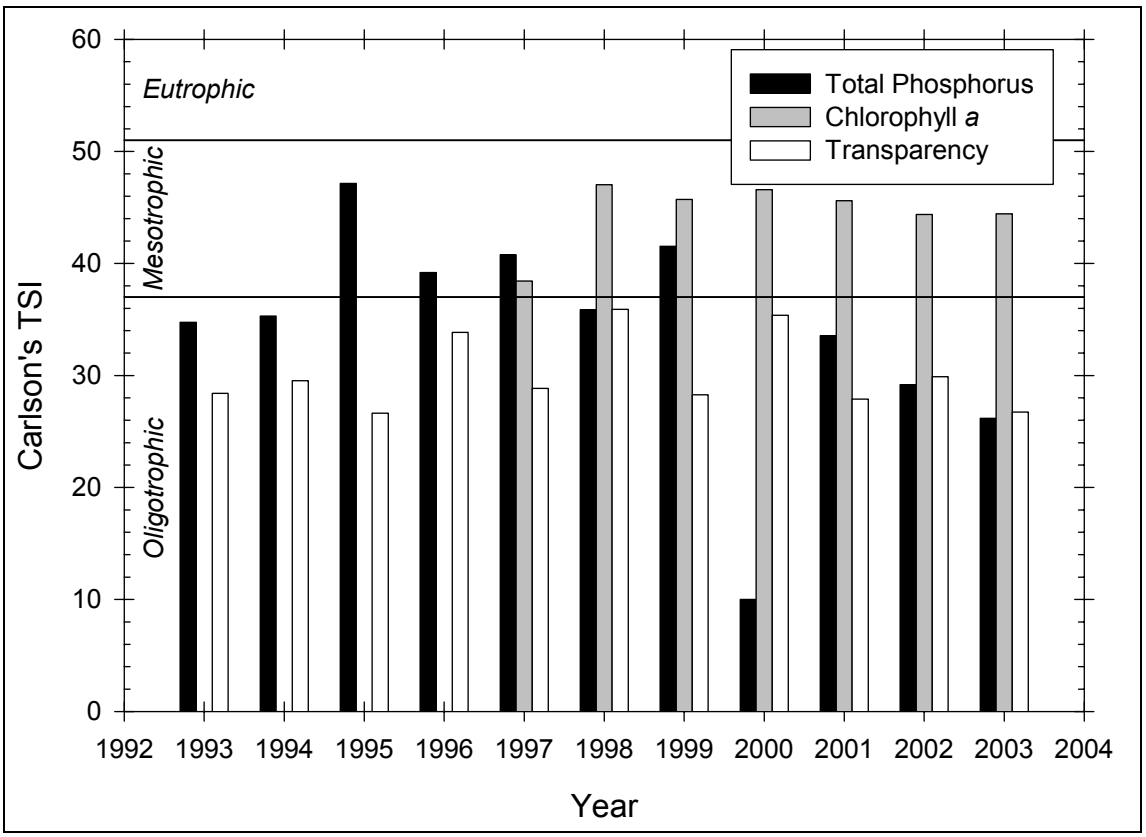


Figure 20 Carlson TSI trend in Blue Mountain Lake

Aluminum

Figure 21 presents the seasonal mean aluminum trend in Blue Mountain Lake, while Table 15 presents descriptive statistics for aluminum in Blue Mountain Lake. The aluminum in Blue Mountain Lake exhibits no distinct trend over the period of study. There appears to be a slight increase in aluminum concentrations in Blue Mountain Lake from 2001 to 2003 (not statistically significant), which contrasts with the county trend. The aluminum in Blue Mountain Lake was slightly lower than the county average, though this difference was not statistically significantly

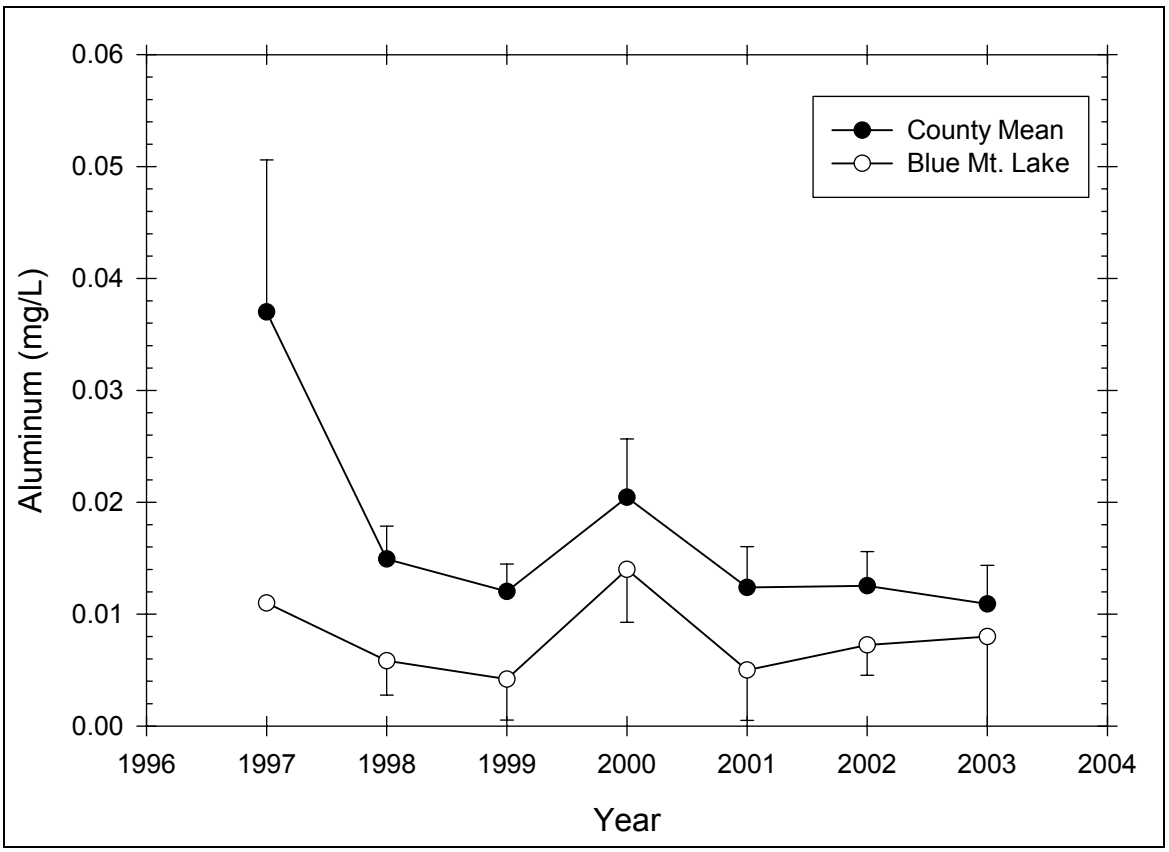


Figure 21 Seasonal mean aluminum trend in Blue Mountain Lake

Table 15 – Descriptive Statistics for Aluminum in Blue Mountain Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0110	--	--	--
1998	6	0	0.00583	0.00293	0.00119	0.00307
1999	6	1	0.00420	0.00295	0.00132	0.00366
2000	6	0	0.0140	0.00452	0.00184	0.00474
2001	6	2	0.00500	0.00283	0.00141	0.00450
2002	6	2	0.00725	0.00171	0.000854	0.00272
2003	6	2	0.00800	0.00668	0.00334	0.0106
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0110	0.0110	0.0110	0.0110	0.0110
1998	0.00700	0.00900	0.00200	0.00600	0.00300	0.00900
1999	0.00700	0.00900	0.00200	0.00300	0.00200	0.00600
2000	0.0120	0.0190	0.00700	0.0140	0.0120	0.0180
2001	0.00600	0.00900	0.00300	0.00400	0.00300	0.00700
2002	0.00400	0.00900	0.00500	0.00750	0.00600	0.00850
2003	0.0140	0.0180	0.00400	0.00500	0.00450	0.0115
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0110	0.000121
1998	-0.186	-1.657	0.194	0.576	0.0350	0.000247
1999	1.430	1.581	0.258	0.312	0.0210	0.000123
2000	-0.527	-0.649	0.171	0.684	0.0840	0.00128
2001	1.414	1.500	0.260	0.387	0.0200	0.000124

2002	-0.753	0.343	0.192	0.657	0.0290	0.000219
2003	1.970	3.906	0.423	0.012	0.0320	0.000390

Calcium

Figure 22 presents the seasonal mean calcium trend in Blue Mountain Lake, while Table 16 presents descriptive statistics for calcium in Blue Mountain Lake. The calcium in Blue Mountain Lake exhibits no distinct trend over the period of study. The calcium in Blue Mountain Lake was slightly lower than the county average, though this difference was not statistically significant.

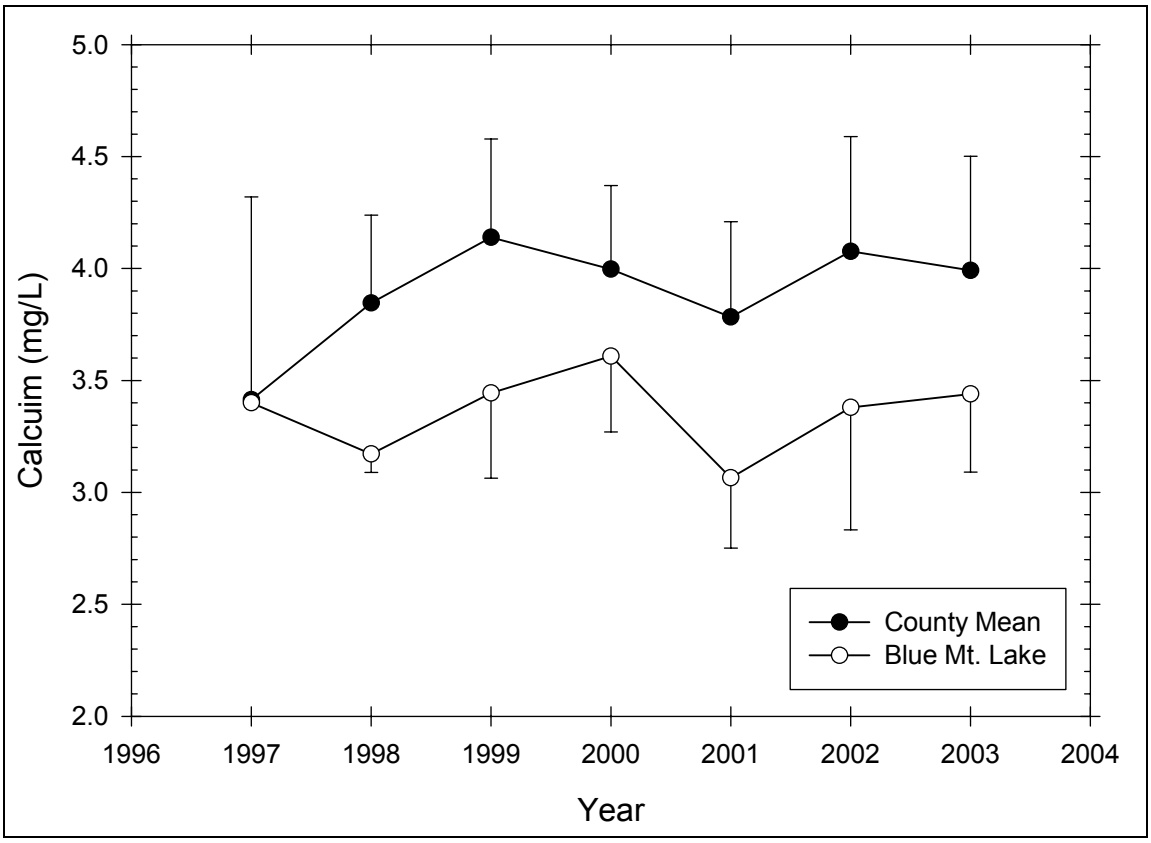


Figure 22 Seasonal mean calcium trend in Blue Mountain Lake

Table 16 – Descriptive Statistics for Calcium in Blue Mountain Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	3.400	--	--	--
1998	6	0	3.172	0.0786	0.0321	0.0825
1999	6	1	3.444	0.307	0.137	0.381
2000	6	0	3.608	0.322	0.132	0.338
2001	6	2	3.065	0.197	0.0985	0.314
2002	6	2	3.380	0.344	0.172	0.547
2003	6	2	3.440	0.220	0.110	0.349
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	3.400	3.400	3.400	3.400	3.400
1998	0.190	3.270	3.080	3.170	3.090	3.250

1999	0.720	3.770	3.050	3.510	3.170	3.703
2000	0.790	3.910	3.120	3.715	3.310	3.880
2001	0.410	3.180	2.770	3.155	2.960	3.170
2002	0.750	3.880	3.130	3.255	3.155	3.605
2003	0.480	3.610	3.130	3.510	3.285	3.595
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	3.400	11.560
1998	0.0720	-1.732	0.184	0.626	19.030	60.388
1999	-0.374	-2.137	0.185	0.658	17.220	59.682
2000	-0.823	-1.115	0.243	0.308	21.650	78.639
2001	-1.976	3.922	0.417	0.015	12.260	37.693
2002	1.658	2.690	0.308	0.199	13.520	46.053
2003	-1.394	1.500	0.250	0.432	13.760	47.479

Calcite Saturation Index

Figure 23 presents the calcite saturation index trend in Blue Mountain Lake. The CSI in Blue Mountain Lake declined considerably between 1997 and 2003, exhibiting a greater decline than the county trend. The CSI in Blue Mountain Lake was consistently lower than in the county lakes, although the difference may not be statistically significant.

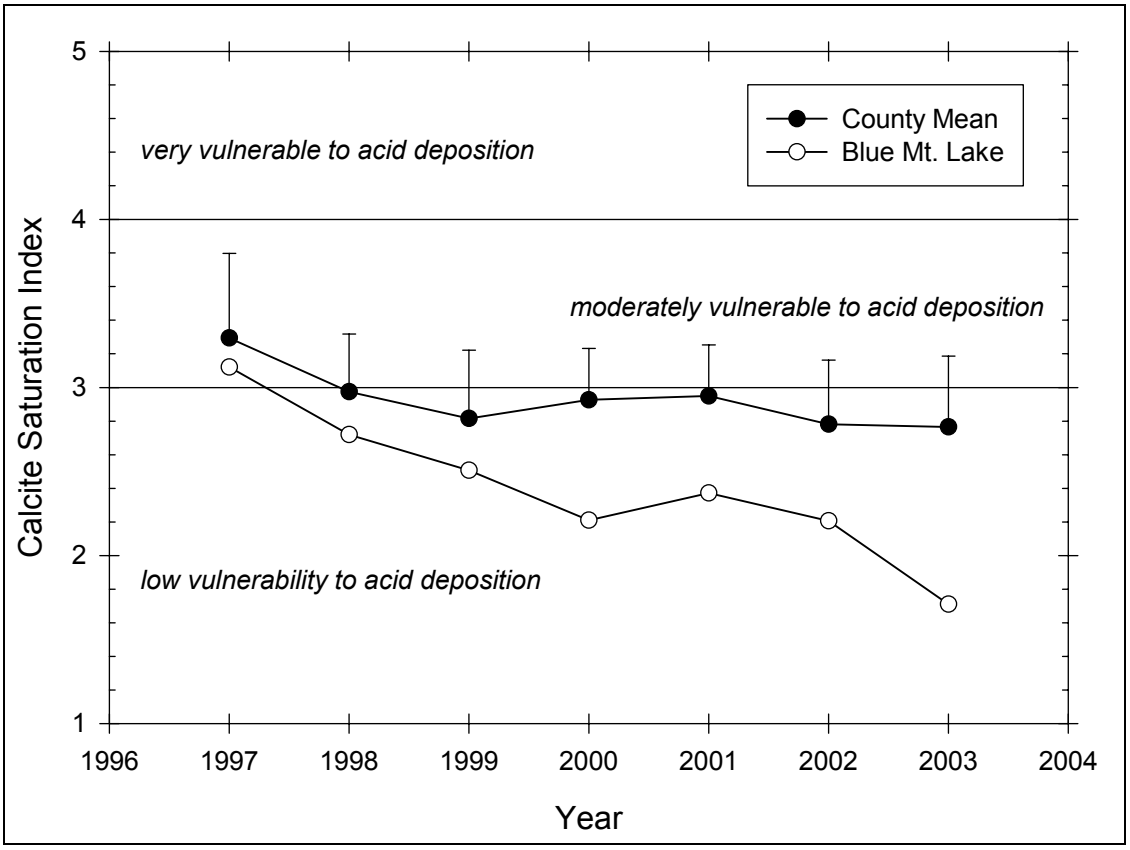
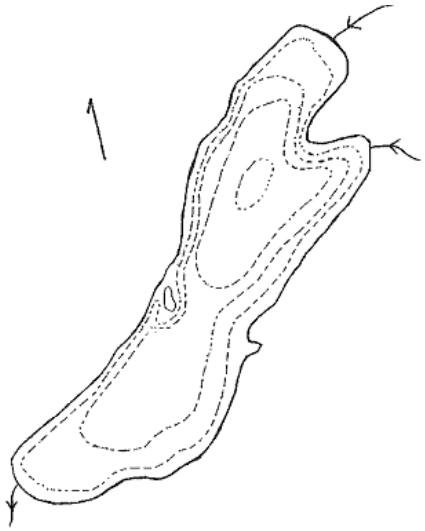


Figure 23 Seasonal mean CSI trend in Blue Mountain Lake

Eighth Lake

Location
Pond Number: 040790
Watershed: Black River
County Hamilton
Topographic Quadrangle: Raquette
Sample Site
Latitude: 43o 46.825'
Longitude: 74o 42.130'
Morphometry
Surface Area: 303 Ac.
Mean Depth: 39 Ft.
Maximum Depth: 81 Ft.
Volume: 11,817 Ac./Ft.
Watershed Area: 2,034 Ac.
Hydraulic Retention Time: 2.5 Yr.
Shoreline Length: 4.0 Mi.
Elevation: 1,791 Ft.
Water Quality Classification: A(T)
Trophic State: Mesotrophic



Temperature and Dissolved Oxygen

Eighth Lake had a minimum DO of 0.3 mg/L (October 1996 and October 1997), with a minimum temperature of 5.0°C and a maximum temperature of 24.2°C. In general, the lowest DO values occurred during the months of August through October.

pH

Figure 24 presents the seasonal mean pH trend in Eighth Lake, while Table 17 presents descriptive statistics for pH in Eighth Lake. The pH in Eighth Lake exhibited a significant decline in 1995 and 1996, followed by higher and stable values from 1997 to 2003. The pH in Eighth Lake was slightly higher than the county average from 1993 until 1999, after which the two trends were quite similar. Any differences were not statistically significant.

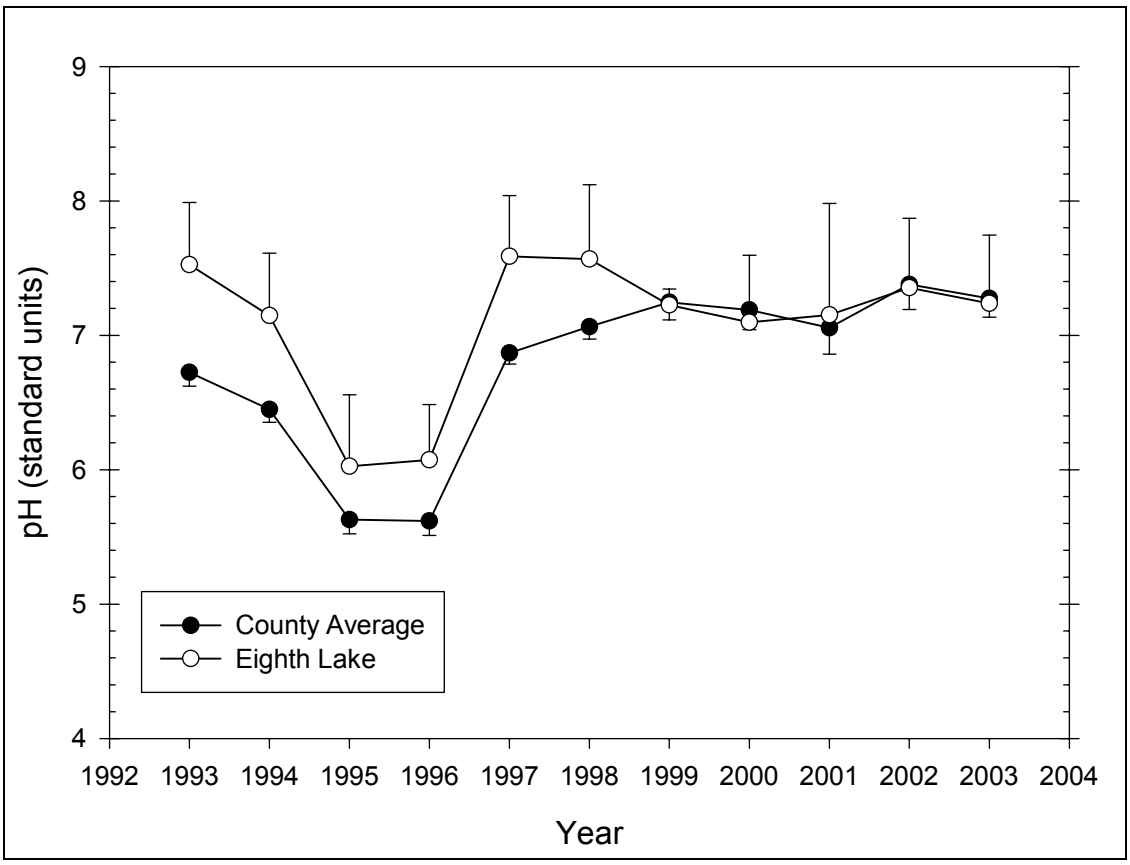


Figure 24 Seasonal mean pH trend in Eight Lake

Table 17 – Descriptive Statistics for pH in Eighth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	7.526	0.373	0.167	0.463
1994	6	0	7.148	0.442	0.180	0.464
1995	6	0	6.027	0.507	0.207	0.532
1996	6	0	6.073	0.392	0.160	0.411
1997	6	0	7.588	0.432	0.176	0.453
1998	6	0	7.568	0.526	0.215	0.552
1999	5	0	7.226	0.0956	0.0427	0.119
2000	6	0	7.098	0.474	0.194	0.498
2001	4	0	7.153	0.521	0.261	0.830
2002	4	0	7.355	0.325	0.162	0.517
2003	4	0	7.238	0.320	0.160	0.509
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.990	7.910	6.920	7.620	7.340	7.753
1994	1.250	7.830	6.580	7.215	6.760	7.290
1995	1.380	6.650	5.270	6.110	5.640	6.380
1996	0.960	6.720	5.760	5.895	5.780	6.390
1997	1.250	8.340	7.090	7.560	7.270	7.710
1998	1.370	8.460	7.090	7.470	7.110	7.810
1999	0.230	7.370	7.140	7.200	7.148	7.295
2000	1.330	7.530	6.200	7.155	7.100	7.450
2001	1.190	7.800	6.610	7.100	6.745	7.560

2002	0.770	7.670	6.900	7.425	7.160	7.550
2003	0.750	7.690	6.940	7.160	7.035	7.440
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-1.286	2.199	0.251	0.346	37.630	283.759
1994	0.277	0.0656	0.208	0.500	42.890	307.568
1995	-0.450	-0.736	0.163	0.714	36.160	219.207
1996	1.168	-0.183	0.319	0.056	36.440	222.080
1997	1.009	1.647	0.222	0.416	45.530	346.428
1998	1.018	0.503	0.208	0.496	45.410	345.062
1999	0.945	-0.168	0.207	0.564	36.130	261.112
2000	-1.691	3.466	0.335	0.034	42.590	303.442
2001	0.453	-1.390	0.199	0.635	28.610	205.449
2002	-1.213	2.339	0.329	0.136	29.420	216.700
2003	1.323	2.375	0.309	0.195	28.950	209.833

Alkalinity

Figure 25 presents the seasonal mean alkalinity trend in Eighth Lake, while Table 18 presents descriptive statistics for alkalinity in Eighth Lake. The alkalinity in Eighth Lake exhibits no distinct trend over the period of study. The alkalinity in Eighth Lake was significantly higher than the county average, though this difference may not be statistically significant in all years.

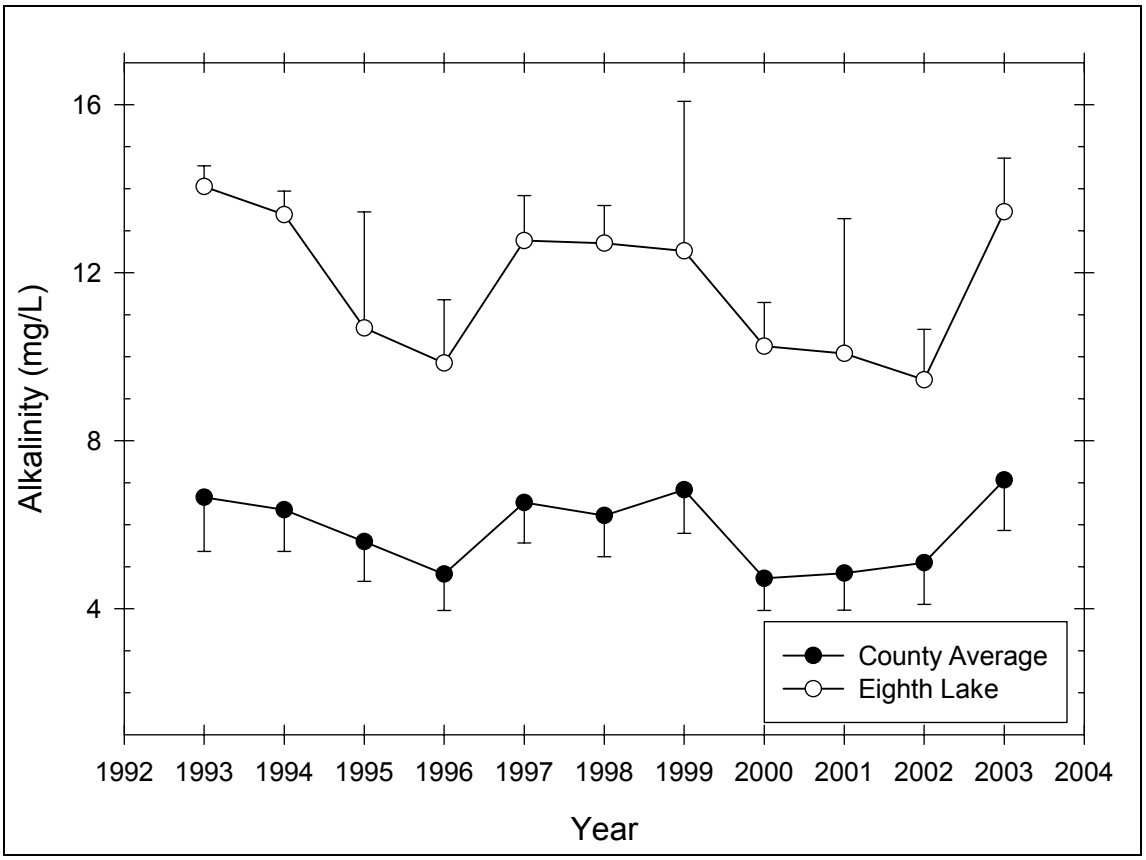


Figure 25 Seasonal mean alkalinity trend in Eighth Lake

Table 18 – Descriptive Statistics for Alkalinity in Eighth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	5	1	14.050	0.311	0.155	0.495
1994	6	0	13.383	0.534	0.218	0.561
1995	6	0	10.683	2.630	1.074	2.760
1996	6	0	9.850	1.436	0.586	1.507
1997	6	0	12.767	1.015	0.414	1.065
1998	6	0	12.700	0.860	0.351	0.903
1999	5	3	9.050	2.333	1.650	20.965
2000	5	0	11.300	2.005	0.897	2.490
2001	5	0	11.040	2.545	1.138	3.160
2002	5	0	10.960	2.665	1.192	3.309
2003	5	1	11.625	2.108	1.054	3.354
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.700	14.500	13.800	13.950	13.850	14.250
1994	1.500	14.400	12.900	13.300	13.000	13.400
1995	7.400	13.300	5.900	11.100	10.100	12.600
1996	3.500	11.600	8.100	10.200	8.200	10.800
1997	2.300	13.800	11.500	12.950	11.700	13.700
1998	2.000	13.700	11.700	12.650	11.900	13.600
1999	3.300	10.700	7.400	9.050	7.400	10.700
2000	5.400	14.000	8.600	10.800	10.250	12.725
2001	5.600	13.900	8.300	10.400	8.900	13.600
2002	5.400	14.000	8.600	9.600	8.825	13.775
2003	4.800	14.000	9.200	11.650	9.950	13.300
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.597	2.704	0.314	0.180	56.200	789.900
1994	1.730	3.568	0.321	0.053	80.300	1076.110
1995	-1.384	2.303	0.246	0.292	64.100	719.390
1996	-0.325	-1.760	0.208	0.497	59.100	592.450
1997	-0.314	-2.340	0.234	0.354	76.600	983.080
1998	0.0848	-2.288	0.186	0.618	76.200	971.440
1999	--	--	0.260	0.481	18.100	169.250
2000	0.0388	0.308	0.202	0.590	56.500	654.530
2001	0.256	-2.810	0.233	0.434	55.200	635.320
2002	0.534	-3.188	0.295	0.165	54.800	629.020
2003	-0.0519	-2.009	0.178	0.688	46.500	553.890

Total Phosphorus

Figure 26 presents the seasonal mean total phosphorus trend in Eighth Lake, while Table 19 presents descriptive statistics for total phosphorus in Eighth Lake. The total phosphorus in Eighth Lake exhibits a trend of decreasing concentrations, particularly between 1998 and 2003. The within year variability in phosphorus concentrations was significant, as evidenced by the large error bars. The total phosphorus in Eighth Lake was generally similar to the county average.

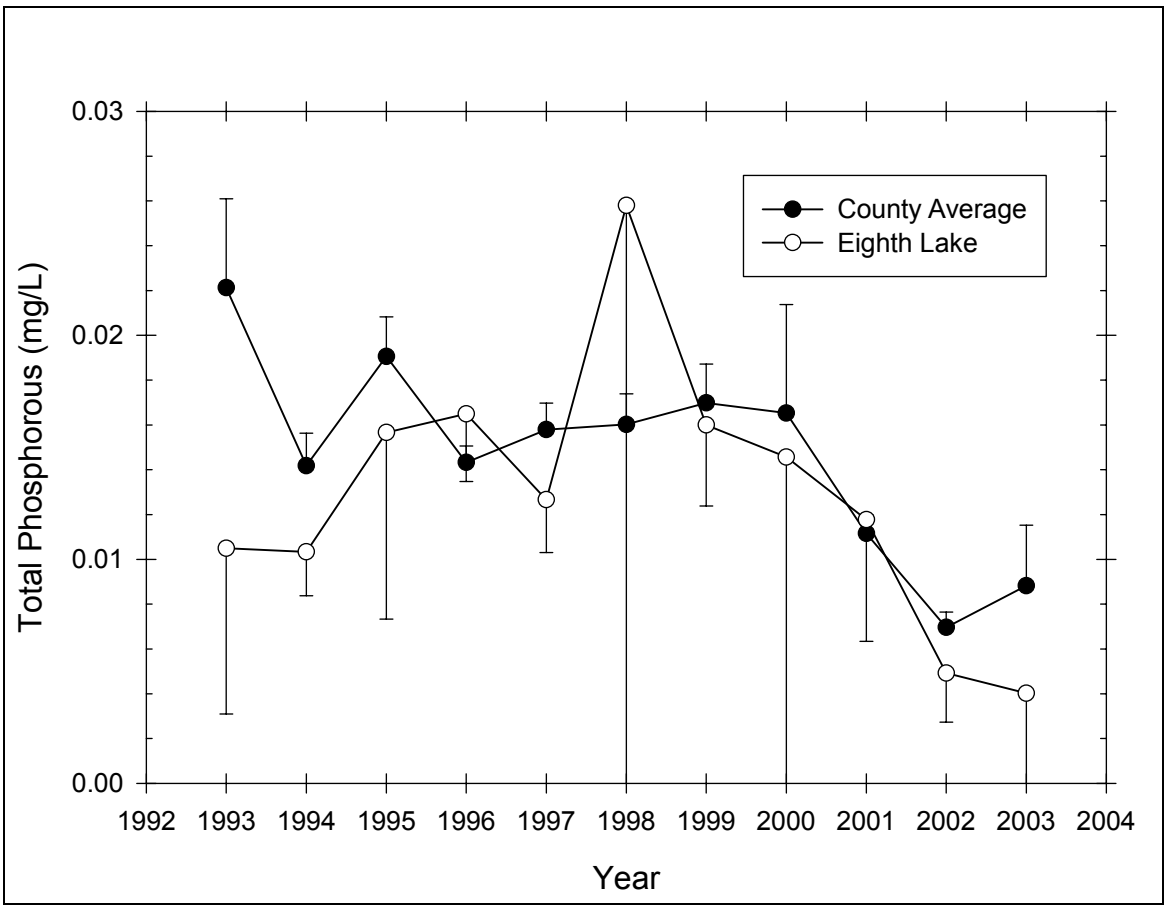


Figure 26 Seasonal mean total phosphorus in Eighth Lake

Table 19 – Descriptive Statistics for Total Phosphorus in Eighth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	2	0.0105	0.00465	0.00233	0.00741
1994	6	0	0.0103	0.00186	0.000760	0.00195
1995	6	0	0.0157	0.00794	0.00324	0.00833
1996	6	0	0.0165	0.00288	0.00118	0.00302
1997	6	0	0.0127	0.00225	0.000919	0.00236
1998	6	1	0.0258	0.0212	0.00947	0.0263
1999	6	1	0.0160	0.00292	0.00130	0.00362
2000	6	0	0.0146	0.0158	0.00645	0.0166
2001	6	2	0.0118	0.00342	0.00171	0.00544
2002	6	2	0.00492	0.00138	0.000691	0.00220
2003	6	2	0.00402	0.00263	0.00131	0.00418
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0110	0.0150	0.00400	0.0115	0.00750	0.0135
1994	0.00500	0.0140	0.00900	0.01000	0.00900	0.01000
1995	0.0210	0.0280	0.00700	0.0145	0.00900	0.0210
1996	0.00700	0.0200	0.0130	0.0175	0.0130	0.0180
1997	0.00700	0.0160	0.00900	0.0130	0.0120	0.0130
1998	0.0480	0.0580	0.01000	0.0130	0.0108	0.0422
1999	0.00700	0.0180	0.0110	0.0170	0.0147	0.0180
2000	0.0430	0.0440	0.001000	0.0102	0.00300	0.0190

2001	0.00800	0.0164	0.00840	0.0112	0.00935	0.0142
2002	0.00280	0.00630	0.00350	0.00495	0.00375	0.00610
2003	0.00570	0.00740	0.00170	0.00350	0.00195	0.00610
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-1.190	2.123	0.293	0.252	0.0420	0.000506
1994	2.066	4.649	0.404	0.003	0.0620	0.000658
1995	0.619	-0.663	0.178	0.655	0.0940	0.00179
1996	-0.452	-1.572	0.236	0.344	0.0990	0.00167
1997	-0.327	2.052	0.274	0.169	0.0760	0.000988
1998	1.118	-0.376	0.327	0.086	0.129	0.00512
1999	-1.816	3.384	0.300	0.149	0.0800	0.00131
2000	1.619	2.779	0.231	0.367	0.0874	0.00252
2001	0.958	0.993	0.224	0.546	0.0471	0.000590
2002	-0.0401	-4.964	0.260	0.389	0.0197	0.000103
2003	0.744	-1.600	0.256	0.404	0.0161	0.0000855

Nitrate

Figure 27 presents the seasonal mean nitrate trend in Eighth Lake, while Table 20 presents descriptive statistics for nitrate in Eighth Lake. The nitrate in Eighth Lake exhibited a steady decreasing trend from 1997 to 2003, perhaps starting as early as 1994. The nitrate in Eighth Lake was lower than the county average, though this difference was not statistically significant.

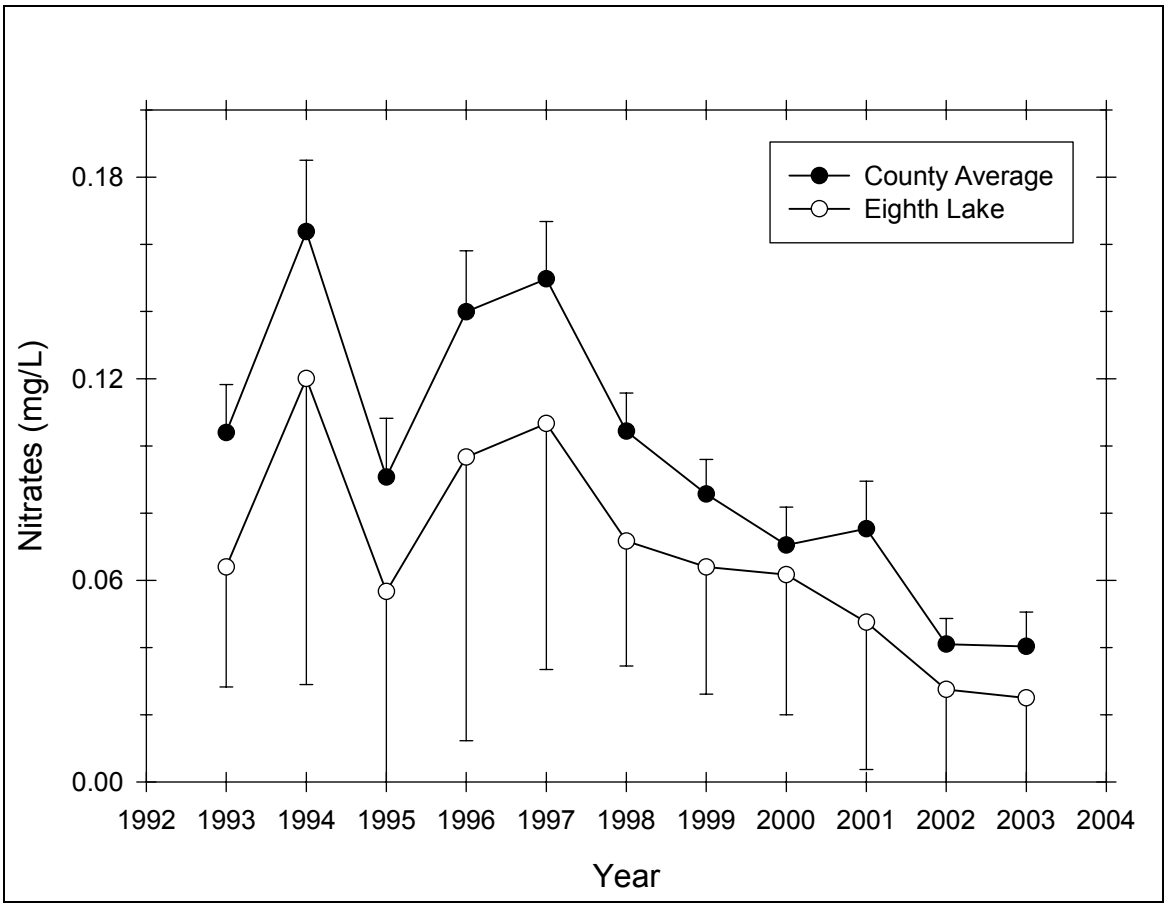


Figure 27 Seasonal mean nitrate trend in Eighth Lake

Table 20 – Descriptive Statistics for Nitrate in Eighth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0640	0.0288	0.0129	0.0358
1994	6	0	0.120	0.0867	0.0354	0.0910
1995	6	0	0.0567	0.0612	0.0250	0.0642
1996	6	0	0.0967	0.0804	0.0328	0.0844
1997	6	0	0.107	0.0698	0.0285	0.0732
1998	6	0	0.0717	0.0354	0.0145	0.0372
1999	6	1	0.0640	0.0305	0.0136	0.0379
2000	6	0	0.0617	0.0397	0.0162	0.0417
2001	6	2	0.0475	0.0275	0.0138	0.0438
2002	6	2	0.0275	0.0222	0.0111	0.0353
2003	6	2	0.0250	0.0238	0.0119	0.0379
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0600	0.1000	0.0400	0.0500	0.0400	0.0925
1994	0.200	0.230	0.0300	0.105	0.0400	0.210
1995	0.140	0.140	0.000	0.0400	0.000	0.120
1996	0.210	0.250	0.0400	0.0700	0.0400	0.110
1997	0.180	0.220	0.0400	0.0950	0.0500	0.140
1998	0.0900	0.130	0.0400	0.0550	0.0500	0.1000
1999	0.0700	0.110	0.0400	0.0500	0.0400	0.0875
2000	0.1000	0.130	0.0300	0.0400	0.0400	0.0900
2001	0.0600	0.0800	0.0200	0.0450	0.0250	0.0700
2002	0.0500	0.0600	0.01000	0.0200	0.0150	0.0400
2003	0.0500	0.0600	0.01000	0.0150	0.01000	0.0400
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.590	-2.849	0.286	0.194	0.320	0.0238
1994	0.323	-2.227	0.218	0.441	0.720	0.124
1995	0.549	-1.924	0.225	0.399	0.340	0.0380
1996	1.812	3.428	0.267	0.195	0.580	0.0884
1997	0.818	-0.300	0.248	0.279	0.640	0.0926
1998	1.128	-0.183	0.296	0.104	0.430	0.0371
1999	1.044	-0.420	0.277	0.230	0.320	0.0242
2000	1.340	0.541	0.374	0.009	0.370	0.0307
2001	0.323	-3.033	0.237	0.488	0.190	0.0113
2002	1.720	3.265	0.382	0.041	0.110	0.00450
2003	1.779	3.135	0.333	0.127	0.1000	0.00420

Chlorophyll a

Figure 28 presents the seasonal mean chlorophyll *a* trend in Eighth Lake, while Table 21 presents descriptive statistics for chlorophyll *a* in Eighth Lake. The chlorophyll *a* in Eighth Lake exhibits a slight trend of increasing values up to 2001, followed by a decrease in concentration in 2002 and 2003. The chlorophyll *a* in Eighth Lake was slightly lower than the county average, though this difference was not statistically significant.

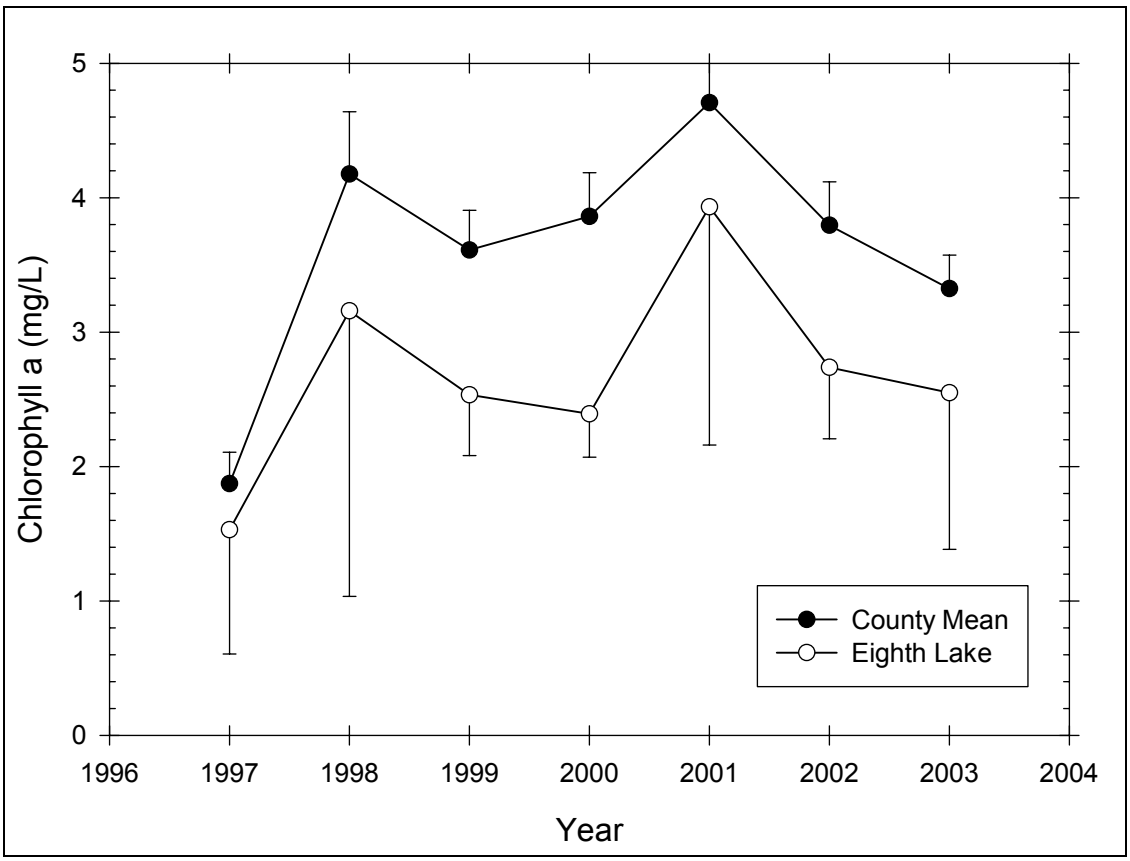


Figure 28 Seasonal mean chlorophyll a trend in Eighth Lake

Table 21 – Descriptive Statistics for Chlorophyll a in Eighth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	1.530	0.882	0.360	0.925
1998	6	0	3.158	2.025	0.827	2.125
1999	6	1	2.534	0.364	0.163	0.452
2000	6	1	2.392	0.260	0.116	0.323
2001	6	2	3.932	1.114	0.557	1.772
2002	6	2	2.737	0.334	0.167	0.531
2003	6	2	2.550	0.733	0.366	1.166
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	2.450	3.260	0.810	1.225	1.100	1.560
1998	5.190	6.470	1.280	2.395	1.650	4.760
1999	0.860	3.180	2.320	2.420	2.328	2.610
2000	0.630	2.780	2.150	2.390	2.158	2.555
2001	2.150	5.010	2.860	3.930	2.975	4.890
2002	0.750	3.130	2.380	2.720	2.470	3.005
2003	1.600	3.470	1.870	2.430	1.965	3.135
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	2.043	4.505	0.320	0.055	9.180	17.931
1998	1.065	-0.206	0.309	0.076	18.950	80.353
1999	2.141	4.662	0.423	0.004	12.670	32.636
2000	0.768	-0.0701	0.214	0.532	11.960	28.879

2001	0.00326	-5.561	0.275	0.322	15.730	65.581
2002	0.217	-2.325	0.203	0.624	10.950	30.309
2003	0.613	-2.042	0.248	0.440	10.200	27.621

Transparency

Figure 29 presents the seasonal mean transparency trend in Eighth Lake, while Table 22 presents descriptive statistics for transparency in Eighth Lake. The transparency in Eighth Lake exhibits no distinct trend over the period of study, with values varying from year to year but generally remaining steady. The transparency in Eighth Lake was slightly higher than the county average, though this difference was not statistically significant.

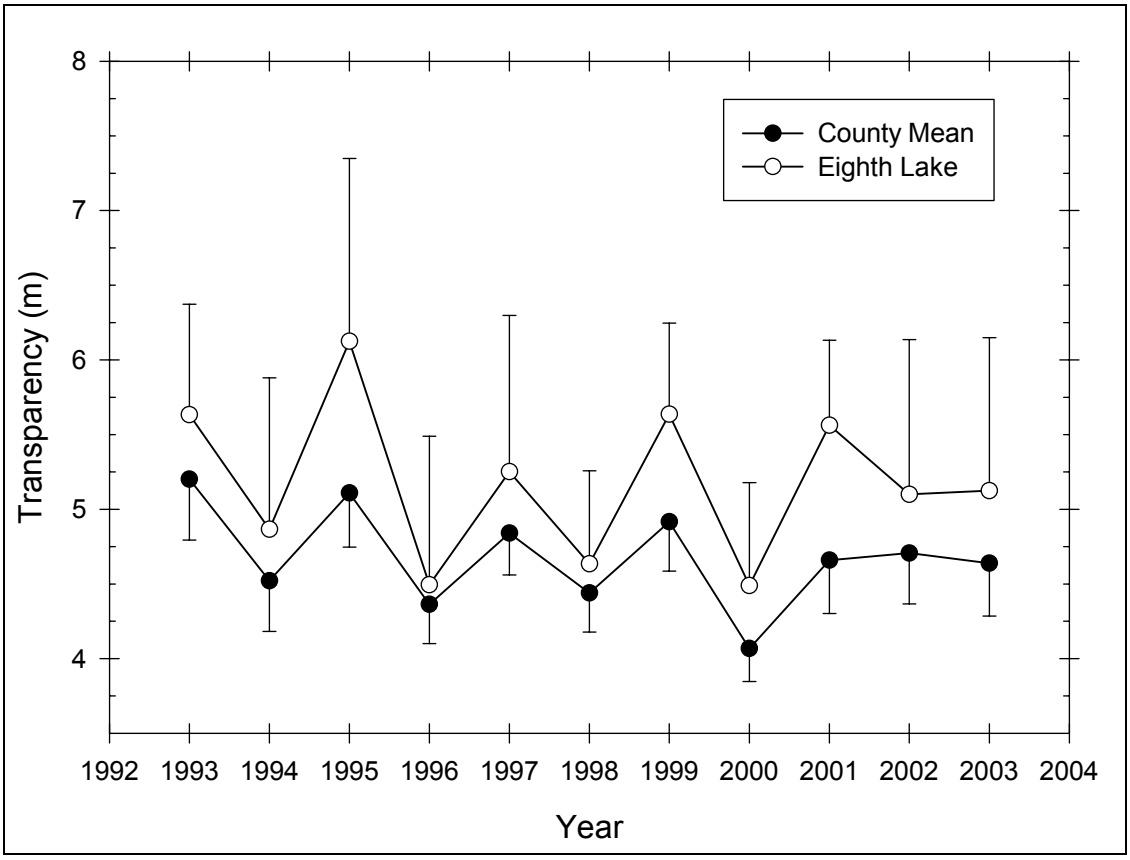


Figure 29 Seasonal mean transparency in Eighth Lake

Table 22 – Descriptive Statistics for Transparency in Eighth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	5.634	0.739	0.330	0.917
1994	6	0	4.867	1.013	0.414	1.063
1995	6	0	6.125	1.224	0.500	1.285
1996	6	0	4.495	0.995	0.406	1.044
1997	6	0	5.252	1.047	0.427	1.098
1998	6	0	4.635	0.624	0.255	0.655
1999	5	0	5.636	0.611	0.273	0.759

2000	6	0	4.490	0.689	0.281	0.723
2001	4	0	5.563	0.571	0.285	0.908
2002	4	0	5.100	1.036	0.518	1.649
2003	4	0	5.125	1.024	0.512	1.630
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.820	6.360	4.540	5.760	5.110	6.247
1994	2.800	6.700	3.900	4.550	4.200	5.300
1995	3.350	7.100	3.750	6.575	5.950	6.800
1996	2.630	5.850	3.220	4.325	3.820	5.430
1997	2.950	6.550	3.600	5.055	5.030	6.220
1998	1.750	5.700	3.950	4.515	4.200	4.930
1999	1.370	6.320	4.950	5.900	5.010	6.065
2000	1.730	5.330	3.600	4.250	4.200	5.310
2001	1.300	6.300	5.000	5.475	5.125	6.000
2002	2.400	6.500	4.100	4.900	4.350	5.850
2003	2.400	6.400	4.000	5.050	4.350	5.900
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.797	-0.308	0.182	0.669	28.170	160.893
1994	1.435	2.002	0.270	0.184	29.200	147.240
1995	-1.957	4.041	0.287	0.128	36.750	232.587
1996	0.263	-1.245	0.160	0.725	26.970	126.181
1997	-0.376	0.263	0.249	0.274	31.510	170.958
1998	1.006	0.940	0.159	0.728	27.810	130.844
1999	-0.304	-2.675	0.267	0.271	28.180	160.316
2000	0.352	-1.306	0.275	0.166	26.940	123.335
2001	0.700	-0.742	0.208	0.606	22.250	124.743
2002	0.971	0.690	0.212	0.593	20.400	107.260
2003	0.368	-0.531	0.161	0.708	20.500	108.210

TSI

Figure 30 presents the Carlson trophic state index trend in Eighth Lake. Transparency TSI values hovered around the oligotrophic-mesotrophic boundary, while chlorophyll TSI values were in the upper mesotrophic to eutrophic range and total phosphorus TSI values exhibited a decrease from near eutrophic well into the oligotrophic range.

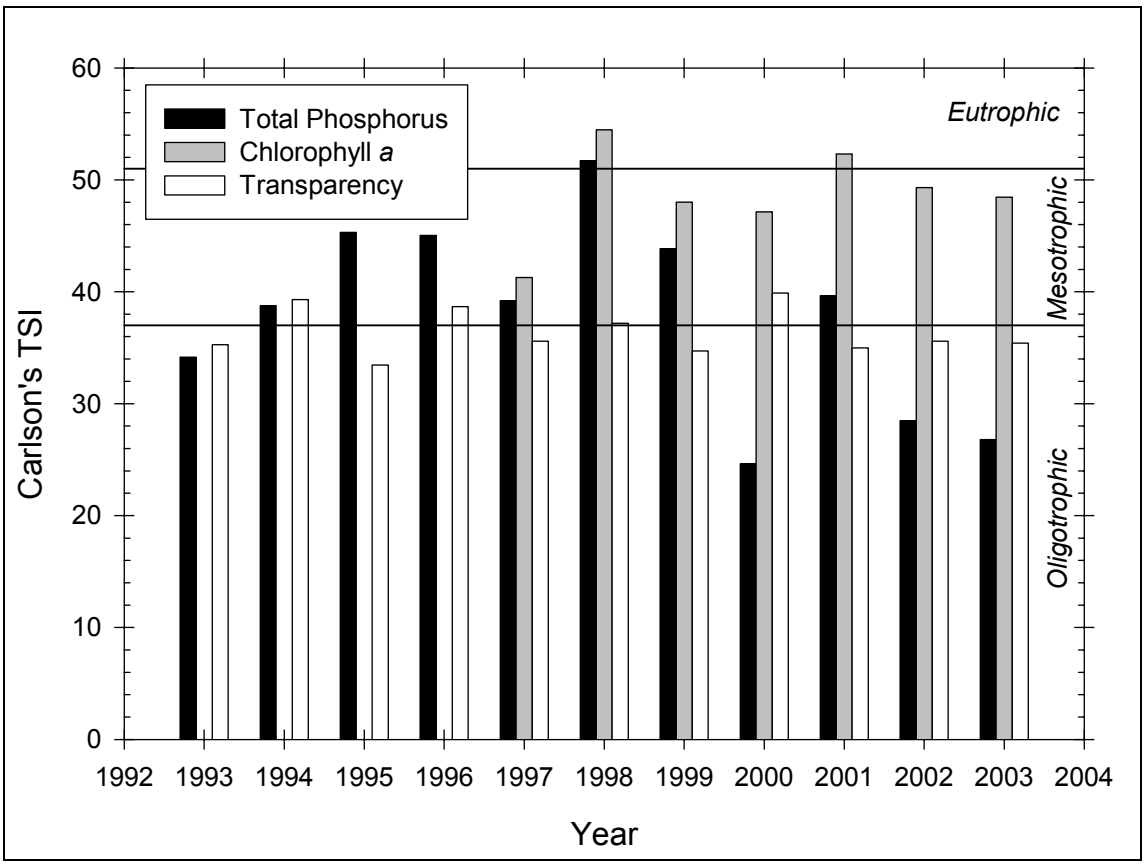


Figure 30 Carlson TSI trend in Eighth Lake

Aluminum

Figure 31 presents the seasonal mean aluminum trend in Eighth Lake, while Table 23 presents descriptive statistics for aluminum in Eighth Lake. The aluminum in Eighth Lake exhibited a decrease from 1997 to 2000, followed by steady conditions. The aluminum in Eighth Lake was slightly lower than the county average, though this difference was not statistically significant.

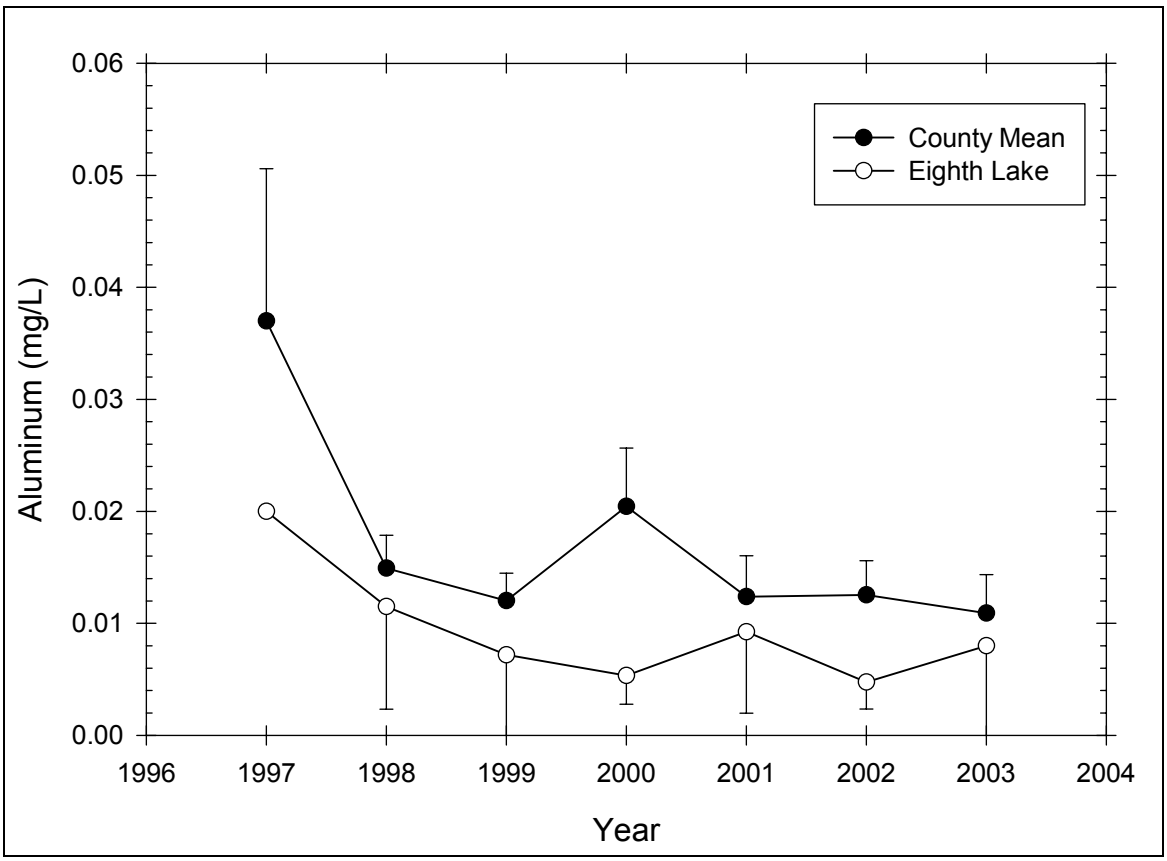


Figure 31 Seasonal mean aluminum trend in Eighth Lake

Table 23 – Descriptive Statistics for Aluminum in Eighth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0200	--	--	--
1998	6	0	0.0115	0.00873	0.00357	0.00917
1999	6	1	0.00720	0.00597	0.00267	0.00742
2000	6	0	0.00533	0.00242	0.000989	0.00254
2001	6	2	0.00925	0.00457	0.00229	0.00728
2002	6	2	0.00475	0.00150	0.000750	0.00239
2003	6	2	0.00800	0.00668	0.00334	0.0106
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0200	0.0200	0.0200	0.0200	0.0200
1998	0.0190	0.0210	0.00200	0.0120	0.00300	0.0190
1999	0.0130	0.0150	0.00200	0.00500	0.00200	0.0128
2000	0.00700	0.00900	0.00200	0.00500	0.00400	0.00700
2001	0.01000	0.0140	0.00400	0.00950	0.00550	0.0130
2002	0.00300	0.00600	0.00300	0.00500	0.00350	0.00600
2003	0.0140	0.0180	0.00400	0.00500	0.00450	0.0115
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0200	0.000400
1998	-0.0378	-2.959	0.272	0.179	0.0690	0.00117
1999	0.573	-2.392	0.244	0.381	0.0360	0.000402
2000	0.305	0.159	0.221	0.421	0.0320	0.000200

2001	-0.196	-3.202	0.226	0.536	0.0370	0.000405
2002	-0.370	-3.901	0.298	0.234	0.0190	0.0000970
2003	1.970	3.906	0.423	0.012	0.0320	0.000390

Calcium

Figure 32 presents the seasonal mean calcium trend in Eighth Lake, while Table 24 presents descriptive statistics for calcium in Eighth Lake. The calcium in Eighth Lake exhibited a steady slight increasing trend from 1997 to 2003. The calcium in Eighth Lake was significantly higher than the county average, though this difference may not be statistically significant for all years.

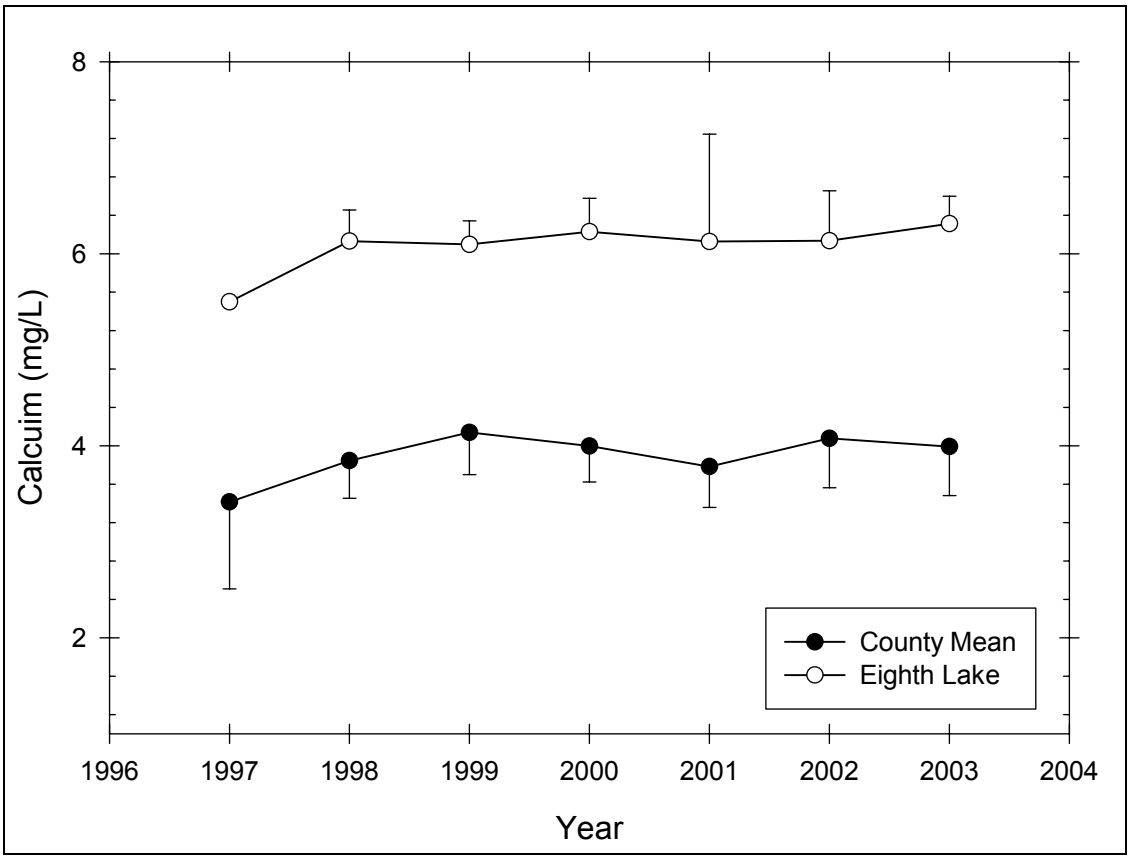


Figure 32 Seasonal mean calcium trend in Eighth Lake

Table 24 – Descriptive Statistics for Calcium in Eighth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	5.500	--	--	--
1998	6	0	6.132	0.309	0.126	0.324
1999	6	1	6.098	0.197	0.0882	0.245
2000	6	0	6.230	0.331	0.135	0.347
2001	6	2	6.128	0.703	0.351	1.118
2002	6	2	6.135	0.327	0.164	0.520
2003	6	2	6.313	0.180	0.0901	0.287
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	5.500	5.500	5.500	5.500	5.500

1998	0.870	6.680	5.810	6.125	5.870	6.180
1999	0.520	6.290	5.770	6.150	6.010	6.215
2000	0.870	6.880	6.010	6.100	6.040	6.250
2001	1.490	6.760	5.270	6.240	5.555	6.700
2002	0.710	6.370	5.660	6.255	5.920	6.350
2003	0.410	6.530	6.120	6.300	6.170	6.455
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	5.500	30.250
1998	1.156	1.871	0.271	0.181	36.790	226.062
1999	-1.481	2.738	0.284	0.204	30.490	186.084
2000	2.084	4.499	0.309	0.075	37.380	233.424
2001	-0.513	-2.874	0.267	0.356	24.510	151.666
2002	-1.652	2.641	0.305	0.210	24.540	150.874
2003	0.304	-1.802	0.196	0.645	25.250	159.488

Calcite Saturation Index

Figure 33 presents the calcite saturation index trend in Eighth Lake. CSI in Eighth Lake remained within the low vulnerability range throughout the study period. CSI values in Eight Lake were lower than the county CSI values, although the difference might not be statistically significant.

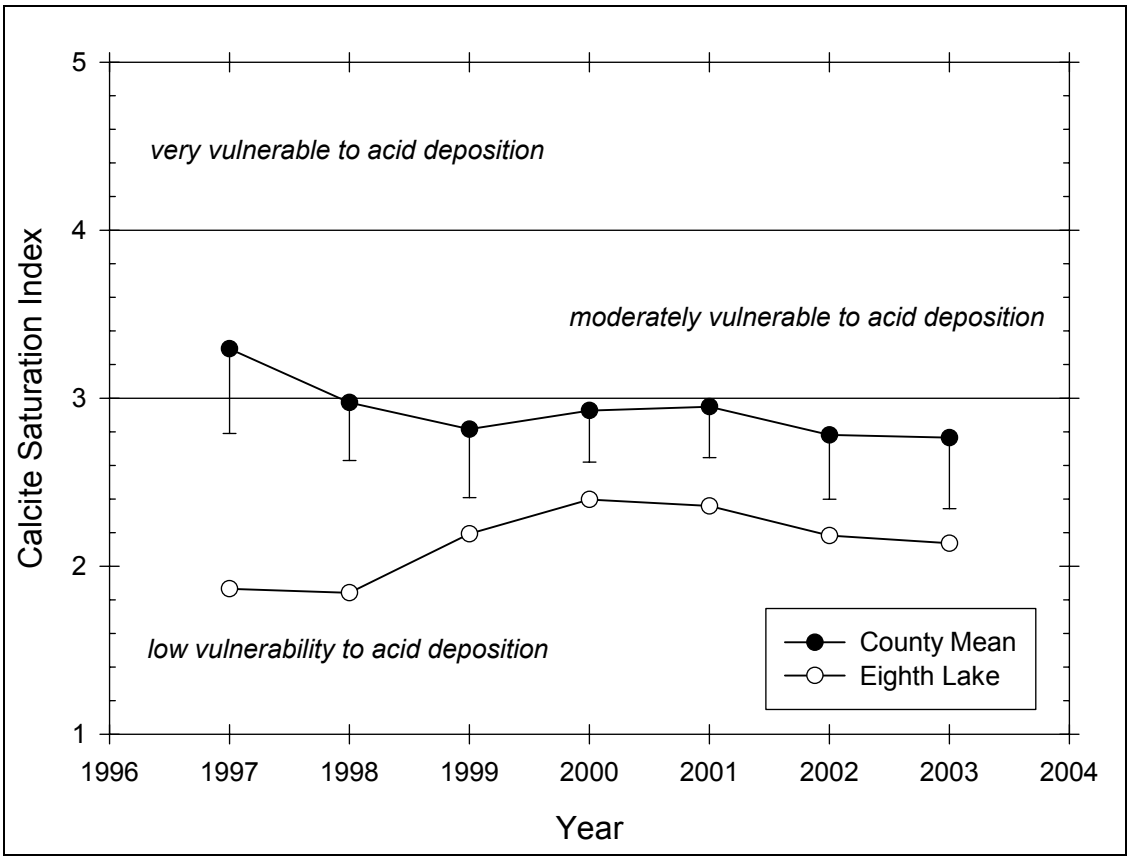
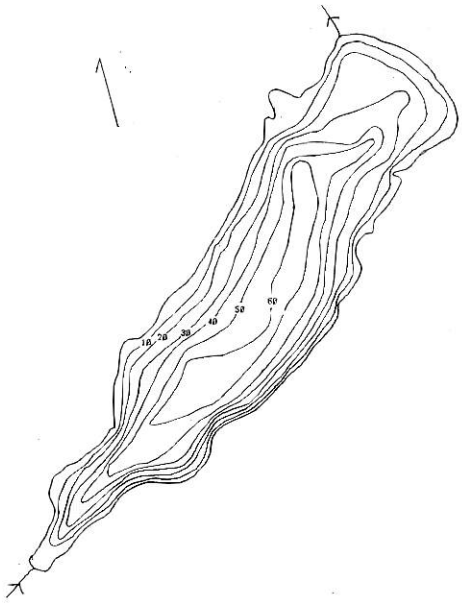


Figure 33 Seasonal mean CSI trend in Eighth Lake

Fawn Lake

Location
Pond Number: 050247
Watershed: Upper Hudson River
County: Hamilton
Topographic Quadrangle: Lake Pleasant
Sample Site
Latitude: 43o 29.274'
Longitude: 74o 27.249'
Morphometry
Surface Area: 289 Ac.
Mean Depth: 34 Ft.
Maximum Depth: 62 Ft.
Volume: 8,314 Ac./Ft.
Watershed Area: 1115 Ac.
Hydraulic Retention Time: 2.3 Yr.
Shoreline Length: 3.5 Mi.
Elevation: 1701 Ft.
Water Quality Classification: N
Trophic State: Mesotrophic



Temperature and Dissolved Oxygen

Fawn Lake had a minimum DO of 0.5 mg/L (September 2000), with a minimum temperature of 4.9°C and a maximum temperature of 25.8 °C. In general, the lowest DO values occurred during the months of July through September.

pH

Figure 34 presents the seasonal mean pH trend in Fawn Lake, while Table 25 presents descriptive statistics for pH in Fawn Lake. The pH in Fawn Lake exhibited no distinct trend. The pH in Fawn Lake was generally slightly higher than the county average, though this difference was not statistically significant.

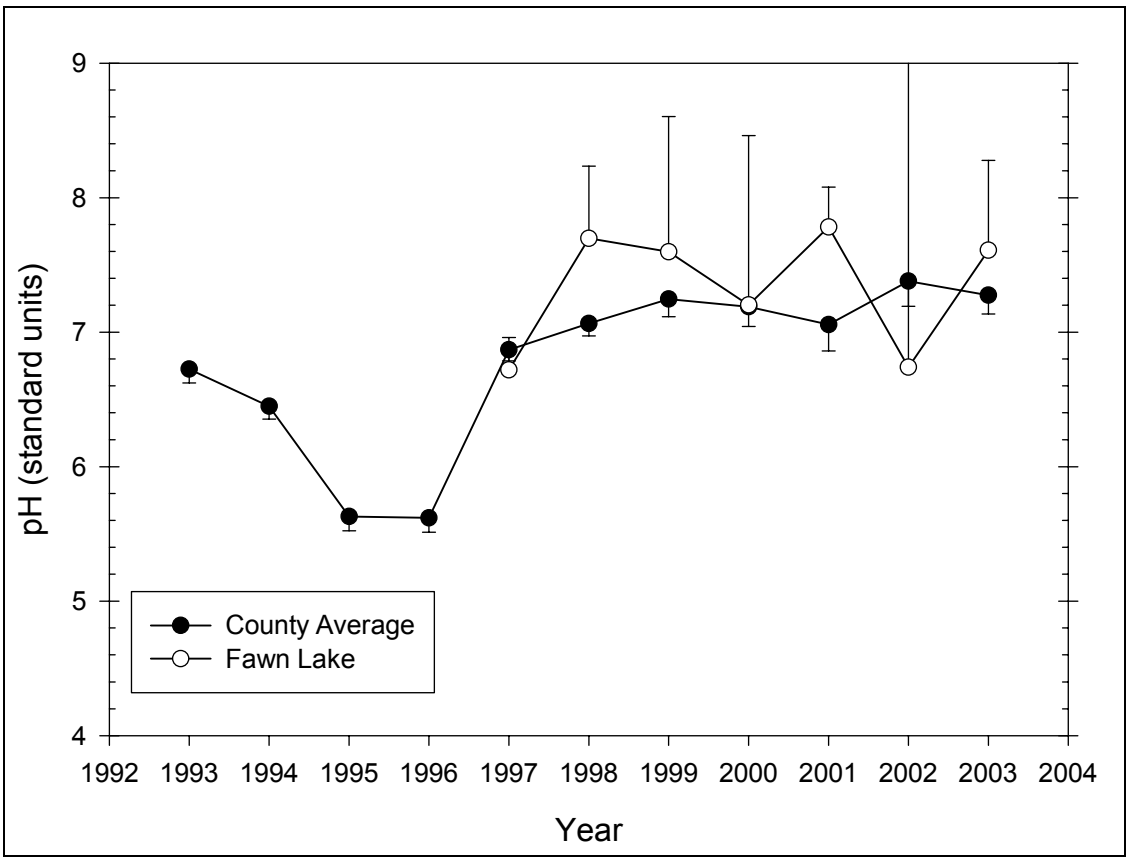


Figure 34 Seasonal mean pH trend in Fawn Lake

Table 25 – Descriptive Statistics for pH in Fawn Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	6.720	0.229	0.0935	0.240
1998	5	1	7.697	0.338	0.169	0.538
1999	4	0	7.598	0.632	0.316	1.006
2000	4	0	7.202	0.792	0.396	1.260
2001	5	0	7.782	0.240	0.107	0.298
2002	2	0	6.740	1.739	1.230	15.629
2003	5	0	7.610	0.537	0.240	0.667
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.640	6.970	6.330	6.795	6.580	6.850
1998	0.720	7.920	7.200	7.835	7.485	7.910
1999	1.480	8.180	6.700	7.755	7.205	7.990
2000	1.830	8.020	6.190	7.300	6.600	7.805
2001	0.600	7.980	7.380	7.800	7.695	7.958
2002	2.460	7.970	5.510	6.740	5.510	7.970
2003	1.430	8.250	6.820	7.610	7.293	8.002
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	-1.083	0.809	0.287	0.129	40.320	271.213
1998	-1.782	3.155	0.335	0.123	30.790	237.349
1999	-1.361	2.495	0.321	0.160	30.390	232.087
2000	-0.592	-0.595	0.188	0.667	28.810	209.385

2001	-1.588	2.786	0.330	0.079	38.910	303.027
2002	--	--	0.260	0.481	13.480	93.881
2003	-0.551	0.497	0.183	0.666	38.050	290.716

Alkalinity

Figure 35 presents the seasonal mean alkalinity trend in Fawn Lake, while Table 26 presents descriptive statistics for alkalinity in Fawn Lake. The alkalinity in Fawn Lake exhibited no distinct trend. The alkalinity in Fawn Lake was significantly lower than the county average, though this difference may not be statistically significant for all years.

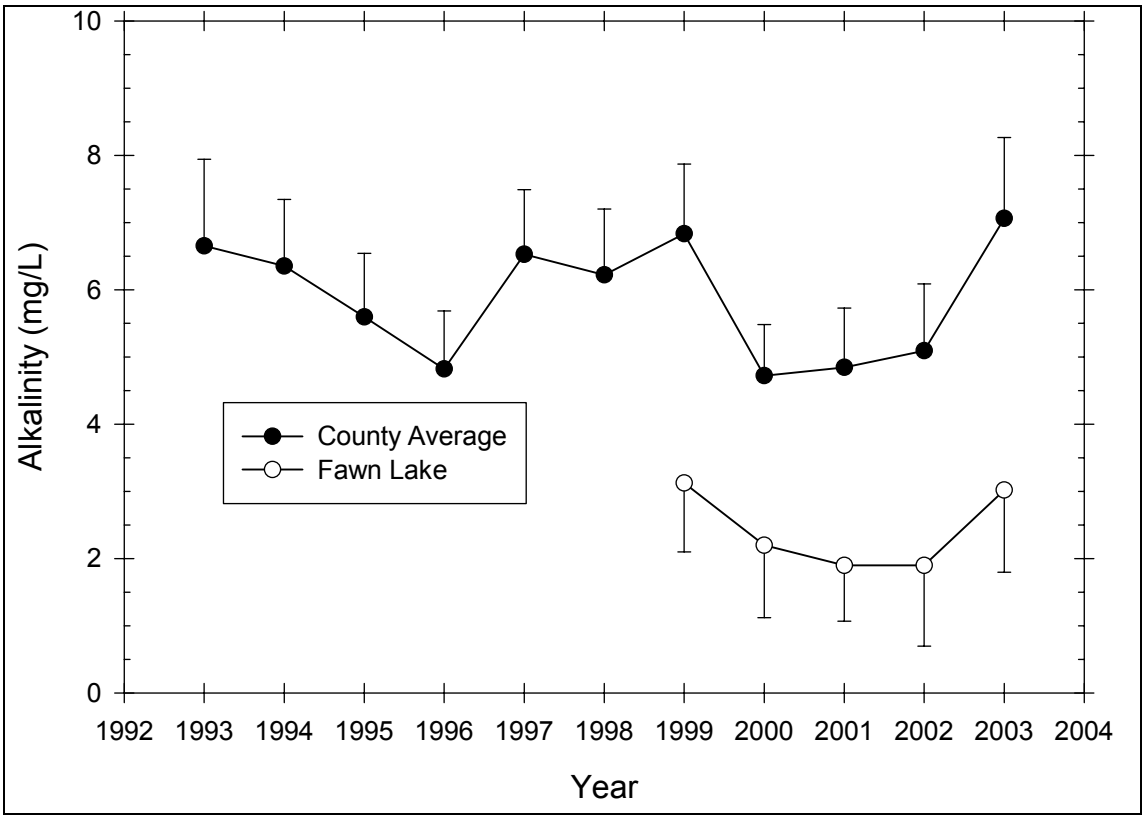


Figure 35 Seasonal mean alkalinity trend in Fawn Lake

Table 26 – Descriptive Statistics for Alkalinity in Fawn Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	5	3	12.450	1.626	1.150	14.612
1997	5	0	2.840	0.336	0.150	0.417
1998	5	1	2.175	0.602	0.301	0.958
1999	6	2	3.125	0.645	0.322	1.026
2000	6	2	2.200	0.678	0.339	1.079
2001	6	2	1.900	0.523	0.261	0.832
2002	6	4	1.900	0.141	0.100	1.271
2003	6	1	3.020	0.986	0.441	1.224
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	2.300	13.600	11.300	12.450	11.300	13.600

1997	0.900	3.200	2.300	2.900	2.675	3.050
1998	1.400	3.000	1.600	2.050	1.750	2.600
1999	1.500	3.700	2.200	3.300	2.750	3.500
2000	1.500	3.000	1.500	2.150	1.650	2.750
2001	1.100	2.600	1.500	1.750	1.500	2.300
2002	0.200	2.000	1.800	1.900	1.800	2.000
2003	2.600	4.100	1.500	3.300	2.400	3.650
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	--	--	0.260	0.481	24.900	312.650
1997	-1.169	2.034	0.253	0.337	14.200	40.780
1998	1.071	1.169	0.233	0.505	8.700	20.010
1999	-1.468	2.756	0.357	0.083	12.500	40.310
2000	0.282	-2.734	0.222	0.552	8.800	20.740
2001	1.008	-0.499	0.278	0.311	7.600	15.260
2002	--	--	0.260	0.481	3.800	7.240
2003	-0.936	0.955	0.212	0.542	15.100	49.490

Total Phosphorus

Figure 36 presents the seasonal mean total phosphorus trend in Fawn Lake, while Table 27 presents descriptive statistics for total phosphorus in Fawn Lake. The total phosphorus in Fawn Lake exhibited a trend of decreasing concentrations from 2000 to 2003. The total phosphorus in Fawn Lake was similar to the county average.

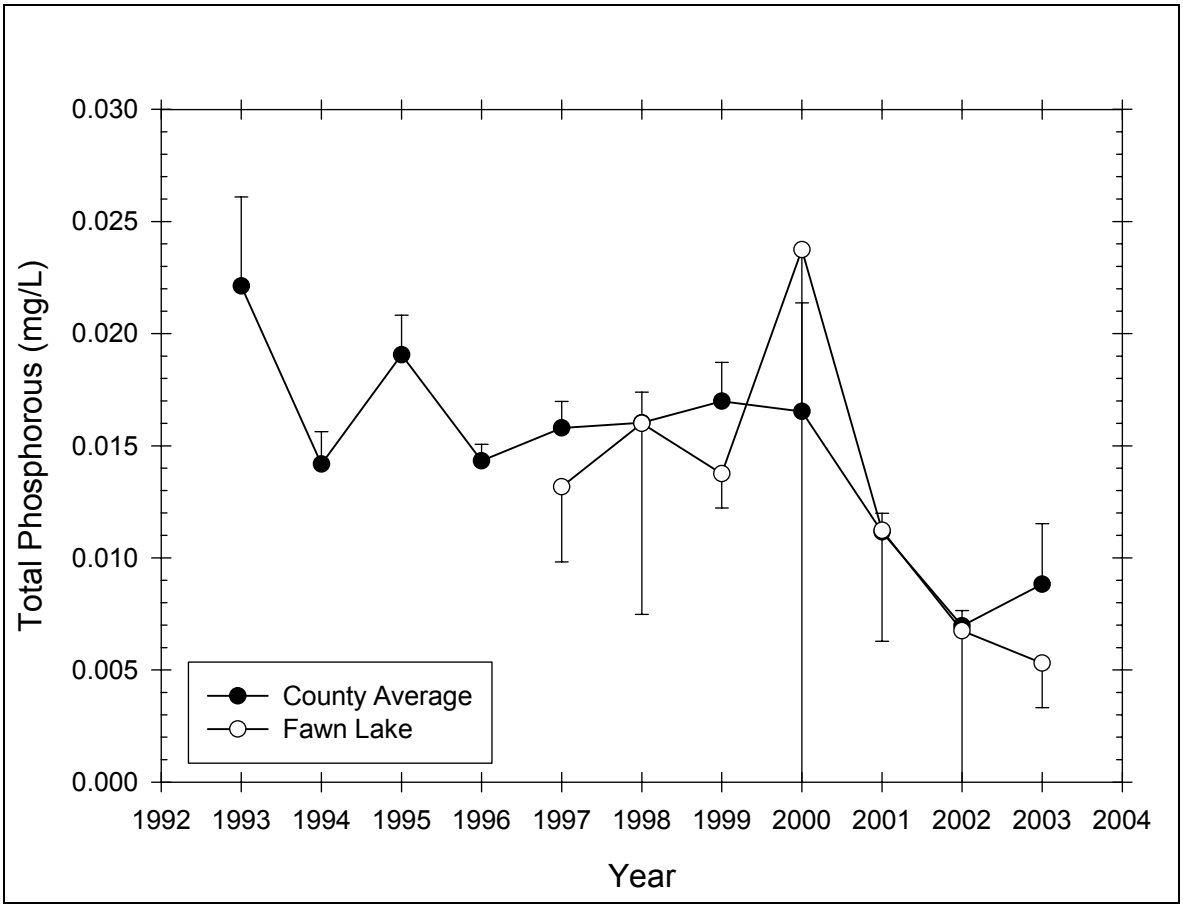


Figure 36 Seasonal mean total phosphorus trend in Fawn Lake

Table 27 – Descriptive Statistics for Total Phosphorus in Fawn Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	0.0132	0.00319	0.00130	0.00335
1998	5	1	0.0160	0.00535	0.00268	0.00852
1999	6	2	0.0137	0.000957	0.000479	0.00152
2000	6	2	0.0238	0.0233	0.0116	0.0370
2001	6	2	0.0112	0.00311	0.00155	0.00495
2002	6	4	0.00675	0.00332	0.00235	0.0299
2003	6	1	0.00530	0.00159	0.000711	0.00197
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.00900	0.0190	0.01000	0.0125	0.0110	0.0140
1998	0.0110	0.0210	0.01000	0.0165	0.0115	0.0205
1999	0.00200	0.0150	0.0130	0.0135	0.0130	0.0145
2000	0.0530	0.0540	0.001000	0.0200	0.00600	0.0415
2001	0.00700	0.0150	0.00800	0.0110	0.00875	0.0137
2002	0.00470	0.00910	0.00440	0.00675	0.00440	0.00910
2003	0.00420	0.00720	0.00300	0.00560	0.00420	0.00638
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	1.440	2.438	0.230	0.372	0.0790	0.00109
1998	-0.235	-4.341	0.272	0.334	0.0640	0.00111
1999	0.855	-1.289	0.283	0.289	0.0550	0.000759

2000	0.741	-0.599	0.208	0.605	0.0950	0.00388
2001	0.371	-2.019	0.210	0.597	0.0449	0.000533
2002	--	--	0.260	0.481	0.0135	0.000102
2003	-0.529	0.138	0.175	0.693	0.0265	0.000151

Nitrate

Figure 37 presents the seasonal mean nitrate trend in Fawn Lake, while Table 28 presents descriptive statistics for nitrate in Fawn Lake. The nitrate in Fawn Lake exhibited a significant trend of decreasing concentration. The nitrate in Fawn Lake was significantly lower than the county average, though this difference may not be statistically significant for all years.

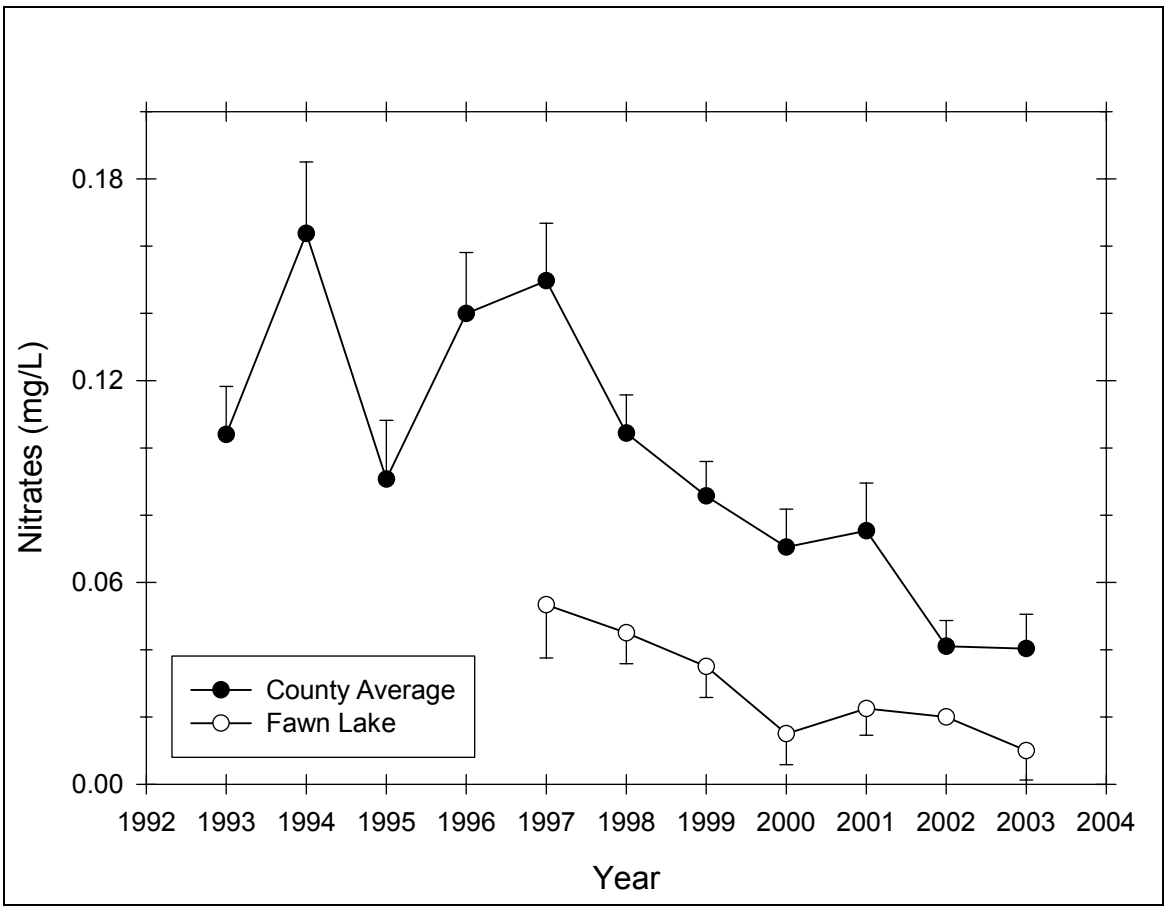


Figure 37 Seasonal mean nitrate trend in Fawn Lake

Table 28 – Descriptive Statistics for Nitrate in Fawn Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	0.0533	0.0151	0.00615	0.0158
1998	5	1	0.0450	0.00577	0.00289	0.00919
1999	6	2	0.0350	0.00577	0.00289	0.00919
2000	6	2	0.0150	0.00577	0.00289	0.00919
2001	6	2	0.0225	0.00500	0.00250	0.00796
2002	6	4	0.0200	0.000	0.000	0.000

2003	6	1	0.01000	0.00707	0.00316	0.00878
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.0400	0.0800	0.0400	0.0500	0.0400	0.0600
1998	0.01000	0.0500	0.0400	0.0450	0.0400	0.0500
1999	0.01000	0.0400	0.0300	0.0350	0.0300	0.0400
2000	0.01000	0.0200	0.01000	0.0150	0.01000	0.0200
2001	0.01000	0.0300	0.0200	0.0200	0.0200	0.0250
2002	0.000	0.0200	0.0200	0.0200	0.0200	0.0200
2003	0.0200	0.0200	0.000	0.01000	0.00750	0.0125
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	1.270	1.531	0.254	0.251	0.320	0.0182
1998	3.701E-015	-6.000	0.307	0.203	0.180	0.00820
1999	-3.701E-015	-6.000	0.307	0.203	0.140	0.00500
2000	5.921E-016	-6.000	0.307	0.203	0.0600	0.001000
2001	2.000	4.000	0.441	0.006	0.0900	0.00210
2002	--	--	0.000	<0.001	0.0400	0.000800
2003	0.000	2.000	0.300	0.149	0.0500	0.000700

Chlorophyll a

Figure 38 presents the seasonal mean chlorophyll *a* trend in Fawn Lake, while Table 29 presents descriptive statistics for chlorophyll *a* in Fawn Lake. The chlorophyll *a* in Fawn Lake exhibited no distinct trend. The chlorophyll *a* in Fawn Lake was generally slightly higher than the county average, though this difference was not statistically significant.

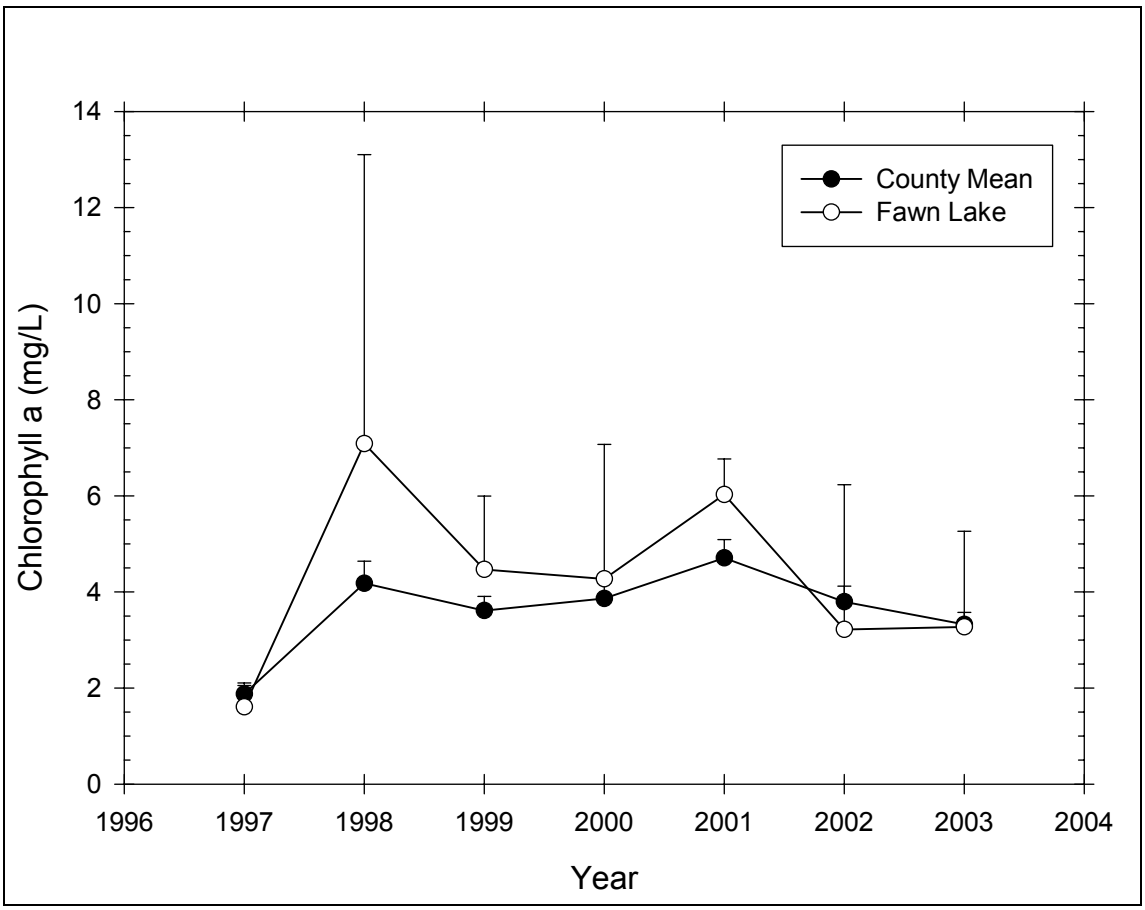


Figure 38 Seasonal mean chlorophyll a trend in Fawn Lake

Table 29 – Descriptive Statistics for Chlorophyll a in Fawn Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	1	1.606	0.359	0.160	0.445
1998	5	1	7.085	3.783	1.891	6.020
1999	6	2	4.468	0.959	0.480	1.527
2000	6	2	4.270	1.759	0.879	2.799
2001	6	2	6.025	0.466	0.233	0.742
2002	6	4	3.220	0.354	0.250	3.177
2003	6	2	3.270	1.252	0.626	1.993
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.940	1.940	1.000	1.700	1.465	1.813
1998	9.080	11.690	2.610	7.020	4.355	9.815
1999	2.060	5.270	3.210	4.695	3.720	5.215
2000	3.810	6.000	2.190	4.445	2.830	5.710
2001	1.030	6.370	5.340	6.195	5.740	6.310
2002	0.500	3.470	2.970	3.220	2.970	3.470
2003	2.660	4.780	2.120	3.090	2.245	4.295
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	-1.625	3.181	0.316	0.107	8.030	13.411
1998	0.0949	0.370	0.161	0.709	28.340	243.722
1999	-0.870	-1.112	0.265	0.367	17.870	82.596
2000	-0.345	-3.111	0.243	0.461	17.080	82.213
2001	-1.759	3.226	0.347	0.095	24.100	145.855
2002	--	--	0.260	0.481	6.440	20.862
2003	0.459	-3.076	0.264	0.371	13.080	47.476

Transparency

Figure 39 presents the seasonal mean transparency trend in Fawn Lake, while Table 30 presents descriptive statistics for transparency in Fawn Lake. The transparency in Fawn Lake exhibited a slight decreasing trend from 1999 to 2002/2003. The transparency in Fawn Lake was slightly higher than the county average prior to 2000 and slightly lower than the county average after 2000, though these differences were not statistically significant.

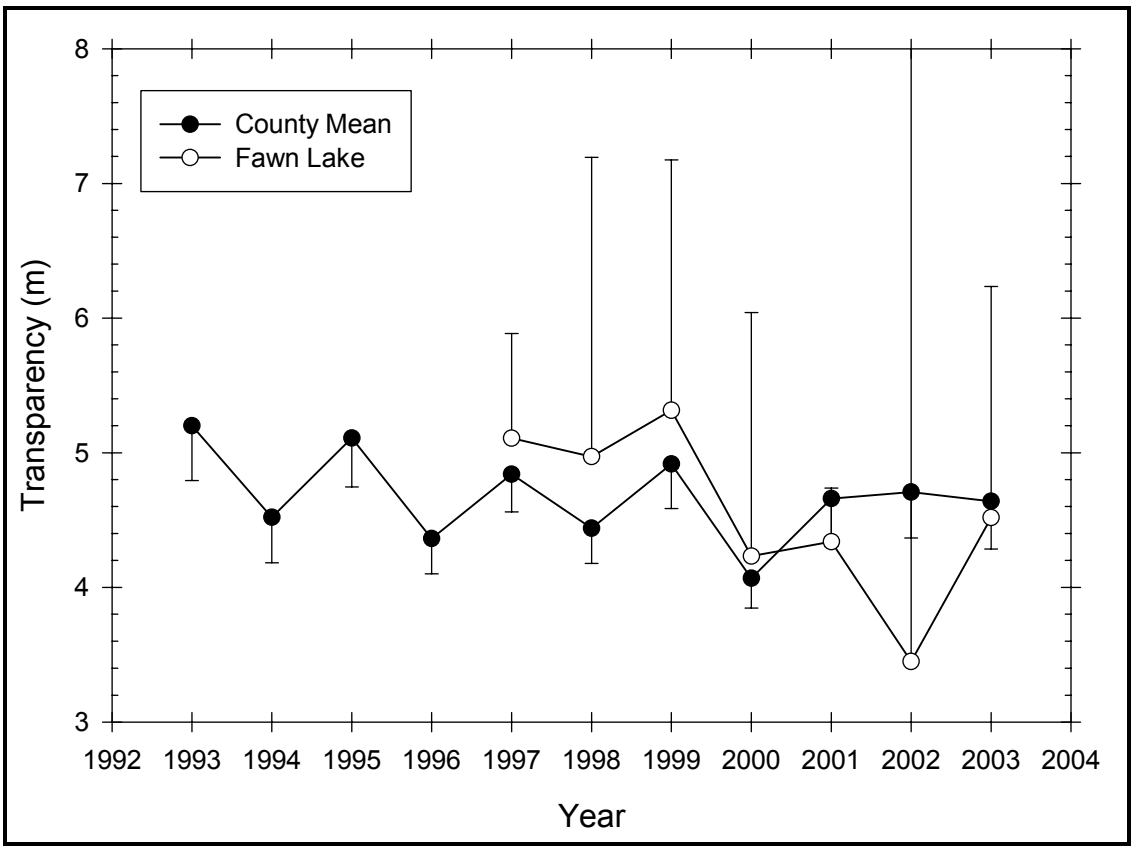


Figure 39 Seasonal mean transparency trend in Fawn Lake

Table 30 – Descriptive Statistics for Transparency in Fawn Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	5.108	0.741	0.302	0.777
1998	5	1	4.970	1.398	0.699	2.225
1999	4	0	5.315	1.169	0.585	1.861
2000	4	0	4.232	1.136	0.568	1.808
2001	5	0	4.340	0.321	0.144	0.398
2002	2	0	3.450	1.202	0.850	10.800
2003	4	0	4.518	1.080	0.540	1.718
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	2.150	6.000	3.850	5.300	4.750	5.450
1998	2.970	6.900	3.930	4.525	3.940	6.000
1999	2.740	6.600	3.860	5.400	4.430	6.200
2000	2.620	5.400	2.780	4.375	3.365	5.100
2001	0.700	4.700	4.000	4.500	4.000	4.550
2002	1.700	4.300	2.600	3.450	2.600	4.300
2003	2.250	5.700	3.450	4.460	3.610	5.425
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	-0.923	1.158	0.189	0.600	30.650	159.313
1998	1.221	0.571	0.267	0.356	19.880	104.667
1999	-0.365	-0.536	0.161	0.708	21.260	117.100
2000	-0.596	-0.673	0.191	0.658	16.930	75.531
2001	-0.299	-2.718	0.291	0.178	21.700	94.590

2002	--	--	0.260	0.481	6.900	25.250
2003	0.144	-4.357	0.256	0.407	18.070	85.128

TSI

Figure 40 presents the Carlson trophic state index trend in Fawn Lake. Total phosphorus TSI was in the mesotrophic range from 1997 to 2000 and then decreased each year after that, entering the oligitrophic range in 2002. Chlorophyll *a* TSI was in the eutrophic range most of the study period, while transparency TSI was in the oligotrophic to mesotrophic range.

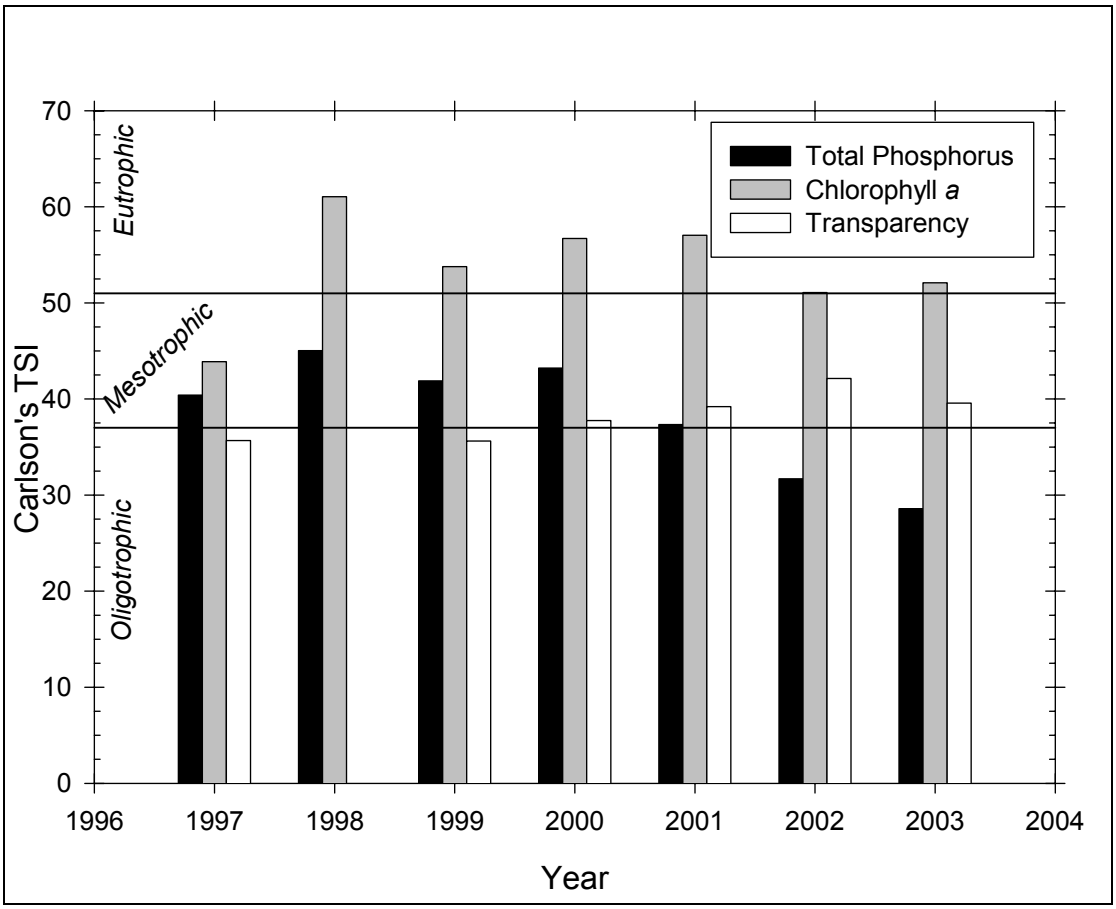


Figure 40 Carlson TSI trend in Fawn Lake

Aluminum

Figure 41 presents the seasonal mean aluminum trend in Fawn Lake, while Table 31 presents descriptive statistics for aluminum in Fawn Lake. The aluminum in Fawn Lake exhibited a relatively stable trend except for a high value in 1997. The aluminum in Fawn Lake was slightly lower than the county average, though this difference was not statistically significant.

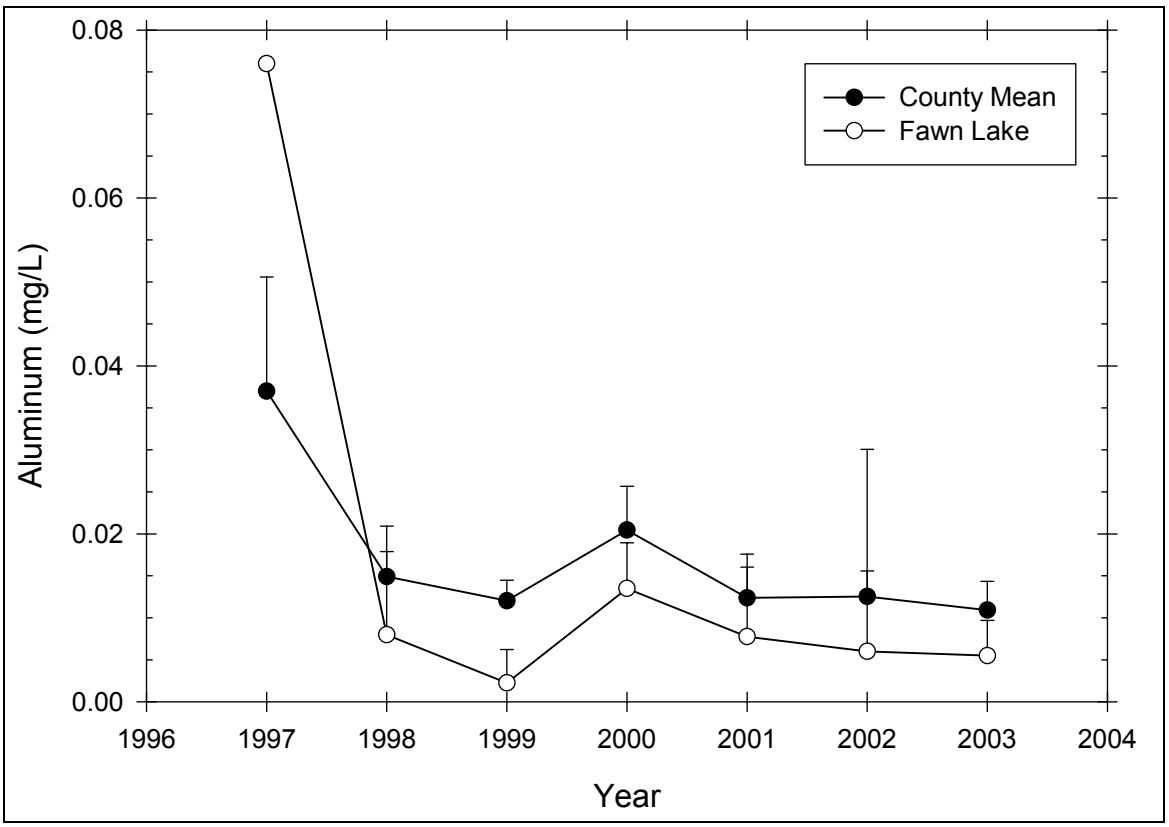


Figure 41 Seasonal mean aluminum trend in Fawn Lake

Table 31 – Descriptive Statistics for Aluminum in Fawn Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0760	--	--	--
1998	5	1	0.00800	0.00812	0.00406	0.0129
1999	6	2	0.00225	0.00250	0.00125	0.00398
2000	6	2	0.0135	0.00342	0.00171	0.00544
2001	6	2	0.00775	0.00618	0.00309	0.00984
2002	6	4	0.00600	0.00283	0.00200	0.0254
2003	6	2	0.00550	0.00265	0.00132	0.00421
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
z1997	0.000	0.0760	0.0760	0.0760	0.0760	0.0760
1998	0.0150	0.0150	0.000	0.00850	0.001000	0.0150
1999	0.00500	0.00600	0.001000	0.001000	0.001000	0.00350
2000	0.00800	0.0170	0.00900	0.0140	0.0110	0.0160
2001	0.0120	0.0130	0.001000	0.00850	0.00250	0.0130
2002	0.00400	0.00800	0.00400	0.00600	0.00400	0.00800
2003	0.00600	0.00900	0.00300	0.00500	0.00350	0.00750
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0760	0.00578
1998	-0.0522	-5.699	0.306	0.207	0.0320	0.000454
1999	2.000	4.000	0.441	0.006	0.00900	0.0000390
2000	-0.753	0.343	0.192	0.657	0.0540	0.000764
2001	-0.200	-4.858	0.302	0.219	0.0310	0.000355
2002	--	--	0.260	0.481	0.0120	0.0000800

2003	0.864	-0.286	0.215	0.582	0.0220	0.000142

Calcium

Figure 42 presents the seasonal mean calcium trend in Fawn Lake, while Table 32 presents descriptive statistics for calcium in Fawn Lake. The calcium in Fawn Lake exhibited a relatively stable trend throughout the study period. The calcium in Fawn Lake was significantly lower than the county average, though this difference may not be statistically significant for all years.

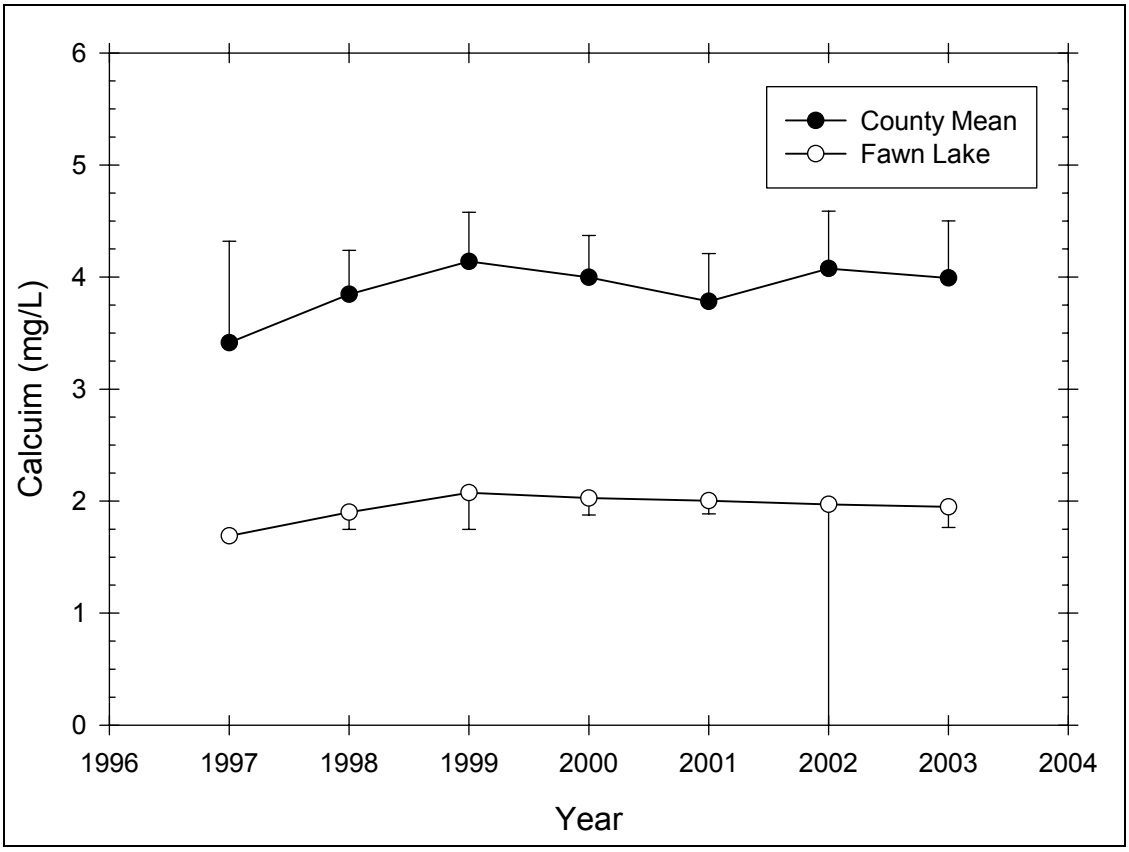


Figure 42 Seasonal mean calcium trend in Fawn Lake

Table 32 – Descriptive Statistics for Calcium in Fawn Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	1.690	--	--	--
1998	5	1	1.900	0.0952	0.0476	0.152
1999	6	2	2.075	0.205	0.103	0.327
2000	6	2	2.027	0.0946	0.0473	0.151
2001	6	2	2.002	0.0727	0.0364	0.116
2002	6	4	1.970	0.438	0.310	3.939
2003	6	2	1.948	0.114	0.0572	0.182
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	1.690	1.690	1.690	1.690	1.690
1998	0.200	1.960	1.760	1.940	1.840	1.960
1999	0.440	2.210	1.770	2.160	1.955	2.195

2000	0.200	2.090	1.890	2.065	1.965	2.090
2001	0.160	2.110	1.950	1.975	1.960	2.045
2002	0.620	2.280	1.660	1.970	1.660	2.280
2003	0.260	2.050	1.790	1.975	1.865	2.030
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	1.690	2.856
1998	-1.779	3.135	0.333	0.127	7.600	14.467
1999	-1.885	3.607	0.374	0.052	8.300	17.349
2000	-1.659	2.615	0.303	0.217	8.110	16.470
2001	1.822	3.465	0.371	0.056	8.010	16.056
2002	--	--	0.260	0.481	3.940	7.954
2003	-1.151	0.911	0.224	0.545	7.790	15.210

Calcite Saturation Index

Figure 43 presents the calcite saturation index trend in Fawn Lake. Based upon CSI, Fawn Lake was moderately to very vulnerable to acid deposition throughout the study period. Fawn Lake CSI was higher than the county CSI, though this difference may not be statistically significant in all years.

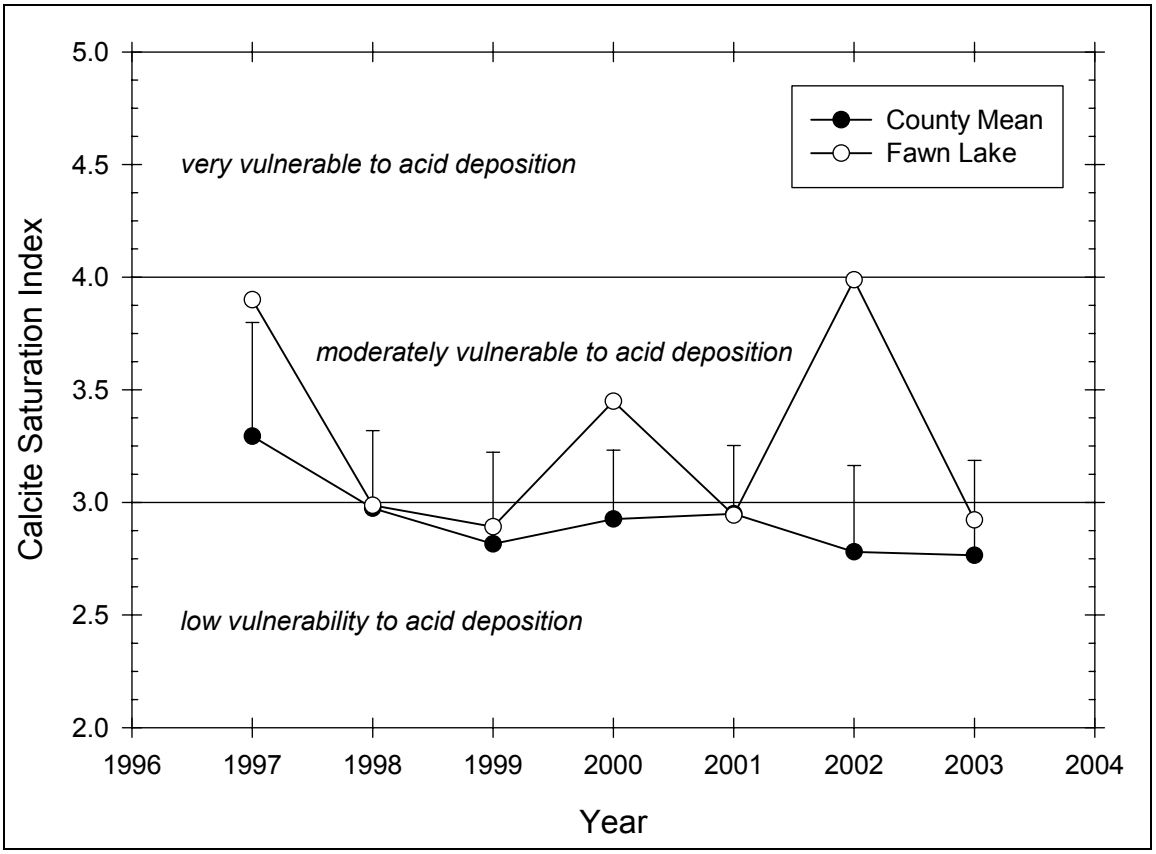
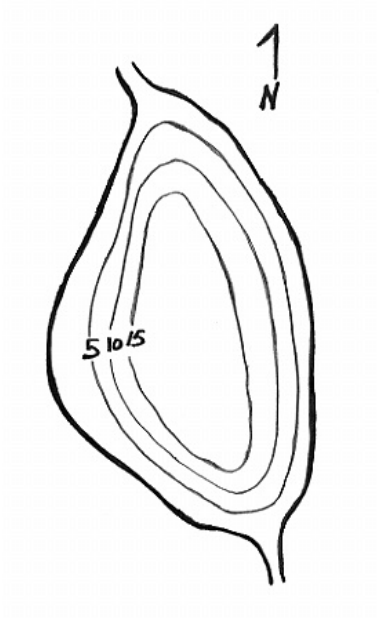


Figure 43 Seasonal mean CSI trend in Fawn Lake

Fifth Lake

Location
Pond Number: 040786
Watershed: Black River
County: Hamilton
Topographic Quadrangle: Old Forge
Sample Site
Latitude: 43o 44.923'
Longitude: 74o 47.531'
Morphometry
Surface Area: 13 Ac.
Mean Depth: 7.7 Ft
Maximum Depth: 16.7 Ft
Volume: 101 Ac./Ft.
Watershed Area: 288 Ac.
Hydraulic Retention Time: 0.06 Yr.
Shoreline Length: 0.6 Mi.
Elevation: 1,706 Ft.
Water Quality Classification: A
Trophic State: Mesotrophic



Temperature and Dissolved Oxygen

Fifth Lake had a minimum DO of 0.5 mg/L (August 1999), with a minimum temperature of 5.0°C and a maximum temperature of 24.1°C. In general, the lowest DO values occurred during the month of August.

pH

Figure 44 presents the seasonal mean pH trend in Fifth Lake, while Table 33 presents descriptive statistics for pH in Fifth Lake. The pH in Fifth Lake exhibited an increasing trend from 1995 to 1997, with relatively stable values from 1998 – 2003. The pH in Fifth Lake was similar to the county average.

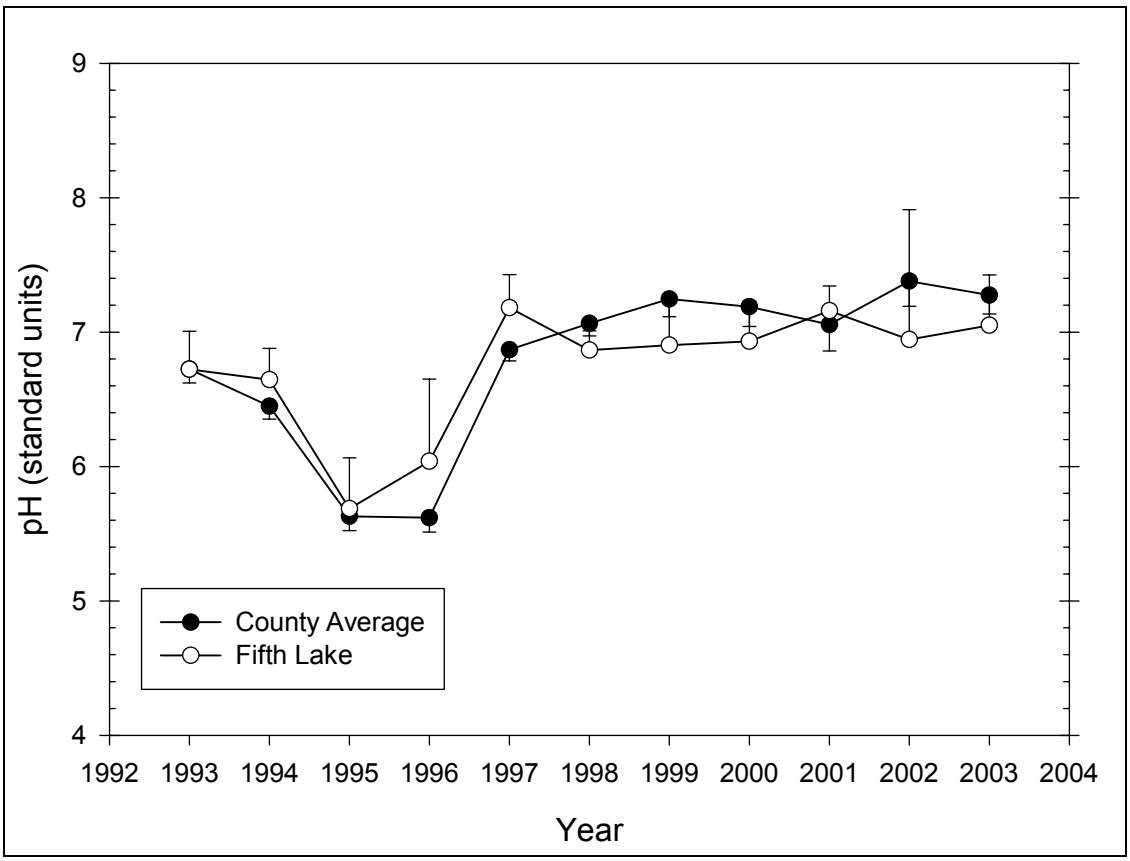


Figure 44 Seasonal mean pH trend in Fifth Lake

Table 33 – Descriptive Statistics for pH in Fifth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	6.724	0.227	0.102	0.282
1994	6	0	6.647	0.222	0.0906	0.233
1995	6	0	5.687	0.360	0.147	0.378
1996	6	0	6.040	0.582	0.238	0.611
1997	6	0	7.182	0.235	0.0958	0.246
1998	6	0	6.867	0.137	0.0560	0.144
1999	5	0	6.904	0.277	0.124	0.344
2000	6	0	6.932	0.286	0.117	0.300
2001	4	0	7.160	0.116	0.0579	0.184
2002	4	0	6.945	0.607	0.304	0.966
2003	4	0	7.050	0.236	0.118	0.375
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.580	6.950	6.370	6.760	6.588	6.898
1994	0.580	6.900	6.320	6.685	6.460	6.830
1995	1.070	6.270	5.200	5.635	5.530	5.850
1996	1.580	7.070	5.490	5.820	5.690	6.350
1997	0.640	7.650	7.010	7.100	7.070	7.160
1998	0.320	7.030	6.710	6.855	6.750	7.000
1999	0.720	7.250	6.530	6.830	6.748	7.130
2000	0.800	7.430	6.630	6.925	6.680	7.000
2001	0.250	7.320	7.070	7.125	7.075	7.245

2002	1.310	7.360	6.050	7.185	6.570	7.320
2003	0.500	7.400	6.900	6.950	6.910	7.190
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-1.041	0.908	0.189	0.644	33.620	226.267
1994	-0.504	-1.088	0.155	0.739	39.880	265.315
1995	0.522	0.980	0.165	0.707	34.120	194.677
1996	1.339	1.369	0.255	0.248	36.240	220.585
1997	2.213	5.133	0.370	0.010	43.090	309.733
1998	0.104	-2.521	0.236	0.340	41.200	283.001
1999	-0.107	-0.522	0.205	0.573	34.520	238.633
2000	1.039	1.532	0.239	0.327	41.590	288.696
2001	1.227	0.645	0.255	0.409	28.640	205.103
2002	-1.800	3.268	0.344	0.102	27.780	194.039
2003	1.879	3.561	0.367	0.064	28.200	198.977

Alkalinity

Figure 45 presents the seasonal mean alkalinity trend in Fifth Lake, while Table 34 presents descriptive statistics for alkalinity in Fifth Lake. The alkalinity in Fifth Lake exhibited no significant trend, although values in recent years (2000 – 2002) were lower than those from earlier years (1993 – 1995). The alkalinity in Fifth Lake was higher than the county average, though this difference may not be statistically significant for all years.

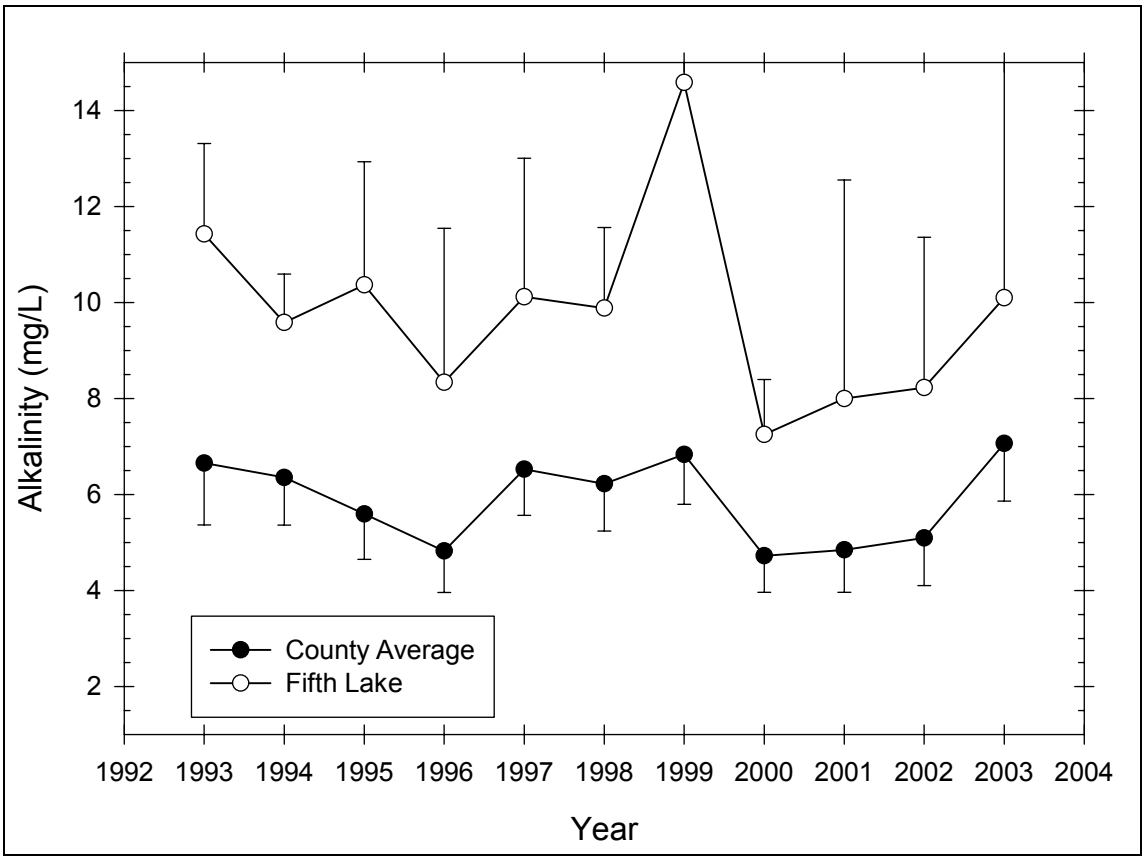


Figure 45 Seasonal mean alkalinity trend in Fifth Lake

Table 34 – Descriptive Statistics for Alkalinity in Fifth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	5	1	11.425	1.184	0.592	1.884
1994	6	0	9.583	0.958	0.391	1.005
1995	6	0	10.367	2.443	0.998	2.564
1996	5	0	8.340	2.581	1.154	3.205
1997	6	0	10.117	2.752	1.124	2.888
1998	6	0	9.883	1.601	0.653	1.680
1999	6	1	14.580	2.922	1.307	3.628
2000	6	0	7.250	1.091	0.446	1.145
2001	6	2	8.000	2.861	1.431	4.553
2002	6	2	8.225	1.969	0.984	3.133
2003	6	2	10.100	5.308	2.654	8.447
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	2.700	12.900	10.200	11.300	10.500	12.350
1994	2.800	11.400	8.600	9.400	9.100	9.600
1995	6.400	12.800	6.400	11.050	8.700	12.200
1996	5.200	11.100	5.900	7.400	6.125	11.100
1997	6.000	13.600	7.600	9.150	7.700	13.500
1998	4.400	12.500	8.100	9.550	8.700	10.900
1999	7.800	19.500	11.700	14.000	13.050	15.525
2000	2.400	8.400	6.000	7.250	6.400	8.200
2001	6.600	11.600	5.000	7.700	5.800	10.200
2002	4.400	9.900	5.500	8.750	6.800	9.650
2003	12.700	16.200	3.500	10.350	6.250	13.950
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.473	-1.371	0.201	0.629	45.700	526.330
1994	1.675	3.632	0.326	0.045	57.500	555.630
1995	-0.895	-0.244	0.221	0.422	62.200	674.660
1996	0.409	-3.122	0.258	0.314	41.700	374.430
1997	0.697	-1.910	0.255	0.246	60.700	651.950
1998	0.837	0.165	0.187	0.609	59.300	598.890
1999	1.565	3.255	0.352	0.042	72.900	1097.030
2000	-0.0436	-3.007	0.282	0.144	43.500	321.330
2001	0.496	-0.906	0.188	0.667	32.000	280.560
2002	-1.216	0.905	0.225	0.542	32.900	282.230
2003	-0.257	0.310	0.168	0.703	40.400	492.580

Total Phosphorus

Figure 46 presents the seasonal mean total phosphorus trend in Fifth Lake, while Table 35 presents descriptive statistics for total phosphorus in Fifth Lake. The total phosphorus in Fifth Lake exhibited a decreasing trend from 1999 to 2002. The total phosphorus in Fifth Lake was similar to the county average.

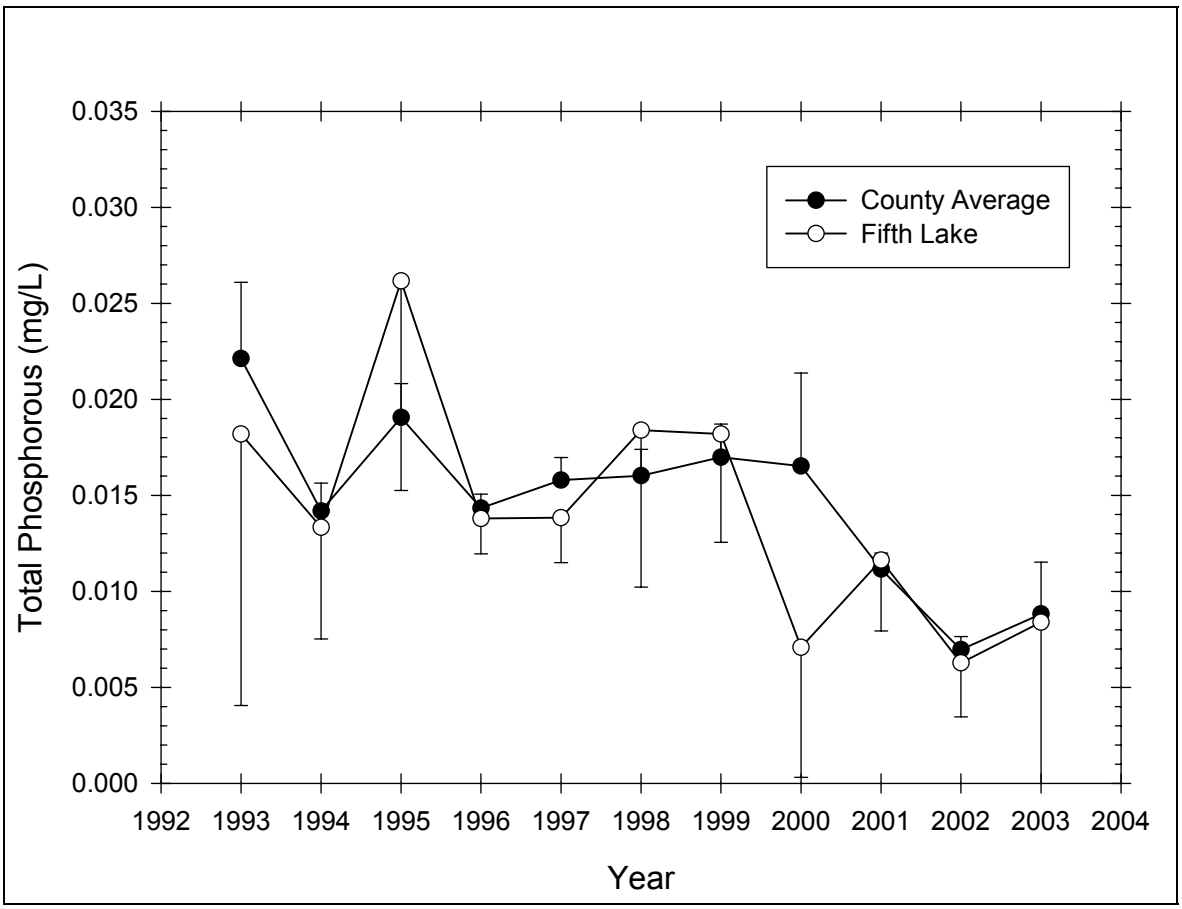


Figure 46 Seasonal mean total phosphorus in Fifth Lake

Table 35 – Descriptive Statistics for Total Phosphorus in Fifth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0182	0.0114	0.00509	0.0141
1994	6	0	0.0133	0.00554	0.00226	0.00581
1995	6	0	0.0262	0.0104	0.00425	0.0109
1996	5	0	0.0138	0.00148	0.000663	0.00184
1997	6	0	0.0138	0.00223	0.000910	0.00234
1998	6	1	0.0184	0.00658	0.00294	0.00817
1999	6	1	0.0182	0.00455	0.00203	0.00565
2000	6	0	0.00708	0.00645	0.00263	0.00677
2001	6	2	0.0116	0.00232	0.00116	0.00369
2002	6	2	0.00627	0.00176	0.000882	0.00281
2003	6	2	0.00840	0.00629	0.00314	0.0100
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0290	0.0330	0.00400	0.0180	0.00925	0.0270
1994	0.0150	0.0240	0.00900	0.0125	0.00900	0.0130
1995	0.0300	0.0410	0.0110	0.0275	0.0190	0.0310
1996	0.00400	0.0160	0.0120	0.0140	0.0128	0.0145
1997	0.00600	0.0170	0.0110	0.0140	0.0120	0.0150
1998	0.0170	0.0280	0.0110	0.0180	0.0133	0.0227
1999	0.0120	0.0240	0.0120	0.0170	0.0158	0.0217
2000	0.0140	0.0150	0.001000	0.00550	0.00150	0.0140

2001	0.00500	0.0150	0.01000	0.0107	0.0101	0.0131
2002	0.00380	0.00890	0.00510	0.00555	0.00530	0.00725
2003	0.0150	0.0164	0.00140	0.00790	0.00385	0.0130
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.0902	-1.055	0.136	0.745	0.0910	0.00218
1994	1.852	3.913	0.357	0.016	0.0800	0.00122
1995	-0.113	0.0157	0.154	0.740	0.157	0.00465
1996	0.552	0.868	0.246	0.368	0.0690	0.000961
1997	0.148	-1.128	0.200	0.544	0.0830	0.00117
1998	0.602	-0.0578	0.148	0.744	0.0920	0.00187
1999	-0.109	-0.197	0.204	0.579	0.0910	0.00174
2000	0.339	-2.520	0.285	0.135	0.0425	0.000509
2001	1.664	2.666	0.306	0.206	0.0465	0.000557
2002	1.908	3.725	0.399	0.025	0.0251	0.000167
2003	0.432	0.397	0.181	0.683	0.0336	0.000401

Nitrate

Figure 47 presents the seasonal mean nitrate trend in Fifth Lake, while Table 36 presents descriptive statistics for nitrate in Fifth Lake. The nitrate in Fifth Lake exhibited a decreasing trend from 1996 to 2002/2003. The nitrate in Fifth Lake was slightly higher than the county average, though this difference was not statistically significant.

