2007 and 2008 Water Quality Study

Mille Lacs Lake Watershed Water Quality Analysis Project

Mille Lacs Lake Watershed Management Group

SEH No. A-MLLWM0801

June 9, 2009

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RE: Mille Lacs Lake Watershed Water Quality Analysis Project
2007 and 2008 Water Quality Study
Mille Lacs Lake Watershed Management Group
SEH No. A-MLLWM0801

Ms. Janet Smude
Mille Lacs Lake Watershed Management Group
130 Southgate Drive
Aitkin, MN 56431

Dear Ms. Smude:

Enclosed is the Report for the Mille Lacs Lake Watershed Management Group - Water Quality Study. This study was undertaken to give the Watershed Management Group a better understanding of the water quality trends in Mille Lacs Lake and a summary of the studies that have been completed for the lake in the past.

Thank you for the opportunity to work with the Mille Lacs Lake Watershed Management Commission. We would also like to thank you for the assistance you have provided us in this study. We would be happy to discuss this report with you at your convenience. Please call me at 320.630.6229, if you have any questions.

Short Elliott Hendrickson Inc. (SEH®)

Sincerely,

Shannon Smith, PE Wetland Creations
Project Engineer
Wetland Creations, Inc.

April Bielejeski, PE
Project Engineer
SEH

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Mille Lacs Lake Watershed Water Quality Analysis Project
2007 and 2008 Water Quality Study
Mille Lacs Lake Watershed Management Group

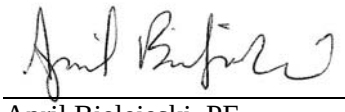
SEH No. A-MLLWM0801

June 9, 2009

I hereby certify that this report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Shannon Smith, PE Wetland Creations

Date: 06/09/09 Lic. No.: 24151

Reviewed by:  06/09/09

April Bielejeski, PE Date

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Executive Summary

The Mille Lacs Lake Watershed Management Group received a Minnesota Pollution Control Agency Clean Water Legacy project grant in 2007 to complete a water quality study of Mille Lacs Lake. This Report is the final report for this study.

The Report includes a summary of previous studies and reports completed for Mille Lacs Lake and its watershed. Lake and tributary water quality data that has been archived since the early 1970's was retrieved and analyzed for water quality trends and current lake water quality status. Water quality data that was collected in 2007 and 2008 was analyzed and presented in this report and presented to the Mille Lacs Lake Watershed Management Group Board in April 2008 and April 2009.

The current status of Mille Lacs Lake water quality is good. The lake water quality indicators are better than the large lake target levels reported by the MPCA. Water quality trends show better lake water quality from 2000-2008 than was found in the 1980's and 1990's.

Recommendations include continuing lake monitoring and studies that will pinpoint some of the problem areas in the lake watersheds that continue to contribute high levels of nutrients and suspended solids to the lake.

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2007 and 2008 Water Quality Study

Mille Lacs Lake Watershed Water Quality Analysis Project

Prepared for Mille Lacs Lake Watershed Management Group

1.0 Introduction

The Mille Lacs Lake Watershed Management Group (MLLWMG) received a Minnesota Pollution Control Agency (MPCA) Clean Water Legacy project grant in 2007 to complete a water quality study of Mille Lacs Lake. The project has four goals:

- Collect water quality samples in 2007 and 2008 to determine current lake water quality constituent concentrations. Constituents sampled will be nutrients, chloride, and field parameters. Sites sampled will include 12 tributary inlet sites, 1 Rum River outlet site, and 4 lake sites.
- Aggregate information and water quality data from all of the studies that have been done on the lake in the past.
- Collect, analyze, and compare water quality data collected through this project in 2007 and 2008.
- Complete two interim reports and a project final report and presentation discussing the findings of the project.

Mille Lacs Lake is a 132,480-acre, 207 mi^2 lake in central Minnesota. It is considered a shallow lake, with maximum depth of 43 feet and average depth of 21 feet. Mille Lacs Lake has a contributing watershed of 182 mi^2. This is a small watershed size compared to the Minnesota average watershed to lake size ratio of 10:1.

Mille Lacs Lake is bordered by three counties, Aitkin, Mille Lacs, and Crow Wing. The watershed for the lake is mostly within these three counties, with one small area of the watershed lying in Kanabec County.

2.0 Background Information

Previous studies of Mille Lacs Lake and the watershed were collected and copied as a part of this study. An electronic and/or paper copy of all the studies found were submitted to the Project Administrator.

Table 1 shows the list of study reports that have been reported. These are summarized in Section 2.1.

The earliest study found during this search was from 1976. The Clean Lakes Study (Heiskary,1994) and the Water Management Plan (Osgood, 2003) offer the most comprehensive studies of various aspects of the lake history, water resource criteria, and water quality data.

Table 1
Previous Studies Completed in the Mille Lacs Lake Area

Title	Author(s)	Year
Report on Investigation of Water Quality of Mille Lacs Lake (Study not found)	MPCA	1971
Mille Lacs Lake Watershed Study	Adams V. Grover and Associates	1976
(Study not found. Same as 1982 Study?)	East Central Regional Development Commission	1980
Mille Lacs Lake – 1981 (Study not found)	MPCA, Division of Water Quality	1982
Mille Lacs Lake 1992 Clean Lakes Study (314a) Water Quality Report	MPCA, Heiskary et.al.	1994
Ground Water Resources of the Mille Lacs Lake Area, East-Central MN	USGS, Trotta and Cowdry	1998
Screening of Highway 169 Improvement Alternatives for Potential Water quality Impacts	Walker	2001
Phase I Clean Water Partnership – Final Report and Recommendations (Mille Lacs Lake Watershed Management Plan)	Osgood Group	2003
Mille Lacs Lake Water Quality Analysis Study	Houston Engineering	2007
Other Research and Studies	Various	Various

2.1 Discussion of Previous Studies

2.1.1 1976 – Mille Lacs Lake Watershed Study, Adams & Grover and Assoc.

This report was the result of MPCA, Mille Lacs and Crow Wing Counties, and Township officials request for a Feasibility Study of a sanitary sewer and water supply project around Mille Lacs Lake.

The report includes a brief project history, a General Watershed study, and a Sanitary Sewer and Water study. The General Watershed Study presents information about the general geology, ecology, vegetation, watershed, and cultural and economic history of the area. A private well analysis is also included in the report. Wells serving residences around the lake were cataloged and sampled for nitrate-nitrogen, surfactant, and coliform bacteria. Results are tabulated in the report.

The Sanitary Sewer and Water study presents detailed information about two sanitary sewer system options, including costs, to provide service to the watershed areas of Mille Lacs Lake. Total construction costs were estimated to be in the range of $12 – $15.2 million. Estimates for connection, financing, operation, and maintenance costs were also provided.

It was determined that it was not feasible to construct a water supply and distribution system to serve the entire lake watershed area. Discussion was provided about the potential for water supply systems for the more densely populated areas of Garrison, Wahkon, and Port Mille Lacs.

It is not known what became of the sanitary sewer system proposal, except that the system was not built. Cooperation and formal agreements would have been necessary to form a Water and Sewer Commission between the three bounding counties, townships, and cities. State and federal funding would have been necessary to allow the project to move forward.

2.1.2 1994 – Lake Mille Lacs 1992 Clean Lakes Study (314a) Water Quality Report, MPCA, Heiskary, Koser et.al.

This study was conducted in cooperation between the Mille Lacs Band of Ojibwe (MLB), MPCA, Department of Natural Resources (DNR), and the Mille Lacs Property Owners Association. The study was partially funded by a U.S. Environmental Protection Agency (EPA) Clean Lakes grant (314a) and was prepared by the MPCA.

The report includes a description of the watershed topography, hydrologic characteristics, surface- and ground-water resources, demographics, economics, sub-watershed delineation, and land use description. A water quality sampling study was completed and reported. Lake water and nutrient budgets were estimated.

A large component of this project is the water quality sampling and analysis study. Water sampling was conducted in 1991 and 1992, although only the 1992 data were entered into the STORET water quality database and used in the report.

The sampling protocol included sampling near shore sites, deeper in-lake sites, tributary sites, and the Rum River outlet. Samples were analyzed for field parameters, nutrients, chloride, trace elements iron, sulfide and silica, transparency, and chlorophyll-a. The MLB also reported that they collected a large number of zooplankton and macroinvertebrate samples, data, and lab sheets. Much of this data exists only on the original, uncataloged data sheets.

Water quality analysis in this report was extensive. The lake models MINLEAP and BATHTUB were used to access internal loading conditions in the lake. The major conclusions were:

- In general, the lake water quality description is typical of minimally impacted, mesotrophic lakes in north-central MN (northern lakes and forest ecoregion).
- Phosphorus is the limiting algal growth nutrient in the lake.
- Based on results from one site, there is minimal evidence of internal phosphorus release from the lake's sediment. Other processes may allow for TP recycling from the lake sediments.
- A trend analysis with samples from 1971, 1981 and 1992 indicate a slight improvement in water quality over time.
- Modeling results indicate that background TP values should be in the range of 11-18 ug/L. The 1992 summer-mean TP value was 27 ug/L.
- Summer-mean secchi transparency reading was 7.2 ft. A slight increase in transparency is indicated over time.
- About 50% of the TP loading to the lake comes from precipitation

The lake has a comparatively long water residence time (30 years)

- Less than 20% of the TP loading to Mille Lacs Lake is potentially controllable by human means. 80% of the TP loading comes from precipitation, natural watershed conditions and internal loading from bottom sediments.

The report includes a list of recommendations all focused on the primary recommendation:

- Establish a non-degradation goal for Mille Lacs Lake.

2.1.3 1998 – Ground Water Resources of the Mille Lacs Lake Area, East-Central MN, USGS WRI 97-4116, Trotta and Cowdry

This study was conducted in cooperation between the MLB and the U.S. Geological Survey (USGS). The purpose of the study is to 1) assess the location, extent and connectivity of groundwater aquifers in the Mille Lacs Lake area; 2) describe the water quality in the surficial and uppermost buried aquifers in the area; 3) define the interaction between groundwater and Lake Onamia; and 4) to describe the susceptibility to contamination of the groundwater in these aquifers.

The report indicates that groundwater in the area occurs in saturated, overlapping but unconnected glacial sand, gravel, and bedrock aquifers. The aquifers were found to be irregular, lens shaped areas of water-bearing coarse sand and gravel. The aquifers are separated by areas of silt and clay glacial till material, which don't hold or transmit enough water to be of use for well water supplies. These glacial till materials form confining units when they are thick enough, generally greater than 10 feet, which separate the aquifer areas. The individual aquifers may be connected or not, depending on the thickness and the percent of silts and clay of the confining layers.

The aquifers north and south of Lake Onamia were found to be connected to Lake Onamia. Direct connection between aquifers and Mille Lacs Lake was not established. Water quality was found to be good and with natural background parameter concentrations. No significant contamination was indicated by well samples.

2.1.4 2001 – Screening of Highway 169 Improvement Alternatives for Potential Water quality Impacts, Walker

This study was conducted by William W. Walker for the Minnesota Department of Transportation study looking at impacts of and alternatives for realigning and expanding Highway 169 on the west side of Mille Lacs Lake.

The study includes a summary of historical trends in lake water quality and nutrient budgets. The report presents an evaluation of potential water quality impacts to Mille Lacs Lake associated with the various design alternatives for Highway 169. Four highway design alternatives were discussed including on-lake and off-lake alignments. Discussion included potential water quality changes, potential benefits of applying best management practices (BMPs) to future highway segments, and long-term implications for management of Mille Lacs water quality.

Simple water and constituent mass balance models were used to estimate the general magnitude of impacts for key water quality constituents associated with each of the alternatives studied. The analysis focused on phosphorus (TP), suspended solids (TSS), chloride (road salt), and heavy metals as the key water quality constituents.

The historical trend analysis showed that water quality had improved from 1971 to 2000, as indicated by a decreased concentration of total phosphorus and chlorophyll-a and by an increase in transparency readings.

Results indicated that:

- Projected increases in TP and TSS concentrations as a result of the various road alternatives were small and most likely not measurable.
- The implementation of roadway BMPs would likely prevent any increase in Mille Lacs Lake TP concentration.
- Some of the inland lakes impacted by off-lake alignment alternatives show a greater sensitivity to increased constituent concentrations than does Mille Lacs Lake to the on-lake alternatives.
- Road deicing salts are projected to impact Mille Lacs Lake in on-lake alternatives with an increase of 17 to 32% (1-3ppm). Percent increases are larger for the inland lakes in off-lake alternatives.
- Overall regional water quality impacts would be lowest for the on-lake alignment alternatives that create the least amount of additional impervious area. This is determined as measured by net outflows to the Mississippi and Rum River basins.

2.1.5 2003 – Final Report and Recommendations of the Mille Lacs Lake Watershed Management Group – Phase I Clean Water Partnership Watershed Management Project (Watershed Management Plan), Osgood Group

This report was prepared in cooperation between the Mille Lacs Lake Watershed Management Group (MLLWMG), MPCA, Minnesota Board of Water and Soil Resources (BWSR), MLB, DNR, Mille Lacs Lake Association, and local units of government. The report was funded by a Phase 1 Clean Water Partnership grant from the MPCA.

The project was conducted over five years, from 1999 to 2003. During the five years many projects and educational outreach workshops were completed that helped to build toward the overall goal of Mille Lacs Lake watershed management. The project costs and a list of the project tasks are listed in the report.

The report includes a brief watershed summary, area history, water quality sampling results from 2000 and 2001, presentation of Mille Lacs Lake water and phosphorus budgets, and a Mille Lacs Lake Watershed implementation plan. A water quality sampling study was completed and reported.

The appendices include county septic system survey reports, Mille Lacs Lake recreational impact studies, 2002 sediment core analysis report, a model storm water ordinance, and an extensive fisheries narrative and data report.

The MLLWMG reported its goal statement and an implementation plan. The goal statement is:

> *The water quality of Mille Lacs Lake will be preserved at its 2000-2001 levels through an ongoing program of advocacy, education, protective actions, planning and monitoring.*

The implementation plan includes six management objectives and 14 management actions to reach the objectives.

Central to the study objectives and goals are:

- Comprehensive watershed coordination.
- Planning and zoning coordination.
- Target reductions to meet water quality goals. The increased rate of TP storage in lake bottom sediments since the 1960's may lead to an increase in suspended lake TP concentrations. Increased lake TP levels would lead to a decrease of lake water quality and increased algae levels.
- Increase the awareness and knowledge of watershed residents, lake users, and local elected officials with regard to the need for lake and watershed protection.
- Implementation of an ongoing monitoring and evaluation program.

2.1.6 2007 – Mille Lacs Lake Water Quality Analysis Study, Houston Eng.

This study was conducted by the MLB as a foundation for their effort toward protecting water quality of Mille Lacs Lake. The report, written by Houston Engineering, Inc., is an analysis of available water quality data for Mille Lacs Lake.

The MLB, as required by federal government guidance criteria and the Clean Water Act Section 106 Tribal Guidance, must conduct a monitoring and assessment program and develop a nutrient criteria plan to ensure protection of lake health for Mille Lacs Lake. This report is a part of meeting these requirements and goals.

The goals of this report were 1) to find a representative baseline water quality condition for Mille Lacs Lake; 2) to determine whether the water quality varies significantly over the lake surface area; and 3) to determine whether water quality trends through time are evident. These goals were set to form a basis for future water quality monitoring and to indicate areas with historic or current vulnerabilities or health.

The study looked at water quality monitoring data collected over time from the lake. Data from studies conducted from 1974 to 2006 were included in the analysis. The three water quality indicator constituents, total phosphorus, chlorophyll-a, and secchi disk transparency depth, were used as a general indicator of lake health and status. These constituents are considered key tropic indicators for lake health. The data was analyzed for levels and trends over time and over the lake surface.

Results of this study indicate that the health of Mille Lacs Lake improved over the years analyzed (1974 to 2006), based on the three trophic indicator constituents assessed.

2.1.7 Other Research and Studies

Personal discussion with Perry Bunting, MLB Natural Resource Department Aquatic Research Biologist, resulted in the following list of other Mille Lacs Lake research projects and studies that are known to have been conducted.

1999 – Continuous Lake Monitoring

The MLB installed a 'Rush unit' (Apprise Co.), which could be used to measure ongoing lake parameters. After several attempts the unit was unable to be stabilized (it washed back into shore) and the effort was abandoned. The MLB is interested in participating in installing a lake monitoring station when it is feasible to try again. Some work has been done in the past to develop an internal lake nutrient cycling model, but that effort needs more work.

2000-2001 – Stage/Discharge data collection

The MLB, with assistance from Mark Evenson, MPCA, collected stage/discharge data for several tributaries and the outflow at Buckmoore dam. This data would be necessary to have stage/discharge flow data for inflow and lake outflow.

2003 – Mille Lacs Lake Paleolimnology Project, Kingston, NRRI

In March 2002, a lake bottom core sample was obtained near lake monitoring station ML6. The sample was 1.0 - 1.5 meter in depth.

The sample was separated into 17 different depth/age intervals. Using standard scientific methods, lead (Pb) was measured and utilized as an indicator of the age of each interval. Diatoms were assessed and counted and then utilized to determine the relative health and nutrient-loading rate for the lake. Diatoms, a type of phytoplankton, are microscopic benthic organisms. Sediment deposition rates were measured and compared over time.

Results indicate that since 1960 the nutrient loading into the sediments of Mille Lacs Lake may be higher than from earlier years. This counters the water quality sampling indications that TP concentrations in the lake water has decreased since 1970.

2006-2007 – Algae Species List, Axler and O'Neill, UMD-NRRI

Researchers have compiled an algae species list for Mille Lacs Lake based on the 2003 diatoms study. They are working on determining the index of biological indicators (IBI).

2006-2007 – Water Quality Phytolith Study, St. Cloud State University

Researchers are studying the phytolith with respect to wild rice population and dispersion.

2005-2007 – Seguchie Sub-Watershed Project, USGS and MnDOT

Researchers began a project to look at compiling pre- and post- highway construction data for a study comparing wetland, watershed, and Mille Lacs Lake inflow and outflow data. The project leaders are looking for a new lead agency to take over this study.

2007-2008 – Mille Lacs Lake Water Quality Analysis Study, MLLWMG and SEH

(This Study) The MLLWMG contracted with SEH Inc. to collect and summarize the historic and current data that exists from Mille Lacs Lake studies. This report is the final result of the study.

2005-present – Water Quality Sampling Project, MLB

The MLB has an ongoing water quality monitoring program for Mille Lacs Lake. Several field parameters are measured and constituents are analyzed from lake samples.

The MLB has an ongoing wet deposition mercury data collection program. They have also looked at mercury in fish tissue.

2008-present – Rum River Sampling Study, Mille Lacs SWCD

The Mille Lacs Soil and Water Conservation District (SWCD) have begun a study to collect water quality samples from the Rum River. The river has very little water quality data that has been collected, so this study will provide the basis for future research.

2.2 Report Scope

This project, 2007-2008 Mille Lacs Lake Water Quality Analysis Project, was begun in the spring of 2007. Water quality sample data collected in 2007 and 2008 was added to the years of collected data and analyzed for trends or patterns. These analyses will be used as the basis for future water quality sampling project designs.

The purpose of this report is to summarize the work that has been done during the two-year study. Additionally, water quality data from this study and others will be looked at together to determine any apparent trends or patterns.

2.3 Information Presented

The report includes three main sections:

- Summary of existing studies and research
- Presentation and analysis of 2007 and 2008 collected water quality data
- Presentation and analysis of historic water quality data combined with the 2007 and 2008 data

3.0 2007 and 2008 Water Sampling Analysis Results

Water samples were taken from the Rum River outflow and 12 tributaries to Mille Lacs Lake in 2007 and 2008 as a part of this study. Sampling was conducted monthly from April to October. Water samples were sent to Era Laboratories for analysis and the results entered into the U.S. EPA STORET database. Water sampling was conducted by the MLLWMG administrative manager.

The water quality vs. flow rate analyses presented in this section are based on the 2007 and 2008 sampling results. The analyses include river discharge flow rate data obtained from the USGS field office and website. The data was reviewed and graphed to present the water quality constituent concentrations against the stream flow rate for the sampling date. This comparison allows a determination of whether high or low concentration numbers might be a result of storm event runoff or, conversely, of a dry period/drought condition.

3.1 Analysis Information

2007 and 2008 water quality monitoring for Mille Lacs Lake included twelve tributaries to the lake, the lake outlet, and four sites on Mille Lacs Lake. Stream sites were sampled 12 times each season. Two lake sites were sampled twice in 2007 and zero times in 2008. Volunteers were not found to complete the lake sampling.

3.1.1 STORET Database

Results from the water analyses were entered into the STORET database. The STORET database was developed by the U.S. EPA so that a central location is available for storing and retrieving all water quality data collected in the country. The data storage and retrieval program in Minnesota is fully supported by the MPCA. The website for retrieving the water quality data is: www.pca.state.mn.us/water/storet.html.

3.1.1.1 Sample Sites

The water quality information includes data from the thirteen different sampling sites (Table 5). The analysis focused on samples taken from these sites from April 2, 2007 through November 18th 2008. These sites are shown in Figure 10 and are listed below:

a. Seastade / Reddick Creek
b. Reddie Creek
c. Ditch 36/Marmon Creek
d. Borden Creek
e. Seventeen Creek
f. Peterson Creek
g. Cedar Creek
h. Thaines/Malone Creek
i. Groundhouse River
j. Lake Outlet (Rum River)
k. Whitefish Creek
l. Seguchie Creek
m. Garrison Creek

3.1.1.2 Constituents Sampled

The field parameters and constituent samples taken at each site includes the following:

- Temperature (Degrees C)
- pH
- Transparency (cm)
- Chloride (mg/L)
- Total Suspended Solids (TSS) (mg/L)
- Specific Conductance (uS/cm)
- Dissolved Oxygen (DO) (mg/L)
- Salinity
- Total Nitrogen (mg/L)
- Total Phosphorus (P) (mg/L)
- Physical Appearance

Of these parameters the analysis presented below focuses on the following three constituents:

- Total Suspended Solids (TSS) (mg/L)
- Chloride (Cl) (mg/L)
- Total Phosphorus (TP) (mg/L)

3.1.2 Analysis of Water Flow Rate vs. constituent concentrations

Mille Lacs Lake daily water elevation records, the Rum River flow rate, and concentration of TSS, Cl, and TP can be plotted to determine how high and low concentrations vary with the lake elevation and river flow rate.

3.1.2.1 Water Flow Rate

Water flow rate data was obtained from the USGS website: waterdata.usgs.gov/nwis. The analysis focused on data obtained from January 1, 2007 through December 22, 2008.

The flow rate, in cubic feet per second (cfs), is obtained from existing river monitoring stations. The scope of the study did not include installation of a monitoring station close to Mille Lacs Lake. The closest official monitoring station for flow rate data is on the Rum River near St. Francis, MN. This station is about 70 miles south of the Mille Lacs Lake Rum River outlet. By river miles the distance would be 5 to 10 times that distance.

However, the relative amount of rainfall that falls in the direct Mille Lacs Lake watershed would, in most cases, rise and fall similarly in the watersheds between the lake and St. Francis.

Location:
USGS Station: 05286000 Rum River (near St. Francis, MN)
Latitude 45^19’40”
Longitude 93^22’20”
NAD27
Anoka County, MN
Hydrologic Unit 07010207

Description:
Drainage Area: 1,360 square miles
Datum of gage: 860.74 feet above sea level NGVD29

3.1.2.2 Lake Stage Data

Lake stage data was obtained from the USGS site office and the USGS website. waterdata.usgs.gov/nwis

The analysis focused on data obtained from January 1, 2007 through December 22, 2008.

Location:
USGS Station: 05284000 Mille Lacs Lake at Cove Bay (near Onamia, MN)
Latitude 46^06’36”
Longitude 93^37’08”
NAD27

Description:
Datum: 1240.40 NGVD29

3.2 Water Quality Constituents

Water quality is a term encompassing numerous factors. The importance of the constituents analyzed – TSS, Cl, and TP – are discussed below.

3.2.1 Total Suspended Solids

Total Suspended Solids (TSS) are small to microscopic solids suspended in the water and could include a wide variety of material, such as silt, decaying plant and animal matter, industrial waste, and sewage. Small silt and clay particles often carry other pollutants, such as phosphorus or heavy metal, because of a chemical bonding process. Suspended solids, in high concentrations, can cause problems for lake and stream health. (http://bcn.boulder.co.us/basin/data/BACT/info/TSS.html)

Effect on Plants

TSS reduces the amount of light that can travel through water. This limits the amount of light reaching plant life. As the light is reduced plants begin to suffer and can die off.

Effect on Fish

TSS can affect fish life in a number of different ways. As plants loose sunlight and die off, the amount of dissolved oxygen in the water is reduced, both from lack of plant production and from consumption from decomposing plant life. Low dissolved oxygen levels can cause fish kills.

High TSS levels reduce water clarity, which can affect the ability of fish to see and obtain food. TSS can also clog gills, reduce growth rates, reduce fish populations, and cause a decrease in the ability of fish to resist disease.

Effect on Water Quality

The effect of TSS on water quality is complex and includes many aspects. Important adverse effects include an increase in water temperature and a contribution to high concentrations of bacteria, nutrients, pesticides, and metals in the water.

3.2.2 Chloride

Although small amounts of chloride are required for normal cell functions in plant and animal life, fish and aquatic life cannot survive with high levels of chlorides.(http://kywater.org/ww/ramp/rmcl.htm)

Chlorides can contaminate surface water from a number of sources including agricultural runoff, wastewater, septic systems, and road salting.

Chloride above certain levels can be toxic. Table 2 presents the chloride levels that are acceptable for aquatic life.

Table 2 Approximate Chloride Levels Toxic for Aquatic Life		
Chloride Levels Above The Following Levels can be Toxic:		
Short Exposure mg/L (PPM)	**Long Term Exposure mg/L (PPM)**	**Species**
2,540	400	Snail
6,570	430	Fathead Minnow
6,740	900	Rainbow Trout
8,000	800	Channel Catfish
8,390	850	Carp

3.2.3 Phosphorous

Phosphorous is a nutrient which aids in plant growth. It is regarded as the most important nutrient causing excessive plant growth. High levels of phosphorous cause aquatic vegetation and algae to multiply. Large amounts of vegetation can rob water of dissolved oxygen through die off, which can negatively affect plants, fish, and water quality. (http://media.www.stoutonia.com/media/storage/paper1199/news/2009/03/05/News/Clean.Lakes.Bill.Will.Directly.Affect.Local.Bodies.Of.Water-3660573.shtml)

Phosphorous is transported by soil particles in runoff. Phosphorous can come from a number of sources including rainfall, agricultural runoff, fertilizers wastewater, septic systems, and industrial activity. (http://ga.water.usgs.gov/edu/urbanpho.html)

3.3 Results

This analysis examines the available water elevation, flow and constituent concentration data and provides a view of concentrations compared to flow rates.

The results show that a broad range of flow conditions were present during the sampling events. Figures 2 – 9 show the graphic plots of this analysis.

High flow rates are mainly caused by snowmelt and heavy rain events. Moist and mid-range flows are from average rain runoff events. Dry condition and low flows are typically from base flow runoff. Often point source pollutant sources show up during low flow conditions.

Figure 2 shows the Rum River flow for 2007-2008, the flow on the sample dates, and the Mille Lacs Lake elevation data. Figure 3 graphs the Rum River flow duration curve. This curve shows that the sample dates represented all of the flow conditions.

3.3.1 Total Suspended Solids

Graphical results for TSS are shown in Figures 4 – 5.
Generally the TSS concentrations are low during the spring months (April-June). After July, the TSS concentrations start to increase for a number of tributaries. The increase is mainly associated with mid-range flows, suggesting that TSS concentration is runoff driven.

3.3.1.1 Seastade Creek

TSS levels range from 2 to 12 mg/L, except one occurrence of 21 mg/L. TSS levels did not change significantly for different flows.

3.3.1.2 Reddie Creek

TSS levels range from 0 to 19 mg/L. Lower levels of TSS are present from July through September, with an increase in TSS levels during high flows. This indicates that increased TSS occurs during heavier rain events and/or snowmelt in this watershed.

3.3.1.3 Ditch 36

TSS levels range from 1 to 17 mg/L. A slight increase is associated with spring months and moist conditions, indicating that increased TSS occurs during rain events and/or snowmelt.

3.3.1.4 Borden Creek

TSS levels range from <1 to 12 mg/L. There are no obvious changes in TSS related to time of year or changes in flow.