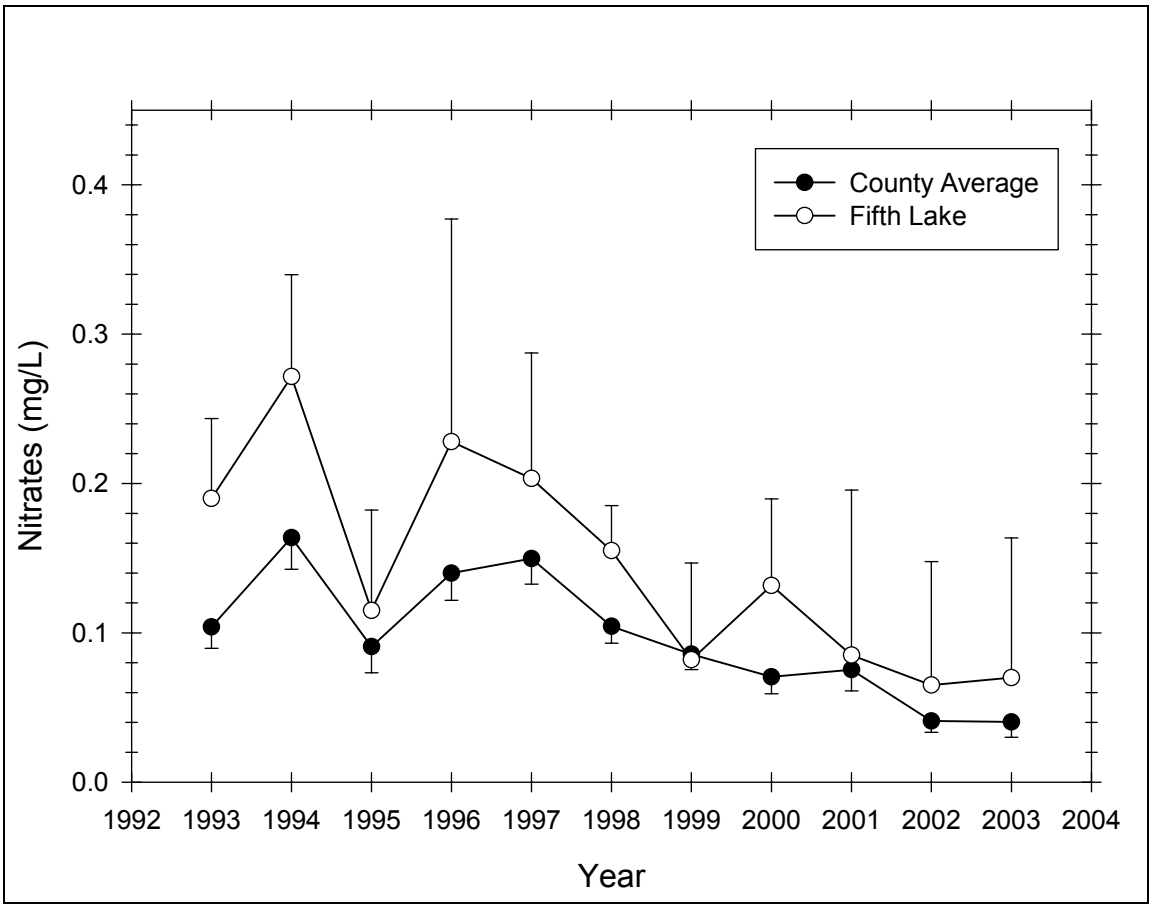


Figure 47 Seasonal mean nitrate trend in Fifth Lake

Table 36 – Descriptive Statistics for Nitrate in Fifth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.190	0.0430	0.0192	0.0534
1994	6	0	0.272	0.0649	0.0265	0.0681
1995	6	0	0.115	0.0641	0.0262	0.0673
1996	5	0	0.228	0.120	0.0537	0.149
1997	6	0	0.203	0.0802	0.0327	0.0841
1998	6	0	0.155	0.0288	0.0118	0.0302
1999	6	1	0.0820	0.0522	0.0233	0.0648
2000	6	0	0.132	0.0553	0.0226	0.0580
2001	6	2	0.0850	0.0695	0.0348	0.111
2002	6	2	0.0650	0.0520	0.0260	0.0827
2003	6	2	0.0700	0.0589	0.0294	0.0937
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.1000	0.250	0.150	0.170	0.158	0.228
1994	0.180	0.360	0.180	0.270	0.230	0.320
1995	0.190	0.220	0.0300	0.1000	0.0900	0.150
1996	0.270	0.370	0.1000	0.250	0.108	0.325
1997	0.220	0.320	0.1000	0.210	0.130	0.250
1998	0.0800	0.200	0.120	0.155	0.130	0.170
1999	0.120	0.160	0.0400	0.0600	0.0400	0.123
2000	0.160	0.230	0.0700	0.120	0.1000	0.150
2001	0.130	0.150	0.0200	0.0850	0.0250	0.145
2002	0.110	0.140	0.0300	0.0450	0.0300	0.1000
2003	0.140	0.150	0.01000	0.0600	0.0300	0.110
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.754	-1.682	0.279	0.222	0.950	0.188
1994	-0.0487	-0.727	0.131	0.771	1.630	0.464
1995	0.642	1.033	0.259	0.229	0.690	0.0999
1996	-0.0758	-2.503	0.237	0.414	1.140	0.318
1997	0.114	-0.606	0.153	0.743	1.220	0.280
1998	0.452	-0.109	0.141	0.766	0.930	0.148
1999	0.992	-0.551	0.263	0.287	0.410	0.0445
2000	1.208	1.939	0.203	0.523	0.790	0.119
2001	-1.591E-015	-5.795	0.286	0.280	0.340	0.0434
2002	1.597	2.340	0.288	0.269	0.260	0.0250
2003	0.941	1.500	0.250	0.432	0.280	0.0300

Chlorophyll a

Figure 48 presents the seasonal mean chlorophyll *a* trend in Fifth Lake, while Table 37 presents descriptive statistics for chlorophyll *a* in Fifth Lake. The chlorophyll *a* in Fifth Lake exhibited an increasing trend from 1997 to 2002, followed by a large decrease in 2003. The chlorophyll *a* in Fifth Lake was slightly lower than the county average, though this difference was not statistically significant.

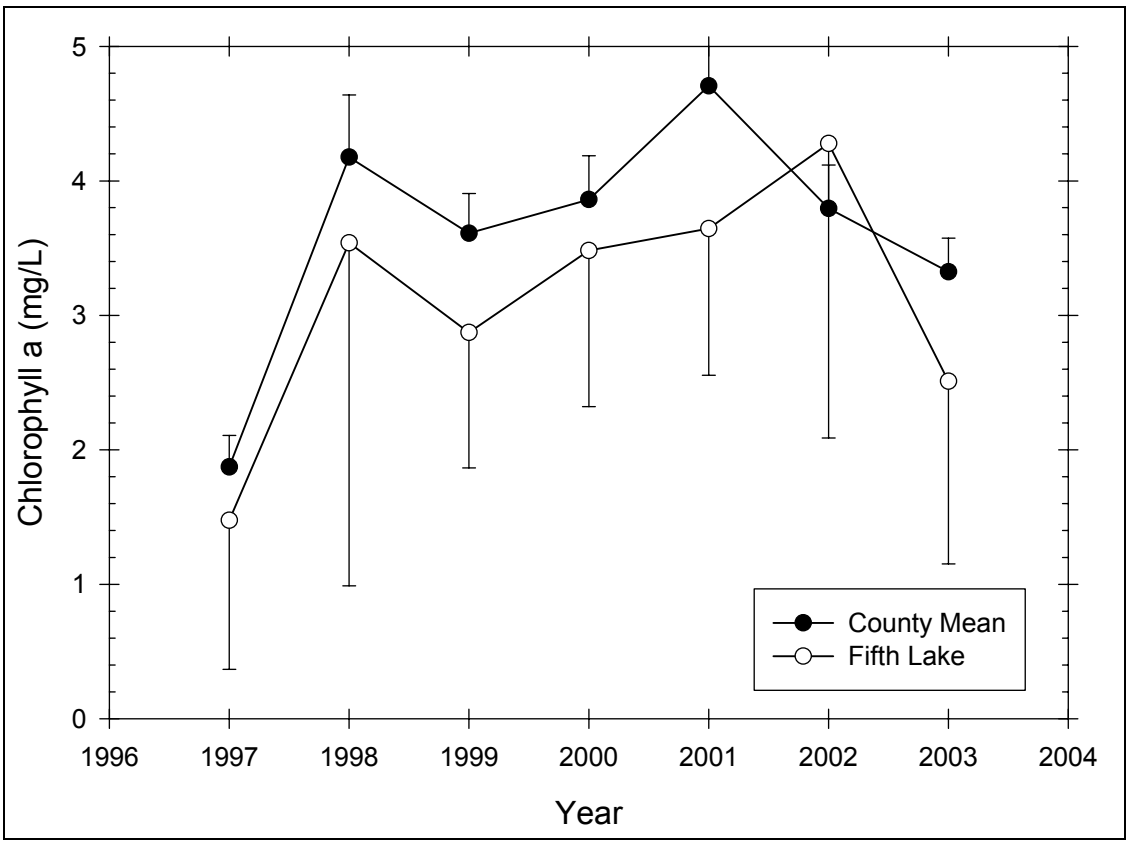


Figure 48 Seasonal mean chlorophyll a trend in Fifth Lake

Table 37 – Descriptive Statistics for Chlorophyll a in Fifth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	1.475	1.056	0.431	1.108
1998	6	0	3.540	2.431	0.993	2.552
1999	6	1	2.872	0.812	0.363	1.008
2000	6	1	3.482	0.935	0.418	1.161
2001	6	2	3.645	0.686	0.343	1.091
2002	6	2	4.277	1.377	0.688	2.191
2003	6	2	2.510	0.854	0.427	1.359
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	2.870	3.470	0.600	1.155	0.780	1.690
1998	5.460	6.730	1.270	2.495	1.760	6.490
1999	2.050	3.880	1.830	2.680	2.333	3.572
2000	2.440	4.900	2.460	3.180	2.880	4.113
2001	1.670	4.420	2.750	3.705	3.210	4.080
2002	3.010	6.320	3.310	3.740	3.515	5.040
2003	1.950	3.670	1.720	2.325	1.885	3.135
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	1.732	3.188	0.253	0.259	8.850	18.626
1998	0.792	-1.855	0.288	0.126	21.240	104.748
1999	0.0375	-1.201	0.194	0.625	14.360	43.877
2000	0.871	0.523	0.227	0.467	17.410	64.117
2001	-0.518	1.599	0.265	0.368	14.580	54.555

2002	1.866	3.616	0.396	0.027	17.110	78.875
2003	1.039	0.550	0.208	0.606	10.040	27.390

Transparency

Figure 49 presents the seasonal mean transparency trend in Fifth Lake, while Table 38 presents descriptive statistics for transparency in Fifth Lake. The transparency in Fifth Lake exhibited a stable trend. The transparency in Fifth Lake was slightly lower than the county average, though this difference was not statistically significant.

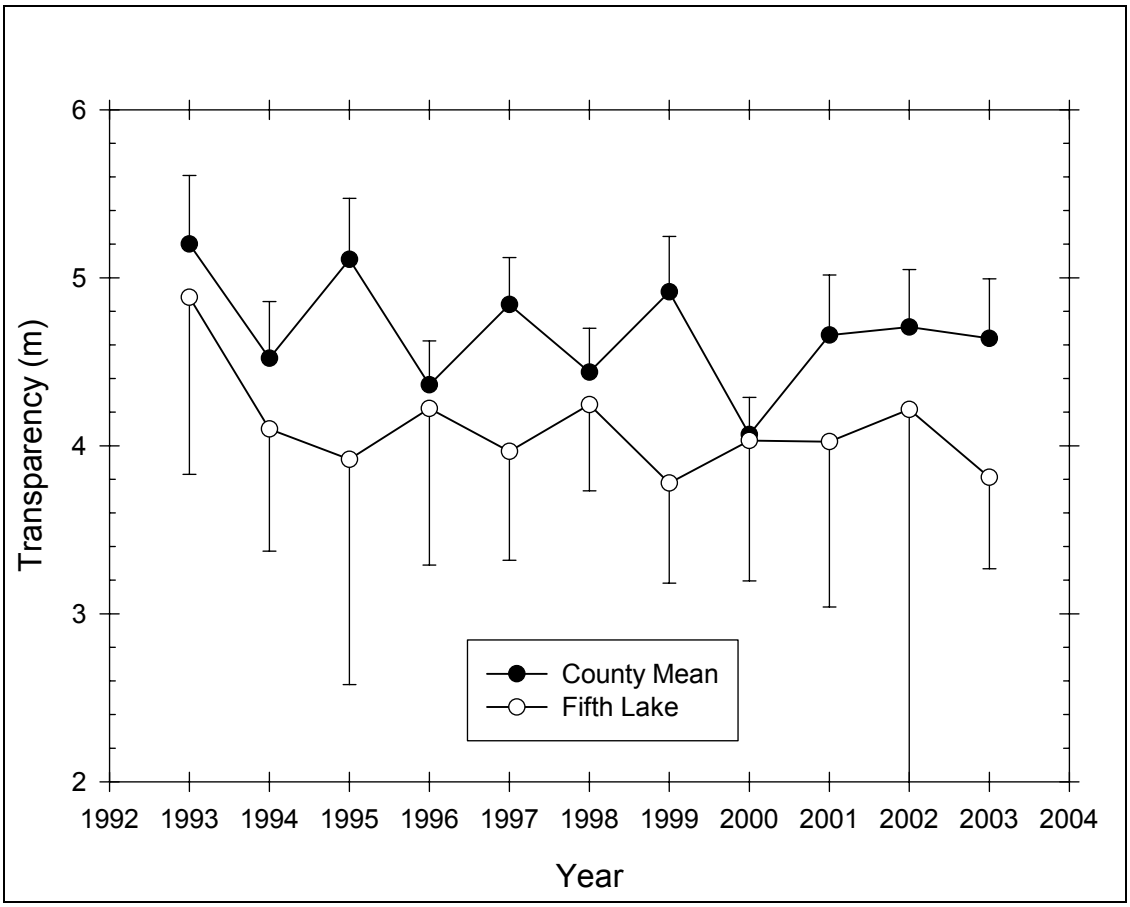


Figure 49 Seasonal mean transparency in Fifth Lake

Table 38 – Descriptive Statistics for Transparency in Fifth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	4.884	0.849	0.380	1.054
1994	6	0	4.100	0.693	0.283	0.727
1995	6	1	3.920	1.080	0.483	1.341
1996	5	0	4.222	0.750	0.336	0.932
1997	6	0	3.967	0.618	0.252	0.648
1998	6	0	4.245	0.489	0.199	0.513
1999	5	0	3.778	0.480	0.215	0.596
2000	6	0	4.032	0.796	0.325	0.835
2001	4	0	4.025	0.618	0.309	0.984

2002	4	1	4.217	0.895	0.517	2.223
2003	4	0	3.813	0.342	0.171	0.545
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	2.000	5.940	3.940	5.150	4.053	5.460
1994	1.700	4.900	3.200	4.200	3.400	4.700
1995	2.450	5.850	3.400	3.450	3.400	4.088
1996	1.850	5.500	3.650	4.050	3.695	4.525
1997	1.700	4.600	2.900	3.975	3.820	4.530
1998	1.300	4.770	3.470	4.300	3.930	4.700
1999	1.300	4.400	3.100	3.770	3.490	4.100
2000	2.000	5.300	3.300	3.800	3.350	4.640
2001	1.300	4.500	3.200	4.200	3.550	4.500
2002	1.550	5.250	3.700	3.700	3.700	4.862
2003	0.800	4.200	3.400	3.825	3.550	4.075
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.0500	-2.046	0.225	0.474	24.420	122.148
1994	-0.287	-1.864	0.177	0.658	24.600	103.260
1995	2.228	4.970	0.451	0.001	19.600	81.495
1996	1.736	3.210	0.312	0.117	21.110	91.379
1997	-0.996	1.226	0.240	0.323	23.800	96.316
1998	-0.660	-0.236	0.171	0.686	25.470	109.314
1999	-0.242	0.586	0.171	0.704	18.890	72.287
2000	0.879	-0.555	0.206	0.507	24.190	100.692
2001	-0.984	-0.620	0.279	0.307	16.100	65.950
2002	1.732	--	0.385	0.089	12.650	54.943
2003	-0.180	-0.896	0.156	0.710	15.250	58.493

TSI

Figure 50 presents the Carlson trophic state index trend in Fifth Lake. All TSI values were in the mesotrophic range from 1993 – 1997. Chlorophyll *a* TSI hovered around the mesotrophic-eutrophic boundary for the rest of the study period while transparency TSI remained mesotrophic and total phosphorus TSI was oligotrophic in 2000, 2002, and 2003.

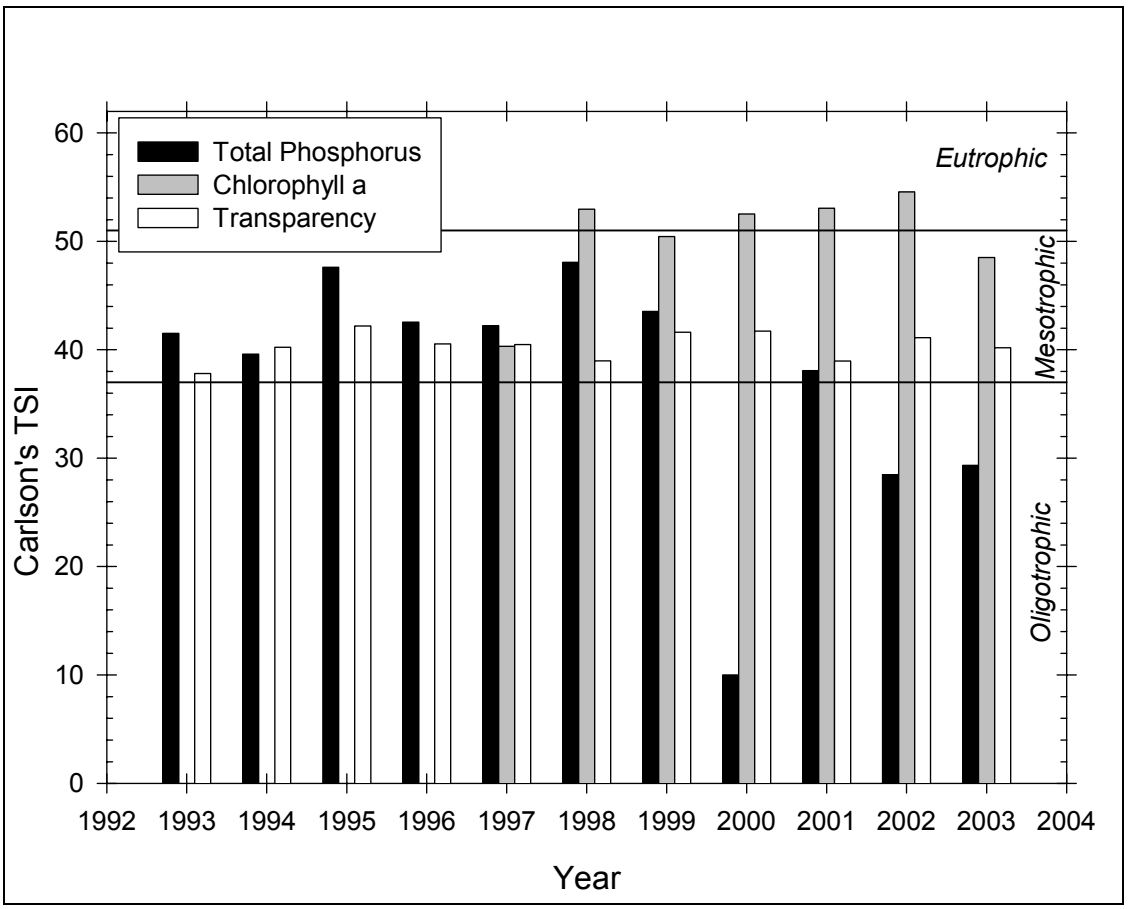


Figure 50 Carlson TSI trend in Fifth Lake

Aluminum

Figure 51 presents the seasonal mean aluminum trend in Fifth Lake, while Table 39 presents descriptive statistics for aluminum in Fifth Lake. The aluminum in Fifth Lake exhibited a stable trend, except for a high value in 1997. The aluminum in Fifth Lake was slightly lower than the county average, though this difference was not statistically significant.

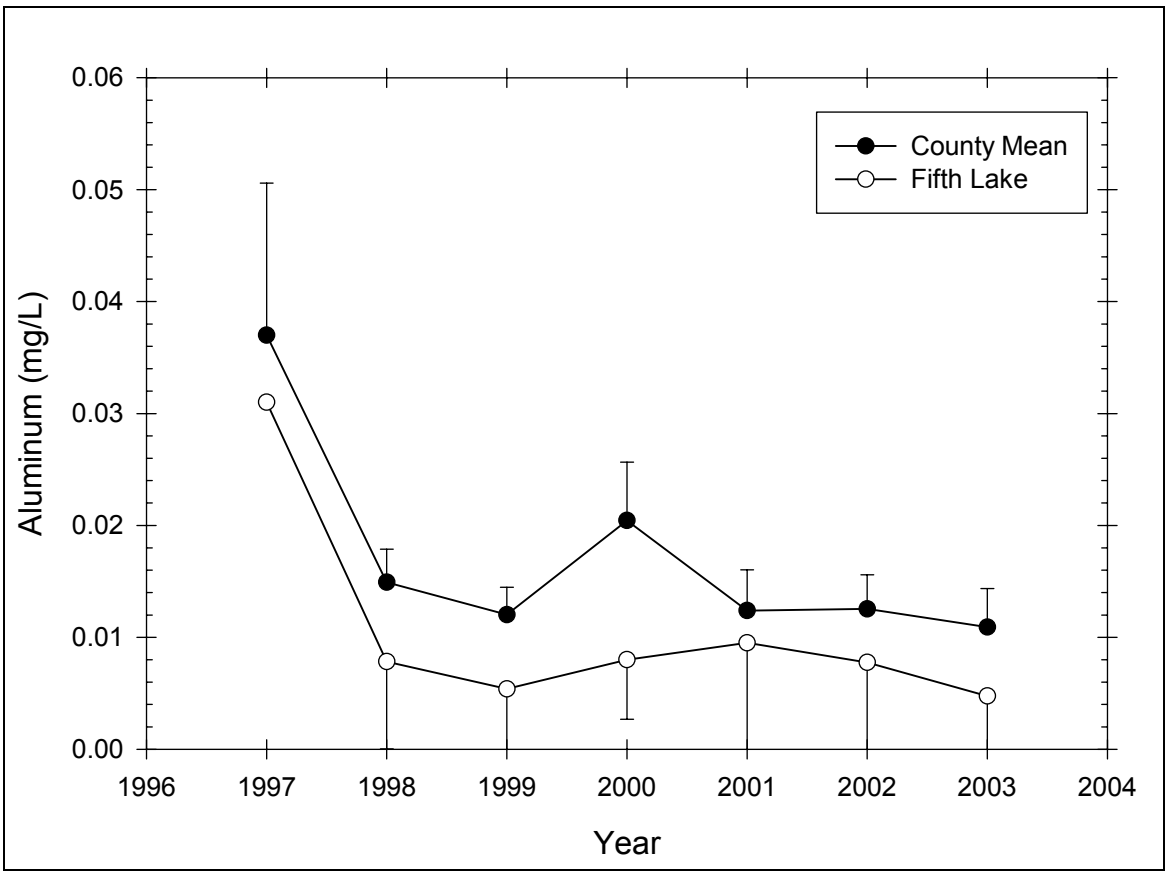


Figure 51 Seasonal mean aluminum trend in Fifth Lake

Table 39 – Descriptive Statistics for Aluminum in Fifth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0310	--	--	--
1998	6	0	0.00783	0.00744	0.00304	0.00781
1999	6	1	0.00540	0.00439	0.00196	0.00545
2000	6	0	0.00800	0.00506	0.00207	0.00531
2001	6	2	0.00950	0.00624	0.00312	0.00994
2002	6	2	0.00775	0.00544	0.00272	0.00865
2003	6	2	0.00475	0.00299	0.00149	0.00475
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0310	0.0310	0.0310	0.0310	0.0310
1998	0.0180	0.0180	0.000	0.00700	0.00200	0.0130
1999	0.0110	0.0130	0.00200	0.00400	0.00275	0.00700
2000	0.0130	0.0150	0.00200	0.00700	0.00400	0.0130
2001	0.0140	0.0170	0.00300	0.00900	0.00450	0.0145
2002	0.0130	0.0150	0.00200	0.00700	0.00400	0.0115
2003	0.00700	0.00800	0.001000	0.00500	0.00250	0.00700
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1998	0.279	-2.190	0.283	0.139	0.0470	0.000645
1999	1.882	3.768	0.336	0.067	0.0270	0.000223
2000	0.431	-1.358	0.245	0.295	0.0480	0.000512
2001	0.328	-2.239	0.212	0.590	0.0380	0.000478

2002	0.769	1.222	0.232	0.513	0.0310	0.000329
2003	-0.423	-0.416	0.162	0.708	0.0190	0.000117

Calcium

Figure 52 presents the seasonal mean calcium trend in Fifth Lake, while Table 40 presents descriptive statistics for calcium in Fifth Lake. The calcium in Fifth Lake exhibited a slight increasing trend over the study period. The calcium in Fifth Lake was higher than the county average, though this difference was not statistically significant.

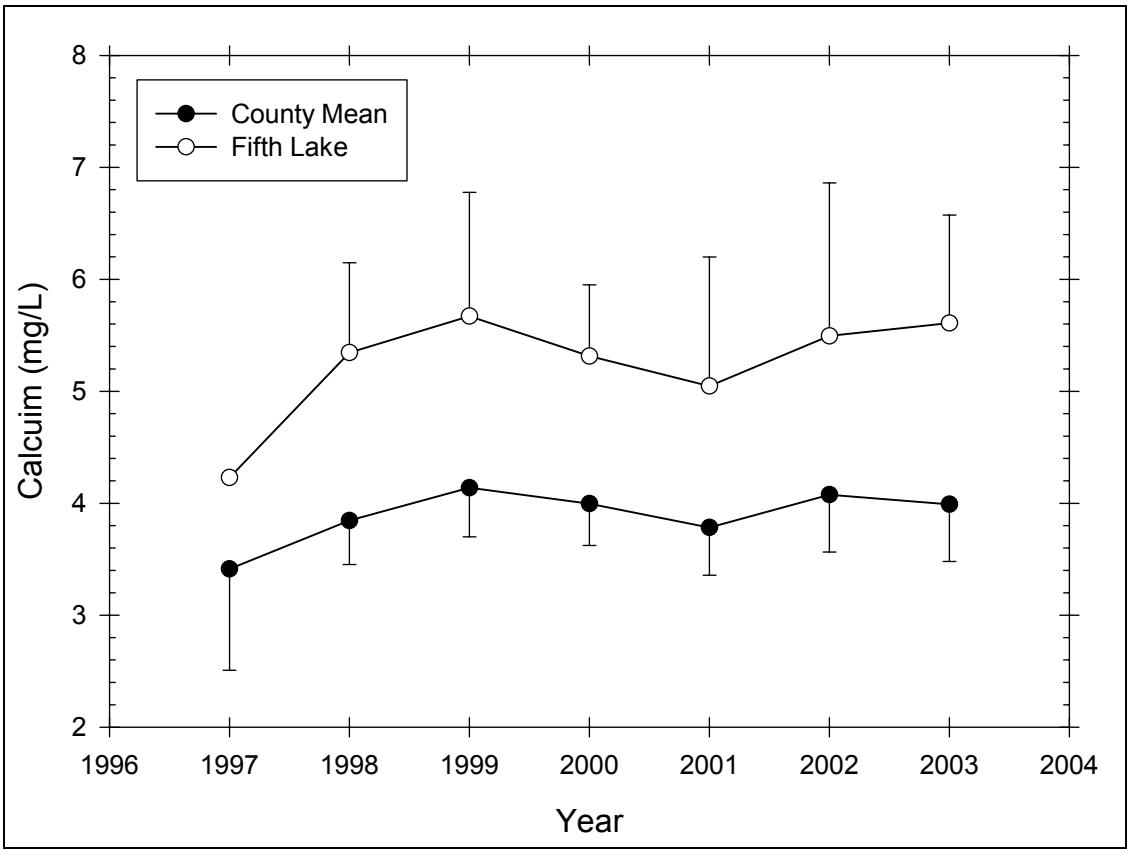


Figure 52 Seasonal mean calcium trend in Fifth Lake

Table 40 – Descriptive Statistics for Calcium in Fifth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	4.230	--	--	--
1998	6	0	5.345	0.764	0.312	0.802
1999	6	1	5.672	0.890	0.398	1.105
2000	6	0	5.315	0.606	0.247	0.636
2001	6	2	5.048	0.724	0.362	1.153
2002	6	2	5.495	0.859	0.429	1.366
2003	6	2	5.610	0.606	0.303	0.964
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	4.230	4.230	4.230	4.230	4.230
1998	1.680	6.270	4.590	5.240	4.690	6.040
1999	2.070	6.660	4.590	6.110	4.808	6.255

2000	1.380	6.270	4.890	4.965	4.910	5.890
2001	1.730	6.050	4.320	4.910	4.600	5.495
2002	1.700	6.270	4.570	5.570	4.765	6.225
2003	1.300	6.180	4.880	5.690	5.115	6.105
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	4.230	17.893
1998	0.159	-2.827	0.297	0.101	32.070	174.336
1999	-0.370	-2.428	0.289	0.186	28.360	164.025
2000	1.122	-0.880	0.371	0.010	31.890	171.329
2001	1.082	2.136	0.309	0.195	20.190	103.483
2002	-0.166	-4.945	0.288	0.272	21.980	122.992
2003	-0.441	-2.992	0.256	0.406	22.440	126.990

Calcite Saturation Index

Figure 53 presents the calcite saturation index trend in Fifth Lake. Fifth Lake CSI was in the low vulnerability range and slightly lower than the county average throughout the study period.

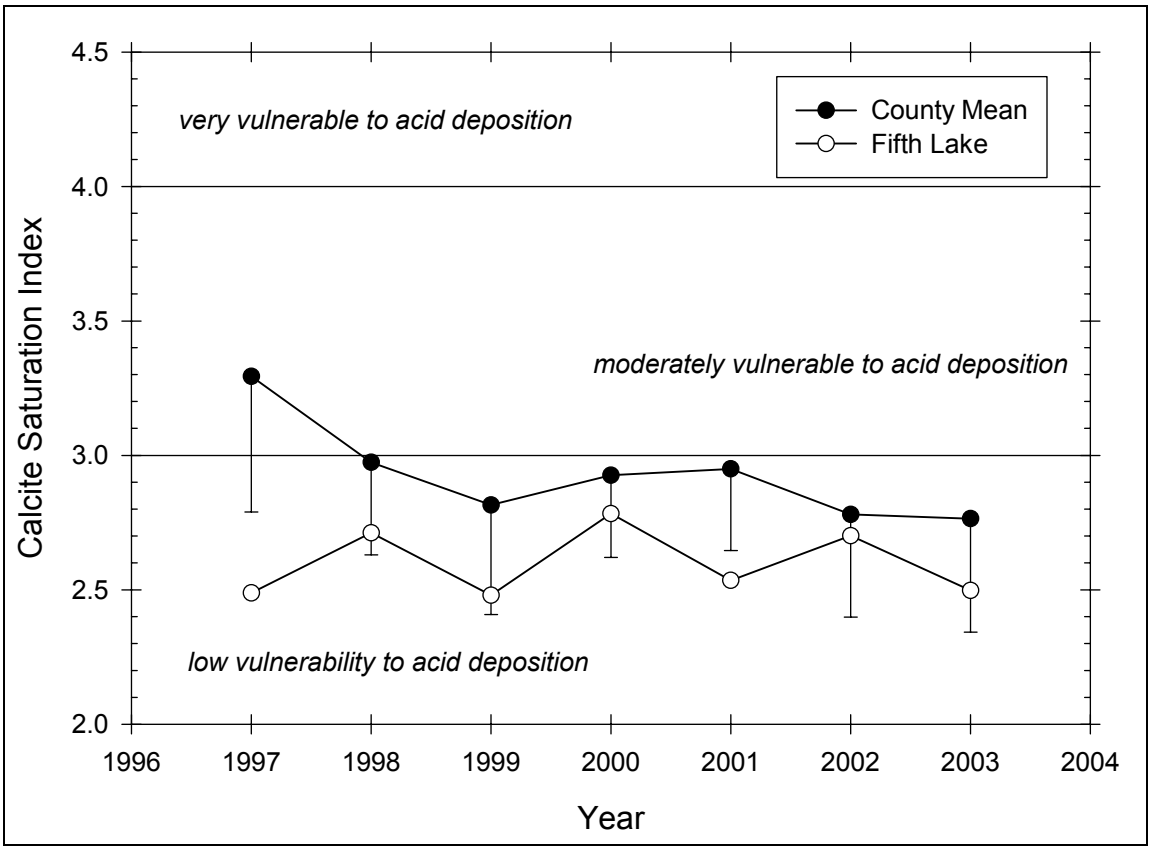
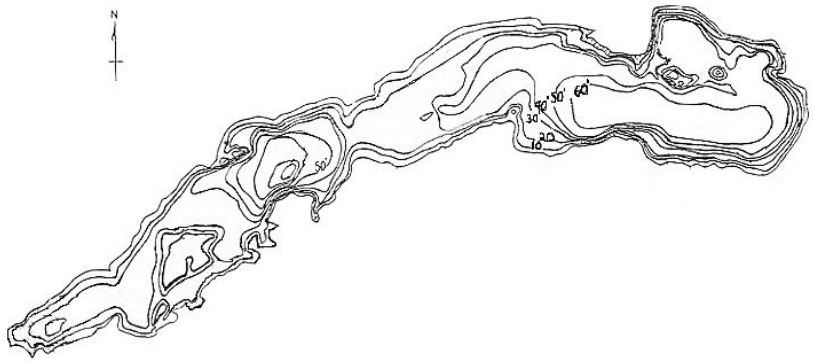


Figure 53 Seasonal mean CSI trend in Fifth Lake

Fourth Lake

Location
Pond Number: 040782D
Watershed: Black River
County: Hamilton
Topographic Quadrangle: Big Moose
Sample Site
Latitude: 43o 45.446'
Longitude: 74o 47.945'
Morphometry
Surface Area: 2,138 Ac.
Mean Depth: 30 Ft.
Maximum Depth: 63 Ft.
Volume: 62,784 Ac./Ft.
Watershed Area: 12,805 Ac.
Hydraulic Retention Time: .96 Yr.
Shoreline Length: 16 Mi.
Elevation: 1707 Ft.
Water Quality Classification: A
Trophic State: Mesotrophic



Temperature and Dissolved Oxygen

Fourth Lake had a minimum DO of 1.0 mg/L (October 1998), with a minimum temperature of 6.1°C and a maximum temperature of 24.7°C. In general, the lowest DO values occurred during the months of August through October.

pH

Figure 54 presents the seasonal mean pH trend in Fourth Lake, while Table 41 presents descriptive statistics for pH in Fourth Lake. The pH in Fourth Lake exhibited an increasing trend over the study period, following a low during 1995 and 1996. The pH in Fourth Lake was similar to the county average.

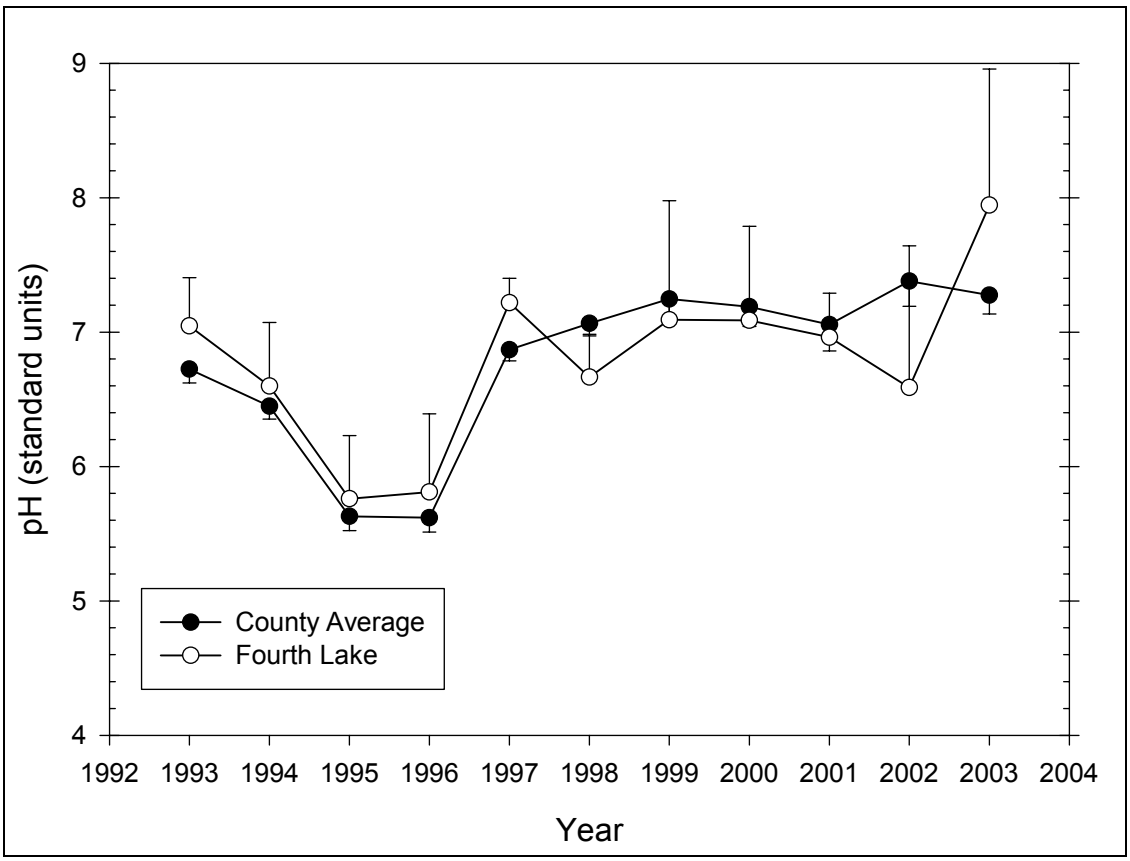


Figure 54 Seasonal mean pH trend in Fourth Lake

Table 41 – Descriptive Statistics for pH in Fourth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	7.046	0.289	0.129	0.359
1994	6	0	6.600	0.450	0.184	0.472
1995	6	0	5.760	0.449	0.183	0.471
1996	6	1	5.810	0.469	0.210	0.583
1997	6	0	7.220	0.172	0.0703	0.181
1998	6	0	6.665	0.304	0.124	0.319
1999	5	0	7.092	0.713	0.319	0.885
2000	6	0	7.088	0.666	0.272	0.699
2001	4	0	6.963	0.205	0.103	0.327
2002	4	0	6.587	0.663	0.331	1.055
2003	4	0	7.945	0.636	0.318	1.013
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.710	7.250	6.540	7.150	6.952	7.213
1994	1.180	6.970	5.790	6.720	6.480	6.920
1995	1.040	6.220	5.180	5.935	5.220	6.070
1996	1.280	6.490	5.210	5.880	5.495	6.033
1997	0.470	7.470	7.000	7.185	7.110	7.370
1998	0.840	7.200	6.360	6.575	6.460	6.820
1999	1.660	8.360	6.700	6.770	6.723	7.265
2000	2.000	7.980	5.980	7.080	6.940	7.470
2001	0.460	7.260	6.800	6.895	6.830	7.095

2002	1.490	7.560	6.070	6.360	6.205	6.970
2003	1.470	8.620	7.150	8.005	7.455	8.435
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-2.006	4.177	0.361	0.032	35.230	248.565
1994	-1.387	1.786	0.255	0.249	39.600	262.371
1995	-0.692	-1.839	0.255	0.249	34.560	200.074
1996	0.357	0.919	0.241	0.396	29.050	169.661
1997	0.404	-0.761	0.213	0.470	43.320	312.919
1998	1.264	1.383	0.264	0.209	39.990	266.995
1999	2.174	4.764	0.406	0.007	35.460	253.515
2000	-0.609	1.431	0.245	0.294	42.530	303.687
2001	1.612	2.708	0.313	0.183	27.850	194.032
2002	1.733	3.286	0.373	0.054	26.350	174.899
2003	-0.447	-0.962	0.184	0.676	31.780	253.707

Alkalinity

Figure 55 presents the seasonal mean alkalinity trend in Fourth Lake, while Table 42 presents descriptive statistics for alkalinity in Fourth Lake. The alkalinity in Fourth Lake exhibited no significant trend. The alkalinity in Fourth Lake was slightly higher than the county average, though this difference was not statistically significant.

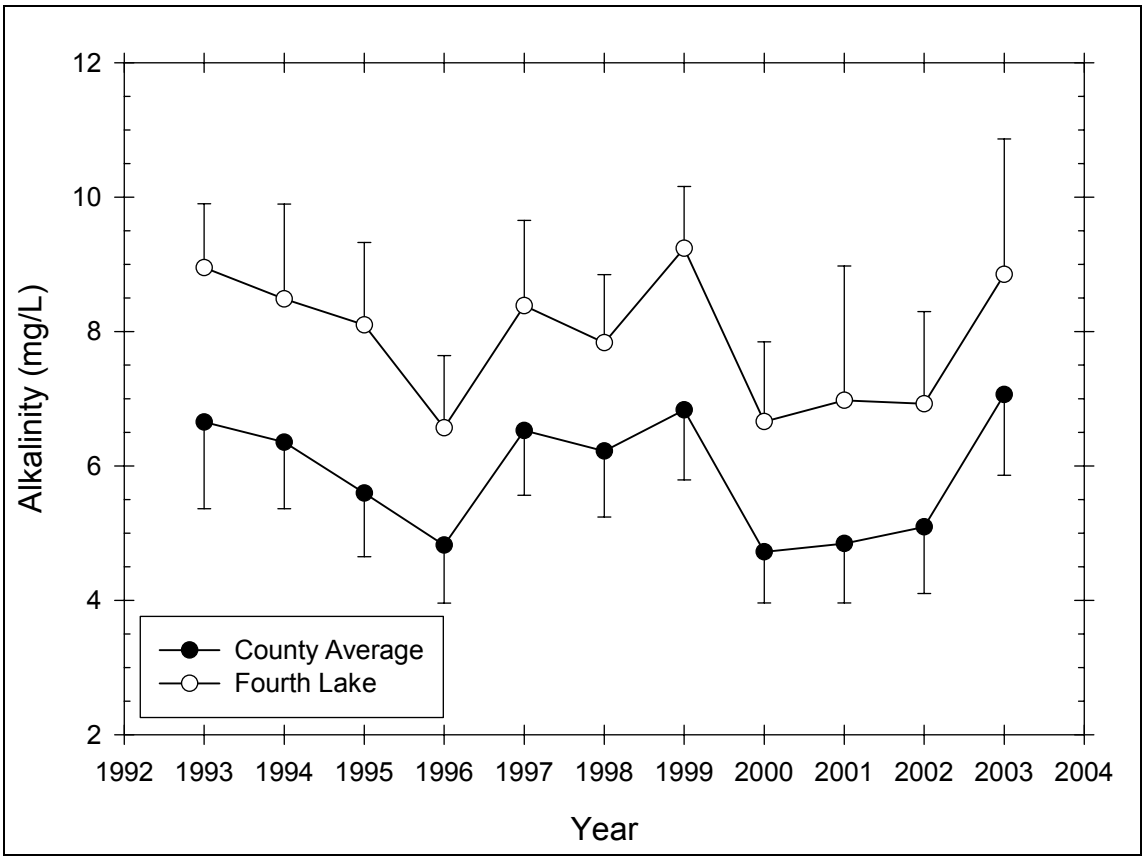


Figure 55 Seasonal mean alkalinity trend in Fourth Lake

Table 42 – Descriptive Statistics for Alkalinity in Fourth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	5	1	8.950	0.597	0.299	0.950
1994	6	0	8.483	1.345	0.549	1.412
1995	6	0	8.100	1.168	0.477	1.226
1996	6	0	6.567	1.023	0.418	1.074
1997	6	0	8.383	1.209	0.494	1.269
1998	6	0	7.833	0.967	0.395	1.015
1999	6	1	9.240	0.740	0.331	0.919
2000	6	1	6.660	0.956	0.427	1.186
2001	6	2	6.975	1.258	0.629	2.002
2002	6	2	6.925	0.862	0.431	1.371
2003	6	2	8.850	1.266	0.633	2.015
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.400	9.600	8.200	9.000	8.500	9.400
1994	4.000	10.700	6.700	8.350	7.900	8.900
1995	2.600	9.400	6.800	8.000	7.100	9.300
1996	2.700	7.500	4.800	7.000	5.900	7.200
1997	2.900	9.600	6.700	8.450	7.600	9.500
1998	2.800	9.500	6.700	7.650	7.300	8.200
1999	1.700	9.700	8.000	9.700	8.825	9.700
2000	2.600	7.700	5.100	6.800	6.300	7.175
2001	3.000	8.700	5.700	6.750	6.150	7.800
2002	1.900	8.200	6.300	6.600	6.450	7.400
2003	2.700	10.100	7.400	8.950	7.800	9.900
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.423	-0.416	0.162	0.708	35.800	321.480
1994	0.607	1.131	0.212	0.476	50.900	440.850
1995	0.0814	-2.742	0.253	0.255	48.600	400.480
1996	-1.276	0.748	0.294	0.108	39.400	263.960
1997	-0.311	-2.051	0.250	0.269	50.300	428.990
1998	0.993	1.362	0.186	0.618	47.000	372.840
1999	-1.661	2.402	0.333	0.073	46.200	429.080
2000	-1.256	2.656	0.317	0.105	33.300	225.430
2001	1.007	1.829	0.274	0.328	27.900	199.350
2002	1.834	3.536	0.397	0.027	27.700	194.050
2003	-0.248	-3.694	0.249	0.437	35.400	318.100

Total Phosphorus

Figure 56 presents the seasonal mean total phosphorus trend in Fourth Lake, while Table 43 presents descriptive statistics for total phosphorus in Fourth Lake. The total phosphorus in Fourth Lake exhibited a decreasing trend from 1998 to 2002. The total phosphorus in Fourth Lake was similar to the county average.

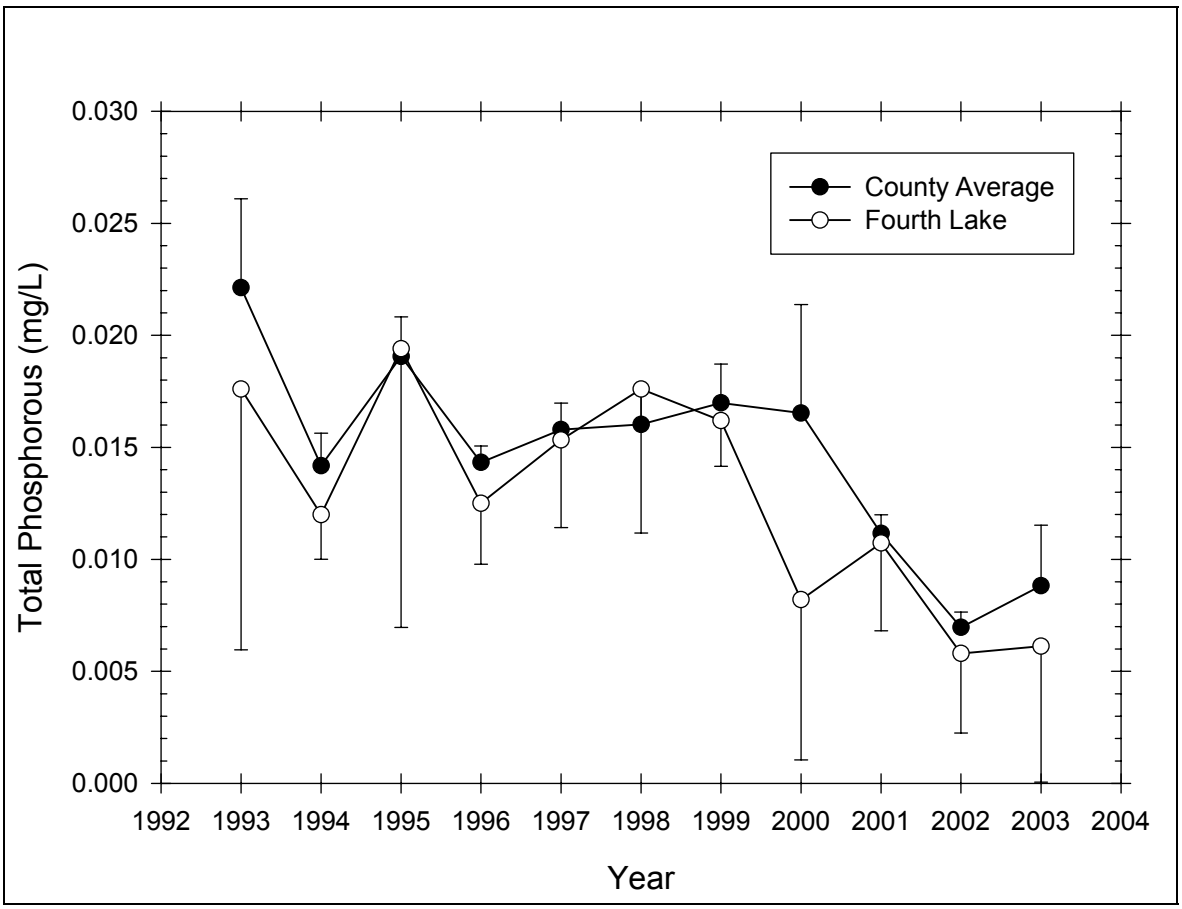


Figure 56 Seasonal mean total phosphorus trend in Fourth Lake

Table 43 – Descriptive Statistics for Total Phosphorus in Fourth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0176	0.00937	0.00419	0.0116
1994	6	0	0.0120	0.00190	0.000775	0.00199
1995	5	0	0.0194	0.0100	0.00448	0.0124
1996	6	0	0.0125	0.00259	0.00106	0.00272
1997	6	0	0.0153	0.00372	0.00152	0.00391
1998	6	1	0.0176	0.00518	0.00232	0.00643
1999	6	1	0.0162	0.00164	0.000735	0.00204
2000	6	1	0.00820	0.00576	0.00258	0.00715
2001	6	2	0.0107	0.00246	0.00123	0.00391
2002	6	2	0.00580	0.00223	0.00112	0.00355
2003	6	2	0.00612	0.00382	0.00191	0.00607
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0260	0.0310	0.00500	0.0170	0.0125	0.0227
1994	0.00500	0.0150	0.01000	0.0120	0.01000	0.0130
1995	0.0220	0.0310	0.00900	0.0220	0.00900	0.0273
1996	0.00700	0.0170	0.01000	0.0115	0.0110	0.0140
1997	0.0110	0.0210	0.01000	0.0155	0.0130	0.0170
1998	0.0130	0.0260	0.0130	0.0150	0.0145	0.0207
1999	0.00300	0.0180	0.0150	0.0150	0.0150	0.0180
2000	0.0140	0.0160	0.00200	0.01000	0.00275	0.0115

2001	0.00590	0.0140	0.00810	0.0104	0.00905	0.0124
2002	0.00440	0.00820	0.00380	0.00560	0.00390	0.00770
2003	0.00840	0.0104	0.00200	0.00605	0.00300	0.00925
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.203	1.328	0.199	0.602	0.0880	0.00190
1994	0.527	-0.0926	0.187	0.609	0.0720	0.000882
1995	-0.159	-2.602	0.250	0.348	0.0970	0.00228
1996	1.245	0.991	0.243	0.304	0.0750	0.000971
1997	0.130	0.586	0.161	0.722	0.0920	0.00148
1998	1.390	1.610	0.292	0.174	0.0880	0.00166
1999	0.609	-3.333	0.367	0.026	0.0810	0.00132
2000	0.234	-1.274	0.223	0.488	0.0410	0.000469
2001	0.746	1.330	0.238	0.486	0.0429	0.000478
2002	0.164	-4.986	0.290	0.263	0.0232	0.000150
2003	0.0725	-3.149	0.211	0.595	0.0245	0.000194

Nitrate

Figure 57 presents the seasonal mean nitrate trend in Fourth Lake, while Table 44 presents descriptive statistics for nitrate in Fourth Lake. The nitrate in Fourth Lake exhibited a decreasing trend from 1997 to 2002. The nitrate in Fourth Lake was slightly higher than the county average, though this difference was not statistically significant.

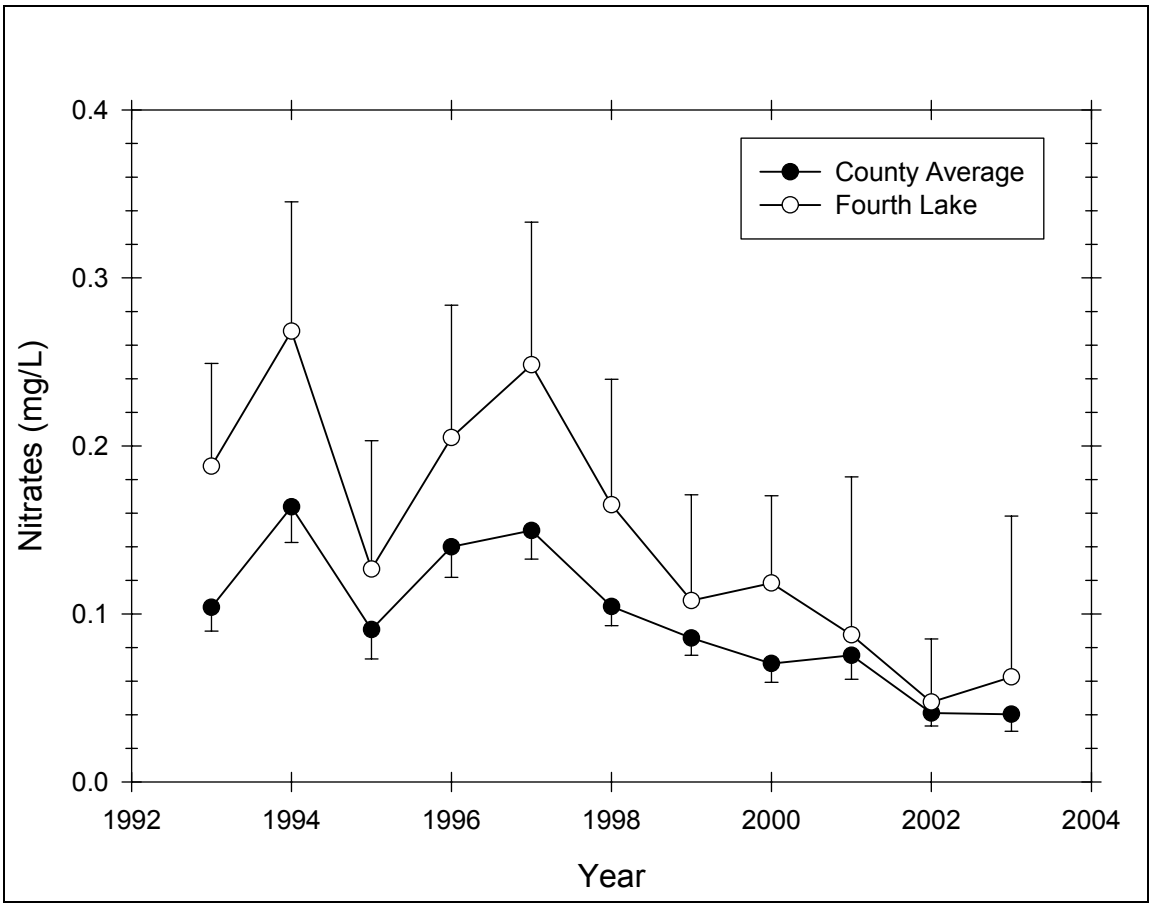


Figure 57 Seasonal mean nitrate trend in Fourth Lake

Table 44 – Descriptive Statistics for Nitrate in Fourth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.188	0.0492	0.0220	0.0611
1994	6	0	0.268	0.0733	0.0299	0.0770
1995	6	0	0.127	0.0728	0.0297	0.0764
1996	6	0	0.205	0.0750	0.0306	0.0787
1997	6	0	0.248	0.0808	0.0330	0.0848
1998	6	0	0.165	0.0712	0.0291	0.0747
1999	6	1	0.108	0.0507	0.0227	0.0629
2000	6	0	0.118	0.0496	0.0202	0.0520
2001	6	2	0.0875	0.0591	0.0295	0.0940
2002	6	2	0.0475	0.0236	0.0118	0.0376
2003	6	2	0.0625	0.0602	0.0301	0.0958
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.110	0.250	0.140	0.170	0.147	0.235
1994	0.180	0.370	0.190	0.260	0.200	0.330
1995	0.190	0.240	0.0500	0.1000	0.0800	0.190
1996	0.170	0.290	0.120	0.200	0.130	0.290
1997	0.220	0.380	0.160	0.230	0.190	0.300
1998	0.190	0.280	0.0900	0.140	0.120	0.220
1999	0.120	0.180	0.0600	0.110	0.0600	0.143
2000	0.130	0.200	0.0700	0.105	0.0800	0.150
2001	0.130	0.160	0.0300	0.0800	0.0400	0.135
2002	0.0500	0.0800	0.0300	0.0400	0.0300	0.0650
2003	0.130	0.140	0.01000	0.0500	0.0150	0.110
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.494	-2.581	0.243	0.385	0.940	0.186
1994	0.334	-1.816	0.199	0.545	1.610	0.459
1995	0.856	-0.726	0.257	0.238	0.760	0.123
1996	0.128	-2.083	0.205	0.516	1.230	0.280
1997	0.838	0.0129	0.182	0.634	1.490	0.403
1998	0.937	-0.222	0.250	0.271	0.990	0.189
1999	0.520	-0.860	0.228	0.460	0.540	0.0686
2000	0.947	-0.0160	0.216	0.451	0.710	0.0963
2001	0.483	-2.347	0.237	0.489	0.350	0.0411
2002	1.194	0.436	0.271	0.342	0.190	0.0107
2003	0.762	-1.571	0.260	0.388	0.250	0.0265

Chlorophyll a

Figure 58 presents the seasonal mean chlorophyll *a* trend in Fourth Lake, while Table 45 presents descriptive statistics for chlorophyll *a* in Fourth Lake. The chlorophyll *a* in Fourth Lake exhibited no significant trend, with stable concentrations from 1998 to 2003, preceded by a lower value in 1997. The chlorophyll *a* in Fourth Lake was similar to the county average.

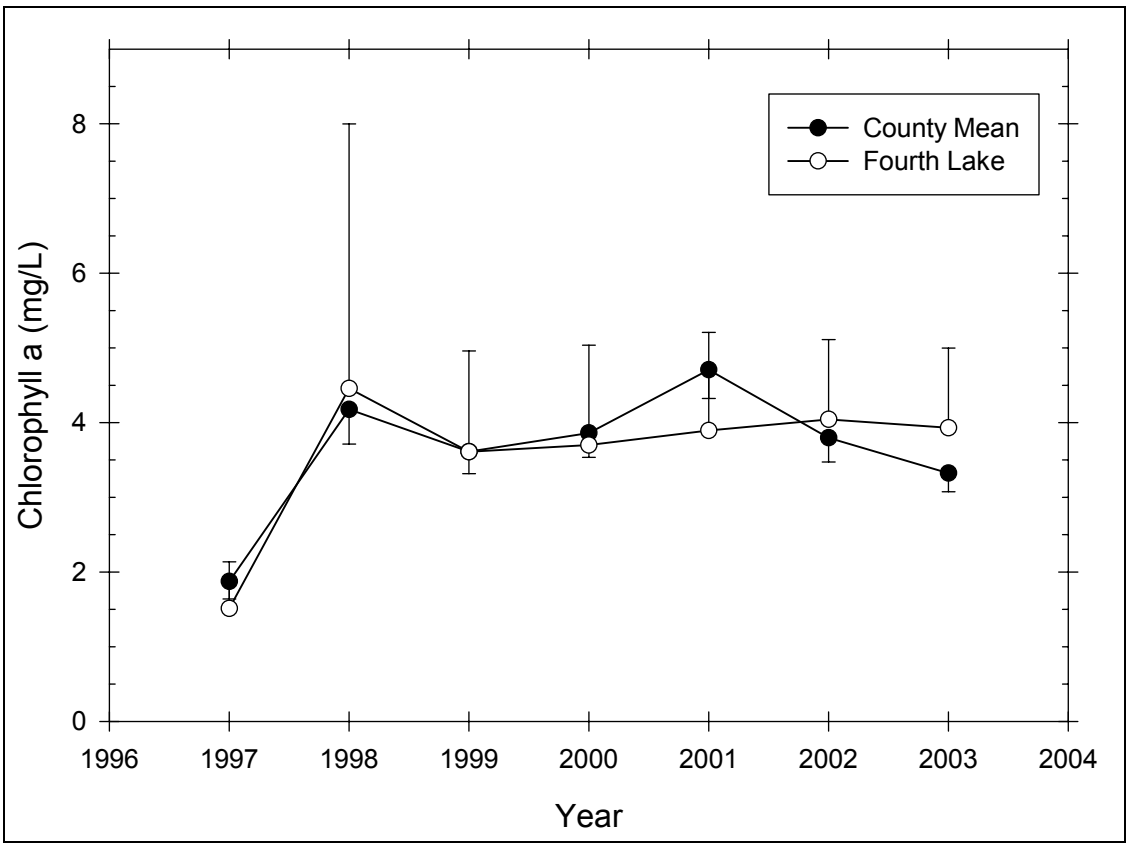


Figure 58 Seasonal mean chlorophyll a trend in Fourth Lake

Table 45 – Descriptive Statistics for Chlorophyll a in Fourth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	1.510	0.596	0.243	0.626
1998	6	0	4.458	3.374	1.378	3.541
1999	6	1	3.610	1.086	0.486	1.349
2000	6	0	3.700	1.272	0.519	1.335
2001	6	2	3.895	0.826	0.413	1.315
2002	6	2	4.043	0.671	0.336	1.068
2003	6	2	3.930	0.672	0.336	1.069
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	1.620	2.160	0.540	1.635	1.120	1.970
1998	8.370	9.940	1.570	3.130	1.800	7.180
1999	2.740	5.450	2.710	3.440	2.860	4.018
2000	3.410	5.560	2.150	3.710	2.520	4.550
2001	1.910	4.770	2.860	3.975	3.260	4.530
2002	1.540	4.980	3.440	3.875	3.575	4.510
2003	1.400	4.330	2.930	4.230	3.540	4.320
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	-0.835	0.0391	0.187	0.612	9.060	15.457
1998	1.055	-0.369	0.261	0.220	26.750	176.195
1999	1.675	3.098	0.326	0.089	18.050	69.880
2000	0.246	-0.850	0.157	0.734	22.200	90.232
2001	-0.461	-0.905	0.184	0.677	15.580	62.732

2002	1.252	1.531	0.251	0.425	16.170	66.720
2003	-1.916	3.693	0.378	0.046	15.720	63.132

Transparency

Figure 59 presents the seasonal mean transparency trend in Fourth Lake, while Table 46 presents descriptive statistics for transparency in Fourth Lake. The transparency in Fourth Lake exhibited a slight decreasing trend over the study period. The transparency in Fourth Lake was generally slightly higher than the county average, though this difference was not statistically significant.

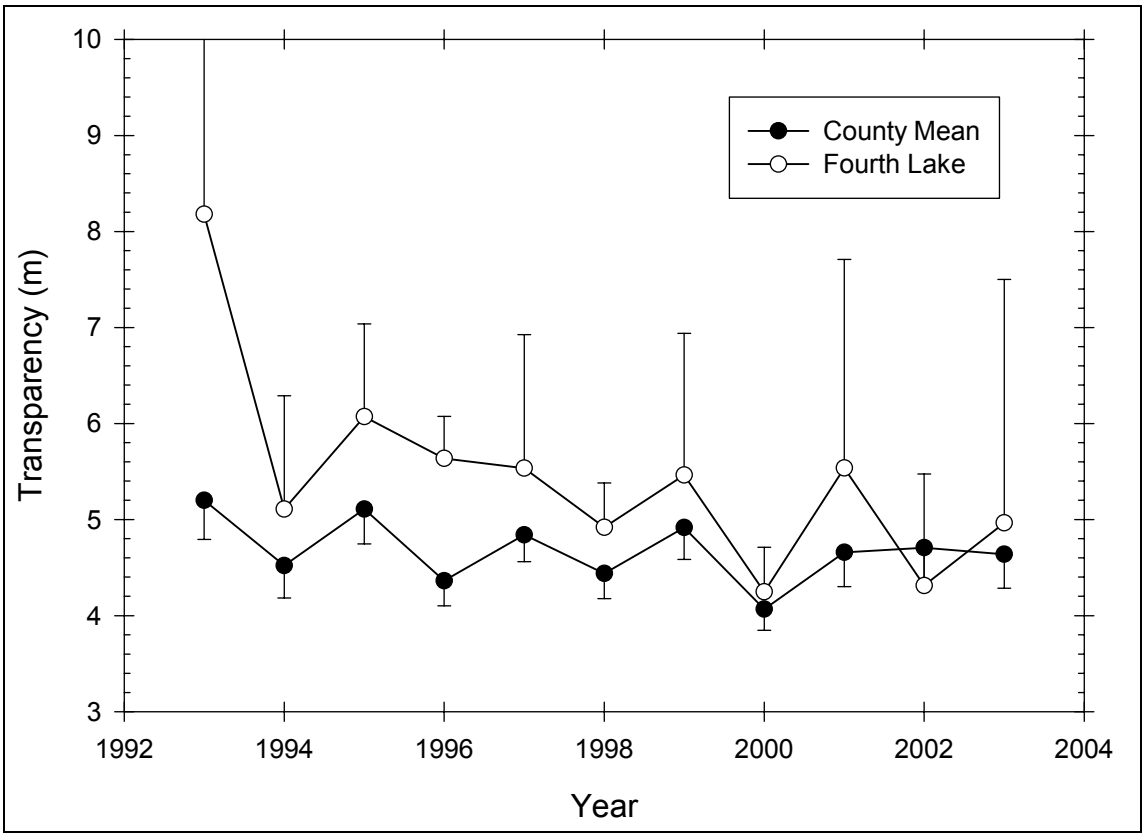


Figure 59 Seasonal mean transparency trend in Fourth Lake

Table 46 – Descriptive Statistics for Transparency in Fourth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	8.180	3.912	1.750	4.858
1994	6	0	5.108	1.125	0.459	1.181
1995	6	0	6.072	0.921	0.376	0.966
1996	6	0	5.637	0.417	0.170	0.438
1997	6	0	5.535	1.324	0.541	1.390
1998	6	0	4.920	0.439	0.179	0.461
1999	5	0	5.462	1.190	0.532	1.477
2000	6	0	4.247	0.442	0.180	0.464
2001	4	0	5.537	1.365	0.682	2.171
2002	4	0	4.313	0.731	0.365	1.163

2003	4	0	4.965	1.595	0.797	2.537
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	9.850	15.000	5.150	7.270	5.945	9.203
1994	3.050	7.250	4.200	4.850	4.300	5.200
1995	2.500	7.450	4.950	5.950	5.430	6.700
1996	1.000	6.100	5.100	5.635	5.250	6.100
1997	3.900	7.750	3.850	5.455	4.710	5.990
1998	1.160	5.710	4.550	4.790	4.610	5.070
1999	2.850	7.420	4.570	4.950	4.615	6.160
2000	1.140	4.910	3.770	4.150	3.900	4.600
2001	3.200	7.200	4.000	5.475	4.500	6.575
2002	1.550	5.350	3.800	4.050	3.800	4.825
2003	3.420	7.050	3.630	4.590	3.720	6.210
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.950	4.078	0.392	0.012	40.900	395.792
1994	1.771	3.445	0.301	0.096	30.650	162.903
1995	0.422	-0.826	0.196	0.565	36.430	225.430
1996	-0.0557	-1.677	0.200	0.541	33.820	191.501
1997	0.722	1.186	0.199	0.548	33.210	192.583
1998	1.386	1.744	0.245	0.293	29.520	146.203
1999	1.512	1.913	0.267	0.273	27.310	154.828
2000	0.595	-1.124	0.212	0.476	25.480	109.181
2001	0.230	-0.679	0.153	0.710	22.150	128.243
2002	1.448	1.659	0.258	0.394	17.250	75.992
2003	0.857	-1.186	0.266	0.363	19.860	106.232

TSI

Figure 60 presents the Carlson trophic state index trend in Fourth Lake. Chlorophyll *a* TSI values were in the eutrophic range while transparency TSI was in the oligotrophic range from 1993 to 1999 and mesotrophic in 2000, 2002 and 2003. Total phosphorus TSI was mesotrophic from 1993 – 1999 and then oligotrophic the remaining years 2000 – 2003.

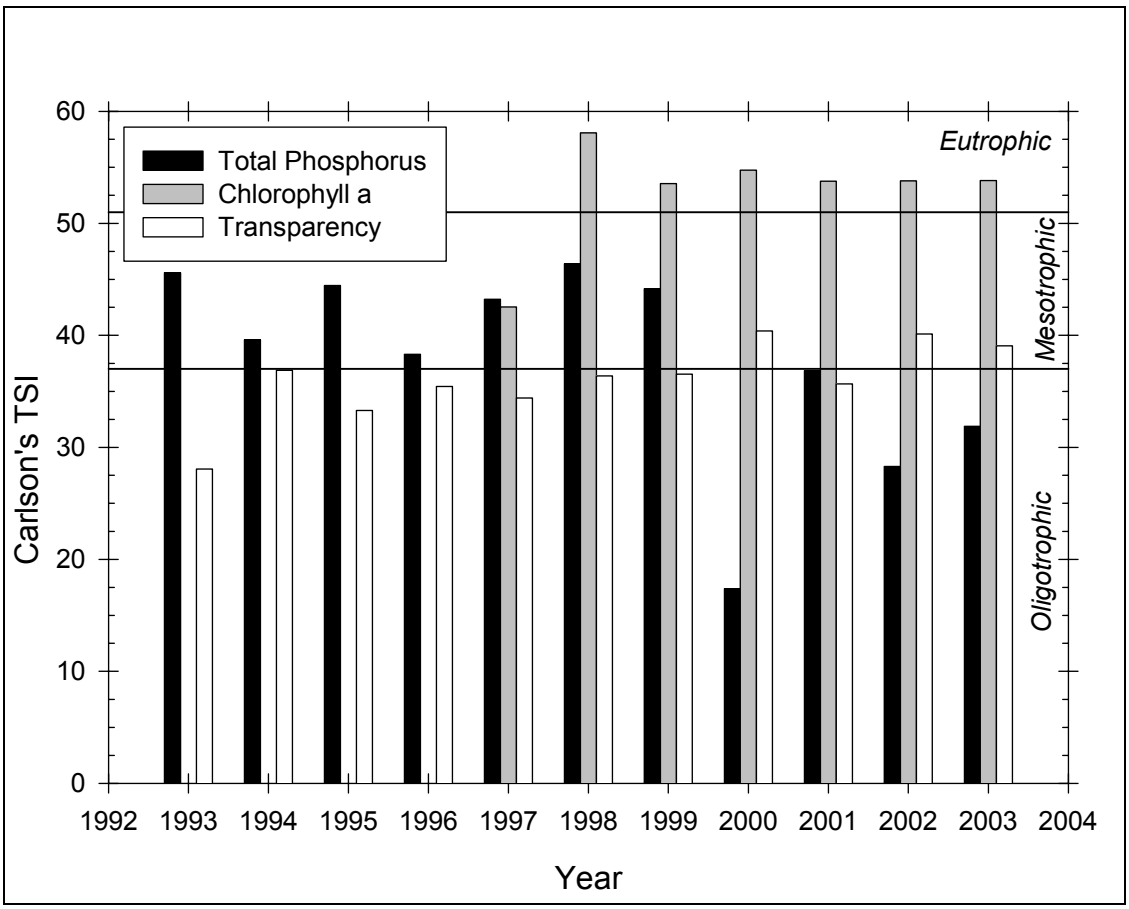


Figure 60 Carlson TSI trend in Fourth Lake

Aluminum

Figure 61 presents the seasonal mean aluminum trend in Fourth Lake, while Table 47 presents descriptive statistics for aluminum in Fourth Lake. The aluminum in Fourth Lake exhibited a stable trend. The aluminum in Fourth Lake was slightly lower than the county average, though this difference was not statistically significant.

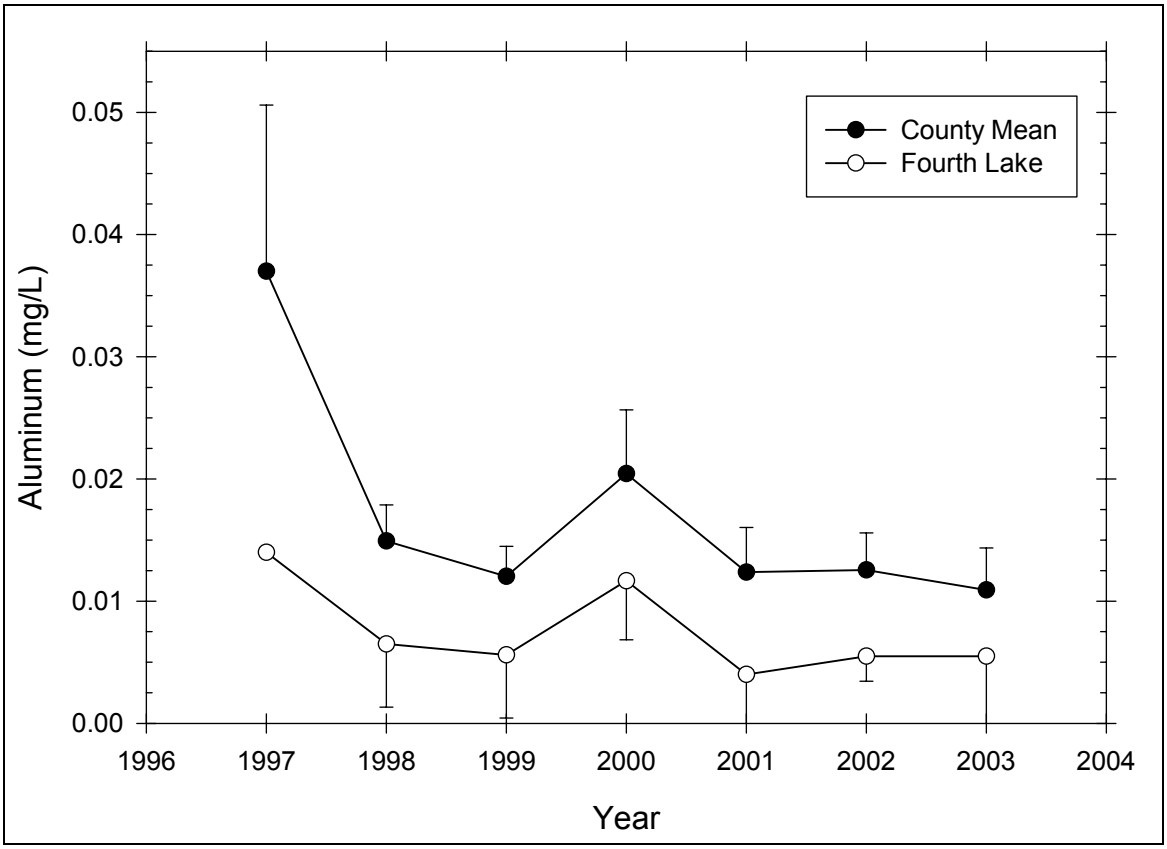


Figure 61 Seasonal mean aluminum trend in Fourth Lake

Table 47 – Descriptive Statistics for Aluminum in Fourth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0140	--	--	--
1998	6	0	0.00650	0.00493	0.00201	0.00517
1999	6	1	0.00560	0.00416	0.00186	0.00516
2000	6	0	0.0117	0.00459	0.00187	0.00482
2001	6	2	0.00400	0.00283	0.00141	0.00450
2002	6	2	0.00550	0.00129	0.000645	0.00205
2003	6	2	0.00550	0.00370	0.00185	0.00588
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0140	0.0140	0.0140	0.0140	0.0140
1998	0.0140	0.0140	0.000	0.00650	0.00300	0.00900
1999	0.01000	0.0120	0.00200	0.00500	0.00200	0.00825
2000	0.01000	0.0160	0.00600	0.0125	0.00700	0.0160
2001	0.00600	0.00800	0.00200	0.00300	0.00200	0.00600
2002	0.00300	0.00700	0.00400	0.00550	0.00450	0.00650

2003	0.00900	0.01000	0.001000	0.00550	0.00300	0.00800
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0140	0.000196
1998	0.301	-0.147	0.139	0.767	0.0390	0.000375
1999	0.992	0.427	0.207	0.567	0.0280	0.000226
2000	-0.274	-2.556	0.266	0.200	0.0700	0.000922
2001	1.414	1.500	0.260	0.387	0.0160	0.0000880
2002	-2.665E-015	-1.200	0.151	0.710	0.0220	0.000126
2003	5.921E-016	1.139	0.196	0.644	0.0220	0.000162

Calcium

Figure 62 presents the seasonal mean calcium trend in Fourth Lake, while Table 48 presents descriptive statistics for calcium in Fourth Lake. The calcium in Fourth Lake exhibited a slight decreasing trend over the study period. The calcium in Fourth Lake was higher than the county average, though this difference may not be statistically significant for all years.

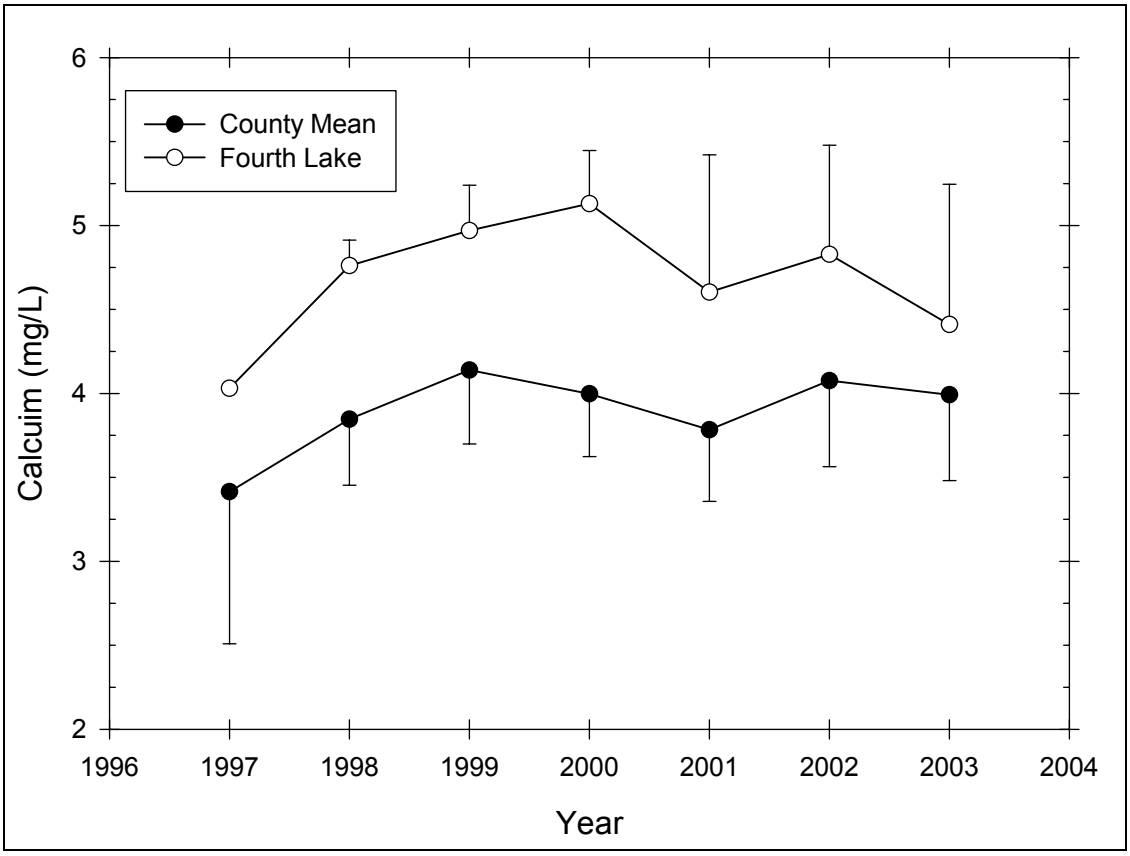


Figure 62 Seasonal mean calcium trend in Fourth Lake

Table 48 – Descriptive Statistics for Calcium in Fourth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	4.030	--	--	--
1998	6	0	4.760	0.146	0.0596	0.153
1999	6	1	4.970	0.217	0.0969	0.269

2000	6	0	5.130	0.301	0.123	0.316
2001	6	2	4.603	0.515	0.257	0.819
2002	6	2	4.828	0.409	0.205	0.651
2003	6	2	4.410	0.525	0.262	0.835
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	4.030	4.030	4.030	4.030	4.030
1998	0.380	4.960	4.580	4.720	4.670	4.910
1999	0.560	5.180	4.620	5.050	4.845	5.105
2000	0.730	5.670	4.940	4.955	4.950	5.310
2001	1.130	5.220	4.090	4.550	4.185	5.020
2002	0.930	5.170	4.240	4.950	4.560	5.095
2003	1.110	5.020	3.910	4.355	3.975	4.845
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	4.030	16.241
1998	0.451	-1.259	0.248	0.280	28.560	136.052
1999	-1.308	1.743	0.244	0.379	24.850	123.692
2000	1.535	1.425	0.380	0.007	30.780	158.355
2001	0.379	-2.712	0.234	0.501	18.410	85.527
2002	-1.512	2.467	0.301	0.222	19.310	93.721
2003	0.318	-3.653	0.260	0.390	17.640	78.619

Calcite Saturation Index

Figure 63 presents the calcite saturation index trend in Fourth Lake. There was no distinct trend in Fourth Lake.

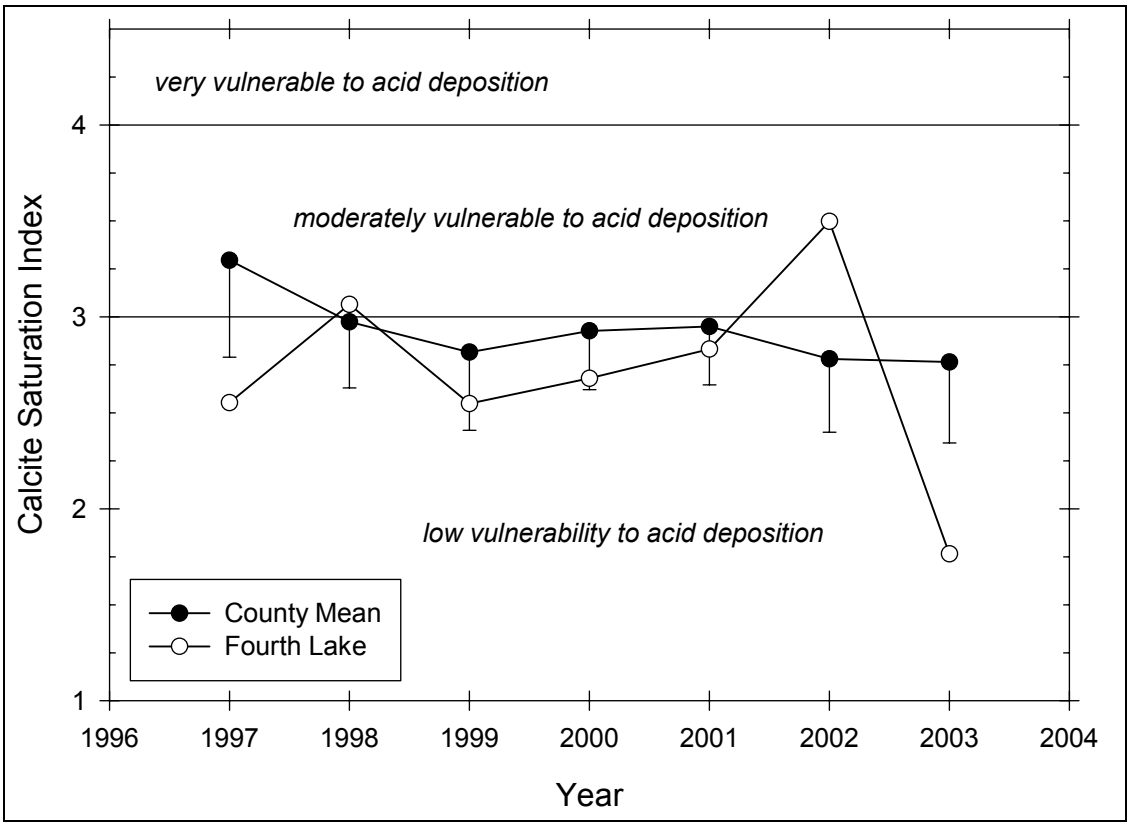
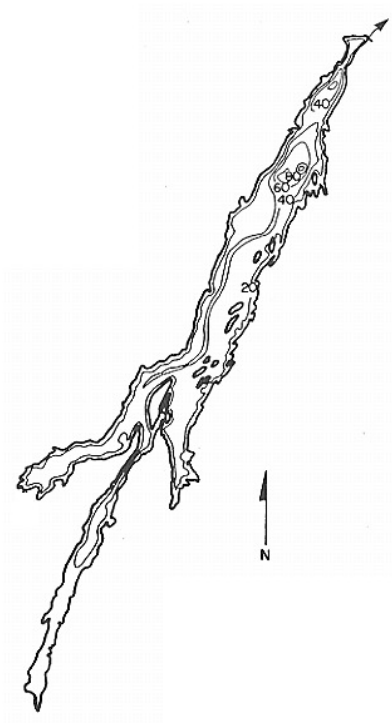


Figure 63 Seasonal mean CSI trend in Fourth Lake

Indian Lake



Location
Pond Number: 050597
Watershed: Upper Hudson River
County: Hamilton
Topographic Quadrangle: Indian Lake
Sample Site
Latitude: 43o 43.418'
Longitude: 74o 18.231'
Morphometry
Surface Area: 4,365 Ac.
Mean Depth: 39 Ft.
Maximum Depth: 85 Ft.
Volume: 170,235 Ac./Ft.
Watershed Area: 83,840 Ac.
Hydraulic Retention Time: 0.9 Yr.
Shoreline Length: 38.7 Mi.
Elevation: 1,650 Ft.

Temperature and Dissolved Oxygen

Indian Lake had a minimum DO of 0.2 mg/L (October 1997), with a minimum temperature of 5.0°C and a maximum temperature of 23.7°C. In general, the lowest DO values occurred during the months of August through October.

pH

Figure 64 presents the seasonal mean pH trend in Indian Lake, while Table 49 presents descriptive statistics for pH in Indian Lake. The pH in Indian Lake exhibited an increasing trend over the study period, following a low in 1995 and 1996. The pH in Indian Lake was similar to the county average.

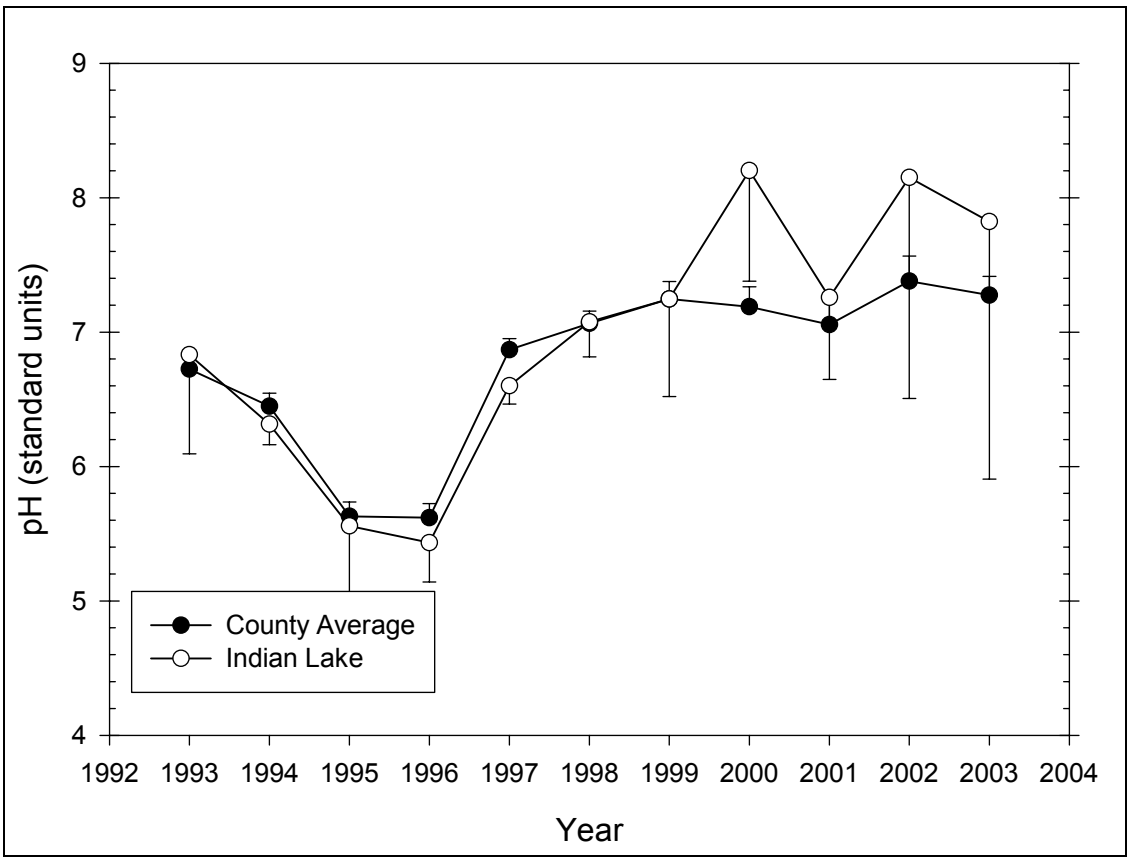


Figure 64 Seasonal mean pH trend in Indian Lake

Table 49 – Descriptive Statistics for pH in Indian Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	2	6.833	0.463	0.232	0.737
1994	6	0	6.315	0.146	0.0594	0.153
1995	6	0	5.558	0.566	0.231	0.594
1996	6	0	5.433	0.279	0.114	0.293
1997	6	0	6.600	0.129	0.0526	0.135
1998	6	0	7.077	0.248	0.101	0.261
1999	5	0	7.246	0.584	0.261	0.726
2000	6	0	8.202	0.784	0.320	0.823
2001	6	0	7.258	0.582	0.238	0.611
2002	4	0	8.150	1.033	0.517	1.644
2003	4	0	7.822	1.205	0.602	1.917
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.040	7.250	6.210	6.935	6.485	7.180
1994	0.340	6.490	6.150	6.300	6.200	6.450
1995	1.420	6.110	4.690	5.700	5.130	6.020
1996	0.740	5.810	5.070	5.425	5.210	5.660
1997	0.370	6.820	6.450	6.570	6.530	6.660
1998	0.740	7.350	6.610	7.115	7.080	7.190
1999	1.260	7.790	6.530	7.370	6.695	7.790
2000	2.040	9.310	7.270	8.070	7.600	8.890
2001	1.270	8.070	6.800	6.940	6.860	7.940

2002	2.500	9.290	6.790	8.260	7.465	8.835
2003	2.610	9.400	6.790	7.550	6.885	8.760
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.988	-0.0125	0.225	0.539	27.330	187.376
1994	0.104	-2.603	0.265	0.206	37.890	239.381
1995	-0.689	-1.065	0.244	0.298	33.350	186.971
1996	0.0775	-1.320	0.131	0.771	32.600	177.516
1997	0.972	1.114	0.179	0.648	39.600	261.443
1998	-1.560	3.539	0.339	0.030	42.460	300.784
1999	-0.345	-2.654	0.224	0.480	36.230	263.889
2000	0.383	-1.366	0.178	0.656	49.210	406.677
2001	0.954	-1.743	0.374	0.009	43.550	317.795
2002	-0.618	1.458	0.246	0.449	32.600	268.892
2003	0.859	-1.086	0.258	0.397	31.290	249.119

Alkalinity

Figure 65 presents the seasonal mean alkalinity trend in Indian Lake, while Table 50 presents descriptive statistics for alkalinity in Indian Lake. The alkalinity in Indian Lake exhibited a steady trend over the study period. The alkalinity in Indian Lake was significantly lower than the county average, though this difference might not be statistically significant for all years.

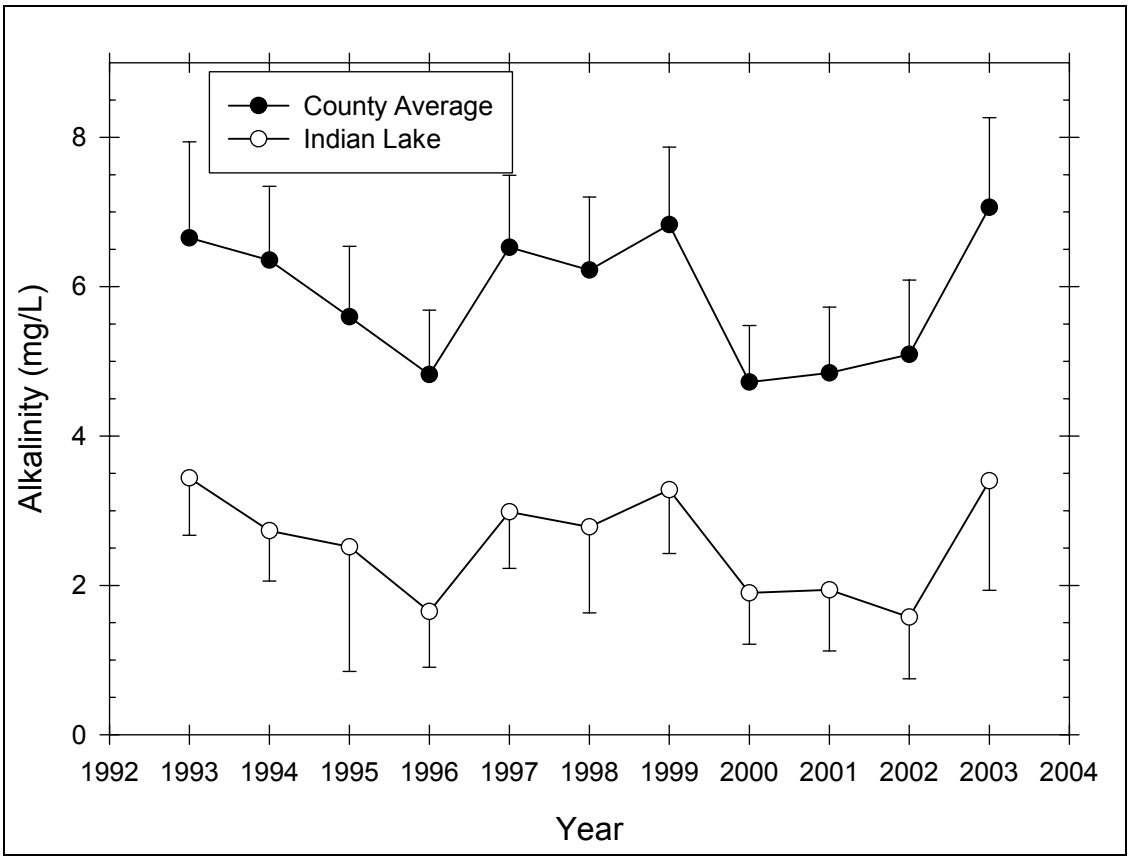


Figure 65 Seasonal mean alkalinity trend in Indian Lake

Table 50 – Descriptive Statistics for Alkalinity in Indian Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	3.440	0.619	0.277	0.768
1994	6	0	2.733	0.644	0.263	0.676
1995	6	0	2.517	1.590	0.649	1.669
1996	6	0	1.650	0.712	0.291	0.747
1997	6	0	2.983	0.719	0.294	0.755
1998	6	0	2.783	1.098	0.448	1.152
1999	6	1	3.280	0.687	0.307	0.853
2000	6	0	1.900	0.654	0.267	0.687
2001	6	1	1.940	0.658	0.294	0.817
2002	6	2	1.575	0.519	0.259	0.826
2003	6	2	3.400	0.920	0.460	1.464
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.500	4.200	2.700	3.400	2.925	3.975
1994	1.500	3.600	2.100	2.550	2.200	3.400
1995	4.300	3.800	-0.500	2.800	2.400	3.800
1996	2.100	2.800	0.700	1.650	1.200	1.900
1997	1.700	3.900	2.200	2.850	2.400	3.700
1998	2.500	4.300	1.800	2.550	1.800	3.700
1999	1.700	3.800	2.100	3.500	3.000	3.725
2000	1.700	2.900	1.200	1.650	1.500	2.500
2001	1.700	2.800	1.100	2.100	1.400	2.350
2002	1.100	2.300	1.200	1.400	1.200	1.950
2003	2.100	4.600	2.500	3.250	2.700	4.100
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.0806	-1.901	0.171	0.703	17.200	60.700
1994	0.517	-2.021	0.250	0.273	16.400	46.900
1995	-1.723	3.408	0.304	0.087	15.100	50.650
1996	0.489	0.856	0.196	0.563	9.900	18.870
1997	0.287	-2.282	0.249	0.275	17.900	55.990
1998	0.394	-2.154	0.289	0.121	16.700	52.510
1999	-1.822	3.476	0.312	0.117	16.400	55.680
2000	0.829	-0.881	0.287	0.129	11.400	23.800
2001	-0.0295	-0.749	0.196	0.615	9.700	20.550
2002	1.316	1.031	0.265	0.365	6.300	10.730
2003	0.755	-0.509	0.207	0.611	13.600	48.780

Total Phosphorus

Figure 66 presents the seasonal mean total phosphorus trend in Indian Lake, while Table 51 presents descriptive statistics for total phosphorus in Indian Lake. The total phosphorus in Indian Lake exhibited a decreasing trend from 1995 to 2002. The total phosphorus in Indian Lake was generally slightly lower than the county average, though this difference was not statistically significant.

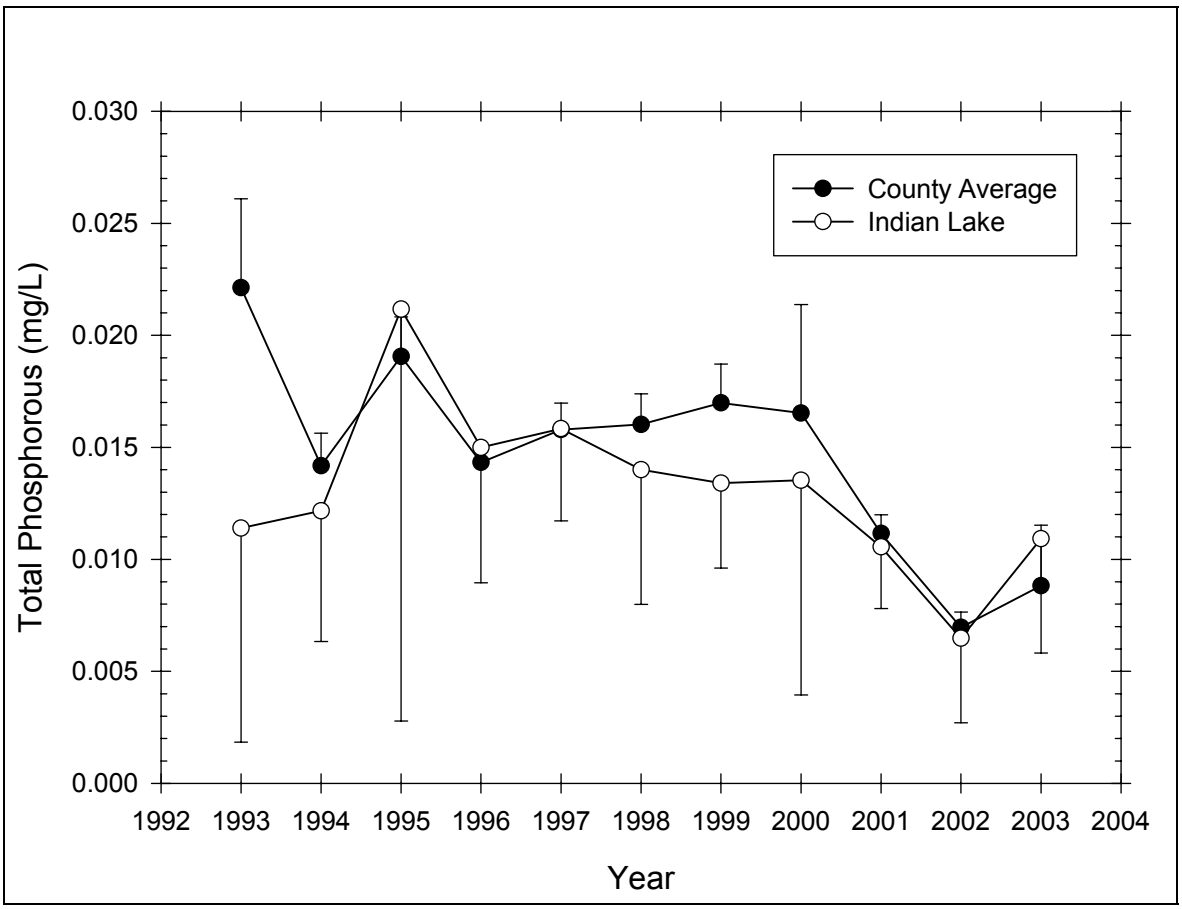


Figure 66 Seasonal mean total phosphorus trend in Indian Lake

Table 51 – Descriptive Statistics for Total Phosphorus in Indian Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0114	0.00770	0.00344	0.00956
1994	6	0	0.0122	0.00556	0.00227	0.00584
1995	6	0	0.0212	0.0175	0.00715	0.0184
1996	6	0	0.0150	0.00576	0.00235	0.00605
1997	6	0	0.0158	0.00392	0.00160	0.00411
1998	6	0	0.0140	0.00573	0.00234	0.00601
1999	6	1	0.0134	0.00305	0.00136	0.00379
2000	6	0	0.0135	0.00914	0.00373	0.00959
2001	6	1	0.0106	0.00222	0.000993	0.00276
2002	6	2	0.00647	0.00237	0.00118	0.00377
2003	6	2	0.0109	0.00321	0.00161	0.00511
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0190	0.0220	0.00300	0.0120	0.00450	0.0168
1994	0.0160	0.0190	0.00300	0.0125	0.01000	0.0160
1995	0.0460	0.0550	0.00900	0.0140	0.01000	0.0250
1996	0.0170	0.0260	0.00900	0.0135	0.0130	0.0150
1997	0.00900	0.0210	0.0120	0.0150	0.0120	0.0200
1998	0.0150	0.0250	0.01000	0.0120	0.01000	0.0150
1999	0.00700	0.0170	0.01000	0.0130	0.0108	0.0163
2000	0.0230	0.0260	0.00300	0.0145	0.00320	0.0200

2001	0.00550	0.0140	0.00850	0.0106	0.00865	0.0118
2002	0.00530	0.00980	0.00450	0.00580	0.00480	0.00815
2003	0.00690	0.0134	0.00650	0.0119	0.00855	0.0133
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.350	-1.086	0.197	0.610	0.0570	0.000887
1994	-0.697	0.679	0.182	0.636	0.0730	0.00104
1995	1.944	3.803	0.325	0.046	0.127	0.00422
1996	1.722	3.892	0.333	0.036	0.0900	0.00152
1997	0.455	-1.930	0.189	0.599	0.0950	0.00158
1998	1.878	3.663	0.264	0.209	0.0840	0.00134
1999	0.162	-2.501	0.203	0.583	0.0670	0.000935
2000	-0.0239	-1.264	0.204	0.518	0.0812	0.00152
2001	0.974	0.735	0.221	0.493	0.0528	0.000577
2002	1.325	1.405	0.246	0.451	0.0259	0.000185
2003	-1.200	0.488	0.260	0.386	0.0437	0.000508

Nitrate

Figure 67 presents the seasonal mean nitrate trend in Indian Lake, while Table 52 presents descriptive statistics for nitrate in Indian Lake. The nitrate in Indian Lake exhibited a slight decreasing trend over the study period. The nitrate in Indian Lake was slightly higher than the county average, though this difference was not statistically significant.

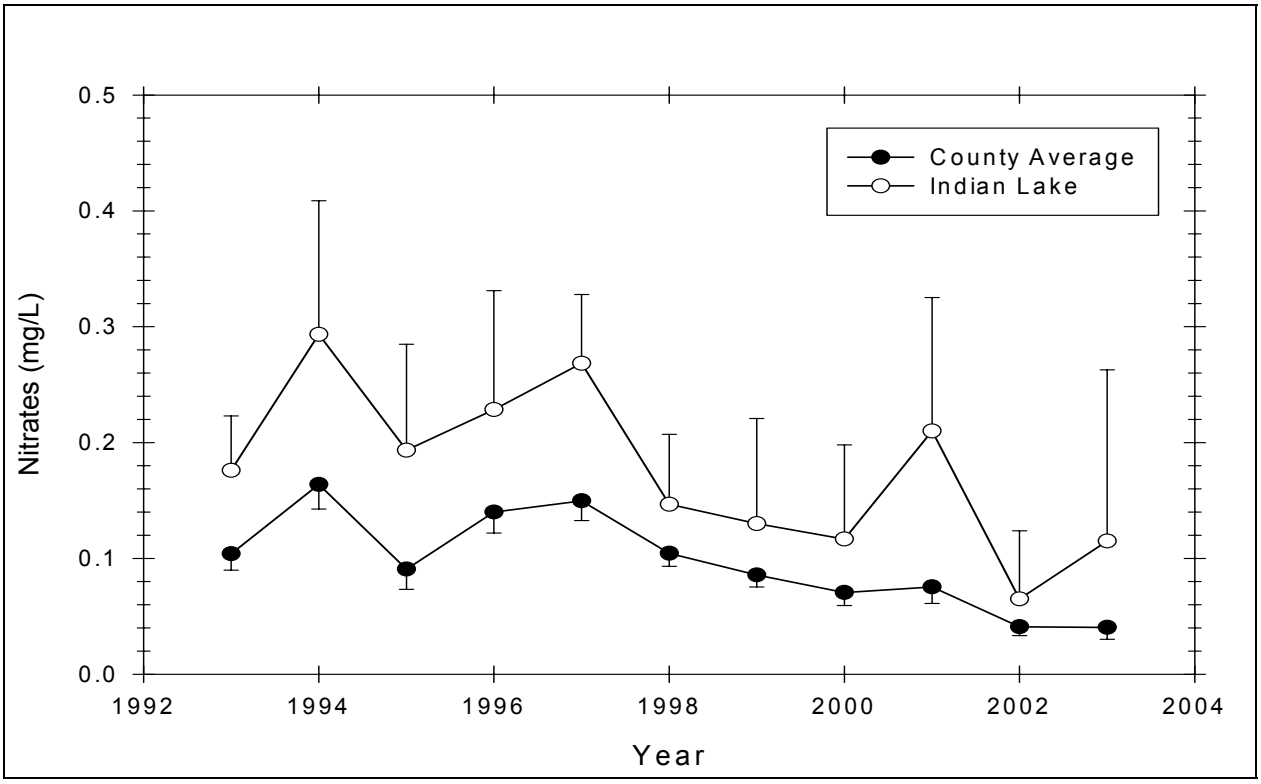


Figure 67 Seasonal mean nitrate trend in Indian Lake

Table 52 – Descriptive Statistics for Nitrate in Indian Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.176	0.0378	0.0169	0.0470
1994	6	0	0.293	0.110	0.0448	0.115
1995	6	0	0.193	0.0871	0.0356	0.0914
1996	6	0	0.228	0.0979	0.0400	0.103
1997	6	0	0.268	0.0567	0.0232	0.0595
1998	6	0	0.147	0.0575	0.0235	0.0603
1999	6	1	0.130	0.0731	0.0327	0.0908
2000	6	0	0.117	0.0774	0.0316	0.0812
2001	6	1	0.210	0.0927	0.0415	0.115
2002	6	2	0.0650	0.0370	0.0185	0.0588
2003	6	2	0.115	0.0929	0.0465	0.148
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0900	0.240	0.150	0.160	0.150	0.195
1994	0.270	0.430	0.160	0.290	0.190	0.400
1995	0.210	0.320	0.110	0.165	0.120	0.280
1996	0.260	0.390	0.130	0.215	0.140	0.280
1997	0.140	0.340	0.200	0.270	0.210	0.320
1998	0.140	0.230	0.0900	0.130	0.1000	0.200
1999	0.190	0.230	0.0400	0.150	0.0700	0.170
2000	0.210	0.260	0.0500	0.105	0.0500	0.130
2001	0.220	0.340	0.120	0.180	0.135	0.288
2002	0.0800	0.120	0.0400	0.0500	0.0450	0.0850
2003	0.200	0.230	0.0300	0.1000	0.0400	0.190
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.718	2.854	0.264	0.285	0.880	0.161
1994	0.0621	-1.875	0.168	0.698	1.760	0.577
1995	0.738	-1.452	0.227	0.387	1.160	0.262
1996	0.854	0.213	0.157	0.732	1.370	0.361
1997	-0.0174	-1.723	0.181	0.638	1.610	0.448
1998	0.627	-1.565	0.238	0.330	0.880	0.146
1999	0.172	-0.481	0.208	0.561	0.650	0.106
2000	1.522	2.767	0.265	0.205	0.700	0.112
2001	0.686	-1.426	0.227	0.466	1.050	0.255
2002	1.900	3.709	0.408	0.020	0.260	0.0210
2003	0.561	-2.478	0.258	0.397	0.460	0.0788

Chlorophyll a

Figure 68 presents the seasonal mean chlorophyll *a* trend in Indian Lake, while Table 53 presents descriptive statistics for chlorophyll *a* in Indian Lake. The chlorophyll *a* in Indian Lake exhibited a slight decreasing trend from 2001 to 2003. The chlorophyll *a* in Indian Lake was similar to the county average.

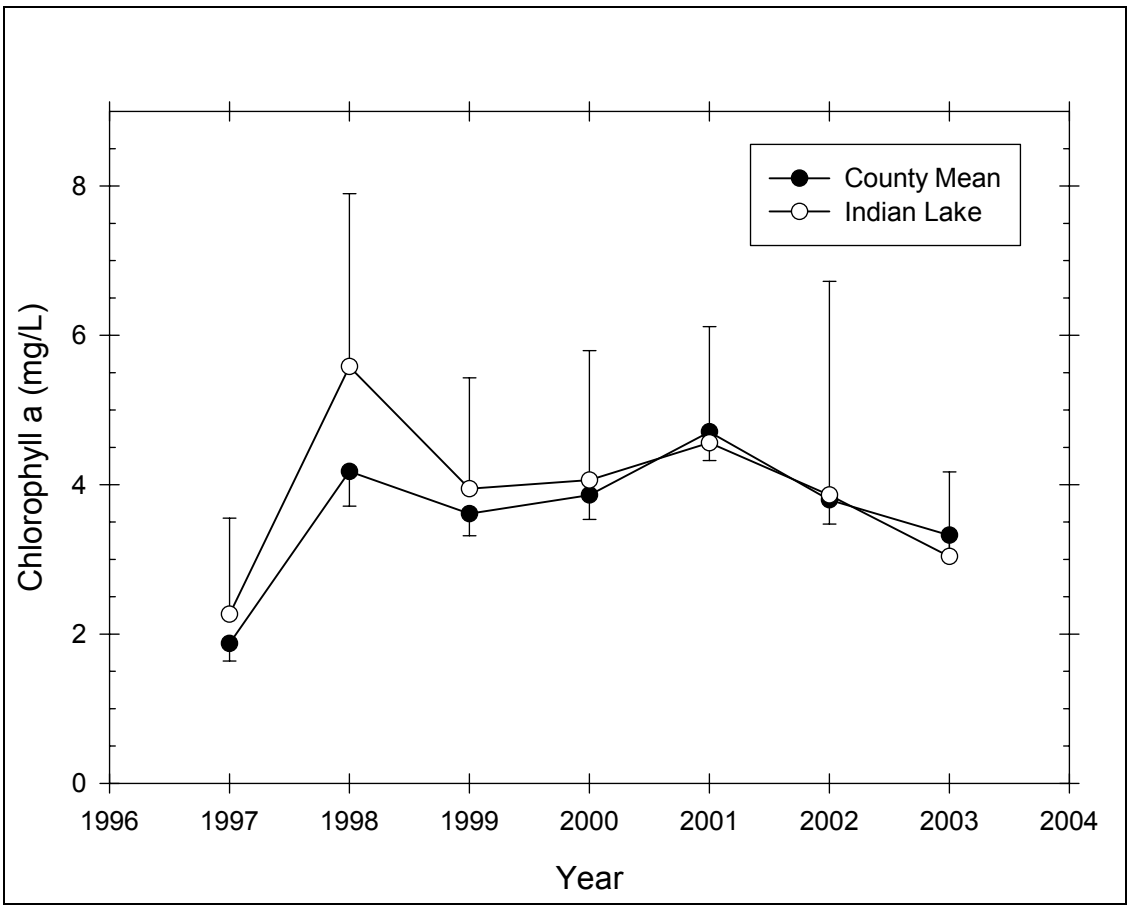


Figure 68 Seasonal mean chlorophyll a trend in Indian Lake

Table 53 – Descriptive Statistics for Chlorophyll a in Indian Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	2.263	1.229	0.502	1.290
1998	6	0	5.582	2.207	0.901	2.316
1999	6	1	3.946	1.196	0.535	1.486
2000	6	0	4.062	1.652	0.675	1.734
2001	6	1	4.560	1.253	0.560	1.556
2002	6	2	3.860	1.800	0.900	2.864
2003	6	2	3.038	0.714	0.357	1.136
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	3.110	3.830	0.720	1.945	1.510	3.630
1998	6.330	8.360	2.030	6.160	4.110	6.670
1999	2.620	5.300	2.680	4.150	2.732	4.962
2000	3.780	5.650	1.870	4.660	2.120	5.410
2001	3.220	6.130	2.910	4.720	3.570	5.470
2002	3.980	6.520	2.540	3.190	2.845	4.875
2003	1.720	3.910	2.190	3.025	2.530	3.545
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	0.349	-1.468	0.207	0.505	13.580	38.286
1998	-0.694	0.390	0.268	0.192	33.490	211.283
1999	-0.124	-2.725	0.241	0.393	19.730	83.580

2000	-0.727	-1.812	0.285	0.133	24.370	112.633
2001	-0.158	-0.871	0.151	0.742	22.800	110.250
2002	1.819	3.495	0.387	0.036	15.440	69.317
2003	0.0984	0.593	0.171	0.699	12.150	38.434

Transparency

Figure 69 presents the seasonal mean transparency trend in Indian Lake, while Table 54 presents descriptive statistics for transparency in Indian Lake. The transparency in Indian Lake was variable year to year and did not exhibit any strong trend during the study period. The appeared to be a decrease in transparency from 1995 – 2000, followed by an increase from 2000 to 2003.

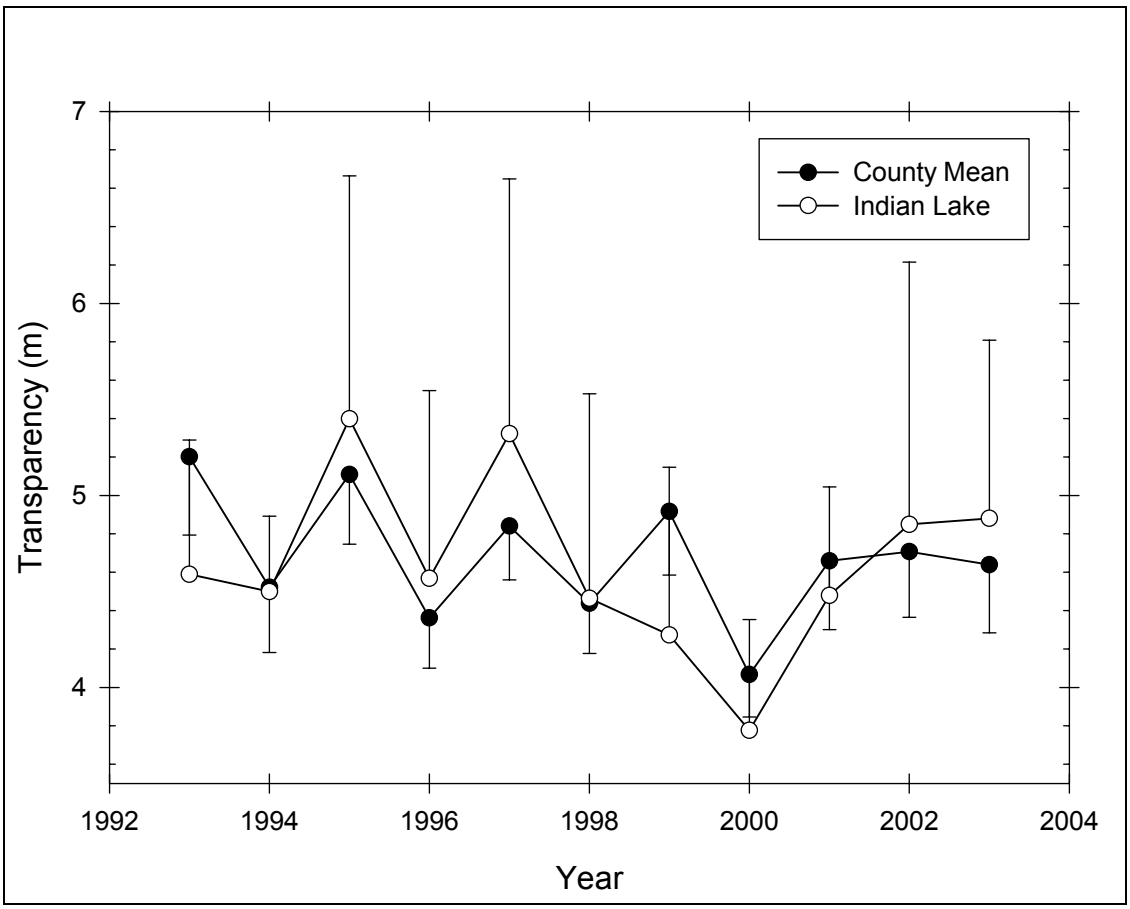


Figure 69 Seasonal mean transparency trend in Indian Lake

Table 54 – Descriptive Statistics for Transparency in Indian Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	2	4.590	0.439	0.220	0.699
1994	6	0	4.500	0.374	0.153	0.393
1995	6	0	5.400	1.205	0.492	1.264
1996	6	0	4.568	0.932	0.380	0.978
1997	6	0	5.322	1.264	0.516	1.327
1998	6	0	4.465	1.014	0.414	1.064

1999	5	0	4.274	0.703	0.315	0.873
2000	6	0	3.777	0.550	0.225	0.577
2001	5	0	4.480	0.455	0.203	0.565
2002	4	0	4.850	0.858	0.429	1.366
2003	4	0	4.880	0.583	0.292	0.928
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.910	5.150	4.240	4.485	4.240	4.940
1994	1.100	5.000	3.900	4.550	4.300	4.700
1995	3.450	7.300	3.850	5.275	4.700	6.000
1996	2.400	5.750	3.350	4.750	3.600	5.210
1997	3.310	7.410	4.100	5.060	4.200	6.100
1998	2.600	5.800	3.200	4.290	3.760	5.450
1999	1.850	5.080	3.230	4.400	3.808	4.765
2000	1.500	4.800	3.300	3.600	3.400	3.960
2001	1.000	5.000	4.000	4.700	4.000	4.775
2002	1.900	5.500	3.600	5.150	4.300	5.400
2003	1.330	5.730	4.400	4.695	4.545	5.215
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.730	-1.947	0.287	0.273	18.360	84.851
1994	-0.515	0.729	0.167	0.701	27.000	122.200
1995	0.492	0.158	0.176	0.663	32.400	182.215
1996	-0.284	-1.408	0.184	0.626	27.410	129.559
1997	0.921	0.130	0.167	0.699	31.930	177.911
1998	0.238	-1.619	0.194	0.573	26.790	124.760
1999	-0.689	0.361	0.171	0.704	21.370	93.315
2000	1.632	2.714	0.293	0.112	22.660	87.092
2001	-0.262	-2.633	0.286	0.197	22.400	101.180
2002	-1.670	2.847	0.319	0.164	19.400	96.300
2003	1.647	3.105	0.371	0.057	19.520	96.279

TSI

Figure 70 presents the Carlson trophic state index trend in Indian Lake. Chlorophyll *a* TSI was generally in the eutrophic range, while transparency and total phosphorus TSI was near the oligotrophic-mesotrophic boundary.

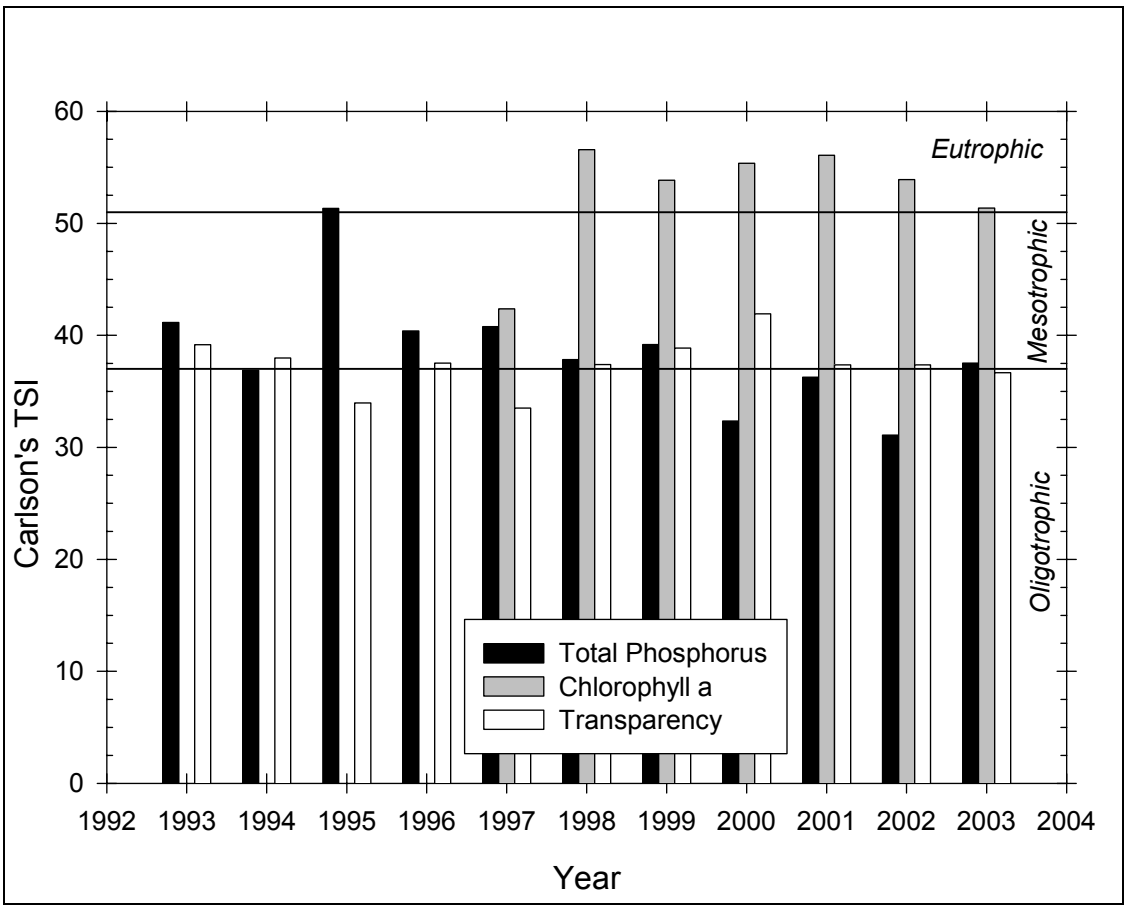


Figure 70 Carlson TSI trend in Indian Lake

Aluminum

Figure 71 presents the seasonal mean aluminum trend in Indian Lake, while Table 55 presents descriptive statistics for aluminum in Indian Lake. The aluminum in Indian Lake exhibited a steady trend throughout the study period. The aluminum in Indian Lake was similar to or slightly lower than the county average, though this difference was not statistically significant.

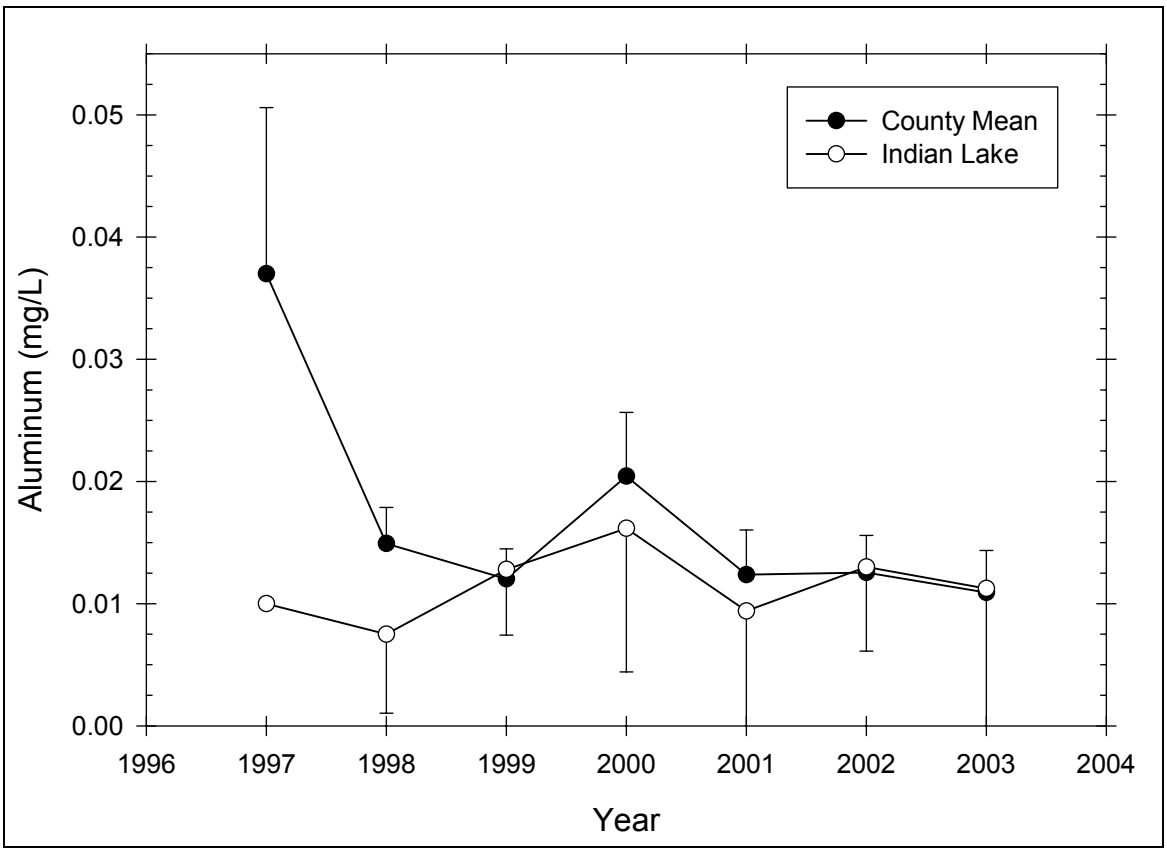


Figure 71 Seasonal mean aluminum trend in Indian Lake

Table 55 – Descriptive Statistics for Aluminum in Indian Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.01000	--	--	--
1998	6	0	0.00750	0.00616	0.00251	0.00646
1999	6	1	0.0128	0.00432	0.00193	0.00537
2000	6	0	0.0162	0.0112	0.00457	0.0118
2001	6	1	0.00940	0.00929	0.00415	0.0115
2002	6	2	0.0130	0.00432	0.00216	0.00687
2003	6	2	0.0113	0.00780	0.00390	0.0124
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.01000	0.01000	0.01000	0.01000	0.01000
1998	0.0180	0.0190	0.001000	0.00650	0.00400	0.00800
1999	0.01000	0.0180	0.00800	0.0130	0.00875	0.0165
2000	0.0310	0.0360	0.00500	0.0145	0.00700	0.0200
2001	0.0240	0.0250	0.001000	0.00600	0.00400	0.0138
2002	0.01000	0.0170	0.00700	0.0140	0.01000	0.0160
2003	0.0170	0.0210	0.00400	0.01000	0.00500	0.0175
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.01000	0.0001000
1998	1.543	3.219	0.301	0.095	0.0450	0.000527
1999	0.0408	-2.369	0.210	0.549	0.0640	0.000894
2000	1.210	1.663	0.199	0.545	0.0970	0.00219
2001	1.600	2.861	0.274	0.241	0.0470	0.000787

2002	-1.190	1.500	0.250	0.432	0.0520	0.000732
2003	0.592	-2.167	0.249	0.435	0.0450	0.000689

Calcium

Figure 72 presents the seasonal mean calcium trend in Indian Lake, while Table 56 presents descriptive statistics for calcium in Indian Lake. The calcium in Indian Lake exhibited a flat trend throughout the study period. The calcium in Indian Lake was significantly lower than the county average.

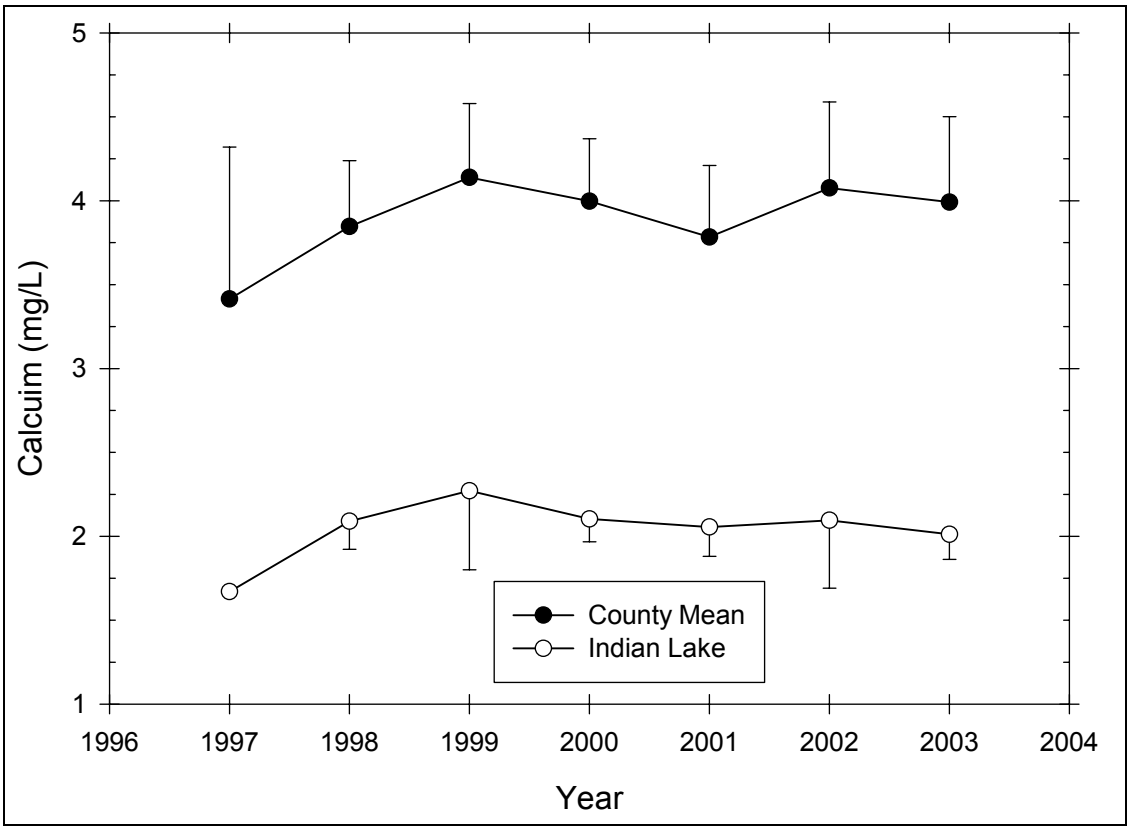


Figure 72 Seasonal mean calcium trend in Indian Lake

Table 56 – Descriptive Statistics for Calcium in Indian Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	1.670	--	--	--
1998	6	0	2.090	0.160	0.0652	0.168
1999	6	1	2.272	0.379	0.170	0.471
2000	6	0	2.103	0.130	0.0529	0.136
2001	6	1	2.056	0.142	0.0633	0.176
2002	6	2	2.095	0.254	0.127	0.404
2003	6	2	2.012	0.0946	0.0473	0.151
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	1.670	1.670	1.670	1.670	1.670
1998	0.370	2.280	1.910	2.070	1.940	2.270
1999	0.900	2.690	1.790	2.440	1.918	2.532
2000	0.340	2.270	1.930	2.075	2.030	2.240

2001	0.350	2.240	1.890	2.090	1.928	2.150
2002	0.610	2.380	1.770	2.115	1.915	2.275
2003	0.210	2.090	1.880	2.040	1.945	2.080
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	1.670	2.789
1998	0.242	-2.021	0.204	0.522	12.540	26.336
1999	-0.424	-2.172	0.271	0.254	11.360	26.386
2000	0.206	-1.144	0.208	0.499	12.620	26.628
2001	0.0582	-1.442	0.195	0.619	10.280	21.216
2002	-0.439	0.722	0.195	0.647	8.380	17.750
2003	-1.314	1.255	0.239	0.479	8.050	16.227

Calcite Saturation Index

Figure 73 presents the calcite saturation index trend in Indian Lake,. The CSI in Indian Lake exhibited a slight decreasing trend over the study period, from very vulnerable to acid deposition in 1997 to low vulnerability to acid deposition by 2000. The calcium in Indian Lake was sometimes slightly higher and sometimes slightly lower than the county average, though this difference was not statistically significant.

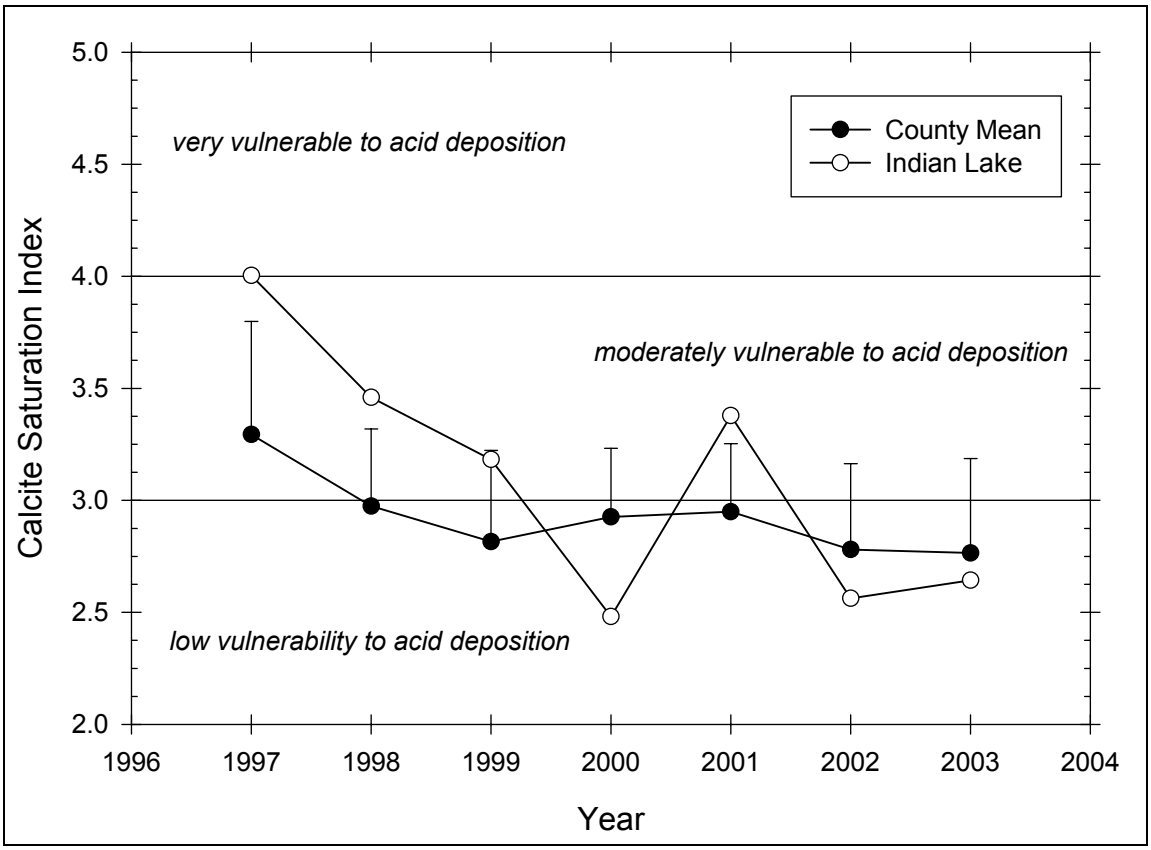
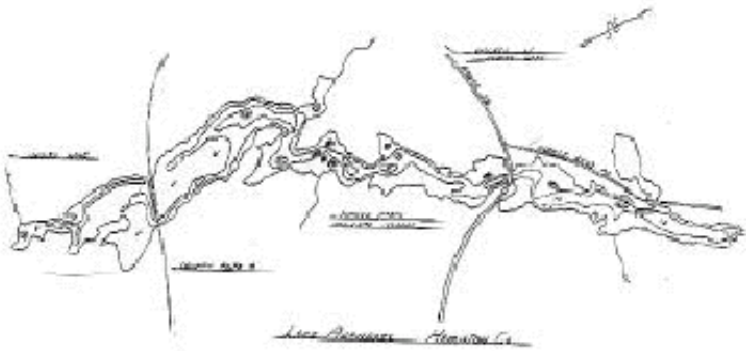


Figure 73 Seasonal mean CSI trend in Indian Lake

Lake Abanakee

Location
Pond Number: 1104-0027
Watershed: Upper Hudson River
County: Hamilton
Topographic Quadrangle: Blue Mountain
Sample Site
Latitude: 43o 46.340'
Longitude: 74o 15.007'
Morphometry
Surface Area: 1017 Ac.
Mean Depth: 12.3 Ft.
Maximum Depth: 26.6 Ft.
Volume: 147596 Ac/F
Watershed Area: 20197 Ac.
Hydraulic Retention Time: .12 Yr.
Shoreline Length: 16.9 Mi.
Elevation: 1598 Ft.
Water Quality Classification: B
Trophic State: Mesotrophic



Temperature and Dissolved Oxygen

Lake Abanakee had a minimum DO of 5.5 mg/L (August 2002), with a minimum temperature of 11.5°C and a maximum temperature of 24.4°C. In general, the lowest DO values occurred during the month of August.

pH

Figure 74 presents the seasonal mean pH trend in Lake Abanakee, while Table 57 presents descriptive statistics for pH in Lake Abanakee. The pH in Lake Abanakee exhibited no discernable trend. The pH in Lake Abanakee was similar to the county average.

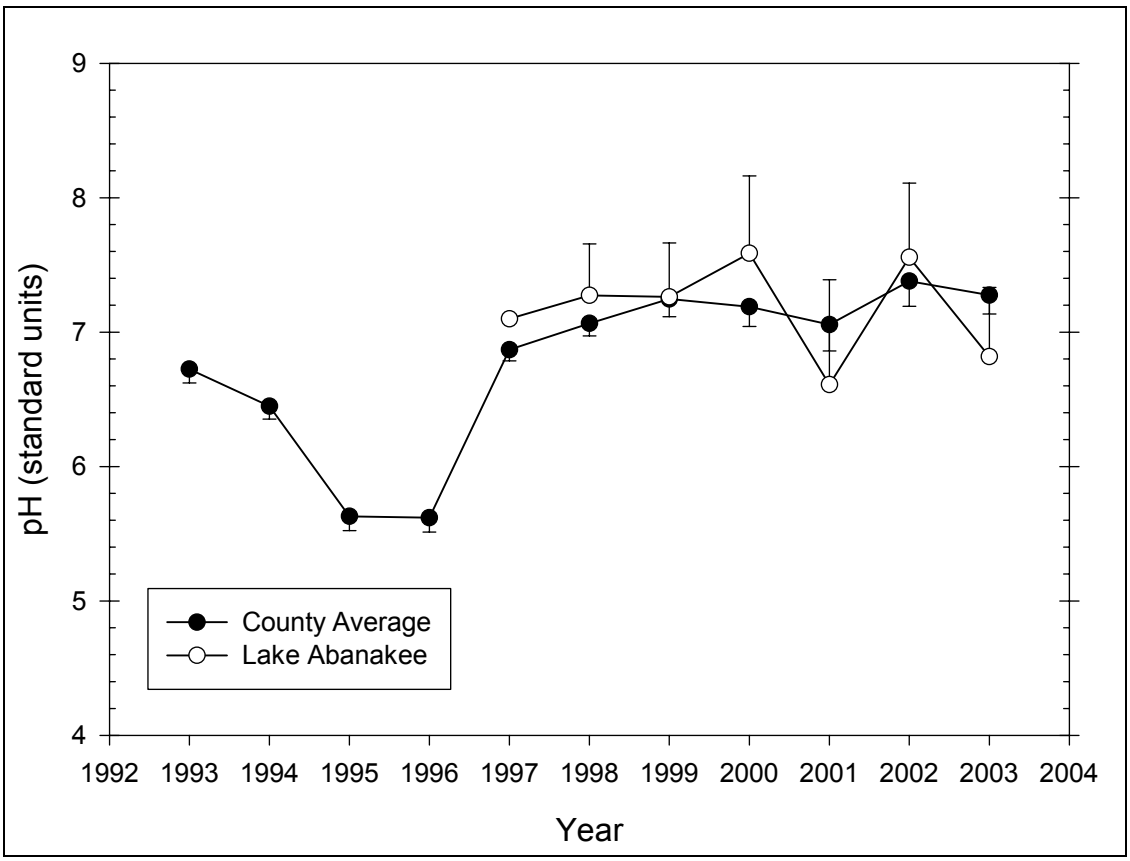


Figure 74 Seasonal mean pH trend in Lake Abanakee

Table 57 – Descriptive Statistics for pH in Lake Abanakee

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	4	3	7.100	--	--	--
1998	6	0	7.273	0.365	0.149	0.383
1999	5	0	7.262	0.324	0.145	0.402
2000	6	0	7.587	0.548	0.224	0.575
2001	5	0	6.610	0.628	0.281	0.779
2002	5	0	7.556	0.445	0.199	0.553
2003	4	0	6.817	0.324	0.162	0.515
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	7.100	7.100	7.100	7.100	7.100
1998	0.850	7.790	6.940	7.175	6.970	7.590
1999	0.900	7.710	6.810	7.230	7.103	7.448
2000	1.680	8.340	6.660	7.615	7.500	7.790
2001	1.530	7.600	6.070	6.590	6.070	6.940
2002	1.070	8.030	6.960	7.720	7.163	7.887
2003	0.620	7.150	6.530	6.795	6.540	7.095
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	7.100	50.410
1998	0.496	-1.922	0.289	0.122	43.640	318.074
1999	-0.0216	1.335	0.224	0.480	36.310	264.103
2000	-0.652	1.973	0.271	0.183	45.520	346.848

2001	1.107	1.108	0.230	0.448	33.050	220.036
2002	-0.531	-1.804	0.244	0.381	37.780	286.259
2003	0.0958	-5.413	0.296	0.241	27.270	186.227

Alkalinity

Figure 75 presents the seasonal mean alkalinity trend in Lake Abanakee, while Table 58 presents descriptive statistics for alkalinity in Lake Abanakee. The alkalinity in Lake Abanakee exhibited a decreasing trend from 1999 to 2002, with an increase to 1999 levels in 2003. The alkalinity in Lake Abanakee was lower than the county average, though this difference may not be statistically significant for all years.

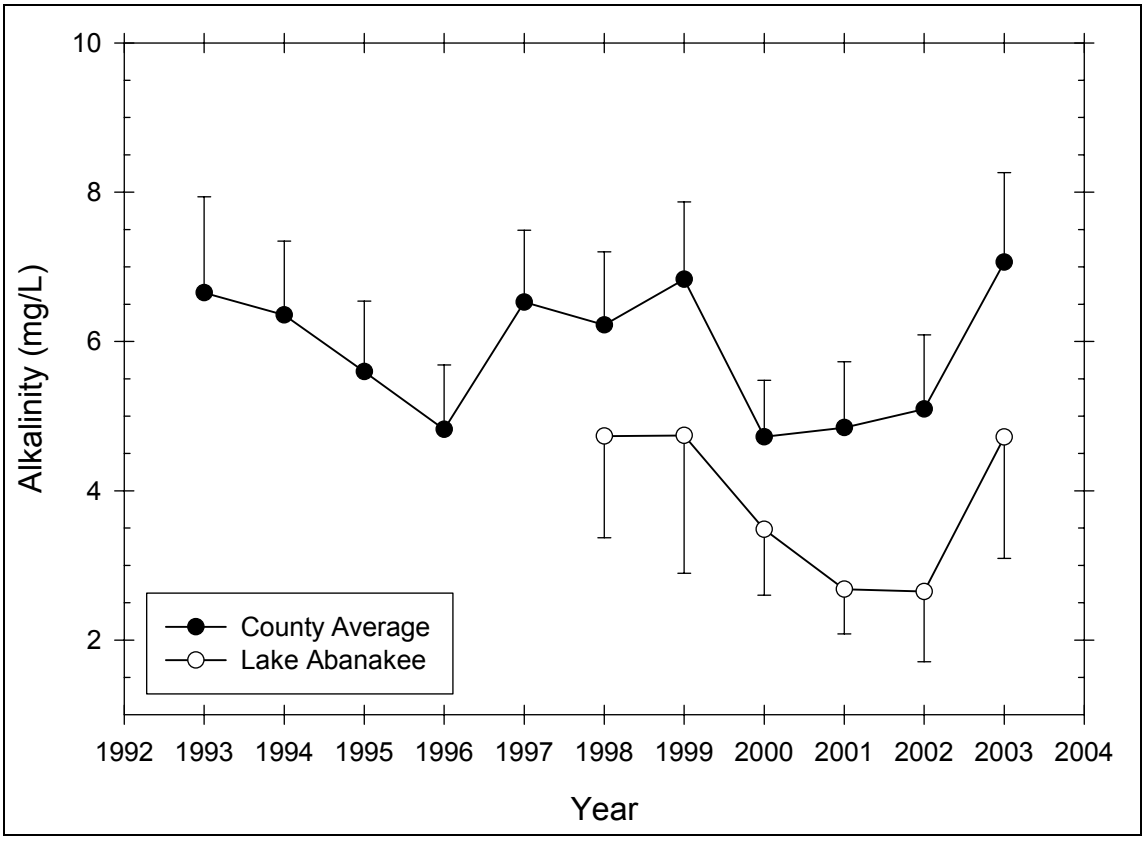


Figure 75 Seasonal mean alkalinity trend in Lake Abanakee

Table 58 – Descriptive Statistics for Alkalinity in Lake Abanakee

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1998	6	0	4.733	1.299	0.530	1.363
1999	6	1	4.740	1.488	0.665	1.847
2000	6	0	3.483	0.840	0.343	0.882
2001	6	1	2.680	0.482	0.215	0.598
2002	6	2	2.650	0.592	0.296	0.941
2003	6	1	4.720	1.308	0.585	1.625
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1998	3.500	6.600	3.100	4.750	3.600	5.600

1999	4.100	6.900	2.800	4.700	3.850	5.550
2000	2.500	4.700	2.200	3.500	3.100	3.900
2001	1.100	3.200	2.100	2.700	2.250	3.125
2002	1.200	3.300	2.100	2.600	2.150	3.150
2003	3.300	6.700	3.400	4.700	3.625	5.500
	1.100	25.700	24.600	25.050	24.700	25.500
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1998	0.185	-0.959	0.142	0.764	28.400	142.860
1999	0.337	1.197	0.204	0.577	23.700	121.190
2000	-0.148	0.721	0.157	0.732	20.900	76.330
2001	-0.132	-2.467	0.208	0.558	13.400	36.840
2002	0.193	-4.629	0.277	0.316	10.600	29.140
2003	0.829	0.320	0.186	0.656	23.600	118.240

Total Phosphorus

Figure 76 presents the seasonal mean total phosphorus trend in Lake Abanakee, while Table 59 presents descriptive statistics for total phosphorus in Lake Abanakee. The total phosphorus in Lake Abanakee exhibited a decreasing trend from 1999 to 2002. The total phosphorus in Lake Abanakee was slightly higher than or similar to the county average, though this difference was not statistically significant.

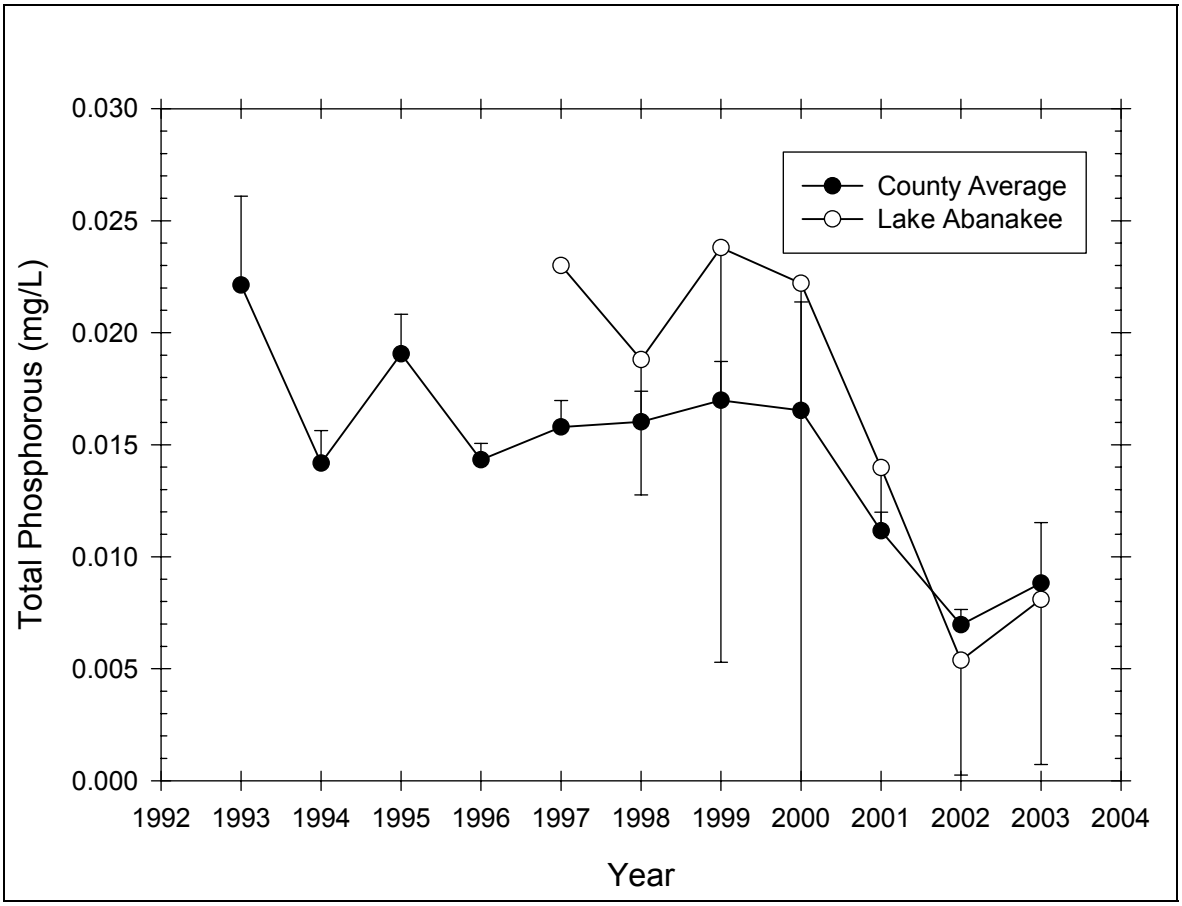


Figure 76 Seasonal mean total phosphorus trend in Lake Abanakee

Table 59 – Descriptive Statistics for Total Phosphorus in Lake Abanakee

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	4	3	0.0230	--	--	--
1998	6	1	0.0188	0.00487	0.00218	0.00604
1999	6	1	0.0238	0.0149	0.00667	0.0185
2000	6	0	0.0222	0.0222	0.00904	0.0232
2001	6	1	0.0140	0.00239	0.00107	0.00297
2002	6	2	0.00538	0.00322	0.00161	0.00512
2003	6	1	0.00810	0.00594	0.00266	0.00737
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0230	0.0230	0.0230	0.0230	0.0230
1998	0.0120	0.0260	0.0140	0.0180	0.0147	0.0222
1999	0.0350	0.0500	0.0150	0.0160	0.0158	0.0290
2000	0.0590	0.0650	0.00600	0.0135	0.00920	0.0260
2001	0.00590	0.0169	0.0110	0.0149	0.0118	0.0155
2002	0.00740	0.00920	0.00180	0.00525	0.00285	0.00790
2003	0.0137	0.0151	0.00140	0.00830	0.00260	0.0133
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0230	0.000529
1998	0.787	-0.321	0.182	0.668	0.0940	0.00186
1999	2.057	4.269	0.348	0.047	0.119	0.00372
2000	1.933	3.855	0.265	0.204	0.133	0.00541
2001	-0.195	-1.635	0.250	0.350	0.0699	0.00100
2002	0.178	-1.568	0.177	0.690	0.0215	0.000147
2003	0.0138	-2.434	0.205	0.575	0.0405	0.000469

Nitrate

Figure 77 presents the seasonal mean nitrate trend in Lake Abanakee, while Table 60 presents descriptive statistics for nitrate in Lake Abanakee. The nitrate in Lake Abanakee exhibited a decreasing trend from 1998 to 2003. The nitrate in Lake Abanakee was generally similar to the county average.

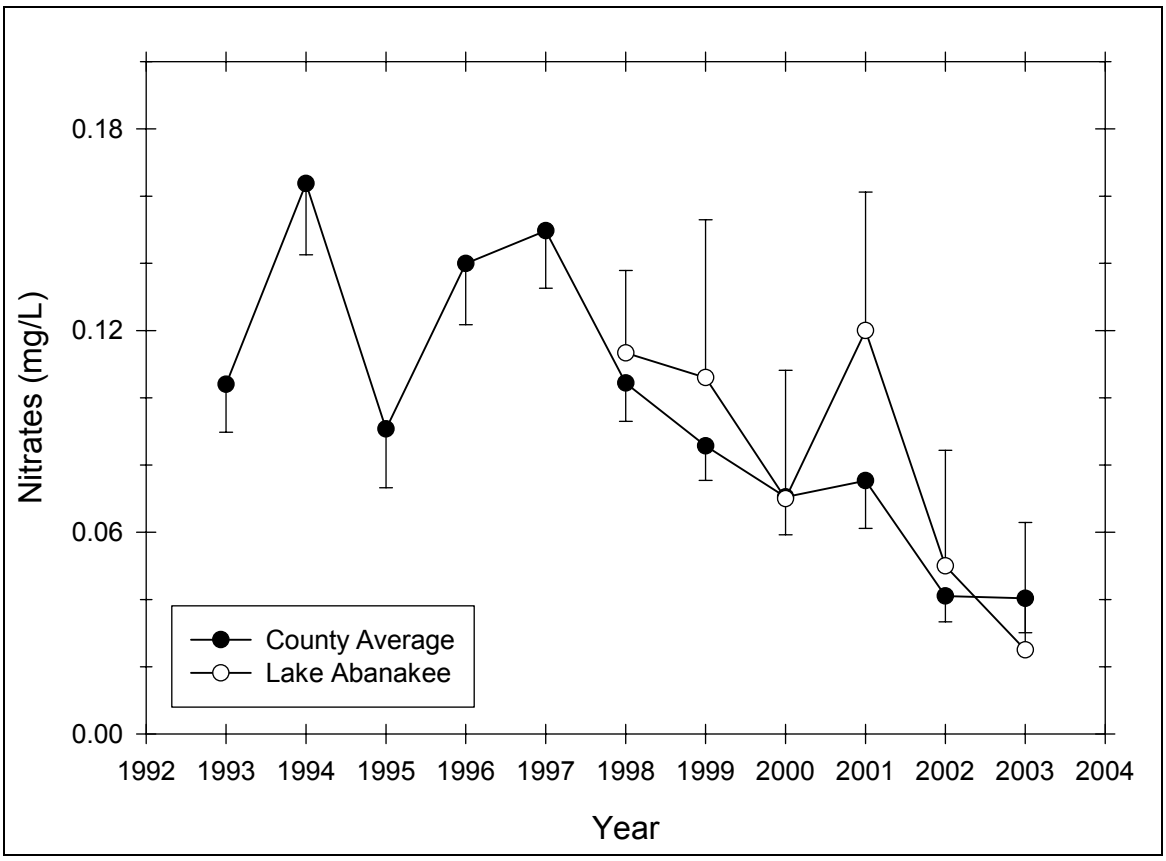


Figure 77 Seasonal mean nitrate trend in Lake Abanakee

Table 60 – Descriptive Statistics for Nitrate in Lake Abanakee

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1998	6	0	0.113	0.0234	0.00955	0.0245
1999	6	1	0.106	0.0378	0.0169	0.0470
2000	6	0	0.0700	0.0363	0.0148	0.0381
2001	6	1	0.120	0.0332	0.0148	0.0412
2002	6	2	0.0500	0.0216	0.0108	0.0344
2003	6	2	0.0250	0.0238	0.0119	0.0379
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1998	0.0600	0.140	0.0800	0.120	0.0900	0.130
1999	0.0900	0.160	0.0700	0.0900	0.0775	0.138
2000	0.1000	0.120	0.0200	0.0700	0.0500	0.0900
2001	0.0700	0.150	0.0800	0.130	0.0875	0.150
2002	0.0500	0.0800	0.0300	0.0450	0.0350	0.0650
2003	0.0500	0.0500	0.000	0.0250	0.00500	0.0450
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1998	-0.600	-1.289	0.279	0.154	0.680	0.0798
1999	0.793	-1.253	0.264	0.285	0.530	0.0619
2000	6.328E-016	-0.971	0.209	0.492	0.420	0.0360
2001	-0.411	-2.835	0.218	0.509	0.600	0.0764
2002	1.190	1.500	0.250	0.432	0.200	0.0114
2003	5.921E-016	-4.339	0.236	0.495	0.1000	0.00420

Chlorophyll a

Figure 78 presents the seasonal mean chlorophyll *a* trend in Lake Abanakee, while Table 61 presents descriptive statistics for chlorophyll *a* in Lake Abanakee. The chlorophyll *a* in Lake Abanakee exhibited no specific trend. The chlorophyll *a* in Lake Abanakee was slightly higher than the county average, though this difference was not statistically significant.

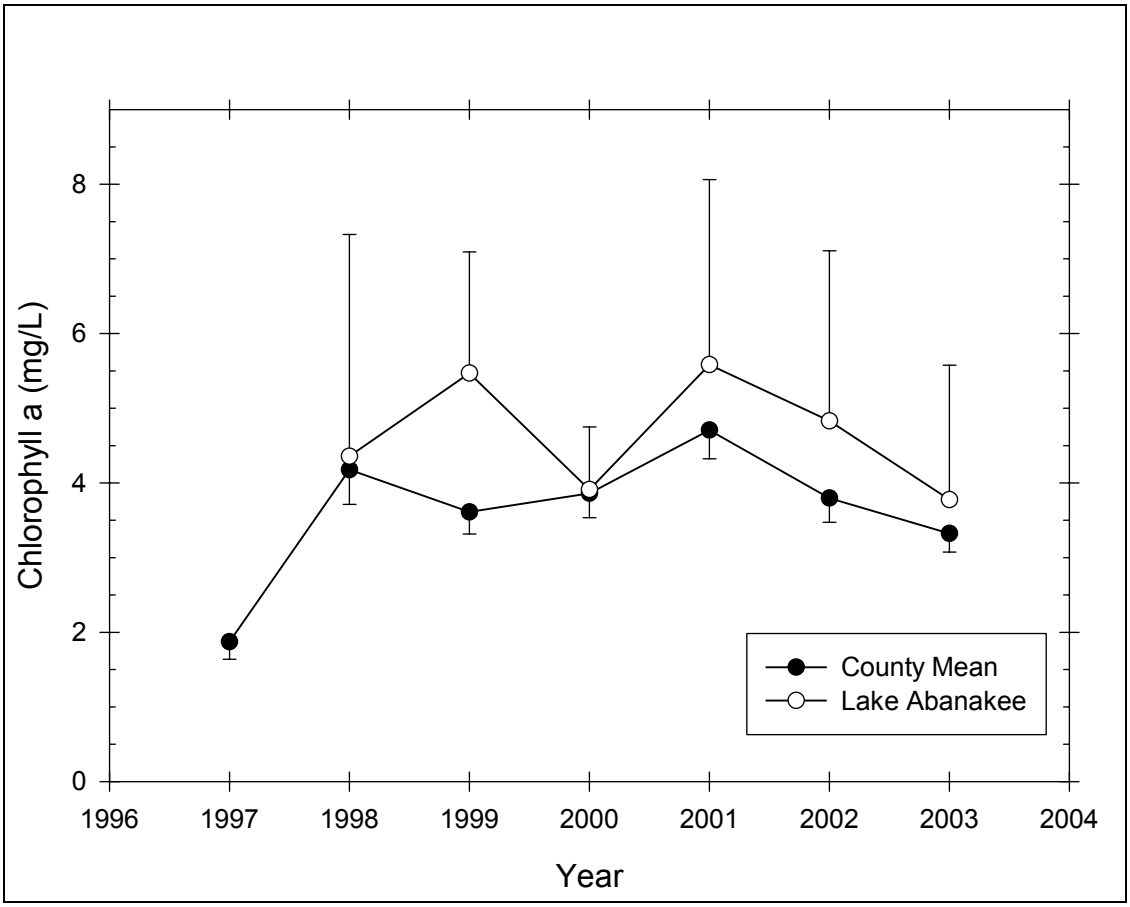


Figure 78 Seasonal mean chlorophyll a trend in Lake Abanakee

Table 61 – Descriptive Statistics for Chlorophyll a in Lake Abanakee

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1998	6	0	4.357	2.831	1.156	2.971
1999	6	1	5.470	1.307	0.584	1.622
2000	6	1	3.910	0.678	0.303	0.842
2001	6	1	5.584	1.997	0.893	2.479
2002	6	2	4.830	1.433	0.716	2.279
2003	6	2	3.775	1.131	0.566	1.800
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1998	7.070	8.800	1.730	3.475	2.110	6.550
1999	3.040	7.080	4.040	5.670	4.205	6.495
2000	1.530	4.710	3.180	3.980	3.248	4.485
2001	5.070	8.790	3.720	4.790	4.282	6.810

2002	3.060	6.780	3.720	4.410	3.755	5.905
2003	2.520	4.780	2.260	4.030	2.920	4.630
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1998	0.821	-0.816	0.247	0.283	26.140	153.959
1999	0.0107	-2.203	0.223	0.487	27.350	156.434
2000	-0.0185	-2.527	0.227	0.463	19.550	78.278
2001	1.297	1.421	0.255	0.328	27.920	171.850
2002	1.118	0.0745	0.266	0.361	19.320	99.472
2003	-0.975	-0.203	0.233	0.505	15.100	60.843

Transparency

Figure 79 presents the seasonal mean transparency trend in Lake Abanakee, while Table 62 presents descriptive statistics for transparency in Lake Abanakee. The transparency in Lake Abanakee exhibited a decreasing trend from 1998 to 2001, followed by somewhat higher values in 2002 and 2003. The transparency in Lake Abanakee was significantly lower than the county average, though this difference may not be statistically significant for all years.

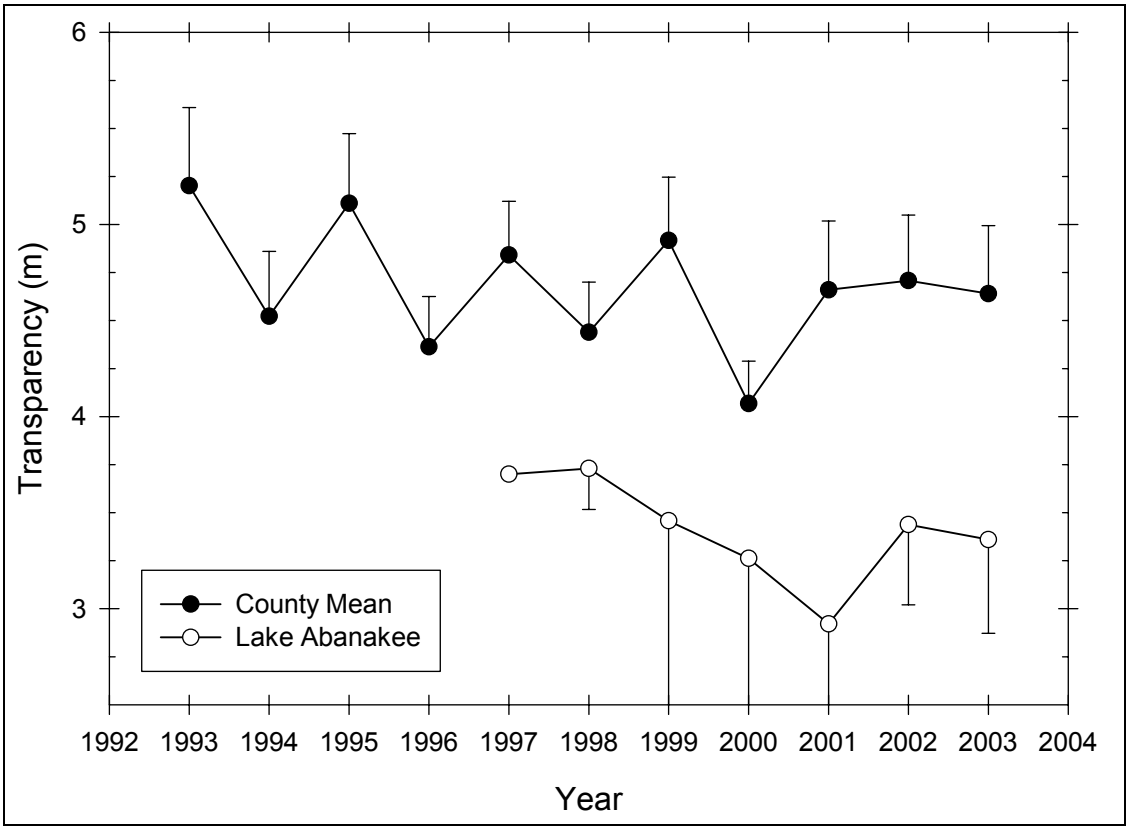


Figure 79 Seasonal mean transparency trend in Lake Abanakee

Table 62 – Descriptive Statistics for Transparency in Lake Abanakee

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	4	3	3.700	--	--	--
1998	6	1	3.730	0.172	0.0767	0.213
1999	5	0	3.458	0.863	0.386	1.072
2000	6	0	3.262	0.730	0.298	0.767
2001	5	0	2.920	0.867	0.388	1.077
2002	4	0	3.438	0.263	0.131	0.418
2003	4	0	3.360	0.307	0.153	0.488
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	3.700	3.700	3.700	3.700	3.700
1998	0.430	3.900	3.470	3.800	3.605	3.848
1999	1.980	4.500	2.520	3.200	2.768	4.290
2000	2.150	4.300	2.150	3.210	3.000	3.700
2001	1.800	3.800	2.000	3.200	2.000	3.650
2002	0.600	3.800	3.200	3.375	3.250	3.625
2003	0.700	3.620	2.920	3.450	3.160	3.560
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	3.700	13.690
1998	-0.975	0.0277	0.258	0.310	18.650	69.682
1999	0.328	-2.534	0.217	0.514	17.290	62.771
2000	-0.155	0.477	0.193	0.578	19.570	66.499
2001	-0.345	-3.021	0.256	0.323	14.600	45.640
2002	1.165	1.085	0.231	0.515	13.750	47.473
2003	-1.496	2.464	0.302	0.219	13.440	45.441

TSI

Figure 80 presents the Carlson trophic state index trend in Lake Abanakee. For the period of record, chlorophyll a TSI was in the eutrophic range, transparency TSI was in the mesotrophic range, and total phosphorus TSI was generally mesotrophic from 1997 to 2001, and oligotrophic in 2002 and 2003.

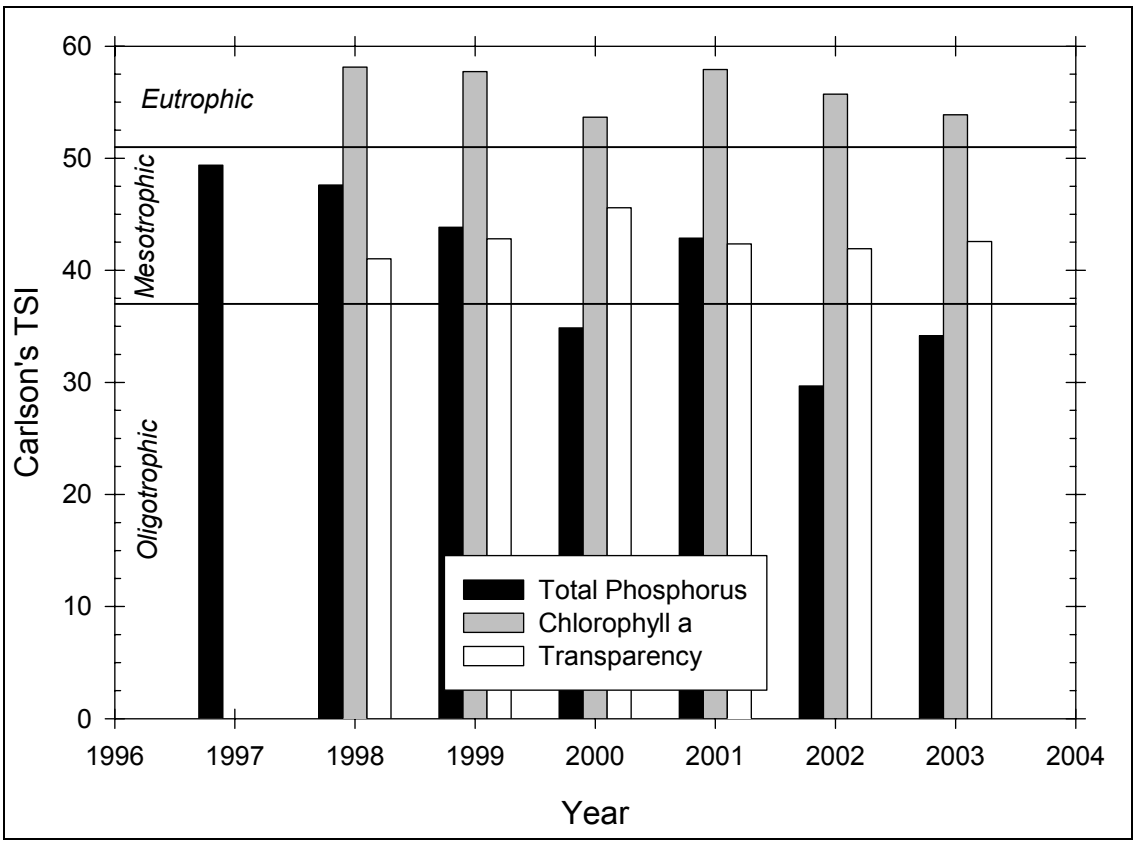


Figure 80 Carlson TSI trend in Lake Abanakee

Aluminum

Figure 81 presents the seasonal mean aluminum trend in Lake Abanakee, while Table 63 presents descriptive statistics for aluminum in Lake Abanakee. The aluminum in Lake Abanakee exhibited a decreasing trend from 2001 to 2003. The aluminum in Lake Abanakee was similar to the county average.

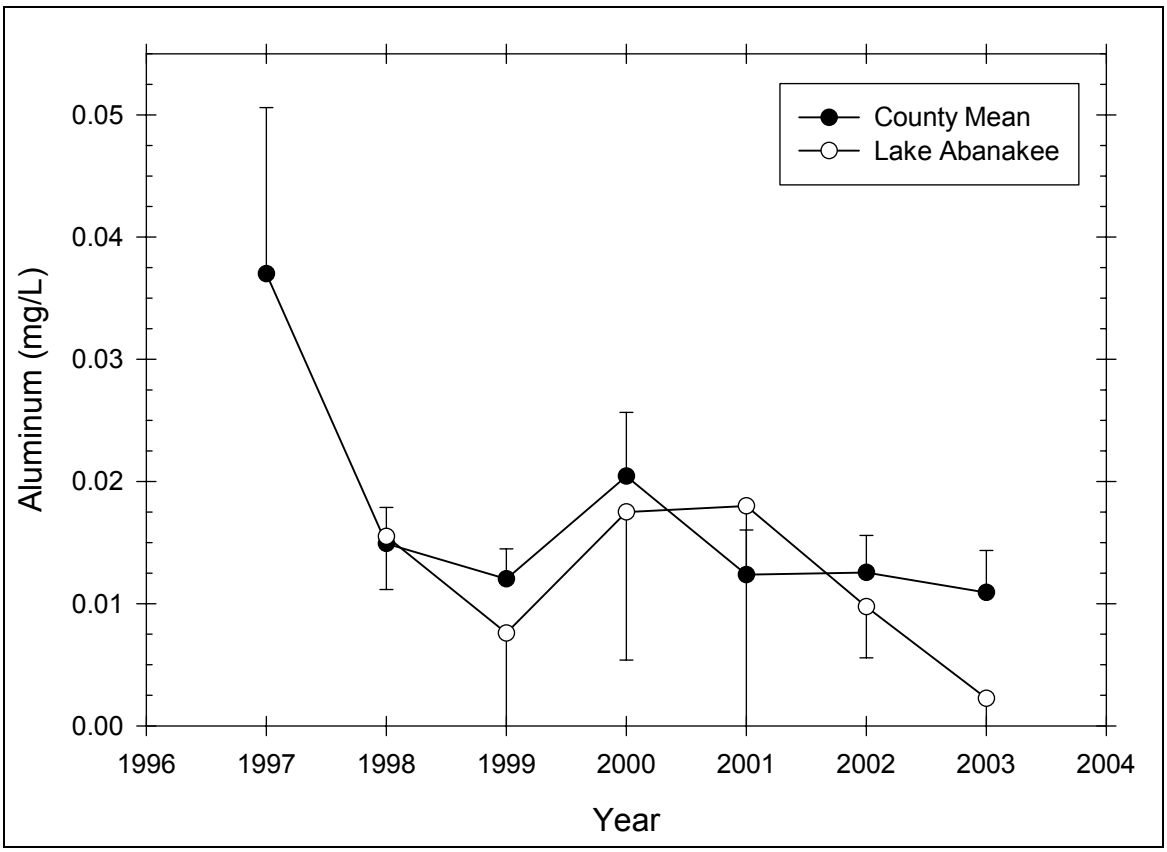


Figure 81 Seasonal mean aluminum trend in Lake Abanakee

Table 63 – Descriptive Statistics for Aluminum in Lake Abanakee

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1998	6	0	0.0155	0.00414	0.00169	0.00434
1999	6	1	0.00760	0.00615	0.00275	0.00763
2000	6	0	0.0175	0.0116	0.00472	0.0121
2001	6	1	0.0180	0.0155	0.00691	0.0192
2002	6	2	0.00975	0.00263	0.00131	0.00418
2003	6	2	0.00225	0.00263	0.00131	0.00418
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1998	0.0120	0.0200	0.00800	0.0160	0.0150	0.0180
1999	0.0150	0.0180	0.00300	0.00700	0.00300	0.00975
2000	0.0360	0.0370	0.001000	0.0170	0.0140	0.0190
2001	0.0370	0.0420	0.00500	0.00900	0.00800	0.0293
2002	0.00600	0.0120	0.00600	0.0105	0.00800	0.0115
2003	0.00500	0.00500	0.000	0.00200	0.000	0.00450
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1998	-1.324	2.412	0.285	0.133	0.0930	0.00153
1999	1.667	3.018	0.339	0.062	0.0380	0.000440
2000	0.561	2.346	0.282	0.144	0.105	0.00250
2001	1.185	0.225	0.320	0.098	0.0900	0.00258
2002	-1.443	2.235	0.288	0.271	0.0390	0.000401
2003	0.124	-5.290	0.304	0.212	0.00900	0.0000410

Calcium

Figure 82 presents the seasonal mean calcium trend in Lake Abanakee, while Table 64 presents descriptive statistics for calcium in Lake Abanakee. The calcium in Lake Abanakee was generally stable throughout the study period. The calcium in Lake Abanakee was significantly lower than the county average, though this difference may not be statistically significant.

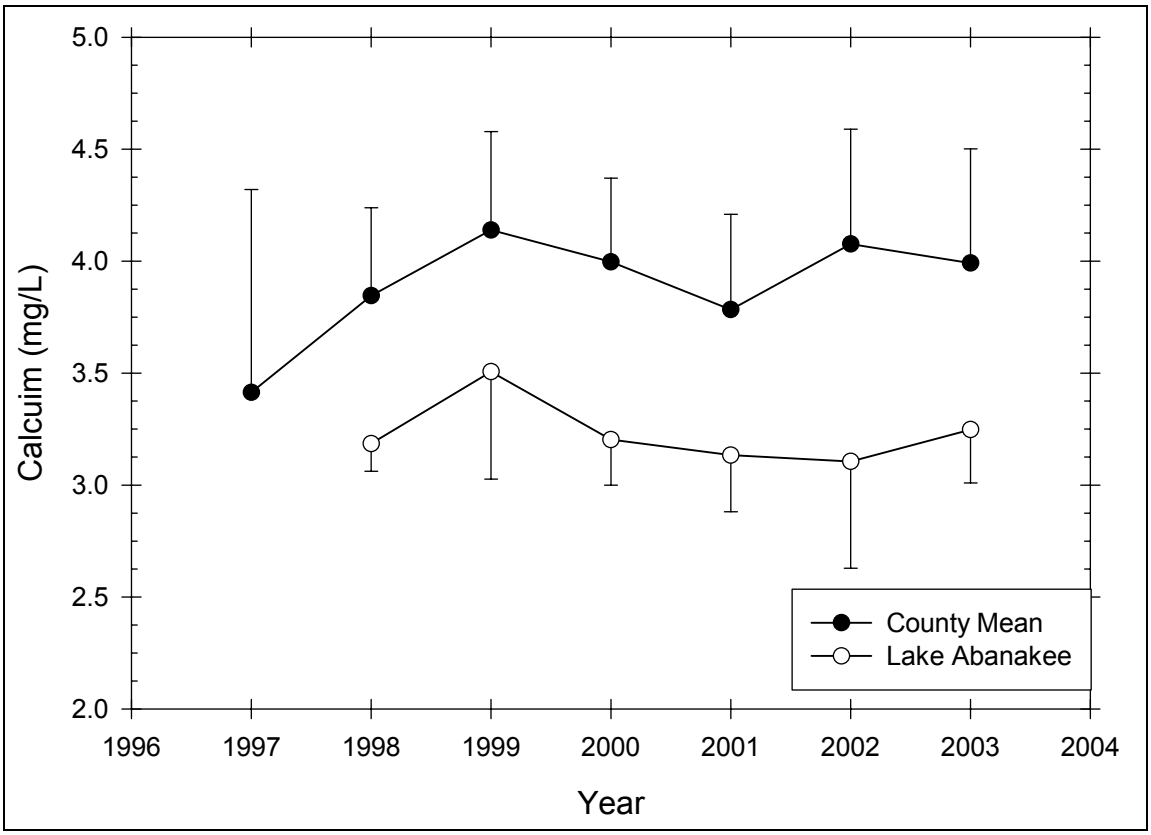


Figure 82 Seasonal mean calcium trend in Lake Abanakee

Table 64 – Descriptive Statistics for Calcium in Lake Abanakee

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1998	6	0	3.185	0.118	0.0481	0.124
1999	6	1	3.506	0.386	0.173	0.479
2000	6	0	3.203	0.194	0.0791	0.203
2001	6	1	3.134	0.204	0.0914	0.254
2002	6	2	3.105	0.300	0.150	0.477
2003	6	2	3.248	0.150	0.0750	0.239
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1998	0.310	3.420	3.110	3.140	3.120	3.180
1999	0.990	3.880	2.890	3.510	3.325	3.805
2000	0.510	3.390	2.880	3.225	3.110	3.390
2001	0.540	3.350	2.810	3.180	3.020	3.268
2002	0.700	3.380	2.680	3.180	2.915	3.295
2003	0.350	3.440	3.090	3.230	3.135	3.360

Year	Skewness	Kurtosis	K-S Dist.	K-S Prob.	Sum	Sum of Squares
1998	2.217	5.066	0.350	0.020	19.110	60.935
1999	-1.167	1.535	0.263	0.290	17.530	62.056
2000	-0.878	0.416	0.168	0.697	19.220	61.756
2001	-1.111	1.569	0.215	0.527	15.670	49.277
2002	-1.356	2.414	0.310	0.193	12.420	38.833
2003	0.584	-0.253	0.174	0.695	12.990	42.252

Calcite Saturation Index

Figure 82 presents the calcite saturation index trend in Lake Abanakee. The CSI in Lake Abanakee exhibited no particular trend. The CSI trend in Lake Abanakee did not resemble the county average trend.

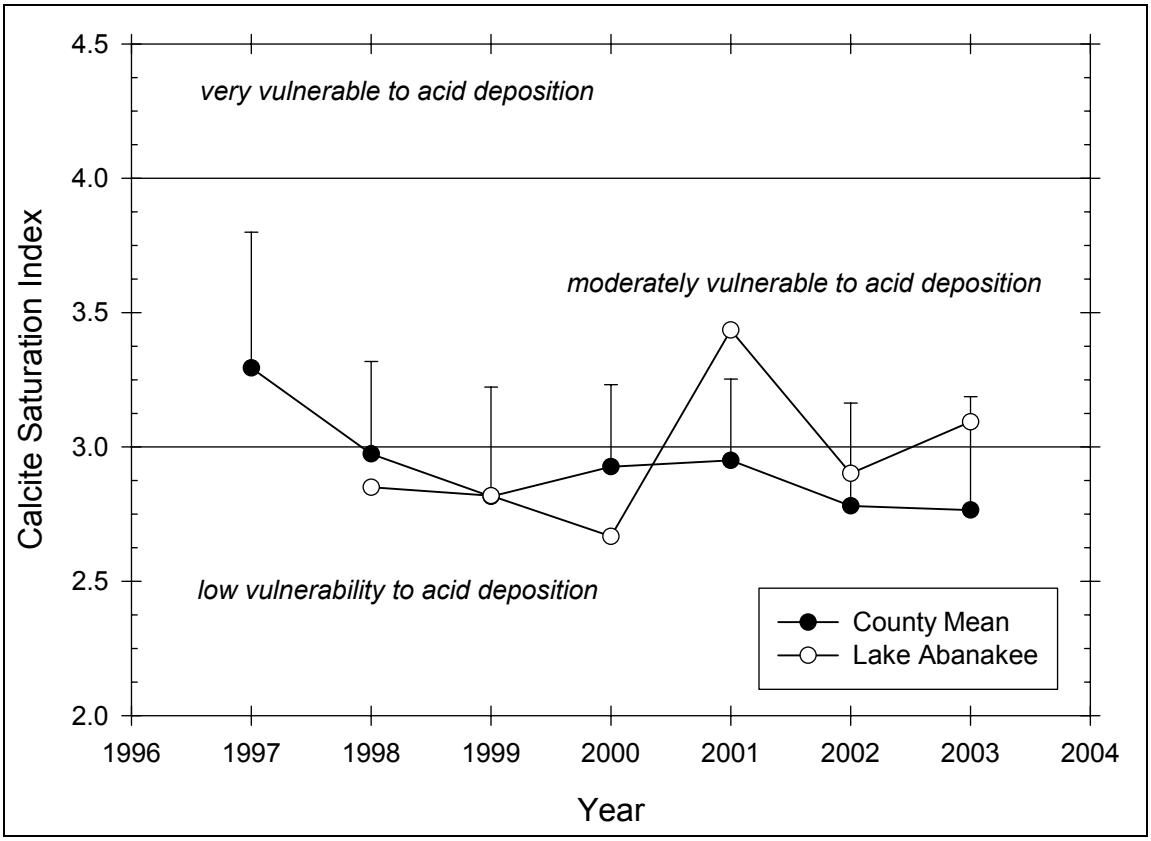
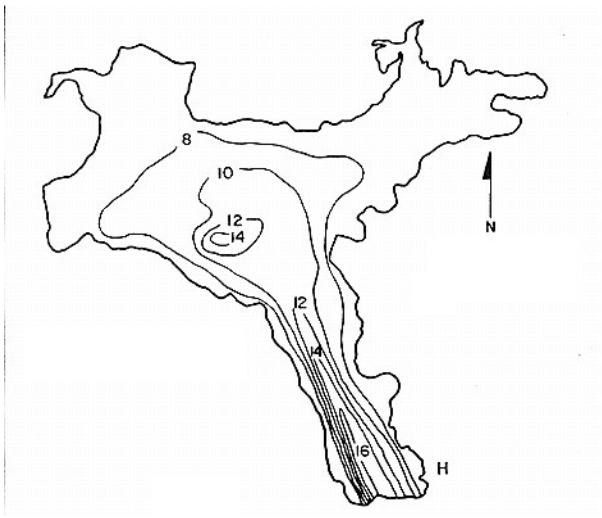


Figure 83 Seasonal mean CSI trend in Lake Abanakee

Lake Adirondack

Location
Pond Number: 050587A
Watershed: Upper Hudson River
County: Hamilton
Topographic Quadrangle: Blue Mountain
Sample Site
Latitude: 43o 46.941'
Longitude: 74o 15.432'
Morphometry
Surface Area: 168 Ac.
Mean Depth: 8 Ft.
Maximum Depth: 19 Ft.
Volume: 1,344 Ac./Ft.
Watershed Area: 667 Ac.
Hydraulic Retention Time: 0.8 Yr.
Shoreline Length: 3.7 Mi.
Elevation: 1,660 Ft.
Water Quality Classification: B
Trophic State: Mesotrophic



Temperature and Dissolved Oxygen

Lake Adirondack had a minimum DO of 0.3 mg/L, with a minimum temperature of 7.0°C and a maximum temperature of 26.3°C.

pH

Figure 84 presents the seasonal mean pH trend in Lake Adirondack, while Table 65 presents descriptive statistics for pH in Lake Adirondack. The pH in Lake Adirondack exhibited an increasing trend from 1996 to 2002. The pH in Lake Adirondack was slightly higher than the county average, though this difference was not statistically significant.

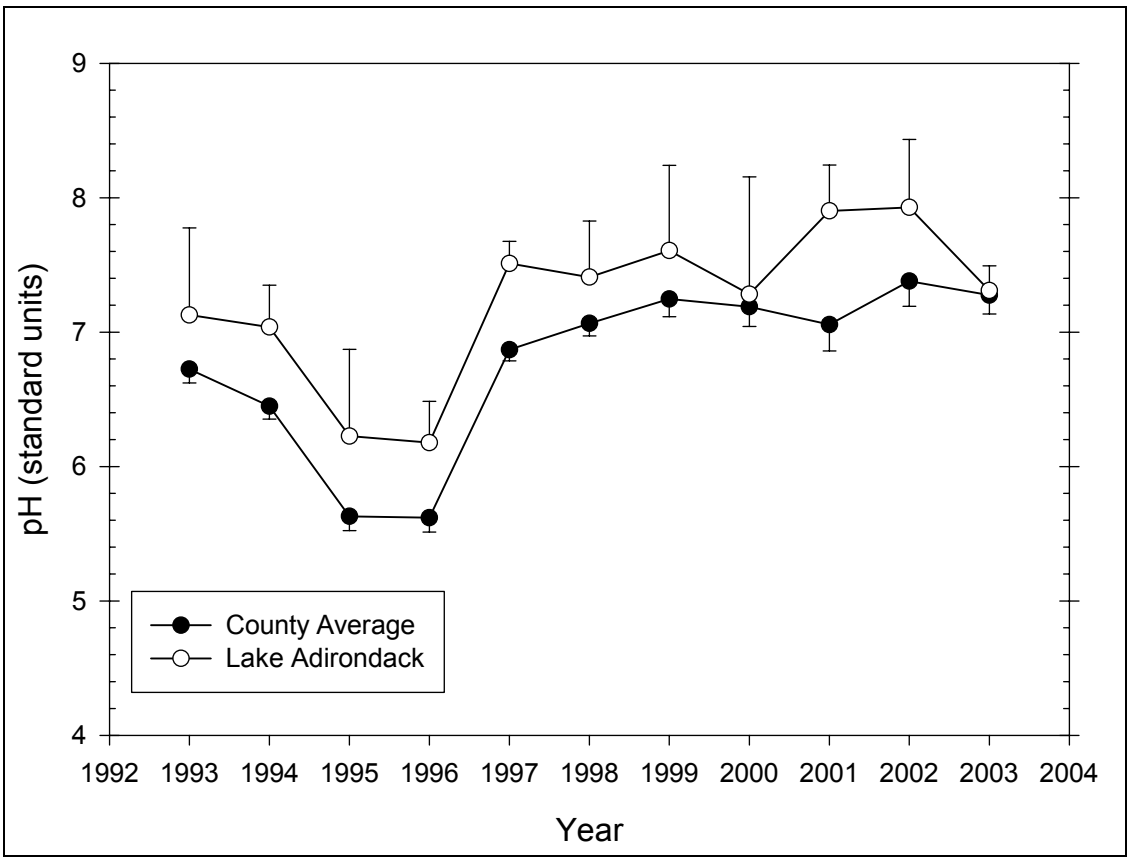


Figure 84 Seasonal mean pH trend in Lake Adirondack

Table 65 – Descriptive Statistics for pH in Lake Adirondack

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	2	7.128	0.407	0.203	0.647
1994	6	0	7.038	0.296	0.121	0.311
1995	6	0	6.227	0.615	0.251	0.646
1996	6	0	6.178	0.292	0.119	0.306
1997	6	0	7.510	0.158	0.0643	0.165
1998	6	0	7.410	0.397	0.162	0.417
1999	5	0	7.606	0.511	0.229	0.635
2000	5	0	7.282	0.703	0.315	0.873
2001	4	0	7.902	0.215	0.107	0.342
2002	4	0	7.928	0.318	0.159	0.506
2003	5	0	7.310	0.148	0.0662	0.184
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.850	7.370	6.520	7.310	6.900	7.355
1994	0.840	7.410	6.570	7.020	6.930	7.280
1995	1.860	7.200	5.340	6.150	5.990	6.530
1996	0.730	6.500	5.770	6.185	5.940	6.490
1997	0.440	7.770	7.330	7.530	7.360	7.540
1998	1.040	7.920	6.880	7.330	7.170	7.830
1999	1.350	8.360	7.010	7.620	7.220	7.902
2000	1.550	7.900	6.350	7.560	6.635	7.877
2001	0.490	8.200	7.710	7.850	7.750	8.055

2002	0.680	8.200	7.520	7.995	7.675	8.180
2003	0.360	7.540	7.180	7.280	7.188	7.405
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-1.950	3.826	0.396	0.028	28.510	203.701
1994	-0.452	0.207	0.191	0.593	42.230	297.667
1995	0.307	1.204	0.210	0.487	37.360	234.522
1996	-0.218	-1.304	0.191	0.592	37.070	229.456
1997	0.645	0.701	0.258	0.235	45.060	338.525
1998	0.206	-1.147	0.237	0.338	44.460	330.237
1999	0.588	0.429	0.189	0.644	38.030	290.301
2000	-0.619	-2.283	0.254	0.332	36.410	267.116
2001	1.197	1.197	0.236	0.494	31.610	249.936
2002	-0.740	-1.771	0.267	0.355	31.710	251.685
2003	1.072	0.597	0.191	0.635	36.550	267.268

Alkalinity

Figure 85 presents the seasonal mean alkalinity trend in Lake Adirondack, while Table 66 presents descriptive statistics for alkalinity in Lake Adirondack. The alkalinity in Lake Adirondack exhibited a decreasing trend from 1998 to 2001, followed by an increasing trend in 2002 and 2003. The alkalinity in Lake Adirondack was significantly higher than the county average.

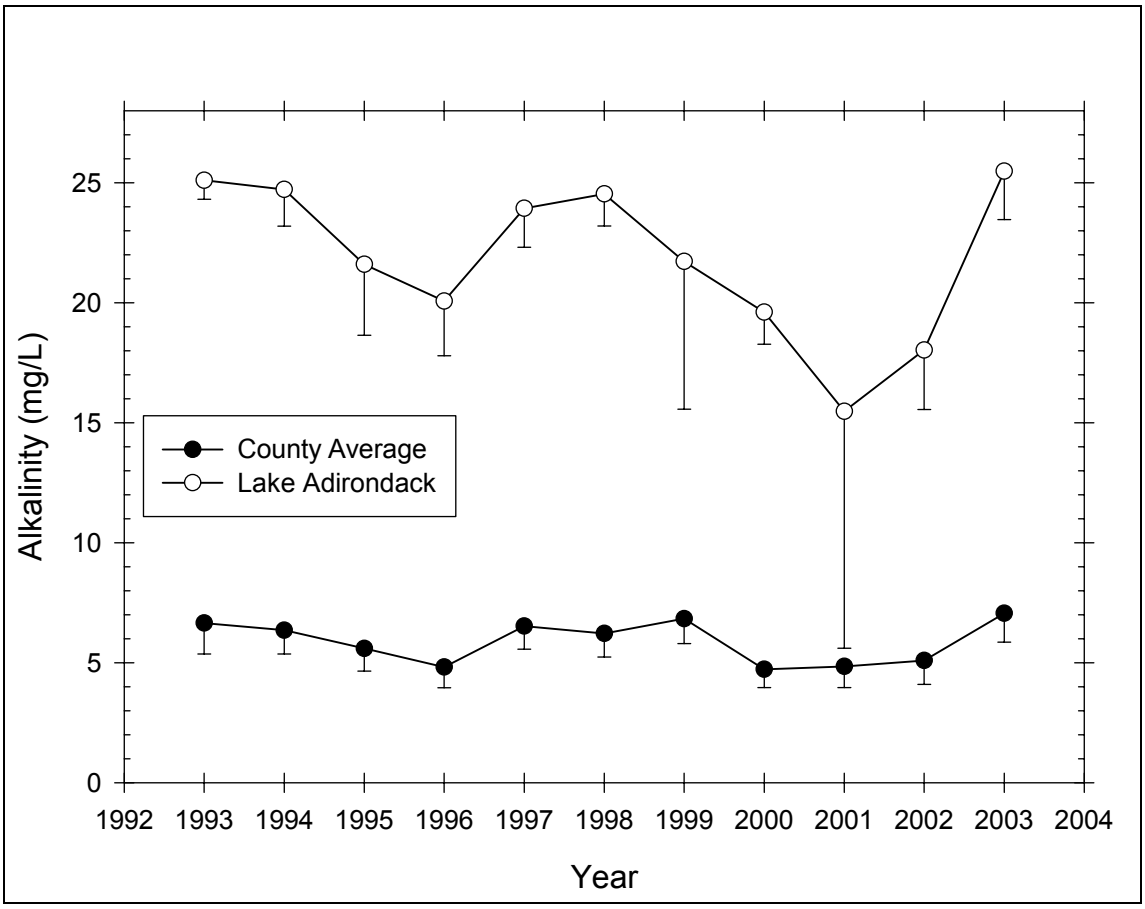


Figure 85 Seasonal mean alkalinity trend in Lake Adirondack

Table 66 – Descriptive Statistics for Alkalinity in Lake Adirondack

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	2	25.100	0.497	0.248	0.790
1994	6	0	24.717	1.455	0.594	1.527
1995	6	0	21.600	2.818	1.150	2.957
1996	6	0	20.067	2.171	0.886	2.279
1997	6	0	23.933	1.547	0.632	1.624
1998	6	0	24.533	1.271	0.519	1.334
1999	6	1	21.720	4.957	2.217	6.155
2000	6	1	19.600	1.070	0.479	1.329
2001	6	1	15.480	7.954	3.557	9.876
2002	6	2	18.025	1.559	0.779	2.480
2003	6	1	25.480	1.628	0.728	2.022
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.100	25.700	24.600	25.050	24.700	25.500
1994	3.700	26.800	23.100	24.450	23.600	25.900
1995	6.500	24.500	18.000	22.100	19.000	23.900
1996	6.600	23.100	16.500	20.250	19.300	21.000
1997	3.800	25.300	21.500	24.700	22.500	24.900
1998	3.400	26.700	23.300	24.000	23.800	25.400
1999	12.200	25.500	13.300	22.700	19.750	25.275
2000	2.300	21.000	18.700	19.000	18.775	20.625
2001	20.000	21.500	1.500	18.100	13.725	19.250
2002	3.600	20.200	16.600	17.650	16.950	19.100
2003	3.800	27.000	23.200	25.600	24.250	27.000
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.392	-2.444	0.227	0.532	100.400	2520.780
1994	0.425	-1.581	0.236	0.343	148.300	3676.070
1995	-0.251	-2.498	0.283	0.142	129.600	2839.060
1996	-0.499	1.548	0.195	0.567	120.400	2439.600
1997	-1.048	-0.830	0.333	0.036	143.600	3448.800
1998	1.206	0.561	0.329	0.041	147.200	3619.380
1999	-1.710	3.134	0.314	0.110	108.600	2457.080
2000	0.686	-2.572	0.313	0.115	98.000	1925.380
2001	-2.034	4.390	0.415	0.005	77.400	1451.200
2002	1.235	1.627	0.256	0.404	72.100	1306.890
2003	-0.531	-1.193	0.225	0.477	127.400	3256.760

Total Phosphorus

Figure 86 presents the seasonal mean total phosphorus trend in Lake Adirondack, while Table 67 presents descriptive statistics for total phosphorus in Lake Adirondack. The total phosphorus in Lake Adirondack exhibited a decreasing trend from 1999 to 2003. The total phosphorus in Lake Adirondack was generally slightly higher than the county average, though this difference was not statistically significant.

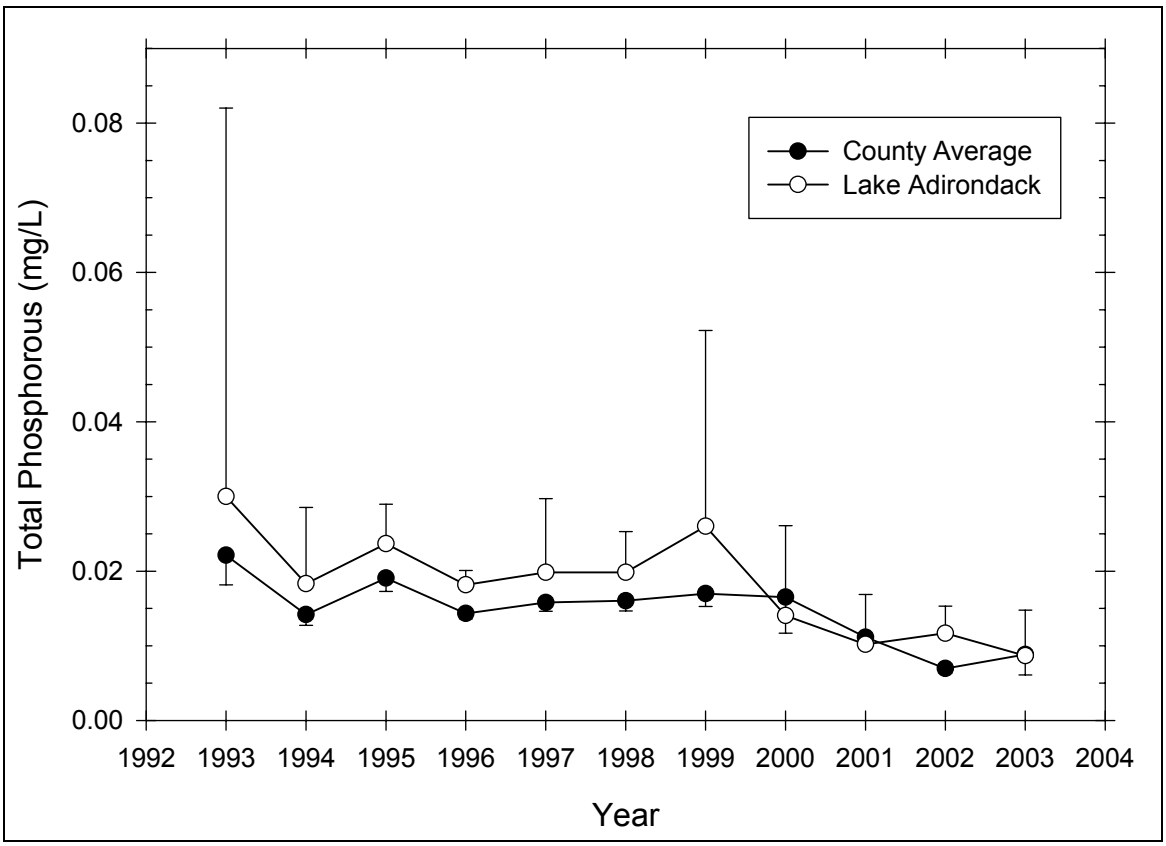


Figure 86 Seasonal mean total phosphorus trend in Lake Adirondack

Table 67 – Descriptive Statistics for Total Phosphorus in Lake Adirondack

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	2	0.0300	0.0327	0.0163	0.0520
1994	6	0	0.0183	0.00971	0.00396	0.0102
1995	6	0	0.0237	0.00505	0.00206	0.00530
1996	6	0	0.0182	0.00183	0.000749	0.00193
1997	6	0	0.0198	0.00941	0.00384	0.00988
1998	6	0	0.0198	0.00519	0.00212	0.00545
1999	6	1	0.0260	0.0211	0.00945	0.0262
2000	6	1	0.0141	0.00970	0.00434	0.0120
2001	6	2	0.0102	0.00420	0.00210	0.00669
2002	6	2	0.0117	0.00229	0.00115	0.00365
2003	6	1	0.00868	0.00490	0.00219	0.00608
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0670	0.0790	0.0120	0.0145	0.0130	0.0470
1994	0.0300	0.0330	0.00300	0.0190	0.0150	0.0210
1995	0.0140	0.0310	0.0170	0.0235	0.0200	0.0270
1996	0.00500	0.0210	0.0160	0.0180	0.0170	0.0190
1997	0.0260	0.0360	0.01000	0.0175	0.0130	0.0250
1998	0.0150	0.0290	0.0140	0.0195	0.0160	0.0210
1999	0.0530	0.0630	0.01000	0.0180	0.0153	0.0323
2000	0.0200	0.0240	0.00400	0.0150	0.00422	0.0233
2001	0.00980	0.0140	0.00420	0.0113	0.00760	0.0128
2002	0.00490	0.0146	0.00970	0.0112	0.00985	0.0135

2003	0.0123	0.0151	0.00280	0.00730	0.00528	0.0129
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.991	3.971	0.427	0.011	0.120	0.00681
1994	-0.152	1.764	0.225	0.401	0.110	0.00249
1995	0.195	-0.656	0.129	0.771	0.142	0.00349
1996	0.513	-0.621	0.238	0.333	0.109	0.00200
1997	1.103	0.945	0.244	0.301	0.119	0.00280
1998	1.106	1.871	0.244	0.298	0.119	0.00250
1999	1.998	4.230	0.375	0.020	0.130	0.00517
2000	-0.114	-2.985	0.243	0.385	0.0703	0.00136
2001	-1.416	2.589	0.325	0.147	0.0408	0.000469
2002	0.718	-1.878	0.267	0.356	0.0467	0.000561
2003	0.289	-1.325	0.211	0.546	0.0434	0.000473

Nitrate

Figure 87 presents the seasonal mean nitrate trend in Lake Adirondack, while Table 68 presents descriptive statistics for nitrate in Lake Adirondack. The nitrate in Lake Adirondack exhibited a slight decreasing trend from 1999 to 2003. The nitrate in Lake Adirondack was significantly lower than the county average, though this difference may not be statistically significant for all years.

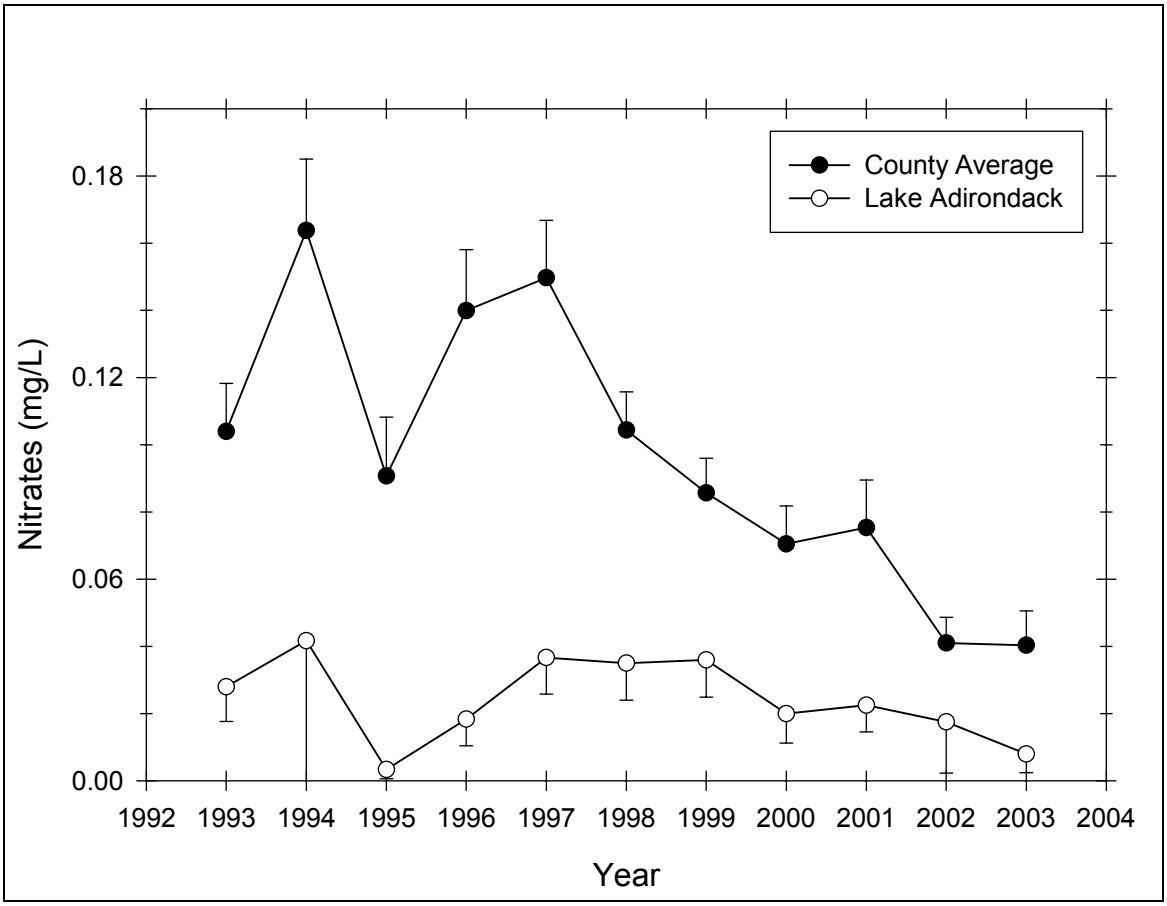


Figure 87 Seasonal mean nitrate trend in Lake Adirondack

Table 68 – Descriptive Statistics for Nitrate in Lake Adirondack

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0280	0.00837	0.00374	0.0104
1994	6	0	0.0417	0.0496	0.0202	0.0520
1995	6	0	0.00333	0.00258	0.00105	0.00271
1996	6	0	0.0183	0.00753	0.00307	0.00790
1997	6	0	0.0367	0.0103	0.00422	0.0108
1998	6	0	0.0350	0.0105	0.00428	0.0110
1999	6	1	0.0360	0.00894	0.00400	0.0111
2000	6	1	0.0200	0.00707	0.00316	0.00878
2001	6	2	0.0225	0.00500	0.00250	0.00796
2002	6	2	0.0175	0.00957	0.00479	0.0152
2003	6	1	0.00800	0.00447	0.00200	0.00555
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0200	0.0400	0.0200	0.0300	0.0200	0.0325
1994	0.130	0.140	0.01000	0.0250	0.01000	0.0400
1995	0.00500	0.00500	0.000	0.00500	0.000	0.00500
1996	0.0200	0.0300	0.01000	0.0200	0.01000	0.0200
1997	0.0300	0.0500	0.0200	0.0400	0.0300	0.0400
1998	0.0300	0.0500	0.0200	0.0350	0.0300	0.0400
1999	0.0200	0.0500	0.0300	0.0300	0.0300	0.0425
2000	0.0200	0.0300	0.01000	0.0200	0.0175	0.0225
2001	0.01000	0.0300	0.0200	0.0200	0.0200	0.0250
2002	0.0200	0.0300	0.01000	0.0150	0.01000	0.0250
2003	0.01000	0.01000	0.000	0.01000	0.00750	0.01000
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.512	-0.612	0.231	0.448	0.140	0.00420
1994	2.157	4.855	0.347	0.023	0.250	0.0227
1995	-0.968	-1.875	0.407	0.002	0.0200	0.0001000
1996	0.313	-0.104	0.254	0.251	0.110	0.00230
1997	-0.666	0.586	0.293	0.111	0.220	0.00860
1998	-1.116E-015	-0.248	0.183	0.630	0.210	0.00790
1999	1.258	0.313	0.349	0.046	0.180	0.00680
2000	-5.551E-016	2.000	0.300	0.149	0.1000	0.00220
2001	2.000	4.000	0.441	0.006	0.0900	0.00210
2002	0.855	-1.289	0.283	0.289	0.0700	0.00150
2003	-2.236	5.000	0.473	<0.001	0.0400	0.000400

Chlorophyll a

Figure 88 presents the seasonal mean chlorophyll *a* trend in Lake Adirondack, while Table 69 presents descriptive statistics for chlorophyll *a* in Lake Adirondack. The chlorophyll *a* in Lake Adirondack exhibited a slight decreasing trend from 1998 to 2003. The chlorophyll *a* in Lake Adirondack was slightly higher than the county average, though this difference was not statistically significant.

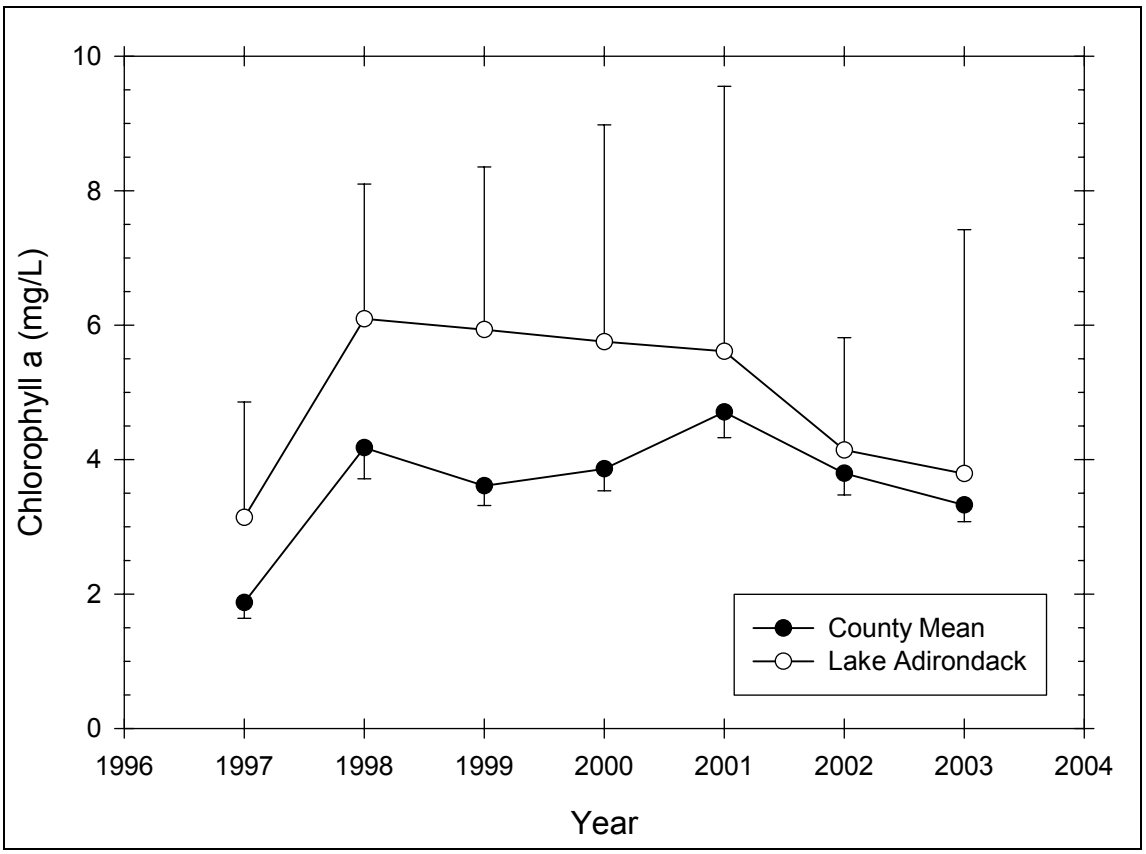


Figure 88 Seasonal mean chlorophyll a trend in Lake Adirondack

Table 69 – Descriptive Statistics for Chlorophyll a in Lake Adirondack

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	3.138	1.637	0.668	1.718
1998	6	0	6.092	1.913	0.781	2.007
1999	6	1	5.934	1.949	0.871	2.419
2000	6	1	5.752	2.598	1.162	3.226
2001	6	2	5.610	2.478	1.239	3.943
2002	6	2	4.143	1.049	0.525	1.669
2003	6	2	3.790	2.281	1.141	3.630
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	4.610	5.960	1.350	2.815	1.960	3.930
1998	4.020	7.760	3.740	6.750	3.830	7.720
1999	5.230	8.180	2.950	6.360	4.773	7.145
2000	6.920	9.960	3.040	4.890	4.308	7.095
2001	5.750	8.770	3.020	5.325	3.730	7.490
2002	2.490	5.170	2.680	4.360	3.480	4.805
2003	4.960	6.920	1.960	3.140	2.100	5.480
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	1.061	1.152	0.222	0.417	18.830	72.497
1998	-0.531	-2.259	0.280	0.149	36.550	240.942
1999	-0.827	1.141	0.188	0.647	29.670	191.249
2000	1.257	2.132	0.241	0.396	28.760	192.428
2001	0.561	-0.531	0.182	0.681	22.440	144.311

2002	-1.163	2.177	0.302	0.218	16.570	71.943
2003	1.170	0.407	0.252	0.425	15.160	73.067

Transparency

Figure 89 presents the seasonal mean transparency trend in Lake Adirondack, while Table 70 presents descriptive statistics for transparency in Lake Adirondack. The transparency in Lake Adirondack exhibited an increasing trend from 1994 to 2002. The transparency in Lake Adirondack was significantly lower than the county average, although the transparency approached the county mean in more recent years, 1999 – 2002, to the point were the difference between the Lake Adirondack and county mean was no longer statistically significant.

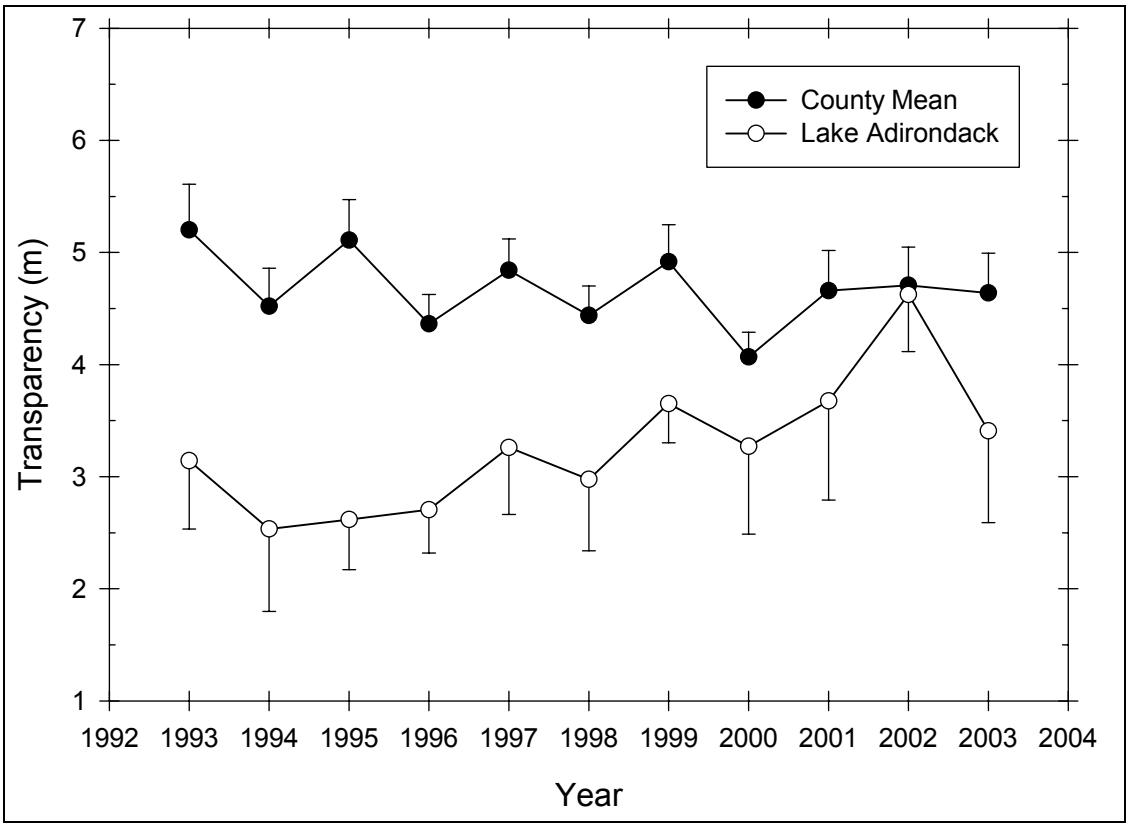


Figure 89 Seasonal mean transparency trend in Lake Adirondack

Table 70 – Descriptive Statistics for Transparency in Lake Adirondack

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	2	3.143	0.383	0.192	0.609
1994	6	0	2.533	0.700	0.286	0.735
1995	6	0	2.617	0.425	0.174	0.446
1996	6	0	2.705	0.368	0.150	0.386
1997	6	0	3.260	0.571	0.233	0.599
1998	6	0	2.975	0.607	0.248	0.637
1999	5	0	3.652	0.282	0.126	0.350
2000	5	0	3.270	0.631	0.282	0.784
2001	4	0	3.675	0.556	0.278	0.885
2002	4	0	4.625	0.320	0.160	0.509
2003	5	0	3.408	0.659	0.295	0.819

Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.920	3.640	2.720	3.105	2.875	3.410
1994	1.800	3.700	1.900	2.300	2.000	3.000
1995	1.150	3.250	2.100	2.650	2.200	2.850
1996	1.090	3.220	2.130	2.775	2.480	2.850
1997	1.650	4.070	2.420	3.335	2.850	3.550
1998	1.770	3.570	1.800	3.120	3.020	3.220
1999	0.730	4.080	3.350	3.680	3.425	3.795
2000	1.450	3.900	2.450	3.600	2.675	3.712
2001	1.200	4.500	3.300	3.450	3.350	4.000
2002	0.700	5.100	4.400	4.500	4.450	4.800
2003	1.770	4.320	2.550	3.350	2.978	3.855
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.550	0.951	0.211	0.595	12.570	39.941
1994	1.050	0.0800	0.232	0.363	15.200	40.960
1995	0.223	-0.560	0.170	0.689	15.700	41.985
1996	-0.368	0.719	0.237	0.337	16.230	44.580
1997	-0.169	0.117	0.195	0.571	19.560	65.393
1998	-1.860	4.234	0.363	0.013	17.850	54.948
1999	0.794	0.597	0.232	0.438	18.260	67.004
2000	-0.582	-2.361	0.299	0.151	16.350	55.058
2001	1.872	3.577	0.374	0.053	14.700	54.950
2002	1.866	3.619	0.402	0.023	18.500	85.870
2003	0.186	0.248	0.135	0.745	17.040	59.812

TSI

Figure 90 presents the Carlson trophic state index trend in Lake Adirondack. Transparency TSI was mesotrophic throughout the period, while chlorophyll *a* TSI was eutrophic in most years. Total phosphorus TSI was mesotrophic but lower in recent years, including in the oligotrophic range in 2000 and 2001.

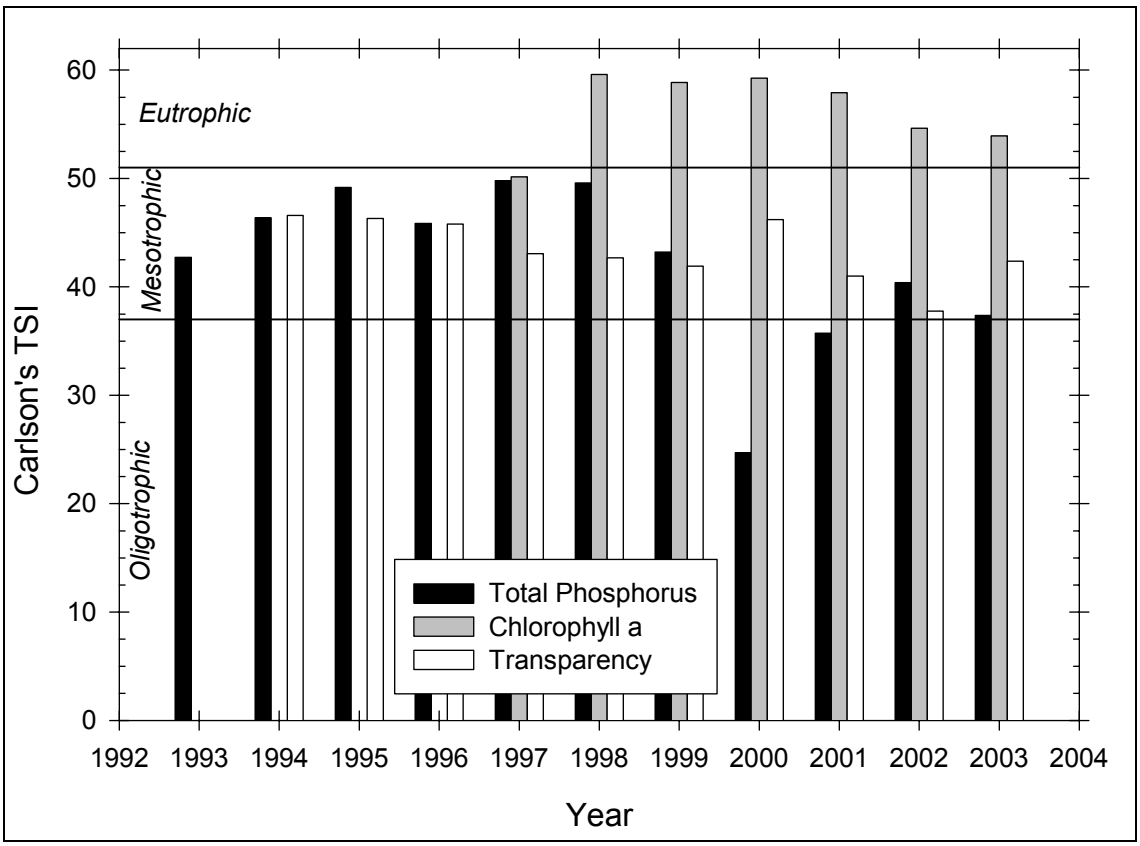


Figure 90 Carlson TSI trend in Lake Adirondack

Aluminum

Figure 91 presents the seasonal mean aluminum trend in Lake Adirondack, while Table 71 presents descriptive statistics for aluminum in Lake Adirondack. The aluminum in Lake Adirondack exhibited a slight decreasing trend from 1997 to 2003. The aluminum in Lake Adirondack was slightly lower than the county average, though this difference may not be statistically significant for all years.

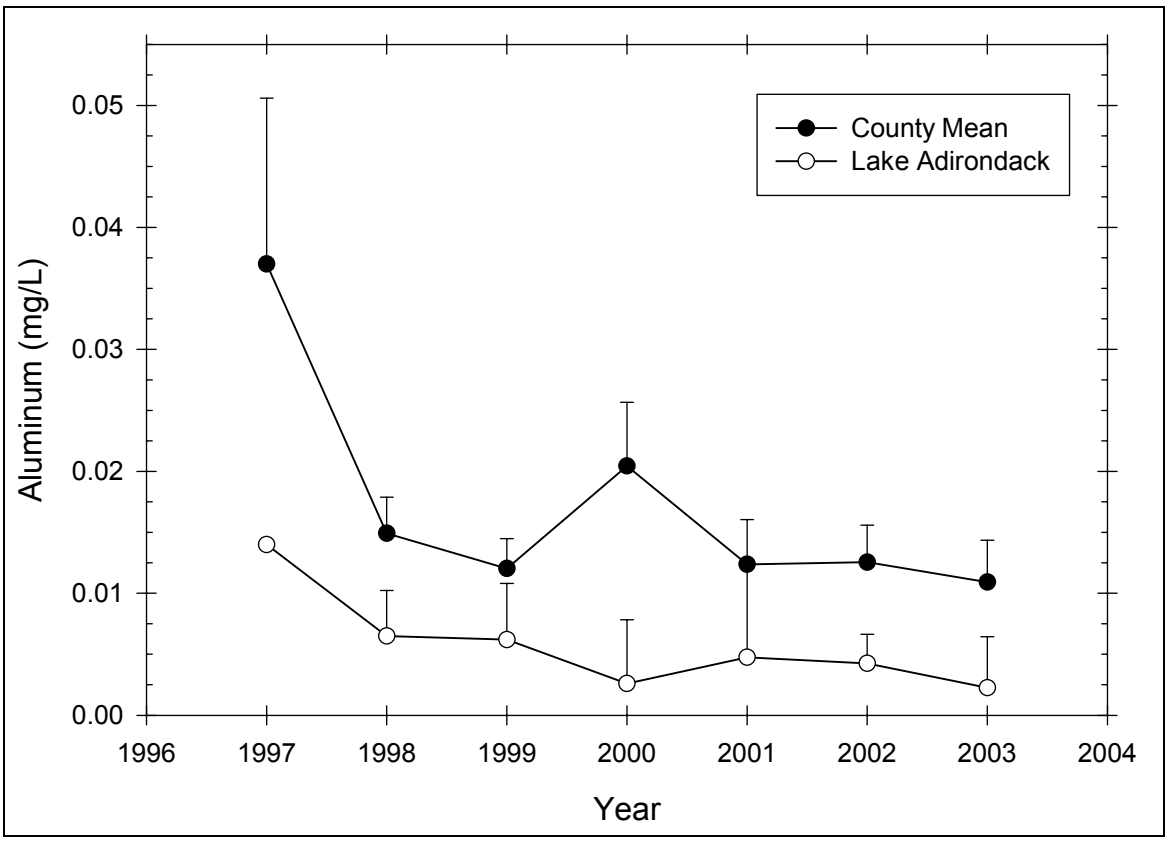


Figure 91 Seasonal mean aluminum trend in Lake Adirondack

Table 71 – Descriptive Statistics for Aluminum in Lake Adirondack

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0140	--	--	--
1998	6	0	0.00650	0.00356	0.00145	0.00374
1999	6	1	0.00620	0.00370	0.00166	0.00460
2000	6	1	0.00260	0.00422	0.00189	0.00524
2001	6	2	0.00475	0.00499	0.00250	0.00794
2002	6	2	0.00425	0.00150	0.000750	0.00239
2003	6	2	0.00225	0.00263	0.00131	0.00418
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0140	0.0140	0.0140	0.0140	0.0140
1998	0.00800	0.01000	0.00200	0.00800	0.00200	0.00900
1999	0.00900	0.0110	0.00200	0.00500	0.00350	0.00950
2000	0.01000	0.01000	0.000	0.001000	0.000	0.00400
2001	0.0110	0.0120	0.001000	0.00300	0.00150	0.00800
2002	0.00300	0.00600	0.00300	0.00400	0.00300	0.00550
2003	0.00500	0.00500	0.000	0.00200	0.000	0.00450
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0140	0.000196
1998	-0.776	-1.826	0.330	0.040	0.0390	0.000317
1999	0.379	-1.813	0.227	0.465	0.0310	0.000247
2000	2.029	4.217	0.357	0.037	0.0130	0.000105
2001	1.646	2.704	0.310	0.193	0.0190	0.000165

2002	0.370	-3.901	0.298	0.234	0.0170	0.0000790
2003	0.124	-5.290	0.304	0.212	0.00900	0.0000410

Calcium

Figure 92 presents the seasonal mean calcium trend in Lake Adirondack, while Table 72 presents descriptive statistics for calcium in Lake Adirondack. The calcium in Lake Adirondack exhibited a slight increasing trend from 1997 to 2003. The calcium in Lake Adirondack was significantly higher than the county average.

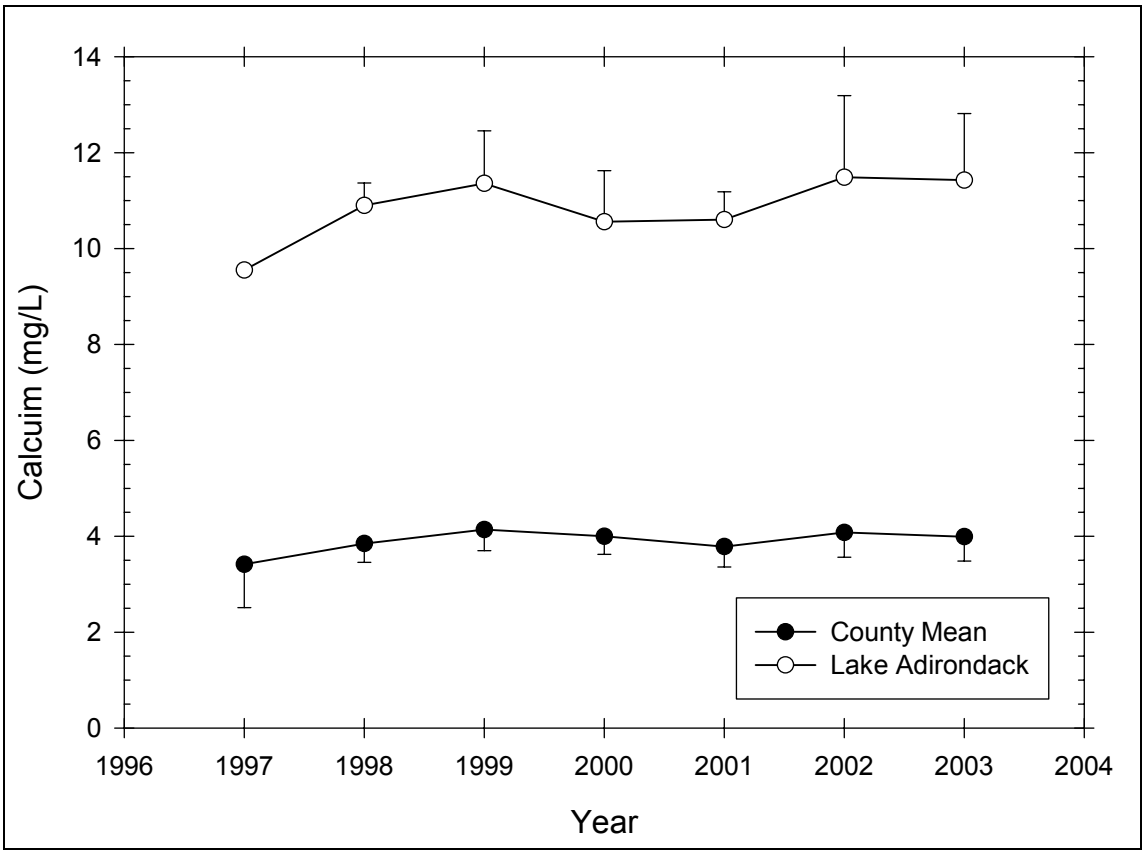


Figure 92 Seasonal mean calcium trend in Lake Adirondack

Table 72 – Descriptive Statistics for Calcium in Lake Adirondack

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	9.550	--	--	--
1998	6	0	10.900	0.444	0.181	0.466
1999	6	1	11.358	0.884	0.395	1.097
2000	6	1	10.560	0.854	0.382	1.061
2001	6	2	10.603	0.364	0.182	0.580
2002	6	2	11.488	1.070	0.535	1.702
2003	6	2	11.425	0.873	0.436	1.389
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	9.550	9.550	9.550	9.550	9.550
1998	1.140	11.550	10.410	10.920	10.450	11.150

1999	2.150	12.100	9.950	11.800	10.767	11.950
2000	2.280	11.550	9.270	10.660	10.050	11.145
2001	0.750	11.030	10.280	10.550	10.300	10.905
2002	2.050	12.400	10.350	11.600	10.575	12.400
2003	1.820	12.500	10.680	11.260	10.715	12.135
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	9.550	91.203
1998	0.291	-1.160	0.178	0.655	65.400	713.846
1999	-1.310	0.955	0.292	0.176	56.790	648.144
2000	-0.735	0.859	0.185	0.659	52.800	560.487
2001	0.381	-3.735	0.281	0.298	42.410	450.050
2002	-0.151	-5.134	0.303	0.215	45.950	531.283
2003	0.564	-2.785	0.280	0.301	45.700	524.408

Calcite Saturation Index

Figure 93 presents the calcite saturation index trend in Lake Adirondack. The CSI in Lake Adirondack was stable throughout the period of record, well within the low vulnerability to acid deposition range. The CSI in Lake Adirondack was significantly lower than the county average, though this difference may not be statistically significant for all years.

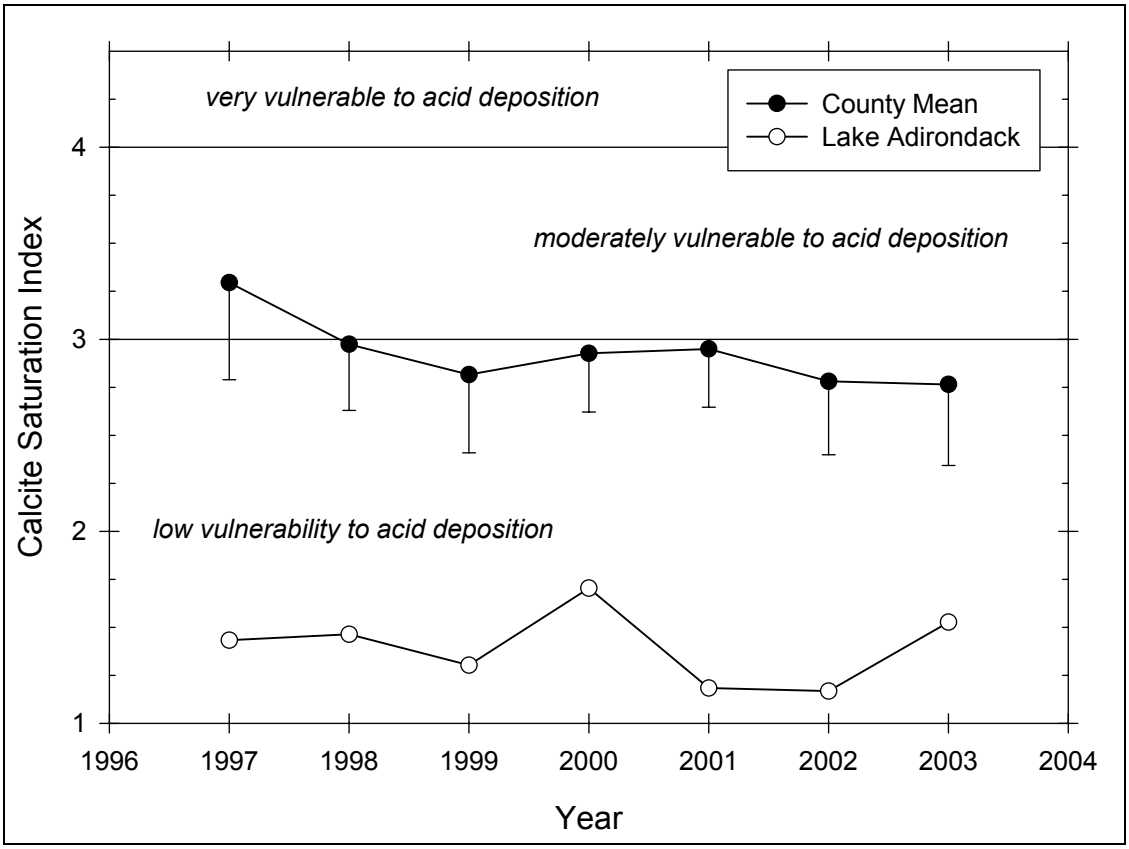
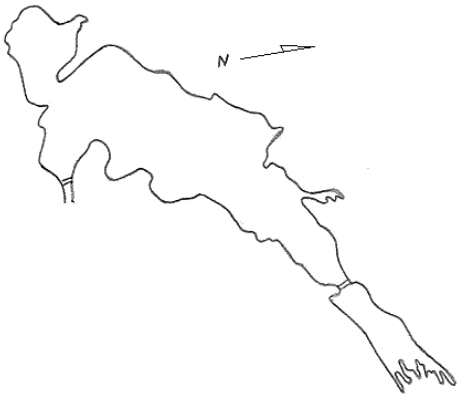


Figure 93 Seasonal mean CSI trend in Lake Adirondack

Lake Algonquin

Location
Pond Number: 050276A
Watershed: Upper Hudson River
County: Hamilton
Topographic Quadrangle: Lake Pleasant
Sample Site
Latitude: 43o 23.454'
Longitude: 74o 17.802'
Morphometry
Surface Area: 224 Ac.
Mean Depth: 5 Ft.
Maximum Depth: 11 Ft.
Volume: 10,473 Ac./Ft.
Watershed Area: 7,280 Ac.
Hydraulic Retention Time: 0.04 Yr.
Shoreline Length: 6.1 Mi.
Elevation: 981 Ft.
Water Quality Classification: AA
Trophic State: Mesotrophic



Temperature and Dissolved Oxygen

Lake Algonquin had a minimum DO of 6.0 mg/L, with a minimum temperature of 4.0°C and a maximum temperature of 25.4°C.

pH

Figure 94 presents the seasonal mean pH trend in Lake Algonquin, while Table 73 presents descriptive statistics for pH in Lake Algonquin. The pH in Lake Algonquin exhibited an increasing trend from 1996 to 1999, followed by fluctuations in pH. The pH in Lake Algonquin was similar to the county average.

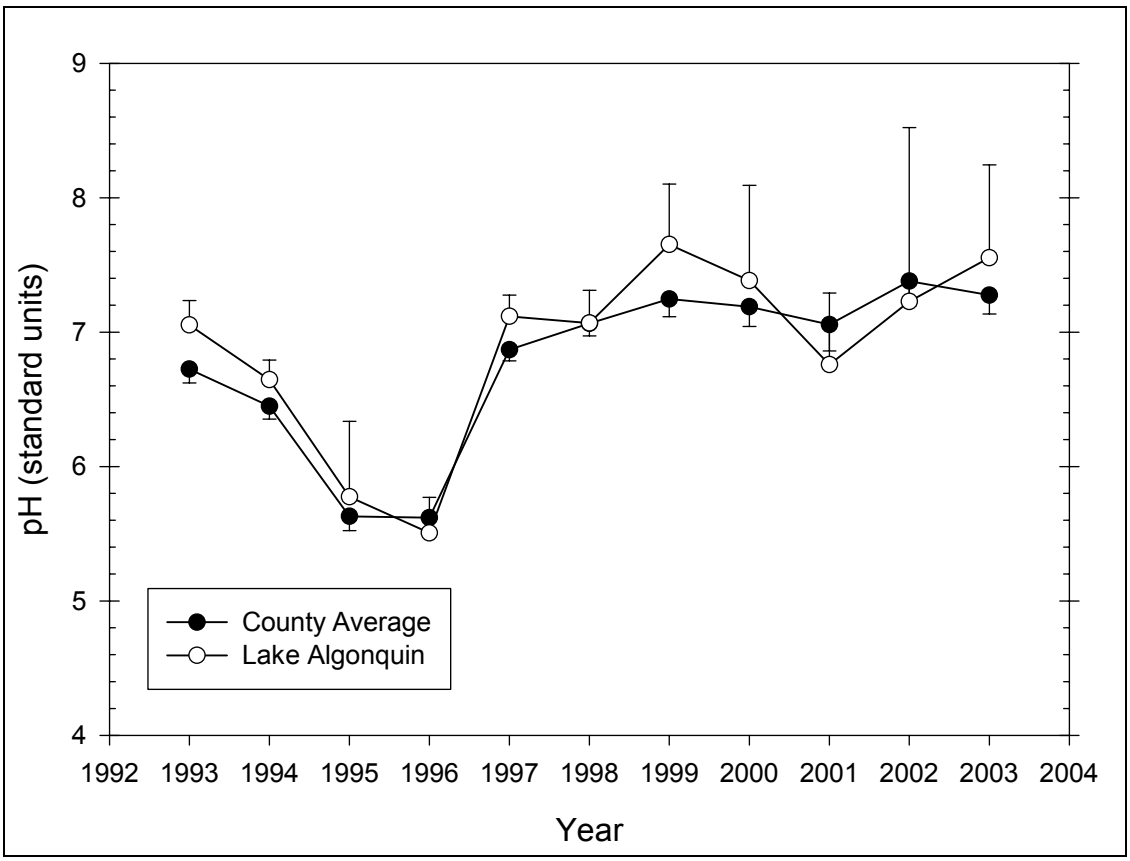


Figure 94 Seasonal mean pH trend in Lake Algonquin

Table 73 – Descriptive Statistics for pH in Lake Algonquin

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	7.054	0.146	0.0653	0.181
1994	6	0	6.647	0.139	0.0568	0.146
1995	6	0	5.775	0.534	0.218	0.561
1996	6	1	5.506	0.214	0.0955	0.265
1997	6	0	7.118	0.149	0.0607	0.156
1998	6	0	7.068	0.231	0.0944	0.243
1999	5	0	7.652	0.362	0.162	0.450
2000	6	0	7.383	0.675	0.276	0.708
2001	4	0	6.758	0.335	0.168	0.534
2002	4	0	7.228	0.813	0.407	1.294
2003	5	0	7.554	0.556	0.249	0.691
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.360	7.290	6.930	7.030	6.938	7.133
1994	0.370	6.830	6.460	6.655	6.530	6.750
1995	1.640	6.580	4.940	5.750	5.630	6.000
1996	0.520	5.800	5.280	5.430	5.348	5.688
1997	0.350	7.250	6.900	7.195	6.960	7.210
1998	0.640	7.520	6.880	7.015	6.930	7.050
1999	0.910	8.020	7.110	7.740	7.395	7.930
2000	1.790	8.470	6.680	7.230	6.820	7.870
2001	0.820	7.170	6.350	6.755	6.540	6.975

2002	1.820	7.890	6.070	7.475	6.670	7.785
2003	1.260	8.110	6.850	7.870	7.015	7.930
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.305	1.638	0.229	0.453	35.270	248.880
1994	-0.0805	-1.309	0.149	0.752	39.880	265.166
1995	-0.104	1.553	0.226	0.393	34.650	201.532
1996	0.594	-1.465	0.239	0.404	27.530	151.763
1997	-0.940	-1.455	0.327	0.043	42.710	304.135
1998	1.995	4.373	0.365	0.012	42.410	300.035
1999	-0.857	-0.0688	0.196	0.615	38.260	293.290
2000	0.843	-0.187	0.245	0.295	44.300	329.359
2001	0.0444	1.390	0.223	0.548	27.030	182.993
2002	-1.446	1.949	0.271	0.341	28.910	210.932
2003	-0.550	-2.578	0.315	0.109	37.770	286.553

Alkalinity

Figure 95 presents the seasonal mean alkalinity trend in Lake Algonquin, while Table 74 presents descriptive statistics for alkalinity in Lake Algonquin. The alkalinity in Lake Algonquin did not exhibit any particular trend. The alkalinity in Lake Algonquin was slightly higher than the county average, though this difference was not statistically significant.

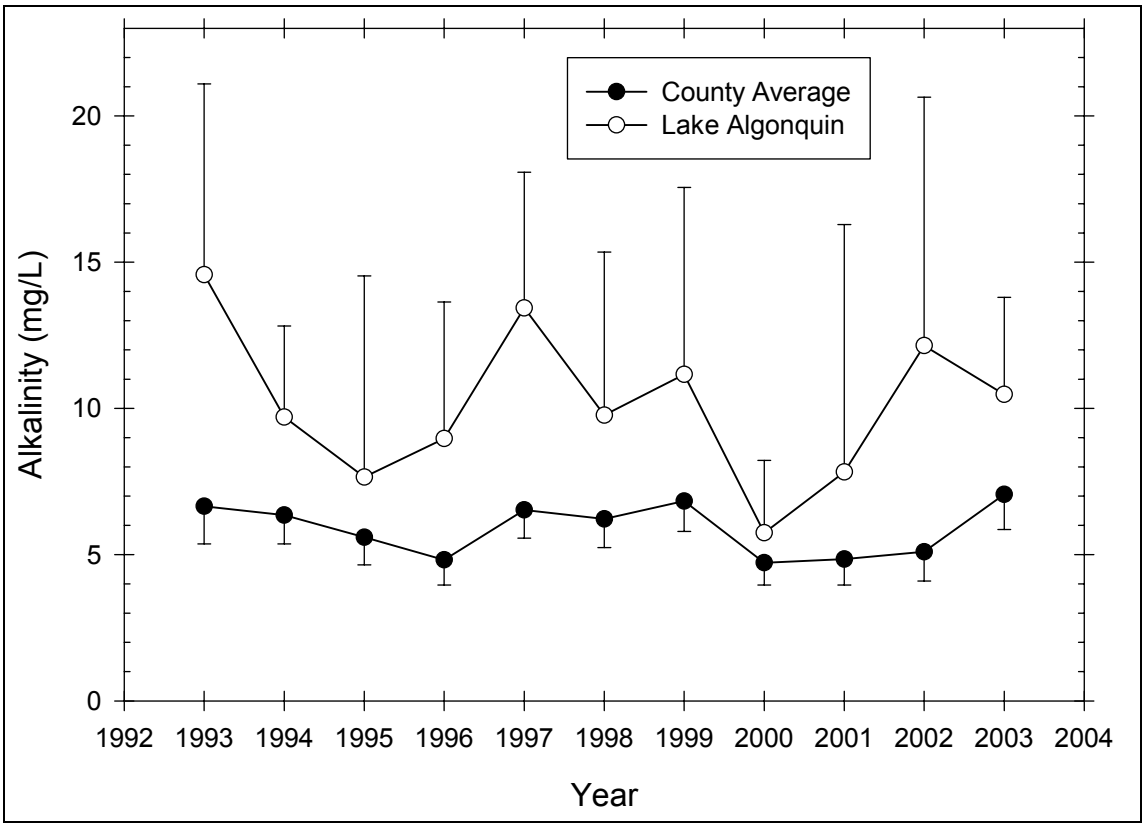


Figure 95 Seasonal mean alkalinity trend in Lake Algonquin

Table 74 – Descriptive Statistics for Alkalinity in Lake Algonquin

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	5	1	14.575	4.099	2.050	6.523
1994	6	0	9.700	2.972	1.213	3.119
1995	6	0	7.650	6.560	2.678	6.885
1996	6	0	8.967	4.454	1.818	4.674
1997	6	0	13.433	4.423	1.806	4.642
1998	6	0	9.767	5.320	2.172	5.583
1999	6	1	11.160	5.149	2.303	6.393
2000	6	0	5.750	2.357	0.962	2.473
2001	6	2	7.825	5.318	2.659	8.462
2002	6	2	12.150	5.339	2.670	8.496
2003	6	1	10.480	2.672	1.195	3.317
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	8.700	17.300	8.600	16.200	11.900	17.250
1994	8.200	13.000	4.800	9.950	8.200	12.300
1995	16.600	15.800	-0.800	8.050	1.200	13.600
1996	13.000	15.300	2.300	9.000	7.000	11.200
1997	11.200	17.700	6.500	15.100	9.600	16.600
1998	13.700	15.800	2.100	10.800	5.100	14.000
1999	13.300	17.300	4.000	12.700	7.150	14.525
2000	6.300	9.800	3.500	5.350	3.600	6.900
2001	12.000	15.600	3.600	6.050	4.650	11.000
2002	11.300	16.100	4.800	13.850	8.200	16.100
2003	6.100	13.700	7.600	11.000	7.825	12.575
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-1.691	2.762	0.311	0.190	58.300	900.130
1994	-0.770	0.444	0.167	0.701	58.200	608.700
1995	-0.127	-1.528	0.182	0.636	45.900	566.330
1996	-0.130	0.225	0.163	0.715	53.800	581.600
1997	-0.917	-0.772	0.244	0.299	80.600	1180.560
1998	-0.479	-1.342	0.183	0.631	58.600	713.840
1999	-0.437	-0.590	0.218	0.513	55.800	728.780
2000	1.064	0.961	0.209	0.492	34.500	226.150
2001	1.694	3.158	0.356	0.086	31.300	329.770
2002	-1.200	0.465	0.270	0.343	48.600	676.020
2003	-0.0535	-2.370	0.233	0.435	52.400	577.700

Total Phosphorus

Figure 96 presents the seasonal mean total phosphorus trend in Lake Algonquin, while Table 75 presents descriptive statistics for total phosphorus in Lake Algonquin. The total phosphorus in Lake Algonquin exhibited a decreasing trend from 1993 to 2003. The total phosphorus in Lake Algonquin was similar to the county average.

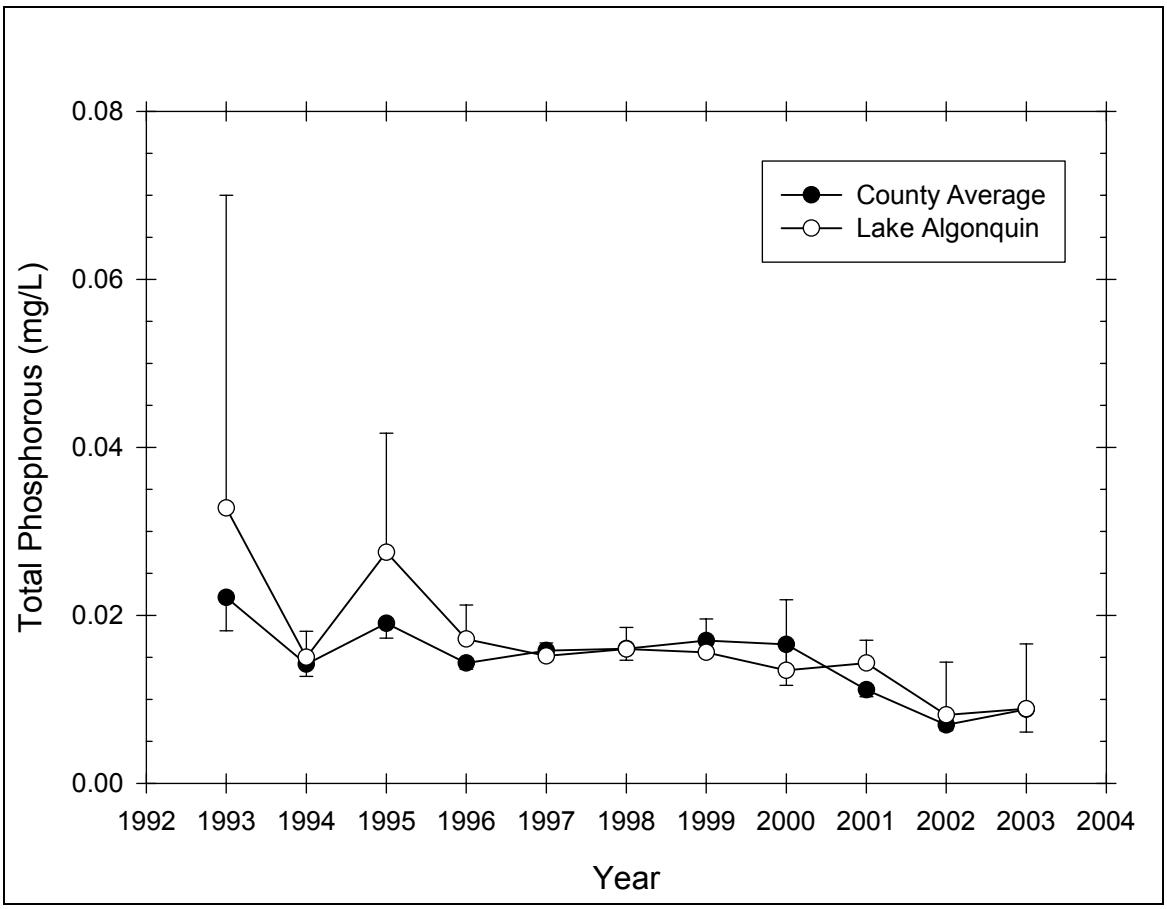


Figure 96 Seasonal mean total phosphorus trend in Lake Algonquin

Table 75 – Descriptive Statistics for Total Phosphorus in Lake Algonquin

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0328	0.0300	0.0134	0.0372
1994	6	0	0.0150	0.00297	0.00121	0.00311
1995	6	0	0.0275	0.0135	0.00551	0.0142
1996	6	0	0.0172	0.00387	0.00158	0.00406
1997	6	0	0.0152	0.00147	0.000601	0.00154
1998	6	0	0.0160	0.00245	0.001000	0.00257
1999	6	1	0.0156	0.00321	0.00144	0.00398
2000	6	0	0.0134	0.00802	0.00327	0.00842
2001	6	2	0.0143	0.00170	0.000850	0.00270
2002	6	2	0.00815	0.00395	0.00198	0.00629
2003	6	1	0.00888	0.00621	0.00278	0.00772
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0760	0.0800	0.00400	0.0340	0.00850	0.0470
1994	0.00900	0.0190	0.01000	0.0155	0.0140	0.0160
1995	0.0370	0.0510	0.0140	0.0260	0.0170	0.0310
1996	0.0110	0.0220	0.0110	0.0175	0.0150	0.0200
1997	0.00400	0.0170	0.0130	0.0155	0.0140	0.0160
1998	0.00700	0.0200	0.0130	0.0160	0.0140	0.0170
1999	0.00800	0.0210	0.0130	0.0140	0.0138	0.0173
2000	0.0210	0.0240	0.00300	0.0110	0.00970	0.0220

2001	0.00400	0.0160	0.0120	0.0147	0.0132	0.0155
2002	0.00830	0.0120	0.00370	0.00845	0.00485	0.0115
2003	0.0146	0.0156	0.001000	0.00860	0.00385	0.0147
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.077	1.195	0.257	0.314	0.164	0.00897
1994	-0.690	1.741	0.201	0.534	0.0900	0.00139
1995	1.118	1.173	0.231	0.368	0.165	0.00545
1996	-0.562	0.246	0.149	0.752	0.103	0.00184
1997	-0.418	-0.859	0.214	0.461	0.0910	0.00139
1998	0.612	0.633	0.175	0.668	0.0960	0.00157
1999	1.661	2.712	0.291	0.178	0.0780	0.00126
2000	0.326	-1.176	0.238	0.329	0.0807	0.00141
2001	-1.026	1.395	0.244	0.458	0.0573	0.000829
2002	-0.218	-4.047	0.257	0.402	0.0326	0.000313
2003	-0.149	-2.047	0.213	0.537	0.0444	0.000549

Nitrate

Figure 97 presents the seasonal mean nitrate trend in Lake Algonquin, while Table 76 presents descriptive statistics for nitrate in Lake Algonquin. The nitrate in Lake Algonquin exhibited a decreasing trend from 1996 to 2003. The nitrate in Lake Algonquin was slightly lower than the county average, though this difference was not statistically significant.

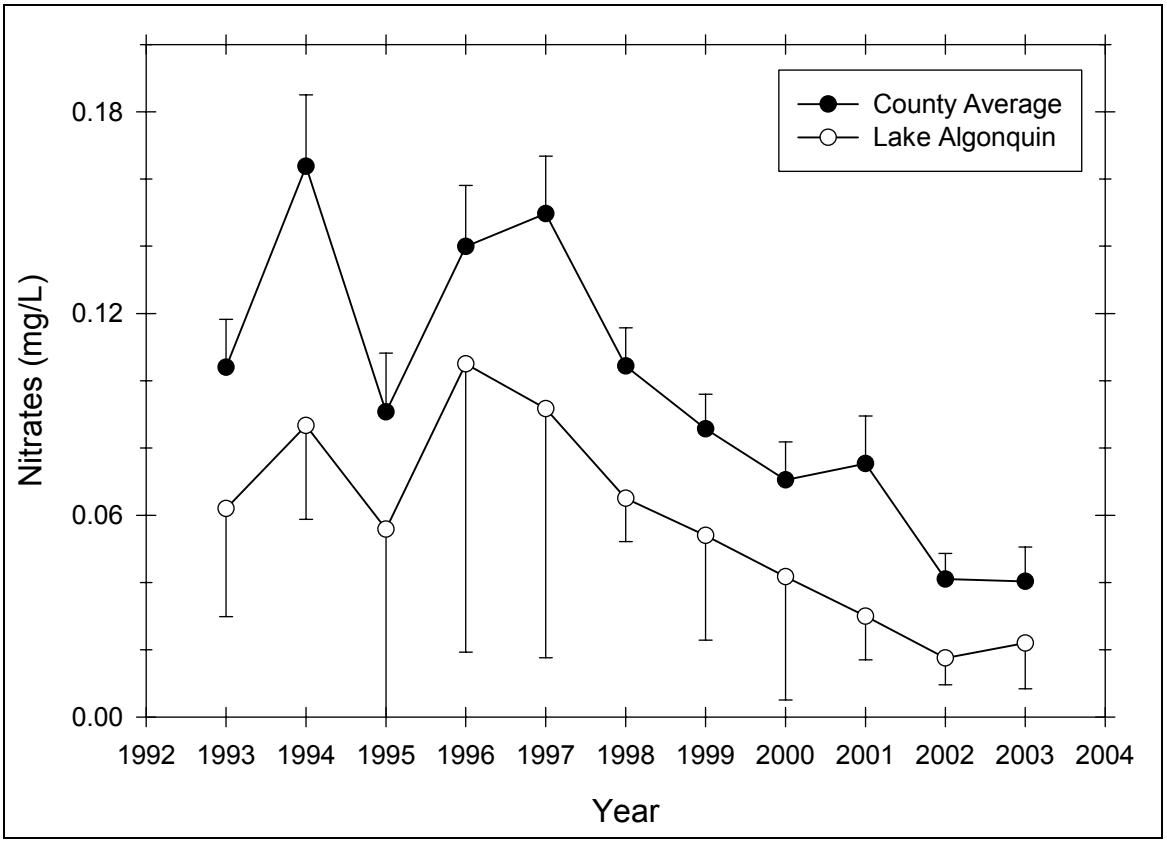


Figure 97 Seasonal mean nitrate trend in Lake Algonquin

Table 76 – Descriptive Statistics for Nitrate in Lake Algonquin

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0620	0.0259	0.0116	0.0321
1994	6	0	0.0867	0.0266	0.0109	0.0279
1995	6	0	0.0558	0.0590	0.0241	0.0619
1996	6	0	0.105	0.0817	0.0333	0.0857
1997	6	0	0.0917	0.0705	0.0288	0.0740
1998	6	0	0.0650	0.0122	0.00500	0.0129
1999	6	1	0.0540	0.0251	0.0112	0.0312
2000	6	0	0.0417	0.0349	0.0142	0.0366
2001	6	2	0.0300	0.00816	0.00408	0.0130
2002	6	2	0.0175	0.00500	0.00250	0.00796
2003	6	1	0.0220	0.0110	0.00490	0.0136
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0600	0.0900	0.0300	0.0700	0.0375	0.0825
1994	0.0600	0.130	0.0700	0.0700	0.0700	0.110
1995	0.155	0.160	0.00500	0.0400	0.01000	0.0800
1996	0.210	0.260	0.0500	0.0750	0.0500	0.120
1997	0.180	0.220	0.0400	0.0700	0.0400	0.110
1998	0.0300	0.0800	0.0500	0.0700	0.0500	0.0700
1999	0.0600	0.0900	0.0300	0.0600	0.0300	0.0675
2000	0.1000	0.110	0.01000	0.0300	0.0300	0.0400
2001	0.0200	0.0400	0.0200	0.0300	0.0250	0.0350
2002	0.01000	0.0200	0.01000	0.0200	0.0150	0.0200
2003	0.0300	0.0400	0.01000	0.0200	0.0175	0.0250
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.363	-2.413	0.221	0.494	0.310	0.0219
1994	1.207	-0.459	0.401	0.003	0.520	0.0486
1995	1.270	1.293	0.228	0.384	0.335	0.0361
1996	1.778	3.265	0.260	0.224	0.630	0.0995
1997	1.458	2.024	0.268	0.193	0.550	0.0753
1998	-0.490	-1.467	0.325	0.047	0.390	0.0261
1999	0.512	-0.612	0.231	0.448	0.270	0.0171
2000	1.997	4.562	0.352	0.019	0.250	0.0165
2001	-1.332E-015	1.500	0.250	0.432	0.120	0.00380
2002	-2.000	4.000	0.441	0.006	0.0700	0.00130
2003	1.293	2.917	0.372	0.022	0.110	0.00290

Chlorophyll a

Figure 98 presents the seasonal mean chlorophyll *a* trend in Lake Algonquin, while Table 77 presents descriptive statistics for chlorophyll *a* in Lake Algonquin. The chlorophyll *a* in Lake Algonquin exhibited an increasing trend from 1998 to 2001. The chlorophyll *a* in Lake Algonquin was generally slightly higher than the county average, though this difference was not statistically significant.

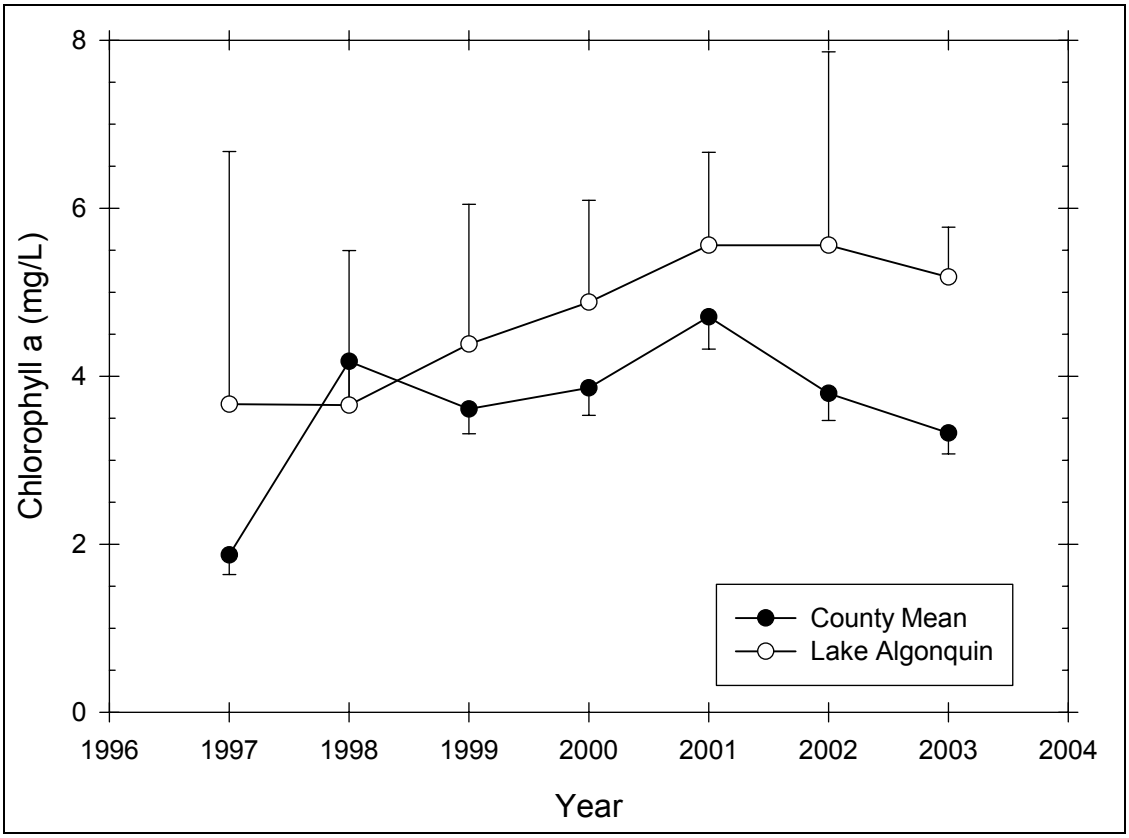


Figure 98 Seasonal mean chlorophyll a trend in Lake Algonquin

Table 77 – Descriptive Statistics for Chlorophyll a in Lake Algonquin

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	3.668	2.866	1.170	3.008
1998	6	0	3.655	1.755	0.717	1.842
1999	6	2	4.383	1.046	0.523	1.665
2000	6	0	4.882	1.155	0.472	1.212
2001	6	2	5.560	0.695	0.347	1.106
2002	6	2	5.560	1.447	0.724	2.303
2003	6	2	5.180	0.374	0.187	0.595
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	8.450	9.130	0.680	2.895	2.620	3.790
1998	4.280	6.200	1.920	2.930	2.480	5.470
1999	2.420	5.880	3.460	4.095	3.720	5.045
2000	2.620	6.140	3.520	5.100	3.530	5.900
2001	1.520	6.390	4.870	5.490	4.995	6.125
2002	3.440	7.050	3.610	5.790	4.560	6.560
2003	0.750	5.510	4.760	5.225	4.865	5.495
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	1.709	3.827	0.316	0.061	22.010	121.814
1998	0.801	-1.461	0.260	0.225	21.930	95.560
1999	1.456	2.566	0.315	0.175	17.530	80.111
2000	-0.340	-2.129	0.212	0.472	29.290	149.655
2001	0.368	-2.823	0.237	0.491	22.240	125.103

2002	-0.874	1.275	0.236	0.493	22.240	129.940
2003	-0.260	-4.457	0.289	0.267	20.720	107.749

Transparency

Figure 99 presents the seasonal mean transparency trend in Lake Algonquin, while Table 78 presents descriptive statistics for transparency in Lake Algonquin. The transparency in Lake Algonquin did not exhibit any discernible trend. The transparency in Lake Algonquin was significantly lower than the county average.

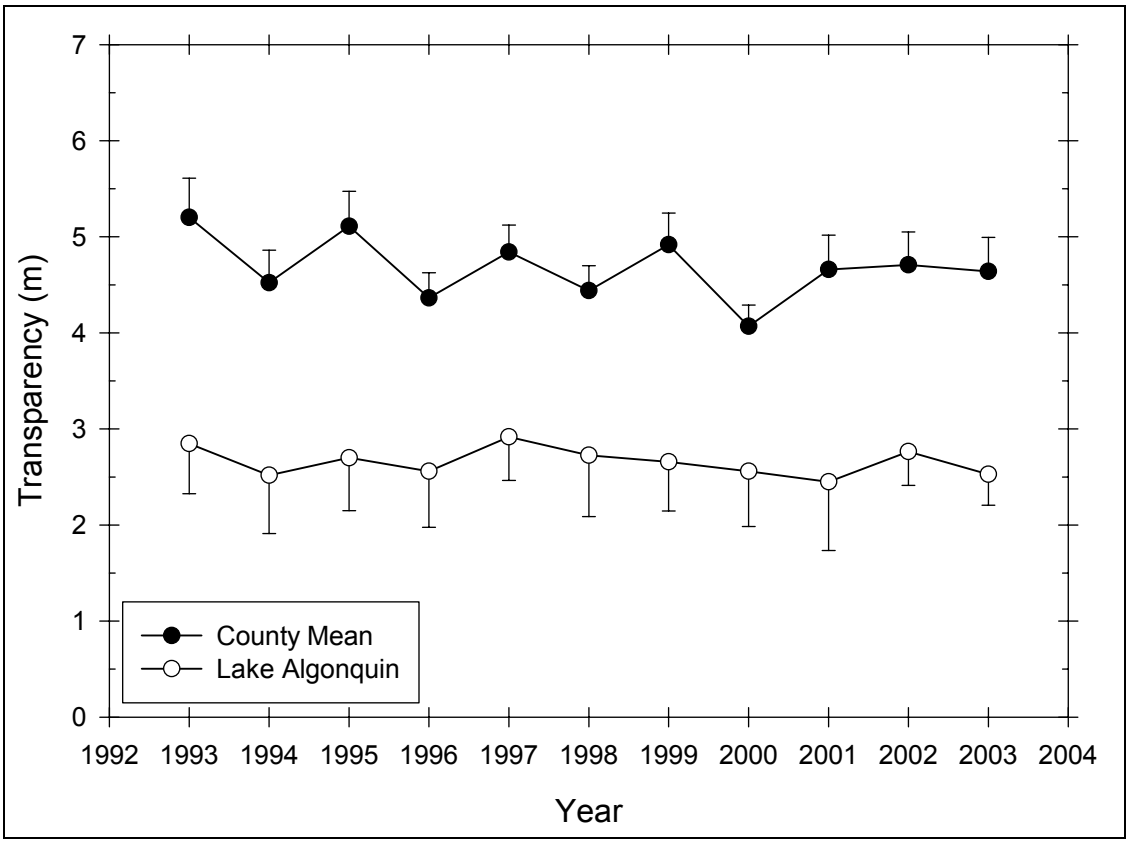


Figure 99 Seasonal mean transparency trend in Lake Algonquin

Table 78 – Descriptive Statistics for Transparency in Lake Algonquin

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	2.848	0.421	0.188	0.522
1994	6	0	2.517	0.578	0.236	0.606
1995	6	0	2.700	0.524	0.214	0.550
1996	6	0	2.558	0.556	0.227	0.584
1997	6	0	2.917	0.432	0.176	0.453
1998	6	0	2.725	0.608	0.248	0.638
1999	5	0	2.658	0.413	0.185	0.513
2000	6	0	2.558	0.548	0.224	0.575
2001	4	0	2.450	0.451	0.225	0.718
2002	4	0	2.763	0.221	0.111	0.352
2003	5	0	2.528	0.261	0.117	0.324

Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.060	3.180	2.120	3.030	2.690	3.067
1994	1.400	3.200	1.800	2.400	2.100	3.200
1995	1.400	3.300	1.900	2.825	2.300	3.050
1996	1.380	3.400	2.020	2.500	2.030	2.900
1997	1.200	3.450	2.250	2.910	2.680	3.300
1998	1.500	3.500	2.000	2.775	2.100	3.200
1999	1.060	3.260	2.200	2.580	2.350	2.953
2000	1.200	3.100	1.900	2.600	2.100	3.050
2001	1.100	3.000	1.900	2.450	2.150	2.750
2002	0.450	3.000	2.550	2.750	2.575	2.950
2003	0.600	2.900	2.300	2.400	2.330	2.750
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-1.889	3.797	0.330	0.079	14.240	41.263
1994	0.292	-1.646	0.215	0.458	15.100	39.670
1995	-0.604	-0.808	0.216	0.450	16.200	45.115
1996	0.535	-1.195	0.223	0.415	15.350	40.817
1997	-0.378	-0.144	0.164	0.712	17.500	51.974
1998	-0.0495	-1.912	0.181	0.639	16.350	46.403
1999	0.661	-0.203	0.175	0.693	13.290	36.007
2000	-0.116	-2.907	0.290	0.120	15.350	40.772
2001	-2.665E-015	1.256	0.206	0.614	9.800	24.620
2002	0.130	-4.773	0.269	0.350	11.050	30.672
2003	0.847	-1.430	0.288	0.187	12.640	32.226

TSI

Figure 100 presents the Carlson trophic state index trend in Lake Algonquin. Transparency TSI was in the mesotrophic range throughout the period, while chlorophyll *a* TSI was in the eutrophic range. Total phosphorus TSI exhibited a trend of decreasing values, beginning in the eutrophic range in 1993 and ending in the oligotrophic range by 2002.

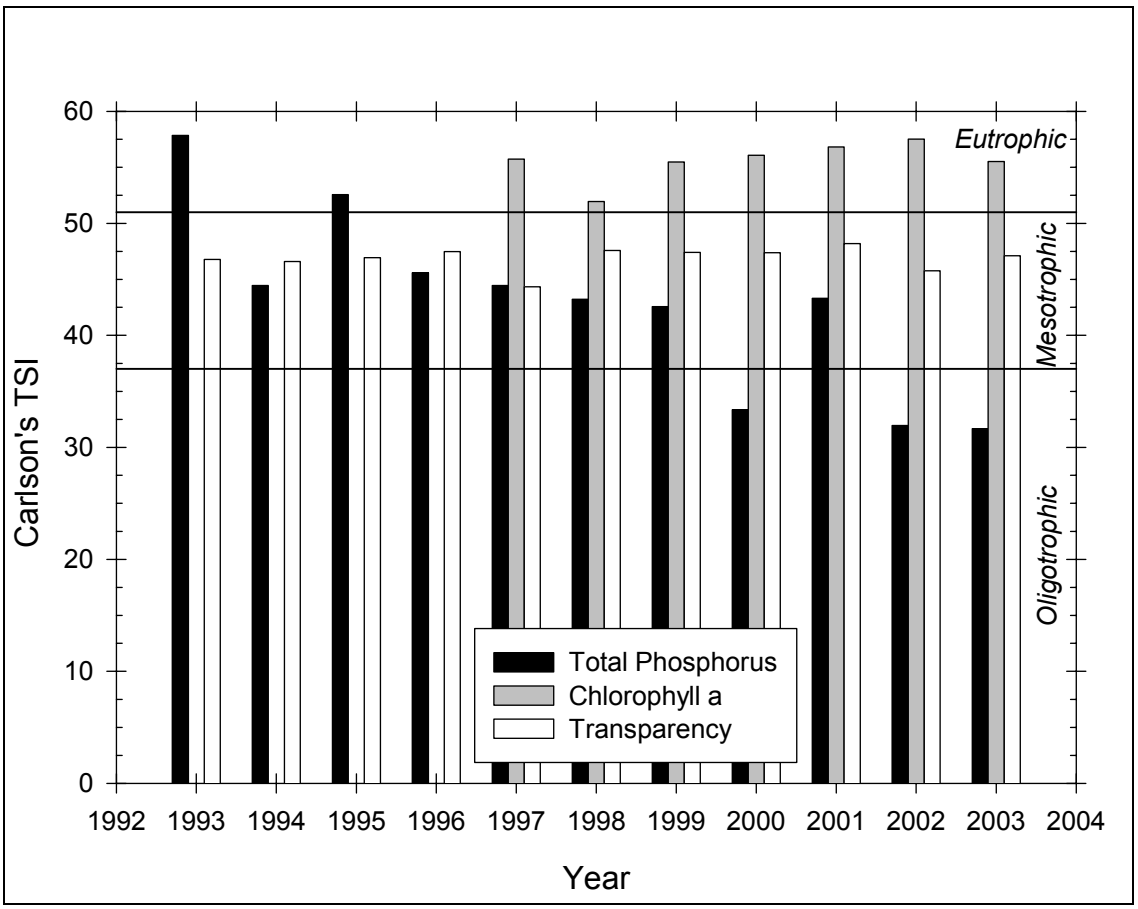


Figure 100 Carlson TSI trend in Lake Algonquin

Aluminum

Figure 101 presents the seasonal mean aluminum trend in Lake Algonquin, while Table 79 presents descriptive statistics for aluminum in Lake Algonquin. The aluminum in Lake Algonquin exhibited a general decreasing trend from 1997 to 2003. The aluminum in Lake Algonquin was similar to the county average.