3.3.1.5 Seventeen Creek

TSS levels range from <1 to 141 mg/L. In both 2007 and 2008, TSS levels increased from spring into early or late summer. In 2007, TSS levels reached 13 mg/L in June and then dropped to 0.5 mg/L in October. In 2008, TSS levels reached 141 mg/L in August, and then dropped to 0.5 mg/L in October. In both years the flow was too low during some of the summer months to collect water samples. The dramatic increase and decrease, along with the fact that the increases occurred during dry conditions, indicate an increase due to a point source.

3.3.1.6 Peterson Creek

TSS levels range from <1 to 26 mg/L. There are no obvious changes in TSS related to time of year or changes in flow for 2007. The 2008, data indicated an increase in TSS during the July and August months. The increases are associated with mid-range flow to dry conditions. This may indicate an increase due to a point source.

3.3.1.7 Cedar Creek

TSS levels generally range from <1 to 38 mg/L except one occurrence of 129 mg/L. The 2007 TSS levels did not change significantly with time of year or changes in flow. The TSS levels generally increased overall in 2008 with a significant increase in October. The overall increase from 2007 to 2008 is most likely due to the increased flow and lake stage in 2008, indicating that the increase occurs during average runoff conditions.

3.3.1.8 Thaines Creek

TSS levels range from <1 to 11 mg/L except for the last sample within the data set from November 18, 2008, which had a TSS reading of 48 mg/L. This increase was associated with a mid-range flow and may be caused by a point source or upstream construction. Continued monitoring at this location would be indicated to determine if the TSS concentrations continue to be high.

3.3.1.9 Groundhouse Creek

TSS levels range from <1 to 32 mg/L. TSS levels increased overall from 2007 to 2008. Both in 2007 and 2008, there was an increase in late spring to early fall. The increases occurred during mid-flow conditions, indicating that the increase occurs during average runoff conditions.

3.3.1.10 Lake Outlet (Rum River)

TSS levels range from <1 to 11 mg/L. There are no obvious changes in TSS related to time of year or changes in flow.

3.3.1.11 Whitefish Creek

TSS levels range from <1 to 24 mg/L. In 2007, there was a slight increase between June and September. This increase was associated with dry conditions, which is associated with a point source or base flow conditions.

3.3.1.12 Seguchie

TSS levels range from <1 to 76 mg/L. Increases in TSS occurred from July into September. These increases occur during dry conditions and mid-range flows. This would indicate increases occur during average runoff conditions and point source or base flow conditions.

3.3.1.13 Garrision Creek

TSS levels range from <1 to 8 mg/L, except one reading from April 22, 2008, which had a TSS reading of 27 mg/L. This reading occurred during high flow conditions, indicating that it resulted from a rain event or snowmelt. The remaining readings do not present any obvious changes in TSS related to time of year or changes in flow.

3.3.2 Chloride

Graphical results for chloride are shown in Figures 6 & 7. The high chloride concentrations are most prevalent at low/base flow conditions. This indicates point sources, possibly septic system inputs.

3.3.2.1 Seastade Creek

Chloride levels range from 6.1 to 46 mg/L. Seastade Creek has a larger chloride level then a majority of the other tributaries. There seems to be an increase in chloride from August to October. The increase occurs during low/base flow conditions, indicating point source(s).

3.3.2.2 Reddie Creek

Chloride levels range from 1.4 to 5.3 mg/L. There are no obvious changes in chloride related to time of year or changes in flow.

3.3.2.3 Ditch 36

Chloride levels range from 3.1 to 6.6 mg/L. There are no obvious changes in chloride related to time of year or changes in flow.

3.3.2.4 Borden Creek

Chloride levels range from 2.9 to 46 mg/L. Borden Creek has a larger chloride level then a majority of the other tributaries. The increase occurs during low/base flow conditions, indicating point source(s).

3.3.2.5 Seventeen Creek

Chloride levels generally range from 1.2 to 5.9 mg/L, except one reading from August 19, 2008, which had a chloride reading of 48 mg/L. This increase corresponds with a sample reading, which also showed increased levels of TSS and Phosphorous. This increase occurred during dry conditions, suggesting that the increase was due to a point source.

3.3.2.6 Peterson Creek

Chloride levels range from 0.7 to 4.8 mg/L. There are no obvious changes in chloride related to time of year or changes in flow.

3.3.2.7 Cedar Creek

Chloride levels range from 4.4 to 11 mg/L. There are no obvious changes in chloride related to time of year or changes in flow.

3.3.2.8 Thaines Creek

Chloride levels range from 2.1 to 10 mg/L. There are no obvious changes in chloride related to time of year or changes in flow.

3.3.2.9 Groundhouse Creek

Chloride levels range from 1.1 to 8.3 mg/L. The data indicates a general increase in chloride from 2007 to 2008. This increase is most likely due to the increased flow and lake stage in 2008, indicating that the chloride increase occurred during average runoff conditions.

3.3.2.10 Lake Outlet (Rum River)

Chloride levels range from 3.3 to 6.2 mg/L. There are no obvious changes in chloride related to time of year or changes in flow.

3.3.2.11 Whitefish Creek

Chloride levels range from 1.5 to 4.1 mg/L. There are no obvious changes in chloride related to time of year or changes in flow.

3.3.2.12 Seguchie

Chloride levels generally range from 1.5 to 2.9 mg/L, except two readings from September 5 & 19, 2008, which had chloride readings of 6.6 mg/L and 9.1 mg/L respectively. All other readings had no obvious changes in chloride related to time of year or changes in flow.

3.3.2.13 Garrision Creek

Chloride levels range from 2.7 to 6.7 mg/L. There are no obvious changes in chloride related to time of year or changes in flow.

3.3.3 Phosphorus

Graphical results for phosphorus are shown in Figures 8 & 9. High phosphorus concentrations are most prevalent during mid-flow conditions, indicating that they are runoff driven during average runoff conditions.

3.3.3.1 Seastade Creek

Phosphorus levels range from 0.022 to 0.344 mg/L. The highest concentrations occur during moist conditions, indicating that they occur during average runoff conditions, heavy rain events and snowmelt.

3.3.3.2 Reddie Creek

Phosphorus levels range from 0.031 to 0.199 mg/L. There are no obvious changes in phosphorus related to time of year or changes in flow.

3.3.3.3 Ditch 36

Phosphorus levels range from 0.034 to 0.161 mg/L. There are no obvious changes in phosphorus related to time of year. Increases seem to occur during moist and high flow conditions, indicating that it is caused by heavy rain events and/or snowmelt.

3.3.3.4 Borden Creek

Phosphorus levels range from 0.033 to 0.143 mg/L. There are no obvious changes in phosphorus related to time of year or changes in flow.

3.3.3.5 Seventeen Creek

Phosphorus levels range from 0.023 to 0.260 mg/L, except two readings from October 8, 2007 and August 19, 2008, which had phosphorus readings of 0.500 mg/L and 0.617 mg/L respectively. This increase corresponds with a sample reading, which also showed increased levels of TSS and Chloride. These increases occurred during dry conditions, suggesting that the increase was due to a point source.

3.3.3.6 Peterson Creek

Phosphorus levels range from 0.038 to 0.211 mg/L. Peterson Creek has higher phosphorus levels than many of the other tributaries; however, there are no obvious changes in phosphorus related to time of year or changes in flow.

3.3.3.7 Cedar Creek

Phosphorus levels range from 0.031 to 0.199 mg/L. Cedar Creek has slightly higher phosphorus levels than many of the other tributaries; however, there are no obvious changes in phosphorus related to time of year or changes in flow.

3.3.3.8 Thaines Creek

Phosphorus levels range from 0.028 to 0.079 mg/L, except the last reading within the data set from November 18, 2008, which had a phosphorus reading of 0.139 mg/L. This increase was associated with a mid-range flow. Continued monitoring at this location would be indicated to determine if the phosphorus concentration continues to remain high.

3.3.3.9 Groundhouse Creek

Phosphorus levels range from 0.030 to 0.339 mg/L and are generally higher than other tributaries. Phosphorus levels are sporadic with no obvious changes due to time of year or changes in flow.

3.3.3.10 Lake Outlet (Rum River)

Phosphorus levels range from 0.016 to 0.099 mg/L. There are no obvious changes in phosphorus related to time of year or changes in flow.

3.3.3.11 Whitefish Creek

Phosphorus levels range from 0.013 to 0.091 mg/L. There are no obvious changes in phosphorus related to time of year or changes in flow.

3.3.3.12 Seguchie

Phosphorus levels range from 0.015 to 0.436 mg/L. Seguchie Creek has higher phosphorus levels than many of the other tributaries. There are no obvious changes in phosphorus related to time of year, however, increased phosphorus level seem to be present during dry conditions, indicating that phosphorus may be the result of point sources.

3.3.3.13 Garrision Creek

Phosphorus levels range from 0.013 to 0.113 mg/L. There are no obvious changes in phosphorus related to time of year or changes in flow.

3.4 Conclusions

Table 5 presents the water quality data for each sampling site and date.

3.4.1 Total Suspended Solids

High TSS concentrations are more predominant during mid-range flow conditions. Mid-range flow conditions indicate that TSS is an average storm event runoff driven constituent. Seguchie Creek has the highest concentrations of TSS.

3.4.2 Chloride

High chloride concentrations are more predominant during dry conditions. This indicates that the high chloride concentrations are the result of point sources, possibly from septic systems. Seastade Creek and Borden Creek have the highest concentrations of chloride.

3.4.3 Phosphorus

High phosphorus concentrations are more predominant during mid-range flow conditions. Mid-range flow conditions indicate that phosphorus is an average storm event runoff driven constituent. Seguchie Creek, Peterson Creek, Groundhouse Creek, Cedar Creek, and Seventeen Creek have higher levels of phosphorus than the other tributaries.

4.0 Mille Lacs Lake Long Term Studies

Recorded water quality sampling results are available from Mille Lacs Lake and its tributaries since 1970. Most of the available data is archived in the STORET database. This data is available on the internet at: www.pca.state.mn.us/water/storet.html.

Water quality analyses from these data are compared in this section to provide a way to look at trends in water quality in Mille Lacs Lake from 1970 to 2008. Table 6 shows the archived lake tributary data. Tables 7 & 8 show the 2007-2008 and archived Mille Lacs Lake data.

4.1 Overview

The simplest way to view water quality trends for Mille Lacs is to look at the key water quality indicators, phosphorus (TP), chlorophyll-a (CLA), and secchi disk transparency and see what trends are indicated.

Table 3 shows the average Mille Lacs Lake phosphorus and chlorophyll-a concentrations and secchi disk reading for several years between 1971 and 2008.

Table 3
Trends in Mille Lacs Lake Water Quality

(Average for year over lake)

Year	Mean TP (ppb)	Mean CLA (ppb)	Mean Secchi (ft)
1971	36	--	--
1981	29	7	6
1992	27	4	7
2000 [a]	17	4	10 [b]
2001 [a]	18	2	12
2007 [a]	17	4	11
2008 [a]	16	4	12
2007	19	4	11
2008	16	3	12
MPCA Large Lake Goal	30	9	6.5

Table Notes:
a - only sites ML-1, ML-6, ML-20, ML-24, south and west side of lake
b - data from MPCA STORET website
1971,1981,1992 from Heiskary et al. (1994)
2000, 2001 from Mille Lacs Lake Watershed Management Plan (2003)
2007, 2008 from this study

This data indicates that Mille Lacs water quality improved from 1971 to 2000 and that it has stabilized since then. Other reports, Heiskary, et al, (1994), Osgood (2003), have reported these same numbers and noted the general improvement since the 1971 and 1981 data. All of the studies caution that water quality data must be monitored and trends observed in order to ensure that lake water quality does not begin to degrade.

Table 3 also shows the MPCA large lake goals for these three indicator constituents. Mille Lacs Lake mean water quality concentrations are better than the MPCA goals. This means that Mille Lacs Lake is in good condition with respect to these water quality constituents.

The trophic status of Mille Lacs Lake continues to be in the mesotrophic range. Mesotrophic means that the lake is relatively clean and clear, with moderate vegetation productivity and few algae blooms. The trophic indicators shown in Table 2 indicate that the Mille Lacs trophic status has improved 5-10 points on the Carlson Trophic State Index (TSI) from 1992 to 2008. Each increase of 10 points on the TSI scale represents a doubling of potential lake algal biomass.

The description of trophic status and how it is determined was described in the Clean Lakes Study (Heiskary, 1994), pp. 59-61. The MPCA website: http://www.pca.state.mn.us/water/clmp/lkwqReadFull.cfm?lakeid=48-0002 also provides a description of trophic status and the value for Mille Lacs Lake.

4.2 Lake Water Quality Data

Water quality data is known to have been collected from Mille Lacs Lake since 1971, and archived data is available since 1974. Figures 10 – 12 show the sampling sites that have been used by different studies over the years.

Figure 10 shows the tributary and lake sites sampled for this study. Figure 11 shows the sites sampled for the Heiskary1994, Osgood 2003, MLB ongoing studies, and other studies that used these same sampling sites. Figure 12 shows the sites sampled by the DNR Fisheries office in Aitkin, MN.

4.2.1 Water Quality Indicators in 5 Year Ranges

Data from all of these studies was combined to graph the change in water quality between 1970 and 2008 in Mille Lacs Lake. Figures 13 – 15 show box plots of the three trophic status indicator constituents TP, CLA, and Transparency readings, by 5-year sampling year ranges. Table 4 shows the median concentration for each constituent by year range.

Table 4
Year Range Trends in Mille Lacs Lake Water Quality

(Median for 5 year range over lake)

Year Range	Median TP (ppm)	Median CLA (ppb)	Median Secchi (ft)
1970-1976	.018	--	7.5
1980-1984	.035	7.8	6.4
1985-1989	.041	12.5	7.0
1990-1994	.025	3.2	7.5
1995-1999	.050	7.3	11.5
2000-2004	.019	4.6	11.0
2005-2008	.021	4.7	10.5

The ranges of lake total phosphorus concentrations are shown in Figure 13 and Table 4. The data show that median total phosphorus concentrations are lower in 2000-2008 than the higher concentrations found from 1980-1999. This agrees with the data results shown in Table 3.

The ranges of lake chlorophyll-a concentrations are shown in Figure 14 and Table 4. The data show that median chlorophyll-a concentrations are lower in 2000-2008 than the higher concentrations found from 1980-1989 and in 1995-1999. 1990-1995 also show a lower median chlorophyll-a concentration than the 5-year range before or after it.

The ranges of lake secchi disk readings are shown in Figure 15 and Table 4. The data show that median secchi disk readings are higher in 1995-2008 than the lower readings found from 1970-1994. Higher secchi disk readings indicate that the lake is clearer than lower readings.

The results from these graphs and tables all show that lake water quality as shown by these three indicator constituents is better in 2000-2008 than it was during the 1980's and 1990's.

4.2.2 2007-2008 Total Phosphorus Concentrations

Figure 16 shows the TP concentrations for 2007 and 2008 from samples lake-wide collected by the MLB. This graph shows the data from each sampling month next to each other for these two years.

TP concentrations are shown to be lower in the early spring, before snowmelt runoff and spring vegetation growth, than they are later in the summer.

4.3 Tributary Water Quality Data

Water quality data from the 2007-2008 sampling for this study was presented in Sections 3.1 to 3.4 and Figures 4-9. A different way to look at this data, is to graph them on scatter plots as shown in Figures 17-29. These graphs show the constituents total nitrogen (TN), Cl, and TP from the 2007-2008 data, and also all other archived data collected from these tributaries since 1981. The majority of the data collected at these sites is from the 2007-2008 study.

Discussion of the relative concentrations of constituents from the tributary sites was presented in Sections 3.3 and 3.4. Data from each site where earlier data from 1981-2006 exist, show that a similar range of constituent concentration was found in earlier samplings as was found in the 2007-2008 study.

Figures 30 – 42 show graphs of the 2007-2008 TP concentrations and transparency tube readings. These graphs show the 2007-2008 data in more detail.

As an example, Figure 30 shows the plot of TP and transparency for Borden Creek. It is easy to see in this set of graphs that the TP and transparency numbers move generally in opposite directions. Transparency tube readings, as with the lake secchi disk readings, are a measure of lake water clarity. This relationship is because higher TP concentrations lead to higher algae production and thus lower lake clarity.

5.0 Conclusions and Recommendations

Water quality studies for Mille Lacs Lake have been undertaken since 1971 and the trends indicate that the lake water quality continues to be in good condition.

It is unknown exactly which factors effecting lake water quality are sizeable enough to affect lake water quality in the future. Land use around the lake has changed dramatically from 200 years ago, to 100 years ago, to today. Lake water quality has certainly already changed over the past 200 years, but the data does not exist to tell us how. We don't know how susceptible the lake will be to changes in runoff caused by further development upstream, changes from seasonal, weekend use to year round lake home living, continued nutrient and other inputs from septic systems and other land uses, switching from septic systems to sanitary sewer systems, changes in climate, or changes from the introduction of eurasion milfoil, zebra mussels or other exotic species.

The best that can be done is to cooperatively continue monitoring and studying lake water quality, and to try and identify the causes of high TP, CLA, or TN readings that have been identified in this study. Questions that can be studied include, 'Where in the upstream watersheds are some of the high concentrations pinpointed in this study coming from?' and 'What land use changes may be adversely impacting Mille Lacs Lake now, or might do so in the future?'

TP concentrations analyzed from the tributary sites are shown to vary more than the TP concentrations from the lake sampling (Tables 5, 6, and 8). This makes common sense, because the tributary samples will reflect variable and high point source contributions. However, the lake samples will show the result of mixing of new inflows from many sources with existing, lower concentrations in the lake water.

The "dilution" effect that the lake has on high point sources has been a safety factor to keep the lake TP concentrations in a health range. However, it is unknown what the turning point is when the lake will no longer be able to dilute higher inflow concentrations and maintain internal lake water TP concentrations at a low, health level.

Controlling phosphorus inputs to Mille Lacs Lake is one of the most important measures to consider for the future health of the lake. In the Clean Lakes Study (Heiskary, 1994) it is stated (paraphrased version):

> *Less than 20 percent of the TP loading to Mille Lacs Lake can be considered 'controllable' (ie., potentially subject to reduction by man). Precipitation on the surface of the lake (48% of total loading) and internal recycling because of wind resuspension (potentially 34 % of total loading) are among the 'uncontrollable' sources. The lake retains about 94% of the TP loading that flows to it each year.*

Only 18% of the annual TP loading from watershed and groundwater sources may be subject to reduction or control. This means that every effort possible should be made to reduce TP loading from the watershed or via groundwater seepage.

For groundwater, this implies reducing TP loads from non-code or poorly maintained septic systems and other sources, which may transport excess amounts of TP to the groundwater. For the watershed, this may mean reducing point source TP loads, urban storm water runoff, feedlot runoff, wetland protection, instituting best management practices designed to minimize runoff where possible, and reducing TP loading from human excreta on the lake during the winter angling season.

The Watershed Management Plan (Osgood, 2003) recommends an implementation plan of management objectives and goals. The MLLWMG goal statement is:

The water quality of Mille Lacs Lake will be preserved at its 2000-2001 levels through an ongoing program of advocacy, education, protective actions, planning and monitoring.

Central to the recommended implementation plan objectives and goals are:

- Comprehensive watershed coordination.
- Planning and zoning coordination.
- Target reductions to meet water quality goals. The increased rate of TP storage in lake bottom sediments since the 1960's may lead to an increase in suspended lake TP concentrations. Increased lake TP levels would lead to a decrease of lake water quality and increased algae levels.
- Increase the awareness and knowledge of watershed residents, lake users, and local elected officials with regard to the need for lake and watershed protection.
- Implementation of an ongoing monitoring and evaluation program.

Supporting these objectives and ensuring that they are continued into the future will create the best environment for management and protection of Mille Lacs Lake.

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Table 6 – Archived 1981-2008 Tributary Water Quality Data
Table 7 – 2007-2008 Mille Lacs Lake Water Quality Data
Table 8 – 1970-2008 Mille Lacs Lake Water Quality Data

Table 5: 2007-2008 Tributary Water Quality Data

Project_Station_ID	STORET_Station_ID	Date	Military_Time	Comments	Staff gage	Bridge Down	Temperature, water	pH	Transparency, tube with disk	Chloride	Solids, Total Suspended (TSS)	Specific conductance	Dissolved oxygen (DO)	Salinity	Nitrogen, Total	Phosphorus, Total as P	Stream Physical Appearance, Minnesota (choice list)
						inches	Degrees C.		cm	mg/L	mg/L	uS/cm	mg/L		mg/L	mg/L	
Seastade Creek	S001-580	4/2/2007	10:25			91	2.71	7.66	60	6.1	3	0.120	14.92	0.06	4.2	0.077	3
Seastade Creek	S001-580	4/18/2007	9:35	Brown Water		89			60	7	2				1	0.037	3
Seastade Creek	S001-580	4/30/2007	9:15	Muddy		89	11.81	7.66	58		5	0.193	5.34	0.09		0.037	3
Seastade Creek	S001-580	6/5/2007	9:00	Muddy		87	16.32	7.65	47		6	0.228	4.91	0.11		0.054	4
Seastade Creek	S001-580	7/16/2007	13:40	1/2+ " rain last night		92	22.08	7.90	92	32	2	0.269	9.37	0.13	0.6	0.030	3
Seastade Creek	S001-580	7/25/2007	9:25	Hot & Dry, Lots of Aq. Veg.		94	24.89	7.70	>100		2	0.262	3.97	0.12		0.038	1B
Seastade Creek	S001-580	9/5/2007	9:20	Aquatic Veg.		97	20.44	7.22	57	45	6	0.379	3.35	0.18	0.8	0.051	2
Seastade Creek	S001-580	9/19/2007	9:25	Rain Event		100	15.30	6.99	29	46	12	0.426	2.78	0.21	0.5	0.059	3
Seastade Creek	S001-580	9/25/2007	9:00	>1/2 " rain last night		99	16.40	7.10	38		9	0.375	3.17	0.18		0.071	3
Seastade Creek	S001-580	10/8/2007	9:10	Rain Event		97	15.75	7.33	18		21	0.289	3.28	0.14		0.110	3
Seastade Creek	S001-580	10/24/2007	15:15			96	9.92		79	15	2	0.237	10.97	0.11	1.6	0.033	3
Seastade Creek	S001-580	11/5/2007	9:10			99	5.14		68		6	0.242	9.54	0.11		0.344	3
Seastade Creek	S001-580	4/7/2008	13:20			95	0.94	6.94	64	9.4	5	0.200	10.86	0.09	5.3	0.068	3
Seastade Creek	S001-580	4/22/2008	10:30	Recent Burning of Adjacent Wetland		91	6.86	7.09	34		10	0.158	9.48	0.08		0.117	3
Seastade Creek	S001-580	4/29/2008	8:10			88	2.71	7.04	77	9.5	3	0.175	10.88	0.08	2.4	0.035	3
Seastade Creek	S001-580	5/21/2008	9:30			87	10.74	7.06	71		5	0.196	10.32	0.09		0.022	3
Seastade Creek	S001-580	6/20/2008	9:15			83	19.19	7.16	65		5	0.201	6.25	0.10		0.027	3
Seastade Creek	S001-580	7/22/2008	9:45	Low - No visible Flow - Lots of Aq. Veg.		82	19.96	7.02	75	11.3	2	0.262	5.95	0.12	0.7	0.026	3
Seastade Creek	S001-580	8/19/2008	11:00	No Visible Flow, Lots of Aquatic Veg.		85	20.97	7.24	66	18	11	0.317	7.04	0.15	1	0.096	1B
Seastade Creek	S001-580	9/16/2008	8:25			90	12.73	6.88	43		4	0.401	5.81	0.19		0.038	3
Seastade Creek	S001-580	9/30/2008	10:45			90	13.01	7.03	52	30	7	0.358	4.38	0.17	0.1	0.050	3
Seastade Creek	S001-580	10/22/2008	9:00			89	6.73	7.23	75		4	0.247	9.42	0.12		0.033	3
Seastade Creek	S001-580	11/4/2008	8:20			90	8.09	7.20	56		6	0.257	8.35	0.12		0.041	3
Seastade Creek	S001-580	11/18/2008	9:50	Windy - Thin layer of Ice			2.81	7.54	64	12	3	0.247	11.69	0.12	1.15	0.033	1B
Reddy Creek	S001-571	4/2/2007	10:35	Recent Beaver Activity		84	2.54	7.53	52	2.8	9	0.134	14.17	0.06	4.6	0.100	1B
Reddy Creek	S001-571	4/18/2007	9:45	Brown Water		84			43	4	5				2	0.068	4
Reddy Creek	S001-571	4/30/2007	9:35	Muddy		83	10.35	7.61	39		13	0.170	5.33	0.08		0.056	3
Reddy Creek	S001-571	6/5/2007	9:15	Muddy		82	13.42	7.63	33		10	0.184	4.94	0.09		0.053	4
Reddy Creek	S001-571	7/16/2007	14:20	large sand bar at lake - no surface connection - no samples taken							0					0.000	
Reddy Creek	S001-571	7/25/2007	9:35	large sand bar at lake - no surface connection - no samples taken							0					0.000	
Reddy Creek	S001-571	9/5/2007	9:30	large sand bar at lake - no surface connection - no samples taken							0					0.000	
Reddy Creek	S001-571	9/19/2007	9:45	Very small channel to lake. Rain Event.		85	15.12	7.25	70	3.7	5	0.204	5.88	0.10	1.2	0.101	3
Reddy Creek	S001-571	9/25/2007	9:30	No surface connection to the lake							0					0.000	
Reddy Creek	S001-571	10/8/2007	9:25	Small connection to the lake		81	15.94	7.58	65		0	0.186	7.31	0.09		0.095	3
Reddy Creek	S001-571	10/24/2007	14:45			90	8.89		66	3.4	2	0.175	10.47	0.08	3.4	0.068	1B
Reddy Creek	S001-571	11/5/2007	9:25			90	5.19		53		4	0.189	10.47	0.09		0.049	3
Reddy Creek	S001-571	4/7/2008	13:00			63	0.44	7.11	48	1.4	11	0.110	12.56	0.05	6.5	0.115	3
Reddy Creek	S001-571	4/22/2008	10:45			86	6.60	6.99	28		11	0.140	9.57	0.07		0.134	3
Reddy Creek	S001-571	4/29/2008	8:30			84	2.62	7.02	73	3.1	2	0.116	11.51	0.05	2	0.048	3
Reddy Creek	S001-571	5/21/2008	9:50			80	10.01	6.87	35		7	0.164	8.91	0.08		0.055	3
Reddy Creek	S001-571	6/20/2008	9:30	oily film		78	18.26	6.80	20		19	0.148	3.97	0.07		0.199	3
Reddy Creek	S001-571	7/22/2008	10:00	Muddy - Still Connected to Lake		80	20.06	6.89	40	2.7	5	0.164	6.28	0.08	1	0.052	3
Reddy Creek	S001-571	8/19/2008	11:15	Small Connection to the Lake		79	20.77	7.27	66	2.3	5	0.238	6.03	0.11	1.1	0.048	3
Reddy Creek	S001-571	9/16/2008	8:40			77	12.43	7.26	84		3	0.251	8.30	0.12		0.039	3
Reddy Creek	S001-571	9/30/2008	10:55			74	12.68	7.25	>100	5.3	3	0.257	7.44	0.12	0.8	0.040	3
Reddy Creek	S001-571	10/22/2008	9:15	Good Channel to Lake		84	6.14	7.17	75		15	0.225	10.43	0.11		0.031	3
Reddy Creek	S001-571	11/4/2008	8:35			85	7.85	7.11	55		16	0.238	9.76	0.11		0.034	3
Reddy Creek	S001-571	11/18/2008	10:05	Windy. Ice			1.11	7.22	68	4.7	15	0.241	11.56	0.11	0.94	0.041	1B
Ditch 36	S001-579	4/2/2007	11:00			48	2.38	7.74	45	4.5	9	0.111	14.29	0.05	3.4	0.100	1B
Ditch 36	S001-579	4/18/2007	10:00			48			54	4	7				3	0.062	1B
Ditch 36	S001-579	4/30/2007	9:50			47	11.92	7.88	>60		6	0.116	4.90	0.05		0.074	1B
Ditch 36	S001-579	6/5/2007	9:30			46	16.26	7.71	47		12	0.152	4.87	0.07		0.105	1B
Ditch 36	S001-579	7/16/2007	13:55	1/2+ " rain last night		52	23.43	7.89	>100	5	4	0.203	8.70	0.10	0.7	0.041	1B
Ditch 36	S001-579	7/25/2007	9:55	Hot & Dry		51	27.29	7.85	97		4	0.205	5.44	0.10		0.043	1B
Ditch 36	S001-579	9/5/2007	9:40			56	21.58	7.59	>100	4.1	4	0.205	7.07	0.10	0.6	0.034	1B
Ditch 36	S001-579	9/19/2007	10:00	Rain Event		58	16.07	7.18	93	6.6	3	0.216	6.82	0.10	0.4	0.052	1B
Ditch 36	S001-579	9/25/2007	9:20	S. wind blowing lake water back into creek		55	17.06	7.34	98		3	0.210	7.93	0.10		0.034	1B
Ditch 36	S001-579	10/8/2007	9:40	Rain Event. Very visible flow		56	15.78	7.43	80		8	0.233	6.18	0.11		0.099	1B
Ditch 36	S001-579	10/24/2007	14:30			55	8.45		66	5.8	3	0.143	9.98	0.07	2.1	0.044	1B
Ditch 36	S001-579	11/5/2007	9:40	S. wind blowing lake water back into creek		53	5.26		93		4	0.150	11.50	0.07		0.047	1B
Ditch 36	S001-579	4/7/2008	12:45			52	0.76	6.95	36	5.7	17	0.183	9.95	0.09	2.9	0.161	1B
Ditch 36	S001-579	4/22/2008	11:00			50	6.09	7.02	75		4	0.071	9.64	0.03		0.105	1B
Ditch 36	S001-579	4/29/2008	8:45			48	2.81	7.15	98	3.1	2	0.066	12.47	0.03	0.2	0.040	1B
Ditch 36	S001-579	5/21/2008	10:05			43	11.47	6.88	60		4	0.087	8.28	0.04		0.054	1B
Ditch 36	S001-579	6/20/2008	9:45			40	19.54	6.89	48		4	0.095	5.44	0.04		0.081	1B
Ditch 36	S001-579	7/22/2008	10:15	Visible Flow to Lake		41	21.14	6.89	55	3.2	2	0.151	5.50	0.07	1.8	0.100	1B
Ditch 36	S001-579	8/19/2008	11:30				22.71	7.41	>100	4	1	0.221	6.69	0.10	1.1	0.038	1B
Ditch 36	S001-579	9/16/2008	9:00	Creek		47	13.42	7.45	>100		3	0.225	9.36	0.11		0.035	1B
Ditch 36	S001-579	9/30/2008	11:10			47	13.23	7.38	>100	5.5	3	0.231	9.31	0.11	0.6	0.037	1B
Ditch 36	S001-579	10/22/2008	9:30			46	6.55	7.23	72		4	0.165	9.38	0.08		0.069	1B
Ditch 36	S001-579	11/4/2008	8:50			48	8.76	7.18	70		6	0.188	9.36	0.09		0.093	1B
Ditch 36	S001-579	11/18/2008	10:20			46	0.28	7.39	77	5.6	4	0.146	13.89	0.07	1.79	0.045	1B