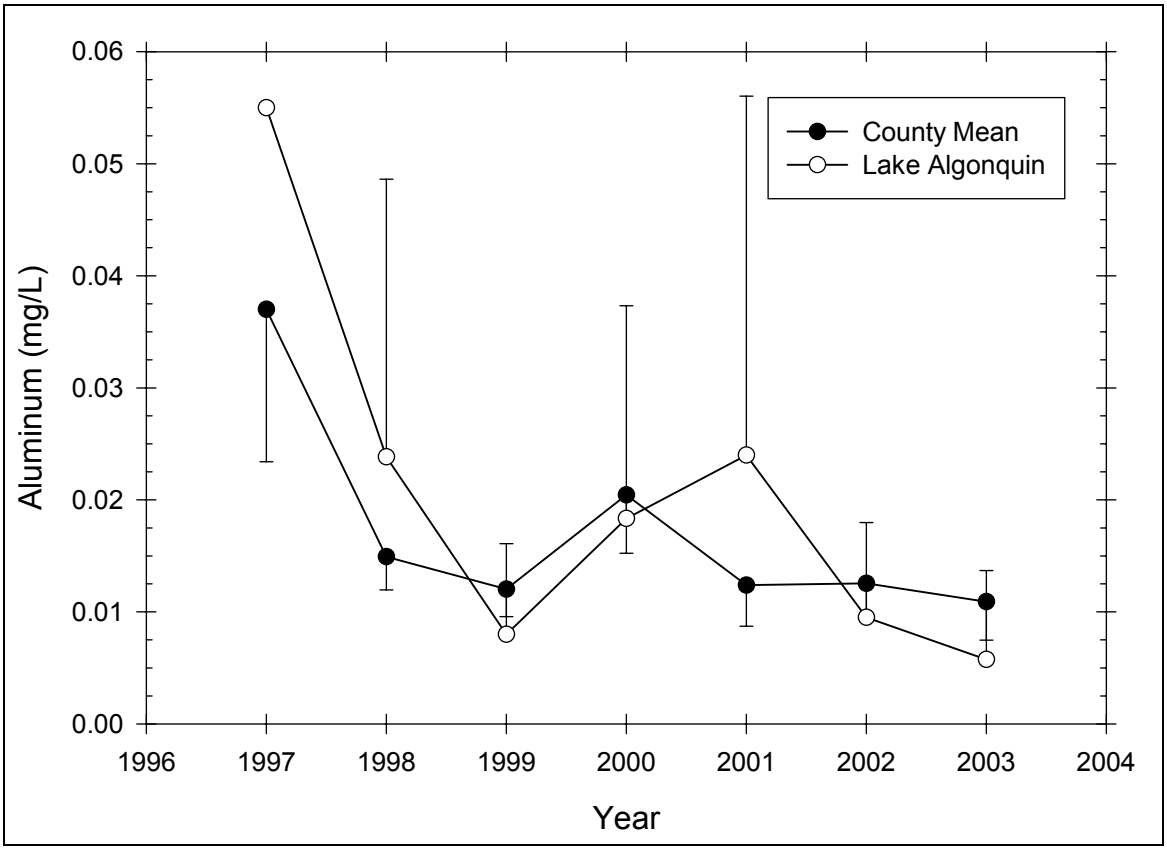


Figure 101 Seasonal mean aluminum trend in Lake Algonquin

Table 79 – Descriptive Statistics for Aluminum in Lake Algonquin

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0550	--	--	--
1998	6	0	0.0238	0.0236	0.00965	0.0248
1999	6	1	0.00800	0.00652	0.00292	0.00809
2000	6	0	0.0183	0.0181	0.00739	0.0190
2001	6	2	0.0240	0.0201	0.0101	0.0320
2002	6	2	0.00950	0.00532	0.00266	0.00847
2003	6	2	0.00575	0.00499	0.00250	0.00794
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0550	0.0550	0.0550	0.0550	0.0550
1998	0.0620	0.0710	0.00900	0.0160	0.00900	0.0220
1999	0.0170	0.0190	0.00200	0.00600	0.00425	0.0107
2000	0.0450	0.0490	0.00400	0.0110	0.00500	0.0300
2001	0.0480	0.0520	0.00400	0.0200	0.0120	0.0360
2002	0.0110	0.0150	0.00400	0.00950	0.00500	0.0140
2003	0.0110	0.0130	0.00200	0.00400	0.00250	0.00900
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0550	0.00302
1998	2.217	5.105	0.364	0.013	0.143	0.00620
1999	1.624	3.096	0.300	0.149	0.0400	0.000490
2000	1.149	0.316	0.269	0.188	0.110	0.00366
2001	1.129	2.227	0.329	0.138	0.0960	0.00352

2002	0.000	-4.655	0.245	0.456	0.0380	0.000446
2003	1.646	2.704	0.310	0.193	0.0230	0.000207

Calcium

Figure 102 presents the seasonal mean calcium trend in Lake Algonquin, while Table 80 presents descriptive statistics for calcium in Lake Algonquin. The calcium in Lake Algonquin exhibited an increasing trend throughout the period of record. The calcium in Lake Algonquin was slightly higher than the county average, though this difference was not statistically significant.

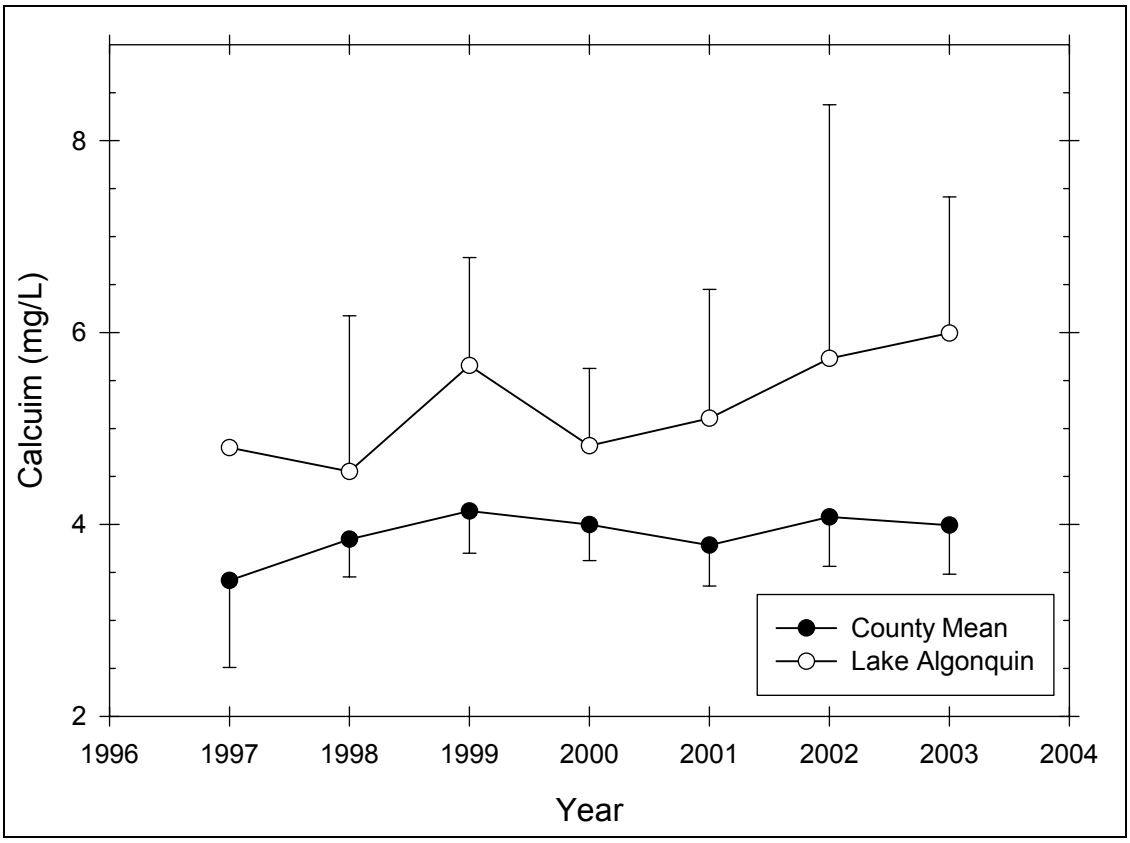


Figure 102 Seasonal mean calcium trend in Lake Algonquin

Table 80 – Descriptive Statistics for Calcium in Lake Algonquin

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	4.800	--	--	--
1998	6	0	4.552	1.545	0.631	1.622
1999	6	1	5.656	0.906	0.405	1.125
2000	6	0	4.818	0.769	0.314	0.807
2001	6	2	5.105	0.845	0.422	1.344
2002	6	2	5.730	1.661	0.831	2.644
2003	6	2	5.992	0.892	0.446	1.420
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	4.800	4.800	4.800	4.800	4.800
1998	4.260	6.210	1.950	4.535	4.090	5.990

1999	2.120	6.160	4.040	6.040	5.495	6.085
2000	2.240	6.210	3.970	4.680	4.410	4.960
2001	1.960	5.880	3.920	5.310	4.535	5.675
2002	3.080	7.260	4.180	5.740	4.295	7.165
2003	2.040	6.880	4.840	6.125	5.310	6.675
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	4.800	23.040
1998	-0.827	0.832	0.216	0.452	27.310	136.248
1999	-2.207	4.899	0.440	0.002	28.280	163.233
2000	1.311	2.393	0.260	0.225	28.910	142.252
2001	-1.272	1.895	0.271	0.339	20.420	106.384
2002	-0.00526	-5.840	0.290	0.263	22.920	139.613
2003	-0.687	-0.682	0.204	0.621	23.970	146.029

Calcite Saturation Index

Figure 103 presents the calcite saturation index trend in Lake Algonquin. The CSI in Lake Algonquin was variable throughout the period of record, but remained within the low vulnerability to acid deposition range. The CSI in Lake Algonquin was generally slightly lower than the county average, though this difference was not statistically significant.

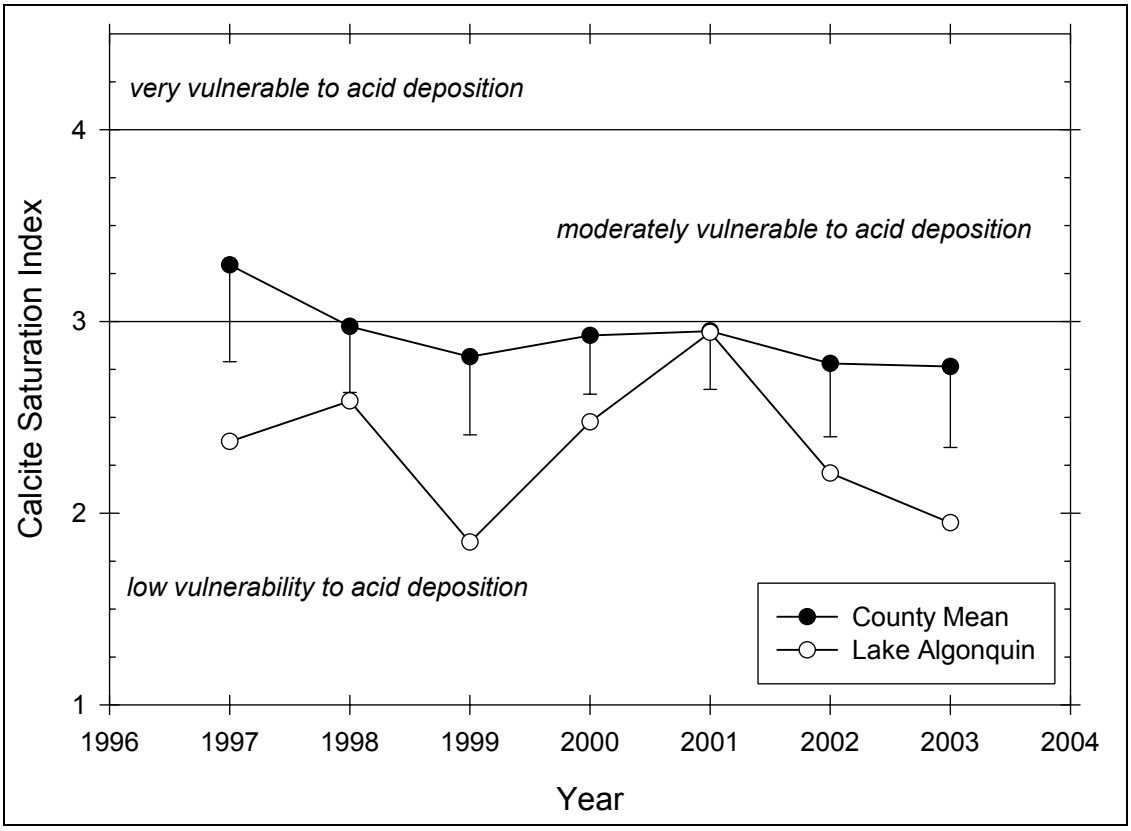
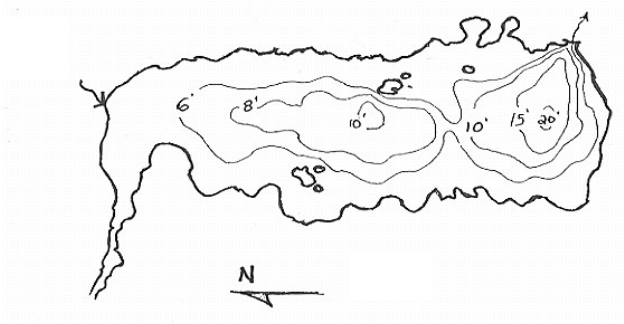


Figure 103 Seasonal mean CSI trend in Lake Algonquin

Lake Durant

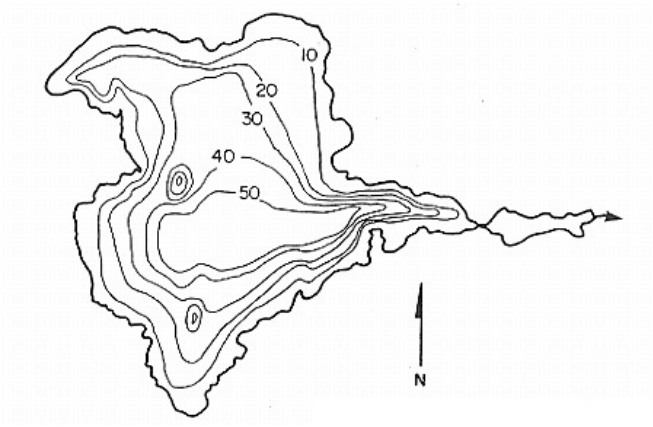
Location
Pond Number: 050645A
Watershed: Upper Hudson River
County: Hamilton
Topographic Quadrangle: Blue Mountain
Sample Site
Latitude: 43o 50.260'
Longitude: 74o 23.030'
Morphometry
Surface Area: 320 Ac.
Mean Depth: 9.3 Ft.
Maximum Depth: 20 Ft.
Volume: 2,970 Ac./Ft.
Watershed Area: 9,759 Ac.
Hydraulic Retention Time: 0.06 Yr.
Shoreline Length: 5.5 Mi.
Elevation: 1,768 Ft.
Water Quality Classification: C
Trophic State: Mesotrophic



Lake Durant was dropped from the Hamilton Lake program following the 1997 season. An analysis of Lake Durant was included in the 5-year trend report.

Lake Eaton

Location
Pond Number: 060248
Watershed: St. Lawrence River
County: Hamilton
Topographic Quadrangle: Blue Mountain
Sample Site
Latitude: 43o 58.662'
Longitude: 74o 27.837'
Morphometry
Surface Area: 556 Ac.
Mean Depth: 26 Ft.
Maximum Depth: 56 Ft.
Volume: 14,456 Ac./Ft.
Watershed Area: 3,157 Ac.
Hydraulic Retention Time: 2.0 Yr.
Shoreline Length: 4.8 Mi.
Elevation: 1,721 Ft.
Water Quality Classification: AA (T)
Trophic State: Oligotrophic



Temperature and Dissolved Oxygen

Lake Eaton had a minimum DO of 0.2 mg/L (September 1998), with a minimum temperature of 6.0°C and a maximum temperature of 24.9°C. In general, the lowest DO values occurred during the months of August through September.

pH

Figure 104 presents the seasonal mean pH trend in Lake Eaton, while Table 81 presents descriptive statistics for pH in Lake Eaton. The pH in Lake Eaton exhibited an increasing trend from 1996 to 2002. The pH in Lake Eaton was similar to the county average.

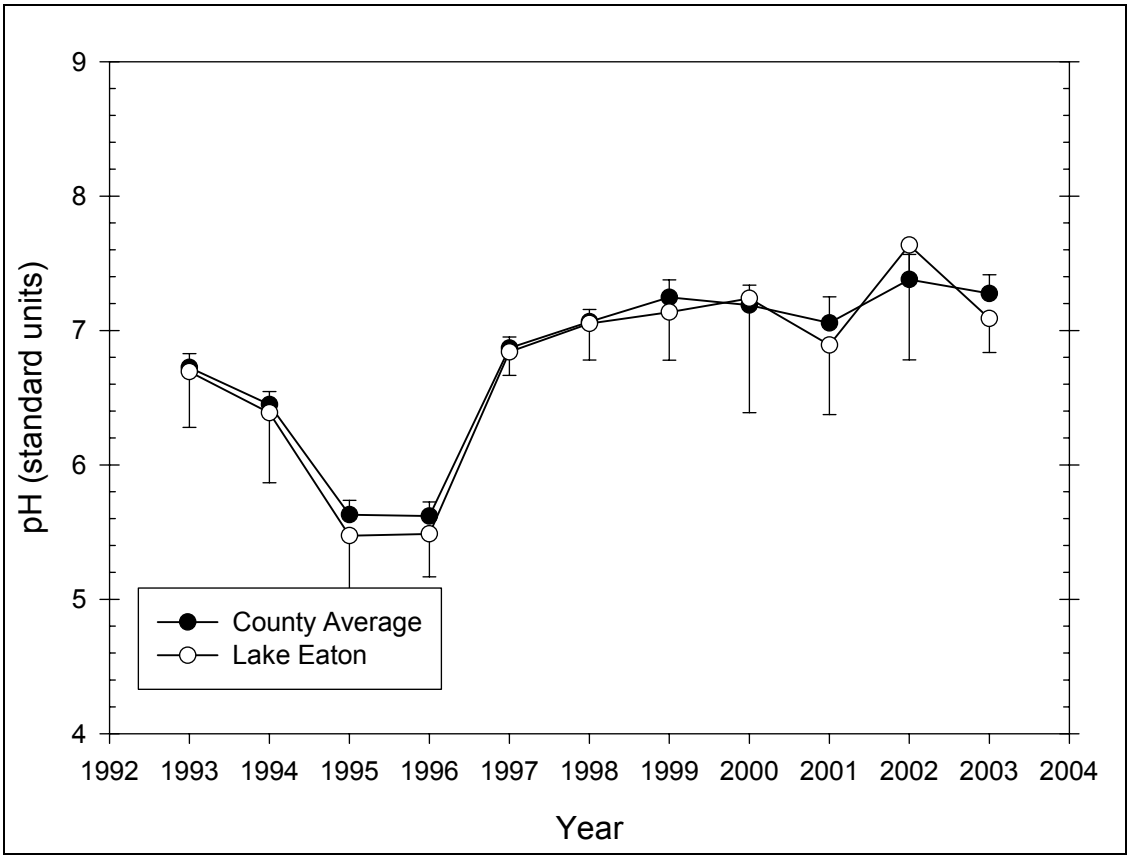


Figure 104 Seasonal mean pH trend in Lake Eaton

Table 81 – Descriptive Statistics for pH in Lake Eaton

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	6.694	0.334	0.149	0.415
1994	6	0	6.388	0.496	0.203	0.521
1995	6	0	5.473	0.399	0.163	0.419
1996	6	0	5.487	0.303	0.124	0.318
1997	6	0	6.840	0.166	0.0677	0.174
1998	6	0	7.052	0.258	0.105	0.271
1999	5	0	7.136	0.287	0.128	0.356
2000	5	0	7.240	0.685	0.306	0.850

2001	4	0	6.893	0.325	0.162	0.517
2002	4	0	7.635	0.536	0.268	0.853
2003	4	0	7.090	0.160	0.0799	0.254
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.830	7.170	6.340	6.760	6.393	6.885
1994	1.410	6.980	5.570	6.480	6.100	6.720
1995	1.080	5.970	4.890	5.490	5.180	5.820
1996	0.760	5.820	5.060	5.520	5.240	5.760
1997	0.440	7.100	6.660	6.830	6.680	6.940
1998	0.680	7.440	6.760	6.955	6.910	7.290
1999	0.680	7.480	6.800	7.070	6.913	7.405
2000	1.580	7.900	6.320	7.610	6.612	7.720
2001	0.760	7.350	6.590	6.815	6.680	7.105
2002	1.200	8.420	7.220	7.450	7.310	7.960
2003	0.390	7.290	6.900	7.085	6.985	7.195
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.467	-0.599	0.202	0.586	33.470	224.494
1994	-0.803	0.572	0.224	0.406	38.330	246.095
1995	-0.281	-0.761	0.153	0.743	32.840	180.540
1996	-0.347	-1.665	0.193	0.577	32.920	181.081
1997	0.565	-0.355	0.166	0.704	41.040	280.851
1998	0.739	-0.897	0.276	0.163	42.310	298.689
1999	0.186	-2.203	0.202	0.587	35.680	254.942
2000	-0.668	-2.120	0.305	0.133	36.200	263.964
2001	1.286	2.158	0.290	0.263	27.570	190.343
2002	1.718	3.170	0.349	0.092	30.540	234.035
2003	0.185	1.345	0.225	0.540	28.360	201.149

Alkalinity

Figure 105 presents the seasonal mean alkalinity trend in Lake Eaton, while Table 82 presents descriptive statistics for alkalinity in Lake Eaton. The alkalinity in Lake Eaton exhibited a slight general increasing trend. The alkalinity in Lake Eaton was slightly lower than the county average, though this difference may not be statistically significant for all years.

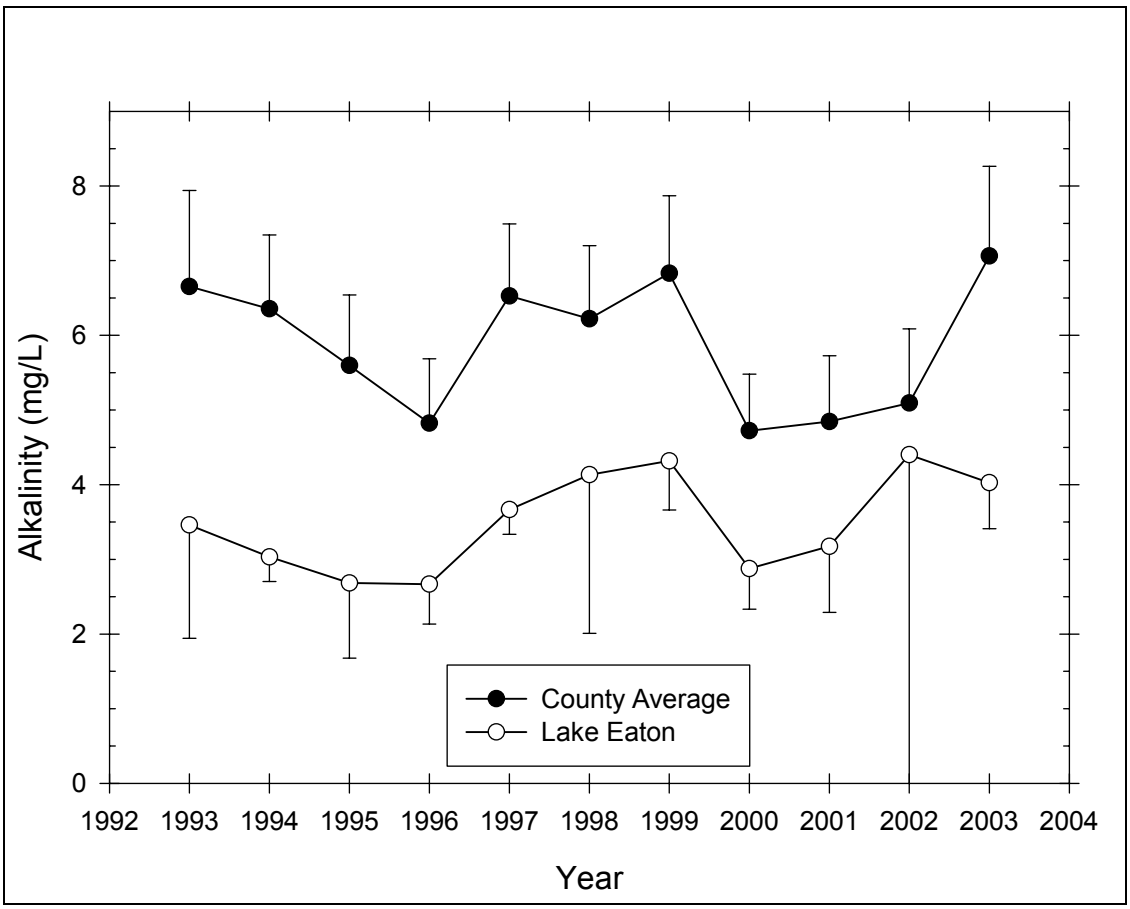


Figure 105 Seasonal mean alkalinity trend in Lake Eaton

Table 82 – Descriptive Statistics for Alkalinity in Lake Eaton

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	3.460	1.222	0.546	1.517
1994	6	0	3.033	0.314	0.128	0.330
1995	6	0	2.683	0.958	0.391	1.005
1996	6	0	2.667	0.509	0.208	0.534
1997	6	0	3.667	0.314	0.128	0.330
1998	6	0	4.133	2.023	0.826	2.123
1999	6	1	4.320	0.531	0.237	0.659
2000	6	2	2.875	0.340	0.170	0.542
2001	6	2	3.175	0.556	0.278	0.885
2002	6	2	4.400	2.832	1.416	4.506
2003	6	2	4.025	0.386	0.193	0.615
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	2.900	4.200	1.300	4.000	3.100	4.125
1994	0.800	3.600	2.800	2.900	2.800	3.200
1995	2.800	3.700	0.900	2.850	2.600	3.200
1996	1.300	3.300	2.000	2.600	2.300	3.200
1997	0.700	4.000	3.300	3.700	3.300	4.000
1998	5.300	7.900	2.600	3.450	2.700	4.700
1999	1.400	5.100	3.700	4.300	3.925	4.650
2000	0.700	3.300	2.600	2.800	2.600	3.150

2001	1.200	4.000	2.800	2.950	2.850	3.500
2002	6.200	8.600	2.400	3.300	2.850	5.950
2003	0.900	4.400	3.500	4.100	3.750	4.300
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-2.110	4.519	0.378	0.019	17.300	65.830
1994	1.514	1.691	0.331	0.039	18.200	55.700
1995	-1.519	3.113	0.299	0.097	16.100	47.790
1996	0.127	-1.457	0.186	0.615	16.000	43.960
1997	-0.237	-1.875	0.212	0.476	22.000	81.160
1998	1.639	2.679	0.229	0.379	24.800	122.960
1999	0.582	0.322	0.167	0.714	21.600	94.440
2000	0.628	-2.492	0.290	0.261	11.500	33.410
2001	1.872	3.577	0.374	0.053	12.700	41.250
2002	1.862	3.607	0.401	0.024	17.600	101.500
2003	-1.002	0.984	0.224	0.544	16.100	65.250

Total Phosphorus

Figure 106 presents the seasonal mean total phosphorus trend in Lake Eaton, while Table 83 presents descriptive statistics for total phosphorus in Lake Eaton. The total phosphorus in Lake Eaton exhibited a general decreasing trend. The total phosphorus in Lake Eaton was similar to the county average.

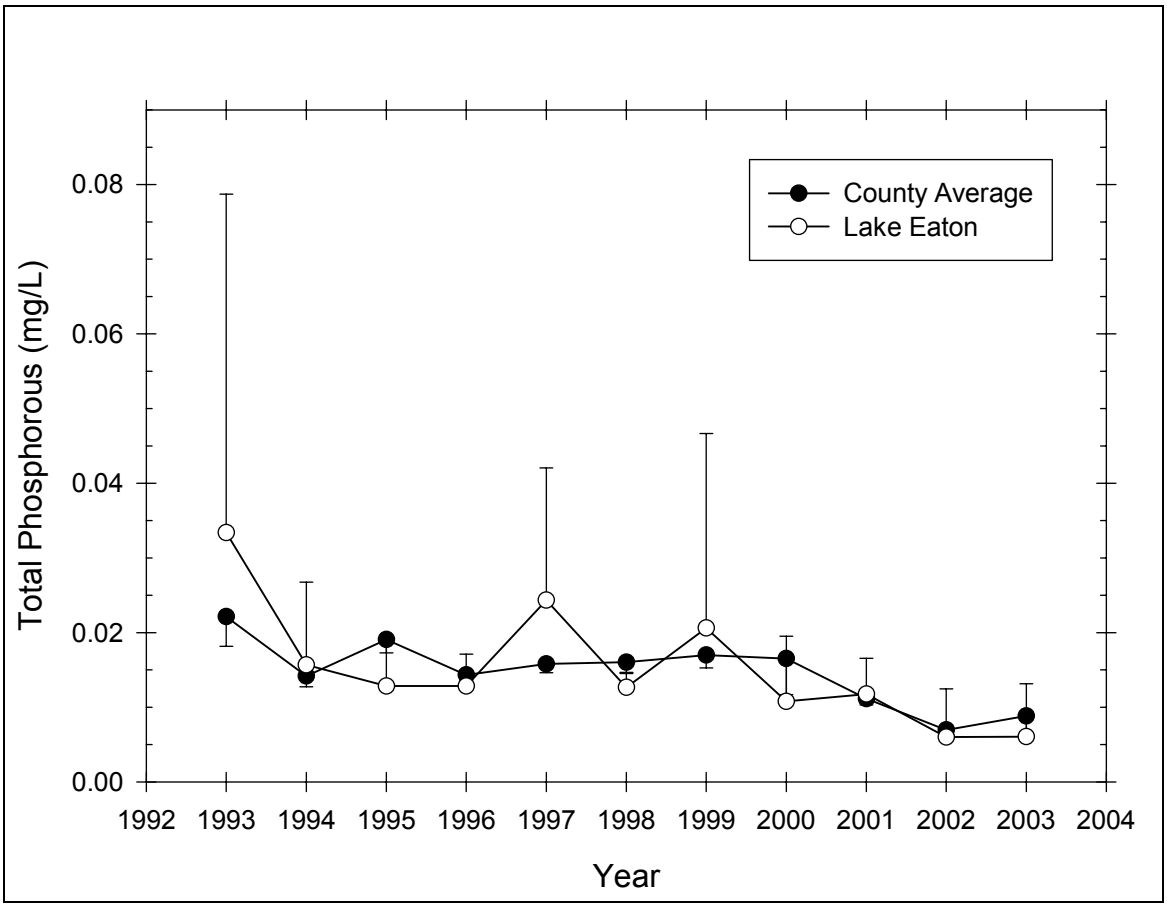


Figure 106 Seasonal mean total phosphorus trend in Lake Eaton

Table 83 – Descriptive Statistics for Total Phosphorus in Lake Eaton

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0334	0.0365	0.0163	0.0453
1994	6	0	0.0157	0.0106	0.00432	0.0111
1995	6	0	0.0128	0.00542	0.00221	0.00569
1996	6	0	0.0128	0.00407	0.00166	0.00427
1997	6	0	0.0243	0.0169	0.00689	0.0177
1998	6	0	0.0127	0.00175	0.000715	0.00184
1999	6	1	0.0206	0.0210	0.00939	0.0261
2000	6	1	0.0108	0.00701	0.00314	0.00871
2001	6	2	0.0118	0.00301	0.00150	0.00478
2002	6	2	0.00600	0.00406	0.00203	0.00646
2003	6	2	0.00605	0.00446	0.00223	0.00710
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0890	0.0940	0.00500	0.0140	0.0110	0.0543
1994	0.0280	0.0370	0.00900	0.0115	0.0110	0.0140
1995	0.0140	0.0210	0.00700	0.0125	0.00800	0.0160
1996	0.0110	0.0210	0.01000	0.0115	0.0110	0.0120
1997	0.0450	0.0550	0.01000	0.0185	0.0120	0.0320
1998	0.00500	0.0160	0.0110	0.0120	0.0120	0.0130
1999	0.0500	0.0580	0.00800	0.0120	0.0110	0.0243
2000	0.0180	0.0190	0.001000	0.0120	0.00550	0.0160
2001	0.00670	0.0160	0.00930	0.0109	0.00965	0.0139
2002	0.00940	0.0117	0.00230	0.00500	0.00325	0.00875
2003	0.00950	0.01000	0.000500	0.00685	0.00245	0.00965
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.579	2.179	0.302	0.142	0.167	0.0109
1994	2.321	5.510	0.396	0.004	0.0940	0.00203
1995	0.476	-1.105	0.199	0.545	0.0770	0.00113
1996	2.262	5.320	0.414	0.002	0.0770	0.00107
1997	1.500	1.982	0.291	0.118	0.146	0.00498
1998	1.763	3.559	0.315	0.064	0.0760	0.000978
1999	2.188	4.841	0.441	0.002	0.103	0.00389
2000	-0.445	-0.633	0.168	0.712	0.0540	0.000780
2001	1.340	1.424	0.247	0.447	0.0471	0.000582
2002	1.282	1.872	0.270	0.346	0.0240	0.000193
2003	-0.597	-2.459	0.267	0.358	0.0242	0.000206

Nitrate

Figure 107 presents the seasonal mean nitrate trend in Lake Eaton, while Table 84 presents descriptive statistics for nitrate in Lake Eaton. The nitrate in Lake Eaton exhibited a decreasing trend from 1997 to 2002. The nitrate in Lake Eaton was slightly lower than the county average, though this difference was not statistically significant.

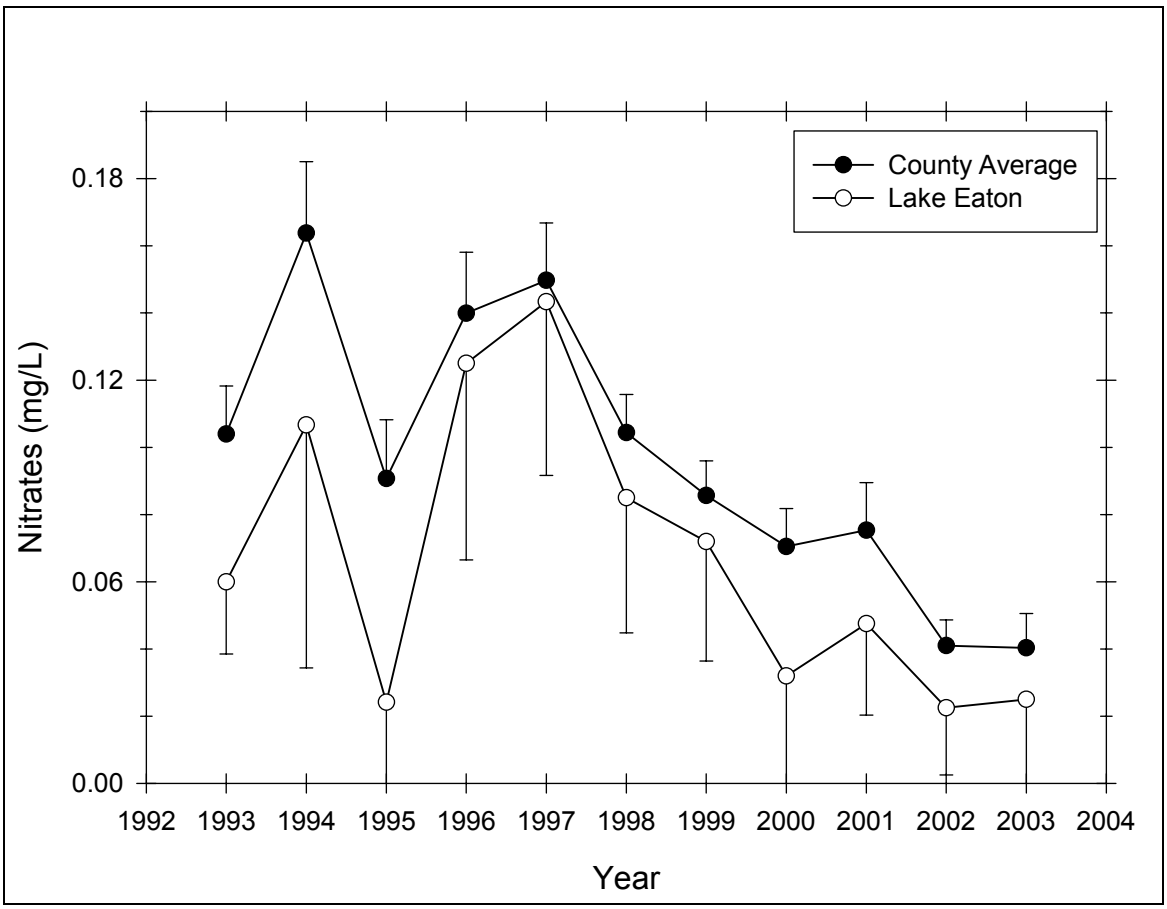


Figure 107 Seasonal mean nitrate trend in Lake Eaton

Table 84 – Descriptive Statistics for Nitrate in Lake Eaton

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0600	0.0173	0.00775	0.0215
1994	6	0	0.107	0.0689	0.0281	0.0723
1995	6	0	0.0242	0.0287	0.0117	0.0301
1996	6	0	0.125	0.0558	0.0228	0.0585
1997	6	0	0.143	0.0493	0.0201	0.0517
1998	6	0	0.0850	0.0383	0.0157	0.0402
1999	6	1	0.0720	0.0286	0.0128	0.0356
2000	6	1	0.0320	0.0277	0.0124	0.0345
2001	6	2	0.0475	0.0171	0.00854	0.0272
2002	6	2	0.0225	0.0126	0.00629	0.0200
2003	6	2	0.0250	0.0238	0.0119	0.0379
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0400	0.0900	0.0500	0.0500	0.0500	0.0675
1994	0.170	0.200	0.0300	0.0900	0.0500	0.180
1995	0.0700	0.0700	0.000	0.01000	0.00500	0.0500
1996	0.140	0.210	0.0700	0.110	0.0800	0.170
1997	0.120	0.200	0.0800	0.155	0.0900	0.180
1998	0.0900	0.140	0.0500	0.0750	0.0500	0.120
1999	0.0700	0.110	0.0400	0.0700	0.0475	0.0950
2000	0.0700	0.0800	0.01000	0.0200	0.0175	0.0425

2001	0.0400	0.0700	0.0300	0.0450	0.0350	0.0600
2002	0.0300	0.0400	0.01000	0.0200	0.0150	0.0300
2003	0.0500	0.0500	0.000	0.0250	0.00500	0.0450
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.925	3.667	0.318	0.101	0.300	0.0192
1994	0.519	-1.595	0.262	0.216	0.640	0.0920
1995	1.099	-0.670	0.356	0.017	0.145	0.00763
1996	0.701	-1.108	0.235	0.347	0.750	0.109
1997	-0.390	-1.875	0.206	0.509	0.860	0.135
1998	0.575	-1.701	0.243	0.306	0.510	0.0507
1999	0.307	-1.544	0.179	0.681	0.360	0.0292
2000	1.881	3.773	0.329	0.082	0.160	0.00820
2001	0.753	0.343	0.192	0.657	0.190	0.00990
2002	1.129	2.227	0.329	0.138	0.0900	0.00250
2003	5.921E-016	-4.339	0.236	0.495	0.1000	0.00420

Chlorophyll a

Figure 108 presents the seasonal mean chlorophyll *a* trend in Lake Eaton, while Table 85 presents descriptive statistics for chlorophyll *a* in Lake Eaton. The chlorophyll *a* in Lake Eaton exhibited an increasing trend from 1997 to 2001, followed by a decreasing trend from 2001 to 2003. The chlorophyll *a* in Lake Eaton was slightly lower than the county average, though this difference was not statistically significant.

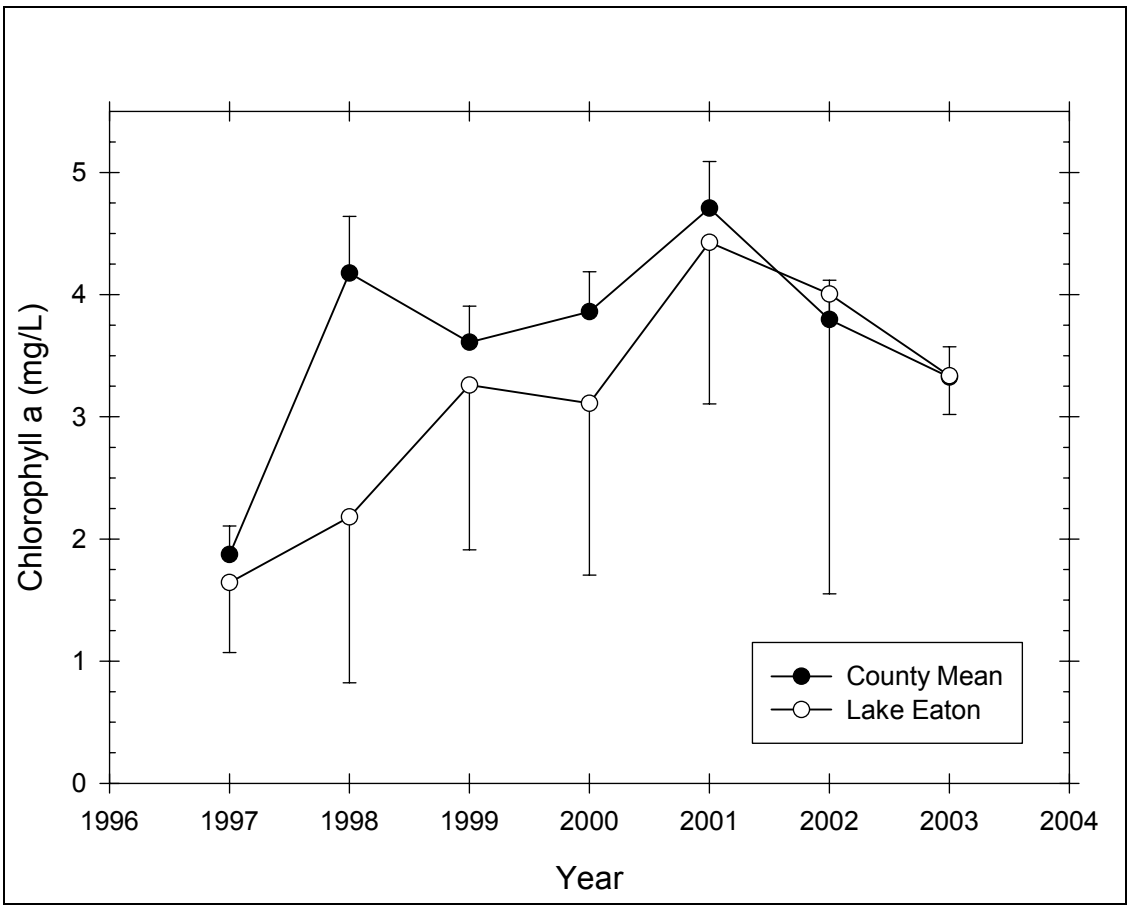


Figure 108 Seasonal mean chlorophyll a trend in Lake Eaton

Table 85 – Descriptive Statistics for Chlorophyll a in Lake Eaton

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	1.643	0.546	0.223	0.573
1998	6	0	2.180	1.294	0.528	1.358
1999	6	1	3.260	1.086	0.486	1.349
2000	6	1	3.110	1.133	0.507	1.406
2001	6	2	4.427	0.830	0.415	1.321
2002	6	2	4.005	1.542	0.771	2.454
2003	6	2	3.335	0.198	0.0991	0.315
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	1.210	2.250	1.040	1.570	1.220	2.210
1998	3.580	4.630	1.050	1.790	1.380	2.440
1999	2.670	4.560	1.890	3.660	2.280	3.975
2000	2.570	4.410	1.840	2.800	2.208	4.230
2001	1.660	5.220	3.560	4.465	3.720	5.135
2002	3.330	6.180	2.850	3.495	2.910	5.100
2003	0.420	3.470	3.050	3.410	3.200	3.470
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	0.102	-2.764	0.281	0.146	9.860	17.691
1998	1.739	3.289	0.254	0.254	13.080	36.886
1999	-0.255	-1.716	0.244	0.381	16.300	57.858

2000	0.240	-2.607	0.225	0.474	15.550	53.491
2001	-0.0909	-5.075	0.273	0.330	17.710	80.479
2002	1.388	1.408	0.249	0.437	16.020	71.296
2003	-1.560	2.173	0.280	0.302	13.340	44.607

Transparency

Figure 109 presents the seasonal mean transparency trend in Lake Eaton, while Table 86 presents descriptive statistics for transparency in Lake Eaton. The transparency in Lake Eaton exhibited no distinct trend. The transparency in Lake Eaton was slightly higher than the county average, though this difference was not statistically significant.

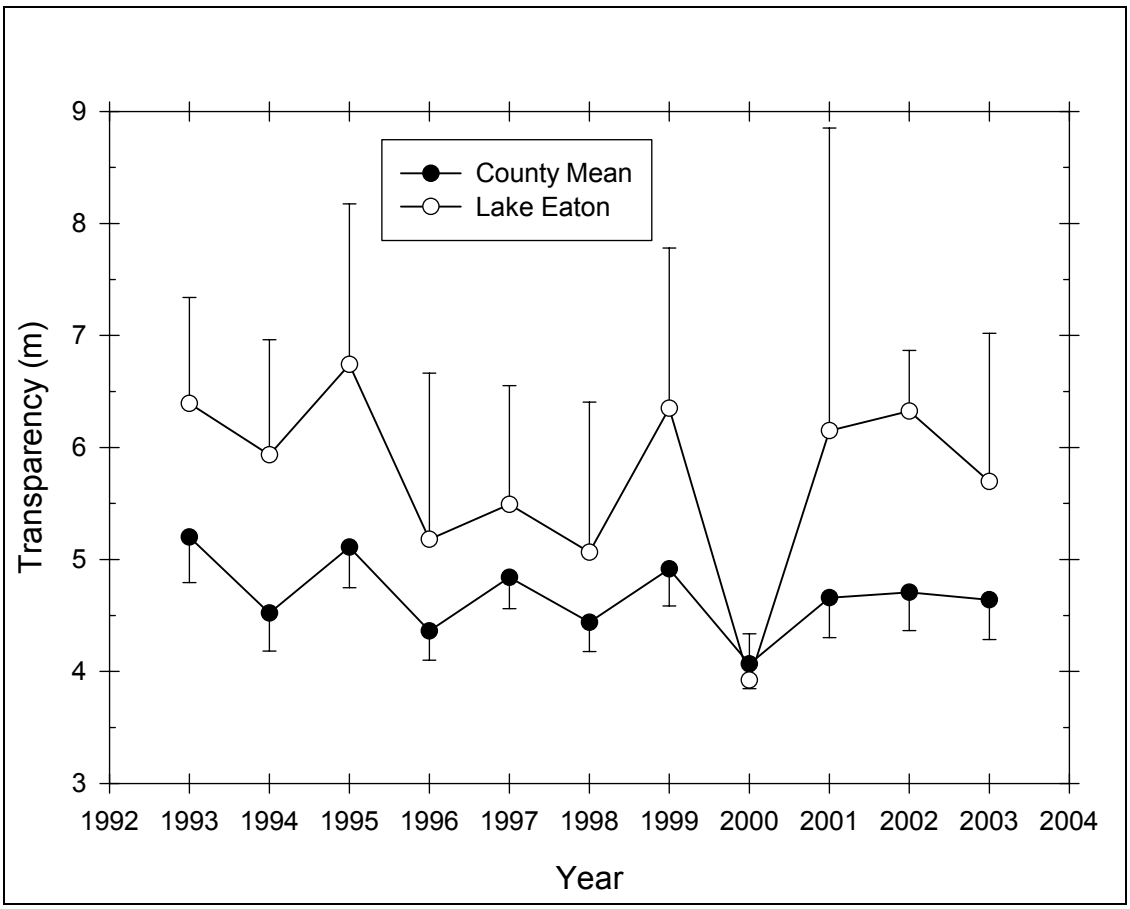


Figure 109 Seasonal mean transparency trend in Lake Eaton

Table 86 – Descriptive Statistics for Transparency in Lake Eaton

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	6.394	0.761	0.340	0.945
1994	6	0	5.933	0.981	0.401	1.030
1995	6	0	6.742	1.365	0.557	1.433
1996	6	0	5.180	1.415	0.577	1.484
1997	6	0	5.492	1.011	0.413	1.061
1998	6	0	5.065	1.278	0.522	1.341

1999	5	0	6.350	1.151	0.515	1.430
2000	5	0	3.924	0.332	0.149	0.412
2001	4	0	6.150	1.698	0.849	2.702
2002	4	0	6.325	0.340	0.170	0.542
2003	4	0	5.695	0.833	0.416	1.325
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.820	7.270	5.450	6.670	5.683	6.933
1994	2.300	7.200	4.900	5.850	4.900	6.900
1995	4.050	8.650	4.600	6.700	6.300	7.500
1996	3.470	7.150	3.680	5.115	3.730	6.290
1997	2.680	6.250	3.570	5.925	5.180	6.100
1998	3.580	6.350	2.770	5.225	4.800	6.020
1999	3.230	8.050	4.820	6.330	5.780	6.850
2000	0.890	4.300	3.410	3.900	3.777	4.158
2001	3.700	8.000	4.300	6.150	4.750	7.550
2002	0.800	6.800	6.000	6.250	6.100	6.550
2003	1.700	6.500	4.800	5.740	4.990	6.400
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.307	-2.107	0.242	0.392	31.970	206.734
1994	0.221	-1.914	0.187	0.610	35.600	216.040
1995	-0.302	0.743	0.207	0.506	40.450	282.023
1996	0.263	-1.666	0.181	0.642	31.080	170.999
1997	-1.826	3.242	0.316	0.061	32.950	186.065
1998	-1.295	1.986	0.251	0.265	30.390	162.088
1999	0.359	1.837	0.265	0.278	31.750	206.916
2000	-0.867	1.343	0.271	0.254	19.620	77.430
2001	1.295E-015	-3.454	0.212	0.591	24.600	159.940
2002	1.199	1.979	0.279	0.305	25.300	160.370
2003	-0.127	-4.725	0.266	0.360	22.780	131.812

TSI

Figure 110 presents the Carlson TSI trend in Lake Eaton. Transparency TSI was generally in the oligotrophic range, while chlorophyll *a* TSI was in the mesotrophic to eutrophic range. Total phosphorus TSI was generally in the low mesotrophic or oligotrophic range, with two excursions into the eutrophic range, in 1993 and 1997.

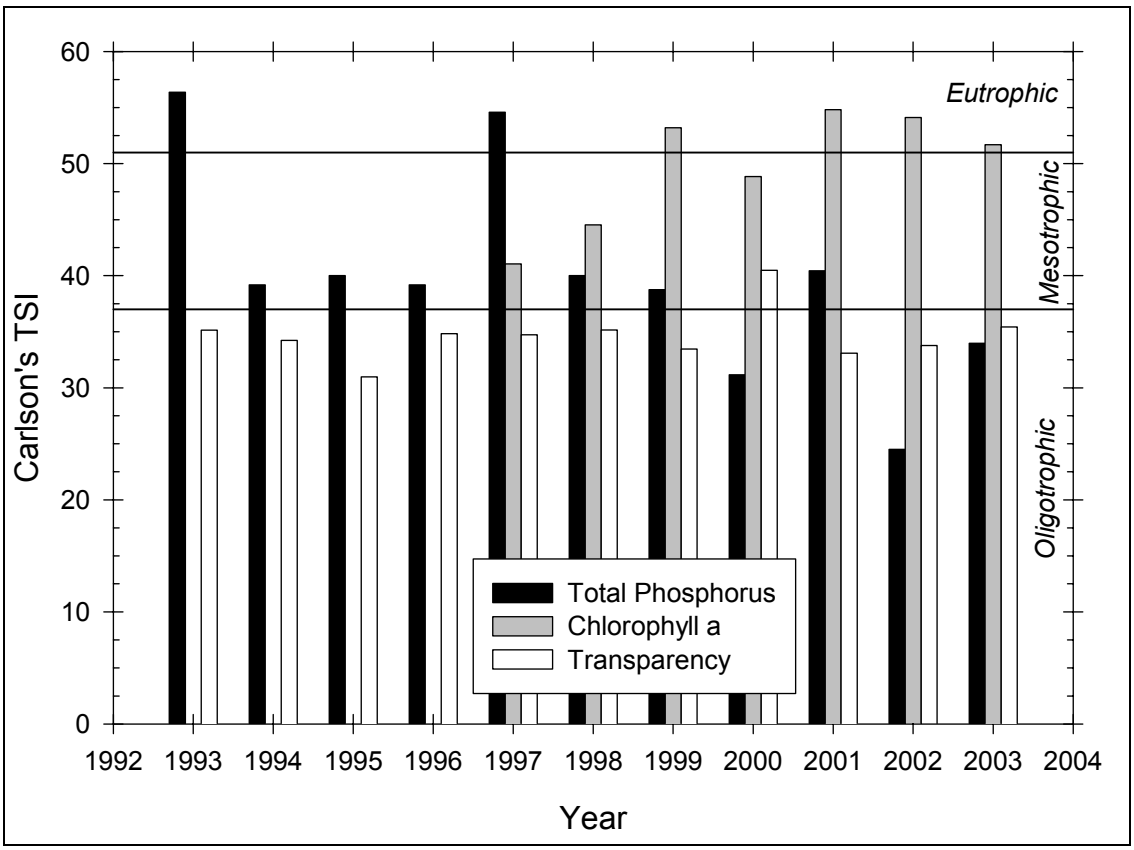


Figure 110 Carlson TSI trend in Lake Eaton

Aluminum

Figure 111 presents the seasonal mean aluminum trend in Lake Eaton, while Table 87 presents descriptive statistics for aluminum in Lake Eaton. The aluminum in Lake Eaton was generally low and somewhat variable. The aluminum in Lake Eaton was slightly lower than the county average, though this difference was not statistically significant.

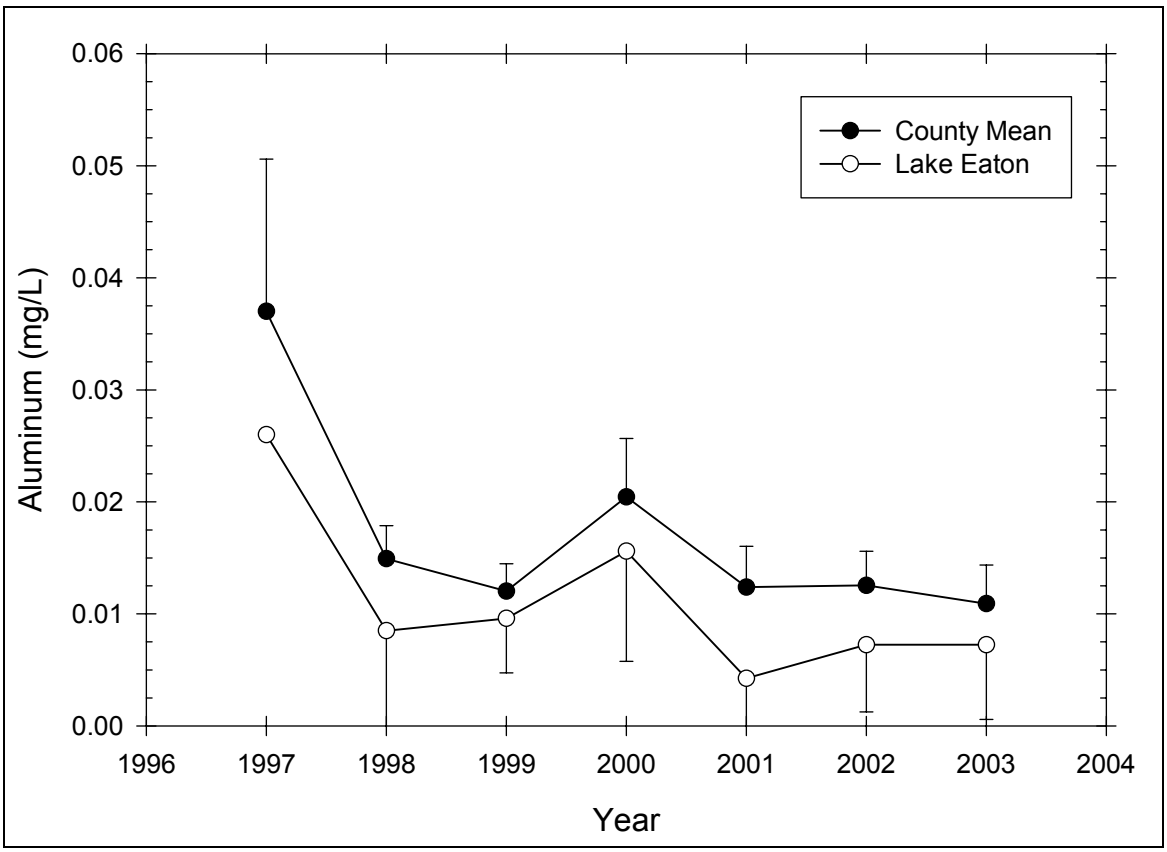


Figure 111 Seasonal mean aluminum trend in Lake Eaton

Table 87 – Descriptive Statistics for Aluminum in Lake Eaton

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0260	--	--	--
1998	6	0	0.00850	0.00853	0.00348	0.00895
1999	6	1	0.00960	0.00391	0.00175	0.00486
2000	6	1	0.0156	0.00792	0.00354	0.00984
2001	6	2	0.00425	0.00457	0.00229	0.00728
2002	6	2	0.00725	0.00377	0.00189	0.00601
2003	6	2	0.00725	0.00419	0.00210	0.00667
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0260	0.0260	0.0260	0.0260	0.0260
1998	0.0210	0.0220	0.001000	0.00500	0.00200	0.0160
1999	0.01000	0.0130	0.00300	0.01000	0.00825	0.0123
2000	0.0180	0.0250	0.00700	0.0170	0.00775	0.0220
2001	0.01000	0.0110	0.001000	0.00250	0.00150	0.00700
2002	0.00900	0.0110	0.00200	0.00800	0.00500	0.00950
2003	0.01000	0.0130	0.00300	0.00650	0.00450	0.01000
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0260	0.000676
1998	1.006	-0.717	0.282	0.143	0.0510	0.000797
1999	-1.631	3.023	0.341	0.059	0.0480	0.000522
2000	-0.0705	-2.464	0.231	0.444	0.0780	0.00147
2001	1.811	3.380	0.358	0.081	0.0170	0.000135

2002	-1.129	2.227	0.329	0.138	0.0290	0.000253
2003	1.007	1.829	0.274	0.328	0.0290	0.000263

Calcium

Figure 112 presents the seasonal mean calcium trend in Lake Eaton, while Table 88 presents descriptive statistics for calcium in Lake Eaton. The calcium in Lake Eaton was stable throughout the period of record. The calcium in Lake Eaton was significantly lower than the county average.

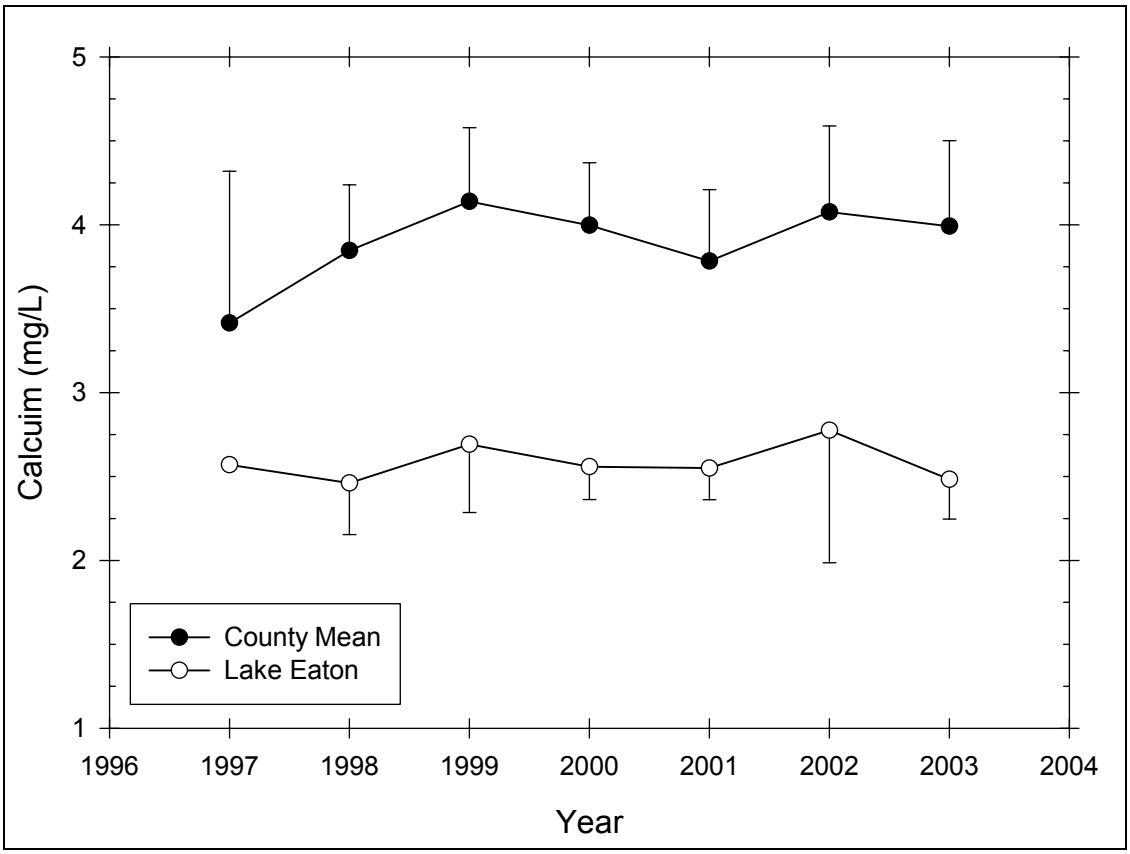


Figure 112 Seasonal mean calcium trend in Lake Eaton

Table 88 – Descriptive Statistics for Calcium in Lake Eaton

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	2.570	--	--	--
1998	6	0	2.462	0.293	0.120	0.308
1999	6	1	2.692	0.328	0.147	0.407
2000	6	1	2.558	0.157	0.0702	0.195
2001	6	2	2.550	0.118	0.0590	0.188
2002	6	2	2.775	0.496	0.248	0.789
2003	6	2	2.483	0.148	0.0742	0.236
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	2.570	2.570	2.570	2.570	2.570
1998	0.820	2.710	1.890	2.570	2.440	2.590
1999	0.710	3.050	2.340	2.740	2.362	2.982

2000	0.350	2.720	2.370	2.550	2.423	2.712
2001	0.250	2.720	2.470	2.505	2.470	2.630
2002	1.160	3.470	2.310	2.660	2.445	3.105
2003	0.340	2.620	2.280	2.515	2.375	2.590
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	2.570	6.605
1998	-1.984	4.291	0.304	0.088	14.770	36.788
1999	-0.139	-2.838	0.237	0.415	13.460	36.664
2000	-0.0564	-2.525	0.233	0.433	12.790	32.816
2001	1.576	2.247	0.284	0.287	10.200	26.052
2002	1.243	1.985	0.278	0.310	11.100	31.541
2003	-1.069	0.759	0.216	0.575	9.930	24.717

Calcite Saturation Index

Figure 113 presents the calcite saturation index trend in Lake Eaton. The CSI in Lake Eaton exhibited a general decreasing trend from 1997 to 2003. The CSI in Lake Eaton was slightly higher than the county average, though this difference was not statistically significant.

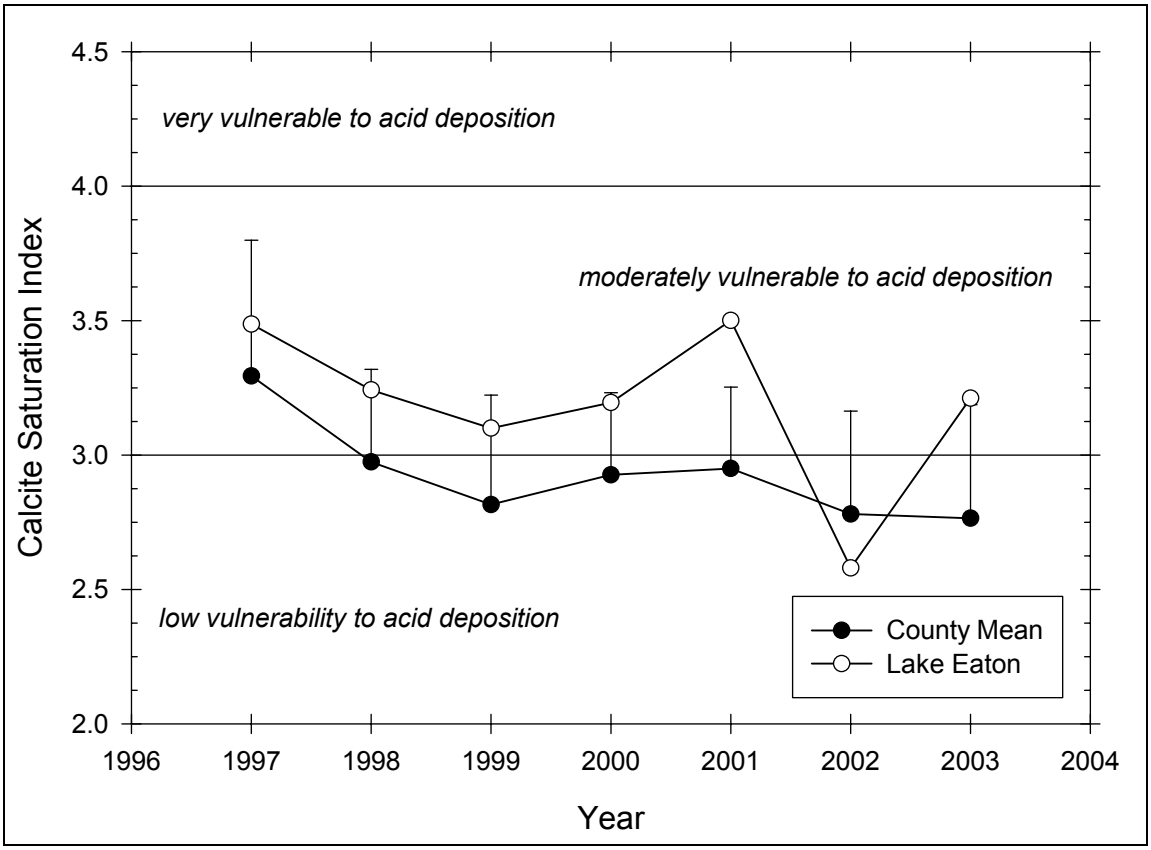


Figure 113 Seasonal mean CSI trend in Lake Eaton

Lake Pleasant

Location
Pond Number: 050313
Watershed: Upper Hudson River
County: Hamilton
Topographic Quadrangle: Lake Pleasant
Sample Site
Latitude: 43o 27.981'
Longitude: 74o 23.761'
Morphometry
Surface Area: 1,547 Ac.
Mean Depth: 29 Ft.
Maximum Depth: 69 Ft.
Volume: 44,863 Ac./Ft.
Watershed Area: 7,907 Ac.
Hydraulic Retention Time: 2.0 Yr.
Shoreline Length: 9.6 Mi.
Elevation: 1,725 Ft.
Water Quality Classification: AA

Temperature and Dissolved Oxygen

Lake Pleasant had a minimum DO of 0.1 mg/L (September 2003), with a minimum temperature of 5.0°C and a maximum temperature of 24.5°C. In general, the lowest DO values occurred during the months of August through October.

pH

Figure 114 presents the seasonal mean pH trend in Lake Pleasant, while Table 89 presents descriptive statistics for pH in Lake Pleasant. The pH in Lake Pleasant exhibited an increasing trend from 1997 to 1999, followed by a slight decrease from 1999 to 2003. The pH in Lake Pleasant was similar to the county average.

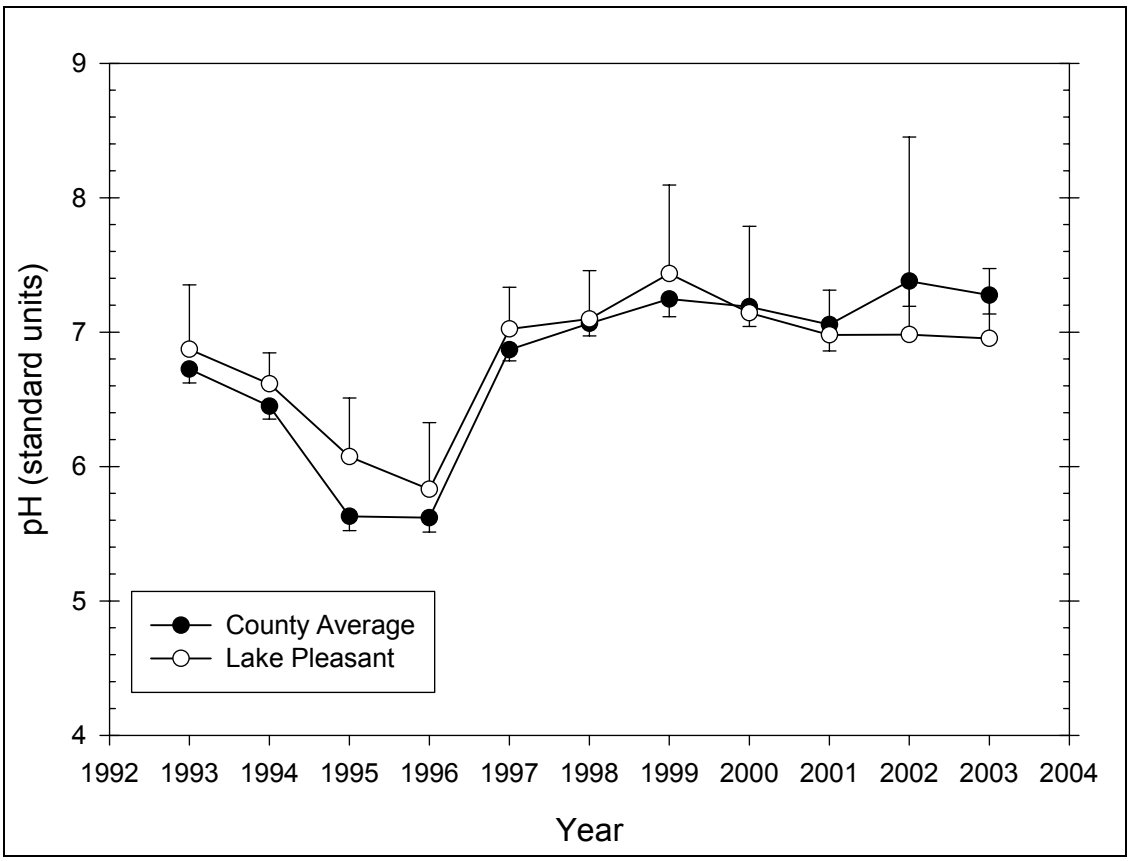


Figure 114 Seasonal mean pH trend in Lake Pleasant

Table 89 – Descriptive Statistics for pH in Lake Pleasant

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	6.872	0.387	0.173	0.480
1994	6	0	6.615	0.220	0.0899	0.231
1995	6	0	6.073	0.416	0.170	0.437
1996	6	0	5.830	0.472	0.193	0.496
1997	6	0	7.023	0.296	0.121	0.311
1998	6	0	7.098	0.343	0.140	0.360
1999	4	0	7.435	0.415	0.208	0.661
2000	6	0	7.143	0.614	0.251	0.644
2001	5	0	6.980	0.267	0.120	0.332
2002	4	0	6.982	0.924	0.462	1.471
2003	5	0	6.954	0.418	0.187	0.519
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.750	7.190	6.440	7.100	6.455	7.175
1994	0.540	6.860	6.320	6.650	6.390	6.820
1995	1.230	6.670	5.440	6.015	5.940	6.360
1996	1.270	6.590	5.320	5.760	5.480	6.070
1997	0.820	7.290	6.470	7.090	6.960	7.240
1998	0.960	7.650	6.690	7.075	6.830	7.270
1999	0.800	7.800	7.000	7.470	7.080	7.790
2000	1.600	8.290	6.690	6.930	6.700	7.320
2001	0.650	7.280	6.630	7.070	6.742	7.175

2002	2.100	7.870	5.770	7.145	6.280	7.685
2003	1.030	7.450	6.420	6.880	6.652	7.330
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.577	-3.281	0.322	0.098	34.360	236.720
1994	-0.383	-1.629	0.212	0.475	39.690	262.792
1995	-0.0884	0.623	0.208	0.499	36.440	222.179
1996	0.734	-0.260	0.223	0.411	34.980	205.049
1997	-1.610	2.934	0.249	0.277	42.140	296.402
1998	0.629	0.157	0.142	0.764	42.590	302.906
1999	-0.125	-5.260	0.297	0.237	29.740	221.634
2000	1.666	2.762	0.230	0.373	42.860	308.047
2001	-0.415	-1.791	0.232	0.441	34.900	243.888
2002	-0.804	-0.459	0.212	0.591	27.930	197.584
2003	-0.0226	-1.581	0.189	0.643	34.770	242.490

Alkalinity

Figure 115 presents the seasonal mean alkalinity trend in Lake Pleasant, while Table 90 presents descriptive statistics for alkalinity in Lake Pleasant. The alkalinity in Lake Pleasant did not exhibit any consistent trend. The alkalinity in Lake Pleasant was slightly higher than the county average, though this difference was not statistically significant.

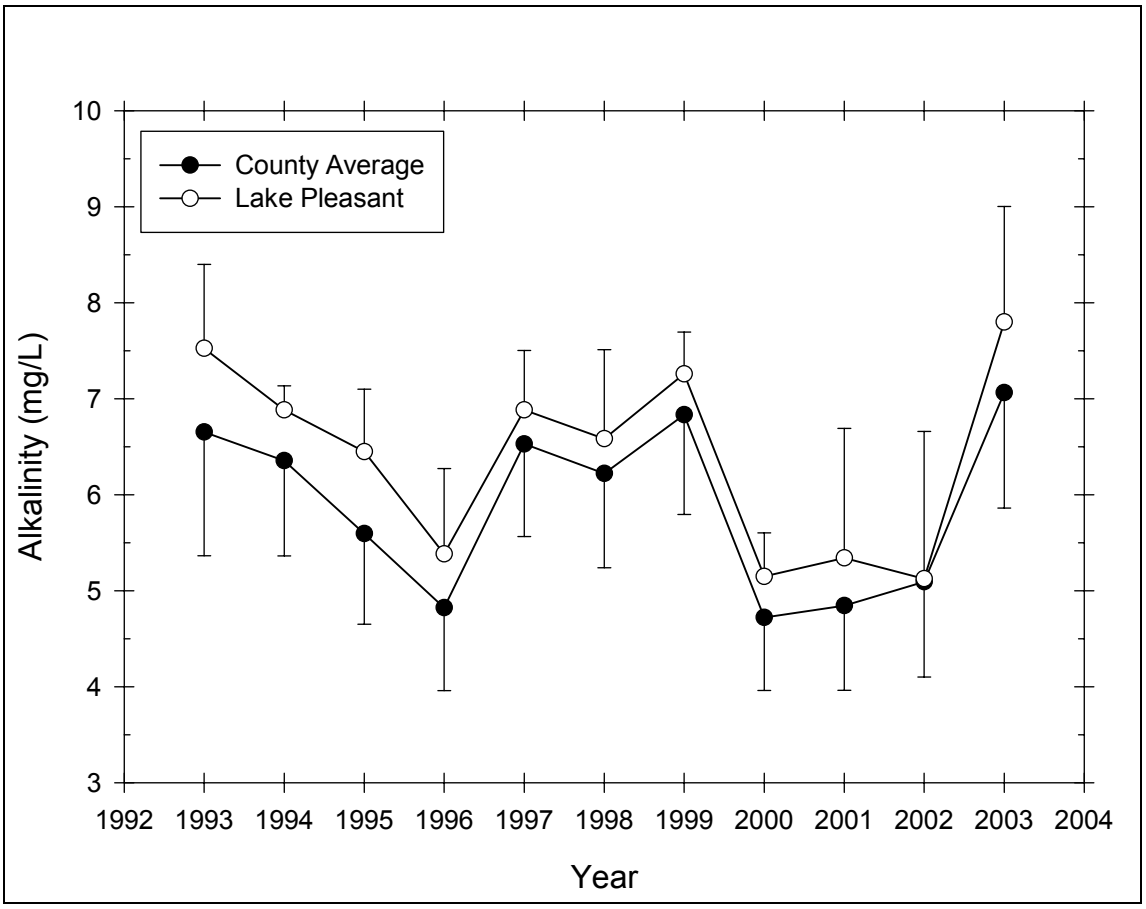


Figure 115 Seasonal mean alkalinity trend in Lake Pleasant

Table 90 – Descriptive Statistics for Alkalinity in Lake Pleasant

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	5	1	7.525	0.550	0.275	0.875
1994	6	0	6.883	0.240	0.0980	0.252
1995	6	0	6.450	0.619	0.253	0.649
1996	6	0	5.383	0.847	0.346	0.889
1997	6	0	6.883	0.591	0.241	0.621
1998	6	0	6.583	0.884	0.361	0.928
1999	6	1	7.260	0.351	0.157	0.435
2000	6	0	5.150	0.432	0.177	0.454
2001	6	1	5.340	1.088	0.486	1.351
2002	6	2	5.125	0.964	0.482	1.534
2003	6	1	7.800	0.970	0.434	1.204
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.200	8.000	6.800	7.650	7.100	7.950
1994	0.700	7.300	6.600	6.800	6.800	7.000
1995	1.600	7.200	5.600	6.400	6.000	7.100
1996	2.200	6.600	4.400	5.350	4.700	5.900
1997	1.400	7.400	6.000	7.150	6.300	7.300
1998	2.300	8.000	5.700	6.500	5.800	7.000
1999	0.900	7.600	6.700	7.300	7.075	7.525
2000	0.900	5.600	4.700	5.150	4.700	5.600
2001	2.800	6.500	3.700	5.400	4.675	6.200
2002	2.200	6.400	4.200	4.950	4.400	5.850
2003	2.400	9.100	6.700	7.700	7.000	8.575
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.894	-0.852	0.252	0.422	30.100	227.410
1994	1.071	1.521	0.302	0.092	41.300	284.570
1995	-0.0114	-1.202	0.199	0.548	38.700	251.530
1996	0.310	-1.493	0.216	0.453	32.300	177.470
1997	-0.876	-1.347	0.259	0.228	41.300	286.030
1998	0.723	-0.398	0.208	0.499	39.500	263.950
1999	-1.185	1.505	0.232	0.440	36.300	264.030
2000	5.121E-015	-2.810	0.218	0.438	30.900	160.070
2001	-0.793	0.388	0.177	0.686	26.700	147.310
2002	0.850	-0.173	0.207	0.610	20.500	107.850
2003	0.337	-1.365	0.165	0.719	39.000	307.960

Total Phosphorus

Figure 116 presents the seasonal mean total phosphorus trend in Lake Pleasant, while Table 91 presents descriptive statistics for total phosphorus in Lake Pleasant. The total phosphorus in Lake Pleasant exhibited a decreasing trend from 1993 to 2003. The total phosphorus in Lake Pleasant was similar to the county average.

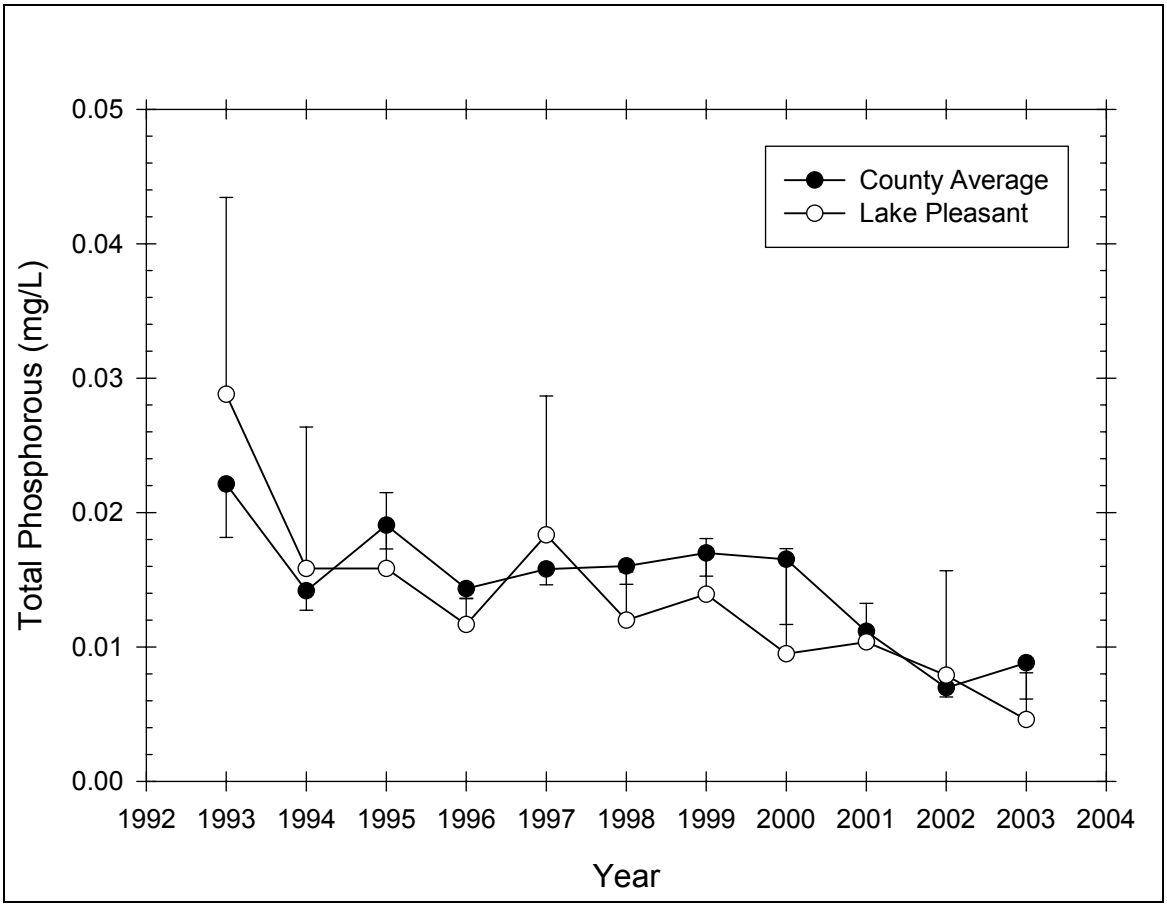


Figure 116 Seasonal mean total phosphorus trend in Lake Pleasant

Table 91 – Descriptive Statistics for Total Phosphorus in Lake Pleasant

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0288	0.0118	0.00528	0.0146
1994	6	0	0.0158	0.0100	0.00409	0.0105
1995	6	0	0.0158	0.00538	0.00220	0.00565
1996	6	0	0.0117	0.00186	0.000760	0.00195
1997	6	0	0.0183	0.00985	0.00402	0.0103
1998	6	0	0.0120	0.00341	0.00139	0.00357
1999	6	1	0.0139	0.00334	0.00149	0.00414
2000	6	0	0.00950	0.00745	0.00304	0.00782
2001	6	1	0.0104	0.00233	0.00104	0.00290
2002	6	2	0.00790	0.00489	0.00245	0.00779
2003	6	1	0.00460	0.00281	0.00125	0.00348
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0270	0.0450	0.0180	0.0250	0.0187	0.0390
1994	0.0260	0.0360	0.01000	0.0115	0.0110	0.0150
1995	0.0120	0.0200	0.00800	0.0185	0.01000	0.0200
1996	0.00500	0.0140	0.00900	0.0120	0.01000	0.0130
1997	0.0250	0.0360	0.0110	0.0135	0.0120	0.0240
1998	0.00900	0.0180	0.00900	0.0105	0.01000	0.0140
1999	0.00800	0.0170	0.00900	0.0156	0.0113	0.0163
2000	0.0170	0.0200	0.00300	0.00850	0.00300	0.0140

2001	0.00610	0.0140	0.00790	0.00990	0.00873	0.0118
2002	0.0112	0.0149	0.00370	0.00650	0.00470	0.0111
2003	0.00690	0.00810	0.00120	0.00480	0.00217	0.00683
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.646	-1.779	0.226	0.469	0.144	0.00470
1994	2.297	5.369	0.366	0.012	0.0950	0.00201
1995	-0.948	-1.538	0.323	0.050	0.0950	0.00165
1996	-0.392	-0.943	0.238	0.332	0.0700	0.000834
1997	1.510	1.485	0.337	0.032	0.110	0.00250
1998	1.367	1.168	0.282	0.143	0.0720	0.000922
1999	-0.934	-0.776	0.293	0.172	0.0696	0.00101
2000	0.374	-2.084	0.309	0.077	0.0570	0.000819
2001	1.017	1.105	0.192	0.632	0.0518	0.000558
2002	1.468	2.402	0.299	0.230	0.0316	0.000321
2003	0.00283	-1.678	0.173	0.699	0.0230	0.000137

Nitrate

Figure 117 presents the seasonal mean nitrate trend in Lake Pleasant, while Table 92 presents descriptive statistics for nitrate in Lake Pleasant. The nitrate in Lake Pleasant exhibited a decreasing trend from 1997 to 2003. The nitrate in Lake Pleasant was slightly lower than the county average, though this difference was not statistically significant.

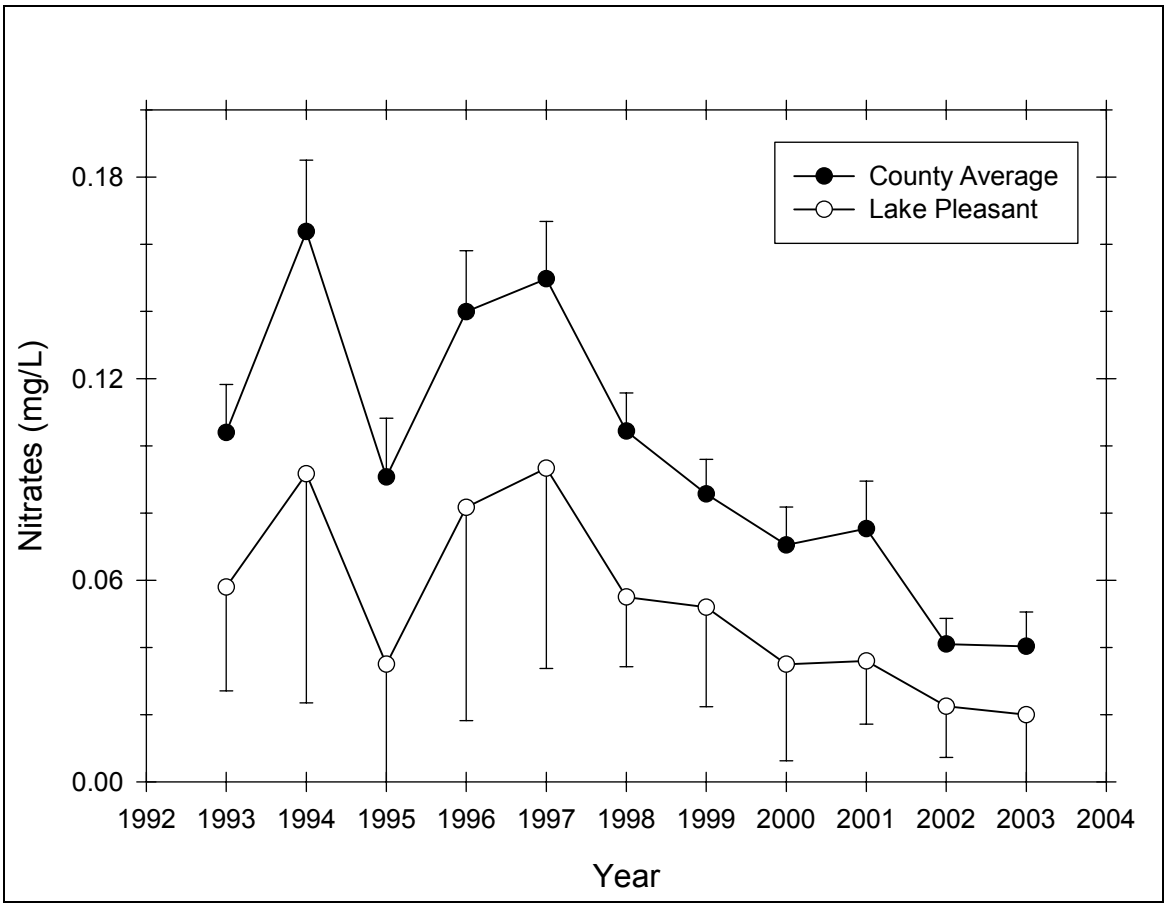


Figure 117 Seasonal mean nitrate trend in Lake Pleasant

Table 92 – Descriptive Statistics for Nitrate in Lake Pleasant

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0580	0.0249	0.0111	0.0309
1994	6	0	0.0917	0.0649	0.0265	0.0681
1995	6	0	0.0350	0.0468	0.0191	0.0491
1996	6	0	0.0817	0.0605	0.0247	0.0635
1997	6	0	0.0933	0.0568	0.0232	0.0596
1998	6	0	0.0550	0.0197	0.00806	0.0207
1999	6	1	0.0520	0.0239	0.0107	0.0296
2000	6	0	0.0350	0.0274	0.0112	0.0287
2001	6	1	0.0360	0.0152	0.00678	0.0188
2002	6	2	0.0225	0.00957	0.00479	0.0152
2003	6	1	0.0200	0.0173	0.00775	0.0215
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0600	0.1000	0.0400	0.0500	0.0400	0.0700
1994	0.140	0.180	0.0400	0.0550	0.0500	0.170
1995	0.1000	0.1000	0.000	0.01000	0.000	0.0900
1996	0.150	0.180	0.0300	0.0650	0.0300	0.120
1997	0.130	0.160	0.0300	0.0850	0.0500	0.150
1998	0.0600	0.0900	0.0300	0.0500	0.0500	0.0600
1999	0.0600	0.0900	0.0300	0.0400	0.0375	0.0675
2000	0.0700	0.0900	0.0200	0.0250	0.0200	0.0300
2001	0.0400	0.0600	0.0200	0.0300	0.0275	0.0450
2002	0.0200	0.0300	0.01000	0.0250	0.0150	0.0300
2003	0.0400	0.0500	0.01000	0.01000	0.01000	0.0275
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.671	2.815	0.268	0.267	0.290	0.0193
1994	0.937	-1.813	0.354	0.018	0.550	0.0715
1995	0.948	-1.757	0.370	0.010	0.210	0.0183
1996	0.895	-0.338	0.255	0.250	0.490	0.0583
1997	0.132	-2.639	0.277	0.159	0.560	0.0684
1998	1.052	2.465	0.267	0.198	0.330	0.0201
1999	1.264	1.099	0.292	0.174	0.260	0.0158
2000	2.279	5.328	0.406	0.003	0.210	0.0111
2001	1.118	1.456	0.254	0.332	0.180	0.00740
2002	-0.855	-1.289	0.283	0.289	0.0900	0.00230
2003	1.925	3.667	0.318	0.101	0.1000	0.00320

Chlorophyll a

Figure 118 presents the seasonal mean chlorophyll *a* trend in Lake Pleasant, while Table 93 presents descriptive statistics for chlorophyll *a* in Lake Pleasant. The chlorophyll *a* in Lake Pleasant did not exhibit any consistent trend, although concentrations generally increased from 1997 to 2001 and decreased from 2001 to 2003. The chlorophyll *a* in Lake Pleasant was generally slightly higher than the county average, though this difference was not statistically significant.

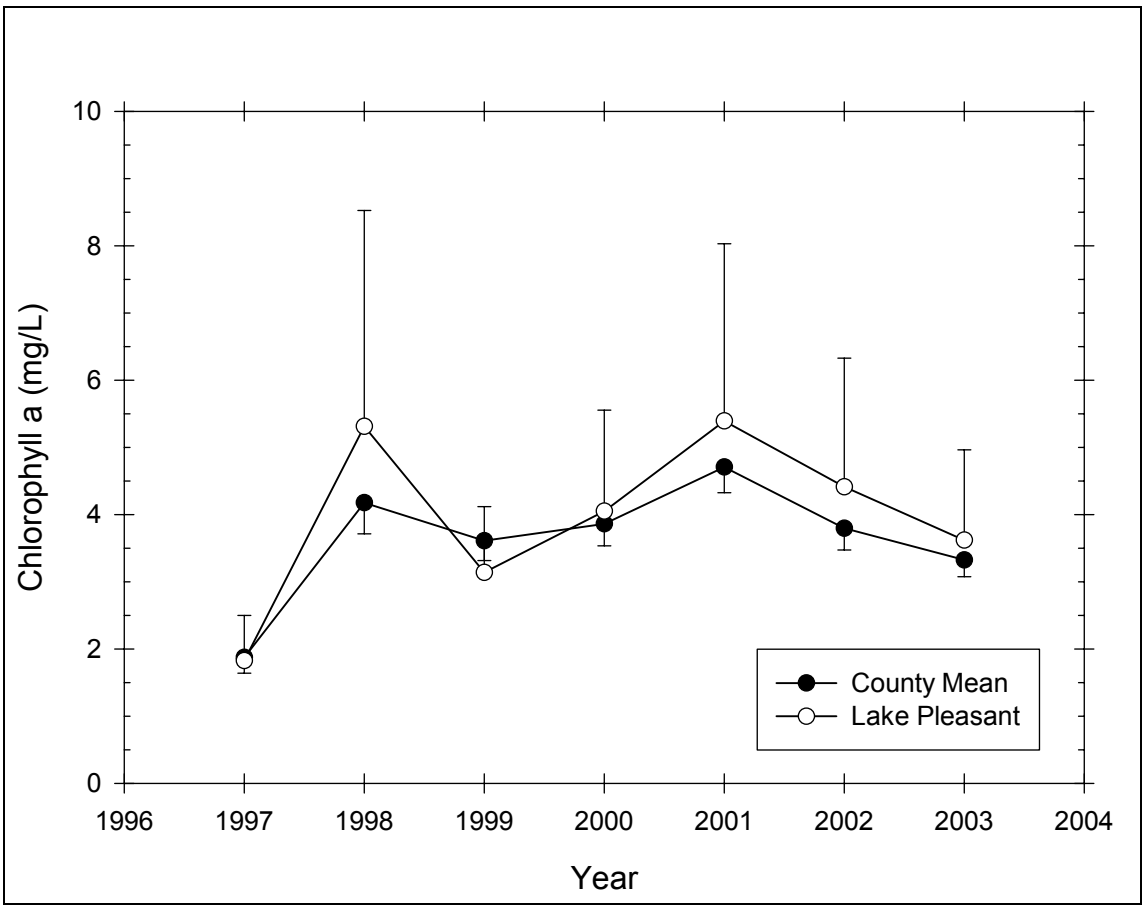


Figure 118 Seasonal mean chlorophyll a trend in Lake Pleasant

Table 93 – Descriptive Statistics for Chlorophyll a in Lake Pleasant

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	1.827	0.639	0.261	0.671
1998	6	0	5.313	3.058	1.249	3.210
1999	6	1	3.138	0.790	0.353	0.981
2000	6	0	4.050	1.433	0.585	1.504
2001	6	1	5.392	2.124	0.950	2.637
2002	6	2	4.412	1.203	0.602	1.915
2003	6	2	3.618	0.846	0.423	1.346
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	1.780	2.840	1.060	1.815	1.270	2.160
1998	7.280	8.370	1.090	6.505	1.970	7.440
1999	1.990	4.470	2.480	2.880	2.623	3.510
2000	3.560	6.270	2.710	3.835	2.760	4.890
2001	5.230	8.660	3.430	5.420	3.543	6.567
2002	2.620	5.330	2.710	4.805	3.565	5.260
2003	1.800	4.880	3.080	3.255	3.155	4.080
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	0.522	0.0805	0.141	0.765	10.960	22.062
1998	-0.707	-1.735	0.235	0.349	31.880	216.161
1999	1.656	2.880	0.274	0.243	15.690	51.731

2000	0.639	-0.992	0.246	0.289	24.300	108.682
2001	0.936	0.584	0.211	0.546	26.960	163.410
2002	-1.412	1.558	0.252	0.421	17.650	82.225
2003	1.939	3.811	0.405	0.021	14.470	54.492

Transparency

Figure 119 presents the seasonal mean transparency trend in Lake Pleasant, while Table 94 presents descriptive statistics for transparency in Lake Pleasant. The transparency in Lake Pleasant was quite variable from year to year, but appears to exhibit a decreasing trend from 1995 to 2003. The transparency in Lake Pleasant was similar to the county average until 1998, and slightly lower than the county average from 1999 to 2003, though this difference was not statistically significant.

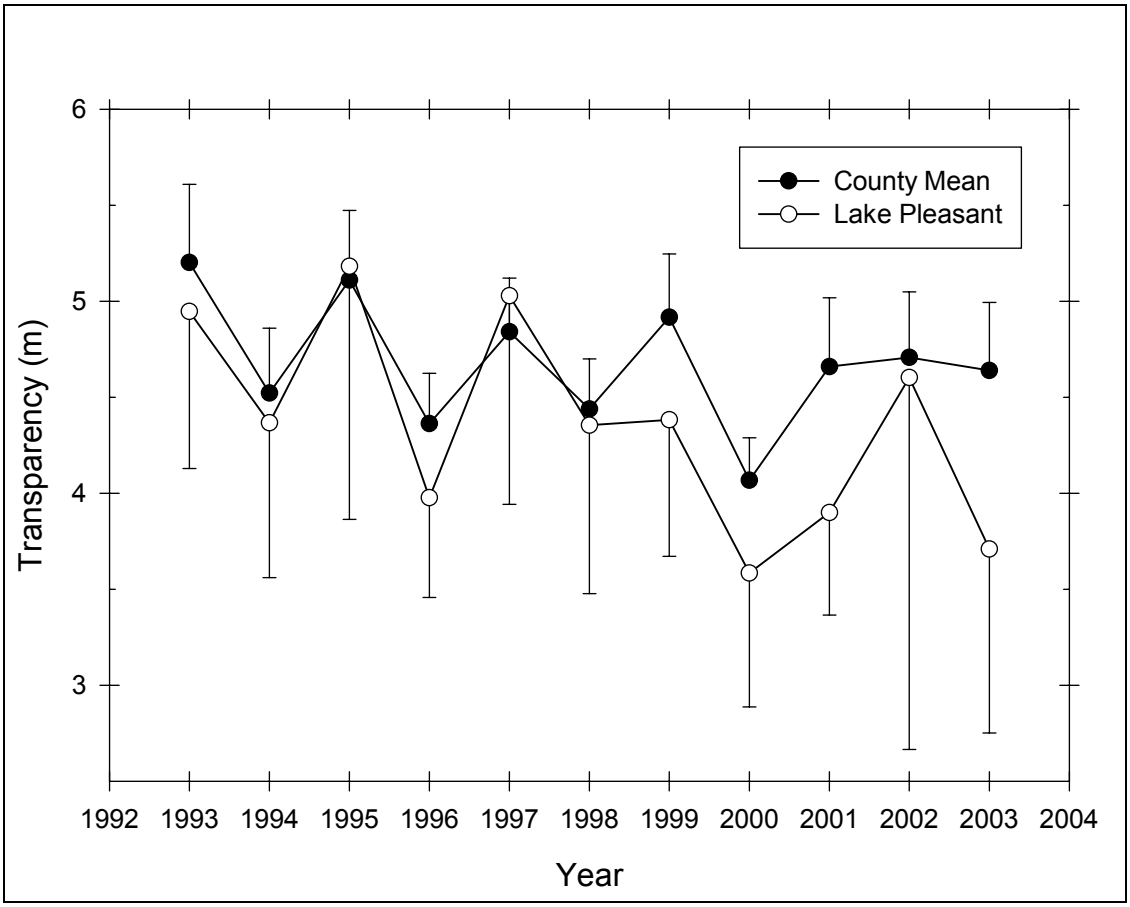


Figure 119 Seasonal mean transparency in Lake Pleasant

Table 94 – Descriptive Statistics for Transparency in Lake Pleasant

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	4.946	0.658	0.294	0.817
1994	6	0	4.367	0.769	0.314	0.807
1995	6	0	5.182	1.256	0.513	1.318
1996	6	0	3.977	0.495	0.202	0.519
1997	6	0	5.028	1.034	0.422	1.086

1998	6	0	4.355	0.836	0.341	0.877
1999	4	0	4.383	0.447	0.224	0.711
2000	6	0	3.585	0.665	0.271	0.698
2001	5	0	3.900	0.430	0.192	0.534
2002	4	0	4.603	1.218	0.609	1.938
2003	5	0	3.710	0.772	0.345	0.958
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.820	5.760	3.940	5.030	4.622	5.303
1994	1.900	5.500	3.600	4.150	3.700	5.100
1995	3.260	6.300	3.040	5.425	4.700	6.200
1996	1.520	4.770	3.250	3.900	3.860	4.180
1997	2.400	6.430	4.030	4.850	4.050	5.960
1998	2.210	5.760	3.550	4.125	3.670	4.900
1999	0.970	4.900	3.930	4.350	4.015	4.750
2000	1.550	4.600	3.050	3.270	3.100	4.220
2001	0.900	4.400	3.500	3.800	3.500	4.325
2002	2.810	6.010	3.200	4.600	3.650	5.555
2003	1.550	4.550	3.000	3.500	3.000	4.513
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.688	1.762	0.242	0.389	24.730	124.047
1994	0.713	-1.258	0.253	0.259	26.200	117.360
1995	-1.055	0.558	0.243	0.307	31.090	168.984
1996	0.301	1.655	0.240	0.320	23.860	96.107
1997	0.367	-2.126	0.244	0.300	30.170	157.055
1998	1.061	0.383	0.264	0.211	26.130	117.292
1999	0.251	-3.301	0.236	0.493	17.530	77.425
2000	0.936	-1.178	0.267	0.197	21.510	79.324
2001	0.314	-2.909	0.224	0.482	19.500	76.790
2002	0.00955	-1.493	0.160	0.709	18.410	89.180
2003	0.327	-3.074	0.247	0.364	18.550	71.203

TSI

Figure 120 presents the seasonal mean nitrate trend in Lake Pleasant. Chlorophyll *a* TSI was generally within the eutrophic range. Total phosphorus TSI was in the mesotrophic range from 1993 to 1999, and within the oligotrophic range from 2000 to 2003. Transparency TSI was variable and fluctuated around the oligotrophic-mesotrophic boundary.

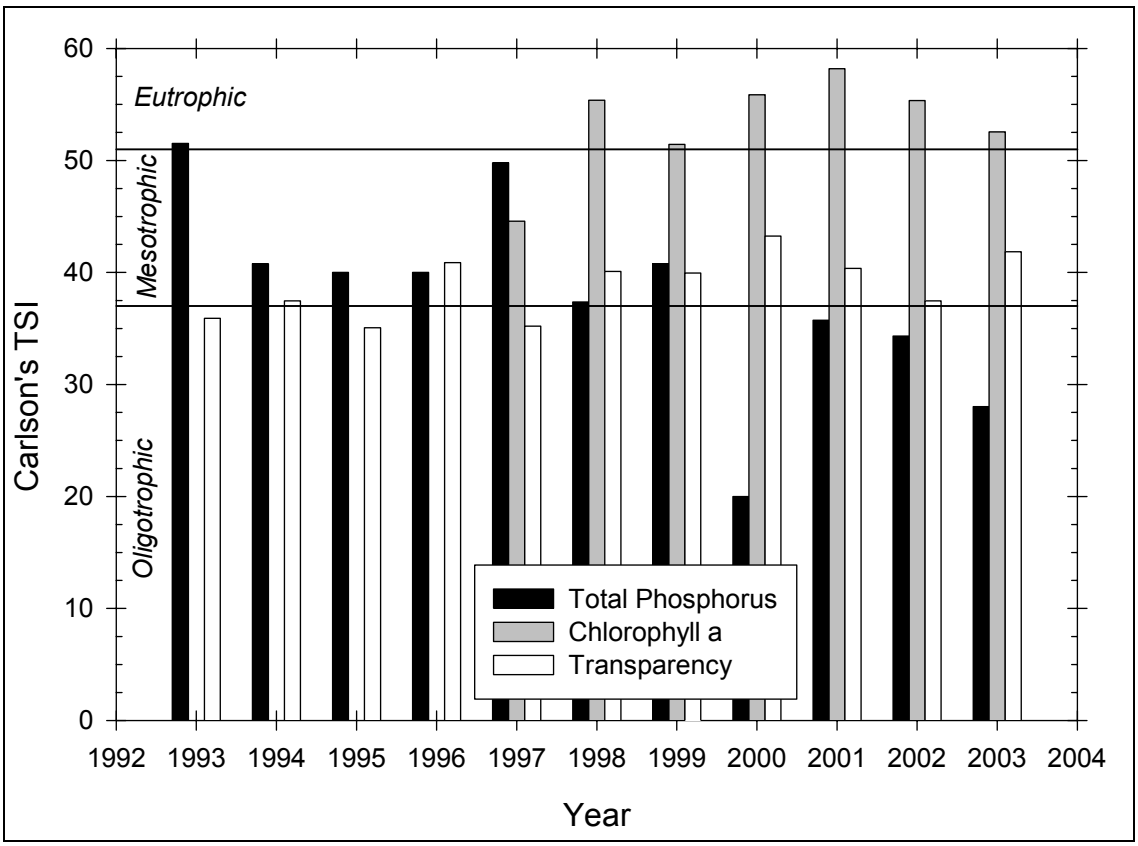


Figure 120 Carlson TSI trend in Lake Pleasant

Aluminum

Figure 121 presents the seasonal mean aluminum trend in Lake Pleasant, while Table 95 presents descriptive statistics for aluminum in Lake Pleasant. The aluminum in Lake Pleasant exhibited a slight decreasing trend from 1997 to 2002. The aluminum in Lake Pleasant was slightly lower than the county average, though this difference may not be statistically significant for all years.

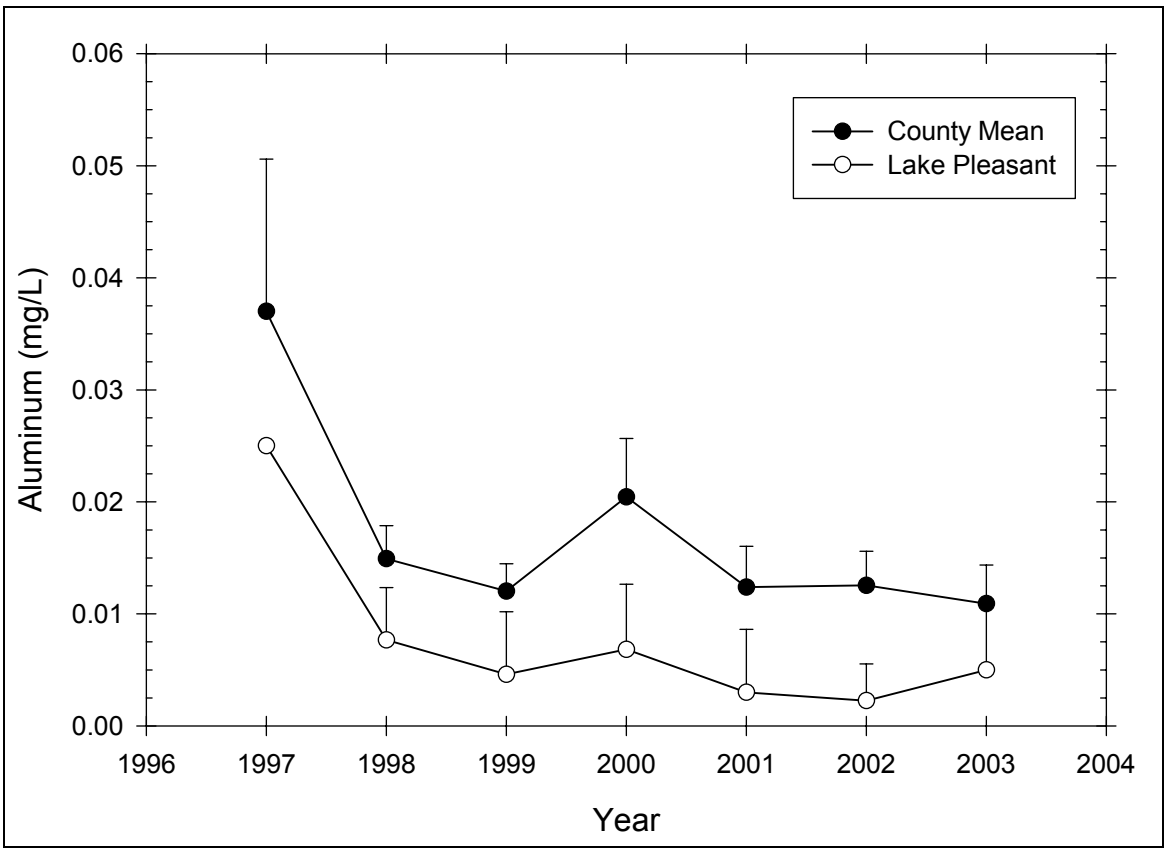


Figure 121 Seasonal mean aluminum trend in Lake Pleasant

Table 95 – Descriptive Statistics for Aluminum in Lake Pleasant

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0250	--	--	--
1998	6	0	0.00767	0.00446	0.00182	0.00468
1999	6	1	0.00460	0.00451	0.00201	0.00559
2000	6	0	0.00683	0.00553	0.00226	0.00580
2001	6	1	0.00300	0.00453	0.00202	0.00562
2002	6	2	0.00225	0.00206	0.00103	0.00328
2003	6	2	0.00500	0.00383	0.00191	0.00609
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0250	0.0250	0.0250	0.0250	0.0250
1998	0.01000	0.0120	0.00200	0.01000	0.00200	0.01000
1999	0.0110	0.0120	0.001000	0.00400	0.001000	0.00675
2000	0.0130	0.0130	0.000	0.00700	0.00200	0.0120
2001	0.0110	0.0110	0.000	0.001000	0.000750	0.00425
2002	0.00400	0.00400	0.000	0.00250	0.000500	0.00400
2003	0.00800	0.01000	0.00200	0.00400	0.00200	0.00800
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0250	0.000625
1998	-0.828	-1.809	0.366	0.012	0.0460	0.000452
1999	1.420	2.115	0.265	0.282	0.0230	0.000187
2000	-0.0897	-2.467	0.217	0.448	0.0410	0.000433
2001	2.101	4.522	0.387	0.014	0.0150	0.000127

2002	-0.200	-4.858	0.302	0.219	0.00900	0.0000330
2003	0.855	-1.289	0.283	0.289	0.0200	0.000144

Calcium

Figure 122 presents the seasonal mean calcium trend in Lake Pleasant, while Table 96 presents descriptive statistics for calcium in Lake Pleasant. The calcium in Lake Pleasant exhibited an increasing trend from 1997 to 2000. The calcium in Lake Pleasant was slightly higher than the county average, though this difference was not statistically significant.

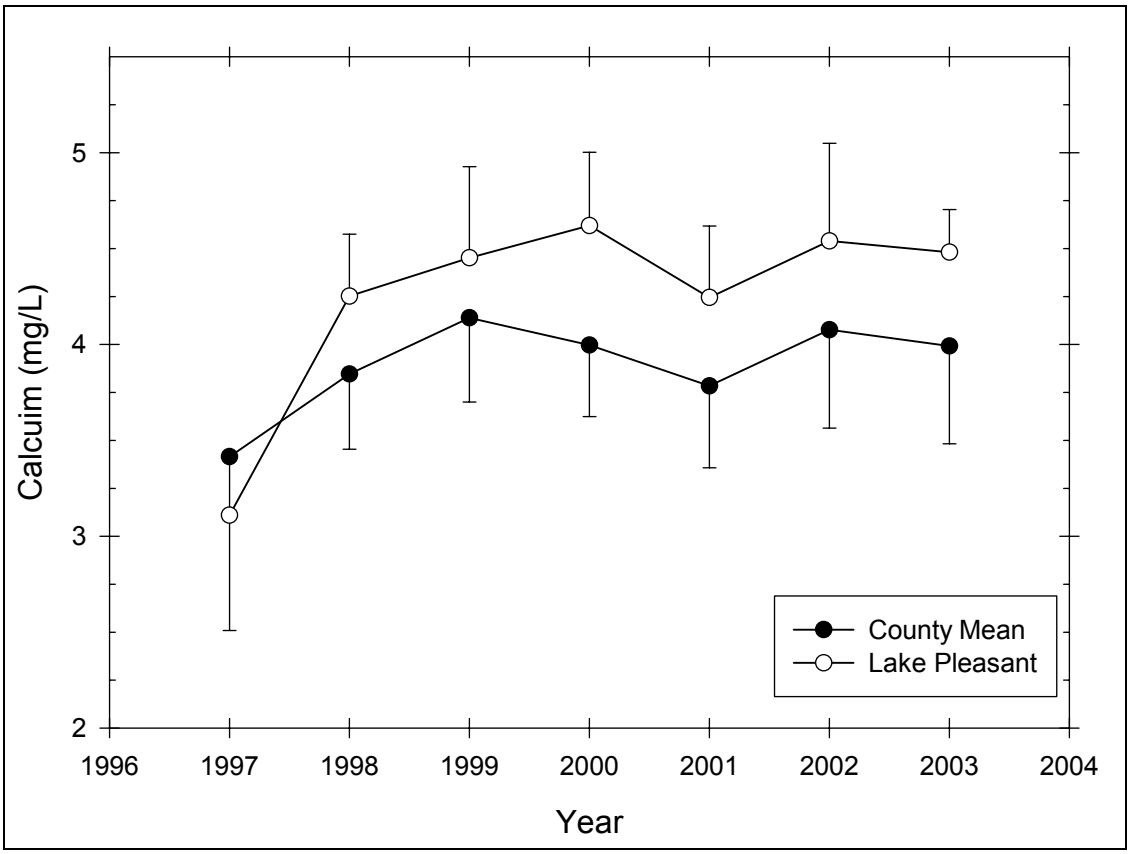


Figure 122 Seasonal mean calcium trend in Lake Pleasant

Table 96 – Descriptive Statistics for Calcium in Lake Pleasant

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	3.110	--	--	--
1998	6	0	4.252	0.308	0.126	0.323
1999	6	1	4.452	0.382	0.171	0.475
2000	6	0	4.620	0.364	0.148	0.382
2001	6	1	4.244	0.300	0.134	0.373
2002	6	2	4.540	0.320	0.160	0.509
2003	6	2	4.480	0.141	0.0704	0.224
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	3.110	3.110	3.110	3.110	3.110
1998	0.770	4.880	4.110	4.130	4.120	4.140

1999	0.830	4.810	3.980	4.660	4.070	4.735
2000	0.980	5.290	4.310	4.490	4.390	4.750
2001	0.760	4.570	3.810	4.310	4.020	4.473
2002	0.770	4.880	4.110	4.585	4.330	4.750
2003	0.330	4.610	4.280	4.515	4.395	4.565
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	3.110	9.672
1998	2.441	5.968	0.475	<0.001	25.510	108.934
1999	-0.572	-2.868	0.307	0.130	22.260	99.686
2000	1.569	2.382	0.221	0.422	27.720	128.728
2001	-0.660	-0.511	0.187	0.652	21.220	90.419
2002	-0.808	1.649	0.262	0.377	18.160	82.753
2003	-1.367	2.561	0.334	0.124	17.920	80.341

Calcite Saturation Index

Figure 123 presents the calcite saturation index trend in Lake Pleasant. The CSI in Lake Pleasant did not exhibit any specific trend and remained within the range of low vulnerability to acid deposition, close to the moderately vulnerable range. The CSI in Lake Pleasant was generally slightly lower than the county average, though this difference was not statistically significant.

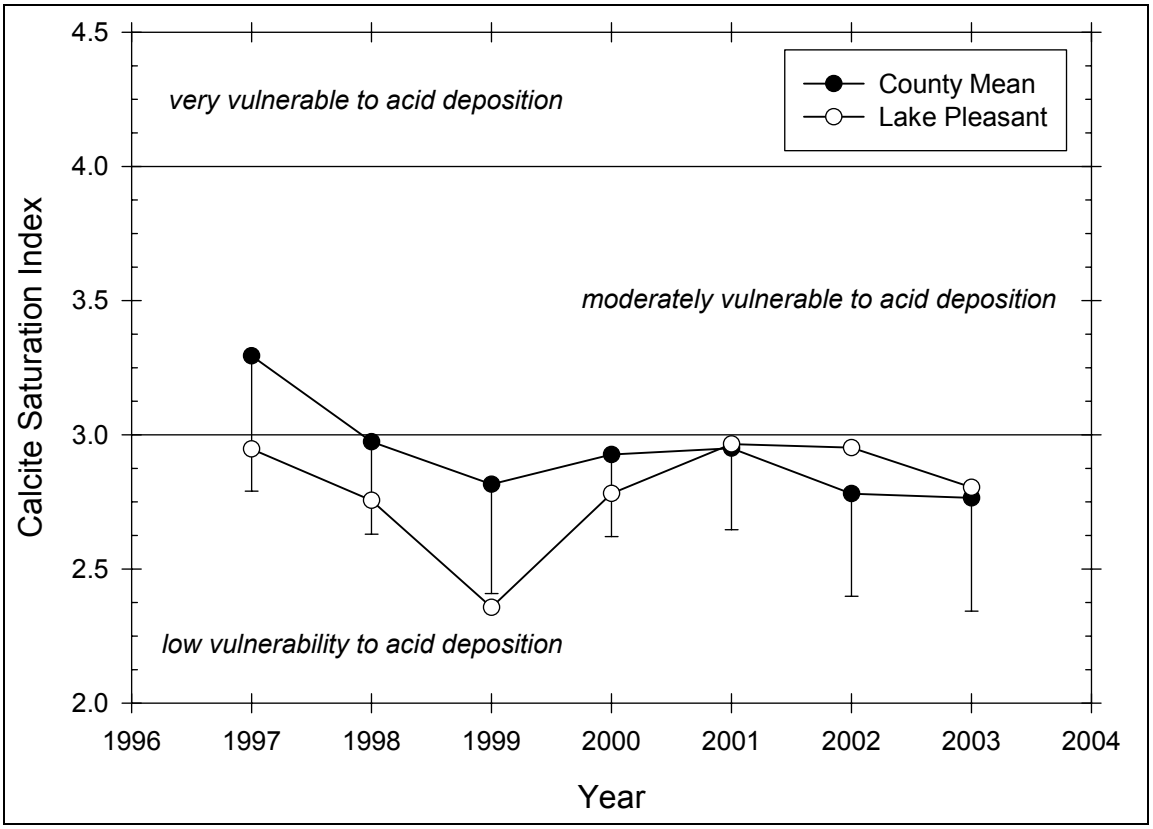
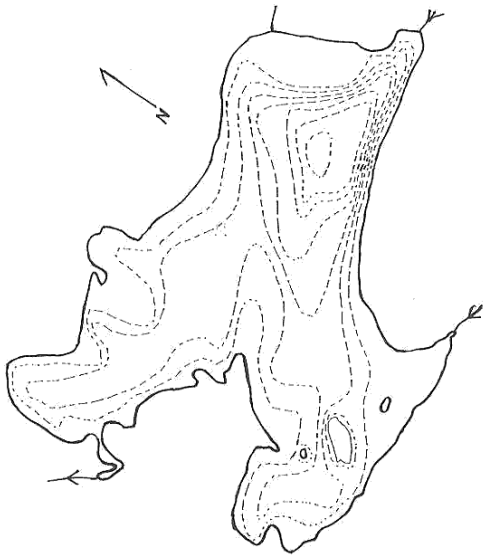


Figure 123 Seasonal mean CSI trend in Lake Pleasant

Limekiln Lake

Location
Pond Number: 040826
Watershed: Black River
County: Hamilton
Topographic Quadrangle: Old Forge
Sample Site
Latitude: 43o 42.816'
Longitude: 74o 47.588'
Morphometry
Surface Area: 462 Ac.
Mean Depth: 20 Ft.
Maximum Depth: 72 Ft.
Volume: 9,240 Ac./Ft.
Watershed Area: 2,580 Ac.
Hydraulic Retention Time: 1.4 Yr.
Shoreline Length: 6.2 Mi.
Elevation: 1,890 Ft.
Water Quality Classification: A (T)



Temperature and Dissolved Oxygen

Limekiln Lake had a minimum DO of 0.8 mg/L (October 1994), with a minimum temperature of 5.2°C and a maximum temperature of 23.7°C. In general, the lowest DO values occurred during the months of September and October.

pH

Figure 124 presents the seasonal mean pH trend in Limekiln Lake, while Table 97 presents descriptive statistics for pH in Limekiln Lake. The pH in Limekiln Lake exhibited an increasing trend from 1996 to 1999, followed by generally stable values. The pH in Limekiln Lake was slightly lower than the county average from 1993 to 1998, slightly higher in 1999 and 2000, and similar to the county average in 2002 and 2003, though any differences were not statistically significant.

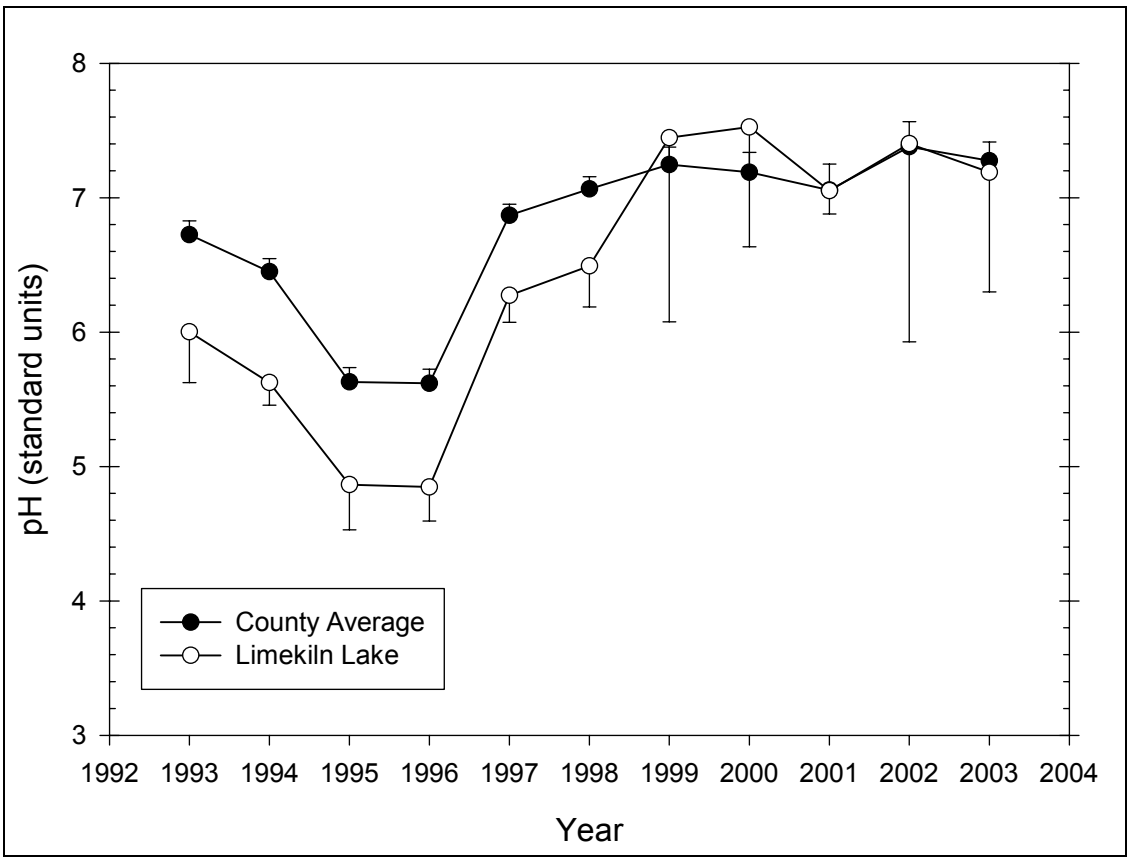


Figure 124 Seasonal mean pH trend in Limekiln Lake

Table 97 – Descriptive Statistics for pH in Limekiln Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	6.002	0.303	0.136	0.377
1994	6	0	5.625	0.161	0.0658	0.169
1995	6	0	4.865	0.319	0.130	0.335
1996	6	0	4.848	0.241	0.0983	0.253
1997	6	0	6.273	0.190	0.0777	0.200
1998	6	0	6.492	0.290	0.118	0.304
1999	5	0	7.446	1.103	0.493	1.370
2000	6	0	7.527	0.850	0.347	0.892
2001	4	0	7.053	0.109	0.0544	0.173
2002	4	0	7.402	0.927	0.464	1.475
2003	4	0	7.190	0.560	0.280	0.890
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.700	6.350	5.650	5.930	5.762	6.297
1994	0.450	5.860	5.410	5.615	5.520	5.730
1995	0.860	5.270	4.410	4.915	4.610	5.070
1996	0.610	5.180	4.570	4.850	4.630	5.010
1997	0.520	6.430	5.910	6.305	6.270	6.420
1998	0.840	7.020	6.180	6.415	6.350	6.570
1999	2.900	8.900	6.000	7.620	6.600	8.158
2000	2.140	8.640	6.500	7.660	6.610	8.090
2001	0.220	7.160	6.940	7.055	6.960	7.145

2002	2.210	8.530	6.320	7.380	6.720	8.085
2003	1.170	7.710	6.540	7.255	6.725	7.655
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.170	-2.443	0.220	0.500	30.010	180.488
1994	0.205	-0.583	0.157	0.734	33.750	189.974
1995	-0.291	-1.093	0.197	0.556	29.190	142.519
1996	0.191	-1.784	0.193	0.579	29.090	141.328
1997	-1.771	3.597	0.326	0.045	37.640	236.310
1998	1.385	2.478	0.227	0.391	38.950	253.271
1999	-0.0354	-0.351	0.163	0.724	37.230	282.082
2000	-0.117	-1.587	0.193	0.580	45.160	343.516
2001	-0.0504	-4.979	0.262	0.379	28.210	198.987
2002	0.130	0.0229	0.149	0.710	29.610	221.767
2003	-0.331	-3.776	0.268	0.352	28.760	207.724

Alkalinity

Figure 125 presents the seasonal mean alkalinity trend in Limekiln Lake, while Table 98 presents descriptive statistics for alkalinity in Limekiln Lake. The alkalinity in Limekiln Lake was low and generally stable throughout the period of record. The alkalinity in Limekiln Lake was significantly lower than the county average.

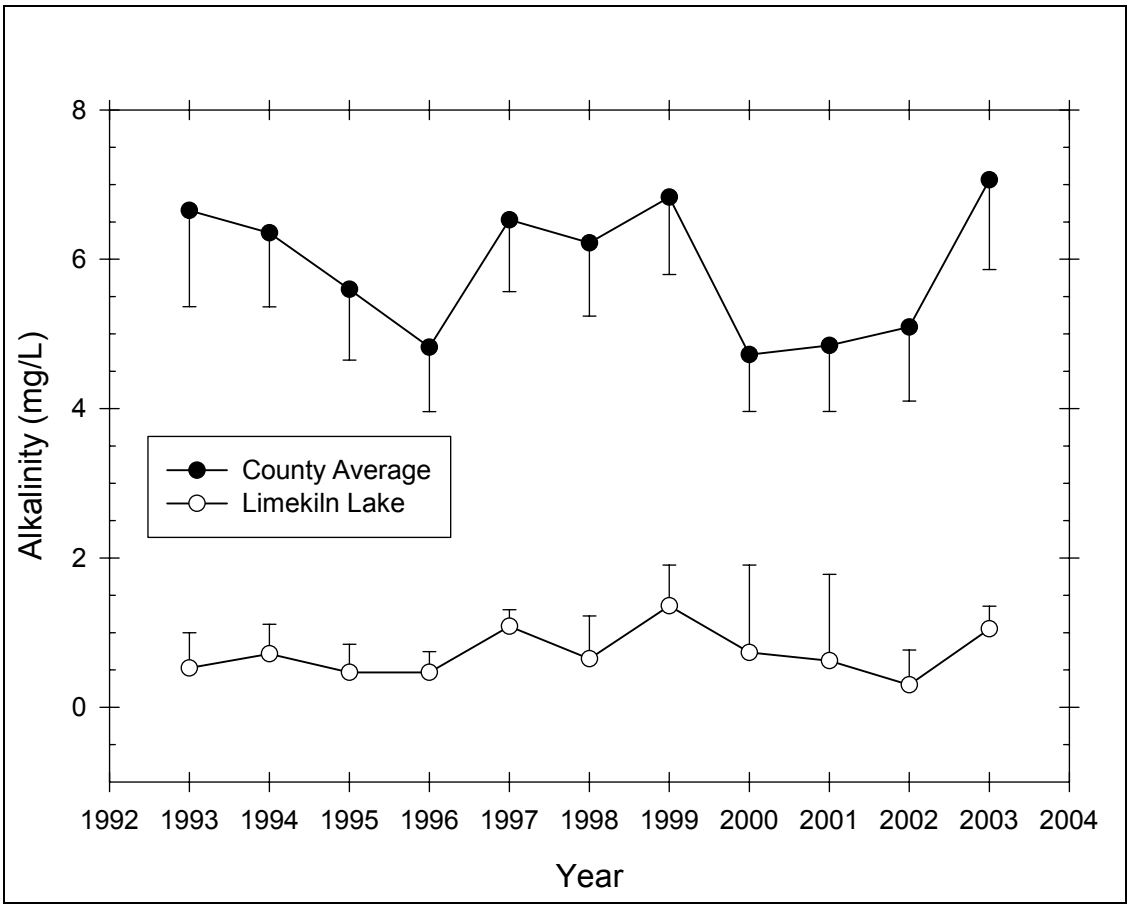


Figure 125 Seasonal mean alkalinity trend in Limekiln Lake

Table 98 – Descriptive Statistics for Alkalinity in Limekiln Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	5	1	0.525	0.299	0.149	0.475
1994	6	0	0.717	0.376	0.154	0.395
1995	6	0	0.467	0.361	0.148	0.379
1996	6	0	0.467	0.266	0.109	0.279
1997	6	0	1.083	0.214	0.0872	0.224
1998	6	0	0.650	0.547	0.223	0.574
1999	6	1	1.360	0.439	0.196	0.545
2000	6	0	0.733	1.117	0.456	1.172
2001	6	2	0.625	0.727	0.364	1.158
2002	6	2	0.300	0.294	0.147	0.468
2003	6	2	1.050	0.191	0.0957	0.305
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.700	0.900	0.200	0.500	0.300	0.750
1994	1.100	1.300	0.200	0.700	0.500	0.900
1995	0.900	1.000	0.1000	0.450	0.1000	0.700
1996	0.600	0.800	0.200	0.350	0.300	0.800
1997	0.500	1.300	0.800	1.100	0.900	1.300
1998	1.400	1.600	0.200	0.400	0.300	1.000
1999	1.100	1.700	0.600	1.500	1.200	1.625
2000	2.800	3.000	0.200	0.250	0.200	0.500
2001	1.600	1.700	0.1000	0.350	0.200	1.050
2002	0.600	0.600	0.000	0.300	0.0500	0.550
2003	0.400	1.200	0.800	1.100	0.900	1.200
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.423	-0.416	0.162	0.708	2.100	1.370
1994	0.313	0.398	0.146	0.757	4.300	3.790
1995	0.404	-1.285	0.178	0.654	2.800	1.960
1996	0.728	-1.861	0.266	0.202	2.800	1.660
1997	-0.232	-2.150	0.207	0.500	6.500	7.270
1998	1.321	0.805	0.275	0.168	3.900	4.030
1999	-1.882	3.768	0.336	0.067	6.800	10.020
2000	2.392	5.766	0.416	0.002	4.400	9.460
2001	1.822	3.465	0.371	0.056	2.500	3.150
2002	-1.073E-015	-4.891	0.252	0.425	1.200	0.620
2003	-0.855	-1.289	0.283	0.289	4.200	4.520

Total Phosphorus

Figure 126 presents the seasonal mean total phosphorus trend in Limekiln Lake, while Table 99 presents descriptive statistics for total phosphorus in Limekiln Lake. The total phosphorus in Limekiln Lake exhibited a decreasing trend from 1995 to 2003. The total phosphorus in Limekiln Lake was generally slightly lower than the county average, though this difference was not statistically significant.

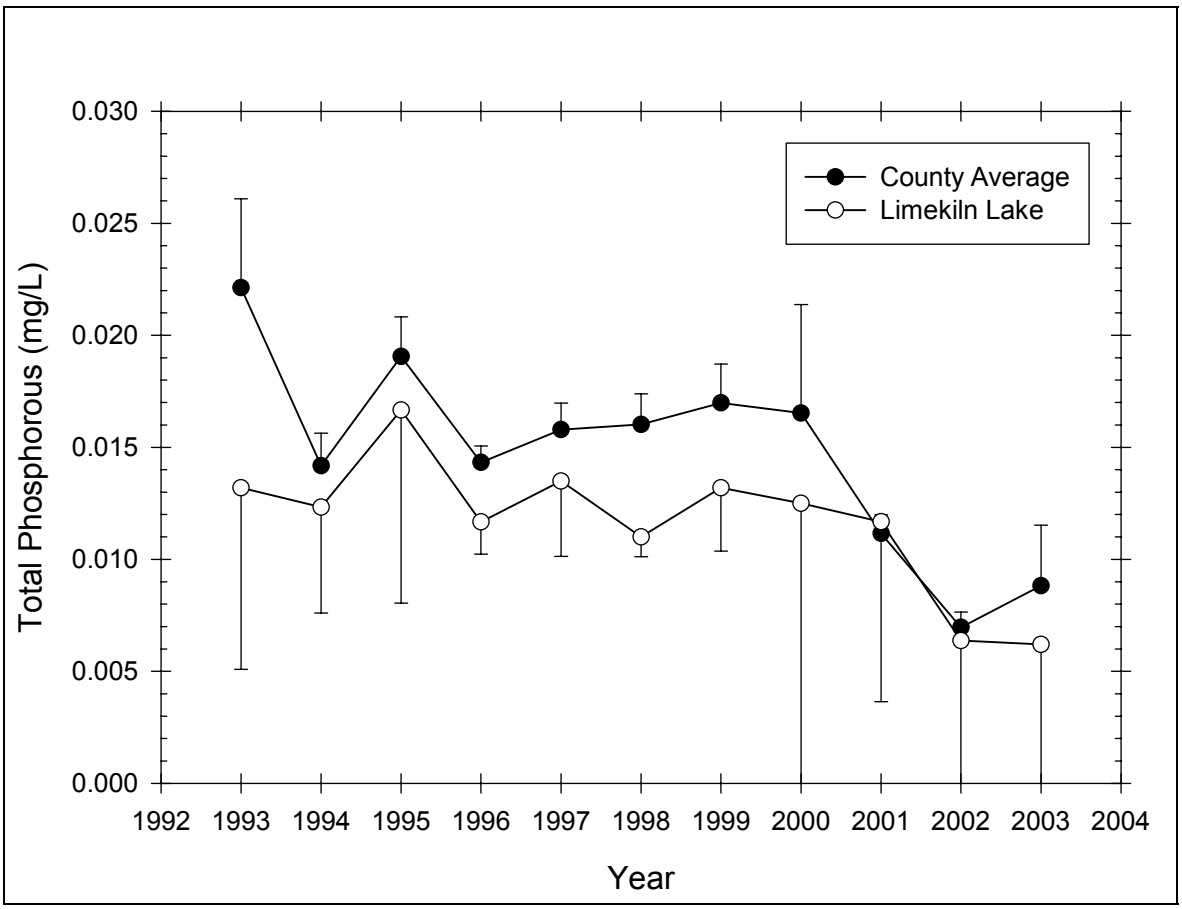


Figure 126 Seasonal mean total phosphorus trend in Limekiln Lake

Table 99 – Descriptive Statistics for Total Phosphorus in Limekiln Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0132	0.00653	0.00292	0.00811
1994	6	0	0.0123	0.00450	0.00184	0.00472
1995	6	0	0.0167	0.00821	0.00335	0.00862
1996	6	0	0.0117	0.00137	0.000558	0.00143
1997	6	0	0.0135	0.00321	0.00131	0.00337
1998	6	1	0.0110	0.000707	0.000316	0.000878
1999	6	1	0.0132	0.00228	0.00102	0.00283
2000	6	1	0.0125	0.0119	0.00532	0.0148
2001	6	2	0.0117	0.00505	0.00252	0.00803
2002	6	2	0.00637	0.00428	0.00214	0.00682
2003	6	2	0.00620	0.00390	0.00195	0.00621
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0160	0.0180	0.00200	0.0160	0.0103	0.0173
1994	0.0130	0.0210	0.00800	0.0115	0.01000	0.0120
1995	0.0230	0.0300	0.00700	0.0160	0.01000	0.0210
1996	0.00300	0.0130	0.01000	0.0120	0.01000	0.0130
1997	0.00900	0.0180	0.00900	0.0140	0.0110	0.0150
1998	0.00200	0.0120	0.01000	0.0110	0.0108	0.0113
1999	0.00600	0.0170	0.0110	0.0130	0.0118	0.0140
2000	0.0315	0.0325	0.001000	0.0110	0.00550	0.0164

2001	0.0110	0.0190	0.00800	0.00985	0.00835	0.0150
2002	0.00950	0.0127	0.00320	0.00480	0.00400	0.00875
2003	0.00900	0.00980	0.000800	0.00710	0.00345	0.00895
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-1.818	3.337	0.288	0.189	0.0660	0.00104
1994	1.823	4.022	0.363	0.013	0.0740	0.00101
1995	0.675	0.312	0.150	0.749	0.1000	0.00200
1996	-0.523	-1.875	0.263	0.213	0.0700	0.000826
1997	-0.0817	-0.514	0.180	0.646	0.0810	0.00114
1998	6.106E-015	2.000	0.300	0.149	0.0550	0.000607
1999	1.493	2.818	0.335	0.069	0.0660	0.000892
2000	1.557	3.099	0.350	0.044	0.0625	0.00135
2001	1.641	2.609	0.303	0.215	0.0467	0.000622
2002	1.808	3.473	0.393	0.030	0.0255	0.000218
2003	-1.164	1.288	0.240	0.477	0.0248	0.000199

Nitrate

Figure 127 presents the seasonal mean nitrate trend in Limekiln Lake, while Table 100 presents descriptive statistics for nitrate in Limekiln Lake. The nitrate in Limekiln Lake exhibited a general decreasing trend from 1997 to 2002. The nitrate in Limekiln Lake was higher than the county average, though this difference may not be statistically significant for all years.

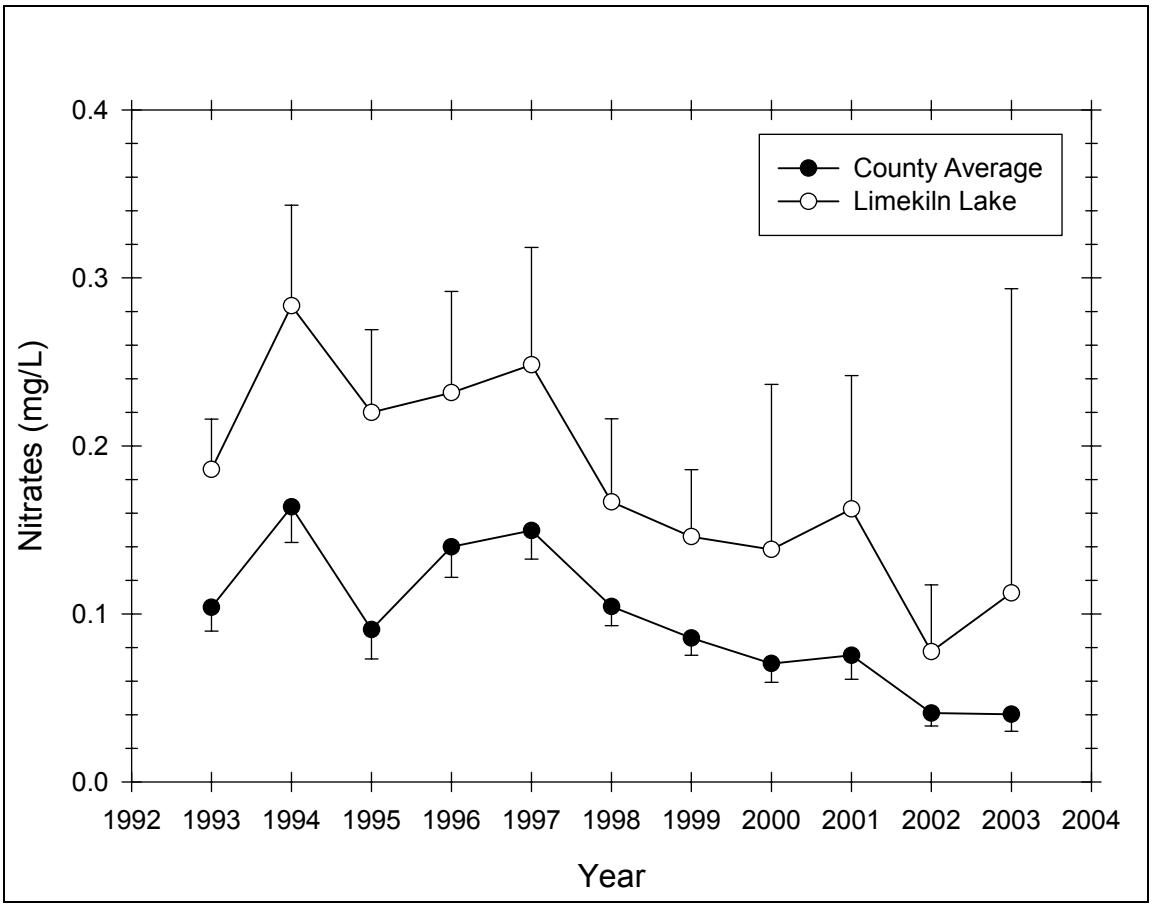


Figure 127 Seasonal mean nitrate trend in Limekiln Lake

Table 100 – Descriptive Statistics for Nitrate in Limekiln Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.186	0.0241	0.0108	0.0299
1994	6	0	0.283	0.0572	0.0233	0.0600
1995	6	0	0.220	0.0469	0.0191	0.0492
1996	6	0	0.232	0.0574	0.0234	0.0603
1997	6	0	0.248	0.0665	0.0271	0.0697
1998	6	0	0.167	0.0472	0.0193	0.0495
1999	6	1	0.146	0.0321	0.0144	0.0398
2000	6	0	0.138	0.0937	0.0382	0.0983
2001	6	2	0.163	0.0499	0.0250	0.0794
2002	6	2	0.0775	0.0250	0.0125	0.0398
2003	6	2	0.113	0.114	0.0569	0.181
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0600	0.220	0.160	0.180	0.168	0.205
1994	0.150	0.360	0.210	0.290	0.230	0.320
1995	0.110	0.280	0.170	0.220	0.170	0.260
1996	0.140	0.320	0.180	0.215	0.180	0.280
1997	0.170	0.340	0.170	0.250	0.180	0.300
1998	0.110	0.220	0.110	0.165	0.120	0.220
1999	0.0800	0.190	0.110	0.150	0.117	0.167
2000	0.280	0.300	0.0200	0.125	0.0900	0.170
2001	0.110	0.230	0.120	0.150	0.125	0.200
2002	0.0600	0.110	0.0500	0.0750	0.0600	0.0950
2003	0.220	0.230	0.01000	0.105	0.0150	0.210
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.601	-0.945	0.198	0.604	0.930	0.175
1994	-0.0475	-1.402	0.180	0.647	1.700	0.498
1995	0.0872	-2.151	0.190	0.595	1.320	0.301
1996	0.784	-0.994	0.209	0.489	1.390	0.339
1997	0.112	-1.326	0.181	0.638	1.490	0.392
1998	0.0558	-1.840	0.204	0.519	1.000	0.178
1999	0.299	-1.021	0.191	0.636	0.730	0.111
2000	0.905	1.799	0.202	0.530	0.830	0.159
2001	1.055	-0.00174	0.243	0.465	0.650	0.113
2002	0.560	0.928	0.210	0.598	0.310	0.0259
2003	0.0991	-5.356	0.292	0.256	0.450	0.0895

Chlorophyll a

Figure 128 presents the seasonal mean chlorophyll *a* trend in Limekiln Lake, while Table 101 presents descriptive statistics for chlorophyll *a* in Limekiln Lake. The chlorophyll *a* in Limekiln Lake exhibited an increasing trend from 1997 to 2001. The chlorophyll *a* in Limekiln Lake was lower than the county average, though this difference may not be statistically significant for all years.

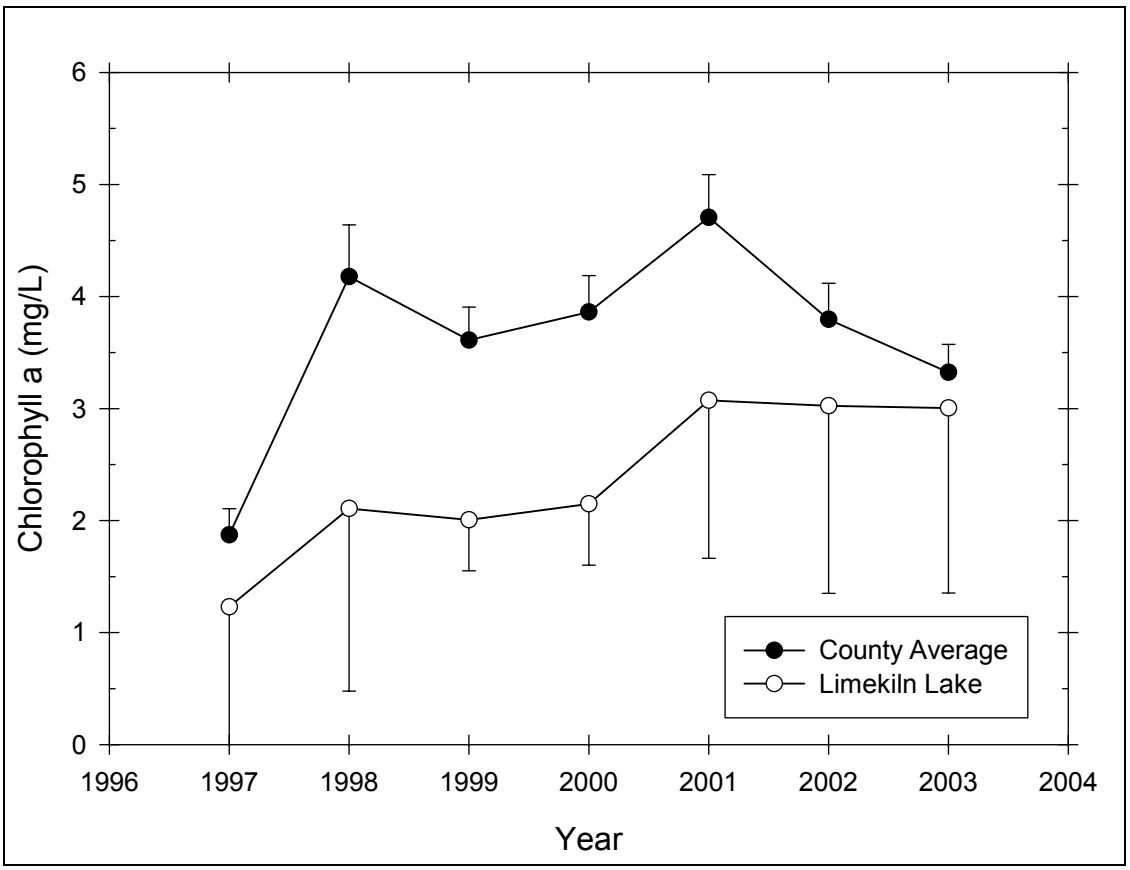


Figure 128 Seasonal mean chlorophyll a trend in Limekiln Lake

Table 101 – Descriptive Statistics for Chlorophyll a in Limekiln Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	1.230	1.605	0.655	1.684
1998	6	0	2.108	1.554	0.634	1.631
1999	6	1	2.006	0.366	0.164	0.454
2000	6	0	2.148	0.521	0.212	0.546
2001	6	2	3.072	0.886	0.443	1.409
2002	6	2	3.025	1.053	0.527	1.676
2003	6	2	3.005	1.038	0.519	1.652
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	4.070	4.460	0.390	0.490	0.440	1.110
1998	3.940	4.570	0.630	1.490	1.070	3.400
1999	0.970	2.450	1.480	2.060	1.758	2.255
2000	1.590	3.080	1.490	2.125	1.920	2.150
2001	2.130	4.220	2.090	2.990	2.455	3.690
2002	2.280	4.570	2.290	2.620	2.360	3.690
2003	2.480	4.440	1.960	2.810	2.355	3.655
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	2.309	5.403	0.363	0.013	7.380	21.950
1998	0.932	-0.668	0.244	0.301	12.650	38.747
1999	-0.472	0.189	0.159	0.731	10.030	20.655
2000	1.088	2.752	0.332	0.037	12.890	29.047

2001	0.525	0.960	0.211	0.597	12.290	40.115
2002	1.752	3.074	0.331	0.132	12.100	39.930
2003	1.069	2.092	0.302	0.220	12.020	39.355

Transparency

Figure 129 presents the seasonal mean transparency trend in Limekiln Lake, while Table 102 presents descriptive statistics for transparency in Limekiln Lake. The transparency in Limekiln Lake was quite variable, but exhibited a slight decreasing trend from 1995 to 2002. The transparency in Limekiln Lake was higher than the county average, though this difference may not be statistically significant for all years.

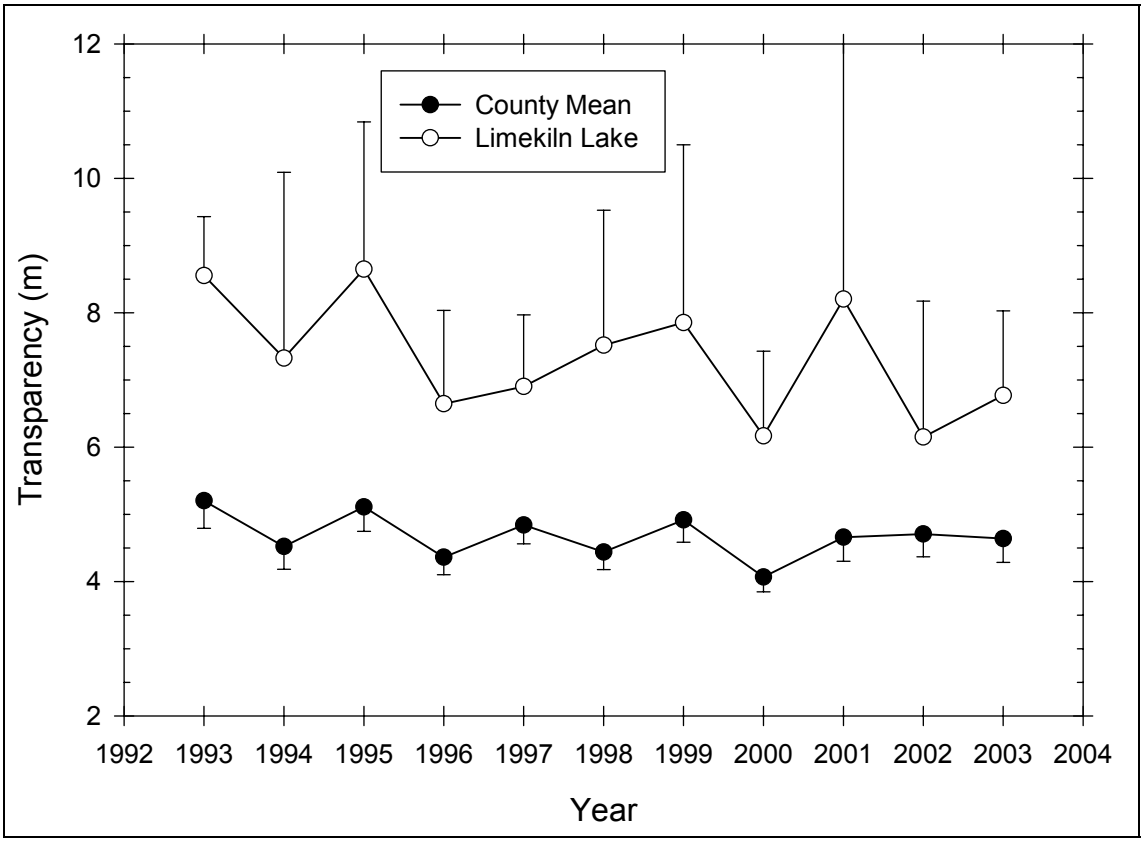


Figure 129 Seasonal mean transparency trend in Limekiln Lake

Table 102 – Descriptive Statistics for Transparency in Limekiln Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	8.552	0.708	0.317	0.879
1994	6	0	7.325	2.635	1.076	2.766
1995	6	0	8.647	2.088	0.853	2.192
1996	6	0	6.645	1.325	0.541	1.391
1997	6	0	6.900	1.017	0.415	1.068
1998	6	0	7.517	1.914	0.781	2.009
1999	5	0	7.852	2.132	0.954	2.648
2000	6	0	6.168	1.199	0.489	1.258
2001	3	0	8.200	1.664	0.961	4.134

2002	4	0	6.150	1.271	0.636	2.023
2003	4	0	6.770	0.790	0.395	1.258
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.660	9.240	7.580	8.790	7.940	9.127
1994	6.750	10.950	4.200	7.400	4.600	9.400
1995	5.700	12.100	6.400	7.890	7.500	10.100
1996	3.300	8.050	4.750	6.940	5.390	7.800
1997	2.710	7.560	4.850	7.185	7.170	7.450
1998	5.010	9.710	4.700	7.575	6.440	9.100
1999	5.550	10.750	5.200	8.400	6.115	9.055
2000	3.140	8.500	5.360	5.625	5.500	6.400
2001	3.100	10.100	7.000	7.500	7.125	9.450
2002	2.700	7.200	4.500	6.450	5.150	7.150
2003	1.780	7.850	6.070	6.580	6.190	7.350
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.636	-1.728	0.232	0.442	42.760	367.690
1994	0.0956	-1.292	0.183	0.632	43.950	356.662
1995	0.987	0.209	0.242	0.310	51.880	470.393
1996	-0.554	-1.453	0.177	0.658	39.870	273.720
1997	-2.305	5.480	0.438	<0.001	41.400	290.836
1998	-0.374	-1.267	0.205	0.512	45.100	357.320
1999	0.136	-0.477	0.201	0.591	39.260	326.459
2000	2.011	4.051	0.334	0.035	37.010	235.472
2001	1.558	--	0.330	0.218	24.600	207.260
2002	-0.817	-1.439	0.273	0.333	24.600	156.140
2003	1.107	0.550	0.220	0.562	27.080	185.206

TSI

Figure 130 presents the Carlson trophic state index trend in Limekiln Lake. Transparency TSI was in the oligotrophic range throughout the period of record, while chlorophyll *a* TSI was within the mesotrophic range from 1997 to 2000 and at the mesotrophic-eutrophic boundary from 2001 to 2003. Total phosphorus TSI was generally mesotrophic or at the oligotrophic-mesotrophic boundary, although the values were into the oligotrophic range in 2002 and 2003.

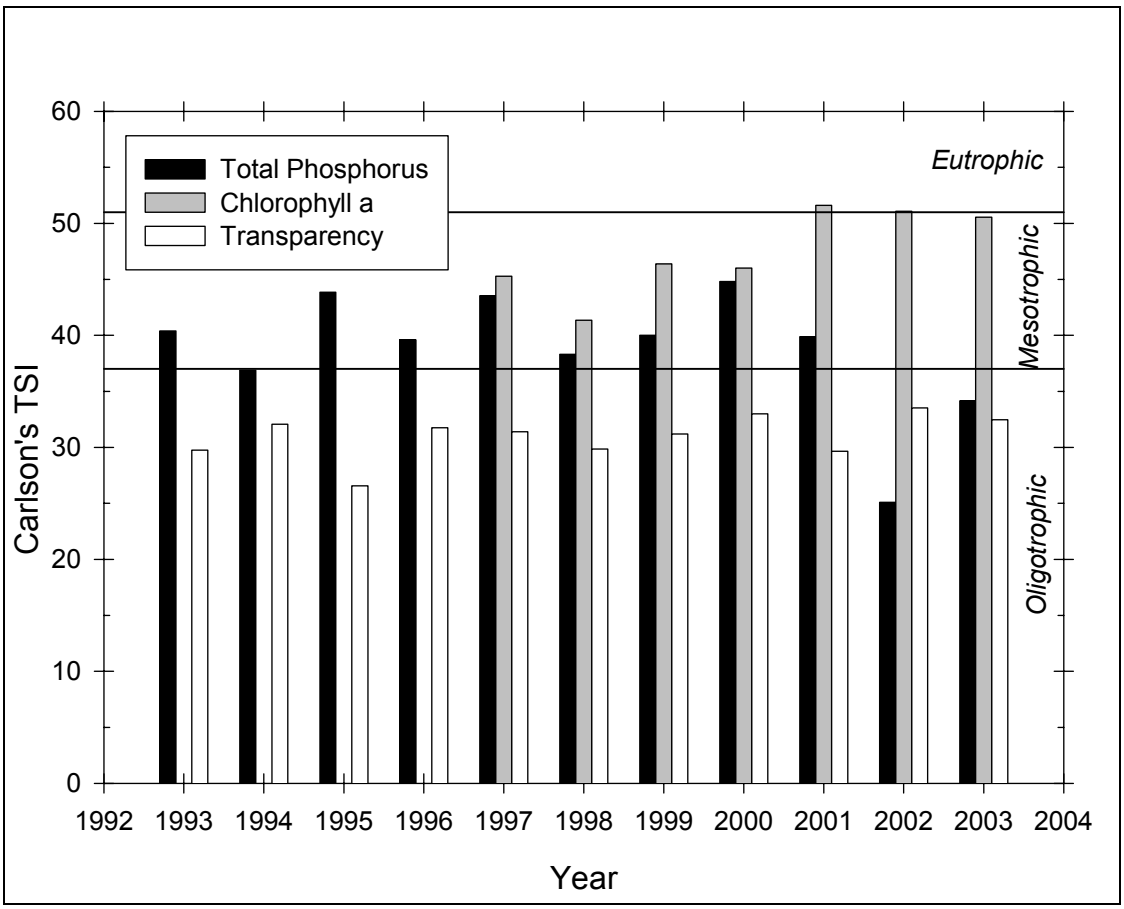


Figure 130 Carlson TSI trend in Limekiln Lake

Aluminum

Figure 131 presents the seasonal mean aluminum trend in Limekiln Lake, while Table 103 presents descriptive statistics for aluminum in Limekiln Lake. The aluminum in Limekiln Lake was quite variable, exhibiting no specific trend. The aluminum in Limekiln Lake was slightly higher than the county average, though this difference was generally not statistically significant.

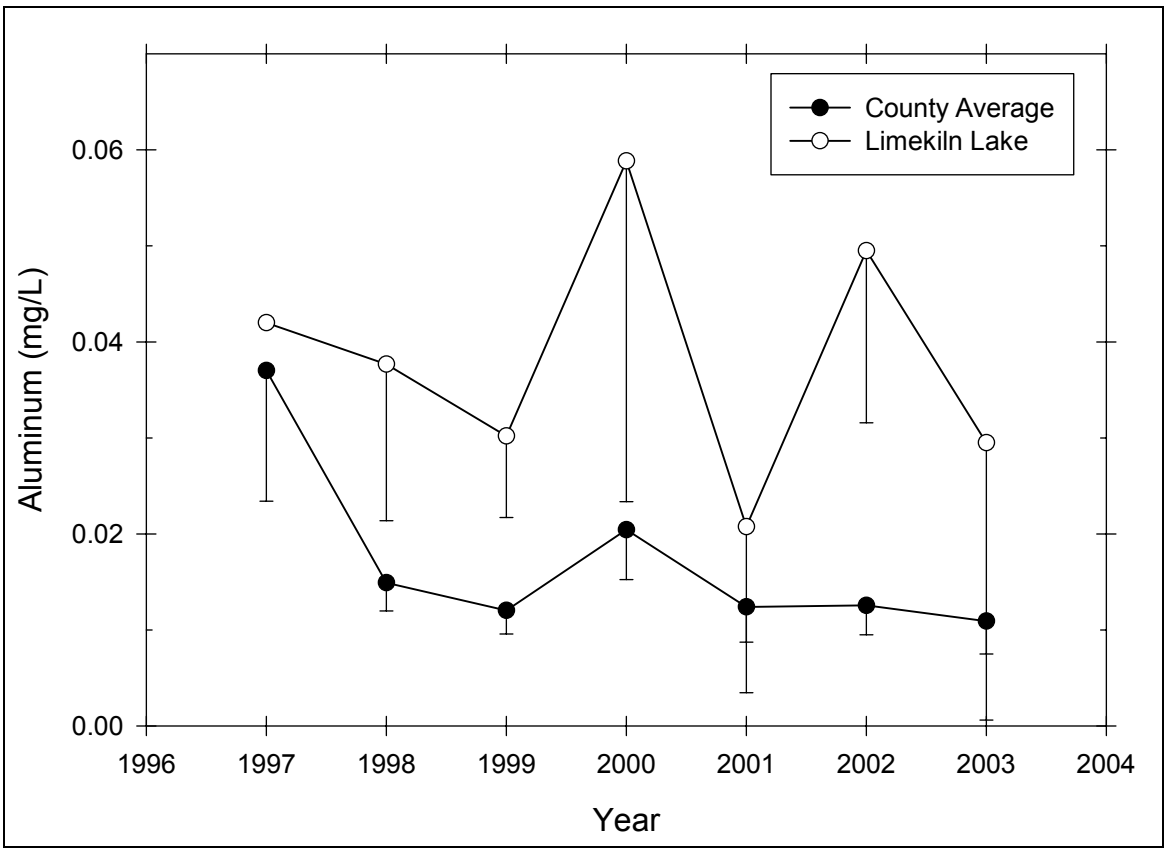


Figure 131 Seasonal mean aluminum trend in Limekiln Lake

Table 103 – Descriptive Statistics for Aluminum in Limekiln Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0420	--	--	--
1998	6	0	0.0377	0.0155	0.00634	0.0163
1999	6	1	0.0302	0.00683	0.00306	0.00849
2000	6	0	0.0588	0.0338	0.0138	0.0355
2001	6	2	0.0208	0.0109	0.00544	0.0173
2002	6	2	0.0495	0.0113	0.00563	0.0179
2003	6	2	0.0295	0.0182	0.00908	0.0289
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0420	0.0420	0.0420	0.0420	0.0420
1998	0.0460	0.0580	0.0120	0.0385	0.0320	0.0470
1999	0.0170	0.0420	0.0250	0.0290	0.0258	0.0323
2000	0.0900	0.118	0.0280	0.0520	0.0290	0.0740
2001	0.0230	0.0280	0.00500	0.0250	0.0135	0.0280
2002	0.0250	0.0580	0.0330	0.0535	0.0425	0.0565
2003	0.0430	0.0550	0.0120	0.0255	0.0185	0.0405
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0420	0.00176
1998	-0.628	1.142	0.191	0.591	0.226	0.00972
1999	1.860	3.712	0.370	0.024	0.151	0.00475
2000	1.189	1.264	0.188	0.604	0.353	0.0265
2001	-1.629	2.487	0.296	0.241	0.0830	0.00208

2002	-1.722	3.094	0.338	0.116	0.198	0.0102
2003	1.235	2.362	0.326	0.144	0.118	0.00447

Calcium

Figure 132 presents the seasonal mean calcium trend in Limekiln Lake, while Table 104 presents descriptive statistics for calcium in Limekiln Lake. The calcium in Limekiln Lake was generally stable throughout the period of record. The calcium in Limekiln Lake was significantly lower than the county average.

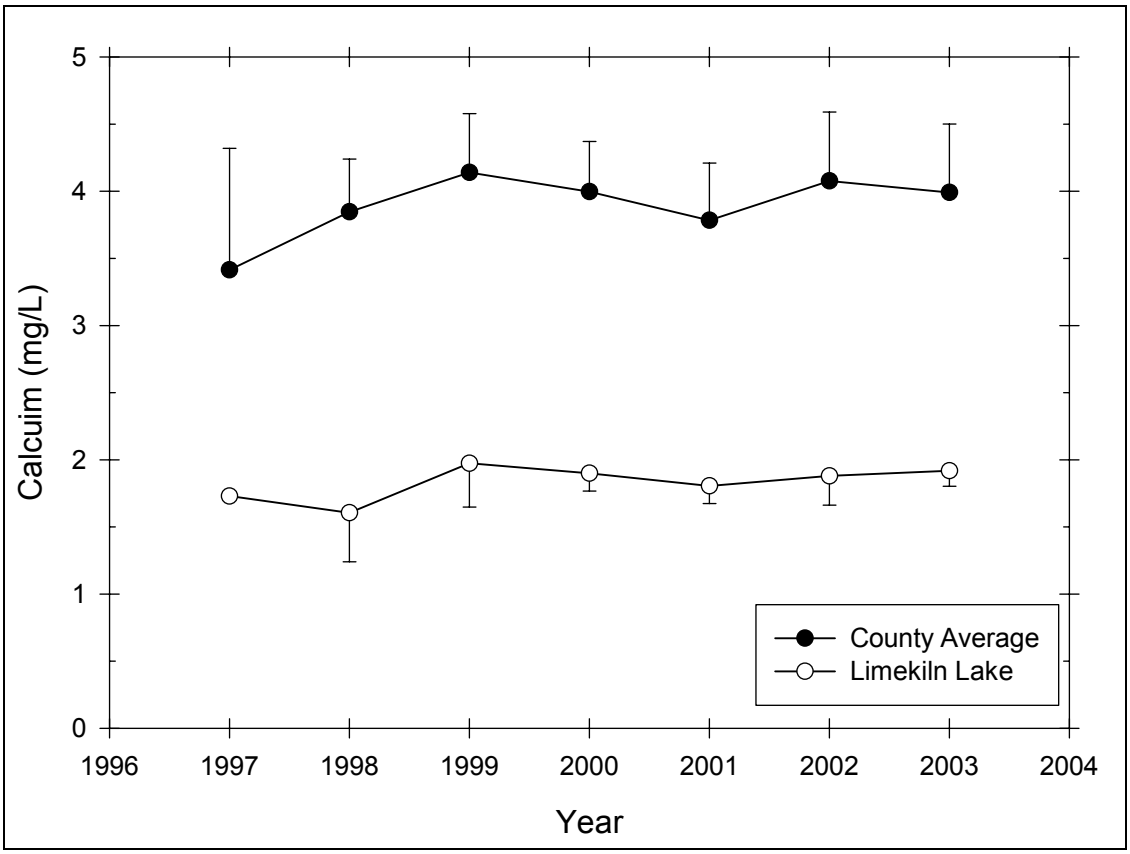


Figure 132 Seasonal mean calcium trend in Limekiln Lake

Table 104 – Descriptive Statistics for Calcium in Limekiln Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	1.730	--	--	--
1998	6	0	1.605	0.348	0.142	0.366
1999	6	1	1.974	0.263	0.117	0.326
2000	6	0	1.900	0.127	0.0519	0.133
2001	6	2	1.805	0.0823	0.0411	0.131
2002	6	2	1.880	0.137	0.0687	0.219
2003	6	2	1.918	0.0727	0.0364	0.116
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	1.730	1.730	1.730	1.730	1.730
1998	0.920	1.880	0.960	1.730	1.470	1.860
1999	0.670	2.320	1.650	2.010	1.755	2.155

2000	0.370	2.080	1.710	1.885	1.850	1.990
2001	0.200	1.910	1.710	1.800	1.750	1.860
2002	0.310	1.990	1.680	1.925	1.795	1.965
2003	0.160	2.010	1.850	1.905	1.860	1.975
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	1.730	2.993
1998	-1.626	2.487	0.285	0.134	9.630	16.063
1999	0.0743	-0.962	0.158	0.732	9.870	19.759
2000	-0.0710	0.257	0.180	0.643	11.400	21.741
2001	0.356	1.282	0.226	0.537	7.220	13.052
2002	-1.653	2.983	0.336	0.119	7.520	14.194
2003	0.672	-1.677	0.243	0.463	7.670	14.723

Calcite Saturation Index

Figure 133 presents the calcite saturation index trend in Limekiln Lake. The CSI in Limekiln Lake exhibited a variable but generally decreasing trend from 1997 to 2003. The CSI was well into the very vulnerable to acid deposition range in 1997 and 1998, but moved into the moderately vulnerable range in 1999 and 2000, then fluctuated around the boundary between moderately and very vulnerable. The CSI in Limekiln Lake was higher than the county average, though this difference may not be statistically significant for all years.

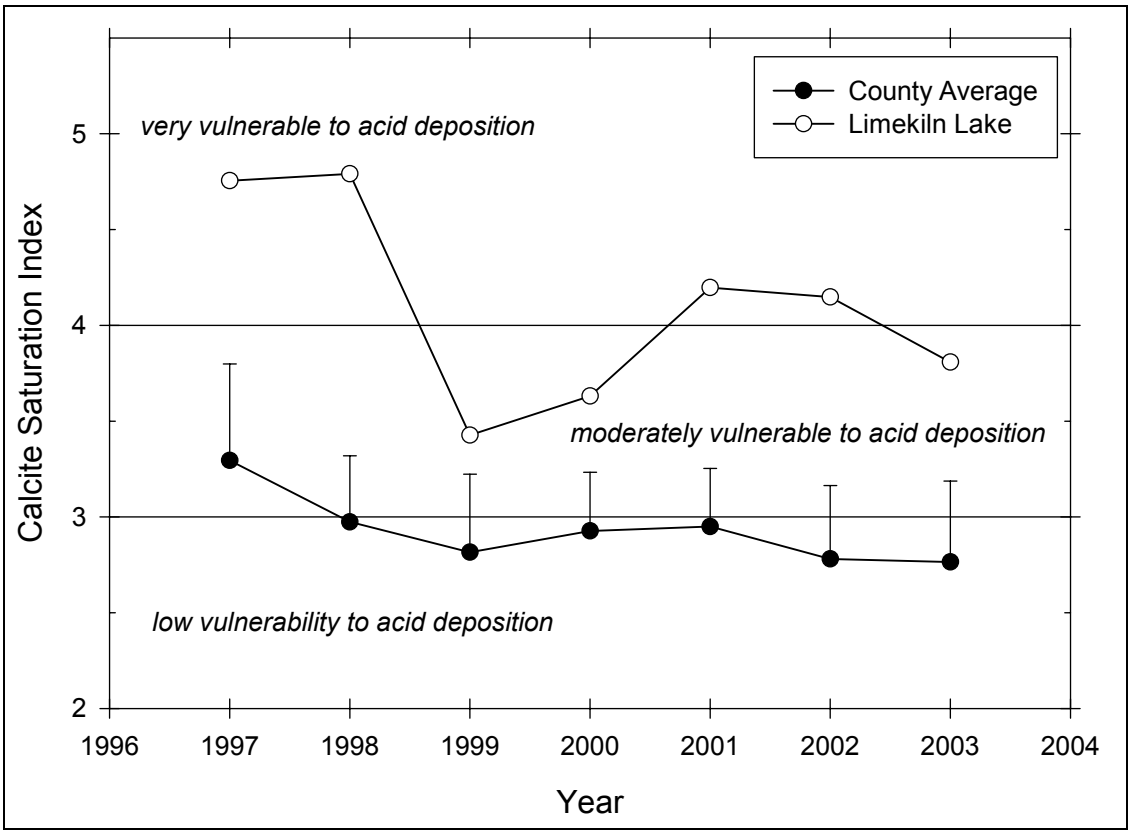
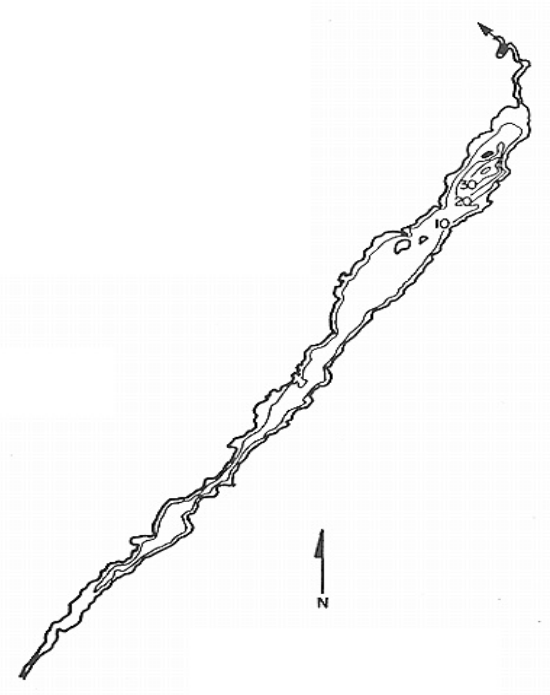


Figure 133 Seasonal mean CSI trend in Limekiln Lake

Long Lake



Location
Pond Number: 060241
Watershed: St. Lawrence River
County: Hamilton
Topographic Quadrangle: Long Lake / Blue Mountain
Sample Site
Latitude: 44o 04.241'
Longitude: 74o 19.760'
Morphometry
Surface Area: 4,077 Ac.
Mean Depth: 13 Ft.
Maximum Depth: 43 Ft.
Volume: 53,001 Ac./Ft.
Watershed Area: 301,467 Ac.
Hydraulic Retention Time: 0.1 Yr.
Shoreline Length: 35.0 Mi.
Elevation: 1,627 Ft.
Water Quality Classification: B

Temperature and Dissolved Oxygen

Long Lake had a minimum DO of 0.2 mg/L (August 1998), with a minimum temperature of 4.0°C and a maximum temperature of 25.2°C. In general, the lowest DO values occurred during the months of August through September.

pH

Figure 134 presents the seasonal mean pH trend in Long Lake, while Table 105 presents descriptive statistics for pH in Long Lake. The pH in Long Lake exhibited an increasing trend from 1996 to 2002. The pH in Long Lake was similar to the county average from 1994 to 1998 and slightly higher than the county average from 1999 to 2003, though this difference was not statistically significant.

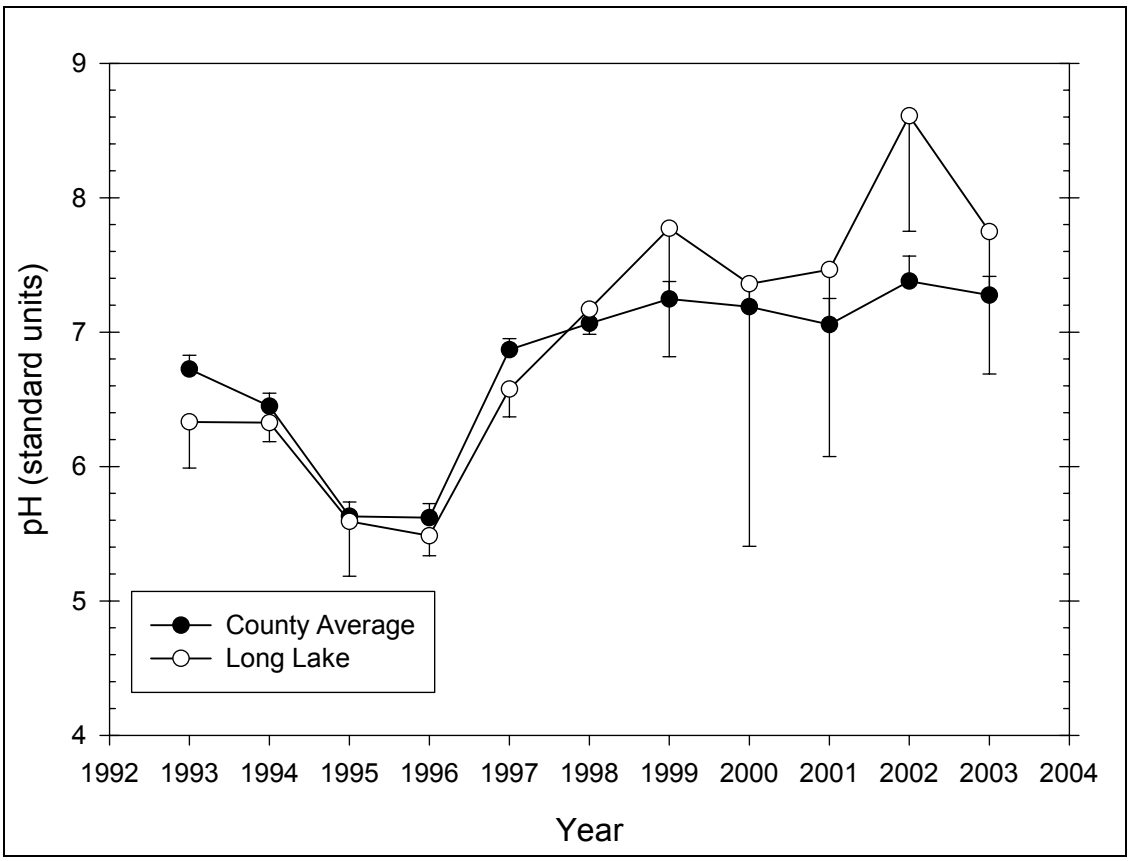


Figure 134 Seasonal mean pH trend in Long Lake

Table 105 – Descriptive Statistics for pH in Long Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	6.332	0.276	0.124	0.343
1994	6	0	6.327	0.135	0.0553	0.142
1995	6	0	5.592	0.389	0.159	0.409
1996	6	0	5.485	0.141	0.0575	0.148
1997	6	0	6.577	0.198	0.0807	0.207
1998	6	0	7.170	0.177	0.0724	0.186
1999	5	0	7.772	0.768	0.344	0.954
2000	3	0	7.360	0.788	0.455	1.957
2001	4	0	7.465	0.874	0.437	1.390
2002	4	0	8.610	0.540	0.270	0.859
2003	4	0	7.748	0.665	0.333	1.058
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.670	6.800	6.130	6.210	6.152	6.470
1994	0.400	6.510	6.110	6.320	6.280	6.420
1995	1.070	6.050	4.980	5.540	5.460	5.980
1996	0.400	5.760	5.360	5.455	5.410	5.470
1997	0.480	6.790	6.310	6.580	6.420	6.780
1998	0.480	7.510	7.030	7.105	7.060	7.210
1999	1.860	8.550	6.690	8.110	7.125	8.317
2000	1.520	8.240	6.720	7.120	6.820	7.960
2001	2.060	8.370	6.310	7.590	6.835	8.095

2002	1.130	9.300	8.170	8.485	8.180	9.040
2003	1.520	8.610	7.090	7.645	7.240	8.255
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.728	2.902	0.271	0.256	31.660	200.776
1994	-0.399	0.850	0.199	0.550	37.960	240.252
1995	-0.389	0.0521	0.201	0.536	33.550	188.359
1996	1.963	4.386	0.376	0.008	32.910	180.611
1997	-0.177	-1.882	0.182	0.638	39.460	259.711
1998	1.866	3.592	0.299	0.096	43.020	308.611
1999	-0.718	-1.323	0.270	0.259	38.860	304.381
2000	1.244	--	0.286	0.366	22.080	163.750
2001	-0.756	0.609	0.202	0.626	29.860	225.195
2002	0.737	-1.898	0.282	0.296	34.440	297.403
2003	0.714	-0.606	0.205	0.618	30.990	241.422

Alkalinity

Figure 135 presents the seasonal mean alkalinity trend in Long Lake, while Table 106 presents descriptive statistics for alkalinity in Long Lake. The alkalinity in Long Lake exhibited no defined trend. The alkalinity in Long Lake was lower than the county average, though this difference may not be statistically significant for some years.

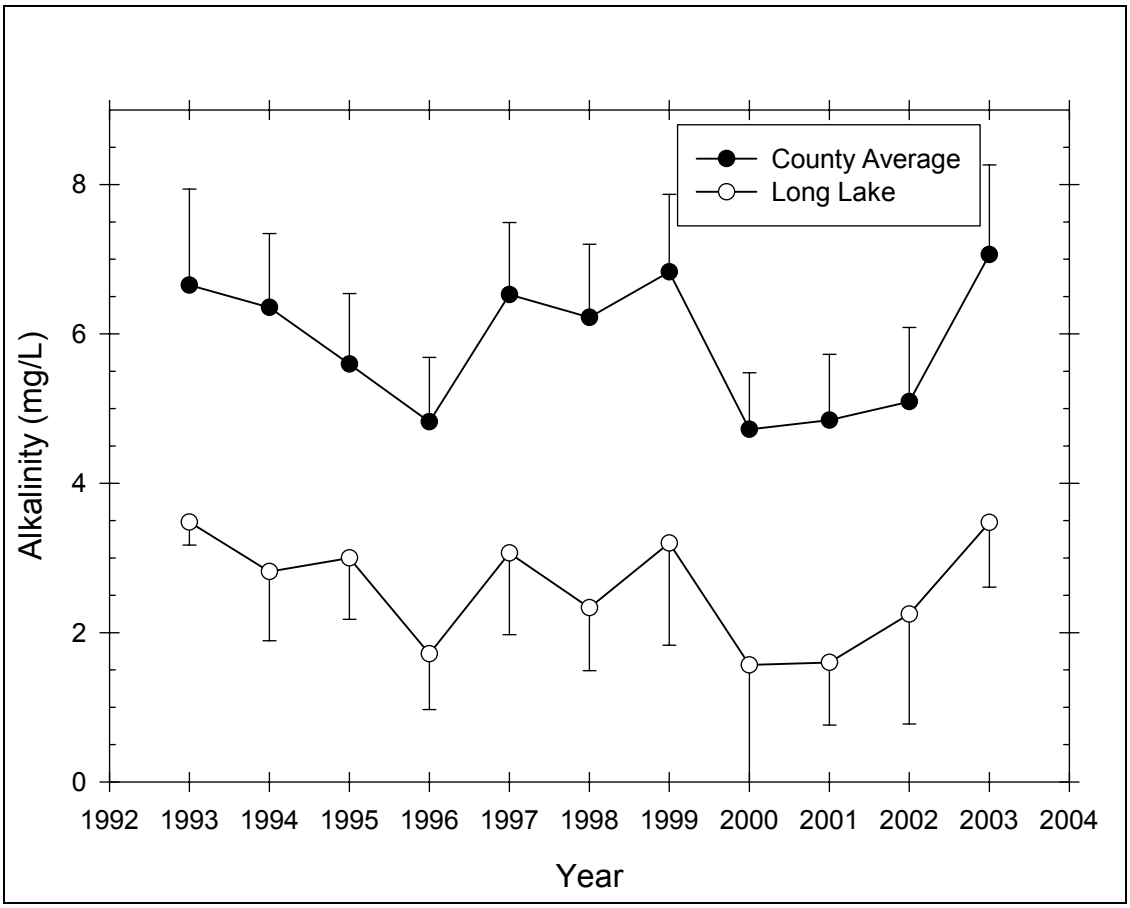


Figure 135 Seasonal mean alkalinity trend in Long Lake

Table 106 – Descriptive Statistics for Alkalinity in Long Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	3.480	0.249	0.111	0.309
1994	6	0	2.817	0.882	0.360	0.925
1995	6	0	3.000	0.782	0.319	0.821
1996	6	0	1.717	0.711	0.290	0.746
1997	6	0	3.067	1.041	0.425	1.092
1998	6	0	2.333	0.804	0.328	0.844
1999	6	2	3.200	0.860	0.430	1.369
2000	6	3	1.567	0.666	0.384	1.654
2001	6	1	1.600	0.675	0.302	0.838
2002	6	2	2.250	0.926	0.463	1.473
2003	6	2	3.475	0.544	0.272	0.865
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.600	3.900	3.300	3.400	3.300	3.600
1994	2.200	4.000	1.800	2.800	1.900	3.600
1995	1.900	4.100	2.200	2.800	2.300	3.800
1996	2.000	3.100	1.100	1.550	1.300	1.700
1997	2.200	4.200	2.000	3.100	2.000	4.000
1998	1.900	3.300	1.400	2.250	1.600	3.200
1999	2.000	4.100	2.100	3.300	2.550	3.850
2000	1.300	2.300	1.000	1.400	1.100	2.075
2001	1.800	2.400	0.600	1.500	1.275	2.100
2002	2.000	3.000	1.000	2.500	1.550	2.950
2003	1.200	3.900	2.700	3.650	3.100	3.850
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.671	2.815	0.268	0.267	17.400	60.800
1994	0.138	-1.491	0.184	0.626	16.900	51.490
1995	0.609	-1.528	0.268	0.195	18.000	57.060
1996	1.943	4.260	0.343	0.026	10.300	20.210
1997	-0.0161	-2.975	0.260	0.228	18.400	61.840
1998	0.181	-2.068	0.193	0.581	14.000	35.900
1999	-0.572	-0.428	0.179	0.686	12.800	43.180
2000	1.056	--	0.265	0.442	4.700	8.250
2001	-0.578	0.667	0.241	0.394	8.000	14.620
2002	-1.059	-0.161	0.259	0.393	9.000	22.820
2003	-1.468	1.908	0.268	0.351	13.900	49.190

Total Phosphorus

Figure 136 presents the seasonal mean total phosphorus trend in Long Lake, while Table 107 presents descriptive statistics for total phosphorus in Long Lake. The total phosphorus in Long Lake was variable, but exhibited a general decreasing trend from 1997 to 2003, with a higher peak in 1999. The total phosphorus in Long Lake was similar to but more variable than the county average.

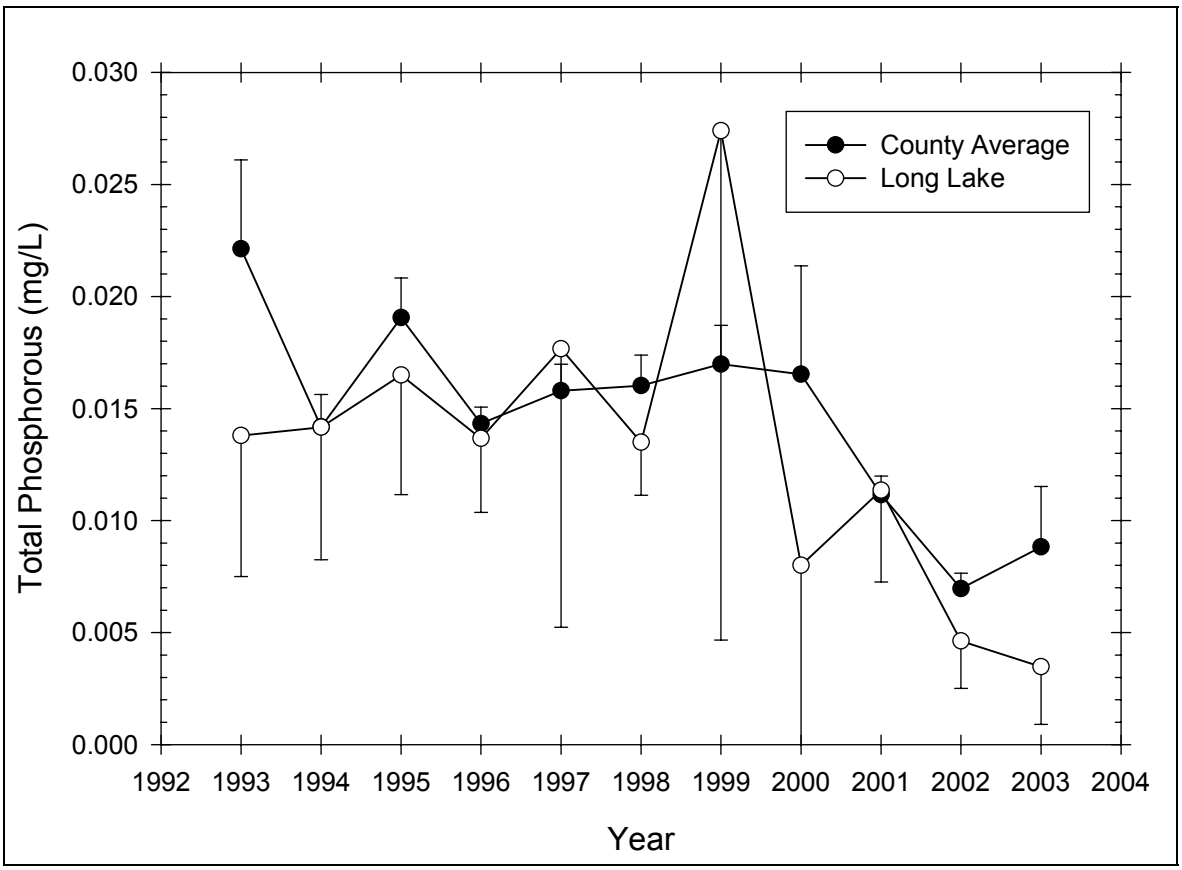


Figure 136 Seasonal mean total phosphorus trend in Long Lake

Table 107 – Descriptive Statistics for Total Phosphorus in Long Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0138	0.00507	0.00227	0.00629
1994	6	0	0.0142	0.00564	0.00230	0.00591
1995	6	0	0.0165	0.00509	0.00208	0.00534
1996	6	0	0.0137	0.00314	0.00128	0.00330
1997	6	0	0.0177	0.0118	0.00484	0.0124
1998	6	0	0.0135	0.00226	0.000922	0.00237
1999	6	1	0.0274	0.0183	0.00819	0.0227
2000	6	4	0.00800	0.00707	0.00500	0.0635
2001	6	2	0.0113	0.00257	0.00129	0.00409
2002	6	2	0.00463	0.00133	0.000666	0.00212
2003	6	2	0.00348	0.00162	0.000808	0.00257
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0130	0.0180	0.00500	0.0150	0.0125	0.0165
1994	0.0160	0.0250	0.00900	0.0120	0.0120	0.0150
1995	0.0150	0.0230	0.00800	0.0175	0.0140	0.0190
1996	0.00900	0.0180	0.00900	0.0135	0.0120	0.0160
1997	0.0320	0.0400	0.00800	0.0135	0.01000	0.0210
1998	0.00600	0.0170	0.0110	0.0130	0.0120	0.0150
1999	0.0430	0.0600	0.0170	0.0190	0.0185	0.0315
2000	0.01000	0.0130	0.00300	0.00800	0.00300	0.0130
2001	0.00610	0.0140	0.00790	0.0118	0.00955	0.0132

2002	0.00280	0.00640	0.00360	0.00425	0.00360	0.00565
2003	0.00380	0.00500	0.00120	0.00385	0.00245	0.00450
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-1.897	3.991	0.394	0.011	0.0690	0.00105
1994	1.849	3.845	0.316	0.061	0.0850	0.00136
1995	-0.765	1.147	0.206	0.510	0.0990	0.00176
1996	-0.120	-0.0342	0.131	0.771	0.0820	0.00117
1997	1.738	3.078	0.256	0.244	0.106	0.00257
1998	0.625	-0.750	0.247	0.287	0.0810	0.00112
1999	2.184	4.808	0.416	0.005	0.137	0.00509
2000	--	--	0.260	0.481	0.0160	0.000178
2001	-0.846	1.103	0.227	0.533	0.0454	0.000535
2002	0.975	-0.668	0.279	0.306	0.0185	0.0000909
2003	-1.277	2.303	0.305	0.207	0.0139	0.0000561

Nitrate

Figure 137 presents the seasonal mean nitrate trend in Long Lake, while Table 108 presents descriptive statistics for nitrate in Long Lake. The nitrate in Long Lake exhibited a decreasing trend from 1997 to 2002. The nitrate in Long Lake was similar to the county average.

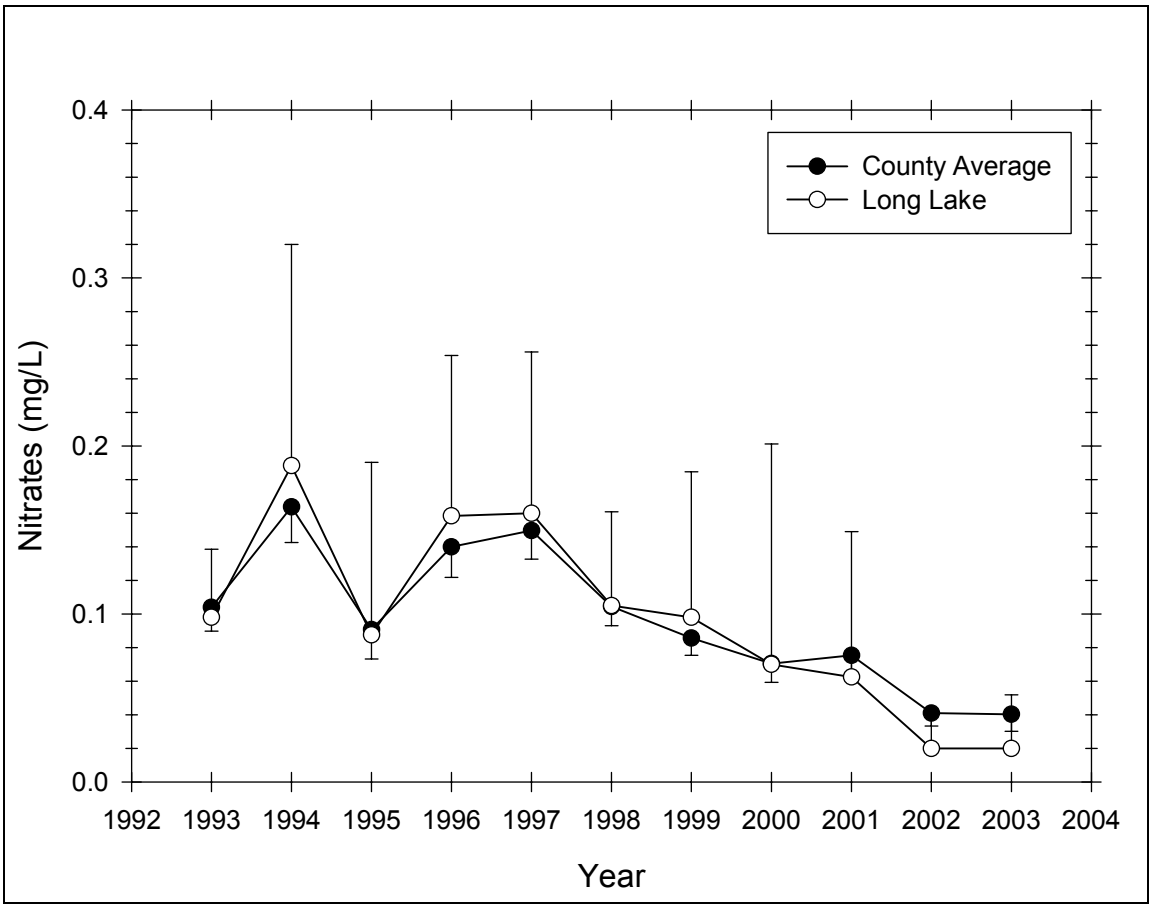


Figure 137 Seasonal mean nitrate trend in Long Lake

Table 108 – Descriptive Statistics for Nitrate in Long Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0980	0.0327	0.0146	0.0406
1994	6	0	0.188	0.125	0.0512	0.132
1995	6	0	0.0875	0.0979	0.0400	0.103
1996	6	0	0.158	0.0911	0.0372	0.0956
1997	6	0	0.160	0.0914	0.0373	0.0960
1998	6	0	0.105	0.0532	0.0217	0.0558
1999	6	1	0.0980	0.0698	0.0312	0.0866
2000	6	3	0.0700	0.0529	0.0306	0.131
2001	6	2	0.0625	0.0544	0.0272	0.0865
2002	6	2	0.0200	0.0141	0.00707	0.0225
2003	6	2	0.0200	0.0200	0.01000	0.0318
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0800	0.130	0.0500	0.110	0.0725	0.123
1994	0.300	0.360	0.0600	0.170	0.0600	0.310
1995	0.240	0.240	0.000	0.0550	0.00500	0.170
1996	0.240	0.310	0.0700	0.145	0.0800	0.200
1997	0.230	0.300	0.0700	0.150	0.0800	0.210
1998	0.140	0.200	0.0600	0.0850	0.0700	0.130
1999	0.170	0.200	0.0300	0.0900	0.0375	0.148
2000	0.1000	0.130	0.0300	0.0500	0.0350	0.110
2001	0.120	0.140	0.0200	0.0450	0.0250	0.1000
2002	0.0300	0.0400	0.01000	0.0150	0.01000	0.0300
2003	0.0400	0.0500	0.01000	0.01000	0.01000	0.0300
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.849	-0.666	0.243	0.384	0.490	0.0523
1994	0.392	-1.636	0.180	0.644	1.130	0.292
1995	0.860	-0.885	0.222	0.420	0.525	0.0938
1996	0.908	0.221	0.202	0.530	0.950	0.192
1997	0.579	-1.117	0.244	0.299	0.960	0.195
1998	1.387	1.524	0.245	0.297	0.630	0.0803
1999	0.716	-0.516	0.197	0.610	0.490	0.0675
2000	1.458	--	0.314	0.268	0.210	0.0203
2001	1.468	1.908	0.268	0.351	0.250	0.0245
2002	1.414	1.500	0.260	0.387	0.0800	0.00220
2003	2.000	4.000	0.441	0.006	0.0800	0.00280

Chlorophyll a

Figure 138 presents the seasonal mean chlorophyll *a* trend in Long Lake, while Table 109 presents descriptive statistics for chlorophyll *a* in Long Lake. The chlorophyll *a* in Long Lake exhibited an increasing trend from 1997 to 2001 and a decreasing trend from 2001 to 2003. The chlorophyll *a* in Long Lake was slightly higher than the county average, though this difference was not statistically significant.

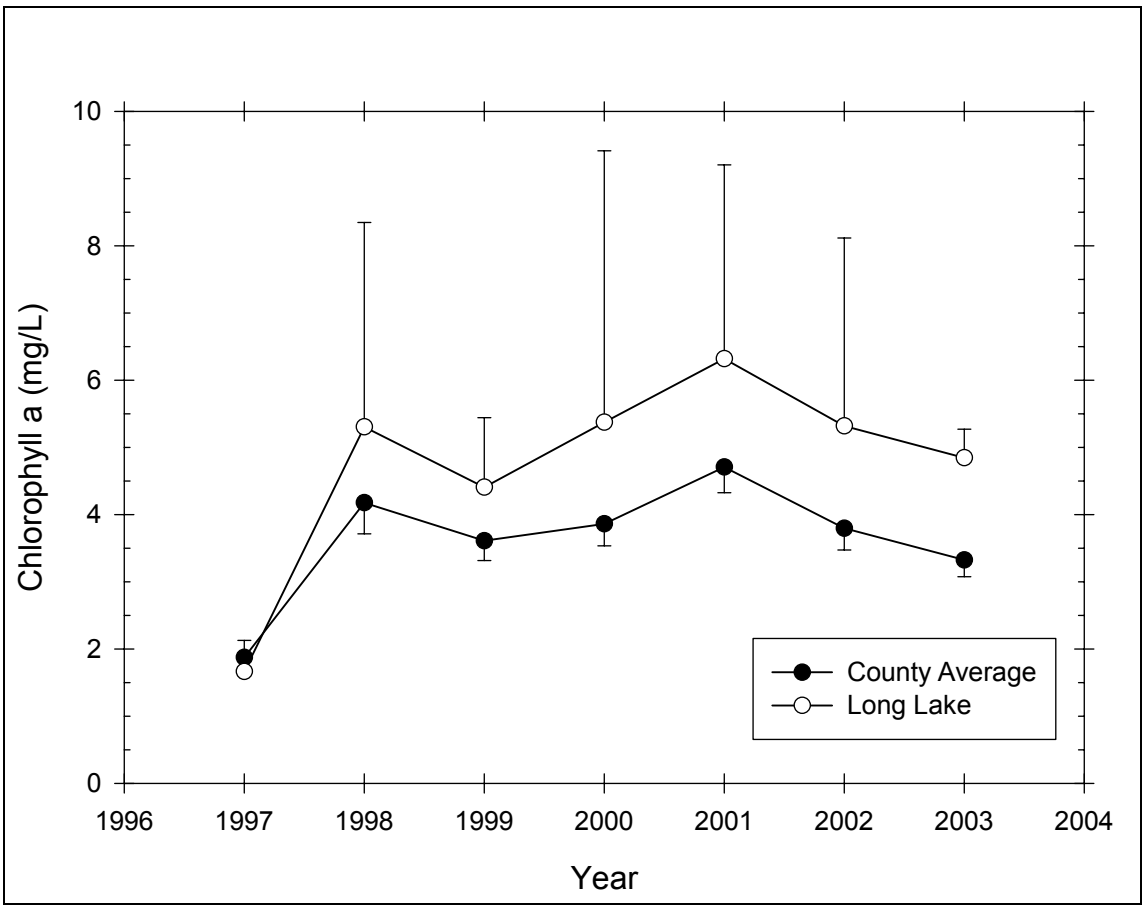


Figure 138 Seasonal mean chlorophyll a trend in Long Lake

Table 109 – Descriptive Statistics for Chlorophyll a in Long Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	1.665	0.439	0.179	0.461
1998	6	0	5.305	2.900	1.184	3.043
1999	6	1	4.406	0.834	0.373	1.036
2000	6	3	5.373	1.629	0.941	4.048
2001	6	2	6.317	1.814	0.907	2.886
2002	6	2	5.317	1.759	0.879	2.798
2003	6	2	4.845	0.267	0.134	0.425
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	1.020	2.180	1.160	1.605	1.320	2.120
1998	6.860	9.240	2.380	4.260	3.210	8.480
1999	2.060	5.780	3.720	4.320	3.750	4.783
2000	3.170	6.740	3.570	5.810	4.130	6.508
2001	3.590	8.270	4.680	6.160	4.775	7.860
2002	3.830	7.780	3.950	4.770	4.055	6.580
2003	0.510	5.090	4.580	4.855	4.615	5.075
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	0.144	-2.466	0.249	0.275	9.990	17.597
1998	0.643	-1.834	0.240	0.321	31.830	210.897
1999	1.435	2.210	0.279	0.222	22.030	99.849

2000	-1.119	--	0.272	0.417	16.120	91.929
2001	0.164	-4.954	0.288	0.272	25.270	169.515
2002	1.327	1.160	0.245	0.455	21.270	122.381
2003	-0.0481	-5.599	0.289	0.265	19.380	94.111

Transparency

Figure 139 presents the seasonal mean transparency trend in Long Lake, while Table 110 presents descriptive statistics for transparency in Long Lake. The transparency in Long Lake was variable, but exhibited a slight decreasing trend from 1995 to 2002. The transparency in Long Lake was slightly lower than the county average, though this difference was not statistically significant.

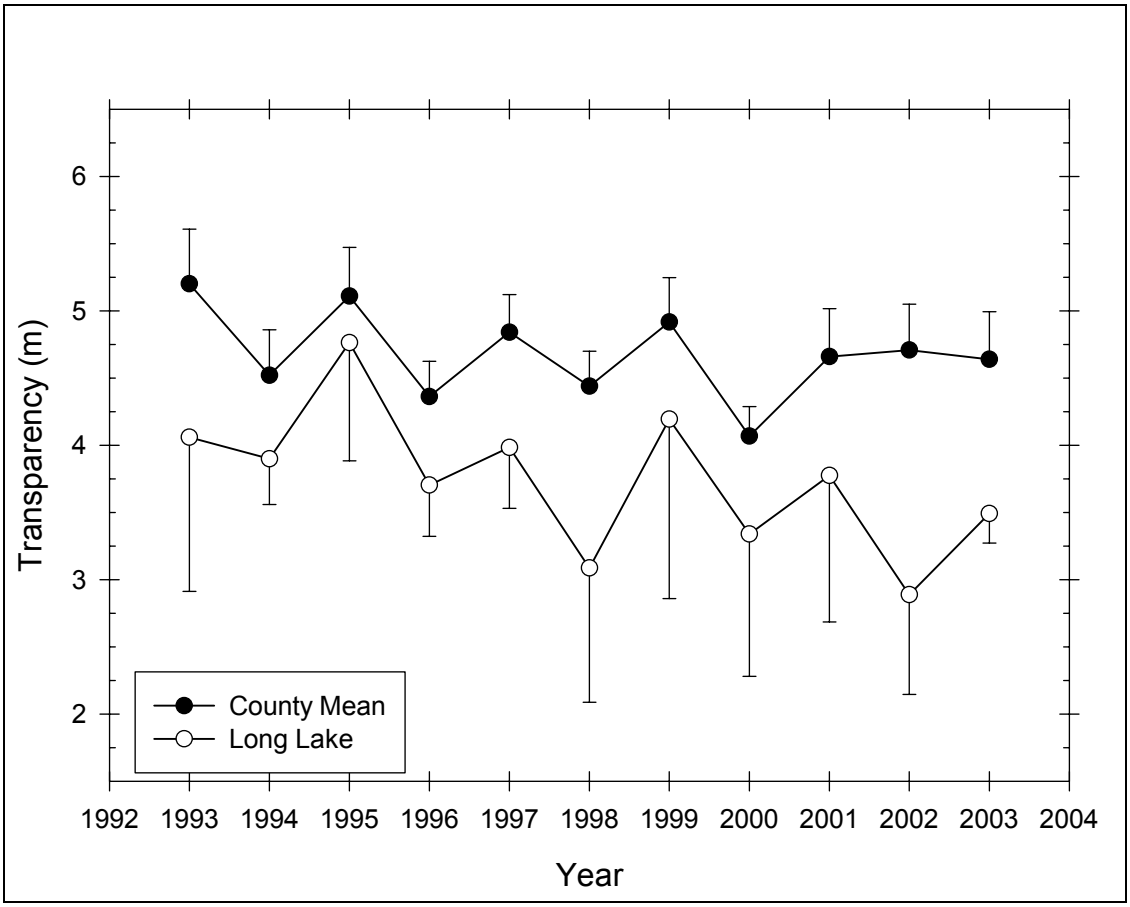


Figure 139 Seasonal mean transparency in Long Lake

Table 110 – Descriptive Statistics for Transparency in Long Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	4.060	0.925	0.414	1.148
1994	6	1	3.900	0.274	0.122	0.340
1995	6	0	4.763	0.838	0.342	0.879
1996	6	0	3.703	0.364	0.149	0.382
1997	6	0	3.983	0.431	0.176	0.453

1998	6	0	3.087	0.952	0.389	0.999
1999	5	0	4.194	1.075	0.481	1.335
2000	3	0	3.340	0.428	0.247	1.062
2001	4	0	3.775	0.685	0.342	1.090
2002	4	0	2.888	0.466	0.233	0.742
2003	4	0	3.492	0.138	0.0692	0.220
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	2.120	5.150	3.030	3.940	3.255	4.925
1994	0.700	4.300	3.600	3.900	3.675	4.075
1995	2.100	5.750	3.650	4.675	4.130	5.700
1996	0.910	4.060	3.150	3.780	3.450	4.000
1997	1.200	4.600	3.400	4.050	3.600	4.200
1998	2.420	4.590	2.170	2.830	2.250	3.850
1999	2.560	5.710	3.150	3.750	3.382	5.103
2000	0.820	3.820	3.000	3.200	3.050	3.665
2001	1.500	4.300	2.800	4.000	3.300	4.250
2002	1.100	3.500	2.400	2.825	2.550	3.225
2003	0.300	3.660	3.360	3.475	3.380	3.605
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.161	-2.511	0.204	0.581	20.300	85.838
1994	0.609	-0.133	0.167	0.713	19.500	76.350
1995	0.0748	-1.395	0.202	0.533	28.580	139.644
1996	-0.613	-1.211	0.260	0.227	22.220	82.950
1997	-0.0303	-0.501	0.173	0.677	23.900	96.132
1998	0.849	-0.574	0.236	0.341	18.520	61.696
1999	0.743	-1.404	0.260	0.302	20.970	92.571
2000	1.316	--	0.295	0.334	10.020	33.832
2001	-1.463	1.829	0.265	0.368	15.100	58.410
2002	0.708	0.512	0.197	0.643	11.550	34.002
2003	0.445	-2.788	0.248	0.441	13.970	48.848

TSI

Figure 140 presents the Carlson trophic state index trend in Long Lake. Transparency TSI was in the mesotrophic range throughout the period of record, while the chlorophyll *a* TSI was in the eutrophic range with the exception of 1997, when it was mesotrophic. Total phosphorus TSI was in the mesotrophic range from 1993 to 1999, and well into the oligotrophic range in 2000, 2002, and 2003.

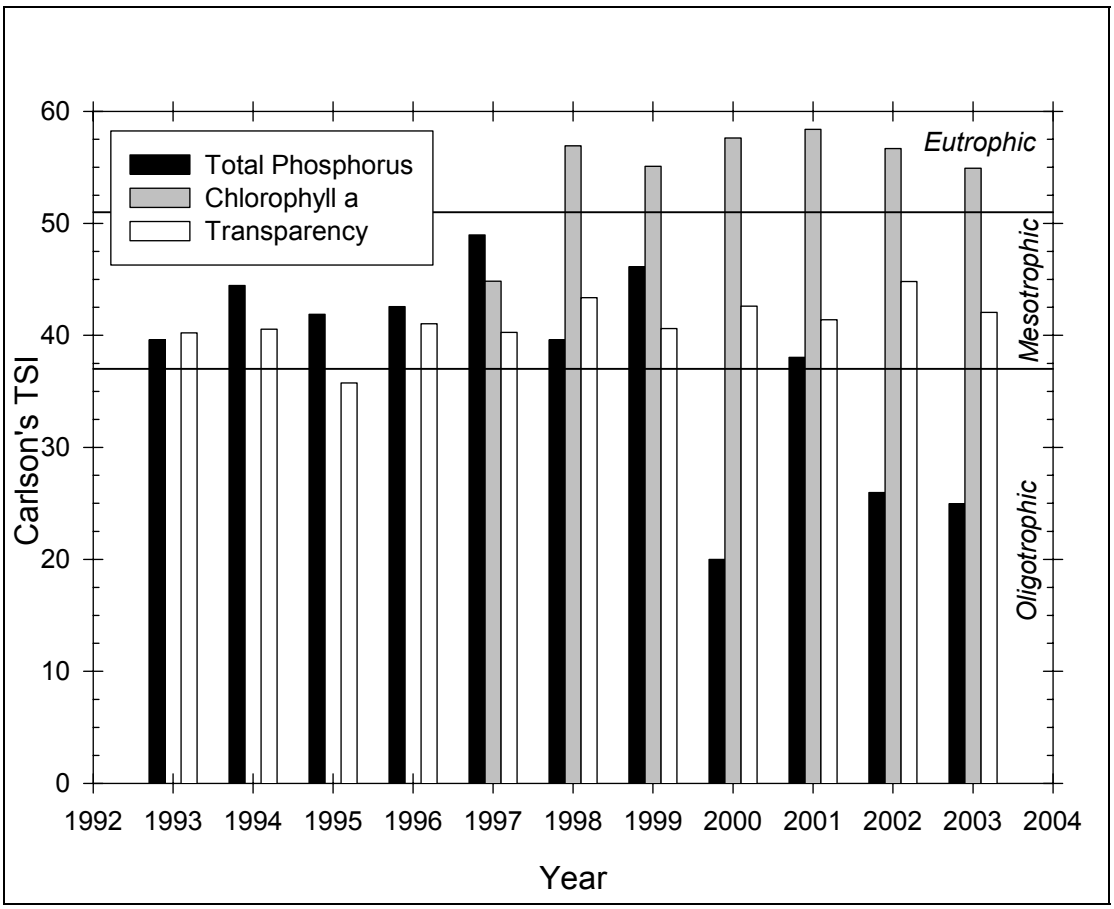


Figure 140 Carlson TSI trend in Long Lake

Aluminum

Figure 141 presents the seasonal mean aluminum trend in Long Lake, while Table 111 presents descriptive statistics for aluminum in Long Lake. The aluminum in Long Lake exhibited a general decreasing trend from 1997 to 2001, with stabilized values in 2001 to 2003. The aluminum in Long Lake was similar to the county average.

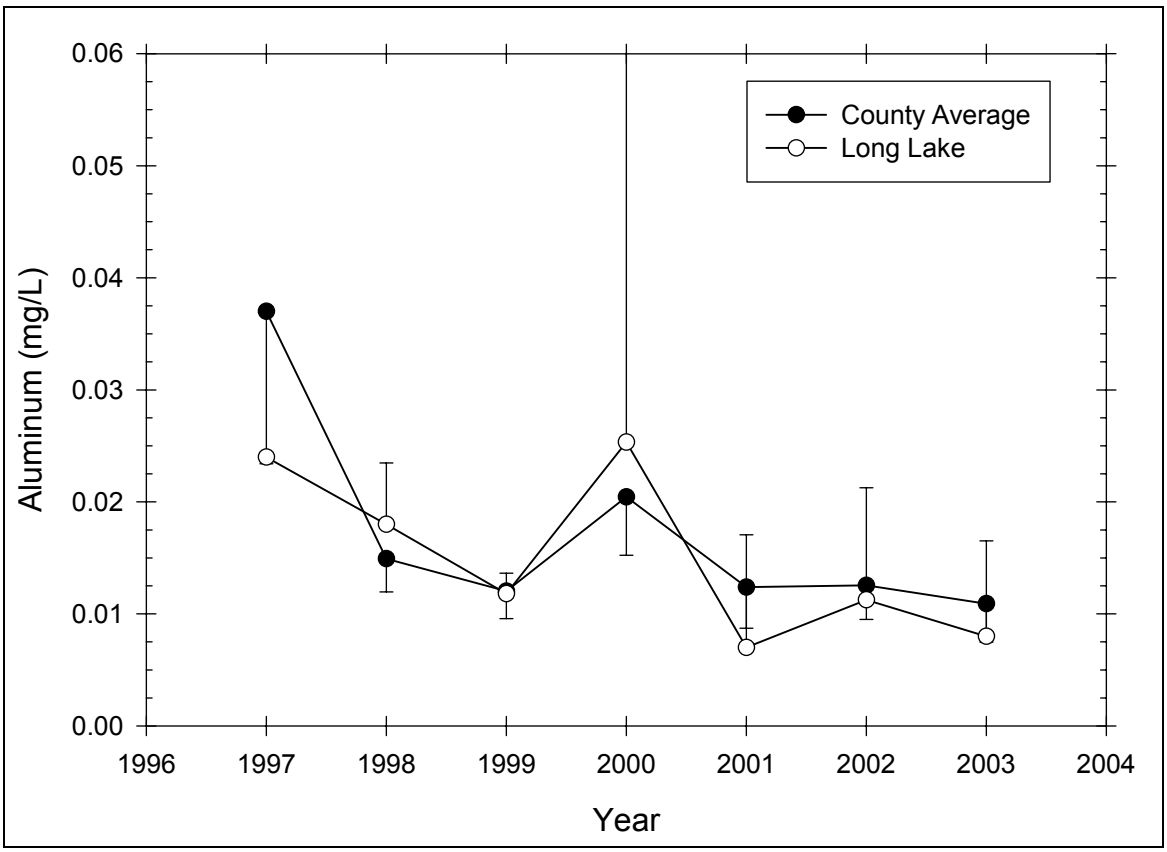


Figure 141 Seasonal mean aluminum trend in Long Lake

Table 111 – Descriptive Statistics for Aluminum in Long Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0240	--	--	--
1998	6	0	0.0180	0.00522	0.00213	0.00547
1999	6	1	0.0118	0.00148	0.000663	0.00184
2000	6	3	0.0253	0.0231	0.0133	0.0574
2001	6	2	0.00700	0.00632	0.00316	0.0101
2002	6	2	0.0113	0.00629	0.00315	0.0100
2003	6	2	0.00800	0.00535	0.00268	0.00852
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0240	0.0240	0.0240	0.0240	0.0240
1998	0.0140	0.0220	0.00800	0.0200	0.0170	0.0210
1999	0.00400	0.0140	0.01000	0.0120	0.0108	0.0125
2000	0.0400	0.0520	0.0120	0.0120	0.0120	0.0420
2001	0.0140	0.0150	0.001000	0.00600	0.00200	0.0120
2002	0.0130	0.0170	0.00400	0.0120	0.00600	0.0165
2003	0.0110	0.0160	0.00500	0.00550	0.00500	0.0110
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0240	0.000576
1998	-1.865	3.609	0.257	0.237	0.108	0.00208
1999	0.552	0.868	0.246	0.368	0.0590	0.000705
2000	1.732	--	0.385	0.089	0.0760	0.00299
2001	0.632	-1.700	0.236	0.492	0.0280	0.000316

2002	-0.316	-3.976	0.275	0.324	0.0450	0.000625
2003	1.955	3.836	0.396	0.028	0.0320	0.000342

Calcium

Figure 142 presents the seasonal mean calcium trend in Long Lake, while Table 112 presents descriptive statistics for calcium in Long Lake. The calcium in Long Lake was relatively stable throughout the period of record. The calcium in Long Lake was significantly lower than the county average.

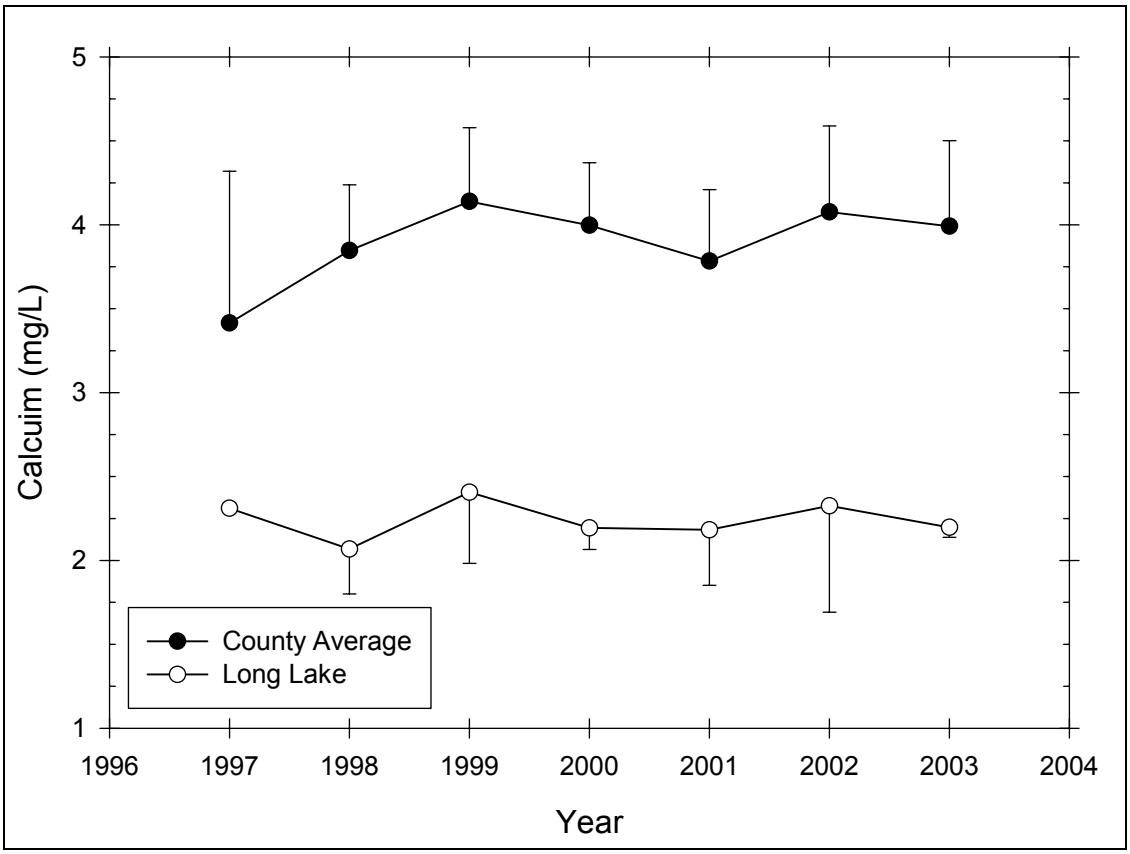


Figure 142 Seasonal mean calcium trend in Long Lake

Table 112 – Descriptive Statistics for Calcium in Long Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	2.310	--	--	--
1998	6	0	2.068	0.255	0.104	0.267
1999	6	1	2.406	0.342	0.153	0.424
2000	6	3	2.193	0.0513	0.0296	0.127
2001	6	2	2.183	0.208	0.104	0.331
2002	6	2	2.325	0.398	0.199	0.634
2003	6	2	2.197	0.0377	0.0189	0.0601
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	2.310	2.310	2.310	2.310	2.310
1998	0.700	2.570	1.870	1.965	1.960	2.080
1999	0.770	2.780	2.010	2.320	2.138	2.750

2000	0.100	2.250	2.150	2.180	2.157	2.232
2001	0.490	2.380	1.890	2.230	2.050	2.315
2002	0.950	2.760	1.810	2.365	2.040	2.610
2003	0.0900	2.240	2.150	2.200	2.170	2.225
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	2.310	5.336
1998	2.088	4.609	0.317	0.060	12.410	25.992
1999	0.160	-2.559	0.236	0.420	12.030	29.411
2000	1.090	--	0.269	0.429	6.580	14.437
2001	-1.258	2.263	0.303	0.217	8.730	19.183
2002	-0.549	0.618	0.195	0.648	9.300	22.098
2003	-0.358	0.257	0.171	0.699	8.790	19.320

Calcite Saturation Index

Figure 143 presents the calcite saturation index trend in Long Lake. The CSI in Long Lake was variable but exhibited a general decreasing trend from 1997 to 2002, moving from the moderately vulnerable to acid deposition range into the low vulnerability to acid deposition range. The CSI in Long Lake was generally slightly higher than the county average, occasionally lower, though any differences were not statistically significant.

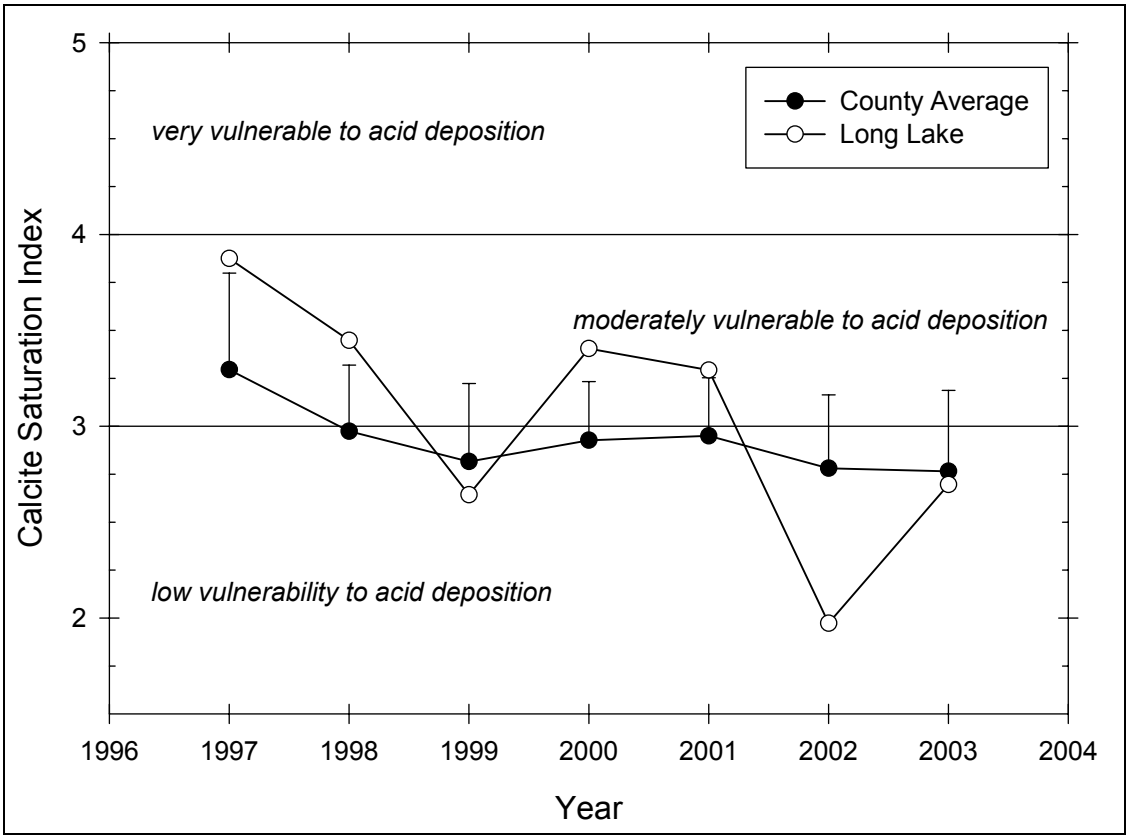
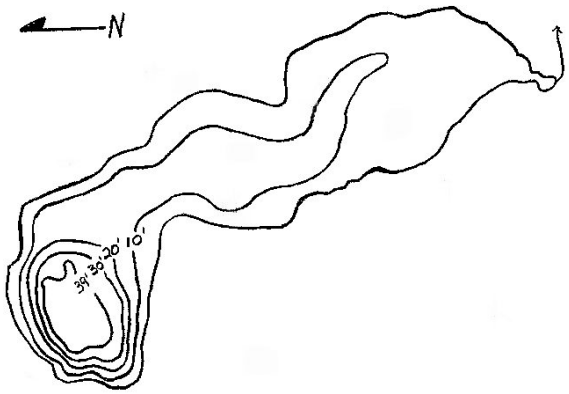


Figure 143 Seasonal mean CSI trend in Long Lake

Morehouse Lake

Location
Pond Number: 070786
Watershed: Mohawk River
County: Hamilton
Topographic Quadrangle: Piseco Lake
Sample Site
Latitude: 43o 21.993'
Longitude: 74o 40.990'
Morphometry
Surface Area: 122 Ac.
Mean Depth: 17 Ft.
Maximum Depth: 37 Ft.
Volume: 2,072 Ac./Ft.
Watershed Area: 2,319 Ac.
Hydraulic Retention Time: Yr.
Shoreline Length: 2.6 Mi.
Elevation: 1,975 Ft.



Temperature and Dissolved Oxygen

Morehouse Lake had a minimum DO of 0.2 mg/L (July 1993), with a minimum temperature of 4.6°C and a maximum temperature of 24.8°C. In general, the lowest DO values occurred during the months of June through October.

pH

Figure 144 presents the seasonal mean pH trend in Morehouse Lake, while Table 113 presents descriptive statistics for pH in Morehouse Lake. The pH in Morehouse Lake exhibited an increasing trend from 1996 to 2000 followed by stable conditions. The pH in Morehouse Lake was lower than the county average, though this difference may not be statistically significant for some years.

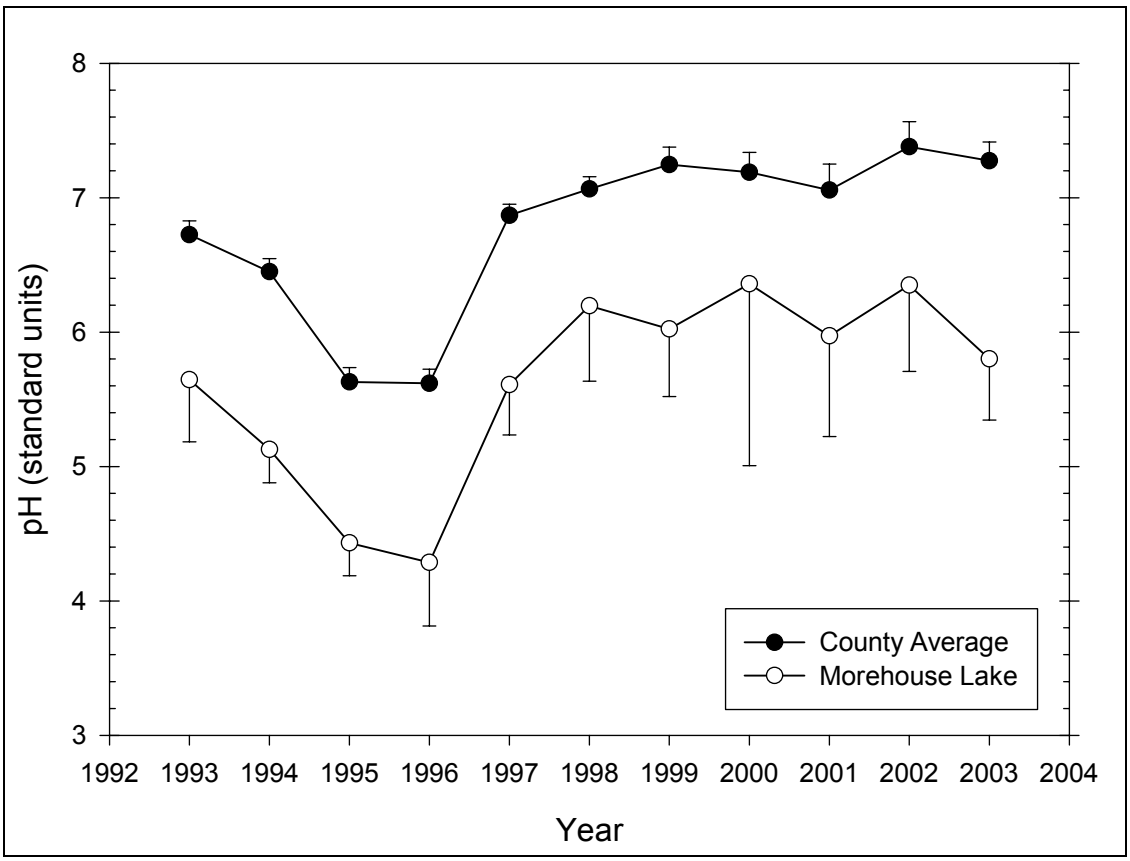


Figure 144 Seasonal mean pH trend in Morehouse Lake

Table 113 – Descriptive Statistics for pH in Morehouse Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	5.646	0.373	0.167	0.463
1994	6	0	5.128	0.237	0.0969	0.249
1995	6	0	4.432	0.233	0.0950	0.244
1996	6	0	4.287	0.451	0.184	0.474
1997	6	0	5.610	0.357	0.146	0.374
1998	6	0	6.197	0.536	0.219	0.562
1999	5	0	6.024	0.405	0.181	0.503
2000	6	0	6.360	1.290	0.527	1.354
2001	5	0	5.972	0.603	0.270	0.749
2002	4	0	6.350	0.404	0.202	0.643
2003	4	0	5.800	0.285	0.143	0.454
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.980	6.030	5.050	5.770	5.433	5.873
1994	0.580	5.500	4.920	5.015	4.970	5.350
1995	0.690	4.760	4.070	4.445	4.310	4.560
1996	1.230	5.000	3.770	4.310	3.840	4.490
1997	0.990	6.080	5.090	5.575	5.410	5.930
1998	1.620	6.840	5.220	6.290	6.140	6.400
1999	0.900	6.440	5.540	6.000	5.675	6.425
2000	3.250	8.120	4.870	6.110	5.320	7.630
2001	1.420	6.930	5.510	5.680	5.533	6.383

2002	0.920	6.720	5.800	6.440	6.055	6.645
2003	0.610	6.010	5.400	5.895	5.595	6.005
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-1.195	1.658	0.230	0.449	28.230	159.942
1994	1.040	-0.874	0.343	0.026	30.770	158.080
1995	-0.276	0.729	0.164	0.712	26.590	118.109
1996	0.471	0.0202	0.172	0.680	25.720	111.272
1997	-0.0802	-0.463	0.189	0.601	33.660	189.469
1998	-1.277	2.960	0.291	0.116	37.180	231.827
1999	-0.0463	-2.537	0.236	0.421	30.120	182.100
2000	0.406	-1.599	0.171	0.685	38.160	251.015
2001	1.305	0.810	0.286	0.196	29.860	179.779
2002	-1.064	0.603	0.211	0.597	25.400	161.779
2003	-1.342	1.162	0.258	0.395	23.200	134.804

Alkalinity

Figure 145 presents the seasonal mean alkalinity trend in Morehouse Lake, while Table 114 presents descriptive statistics for alkalinity in Morehouse Lake. The alkalinity in Morehouse Lake was low and relatively stable throughout the period of record. The alkalinity in Morehouse Lake was significantly lower than the county average.

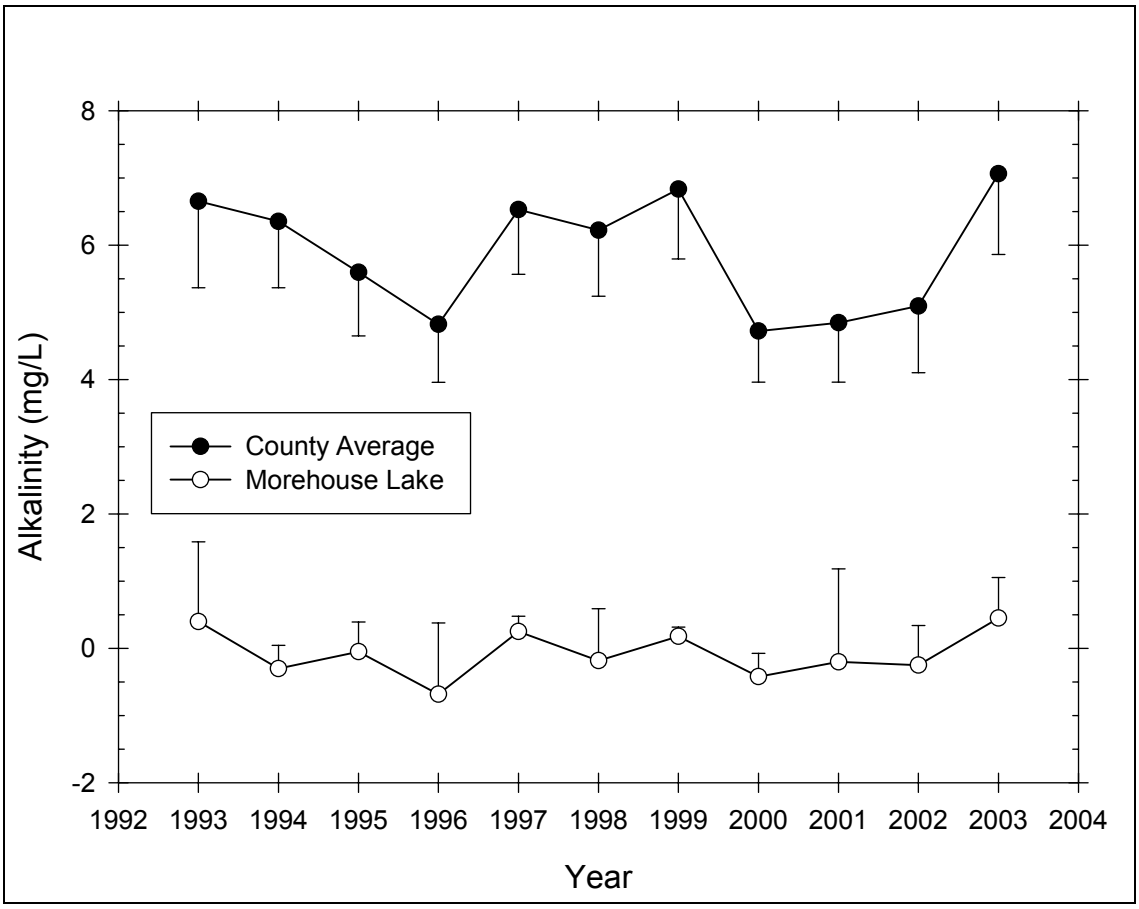


Figure 145 Seasonal mean alkalinity trend in Morehouse Lake

Table 114 – Descriptive Statistics for Alkalinity in Morehouse Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.400	0.954	0.427	1.184
1994	6	0	-0.300	0.329	0.134	0.345
1995	6	0	-0.0500	0.423	0.173	0.444
1996	6	0	-0.683	1.011	0.413	1.061
1997	6	0	0.250	0.217	0.0885	0.228
1998	6	0	-0.183	0.736	0.300	0.772
1999	6	1	0.180	0.110	0.0490	0.136
2000	6	1	-0.420	0.277	0.124	0.345
2001	6	3	-0.200	0.557	0.321	1.383
2002	6	2	-0.250	0.370	0.185	0.588
2003	6	2	0.450	0.379	0.189	0.602
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	2.500	2.000	-0.500	0.300	-0.200	0.725
1994	0.800	0.000	-0.800	-0.200	-0.600	0.000
1995	1.100	0.300	-0.800	0.150	-0.300	0.200
1996	2.900	0.500	-2.400	-0.650	-1.000	0.1000
1997	0.500	0.500	0.000	0.300	0.000	0.400
1998	1.800	0.700	-1.100	-0.300	-0.700	0.600
1999	0.200	0.300	0.1000	0.1000	0.1000	0.300
2000	0.700	-0.1000	-0.800	-0.500	-0.575	-0.175
2001	1.100	0.300	-0.800	-0.1000	-0.625	0.200
2002	0.800	0.300	-0.500	-0.400	-0.450	-0.0500
2003	0.800	1.000	0.200	0.300	0.200	0.700
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.555	2.978	0.342	0.057	2.000	4.440
1994	-0.811	-1.029	0.286	0.130	-1.800	1.080
1995	-1.426	1.257	0.305	0.085	-0.300	0.910
1996	-0.857	1.149	0.210	0.484	-4.100	7.910
1997	-0.265	-2.214	0.255	0.246	1.500	0.610
1998	0.147	-1.970	0.214	0.461	-1.100	2.910
1999	0.609	-3.333	0.367	0.026	0.900	0.210
2000	-0.243	-0.882	0.213	0.534	-2.100	1.190
2001	-0.782	--	0.238	0.537	-0.600	0.740
2002	1.900	3.709	0.408	0.020	-1.000	0.660
2003	1.659	2.615	0.303	0.217	1.800	1.240

Total Phosphorus

Figure 146 presents the seasonal mean total phosphorus trend in Morehouse Lake, while Table 115 presents descriptive statistics for total phosphorus in Morehouse Lake. The total phosphorus in Morehouse Lake exhibited a decreasing trend from about 1995 to 2003. The total phosphorus in Morehouse Lake was similar to the county average.

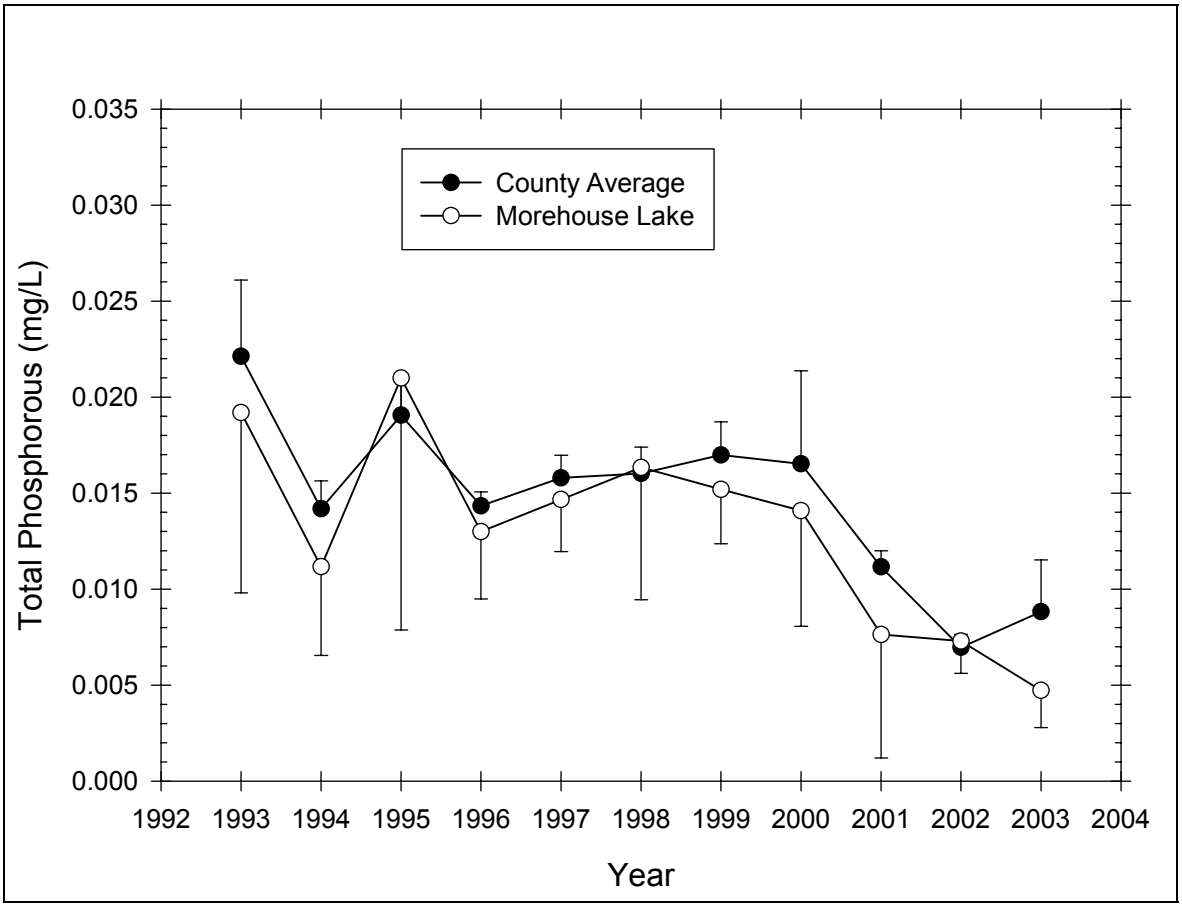


Figure 146 Seasonal mean total phosphorus trend in Morehouse Lake (outlier in 2000 replaced, 0.117 to 0.017)

Table 115 – Descriptive Statistics for Total Phosphorus in Morehouse Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0192	0.00756	0.00338	0.00939
1994	6	0	0.0112	0.00440	0.00180	0.00462
1995	6	0	0.0210	0.0125	0.00511	0.0131
1996	6	0	0.0130	0.00335	0.00137	0.00351
1997	6	0	0.0147	0.00258	0.00105	0.00271
1998	6	0	0.0163	0.00656	0.00268	0.00689
1999	6	1	0.0152	0.00228	0.00102	0.00283
2000	6	0	0.0308	0.0426	0.0174	0.0447
2001	6	1	0.00764	0.00519	0.00232	0.00644
2002	6	2	0.00730	0.00106	0.000531	0.00169
2003	6	2	0.00473	0.00122	0.000609	0.00194
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0160	0.0260	0.01000	0.0240	0.0115	0.0245
1994	0.0110	0.0170	0.00600	0.0120	0.00600	0.0140
1995	0.0330	0.0420	0.00900	0.0160	0.0130	0.0300
1996	0.01000	0.0190	0.00900	0.0120	0.0120	0.0140
1997	0.00700	0.0180	0.0110	0.0145	0.0130	0.0170
1998	0.0150	0.0260	0.0110	0.0135	0.0110	0.0230
1999	0.00600	0.0180	0.0120	0.0160	0.0135	0.0165

2000	0.111	0.117	0.00600	0.0165	0.00800	0.0205
2001	0.0140	0.0160	0.00200	0.00660	0.00463	0.0101
2002	0.00230	0.00880	0.00650	0.00695	0.00655	0.00805
2003	0.00270	0.00650	0.00380	0.00430	0.00395	0.00550
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.594	-3.014	0.337	0.065	0.0960	0.00207
1994	-0.188	-1.307	0.242	0.312	0.0670	0.000845
1995	1.146	0.258	0.292	0.114	0.126	0.00343
1996	1.201	2.433	0.284	0.137	0.0780	0.00107
1997	-0.0775	-0.867	0.150	0.750	0.0880	0.00132
1998	0.862	-1.464	0.247	0.285	0.0980	0.00182
1999	-0.405	-0.178	0.237	0.414	0.0760	0.00118
2000	2.356	5.651	0.428	<0.001	0.185	0.0148
2001	1.177	2.229	0.265	0.282	0.0382	0.000399
2002	1.405	1.500	0.250	0.432	0.0292	0.000217
2003	1.679	2.901	0.323	0.152	0.0189	0.0000938

Nitrate

Figure 147 presents the seasonal mean nitrate trend in Morehouse Lake, while Table 116 presents descriptive statistics for nitrate in Morehouse Lake. The nitrate in Morehouse Lake exhibited a decreasing trend from 1997 to 2003. The nitrate in Morehouse Lake was similar to but more variable than the county average.

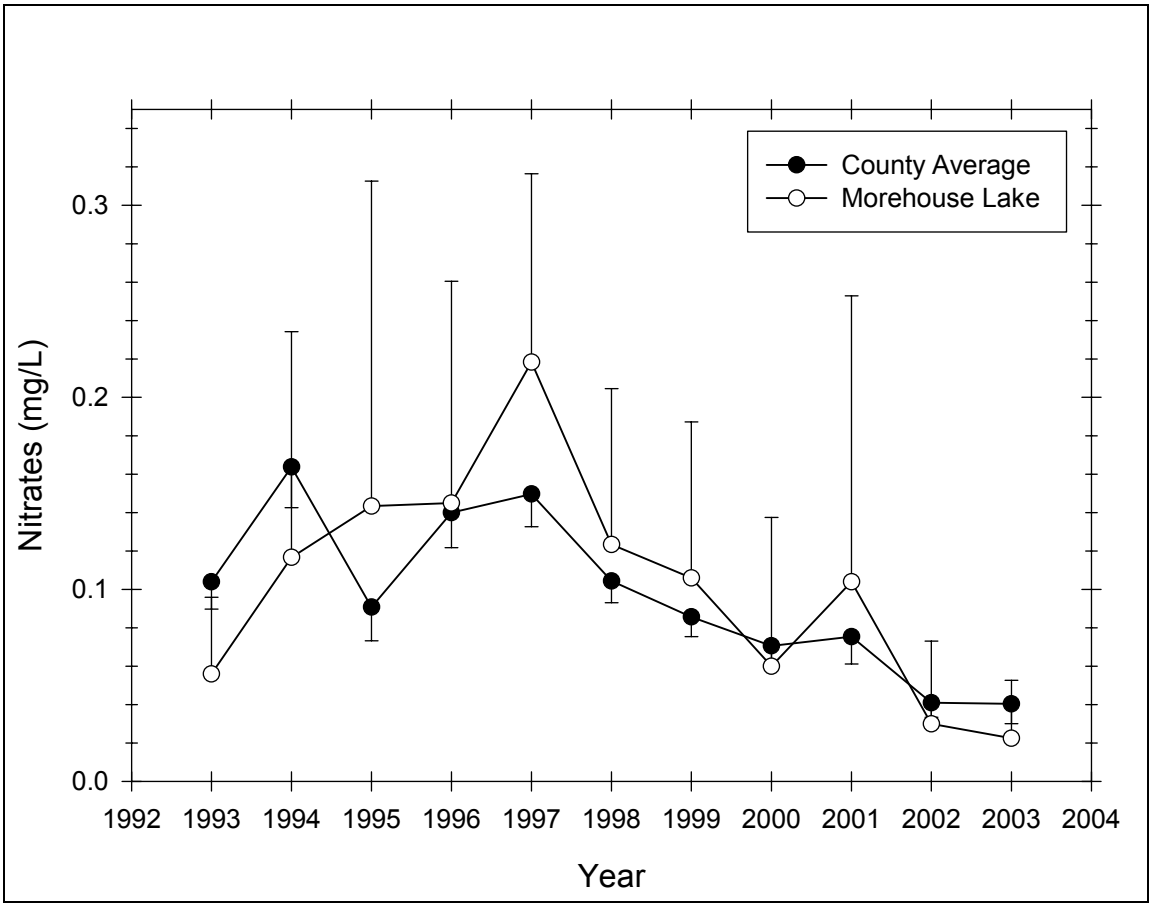


Figure 147 Seasonal mean nitrate trend in Morehouse Lake

Table 116 – Descriptive Statistics for Nitrate in Morehouse Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0560	0.0321	0.0144	0.0398
1994	6	0	0.117	0.112	0.0457	0.118
1995	6	0	0.143	0.161	0.0659	0.169
1996	6	0	0.145	0.110	0.0449	0.115
1997	6	0	0.218	0.0935	0.0382	0.0981
1998	6	0	0.123	0.0774	0.0316	0.0812
1999	6	1	0.106	0.0654	0.0293	0.0812
2000	6	0	0.0600	0.0738	0.0301	0.0774
2001	6	1	0.104	0.120	0.0536	0.149
2002	6	2	0.0300	0.0271	0.0135	0.0431
2003	6	2	0.0225	0.0189	0.00946	0.0301
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0800	0.110	0.0300	0.0400	0.0375	0.0725
1994	0.270	0.300	0.0300	0.0650	0.0300	0.210
1995	0.410	0.440	0.0300	0.0650	0.0400	0.220
1996	0.290	0.360	0.0700	0.1000	0.0800	0.160
1997	0.230	0.370	0.140	0.180	0.150	0.290
1998	0.180	0.250	0.0700	0.0800	0.0700	0.190
1999	0.160	0.210	0.0500	0.0700	0.0650	0.150
2000	0.190	0.210	0.0200	0.0300	0.0300	0.0400

2001	0.280	0.310	0.0300	0.0400	0.0300	0.160
2002	0.0600	0.0700	0.01000	0.0200	0.0150	0.0450
2003	0.0400	0.0500	0.01000	0.0150	0.01000	0.0350
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.661	2.712	0.291	0.178	0.280	0.0198
1994	1.150	-0.320	0.328	0.042	0.700	0.144
1995	1.639	2.174	0.319	0.056	0.860	0.253
1996	2.034	4.236	0.291	0.115	0.870	0.187
1997	1.006	-0.410	0.268	0.194	1.310	0.330
1998	1.206	-0.383	0.379	0.007	0.740	0.121
1999	1.294	0.906	0.309	0.124	0.530	0.0733
2000	2.409	5.847	0.440	<0.001	0.360	0.0488
2001	1.853	3.350	0.303	0.140	0.520	0.112
2002	1.813	3.483	0.394	0.030	0.120	0.00580
2003	1.659	2.615	0.303	0.217	0.0900	0.00310

Chlorophyll a

Figure 148 presents the seasonal mean chlorophyll *a* trend in Morehouse Lake, while Table 117 presents descriptive statistics for chlorophyll *a* in Morehouse Lake. The chlorophyll *a* in Morehouse Lake did not exhibit any discernible trend. The chlorophyll *a* in Morehouse Lake was generally lower than or similar to the county average, though any difference was not statistically significant.

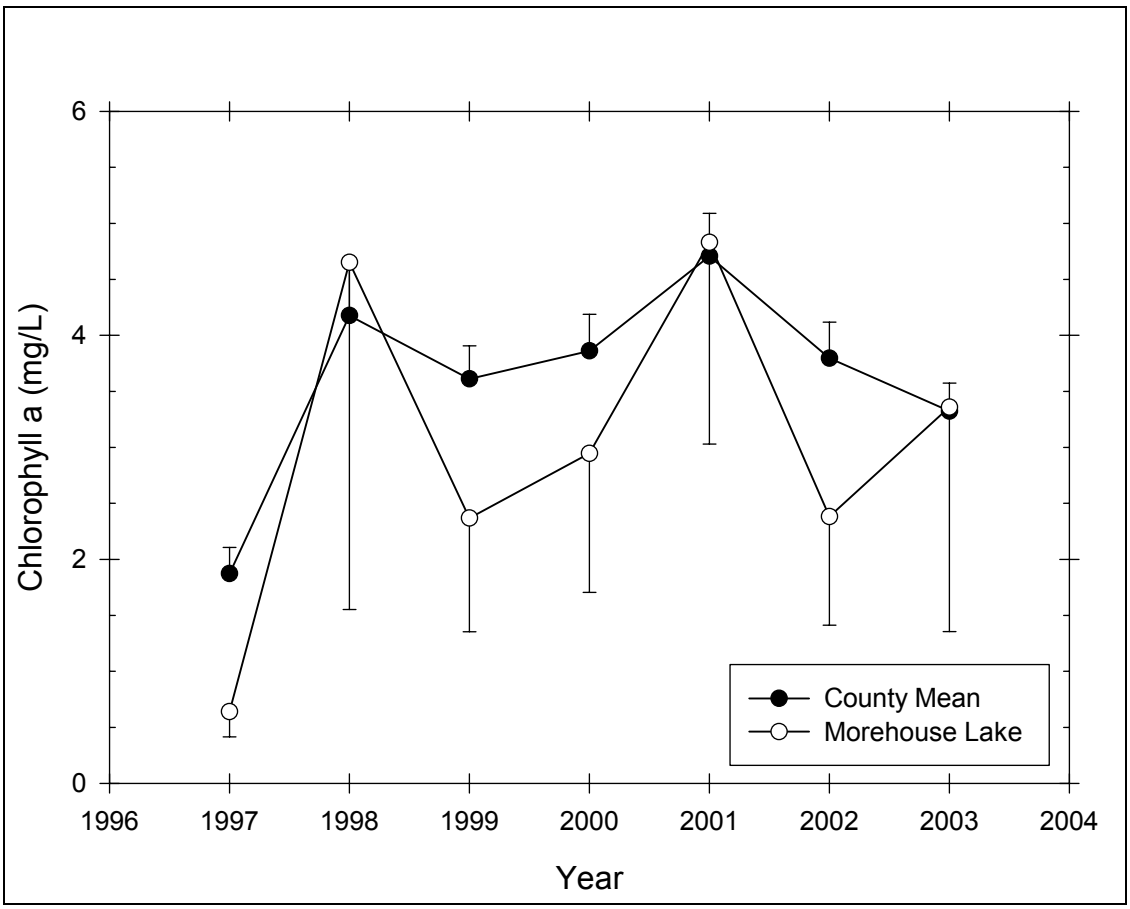


Figure 148 Seasonal mean chlorophyll a trend in Morehouse Lake

Table 117 – Descriptive Statistics for Chlorophyll a in Morehouse Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	0.640	0.214	0.0872	0.224
1998	6	0	4.652	2.954	1.206	3.100
1999	6	1	2.368	0.817	0.365	1.014
2000	6	0	2.947	1.183	0.483	1.241
2001	6	1	4.830	1.449	0.648	1.799
2002	6	2	2.382	0.610	0.305	0.971
2003	6	3	3.360	0.809	0.467	2.009
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.570	1.040	0.470	0.570	0.500	0.690
1998	6.630	8.880	2.250	3.170	2.510	7.930
1999	1.970	3.760	1.790	1.940	1.880	2.770
2000	3.150	5.010	1.860	2.710	2.020	3.370
2001	3.400	6.450	3.050	4.760	3.620	6.173
2002	1.310	3.030	1.720	2.390	1.875	2.890
2003	1.470	3.900	2.430	3.750	2.760	3.862
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	1.672	2.877	0.241	0.317	3.840	2.686
1998	0.925	-1.630	0.315	0.064	27.910	173.459
1999	1.780	3.065	0.300	0.150	11.840	30.707

2000	1.173	1.091	0.219	0.433	17.680	59.090
2001	-0.0680	-2.204	0.206	0.570	24.150	125.045
2002	-0.0395	-3.840	0.226	0.535	9.530	23.823
2003	-1.665	--	0.352	0.157	10.080	35.177

Transparency

Figure 149 presents the seasonal mean transparency trend in Morehouse Lake, while Table 118 presents descriptive statistics for transparency in Morehouse Lake. The transparency in Morehouse Lake generally exhibited an increasing trend from 1994 to 2002. The transparency in Morehouse Lake was slightly higher than the county average, though this difference was not statistically significant.

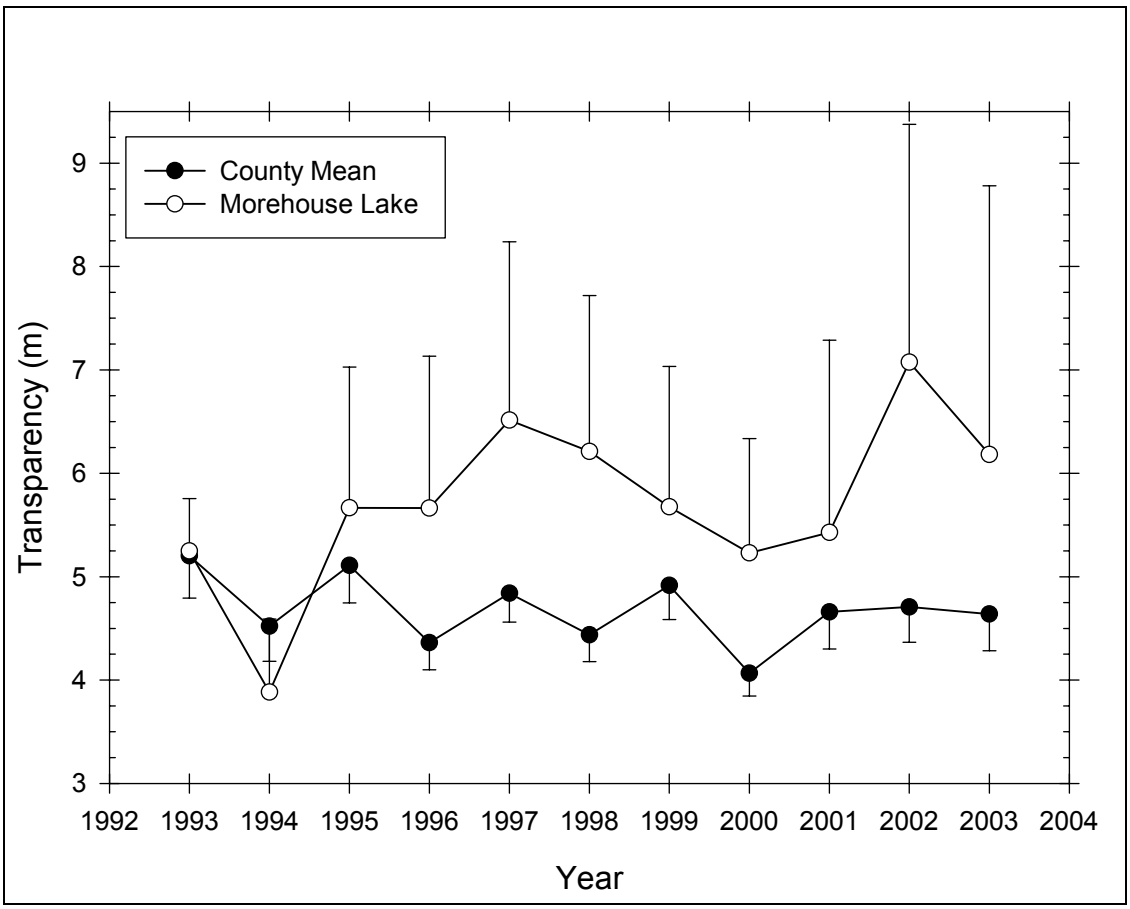


Figure 149 Seasonal mean transparency trend in Morehouse Lake

Table 118 – Descriptive Statistics for Transparency in Morehouse Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	5.248	0.408	0.182	0.507
1994	6	0	3.883	0.674	0.275	0.707
1995	6	0	5.667	1.296	0.529	1.360
1996	6	0	5.663	1.400	0.571	1.469
1997	6	0	6.515	1.644	0.671	1.725
1998	6	0	6.212	1.437	0.587	1.508

1999	5	0	5.676	1.094	0.489	1.358
2000	6	0	5.230	1.054	0.430	1.106
2001	5	0	5.428	1.497	0.670	1.859
2002	4	0	7.075	1.445	0.723	2.300
2003	4	0	6.183	1.633	0.817	2.599
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.090	5.940	4.850	5.150	5.075	5.348
1994	1.900	4.600	2.700	3.950	3.700	4.400
1995	3.250	7.500	4.250	5.275	4.700	7.000
1996	3.550	7.420	3.870	5.500	4.550	7.140
1997	4.220	8.340	4.120	7.130	4.870	7.500
1998	3.570	7.420	3.850	6.850	5.050	7.250
1999	2.690	6.970	4.280	5.980	4.707	6.467
2000	3.030	7.130	4.100	5.075	4.500	5.500
2001	3.440	7.940	4.500	4.500	4.500	6.260
2002	3.500	8.700	5.200	7.200	6.100	8.050
2003	3.350	7.800	4.450	6.240	4.800	7.565
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.628	3.481	0.395	0.010	26.240	138.374
1994	-1.127	1.570	0.226	0.395	23.300	92.750
1995	0.641	-1.433	0.263	0.212	34.000	201.065
1996	0.161	-1.478	0.188	0.608	33.980	202.235
1997	-0.721	-1.209	0.297	0.102	39.090	268.180
1998	-1.137	-0.231	0.300	0.099	37.270	241.834
1999	-0.269	-1.693	0.209	0.553	28.380	165.872
2000	1.291	2.240	0.232	0.362	31.380	169.669
2001	1.672	2.457	0.332	0.074	27.140	156.284
2002	-0.500	1.273	0.229	0.523	28.300	206.490
2003	-0.0854	-4.724	0.259	0.393	24.730	160.894

TSI

Figure 150 presents the Carlson trophic state index trend in Morehouse Lake. Transparency TSI was generally oligotrophic near the oligotrophic-mesotrophic boundary. Chlorophyll *a* TSI was variable, between the upper mesotrophic and eutrophic ranges. Total phosphorus TSI values were mesotrophic from 1993 to 1999, eutrophic in 2000 (data outlier), and oligotrophic in 2001 to 2003.

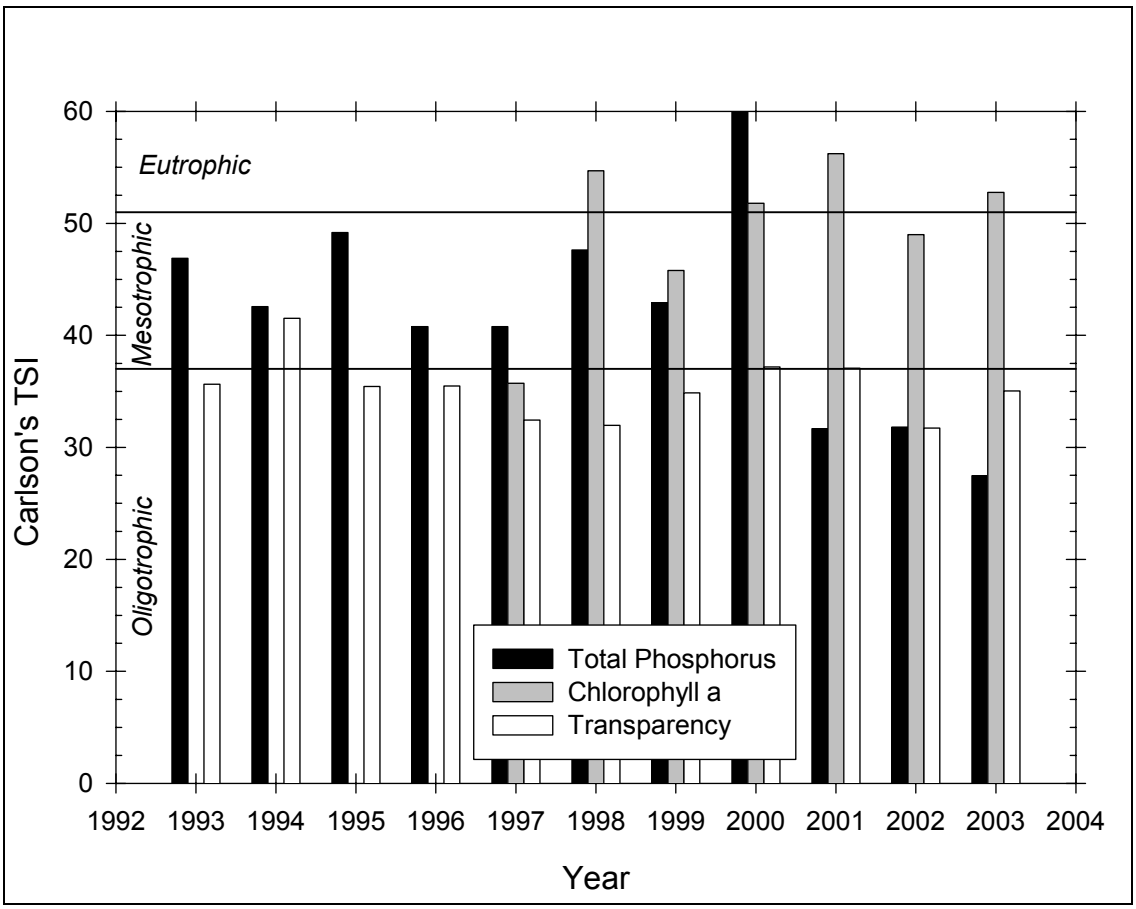


Figure 150 Carlson TSI trend in Morehouse Lake

Aluminum

Figure 151 presents the seasonal mean aluminum trend in Morehouse Lake, while Table 119 presents descriptive statistics for aluminum in Morehouse Lake. The aluminum in Morehouse Lake exhibited no discernible trend. The aluminum in Morehouse Lake was higher than the county average, though this difference may not be statistically significant for all years.

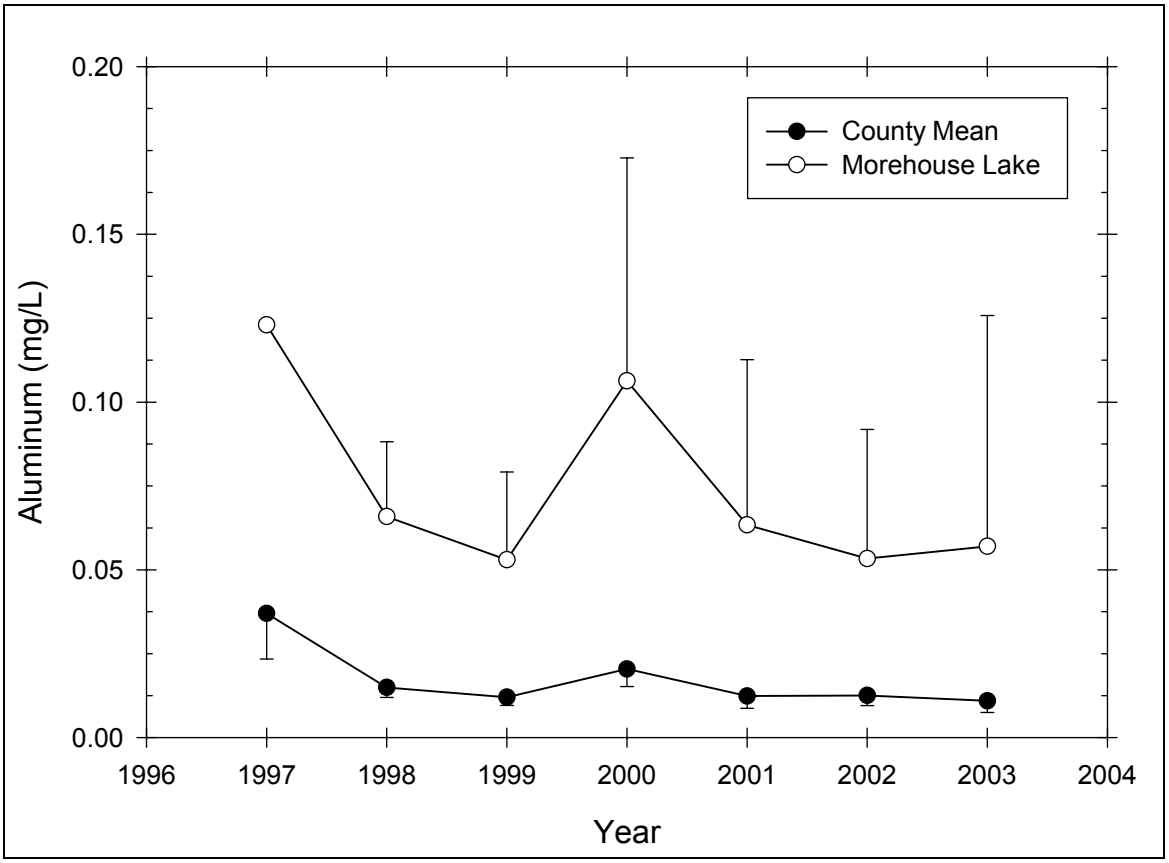


Figure 151 Seasonal mean aluminum trend in Morehouse Lake

Table 119 – Descriptive Statistics for Aluminum in Morehouse Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.123	--	--	--
1998	6	0	0.0658	0.0213	0.00869	0.0223
1999	6	1	0.0530	0.0211	0.00942	0.0261
2000	6	0	0.106	0.0633	0.0258	0.0664
2001	6	1	0.0634	0.0397	0.0177	0.0493
2002	6	3	0.0533	0.0155	0.00897	0.0386
2003	6	2	0.0570	0.0432	0.0216	0.0688
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.123	0.123	0.123	0.123	0.123
1998	0.0520	0.0870	0.0350	0.0675	0.0520	0.0860
1999	0.0530	0.0870	0.0340	0.0490	0.0370	0.0645
2000	0.147	0.186	0.0390	0.0935	0.0520	0.174
2001	0.0960	0.110	0.0140	0.0730	0.0275	0.0935
2002	0.0300	0.0660	0.0360	0.0580	0.0415	0.0640
2003	0.0930	0.121	0.0280	0.0395	0.0310	0.0830
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.123	0.0151
1998	-0.402	-1.666	0.232	0.364	0.395	0.0283
1999	1.297	1.646	0.225	0.477	0.265	0.0158
2000	0.349	-2.211	0.228	0.387	0.638	0.0879

2001	-0.231	-1.935	0.196	0.617	0.317	0.0264
2002	-1.230	--	0.285	0.372	0.160	0.00902
2003	1.846	3.453	0.359	0.078	0.228	0.0186

Calcium

Figure 152 presents the seasonal mean calcium trend in Morehouse Lake, while Table 120 presents descriptive statistics for calcium in Morehouse Lake. The calcium in Morehouse Lake exhibited a very slight increasing trend from 1997 to 2002. The calcium in Morehouse Lake was significantly lower than the county average.

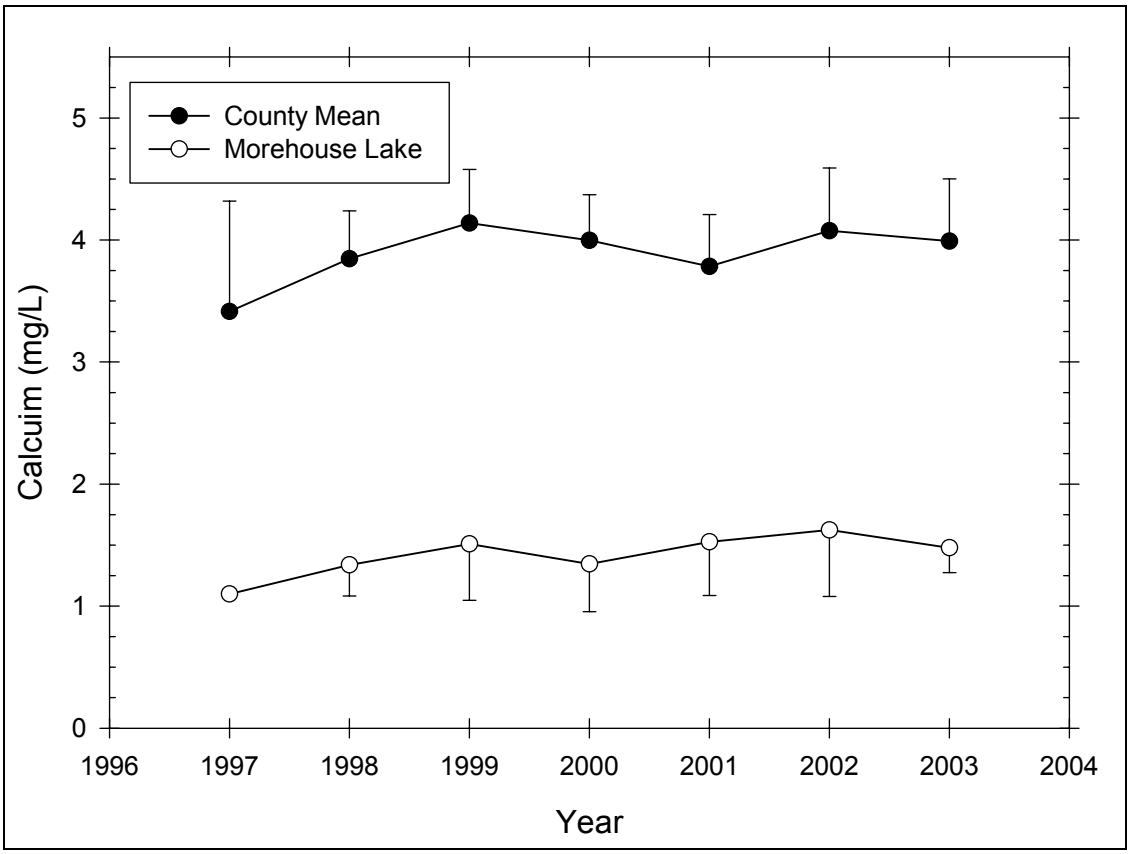


Figure 152 Seasonal mean calcium trend in Morehouse Lake

Table 120 – Descriptive Statistics for Calcium in Morehouse Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	1.100	--	--	--
1998	6	0	1.338	0.243	0.0992	0.255
1999	6	1	1.510	0.372	0.166	0.462
2000	6	0	1.347	0.374	0.152	0.392
2001	6	1	1.526	0.354	0.158	0.439
2002	6	3	1.623	0.219	0.127	0.545
2003	6	2	1.478	0.127	0.0637	0.203
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	1.100	1.100	1.100	1.100	1.100
1998	0.610	1.660	1.050	1.320	1.130	1.550

1999	0.980	2.010	1.030	1.470	1.255	1.785
2000	0.970	1.980	1.010	1.260	1.020	1.550
2001	0.860	2.010	1.150	1.390	1.270	1.830
2002	0.420	1.870	1.450	1.550	1.475	1.790
2003	0.250	1.620	1.370	1.460	1.370	1.585
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	1.100	1.210
1998	0.180	-1.891	0.187	0.612	8.030	11.042
1999	0.133	-0.306	0.143	0.746	7.550	11.955
2000	1.053	0.514	0.191	0.588	8.080	11.579
2001	0.585	-1.534	0.250	0.351	7.630	12.144
2002	1.336	--	0.298	0.325	4.870	8.002
2003	0.255	-4.547	0.301	0.224	5.910	8.781

Calcite Saturation Index

Figure 153 presents the calcite saturation index trend in Morehouse Lake. The calcium in Morehouse Lake oscillated between very vulnerable to acid deposition to extremely vulnerable to acid deposition (CSI value of infinity due to negative alkalinities). The CSI in Morehouse Lake was significantly higher than the county average.