Table 5: 2007-2008 Tributary Water Quality Data

Project_Station_ID	STORET_Station_ID	Date	Military_Time	Comments	Staff gage	Bridge Down	Temperature, water	pH	Transparency, tube with disk	Chloride	Solids, Total Suspended (TSS)	Specific conductance	Dissolved oxygen (DO)	Salinity	Nitrogen, Total	Phosphorus, Total as P	Stream Physical Appearance, Minnesota (choice list)
						inches	Degrees C.		cm	mg/L	mg/L	uS/cm	mg/L		mg/L	mg/L	
Borden Creek	S001-296	4/2/2007	11:25	Swift Flow		64	2.70	7.80	>60	6	2	0.117	15.03	0.05	1.6	0.070	1A
Borden Creek	S001-296	4/18/2007	10:20	Swift Flow		77	7.49	7.99	>60	6	2	0.150	9.81	0.07	1.1	0.048	1B
Borden Creek	S001-296	4/30/2007	10:10	Suckers in the Creek		79	12.49	7.78	>60		2	0.180	5.06	0.09		0.058	1B
Borden Creek	S001-296	6/5/2007	9:45			82	13.03	7.71	>60		3	0.281	5.13	0.13		0.051	1A
Borden Creek	S001-296	7/16/2007	14:10			81	23.12	8.88	>100	28	2	0.302	15.01	0.14	0.7	0.044	1A
Borden Creek	S001-296	7/25/2007	10:10			83	23.89	8.47	83		12	0.268	5.47	0.13		0.105	1A
Borden Creek	S001-296	9/5/2007	9:50			85	19.17	7.51	>100	44	3	0.416	7.63	0.20	0.6	0.047	1A
Borden Creek	S001-296	9/19/2007	10:15	Rain Event		83	13.76	7.17	56	17	9	0.305	7.14	0.15	1.1	0.117	1A
Borden Creek	S001-296	9/25/2007	9:35	A little visible flow		80	13.95	7.24	>100		1	0.396	6.89	0.19		0.033	1B
Borden Creek	S001-296	10/8/2007	9:55	Rain Event		76	14.86	7.47	77		6	0.256	6.70	0.12		0.114	1A
Borden Creek	S001-296	10/24/2007	14:15			69	8.09		87	4.4	0.5	0.169	9.52	0.08	1.6	0.043	1B
Borden Creek	S001-296	11/5/2007	10:00			79	5.19		>100		1	0.194	12.40	0.09		0.039	1B
Borden Creek	S001-296	4/7/2008	12:25			62	0.84	7.18	64	7.9	9	0.176	10.73	0.08	1.7	0.143	1B
Borden Creek	S001-296	4/22/2008	11:15	Swift Flow		63	5.47	7.14	>100		1	0.087	9.49	0.04		0.089	1B
Borden Creek	S001-296	4/29/2008	9:00	Swift Flow		59	3.34	7.24	>100	2.9	1	0.076	12.02	0.03	<0.1	0.036	1B
Borden Creek	S001-296	5/21/2008	10:25			77	12.52	7.16	73		2	0.108	9.23	0.05		0.044	1B
Borden Creek	S001-296	6/20/2008	10:05			74	20.45	7.20	71		3	0.135	6.56	0.06		0.075	1B
Borden Creek	S001-296	7/22/2008	10:30			77	19.61	7.16	77	6	2	0.216	6.17	0.10	1.4	0.086	1B
Borden Creek	S001-296	8/19/2008	11:45	Very Low Water - Hard to Get a Good Sample		80	19.33	7.80	93	46	7	0.574	10.70	0.28	0.6	0.037	1A
Borden Creek	S001-296	9/16/2008	9:15	Low Water - but some flow		80	11.59	7.41	>100		9	0.315	10.14	0.15		0.052	1A
Borden Creek	S001-296	9/30/2008	11:25	Oily/Filmy - Green Dots all over rocks		82	10.48	7.46	>100	30	2	0.521	11.99	0.25	0.4	0.034	1B
Borden Creek	S001-296	10/22/2008	9:50			81	6.19	7.29	>100		2	0.338	10.88	0.16		0.042	1A
Borden Creek	S001-296	11/4/2008	9:10	Swift Flow		74	7.99	7.34	87		4	0.221	11.01	0.11		0.048	1B
Borden Creek	S001-296	11/18/2008	10:35				0.16	7.29		6.9	2	0.243	14.22	0.11	1.25	0.042	
Seventeen Creek	S001-469	4/2/2007	11:40			64	2.48	7.58	>60	4.4	5	0.164	13.64	0.08	7.4	0.113	1B
Seventeen Creek	S001-469	4/18/2007	10:30			76	4.98	7.94	>60	5	2	0.150	9.53	0.07	3	0.070	1B
Seventeen Creek	S001-469	4/30/2007	10:20			75	10.37	7.63	56		8	0.153	4.80	0.07		0.081	1B
Seventeen Creek	S001-469	6/5/2007	10:00			81	12.19	7.63	33		13	0.199	5.58	0.09		0.108	3
Seventeen Creek	S001-469	7/16/2007	9:45	No Flow. Some standing water, Dry at upstream side of culvert							0					0.000	
Seventeen Creek	S001-469	7/25/2007	12:00	Creek is dry							0					0.000	
Seventeen Creek	S001-469	9/5/2007	10:00	Creek is dry							0					0.000	
Seventeen Creek	S001-469	9/19/2007	10:25	Creek is dry							0					0.000	
Seventeen Creek	S001-469	9/25/2007	9:45	Creek is dry, except for a few puddles							0					0.000	
Seventeen Creek	S001-469	10/8/2007	10:05	Rain event. Only a couple inches of water in the creek		86	15.13	7.45	19		0	0.195	8.84	0.09		0.500	3
Seventeen Creek	S001-469	10/24/2007	14:05			73	7.88		92	5.8	0.5	0.201	9.12	0.10	5.6	0.067	1B
Seventeen Creek	S001-469	11/5/2007	10:10			83	4.69		>100		0.5	0.186	12.23	0.09		0.054	1B
Seventeen Creek	S001-469	4/7/2008	12:10			60	0.72	6.98	90	4.6	9	0.157	11.34	0.07	5.5	0.163	1B
Seventeen Creek	S001-469	4/22/2008	11:25			67	7.72	7.09	94		4	0.100	9.12	0.05		0.106	1B
Seventeen Creek	S001-469	4/29/2008	9:10			61	2.39	7.11	>100	4	4	0.087	11.63	0.04	<0.5	0.056	1B
Seventeen Creek	S001-469	5/21/2008	10:45			77	10.69	6.84	63		3	0.120	9.37	0.06		0.073	1B
Seventeen Creek	S001-469	6/20/2008	10:20			74	16.93	6.94	33		12	0.143	6.57	0.07		0.213	1B
Seventeen Creek	S001-469	7/22/2008	10:45	Good Flow		77	17.24	7.07	36	1.2	26	0.217	7.17	0.10	2.8	0.260	1B
Seventeen Creek	S001-469	8/19/2008	12:00	Scant Flow - Nearly Dry		85	17.62	7.45	25	48	141	0.577	5.81	0.28	3.7	0.617	3
Seventeen Creek	S001-469	9/16/2008		Dry at the Culvert - No Samples							0						
Seventeen Creek	S001-469	9/30/2008		Dry at the Culvert - No Samples							0						
Seventeen Creek	S001-469	10/22/2008	10:00			82	5.41	7.19	>100		0.5	0.221	9.75	0.10		0.073	1B
Seventeen Creek	S001-469	11/4/2008	9:20			81	8.23	7.15	98		6	0.232	9.09	0.11		0.023	1B
Seventeen Creek	S001-469	11/18/2008	10:45	Ice			0.04	6.98		5.9	1	0.216	11.33	0.10	1.98	0.046	
Peterson Creek	S001-287	4/2/2007	11:50			60	2.63	7.74	>60	3.7	2	0.105	15.76	0.05	3.1	0.077	1B
Peterson Creek	S001-287	4/18/2007	10:45	Little Flow		69	6.60	8.09	>60	4	2	0.106	10.21	0.05	2	0.041	1B
Peterson Creek	S001-287	4/30/2007	10:40			70	11.40	7.94	>60		2	0.108	5.83	0.05		0.048	1B
Peterson Creek	S001-287	6/5/2007	11:40			70	16.07	7.98	52		1.5	0.128	5.58	0.06		0.211	1B
Peterson Creek	S001-287	7/16/2007	9:55	1/2+ " Rain last night		75	19.87	7.43	59	4.8	6	0.139	5.11	0.07	1.8	0.159	2
Peterson Creek	S001-287	7/25/2007	12:15	Hot & Dry		83	26.27	8.01	90		4	0.152	5.18	0.07		0.111	1B
Peterson Creek	S001-287	9/5/2007	10:15	Dry at upstream side of culvert, Standing water at downstream side. No samples taken							0					0.000	
Peterson Creek	S001-287	9/19/2007	10:30	Creek is Dry							0					0.000	
Peterson Creek	S001-287	9/25/2007	9:50	Creek is dry at the upstream side of culver							0					0.000	
Peterson Creek	S001-287	10/8/2007	10:30	Rain Event		73	15.94	7.69	91		4	0.154	8.04	0.07		0.156	1B
Peterson Creek	S001-287	10/24/2007	13:55			67	7.99		89	3.8	0.5	0.122	10.36	0.06	2.4	0.060	1B
Peterson Creek	S001-287	11/5/2007	10:20			72	4.60		88		0.5	0.102	13.77	0.05		0.038	1B
Peterson Creek	S001-287	4/7/2008	12:00			60	1.06	7.25	72	3.4	13	0.109	13.21	0.05	2.2	0.135	1B
Peterson Creek	S001-287	4/22/2008	11:40			59	7.57	7.17	84		2	0.073	10.36	0.03		0.091	1B
Peterson Creek	S001-287	4/29/2008	9:25			52	2.58	7.19	98	2.8	1	0.061	13.41	0.03	<0.1	0.037	1B
Peterson Creek	S001-287	5/21/2008	12:15			68	12.99	7.02	64		5	0.083	10.13	0.04		0.042	1B
Peterson Creek	S001-287	6/20/2008	11:00			69	19.00	7.10	55		5	0.092	7.65	0.04		0.090	1B
Peterson Creek	S001-287	7/22/2008	12:15			72	20.80	7.23	22	0.7	25	0.137	7.48	0.06	2	0.170	3
Peterson Creek	S001-287	8/19/2008	12:15	Appears Stagnant - Oily Film		81	21.91	7.39	22	2.5	26	0.173	6.46	0.08	1.7	0.137	1B
Peterson Creek	S001-287	9/16/2008	9:30			78	12.44	7.34	65		12	0.165	7.90	0.08		0.075	1B
Peterson Creek	S001-287	9/30/2008	11:40	Duck Weed		76	11.21	7.45	>100	2.8	9	0.174	11.58	0.08	1.2	0.072	1B
Peterson Creek	S001-287	10/22/2008	10:15			72	5.61	7.38	>100		4	0.115	11.52	0.05		0.054	1B
Peterson Creek	S001-287	11/4/2008	9:35			72	8.04	7.25	97		4	0.124	11.15	0.06		0.056	1B
Peterson Creek	S001-287	11/18/2008	11:00			71	0.13	7.16		3.4	4	0.128	8.18	0.06	1.24	0.033	

Table 5: 2007-2008 Tributary Water Quality Data

Project_Station_ID	STORET_Station_ID	Date	Military_Time	Comments	Staff gage	Bridge Down	Temperature, water	pH	Transparency, tube with disk	Chloride	Solids, Total Suspended (TSS)	Specific conductance	Dissolved oxygen (DO)	Salinity	Nitrogen, Total	Phosphorus, Total as P	Stream Physical Appearance, Minnesota (choice list)
						inches	Degrees C.		cm	mg/L	mg/L	uS/cm	mg/L		mg/L	mg/L	
Cedar Creek	S001-285	4/2/2007	12:05	Creek eroded through sand bar at lake		50	2.21	7.78	>60	6.4	3	0.107	13.56	0.05	1.6	0.076	1B
Cedar Creek	S001-285	4/18/2007	11:00			48	5.86	7.93	>60	7	2	0.117	7.16	0.06	0.9	0.039	1B
Cedar Creek	S001-285	4/30/2007	11:00			47	11.82	7.74	>60		10	0.133	3.60	0.06		0.062	1B
Cedar Creek	S001-285	6/5/2007	11:55	Filmy		47	17.57	7.71	57		16	0.154	4.26	0.07		0.170	2
Cedar Creek	S001-285	7/16/2007	11:15	Large sand bar at lake - no surface connection - no samples taken							0					0.000	
Cedar Creek	S001-285	7/25/2007	12:25	Large sand bar at lake - no surface connection - no samples taken							0					0.000	
Cedar Creek	S001-285	9/5/2007	10:25	Large sand bar at lake - no surface connection - no samples taken							0					0.000	
Cedar Creek	S001-285	9/19/2007	11:25	Sand bar still at lake. Sampled anyway. Rain Event		47	15.06	7.47	>100	7.3	4	0.210	10.36	0.10	1.2	0.087	1B
Cedar Creek	S001-285	9/25/2007	10:00	Sand bar at lake. No surface connection. No samples taken							0					0.000	
Cedar Creek	S001-285	10/8/2007	10:45	Sand bar at lake. No surface connection. No samples taken							0					0.000	
Cedar Creek	S001-285	10/24/2007	13:40	Sand bar eroded through. Some flow		55	7.77		82	8	0.5	0.144	7.15	0.07	1.6	0.055	1B
Cedar Creek	S001-285	11/5/2007	10:35	Wind pushing lake water back into reek		53	4.70		88		3	0.154	10.08	0.07		0.067	1B
Cedar Creek	S001-285	4/7/2008	11:45	Still Some Ice - Swift Flow		48	0.69	7.15	68	5.6	10	0.112	10.62	0.05	1.6	0.100	1B
Cedar Creek	S001-285	4/22/2008	11:55	Bog Wedged in Culvert - many particles		51	5.83	7.03	>100		4	0.090	6.18	0.04		0.091	1B
Cedar Creek	S001-285	4/29/2008	9:40			49	2.61	7.02	>100	5.2	1	0.076	9.38	0.04	0.9	0.031	1B
Cedar Creek	S001-285	5/21/2008	12:35			47	15.09	6.87	85		1	0.114	6.54	0.05		0.041	1B
Cedar Creek	S001-285	6/20/2008	11:30	Filmy		42	22.03	6.88	93		2	0.131	3.64	0.06		0.084	1B
Cedar Creek	S001-285	7/22/2008	12:30	Sand Bar at Lake		35	23.69	7.34	54	4.4	4	0.182	9.15	0.09	1.6	0.113	1B
Cedar Creek	S001-285	8/19/2008	12:30	Sand Bar at Lake		38	23.29	7.46	52	7.3	16	0.220	11.13	0.10	1.9	0.199	1B
Cedar Creek	S001-285	9/16/2008	9:50	Large Sand Bar at Lake		36	13.49	6.97	93		38	0.205	5.61	0.10		0.121	1B
Cedar Creek	S001-285	9/30/2008	11:55	Sand Bar at Lake		36	13.04	7.09	>100	5.2	9	0.208	5.81	0.10	1.1	0.074	1B
Cedar Creek	S001-285	10/22/2008	10:30	Channel to Lake Open		48	6.50	6.82	52		129	0.191	5.89	0.09		0.193	1B
Cedar Creek	S001-285	11/4/2008	9:50	Appears Stagnant		50	7.83	6.73	65		12	0.180	5.80	0.09		0.085	1B
Cedar Creek	S001-285	11/18/2008	11:10	Ice			0.89	7.46		11	5	0.183	10.35	0.09	1.13	0.042	
Thaines	S001-467	4/2/2007	12:30			63	2.79	7.84	>60	3.9	3	0.087	11.98	0.04	1.3	0.075	1B
Thaines	S001-467	4/18/2007	11:15			69	8.50	8.07	58	4	3	0.093	8.35	0.04	0.8	0.049	1B
Thaines	S001-467	4/30/2007	11:20	Lots of Suckers		70	14.89	8.12	>60		2	0.094	5.31	0.04		0.040	1B
Thaines	S001-467	6/5/2007	12:10			69	19.19	7.92	>60		2	0.130	5.54	0.06		0.059	1B
Thaines	S001-467	7/16/2007	11:25	1/2+ " Rain last night		75	20.71	7.52	>100	5.3	2	0.207	6.00	0.10	0.9	0.038	1B
Thaines	S001-467	7/25/2007	12:35	Hot & Dry		76	27.24	7.75	>100		6	0.238	5.31	0.11		0.064	1B
Thaines	S001-467	9/5/2007	10:35			79	20.70	7.28	90	10	11	0.290	3.16	0.14	0.6	0.053	1B
Thaines	S001-467	9/19/2007	11:40	Rain Event		74	15.21	7.38	>100	7.3	1	0.270	6.75	0.13	0.5	0.035	1A
Thaines	S001-467	9/25/2007	10:10	>1/2" rain last night		74	15.68	7.33	>100		1	0.246	4.91	0.12		0.028	1B
Thaines	S001-467	10/8/2007	10:50	Rain Event		69	16.31	7.55	>100		2	0.193	5.63	0.09		0.060	1B
Thaines	S001-467	10/24/2007	13:25			66	8.45		69	4.6	0.5	0.105	8.23	0.05	1.3	0.039	1B
Thaines	S001-467	11/5/2007	10:50			71	5.05		78		3	0.108	12.50	0.06		0.041	1B
Thaines	S001-467	4/7/2008	11:25			64	0.99	7.07	88	4	4	0.118	9.10	0.05	1	0.077	1B
Thaines	S001-467	4/22/2008	12:10			61	7.29	7.14	96		2	0.060	9.54	0.03		0.079	1B
Thaines	S001-467	4/29/2008	9:55			58	3.71	7.19	>100	2.7	2	0.054	11.71	0.02	0.6	0.031	1B
Thaines	S001-467	5/21/2008	12:50			72	15.11	7.16	68		4	0.076	9.64	0.04		0.036	1B
Thaines	S001-467	6/20/2008	11:45			71	22.61	7.12	77		1	0.091	7.60	0.04		0.043	1B
Thaines	S001-467	7/22/2008	12:50			73	22.36	7.29	91	2.1	1	0.160	8.51	0.07	1.2	0.052	1B
Thaines	S001-467	8/19/2008	12:45	No Visible Flow		75	21.44	7.19	>100	4.4	5	0.255	6.36	0.12	1	0.053	1B
Thaines	S001-467	9/16/2008	10:05			76	12.47	7.12	>100		9	0.237	6.89	0.11		0.060	1B
Thaines	S001-467	9/30/2008	12:10			76	12.18	7.23	>100	5.2	3	0.246	8.84	0.12	0.7	0.043	1B
Thaines	S001-467	10/22/2008	10:45			70	7.23	7.17	>100		2	0.178	8.57	0.08		0.038	1B
Thaines	S001-467	11/4/2008	10:05			71	7.66	7.13	95		2	0.172	10.28	0.08		0.032	1B
Thaines	S001-467	11/18/2008	11:25			75	1.22	7.60		5	48	0.153	11.77	0.07	1.23	0.139	
Groundhouse	S002-875	4/2/2007	12:55			24	3.06	7.72	>60	6.2	0.5	0.109	14.22	0.05	1.2	0.073	1B
Groundhouse	S002-875	4/18/2007	11:30			32	4.98	8.15	>60	7	0.5	0.124	9.42	0.06	0.9	0.063	1B
Groundhouse	S002-875	4/30/2007	11:40			34	9.04	8.02	>60		0.5	0.142	4.68	0.07		0.037	1B
Groundhouse	S002-875	6/5/2007	12:25			29	16.57	7.64	>60		1	0.154	2.74	0.07		0.067	1B
Groundhouse	S002-875	7/16/2007	11:40	Dry at the culvert - no flow							0					0.000	
Groundhouse	S002-875	7/25/2007	12:50	Dry at the culvert - no flow							0					0.000	
Groundhouse	S002-875	9/5/2007	10:50	Dry at the culvert - no flow							0					0.000	
Groundhouse	S002-875	9/19/2007	11:55	Dry at the culvert - no flow							0					0.000	
Groundhouse	S002-875	9/25/2007	10:25	Water in channel. Questionable Flow		45	14.65	7.29	16		26	0.203	5.05	0.10		0.339	3
Groundhouse	S002-875	10/8/2007	11:10	Rain Event		39	15.07	7.60	14		0	0.156	5.10	0.07		0.274	3
Groundhouse	S002-875	10/24/2007	13:00			27	7.56		98	5.3	0.5	0.142	6.50	0.07	1.7	0.065	1B
Groundhouse	S002-875	11/5/2007	11:10			37	3.81		>100		0.5	0.145	11.44	0.07		0.041	1B
Groundhouse	S002-875	4/7/2008	11:00			18	0.89	7.31	97	5.9	11	0.114	11.66	0.05	1.5	0.124	1B
Groundhouse	S002-875	4/22/2008	12:30	Reddish Color		26	6.92	7.18	>100		0.5	0.102	8.56	0.05		0.087	1B
Groundhouse	S002-875	4/29/2008	10:10			18	2.91	7.18	>100	4.2	0.5	0.088	11.41	0.04	0.7	0.036	1B
Groundhouse	S002-875	5/21/2008	13:10			34	10.03	6.82	>100		0.5	0.123	7.54	0.06		0.034	1B
Groundhouse	S002-875	6/20/2008	12:00	Filmy		21	18.80	6.82	35		16	0.168	2.32	0.08		0.264	1B
Groundhouse	S002-875	7/22/2008	13:10	Questionable Flow		43	18.62	6.64	85	1.1	5	0.190	3.10	0.09	1.7	0.189	1B
Groundhouse	S002-875	8/19/2008	13:15	Low Water - No Visible Flow		49	17.22	7.12	52	8.3	8	0.227	6.84	0.11	1.6	0.183	1B
Groundhouse	S002-875	9/16/2008	10:20			41	10.83	6.77	>100		3	0.180	6.21	0.09		0.037	1B
Groundhouse	S002-875	9/30/2008	12:30	Stagnant		47	10.79	6.97	82	7.3	6	0.252	8.30	0.12	1.5	0.090	1B
Groundhouse	S002-875	10/22/2008	11:00			39	5.20	7.07	>100		4	0.193	8.49	0.09		0.037	1B
Groundhouse	S002-875	11/4/2008	10:20			41	6.82	7.01	>100		5	0.207	7.95	0.10		0.030	1B
Groundhouse	S002-875	11/18/2008	11:45	Ice		37	0.54	7.55		7.5	32	0.206	12.58	0.10	1.42	0.046	

Table 5: 2007-2008 Tributary Water Quality Data

Project_Station_ID	STORET_Station_ID	Date	Military_Time	Comments	Staff gage	Bridge Down	Temperature, water	pH	Transparency, tube with disk	Chloride	Solids, Total Suspended (TSS)	Specific conductance	Dissolved oxygen (DO)	Salinity	Nitrogen, Total	Phosphorus, Total as P	Stream Physical Appearance, Minnesota (choice list)
						inches	Degrees C.		cm	mg/L	mg/L	uS/cm	mg/L		mg/L	mg/L	
Lake Outlet	S000-061	4/2/2007	13:50		0.66		5.83	7.82	>60	3.4	0.5	0.175	19.23	0.08	0.5	0.017	1A
Lake Outlet	S000-061	4/18/2007	12:10		0.68		9.92	8.22	>60	5	2	0.196	11.27	0.09	0.5	0.016	1A
Lake Outlet	S000-061	4/30/2007	12:55		0.78		12.25	8.33	>60		2	0.182	7.12	0.09		0.024	1A
Lake Outlet	S000-061	6/5/2007	13:10		0.94		19.58	8.24	>60		3	0.194	6.03	0.09		0.022	1A
Lake Outlet	S000-061	7/16/2007	12:15	1/2+ " Rain last night	0.48		24.34	8.47	>100	3.6	6	0.187	10.29	0.09	0.6	0.032	1A
Lake Outlet	S000-061	7/25/2007	14:50	Clam Harvesters - Hot & Dry	0.4		33.52	8.83	>100		10	0.183	7.55	0.08		0.084	1A
Lake Outlet	S000-061	9/5/2007	11:15	Small channel with obvious flow	water below gage		24.09	8.00	>100	3.4	11	0.198	9.65	0.09	0.8	0.047	1A
Lake Outlet	S000-061	9/19/2007	12:30	Small channel with obvious flow	water below gage		15.54	7.80	>100	3.3	2	0.198	10.87	0.09	0.4	0.020	1A
Lake Outlet	S000-061	9/19/2007	12:30							3.3	2					0.000	
Lake Outlet	S000-061	9/25/2007	11:10		water below gage - but has come up a		15.01	7.74	>100		3	0.198	10.80	0.09		0.031	1A
Lake Outlet	S000-061	10/24/2007	12:30	Ducks	Water below gage		9.76		>100	3.8	2	0.127	12.29	0.06	0.6	0.029	1A
Lake Outlet	S000-061	11/5/2007	11:40		Water below gage		5.02		>100		2	0.196	15.08	0.09		0.040	1A
Lake Outlet	S003-856	4/7/2008	10:30		1" below gage		2.67	8.04	>100	3.8	2	0.207	13.87	0.10	0.6	0.018	1A
Lake Outlet	S003-856	4/22/2008	13:00		0.54		9.46	7.74	>100		2	0.152	12.50	0.07		0.074	1A
Lake Outlet	S003-856	4/29/2008	10:45		0.76		5.46	7.80	>100	6.2	1	0.166	13.95	0.08	0.5	0.031	1A
Lake Outlet	S003-856	5/21/2008	13:45		0.98		14.16	8.20	>100		3	0.168	11.22	0.08		0.023	1A
Lake Outlet	S003-856	6/20/2008	12:40		1.3		22.25	8.48	>100		2	0.170	10.51	0.08		0.022	1A
Lake Outlet	S003-856	7/22/2008	13:45		1.2		25.94	8.75	>100	3.7	5	0.187	10.40	0.09	0.7	0.033	1A
Lake Outlet	S003-856	8/19/2008	13:45	Slightly Stirred by High Winds	0.94		25.68	9.15	>100	3.5	3	0.206	11.85	0.10	0.6	0.024	1A
Lake Outlet	S003-856	9/16/2008	10:50		0.7		13.70	7.46	>100		3	0.220	9.56	0.10		0.043	1A
Lake Outlet	S003-856	9/30/2008	13:00		0.72		12.50	8.60	>100	3.5	3	0.209	14.19	0.10	0.5	0.022	1A
Lake Outlet	S003-856	10/22/2008	11:30	Numerous Ducks & Geese at Site	0.78		6.69	7.87	>100		4	0.220	13.11	0.10		0.032	1A
Lake Outlet	S003-856	11/4/2008	10:55		0.72		10.57	8.18	>100		9	0.214	13.89	0.10		0.028	1A
Lake Outlet	S003-856	11/18/2008	12:15	Ice	0.8		0.14	8.09		4.2	11	0.219	15.97	0.10	0.8	0.099	
Whitefish	Pending	4/2/2007	14:05			5	4.91	7.96	>60	1.5	2	0.140	18.20	0.07	0.5	0.020	1A
Whitefish	Pending	4/18/2007	12:25			9	9.17	8.26	>60	1.5	4	0.147	11.40	0.07	0.4	0.023	1A
Whitefish	Pending	4/30/2007	13:10			9	16.08	8.31	>60		5	0.232	8.04	0.11		0.025	1A
Whitefish	Pending	6/5/2007	13:25			12	21.17	8.10	>60		2	0.241	5.25	0.11		0.020	1A
Whitefish	Pending	7/16/2007	12:30	1/2+ " rain last night. Lots of Aquatic Veg.		20	23.65	7.54	>100	1.7	5	0.247	6.17	0.12	0.5	0.026	1A
Whitefish	Pending	7/25/2007	15:10	Hot & Dry		25	28.82	7.60	54		24	0.337	4.16	0.16		0.091	1B
Whitefish	Pending	9/5/2007	11:45	Questionable Flow. Lots of Aq. Veg.		24	22.05	7.28	61	3	18	0.270	4.92	0.13	0.9	0.079	1A
Whitefish	Pending	9/19/2007	12:45	Questionable Flow. Lots of Aq. Veg.		25	14.33	7.34	>100	4.1	4	0.300	4.27	0.14	0.6	0.047	1A
Whitefish	Pending	9/25/2007	11:30	A little visible flow		17	15.60	7.48	>100		2	0.246	7.50	0.12		0.023	1A
Whitefish	Pending	10/8/2007	11:45	Rain Event		12	0.24	7.63	>100		1	0.242	6.63	0.12		0.024	1A
Whitefish	Pending	10/24/2007	9:40			7	6.87		>100	1.7	1	0.252	10.78	0.12	0.7	0.016	1A
Whitefish	Pending	11/5/2007	11:55			9	4.30		>100		1	0.257	14.96	0.12		0.017	1A
Whitefish	S004-615	4/7/2008	10:10			9	2.46	7.82	>100	1.6	1	0.205	12.68	0.10	0.7	0.013	1A
Whitefish	S004-615	4/22/2008	13:15			5	7.27	7.63	>100		2	0.118	12.12	0.06		0.059	1A
Whitefish	S004-615	4/29/2008	11:00			4	5.88	7.88	>100	2.2	3	0.209	13.43	0.10	0.7	0.022	1A
Whitefish	S004-615	5/21/2008	14:00			8	15.90	8.47	>100		2	0.220	11.38	0.10		0.024	1A
Whitefish	S004-615	6/20/2008	12:55	Little Fish Everywhere		9	24.40	8.52	>100		2	0.214	9.96	0.10		0.021	1A
Whitefish	S004-615	7/22/2008	14:00			8	26.10	8.04	>100	1.8	0.5	0.234	8.26	0.11	0.8	0.017	1A
Whitefish	S004-615	8/19/2008	14:10			17	25.89	7.60	>100	1.5	3	0.259	5.65	0.12	0.8	0.023	1A
Whitefish	S004-615	9/16/2008	11:05			18.5	14.58	7.38	>100		0.5	0.263	8.39	0.13		0.015	1A
Whitefish	S004-615	9/30/2008	13:15			20	12.94	7.59	>100	1.9	7	0.272	9.96	0.13	0.7	0.019	1A
Whitefish	S004-615	10/22/2008	11:50			12	7.21	7.85	>100		0.5	0.276	11.21	0.13		0.013	1A
Whitefish	S004-615	11/4/2008	11:05			14	11.45	7.84	>100		2	0.275	10.57	0.13		0.013	1A
Whitefish	S004-615	11/18/2008	12:35	Open Water			0.64	7.95	>100	2	2	0.278	15.02	0.13	0.69	0.013	1A
Seguchie	S001-465	4/2/2007	14:20			73	5.66	7.98	>60	1.5	6	0.164	19.62	0.08	0.7	0.050	1A
Seguchie	S001-465	4/18/2007	12:40	Numerous suckers at site		75	8.59	8.09	>60	1.5	2	0.174	9.77	0.08	0.5	0.029	1A
Seguchie	S001-465	4/30/2007	13:20			74	14.44	8.10	>60		3	0.220	7.14	0.10		0.027	1A
Seguchie	S001-465	6/5/2007	13:40			79	20.10	7.90	>60		3	0.205	5.04	0.10		0.085	1A
Seguchie	S001-465	7/16/2007	12:45	1/2+ " Rain last night. Tons of Duckweed		93	19.29	7.34	71	2.8	9	0.261	3.07	0.12	1.7	0.436	1A
Seguchie	S001-465	7/25/2007	15:20	Hot & Dry. Tons of Duckweed		96	27.59	7.52	45		37	0.316	3.11	0.15		0.153	1B
Seguchie	S001-465	9/5/2007	12:00	Very low. Tons of Duckweed		98	23.19	7.22	18	6.6	76	0.342	3.35	0.16	1.2	0.385	1B / 3
Seguchie	S001-465	9/19/2007	13:05	Questionable connection to lake. No visible flow.		100	14.56	7.35	43	9.1	21	0.366	4.18	0.18	1.1	0.210	4
Seguchie	S001-465	9/25/2007	11:40	A little visible flow - still lots of duckweed		92	15.23	7.43	63		7	0.305	3.23	0.15		0.151	1B
Seguchie	S001-465	10/8/2007	12:00	Rain Event. A little visible flow		90	15.15	7.57	>100		0	0.248	3.96	0.12		0.217	1A
Seguchie	S001-465	10/24/2007	9:25			82	6.72		>100	2.1	0.5	0.212	8.03	0.10	0.6	0.019	1A
Seguchie	S001-465	11/5/2007	12:10			80	5.07		>100		1	0.220	14.36	0.10		0.020	1A
Seguchie	S001-465	4/7/2008	10:00			78	3.12	7.42	>100	2.4	2	0.236	9.49	0.11	1	0.066	1B
Seguchie	S001-465	4/22/2008	13:25			73	8.46	7.42	>100		3	0.153	10.50	0.07		0.061	1A
Seguchie	S001-465	4/29/2008	11:15			72	4.88	7.65	>100	2.2	4	0.184	12.25	0.09	0.5	0.024	1A
Seguchie	S001-465	5/21/2008	14:15			74	15.75	7.96	>100		3	0.194	10.78	0.09		0.025	1A
Seguchie	S001-465	6/20/2008	13:25			76	23.21	7.58	>100		1	0.191	7.07	0.09		0.056	1A
Seguchie	S001-465	7/22/2008	14:15	Lots of Duckweed		89	21.68	6.96	100	2.9	15	0.219	2.53	0.10	1.2	0.079	1B
Seguchie	S001-465	8/19/2008	14:25	Lots of Duckweed		87	23.57	7.02	>100	2.2	2	0.253	3.03	0.12	0.9	0.060	1A
Seguchie	S001-465	9/16/2008	11:20	Lots of Duckweed - No Visible Flow		91	12.25	7.01	>100		50	0.260	3.39	0.12		0.345	1A
Seguchie	S001-465	9/30/2008	13:25	Visible Flow		76	12.95	7.32	>100	2.1	12	0.245	7.29	0.12	0.7	0.036	1A
Seguchie	S001-465	10/22/2008	12:00			82	7.28	7.55	>100		1	0.241	8.37	0.11		0.021	1A
Seguchie	S001-465	11/4/2008	11:20			75	9.51	7.74	>100		0.5	0.247	10.78	0.12		0.015	1A
Seguchie	S001-465	11/18/2008	12:50			79	0.64	7.86	>100	2.3	2	0.255	15.21	0.12	0.73	0.018	1A

Table 5: 2007-2008 Tributary Water Quality Data

Project_Station_ID	STORET_Station_ID	Date	Military_Time	Comments	Staff gage	Bridge Down	Temperature, water	pH	Transparency, tube with disk	Chloride	Solids, Total Suspended (TSS)	Specific conductance	Dissolved oxygen (DO)	Salinity	Nitrogen, Total	Phosphorus, Total as P	Stream Physical Appearance, Minnesota (choice list)
						inches	Degrees C.		cm	mg/L	mg/L	uS/cm	mg/L		mg/L	mg/L	
Garrison Creek	S001-464	4/2/2007	14:45			66	6.08	8.01	>60	3.6	4	0.160	17.77	0.08	0.7	0.030	1A
Garrison Creek	S001-464	4/18/2007	13:05			68	10.02	8.22	>60	4	3	0.190	10.83	0.09	0.5	0.020	1A
Garrison Creek	S001-464	4/30/2007	13:45	Suckers in the Creek		67	14.97	8.20	>60		7	0.219	7.70	0.10		0.031	1A
Garrison Creek	S001-464	6/5/2007	13:50			68	21.80	7.98	>60		1.5	0.218	7.19	0.10		0.032	1A
Garrison Creek	S001-464	7/16/2007	13:00	1/2+ " rain last night. Low Water		72	25.86	8.04	38	2.7	4	0.185	11.24	0.09	0.5	0.040	1A
Garrison Creek	S001-464	7/25/2007	9:00	Hot & Dry		73	24.30	7.58	>60		8	0.206	4.41	0.10		0.090	1A
Garrison Creek	S001-464	9/5/2007	12:15	Water very low - but some visible flow		78	24.57	7.71	>100	5.1	5	0.181	9.23	0.08	0.6	0.072	1A
Garrison Creek	S001-464	9/19/2007	13:30	Rain Event		75	16.06	7.74	>100	5.1	4	0.182	11.53	0.09	0.3	0.056	1A
Garrison Creek	S001-464	9/25/2007	12:00	<1/2" rain last night		74	15.11	7.64	>100		3	0.188	10.68	0.09		0.063	2
Garrison Creek	S001-464	10/8/2007	12:15	Rain Event. Significant Flow		74	14.62	7.67	>100		7	0.197	8.10	0.09		0.058	1A
Garrison Creek	S001-464	10/24/2007	9:10			69	7.37		>100	4.5	1	0.211	10.20	0.10	0.7	0.021	1A
Garrison Creek	S001-464	11/5/2007	12:20			73	5.50		>100		2	0.228	14.54	0.11		0.020	1A
Garrison Creek	S001-464	4/7/2008	9:45			68	2.93	7.63	>100	3.9	4	0.234	11.42	0.11	0.7	0.029	1A
Garrison Creek	S001-464	4/22/2008	13:40			68	8.16	7.53	>100		27	0.125	11.53	0.06		0.113	1A
Garrison Creek	S001-464	4/29/2008	7:50			65	2.52	7.65	>100	4.3	3	0.194	12.30	0.09	0.1	0.024	1A
Garrison Creek	S001-464	5/21/2008	14:30			68	15.75	8.16	>100		2	0.198	12.01	0.09		0.026	1A
Garrison Creek	S001-464	6/20/2008	13:25	Many Little Fish		64	23.19	7.96	>100		2	0.200	9.47	0.09		0.025	1A
Garrison Creek	S001-464	7/22/2008	14:30			66	24.59	7.34	>100	3.4	1	0.207	7.61	0.10	1.1	0.097	1A
Garrison Creek	S001-464	8/19/2008	10:40			67	21.81	7.29	>100	6.7	1	0.244	7.25	0.12	0.6	0.021	1A
Garrison Creek	S001-464	9/16/2008	8:00	Good Flow		70	12.69	7.31	>100		0.5	0.236	8.21	0.11		0.013	1A
Garrison Creek	S001-464	9/30/2008	10:20	Sewer District Working Nearby - Pipe entering Stream at sample site		72	12.66	7.64	>100	3.1	0.5	0.245	9.52	0.12	0.3	0.013	1A
Garrison Creek	S001-464	10/22/2008	12:15			71	8.10	7.67	>100		1	0.247	10.46	0.12		0.026	1A
Garrison Creek	S001-464	11/4/2008	8:00			71	9.30	7.54	>100		1	0.252	9.96	0.12		0.015	1A
Garrison Creek	S001-464	11/18/2008	13:05	Open Water			0.51	7.85	>100	4.3	8	0.250	0.475 ?	0.12	0.69	0.021	1A

Table 6: Archived 1981-2008 Tributary Water Quality Data

Site	Sample Date	Sample Type	CSMP Transparency Tube-60 cm	Dissolved oxygen	Kjeldahl Nitrogen	Nitrate and Nitrite Nitrogen-Total	Field pH	Phosphorus	Suspended Solids	Temperature	Field Turbidity	Fecal Coliform	E. Coli
			cm	mg/L	mg/L	mg/L		mg/L	mg/L	degrees C	FTU	#/100ml	#/100ml
Seastade Cr	4/10/2000	Routine Sample/Observation	34										
Seastade Cr	6/5/2000	Routine Sample/Observation	37										
Seastade Cr	6/29/2000	Routine Sample/Observation	45										
Seastade Cr	7/19/2000	Routine Sample/Observation	53							18			
Seastade Cr	8/4/2000	Routine Sample/Observation	> 60										
Seastade Cr	10/6/2000	Routine Sample/Observation	> 60										
Seastade Cr	6/8/2004	Routine Sample/Observation		4.68			6.95			21.2			
Seastade Cr	4/26/2005	Routine Sample/Observation	32							5.6			
Seastade Cr	6/7/2005	Routine Sample/Observation	40										
Seastade Cr	7/5/2005	Routine Sample/Observation	44							18.9			
Seastade Cr	8/24/2005	Routine Sample/Observation	60							18.3			
Seastade Cr	9/22/2005	Routine Sample/Observation	54							16.1			
Seastade Cr	11/1/2005	Routine Sample/Observation	39							6.1			
Seastade Cr	5/31/2006	Routine Sample/Observation	45							22.2			
Seastade Cr	6/28/2006	Routine Sample/Observation	58							21.7			
Seastade Cr	7/18/2006	Routine Sample/Observation	> 60										
Seastade Cr	8/23/2006	Routine Sample/Observation	> 60										
Seastade Cr	9/19/2006	Routine Sample/Observation	50							12.2			
Seastade Cr	10/25/2006	Routine Sample/Observation	25										
Seastade Cr	11/28/2006	Routine Sample/Observation	12										
Reddy Cr	3/28/2000	Routine Sample/Observation	21							5.6			
Reddy Cr	4/21/2000	Routine Sample/Observation	33							6.1			
Reddy Cr	5/6/2000	Routine Sample/Observation	18							17.5			
Reddy Cr	5/8/2000	Routine Sample/Observation	29							16.1			
Reddy Cr	5/16/2000	Routine Sample/Observation	30							12.8			
Reddy Cr	5/31/2000	Routine Sample/Observation	25							17.8			
Reddy Cr	6/22/2000	Routine Sample/Observation	18							20			
Reddy Cr	7/11/2000	Routine Sample/Observation	38							23.9			
Reddy Cr	7/26/2000	Routine Sample/Observation	22							23.9			
Reddy Cr	8/10/2000	Routine Sample/Observation	26							23.3			
Reddy Cr	8/15/2000	Routine Sample/Observation	12							18.9			
Reddy Cr	8/29/2000	Routine Sample/Observation	47							21.1			
Reddy Cr	4/10/2001	Routine Sample/Observation	47							3.3			
Reddy Cr	4/12/2001	Routine Sample/Observation	43							6.1			
Reddy Cr	4/18/2001	Routine Sample/Observation	53							4.5			
Reddy Cr	4/24/2001	Routine Sample/Observation	46							8.1			
Reddy Cr	5/25/2001	Routine Sample/Observation	45							13.3			
Reddy Cr	5/30/2001	Routine Sample/Observation	35							17.8			
Reddy Cr	6/7/2001	Routine Sample/Observation	25							14.4			
Reddy Cr	6/20/2001	Routine Sample/Observation	15							19.2			
Reddy Cr	7/3/2001	Routine Sample/Observation	15							20			
Reddy Cr	7/13/2001	Routine Sample/Observation	19							21.9			
Reddy Cr	7/23/2001	Routine Sample/Observation	13							26.7			
Reddy Cr	8/6/2001	Routine Sample/Observation	25							29.7			
Reddy Cr	8/23/2001	Routine Sample/Observation	17							21.1			
Reddy Cr	9/12/2001	Routine Sample/Observation	10							18.9			
Reddy Cr	10/9/2001	Routine Sample/Observation	16							10			
Reddy Cr	5/7/2002	Routine Sample/Observation	44							10			
Reddy Cr	5/24/2002	Routine Sample/Observation	45							13.9			

Table 6: Archived 1981-2008 Tributary Water Quality Data

Site	Sample Date	Sample Type	CSMP Transparency Tube-60 cm	Dissolved oxygen	Kjeldahl Nitrogen	Nitrate and Nitrite Nitrogen-Total	Field pH	Phosphorus	Suspended Solids	Temperature	Field Turbidity	Fecal Coliform	E. Coli
			cm	mg/L	mg/L	mg/L		mg/L	mg/L	degrees C	FTU	#/100ml	#/100ml
Reddy Cr	6/21/2002	Routine Sample/Observation	22							24.4			
Reddy Cr	7/8/2002	Routine Sample/Observation	20							21.7			
Reddy Cr	7/23/2002	Routine Sample/Observation	26							19.7			
Reddy Cr	9/3/2002	Routine Sample/Observation	14							19.7			
Reddy Cr	5/19/2004	Routine Sample/Observation	36	2.6	1.3	0.09		0.058	7	13.4			
Reddy Cr	6/8/2004	Routine Sample/Observation	33	2.72			6.61	0.095	11	19.2			
Reddy Cr	7/19/2004	Routine Sample/Observation	19	7.03	1.3	< 0.5	6.99	0.072	6	23.1			
Reddy Cr	8/9/2004	Routine Sample/Observation	21	3.95			6.91	0.048	11	18.7			
Reddy Cr	9/7/2004	Routine Sample/Observation	38	5.15	1	0.12	6.88	0.071	9	14.91			
Reddy Cr	10/5/2004	Routine Sample/Observation	25	7.54			7.23	0.082	17	6.02			
Reddy Cr	11/17/2004	Routine Sample/Observation	25	10.13	1	0.01	6.83	0.056	10	5.9			
Reddy Cr	4/26/2005	Routine Sample/Observation	32							5			
Reddy Cr	6/7/2005	Routine Sample/Observation	35										
Reddy Cr	7/5/2005	Routine Sample/Observation	22							18.9			
Reddy Cr	8/24/2005	Routine Sample/Observation	18										
Reddy Cr	9/22/2005	Routine Sample/Observation	41							15			
Reddy Cr	11/1/2005	Routine Sample/Observation	20							4.4			
Reddy Cr	5/31/2006	Routine Sample/Observation	15							18.3			
Reddy Cr	6/28/2006	Routine Sample/Observation	26							21.7			
Reddy Cr	7/18/2006	Routine Sample/Observation	52										
Reddy Cr	8/23/2006	Routine Sample/Observation	34										
Reddy Cr	9/19/2006	Routine Sample/Observation	42							11.7			
Marmon Cr	3/19/1992	Routine Sample/Observation						0.0575					
Marmon Cr	5/12/1992	Routine Sample/Observation						0.0845					
Marmon Cr	6/2/1992	Routine Sample/Observation						0.0725					
Marmon Cr	6/22/1992	Routine Sample/Observation						0.0525					
Marmon Cr	12/17/1992	Routine Sample/Observation						0.1035					
Marmon Cr	4/10/2000	Routine Sample/Observation	> 60										
Marmon Cr	5/10/2000	Routine Sample/Observation	> 60										
Marmon Cr	6/5/2000	Routine Sample/Observation	50										
Marmon Cr	6/29/2000	Routine Sample/Observation	48										
Marmon Cr	7/19/2000	Routine Sample/Observation	> 60							18.9			
Marmon Cr	8/4/2000	Routine Sample/Observation	> 60										
Marmon Cr	10/6/2000	Routine Sample/Observation	> 60										
Marmon Cr	7/23/2001	Routine Sample/Observation	> 60							28.3			
Marmon Cr	8/6/2001	Routine Sample/Observation	56							30			
Marmon Cr	8/23/2001	Routine Sample/Observation	> 60							23.9			
Marmon Cr	9/12/2001	Routine Sample/Observation	> 60							19.2			
Marmon Cr	10/9/2001	Routine Sample/Observation	> 60							10.6			
Marmon Cr	5/7/2002	Routine Sample/Observation	> 60							10			
Marmon Cr	5/24/2002	Routine Sample/Observation	50.8							13.6			
Marmon Cr	6/21/2002	Routine Sample/Observation	38.8							24.4			
Marmon Cr	7/8/2002	Routine Sample/Observation	46.8							22.2			
Marmon Cr	7/23/2002	Routine Sample/Observation	38							21.1			
Marmon Cr	9/3/2002	Routine Sample/Observation	35.6							20.1			
Marmon Cr	5/19/2004	Routine Sample/Observation	> 60	2.25	1.4	< 0.01		0.046	5	13.6			
Marmon Cr	6/8/2004	Routine Sample/Observation	> 60	4.73			6.7	0.074	57	21.5			
Marmon Cr	7/19/2004	Routine Sample/Observation	> 60	5.39	1.3	< 0.5	7.05	0.075	5	23.8			

Table 6: Archived 1981-2008 Tributary Water Quality Data

Site	Sample Date	Sample Type	CSMP Transparency Tube-60 cm	Dissolved oxygen	Kjeldahl Nitrogen	Nitrate and Nitrite Nitrogen-Total	Field pH	Phosphorus	Suspended Solids	Temperature	Field Turbidity	Fecal Coliform	E. Coli
			cm	mg/L	mg/L	mg/L		mg/L	mg/L	degrees C	FTU	#/100ml	#/100ml
Marmon Cr	8/9/2004	Routine Sample/Observation	> 60	6.35			7.5	0.031	6	20.32			
Marmon Cr	9/7/2004	Routine Sample/Observation	> 60	6.48	0.7	< 0.01	7.24	0.049	5	17.1			
Marmon Cr	10/5/2004	Routine Sample/Observation	55	7.32			7.2	0.06	2	7.3			
Marmon Cr	11/17/2004	Routine Sample/Observation	> 60	8.98	0.8	0.01	6.75	0.046	3	4.3			
Marmon Cr	4/26/2005	Routine Sample/Observation	> 60							6.7			
Marmon Cr	6/7/2005	Routine Sample/Observation	> 60										
Marmon Cr	7/5/2005	Routine Sample/Observation	49							20.6			
Marmon Cr	8/24/2005	Routine Sample/Observation	> 60							19.4			
Marmon Cr	9/22/2005	Routine Sample/Observation	> 60							17.2			
Marmon Cr	11/1/2005	Routine Sample/Observation	> 60							6.1			
Marmon Cr	5/31/2006	Routine Sample/Observation	50							22.2			
Marmon Cr	6/28/2006	Routine Sample/Observation	> 60							21.7			
Marmon Cr	7/18/2006	Routine Sample/Observation	> 60										
Marmon Cr	8/23/2006	Routine Sample/Observation	> 60										
Marmon Cr	9/19/2006	Routine Sample/Observation	> 60							11.7			
Marmon Cr	10/25/2006	Routine Sample/Observation	60										
Marmon Cr	11/28/2006	Routine Sample/Observation	58										
Borden Creek	6/18/1981	Routine Sample/Observation		4.1	2.1	0.01		0.086	7	16	2.4	50	
Borden Creek	8/20/1981	Routine Sample/Observation		2.8	1.96	0.05		0.108	2	19	2.2	20	
Borden Creek	10/8/1981	Routine Sample/Observation		7.5	1.84	0.03		0.066	6	8	4.3	20	
Borden Creek	4/5/2004	Routine Sample/Observation	60	10.07			7.02			2.98			
Borden Creek	5/19/2004	Routine Sample/Observation	> 60	2.26	1.2	< 0.01		0.04	2	14.2			
Borden Creek	6/8/2004	Routine Sample/Observation	> 60	3.69			6.93	0.068	4	21.19			
Borden Creek	7/19/2004	Routine Sample/Observation	> 60	4.11	1.3	< 0.5	6.93	0.117	10	21.63			
Borden Creek	8/9/2004	Routine Sample/Observation	48	6.13			7.44	0.12	8	16.47			
Borden Creek	9/7/2004	Routine Sample/Observation	60	6.85	1	< 0.01	7.18	0.115	7	14.49			
Borden Creek	10/5/2004	Routine Sample/Observation	> 60	7.57			7.43	0.043	3	7.44			
Borden Creek	11/17/2004	Routine Sample/Observation	> 60	9.71	1.3	0.07	7.03	0.048	3	4.63			
Seventeen Cr	7/27/1999	Routine Sample/Observation	21										
Seventeen Cr	7/29/1999	Routine Sample/Observation	14										
Seventeen Cr	8/3/1999	Routine Sample/Observation	28										
Seventeen Cr	8/13/1999	Routine Sample/Observation	48										
Seventeen Cr	8/16/1999	Routine Sample/Observation	51										
Seventeen Cr	9/1/1999	Routine Sample/Observation	31										
Seventeen Cr	9/15/1999	Routine Sample/Observation	44							16.7			
Seventeen Cr	3/4/2000	Routine Sample/Observation	54										
Seventeen Cr	3/28/2000	Routine Sample/Observation	59							4.4			
Seventeen Cr	4/21/2000	Routine Sample/Observation	> 60							5.6			
Seventeen Cr	5/6/2000	Routine Sample/Observation	53							16.1			
Seventeen Cr	5/8/2000	Routine Sample/Observation	57							14.4			
Seventeen Cr	5/16/2000	Routine Sample/Observation	55							11.1			
Seventeen Cr	5/31/2000	Routine Sample/Observation	56							16.7			
Seventeen Cr	6/22/2000	Routine Sample/Observation	59							17.8			
Seventeen Cr	7/11/2000	Routine Sample/Observation	56							20.6			
Seventeen Cr	7/26/2000	Routine Sample/Observation	43							19.4			
Seventeen Cr	8/10/2000	Routine Sample/Observation	37							22.8			
Seventeen Cr	8/15/2000	Routine Sample/Observation	22							18.3			
Seventeen Cr	8/29/2000	Routine Sample/Observation	34							18.3			