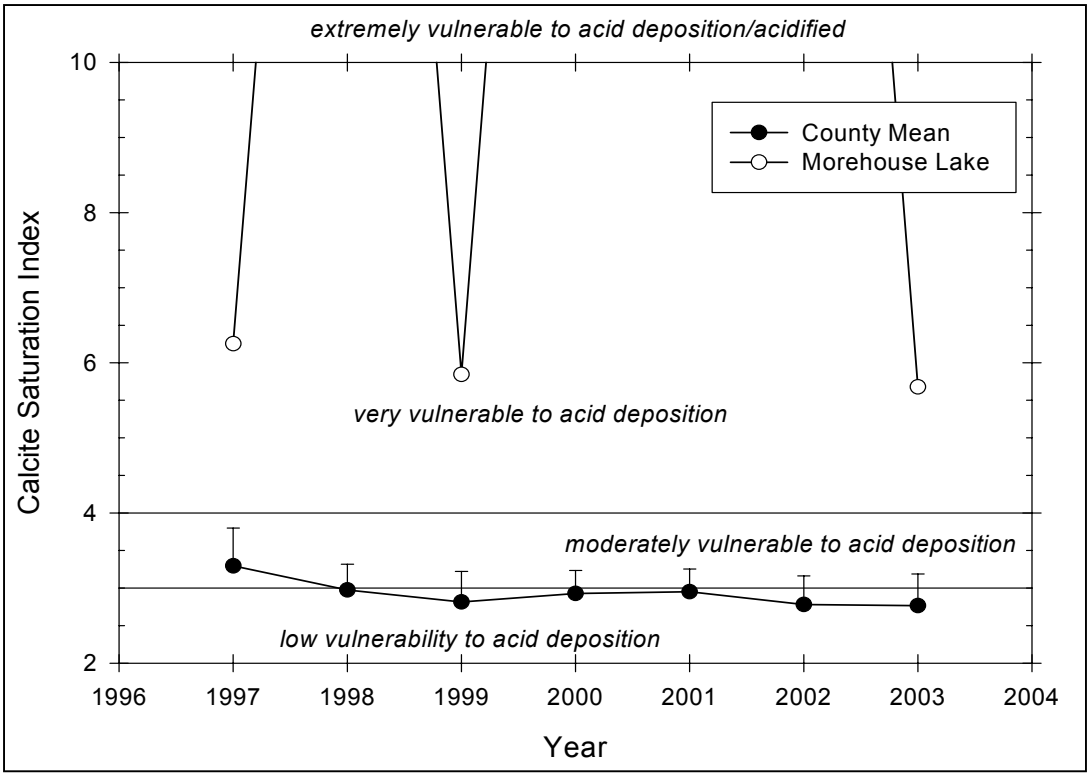
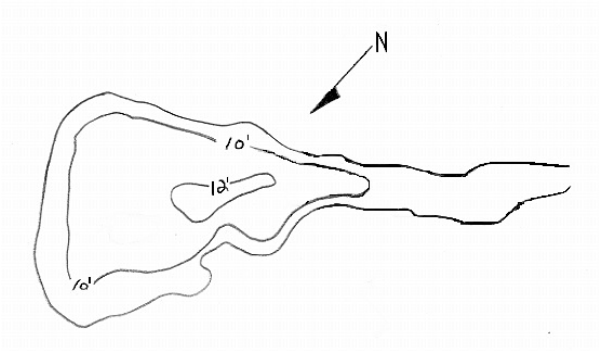


Figure 153 Seasonal mean CSI trend in Morehouse Lake

Oxbow Lake

Location
Pond Number: 050252
Watershed: Upper Hudson River
County: Hamilton
Topographic Quadrangle: Lake Pleasant
Sample Site
Latitude: 43o 26.260'
Longitude: 74o 29.252'
Morphometry
Surface Area: 282 Ac.
Mean Depth: 5 Ft.
Maximum Depth: 10 Ft.
Volume: 1,307 Ac.
Watershed Area: 3,257 Ac.
Hydraulic Retention Time: 0.11 Yr.
Shoreline Length: 4.3 Mi.
Elevation: 1,706 Ft.
Water Quality Classification: B



Temperature and Dissolved Oxygen

Oxbow Lake had a minimum DO of 0.8 mg/L (August 1993), with a minimum temperature of 7.0°C and a maximum temperature of 24.8°C.

pH

Figure 154 presents the seasonal mean pH trend in Oxbow Lake, while Table 121 presents descriptive statistics for pH in Oxbow Lake. The pH in Oxbow Lake exhibited an increasing trend from 1995 to 1997 followed by stable but somewhat variable conditions. The pH in Oxbow Lake was similar to the county average.

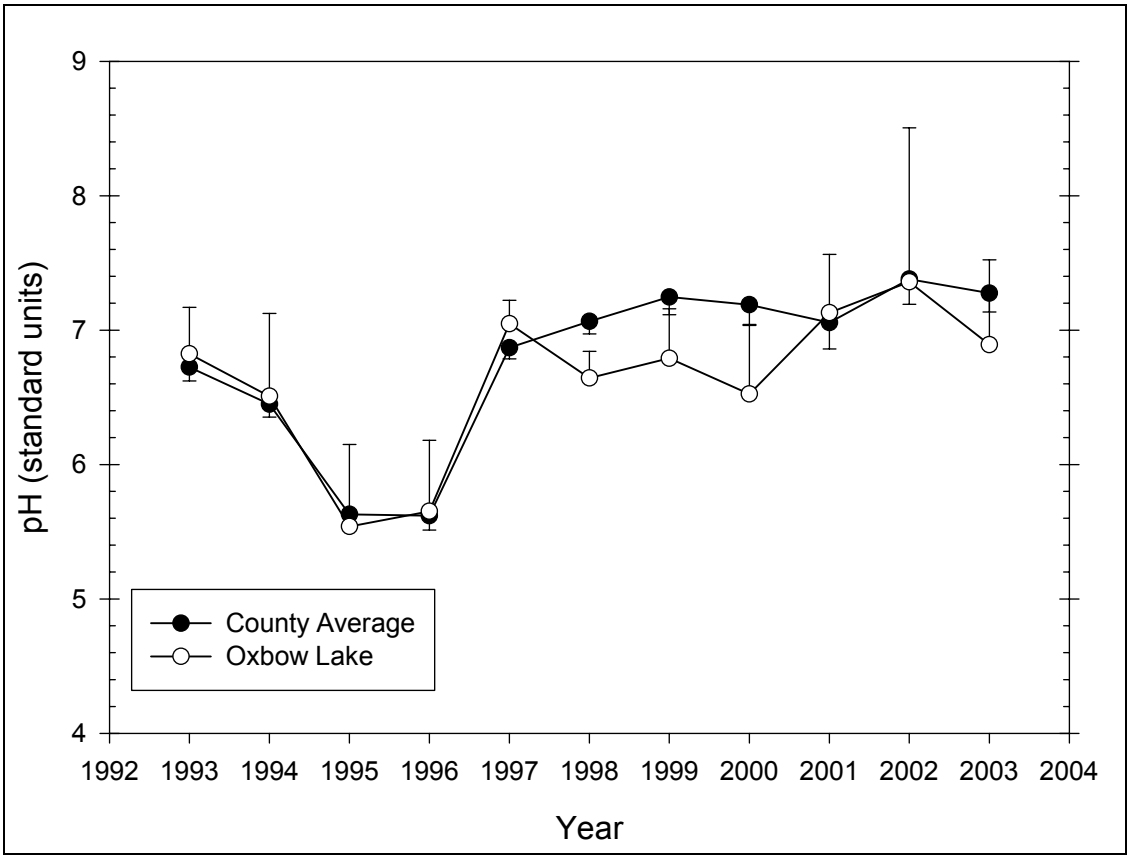


Figure 154 Seasonal mean pH trend in Oxbow Lake

Table 121 – Descriptive Statistics for pH in Oxbow Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	6.824	0.278	0.124	0.345
1994	6	0	6.508	0.587	0.240	0.616
1995	6	0	5.540	0.581	0.237	0.610
1996	6	0	5.652	0.505	0.206	0.530
1997	6	0	7.048	0.165	0.0674	0.173
1998	6	0	6.643	0.189	0.0772	0.198
1999	5	0	6.790	0.298	0.133	0.370
2000	6	0	6.525	0.487	0.199	0.511
2001	5	0	7.130	0.349	0.156	0.434
2002	4	0	7.360	0.720	0.360	1.145
2003	5	0	6.892	0.508	0.227	0.631
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.710	7.250	6.540	6.710	6.645	7.018
1994	1.750	7.320	5.570	6.500	6.320	6.840
1995	1.630	6.130	4.500	5.640	5.350	5.980
1996	1.260	6.580	5.320	5.390	5.330	5.900
1997	0.380	7.270	6.890	6.995	6.910	7.230
1998	0.510	6.880	6.370	6.690	6.470	6.760
1999	0.800	7.110	6.310	6.870	6.640	6.960
2000	1.210	7.140	5.930	6.385	6.220	7.090
2001	0.960	7.610	6.650	7.100	6.935	7.348

2002	1.630	8.050	6.420	7.485	6.810	7.910
2003	1.230	7.550	6.320	6.920	6.433	7.288
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.998	0.407	0.259	0.307	34.120	233.144
1994	-0.389	0.953	0.208	0.500	39.050	255.875
1995	-1.282	1.935	0.205	0.513	33.240	185.836
1996	1.656	2.147	0.365	0.012	33.910	192.922
1997	0.623	-1.911	0.224	0.404	42.290	298.210
1998	-0.470	-0.873	0.264	0.208	39.860	264.982
1999	-1.191	2.117	0.247	0.367	33.950	230.876
2000	0.439	-1.508	0.276	0.164	39.150	256.637
2001	0.0114	0.927	0.187	0.650	35.650	254.673
2002	-0.782	-0.616	0.216	0.578	29.440	218.232
2003	0.164	-1.728	0.197	0.612	34.460	238.532

Alkalinity

Figure 155 presents the seasonal mean alkalinity trend in Oxbow Lake, while Table 122 presents descriptive statistics for alkalinity in Oxbow Lake. The alkalinity in Oxbow Lake exhibited no discernible trend. The alkalinity in Oxbow Lake was similar to the county average.

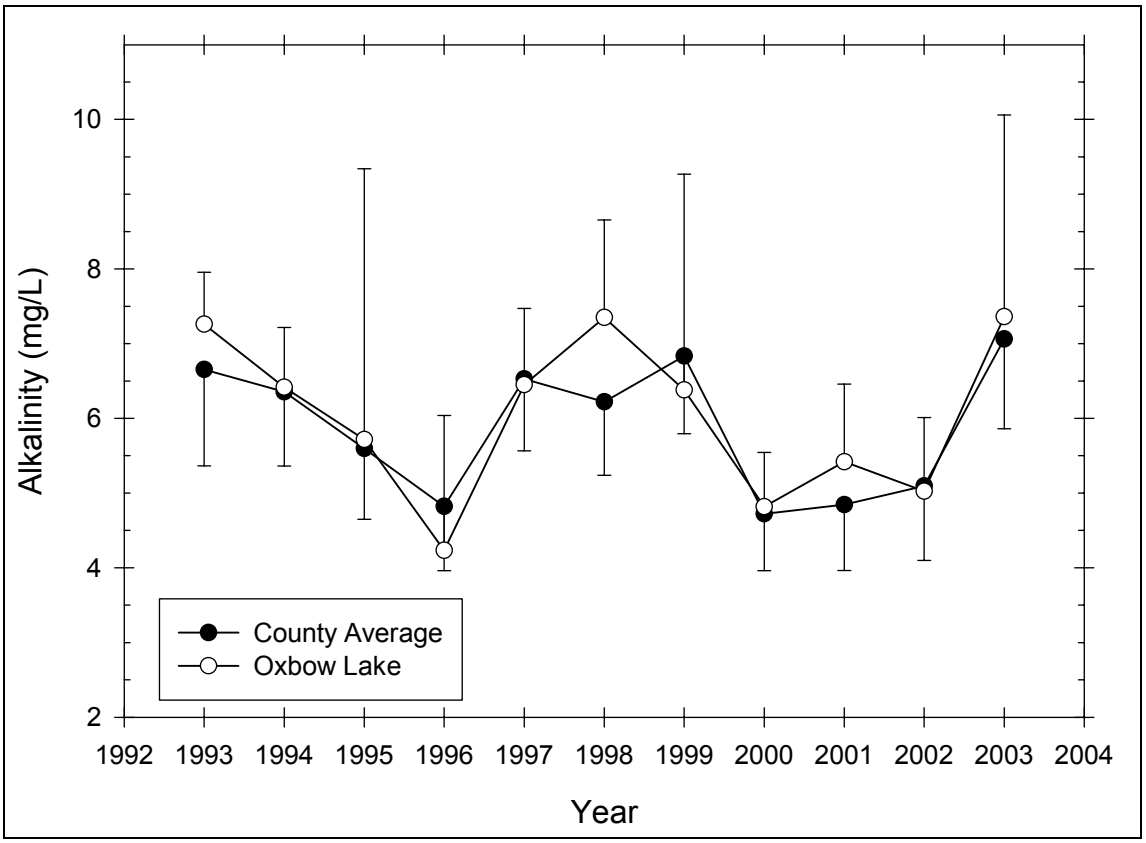


Figure 155 Seasonal mean alkalinity trend in Oxbow Lake

Table 122 – Descriptive Statistics for Alkalinity in Oxbow Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	7.260	0.559	0.250	0.695
1994	6	0	6.417	0.763	0.311	0.800
1995	6	0	5.717	3.453	1.410	3.624
1996	6	0	4.233	1.721	0.703	1.806
1997	6	0	6.450	0.973	0.397	1.021
1998	6	0	7.350	1.244	0.508	1.305
1999	6	1	6.380	2.325	1.040	2.887
2000	6	0	4.817	0.694	0.283	0.728
2001	6	1	5.420	0.835	0.373	1.037
2002	6	2	5.025	0.618	0.309	0.984
2003	6	1	7.360	2.174	0.972	2.700
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.500	7.900	6.400	7.400	6.925	7.600
1994	1.900	7.100	5.200	6.650	5.900	7.000
1995	9.500	8.600	-0.900	6.600	5.600	7.800
1996	4.500	5.500	1.000	4.800	3.800	5.500
1997	2.000	7.200	5.200	7.000	5.200	7.100
1998	3.100	8.800	5.700	7.400	6.500	8.300
1999	4.700	8.400	3.700	7.700	3.925	8.175
2000	1.600	5.700	4.100	4.800	4.200	5.300
2001	2.100	6.100	4.000	5.700	5.050	5.950
2002	1.300	5.500	4.200	5.200	4.550	5.500
2003	5.400	11.100	5.700	6.600	6.000	8.250
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.860	1.176	0.199	0.603	36.300	264.790
1994	-0.828	-0.638	0.278	0.157	38.500	249.950
1995	-1.828	3.667	0.320	0.055	34.300	255.710
1996	-1.701	2.949	0.234	0.352	25.400	122.340
1997	-0.926	-1.881	0.345	0.025	38.700	254.350
1998	-0.157	-2.153	0.253	0.258	44.100	331.870
1999	-0.567	-3.207	0.315	0.109	31.900	225.150
2000	0.157	-2.636	0.272	0.179	28.900	141.610
2001	-1.730	3.164	0.290	0.180	27.100	149.670
2002	-0.984	-0.620	0.279	0.307	20.100	102.150
2003	1.836	3.525	0.311	0.119	36.800	289.760

Total Phosphorus

Figure 156 presents the seasonal mean total phosphorus trend in Oxbow Lake, while Table 123 presents descriptive statistics for total phosphorus in Oxbow Lake. The total phosphorus in Oxbow Lake exhibited a decreasing trend from 1993 to 2002. The total phosphorus in Oxbow Lake was slightly higher than or similar to the county average, though any difference was not statistically significant.

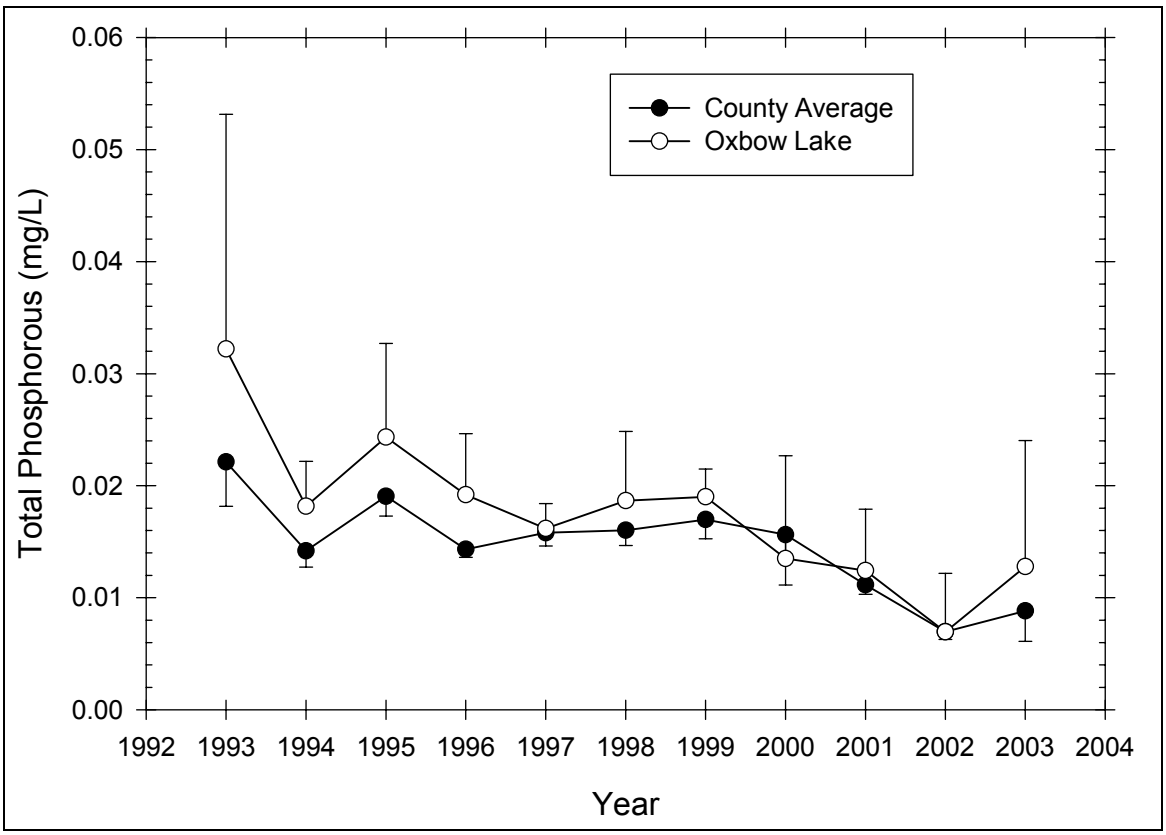


Figure 156 Seasonal mean total phosphorus trend in Oxbow Lake (2003 outlier of 0.116 changed to 0.016)

Table 123 – Descriptive Statistics for Total Phosphorus in Oxbow Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0322	0.0169	0.00755	0.0210
1994	6	0	0.0182	0.00382	0.00156	0.00401
1995	6	0	0.0243	0.00797	0.00325	0.00836
1996	5	0	0.0192	0.00438	0.00196	0.00544
1997	6	0	0.0162	0.00214	0.000872	0.00224
1998	6	0	0.0187	0.00589	0.00240	0.00618
1999	6	1	0.0190	0.00200	0.000894	0.00248
2000	6	1	0.0135	0.00738	0.00330	0.00917
2001	6	1	0.0124	0.00442	0.00198	0.00549
2002	6	2	0.00695	0.00329	0.00165	0.00524
2003	6	1	0.0328	0.0475	0.0212	0.0589
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0370	0.0500	0.0130	0.0250	0.0205	0.0500
1994	0.01000	0.0230	0.0130	0.0185	0.0150	0.0210
1995	0.0190	0.0340	0.0150	0.0230	0.0180	0.0330
1996	0.0110	0.0260	0.0150	0.0170	0.0165	0.0222
1997	0.00600	0.0190	0.0130	0.0160	0.0150	0.0180
1998	0.0170	0.0290	0.0120	0.0175	0.0150	0.0210
1999	0.00500	0.0220	0.0170	0.0180	0.0177	0.0205
2000	0.0200	0.0250	0.00500	0.0120	0.00912	0.0175
2001	0.0110	0.0170	0.00600	0.0145	0.00893	0.0153
2002	0.00690	0.0113	0.00440	0.00605	0.00440	0.00950

2003	0.114	0.116	0.00180	0.0155	0.00480	0.0475
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.265	-2.656	0.265	0.279	0.161	0.00632
1994	-0.159	-1.511	0.185	0.623	0.109	0.00205
1995	0.244	-2.091	0.207	0.504	0.146	0.00387
1996	1.114	0.500	0.292	0.174	0.0960	0.00192
1997	-0.137	-0.270	0.198	0.554	0.0970	0.00159
1998	1.125	1.669	0.212	0.476	0.112	0.00226
1999	0.937	-0.188	0.291	0.177	0.0950	0.00182
2000	0.911	1.596	0.219	0.504	0.0675	0.00113
2001	-0.791	-0.699	0.281	0.214	0.0621	0.000849
2002	0.927	-0.912	0.281	0.299	0.0278	0.000226
2003	2.047	4.305	0.368	0.025	0.164	0.0144

Nitrate

Figure 157 presents the seasonal mean nitrate trend in Oxbow Lake, while Table 124 presents descriptive statistics for nitrate in Oxbow Lake. The nitrate in Oxbow Lake was relatively low, and exhibited a slight decreasing trend from 1997 to 2003. The nitrate in Oxbow Lake was significantly lower than the county average.

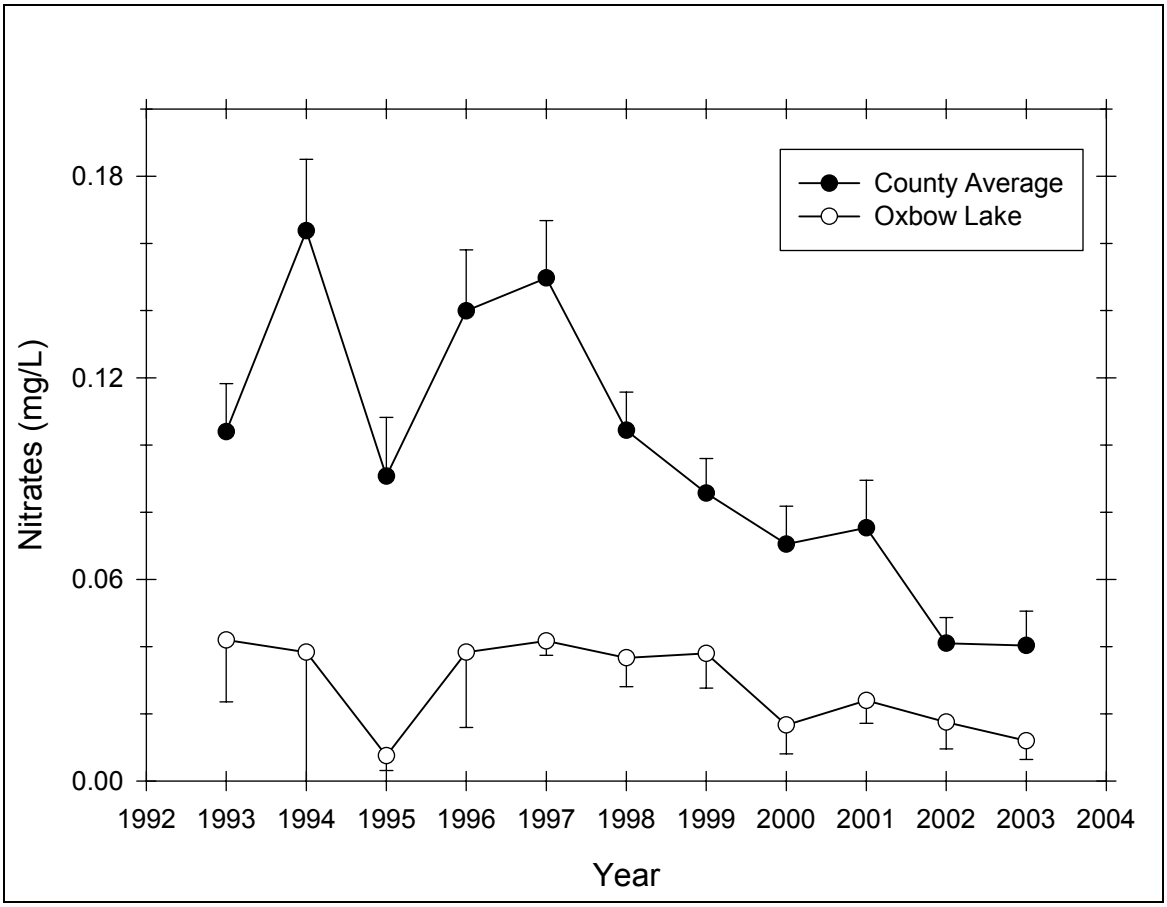


Figure 157 Seasonal mean nitrate trend in Oxbow Lake

Table 124 – Descriptive Statistics for Nitrate in Oxbow Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0420	0.0148	0.00663	0.0184
1994	6	0	0.0383	0.0382	0.0156	0.0401
1995	6	0	0.00750	0.00418	0.00171	0.00439
1996	6	0	0.0383	0.0214	0.00872	0.0224
1997	6	0	0.0417	0.00408	0.00167	0.00428
1998	6	0	0.0367	0.00816	0.00333	0.00857
1999	6	1	0.0380	0.00837	0.00374	0.0104
2000	6	0	0.0167	0.00816	0.00333	0.00857
2001	6	1	0.0240	0.00548	0.00245	0.00680
2002	6	2	0.0175	0.00500	0.00250	0.00796
2003	6	1	0.0120	0.00447	0.00200	0.00555
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0400	0.0600	0.0200	0.0400	0.0350	0.0525
1994	0.1000	0.110	0.01000	0.0250	0.01000	0.0500
1995	0.01000	0.01000	0.000	0.01000	0.00500	0.01000
1996	0.0500	0.0700	0.0200	0.0300	0.0200	0.0600
1997	0.01000	0.0500	0.0400	0.0400	0.0400	0.0400
1998	0.0200	0.0500	0.0300	0.0350	0.0300	0.0400
1999	0.0200	0.0500	0.0300	0.0400	0.0300	0.0425
2000	0.0200	0.0300	0.01000	0.0150	0.01000	0.0200
2001	0.01000	0.0300	0.0200	0.0200	0.0200	0.0300
2002	0.01000	0.0200	0.01000	0.0200	0.0150	0.0200
2003	0.01000	0.0200	0.01000	0.01000	0.01000	0.0125
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.552	0.868	0.246	0.368	0.210	0.00970
1994	1.713	2.923	0.253	0.257	0.230	0.0161
1995	-1.537	1.429	0.392	0.004	0.0450	0.000425
1996	0.874	-1.344	0.318	0.057	0.230	0.0111
1997	2.449	6.000	0.492	<0.001	0.250	0.0105
1998	0.857	-0.300	0.293	0.112	0.220	0.00840
1999	0.512	-0.612	0.231	0.448	0.190	0.00750
2000	0.857	-0.300	0.293	0.112	0.1000	0.00200
2001	0.609	-3.333	0.367	0.026	0.120	0.00300
2002	-2.000	4.000	0.441	0.006	0.0700	0.00130
2003	2.236	5.000	0.473	<0.001	0.0600	0.000800

Chlorophyll a

Figure 158 presents the seasonal mean chlorophyll *a* trend in Oxbow Lake, while Table 125 presents descriptive statistics for chlorophyll *a* in Oxbow Lake. The chlorophyll *a* in Oxbow Lake exhibited an increasing trend from 1997 to 2001 and a decreasing trend from 2001 to 2003. The chlorophyll *a* in Oxbow Lake was slightly higher than the county average, though this difference was not statistically significant.

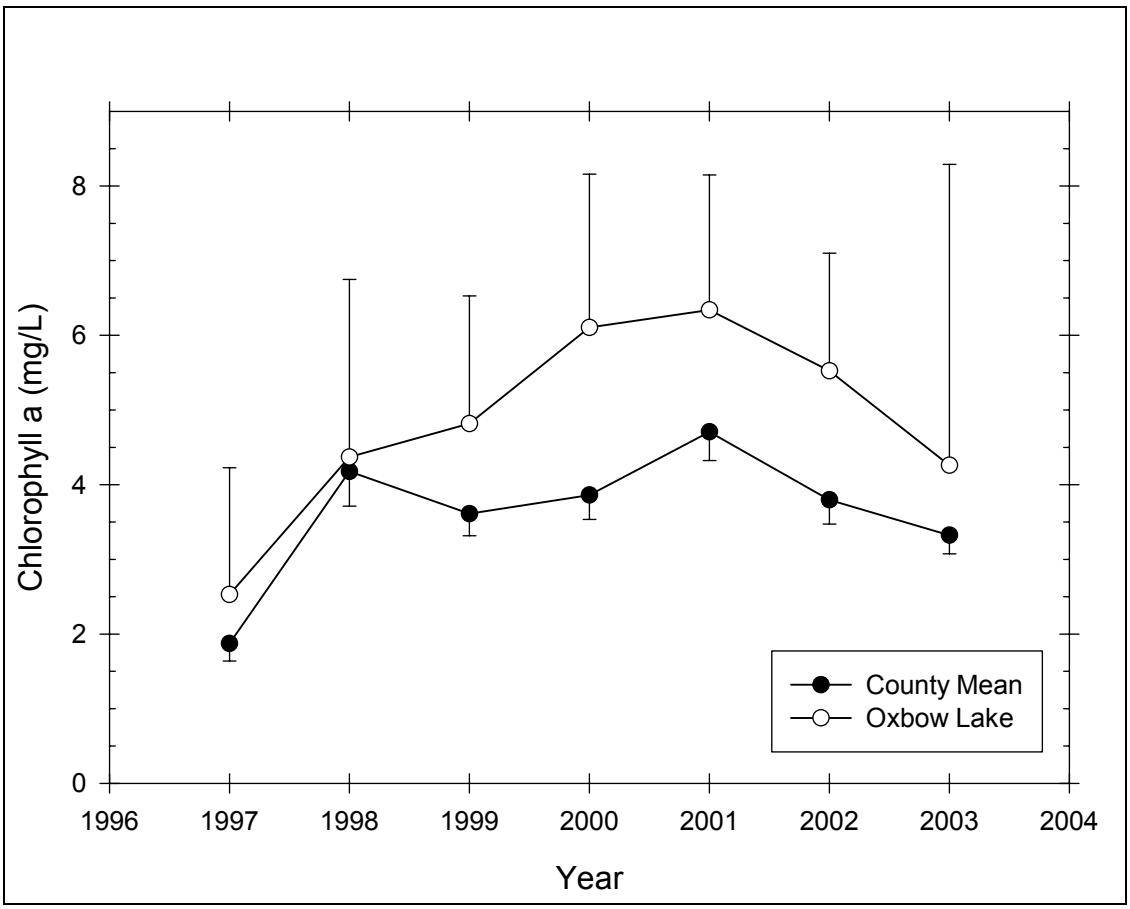


Figure 158 Seasonal mean chlorophyll a trend in Oxbow Lake

Table 125 – Descriptive Statistics for Chlorophyll a in Oxbow Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	2.530	1.617	0.660	1.696
1998	6	0	4.370	2.268	0.926	2.380
1999	6	1	4.818	1.377	0.616	1.709
2000	6	0	6.105	1.956	0.799	2.053
2001	6	1	6.340	1.456	0.651	1.808
2002	6	2	5.525	0.991	0.495	1.576
2003	6	3	4.260	1.625	0.938	4.037
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	4.380	5.030	0.650	2.015	1.630	3.840
1998	6.280	7.940	1.660	3.875	2.900	5.970
1999	2.680	5.920	3.240	5.660	3.353	5.890
2000	4.360	8.250	3.890	6.050	4.140	8.250
2001	3.900	8.250	4.350	6.080	5.513	7.402
2002	1.910	6.430	4.520	5.575	4.675	6.375
2003	3.230	5.770	2.540	4.470	3.023	5.445
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	0.702	-0.542	0.211	0.480	15.180	51.471
1998	0.660	-0.205	0.174	0.673	26.220	140.295
1999	-0.592	-3.264	0.330	0.080	24.090	123.646

2000	0.0438	-2.329	0.197	0.559	36.630	242.757
2001	-0.0730	0.182	0.181	0.673	31.700	209.456
2002	-0.0734	-5.457	0.289	0.267	22.100	125.047
2003	-0.572	--	0.218	0.593	12.780	59.725

Transparency

Figure 159 presents the seasonal mean transparency trend in Oxbow Lake, while Table 126 presents descriptive statistics for transparency in Oxbow Lake. The transparency in Oxbow Lake was stable throughout the period of record. The transparency in Oxbow Lake was significantly lower than the county average.

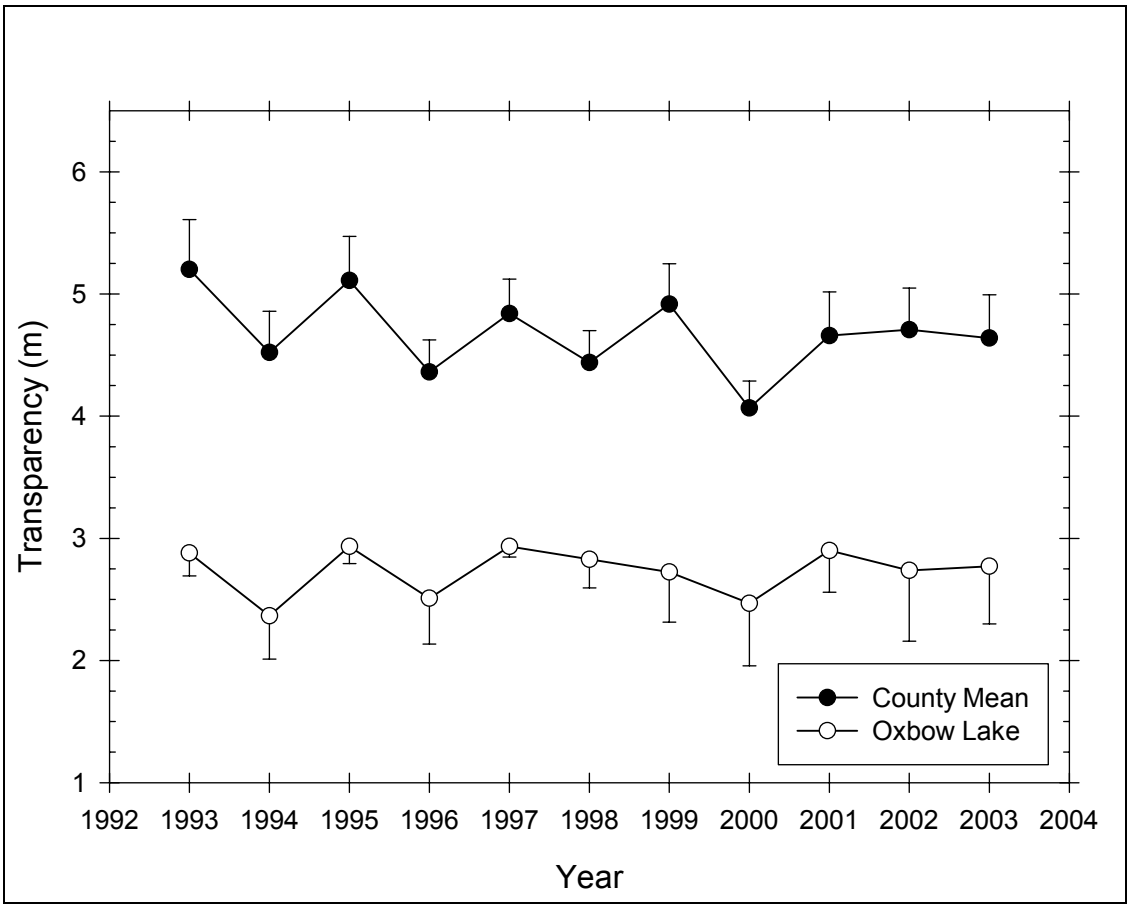


Figure 159 Seasonal mean transparency trend in Oxbow Lake

Table 126 – Descriptive Statistics for Transparency in Oxbow Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	2.880	0.150	0.0671	0.186
1994	6	0	2.367	0.339	0.138	0.355
1995	6	0	2.933	0.133	0.0543	0.139
1996	6	0	2.510	0.357	0.146	0.375
1997	6	0	2.933	0.0816	0.0333	0.0857
1998	6	0	2.828	0.223	0.0909	0.234
1999	5	0	2.724	0.330	0.147	0.409

2000	6	0	2.468	0.488	0.199	0.512
2001	5	0	2.900	0.274	0.122	0.340
2002	4	0	2.737	0.364	0.182	0.579
2003	5	0	2.772	0.380	0.170	0.472
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.300	3.030	2.730	2.880	2.730	3.030
1994	0.900	2.900	2.000	2.300	2.100	2.600
1995	0.400	3.150	2.750	2.900	2.900	3.000
1996	0.900	2.900	2.000	2.650	2.140	2.720
1997	0.200	3.100	2.900	2.900	2.900	2.900
1998	0.600	3.000	2.400	2.875	2.820	3.000
1999	0.880	3.150	2.270	2.700	2.518	2.962
2000	1.150	3.000	1.850	2.480	2.100	2.900
2001	0.700	3.300	2.600	2.900	2.675	3.075
2002	0.800	3.000	2.200	2.875	2.525	2.950
2003	1.050	3.250	2.200	2.810	2.575	2.987
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.000	-3.000	0.241	0.393	14.400	41.562
1994	0.707	-0.512	0.189	0.602	14.200	34.180
1995	0.536	1.279	0.266	0.202	17.600	51.715
1996	-0.706	-1.389	0.266	0.200	15.060	38.438
1997	2.449	6.000	0.492	<0.001	17.600	51.660
1998	-1.848	3.823	0.318	0.057	16.970	48.245
1999	-0.148	0.116	0.153	0.739	13.620	37.535
2000	-0.125	-2.551	0.252	0.264	14.810	37.748
2001	0.609	-0.133	0.167	0.713	14.500	42.350
2002	-1.822	3.465	0.371	0.056	10.950	30.373
2003	-0.577	1.529	0.225	0.476	13.860	38.999

TSI

Figure 160 presents the Carlson trophic state index trend in Oxbow Lake. Transparency TSI was mesotrophic throughout the period of record. Total phosphorus TSI was mesotrophic for the period of record, with the exception of 1993 (eutrophic) and 2000 and 2002 (oligotrophic). Chlorophyll *a* TSI was eutrophic from 1998 to 2003 and mesotrophic in 1997.

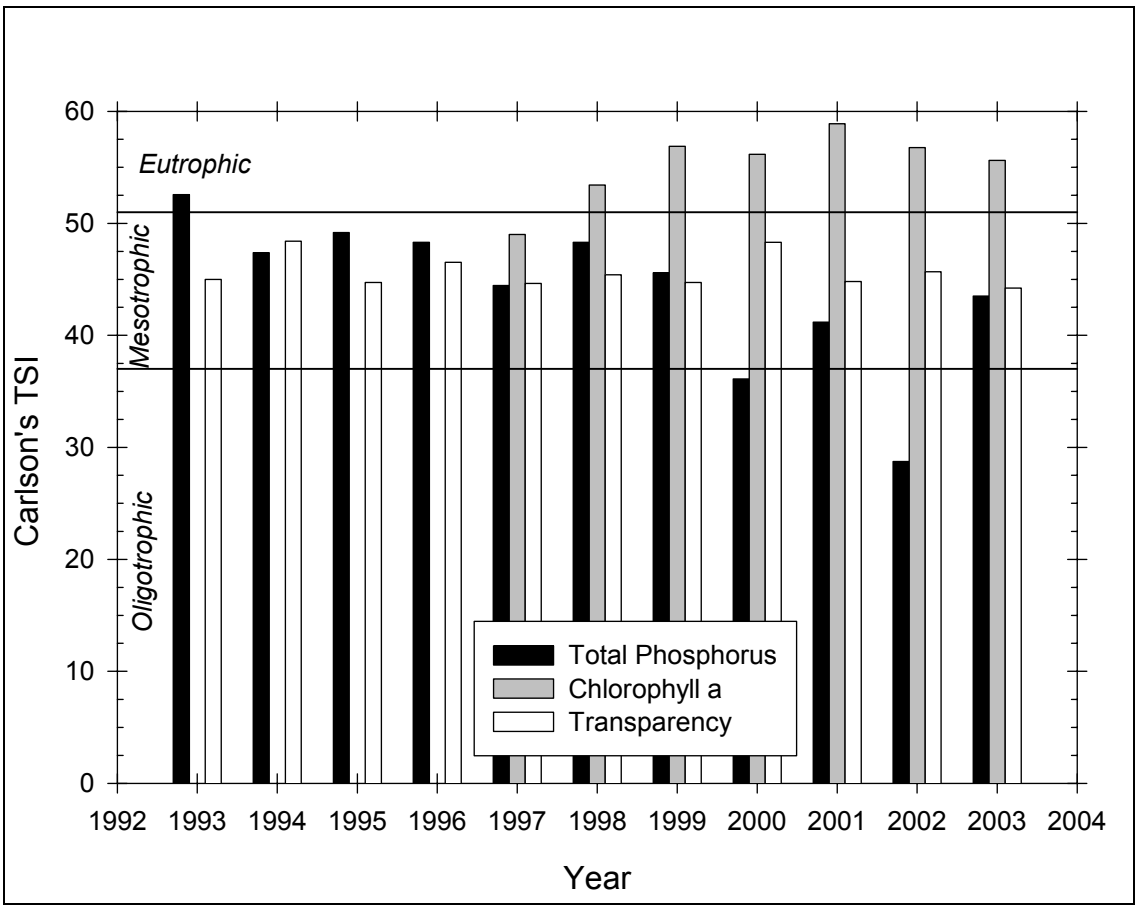


Figure 160 Carlson TSI trend in Oxbow Lake

Aluminum

Figure 161 presents the seasonal mean aluminum trend in Oxbow Lake, while Table 127 presents descriptive statistics for aluminum in Oxbow Lake. The aluminum in Oxbow Lake exhibited a decreasing trend from 1997 to 2003. The aluminum in Oxbow Lake was significantly lower than the county average, though this difference may not be statistically significant for some years.

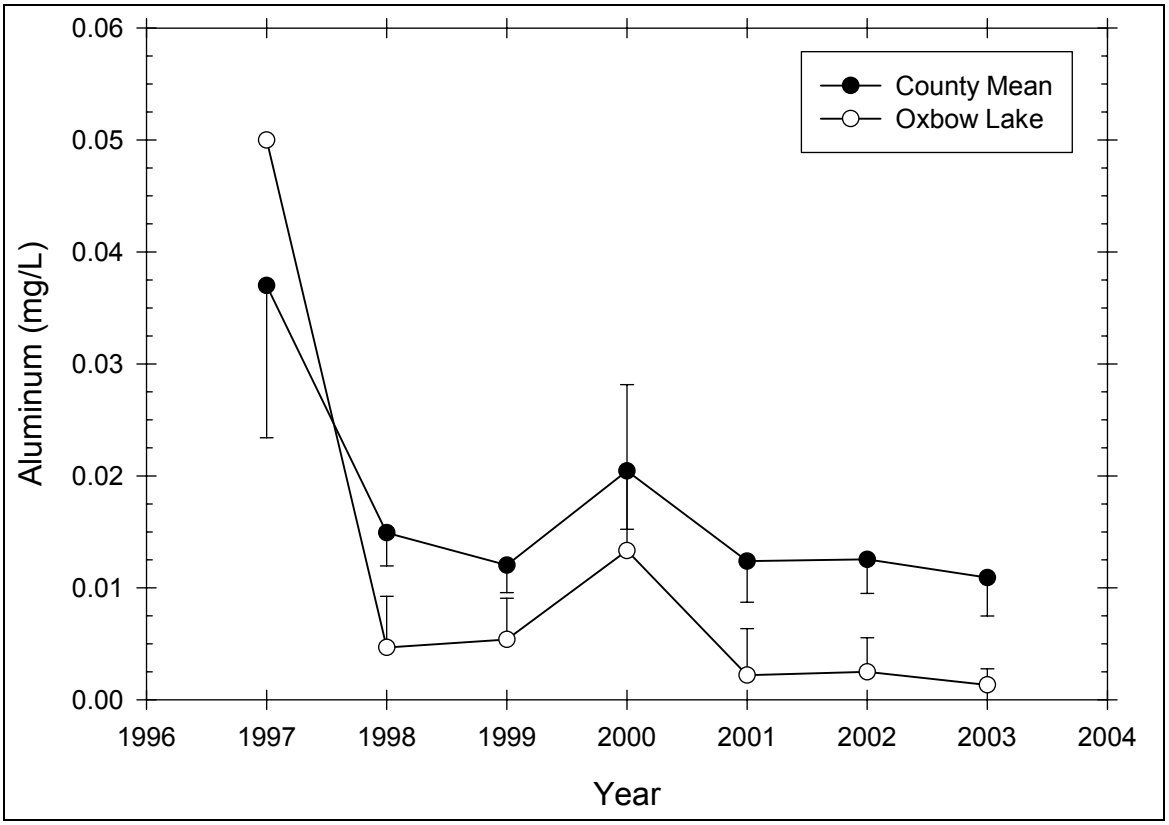


Figure 161 Seasonal mean aluminum trend in Oxbow Lake

Table 127 – Descriptive Statistics for Aluminum in Oxbow Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0500	--	--	--
1998	6	0	0.00467	0.00437	0.00178	0.00458
1999	6	1	0.00540	0.00297	0.00133	0.00368
2000	6	0	0.0133	0.0141	0.00577	0.0148
2001	6	1	0.00220	0.00335	0.00150	0.00416
2002	6	2	0.00250	0.00191	0.000957	0.00305
2003	6	3	0.00133	0.000577	0.000333	0.00143
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0500	0.0500	0.0500	0.0500	0.0500
1998	0.0110	0.0110	0.000	0.00300	0.00200	0.00900
1999	0.00800	0.01000	0.00200	0.00500	0.00350	0.00700
2000	0.0400	0.0410	0.001000	0.01000	0.00600	0.0120
2001	0.00800	0.00800	0.000	0.001000	0.000	0.00350
2002	0.00400	0.00500	0.001000	0.00200	0.001000	0.00400
2003	0.001000	0.00200	0.001000	0.001000	0.001000	0.00175
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0500	0.00250
1998	0.705	-1.365	0.229	0.378	0.0280	0.000226
1999	0.885	1.449	0.220	0.502	0.0270	0.000181
2000	2.003	4.523	0.371	0.010	0.0800	0.00206
2001	1.913	3.764	0.324	0.094	0.0110	0.0000690
2002	0.855	-1.289	0.283	0.289	0.01000	0.0000360

2003	1.732	--	0.385	0.089	0.00400	0.00000600

Calcium

Figure 162 presents the seasonal mean calcium trend in Oxbow Lake, while Table 128 presents descriptive statistics for calcium in Oxbow Lake. The calcium in Oxbow Lake exhibited an increasing trend from 1997 to 1999 and a decreasing trend from 1999 to 2003. The calcium in Oxbow Lake was slightly higher than the county average, though this difference was not statistically significant.

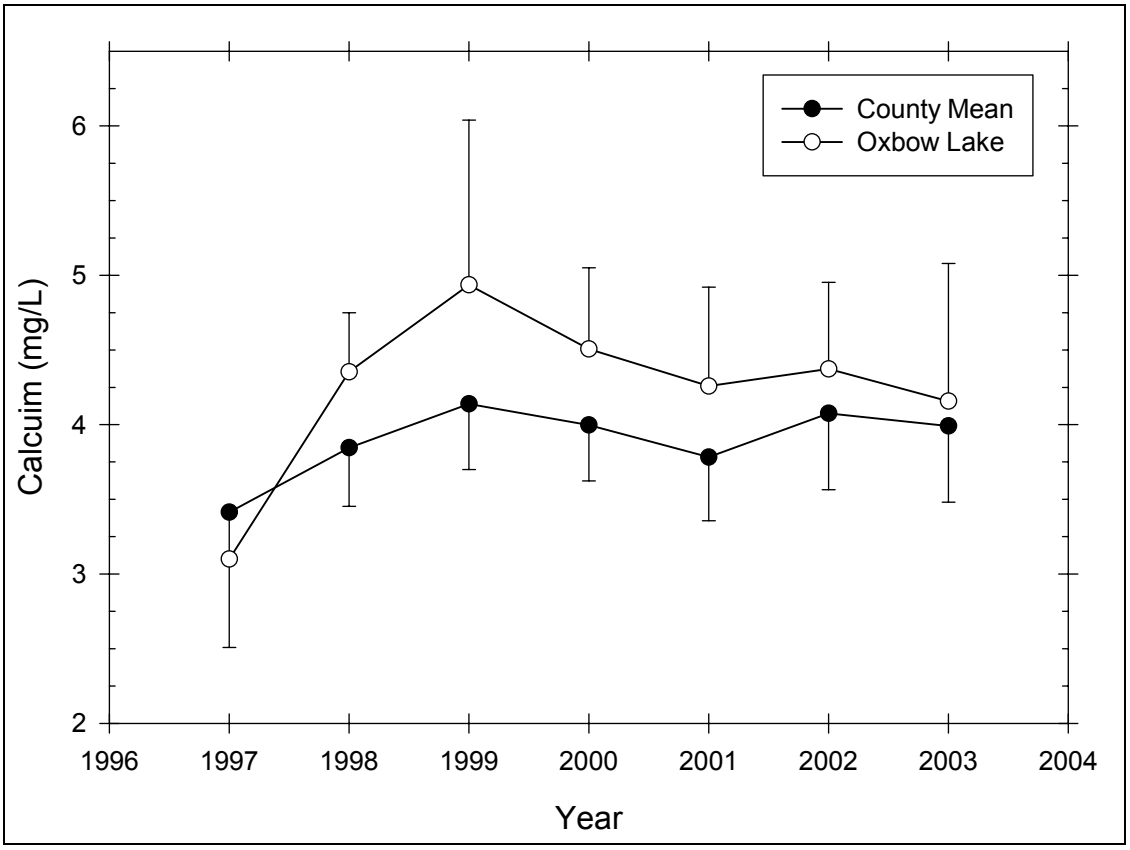


Figure 162 Seasonal mean calcium trend in Oxbow Lake

Table 128 – Descriptive Statistics for Calcium in Oxbow Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	3.100	--	--	--
1998	6	0	4.353	0.378	0.154	0.396
1999	6	1	4.936	0.888	0.397	1.103
2000	6	0	4.507	0.519	0.212	0.544
2001	6	1	4.258	0.534	0.239	0.663
2002	6	2	4.373	0.364	0.182	0.580
2003	6	3	4.157	0.372	0.215	0.924
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	3.100	3.100	3.100	3.100	3.100
1998	1.030	5.010	3.980	4.300	4.020	4.510
1999	2.390	6.430	4.040	4.750	4.542	5.170

2000	1.420	5.440	4.020	4.450	4.070	4.610
2001	1.270	5.150	3.880	4.020	3.888	4.550
2002	0.860	4.780	3.920	4.395	4.100	4.645
2003	0.730	4.480	3.750	4.240	3.873	4.420
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	3.100	9.610
1998	1.098	1.252	0.191	0.589	26.120	114.423
1999	1.541	3.314	0.383	0.016	24.680	124.976
2000	1.313	2.002	0.254	0.251	27.040	123.205
2001	1.626	2.406	0.272	0.249	21.290	91.792
2002	-0.319	-0.274	0.150	0.710	17.490	76.873
2003	-0.957	--	0.255	0.479	12.470	52.111

Calcite Saturation Index

Figure 163 presents the calcite saturation index trend in Oxbow Lake. The CSI in Oxbow Lake exhibited a slight decreasing trend over the period of record, moving from moderately vulnerable to acid deposition to low vulnerability to acid deposition. The CSI in Oxbow Lake was slightly higher than the county average in some years, and other times slightly lower than the county average, though any difference was not statistically significant.

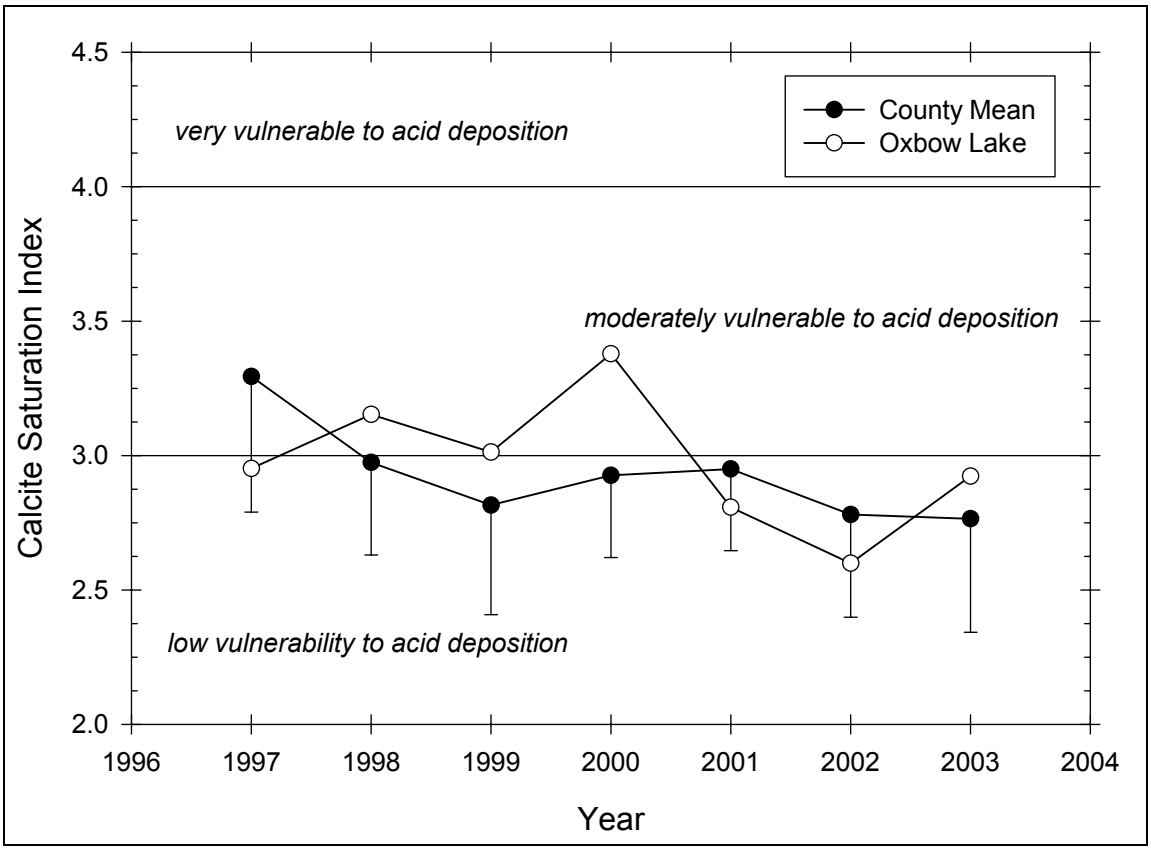
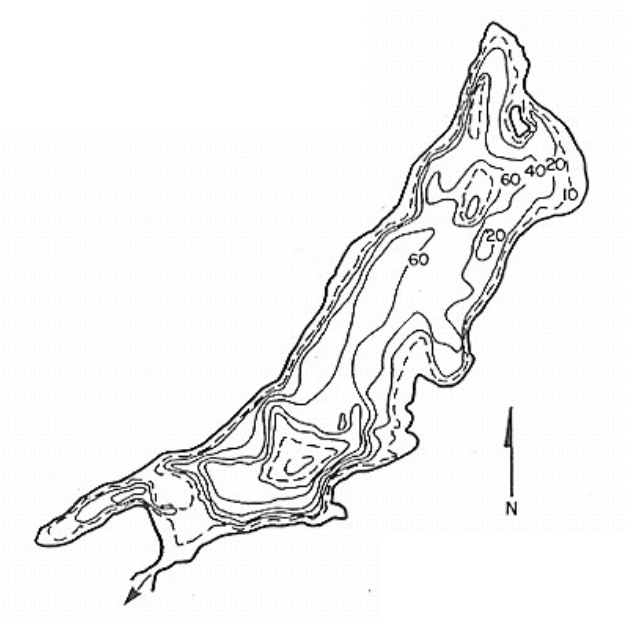


Figure 163 Seasonal mean CSI trend in Oxbow Lake

Piseco Lake

Location
Pond Number: 050234
Watershed: Upper Hudson River
County: Hamilton
Topographic Quadrangle: Piseco Lake
Sample Site
Latitude: 43o 23.860'
Longitude: 74o 33.334'
Morphometry
Surface Area: 2,842 Ac.
Mean Depth: 58 Ft.
Maximum Depth: 125 Ft.
Volume: 164,836 Ac./Ft.
Watershed Area: 38,023 Ac.
Hydraulic Retention Time: 1.5 Yr.
Shoreline Length: 21.3 Mi.
Elevation: 1,661 Ft.
Water Quality Classification: B
Trophic State: Mesotrophic



Temperature and Dissolved Oxygen

Piseco Lake had a minimum DO of 2.7 mg/L (October 2000), with a minimum temperature of 4.8°C and a maximum temperature of 24.0°C.

pH

Figure 164 presents the seasonal mean pH trend in Piseco Lake, while Table 129 presents descriptive statistics for pH in Piseco Lake. The pH in Piseco Lake exhibited an increasing trend from 1995 to 2003, with a dip in pH between 1999 and 2002. The pH in Piseco Lake was fairly similar to the county average, with some variation.

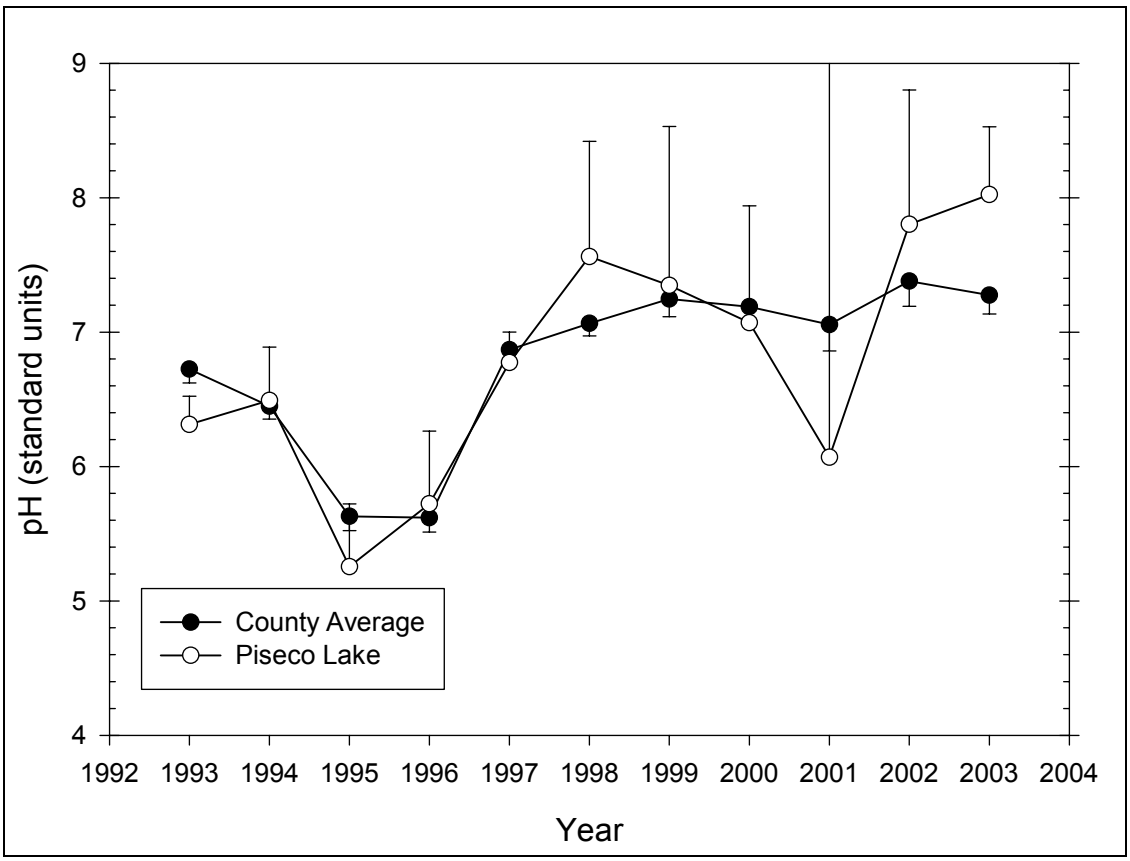


Figure 164 Seasonal mean pH trend in Piseco Lake

Table 129 – Descriptive Statistics for pH in Piseco Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	6.314	0.169	0.0756	0.210
1994	6	0	6.492	0.378	0.154	0.397
1995	6	0	5.255	0.445	0.182	0.467
1996	6	0	5.722	0.516	0.211	0.542
1997	6	0	6.773	0.217	0.0887	0.228
1998	6	0	7.562	0.818	0.334	0.858
1999	5	0	7.348	0.953	0.426	1.183
2000	6	0	7.070	0.828	0.338	0.869
2001	5	0	6.070	3.438	1.538	4.269
2002	4	0	7.803	0.628	0.314	1.000
2003	5	0	8.024	0.406	0.182	0.504
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.420	6.440	6.020	6.380	6.253	6.410
1994	1.100	7.170	6.070	6.420	6.260	6.610
1995	1.270	5.700	4.430	5.400	5.120	5.480
1996	1.390	6.520	5.130	5.615	5.340	6.110
1997	0.580	6.950	6.370	6.865	6.690	6.900
1998	2.410	8.640	6.230	7.535	7.300	8.130
1999	2.190	8.680	6.490	6.860	6.640	8.185
2000	2.400	8.430	6.030	7.040	6.550	7.330
2001	8.240	8.240	0.000	7.450	5.070	7.985

2002	1.370	8.260	6.890	8.030	7.390	8.215
2003	1.130	8.640	7.510	7.990	7.810	8.213
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-1.939	3.932	0.338	0.064	31.570	199.447
1994	1.249	2.166	0.242	0.311	38.950	253.566
1995	-1.562	2.797	0.294	0.108	31.530	166.680
1996	0.640	-0.587	0.166	0.703	34.330	197.758
1997	-1.650	2.541	0.270	0.187	40.640	275.504
1998	-0.517	0.960	0.208	0.498	45.370	346.416
1999	0.787	-1.730	0.296	0.163	36.740	273.599
2000	0.662	0.723	0.210	0.485	42.420	303.337
2001	-2.095	4.477	0.380	0.018	30.350	231.508
2002	-1.649	2.648	0.305	0.207	31.210	244.701
2003	0.600	1.826	0.255	0.326	40.120	322.583

Alkalinity

Figure 165 presents the seasonal mean alkalinity trend in Piseco Lake, while Table 130 presents descriptive statistics for alkalinity in Piseco Lake. The alkalinity in Piseco Lake was variable but relatively stable throughout the period of record. The alkalinity in Piseco Lake was significantly lower than the county average, though this difference may not be statistically significant for some years.

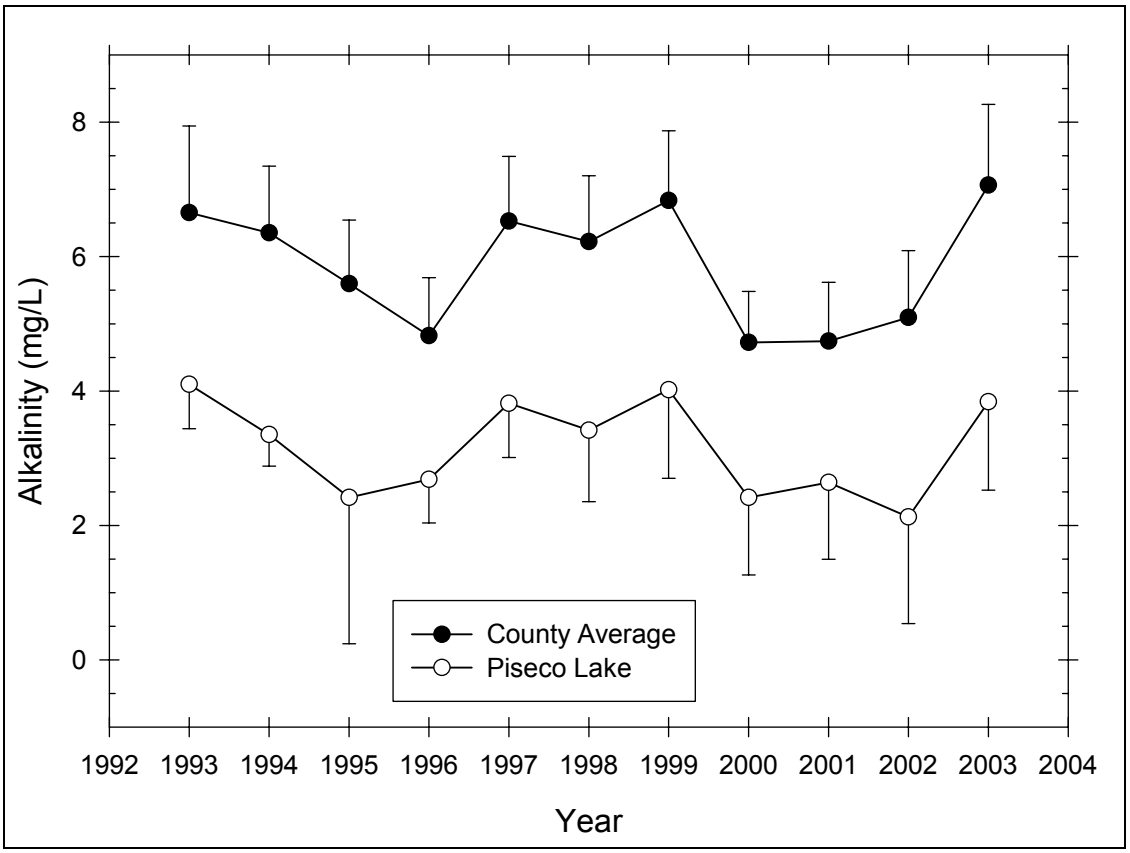


Figure 165 Seasonal alkalinity trend in Piseco Lake (outlier of 11.16 corrected to 1.6)

Table 130 – Descriptive Statistics for Alkalinity in Piseco Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	4.100	0.534	0.239	0.663
1994	6	0	3.350	0.446	0.182	0.468
1995	6	0	2.417	2.076	0.848	2.179
1996	6	0	2.683	0.618	0.252	0.648
1997	6	0	3.817	0.768	0.313	0.806
1998	6	0	3.417	1.013	0.413	1.063
1999	6	1	4.020	1.062	0.475	1.318
2000	6	0	2.417	1.100	0.449	1.154
2001	6	1	2.640	0.921	0.412	1.143
2002	6	2	2.125	0.998	0.499	1.588
2003	6	1	3.840	1.060	0.474	1.316
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.300	4.800	3.500	3.900	3.725	4.575
1994	1.300	4.200	2.900	3.200	3.200	3.400
1995	4.900	4.100	-0.800	3.250	0.600	4.100
1996	1.600	3.500	1.900	2.700	2.100	3.200
1997	2.000	4.700	2.700	4.000	3.100	4.400
1998	2.500	4.700	2.200	3.100	2.800	4.600
1999	2.700	5.000	2.300	4.300	3.425	4.775
2000	2.900	3.100	0.200	2.800	2.600	3.000
2001	2.400	3.700	1.300	2.900	1.975	3.250
2002	2.400	3.200	0.800	2.250	1.450	2.800
2003	2.200	5.000	2.800	3.600	2.875	4.925
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.427	-1.767	0.246	0.369	20.500	85.190
1994	1.734	3.729	0.298	0.098	20.100	68.330
1995	-0.888	-1.017	0.263	0.215	14.500	56.590
1996	0.00565	-1.403	0.161	0.722	16.100	45.110
1997	-0.570	-1.125	0.261	0.221	22.900	90.350
1998	0.477	-1.565	0.251	0.265	20.500	75.170
1999	-1.331	1.740	0.218	0.511	20.100	85.310
2000	-2.312	5.481	0.400	0.003	14.500	41.090
2001	-0.632	-0.0500	0.211	0.545	13.200	38.240
2002	-0.713	1.368	0.240	0.476	8.500	21.050
2003	0.274	-3.017	0.241	0.392	19.200	78.220

Total Phosphorus

Figure 166 presents the seasonal mean total phosphorus trend in Piseco Lake, while Table 131 presents descriptive statistics for total phosphorus in Piseco Lake. The total phosphorus in Piseco Lake exhibited a general decreasing trend from 1993 to 2002, with an elevated total phosphorus in 2003. The total phosphorus in Piseco Lake was similar to the county average, except for the higher value in 2003.

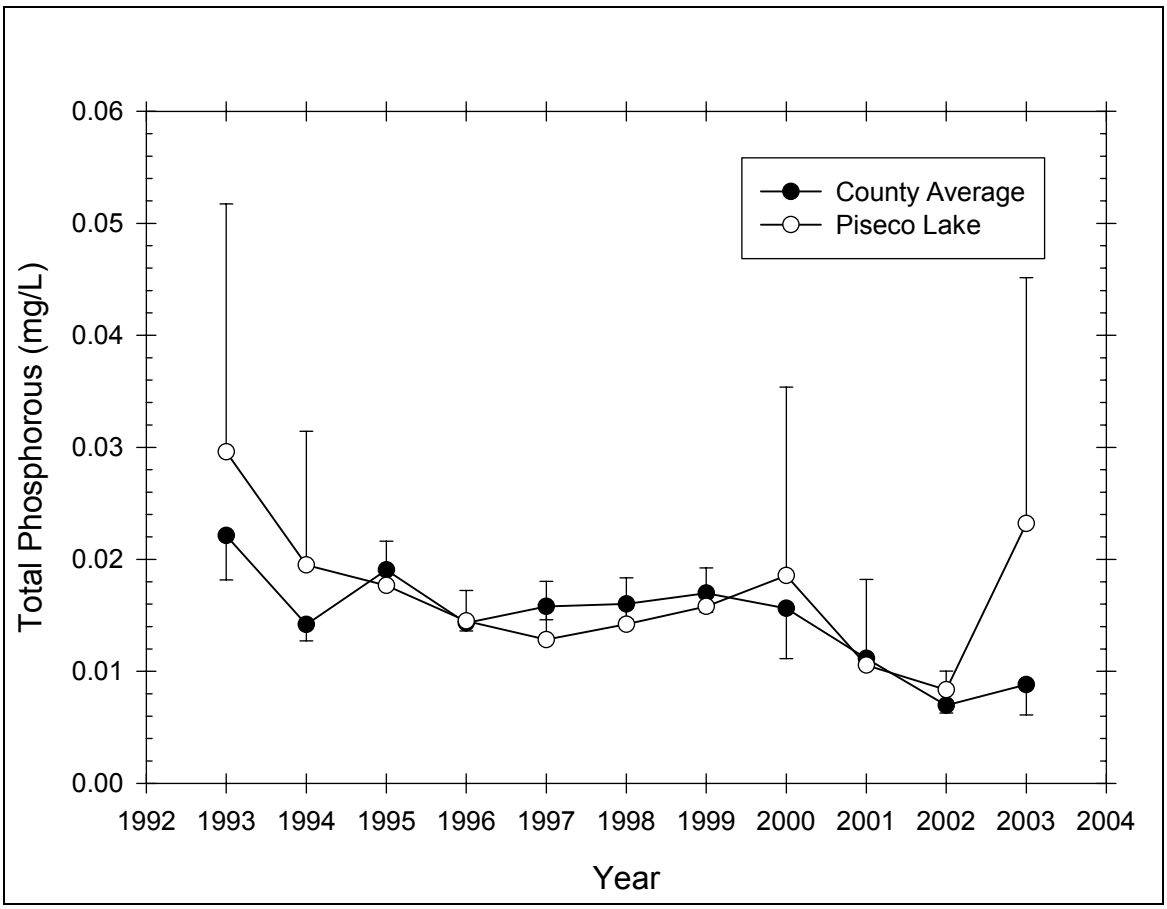


Figure 166 Seasonal mean total phosphorus trend in Piseco Lake

Table 131 – Descriptive Statistics for Total Phosphorus in Piseco Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0296	0.0178	0.00797	0.0221
1994	6	0	0.0195	0.0114	0.00464	0.0119
1995	6	0	0.0177	0.00378	0.00154	0.00396
1996	6	0	0.0145	0.00259	0.00106	0.00272
1997	6	0	0.0128	0.00496	0.00202	0.00520
1998	5	0	0.0142	0.00335	0.00150	0.00416
1999	6	1	0.0158	0.00277	0.00124	0.00345
2000	6	0	0.0186	0.0160	0.00655	0.0168
2001	6	1	0.0106	0.00617	0.00276	0.00766
2002	6	2	0.00835	0.00105	0.000524	0.00167
2003	6	1	0.0232	0.0177	0.00790	0.0219
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0470	0.0590	0.0120	0.0250	0.0187	0.0380
1994	0.0300	0.0420	0.0120	0.0160	0.0120	0.0190
1995	0.0110	0.0240	0.0130	0.0175	0.0150	0.0190
1996	0.00700	0.0170	0.01000	0.0145	0.0140	0.0170
1997	0.0140	0.0170	0.00300	0.0140	0.0140	0.0150
1998	0.00800	0.0200	0.0120	0.0130	0.0120	0.0155
1999	0.00700	0.0200	0.0130	0.0150	0.0138	0.0178
2000	0.0420	0.0430	0.001000	0.0125	0.00930	0.0330

2001	0.0160	0.0210	0.00500	0.00940	0.00673	0.0128
2002	0.00240	0.00970	0.00730	0.00820	0.00755	0.00915
2003	0.0441	0.0531	0.00900	0.0163	0.0120	0.0317
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.414	2.508	0.269	0.264	0.148	0.00565
1994	2.135	4.799	0.351	0.020	0.117	0.00293
1995	0.755	1.100	0.195	0.567	0.106	0.00194
1996	-1.038	1.366	0.257	0.240	0.0870	0.00130
1997	-2.128	4.976	0.426	0.001	0.0770	0.00111
1998	1.913	3.764	0.324	0.094	0.0710	0.00105
1999	0.927	0.130	0.213	0.534	0.0790	0.00128
2000	0.783	-0.867	0.254	0.251	0.111	0.00335
2001	1.652	3.197	0.330	0.080	0.0528	0.000710
2002	0.669	-0.661	0.200	0.632	0.0334	0.000282
2003	1.697	2.931	0.268	0.265	0.116	0.00394

Nitrate

Figure 167 presents the seasonal mean nitrate trend in Piseco Lake, while Table 132 presents descriptive statistics for nitrate in Piseco Lake. The nitrate in Piseco Lake exhibited a decreasing trend from 1997 to 2002. The nitrate in Piseco Lake was similar to the county average.

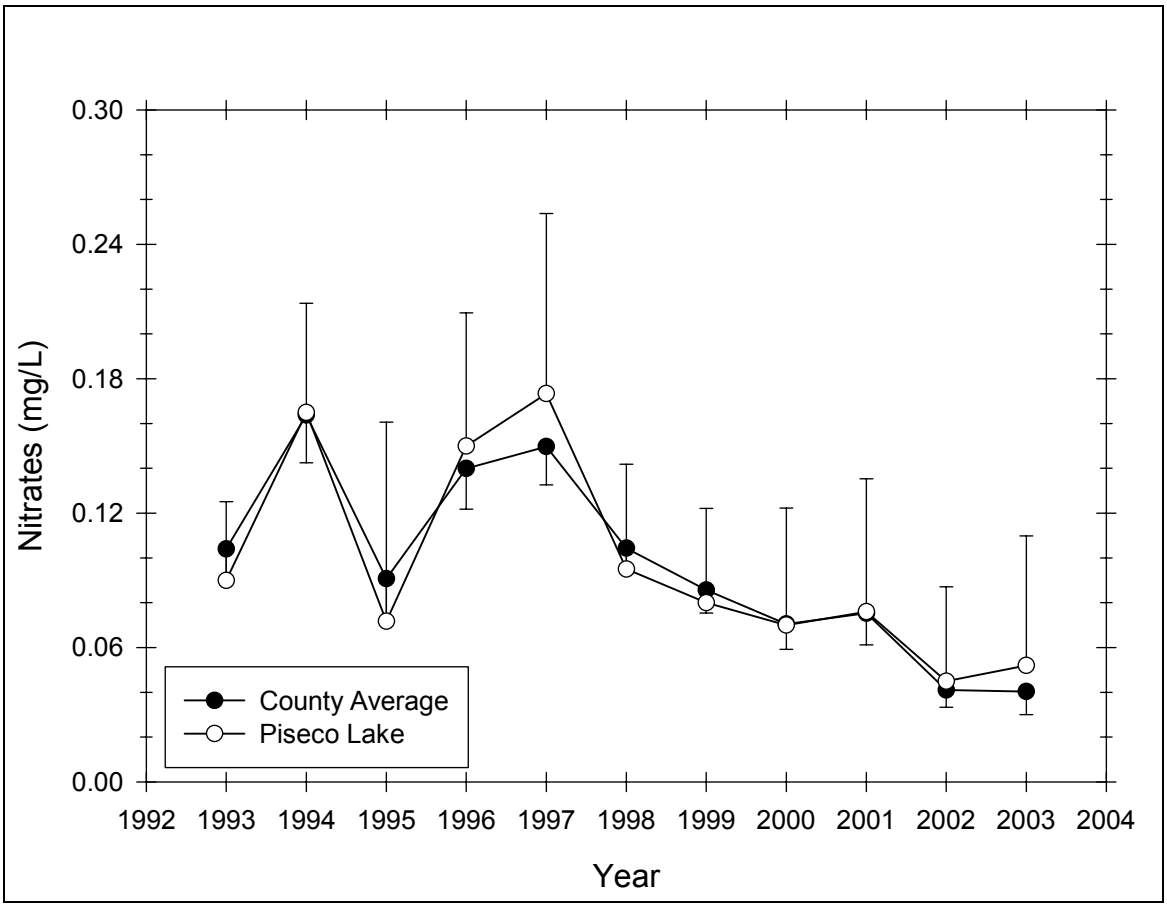


Figure 167 Seasonal mean nitrate trend in Piseco Lake

Table 132 – Descriptive Statistics for Nitrate in Piseco Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0900	0.0283	0.0126	0.0351
1994	6	0	0.165	0.0464	0.0189	0.0487
1995	6	0	0.0717	0.0847	0.0346	0.0889
1996	6	0	0.150	0.0566	0.0231	0.0594
1997	6	0	0.173	0.0766	0.0313	0.0804
1998	6	0	0.0950	0.0446	0.0182	0.0468
1999	6	1	0.0800	0.0339	0.0152	0.0421
2000	6	0	0.0700	0.0498	0.0203	0.0523
2001	6	1	0.0760	0.0477	0.0214	0.0593
2002	6	2	0.0450	0.0265	0.0132	0.0421
2003	6	1	0.0520	0.0466	0.0208	0.0578
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0600	0.120	0.0600	0.0800	0.0675	0.120
1994	0.110	0.230	0.120	0.150	0.130	0.210
1995	0.210	0.210	0.000	0.0350	0.01000	0.140
1996	0.140	0.230	0.0900	0.140	0.1000	0.200
1997	0.220	0.290	0.0700	0.170	0.130	0.210
1998	0.110	0.170	0.0600	0.0700	0.0700	0.130
1999	0.0900	0.130	0.0400	0.0800	0.0550	0.1000
2000	0.130	0.170	0.0400	0.0550	0.0400	0.0600
2001	0.120	0.150	0.0300	0.0700	0.0375	0.105
2002	0.0600	0.0800	0.0200	0.0400	0.0250	0.0650
2003	0.110	0.120	0.01000	0.0300	0.0175	0.0900
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.331	-2.922	0.256	0.323	0.450	0.0437
1994	0.569	-1.850	0.275	0.168	0.990	0.174
1995	1.093	-0.322	0.268	0.195	0.430	0.0667
1996	0.447	-1.654	0.202	0.531	0.900	0.151
1997	0.290	-0.0193	0.168	0.695	1.040	0.210
1998	1.267	0.0806	0.379	0.007	0.570	0.0641
1999	0.577	0.488	0.184	0.663	0.400	0.0366
2000	2.274	5.336	0.413	0.002	0.420	0.0418
2001	1.009	0.701	0.185	0.660	0.380	0.0380
2002	0.864	-0.286	0.215	0.582	0.180	0.0102
2003	0.902	-0.994	0.282	0.212	0.260	0.0222

Chlorophyll a

Figure 168 presents the seasonal mean chlorophyll *a* trend in Piseco Lake, while Table 133 presents descriptive statistics for chlorophyll *a* in Piseco Lake. The chlorophyll *a* in Piseco Lake exhibited an increasing trend from 1997 to 2001 and a decreasing trend from 2001 to 2003. The chlorophyll *a* in Piseco Lake was generally slightly higher than the county average, though this difference was not statistically significant.

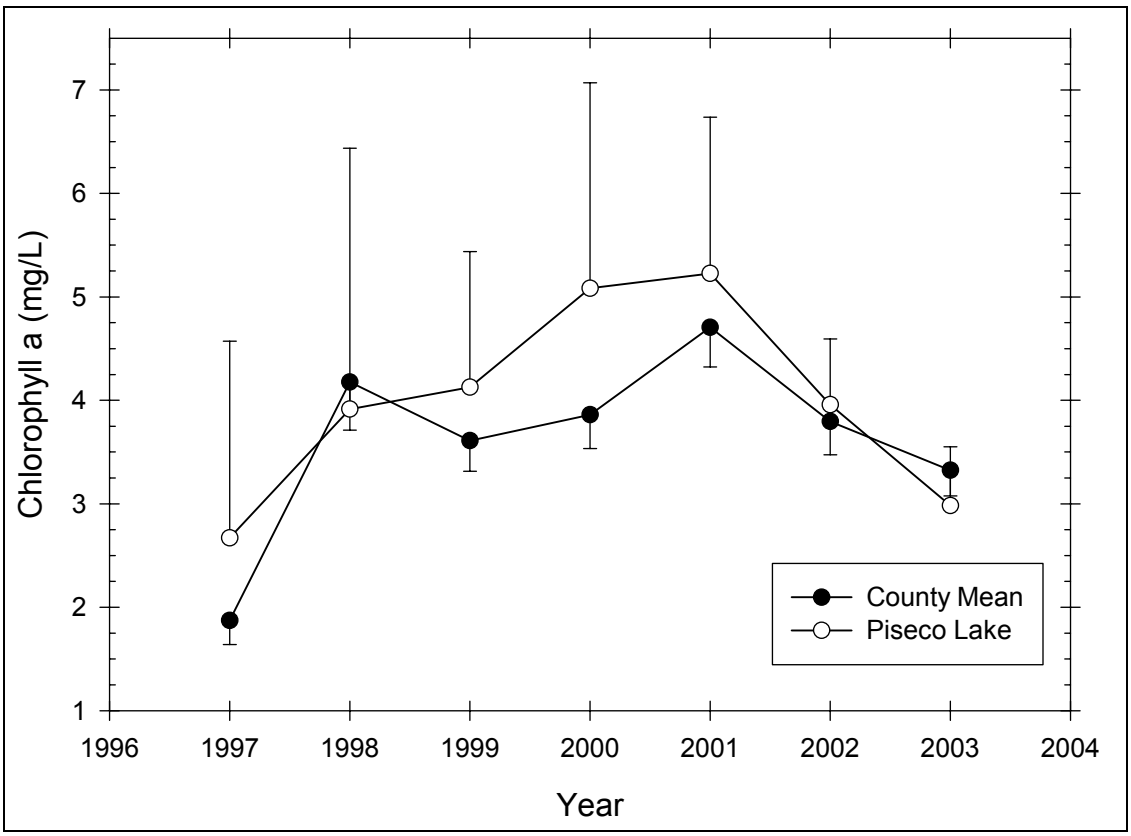


Figure 168 Seasonal mean chlorophyll a trend in Piseco Lake

Table 133 – Descriptive Statistics for Chlorophyll a in Piseco Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	2.670	1.812	0.740	1.901
1998	6	0	3.915	2.404	0.981	2.523
1999	6	1	4.126	1.056	0.472	1.311
2000	6	0	5.083	1.893	0.773	1.986
2001	6	1	5.226	1.217	0.544	1.511
2002	6	2	3.958	0.400	0.200	0.636
2003	6	2	2.982	0.357	0.179	0.568
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	4.880	5.660	0.780	2.060	1.500	3.960
1998	6.000	7.190	1.190	3.320	2.040	6.430
1999	2.310	5.350	3.040	4.290	3.047	5.013
2000	4.350	7.610	3.260	4.445	3.490	7.250
2001	3.330	7.210	3.880	5.030	4.615	5.665
2002	0.920	4.320	3.400	4.055	3.680	4.235
2003	0.850	3.340	2.490	3.050	2.750	3.215
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	1.001	0.108	0.245	0.293	16.020	59.188
1998	0.506	-1.570	0.214	0.464	23.490	120.856
1999	-0.0795	-2.639	0.246	0.370	20.630	89.581
2000	0.681	-1.830	0.243	0.306	30.500	172.950
2001	1.228	2.704	0.325	0.091	26.130	142.482

2002	-1.237	1.551	0.252	0.421	15.830	63.127
2003	-1.061	1.927	0.281	0.299	11.930	35.964

Transparency

Figure 169 presents the seasonal mean transparency trend in Piseco Lake, while Table 134 presents descriptive statistics for transparency in Piseco Lake. The transparency in Piseco Lake did not exhibit any discernible trend. The transparency in Piseco Lake was generally slightly lower than the county average, though this difference was not statistically significant.

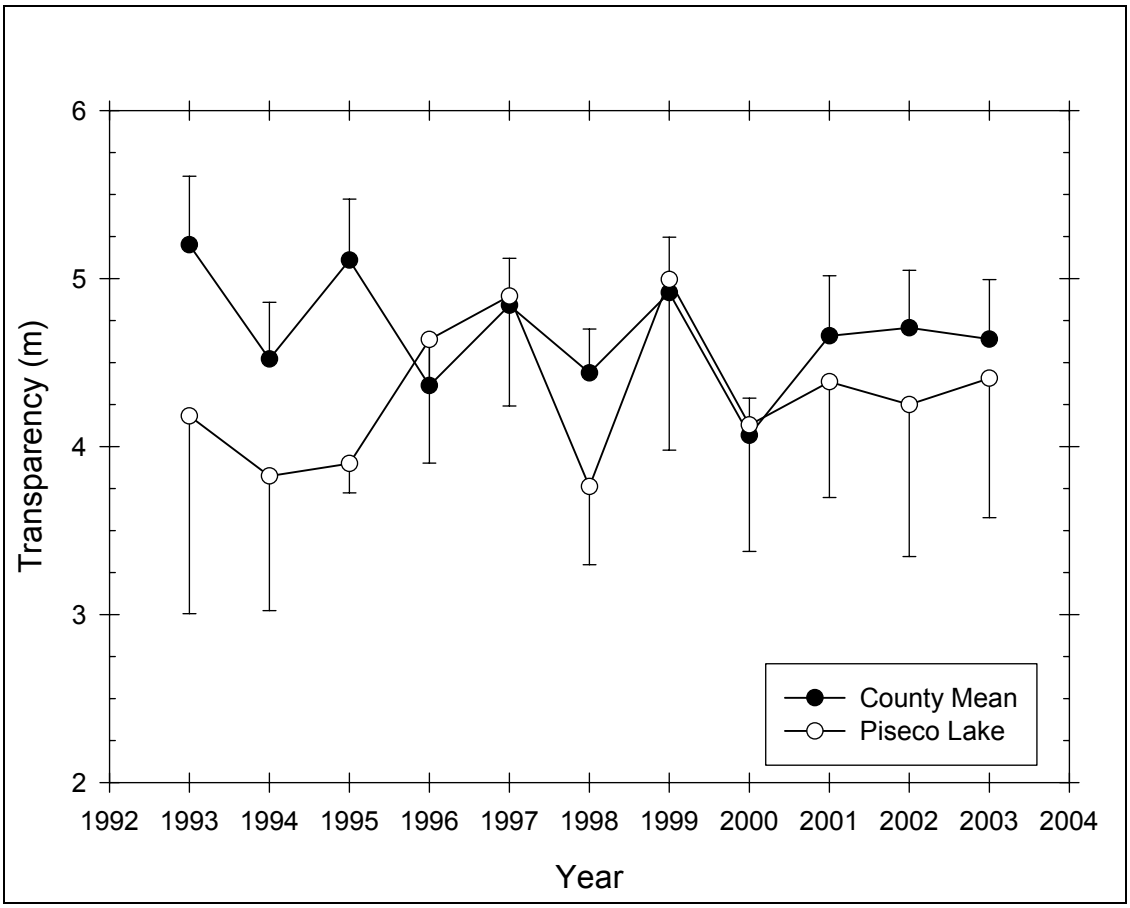


Figure 169 Seasonal mean transparency trend in Piseco Lake

Table 134 – Descriptive Statistics for Transparency in Piseco Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	4.182	0.948	0.424	1.177
1994	6	0	3.825	0.764	0.312	0.802
1995	6	0	3.898	0.166	0.0678	0.174
1996	6	0	4.637	0.701	0.286	0.736
1997	6	0	4.895	0.623	0.254	0.653
1998	6	0	3.762	0.443	0.181	0.465
1999	5	0	4.994	0.817	0.365	1.015
2000	6	0	4.128	0.718	0.293	0.753

2001	5	0	4.386	0.555	0.248	0.689
2002	4	0	4.250	0.569	0.284	0.905
2003	5	0	4.406	0.668	0.299	0.830
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	2.420	5.150	2.730	4.540	3.525	4.813
1994	2.200	4.600	2.400	4.000	3.750	4.200
1995	0.460	4.200	3.740	3.850	3.800	3.950
1996	2.150	5.750	3.600	4.610	4.400	4.850
1997	1.750	5.810	4.060	4.810	4.560	5.320
1998	1.220	4.120	2.900	3.875	3.750	4.050
1999	1.850	5.950	4.100	5.230	4.168	5.612
2000	2.070	5.520	3.450	3.950	3.800	4.100
2001	1.430	5.130	3.700	4.500	3.925	4.732
2002	1.300	4.900	3.600	4.250	3.800	4.700
2003	1.470	5.300	3.830	4.100	3.860	5.023
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.992	0.408	0.247	0.364	20.910	91.041
1994	-1.563	3.043	0.294	0.108	22.950	90.703
1995	1.420	2.106	0.223	0.413	23.390	91.320
1996	0.226	1.574	0.214	0.465	27.820	131.448
1997	0.245	-0.470	0.188	0.607	29.370	145.705
1998	-1.955	4.206	0.323	0.050	22.570	85.882
1999	-0.166	-2.505	0.237	0.413	24.970	127.372
2000	1.895	4.255	0.349	0.021	24.770	104.833
2001	0.104	-0.721	0.181	0.672	21.930	97.417
2002	2.517E-015	-1.868	0.170	0.700	17.000	73.220
2003	0.677	-2.263	0.276	0.232	22.030	98.851

TSI

Figure 170 presents the Carlson trophic state index trend in Piseco Lake. Transparency TSI was in the mesotrophic range close to the oligotrophic-mesotrophic boundary throughout the period of record. Chlorophyll *a* TSI was in the eutrophic range from 1998 to 2002, and in the upper mesotrophic range in 1997 and 2003. Total phosphorus TSI was mesotrophic throughout the period of record, with the exception of 2001 and 2002 that were in the upper oligotrophic range and 2003 that was at the mesotrophic-eutrophic boundary.

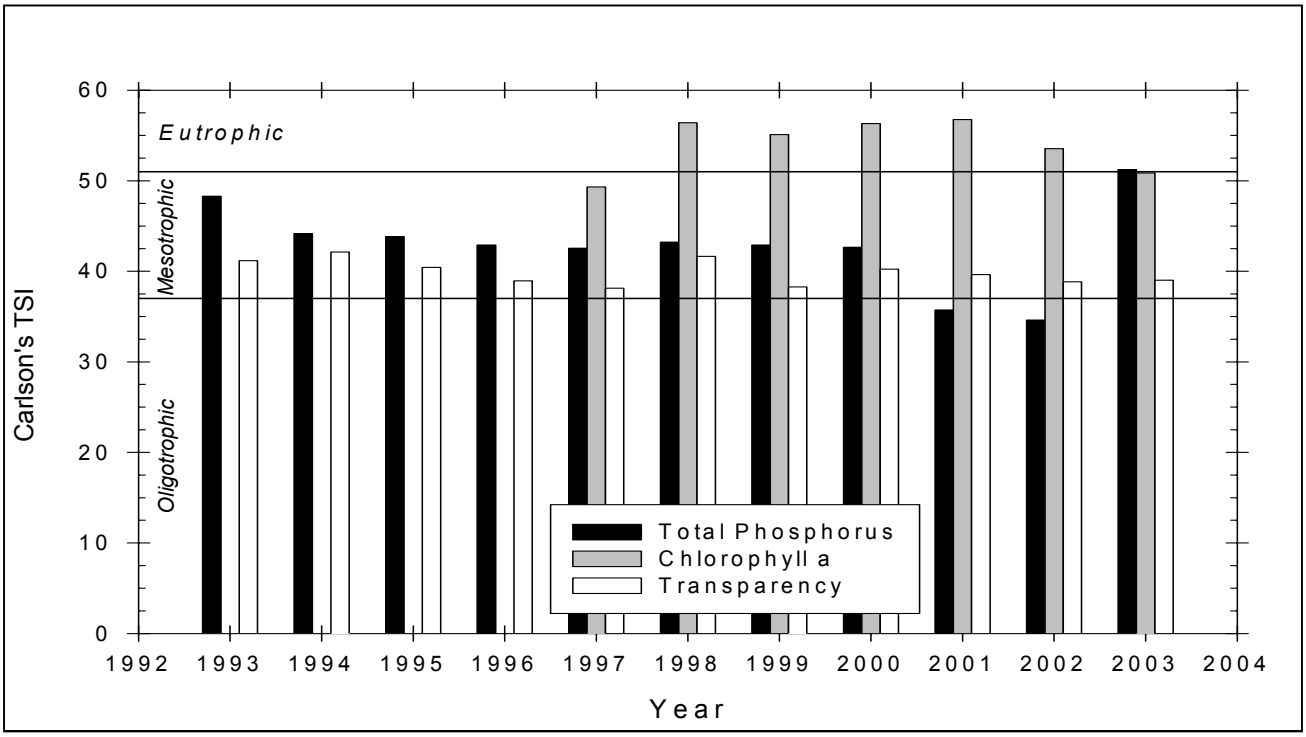


Figure 170 Carlson TSI trend in Piseco Lake

Aluminum

Figure 171 presents the seasonal mean aluminum trend in Piseco Lake, while Table 135 presents descriptive statistics for aluminum in Piseco Lake. The aluminum in Piseco Lake exhibited a slight decreasing trend from 1997 to 2003. The aluminum in Piseco Lake was similar to the county average.

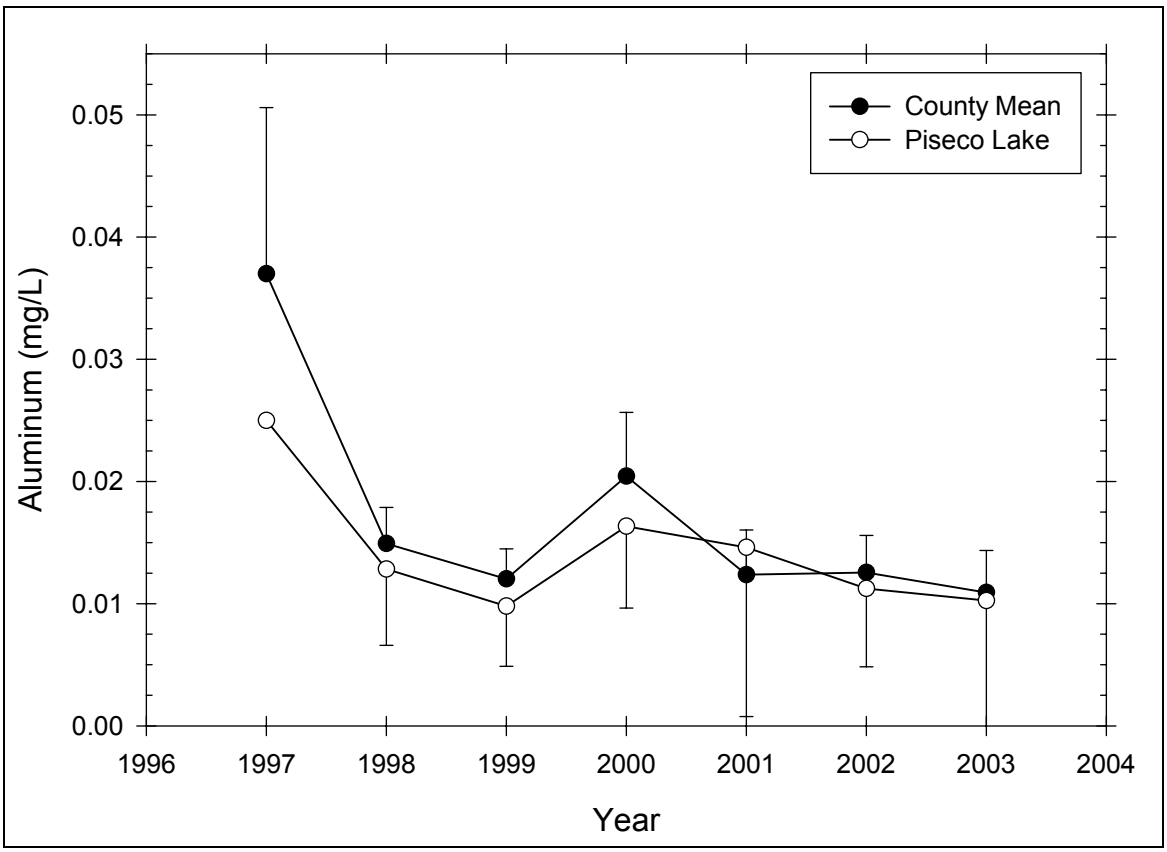


Figure 171 Seasonal mean aluminum trend in Piseco Lake

Table 135 – Descriptive Statistics for Aluminum in Piseco Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0250	--	--	--
1998	6	0	0.0128	0.00595	0.00243	0.00624
1999	6	1	0.00980	0.00396	0.00177	0.00492
2000	6	0	0.0163	0.00638	0.00260	0.00669
2001	6	1	0.0146	0.0111	0.00499	0.0138
2002	6	2	0.0113	0.00403	0.00202	0.00641
2003	6	2	0.0102	0.00785	0.00392	0.0125
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0250	0.0250	0.0250	0.0250	0.0250
1998	0.0160	0.0180	0.00200	0.0135	0.0120	0.0180
1999	0.01000	0.0150	0.00500	0.01000	0.00650	0.0128
2000	0.0170	0.0270	0.01000	0.0155	0.0110	0.0190
2001	0.0250	0.0280	0.00300	0.00900	0.00675	0.0258
2002	0.00900	0.0160	0.00700	0.0110	0.00800	0.0145
2003	0.0150	0.0180	0.00300	0.01000	0.00350	0.0170
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0250	0.000625
1998	-1.407	2.269	0.278	0.158	0.0770	0.00116
1999	0.125	-1.170	0.160	0.729	0.0490	0.000543
2000	0.919	0.330	0.199	0.545	0.0980	0.00180
2001	0.453	-2.747	0.292	0.174	0.0730	0.00156

2002	0.248	-2.514	0.212	0.593	0.0450	0.000555
2003	0.0419	-5.599	0.287	0.274	0.0410	0.000605

Calcium

Figure 172 presents the seasonal mean calcium trend in Piseco Lake, while Table 136 presents descriptive statistics for calcium in Piseco Lake. The calcium in Piseco Lake was low and exhibited no discernible trend. The calcium in Piseco Lake was significantly lower than the county average.

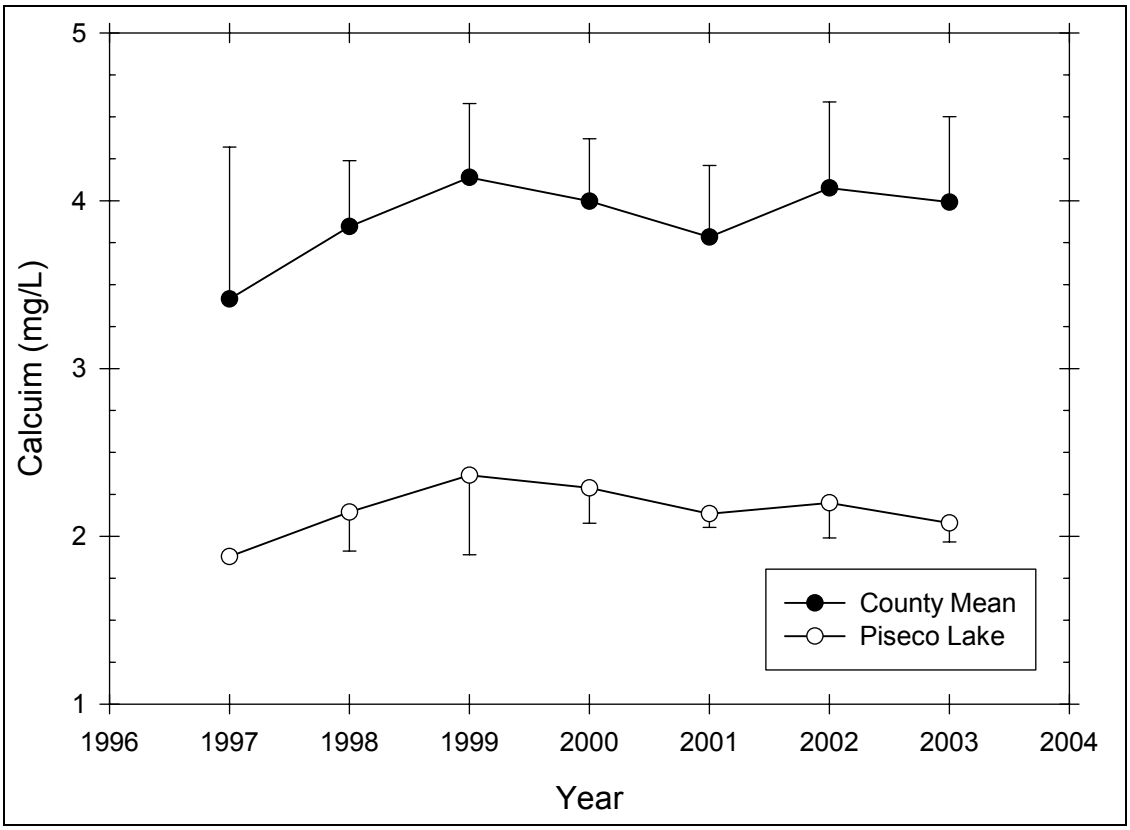


Figure 172 Seasonal mean calcium trend in Piseco Lake

Table 136 – Descriptive Statistics for Calcium in Piseco Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	1.880	--	--	--
1998	6	0	2.145	0.222	0.0904	0.232
1999	6	1	2.364	0.382	0.171	0.475
2000	6	0	2.288	0.201	0.0819	0.210
2001	6	1	2.134	0.0650	0.0291	0.0808
2002	6	2	2.200	0.132	0.0658	0.209
2003	6	2	2.080	0.0712	0.0356	0.113
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	1.880	1.880	1.880	1.880	1.880
1998	0.610	2.490	1.880	2.115	1.980	2.290
1999	0.810	2.770	1.960	2.420	1.975	2.710
2000	0.530	2.680	2.150	2.225	2.160	2.290

2001	0.160	2.240	2.080	2.110	2.087	2.172
2002	0.320	2.360	2.040	2.200	2.110	2.290
2003	0.160	2.140	1.980	2.100	2.030	2.130
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	1.880	3.534
1998	0.563	-0.339	0.149	0.752	12.870	27.851
1999	-0.155	-2.923	0.242	0.388	11.820	28.527
2000	2.010	4.270	0.330	0.040	13.730	31.620
2001	1.422	1.703	0.244	0.380	10.670	22.787
2002	-9.891E-015	1.046	0.190	0.662	8.800	19.412
2003	-1.331	1.500	0.250	0.432	8.320	17.321

Calcite Saturation Index

Figure 173 presents the calcite saturation index trend in Piseco Lake,. The CSI in Piseco Lake exhibited a steady decreasing trend from 2000 to 2003, moving from moderately vulnerable to acid deposition to low vulnerability. The CSI in Piseco Lake was more variable than the county average, though this difference was not statistically significant.

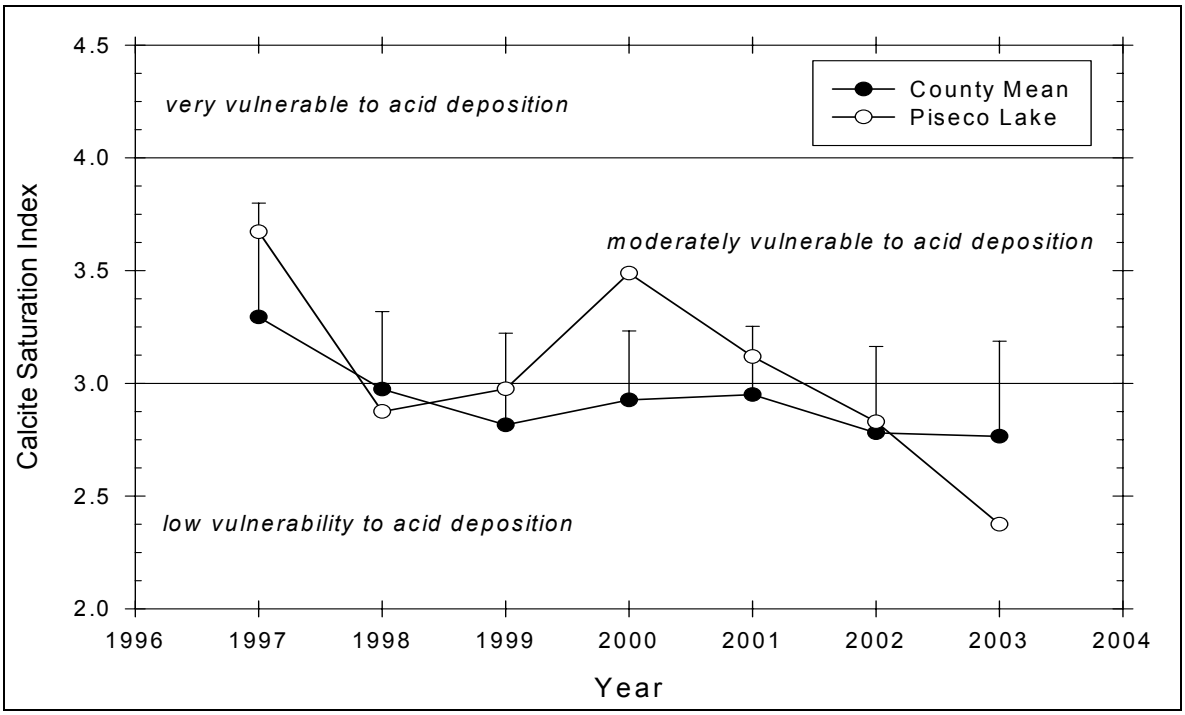
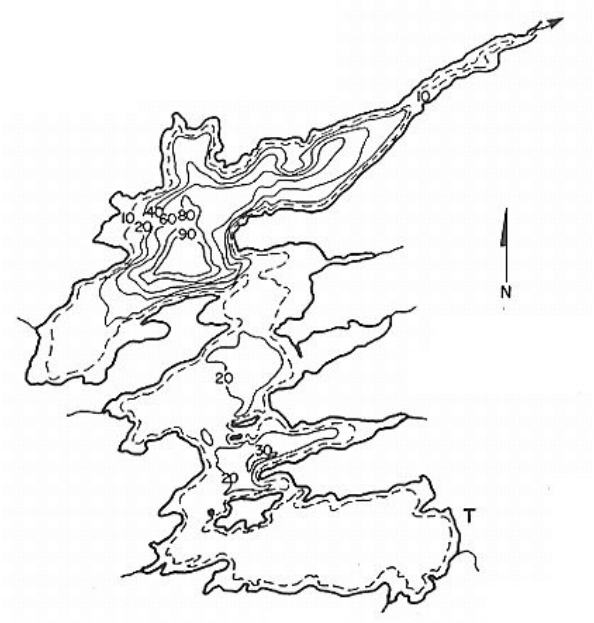


Figure 173 Seasonal mean CSI trend in Piseco Lake

Raquette Lake

Location
Pond Number: 060293
Watershed: St. Lawrence River
County: Hamilton
Topographic Quadrangle: Raquette Lake
Sample Site
Latitude: 43o 51.132'
Longitude: 74o 39.189'
Morphometry
Surface Area: 5,263 Ac.
Mean Depth: 44 Ft.
Maximum Depth: 95 Ft.
Volume: 231,572 Ac./Ft.
Watershed Area: 80,691 Ac.
Hydraulic Retention Time: 1.1 Yr.
Shoreline Length: 32.8 Mi.
Elevation: 1,762 Ft.
Water Quality Classification: AA
Trophic State: Mesotrophic



Temperature and Dissolved Oxygen

Raquette Lake had a minimum DO of 0.3 mg/L (October 2000), with a minimum temperature of 5.5°C and a maximum temperature of 23.9°C. In general, the lowest DO values occurred during the months of August through October.

pH

Figure 174 presents the seasonal mean pH trend in Raquette Lake, while Table 137 presents descriptive statistics for pH in Raquette Lake. The pH in Raquette Lake exhibited an increasing trend from 1996 to 1999 with relatively stable values from 2000 to 2003. The pH in Raquette Lake was generally similar to the county average.

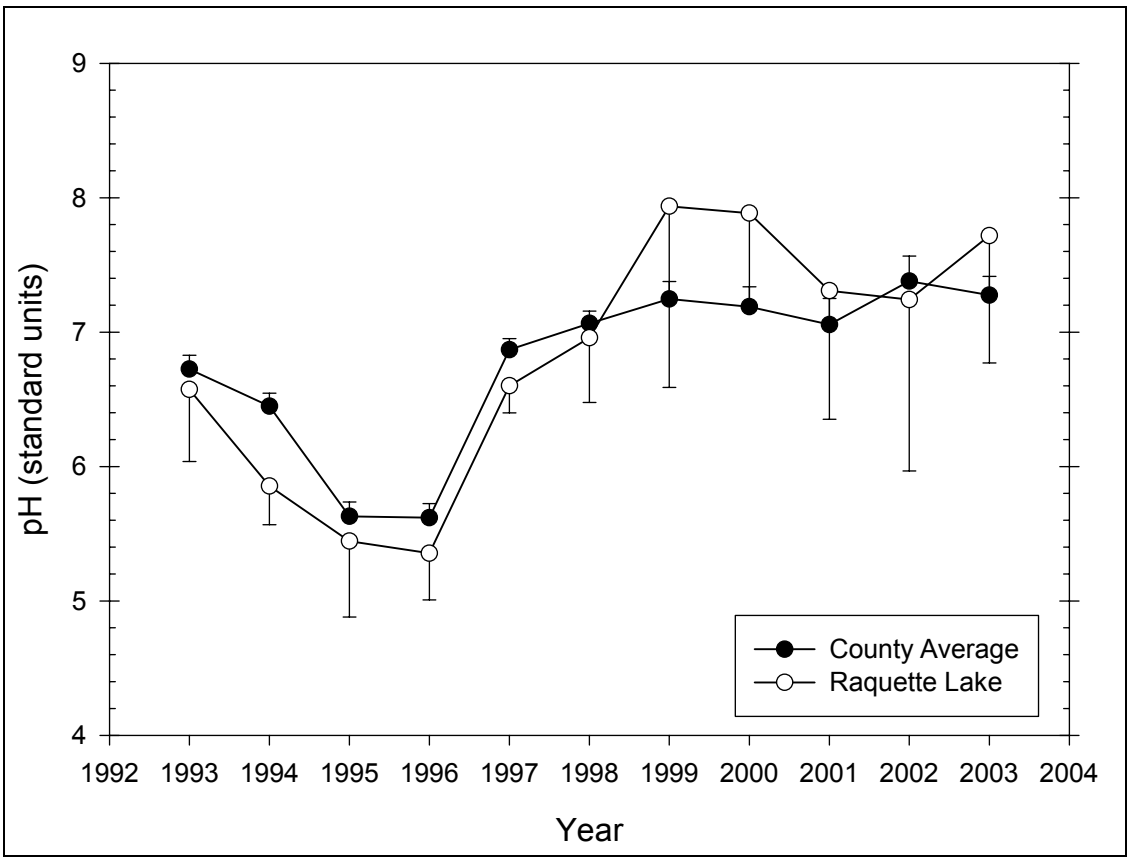


Figure 174 Seasonal mean pH trend in Raquette Lake

Table 137 – Descriptive Statistics for pH in Raquette Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	6.574	0.432	0.193	0.536
1994	6	0	5.855	0.273	0.111	0.287
1995	6	0	5.445	0.538	0.220	0.564
1996	6	0	5.355	0.331	0.135	0.347
1997	6	0	6.600	0.191	0.0779	0.200
1998	6	0	6.958	0.459	0.188	0.482
1999	5	0	7.936	1.084	0.485	1.346
2000	6	0	7.885	0.689	0.281	0.723
2001	4	0	7.307	0.601	0.300	0.956
2002	4	0	7.243	0.802	0.401	1.275
2003	4	0	7.718	0.595	0.297	0.947
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.920	7.060	6.140	6.410	6.223	7.023
1994	0.690	6.200	5.510	5.825	5.630	6.140
1995	1.430	6.130	4.700	5.330	5.170	6.010
1996	0.920	5.890	4.970	5.350	5.060	5.510
1997	0.500	6.830	6.330	6.560	6.510	6.810
1998	1.170	7.510	6.340	6.940	6.590	7.430
1999	3.040	9.350	6.310	7.960	7.495	8.465
2000	1.870	8.460	6.590	8.065	7.720	8.410
2001	1.250	7.830	6.580	7.410	6.815	7.800

2002	1.900	8.300	6.400	7.135	6.670	7.815
2003	1.180	8.380	7.200	7.645	7.215	8.220
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.401	-3.006	0.248	0.360	32.870	216.834
1994	0.171	-1.531	0.185	0.621	35.130	206.059
1995	0.124	-0.923	0.244	0.300	32.670	179.334
1996	0.615	0.319	0.153	0.744	32.130	172.602
1997	0.0342	-0.895	0.208	0.495	39.600	261.542
1998	-0.0437	-1.429	0.181	0.640	41.750	291.566
1999	-0.477	1.948	0.283	0.206	39.680	319.601
2000	-1.676	3.054	0.261	0.220	47.310	375.415
2001	-0.494	-3.136	0.279	0.305	29.230	214.681
2002	0.722	0.738	0.207	0.611	28.970	211.743
2003	0.242	-4.594	0.294	0.249	30.870	239.301

Alkalinity

Figure 175 presents the seasonal mean alkalinity trend in Raquette Lake, while Table 138 presents descriptive statistics for alkalinity in Raquette Lake. The alkalinity in Raquette Lake exhibited no discernible trend, but varied up and down throughout the period of record. The alkalinity in Raquette Lake was significantly lower than the county average.

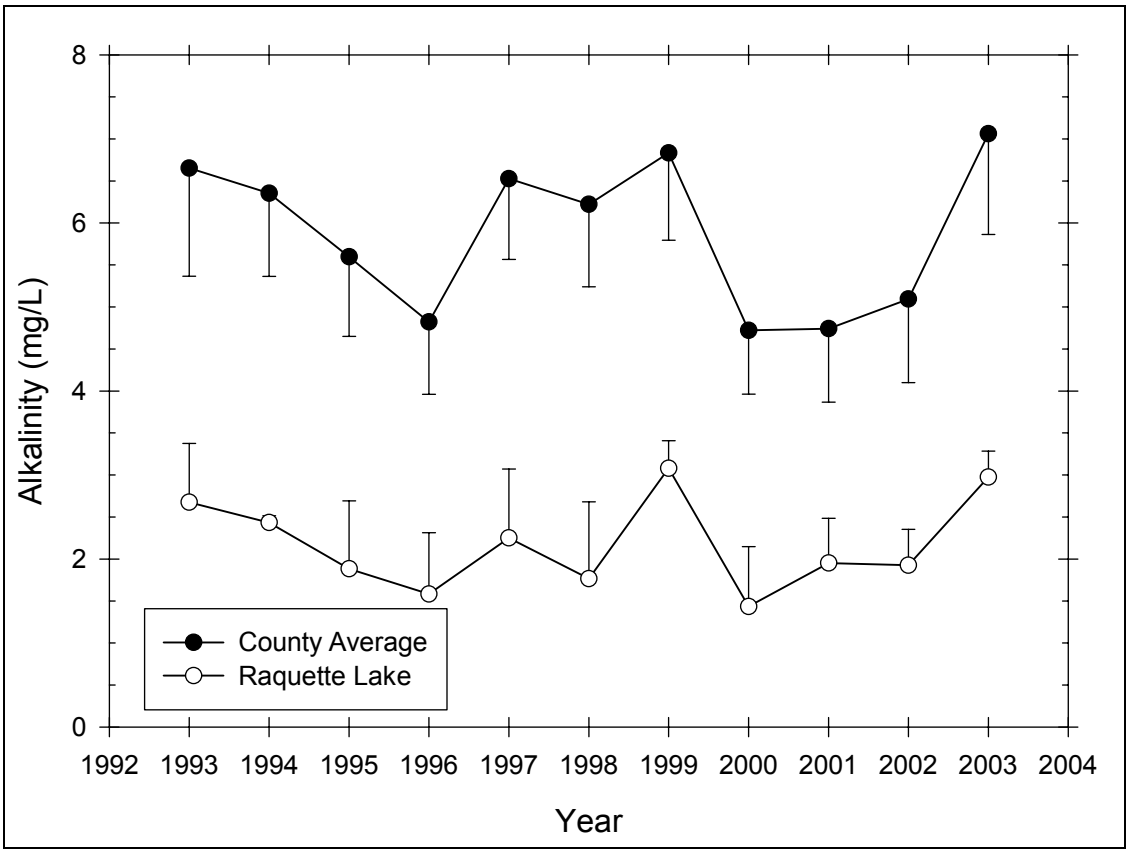


Figure 175 Seasonal alkalinity trend in Raquette Lake

Table 138 – Descriptive Statistics for Alkalinity in Raquette Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	5	1	2.675	0.699	0.350	1.113
1994	6	0	2.433	0.0816	0.0333	0.0857
1995	6	0	1.883	0.808	0.330	0.848
1996	6	0	1.583	0.728	0.297	0.764
1997	6	0	2.250	0.822	0.335	0.862
1998	6	0	1.767	0.914	0.373	0.959
1999	6	1	3.080	0.327	0.146	0.406
2000	6	0	1.433	0.715	0.292	0.750
2001	6	2	4.340	4.572	2.286	7.275
2002	6	2	1.925	0.427	0.214	0.680
2003	6	2	2.975	0.310	0.155	0.493
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.600	3.600	2.000	2.550	2.150	3.200
1994	0.200	2.600	2.400	2.400	2.400	2.400
1995	2.300	2.900	0.600	2.150	1.300	2.200
1996	1.800	2.600	0.800	1.400	1.000	2.300
1997	2.400	3.100	0.700	2.400	2.200	2.700
1998	2.300	3.200	0.900	1.350	1.200	2.600
1999	0.900	3.500	2.600	3.100	2.900	3.275
2000	1.900	2.400	0.500	1.450	0.900	1.900
2001	9.760	11.160	1.400	2.400	1.850	6.830
2002	0.900	2.200	1.300	2.100	1.650	2.200
2003	0.700	3.400	2.700	2.900	2.750	3.200
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.844	-0.131	0.204	0.620	10.700	30.090
1994	2.449	6.000	0.492	<0.001	14.600	35.560
1995	-0.674	0.170	0.272	0.177	11.300	24.550
1996	0.532	-1.644	0.201	0.537	9.500	17.690
1997	-1.629	3.484	0.309	0.076	13.500	33.750
1998	0.999	-0.788	0.323	0.050	10.600	22.900
1999	-0.420	1.220	0.203	0.582	15.400	47.860
2000	0.0431	-1.443	0.196	0.563	8.600	14.880
2001	1.933	3.797	0.406	0.020	17.360	138.046
2002	-1.728	2.919	0.320	0.163	7.700	15.370
2003	1.138	0.758	0.218	0.570	11.900	35.690

Total Phosphorus

Figure 176 presents the seasonal mean total phosphorus trend in Raquette Lake, while Table 139 presents descriptive statistics for total phosphorus in Raquette Lake. The total phosphorus in Raquette Lake exhibited a decreasing trend from 1993 to 2003. The total phosphorus in Raquette Lake was similar to the county average.

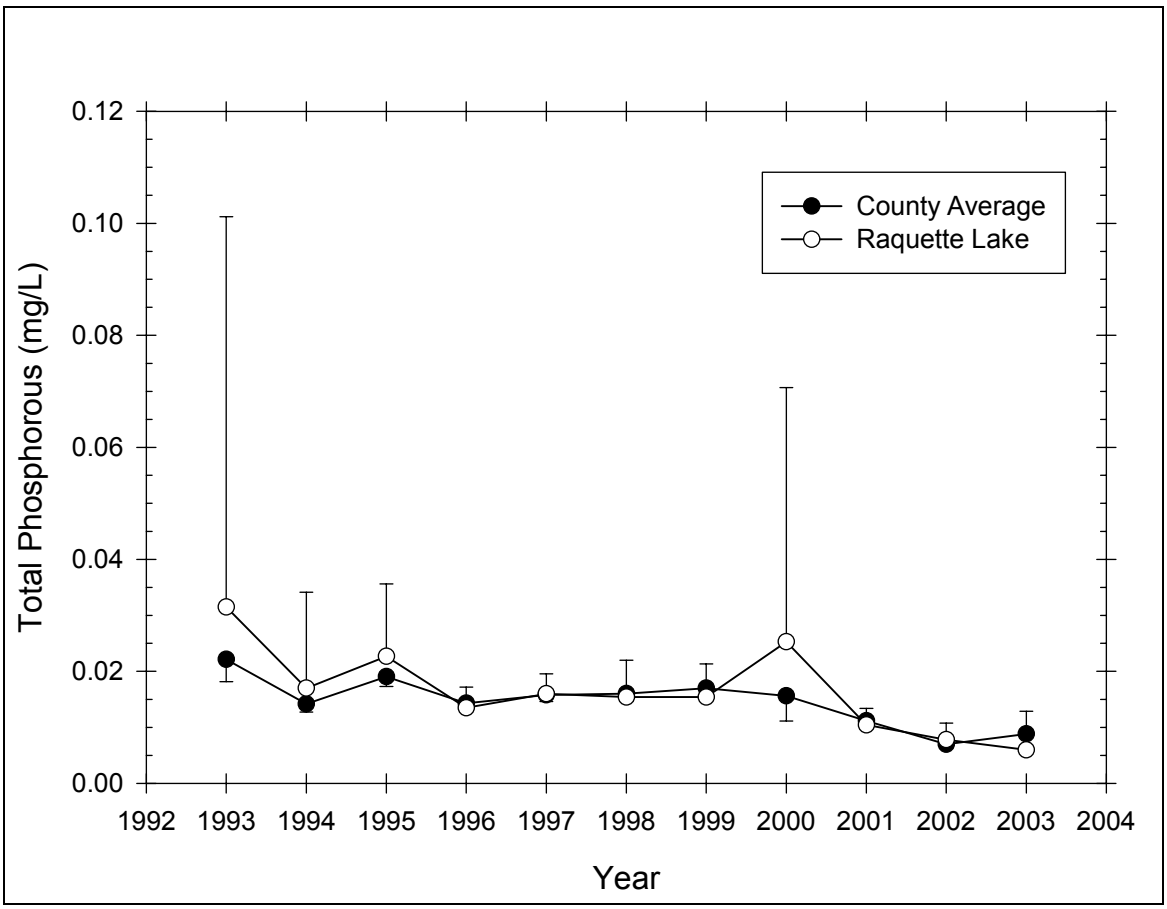


Figure 176 Seasonal mean total phosphorus trend in Raquette Lake

Table 139 – Descriptive Statistics for Total Phosphorus in Raquette Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	2	0.0315	0.0438	0.0219	0.0697
1994	6	0	0.0170	0.0163	0.00667	0.0171
1995	6	0	0.0227	0.0123	0.00504	0.0129
1996	6	0	0.0135	0.00351	0.00143	0.00368
1997	6	0	0.0160	0.00341	0.00139	0.00357
1998	6	1	0.0154	0.00532	0.00238	0.00661
1999	6	1	0.0154	0.00477	0.00214	0.00593
2000	6	1	0.0253	0.0366	0.0163	0.0454
2001	6	2	0.0104	0.00184	0.000919	0.00292
2002	6	2	0.00780	0.00185	0.000925	0.00294
2003	6	2	0.00597	0.00434	0.00217	0.00690
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0920	0.0970	0.00500	0.0120	0.00800	0.0550
1994	0.0430	0.0500	0.00700	0.0115	0.00900	0.0130
1995	0.0320	0.0410	0.00900	0.0190	0.0140	0.0340
1996	0.00900	0.0190	0.01000	0.0125	0.0110	0.0160
1997	0.01000	0.0220	0.0120	0.0155	0.0140	0.0170
1998	0.0140	0.0230	0.00900	0.0160	0.0113	0.0185
1999	0.0130	0.0230	0.01000	0.0140	0.0130	0.0178
2000	0.0884	0.0894	0.001000	0.0130	0.00325	0.0366

2001	0.00430	0.0130	0.00870	0.0101	0.00920	0.0117
2002	0.00390	0.0103	0.00640	0.00725	0.00640	0.00920
2003	0.00980	0.0110	0.00120	0.00585	0.00250	0.00945
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.963	3.885	0.414	0.016	0.126	0.00972
1994	2.337	5.580	0.430	<0.001	0.102	0.00307
1995	0.675	-1.086	0.220	0.427	0.136	0.00384
1996	0.751	-0.779	0.262	0.217	0.0810	0.00116
1997	1.093	1.917	0.218	0.441	0.0960	0.00159
1998	0.393	0.0446	0.182	0.671	0.0770	0.00130
1999	1.057	2.086	0.250	0.350	0.0770	0.00128
2000	2.027	4.242	0.368	0.025	0.126	0.00854
2001	1.160	1.696	0.261	0.384	0.0418	0.000447
2002	1.071	-0.176	0.275	0.321	0.0312	0.000254
2003	0.121	-2.278	0.192	0.657	0.0239	0.000199

Nitrate

Figure 177 presents the seasonal mean nitrate trend in Raquette Lake, while Table 140 presents descriptive statistics for nitrate in Raquette Lake. The nitrate in Raquette Lake exhibited a decreasing trend from 1994 to 2002. The nitrate in Raquette Lake was slightly higher than the county average from 1993 to 1999 and lower from 2000 to 2002, though any difference was not statistically significant.

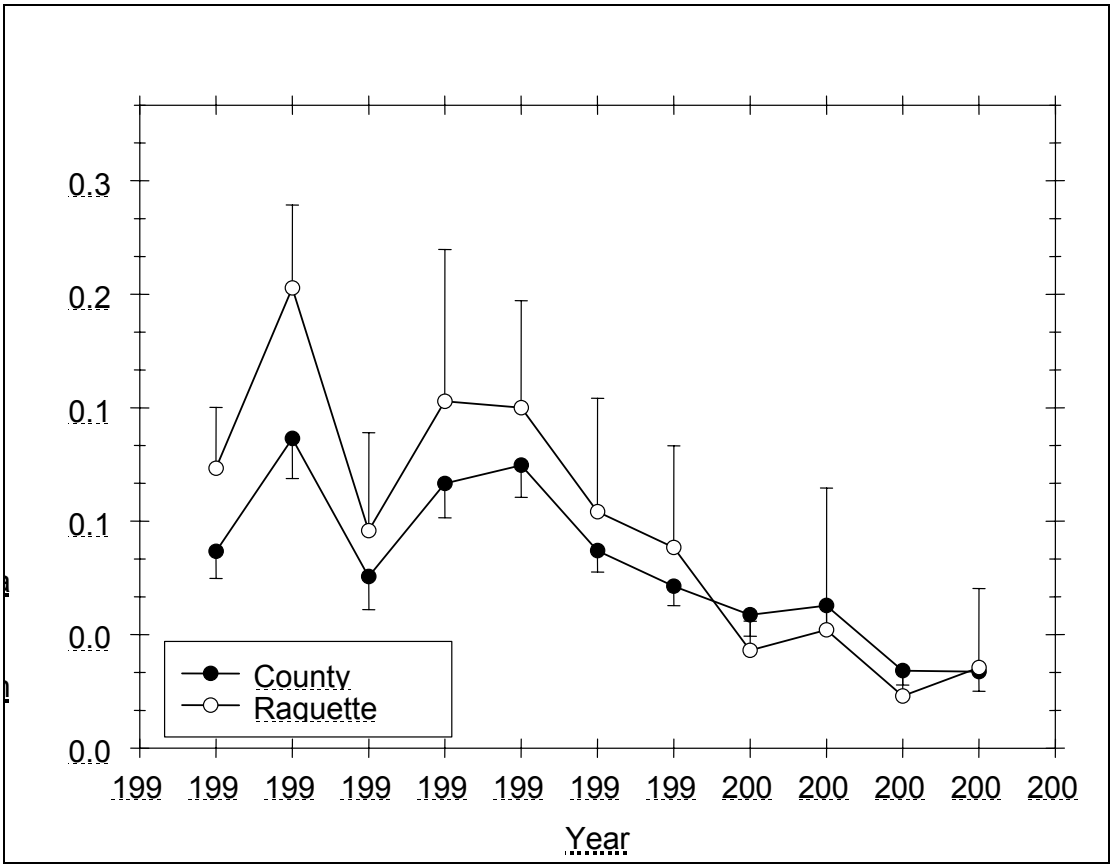


Figure 177 Seasonal mean nitrate trend in Raquette Lake

Table 140 – Descriptive Statistics for Nitrate in Raquette Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.148	0.0259	0.0116	0.0321
1994	6	0	0.243	0.0418	0.0171	0.0439
1995	6	0	0.115	0.0493	0.0201	0.0517
1996	6	0	0.183	0.0766	0.0313	0.0804
1997	6	0	0.180	0.0540	0.0221	0.0567
1998	6	0	0.125	0.0572	0.0233	0.0600
1999	6	1	0.106	0.0434	0.0194	0.0538
2000	6	0	0.0517	0.0147	0.00601	0.0154
2001	6	2	0.0625	0.0472	0.0236	0.0751
2002	6	2	0.0275	0.00957	0.00479	0.0152
2003	6	2	0.0425	0.0263	0.0131	0.0418
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0600	0.180	0.120	0.140	0.128	0.172
1994	0.110	0.300	0.190	0.240	0.210	0.280
1995	0.120	0.180	0.0600	0.1000	0.0800	0.170
1996	0.200	0.310	0.110	0.160	0.130	0.230
1997	0.120	0.240	0.120	0.175	0.130	0.240
1998	0.130	0.210	0.0800	0.1000	0.0800	0.180
1999	0.120	0.170	0.0500	0.110	0.0800	0.125
2000	0.0400	0.0800	0.0400	0.0500	0.0400	0.0500
2001	0.1000	0.130	0.0300	0.0450	0.0300	0.0950
2002	0.0200	0.0400	0.0200	0.0250	0.0200	0.0350
2003	0.0500	0.0700	0.0200	0.0400	0.0200	0.0650
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.363	-2.413	0.221	0.494	0.740	0.112
1994	0.166	-1.322	0.143	0.763	1.460	0.364
1995	0.541	-1.740	0.207	0.502	0.690	0.0915
1996	0.959	-0.000620	0.257	0.239	1.100	0.231
1997	0.137	-2.465	0.211	0.482	1.080	0.209
1998	0.813	-1.428	0.284	0.136	0.750	0.110
1999	0.422	1.435	0.263	0.288	0.530	0.0637
2000	1.840	3.912	0.378	0.007	0.310	0.0171
2001	1.517	1.980	0.271	0.339	0.250	0.0223
2002	0.855	-1.289	0.283	0.289	0.110	0.00330
2003	0.124	-5.290	0.304	0.212	0.170	0.00930

Chlorophyll a

Figure 178 presents the seasonal mean chlorophyll *a* trend in Raquette Lake, while Table 141 presents descriptive statistics for chlorophyll *a* in Raquette Lake. The chlorophyll *a* in Raquette Lake was relatively stable from 1998 to 2001 followed by a decreasing trend from 2001 to 2003. The chlorophyll *a* in Raquette Lake was generally slightly higher than the county average, though this difference was not statistically significant.

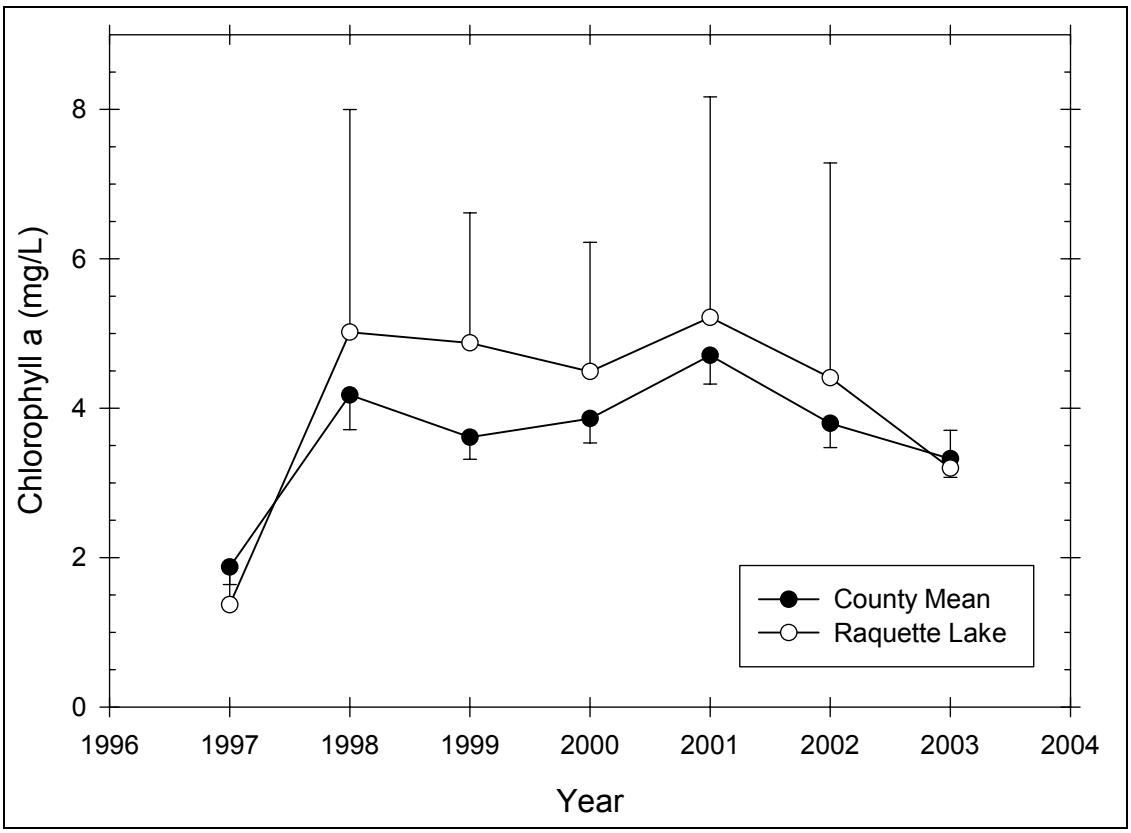


Figure 178 Seasonal mean chlorophyll a trend in Raquette Lake

Table 141 – Descriptive Statistics for Chlorophyll a in Raquette Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	1.370	0.439	0.179	0.461
1998	6	0	5.018	2.839	1.159	2.980
1999	6	1	4.874	1.403	0.628	1.742
2000	6	0	4.490	1.649	0.673	1.730
2001	6	2	5.215	1.856	0.928	2.954
2002	6	2	4.410	1.807	0.903	2.875
2003	6	2	3.198	0.319	0.159	0.507
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	1.210	1.800	0.590	1.390	1.290	1.760
1998	6.420	8.890	2.470	3.490	3.370	8.400
1999	3.320	6.790	3.470	4.240	3.853	6.115
2000	4.230	6.390	2.160	4.480	3.260	6.170
2001	4.540	7.430	2.890	5.270	4.030	6.400
2002	4.400	6.450	2.050	4.570	3.270	5.550
2003	0.730	3.630	2.900	3.130	2.965	3.430
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	-1.186	1.779	0.261	0.221	8.220	12.227
1998	0.898	-1.770	0.370	0.010	30.110	191.410
1999	0.655	-1.800	0.274	0.241	24.370	126.655
2000	-0.195	-1.250	0.179	0.649	26.940	134.553
2001	-0.177	1.460	0.240	0.475	20.860	119.123

2002	-0.524	1.616	0.268	0.354	17.640	87.588
2003	1.028	0.595	0.209	0.601	12.790	41.201

Transparency

Figure 179 presents the seasonal mean transparency trend in Raquette Lake, while Table 142 presents descriptive statistics for transparency in Raquette Lake. The transparency in Raquette Lake exhibited a decreasing trend from 1993 to 1998 and a slight increasing trend from 1998 to 2003. The transparency in Raquette Lake was slightly higher than the county average in 1993 and 1994 and slightly lower than the county average from 1997 to 2003, though any difference was not statistically significant.