Table 6: Archived 1981-2008 Tributary Water Quality Data

Site	Sample Date	Sample Type	CSMP Transparency Tube-60 cm	Dissolved oxygen	Kjeldahl Nitrogen	Nitrate and Nitrite Nitrogen-Total	Field pH	Phosphorus	Suspended Solids	Temperature	Field Turbidity	Fecal Coliform	E. Coli
			cm	mg/L	mg/L	mg/L		mg/L	mg/L	degrees C	FTU	#/100ml	#/100ml
Seventeen Cr	4/10/2001	Routine Sample/Observation	> 60							3.1			
Seventeen Cr	4/12/2001	Routine Sample/Observation	> 60							5.6			
Seventeen Cr	4/18/2001	Routine Sample/Observation	> 60							4.2			
Seventeen Cr	4/24/2001	Routine Sample/Observation	> 60							8.3			
Seventeen Cr	5/25/2001	Routine Sample/Observation	56							13.6			
Seventeen Cr	5/30/2001	Routine Sample/Observation	57							17.8			
Seventeen Cr	6/7/2001	Routine Sample/Observation	50							14.4			
Seventeen Cr	6/20/2001	Routine Sample/Observation	39							18.9			
Seventeen Cr	7/3/2001	Routine Sample/Observation	26							18.9			
Seventeen Cr	7/13/2001	Routine Sample/Observation	18							19.4			
Seventeen Cr	7/23/2001	Routine Sample/Observation	24							23.9			
Seventeen Cr	5/7/2002	Routine Sample/Observation	> 60							9.7			
Seventeen Cr	5/24/2002	Routine Sample/Observation	53							14.2			
Seventeen Cr	6/21/2002	Routine Sample/Observation	47							21.7			
Seventeen Cr	7/8/2002	Routine Sample/Observation	> 60							21.1			
Seventeen Cr	7/23/2002	Routine Sample/Observation	40							19.4			
Seventeen Cr	8/16/2002	Routine Sample/Observation	47							20			
Seventeen Cr	9/3/2002	Routine Sample/Observation	21							18.9			
Seventeen Cr	5/19/2004	Routine Sample/Observation	60	2.37	2.2	< 0.01		0.109	9	12			
Seventeen Cr	6/8/2004	Routine Sample/Observation	> 60	5.76			6.89	0.109	12	18.34			
Seventeen Cr	7/19/2004	Routine Sample/Observation	42	7.28	2.2	< 0.5	7.17	0.298	6	19.9			
Seventeen Cr	8/9/2004	Routine Sample/Observation	43	4.52			7.08	0.238	7	16.8			
Seventeen Cr	9/7/2004	Routine Sample/Observation	> 60	6.61	1.4	0.01	7.19	0.108	5	14.1			
Seventeen Cr	10/5/2004	Routine Sample/Observation	> 60	8.48			7.16	0.053	2	6.35			
Seventeen Cr	11/17/2004	Routine Sample/Observation	> 60	10.4	1.1	0.01	6.8	0.036	2	4.74			
Seventeen Cr	4/11/2005	Routine Sample/Observation	> 60							6.7			
Seventeen Cr	4/26/2005	Routine Sample/Observation	60							5.6			
Seventeen Cr	6/7/2005	Routine Sample/Observation	44										
Seventeen Cr	7/5/2005	Routine Sample/Observation	31							17.8			
Seventeen Cr	8/24/2005	Routine Sample/Observation	8										
Seventeen Cr	9/22/2005	Routine Sample/Observation	48							14.4			
Seventeen Cr	11/1/2005	Routine Sample/Observation	> 60							5			
Seventeen Cr	5/31/2006	Routine Sample/Observation	37							17.8			
Seventeen Cr	6/28/2006	Routine Sample/Observation	40							16.1			
Peterson Cr	6/17/1981	Routine Sample/Observation		5.7	2.18	0.11		0.107	14	17	2.4	490	
Peterson Cr	8/20/1981	Routine Sample/Observation		5.1	2.39	0.03		0.136	2	19.5	3.6	2300	
Peterson Cr	10/8/1981	Routine Sample/Observation		8.5	1.4	< 0.01		0.042	6	7	1.3	130	
Peterson Cr	4/5/2004	Routine Sample/Observation	> 60	11.38			6.97			2.01			
Peterson Cr	5/19/2004	Routine Sample/Observation	> 60	2.17	1.3	0.05		0.05	3	13			
Peterson Cr	6/8/2004	Routine Sample/Observation	60	6.11			6.94	0.068	8	19.62			
Peterson Cr	7/19/2004	Routine Sample/Observation	59	6.52	1.6	< 0.5	7.13	0.19	10	24.03			
Peterson Cr	8/9/2004	Routine Sample/Observation	> 60	4.61			7.08	0.112	3	18.88			
Peterson Cr	9/7/2004	Routine Sample/Observation	> 60	8.24	1.5	0.08	7.31	0.103	3	15.1			
Peterson Cr	10/5/2004	Routine Sample/Observation	60	9.25			7.26	0.047	2	6.38			
Peterson Cr	11/17/2004	Routine Sample/Observation	> 60	11.85	0.9	< 0.01	6.99	0.038	3	4.48			

Table 6: Archived 1981-2008 Tributary Water Quality Data

Site	Sample Date	Sample Type	CSMP Transparency Tube-60 cm	Dissolved oxygen	Kjeldahl Nitrogen	Nitrate and Nitrite Nitrogen-Total	Field pH	Phosphorus	Suspended Solids	Temperature	Field Turbidity	Fecal Coliform	E. Coli
			cm	mg/L	mg/L	mg/L		mg/L	mg/L	degrees C	FTU	#/100ml	#/100ml
Cedar Creek	6/17/1981	Routine Sample/Observation		1.5	1.82	< 0.01		0.184	7	14.5	1.7	110	
Cedar Creek	8/20/1981	Routine Sample/Observation		1	2.23	< 0.01		0.181	6	22.5	1.9	50	
Cedar Creek	10/8/1981	Routine Sample/Observation		1.8	1.54	< 0.01		0.049	4	8.5	1.1	< 20	
Cedar Creek	6/22/1992	Routine Sample/Observation						0.046					
Cedar Creek	7/14/1992	Routine Sample/Observation						0.074					
Cedar Creek	12/17/1992	Routine Sample/Observation						0.149					
Cedar Creek	5/19/2004	Routine Sample/Observation	> 60	1.67	1.1	< 0.01		0.044	2	12.4			
Cedar Creek	6/8/2004	Routine Sample/Observation	> 60	2.37			6.57	0.534	57	18.69			
Cedar Creek	7/19/2004	Routine Sample/Observation	> 60	7.31	1.4	< 0.5	6.78	0.103	7	24.78			
Cedar Creek	8/9/2004	Routine Sample/Observation	> 60	5.25			7.42	0.047	9	20			
Cedar Creek	9/7/2004	Routine Sample/Observation	60	3.03	1.2	< 0.01	6.9	0.093	8	16.66			
Cedar Creek	10/5/2004	Routine Sample/Observation	> 60	4.74			6.95	0.028	< 2	6.93			
Cedar Creek	11/17/2004	Routine Sample/Observation	> 60	4.16	0.7	< 0.01	6.26	0.027	4	4.06			
Malone Cr	8/12/1999	Routine Sample/Observation	52										
Malone Cr	8/26/1999	Routine Sample/Observation	53										
Malone Cr	5/19/2004	Routine Sample/Observation	> 60	1.74	0.9	< 0.01		0.051	5	16.4			
Malone Cr	6/8/2004	Routine Sample/Observation	> 60	5.86			6.96	0.049	7	21.1			
Malone Cr	7/19/2004	Routine Sample/Observation	> 60	6.33	1.1	< 0.5	6.97	0.057	3	23.5			
Malone Cr	8/9/2004	Routine Sample/Observation	> 60	5.28			7.07	0.028	4	19.1			
Malone Cr	9/7/2004	Routine Sample/Observation	> 60	4.4	0.6	< 0.01	7.02	0.048	2	16.8			
Malone Cr	10/5/2004	Routine Sample/Observation	> 60	6.17			7.19	0.044	2	7.7			
Malone Cr	11/7/2004	Routine Sample/Observation	> 60							5			
Malone Cr	11/17/2004	Routine Sample/Observation	> 60	9.53	0.8	0.01	6.87	0.04	4	4.99			
Malone Cr	4/26/2005	Routine Sample/Observation	> 60							8.3			
Malone Cr	6/7/2005	Routine Sample/Observation	> 60										
Malone Cr	7/5/2005	Routine Sample/Observation	> 60							21.7			
Malone Cr	8/24/2005	Routine Sample/Observation	> 60							17.2			
Malone Cr	9/22/2005	Routine Sample/Observation	> 60							16.7			
Malone Cr	11/1/2005	Routine Sample/Observation	> 60							6.1			
Malone Cr	5/22/2006	Routine Sample/Observation	91										
Malone Cr	6/21/2006	Routine Sample/Observation	89										
Malone Cr	7/25/2006	Routine Sample/Observation	100										
Malone Cr	8/21/2006	Routine Sample/Observation	100										
Malone Cr	9/26/2006	Routine Sample/Observation	94										
Malone Cr	10/25/2006	Routine Sample/Observation	> 60										
Malone Cr	11/28/2006	Routine Sample/Observation	> 60										
Groundhouse Cr	3/19/1992	Routine Sample/Observation						0.2125					
Groundhouse Cr	12/17/1992	Routine Sample/Observation						0.4095					
Lake Outlet	4/26/2005	Routine Sample/Observation	> 60							6.9			
Lake Outlet	6/7/2005	Routine Sample/Observation	> 60										
Lake Outlet	6/13/2005	Routine Sample/Observation	> 60							16			11
Lake Outlet	6/20/2005	Routine Sample/Observation	> 60							20			44
Lake Outlet	6/27/2005	Routine Sample/Observation	> 60							19			11
Lake Outlet	7/5/2005	Routine Sample/Observation	> 60							21.7			200
Lake Outlet	7/11/2005	Routine Sample/Observation	> 60							21			27
Lake Outlet	7/18/2005	Routine Sample/Observation	> 60							20			11
Lake Outlet	7/25/2005	Routine Sample/Observation	> 60							23			33
Lake Outlet	8/2/2005	Routine Sample/Observation	> 60							25			33

Table 6: Archived 1981-2008 Tributary Water Quality Data

Site	Sample Date	Sample Type	CSMP Transparency Tube-60 cm	Dissolved oxygen	Kjeldahl Nitrogen	Nitrate and Nitrite Nitrogen-Total	Field pH	Phosphorus	Suspended Solids	Temperature	Field Turbidity	Fecal Coliform	E. Coli
			cm	mg/L	mg/L	mg/L		mg/L	mg/L	degrees C	FTU	#/100ml	#/100ml
Lake Outlet	8/17/2005	Routine Sample/Observation	> 60							22			33
Lake Outlet	8/23/2005	Routine Sample/Observation	> 60							18			17
Lake Outlet	8/24/2005	Routine Sample/Observation	> 60							21.9			
Lake Outlet	8/29/2005	Routine Sample/Observation	> 60							18			17
Lake Outlet	9/6/2005	Routine Sample/Observation	> 60							18			240
Lake Outlet	9/13/2005	Routine Sample/Observation	> 60							17			67
Lake Outlet	9/22/2005	Routine Sample/Observation	> 60							17.3			
Lake Outlet	9/26/2005	Routine Sample/Observation	> 60							13			200
Lake Outlet	11/1/2005	Routine Sample/Observation	> 60							6.8			
Lake Outlet	5/22/2006	Routine Sample/Observation	> 100										
Lake Outlet	6/21/2006	Routine Sample/Observation	> 100										
Lake Outlet	7/25/2006	Routine Sample/Observation	> 100										
Lake Outlet	8/21/2006	Routine Sample/Observation	100										
Lake Outlet	9/26/2006	Routine Sample/Observation	100										
Lake Outlet	10/25/2006	Routine Sample/Observation	> 60										
Lake Outlet	11/28/2006	Routine Sample/Observation	> 60										
Whitefish Cr	NA	No Results Prior to 2007	100							30			
Seguchie Cr	5/19/2004	Routine Sample/Observation	> 60	1.87				0.026	3	15.3			
Seguchie Cr	5/24/2004	Routine Sample/Observation	60										
Seguchie Cr	5/29/2004	Routine Sample/Observation	60										
Seguchie Cr	6/6/2004	Routine Sample/Observation	60										
Seguchie Cr	6/8/2004	Routine Sample/Observation	> 60	4.4			7.33	0.044	< 2	21.4			
Seguchie Cr	6/12/2004	Routine Sample/Observation	60										
Seguchie Cr	6/20/2004	Routine Sample/Observation	60										
Seguchie Cr	6/27/2004	Routine Sample/Observation	60										
Seguchie Cr	7/4/2004	Routine Sample/Observation	60										
Seguchie Cr	7/11/2004	Routine Sample/Observation	60										
Seguchie Cr	7/17/2004	Routine Sample/Observation	60										
Seguchie Cr	7/19/2004	Routine Sample/Observation	> 60	6.07			7.18	0.03	< 2	25.2			
Seguchie Cr	7/24/2004	Routine Sample/Observation	60										
Seguchie Cr	8/2/2004	Routine Sample/Observation	60										
Seguchie Cr	8/7/2004	Routine Sample/Observation	60										
Seguchie Cr	8/9/2004	Routine Sample/Observation	> 60	3.41			6.98	0.029	< 2	19.8			
Seguchie Cr	8/16/2004	Routine Sample/Observation	60										
Seguchie Cr	8/21/2004	Routine Sample/Observation	60										
Seguchie Cr	8/28/2004	Routine Sample/Observation	60										
Seguchie Cr	9/4/2004	Routine Sample/Observation	60										
Seguchie Cr	9/7/2004	Routine Sample/Observation	> 60	4.31			7.17	0.027	< 2	16.96			
Seguchie Cr	9/12/2004	Routine Sample/Observation	60										
Seguchie Cr	9/19/2004	Routine Sample/Observation	60										
Seguchie Cr	9/25/2004	Routine Sample/Observation	60										
Seguchie Cr	10/2/2004	Routine Sample/Observation	60										
Seguchie Cr	10/5/2004	Routine Sample/Observation	> 60	7.49			7.68	0.015	< 1	8.3			
Seguchie Cr	10/9/2004	Routine Sample/Observation	60										
Seguchie Cr	10/19/2004	Routine Sample/Observation	60										
Seguchie Cr	10/24/2004	Routine Sample/Observation	60										
Seguchie Cr	10/31/2004	Routine Sample/Observation	60										
Seguchie Cr	11/17/2004	Routine Sample/Observation	> 60	10.9			7.58	0.023	2	5.2			

Table 6: Archived 1981-2008 Tributary Water Quality Data

Site	Sample Date	Sample Type	CSMP Transparency Tube-60 cm	Dissolved oxygen	Kjeldahl Nitrogen	Nitrate and Nitrite Nitrogen-Total	Field pH	Phosphorus	Suspended Solids	Temperature	Field Turbidity	Fecal Coliform	E. Coli
			cm	mg/L	mg/L	mg/L		mg/L	mg/L	degrees C	FTU	#/100ml	#/100ml
Seguchie Cr	4/2/2005	Routine Sample/Observation	60										
Seguchie Cr	4/11/2005	Routine Sample/Observation	60										
Seguchie Cr	4/16/2005	Routine Sample/Observation	60										
Seguchie Cr	4/24/2005	Routine Sample/Observation	60										
Seguchie Cr	4/26/2005	Routine Sample/Observation	> 60							8.9			
Seguchie Cr	4/27/2005	Routine Sample/Observation	60										
Seguchie Cr	5/6/2005	Routine Sample/Observation	60										
Seguchie Cr	5/15/2005	Routine Sample/Observation	60										
Seguchie Cr	5/21/2005	Routine Sample/Observation	60										
Seguchie Cr	5/30/2005	Routine Sample/Observation	60										
Seguchie Cr	6/4/2005	Routine Sample/Observation	60										
Seguchie Cr	6/7/2005	Routine Sample/Observation	> 60										
Seguchie Cr	6/11/2005	Routine Sample/Observation	60										
Seguchie Cr	6/18/2005	Routine Sample/Observation	60										
Seguchie Cr	6/26/2005	Routine Sample/Observation	60										
Seguchie Cr	7/3/2005	Routine Sample/Observation	60										
Seguchie Cr	7/5/2005	Routine Sample/Observation	> 60							21.7			
Seguchie Cr	7/10/2005	Routine Sample/Observation	60										
Seguchie Cr	7/17/2005	Routine Sample/Observation	60										
Seguchie Cr	7/23/2005	Routine Sample/Observation	60										
Seguchie Cr	7/31/2005	Routine Sample/Observation	60										
Seguchie Cr	8/8/2005	Routine Sample/Observation	60										
Seguchie Cr	8/15/2005	Routine Sample/Observation	60										
Seguchie Cr	8/20/2005	Routine Sample/Observation	60										
Seguchie Cr	8/24/2005	Routine Sample/Observation	> 60							20			
Seguchie Cr	8/28/2005	Routine Sample/Observation	60										
Seguchie Cr	9/4/2005	Routine Sample/Observation	60										
Seguchie Cr	9/12/2005	Routine Sample/Observation	60										
Seguchie Cr	9/18/2005	Routine Sample/Observation	60										
Seguchie Cr	9/22/2005	Routine Sample/Observation	> 60							14.4			
Seguchie Cr	9/25/2005	Routine Sample/Observation	60										
Seguchie Cr	10/2/2005	Routine Sample/Observation	60										
Seguchie Cr	10/7/2005	Routine Sample/Observation	60										
Seguchie Cr	10/16/2005	Routine Sample/Observation	60										
Seguchie Cr	10/24/2005	Routine Sample/Observation	60										
Seguchie Cr	10/30/2005	Routine Sample/Observation	60										
Seguchie Cr	11/1/2005	Routine Sample/Observation	> 60							7.2			
Seguchie Cr	4/1/2006	Routine Sample/Observation	40										
Seguchie Cr	4/9/2006	Routine Sample/Observation	60										
Seguchie Cr	4/16/2006	Routine Sample/Observation	58										
Seguchie Cr	4/22/2006	Routine Sample/Observation	60										
Seguchie Cr	4/30/2006	Routine Sample/Observation	60										
Seguchie Cr	5/6/2006	Routine Sample/Observation	60										
Seguchie Cr	5/14/2006	Routine Sample/Observation	60										
Seguchie Cr	5/20/2006	Routine Sample/Observation	60										
Seguchie Cr	5/28/2006	Routine Sample/Observation	60										
Seguchie Cr	5/31/2006	Routine Sample/Observation	> 60							21.7			
Seguchie Cr	6/4/2006	Routine Sample/Observation	60										

Table 6: Archived 1981-2008 Tributary Water Quality Data

Site	Sample Date	Sample Type	CSMP Transparency Tube-60 cm	Dissolved oxygen	Kjeldahl Nitrogen	Nitrate and Nitrite Nitrogen-Total	Field pH	Phosphorus	Suspended Solids	Temperature	Field Turbidity	Fecal Coliform	E. Coli
			cm	mg/L	mg/L	mg/L		mg/L	mg/L	degrees C	FTU	#/100ml	#/100ml
Seguchie Cr	6/9/2006	Routine Sample/Observation	60										
Seguchie Cr	6/18/2006	Routine Sample/Observation	60										
Seguchie Cr	6/25/2006	Routine Sample/Observation	60										
Seguchie Cr	6/28/2006	Routine Sample/Observation	> 60							20.6			
Seguchie Cr	7/2/2006	Routine Sample/Observation	60										
Seguchie Cr	7/8/2006	Routine Sample/Observation	60										
Seguchie Cr	7/15/2006	Routine Sample/Observation	60										
Seguchie Cr	7/18/2006	Routine Sample/Observation	> 60										
Seguchie Cr	7/22/2006	Routine Sample/Observation	50										
Seguchie Cr	7/30/2006	Routine Sample/Observation	40										
Seguchie Cr	8/7/2006	Routine Sample/Observation	35										
Seguchie Cr	8/13/2006	Routine Sample/Observation	60										
Seguchie Cr	8/20/2006	Routine Sample/Observation	45										
Seguchie Cr	8/23/2006	Routine Sample/Observation	> 60										
Seguchie Cr	8/27/2006	Routine Sample/Observation	50										
Seguchie Cr	9/3/2006	Routine Sample/Observation	50										
Seguchie Cr	9/10/2006	Routine Sample/Observation	45										
Seguchie Cr	9/16/2006	Routine Sample/Observation	50										
Seguchie Cr	9/19/2006	Routine Sample/Observation	> 60							11.7			
Seguchie Cr	9/24/2006	Routine Sample/Observation	45										
Seguchie Cr	9/30/2006	Routine Sample/Observation	60										
Seguchie Cr	10/6/2006	Routine Sample/Observation	60										
Seguchie Cr	10/13/2006	Routine Sample/Observation	60										
Seguchie Cr	10/20/2006	Routine Sample/Observation	60										
Seguchie Cr	10/25/2006	Routine Sample/Observation	> 60										
Seguchie Cr	10/27/2006	Routine Sample/Observation	60										
Seguchie Cr	11/28/2006	Routine Sample/Observation	> 60										
Garrison Creek	5/19/2004	Routine Sample/Observation	> 60	1.91				0.021	6	15.4			
Garrison Creek	6/8/2004	Routine Sample/Observation	> 60	6.61			7.67	0.036	8	19.2			
Garrison Creek	7/16/2004	Routine Sample/Observation	> 60							26.7			
Garrison Creek	7/19/2004	Routine Sample/Observation	> 60	7.84			7.56	0.043	3	26.66			
Garrison Creek	8/9/2004	Routine Sample/Observation	> 60	7.83			7.87	0.021	2	20.3			
Garrison Creek	9/7/2004	Routine Sample/Observation	> 60	8.04			7.56	0.03	3	14.74			
Garrison Creek	10/5/2004	Routine Sample/Observation	> 60	9.32			7.83	0.022	2	7.1			
Garrison Creek	11/17/2004	Routine Sample/Observation	> 60	11.27			7.71	0.019	2	6.8			
Garrison Creek	4/26/2005	Routine Sample/Observation	> 60							8.3			
Garrison Creek	6/7/2005	Routine Sample/Observation	> 60										
Garrison Creek	7/5/2005	Routine Sample/Observation	> 60							21.7			
Garrison Creek	8/24/2005	Routine Sample/Observation	> 60							20			
Garrison Creek	9/22/2005	Routine Sample/Observation	> 60							17.2			
Garrison Creek	11/1/2005	Routine Sample/Observation	> 60							6.1			
Garrison Creek	5/31/2006	Routine Sample/Observation	> 60							20.6			
Garrison Creek	6/28/2006	Routine Sample/Observation	> 60							19.4			
Garrison Creek	7/18/2006	Routine Sample/Observation	> 60										
Garrison Creek	8/23/2006	Routine Sample/Observation	> 60										
Garrison Creek	9/19/2006	Routine Sample/Observation	> 60							12.2			
Garrison Creek	10/25/2006	Routine Sample/Observation	55										
Garrison Creek	11/28/2006	Routine Sample/Observation	> 60										

Table 7: 2007-2008 Mille Lacs Lake Water Quality Data

All data collected and reported by MLB Department of Natural Resources.

Site	Date Sampled	Chl (ppb)	Phaeo (ppb)	TP (ppb)	TP code	OP (ppb)	OP code	TN (ppb)	NH4-N (ppb)	NH4-N code	NO2/NO3-N (ppb)	NO2/NO3-N code	Cl (mg/L)	Algal Scans	Notes
ML-1	3/27/2007	0.76	0.43	9		1	LOD	420	74		72		1.95		Chl-a= 1500mL
ML-1	6/21/2007	2.62	0.49	18		2	LOD	489	80	LOD	0	LOD	3.15		
ML-1	8/8/2007	5.61	1.88	24		1	LOD	575	1	LOD	0	LOD	3.34		Chl-a= 600 mL
ML-1	9/26/2007	3.15	0.94	20		1	LOD	499	5		0	LOD	3.42		Chl-a= 1000 mL
ML-1	3/26/2008	1.49	0.55	6	0.006	1	LOD	450	18		5		3.69		Chl-a= 1000mL
ML-1	6/24/2008	1.4	0.3	11	0.011	1	LOD	429	5		0	LOD	-99		Chl-a= 1000 mL
ML-1	8/13/2008	2.98	0.58	15	0.015	1	LOD	454.5	14		0	LOD	3.556		Chl= 1000 mL
ML-1	9/24/2008	7.52	1.36	23	0.023	1	LOD	589.8	8		4	LOD	3.759		
ML-20	3/27/2007	0.57	0.2	5		1	LOD	337	52		25		1.94		Chl-a= 1400mL
ML-20	6/21/2007	4.03	0.47	22		3	LOD	506	9		3	LOD	3.15		
ML-20	8/8/2007	12.11	5.18	30		1	LOD	576	3	LOD	0	LOD	3.33		Chl-a= 800 mL
ML-20	9/26/2007	3.9	0.82	20		1	LOD	482	5		0	LOD	3.38		Chl-a= 800 mL
ML-20	3/26/2008	2.16	0.54	8	0.008	1	LOD	433	16		0	LOD	3.43		Chl-a= 1000mL
ML-20	6/24/2008	0.85	0.65	17	0.017	2	LOD	468	8		0	LOD	-99		Chl-a= 1350 mL
ML-20	8/13/2008	7.03	1.6	21	0.021	2	LOD	541	12		1	LOD	3.423		Chl= 500 mL
ML-20	9/24/2008	7.1	1.41	28	0.028	1	LOD	-99	6		0	LOD	3.755		
ML-24	3/27/2007	0.45	0.15	6		1	LOD	413	52		48		2.43		Chl-a= 1500mL
ML-24	6/21/2007	4.36	0.74	20		2	LOD	494	5		0	LOD	3.16	-99	
ML-24	8/8/2007	10.75	1.67	26		1	LOD	578	8		0	LOD	3.41		Chl-a= 500 mL
ML-24	9/26/2007	3.74	0.98	18		1	LOD	469	4	LOD	0	LOD	3.4		Chl-a= 800 mL
ML-24	3/26/2008	3.52	0.85	9	0.009	1	LOD	459	15		0	LOD	3.44		Chl-a= 1000mL
ML-24	6/24/2008	1.01	0.31	10	0.01	1	LOD	414	9		0	LOD	-99		Chl-a= 1500 mL
ML-24	8/13/2008	4.93	1.14	19	0.019	1	LOD	521.3	14		0	LOD	3.45		Chl= 1000 mL
ML-24	9/24/2008	5.57	1.2	26	0.026	0	LOD	-99	7		0	LOD	3.73		
ML-24 Dup	6/21/2007	2.62	0.31	20		2	LOD	491	8		3	LOD	3.13		
ML-6	3/27/2007	0.48	0.19	7		1	LOD	474	107		103		1.99	-99	Chl-a= 1400mL
ML-6	6/21/2007	2.36	0.51	15		2	LOD	461	3	LOD	0	LOD	3.14		
ML-6	8/8/2007	7.15	2.74	23		0	LOD	556	2	LOD	0	LOD	3.37	-99	Chl-a= 700 mL
ML-6	9/26/2007	3.21	0.62	15		1	LOD	469	4	LOD	0	LOD	3.38	-99	Chl-a= 800 mL
ML-6	3/26/2008	1.65	0.46	8	0.008	1	LOD	439	7		4	LOD	3.49	-99	Chl-a= 1000mL
ML-6	6/24/2008	0.56	0.12	9	0.009	3	LOD	431	6		0	LOD	-99		Chl-a= 1000 mL
ML-6	8/13/2008	4.06	1.09	21	0.021	1	LOD	483.5	9		0	LOD	3.554	-99	Chl= 1000 mL
ML-6	9/24/2008	5.51	1.06	22	0.022	0	LOD	553.4	5		0	LOD	3.651		
ML-6 Field Rep	3/27/2007	0.33	0.27	6		1	LOD	490	91		68		1.64		Chl-a= 1400mL
ML-6 Field Rep	8/8/2007	6.76	2.73	26		1	LOD	569	6		1	LOD	3.41		Chl-a= 700 mL
ML-6 Field Rep	3/26/2008	1.16	0.24	9	0.009	1	LOD	434	8		4	LOD	3.49		Chl-a= 1000mL
ML-6 Field Rep	6/24/2008	0.98	0.14	10	0.01	4	LOD	396	6		0	LOD	-99		Chl-a= 1000 mL
ML-6 Field Rep	8/13/2008	5.15	1.21	19	0.019	1	LOD	472.6	10		0	LOD	3.54		Chl= 1000 mL
ML-6 field rep	9/24/2008	4.02	0.6	22	0.022	0	LOD	499.1	7		0	LOD	3.69	-99	
ML-CE	3/27/2007	0.47	0.19	9		1	LOD	487	81		82		2.38		Chl-a= 1000mL
ML-CE	6/21/2007	3.33	0.35	19		2	LOD	503	17		0	LOD	3.13		
ML-CE	8/8/2007	6.83	2.2	23		0	LOD	539	3	LOD	0	LOD	3.37		Chl-a= 825 mL
ML-CE	9/26/2007	4.12	0.97	19		1	LOD	479	2	LOD	0	LOD	3.46		Chl-a= 800 mL
ML-CE	3/26/2008	2.16	0.45	10	0.01	1	LOD	422	18		0	LOD	3.44		Chl-a= 1000mL
ML-CE	6/24/2008	0.69	0.58	15	0.015	1	LOD	414	9		0	LOD	-99		Chl-a= 1000 mL
ML-CE	8/13/2008	2.58	0.72	17	0.017	1	LOD	448.6	10		0	LOD	3.453		Chl= 1000 mL
ML-CE	9/24/2008	7.14	1.22	23	0.023	0	LOD	497.5	8		22		3.792		

Table 7: 2007-2008 Mille Lacs Lake Water Quality Data

All data collected and reported by MLB Department of Natural Resources.

Site	Date Sampled	Chl (ppb)	Phaeo (ppb)	TP (ppb)	TP code	OP (ppb)	OP code	TN (ppb)	NH4-N (ppb)	NH4-N code	NO2/NO3-N (ppb)	NO2/NO3-N code	Cl (mg/L)	Algal Scans	Notes
ML-Ditch 36	3/27/2007	2.2	0.23	35		10		722	150		185		1.64		Chl-a= 1000mL
ML-Ditch 36	6/21/2007	2.57	0.29	18		2	LOD	514	4	LOD	0	LOD	3.17		
ML-Ditch 36	8/8/2007	12.14	1.84	23		0	LOD	633	3	LOD	0	LOD	3.31		Chl-a= 600 mL
ML-Ditch 36	9/26/2007	2.48	0.67	16		1	LOD	471	3	LOD	0	LOD	3.4		Chl-a= 1200 mL
ML-Ditch 36	3/26/2008	2.05	0.59	12	0.012	1	LOD	490	14		4	LOD	3.79		Chl-a= 1000mL
ML-Ditch 36	6/24/2008	1.84	0.49	13	0.013	1	LOD	426	7		0	LOD	-99		Chl-a= 1000 mL
ML-Ditch 36	8/13/2008	2.65	0.84	21	0.021	1	LOD	467.7	11		0	LOD	3.463		Chl= 600 mL
ML-Ditch 36	9/24/2008	6.83	1.42	22	0.022	0	LOD	521.8	8		19		3.701		
ML-Garrison	3/27/2007	0.48	0.29	7		1	LOD	457	69		63		2.51		Chl-a= 1400mL
ML-Garrison	6/21/2007	1.38	0.28	24		3	LOD	546	43		7		3.17		
ML-Garrison	8/8/2007	4.62	1.48	24		1	LOD	550	1	LOD	0	LOD	3.46		Chl-a= 600 mL
ML-Garrison	9/26/2007	5.65	1.73	25		1	LOD	530	3	LOD	0	LOD	3.43		Chl-a= 800 mL
ML-Garrison	3/26/2008	7.98	5.31	14	0.014	1	LOD	524	8		9		3.78		Chl-a= 1000mL
ML-Garrison	6/24/2008	0.92	0.33	16	0.016	2	LOD	440	6		0	LOD	-99		Chl-a= 1400 mL
ML-Garrison	8/13/2008	5.04	1.36	24	0.024	1	LOD	474.7	11		0	LOD	3.604		Chl= 700 mL
ML-Garrison	9/24/2008	5.94	1.18	21	0.021	1	LOD	510.3	7		0	LOD	3.525		
ML-Malone	3/27/2007	1.54	0.57	8		1	LOD	420	49		52		2.51		Chl-a= 1000mL
ML-Malone	6/21/2007	2.11	0.57	16		2	LOD	485	14		2	LOD	3.16		
ML-Malone	8/8/2007	4.72	0.77	20		0	LOD	559	1	LOD	0	LOD	3.32		Chl-a= 600 mL
ML-Malone	9/26/2007	3.73	1.05	17		1	LOD	498	4	LOD	0	LOD	3.35		Chl-a= 1000 mL
ML-Malone	3/26/2008	4.04	2.11	18	0.018	1	LOD	526	7		0	LOD	3.81		Chl-a= 1000mL
ML-Malone	6/24/2008	2.38	0.83	16	0.016	2	LOD	460.2	8		0	LOD	3.455		Chl-a= 1000 mL
ML-Malone	8/13/2008	2.97	0.52	17	0.017	1	LOD	471.1	12		0	LOD	3.432		Chl= 500 mL
ML-Malone	9/24/2008	5.48	0.79	22	0.022	0	LOD	538.5	7		0	LOD	3.551		
ML-N Shore	3/27/2007	0.72	0.15	7		1	LOD	433	45		56		2.74		Chl-a= 1400mL
ML-N Shore	6/21/2007	3.16	0.86	16		2	LOD	489	4	LOD	0	LOD	3.16		
ML-N Shore	8/8/2007	6.49	1.86	21		1	LOD	509	3	LOD	0	LOD	3.29		Chl-a= 800 mL
ML-N Shore	9/26/2007	4.26	1.06	16		1	LOD	458	3	LOD	0	LOD	3.37		Chl-a= 800 mL
ML-N Shore	3/26/2008	1.32	0.3	7	0.007	1	LOD	433	9		0	LOD	3.55		Chl-a= 1000mL
ML-N Shore	6/24/2008	1.21	0.6	19	0.019	12		446.4	7		0	LOD	3.397		Chl-a= 1200 mL
ML-N Shore	8/13/2008	4.63	1.55	24	0.024	1	LOD	491.2	8		0	LOD	3.599		Chl= 600 mL
ML-N Shore	9/24/2008	4.63	0.93	21	0.021	1	LOD	497.2	6		5		3.64		
ML-NE	3/27/2007	0.24	0.1	5		1	LOD	433	73		73		2.31		Chl-a= 1400mL
ML-NE	6/21/2007	4.86	0.73	19		2	LOD	514	3	LOD	0	LOD	3.15		
ML-NE	8/8/2007	7	2.11	23		1	LOD	524	1	LOD	0	LOD	3.35		Chl-a= 800 mL
ML-NE	9/26/2007	5.02	1.29	19		1	LOD	483	4	LOD	0	LOD	3.39		Chl-a= 1000 mL
ML-NE	3/26/2008	4.09	1.03	10	0.01	1	LOD	442	11		0	LOD	3.44		Chl-a= 1000mL
ML-NE	6/24/2008	0.69	0.22	11	0.011	2	LOD	397.2	7		0	LOD	3.375		Chl-a= 1500 mL
ML-NE	8/13/2008	5.62	1.3	19	0.019	1	LOD	462.2	27		13		3.459		Chl= 800 mL
ML-NE	9/24/2008	6.82	1.54	23	0.023	1	LOD	502.7	8		14		3.649		
ML-NW	3/27/2007	0.38	0.09	6		1	LOD	430	76		61		2.33		Chl-a= 1600mL
ML-NW	6/21/2007	3.75	0.46	16		2	LOD	487	3	LOD	0	LOD	3.14		
ML-NW	8/8/2007	8.18	2.82	26		1	LOD	558	4	LOD	0	LOD	3.37		Chl-a= 600 mL
ML-NW	9/26/2007	3.43	0.82	18		1	LOD	472	4	LOD	0	LOD	3.41		Chl-a= 700 mL
ML-NW	3/26/2008	1.26	0.43	9	0.009	1	LOD	427	7		0	LOD	3.48		Chl-a= 1000mL
ML-NW	6/24/2008	0.88	0.25	15	0.015	1	LOD	431.7	9		0	LOD	3.481		Chl-a= 1200 mL
ML-NW	8/13/2008	6.33	1.56	20	0.02	1	LOD	466.8	6		0	LOD	3.526		Chl= 1000 mL
ML-NW	9/24/2008	5.61	0.95	21	0.021	2	LOD	489.3	7		0	LOD	3.619		

Table 7: 2007-2008 Mille Lacs Lake Water Quality Data

All data collected and reported by MLB Department of Natural Resources.

Site	Date Sampled	Chl (ppb)	Phaeo (ppb)	TP (ppb)	TP code	OP (ppb)	OP code	TN (ppb)	NH4-N (ppb)	NH4-N code	NO2/NO3-N (ppb)	NO2/NO3-N code	Cl (mg/L)	Algal Scans	Notes
ML-Peterson	3/27/2007	2.11	1.12	45		17		772	147		285		2.36		Chl-a= 1200mL
ML-Peterson	6/21/2007	2.9	0.4	19		2	LOD	475	4	LOD	0	LOD	3.13		
ML-Peterson	8/8/2007	7.3	1.82	25		0	LOD	572	3	LOD	0	LOD	3.34		Chl-a= 600 mL
ML-Peterson	9/26/2007	3.5	0.84	16		1	LOD	473	3	LOD	0	LOD	3.4		Chl-a= 700 mL
ML-Peterson	3/26/2008	0.92	0.67	8	0.008	1	LOD	468	9		0	LOD	3.67		Chl-a= 1200mL
ML-Peterson	6/24/2008	0.8	0.21	14	0.014	1	LOD	436	11		0	LOD	3.529		Chl-a= 1000 mL
ML-Peterson	8/13/2008	2.41	0.84	20	0.02	1	LOD	476.5	11		0	LOD	3.559		Chl= 600 mL
ML-Peterson	9/24/2008	4.46	0.65	22	0.022	0	LOD	544.3	8		10		3.682		
ML-SE	3/27/2007	0.36	0.11	7		1	LOD	520	85		87		2.42		Chl-a= 1500mL
ML-SE	6/21/2007	3.29	0.63	18		2	LOD	476	4	LOD	0	LOD	3.14		
ML-SE	8/8/2007	5.09	3.41	25		1	LOD	583	5		0	LOD	3.35		Chl-a= 600 mL
ML-SE	9/26/2007	3.88	1.12	15		1	LOD	458	5		0	LOD	3.41		Chl-a= 800 mL
ML-SE	3/26/2008	1.55	0.41	6	0.006	1	LOD	435	6		0	LOD	3.55		Chl-a= 1000mL
ML-SE	6/24/2008	0.78	0.45	14	0.014	2	LOD	447.7	9		0	LOD	3.563		Chl-a= 1000 mL
ML-SE	8/13/2008	3.17	0.84	19	0.019	3	LOD	465.8	10		0	LOD	3.363		Chl= 1000 mL
ML-SE	9/24/2008	6.89	1.13	21	0.021	0	LOD	500	7		12		3.576		
ML-Seventeen	3/27/2007	1.47	0	48		23		1137	172		483		2.52		Chl-a= 1000mL
ML-Seventeen	6/21/2007	3.63	0.65	19		5		509	7		1	LOD	3.16		
ML-Seventeen	8/8/2007	3.74	0.49	21		0	LOD	581	3	LOD	5		3.41		Chl-a= 600 mL
ML-Seventeen	9/26/2007	3.08	0.63	17		1	LOD	476	4	LOD	0	LOD	3.35		Chl-a= 800 mL
ML-Seventeen	3/26/2008	1.54	0.39	9	0.009	1	LOD	453	15		0	LOD	3.6		Chl-a= 1000mL
ML-Seventeen	6/24/2008	1.44	0.69	17	0.017	1	LOD	467.3	7		0	LOD	4.505		Chl-a= 1300 mL
ML-Seventeen	8/13/2008	3.47	1.28	21	0.021	1	LOD	479	11		0	LOD	3.449		Chl= 1000 mL
ML-Seventeen	9/24/2008	3.85	0.89	20	0.02	1	LOD	517.7	10		0	LOD	3.68		
ML-Thaines	3/27/2007	2.6	0.67	30		5		610	90		87		3.1		Chl-a= 1000mL
ML-Thaines	6/21/2007	2.92	0.99	25		2	LOD	573	4	LOD	0	LOD	3.19		
ML-Thaines	8/8/2007	3.77	0.85	22		0	LOD	584	9		0	LOD	3.38		Chl-a= 620 mL
ML-Thaines	3/26/2008	4.9	0.93	14	0.014	1	LOD	505	6		4	LOD	3.79		Chl-a= 1000mL
ML-Thaines	6/24/2008	4.49	2.1	22	0.022	2	LOD	546.8	9		0	LOD	3.616		Chl-a= 1000 mL
ML-Thaines	8/13/2008	3.55	0.68	17	0.017	2	LOD	491.9	6		0	LOD	3.52		Chl= 500 mL
ML-Thaines	9/24/2008	6.84	0.82	21	0.021	0	LOD	524.9	8		0	LOD	3.698		
ML-Vineland	3/27/2007	1	0.31	4	LOD	1	LOD	356	73		46		1.77		Chl-a= 1000mL
ML-Vineland	6/21/2007	3.41	0.28	19		2	LOD	476	3	LOD	0	LOD	3.16		
ML-Vineland	8/8/2007	7.5	2.4	27		0	LOD	579	1	LOD	0	LOD	3.33		Chl-a= 600 mL
ML-Vineland	3/26/2008	1.1	0.24	9	0.009	1	LOD	436	8		1	LOD	3.57		Chl-a= 1000mL
ML-Vineland	6/24/2008	0.74	0.18	11	0.011	4	LOD	393.5	6		0	LOD	3.36		Chl-a= 1000 mL
ML-Vineland	8/13/2008	3.83	0.55	18	0.018	0	LOD	460.1	9		0	LOD	3.596		Chl= 700 mL
ML-Vineland	9/24/2008	5.56	0.93	21	0.021	1	LOD	500.6	7		6		3.813		

Table 8: 1970-2008 Mille Lacs Lake Water Quality Data

Table Notes:

Cl	Chloride (ppm)
TN	Total Nitrogen (ppm)
TP	Total Phosphorus (ppb)
CHLA	Chlorophyll a (ppb)
SD M	Seechi Disc (feet)

Band - Mille Lacs Band of the Ojibwe, various programs and dates.
secchi depth data collected in the 1990's
Mille Lacs Lake Watershed Management Project (2000)
Surface Water Quality Monitoring for Long Term Trend Analysis (2005-2006)
Band-CLP - Mille Lacs Environmental Program, Mille Lacs Band of Ojibwe. Includes Clean Lakes Project (CLP) data (1992)
CLMP - Citizen Lake Monitoring Program, various dates (1974-2006).
MPCA - MPCA Lake Monitoring Program Project (1981).

Month	Day Date	Year	Year Group	SITE	Cl (ppm)	TN (ppm)	TP (ppm)	CHLA (ppb)	Secchi Rdg (ft)	Source
9	24	1970	1970-1976	PETERSON CREEK INLET			0.018			DNR Fisheries, Aitkin
7	24	1974	1970-1976	201					4.49	*CLMP*
7	31	1974	1970-1976	201					6.49	*CLMP*
8	7	1974	1970-1976	201					7.51	*CLMP*
8	14	1974	1970-1976	201					7.51	*CLMP*
8	21	1974	1970-1976	201					7.51	*CLMP*
8	28	1974	1970-1976	201					7.51	*CLMP*
9	4	1974	1970-1976	201					7.51	*CLMP*
9	11	1974	1970-1976	201					8.00	*CLMP*
9	18	1974	1970-1976	201					8.00	*CLMP*
9	25	1974	1970-1976	201					8.50	*CLMP*
10	2	1974	1970-1976	201					8.50	*CLMP*
8	6	1976	1970-1976	COMPOSITE						DNR Fisheries, Aitkin
8	6	1976	1970-1976	SURFACE COMPOSITE						DNR Fisheries, Aitkin
8	6	1976	1970-1976	NE CORNER, FISHERS RESORT, SURFACE COMPOSITE						DNR Fisheries, Aitkin
10	6	1980	1980-1984	1 MILE OUT OF ISLE BAY			0.030			DNR Fisheries, Aitkin
6	22	1981	1980-1984	102			0.021	9.60	6.23	*MPCA*
8	19	1981	1980-1984	102			0.018	6.80	7.54	*MPCA*
10	7	1981	1980-1984	102			0.069	10.40	6.89	*MPCA*
6	18	1981	1980-1984	103			0.056			*MPCA*
8	12	1981	1980-1984	103			0.035	11.50	5.58	*MPCA*
8	19	1981	1980-1984	103			0.018	6.60	7.87	*MPCA*
10	7	1981	1980-1984	103			0.070	11.20	6.89	*MPCA*
6	18	1981	1980-1984	104			0.047		4.92	*MPCA*
6	18	1981	1980-1984	105			0.031	7.70	4.26	*MPCA*
8	19	1981	1980-1984	105			0.020	7.30	7.54	*MPCA*
10	7	1981	1980-1984	105			0.070	10.60	6.56	*MPCA*
6	22	1981	1980-1984	106			0.022		4.26	*MPCA*
6	22	1981	1980-1984	107			0.028		5.58	*MPCA*
6	22	1981	1980-1984	108			0.025		5.90	*MPCA*
6	22	1981	1980-1984	109			0.042		6.23	*MPCA*
6	22	1981	1980-1984	110			0.034		6.56	*MPCA*
6	17	1981	1980-1984	111			0.021		5.25	*MPCA*
6	17	1981	1980-1984	112			0.024		5.58	*MPCA*
6	17	1981	1980-1984	113			0.034		4.92	*MPCA*
6	17	1981	1980-1984	114			0.027	4.20	5.90	*MPCA*
8	19	1981	1980-1984	114			0.033	5.30	9.18	*MPCA*
10	7	1981	1980-1984	114			0.072	9.90	5.58	*MPCA*
6	17	1981	1980-1984	115			0.035		4.26	*MPCA*
8	19	1981	1980-1984	115			0.038	7.20	8.53	*MPCA*
10	7	1981	1980-1984	115			0.075	12.80	4.59	*MPCA*
6	17	1981	1980-1984	116			0.038	4.20	5.58	*MPCA*
8	19	1981	1980-1984	116			0.039	4.60	8.86	*MPCA*
10	7	1981	1980-1984	116			0.070	8.30	6.23	*MPCA*
6	18	1981	1980-1984	117			0.020	5.20	5.90	*MPCA*
8	19	1981	1980-1984	117			0.012	4.80	8.20	*MPCA*
10	7	1981	1980-1984	117			0.052	8.30	6.56	*MPCA*
6	18	1981	1980-1984	118			0.027	7.20	5.90	*MPCA*
8	19	1981	1980-1984	118			0.021	6.20	6.89	*MPCA*
10	7	1981	1980-1984	118			0.049	9.60	6.89	*MPCA*
6	18	1981	1980-1984	119			0.031	11.20	4.92	*MPCA*
8	19	1981	1980-1984	119			0.022	4.80	7.22	*MPCA*
10	7	1981	1980-1984	119			0.050	8.00	6.56	*MPCA*
6	18	1981	1980-1984	120			0.039		5.58	*MPCA*
6	18	1981	1980-1984	121			0.042		27.88	*MPCA*
6	22	1981	1980-1984	122			0.010		7.54	*MPCA*
6	22	1981	1980-1984	123			0.037	6.80	4.92	*MPCA*
8	19	1981	1980-1984	123			0.038	6.80	8.20	*MPCA*
10	7	1981	1980-1984	123			0.078	12.80	6.56	*MPCA*
6	15	1982	1980-1984	202					5.51	*CLMP*
7	4	1982	1980-1984	202					6.49	*CLMP*
7	28	1982	1980-1984	202					6.99	*CLMP*
9	18	1982	1980-1984	202					8.50	*CLMP*
	840821	1984	1980-1984	HUNTERS PT			0.042	17.0		DNR Fisheries, Aitkin
	840821	1984	1980-1984	ISLE BAY			0.038	17.9		DNR Fisheries, Aitkin
	840821	1984	1980-1984	STN 1			0.042	16.6		DNR Fisheries, Aitkin
	850806	1985	1985-1989				0.081	16.8		DNR Fisheries, Aitkin
	860728	1986	1985-1989	BARNACLE BILLS			0.044	9.7		DNR Fisheries, Aitkin
	860728	1986	1985-1989	FISHERS HARBOR			0.035	11.3		DNR Fisheries, Aitkin
	860728	1986	1985-1989	PORT MILLE LACS			0.059	24.5		DNR Fisheries, Aitkin
	860728	1986	1985-1989	STN 1			0.038	12.1		DNR Fisheries, Aitkin
	860728	1986	1985-1989	STN 2			0.023	8.6		DNR Fisheries, Aitkin
	860728	1986	1985-1989	STN 3			0.029	7.4		DNR Fisheries, Aitkin
	870623	1987	1985-1989	BARNACLE BILLS			0.078	22.6		DNR Fisheries, Aitkin
	870825	1987	1985-1989	BARNACLE BILLS			0.059	14.8		DNR Fisheries, Aitkin
	870623	1987	1985-1989	EARLY BIRD			0.072	34.8		DNR Fisheries, Aitkin
	870825	1987	1985-1989	EARLY BIRD			0.059	13.5		DNR Fisheries, Aitkin
	870623	1987	1985-1989	FISHERS NORTH			0.026	8.3		DNR Fisheries, Aitkin
	870825	1987	1985-1989	FISHERS NORTH			0.056	21.5		DNR Fisheries, Aitkin
	870623	1987	1985-1989	GARRISON CREEK			0.041	16.3		DNR Fisheries, Aitkin
	870825	1987	1985-1989	GARRISON CREEK			0.038	12.5		DNR Fisheries, Aitkin
	870623	1987	1985-1989	HAZEL GLADE			0.038	13.7		DNR Fisheries, Aitkin
	870825	1987	1985-1989	HAZEL GLADE			0.029	9.3		DNR Fisheries, Aitkin

Month	Day Date	Year	Year Group	SITE	Cl (ppm)	TN (ppm)	TP (ppm)	CHLA (ppb)	Secchi Rdg (ft)	Source
6	22	1992	1990-1994	ML-6			0.025	3.74	8.00	*Band-CLP*
7	6	1992	1990-1994	ML-6			0.021	3.20	8.99	*Band-CLP*
7	20	1992	1990-1994	ML-6			0.025	3.74	7.51	*Band-CLP*
8	4	1992	1990-1994	ML-6			0.024		6.99	*Band-CLP*
8	17	1992	1990-1994	ML-6			0.019	6.23	6.99	*Band-CLP*
8	31	1992	1990-1994	ML-6			0.031	3.56		*Band-CLP*
9	13	1992	1990-1994	ML-6			0.023	3.20	5.90	*Band-CLP*
10	30	1992	1990-1994	ML-6			0.026	1.60	7.54	*Band-CLP*
7	20	1992	1990-1994	ML-8			0.029	4.27		*Band-CLP*
9	14	1992	1990-1994	ML-8			0.031			*Band-CLP*
10	29	1992	1990-1994	ML-8			0.019	1.60	7.38	*Band-CLP*
7	7	1992	1990-1994	ML-9			0.025			*Band-CLP*
7	23	1992	1990-1994	ML-9			0.031			*Band-CLP*
8	11	1992	1990-1994	ML-9			0.030	3.20		*Band-CLP*
9	16	1992	1990-1994	ML-9			0.046			*Band-CLP*
9	21	1992	1990-1994	ML-9			0.052			*Band-CLP*
10	29	1992	1990-1994	ML-9			0.024	1.07	7.38	*Band-CLP*
	930719	1993	1990-1994	BARNACLE BILLS			0.153	9.4		DNR Fisheries, Aitkin
	930719	1993	1990-1994	FATHER HENNEPIN PARK			0.029	5.8		DNR Fisheries, Aitkin
	930719	1993	1990-1994	NORTH GARRISON			0.026	5.0		DNR Fisheries, Aitkin
	930719	1993	1990-1994	SHA BUSH KUNG			0.021	5.4		DNR Fisheries, Aitkin
	930719	1993	1990-1994	WEALTHWOOD			0.024	5.9		DNR Fisheries, Aitkin
7	1	1993	1990-1994	205					6.99	*CLMP*
7	7	1993	1990-1994	205					6.99	*CLMP*
7	14	1993	1990-1994	205					6.99	*CLMP*
7	21	1993	1990-1994	205					6.99	*CLMP*
7	27	1993	1990-1994	205					6.99	*CLMP*
8	4	1993	1990-1994	205					6.99	*CLMP*
8	11	1993	1990-1994	205					6.99	*CLMP*
8	19	1993	1990-1994	205					6.99	*CLMP*
8	26	1993	1990-1994	205					6.99	*CLMP*
9	1	1993	1990-1994	205					6.99	*CLMP*
9	8	1993	1990-1994	205					6.49	*CLMP*
9	16	1993	1990-1994	205					6.49	*CLMP*
9	22	1993	1990-1994	205					6.49	*CLMP*
6	20	1993	1990-1994	206					10.00	*CLMP*
6	28	1993	1990-1994	206					10.00	*CLMP*
7	10	1993	1990-1994	206					10.00	*CLMP*
7	18	1993	1990-1994	206					12.99	*CLMP*
7	24	1993	1990-1994	206					10.00	*CLMP*
7	31	1993	1990-1994	206					9.51	*CLMP*
8	7	1993	1990-1994	206					10.99	*CLMP*
8	15	1993	1990-1994	206					9.51	*CLMP*
8	21	1993	1990-1994	206					9.51	*CLMP*
8	29	1993	1990-1994	206					8.00	*CLMP*
9	5	1993	1990-1994	206					8.00	*CLMP*
6	20	1993	1990-1994	207					8.99	*CLMP*
7	24	1993	1990-1994	207					9.51	*CLMP*
8	10	1993	1990-1994	207					8.50	*CLMP*
6	20	1993	1990-1994	208					7.51	*CLMP*
6	28	1993	1990-1994	208					6.49	*CLMP*
7	9	1993	1990-1994	208					7.51	*CLMP*
7	14	1993	1990-1994	208					8.00	*CLMP*
7	22	1993	1990-1994	208					7.51	*CLMP*
7	28	1993	1990-1994	208					6.49	*CLMP*
8	5	1993	1990-1994	208					6.49	*CLMP*
8	13	1993	1990-1994	208					5.51	*CLMP*
8	23	1993	1990-1994	208					5.51	*CLMP*
6	18	1993	1990-1994	209					12.00	*CLMP*
6	23	1993	1990-1994	209					12.00	*CLMP*
6	28	1993	1990-1994	209					10.00	*CLMP*
7	8	1993	1990-1994	209					10.00	*CLMP*
7	15	1993	1990-1994	209					10.00	*CLMP*
7	22	1993	1990-1994	209					10.00	*CLMP*
7	30	1993	1990-1994	209					9.51	*CLMP*
8	4	1993	1990-1994	209					9.51	*CLMP*
8	12	1993	1990-1994	209					10.00	*CLMP*
8	23	1993	1990-1994	209					10.00	*CLMP*
9	7	1993	1990-1994	209					9.51	*CLMP*
6	20	1993	1990-1994	210					8.00	*CLMP*
6	28	1993	1990-1994	210					8.99	*CLMP*
7	9	1993	1990-1994	210					8.50	*CLMP*
7	14	1993	1990-1994	210					8.00	*CLMP*
7	22	1993	1990-1994	210					7.51	*CLMP*
7	28	1993	1990-1994	210					6.49	*CLMP*
8	5	1993	1990-1994	210					6.49	*CLMP*
8	13	1993	1990-1994	210					5.51	*CLMP*
8	23	1993	1990-1994	210					5.51	*CLMP*
6	18	1993	1990-1994	211					8.50	*CLMP*
6	21	1993	1990-1994	211					8.50	*CLMP*
6	28	1993	1990-1994	211					8.50	*CLMP*
7	1	1993	1990-1994	211					8.50	*CLMP*
7	5	1993	1990-1994	211					8.50	*CLMP*