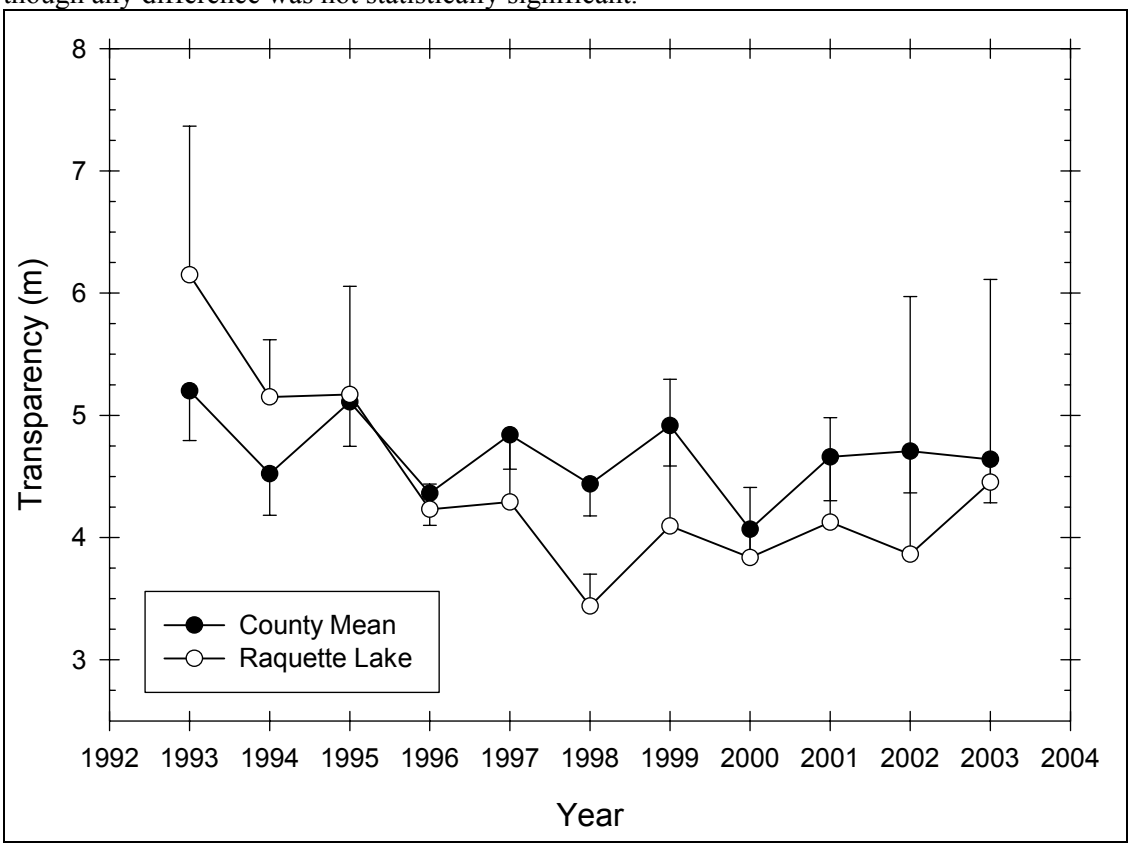


Figure 179 Seasonal mean transparency trend in Raquette Lake

Table 142 – Descriptive Statistics for Transparency in Raquette Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	6.150	0.979	0.438	1.216
1994	6	0	5.150	0.446	0.182	0.468
1995	6	0	5.170	0.843	0.344	0.885
1996	6	0	4.232	0.198	0.0806	0.207
1997	6	0	4.290	0.508	0.207	0.533
1998	6	0	3.438	0.251	0.102	0.263
1999	5	0	4.094	0.967	0.432	1.200
2000	6	0	3.837	0.547	0.223	0.574
2001	4	0	4.125	0.538	0.269	0.856
2002	4	0	3.862	1.326	0.663	2.110

2003	4	0	4.453	1.043	0.522	1.660
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	2.120	7.270	5.150	5.760	5.375	7.157
1994	1.300	5.700	4.400	5.300	4.900	5.300
1995	2.100	6.100	4.000	5.275	4.500	5.870
1996	0.550	4.500	3.950	4.200	4.140	4.400
1997	1.450	4.900	3.450	4.295	4.120	4.680
1998	0.760	3.800	3.040	3.435	3.350	3.570
1999	2.270	5.370	3.100	3.650	3.400	4.980
2000	1.250	4.450	3.200	3.845	3.300	4.380
2001	1.300	4.800	3.500	4.100	3.750	4.500
2002	2.950	5.750	2.800	3.450	2.950	4.775
2003	2.500	5.650	3.150	4.505	3.700	5.205
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.406	-2.945	0.255	0.327	30.750	192.950
1994	-0.882	1.056	0.298	0.098	30.900	160.130
1995	-0.320	-1.887	0.235	0.346	31.020	163.929
1996	0.0170	-0.550	0.160	0.723	25.390	107.637
1997	-0.712	0.699	0.202	0.529	25.740	111.715
1998	-0.271	1.268	0.196	0.565	20.630	71.248
1999	0.568	-2.106	0.277	0.230	20.470	87.542
2000	-0.0335	-2.457	0.185	0.621	23.020	89.815
2001	0.265	0.869	0.195	0.649	16.500	68.930
2002	1.452	1.912	0.269	0.349	15.450	64.953
2003	-0.277	0.407	0.173	0.696	17.810	82.565

TSI

Figure 180 presents the Carlson trophic state index trend in Raquette Lake. Transparency TSI increased from upper oligotrophic in 1993 through 1995 to lower mesotrophic from 1996 to 2003. Chlorophyll *a* TSI was in the eutrophic range from 1998 to 2003 and mesotrophic in 1997. Total phosphorus TSI was eutrophic in 1993 and 2000, mesotrophic and decreasing from 1994 through 1999, and oligotrophic in 2001 to 2003.

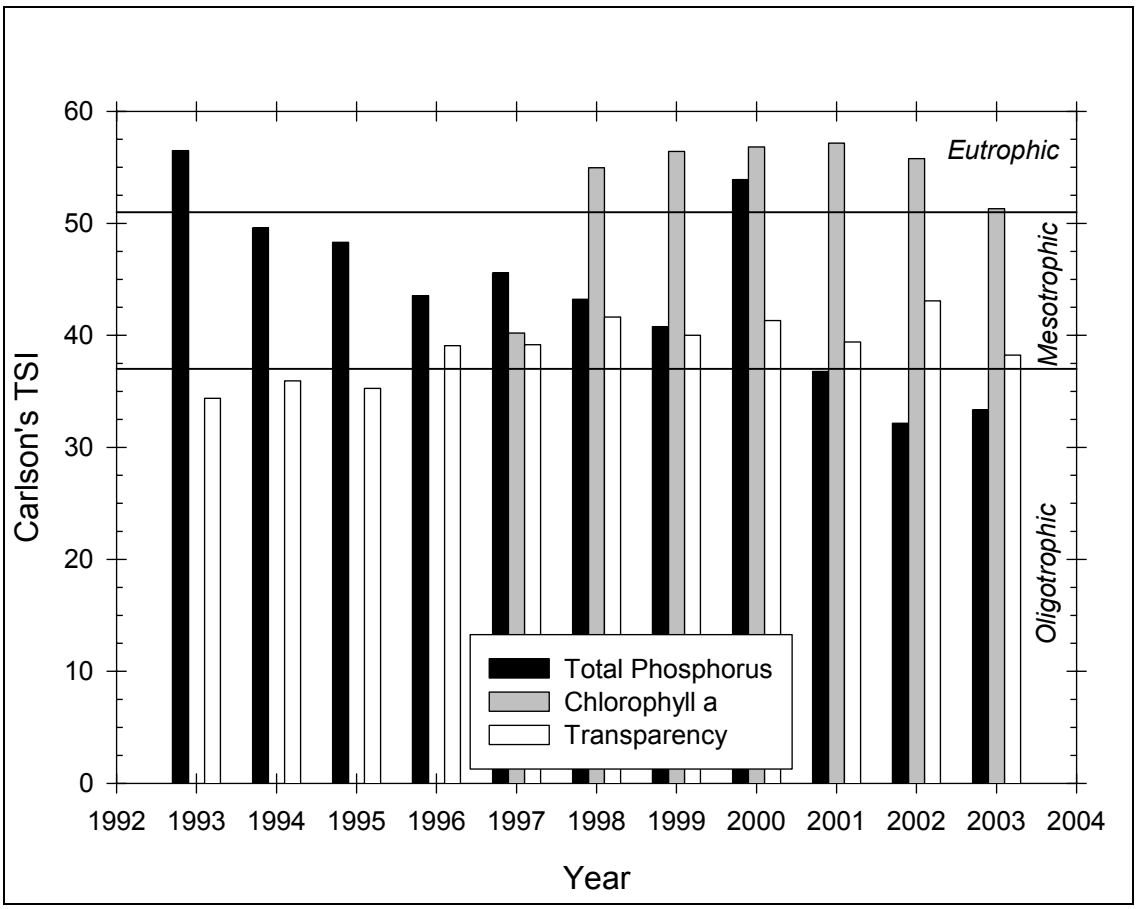


Figure 180 Carlson TSI trend in Raquette Lake

Aluminum

Figure 181 presents the seasonal mean aluminum trend in Raquette Lake, while Table 143 presents descriptive statistics for aluminum in Raquette Lake. The aluminum in Raquette Lake exhibited a decreasing trend from 1997 to 2003. The aluminum in Raquette Lake was slightly higher than the county average from 1997 to 1999 and similar to the county average from 2000 to 2003, though any difference except for 1997 was not statistically significant.

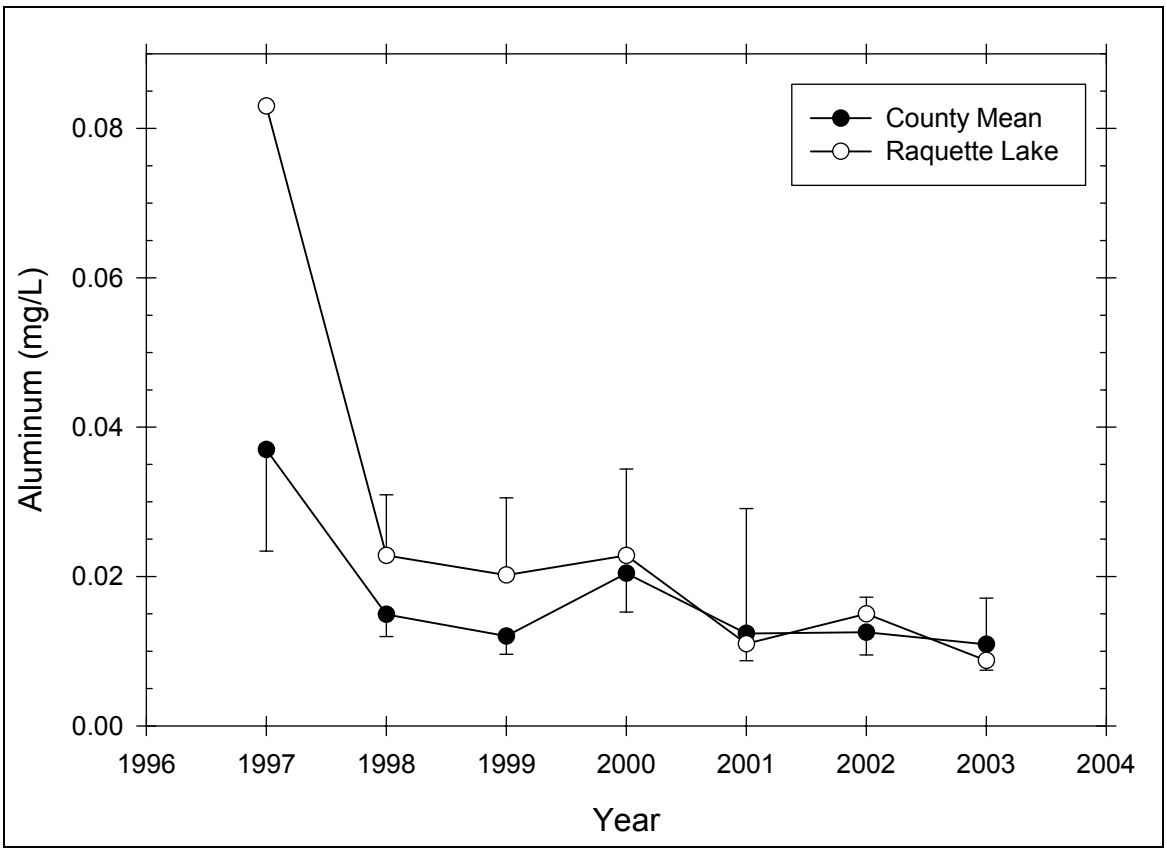


Figure 181 Seasonal mean aluminum trend in Raquette Lake

Table 143 – Descriptive Statistics for Aluminum in Raquette Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0830	--	--	--
1998	6	0	0.0228	0.00773	0.00316	0.00811
1999	6	1	0.0202	0.00832	0.00372	0.0103
2000	6	0	0.0228	0.0110	0.00450	0.0116
2001	6	2	0.0110	0.0114	0.00569	0.0181
2002	6	2	0.0150	0.00141	0.000707	0.00225
2003	6	2	0.00875	0.00525	0.00263	0.00836
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0830	0.0830	0.0830	0.0830	0.0830
1998	0.0230	0.0320	0.00900	0.0235	0.0220	0.0270
1999	0.0220	0.0340	0.0120	0.0190	0.0150	0.0235
2000	0.0300	0.0450	0.0150	0.0195	0.0180	0.0200
2001	0.0240	0.0280	0.00400	0.00600	0.00500	0.0170
2002	0.00300	0.0160	0.0130	0.0155	0.0140	0.0160
2003	0.0120	0.0160	0.00400	0.00750	0.00500	0.0125
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0830	0.00689
1998	-1.166	2.373	0.290	0.118	0.137	0.00343
1999	1.448	2.729	0.310	0.122	0.101	0.00232
2000	2.288	5.445	0.435	<0.001	0.137	0.00374
2001	1.958	3.871	0.420	0.013	0.0440	0.000872

2002	-1.414	1.500	0.260	0.387	0.0600	0.000906
2003	1.165	1.085	0.231	0.515	0.0350	0.000389

Calcium

Figure 182 presents the seasonal mean calcium trend in Raquette Lake, while Table 144 presents descriptive statistics for calcium in Raquette Lake. The calcium in Raquette Lake was low and did not exhibit any discernible trend. The calcium in Raquette Lake was significantly lower than the county average.

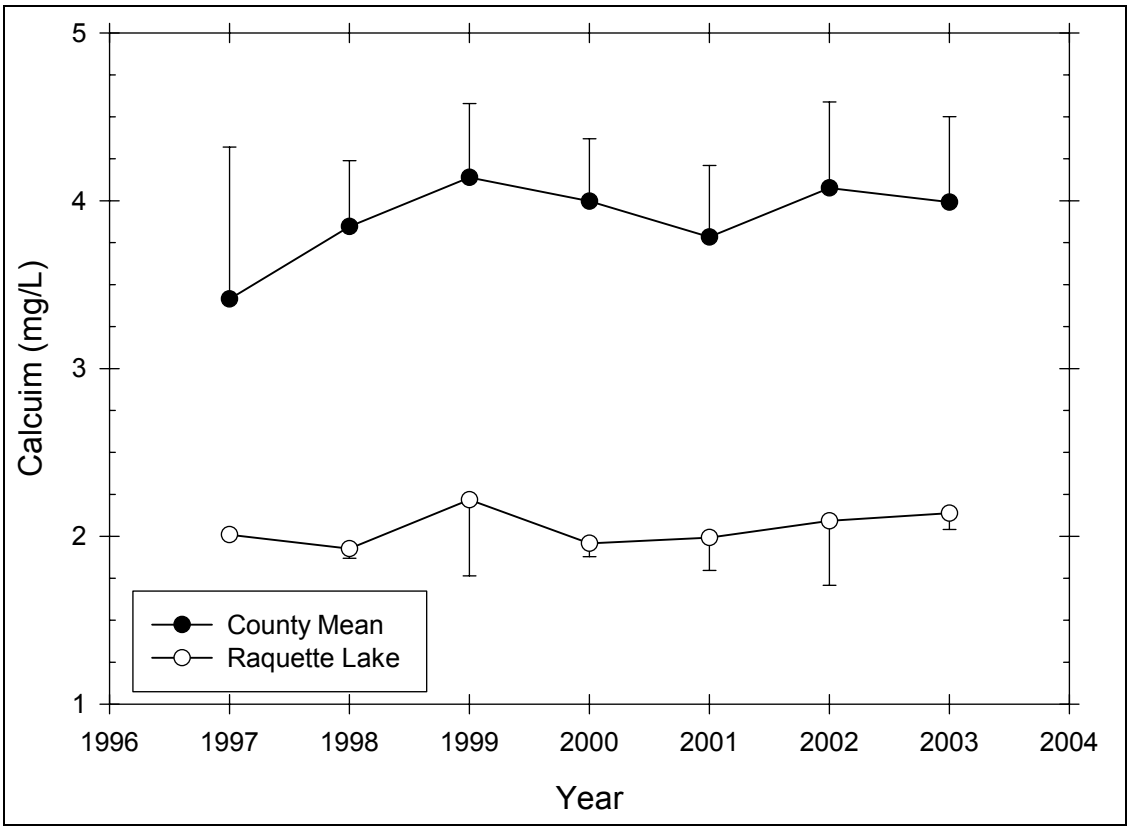


Figure 182 Seasonal mean calcium trend in Raquette Lake

Table 144 – Descriptive Statistics for Calcium in Raquette Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	2.010	--	--	--
1998	6	0	1.927	0.0547	0.0223	0.0574
1999	6	1	2.218	0.365	0.163	0.454
2000	6	0	1.958	0.0765	0.0312	0.0803
2001	6	2	1.992	0.123	0.0614	0.195
2002	6	2	2.093	0.242	0.121	0.385
2003	6	2	2.137	0.0608	0.0304	0.0967
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	2.010	2.010	2.010	2.010	2.010
1998	0.140	1.980	1.840	1.950	1.880	1.960
1999	0.940	2.820	1.880	2.110	1.977	2.408
2000	0.180	2.060	1.880	1.940	1.890	2.040

2001	0.290	2.110	1.820	2.020	1.915	2.070
2002	0.540	2.280	1.740	2.175	1.940	2.245
2003	0.140	2.190	2.050	2.155	2.100	2.175
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	2.010	4.040
1998	-0.964	-0.619	0.263	0.213	11.560	22.287
1999	1.446	2.258	0.243	0.382	11.090	25.132
2000	0.495	-1.905	0.192	0.586	11.750	23.040
2001	-1.242	2.279	0.307	0.203	7.970	15.925
2002	-1.672	2.938	0.328	0.140	8.370	17.690
2003	-1.521	2.764	0.331	0.131	8.550	18.287

Calcite Saturation Index

Figure 183 presents the calcite saturation index trend in Raquette Lake. The CSI in Raquette Lake was variable from year to year but in general decreased in the lake over time between 1997 and 2003. The CSI value was in the moderately vulnerable to acid deposition range for most of the period of record. The CSI in Raquette Lake was generally slightly higher than the county average, though this difference was not statistically significant.

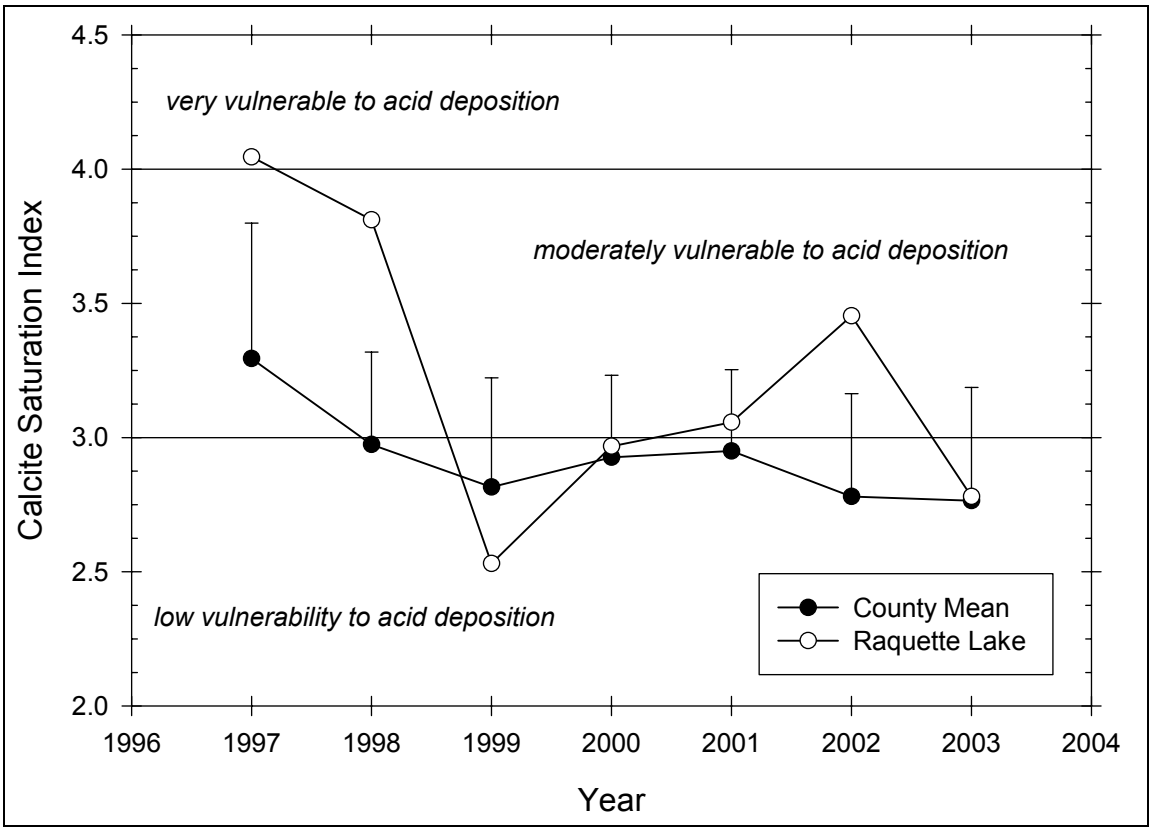


Figure 183 Seasonal mean CSI trend in Raquette Lake

Sacandaga Lake

Location
Pond Number: 050314
Watershed: Upper Hudson River
County: Hamilton
Topographic Quadrangle: Lake Pleasant
Sample Site
Latitude: 43o 29.296'
Longitude: 74o 24.378'
Morphometry
Surface Area: 1620 Ac.
Mean Depth: 28 Ft.
Maximum Depth: 73 Ft.
Volume: 34,195 Ac./Ft.
Watershed Area: 12,784 Ac.
Hydraulic Retention Time: 0.5 Yr.
Shoreline Length: 13.2 Mi.
Elevation: 1,726 Ft.
Water Quality Classification: AA
Trophic State: Mesotrophic

Temperature and Dissolved Oxygen

Sacandaga Lake had a minimum DO of 0.2 mg/L (September 2000), with a minimum temperature of 5.5°C and a maximum temperature of 24.4°C. In general, the lowest DO values occurred during the months of August through September.

pH

Figure 184 presents the seasonal mean pH trend in Sacandaga Lake, while Table 145 presents descriptive statistics for pH in Sacandaga Lake. The pH in Sacandaga Lake exhibited an increasing trend from 1996 to 2002 with generally stable values from 1999 to 2003. The pH in Sacandaga Lake was slightly higher than the county average, though this difference was not statistically significant.

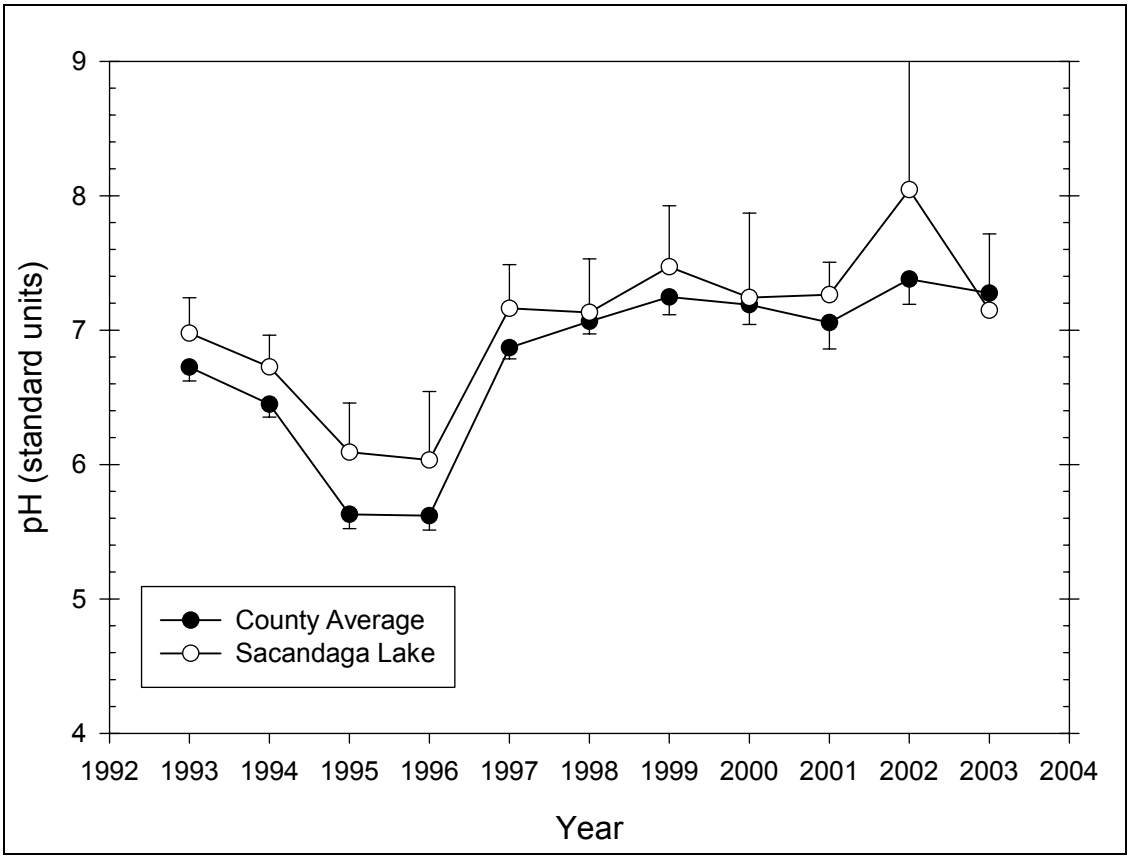


Figure 184 Seasonal mean pH trend in Sacandaga Lake

Table 145 – Descriptive Statistics for pH in Sacandaga Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	6.978	0.212	0.0947	0.263
1994	6	0	6.727	0.225	0.0917	0.236
1995	6	0	6.092	0.348	0.142	0.365
1996	6	0	6.033	0.486	0.198	0.510
1997	6	0	7.162	0.311	0.127	0.327
1998	5	0	7.132	0.322	0.144	0.399
1999	5	0	7.470	0.366	0.164	0.454
2000	6	0	7.242	0.600	0.245	0.629
2001	5	0	7.264	0.195	0.0870	0.242
2002	4	0	8.045	0.801	0.400	1.274
2003	5	0	7.148	0.458	0.205	0.569
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.540	7.330	6.790	6.920	6.835	7.082
1994	0.600	6.970	6.370	6.715	6.640	6.950
1995	1.030	6.530	5.500	6.170	5.930	6.250
1996	1.220	6.850	5.630	5.905	5.650	6.260
1997	0.810	7.460	6.650	7.245	6.950	7.420
1998	0.830	7.490	6.660	7.150	6.923	7.385
1999	0.880	7.870	6.990	7.570	7.148	7.758
2000	1.450	8.120	6.670	7.045	6.730	7.840
2001	0.540	7.540	7.000	7.280	7.150	7.360

2002	1.800	9.080	7.280	7.910	7.425	8.665
2003	1.160	7.890	6.730	6.940	6.865	7.425
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.521	2.481	0.259	0.309	34.890	243.642
1994	-0.549	-0.137	0.183	0.630	40.360	271.741
1995	-0.866	1.404	0.233	0.357	36.550	223.257
1996	1.003	0.214	0.279	0.154	36.200	219.588
1997	-0.958	-0.0366	0.190	0.595	42.970	308.222
1998	-0.635	0.0101	0.152	0.740	35.660	254.741
1999	-0.422	-1.869	0.208	0.562	37.350	279.540
2000	0.771	-1.365	0.273	0.174	43.450	316.448
2001	0.136	1.303	0.227	0.467	36.320	263.980
2002	0.730	-0.999	0.223	0.547	32.180	260.812
2003	1.363	1.606	0.275	0.238	35.740	256.310

Alkalinity

Figure 185 presents the seasonal mean alkalinity trend in Sacandaga Lake, while Table 146 presents descriptive statistics for alkalinity in Sacandaga Lake. The alkalinity in Sacandaga Lake was variable from year to year and did not exhibit any discernible trend. The alkalinity in Sacandaga Lake was slightly higher than the county average, though this difference was not statistically significant.

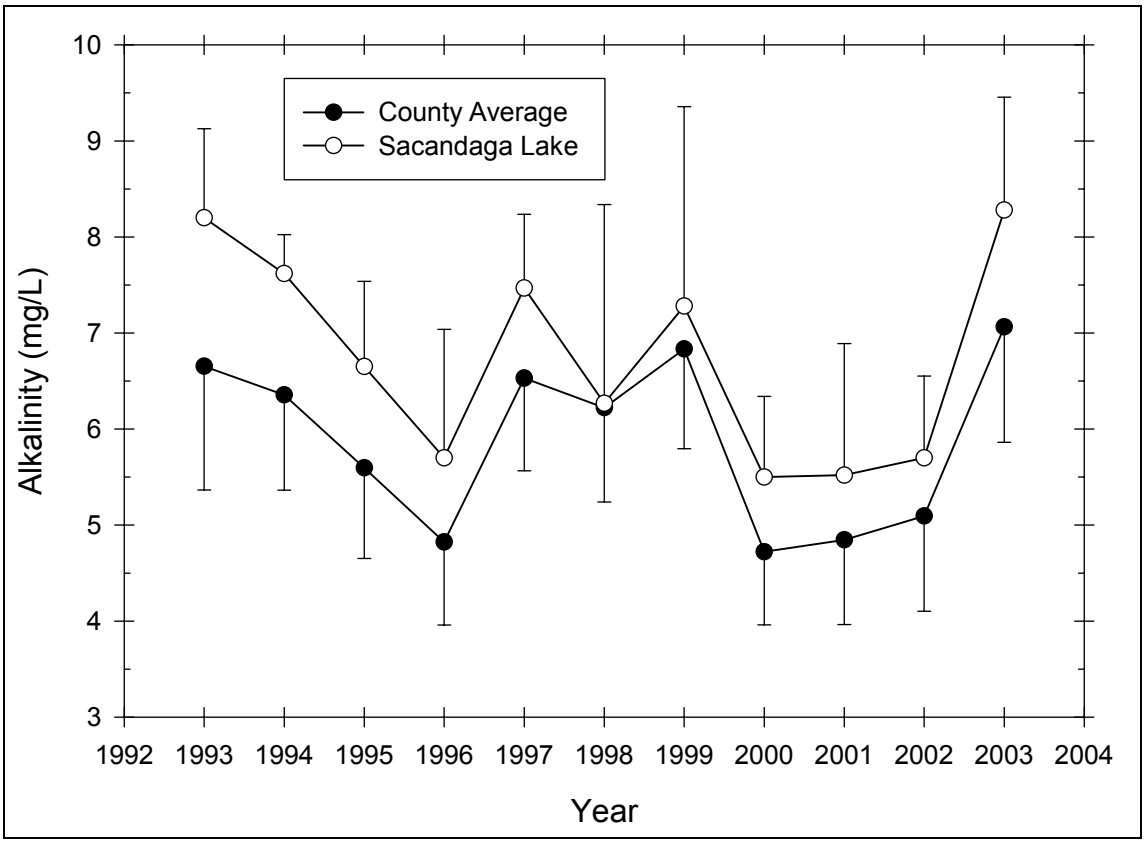


Figure 185 Seasonal mean alkalinity trend in Sacandaga Lake

Table 146 – Descriptive Statistics for Alkalinity in Sacandaga Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	6.978	0.212	0.0947	0.263
1994	6	0	6.727	0.225	0.0917	0.236
1995	6	0	6.092	0.348	0.142	0.365
1996	6	0	6.033	0.486	0.198	0.510
1997	6	0	7.162	0.311	0.127	0.327
1998	5	0	7.132	0.322	0.144	0.399
1999	5	0	7.470	0.366	0.164	0.454
2000	6	0	7.242	0.600	0.245	0.629
2001	5	0	7.264	0.195	0.0870	0.242
2002	4	0	8.045	0.801	0.400	1.274
2003	5	0	7.148	0.458	0.205	0.569
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.540	7.330	6.790	6.920	6.835	7.082
1994	0.600	6.970	6.370	6.715	6.640	6.950
1995	1.030	6.530	5.500	6.170	5.930	6.250
1996	1.220	6.850	5.630	5.905	5.650	6.260
1997	0.810	7.460	6.650	7.245	6.950	7.420
1998	0.830	7.490	6.660	7.150	6.923	7.385
1999	0.880	7.870	6.990	7.570	7.148	7.758
2000	1.450	8.120	6.670	7.045	6.730	7.840
2001	0.540	7.540	7.000	7.280	7.150	7.360
2002	1.800	9.080	7.280	7.910	7.425	8.665
2003	1.160	7.890	6.730	6.940	6.865	7.425
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.521	2.481	0.259	0.309	34.890	243.642
1994	-0.549	-0.137	0.183	0.630	40.360	271.741
1995	-0.866	1.404	0.233	0.357	36.550	223.257
1996	1.003	0.214	0.279	0.154	36.200	219.588
1997	-0.958	-0.0366	0.190	0.595	42.970	308.222
1998	-0.635	0.0101	0.152	0.740	35.660	254.741
1999	-0.422	-1.869	0.208	0.562	37.350	279.540
2000	0.771	-1.365	0.273	0.174	43.450	316.448
2001	0.136	1.303	0.227	0.467	36.320	263.980
2002	0.730	-0.999	0.223	0.547	32.180	260.812
2003	1.363	1.606	0.275	0.238	35.740	256.310

Total Phosphorus

Figure 186 presents the seasonal mean total phosphorus trend in Sacandaga Lake, while Table 147 presents descriptive statistics for total phosphorus in Sacandaga Lake. The total phosphorus in Sacandaga Lake exhibited a decreasing trend from 1993 to 2003, disregarding the high value for Sacandaga Lake in 2000 due to an outlying data point. The total phosphorus in Sacandaga Lake was similar to the county average.

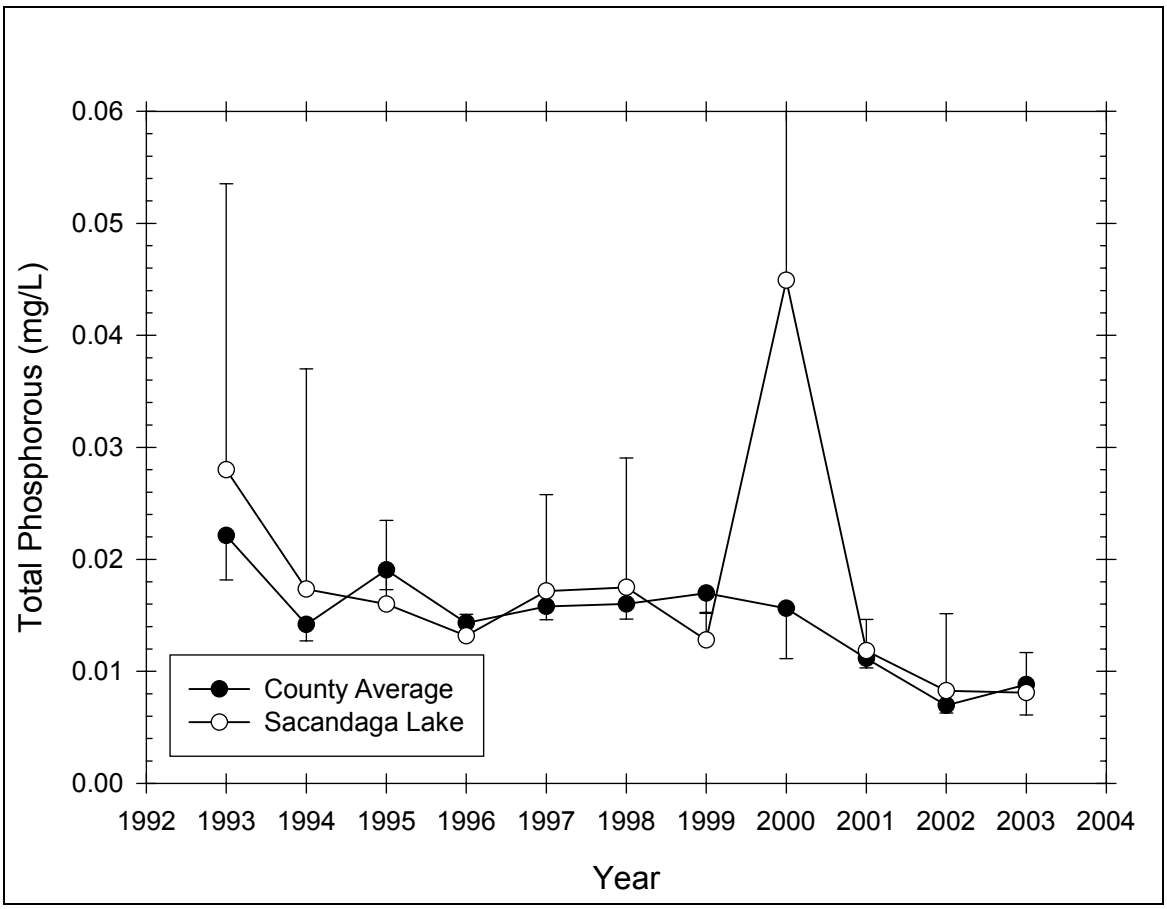


Figure 186 Seasonal mean total phosphorus trend in Sacandaga Lake (2000 contains an outlier of 0.221)

Table 147 – Descriptive Statistics for Total Phosphorus in Sacandaga Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0280	0.0206	0.00919	0.0255
1994	6	0	0.0173	0.0187	0.00765	0.0197
1995	6	0	0.0160	0.00713	0.00291	0.00748
1996	6	0	0.0132	0.00183	0.000749	0.00193
1997	6	0	0.0172	0.00821	0.00335	0.00861
1998	6	0	0.0175	0.0110	0.00449	0.0115
1999	6	1	0.0128	0.00192	0.000860	0.00239
2000	6	0	0.0449	0.0864	0.0353	0.0907
2001	6	1	0.0118	0.00225	0.00101	0.00280
2002	6	2	0.00827	0.00432	0.00216	0.00688
2003	6	1	0.00810	0.00289	0.00129	0.00359
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0530	0.0630	0.01000	0.0240	0.0153	0.0353
1994	0.0500	0.0550	0.00500	0.01000	0.00900	0.0150
1995	0.0210	0.0290	0.00800	0.0140	0.0130	0.0180
1996	0.00500	0.0160	0.0110	0.0130	0.0120	0.0140
1997	0.0220	0.0320	0.01000	0.0160	0.01000	0.0190
1998	0.0250	0.0340	0.00900	0.0115	0.01000	0.0290
1999	0.00500	0.0150	0.01000	0.0130	0.0115	0.0143
2000	0.220	0.221	0.001000	0.0122	0.00800	0.0150

2001	0.00560	0.0140	0.00840	0.0130	0.0102	0.0133
2002	0.00960	0.0137	0.00410	0.00765	0.00485	0.0117
2003	0.00770	0.0110	0.00330	0.00880	0.00690	0.00972
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.710	3.348	0.339	0.062	0.140	0.00561
1994	2.287	5.378	0.383	0.006	0.104	0.00356
1995	1.367	2.643	0.277	0.159	0.0960	0.00179
1996	0.513	-0.621	0.238	0.333	0.0790	0.00106
1997	1.358	2.048	0.245	0.295	0.103	0.00211
1998	1.021	-1.348	0.358	0.016	0.105	0.00244
1999	-0.590	-0.0219	0.141	0.746	0.0640	0.000834
2000	2.431	5.930	0.469	<0.001	0.269	0.0494
2001	-1.046	0.108	0.297	0.159	0.0592	0.000721
2002	0.583	-1.798	0.232	0.511	0.0331	0.000330
2003	-1.454	2.840	0.300	0.149	0.0405	0.000361

Nitrate

Figure 187 presents the seasonal mean nitrate trend in Sacandaga Lake, while Table 148 presents descriptive statistics for nitrate in Sacandaga Lake. The nitrate in Sacandaga Lake exhibited a decreasing trend from 1997 to 2002. The nitrate in Sacandaga Lake was slightly lower than the county average, though this difference was not statistically significant.

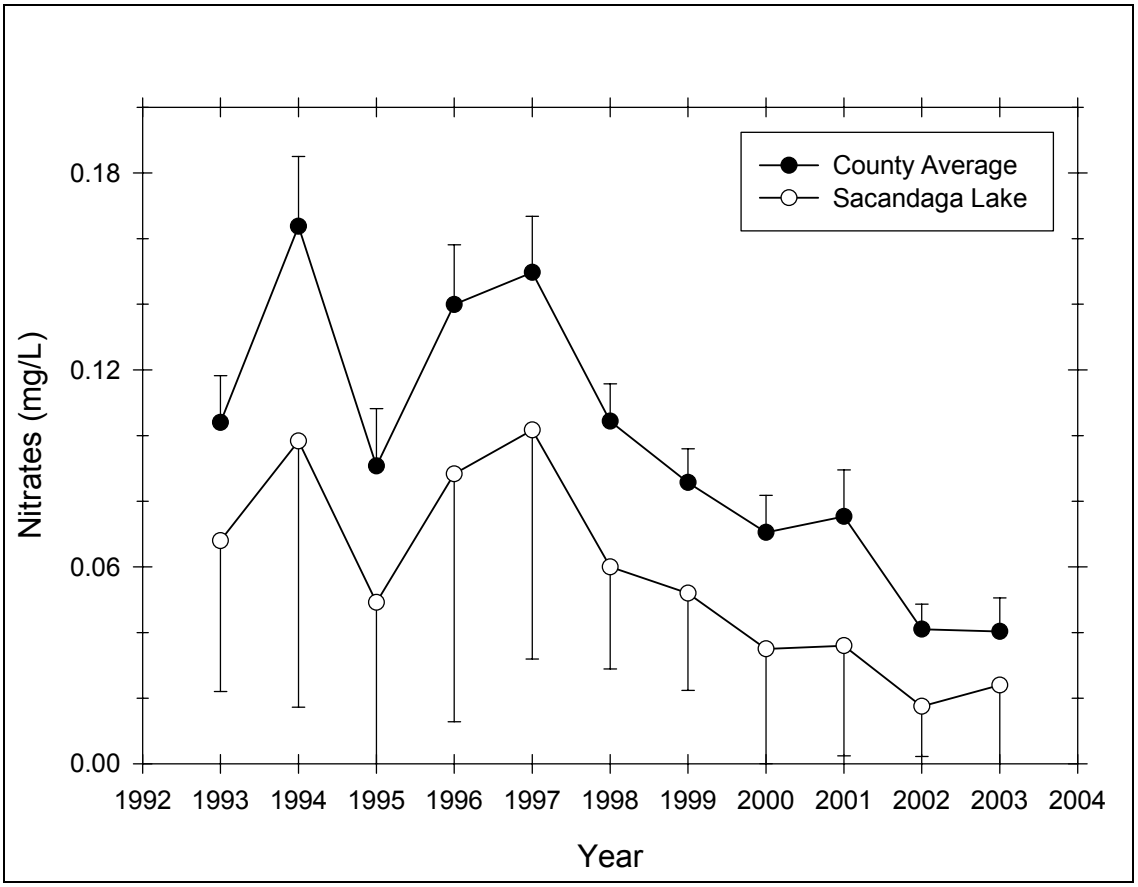


Figure 187 Seasonal mean nitrate trend in Sacandaga Lake

Table 148 – Descriptive Statistics for Nitrate in Sacandaga Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0680	0.0370	0.0166	0.0460
1994	6	0	0.0983	0.0773	0.0316	0.0811
1995	6	0	0.0492	0.0749	0.0306	0.0786
1996	6	0	0.0883	0.0719	0.0294	0.0755
1997	6	0	0.102	0.0665	0.0271	0.0697
1998	6	0	0.0600	0.0297	0.0121	0.0311
1999	6	1	0.0520	0.0239	0.0107	0.0296
2000	6	0	0.0350	0.0333	0.0136	0.0350
2001	6	1	0.0360	0.0270	0.0121	0.0335
2002	6	2	0.0175	0.00957	0.00479	0.0152
2003	6	1	0.0240	0.0251	0.0112	0.0312
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0900	0.130	0.0400	0.0600	0.0400	0.0850
1994	0.170	0.200	0.0300	0.0700	0.0300	0.190
1995	0.160	0.160	0.000	0.00250	0.000	0.130
1996	0.180	0.200	0.0200	0.0650	0.0300	0.150
1997	0.160	0.190	0.0300	0.0850	0.0500	0.170
1998	0.0900	0.110	0.0200	0.0550	0.0500	0.0700
1999	0.0600	0.0900	0.0300	0.0400	0.0375	0.0675
2000	0.0900	0.1000	0.01000	0.0200	0.0200	0.0400
2001	0.0600	0.0700	0.01000	0.0200	0.0175	0.0625
2002	0.0200	0.0300	0.01000	0.0150	0.01000	0.0250
2003	0.0600	0.0600	0.000	0.01000	0.00750	0.0450
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.593	2.662	0.278	0.224	0.340	0.0286
1994	0.727	-1.874	0.260	0.224	0.590	0.0879
1995	1.035	-1.460	0.389	0.005	0.295	0.0425
1996	0.848	-0.882	0.213	0.470	0.530	0.0727
1997	0.440	-1.972	0.235	0.349	0.610	0.0841
1998	0.690	1.741	0.201	0.534	0.360	0.0260
1999	1.264	1.099	0.292	0.174	0.260	0.0158
2000	2.020	4.200	0.340	0.029	0.210	0.0129
2001	0.578	-2.708	0.323	0.096	0.180	0.00940
2002	0.855	-1.289	0.283	0.289	0.0700	0.00150
2003	0.828	-1.217	0.312	0.117	0.120	0.00540

Chlorophyll a

Figure 188 presents the seasonal mean chlorophyll *a* trend in Sacandaga Lake, while Table 149 presents descriptive statistics for chlorophyll *a* in Sacandaga Lake. The chlorophyll *a* in Sacandaga Lake exhibited an increasing trend from 1997 to 2001 and a decreasing trend from 2001 to 2003. The chlorophyll *a* in Sacandaga Lake was generally slightly lower than the county average, though this difference was not statistically significant.

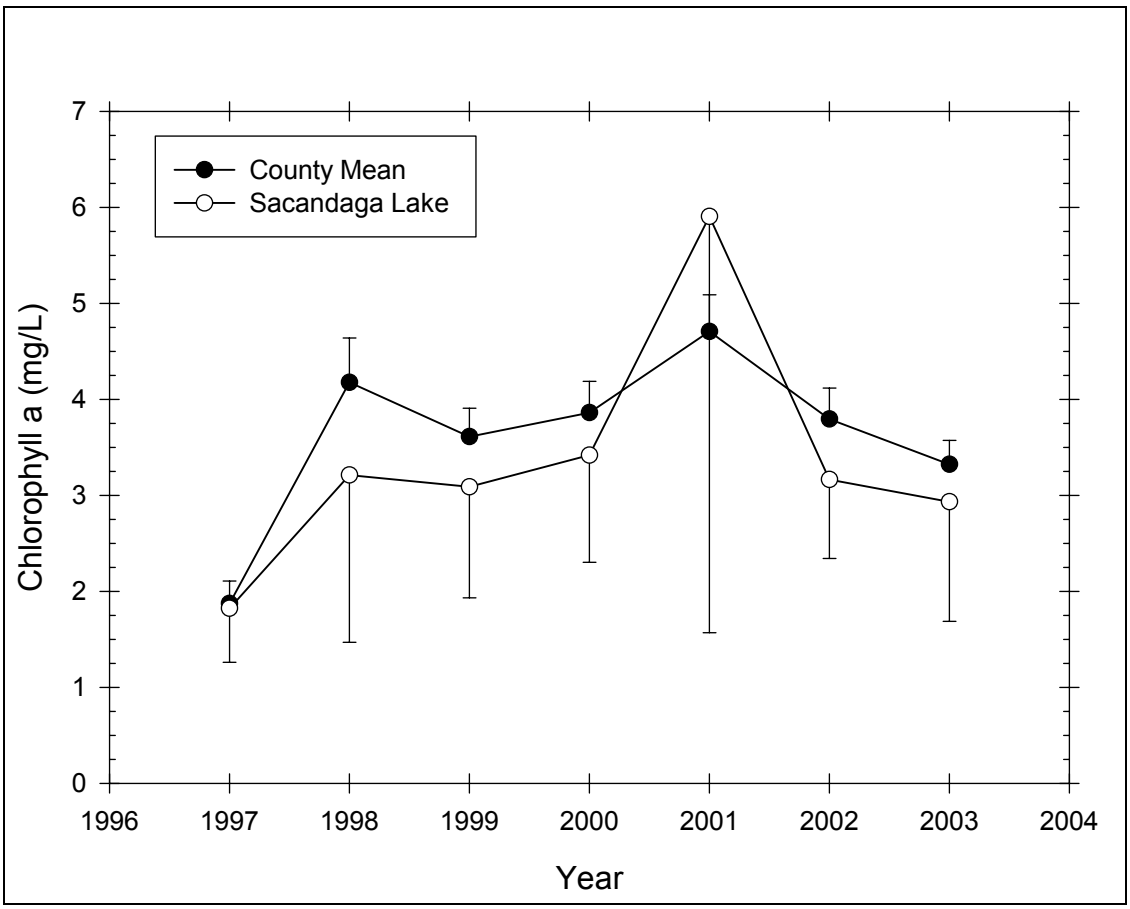


Figure 188 Seasonal mean chlorophyll a trend in Sacandaga Lake

Table 149 – Descriptive Statistics for Chlorophyll a in Sacandaga Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	1.823	0.535	0.218	0.562
1998	6	0	3.212	1.660	0.678	1.742
1999	6	1	3.090	0.932	0.417	1.157
2000	6	0	3.418	1.063	0.434	1.115
2001	6	1	5.906	3.493	1.562	4.338
2002	6	2	3.165	0.517	0.258	0.822
2003	6	2	2.932	0.783	0.392	1.246
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	1.330	2.450	1.120	1.845	1.320	2.360
1998	4.220	5.150	0.930	2.905	2.260	5.120
1999	2.380	4.560	2.180	2.830	2.427	3.667
2000	2.830	5.200	2.370	3.305	2.470	3.860
2001	7.150	10.240	3.090	3.870	3.158	9.423
2002	1.190	3.610	2.420	3.315	2.850	3.480
2003	1.650	3.690	2.040	3.000	2.280	3.585
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	-0.146	-1.591	0.175	0.666	10.940	21.379
1998	0.0895	-1.144	0.208	0.496	19.270	75.664
1999	1.150	1.094	0.210	0.551	15.450	51.212

2000	0.912	0.439	0.172	0.680	20.510	75.755
2001	0.631	-2.973	0.320	0.097	29.530	223.218
2002	-1.536	2.821	0.338	0.115	12.660	40.869
2003	-0.253	-3.910	0.258	0.398	11.730	36.239

Transparency

Figure 189 presents the seasonal mean transparency trend in Sacandaga Lake, while Table 150 presents descriptive statistics for transparency in Sacandaga Lake. The transparency in Sacandaga Lake did not exhibit any discernible trend. The transparency in Sacandaga Lake was generally slightly lower than the county average, though this difference was not statistically significant.

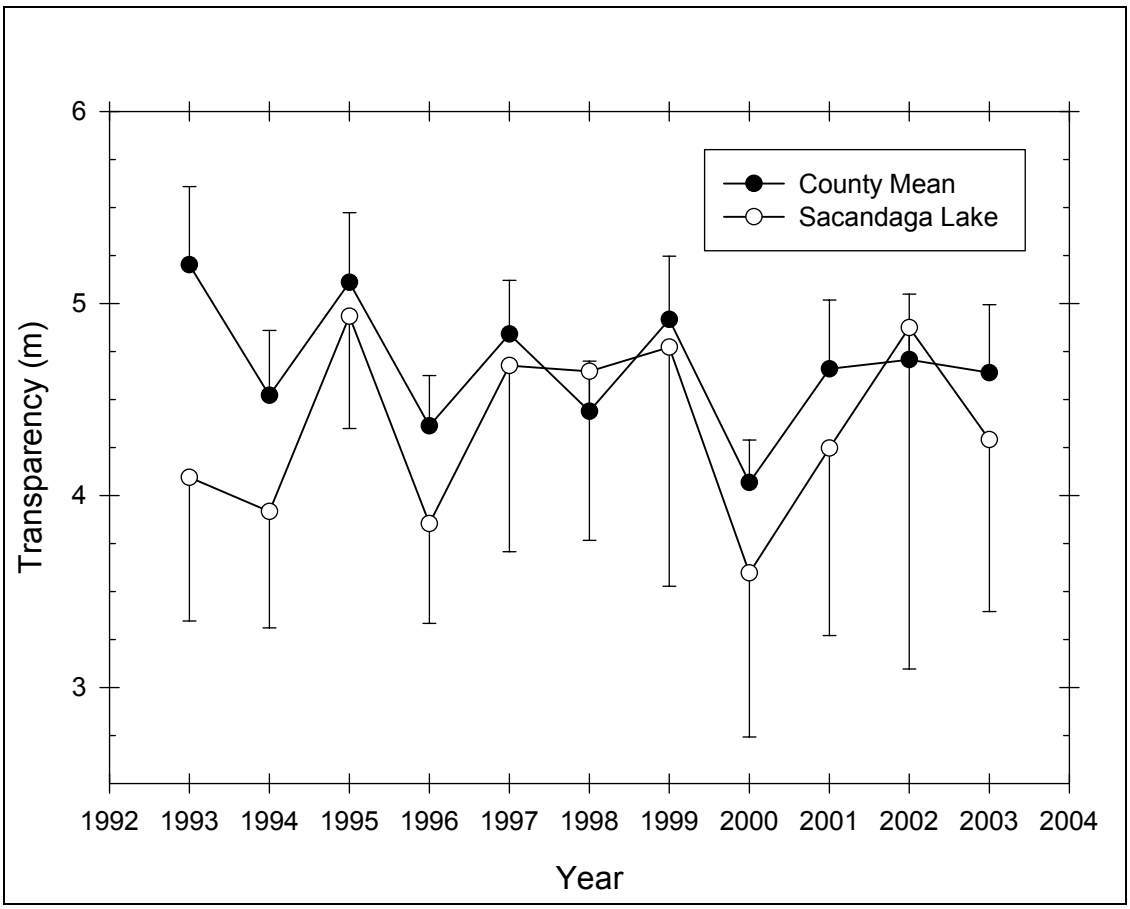


Figure 189 Seasonal mean transparency in Sacandaga Lake

Table 150 – Descriptive Statistics for Transparency in Sacandaga Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	2	4.095	0.470	0.235	0.748
1994	6	0	3.917	0.578	0.236	0.606
1995	6	0	4.933	0.557	0.228	0.585
1996	6	0	3.853	0.495	0.202	0.519
1997	6	0	4.677	0.924	0.377	0.969
1998	6	0	4.647	0.839	0.342	0.880

1999	5	0	4.772	1.002	0.448	1.244
2000	6	0	3.597	0.814	0.332	0.854
2001	5	0	4.246	0.786	0.351	0.975
2002	4	0	4.875	1.118	0.559	1.778
2003	5	0	4.290	0.721	0.322	0.895
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.040	4.550	3.510	4.160	3.720	4.470
1994	1.300	4.500	3.200	3.950	3.500	4.400
1995	1.500	5.800	4.300	4.950	4.400	5.200
1996	1.290	4.300	3.010	3.980	3.570	4.280
1997	2.660	5.730	3.070	4.855	4.300	5.250
1998	2.300	5.850	3.550	4.585	4.000	5.310
1999	2.510	6.130	3.620	5.050	3.875	5.357
2000	1.730	4.730	3.000	3.150	3.000	4.550
2001	2.000	5.000	3.000	4.530	3.750	4.775
2002	2.400	6.000	3.600	4.950	3.950	5.800
2003	1.750	4.800	3.050	4.550	3.987	4.763
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.544	-2.032	0.235	0.499	16.380	67.740
1994	-0.138	-2.798	0.299	0.097	23.500	93.710
1995	0.462	-0.360	0.164	0.711	29.600	147.580
1996	-1.098	0.604	0.188	0.605	23.120	90.314
1997	-1.069	1.471	0.181	0.640	28.060	135.494
1998	0.226	-0.722	0.179	0.648	27.880	133.068
1999	0.206	-1.036	0.209	0.554	23.860	117.875
2000	0.954	-1.752	0.354	0.018	21.580	80.925
2001	-1.207	1.146	0.241	0.394	21.230	92.611
2002	-0.219	-3.609	0.242	0.469	19.500	98.810
2003	-1.848	3.503	0.306	0.133	21.450	94.097

TSI

Figure 190 presents the Carlson trophic state index trend in Sacandaga Lake. Transparency TSI oscillated around the oligotrophic-mesotrophic boundary, while chlorophyll *a* TSI oscillated between the mesotrophic-eutrophic boundary and the eutrophic range. Total phosphorus TSI was mesotrophic except for during 2000, 2002, and 2003.

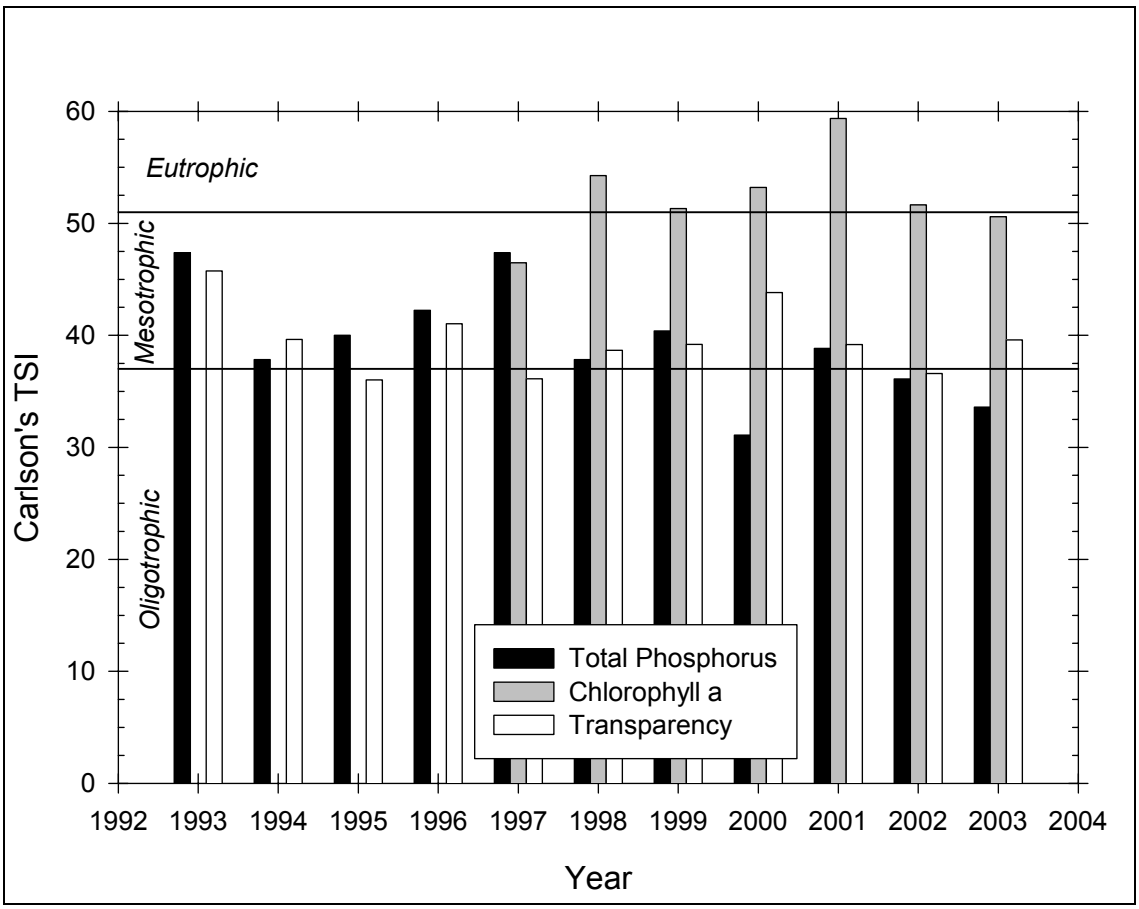


Figure 190 Carlson TSI trend in Sacandaga Lake

Aluminum

Figure 191 presents the seasonal mean aluminum trend in Sacandaga Lake, while Table 151 presents descriptive statistics for aluminum in Sacandaga Lake. The aluminum in Sacandaga Lake exhibited a slight decreasing trend from 1997 to 2000, with relatively low stable values from 2000 to 2003. The aluminum in Sacandaga Lake was lower than the county average, though this difference may not be statistically significant for all years.

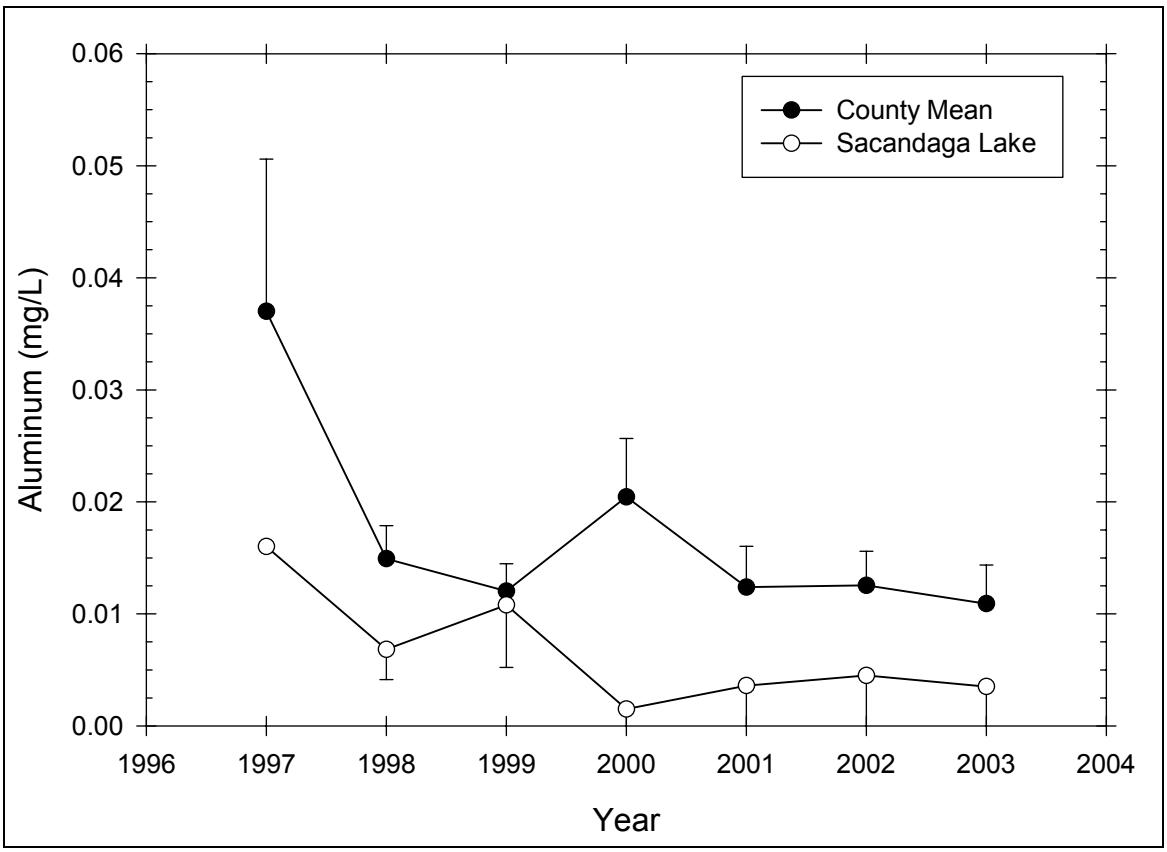


Figure 191 Seasonal mean aluminum trend in Sacandaga Lake

Table 151 – Descriptive Statistics for Aluminum in Sacandaga Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0160	--	--	--
1998	6	0	0.00683	0.00256	0.00105	0.00269
1999	6	1	0.0108	0.00449	0.00201	0.00558
2000	6	0	0.00150	0.00207	0.000847	0.00218
2001	6	1	0.00360	0.00344	0.00154	0.00427
2002	6	2	0.00450	0.00311	0.00155	0.00495
2003	6	2	0.00350	0.00436	0.00218	0.00694
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0160	0.0160	0.0160	0.0160	0.0160
1998	0.00600	0.00900	0.00300	0.00750	0.00500	0.00900
1999	0.01000	0.0150	0.00500	0.0130	0.00650	0.0143
2000	0.00500	0.00500	0.000	0.000500	0.000	0.00300
2001	0.00800	0.00900	0.001000	0.00200	0.001000	0.00600
2002	0.00700	0.00800	0.001000	0.00450	0.00200	0.00700
2003	0.00900	0.00900	0.000	0.00250	0.000	0.00700
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0160	0.000256
1998	-0.580	-1.480	0.301	0.095	0.0410	0.000313
1999	-0.608	-2.548	0.288	0.189	0.0540	0.000664
2000	1.211	0.200	0.265	0.204	0.00900	0.0000350
2001	1.243	0.547	0.279	0.221	0.0180	0.000112

2002	6.661E-016	-2.433	0.185	0.673	0.0180	0.000110
2003	0.676	-2.233	0.289	0.267	0.0140	0.000106

Calcium

Figure 192 presents the seasonal mean calcium trend in Sacandaga Lake, while Table 152 presents descriptive statistics for calcium in Sacandaga Lake. The calcium in Sacandaga Lake exhibited an increasing trend from 1997 to 2000 with relatively stable values from 2000 to 2003. The calcium in Sacandaga Lake was slightly higher than the county average, though this difference was not statistically significant.

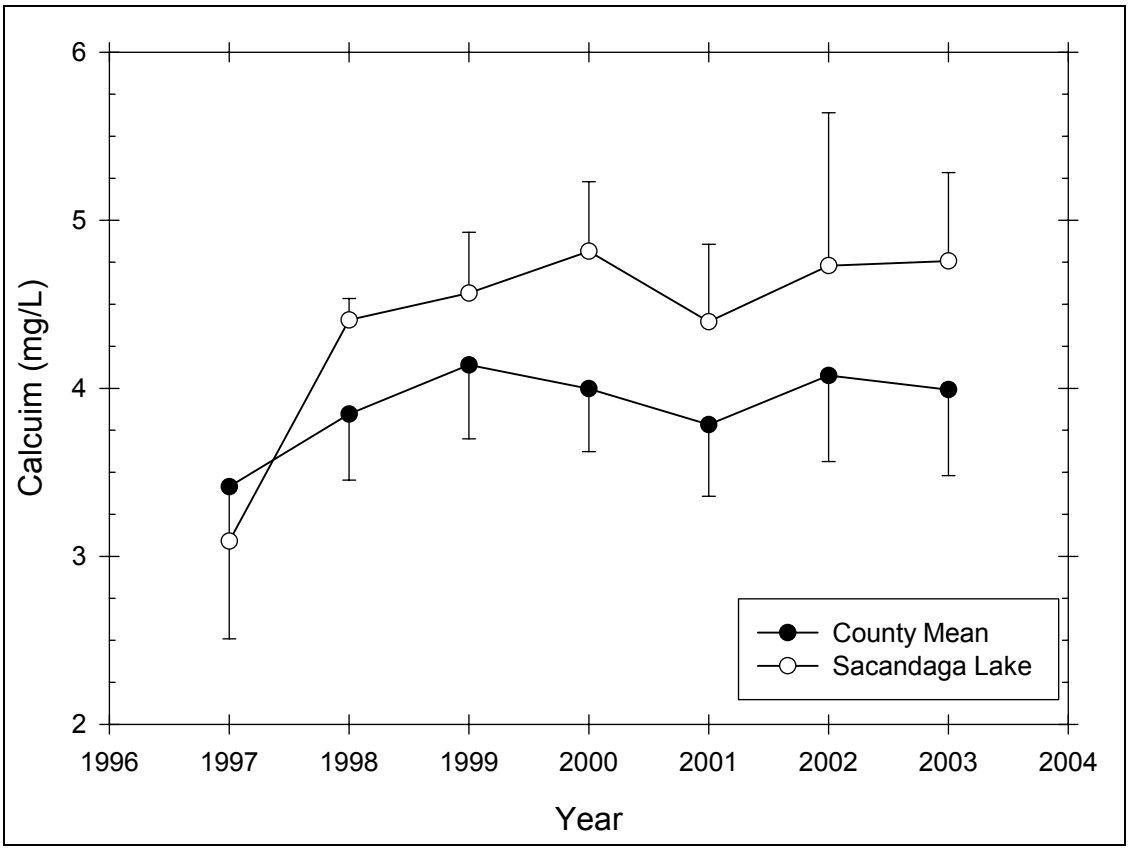


Figure 192 Seasonal mean calcium trend in Sacandaga Lake

Table 152 – Descriptive Statistics for Calcium in Sacandaga Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	3.090	--	--	--
1998	6	0	4.407	0.121	0.0494	0.127
1999	6	1	4.566	0.292	0.131	0.363
2000	6	0	4.815	0.395	0.161	0.414
2001	6	1	4.396	0.371	0.166	0.461
2002	6	2	4.730	0.571	0.286	0.909
2003	6	2	4.757	0.331	0.166	0.527
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	3.090	3.090	3.090	3.090	3.090
1998	0.300	4.570	4.270	4.370	4.320	4.540

1999	0.620	4.810	4.190	4.750	4.280	4.780
2000	1.010	5.320	4.310	4.755	4.570	5.180
2001	1.010	4.870	3.860	4.440	4.167	4.623
2002	1.200	5.080	3.880	4.980	4.395	5.065
2003	0.740	5.010	4.270	4.875	4.570	4.945
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	3.090	9.548
1998	0.579	-1.575	0.286	0.132	26.440	116.586
1999	-0.678	-2.747	0.335	0.068	22.830	104.584
2000	0.103	-1.772	0.233	0.360	28.890	139.884
2001	-0.379	0.823	0.167	0.714	21.980	97.175
2002	-1.903	3.642	0.374	0.053	18.920	90.471
2003	-1.771	3.380	0.383	0.041	19.030	90.864

Calcite Saturation Index

Figure 193 presents the calcite saturation index trend in Sacandaga Lake. The CSI in Sacandaga Lake was low and stable for the period of record, within the low vulnerability to acid deposition range. The CSI in Sacandaga Lake was slightly lower than the county average, though this difference was not statistically significant.

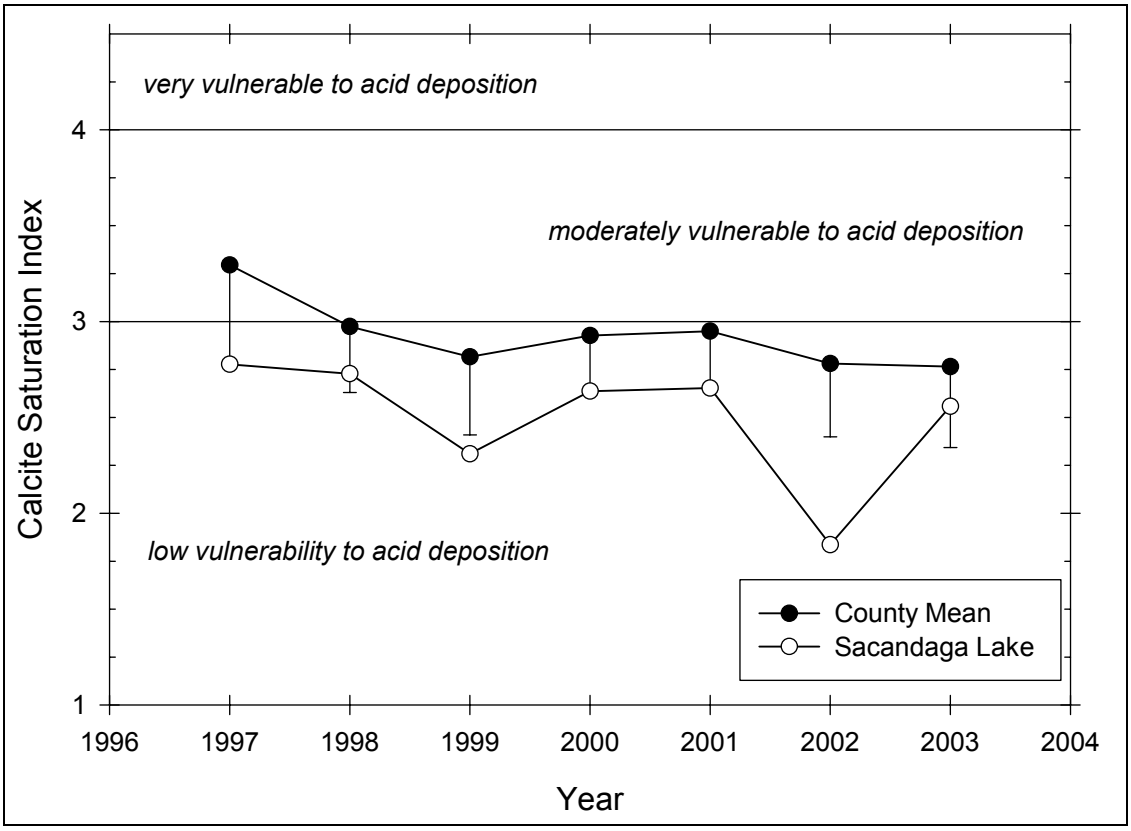
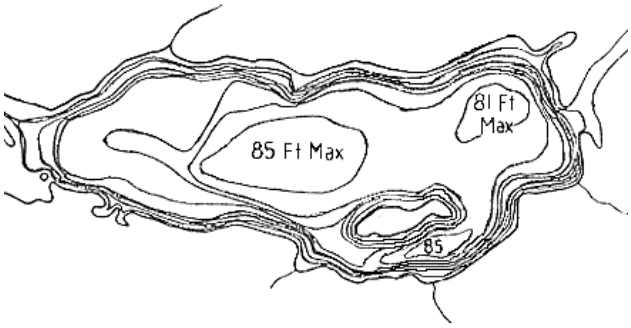


Figure 193 Seasonal mean CSI trend in Sacandaga Lake

Seventh Lake

Location
Pond Number: 040878B
Watershed: Black River
County: Hamilton
Topographic Quadrangle: Old Forge/West Canada Lakes
Sample Site
Latitude: 43o 44.381'
Longitude: 74o 44.262'
Morphometry
Surface Area: 851 Ac.
Mean Depth: 40 Ft.
Maximum Depth: 87 Ft.
Volume: 34,195 Ac./Ft.
Watershed Area: 8,642 Ac.
Hydraulic Retention Time: .76 Yr.
Shoreline Length: 11.2 Mi.
Elevation: 1,788 Ft.
Water Quality Classification: A(T)
Trophic State: Mesotrophic



Temperature and Dissolved Oxygen

Limekiln Lake had a minimum DO of 4.1 mg/L (September 2002), with a minimum temperature of 4.5°C and a maximum temperature of 24.1°C.

pH

Figure 194 presents the seasonal mean pH trend in Seventh Lake, while Table 153 presents descriptive statistics for pH in Seventh Lake. The pH in Seventh Lake exhibited an increasing trend from 1995 to 2000 with stable values from 2000 to 2003. The pH in Seventh Lake was similar to the county average.

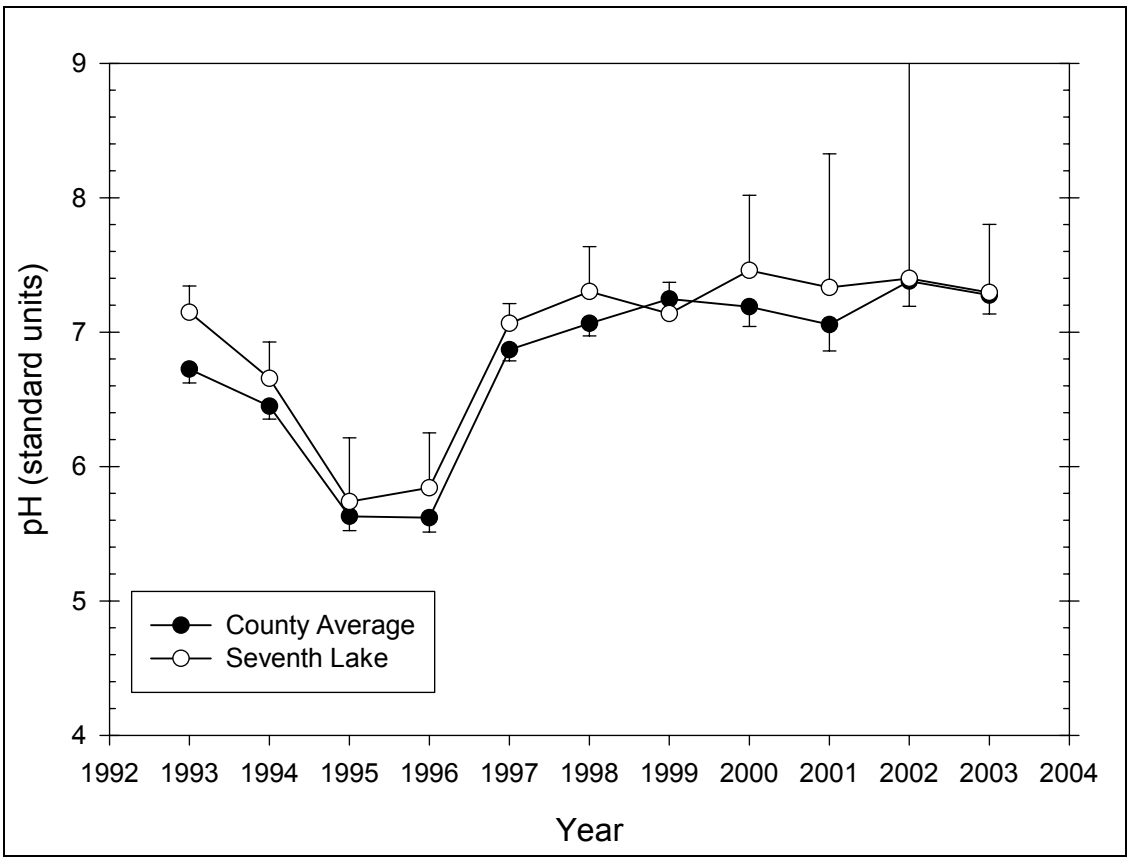


Figure 194 Seasonal mean pH trend in Seventh Lake

Table 153 – Descriptive Statistics for pH in Seventh Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	7.148	0.158	0.0707	0.196
1994	6	0	6.657	0.256	0.105	0.269
1995	6	0	5.740	0.452	0.184	0.474
1996	6	0	5.842	0.390	0.159	0.410
1997	6	0	7.065	0.140	0.0573	0.147
1998	6	0	7.302	0.319	0.130	0.334
1999	5	0	7.138	0.187	0.0836	0.232
2000	6	0	7.460	0.532	0.217	0.558
2001	4	0	7.332	0.625	0.312	0.994
2002	4	0	7.400	1.046	0.523	1.665
2003	4	0	7.295	0.319	0.160	0.508
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.390	7.290	6.900	7.150	7.065	7.282
1994	0.690	6.920	6.230	6.675	6.540	6.900
1995	1.100	6.210	5.110	5.810	5.330	6.170
1996	0.960	6.400	5.440	5.710	5.560	6.230
1997	0.360	7.270	6.910	7.065	6.920	7.160
1998	0.870	7.840	6.970	7.225	7.090	7.460
1999	0.420	7.330	6.910	7.210	6.955	7.285
2000	1.480	8.140	6.660	7.470	7.140	7.880
2001	1.520	8.060	6.540	7.365	6.915	7.750

2002	2.140	8.260	6.120	7.610	6.545	8.255
2003	0.750	7.720	6.970	7.245	7.065	7.525
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-1.068	1.009	0.230	0.452	35.740	255.569
1994	-0.824	0.488	0.162	0.718	39.940	266.196
1995	-0.413	-1.694	0.179	0.650	34.440	198.705
1996	0.662	-1.560	0.232	0.363	35.050	205.513
1997	0.293	-1.079	0.182	0.633	42.390	299.584
1998	0.992	0.539	0.226	0.395	43.810	320.394
1999	-0.437	-2.681	0.250	0.350	35.690	254.895
2000	-0.309	-0.434	0.118	0.763	44.760	335.325
2001	-0.305	1.269	0.223	0.549	29.330	216.233
2002	-0.539	-2.973	0.292	0.256	29.600	222.325
2003	0.820	0.662	0.206	0.612	29.180	213.174

Alkalinity

Figure 195 presents the seasonal mean alkalinity trend in Seventh Lake, while Table 154 presents descriptive statistics for alkalinity in Seventh Lake. The alkalinity in Seventh Lake exhibited no discernible trend. The alkalinity in Seventh Lake was slightly higher than the county average, though this difference was not statistically significant.

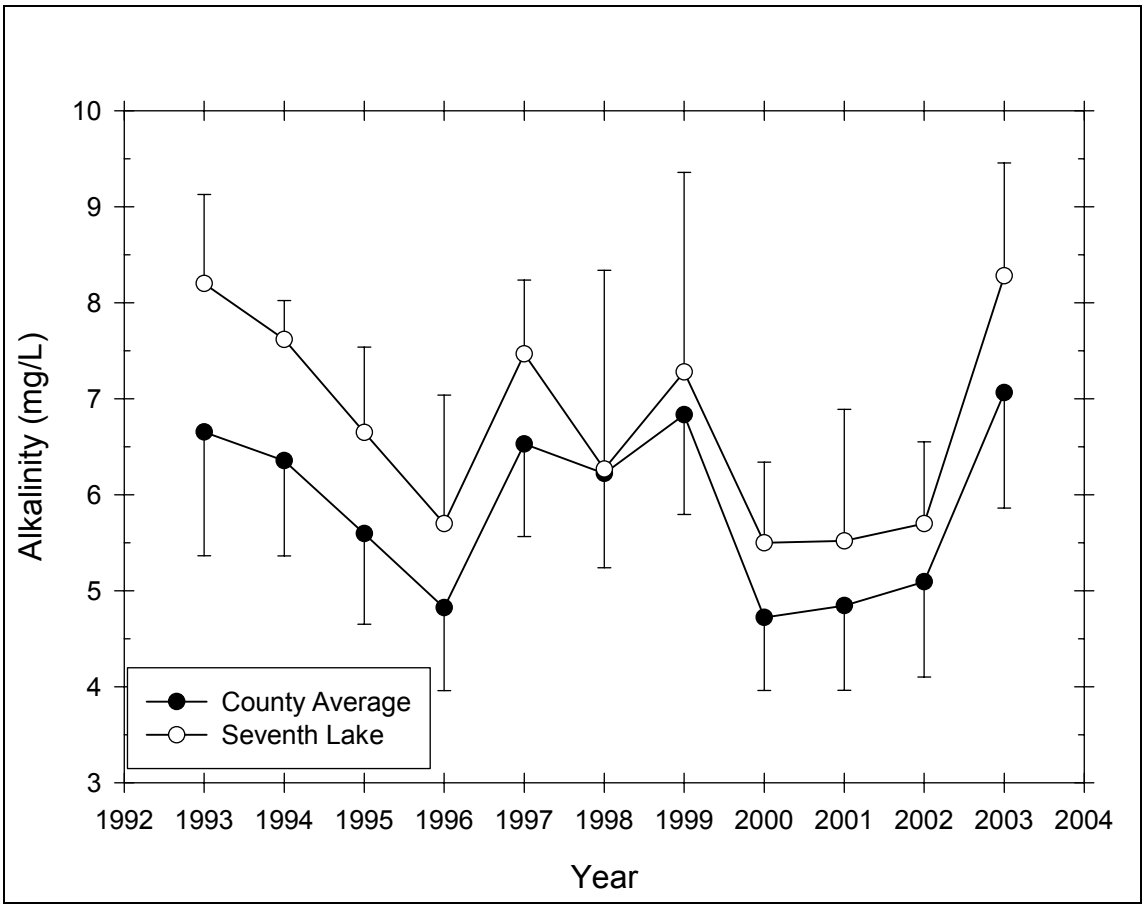


Figure 195 Seasonal mean alkalinity trend in Seventh Lake

Table 154 – Descriptive Statistics for Alkalinity in Seventh Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	7.148	0.158	0.0707	0.196
1994	6	0	6.657	0.256	0.105	0.269
1995	6	0	5.740	0.452	0.184	0.474
1996	6	0	5.842	0.390	0.159	0.410
1997	6	0	7.065	0.140	0.0573	0.147
1998	6	0	7.302	0.319	0.130	0.334
1999	5	0	7.138	0.187	0.0836	0.232
2000	6	0	7.460	0.532	0.217	0.558
2001	4	0	7.332	0.625	0.312	0.994
2002	4	0	7.400	1.046	0.523	1.665
2003	4	0	7.295	0.319	0.160	0.508
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.390	7.290	6.900	7.150	7.065	7.282
1994	0.690	6.920	6.230	6.675	6.540	6.900
1995	1.100	6.210	5.110	5.810	5.330	6.170
1996	0.960	6.400	5.440	5.710	5.560	6.230
1997	0.360	7.270	6.910	7.065	6.920	7.160
1998	0.870	7.840	6.970	7.225	7.090	7.460
1999	0.420	7.330	6.910	7.210	6.955	7.285
2000	1.480	8.140	6.660	7.470	7.140	7.880
2001	1.520	8.060	6.540	7.365	6.915	7.750
2002	2.140	8.260	6.120	7.610	6.545	8.255
2003	0.750	7.720	6.970	7.245	7.065	7.525
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-1.068	1.009	0.230	0.452	35.740	255.569
1994	-0.824	0.488	0.162	0.718	39.940	266.196
1995	-0.413	-1.694	0.179	0.650	34.440	198.705
1996	0.662	-1.560	0.232	0.363	35.050	205.513
1997	0.293	-1.079	0.182	0.633	42.390	299.584
1998	0.992	0.539	0.226	0.395	43.810	320.394
1999	-0.437	-2.681	0.250	0.350	35.690	254.895
2000	-0.309	-0.434	0.118	0.763	44.760	335.325
2001	-0.305	1.269	0.223	0.549	29.330	216.233
2002	-0.539	-2.973	0.292	0.256	29.600	222.325
2003	0.820	0.662	0.206	0.612	29.180	213.174

Total Phosphorus

Figure 196 presents the seasonal mean total phosphorus trend in Seventh Lake, while Table 155 presents descriptive statistics for total phosphorus in Seventh Lake. The total phosphorus in Seventh Lake exhibited an increasing trend from 1994 to 2000 and a decreasing trend from 2000 to 2003. The total phosphorus in Seventh Lake was generally slightly lower than the county average, though this difference was not statistically significant.

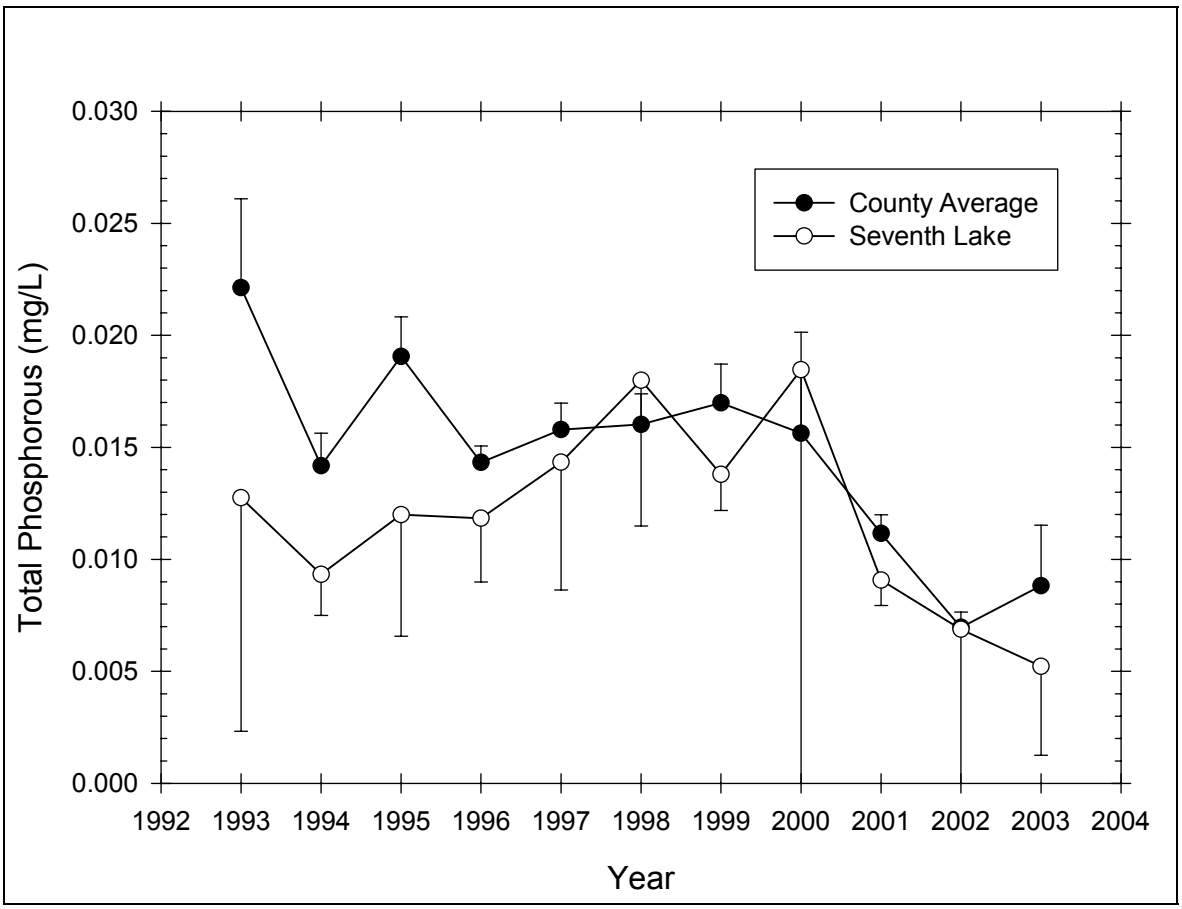


Figure 196 Seasonal mean total phosphorus in Seventh Lake

Table 155 – Descriptive Statistics for Total Phosphorus in Seventh Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	2	0.0128	0.00655	0.00328	0.0104
1994	6	0	0.00933	0.00175	0.000715	0.00184
1995	6	0	0.0120	0.00518	0.00211	0.00543
1996	6	0	0.0118	0.00271	0.00111	0.00285
1997	6	0	0.0143	0.00543	0.00222	0.00570
1998	6	1	0.0180	0.00524	0.00235	0.00651
1999	6	1	0.0138	0.00130	0.000583	0.00162
2000	6	0	0.0185	0.0252	0.0103	0.0264
2001	6	2	0.00907	0.000714	0.000357	0.00114
2002	6	2	0.00687	0.00449	0.00225	0.00715
2003	6	2	0.00522	0.00249	0.00125	0.00397
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0140	0.0170	0.00300	0.0155	0.00900	0.0165
1994	0.00400	0.0120	0.00800	0.00850	0.00800	0.0110
1995	0.0130	0.0200	0.00700	0.0110	0.00800	0.0150
1996	0.00700	0.0160	0.00900	0.0110	0.01000	0.0140
1997	0.0160	0.0230	0.00700	0.0135	0.0120	0.0170
1998	0.0130	0.0230	0.01000	0.0190	0.0145	0.0222
1999	0.00300	0.0150	0.0120	0.0140	0.0128	0.0150
2000	0.0678	0.0688	0.001000	0.01000	0.00500	0.0160

2001	0.00160	0.00970	0.00810	0.00925	0.00855	0.00960
2002	0.00990	0.0117	0.00180	0.00700	0.00320	0.0106
2003	0.00550	0.00850	0.00300	0.00470	0.00330	0.00715
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-1.907	3.694	0.384	0.039	0.0510	0.000779
1994	0.919	-1.205	0.277	0.161	0.0560	0.000538
1995	0.636	-1.055	0.280	0.149	0.0720	0.000998
1996	0.712	-0.955	0.250	0.270	0.0710	0.000877
1997	0.470	0.719	0.167	0.700	0.0860	0.00138
1998	-0.953	0.255	0.177	0.686	0.0900	0.00173
1999	-0.541	-1.488	0.221	0.494	0.0690	0.000959
2000	2.228	5.170	0.372	0.009	0.111	0.00522
2001	-1.113	0.501	0.224	0.544	0.0363	0.000331
2002	-0.103	-3.098	0.213	0.588	0.0275	0.000250
2003	0.861	-0.850	0.243	0.464	0.0209	0.000128

Nitrate

Figure 197 presents the seasonal mean nitrate trend in Seventh Lake, while Table 156 presents descriptive statistics for nitrate in Seventh Lake. The nitrate in Seventh Lake exhibited a decreasing trend from 1994 to 2003. The nitrate in Seventh Lake was higher than the county average, though this difference may not be statistically significant for all years.

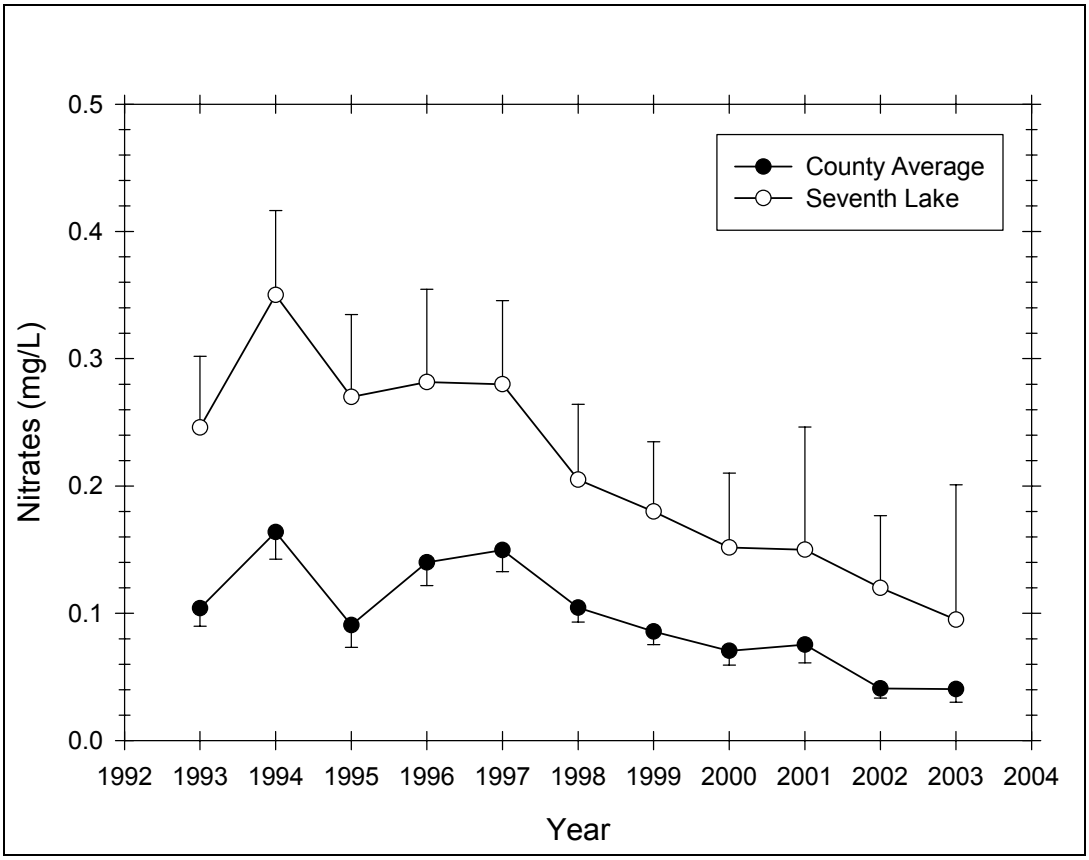


Figure 197 Seasonal mean nitrate trend in Seventh Lake

Table 156 – Descriptive Statistics for Nitrate in Seventh Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.246	0.0451	0.0201	0.0559
1994	6	0	0.350	0.0632	0.0258	0.0664
1995	6	0	0.270	0.0616	0.0252	0.0647
1996	6	0	0.282	0.0694	0.0283	0.0728
1997	6	0	0.280	0.0626	0.0256	0.0657
1998	6	0	0.205	0.0565	0.0231	0.0593
1999	6	1	0.180	0.0442	0.0197	0.0548
2000	6	0	0.152	0.0556	0.0227	0.0584
2001	6	2	0.150	0.0606	0.0303	0.0964
2002	6	2	0.120	0.0356	0.0178	0.0566
2003	6	2	0.0950	0.0666	0.0333	0.106
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.110	0.290	0.180	0.270	0.210	0.275
1994	0.140	0.430	0.290	0.330	0.300	0.420
1995	0.170	0.360	0.190	0.260	0.230	0.320
1996	0.190	0.410	0.220	0.270	0.230	0.290
1997	0.170	0.380	0.210	0.255	0.250	0.330
1998	0.130	0.270	0.140	0.200	0.150	0.270
1999	0.120	0.240	0.120	0.190	0.150	0.203
2000	0.140	0.240	0.1000	0.130	0.110	0.200
2001	0.130	0.240	0.110	0.125	0.115	0.185
2002	0.0800	0.170	0.0900	0.110	0.0950	0.145
2003	0.150	0.190	0.0400	0.0750	0.0500	0.140
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.876	-0.768	0.303	0.141	1.230	0.311
1994	0.462	-2.293	0.285	0.133	2.100	0.755
1995	0.346	-0.649	0.167	0.701	1.620	0.456
1996	1.535	2.616	0.286	0.132	1.690	0.500
1997	0.880	-0.235	0.292	0.114	1.680	0.490
1998	0.175	-1.933	0.208	0.495	1.230	0.268
1999	-0.0290	0.580	0.210	0.548	0.900	0.170
2000	0.995	-0.635	0.318	0.058	0.910	0.154
2001	1.892	3.642	0.379	0.045	0.600	0.101
2002	1.331	1.500	0.250	0.432	0.480	0.0614
2003	1.463	2.120	0.280	0.303	0.380	0.0494

Chlorophyll a

Figure 198 presents the seasonal mean chlorophyll *a* trend in Seventh Lake, while Table 157 presents descriptive statistics for chlorophyll *a* in Seventh Lake. The chlorophyll *a* in Seventh Lake exhibited a general increasing trend from 1997 to 2003, except for a peak in 1998 that may be the result of an outlying data point. The chlorophyll *a* in Seventh Lake was significantly lower than the county average, though this difference may not be statistically significant for some years.

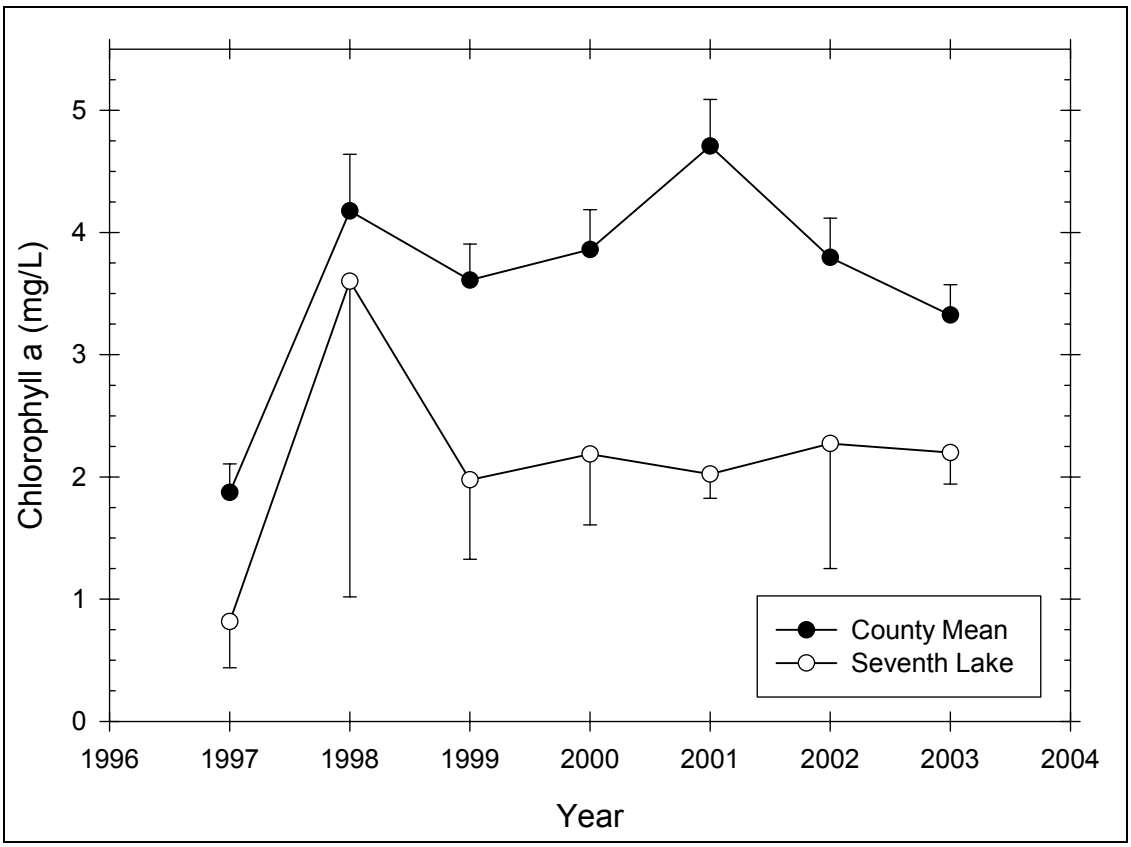


Figure 198 Seasonal mean chlorophyll a trend in Seventh Lake

Table 157 – Descriptive Statistics for Chlorophyll a in Seventh Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	0.817	0.359	0.147	0.377
1998	6	0	3.602	2.461	1.005	2.582
1999	6	1	1.976	0.522	0.234	0.649
2000	6	1	2.186	0.465	0.208	0.577
2001	6	2	2.023	0.124	0.0621	0.198
2002	6	2	2.273	0.643	0.321	1.023
2003	6	2	2.200	0.162	0.0811	0.258
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.850	1.260	0.410	0.775	0.470	1.210
1998	5.440	6.480	1.040	3.530	1.090	5.940
1999	1.400	2.850	1.450	1.880	1.698	2.152
2000	1.180	2.970	1.790	2.040	1.888	2.400
2001	0.280	2.190	1.910	1.995	1.930	2.115
2002	1.240	2.900	1.660	2.265	1.720	2.825
2003	0.390	2.370	1.980	2.225	2.095	2.305
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	0.249	-1.849	0.197	0.560	4.900	4.646
1998	0.0643	-2.659	0.218	0.439	21.610	108.111
1999	1.501	3.111	0.343	0.055	9.880	20.614
2000	1.651	2.924	0.279	0.220	10.930	24.757
2001	1.009	0.160	0.220	0.560	8.090	16.408

2002	0.0169	-5.560	0.278	0.310	9.090	21.896
2003	-0.885	1.788	0.275	0.325	8.800	19.439

Transparency

Figure 199 presents the seasonal mean transparency trend in Seventh Lake, while Table 158 presents descriptive statistics for transparency in Seventh Lake. The transparency in Seventh Lake was variable from year to year but may exhibit a slight decrease over time. The transparency in Seventh Lake was slightly higher than the county average, though this difference was not statistically significant.

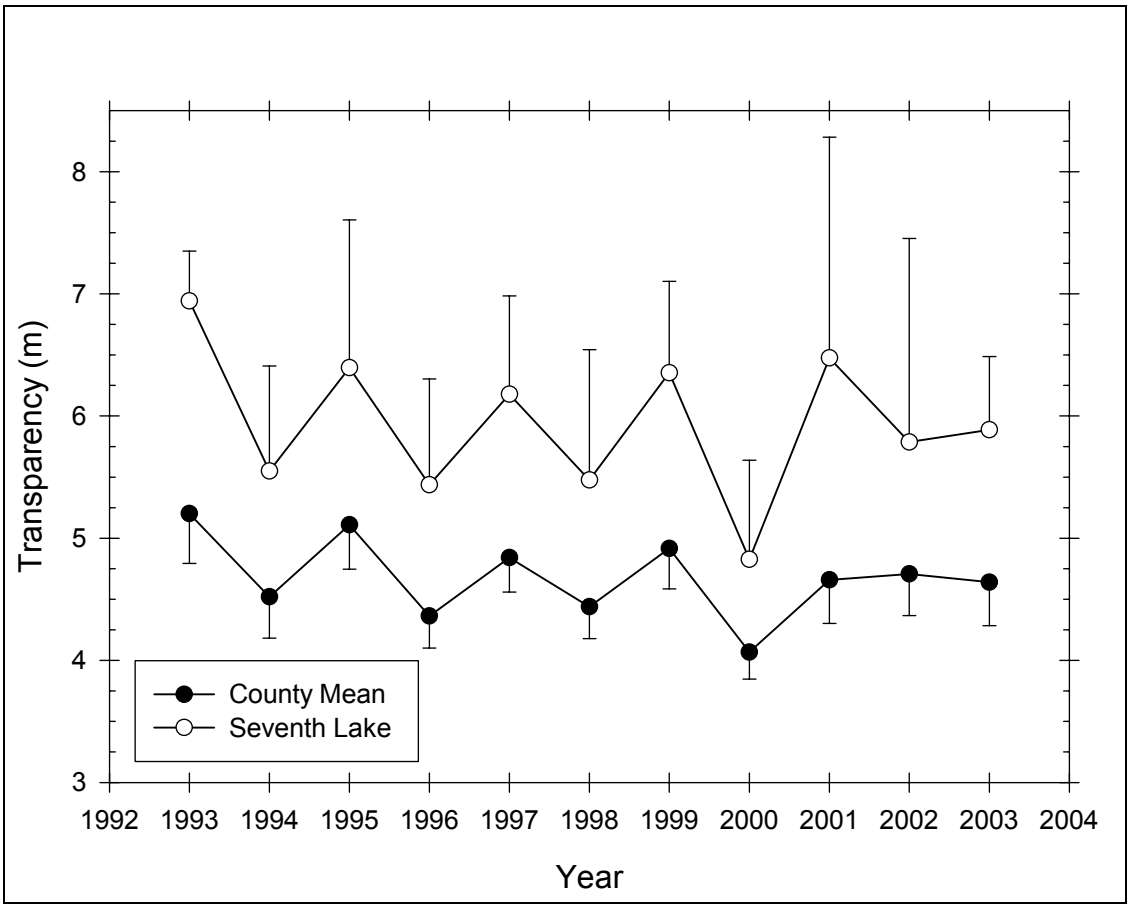


Figure 199 Seasonal mean transparency trend in Seventh Lake

Table 158 – Descriptive Statistics for Transparency in Seventh Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	6.942	0.406	0.182	0.505
1994	6	0	5.550	0.860	0.351	0.902
1995	6	0	6.395	1.211	0.494	1.270
1996	6	0	5.437	0.867	0.354	0.910
1997	6	0	6.178	0.804	0.328	0.844
1998	6	0	5.475	1.068	0.436	1.120
1999	5	0	6.354	0.749	0.335	0.930
2000	6	0	4.827	0.811	0.331	0.851

2001	4	0	6.475	1.808	0.904	2.877
2002	4	0	5.787	1.665	0.832	2.649
2003	4	0	5.888	0.599	0.300	0.953
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.060	7.580	6.520	6.970	6.632	7.123
1994	2.200	6.500	4.300	5.600	4.900	6.400
1995	3.380	8.050	4.670	6.550	5.400	7.150
1996	2.400	6.750	4.350	5.585	4.600	5.750
1997	2.280	7.390	5.110	6.125	5.750	6.570
1998	3.010	7.110	4.100	5.375	4.870	6.020
1999	1.910	7.600	5.690	6.200	5.833	6.700
2000	2.300	6.300	4.000	4.650	4.360	5.000
2001	4.000	9.100	5.100	5.850	5.300	7.650
2002	3.750	8.200	4.450	5.250	4.725	6.850
2003	1.180	6.500	5.320	5.865	5.375	6.400
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.021	1.296	0.273	0.248	34.710	241.618
1994	-0.351	-1.173	0.172	0.681	33.300	188.510
1995	-0.194	-0.493	0.201	0.535	38.370	252.704
1996	0.202	-0.227	0.196	0.565	32.620	181.106
1997	0.286	-0.291	0.203	0.526	37.070	232.264
1998	0.388	-0.283	0.205	0.514	32.850	185.552
1999	1.519	2.549	0.276	0.236	31.770	204.111
2000	1.383	2.258	0.249	0.277	28.960	143.070
2001	1.640	2.707	0.310	0.191	25.900	177.510
2002	1.610	2.769	0.319	0.166	23.150	142.292
2003	0.0665	-5.290	0.277	0.313	23.550	139.727

TSI

Figure 200 presents the Carlson trophic state index trend in Seventh Lake. Transparency TSI was generally in the upper oligotrophic range, while chlorophyll *a* TSI was generally in the mesotrophic range. Total phosphorus TSI increased from upper oligotrophic in 1993 to upper mesotrophic in 2000, followed by a return and decreasing values in the oligotrophic range in 2001 to 2003.

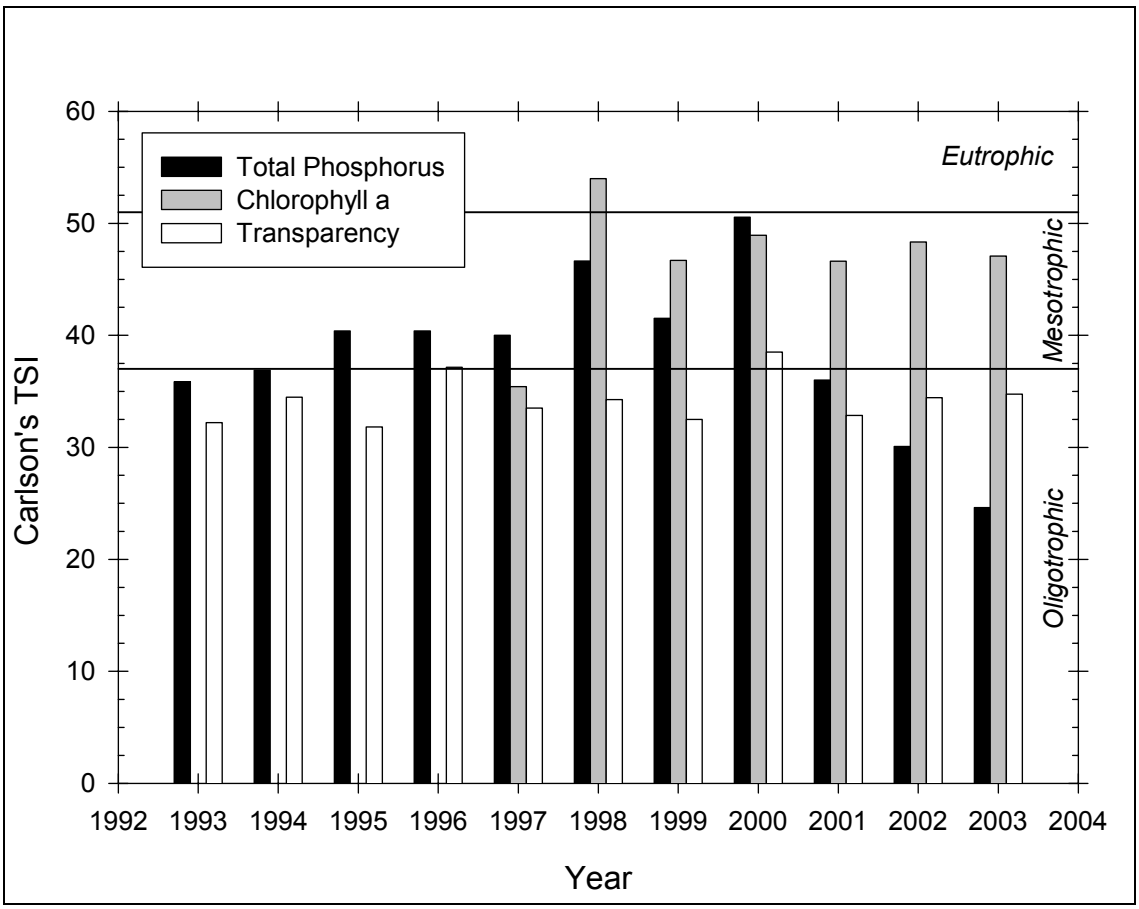


Figure 200 Carlson TSI trend in Seventh Lake

Aluminum

Figure 201 presents the seasonal mean aluminum trend in Seventh Lake, while Table 159 presents descriptive statistics for aluminum in Seventh Lake. The aluminum in Seventh Lake exhibited no discernible trend. The aluminum in Seventh Lake was similar to the county average, except in 2002 and 2003, when it was slightly higher than the county average, though any difference was not statistically significant.

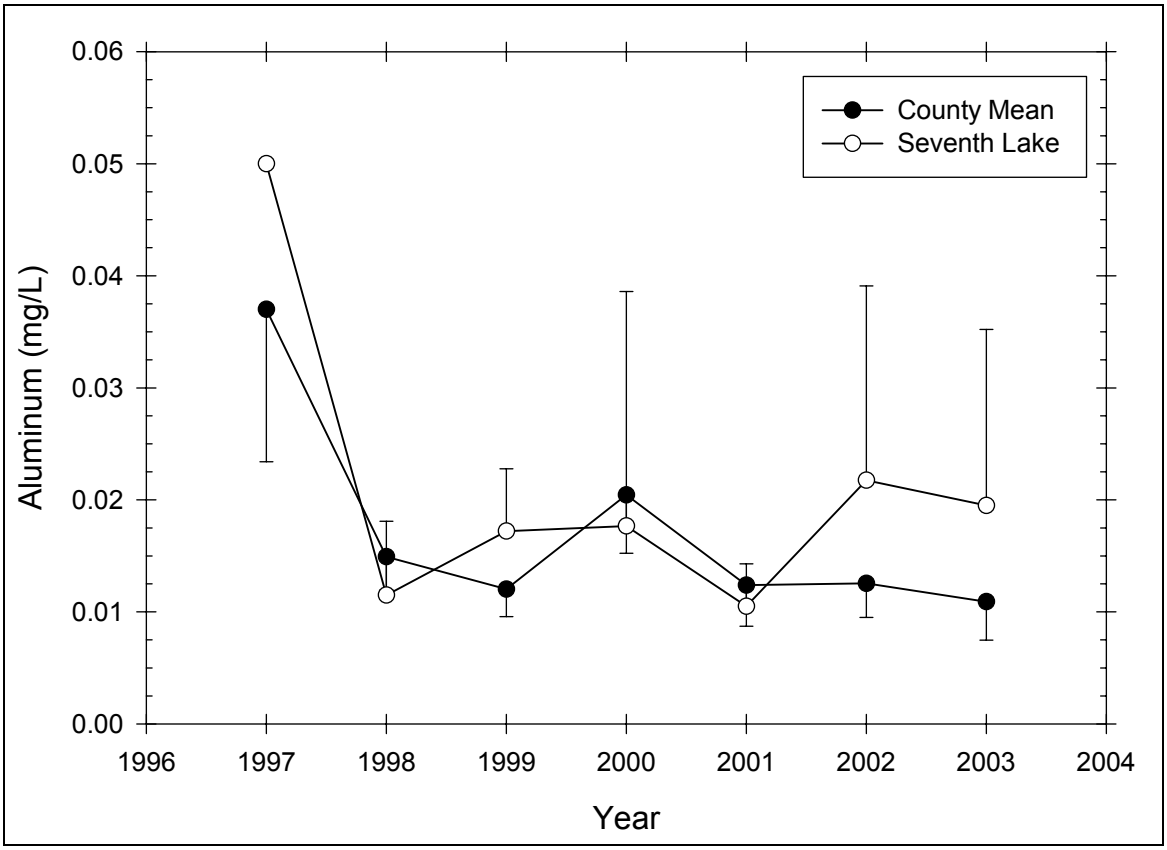


Figure 201 Seasonal mean aluminum trend in Seventh Lake

Table 159 – Descriptive Statistics for Aluminum in Seventh Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0500	--	--	--
1998	6	0	0.0115	0.00628	0.00257	0.00660
1999	6	1	0.0172	0.00449	0.00201	0.00558
2000	6	0	0.0177	0.0199	0.00814	0.0209
2001	6	2	0.0105	0.00238	0.00119	0.00379
2002	6	2	0.0218	0.0109	0.00545	0.0174
2003	6	2	0.0195	0.00988	0.00494	0.0157
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0500	0.0500	0.0500	0.0500	0.0500
1998	0.0140	0.0160	0.00200	0.0150	0.00500	0.0160
1999	0.0110	0.0220	0.0110	0.0170	0.0140	0.0212
2000	0.0510	0.0570	0.00600	0.00800	0.00700	0.0200
2001	0.00500	0.0120	0.00700	0.0115	0.00900	0.0120
2002	0.0230	0.0310	0.00800	0.0240	0.0130	0.0305
2003	0.0230	0.0320	0.00900	0.0185	0.0120	0.0270
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0500	0.00250
1998	-1.044	-1.292	0.378	0.008	0.0690	0.000991
1999	-0.383	-1.137	0.201	0.592	0.0860	0.00156
2000	2.127	4.551	0.353	0.019	0.106	0.00386
2001	-1.779	3.135	0.333	0.127	0.0420	0.000458

2002	-0.668	-2.210	0.275	0.322	0.0870	0.00225
2003	0.497	-0.564	0.176	0.692	0.0780	0.00181

Calcium

Figure 202 presents the seasonal mean calcium trend in Seventh Lake, while Table 160 presents descriptive statistics for calcium in Seventh Lake. The calcium in Seventh Lake exhibited no discernible trend. The calcium in Seventh Lake was slightly higher than the county average, though this difference was not statistically significant in most years.

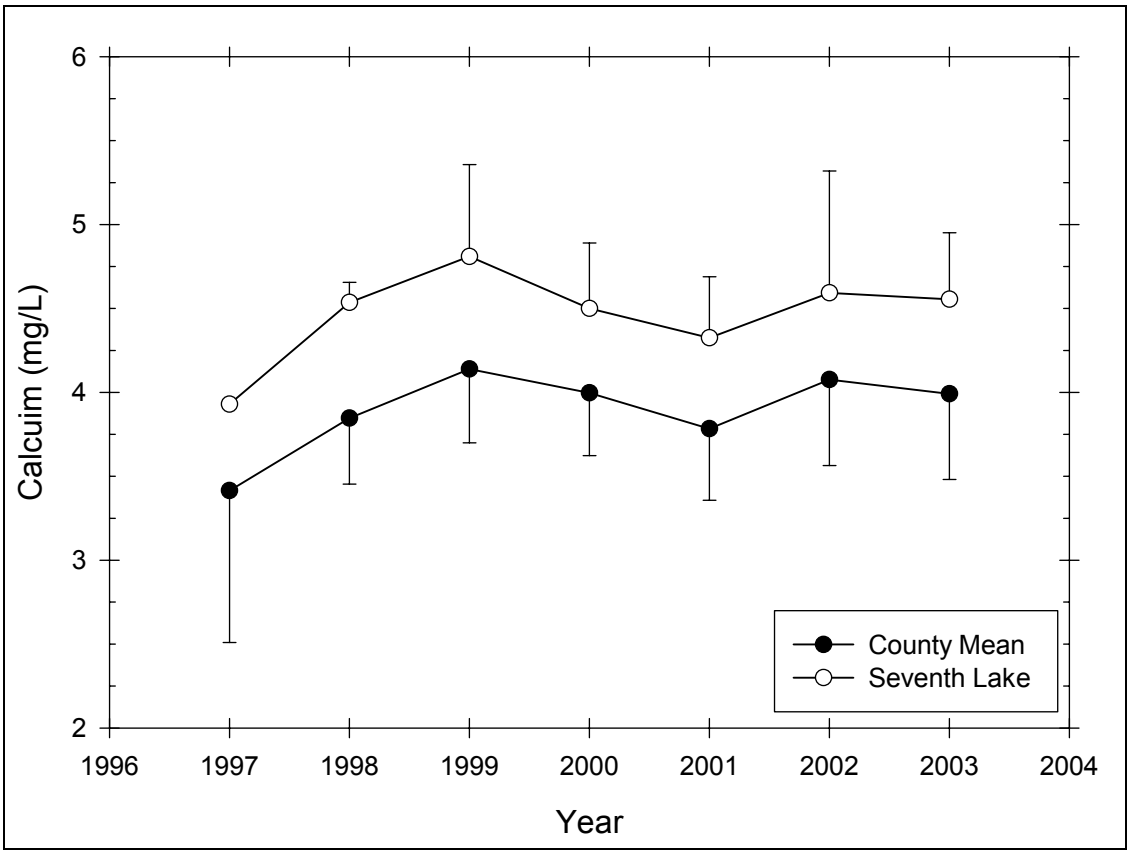


Figure 202 Seasonal mean calcium trend in Seventh Lake

Table 160 – Descriptive Statistics for Calcium in Seventh Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	3.930	--	--	--
1998	6	0	4.535	0.115	0.0468	0.120
1999	6	1	4.810	0.441	0.197	0.547
2000	6	0	4.500	0.371	0.151	0.389
2001	6	2	4.325	0.228	0.114	0.363
2002	6	2	4.592	0.457	0.229	0.728
2003	6	2	4.555	0.249	0.125	0.396
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	3.930	3.930	3.930	3.930	3.930
1998	0.300	4.670	4.370	4.545	4.440	4.640

1999	0.980	5.150	4.170	5.050	4.440	5.150
2000	1.010	5.090	4.080	4.435	4.250	4.710
2001	0.540	4.580	4.040	4.340	4.155	4.495
2002	1.000	5.050	4.050	4.635	4.220	4.965
2003	0.550	4.740	4.190	4.645	4.400	4.710
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	3.930	15.445
1998	-0.344	-1.083	0.184	0.626	27.210	123.463
1999	-0.933	-1.240	0.307	0.129	24.050	116.457
2000	0.677	-0.307	0.223	0.410	27.000	122.188
2001	-0.342	-0.165	0.155	0.710	17.300	74.979
2002	-0.338	-2.907	0.235	0.497	18.370	84.992
2003	-1.734	3.109	0.337	0.117	18.220	83.178

Calcite Saturation Index

Figure 203 presents the calcite saturation index trend in Seventh Lake. The CSI in Seventh Lake exhibited a slight decreasing trend from 1997 to 2003, within the low vulnerability to acid deposition rain throughout the period. The CSI in Seventh Lake was slightly lower than the county average, though this difference was not statistically significant.

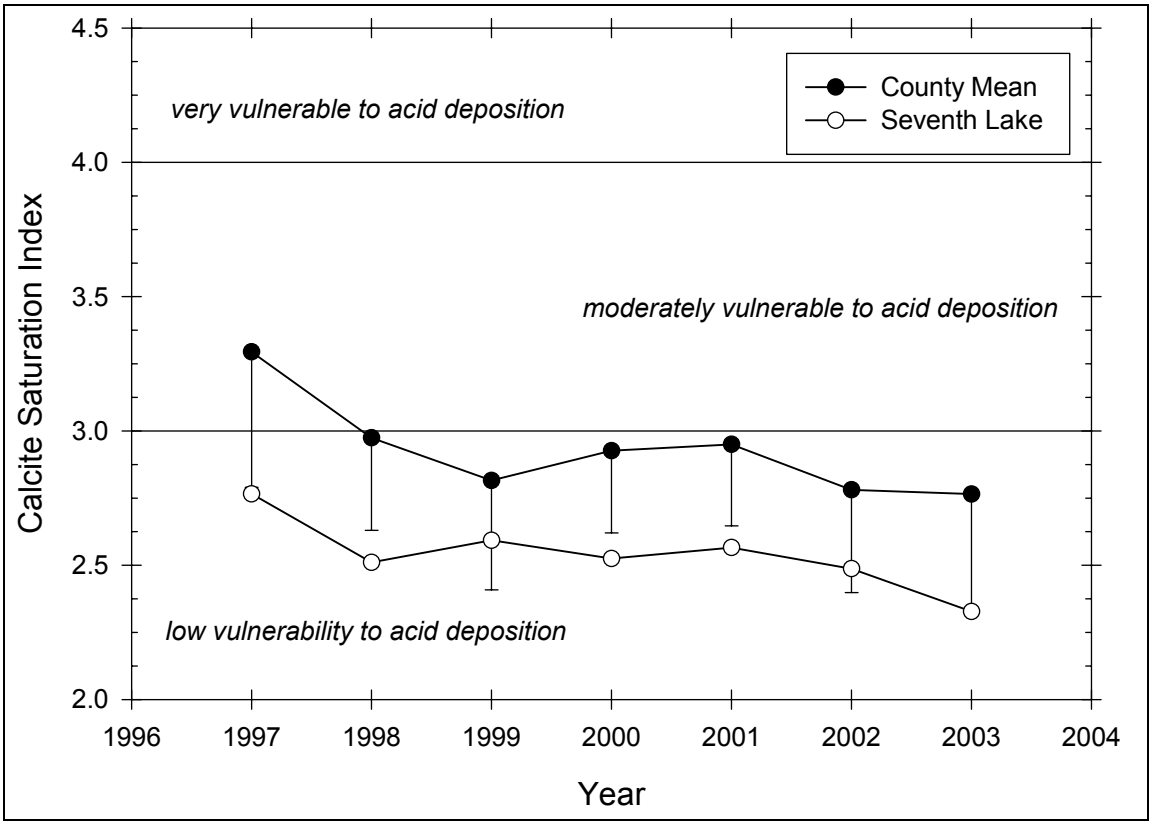
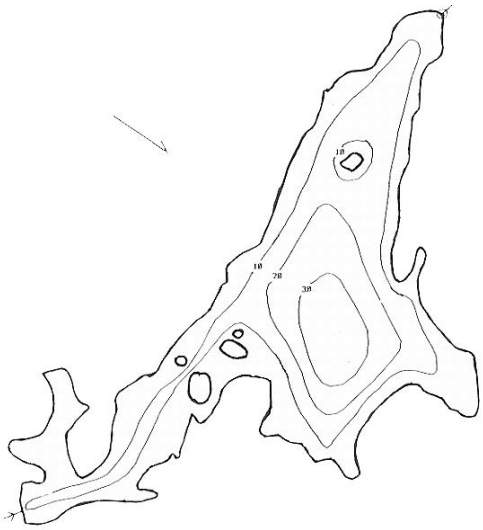


Figure 203 Seasonal mean CSI trend in Seventh Lake

Sixth Lake

Location
Pond Number: 040787A
Watershed: Black River
County: Hamilton
Topographic Quadrangle: Old Forge
Sample Site
Latitude: 43o 44.920'
Longitude: 74o 46.431'
Morphometry
Surface Area: 108 Ac.
Mean Depth: 12 Ft.
Maximum Depth: 43 Ft.
Volume: 1,296 Ac./Ft.
Watershed Area: 11,953 Ac.
Hydraulic Retention Time: 0.04 Yr.
Shoreline Length: 3.8 Mi.
Elevation: 1,785 Ft.
Water Quality Classification: A
Trophic State: Mesotrophic



Temperature and Dissolved Oxygen

Sixth Lake had a minimum DO of 0.2 mg/L (September 1996), with a minimum temperature of 5.0°C and a maximum temperature of 24.4°C. In general, the lowest DO values occurred during the months of July through September.

pH

Figure 204 presents the seasonal mean pH trend in Sixth Lake, while Table 161 presents descriptive statistics for pH in Sixth Lake. The pH in Sixth Lake exhibited an increasing trend from 1996 to 1998 followed by a relatively stable period from 1998 to 2003. The pH in Sixth Lake was slightly higher than the county average from 1993 through 1998, though this difference was not statistically significant.

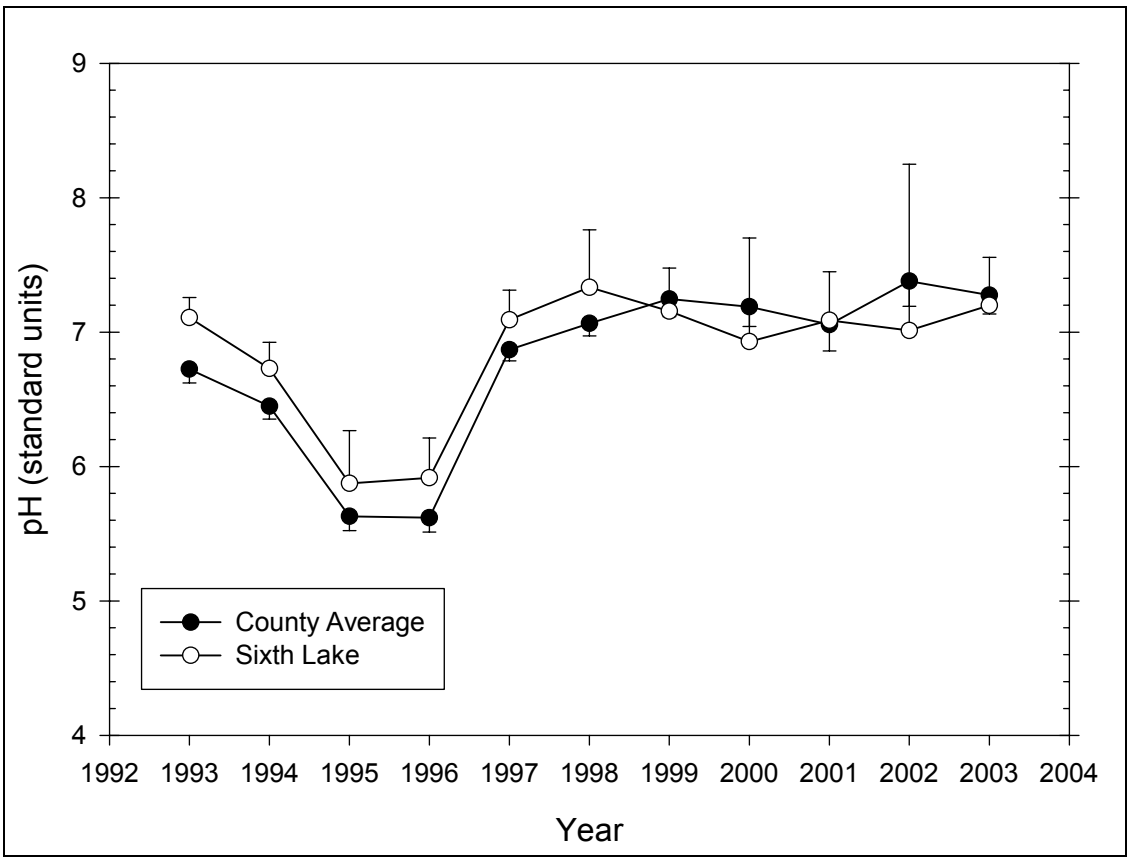


Figure 204 Seasonal mean pH trend in Sixth Lake

Table 161 – Descriptive Statistics for pH in Sixth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	7.108	0.121	0.0540	0.150
1994	6	0	6.730	0.186	0.0759	0.195
1995	6	0	5.875	0.374	0.153	0.393
1996	6	0	5.917	0.281	0.115	0.295
1997	6	0	7.092	0.210	0.0859	0.221
1998	6	0	7.333	0.407	0.166	0.427
1999	5	0	7.156	0.259	0.116	0.321
2000	6	0	6.930	0.734	0.300	0.771
2001	4	0	7.088	0.227	0.114	0.362
2002	4	0	7.013	0.778	0.389	1.238
2003	4	0	7.200	0.224	0.112	0.357
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.290	7.220	6.930	7.100	7.035	7.220
1994	0.470	6.970	6.500	6.755	6.550	6.850
1995	0.960	6.330	5.370	5.960	5.490	6.140
1996	0.770	6.280	5.510	5.890	5.780	6.150
1997	0.570	7.500	6.930	7.040	6.940	7.100
1998	1.150	7.940	6.790	7.330	7.020	7.590
1999	0.610	7.510	6.900	7.180	6.908	7.338
2000	2.180	8.000	5.820	6.910	6.640	7.300
2001	0.540	7.370	6.830	7.075	6.920	7.255

2002	1.740	7.610	5.870	7.285	6.555	7.470
2003	0.480	7.510	7.030	7.130	7.035	7.365
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.684	-0.223	0.223	0.484	35.540	252.677
1994	-0.0621	-1.846	0.223	0.413	40.380	271.930
1995	-0.404	-1.423	0.204	0.520	35.250	207.794
1996	-0.149	-0.843	0.186	0.614	35.500	210.438
1997	1.936	4.124	0.318	0.059	42.550	301.972
1998	0.219	-0.201	0.170	0.689	44.000	323.494
1999	0.353	-1.311	0.229	0.453	35.780	256.309
2000	-0.0926	0.637	0.180	0.646	41.580	290.845
2001	0.293	0.0193	0.159	0.709	28.350	201.086
2002	-1.749	3.296	0.365	0.067	28.050	198.516
2003	1.227	0.612	0.262	0.378	28.800	207.511

Alkalinity

Figure 205 presents the seasonal mean alkalinity trend in Sixth Lake, while Table 162 presents descriptive statistics for alkalinity in Sixth Lake. The alkalinity in Sixth Lake exhibited no discernible trend. The alkalinity in Sixth Lake was slightly higher than the county average, though this difference was not statistically significant.