Month	Day Date	Year	Year Group	SITE	Cl (ppm)	TN (ppm)	TP (ppm)	CHLA (ppb)	Secchi Rdg (ft)	Source
6	14	2000	2000-2004	ML-6			0.014			*Band*
6	14	2000	2000-2004	ML-6			0.022			*Band*
6	29	2000	2000-2004	ML-6			0.018	2.90		*Band*
6	29	2000	2000-2004	ML-6			0.019			*Band*
6	29	2000	2000-2004	ML-6			0.022			*Band*
7	14	2000	2000-2004	ML-6			0.020	6.43	8.50	*Band*
7	14	2000	2000-2004	ML-6			0.019			*Band*
7	14	2000	2000-2004	ML-6			0.018			*Band*
8	4	2000	2000-2004	ML-6			0.022	4.73	8.50	*Band*
8	4	2000	2000-2004	ML-6			0.016			*Band*
8	4	2000	2000-2004	ML-6			0.012			*Band*
8	22	2000	2000-2004	ML-6			0.021	7.09	7.50	*Band*
8	22	2000	2000-2004	ML-6			0.021			*Band*
8	22	2000	2000-2004	ML-6			0.021			*Band*
9	8	2000	2000-2004	ML-6			0.019	5.45	9.50	*Band*
9	8	2000	2000-2004	ML-6			0.019			*Band*
9	8	2000	2000-2004	ML-6			0.032			*Band*
10	18	2000	2000-2004	ML-6			0.011	2.47	11.50	*Band*
10	18	2000	2000-2004	ML-6			0.014			*Band*
10	18	2000	2000-2004	ML-6			0.014			*Band*
	010716	2001	2000-2004	CEDAR CREEK			0.038	4.3		DNR Fisheries, Aitkin
	010716	2001	2000-2004	IZATYS			0.061	7.1		DNR Fisheries, Aitkin
	010716	2001	2000-2004	NORTH GARRISON			0.048	9.4		DNR Fisheries, Aitkin
	010716	2001	2000-2004	RUM RIVER			0.025	5.6		DNR Fisheries, Aitkin
	010716	2001	2000-2004	SEASTAD CREEK			0.052	7.1		DNR Fisheries, Aitkin
5	27	2001	2000-2004	206					12.99	*CLMP*
6	3	2001	2000-2004	206					12.99	*CLMP*
6	10	2001	2000-2004	206					13.48	*CLMP*
6	17	2001	2000-2004	206					12.50	*CLMP*
6	22	2001	2000-2004	206					12.50	*CLMP*
7	1	2001	2000-2004	206					20.01	*CLMP*
7	7	2001	2000-2004	206					12.50	*CLMP*
7	12	2001	2000-2004	206					16.50	*CLMP*
7	18	2001	2000-2004	206					12.00	*CLMP*
7	26	2001	2000-2004	206					8.99	*CLMP*
8	3	2001	2000-2004	206					10.50	*CLMP*
8	11	2001	2000-2004	206					10.99	*CLMP*
8	17	2001	2000-2004	206					8.99	*CLMP*
8	24	2001	2000-2004	206					8.00	*CLMP*
8	29	2001	2000-2004	206					8.00	*CLMP*
9	15	2001	2000-2004	206					8.50	*CLMP*
5	18	2001	2000-2004	211					9.51	*CLMP*
5	25	2001	2000-2004	211					11.51	*CLMP*
5	31	2001	2000-2004	211					12.50	*CLMP*
6	9	2001	2000-2004	211					16.50	*CLMP*
6	26	2001	2000-2004	211					14.50	*CLMP*
7	13	2001	2000-2004	211					16.01	*CLMP*
8	2	2001	2000-2004	211					11.51	*CLMP*
8	18	2001	2000-2004	211					10.50	*CLMP*
8	31	2001	2000-2004	211					8.99	*CLMP*
9	13	2001	2000-2004	211					8.50	*CLMP*
5	19	2001	2000-2004	213					12.00	*CLMP*
5	27	2001	2000-2004	213					14.50	*CLMP*
7	4	2001	2000-2004	213					14.99	*CLMP*
7	8	2001	2000-2004	213					12.99	*CLMP*
7	28	2001	2000-2004	213					10.99	*CLMP*
8	4	2001	2000-2004	213					13.48	*CLMP*
9	3	2001	2000-2004	213					11.51	*CLMP*
9	22	2001	2000-2004	213					10.99	*CLMP*
6	15	2001	2000-2004	216					12.82	*CLMP*
7	7	2001	2000-2004	216					12.43	*CLMP*
8	12	2001	2000-2004	216					11.91	*CLMP*
9	26	2001	2000-2004	216					11.41	*CLMP*
5	25	2001	2000-2004	ML-1			0.020	1.43		*Band*
6	21	2001	2000-2004	ML-1			0.020	2.99		*Band*
6	28	2001	2000-2004	ML-1			0.015	0.51		*Band*
7	16	2001	2000-2004	ML-1			0.010	1.82		*Band*
8	7	2001	2000-2004	ML-1			0.019	0.80		*Band*
9	21	2001	2000-2004	ML-1			0.022	2.32		*Band*
5	25	2001	2000-2004	ML-20			0.016	2.08		*Band*
6	21	2001	2000-2004	ML-20			0.015	1.02		*Band*
6	28	2001	2000-2004	ML-20			0.014	2.06		*Band*
7	16	2001	2000-2004	ML-20			0.015	4.03		*Band*
8	7	2001	2000-2004	ML-20			0.023	3.59		*Band*
9	21	2001	2000-2004	ML-20			0.021	3.76		*Band*
5	25	2001	2000-2004	ML-24			0.021	1.31		*Band*
5	25	2001	2000-2004	ML-24			0.014			*Band*
5	25	2001	2000-2004	ML-24			0.015			*Band*
6	21	2001	2000-2004	ML-24			0.013	1.63	13.00	*Band*
6	21	2001	2000-2004	ML-24			0.019			*Band*
6	21	2001	2000-2004	ML-24			0.021			*Band*
6	28	2001	2000-2004	ML-24			0.012	1.65	13.50	*Band*
6	28	2001	2000-2004	ML-24			0.019			*Band*

Table 8: 1970-2008 Mille Lacs Lake Water Quality Data

Table Notes:

Cl	Chloride (ppm)
TN	Total Nitrogen (ppm)
TP	Total Phosphorus (ppb)
CHLA	Chlorophyll a (ppb)
SD M	Seechi Disc (feet)

Band - Mille Lacs Band of the Ojibwe, various programs and dates.
secchi depth data collected in the 1990's
Mille Lacs Lake Watershed Management Project (2000)
Surface Water Quality Monitoring for Long Term Trend Analysis (2005-2006)
Band-CLP - Mille Lacs Environmental Program, Mille Lacs Band of Ojibwe. Includes Clean Lakes Project (CLP) data (1992)
CLMP - Citizen Lake Monitoring Program, various dates (1974-2006).
MPCA - MPCA Lake Monitoring Program Project (1981).

Month	Day Date	Year	Year Group	SITE	Cl (ppm)	TN (ppm)	TP (ppm)	CHLA (ppb)	Secchi Rdg (ft)	Source
	870623	1987	1985-1989	IZATYS			0.041	5.5		DNR Fisheries, Aitkin
	870825	1987	1985-1989	IZATYS			0.047	14.0		DNR Fisheries, Aitkin
	870623	1987	1985-1989	LEEWARD			0.020	4.9		DNR Fisheries, Aitkin
	870825	1987	1985-1989	LEEWARD			0.032	11.1		DNR Fisheries, Aitkin
	870623	1987	1985-1989	MILLE LACS ISLAND			0.154	25.8		DNR Fisheries, Aitkin
	870825	1987	1985-1989	MILLE LACS ISLAND			0.075	8.5		DNR Fisheries, Aitkin
	870623	1987	1985-1989	PORT MILLE LACS			0.026	7.0		DNR Fisheries, Aitkin
	870825	1987	1985-1989	PORT MILLE LACS			0.056	20.0		DNR Fisheries, Aitkin
	870623	1987	1985-1989	WINDWARD			0.059	12.4		DNR Fisheries, Aitkin
	870825	1987	1985-1989	WINDWARD			0.081	18.0		DNR Fisheries, Aitkin
	880718	1988	1985-1989	LEEWARD			0.046	22.3		DNR Fisheries, Aitkin
	880718	1988	1985-1989	NORTH			0.046	17.9		DNR Fisheries, Aitkin
	880718	1988	1985-1989	WINDWARD			0.021	12.7		DNR Fisheries, Aitkin
6	7	1988	1985-1989	204					8.76	*CLMP*
6	14	1988	1985-1989	204					8.00	*CLMP*
6	21	1988	1985-1989	204					7.74	*CLMP*
6	28	1988	1985-1989	204					6.99	*CLMP*
7	4	1988	1985-1989	204					6.49	*CLMP*
7	12	1988	1985-1989	204					6.00	*CLMP*
7	18	1988	1985-1989	204					6.00	*CLMP*
7	22	1988	1985-1989	204					5.51	*CLMP*
	890717	1989	1985-1989	CARLSON BEACH			0.028	9.4		DNR Fisheries, Aitkin
	890717	1989	1985-1989	FATHER HENNEPIN PARK			0.014	6.2		DNR Fisheries, Aitkin
	890717	1989	1985-1989	HUNTERS PT			0.027	8.5		DNR Fisheries, Aitkin
6	21	1989	1985-1989	204					8.50	*CLMP*
6	28	1989	1985-1989	204					8.50	*CLMP*
7	6	1989	1985-1989	204					8.00	*CLMP*
7	12	1989	1985-1989	204					8.00	*CLMP*
7	20	1989	1985-1989	204					8.00	*CLMP*
7	25	1989	1985-1989	204					7.51	*CLMP*
8	3	1989	1985-1989	204					6.99	*CLMP*
8	10	1989	1985-1989	204					6.49	*CLMP*
8	15	1989	1985-1989	204					6.49	*CLMP*
8	24	1989	1985-1989	204					6.49	*CLMP*
8	29	1989	1985-1989	204					6.00	*CLMP*
9	6	1989	1985-1989	204					6.00	*CLMP*
	900716	1990	1990-1994	CEDAR CREEK			0.018	3.6		DNR Fisheries, Aitkin
	900716	1990	1990-1994	COZY COVE			0.034	37.2		DNR Fisheries, Aitkin
	900716	1990	1990-1994	WEALTHWOOD			0.082	31.1		DNR Fisheries, Aitkin
7	2	1990	1990-1994	204					6.99	*CLMP*
7	9	1990	1990-1994	204					6.99	*CLMP*
7	17	1990	1990-1994	204					6.49	*CLMP*
7	23	1990	1990-1994	204					6.49	*CLMP*
8	1	1990	1990-1994	204					6.49	*CLMP*
8	7	1990	1990-1994	204					6.00	*CLMP*
8	16	1990	1990-1994	204					6.00	*CLMP*
8	21	1990	1990-1994	204					6.00	*CLMP*
8	29	1990	1990-1994	204					5.51	*CLMP*
9	4	1990	1990-1994	204					4.99	*CLMP*
9	10	1990	1990-1994	204					4.99	*CLMP*
	910722	1991	1990-1994	CEDAR CREEK			0.047	11.0		DNR Fisheries, Aitkin
	910722	1991	1990-1994	COZY COVE			0.026	16.0		DNR Fisheries, Aitkin
	910722	1991	1990-1994	NORTH GARRISON			0.005	5.3		DNR Fisheries, Aitkin
	910722	1991	1990-1994	SEASTAD CREEK			0.034	12.0		DNR Fisheries, Aitkin
	910722	1991	1990-1994	WEALTHWOOD			0.018	13.0		DNR Fisheries, Aitkin
7	9	1991	1990-1994	ML-1					8.53	*Band*
7	22	1991	1990-1994	ML-1					6.56	*Band*
8	5	1991	1990-1994	ML-1					6.56	*Band*
8	19	1991	1990-1994	ML-1					6.89	*Band*
9	2	1991	1990-1994	ML-1					6.89	*Band*
10	1	1991	1990-1994	ML-1					6.89	*Band*
10	22	1991	1990-1994	ML-1					8.86	*Band*
6	12	1991	1990-1994	ML-11					11.48	*Band*
6	24	1991	1990-1994	ML-11					10.17	*Band*
7	8	1991	1990-1994	ML-11					7.87	*Band*
7	21	1991	1990-1994	ML-38					7.54	*Band*
8	5	1991	1990-1994	ML-38					6.89	*Band*
8	19	1991	1990-1994	ML-38					5.90	*Band*
9	2	1991	1990-1994	ML-38					6.89	*Band*
9	29	1991	1990-1994	ML-38					7.87	*Band*
8	19	1991	1990-1994	ML-42					6.89	*Band*
9	2	1991	1990-1994	ML-42					6.89	*Band*
9	16	1991	1990-1994	ML-42					6.56	*Band*
7	8	1991	1990-1994	ML-43					5.90	*Band*
8	19	1991	1990-1994	ML-43					5.90	*Band*
9	2	1991	1990-1994	ML-43					6.56	*Band*
8	19	1991	1990-1994	ML-44					4.92	*Band*
9	2	1991	1990-1994	ML-44					6.56	*Band*
9	16	1991	1990-1994	ML-44					6.89	*Band*
6	24	1991	1990-1994	ML-47					8.86	*Band*
7	22	1991	1990-1994	ML-47					6.89	*Band*
8	5	1991	1990-1994	ML-47					6.89	*Band*
8	19	1991	1990-1994	ML-47					5.90	*Band*
9	2	1991	1990-1994	ML-47					6.89	*Band*
7	12	1993	1990-1994	211					8.50	*CLMP*
7	19	1993	1990-1994	211					8.00	*CLMP*
7	26	1993	1990-1994	211					8.00	*CLMP*
7	29	1993	1990-1994	211					8.50	*CLMP*
8	3	1993	1990-1994	211					7.51	*CLMP*
8	10	1993	1990-1994	211					12.00	*CLMP*
8	14	1993	1990-1994	211					8.50	*CLMP*
8	17	1993	1990-1994	211					8.50	*CLMP*
8	21	1993	1990-1994	211					8.50	*CLMP*
8	24	1993	1990-1994	211					8.50	*CLMP*
8	28	1993	1990-1994	211					8.50	*CLMP*
8	31	1993	1990-1994	211					8.50	*CLMP*
6	2	1993	1990-1994	ML-1					11.48	*Band*
7	7	1993	1990-1994	ML-1					7.64	*Band*
7	7	1993	1990-1994	ML-12					8.20	*Band*
5	3	1993	1990-1994	ML-14					12.30	*Band*
6	2	1993	1990-1994	ML-14					10.66	*Band*
7	7	1993	1990-1994	ML-14					8.20	*Band*
5	3	1993	1990-1994	ML-15					12.30	*Band*
6	2	1993	1990-1994	ML-15					12.30	*Band*
7	7	1993	1990-1994	ML-15					8.20	*Band*
7	7	1993	1990-1994	ML-17					8.20	*Band*
5	3	1993	1990-1994	ML-18					11.48	*Band*
6	2	1993	1990-1994	ML-18					12.30	*Band*
7	7	1993	1990-1994	ML-18					8.20	*Band*
5	3	1993	1990-1994	ML-20					11.48	*Band*
6	2	1993	1990-1994	ML-20					12.30	*Band*
7	7	1993	1990-1994	ML-20					8.20	*Band*
5	3	1993	1990-1994	ML-24					11.48	*Band*
6	2	1993	1990-1994	ML-24					12.30	*Band*
7	7	1993	1990-1994	ML-24					8.20	*Band*
7	7	1993	1990-1994	ML-38					7.64	*Band*
6	2	1993	1990-1994	ML-5					12.30	*Band*
7	7	1993	1990-1994	ML-5					9.84	*Band*
5	3	1993	1990-1994	ML-52					13.12	*Band*
6	2	1993	1990-1994	ML-52					12.30	*Band*
7	7	1993	1990-1994	ML-52					9.84	*Band*
5	3	1993	1990-1994	ML-53					14.10	*Band*
6	2	1993	1990-1994	ML-53					12.30	*Band*
7	7	1993	1990-1994	ML-53					9.02	*Band*
5	3	1993	1990-1994	ML-6					15.09	*Band*
6	2	1993	1990-1994	ML-6					11.48	*Band*
7	7	1993	1990-1994	ML-6					9.84	*Band*
7	6	1993	1990-1994	ML-6					8.20	*Band*
	940801	1994	1990-1994	FATHER HENNEPIN PARK			0.024	5.3		DNR Fisheries, Aitkin
	940801	1994	1990-1994	NORTH GARRISON			0.031	7.2		DNR Fisheries, Aitkin
	940801	1994	1990-1994	SEASTAD CREEK			0.051	6.9		DNR Fisheries, Aitkin
	940801	1994	1990-1994	SHA BUSH KUNG			0.053	20.0		DNR Fisheries, Aitkin
	940801	1994	1990-1994	WEALTHWOOD			0.060	4.6		DNR Fisheries, Aitkin
6	18	1994	1990-1994	205					6.49	*CLMP*
6	25	1994	1990-1994	205					6.99	*CLMP*
7	4	1994	1990-1994	205					6.00	*CLMP*
7	16	1994	1990-1994	205					5.51	*CLMP*
7	25	1994	1990-1994	205					6.00	*CLMP*
8	6	1994	1990-1994	205					6.00	*CLMP*
8	15	1994	1990-1994	205					6.00	*CLMP*
8	26	1994	1990-1994	205					6.00	*CLMP*
9	10	1994	1990-1994	205					6.00	*CLMP*
9	17	1994	1990-1994	205					6.49	*CLMP*
10	6	1994	1990-1994	205					6.49	*CLMP*
5	20	1994	1990-1994	206					12.50	*CLMP*
5	29	1994	1990-1994	206					14.50	*CLMP*
6	5	1994	1990-1994	206					10.99	*CLMP*
6	13	1994	1990-1994	206					10.00	*CLMP*
6	19	1994	1990-1994	206					8.50	*CLMP*
7	2	1994	1990-1994	206					9.51	*CLMP*
7	13	1994	1990-1994	206					8.50	*CLMP*
7	18	1994	1990-1994	206					8.00	*CLMP*
7	28	1994	1990-1994	206					6.99	*CLMP*
8	5	1994	1990-1994	206					7.51	*CLMP*
8	11	1994	1990-1994	206					8.50	*CLMP*
8	16	1994	1990-1994	206					6.49	*CLMP*
8	24	1994	1990-1994	206					6.49	*CLMP*
9	4	1994	1990-1994	206					6.99	*CLMP*
7	10	1994	1990-1994	207					10.00	*CLMP*
	950717	1995	1995-1999	COZY COVE			0.007			DNR Fisheries, Aitkin
	950717	1995	1995-1999	FATHER HENNEPIN PARK			0.010			DNR Fisheries, Aitkin
	950717	1995	1995-1999	IZATYS			0.022			DNR Fisheries, Aitkin
	950717	1995	1995-1999	NORTH GARRISON			0.009			DNR Fisheries, Aitkin
	950717	1995	1995-1999	SEASTAD CREEK			0.057			DNR Fisheries, Aitkin
6	20	1995	1995-1999	205					8.99	*CLMP*
6	27	1995	1995-1999	205					8.99	*CLMP*
7	7	1995	1995-1999	205					8.99	*CLMP*
7	16	1995	1995-1999	205					8.50	*CLMP*
7	27	2001	2000-2004	ML-24					9.84	*Band*
7	16	2001	2000-2004	ML-24					8.00	*CLMP*
7	16	2001	2000-2004	ML-24					8.00	*CLMP*
7	16	2001	2000-2004	ML-24					8.50	*CLMP*
8	7	2001	2000-2004	ML-24					7.51	*CLMP*
8	7	2001	2000-2004	ML-24					12.00	*CLMP*
8	7	2001	2000-2004	ML-24					8.50	*CLMP*
8	7	2001	2000-2004	ML-24					8.50	*CLMP*
9	21	2001	2000-2004	ML-24					8.50	*CLMP*
9	21	2001	2000-2004	ML-24					8.50	*CLMP*
9	21	2001	2000-2004	ML-24					8.50	*CLMP*
5	25	2001	2000-2004	ML-6					8.50	*CLMP*
5	25	2001	2000-2004	ML-6					8.50	*CLMP*
5	25	2001	2000-2004	ML-6					11.48	*Band*
6	21	2001	2000-2004	ML-6					7.64	*Band*
6	21	2001	2000-2004	ML-6					8.20	*Band*
6	21	2001	2000-2004	ML-6					12.30	*Band*
6	28	2001	2000-2004	ML-6					10.66	*Band*
6	28	2001	2000-2004	ML-6					8.20	*Band*
6	28	2001	2000-2004	ML-6					12.30	*Band*
7	16	2001	2000-2004	ML-6					12.30	*Band*
7	16	2001	2000-2004	ML-6					8.20	*Band*
7	16	2001	2000-2004	ML-6					8.20	*Band*
8	7	2001	2000-2004	ML-6					11.48	*Band*
8	7	2001	2000-2004	ML-6					12.30	*Band*
8	7	2001	2000-2004	ML-6					8.20	*Band*
9	21	2001	2000-2004	ML-6					11.48	*Band*
9	21	2001	2000-2004	ML-6					12.30	*Band*
9	21	2001	2000-2004	ML-6					8.20	*Band*
	020716	2002	2000-2004	CEDAR CREEK					4.7	DNR Fisheries, Aitkin
	020716	2002	2000-2004	IZATYS					33.9	DNR Fisheries, Aitkin
	020716	2002	2000-2004	NORTH GARRISON					8.6	DNR Fisheries, Aitkin
	020716	2002	2000-2004	RUM RIVER					5.2	DNR Fisheries, Aitkin
	020716	2002	2000-2004	SEASTAD CREEK					5.7	DNR Fisheries, Aitkin
6	14	2002	2000-2004	206					10.99	*CLMP*
6	22	2002	2000-2004	206					10.99	*CLMP*
6	29	2002	2000-2004	206					14.01	*CLMP*
7	4	2002	2000-2004	206					13.48	*CLMP*
7	13	2002	2000-2004	206					11.51	*CLMP*
7	19	2002	2000-2004	206					9.51	*CLMP*
7	27	2002	2000-2004	206					8.99	*CLMP*
8	6	2002	2000-2004	206					7.51	*CLMP*
8	11	2002	2000-2004	206					8.00	*CLMP*
8	31	2002	2000-2004	206					6.99	*CLMP*
9	8	2002	2000-2004	206					6.49	*CLMP*
9	21	2002	2000-2004	206					7.51	*CLMP*
7	30	2002	2000-2004	209					11.51	*CLMP*
8	8	2002	2000-2004	209					7.51	*CLMP*
8	19	2002	2000-2004	209					8.50	*CLMP*
8	23	2002	2000-2004	209					8.50	*CLMP*
8	28	2002	2000-2004	209					6.49	*CLMP*
5	14	2002	2000-2004	211					9.51	*CLMP*
5	29	2002	2000-2004	211					14.50	*CLMP*
6	19	2002	2000-2004	211					14.01	*CLMP*
7	4	2002	2000-2004	211					14.99	*CLMP*
7	9	2002	2000-2004	211					10.00	*CLMP*
7	18	2002	2000-2004	211					8.99	*CLMP*
8	5	2002	2000-2004	211					8.99	*CLMP*
8	24	2002	2000-2004	211					8.50	*CLMP*
5	18	2002	2000-2004	213					12.00	*CLMP*
5	25	2002	2000-2004	213					13.48	*CLMP*
5	26	2002	2000-2004	213					14.01	*CLMP*
5	27	2002	2000-2004	213					14.01	*CLMP*
6	3	2002	2000-2004	213					13.48	*CLMP*
6	23	2002	2000-2004	213					12.50	*CLMP*
7	7	2002	2000-2004	213					10.50	*CLMP*
7	9	2002	2000-2004	213					12.00	*CLMP*
8	3	2002	2000-2004	213					9.51	*CLMP*
8	18	2002	2000-2004	213					8.50	*CLMP*
9	2	2002	2000-2004	213					6.99	*CLMP*
9	14	2002	2000-2004	213					9.51	*CLMP*
8	24	2002	2000-2004	217					6.99	*CLMP*
9	1	2002	2000-2004	217					5.51	*CLMP*
9	7	2002	2000-2004	217					6.49	*CLMP*
9	15	2002	2000-2004	217					8.00	*CLMP*
	030728	2003	2000-2004	CEDAR CREEK			0.010	5.7		DNR Fisheries, Aitkin
	030728	2003	2000-2004	IZATYS			0.028	11.4		DNR Fisheries, Aitkin
	030728	2003	2000-2004	NORTH GARRISON			0.010	4.6		DNR Fisheries, Aitkin
	030728	2003	2000-2004	RUM RIVER			0.010	5.2		DNR Fisheries, Aitkin
	030728	2003	2000-2004	SEASTAD CREEK			0.025	7.9		DNR Fisheries, Aitkin
5	29	2003	2000-2004	209					11.51	*CLMP*
6	11	2003	2000-2004	209					10.50	*CLMP*
6	16	2003	2000-2004	209					15.48	*CLMP*
6	18	2003	2000-2004	209					15.48	*CLMP*
6	19	2003	2000-2004	209					12.50	*CLMP*

Table 8: 1970-2008 Mille Lacs Lake Water Quality Data

Table Notes:

Cl	Chloride (ppm)
TN	Total Nitrogen (ppm)
TP	Total Phosphorus (ppb)
CHLA	Chlorophyll a (ppb)
SD M	Seechi Disc (feet)

Band - Mille Lacs Band of the Ojibwe, various programs and dates.
secchi depth data collected in the 1990's
Mille Lacs Lake Watershed Management Project (2000)
Surface Water Quality Monitoring for Long Term Trend Analysis (2005-2006)
Band-CLP - Mille Lacs Environmental Program, Mille Lacs Band of Ojibwe. Includes Clean Lakes Project (CLP) data (1992)
CLMP - Citizen Lake Monitoring Program, various dates (1974-2006).
MPCA - MPCA Lake Monitoring Program Project (1981).