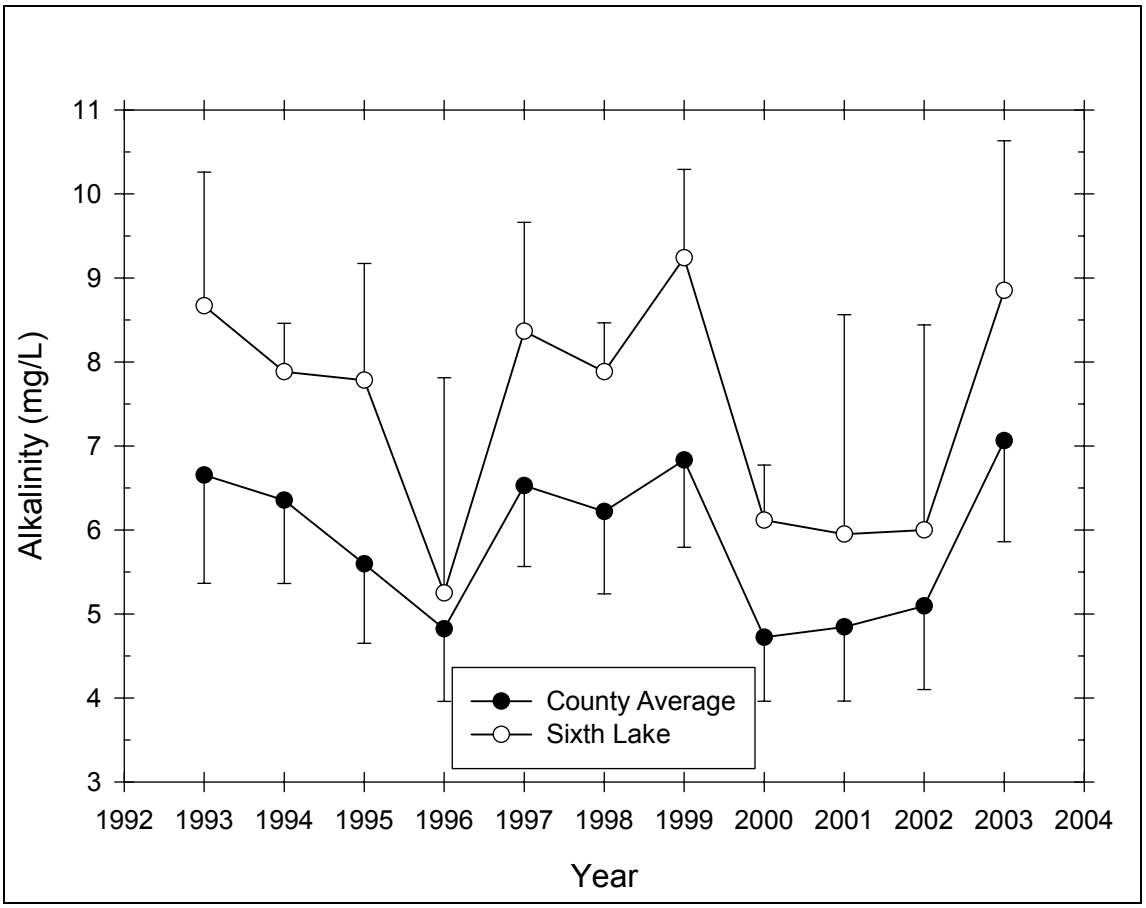


Figure 205 Seasonal mean alkalinity trend in Sixth Lake

Table 162 – Descriptive Statistics for Alkalinity in Sixth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	5	2	8.667	0.643	0.371	1.597
1994	6	0	7.883	0.549	0.224	0.576
1995	6	0	7.783	1.323	0.540	1.388
1996	6	0	5.250	2.442	0.997	2.563
1997	6	0	8.367	1.234	0.504	1.295
1998	6	0	7.883	0.556	0.227	0.584
1999	6	1	9.240	0.847	0.379	1.052
2000	6	0	6.117	0.624	0.255	0.655
2001	6	2	5.950	1.642	0.821	2.613
2002	6	2	6.000	1.534	0.767	2.441
2003	6	2	8.850	1.121	0.561	1.784
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.200	9.400	8.200	8.400	8.250	9.150
1994	1.500	8.600	7.100	8.000	7.400	8.200
1995	3.000	9.500	6.500	7.200	6.900	9.400
1996	6.400	6.700	0.300	6.100	5.900	6.400
1997	3.000	9.600	6.600	8.650	7.300	9.400
1998	1.500	8.800	7.300	7.800	7.400	8.200
1999	2.200	10.100	7.900	9.500	8.725	9.800
2000	1.700	6.800	5.100	6.250	5.700	6.600
2001	4.000	8.000	4.000	5.900	4.850	7.050
2002	3.400	7.700	4.300	6.000	4.750	7.250
2003	2.700	10.200	7.500	8.850	8.050	9.650
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.545	--	0.328	0.225	26.000	226.160
1994	-0.332	-0.811	0.179	0.651	47.300	374.390
1995	0.771	-1.852	0.281	0.148	46.700	372.230
1996	-2.373	5.716	0.438	<0.001	31.500	195.190
1997	-0.509	-1.728	0.250	0.270	50.200	427.620
1998	0.843	0.229	0.155	0.739	47.300	374.430
1999	-1.143	1.272	0.221	0.498	46.200	429.760
2000	-0.844	0.0764	0.220	0.431	36.700	226.430
2001	0.179	1.225	0.214	0.586	23.800	149.700
2002	5.551E-017	-2.953	0.199	0.636	24.000	151.060
2003	-9.918E-015	0.538	0.162	0.708	35.400	317.060

Total Phosphorus

Figure 206 presents the seasonal mean total phosphorus trend in Sixth Lake, while Table 163 presents descriptive statistics for total phosphorus in Sixth Lake. The total phosphorus in Sixth Lake exhibited a stable trend from 1994 to 2000, followed by a decreasing trend from 2000 to 2002. The total phosphorus in Sixth Lake was similar to but more variable than the county average. Any difference between the two was not statistically significant.

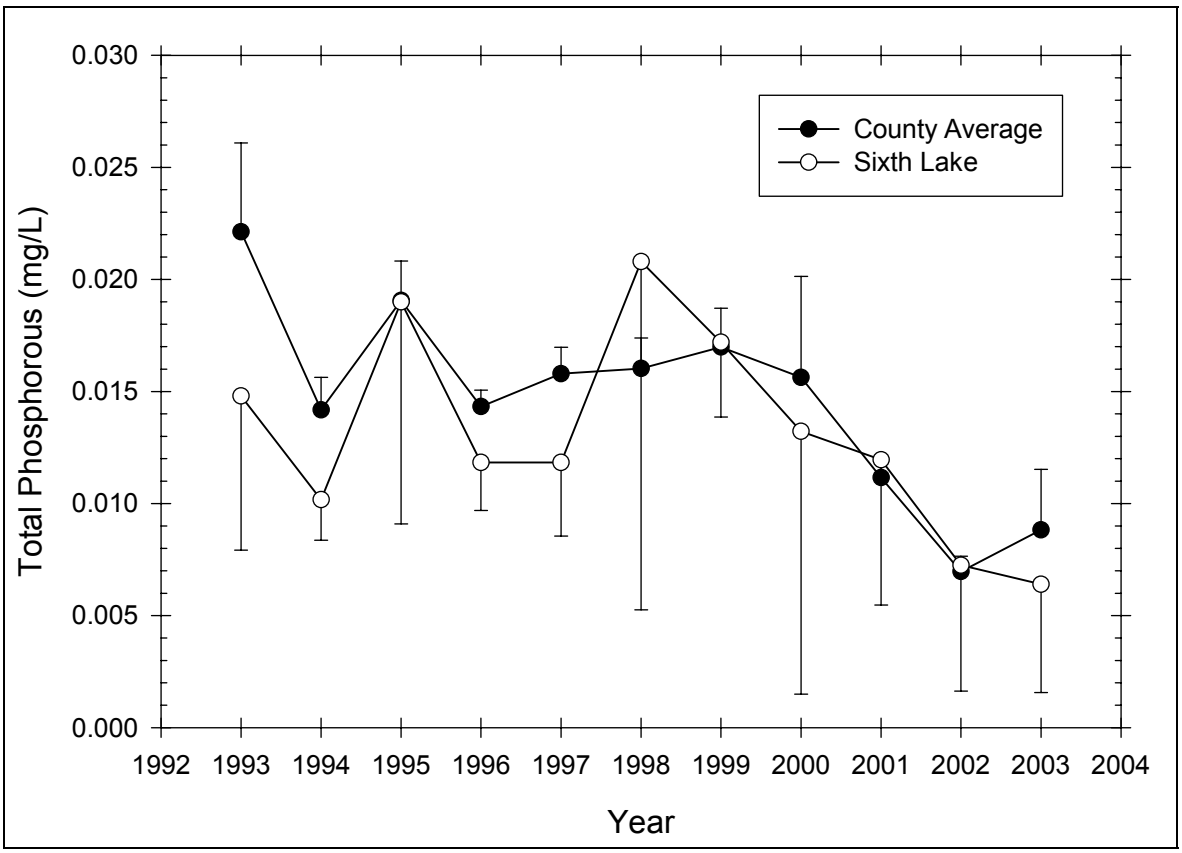


Figure 206 Seasonal mean total phosphorus trend in Sixth Lake

Table 163 – Descriptive Statistics for Total Phosphorus in Sixth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0148	0.00554	0.00248	0.00688
1994	6	0	0.0102	0.00172	0.000703	0.00181
1995	6	0	0.0190	0.00944	0.00386	0.00991
1996	6	0	0.0118	0.00204	0.000833	0.00214
1997	6	0	0.0118	0.00313	0.00128	0.00328
1998	6	1	0.0208	0.0125	0.00560	0.0155
1999	6	1	0.0172	0.00268	0.00120	0.00333
2000	6	1	0.0132	0.00944	0.00422	0.0117
2001	6	2	0.0120	0.00407	0.00204	0.00648
2002	6	2	0.00725	0.00353	0.00177	0.00562
2003	6	2	0.00640	0.00304	0.00152	0.00484
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0150	0.0210	0.00600	0.0160	0.0120	0.0180
1994	0.00400	0.0120	0.00800	0.01000	0.00900	0.0120
1995	0.0240	0.0320	0.00800	0.0200	0.00900	0.0250
1996	0.00600	0.0140	0.00800	0.0120	0.0120	0.0130
1997	0.00800	0.0150	0.00700	0.0120	0.01000	0.0150
1998	0.0310	0.0420	0.0110	0.0190	0.0118	0.0255
1999	0.00600	0.0200	0.0140	0.0160	0.0155	0.0200
2000	0.0211	0.0231	0.00200	0.01000	0.00650	0.0230
2001	0.00940	0.0176	0.00820	0.0110	0.00910	0.0148
2002	0.00690	0.0111	0.00420	0.00685	0.00425	0.0103

2003	0.00630	0.00980	0.00350	0.00615	0.00385	0.00895
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-1.056	1.948	0.243	0.386	0.0740	0.00122
1994	-0.0261	-2.367	0.251	0.267	0.0610	0.000635
1995	0.0491	-1.432	0.188	0.603	0.114	0.00261
1996	-1.572	3.420	0.366	0.012	0.0710	0.000861
1997	-0.536	-0.669	0.178	0.655	0.0710	0.000889
1998	1.678	3.058	0.325	0.090	0.104	0.00279
1999	0.166	-2.407	0.273	0.247	0.0860	0.00151
2000	0.154	-2.442	0.250	0.351	0.0661	0.00123
2001	1.185	1.400	0.245	0.454	0.0478	0.000621
2002	0.196	-4.872	0.298	0.233	0.0290	0.000248
2003	0.218	-4.267	0.265	0.364	0.0256	0.000192

Nitrate

Figure 207 presents the seasonal mean nitrate trend in Sixth Lake, while Table 164 presents descriptive statistics for nitrate in Sixth Lake. The nitrate in Sixth Lake exhibited a decreasing trend from 1997 to 2003. The nitrate in Sixth Lake was slightly higher than the county average, though this difference was not statistically significant.

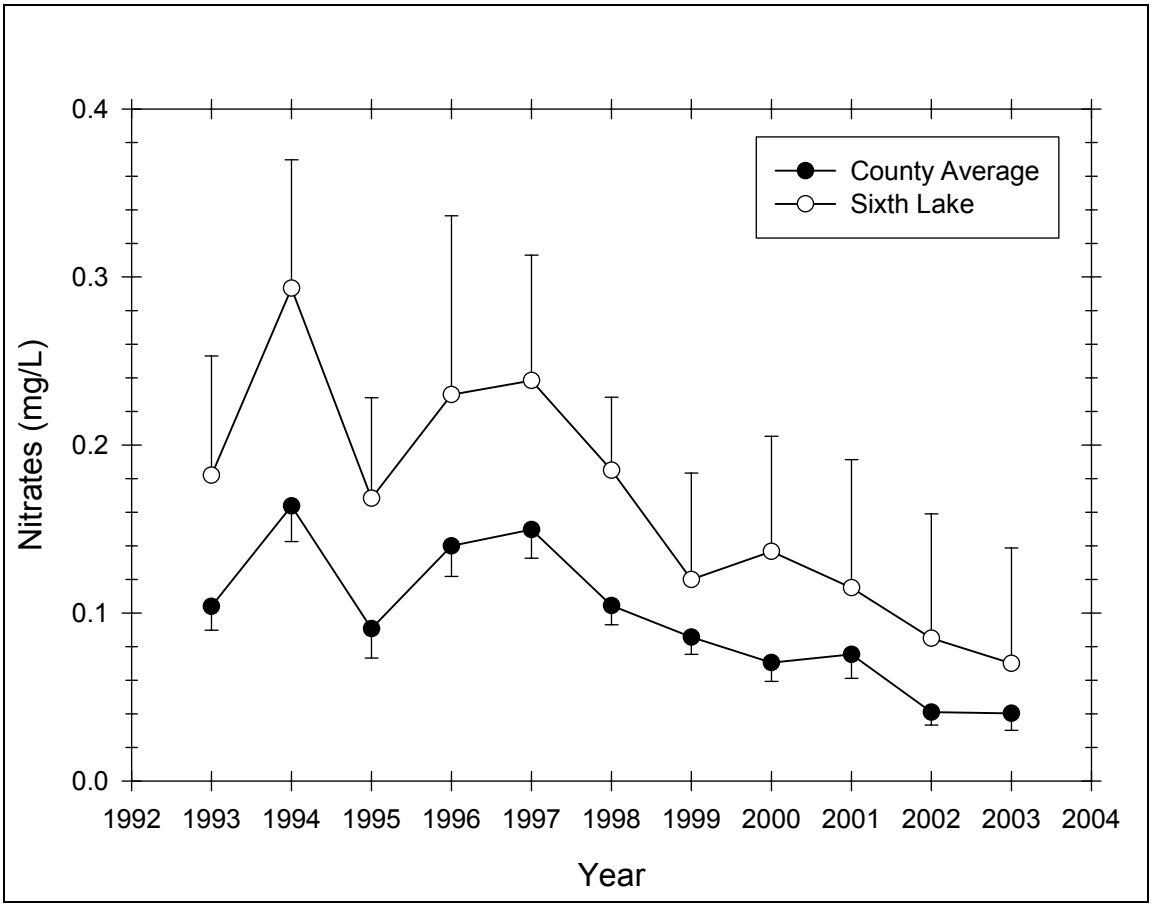


Figure 207 Seasonal mean nitrate trend in Sixth Lake

Table 164 – Descriptive Statistics for X in Sixth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.182	0.0572	0.0256	0.0710
1994	6	0	0.293	0.0728	0.0297	0.0764
1995	6	0	0.168	0.0571	0.0233	0.0599
1996	6	0	0.230	0.101	0.0414	0.106
1997	6	0	0.238	0.0711	0.0290	0.0746
1998	6	0	0.185	0.0414	0.0169	0.0434
1999	6	1	0.120	0.0510	0.0228	0.0633
2000	6	0	0.137	0.0653	0.0267	0.0685
2001	6	2	0.115	0.0480	0.0240	0.0763
2002	6	2	0.0850	0.0465	0.0233	0.0741
2003	6	2	0.0700	0.0432	0.0216	0.0687
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.130	0.240	0.110	0.170	0.140	0.240
1994	0.190	0.400	0.210	0.270	0.250	0.360
1995	0.160	0.250	0.0900	0.160	0.140	0.210
1996	0.260	0.380	0.120	0.210	0.150	0.310
1997	0.180	0.330	0.150	0.225	0.190	0.310
1998	0.110	0.240	0.130	0.185	0.160	0.210
1999	0.120	0.180	0.0600	0.120	0.0750	0.165
2000	0.180	0.250	0.0700	0.120	0.0900	0.170
2001	0.1000	0.160	0.0600	0.120	0.0750	0.155
2002	0.110	0.150	0.0400	0.0750	0.0550	0.115
2003	0.1000	0.130	0.0300	0.0600	0.0400	0.1000
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.0390	-2.088	0.245	0.376	0.910	0.179
1994	0.596	-1.167	0.224	0.407	1.760	0.543
1995	0.149	-0.544	0.190	0.594	1.010	0.186
1996	0.528	-1.297	0.223	0.412	1.380	0.369
1997	0.235	-1.719	0.205	0.514	1.430	0.366
1998	2.956E-015	-1.495	0.227	0.389	1.110	0.214
1999	2.776E-015	-2.260	0.184	0.664	0.600	0.0824
2000	1.158	1.103	0.207	0.501	0.820	0.133
2001	-0.290	-3.958	0.267	0.356	0.460	0.0598
2002	1.190	2.123	0.293	0.252	0.340	0.0354
2003	1.190	1.500	0.250	0.432	0.280	0.0252

Chlorophyll a

Figure 208 presents the seasonal mean chlorophyll *a* trend in Sixth Lake, while Table 165 presents descriptive statistics for chlorophyll *a* in Sixth Lake. The chlorophyll *a* in Sixth Lake exhibited no discernible trend. The chlorophyll *a* in Sixth Lake was slightly lower than the county average, though this difference was not statistically significant.

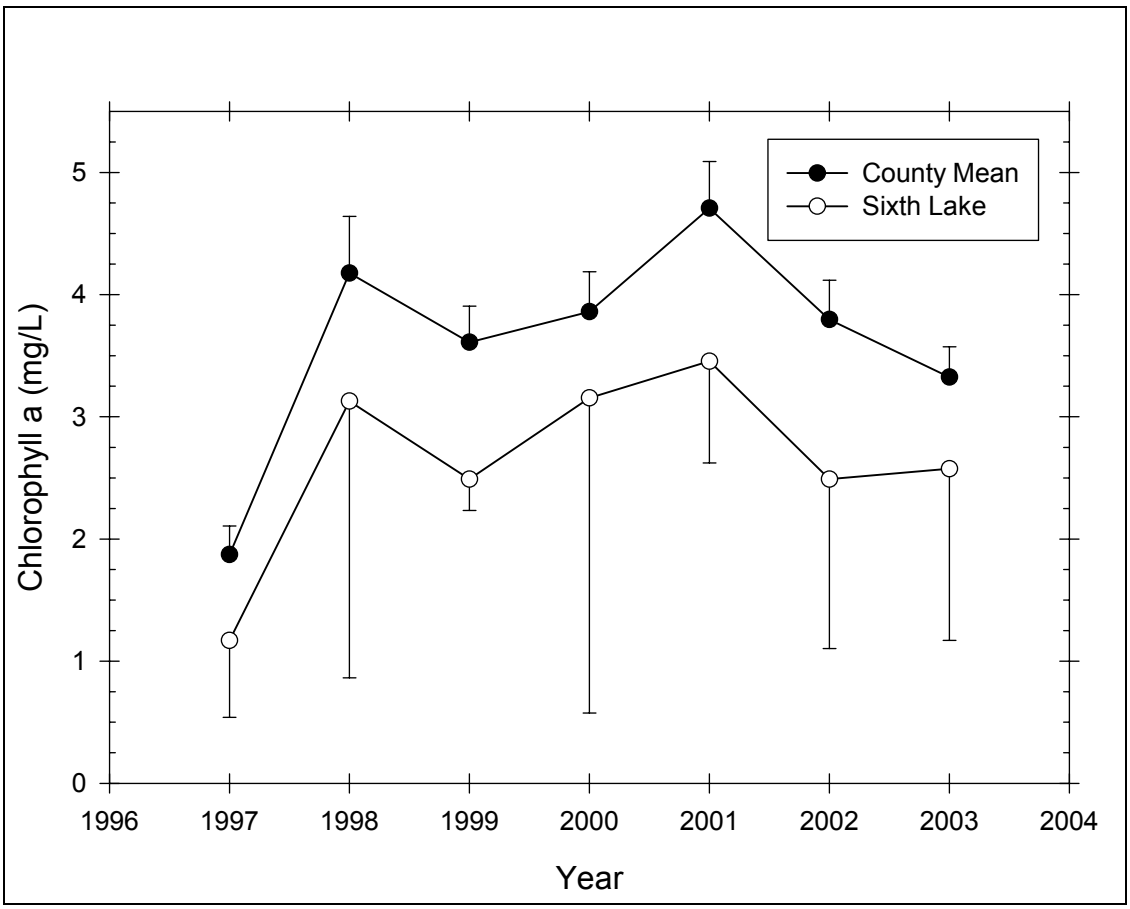


Figure 208 Seasonal mean chlorophyll a trend in Sixth Lake

Table 165 – Descriptive Statistics for Chlorophyll a in Sixth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	1.170	0.600	0.245	0.629
1998	6	0	3.128	2.158	0.881	2.265
1999	6	1	2.490	0.207	0.0925	0.257
2000	6	1	3.154	2.076	0.929	2.578
2001	6	2	3.455	0.523	0.262	0.833
2002	6	2	2.490	0.871	0.435	1.386
2003	6	2	2.575	0.883	0.442	1.405
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	1.650	2.220	0.570	1.065	0.710	1.390
1998	5.730	6.600	0.870	2.935	1.090	4.340
1999	0.540	2.730	2.190	2.470	2.370	2.655
2000	4.830	6.850	2.020	2.190	2.110	3.640
2001	1.090	3.970	2.880	3.485	3.015	3.895
2002	1.880	3.760	1.880	2.160	1.925	3.055
2003	1.950	3.880	1.930	2.245	2.070	3.080
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	1.161	1.307	0.190	0.594	7.020	10.012
1998	0.698	-0.0877	0.161	0.721	18.770	82.001
1999	-0.501	0.0623	0.186	0.656	12.450	31.172

2000	2.183	4.798	0.411	0.006	15.770	66.983
2001	-0.155	-4.353	0.257	0.400	13.820	48.570
2002	1.694	2.808	0.314	0.180	9.960	27.075
2003	1.820	3.487	0.381	0.043	10.300	28.862

Transparency

Figure 209 presents the seasonal mean transparency trend in Sixth Lake, while Table 166 presents descriptive statistics for transparency in Sixth Lake. The transparency in Sixth Lake exhibited a decreasing trend from 1993 to about 2001. The transparency in Sixth Lake was slightly higher than the county average, though this difference was not statistically significant.

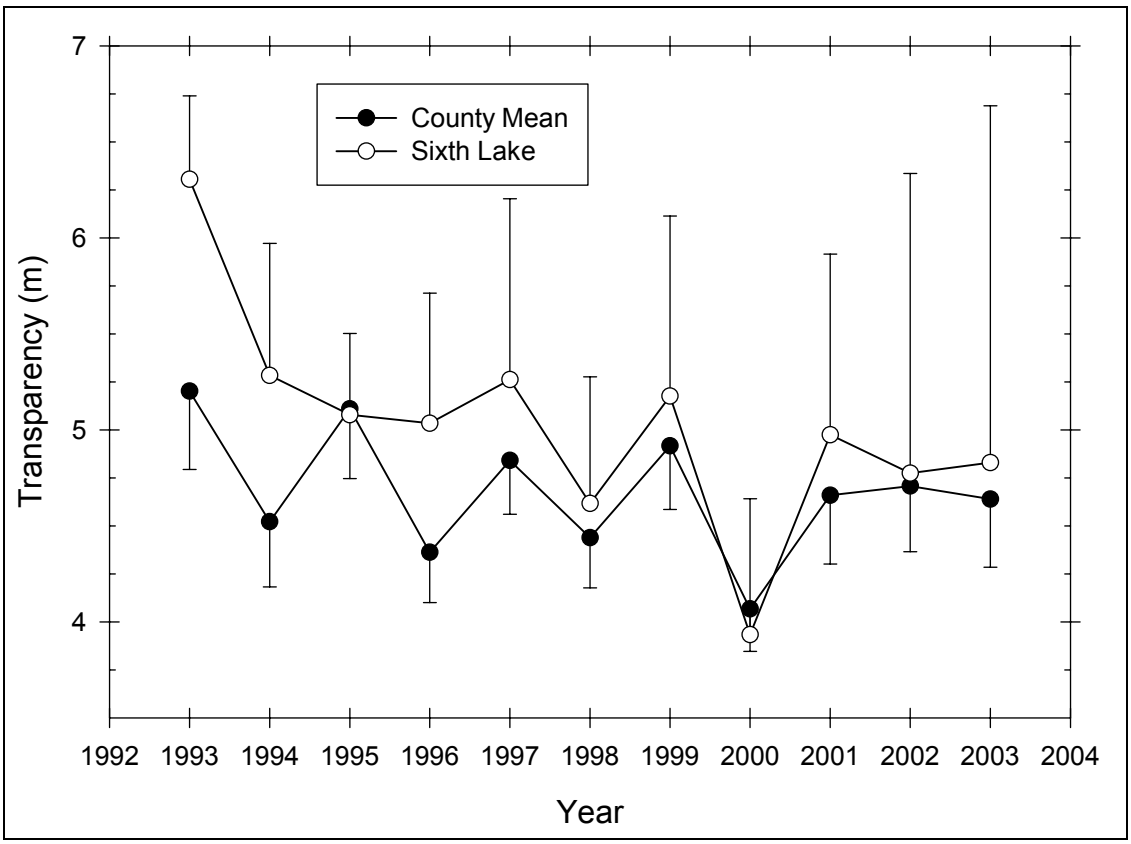


Figure 209 Seasonal mean transparency trend in Sixth Lake

Table 166 – Descriptive Statistics for Transparency in Sixth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	6.304	0.351	0.157	0.435
1994	6	0	5.283	0.655	0.268	0.688
1995	6	0	5.078	0.404	0.165	0.424
1996	6	0	5.035	0.646	0.264	0.678
1997	6	0	5.262	0.898	0.366	0.942
1998	6	0	4.617	0.629	0.257	0.660
1999	5	0	5.176	0.755	0.338	0.938
2000	6	0	3.933	0.675	0.276	0.708

2001	4	0	4.975	0.591	0.295	0.940
2002	4	0	4.775	0.981	0.491	1.561
2003	4	0	4.830	1.168	0.584	1.858
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.760	6.670	5.910	6.210	6.023	6.670
1994	1.700	6.000	4.300	5.450	4.700	5.800
1995	1.200	5.700	4.500	5.150	4.800	5.170
1996	1.600	5.700	4.100	5.300	4.360	5.450
1997	2.010	6.410	4.400	4.955	4.500	6.350
1998	1.570	5.520	3.950	4.415	4.150	5.250
1999	2.000	5.950	3.950	5.310	4.813	5.665
2000	1.900	5.000	3.100	3.775	3.550	4.400
2001	1.400	5.600	4.200	5.050	4.550	5.400
2002	2.200	6.000	3.800	4.650	4.000	5.550
2003	2.830	6.100	3.270	4.975	4.110	5.550
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	0.208	-2.734	0.252	0.341	31.520	199.194
1994	-0.673	-0.986	0.237	0.335	31.700	169.630
1995	0.122	0.758	0.244	0.302	30.470	155.554
1996	-0.805	-1.390	0.326	0.045	30.210	154.192
1997	0.685	-1.876	0.264	0.208	31.570	170.139
1998	0.686	-1.411	0.240	0.319	27.700	129.857
1999	-1.273	2.157	0.260	0.303	25.880	136.236
2000	0.641	-0.00540	0.186	0.614	23.600	95.105
2001	-0.680	0.606	0.200	0.634	19.900	100.050
2002	0.533	-1.712	0.221	0.557	19.100	94.090
2003	-0.729	1.790	0.291	0.259	19.320	97.405

TSI

Figure 210 presents the Carlson trophic state index trend in Sixth Lake. Transparency TSI was generally at the upper oligotrophic range or oligotrophic-mesotrophic boundary, while chlorophyll *a* TSI was generally at the upper mesotrophic range or lower eutrophic range.

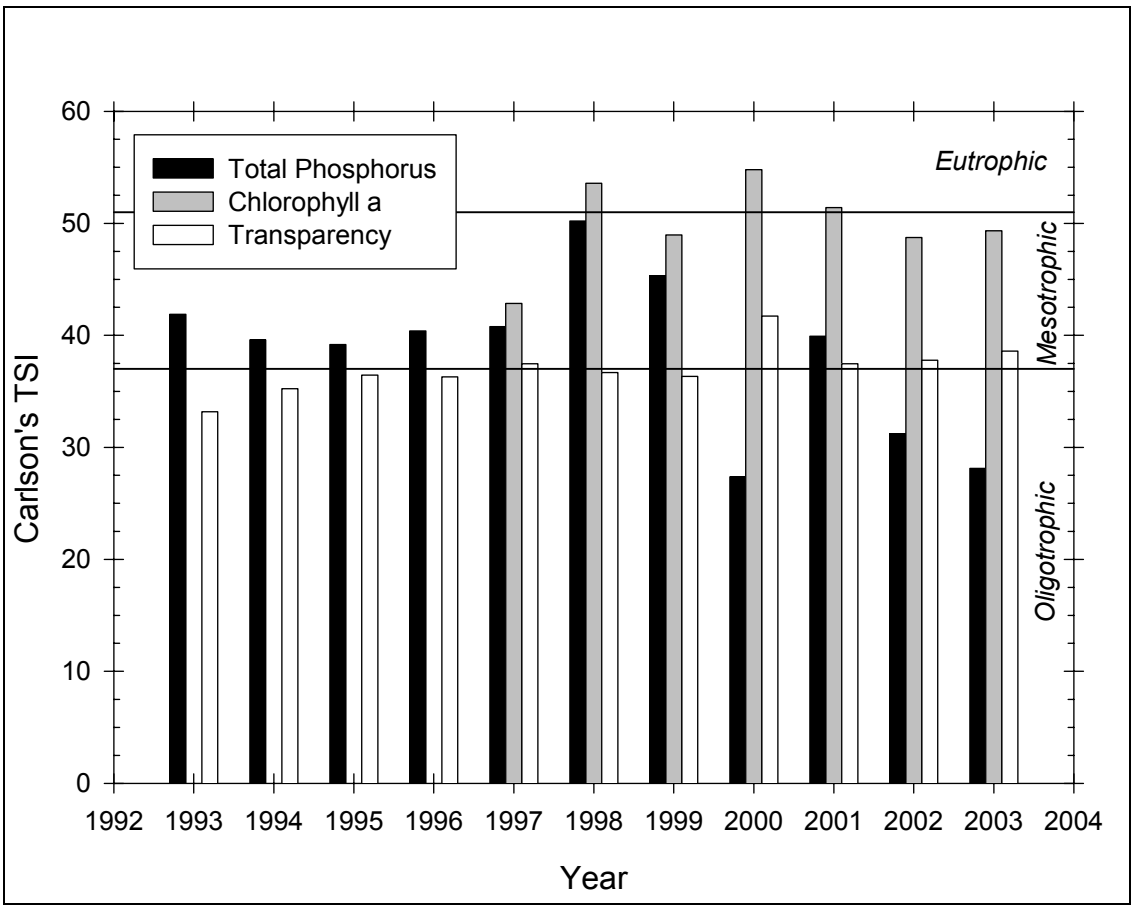


Figure 210 Carlson TSI trend in Sixth Lake

Aluminum

Figure 211 presents the seasonal mean aluminum trend in Sixth Lake, while Table 167 presents descriptive statistics for aluminum in Sixth Lake. The aluminum in Sixth Lake was generally variable from year to year and exhibited no discernible trend other than a higher value in 1997. The aluminum in Sixth Lake was slightly lower than the county average, though this difference was not statistically significant.

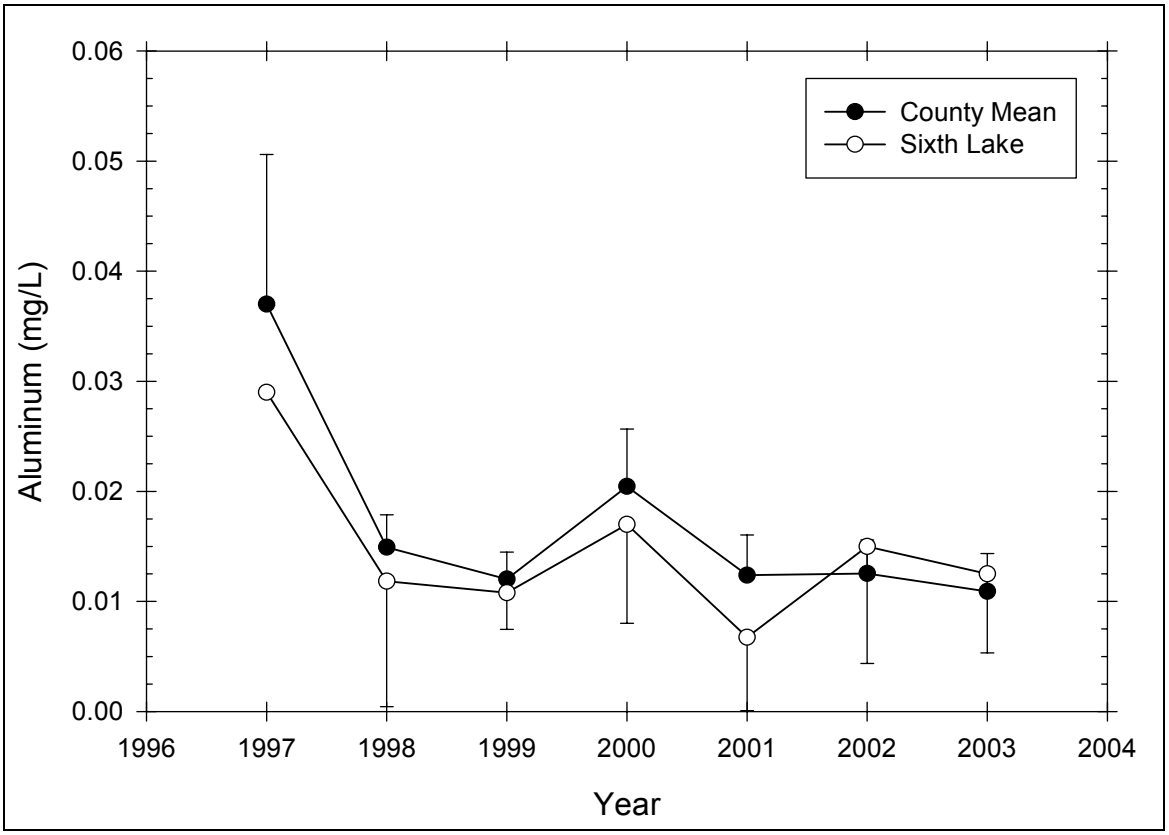


Figure 211 Seasonal mean aluminum trend in Sixth Lake

Table 167 – Descriptive Statistics for Aluminum in Sixth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0290	--	--	--
1998	6	0	0.0118	0.0109	0.00443	0.0114
1999	6	1	0.0108	0.00268	0.00120	0.00333
2000	6	0	0.0170	0.00856	0.00349	0.00898
2001	6	2	0.00675	0.00419	0.00210	0.00667
2002	6	2	0.0150	0.00668	0.00334	0.0106
2003	6	2	0.0125	0.00451	0.00225	0.00718
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0290	0.0290	0.0290	0.0290	0.0290
1998	0.0280	0.0280	0.000	0.0120	0.001000	0.0180
1999	0.00600	0.0150	0.00900	0.00900	0.00900	0.0128
2000	0.0220	0.0310	0.00900	0.0155	0.00900	0.0220
2001	0.01000	0.0110	0.001000	0.00750	0.00400	0.00950
2002	0.0140	0.0250	0.0110	0.0120	0.0115	0.0185
2003	0.01000	0.0190	0.00900	0.0110	0.00950	0.0155
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0290	0.000841
1998	0.363	-1.018	0.174	0.671	0.0710	0.00143
1999	1.258	0.313	0.349	0.046	0.0540	0.000612
2000	0.854	-0.0459	0.180	0.645	0.102	0.00210
2001	-1.007	1.829	0.274	0.328	0.0270	0.000235

2002	1.970	3.906	0.423	0.012	0.0600	0.00103
2003	1.571	2.417	0.294	0.247	0.0500	0.000686

Calcium

Figure 212 presents the seasonal mean calcium trend in Sixth Lake, while Table 168 presents descriptive statistics for calcium in Sixth Lake. The calcium in Sixth Lake exhibited an increasing trend from 1997 to 2000 with stable values from 2000 to 2003. The calcium in Sixth Lake was higher than the county average, though this difference may not be statistically significant for all years.

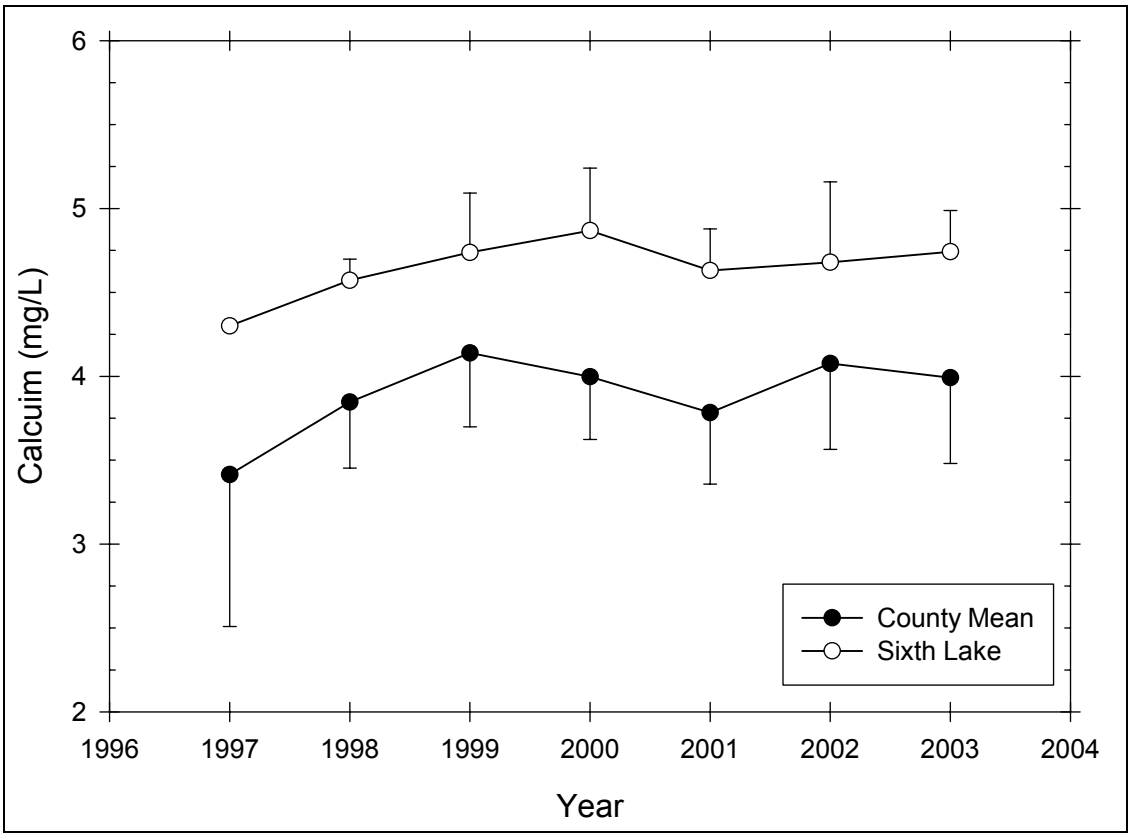


Figure 212 Seasonal mean calcium trend in Sixth Lake

Table 168 – Descriptive Statistics for Calcium in Sixth Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	4.300	--	--	--
1998	6	0	4.572	0.120	0.0492	0.126
1999	6	1	4.738	0.285	0.127	0.354
2000	6	0	4.868	0.354	0.145	0.372
2001	6	2	4.630	0.156	0.0782	0.249
2002	6	2	4.680	0.301	0.150	0.479
2003	6	2	4.742	0.154	0.0772	0.246
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	4.300	4.300	4.300	4.300	4.300
1998	0.280	4.690	4.410	4.580	4.480	4.690

1999	0.760	5.120	4.360	4.670	4.578	4.947
2000	0.940	5.520	4.580	4.720	4.650	5.020
2001	0.360	4.780	4.420	4.660	4.515	4.745
2002	0.730	5.010	4.280	4.715	4.495	4.865
2003	0.330	4.940	4.610	4.710	4.620	4.865
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	4.300	18.490
1998	-0.247	-2.260	0.242	0.309	27.430	125.473
1999	0.0767	0.0498	0.194	0.622	23.690	112.568
2000	1.600	2.270	0.276	0.163	29.210	142.831
2001	-0.938	0.377	0.199	0.636	18.520	85.821
2002	-0.685	1.758	0.290	0.264	18.720	87.881
2003	0.736	-1.785	0.267	0.357	18.970	90.037

Calcite Saturation Index

Figure 212 presents the calcite saturation index trend in Sixth Lake. The CSI in Sixth Lake exhibited no consistent trend for the period of record. The CSI in Sixth Lake was slightly lower than the county average, though this difference was not statistically significant.

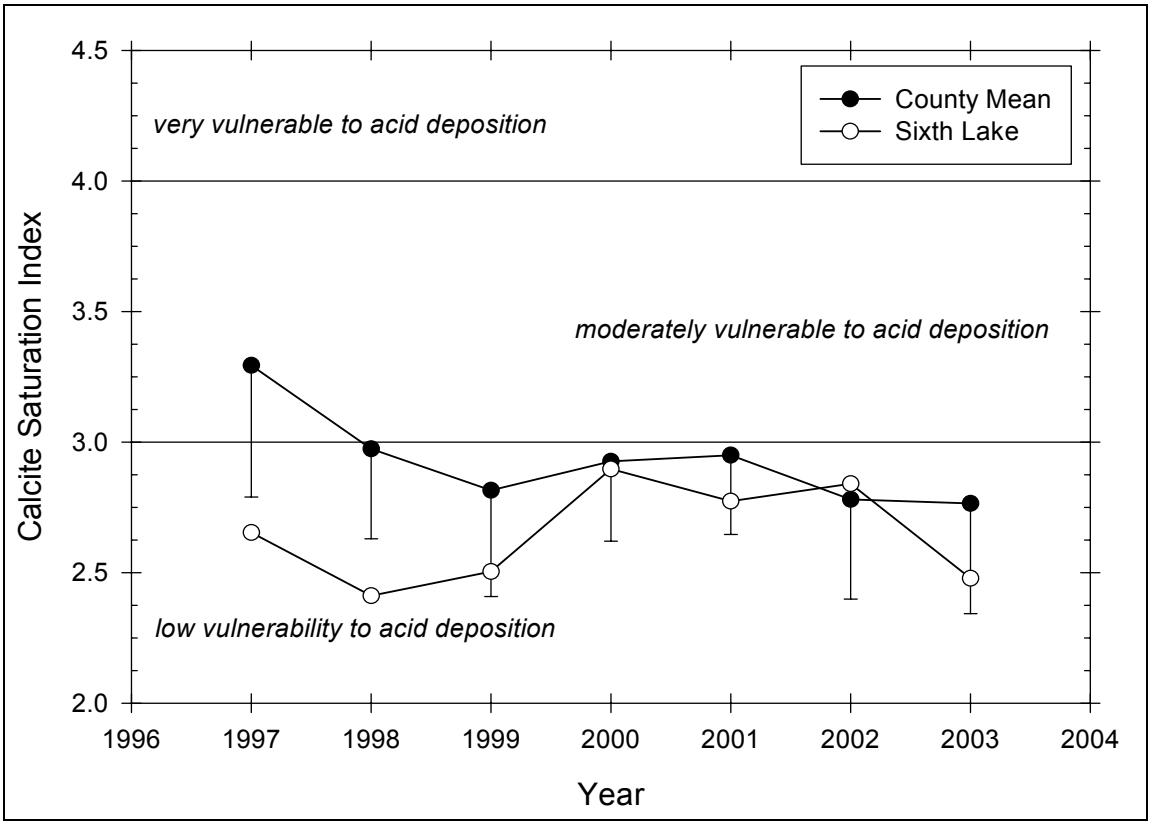
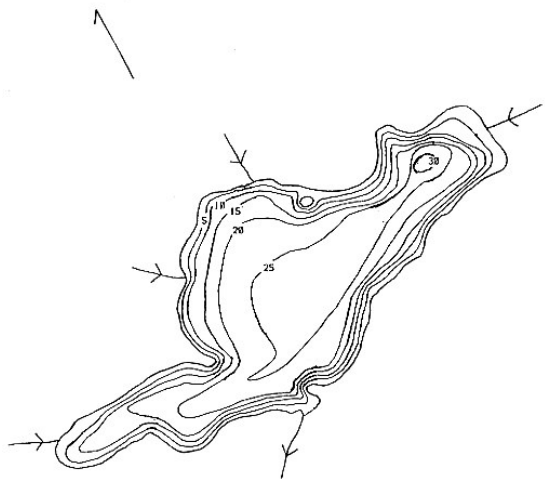


Figure 213 Seasonal mean CSI trend in Sixth Lake

Spy Lake

Location
Pond Number: 050232
Watershed: Upper Hudson River
County: Hamilton
Topographic Quadrangle: Piseco Lake
Sample Site
Latitude: 43o 23.910'
Longitude: 74o 30.728'
Morphometry
Surface Area: 374 Ac.
Mean Depth: 17 Ft.
Maximum Depth: 30 Ft.
Volume: 6,358 Ac./Ft.
Watershed Area: 2,234 Ac.
Hydraulic Retention Time: 1.0 Yr.
Shoreline Length: 4.6 Mi.
Elevation: 1,657 Ft.
Water Quality Classification: C
Trophic State: Mesotrophic



Temperature and Dissolved Oxygen

Spy Lake had a minimum DO of 0.1 mg/L (August 2003), with a minimum temperature of 7.5°C and a maximum temperature of 25.3°C. In general, the lowest DO values occurred during the months of July through August.

pH

Figure 214 presents the seasonal mean pH trend in Spy Lake, while Table 169 presents descriptive statistics for pH in Spy Lake. The pH in Spy Lake exhibited an increasing trend from 1996 to 1997 followed by relatively stable values from 1997 to 2003. The pH in Spy Lake was slightly lower than the county average, though this difference may not be statistically significant for all years.

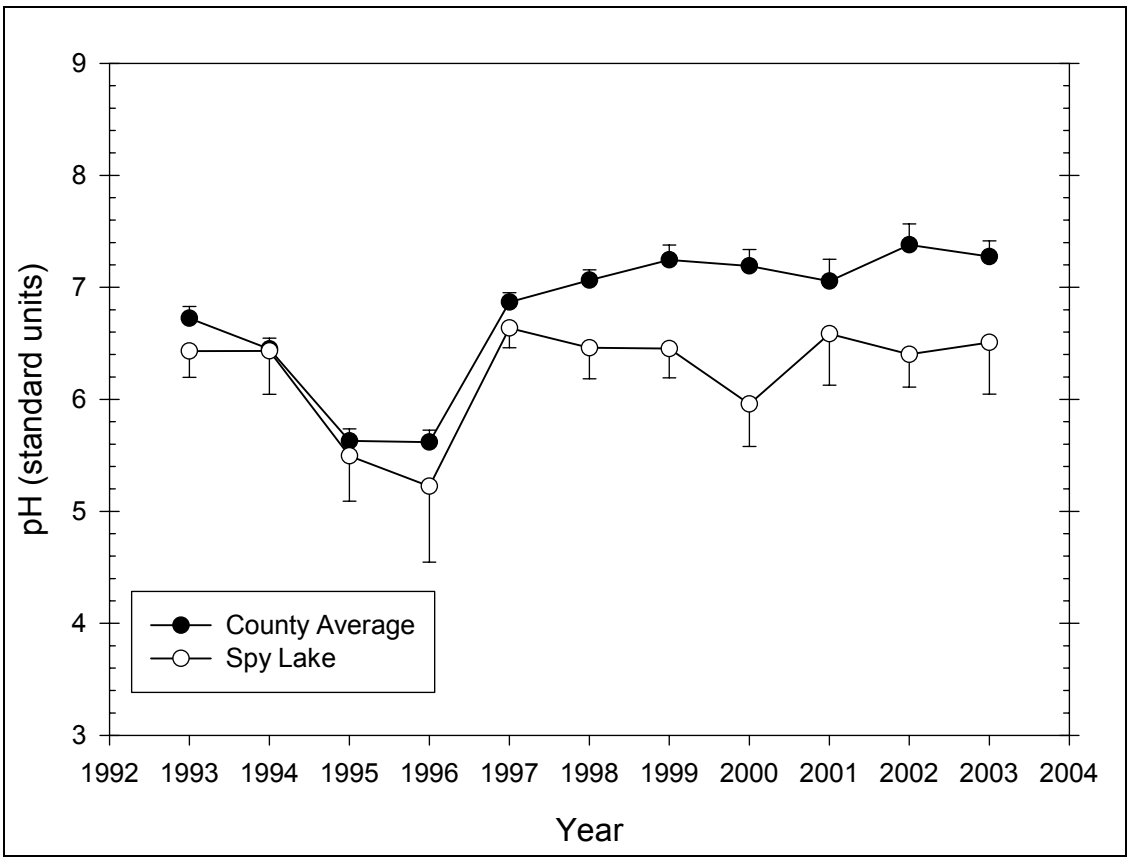


Figure 214 Seasonal mean pH trend in Spy Lake

Table 169 – Descriptive Statistics for pH in Spy Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	6.432	0.189	0.0847	0.235
1994	6	0	6.433	0.369	0.151	0.387
1995	6	0	5.495	0.385	0.157	0.404
1996	6	0	5.225	0.646	0.264	0.677
1997	6	0	6.637	0.168	0.0687	0.177
1998	5	0	6.460	0.222	0.0995	0.276
1999	5	0	6.454	0.210	0.0941	0.261
2000	6	0	5.958	0.362	0.148	0.380
2001	5	0	6.586	0.370	0.165	0.459
2002	4	0	6.402	0.185	0.0924	0.294
2003	4	0	6.508	0.290	0.145	0.461
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.390	6.600	6.210	6.500	6.240	6.600
1994	1.080	7.080	6.000	6.390	6.200	6.540
1995	1.040	6.090	5.050	5.470	5.210	5.680
1996	1.700	6.360	4.660	4.950	4.820	5.610
1997	0.470	6.930	6.460	6.595	6.530	6.710
1998	0.500	6.790	6.290	6.340	6.290	6.640
1999	0.480	6.610	6.130	6.590	6.295	6.595
2000	0.850	6.380	5.530	5.960	5.670	6.250
2001	0.880	7.070	6.190	6.600	6.243	6.875

2002	0.410	6.570	6.160	6.440	6.260	6.545
2003	0.690	6.870	6.180	6.490	6.295	6.720
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.440	-3.006	0.240	0.398	32.160	206.997
1994	1.056	1.810	0.220	0.432	38.600	249.007
1995	0.527	-0.666	0.212	0.476	32.970	181.911
1996	1.361	1.116	0.285	0.133	31.350	165.888
1997	1.150	1.257	0.197	0.560	39.820	264.414
1998	1.006	-0.846	0.305	0.134	32.300	208.856
1999	-1.177	-0.0862	0.341	0.058	32.270	208.448
2000	-0.0136	-2.686	0.257	0.240	35.750	213.665
2001	0.229	-1.781	0.211	0.546	32.930	217.425
2002	-0.846	-0.818	0.238	0.487	25.610	164.071
2003	0.324	0.134	0.165	0.706	26.030	169.642

Alkalinity

Figure 215 presents the seasonal mean alkalinity trend in Spy Lake, while Table 170 presents descriptive statistics for alkalinity in Spy Lake. The alkalinity in Spy Lake did not exhibit any strong trends, although the overall trend from 1993 to 2003 was for slightly decreasing alkalinity. The alkalinity in Spy Lake was significantly lower than the county average.

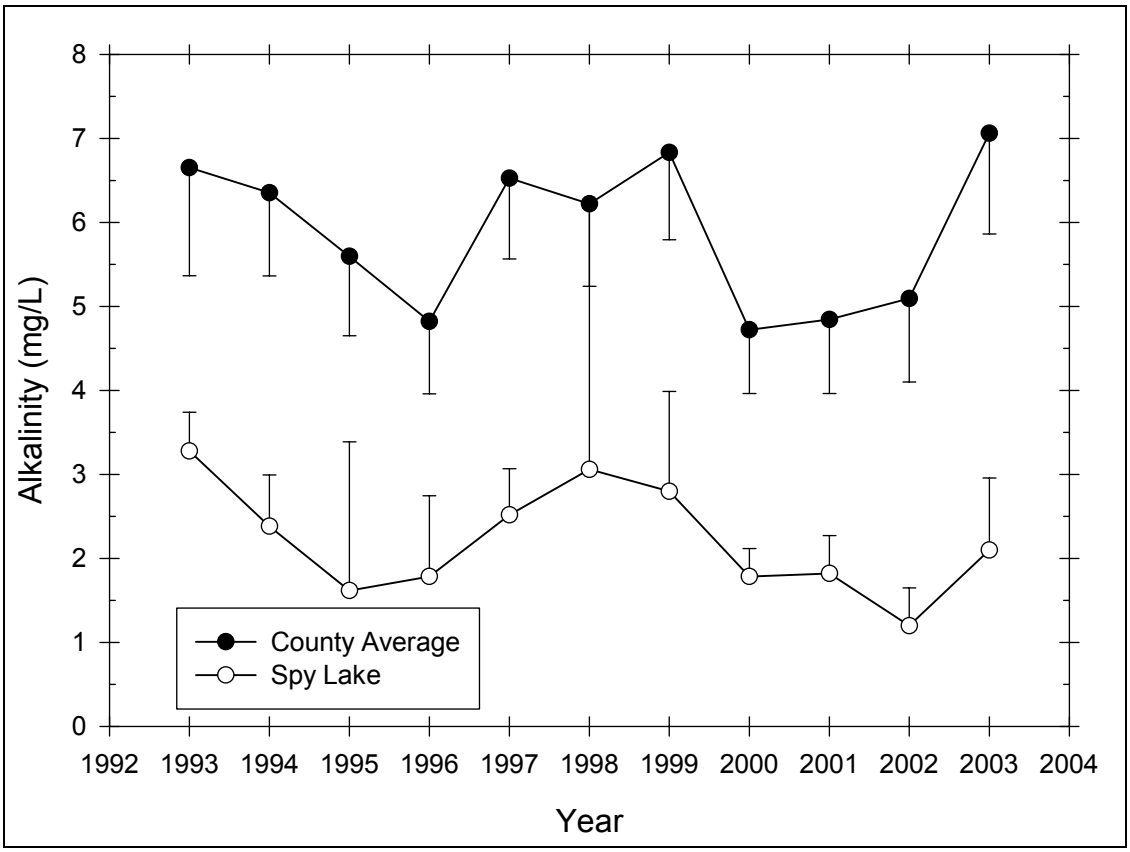


Figure 215 Seasonal mean alkalinity trend in Spy Lake

Table 170 – Descriptive Statistics for Alkalinity in Spy Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	3.280	0.370	0.166	0.460
1994	6	0	2.383	0.581	0.237	0.610
1995	6	0	1.617	1.688	0.689	1.772
1996	6	0	1.783	0.917	0.375	0.963
1997	6	0	2.517	0.527	0.215	0.553
1998	5	0	3.060	2.548	1.140	3.164
1999	6	1	2.800	0.957	0.428	1.188
2000	6	0	1.783	0.319	0.130	0.335
2001	6	1	1.820	0.363	0.162	0.451
2002	6	2	1.200	0.283	0.141	0.450
2003	6	1	2.100	0.689	0.308	0.856
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	1.000	3.700	2.700	3.400	3.075	3.475
1994	1.700	3.000	1.300	2.500	2.300	2.700
1995	4.400	2.600	-1.800	2.200	2.000	2.500
1996	2.300	3.000	0.700	1.500	1.200	2.800
1997	1.300	3.000	1.700	2.650	2.100	3.000
1998	6.300	7.100	0.800	2.200	1.175	4.700
1999	2.300	3.400	1.100	3.200	2.600	3.250
2000	0.800	2.200	1.400	1.750	1.500	2.100
2001	0.900	2.200	1.300	2.000	1.525	2.050
2002	0.600	1.600	1.000	1.100	1.000	1.400
2003	1.900	2.900	1.000	2.200	1.825	2.450
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.970	1.639	0.227	0.465	16.400	54.340
1994	-1.533	3.158	0.276	0.162	14.300	35.770
1995	-2.357	5.652	0.423	0.001	9.700	29.930
1996	0.513	-1.531	0.246	0.291	10.700	23.290
1997	-0.755	-0.888	0.205	0.516	15.100	39.390
1998	1.232	0.987	0.232	0.439	15.300	72.790
1999	-2.162	4.752	0.423	0.004	14.000	42.860
2000	0.226	-1.626	0.173	0.676	10.700	19.590
2001	-0.736	-0.940	0.290	0.182	9.100	17.090
2002	1.414	1.500	0.260	0.387	4.800	6.000
2003	-1.031	2.390	0.300	0.149	10.500	23.950

Total Phosphorus

Figure 216 presents the seasonal mean total phosphorus trend in Spy Lake, while Table 171 presents descriptive statistics for total phosphorus in Spy Lake. The total phosphorus in Spy Lake exhibited a decreasing trend from 1997 to 2003. The total phosphorus in Spy Lake was slightly lower than the county average, though this difference was not statistically significant.

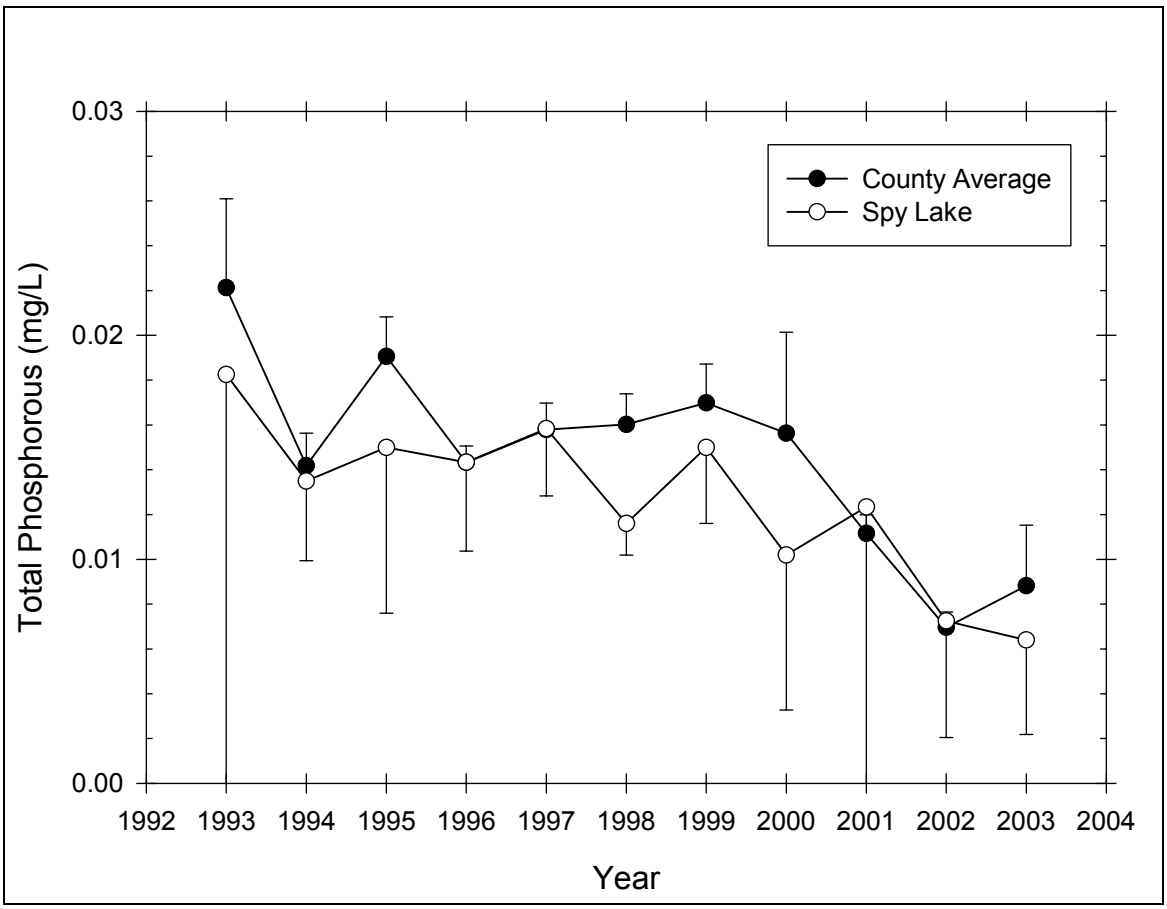


Figure 216 Seasonal mean total phosphorus trend in Spy Lake

Table 171 – Descriptive Statistics for Total Phosphorus in Spy Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	2	0.0182	0.0177	0.00887	0.0282
1994	6	0	0.0135	0.00339	0.00138	0.00356
1995	6	1	0.0150	0.00596	0.00266	0.00740
1996	6	0	0.0143	0.00378	0.00154	0.00396
1997	6	0	0.0158	0.00286	0.00117	0.00300
1998	5	0	0.0116	0.00114	0.000510	0.00142
1999	6	1	0.0150	0.00274	0.00122	0.00340
2000	6	0	0.0102	0.00660	0.00269	0.00692
2001	6	1	0.0123	0.0110	0.00492	0.0137
2002	6	2	0.00725	0.00327	0.00164	0.00520
2003	6	1	0.00640	0.00340	0.00152	0.00422
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0410	0.0430	0.00200	0.0140	0.00600	0.0305
1994	0.00900	0.0190	0.01000	0.0125	0.0110	0.0160
1995	0.0140	0.0250	0.0110	0.0120	0.0110	0.0183
1996	0.01000	0.0190	0.00900	0.0150	0.0110	0.0170
1997	0.00800	0.0190	0.0110	0.0160	0.0150	0.0180
1998	0.00300	0.0130	0.01000	0.0120	0.0108	0.0123
1999	0.00700	0.0180	0.0110	0.0150	0.0133	0.0173
2000	0.0180	0.0210	0.00300	0.00960	0.00500	0.0130

2001	0.0289	0.0299	0.001000	0.00850	0.00573	0.0187
2002	0.00790	0.0111	0.00320	0.00735	0.00495	0.00955
2003	0.00790	0.0112	0.00330	0.00480	0.00383	0.00933
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.230	1.612	0.256	0.407	0.0730	0.00228
1994	0.923	-0.172	0.225	0.400	0.0810	0.00115
1995	1.667	2.508	0.293	0.172	0.0750	0.00127
1996	-0.354	-1.211	0.170	0.687	0.0860	0.00130
1997	-0.907	0.794	0.219	0.437	0.0950	0.00154
1998	-0.405	-0.178	0.237	0.414	0.0580	0.000678
1999	-0.609	-0.133	0.167	0.713	0.0750	0.00116
2000	0.776	0.109	0.186	0.615	0.0612	0.000842
2001	1.186	1.601	0.236	0.417	0.0617	0.00125
2002	-0.174	0.750	0.183	0.678	0.0290	0.000242
2003	0.795	-1.543	0.281	0.214	0.0320	0.000251

Nitrate

Figure 217 presents the seasonal mean nitrate trend in Spy Lake, while Table 172 presents descriptive statistics for nitrate in Spy Lake. The nitrate in Spy Lake exhibited decreasing trend from 1997 to 2003. The nitrate in Spy Lake was lower than the county average, though this difference was not statistically significant for most years.

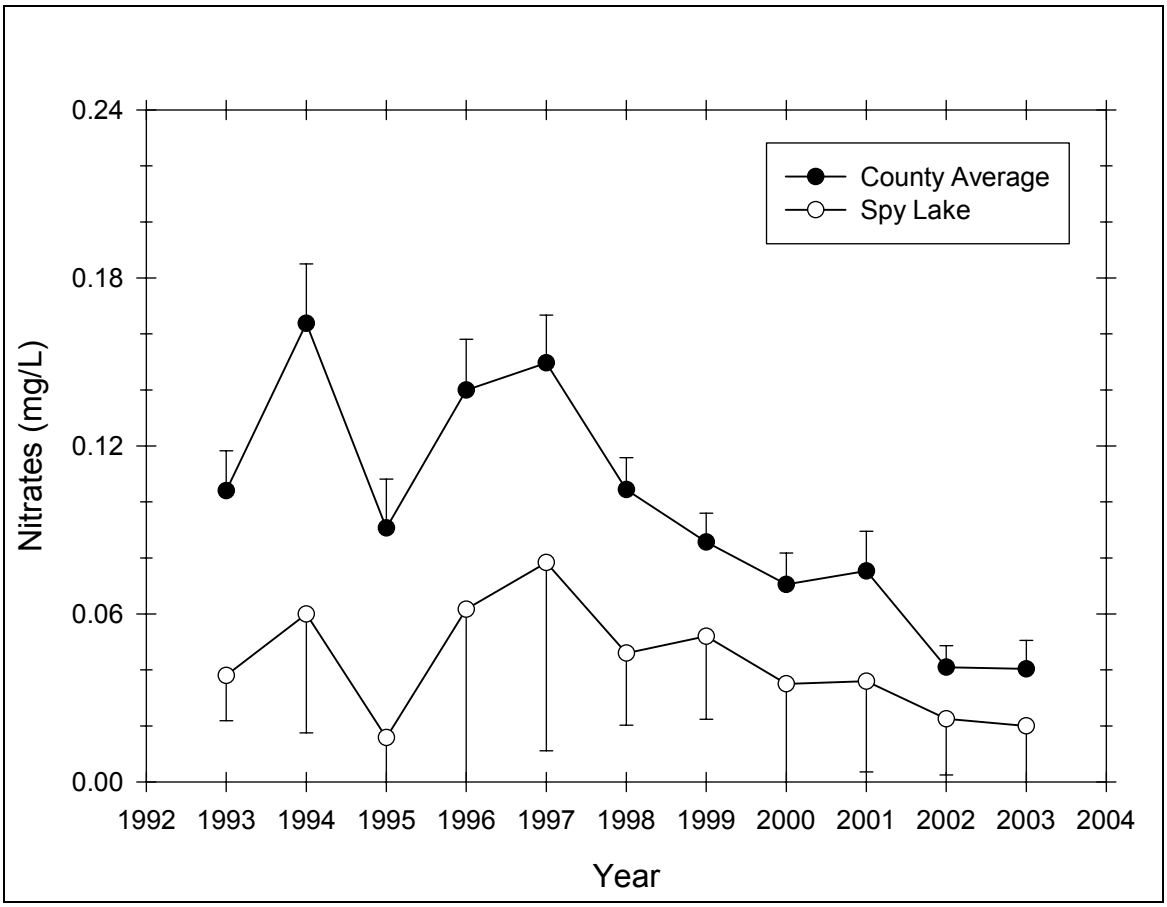


Figure 217 Seasonal mean nitrate trend in Spy Lake

Table 172 – Descriptive Statistics for Nitrate in Spy Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	0.0380	0.0130	0.00583	0.0162
1994	6	0	0.0600	0.0405	0.0165	0.0425
1995	6	0	0.0158	0.0267	0.0109	0.0280
1996	6	0	0.0617	0.0605	0.0247	0.0635
1997	6	0	0.0783	0.0640	0.0261	0.0672
1998	5	0	0.0460	0.0207	0.00927	0.0257
1999	6	1	0.0520	0.0239	0.0107	0.0296
2000	6	0	0.0350	0.0418	0.0171	0.0439
2001	6	1	0.0360	0.0261	0.0117	0.0324
2002	6	2	0.0225	0.0126	0.00629	0.0200
2003	6	1	0.0200	0.0173	0.00775	0.0215
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	0.0300	0.0500	0.0200	0.0400	0.0275	0.0500
1994	0.110	0.140	0.0300	0.0450	0.0400	0.0600
1995	0.0700	0.0700	0.000	0.00500	0.00500	0.01000
1996	0.160	0.180	0.0200	0.0350	0.0300	0.0700
1997	0.160	0.190	0.0300	0.0500	0.0300	0.120
1998	0.0500	0.0800	0.0300	0.0400	0.0300	0.0575
1999	0.0600	0.0900	0.0300	0.0400	0.0375	0.0675
2000	0.110	0.120	0.01000	0.0200	0.0200	0.0200
2001	0.0600	0.0800	0.0200	0.0200	0.0200	0.0500
2002	0.0300	0.0400	0.01000	0.0200	0.0150	0.0300
2003	0.0400	0.0500	0.01000	0.01000	0.01000	0.0275
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	-0.541	-1.488	0.221	0.494	0.190	0.00790
1994	2.114	4.707	0.333	0.036	0.360	0.0298
1995	2.373	5.709	0.420	0.001	0.0950	0.00508
1996	2.051	4.290	0.307	0.081	0.370	0.0411
1997	1.365	0.870	0.338	0.031	0.470	0.0573
1998	1.447	1.931	0.224	0.483	0.230	0.0123
1999	1.264	1.099	0.292	0.174	0.260	0.0158
2000	2.397	5.817	0.473	<0.001	0.210	0.0161
2001	1.714	2.664	0.330	0.079	0.180	0.00920
2002	1.129	2.227	0.329	0.138	0.0900	0.00250
2003	1.925	3.667	0.318	0.101	0.1000	0.00320

Chlorophyll a

Figure 218 presents the seasonal mean chlorophyll *a* trend in Spy Lake, while Table 173 presents descriptive statistics for chlorophyll *a* in Spy Lake. The chlorophyll *a* in Spy Lake exhibited a slight decreasing trend from 1998 to 2003. The chlorophyll *a* in Spy Lake was slightly higher than the county average, though this difference was not statistically significant.

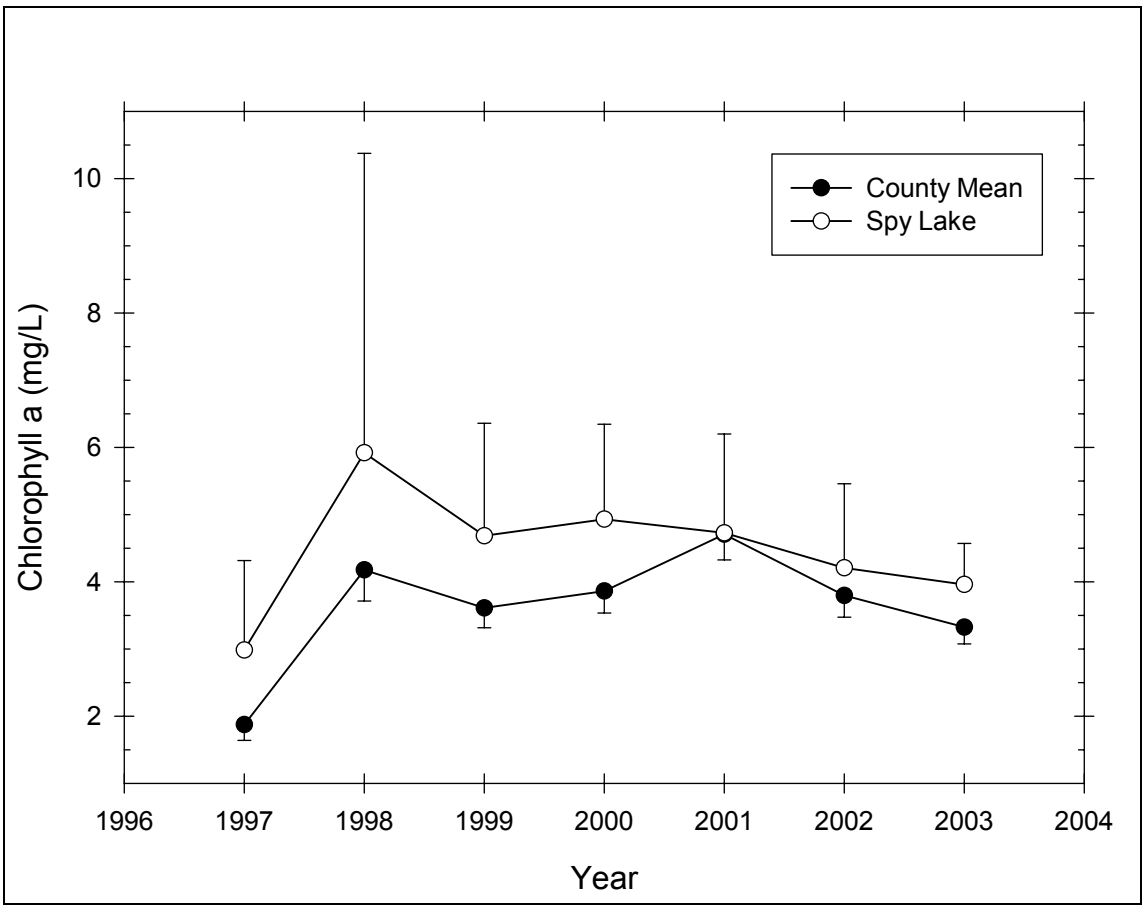


Figure 218 Seasonal mean chlorophyll a trend in Spy Lake

Table 173 – Descriptive Statistics for Chlorophyll a in Spy Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	0	2.983	1.269	0.518	1.331
1998	5	0	5.918	3.590	1.605	4.457
1999	6	1	4.684	1.348	0.603	1.674
2000	6	0	4.930	1.346	0.550	1.413
2001	6	1	4.726	1.186	0.530	1.472
2002	6	2	4.207	0.787	0.393	1.252
2003	6	2	3.960	0.384	0.192	0.611
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	3.590	4.980	1.390	2.985	2.010	3.550
1998	6.950	8.970	2.020	7.580	2.043	8.970
1999	2.860	6.210	3.350	4.040	3.657	6.098
2000	3.200	6.440	3.240	5.035	3.850	5.980
2001	2.680	6.020	3.340	4.520	3.752	5.900
2002	1.640	5.380	3.740	3.855	3.755	4.660
2003	0.830	4.280	3.450	4.055	3.665	4.255
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	0.467	0.0678	0.161	0.721	17.900	61.448
1998	-0.501	-3.214	0.278	0.225	29.590	226.661
1999	0.464	-3.052	0.284	0.205	23.420	116.969

2000	-0.119	-2.548	0.273	0.173	29.580	154.895
2001	0.0924	-2.536	0.231	0.447	23.630	117.298
2002	1.927	3.734	0.383	0.041	16.830	72.669
2003	-0.952	-0.667	0.259	0.391	15.840	63.168

Transparency

Figure 219 presents the seasonal mean transparency trend in Spy Lake, while Table 174 presents descriptive statistics for transparency in Spy Lake. The transparency in Spy Lake exhibited no discernible trend. The transparency in Spy Lake was slightly lower than the county average, though this difference was not statistically significant.

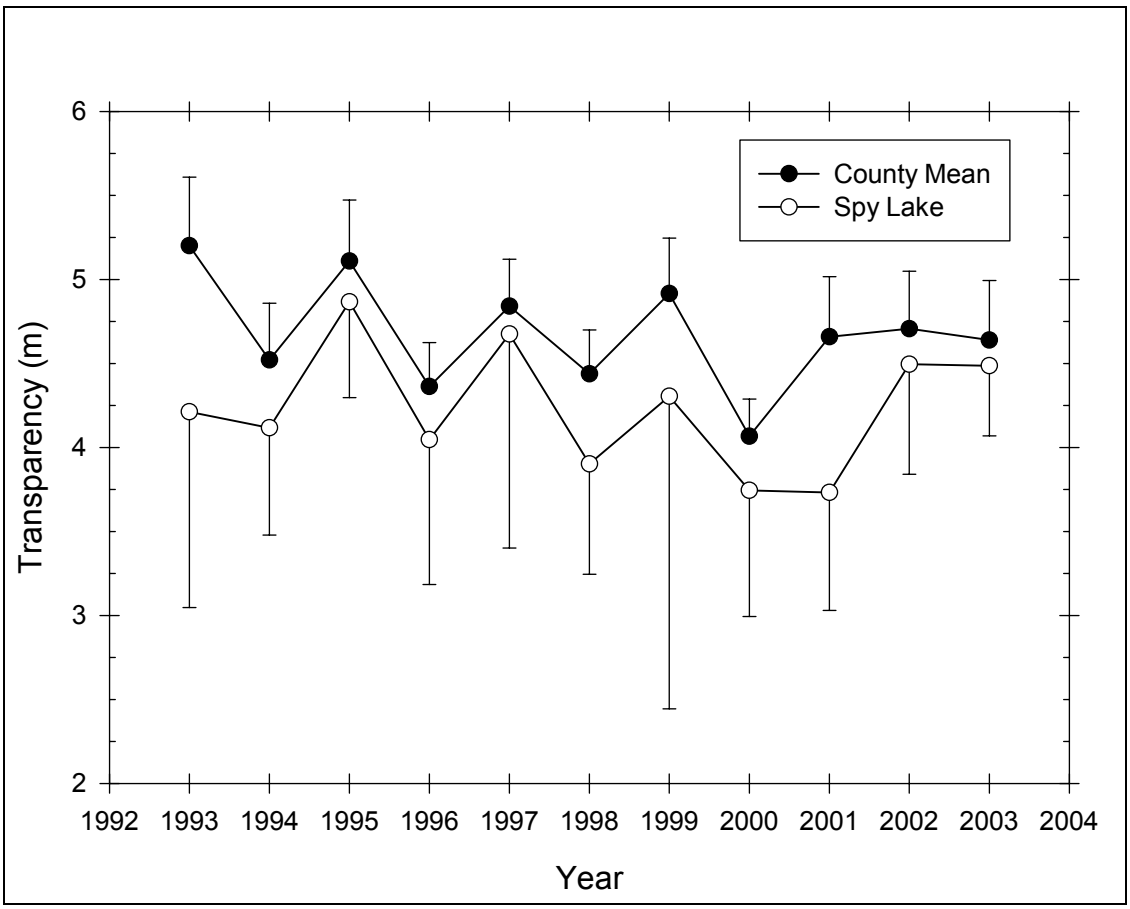


Figure 219 Seasonal mean transparency trend in Spy Lake

Table 174 – Descriptive Statistics for Transparency in Spy Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1993	6	1	4.212	0.938	0.419	1.164
1994	6	0	4.117	0.608	0.248	0.638
1995	6	0	4.867	0.543	0.222	0.570
1996	6	0	4.047	0.821	0.335	0.862
1997	6	0	4.675	1.213	0.495	1.273
1998	5	0	3.902	0.529	0.237	0.657

1999	5	0	4.304	1.498	0.670	1.860
2000	6	0	3.745	0.716	0.292	0.751
2001	5	0	3.732	0.565	0.253	0.701
2002	4	0	4.495	0.412	0.206	0.655
2003	5	0	4.486	0.336	0.150	0.417
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1993	2.430	5.760	3.330	4.090	3.563	4.620
1994	1.800	4.900	3.100	4.150	3.900	4.500
1995	1.600	5.800	4.200	4.750	4.600	5.100
1996	1.950	4.830	2.880	4.230	3.310	4.800
1997	3.520	6.400	2.880	4.845	3.820	5.260
1998	1.350	4.700	3.350	3.930	3.462	4.197
1999	3.610	6.910	3.300	3.700	3.383	4.878
2000	2.020	4.520	2.500	3.825	3.500	4.300
2001	1.340	4.500	3.160	3.800	3.190	4.125
2002	0.900	5.100	4.200	4.340	4.240	4.750
2003	0.830	4.880	4.050	4.550	4.200	4.745
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1993	1.432	2.436	0.288	0.188	21.060	92.222
1994	-0.699	1.273	0.194	0.574	24.700	103.530
1995	0.948	1.531	0.216	0.454	29.200	143.580
1996	-0.514	-1.757	0.234	0.352	24.280	101.623
1997	-0.176	0.177	0.181	0.638	28.050	138.494
1998	0.779	0.362	0.204	0.577	19.510	77.248
1999	1.953	3.898	0.328	0.085	21.520	101.596
2000	-1.062	1.380	0.199	0.545	22.470	86.713
2001	0.312	-1.369	0.227	0.466	18.660	70.916
2002	1.768	3.193	0.341	0.108	17.980	81.328
2003	-0.273	-1.562	0.176	0.691	22.430	101.072

TSI

Figure 220 presents the Carlson trophic state index trend in Spy Lake. Transparency TSI was at the lower mesotrophic range, while chlorophyll *a* TSI was in the eutrophic range with the exception of 1997. Total phosphorus TSI was in the mesotrophic range except for 1993, 2000, 2002 and 2003.

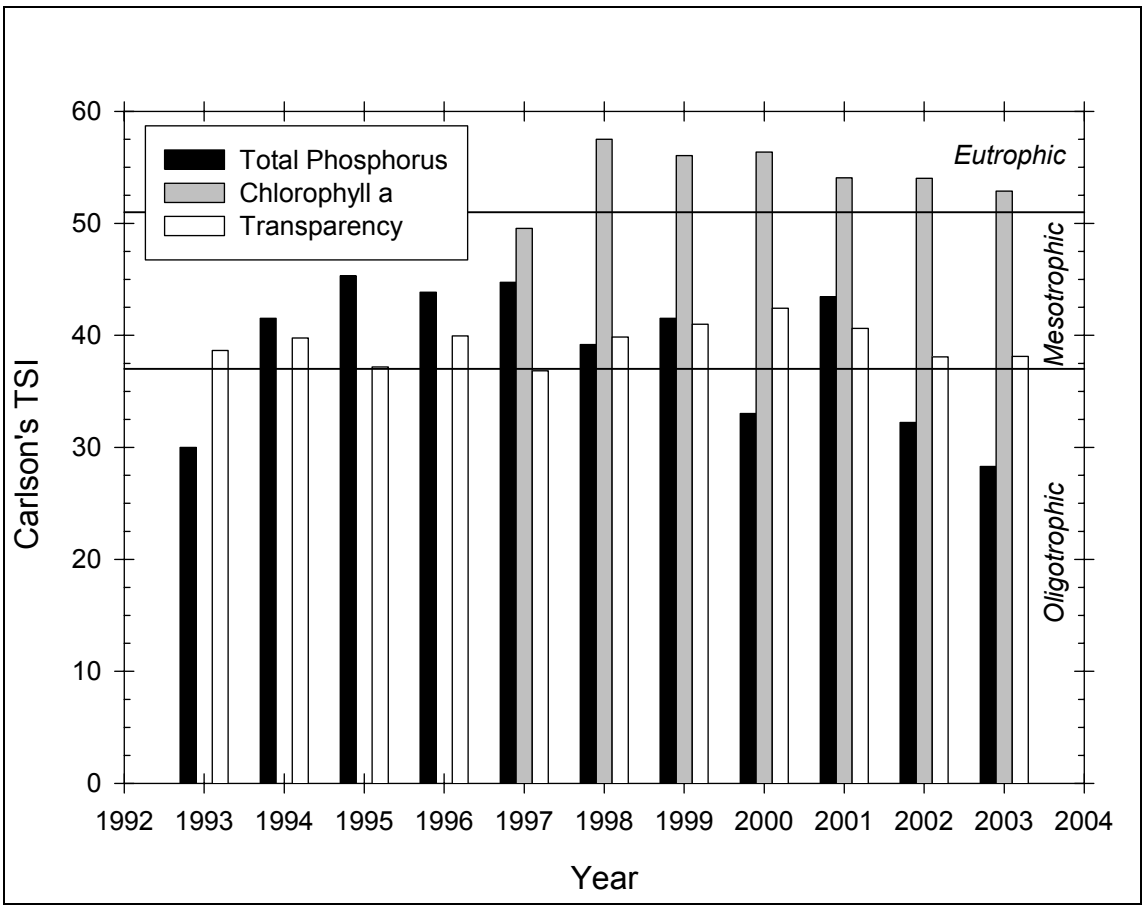


Figure 220 Carlson TSI trend in Spy Lake

Aluminum

Figure 221 presents the seasonal mean aluminum trend in Spy Lake, while Table 175 presents descriptive statistics for aluminum in Spy Lake. The aluminum in Spy Lake was low and relatively constant. The aluminum in Spy Lake was generally slightly lower than the county average, though this difference was not statistically significant.

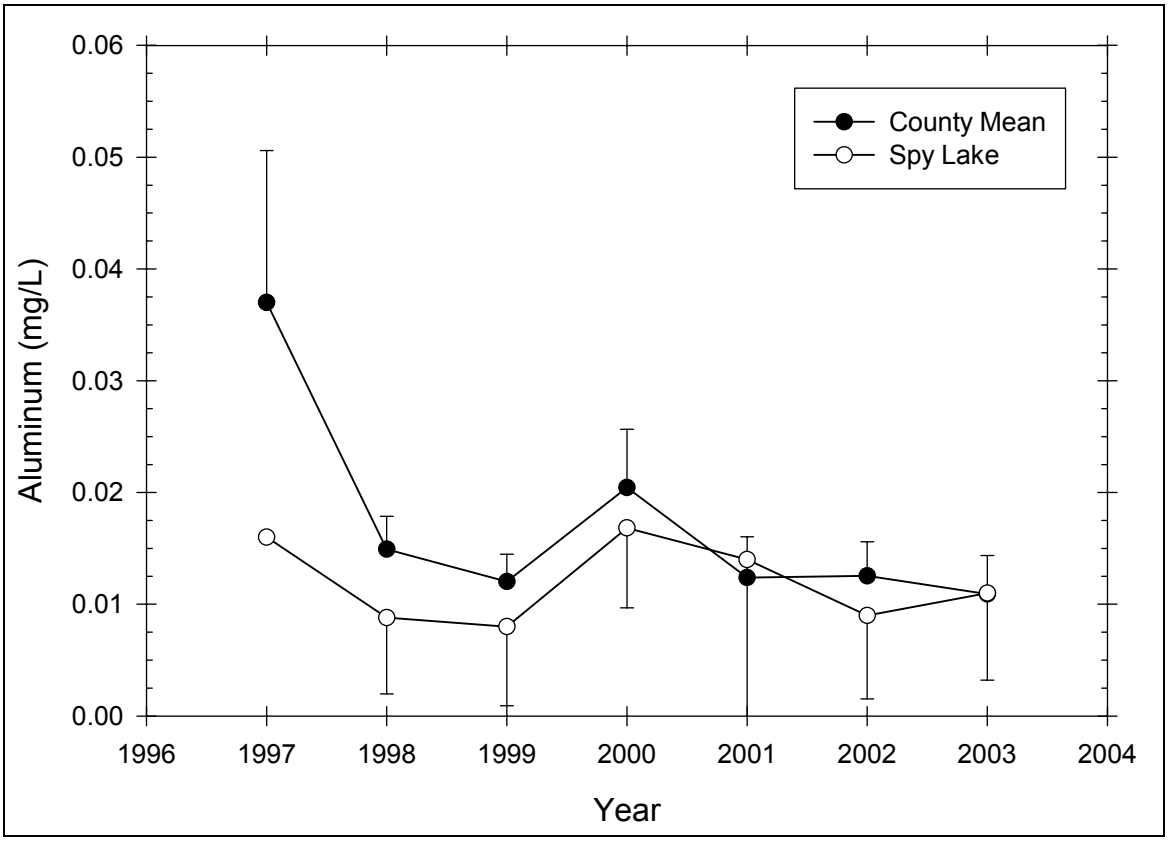


Figure 221 Seasonal mean aluminum trend in Spy Lake

Table 175 – Descriptive Statistics for Aluminum in Spy Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	0.0160	--	--	--
1998	5	0	0.00880	0.00550	0.00246	0.00682
1999	6	1	0.00800	0.00570	0.00255	0.00708
2000	6	0	0.0168	0.00682	0.00279	0.00716
2001	6	1	0.0140	0.0128	0.00573	0.0159
2002	6	2	0.00900	0.00469	0.00235	0.00746
2003	6	2	0.0110	0.00490	0.00245	0.00780
Year	**Range**	**Max**	**Min**	**Median**	**25%**	**75%**
1997	0.000	0.0160	0.0160	0.0160	0.0160	0.0160
1998	0.0120	0.0130	0.001000	0.0120	0.00400	0.0130
1999	0.0140	0.0160	0.00200	0.00900	0.00275	0.0115
2000	0.0180	0.0250	0.00700	0.0170	0.0120	0.0230
2001	0.0330	0.0360	0.00300	0.00900	0.00750	0.0187
2002	0.00900	0.0140	0.00500	0.00850	0.00500	0.0130
2003	0.01000	0.0150	0.00500	0.0120	0.00700	0.0150
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	0.0160	0.000256
1998	-0.875	-1.644	0.320	0.098	0.0440	0.000508
1999	0.405	-0.859	0.210	0.552	0.0400	0.000450
2000	-0.265	-1.142	0.150	0.750	0.101	0.00193
2001	1.799	3.626	0.331	0.077	0.0700	0.00164

2002	0.155	-5.112	0.303	0.215	0.0360	0.000390
2003	-0.544	-2.944	0.293	0.252	0.0440	0.000556

Calcium

Figure 222 presents the seasonal mean calcium trend in Spy Lake, while Table 176 presents descriptive statistics for calcium in Spy Lake. The calcium in Spy Lake was low and relatively constant throughout the period of record. The calcium in Spy Lake was significantly lower than the county average.

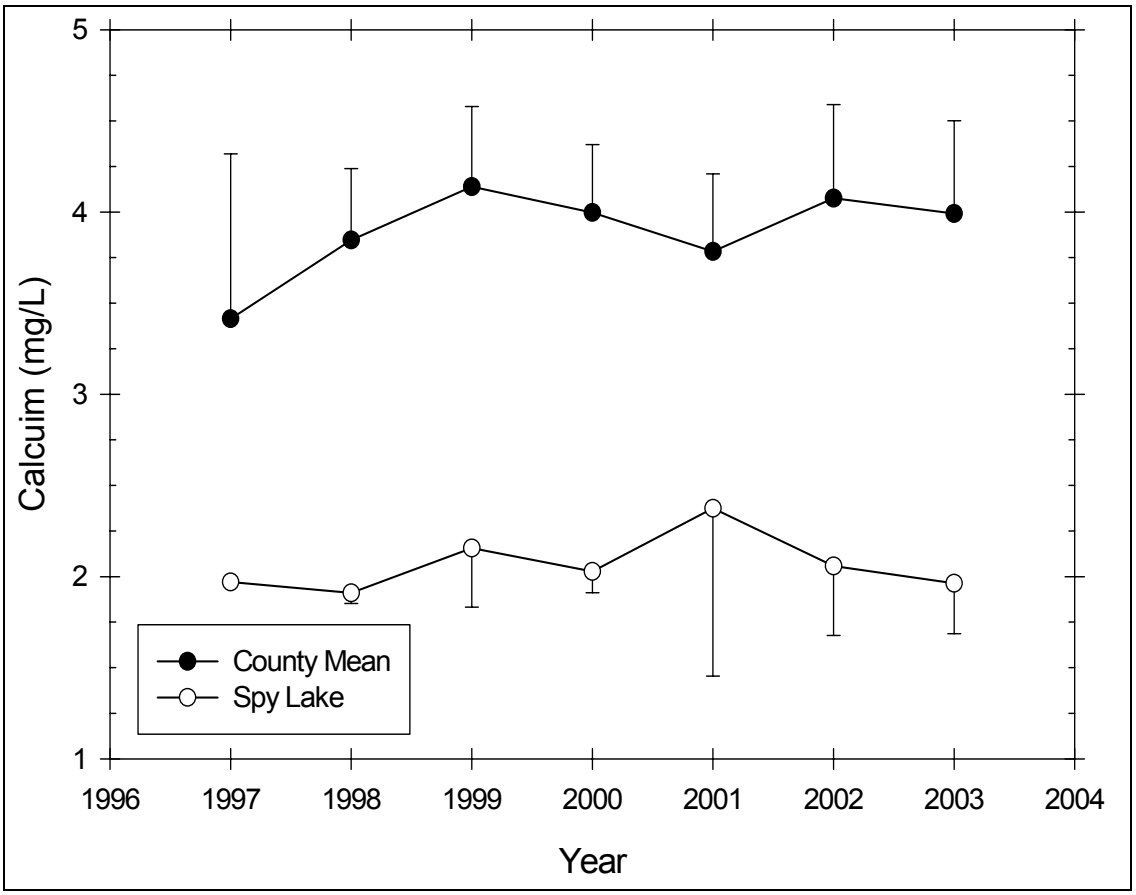


Figure 222 Seasonal mean calcium trend in Spy Lake

Table 176 – Descriptive Statistics for Calcium in Spy Lake

Year	Size	Missing	Mean	Std Dev	Std. Error	C.I. of Mean
1997	6	5	1.970	--	--	--
1998	6	0	1.910	0.0548	0.0224	0.0575
1999	6	1	2.156	0.260	0.116	0.323
2000	6	0	2.028	0.111	0.0454	0.117
2001	6	1	2.374	0.740	0.331	0.919
2002	6	2	2.058	0.239	0.119	0.380
2003	6	2	1.962	0.173	0.0866	0.276

Year	Range	Max	Min	Median	25%	75%
1997	0.000	1.970	1.970	1.970	1.970	1.970
1998	0.140	1.990	1.850	1.905	1.870	1.940
1999	0.610	2.420	1.810	2.140	1.960	2.405
2000	0.300	2.220	1.920	1.995	1.950	2.090
2001	1.850	3.670	1.820	2.150	1.962	2.583
2002	0.550	2.290	1.740	2.100	1.880	2.235
2003	0.350	2.140	1.790	1.960	1.815	2.110
Year	**Skewness**	**Kurtosis**	**K-S Dist.**	**K-S Prob.**	**Sum**	**Sum of Squares**
1997	--	--	--	--	1.970	3.881
1998	0.405	-1.532	0.267	0.195	11.460	21.904
1999	-0.275	-1.663	0.226	0.471	10.780	23.512
2000	1.160	0.838	0.200	0.542	12.170	24.747
2001	1.995	4.210	0.382	0.016	11.870	30.372
2002	-0.863	0.113	0.196	0.645	8.230	17.105
2003	0.0312	-5.018	0.260	0.387	7.850	15.496

Calcite Saturation Index

Figure 223 presents the calcite saturation index trend in Spy Lake. The CSI in Spy Lake remained relatively stable within the very vulnerable to acid deposition range. The CSI in Spy Lake was significantly higher than the county average.

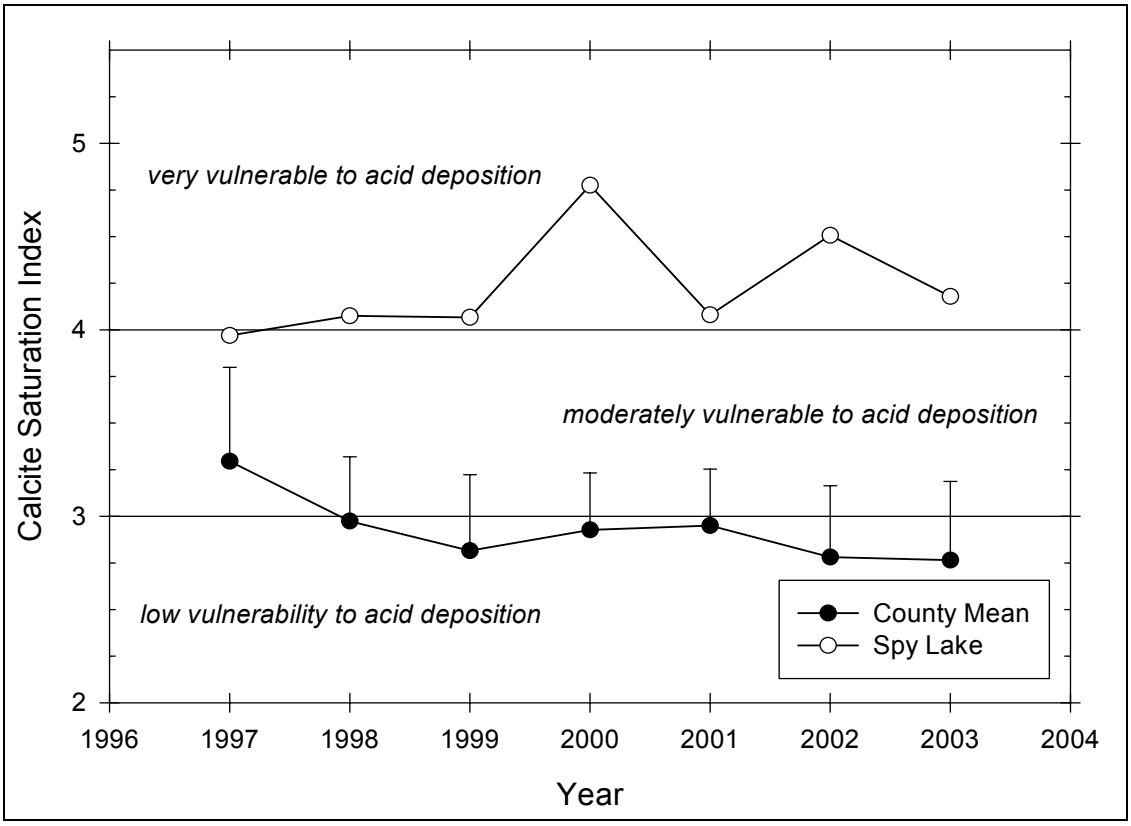


Figure 223 Seasonal mean CSI trend in Spy Lake

Discussion

Climate

There were no apparent climatic trends controlling water quality in the Hamilton County lakes.

Water Quality

In general, water quality in the Hamilton County lakes has shown an improvement over the past five to six years. This improvement has included a decrease in acidity and a decrease in total phosphorus and nitrate. Lake transparency has not changed significantly throughout the study period.

Chlorophyll *a* concentrations were more related to nitrate concentrations than to phosphorus concentrations. Chlorophyll *a* trophic state index (TSI) values were higher than would be expected compared to the total phosphorus TSI values, indicating that algal growth is being spurned on by other factors than just total phosphorus in the Hamilton County lakes. Therefore, the SWCD may wish to consider monitoring for total nitrogen rather than nitrate nitrogen alone.

Lake pH exhibited a sharp decrease from 1993 to 1995 followed by a sharp increase from 1996 to 2000 or 2001. In general, lake acidity appeared to be improving the Hamilton County lakes, evidenced by increasing pH, alkalinity, calcium and aluminum values, and decreasing calcite saturation index values.

Table 177 provides a summary of those lakes that exhibited water quality conditions that were significantly higher or lower than the county averages.

Table 177
County Lakes that Differed from County Average Water Quality by Parameter

Parameter	Lakes with average concentrations significantly HIGHER than County average	Lakes with average concentrations significantly LOWER than County average
Chlorophyll *a*		Blue Mountain Lake, Seventh Lake
Transparency	Blue Mountain Lake	Lake Abanakee, Lake Adirondack, Algonquin Lake, Oxbow Lake
pH		Morehouse Lake
Alkalinity	Eight Lake, Lake Adirondack	Fawn Lake, Indian Lake, Limekiln Lake, Long Lake, Morehouse Lake, Piseco Lake, Raquette Lake, Spy Lake
Nitrates	Seventh Lake	Fawn Lake, Lake Adirondack, Limekiln Lake, Oxbow Lake
Aluminum		Oxbow Lake
Calcium	Eight Lake, Lake Adirondack	Fawn Lake, Indian Lake, Lake Abanakee, Lake Eaton, Limekiln Lake, Long Lake, Morehouse Lake, Piseco Lake, Raquette Lake, Spy Lake
Calcite Saturation Index	Morehouse Lake, Spy Lake	Lake Adirondack

Seasonality

The Hamilton County data were collected to represent the open water growing season in Hamilton County lakes, monthly from May through October. A simple analysis of seasonal mean data, averaging all data for each year, provides an evaluation of trends with seasonality removed. This has been accomplished for the county lakes combined in the first section of this report, as well as individually for each county. Another way to examine and remove seasonality is to plot all data as a time-series plot and then apply one of several smoothing functions to the data and plot the results. One two-dimensional smoothing method that works very well for environmental data is the Loess smoothing method. Loess applies a tricubic weighted function and polynomial regression analysis using nearest neighbors. Figure 224 presents the total phosphorus for all county lakes, showing the raw time-series data (monthly mean for all lakes) and the loess smoothed curve, using the following parameters: sampling proportion of 0.2 (fraction of a total number of data points used to compute each smoothed value), polynomial degree of 1. The Loess fit compares favorably to the seasonal mean values shown in Figure 225 (identical to Figure 6).

Total phosphorus values were quite variable within each season, with a TP maxima often several times greater than the TP minima. There was no apparent trend within each season, with the minima and maxima occurring at different times from year to year.

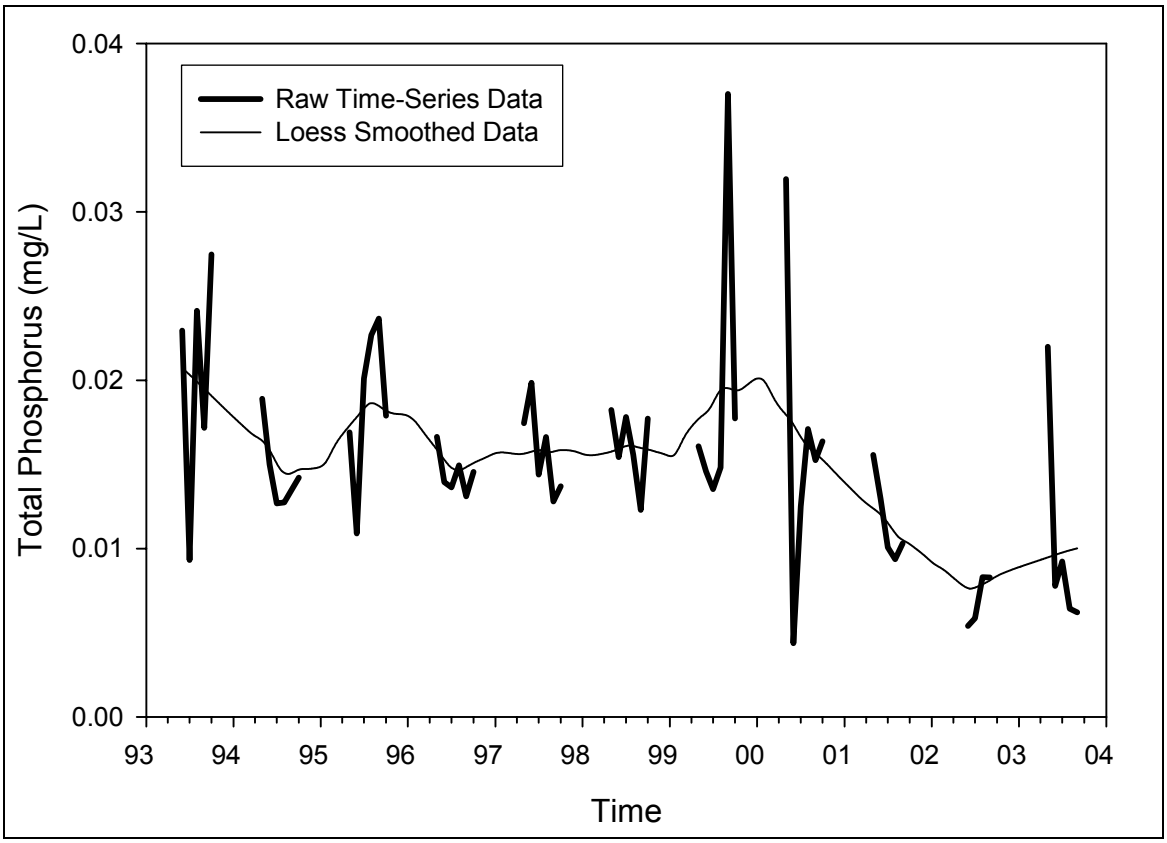


Figure 224 Comparison of time-series and loess smoothed total phosphorus data for Hamilton County Lakes

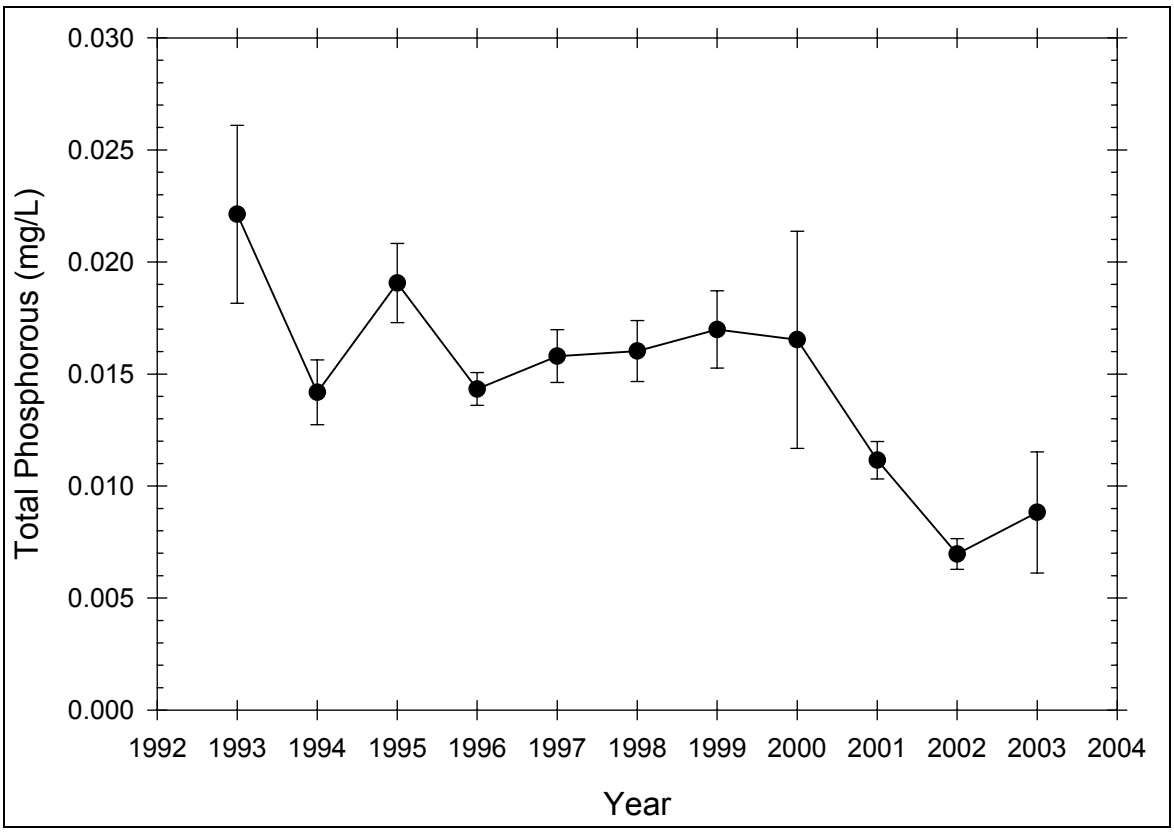


Figure 225 Seasonal mean total phosphorus in Hamilton County Lakes

Figure 226 presents a comparison of time-series and loess smoothed pH data for the Hamilton County lakes. In general, pH climbed and peaked early in each season, followed by a decline to a minimum value in the middle of each season.

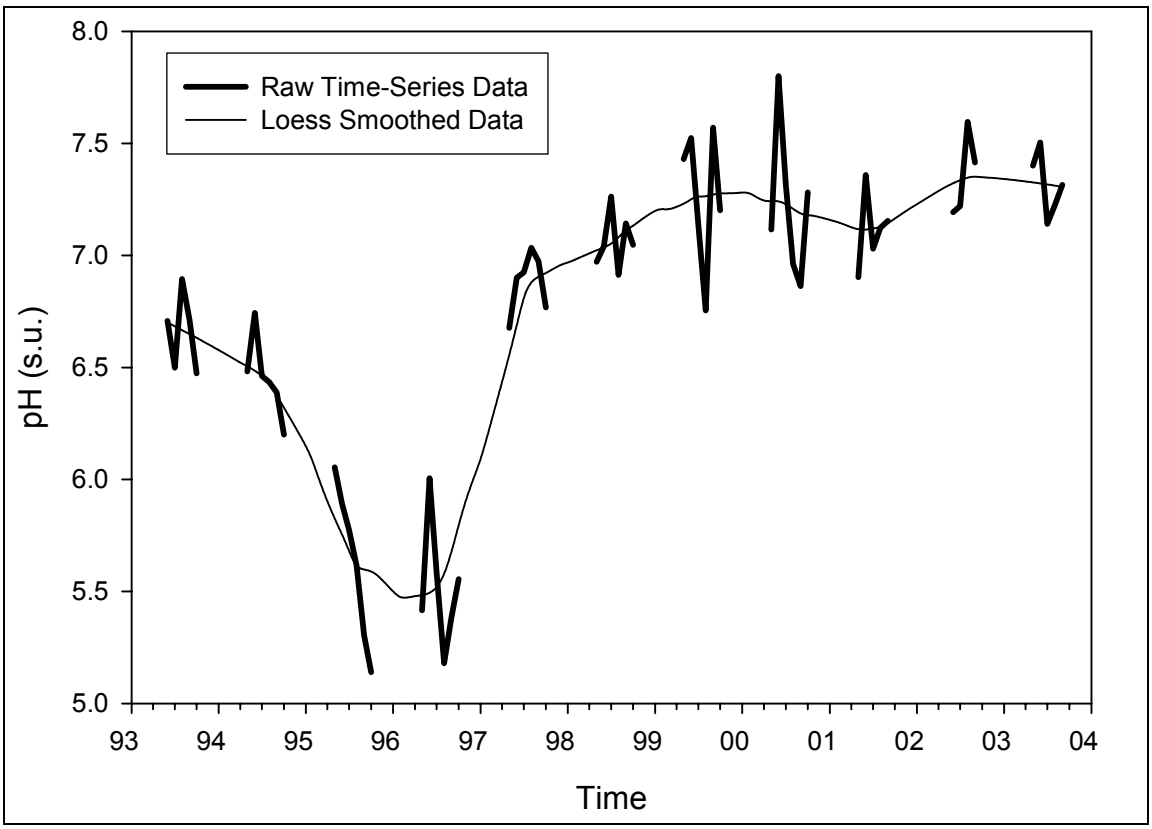


Figure 226 Comparison of time-series and loess smoothed pH data for Hamilton County Lakes

Figure 227 presents a comparison of time-series and loess smoothed alkalinity data for the Hamilton County lakes. In general, alkalinity did not appear to follow any specific seasonal trend from year to year.

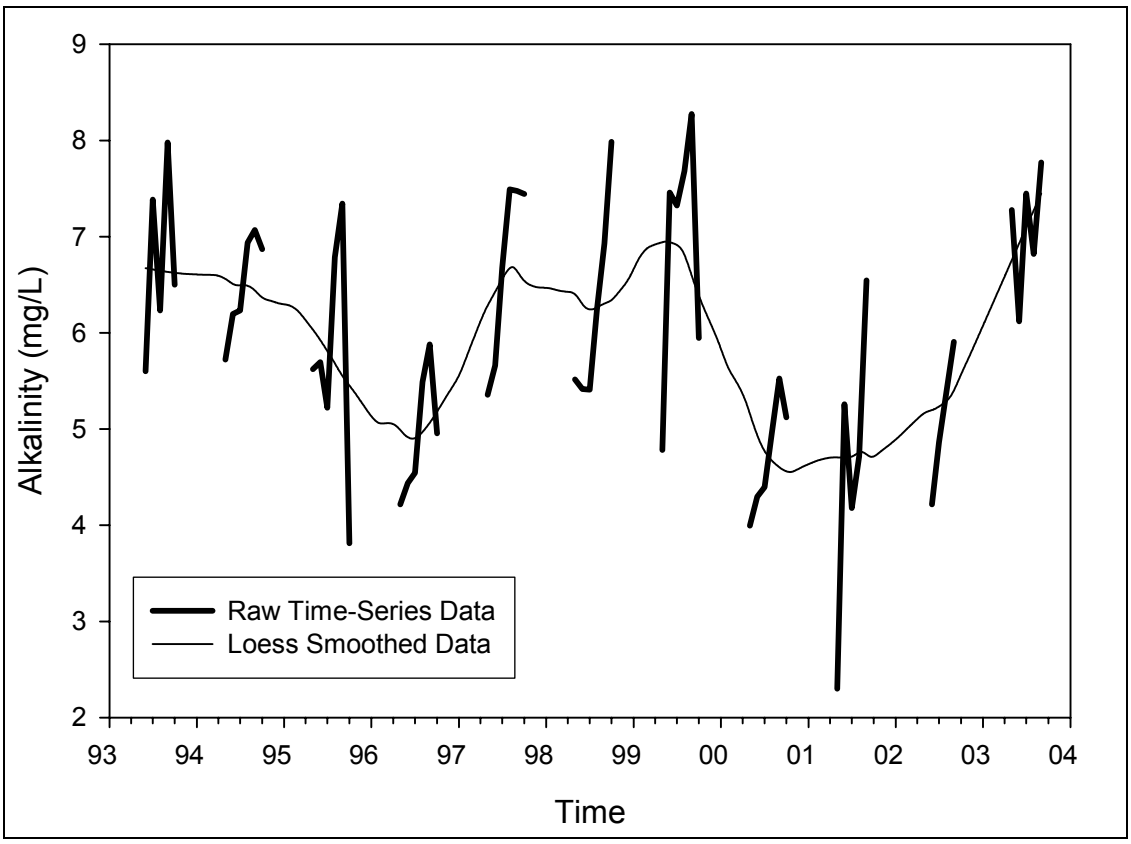


Figure 227 Comparison of time-series and loess smoothed alkalinity data for Hamilton County Lakes

Figure 228 presents a comparison of time-series and loess smoothed nitrate data for the Hamilton County lakes. Nitrate concentrations were consistently highest in May, followed by a marked decline through the monitoring season.

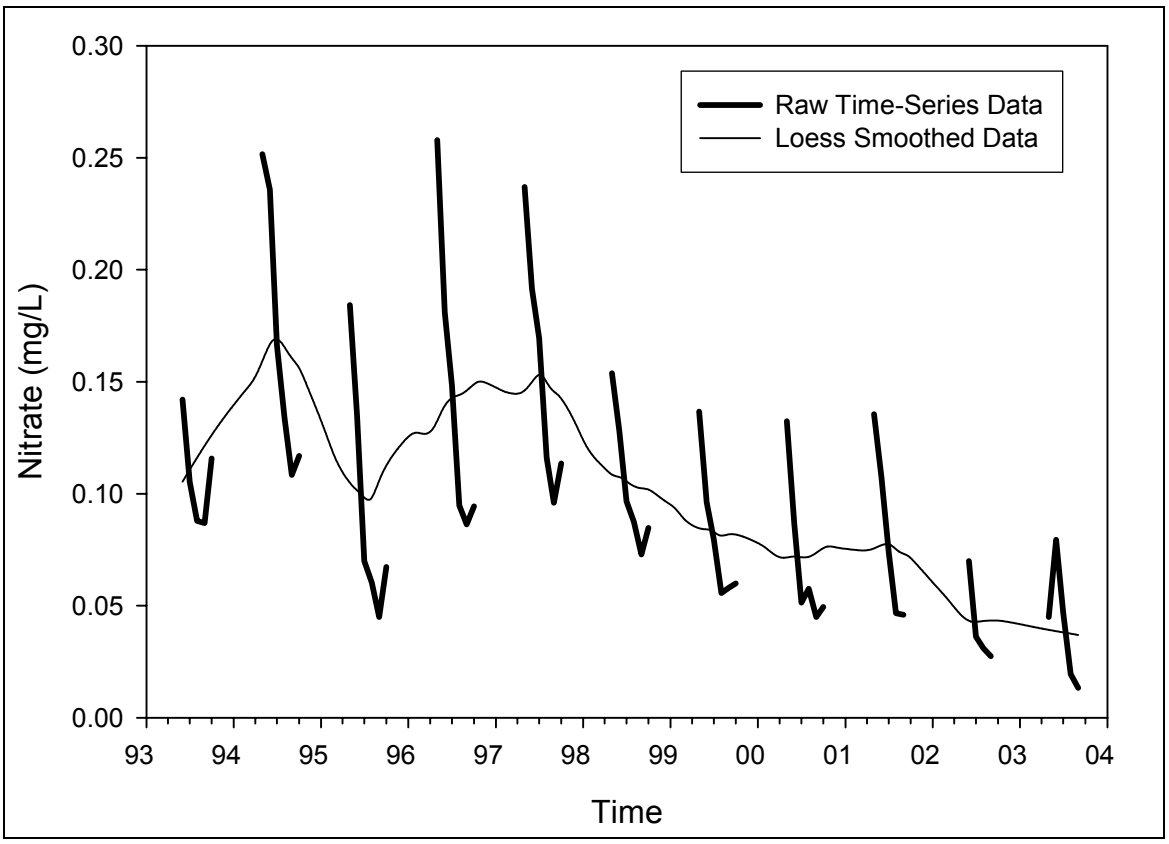


Figure 228 Comparison of time-series and loess smoothed nitrate data for Hamilton County lakes

Figure 229 presents a comparison of time-series and loess smoothed transparency data for the Hamilton County lakes. Transparency did not appear to exhibit any specific seasonal trend. The smoothed data shows the sine wave curve of annual transparency, where the lakes alternated between high and low transparencies from 1993 through 2000.

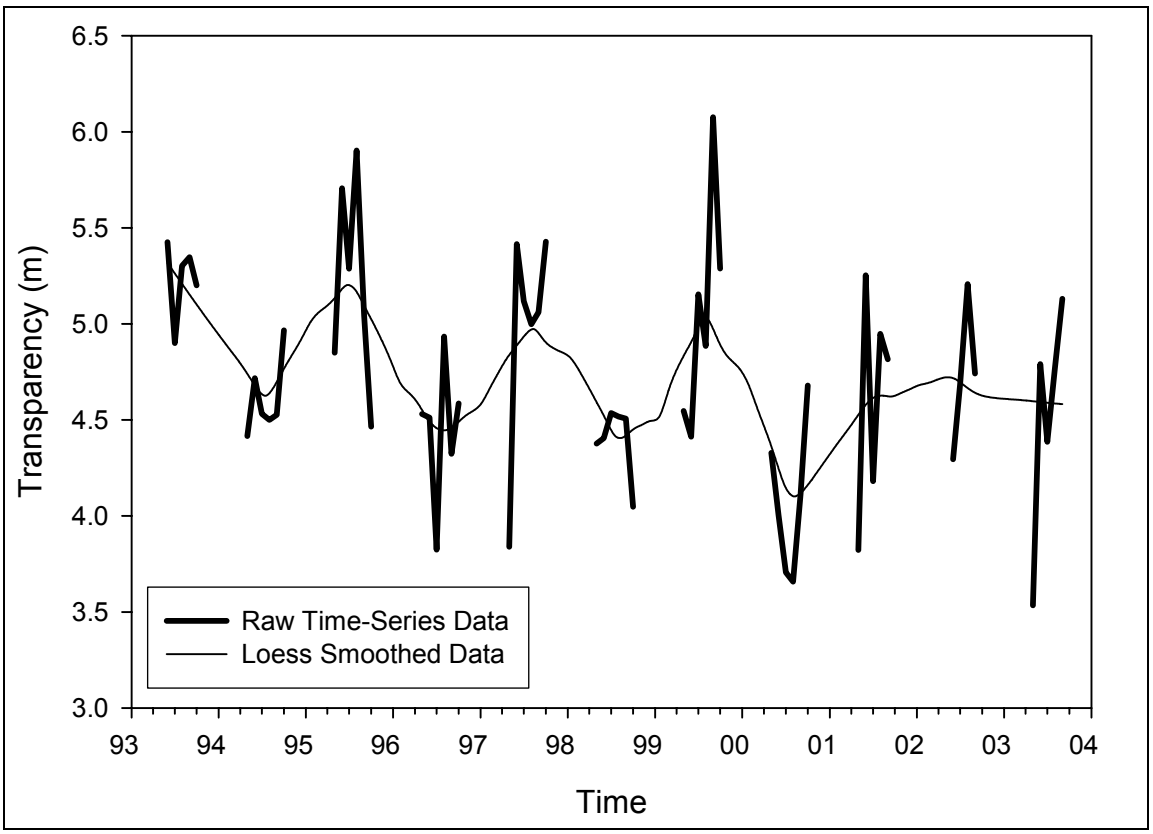


Figure 229 Comparison of raw time-series and loess smoothed transparency data in Hamilton County lakes

Figure 230 presents a comparison of time-series and loess smoothed chlorophyll *a* data for the Hamilton County lakes. Chlorophyll *a* concentrations generally peaked during the middle of each season, with low values in May and September/October. A sampling proportion of 0.3 was used in the loess function for this analysis.

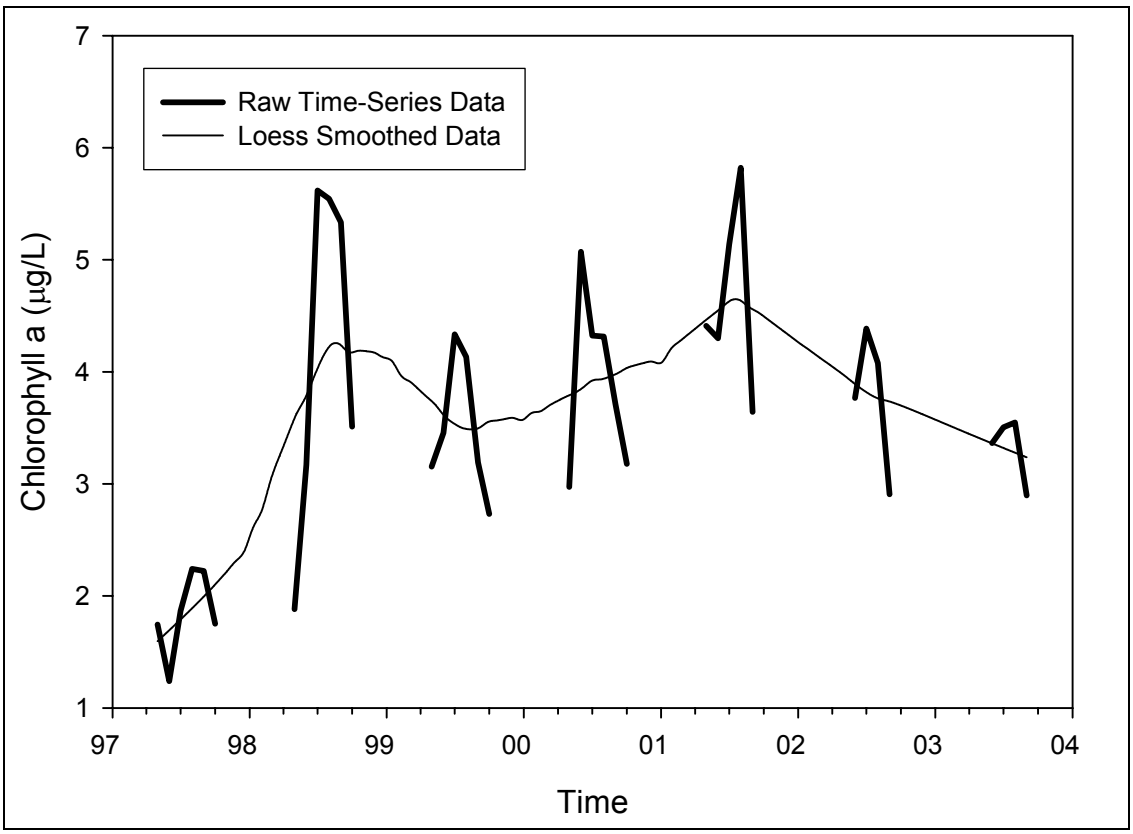


Figure 230 Comparison of time-series and loess smoothed chlorophyll *a* data in Hamilton County lakes

Figure 231 presents a comparison of time-series and loess smoothed aluminum data for the Hamilton County lakes. Aluminum concentrations did not exhibit any consistent seasonal trends. A sampling proportion of 0.3 was used in the loess function for this analysis.

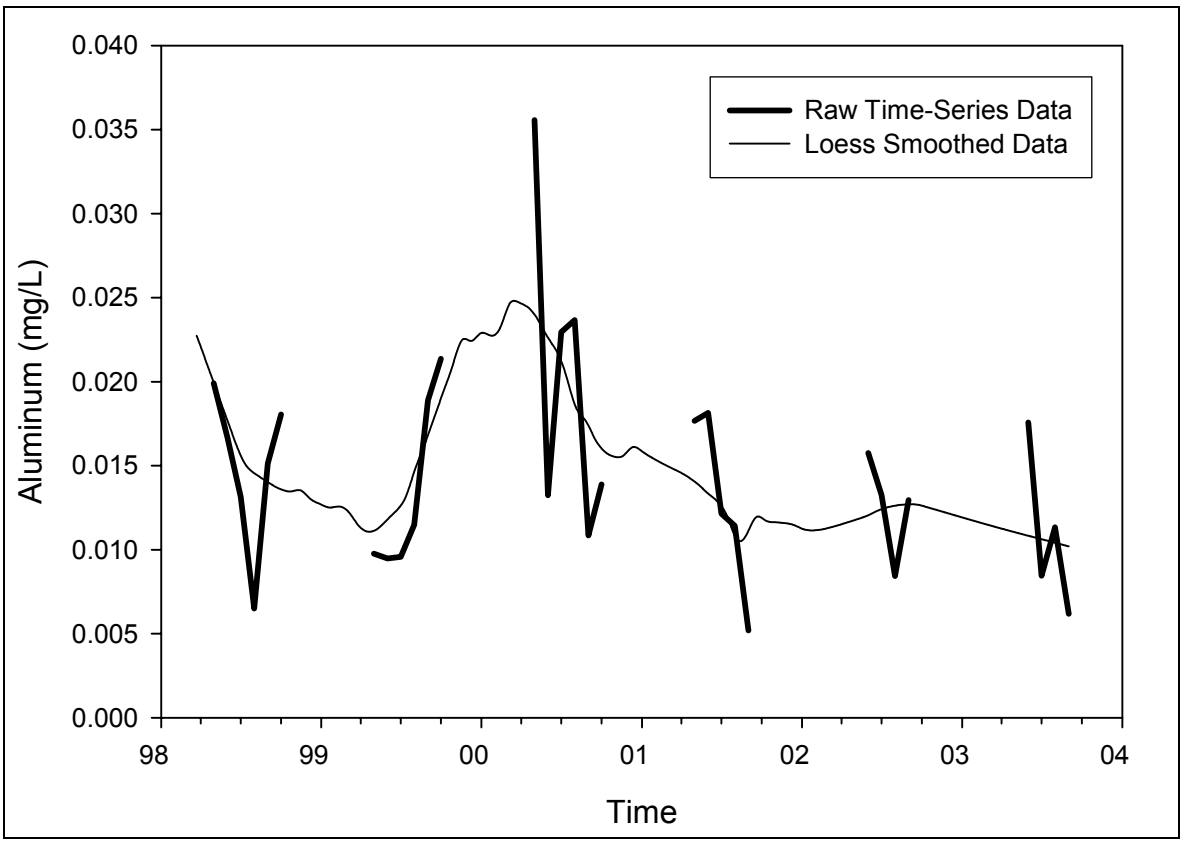


Figure 231 Comparison of time-series and loess smoothed aluminum data in Hamilton County lakes

Figure 232 presents a comparison of time-series and loess smoothed calcium data for the Hamilton County lakes. Calcium concentrations did not exhibit any consistent trend within each season. A sampling proportion of 0.3 was used in the loess function for this analysis.

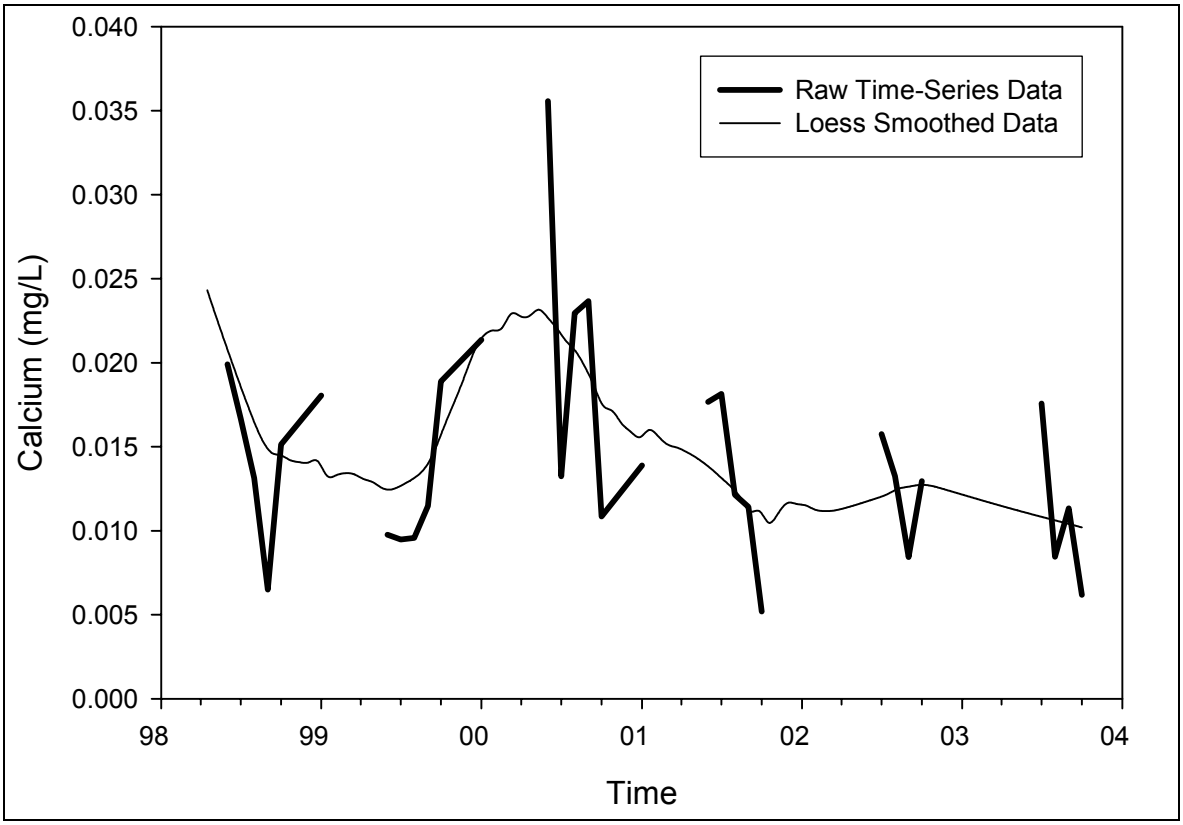


Figure 232 Comparison of time-series and loess smoothed calcium data for Hamilton County lakes

Data Integrity

There were no major issues with data integrity in the Hamilton County water quality database provided by the SWCD apparent within the Hamilton County water quality monitoring program, including sampling and analysis. One issue of note was some apparent DO meter calibration issues, most notably in August and September 2002, that resulted in DO values lower than typical for many of the lakes during those sampling events.

Total phosphorus exhibited an unusual and significant countywide drop in 2001 through 2003. Upon discussions with the SWCD, there were no reported changes in laboratory methodology that could explain this drop. The observed total phosphorus trend is likely real, therefore, especially given that other parameters such as nitrate also experienced improvements.

Appendix – Description of Statistical Parameters

Size: the number of non-missing observations in a worksheet column.

Missing: the number of missing observations in a worksheet column.

Mean: the average value for a column. If the observations are normally distributed, the mean is the center of the distribution.

Standard Deviation: a measure of data variability about the mean.

Standard Error of the Mean: a measure of how closely the sample mean approximates the true population mean.

Range: the minimum values subtracted from the maximum values.

Maximum: the largest observation.

Minimum: the smallest observation.

Median: the "middle" observation, computed by ordering all observations from smallest to largest, then selecting the largest value of the smaller half of the observations.

Percentiles: The two percentile points, which define the upper and lower ends (tails) of the data.

Sum: the sum of all observations. The mean equals the sum divided by the sample size.

Sum of Squares: the sum of squared deviations from the mean.

Confidence Interval (C.I.) for the Mean: the range in which the true population means will fall for a percentage of all possible samples drawn from the population.

Skewness: a measure of how symmetrically the observed values are distributed about the mean. A normal distribution has skewness equal to zero.

Kurtosis: a measure of how peaked or flat the distribution of observed values is, compared to a normal distribution. A normal distribution has Kurtosis equal to zero.

K-S Distance: the maximum cumulative distance between the histogram of your data and the gaussian distribution curve of your data.

Normality (K-S probability): tests the observations for normality using the Kolmogorov-Smirnov test.

GLOSSARY

Algae – small aquatic plants that occur as single cells, colonies, or filaments. Planktonic algae float freely in the open water. Filamentous algae form long threads and are often seen as mats on the surface in shallow areas of a lake.

Cultural Eutrophication – the process whereby human activities increase the amounts of nutrients entering surface waters, giving increased algal and other aquatic plant population growths, resulting in accelerated eutrophication of the watercourse or water body.

Decomposition – the break down of organic matter by bacteria and fungi.

Epilimnion – the uppermost warmest well-mixed layer of a lake during summer thermal stratification. This region extends from the surface to the thermocline.

Eutrophic – low clarity, high nutrient levels and excessive plant growth.

Eutrophication – a natural process whereby a watercourse or water body receives nutrients and becomes more biologically productive, possibly leading to a water body clogged with aquatic vegetation.

Hydraulic retention time – a theoretic measure of the amount of time it takes for the water in the lake or pond to completely replace itself through new inputs. Surface area, mean depth, watershed area, and average annual runoff is used to calculate the hydraulic retention time.

Hypolimnion – the lowest, coolest layer of a lake during summer thermal stratification. This region extends form the bottom of the thermocline to the bottom of the lake.

Ion - an atom or a group of atoms that has acquired a net electric charge by gaining or losing one or more electrons.

Limnology – is the study of fresh water bodies including physical, chemical and biological conditions.

Mesotrophic – Moderate clarity, nutrient levels, and plant growth.

Metalimnion – the middle layer of a thermally stratified lake where a rapid temperature and density change occurs.

Morphometry – Relating to a lake's physical structure (e. g., depth, shoreline).

Nutrient - any substance, such as fertilizer phosphorous and nitrogen compounds, which enhances the growth of plants and animals.

Oligotrophic - high clarity, low nutrient levels and low plant growth

pH - an expression of the intensity of the basic or acid condition of a liquid; may range from 0 to 14, where 0 is the most acid and 7 neutral. Natural waters usually have a pH between 6.5 and 8.5.

Heophyton – a degradation product of Chlorophyll *a* trichromatic method.

(Glossary cont.)

Photic Zone – the lighted region within a lake where photosynthesis takes place. This region extends down to the depth where plant growth and respiration are balanced by the amount of light available.

Photosynthesis - the process by which plants manufacture their own food (simple carbohydrates) from carbon dioxide (CO_2) and water. The plant's chlorophyll – containing cells us light as an energy source and release oxygen as a byproduct.

Phytoplankton – microscopic algae and microbes that float freely in open water of lakes or oceans.

Plankton – microscopic plants and animals floating or swimming freely about in lakes or oceans.

Pond Number – That number which has been designated for specific ponded water by the New York State Department of Environmental Conservation in Part 800 of its Codes, Rules and Regulations (NYS, 1984a) pertaining to Article 15 of the New York State Environmental Conservation Law (NYS, 1984b). The pond number has the form: VV-NNNNQQ
where: VV = New York State Biological Survey Volume code
NNNN = One to four digit number
QQ = Zero to two character qualifier

Trophic Status - total phosphorus, chlorophyll a, and secchi disk transparency are used to determine an approximate trophic status. It is used primarily to compare lakes within a given region, and to assess the changes in the degree of eutrophication.

Turbidity - presence of sediment in water that may make the water appear murky, unclear or opaque. A cloudy condition in water due to suspended solids or organic matter.

ug/L - a unit of measurement representing, micrograms per liter.

Watershed – the major drainage basin within which the lake is located. Within New York State there are seventeen major watersheds.

Water Quality Classification – New York State in Part 701 of Codes, Rules and Regulations pertaining to Article 15 of the Environmental Conservation Law, has designated the waters of the State as to best usage. Appendix E describes theses classifications.

REFERENCES

Baker, J. P., etal. 1990. An Interpretive Analysis of Fish Communities and Water Chemistry, 1984-87. Adirondack Lakes Survey Corporation, Ray Brook, NY

Carlson, R. E. 1977. A Trophic State Index for Lakes. Limnol. Oceanogr. 22: 363-369

Martin, M. R. and J. B. Hyde, 1995, The Limnological Condition of Blue Mountain Lake, Final Report of 1994. Monitoring Program, Adirondack Aquatic Institute, Paul Smiths, New York, Pages 27

Mitchell, M. K. and W. B. Stapp. 1995. Field Manual for Water Quality Monitoring, Ninth Edition. Thomson-Shore, Inc. Dexter, Michigan. Pages 272.

Mikol, G. F. and D. M. Polsinelli. 1985. New York State A Morphometric Atlas of Selected Lakes, Volume 1, Region 5. NYSDEC Bureau Water Research Dept., Albany, NY. Pages 81.

NYS DEC and Federation of Lakes Associations, Inc. 1990. Diet for a Small Lake, A New Yorker's Guide to Lake Management. Pages 265.
Souza, S. J., Ph. D. and J. D. Koppen, Ph. D. 1983, A Laymans Guide to Interpreting Lake Water

Quality Parameters. Princeton Aqua Science, New Brunswick, New Jersey
Swart, J. M. and J. A. Bloomfield. 1987. Characteristics of New York State Lakes Gazetteer of Lakes, Ponds and Reservoirs, Third Edition. NYS DEC, Albany, NY.

River Watch Network. 1991. Water Quality Manual. Hudson Headwaters River Watch Program. Pages 72.

Terrell, C. R. and Bytnar Perfetti, P. 1989. Water Quality Indicators Guide Surface Water, Second Edition. Kendall/Hunt Publishing Company, Dubuque, Iowa. Pages 131.

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