Month	Day Date	Year	Year Group	SITE	Cl (ppm)	TN (ppm)	TP (ppm)	CHLA (ppb)	Secchi Rdg (ft)	Source
9	15	1991	1990-1994	ML-47					7.87	*Band*
9	29	1991	1990-1994	ML-47					6.89	*Band*
5	28	1991	1990-1994	ML-48					11.15	*Band*
6	24	1991	1990-1994	ML-48					7.87	*Band*
7	22	1991	1990-1994	ML-48					6.89	*Band*
8	5	1991	1990-1994	ML-48					6.89	*Band*
8	19	1991	1990-1994	ML-48					5.90	*Band*
9	2	1991	1990-1994	ML-48					6.89	*Band*
9	15	1991	1990-1994	ML-48					7.87	*Band*
9	29	1991	1990-1994	ML-48					6.89	*Band*
5	28	1991	1990-1994	ML-49					11.15	*Band*
6	24	1991	1990-1994	ML-49					7.87	*Band*
7	22	1991	1990-1994	ML-49					6.89	*Band*
8	5	1991	1990-1994	ML-49					6.89	*Band*
8	19	1991	1990-1994	ML-49					5.90	*Band*
9	2	1991	1990-1994	ML-49					6.89	*Band*
9	15	1991	1990-1994	ML-49					7.87	*Band*
9	29	1991	1990-1994	ML-49					7.87	*Band*
5	29	1991	1990-1994	ML-5					13.12	*Band*
6	10	1991	1990-1994	ML-5					10.17	*Band*
6	24	1991	1990-1994	ML-5					10.17	*Band*
7	9	1991	1990-1994	ML-5					11.15	*Band*
7	22	1991	1990-1994	ML-5					8.86	*Band*
8	5	1991	1990-1994	ML-5					7.54	*Band*
8	19	1991	1990-1994	ML-5					6.89	*Band*
9	2	1991	1990-1994	ML-5					6.89	*Band*
9	15	1991	1990-1994	ML-5					10.50	*Band*
10	22	1991	1990-1994	ML-5					7.54	*Band*
5	28	1991	1990-1994	ML-52					13.12	*Band*
6	10	1991	1990-1994	ML-52					13.12	*Band*
6	24	1991	1990-1994	ML-52					11.48	*Band*
7	8	1991	1990-1994	ML-52					9.51	*Band*
7	21	1991	1990-1994	ML-52					8.86	*Band*
8	5	1991	1990-1994	ML-52					7.87	*Band*
8	19	1991	1990-1994	ML-52					6.56	*Band*
9	2	1991	1990-1994	ML-52					6.89	*Band*
9	16	1991	1990-1994	ML-52					7.87	*Band*
9	29	1991	1990-1994	ML-52					8.53	*Band*
10	22	1991	1990-1994	ML-52					7.54	*Band*
5	28	1991	1990-1994	ML-53					14.10	*Band*
6	10	1991	1990-1994	ML-53					12.46	*Band*
6	24	1991	1990-1994	ML-53					11.48	*Band*
7	8	1991	1990-1994	ML-53					10.50	*Band*
7	21	1991	1990-1994	ML-53					10.17	*Band*
8	5	1991	1990-1994	ML-53					8.53	*Band*
8	19	1991	1990-1994	ML-53					8.53	*Band*
9	2	1991	1990-1994	ML-53					7.87	*Band*
9	16	1991	1990-1994	ML-53					8.86	*Band*
9	29	1991	1990-1994	ML-53					8.86	*Band*
10	22	1991	1990-1994	ML-53					8.53	*Band*
5	31	1991	1990-1994	ML-6					12.14	*Band*
6	10	1991	1990-1994	ML-6					7.87	*Band*
6	24	1991	1990-1994	ML-6					10.17	*Band*
7	9	1991	1990-1994	ML-6					11.15	*Band*
7	22	1991	1990-1994	ML-6					9.51	*Band*
8	5	1991	1990-1994	ML-6					7.87	*Band*
8	19	1991	1990-1994	ML-6					6.89	*Band*
9	2	1991	1990-1994	ML-6					7.87	*Band*
9	15	1991	1990-1994	ML-6					10.17	*Band*
10	1	1991	1990-1994	ML-6					7.87	*Band*
10	22	1991	1990-1994	ML-6					7.87	*Band*
6	24	1991	1990-1994	ML-8					10.17	*Band*
	920721	1992	1990-1994	BARNACLE BILLS			0.026	9.5		DNR Fisheries, Aitkin
	920721	1992	1990-1994	FATHER HENNEPIN PARK			0.036	7.8		DNR Fisheries, Aitkin
	920721	1992	1990-1994	NORTH GARRISON			0.037	6.9		DNR Fisheries, Aitkin
	920721	1992	1990-1994	ORRS			0.048	10.9		DNR Fisheries, Aitkin
	920721	1992	1990-1994	SHA BUSH KUNG			0.033	7.7		DNR Fisheries, Aitkin
5	6	1992	1990-1994	ML-1			0.028	1.60	10.66	*Band-CLP*
5	27	1992	1990-1994	ML-1			0.023	1.60	8.20	*Band-CLP*
6	22	1992	1990-1994	ML-1			0.038	5.34	6.99	*Band-CLP*
7	6	1992	1990-1994	ML-1			0.020	2.67	8.99	*Band-CLP*
7	20	1992	1990-1994	ML-1			0.023	2.14	8.00	*Band-CLP*
8	4	1992	1990-1994	ML-1			0.024		6.99	*Band-CLP*
8	17	1992	1990-1994	ML-1			0.022	8.01	6.00	*Band-CLP*
8	28	1992	1990-1994	ML-1					4.49	*Band-CLP*
8	31	1992	1990-1994	ML-1			0.027	2.67		*Band-CLP*
9	13	1992	1990-1994	ML-1			0.015	6.41	5.58	*Band-CLP*
10	30	1992	1990-1994	ML-1			0.022	2.14	7.54	*Band-CLP*
7	7	1992	1990-1994	ML-10			0.026			*Band-CLP*
7	23	1992	1990-1994	ML-10			0.024			*Band-CLP*
8	11	1992	1990-1994	ML-10			0.027	4.27		*Band-CLP*
9	16	1992	1990-1994	ML-10			0.050			*Band-CLP*
9	21	1992	1990-1994	ML-10			0.074			*Band-CLP*
10	29	1992	1990-1994	ML-10			0.028	1.07	7.38	*Band-CLP*
7	20	1995	1995-1999	205					8.99	*CLMP*
7	29	1995	1995-1999	205					8.99	*CLMP*
8	5	1995	1995-1999	205					8.50	*CLMP*
8	15	1995	1995-1999	205					8.99	*CLMP*
8	22	1995	1995-1999	205					8.00	*CLMP*
9	3	1995	1995-1999	205					8.00	*CLMP*
9	12	1995	1995-1999	205					6.99	*CLMP*
9	18	1995	1995-1999	205					6.99	*CLMP*
9	26	1995	1995-1999	205					8.50	*CLMP*
5	11	1995	1995-1999	206					12.50	*CLMP*
5	21	1995	1995-1999	206					12.00	*CLMP*
5	26	1995	1995-1999	206					12.50	*CLMP*
6	2	1995	1995-1999	206					12.50	*CLMP*
6	11	1995	1995-1999	206					10.50	*CLMP*
6	20	1995	1995-1999	206					16.01	*CLMP*
7	2	1995	1995-1999	206					14.01	*CLMP*
7	9	1995	1995-1999	206					12.00	*CLMP*
7	16	1995	1995-1999	206					14.99	*CLMP*
7	23	1995	1995-1999	206					14.50	*CLMP*
8	1	1995	1995-1999	206					12.99	*CLMP*
8	6	1995	1995-1999	206					12.00	*CLMP*
8	17	1995	1995-1999	206					12.50	*CLMP*
8	25	1995	1995-1999	206					10.00	*CLMP*
9	2	1995	1995-1999	206					10.00	*CLMP*
	960716	1996	1995-1999	COZY COVE			0.055	4.1		DNR Fisheries, Aitkin
	960716	1996	1995-1999	FATHER HENNEPIN PARK			0.069	3.7		DNR Fisheries, Aitkin
	960716	1996	1995-1999	IZATYS			0.067	9.3		DNR Fisheries, Aitkin
	960716	1996	1995-1999	NORTH GARRISON			0.054	4.1		DNR Fisheries, Aitkin
	960716	1996	1995-1999	SEASTAD CREEK			0.083	4.4		DNR Fisheries, Aitkin
6	14	1996	1995-1999	205					8.99	*CLMP*
6	21	1996	1995-1999	205					8.99	*CLMP*
7	1	1996	1995-1999	205					10.00	*CLMP*
7	4	1996	1995-1999	205					11.51	*CLMP*
7	14	1996	1995-1999	205					10.99	*CLMP*
7	28	1996	1995-1999	205					8.99	*CLMP*
8	9	1996	1995-1999	205					8.99	*CLMP*
8	15	1996	1995-1999	205					8.99	*CLMP*
8	22	1996	1995-1999	205					7.51	*CLMP*
9	3	1996	1995-1999	205					8.50	*CLMP*
9	15	1996	1995-1999	205					8.50	*CLMP*
5	7	1996	1995-1999	206					12.50	*CLMP*
5	22	1996	1995-1999	206					12.50	*CLMP*
5	29	1996	1995-1999	206					12.00	*CLMP*
6	4	1996	1995-1999	206					13.48	*CLMP*
6	14	1996	1995-1999	206					17.48	*CLMP*
6	28	1996	1995-1999	206					18.01	*CLMP*
7	3	1996	1995-1999	206					16.99	*CLMP*
7	10	1996	1995-1999	206					15.48	*CLMP*
7	16	1996	1995-1999	206					15.48	*CLMP*
7	25	1996	1995-1999	206					12.50	*CLMP*
8	3	1996	1995-1999	206					11.51	*CLMP*
8	10	1996	1995-1999	206					10.99	*CLMP*
8	17	1996	1995-1999	206					12.99	*CLMP*
	970714	1997	1995-1999	CEDAR CREEK			0.005	7.9		DNR Fisheries, Aitkin
	970714	1997	1995-1999	IZATYS			0.067	14.5		DNR Fisheries, Aitkin
	970714	1997	1995-1999	NORTH GARRISON			0.048	9.9		DNR Fisheries, Aitkin
	970714	1997	1995-1999	RUM RIVER			0.005	6.7		DNR Fisheries, Aitkin
	970714	1997	1995-1999	SEASTAD CREEK			0.022	8.0		DNR Fisheries, Aitkin
6	2	1997	1995-1999	205					10.99	*CLMP*
6	12	1997	1995-1999	205					10.99	*CLMP*
6	25	1997	1995-1999	205					10.99	*CLMP*
6	30	1997	1995-1999	205					10.50	*CLMP*
7	4	1997	1995-1999	205					10.00	*CLMP*
7	20	1997	1995-1999	205					10.00	*CLMP*
8	2	1997	1995-1999	205					9.51	*CLMP*
8	11	1997	1995-1999	205					9.51	*CLMP*
8	27	1997	1995-1999	205					10.00	*CLMP*
9	9	1997	1995-1999	205					10.00	*CLMP*
5	31	1997	1995-1999	206					14.99	*CLMP*
6	6	1997	1995-1999	206					16.01	*CLMP*
6	14	1997	1995-1999	206					16.50	*CLMP*
6	26	1997	1995-1999	206					17.48	*CLMP*
6	30	1997	1995-1999	206					17.48	*CLMP*
7	7	1997	1995-1999	206					14.99	*CLMP*
7	13	1997	1995-1999	206					15.48	*CLMP*
7	19	1997	1995-1999	206					10.99	*CLMP*
8	1	1997	1995-1999	206					12.99	*CLMP*
8	6	1997	1995-1999	206					11.51	*CLMP*
8	11	1997	1995-1999	206					12.00	*CLMP*
8	22	1997	1995-1999	206					11.51	*CLMP*
8	26	1997	1995-1999	206					10.00	*CLMP*
6	12	1997	1995-1999	210					20.99	*CLMP*
7	4	1997	1995-1999	210					18.01	*CLMP*
8	21	1997	1995-1999	210					12.50	*CLMP*
6	30	2003	2000-2004	209					12.50	*CLMP*
7	1	2003	2000-2004	209					11.51	*CLMP*
7	5	2003	2000-2004	209					11.51	*CLMP*
8	5	2003	2000-2004	209					7.51	*CLMP*
8	12	2003	2000-2004	209					8.99	*CLMP*
10	7	2003	2000-2004	209					12.00	*CLMP*
5	24	2003	2000-2004	213					12.99	*CLMP*
5	25	2003	2000-2004	213					12.99	*CLMP*
6	22	2003	2000-2004	213					14.01	*CLMP*
7	5	2003	2000-2004	213					14.50	*CLMP*
7	26	2003	2000-2004	213					11.51	*CLMP*
7	29	2003	2000-2004	213					12.00	*CLMP*
8	2	2003	2000-2004	213					10.00	*CLMP*
9	7	2003	2000-2004	213					10.00	*CLMP*
	040719	2004	2000-2004	CEDAR CREEK ACCESS				0.010	7.2		DNR Fisheries, Aitkin
	040719	2004	2000-2004	IZATYS				0.164			DNR Fisheries, Aitkin
	040719	2004	2000-2004	NORTH GARRISON ACCESS				0.023	12.2		DNR Fisheries, Aitkin
	040719	2004	2000-2004	RUM RIVER OUTLET				0.016	6.2		DNR Fisheries, Aitkin
	040719	2004	2000-2004	SEASTAD CREEK				0.027	7.1		DNR Fisheries, Aitkin
6	4	2004	2000-2004	209					14.50	*CLMP*
6	8	2004	2000-2004	209					11.51	*CLMP*
6	26	2004	2000-2004	209					12.50	*CLMP*
7	1	2004	2000-2004	209					14.99	*CLMP*
7	18	2004	2000-2004	209					12.00	*CLMP*
7	27	2004	2000-2004	209					10.50	*CLMP*
5	22	2004	2000-2004	213					14.99	*CLMP*
5	29	2004	2000-2004	213					16.50	*CLMP*
6	19	2004	2000-2004	213					12.00	*CLMP*
7	11	2004	2000-2004	213					10.99	*CLMP*
7	31	2004	2000-2004	213					12.99	*CLMP*
9	25	2004	2000-2004	213					8.50	*CLMP*
	050718	2005	2005-2008	CEDAR CREEK				0.052	13.8		DNR Fisheries, Aitkin
	050718	2005	2005-2008	IZATYS				0.070	25.5		DNR Fisheries, Aitkin
	050718	2005	2005-2008	NORTH GARRISON				0.048	23.3		DNR Fisheries, Aitkin
	050718	2005	2005-2008	RUM RIVER				0.039	14.5		DNR Fisheries, Aitkin
	050718	2005	2005-2008	SEASTAD CREEK				0.084	11.6		DNR Fisheries, Aitkin
6	12	2005	2005-2008	209					12.99	*CLMP*
6	17	2005	2005-2008	209					12.00	*CLMP*
9	14	2005	2005-2008	209					10.99	*CLMP*
6	4	2005	2005-2008	213					13.48	*CLMP*
6	18	2005	2005-2008	213					14.01	*CLMP*
6	25	2005	2005-2008	213					16.99	*CLMP*
7	3	2005	2005-2008	213					16.01	*CLMP*
7	4	2005	2005-2008	213					14.99	*CLMP*
7	9	2005	2005-2008	213					10.00	*CLMP*
8	1	2005	2005-2008	213					8.50	*CLMP*
9	3	2005	2005-2008	213					8.00	*CLMP*
9	24	2005	2005-2008	213					8.99	*CLMP*
6	28	2005	2005-2008	ML-1				0.015	2.14	13.60	*Band*
9	27	2005	2005-2008	ML-1				0.022	4.27	12.90	*Band*
6	28	2005	2005-2008	ML-20				0.016	2.20	10.50	*Band*
9	27	2005	2005-2008	ML-20				0.021	3.47	16.00	*Band*
6	28	2005	2005-2008	ML-24				0.016	1.87	17.99	*Band*
9	27	2005	2005-2008	ML-24				0.023	3.00	15.50	*Band*
6	28	2005	2005-2008	ML-6				0.016	1.20	17.49	*Band*
9	27	2005	2005-2008	ML-6				0.030	2.80	16.49	*Band*
6	28	2005	2005-2008	ML-CE				0.014	1.20	17.99	*Band*
9	27	2005	2005-2008	ML-CE				0.019	2.74	15.00	*Band*
6	28	2005	2005-2008	ML-DITCH 36				0.023	1.54	6.50	*Band*
9	27	2005	2005-2008	ML-DITCH 36				0.023	4.27	5.70	*Band*
6	28	2005	2005-2008	ML-GARRISON				0.019	1.87	7.80	*Band*
9	27	2005	2005-2008	ML-GARRISON				0.022	3.87	6.10	*Band*
6	28	2005	2005-2008	ML-MALONE				0.020	1.60	11.00	*Band*
9	27	2005	2005-2008	ML-MALONE				0.023	4.01	9.50	*Band*
6	28	2005	2005-2008	ML-NE				0.024	1.40	16.99	*Band*
9	27	2005	2005-2008	ML-NE				0.023	4.21	12.50	*Band*
6	28	2005	2005-2008	ML-NSHORE				0.017	1.47	13.50	*Band*
9	27	2005	2005-2008	ML-NSHORE				0.021	3.14	12.00	*Band*
6	28	2005	2005-2008	ML-NW				0.017	3.47	14.50	*Band*
9	27	2005	2005-2008	ML-NW				0.018	3.20	15.00	*Band*
6	28	2005	2005-2008	ML-PETERSON				0.015	0.80	16.99	*Band*
9	27	2005	2005-2008	ML-PETERSON				0.020	2.14	13.50	*Band*
6	28	2005	2005-2008	ML-SE				0.016	1.34	16.49	*Band*
9	27	2005	2005-2008	ML-SE				0.022	2.27	14.50	*Band*
6	28	2005	2005-2008	ML-SEVENTEEN				0.026	1.34	14.50	*Band*
9	27	2005	2005-2008	ML-SEVENTEEN				0.022	3.00	14.50	*Band*
6	28	2005	2005-2008	ML-THAINS				0.020	2.34	6.40	*Band*
9	27	2005	2005-2008	ML-THAINS				0.022	5.67	6.50	*Band*
6	28	2005	2005-2008	ML-VINELAND				0.018	1.20	14.00	*Band*
9	27	2005	2005-2008	ML-VINELAND				0.019	3.00	13.50	*Band*
	060724	2006	2005-2008	CEDAR CREEK ACCESS				0.027	10.3		DNR Fisheries, Aitkin
	060724	2006	2005-2008	IZATYS				0.057	15.9		DNR Fisheries, Aitkin
	060724	2006	2005-2008	NORTH GARRISON				0.022	8.0		DNR Fisheries, Aitkin
	060724	2006	2005-2008	RUM RIVER				0.022	3.5		DNR Fisheries, Aitkin

Table 8: 1970-2008 Mille Lacs Lake Water Quality Data

Table Notes:

Cl	Chloride (ppm)
TN	Total Nitrogen (ppm)
TP	Total Phosphorus (ppb)
CHLA	Chlorophyll a (ppb)
SD M	Seechi Disc (feet)

Band - Mille Lacs Band of the Ojibwe, various programs and dates.
secchi depth data collected in the 1990's
Mille Lacs Lake Watershed Management Project (2000)
Surface Water Quality Monitoring for Long Term Trend Analysis (2005-2006)
Band-CLP - Mille Lacs Environmental Program, Mille Lacs Band of Ojibwe. Includes Clean Lakes Project (CLP) data (1992)
CLMP - Citizen Lake Monitoring Program, various dates (1974-2006).
MPCA - MPCA Lake Monitoring Program Project (1981).

Month	Day Date	Year	Year Group	SITE	Cl (ppm)	TN (ppm)	TP (ppm)	CHLA (ppb)	Secchi Rdg (ft)	Source
7	20	1992	1990-1994	ML-11			0.029	5.34		*Band-CLP*
9	14	1992	1990-1994	ML-11			0.024			*Band-CLP*
10	29	1992	1990-1994	ML-11			0.025	0.53	7.38	*Band-CLP*
5	5	1992	1990-1994	ML-12			0.030	2.67	6.23	*Band-CLP*
5	26	1992	1990-1994	ML-12			0.023	1.60	9.84	*Band-CLP*
6	22	1992	1990-1994	ML-12			0.036	4.27	7.54	*Band-CLP*
7	7	1992	1990-1994	ML-12			0.025	4.81	7.54	*Band-CLP*
7	20	1992	1990-1994	ML-12			0.025	2.67	7.54	*Band-CLP*
8	3	1992	1990-1994	ML-12			0.021	2.14	6.89	*Band-CLP*
8	17	1992	1990-1994	ML-12			0.022	3.56	6.56	*Band-CLP*
8	31	1992	1990-1994	ML-12			0.024	4.45	4.26	*Band-CLP*
9	14	1992	1990-1994	ML-12			0.027	3.74	5.90	*Band-CLP*
10	5	1992	1990-1994	ML-12			0.034	2.67	6.56	*Band-CLP*
10	22	1992	1990-1994	ML-12			0.035			*Band-CLP*
10	29	1992	1990-1994	ML-12			0.027	2.14	5.90	*Band-CLP*
7	6	1992	1990-1994	ML-13			0.032			*Band-CLP*
7	21	1992	1990-1994	ML-13			0.025	5.34		*Band-CLP*
8	4	1992	1990-1994	ML-13			0.025			*Band-CLP*
8	17	1992	1990-1994	ML-13			0.018	4.45		*Band-CLP*
8	31	1992	1990-1994	ML-13			0.039	3.56		*Band-CLP*
9	14	1992	1990-1994	ML-13			0.026			*Band-CLP*
10	30	1992	1990-1994	ML-13			0.028	2.67	7.38	*Band-CLP*
5	5	1992	1990-1994	ML-14			0.027	2.14	9.84	*Band-CLP*
5	26	1992	1990-1994	ML-14			0.025	1.07	8.20	*Band-CLP*
6	22	1992	1990-1994	ML-14			0.035	3.74	7.54	*Band-CLP*
7	7	1992	1990-1994	ML-14			0.030	2.14	8.20	*Band-CLP*
7	20	1992	1990-1994	ML-14			0.030	2.67	8.20	*Band-CLP*
8	3	1992	1990-1994	ML-14			0.021	3.20	8.20	*Band-CLP*
8	17	1992	1990-1994	ML-14			0.028	8.01	6.56	*Band-CLP*
8	31	1992	1990-1994	ML-14			0.025	0.89	4.26	*Band-CLP*
9	14	1992	1990-1994	ML-14			0.022	3.20	5.90	*Band-CLP*
10	5	1992	1990-1994	ML-14			0.029	1.60	6.07	*Band-CLP*
10	29	1992	1990-1994	ML-14			0.023	2.67	8.20	*Band-CLP*
5	5	1992	1990-1994	ML-15			0.024	1.60	11.48	*Band-CLP*
5	26	1992	1990-1994	ML-15			0.027	1.07	10.82	*Band-CLP*
6	22	1992	1990-1994	ML-15			0.036	2.67	7.54	*Band-CLP*
7	7	1992	1990-1994	ML-15			0.026	3.74	8.20	*Band-CLP*
7	20	1992	1990-1994	ML-15			0.027	4.27	8.20	*Band-CLP*
8	3	1992	1990-1994	ML-15			0.020	2.67	8.20	*Band-CLP*
8	17	1992	1990-1994	ML-15			0.030	5.34	6.56	*Band-CLP*
8	31	1992	1990-1994	ML-15			0.025	2.67	4.26	*Band-CLP*
9	14	1992	1990-1994	ML-15			0.021	5.87	5.25	*Band-CLP*
10	5	1992	1990-1994	ML-15			0.024	2.00	5.74	*Band-CLP*
10	29	1992	1990-1994	ML-15			0.021	2.67	7.38	*Band-CLP*
5	28	1992	1990-1994	ML-16					11.48	*Band-CLP*
6	23	1992	1990-1994	ML-16			0.028	3.74	7.54	*Band-CLP*
7	8	1992	1990-1994	ML-16			0.025	2.67	9.02	*Band-CLP*
7	20	1992	1990-1994	ML-16			0.027	3.74	7.54	*Band-CLP*
8	3	1992	1990-1994	ML-16			0.024	3.20	6.56	*Band-CLP*
8	17	1992	1990-1994	ML-16			0.025	1.78	5.90	*Band-CLP*
8	31	1992	1990-1994	ML-16			0.025	1.78	4.10	*Band-CLP*
9	14	1992	1990-1994	ML-16			0.024	3.20	5.74	*Band-CLP*
10	6	1992	1990-1994	ML-16			0.027	2.00	5.74	*Band-CLP*
10	28	1992	1990-1994	ML-16			0.033	4.27	6.56	*Band-CLP*
5	28	1992	1990-1994	ML-17					11.48	*Band-CLP*
6	23	1992	1990-1994	ML-17			0.021	4.81	7.54	*Band-CLP*
7	8	1992	1990-1994	ML-17			0.023	1.60	9.02	*Band-CLP*
7	20	1992	1990-1994	ML-17			0.028	2.67	7.54	*Band-CLP*
8	3	1992	1990-1994	ML-17			0.021	2.14	6.56	*Band-CLP*
8	17	1992	1990-1994	ML-17			0.026	8.90	5.90	*Band-CLP*
8	31	1992	1990-1994	ML-17			0.028	1.78	4.26	*Band-CLP*
9	14	1992	1990-1994	ML-17			0.029	5.34	5.74	*Band-CLP*
10	6	1992	1990-1994	ML-17			0.028	2.67	5.74	*Band-CLP*
10	28	1992	1990-1994	ML-17			0.034	3.20	6.56	*Band-CLP*
5	5	1992	1990-1994	ML-18			0.019	0.53	12.14	*Band-CLP*
5	27	1992	1990-1994	ML-18			0.029	1.60	9.84	*Band-CLP*
5	28	1992	1990-1994	ML-18					13.12	*Band-CLP*
6	23	1992	1990-1994	ML-18			0.037	3.74	7.54	*Band-CLP*
7	8	1992	1990-1994	ML-18			0.024	2.14	8.53	*Band-CLP*
7	20	1992	1990-1994	ML-18			0.024	3.74	6.56	*Band-CLP*
8	3	1992	1990-1994	ML-18			0.028	3.74	6.56	*Band-CLP*
8	17	1992	1990-1994	ML-18			0.028	4.45	5.90	*Band-CLP*
8	31	1992	1990-1994	ML-18			0.024	4.45	4.10	*Band-CLP*
9	14	1992	1990-1994	ML-18			0.030	3.74	6.56	*Band-CLP*
10	6	1992	1990-1994	ML-18			0.040	0.67	5.74	*Band-CLP*
10	28	1992	1990-1994	ML-18			0.031	3.74	6.56	*Band-CLP*
6	21	1992	1990-1994	ML-2			0.033			*Band-CLP*
7	6	1992	1990-1994	ML-2			0.025			*Band-CLP*
8	4	1992	1990-1994	ML-2			0.027			*Band-CLP*
8	17	1992	1990-1994	ML-2			0.021	4.45		*Band-CLP*
8	31	1992	1990-1994	ML-2			0.029	3.56		*Band-CLP*
9	13	1992	1990-1994	ML-2			0.027			*Band-CLP*
10	30	1992	1990-1994	ML-2			0.011	2.14	6.56	*Band-CLP*
5	5	1992	1990-1994	ML-20			0.020	1.07	12.79	*Band-CLP*
6	10	1997	1995-1999	211					20.01	*CLMP*
6	17	1997	1995-1999	211					19.48	*CLMP*
6	22	1997	1995-1999	211					20.01	*CLMP*
6	28	1997	1995-1999	211					16.50	*CLMP*
7	9	1997	1995-1999	211					15.48	*CLMP*
7	15	1997	1995-1999	211					16.99	*CLMP*
7	21	1997	1995-1999	211					14.99	*CLMP*
8	2	1997	1995-1999	211					14.01	*CLMP*
8	20	1997	1995-1999	211					12.00	*CLMP*
8	26	1997	1995-1999	211					10.50	*CLMP*
9	9	1997	1995-1999	211					11.51	*CLMP*
9	17	1997	1995-1999	211					12.99	*CLMP*
9	25	1997	1995-1999	211					13.48	*CLMP*
10	4	1997	1995-1999	211					14.01	*CLMP*
6	14	1997	1995-1999	212					20.01	*CLMP*
6	22	1997	1995-1999	212					16.99	*CLMP*
8	3	1997	1995-1999	212					15.48	*CLMP*
9	1	1997	1995-1999	212					12.99	*CLMP*
6	22	1997	1995-1999	213					19.48	*CLMP*
7	4	1997	1995-1999	213					16.99	*CLMP*
7	13	1997	1995-1999	213					19.48	*CLMP*
8	23	1997	1995-1999	213					14.01	*CLMP*
9	6	1997	1995-1999	213					12.50	*CLMP*
7	13	1997	1995-1999	214					14.01	*CLMP*
7	19	1997	1995-1999	214					12.00	*CLMP*
7	26	1997	1995-1999	214					12.99	*CLMP*
8	9	1997	1995-1999	214					12.50	*CLMP*
8	26	1997	1995-1999	214					11.51	*CLMP*
9	13	1997	1995-1999	214					10.99	*CLMP*
6	10	1997	1995-1999	215					20.99	*CLMP*
6	11	1997	1995-1999	215					22.99	*CLMP*
6	17	1997	1995-1999	215					22.01	*CLMP*
6	20	1997	1995-1999	215					20.99	*CLMP*
6	25	1997	1995-1999	215					20.01	*CLMP*
7	11	1997	1995-1999	215					18.01	*CLMP*
7	17	1997	1995-1999	215					16.01	*CLMP*
8	1	1997	1995-1999	215					14.99	*CLMP*
8	20	1997	1995-1999	215					18.01	*CLMP*
9	2	1997	1995-1999	215					18.01	*CLMP*
9	21	1997	1995-1999	215					20.01	*CLMP*
10	15	1997	1995-1999	215					18.99	*CLMP*
5	20	1997	1995-1999	ML-15					12.50	*Band*
5	20	1997	1995-1999	ML-24					13.00	*Band*
5	20	1997	1995-1999	ML-53					13.00	*Band*
5	20	1997	1995-1999	ML-6					13.00	*Band*
	980713	1998	1995-1999	CEDAR CREEK			0.029	6.3		DNR Fisheries, Aitkin
	980713	1998	1995-1999	IZATYS			0.050	6.7		DNR Fisheries, Aitkin
	980713	1998	1995-1999	NORTH GARRISON			0.050	12.9		DNR Fisheries, Aitkin
	980713	1998	1995-1999	RUM RIVER			0.051	9.2		DNR Fisheries, Aitkin
	980713	1998	1995-1999	SEASTAD CREEK			0.062	5.8		DNR Fisheries, Aitkin
	980519	1998	1995-1999	SHA BUSH KUNG				4.1		DNR Fisheries, Aitkin
	980602	1998	1995-1999	SHA BUSH KUNG				3.4		DNR Fisheries, Aitkin
	980616	1998	1995-1999	SHA BUSH KUNG				1.3		DNR Fisheries, Aitkin
	980701	1998	1995-1999	SHA BUSH KUNG				4.0		DNR Fisheries, Aitkin
	980715	1998	1995-1999	SHA BUSH KUNG				6.3		DNR Fisheries, Aitkin
	980728	1998	1995-1999	SHA BUSH KUNG				7.3		DNR Fisheries, Aitkin
	980811	1998	1995-1999	SHA BUSH KUNG				7.8		DNR Fisheries, Aitkin
	980825	1998	1995-1999	SHA BUSH KUNG				11.0		DNR Fisheries, Aitkin
	980911	1998	1995-1999	SHA BUSH KUNG				7.3		DNR Fisheries, Aitkin
	980928	1998	1995-1999	SHA BUSH KUNG				6.2		DNR Fisheries, Aitkin
	980519	1998	1995-1999	WEALTHWOOD				4.9		DNR Fisheries, Aitkin
	980602	1998	1995-1999	WEALTHWOOD				4.1		DNR Fisheries, Aitkin
	980616	1998	1995-1999	WEALTHWOOD				0.9		DNR Fisheries, Aitkin
	980701	1998	1995-1999	WEALTHWOOD				4.5		DNR Fisheries, Aitkin
	980715	1998	1995-1999	WEALTHWOOD				9.8		DNR Fisheries, Aitkin
	980728	1998	1995-1999	WEALTHWOOD				8.9		DNR Fisheries, Aitkin
	980811	1998	1995-1999	WEALTHWOOD				7.6		DNR Fisheries, Aitkin
	980825	1998	1995-1999	WEALTHWOOD				11.8		DNR Fisheries, Aitkin
	980911	1998	1995-1999	WEALTHWOOD				7.5		DNR Fisheries, Aitkin
	980928	1998	1995-1999	WEALTHWOOD				8.0		DNR Fisheries, Aitkin
5	5	1998	1995-1999	206					14.50	*CLMP*
5	11	1998	1995-1999	206					13.48	*CLMP*
5	17	1998	1995-1999	206					12.99	*CLMP*
5	25	1998	1995-1999	206					14.01	*CLMP*
6	5	1998	1995-1999	206					12.50	*CLMP*
6	11	1998	1995-1999	206					16.01	*CLMP*
6	19	1998	1995-1999	206					16.99	*CLMP*
6	27	1998	1995-1999	206					14.01	*CLMP*
7	3	1998	1995-1999	206					18.01	*CLMP*
7	31	1998	1995-1999	206					10.99	*CLMP*
8	8	1998	1995-1999	206					7.51	*CLMP*
8	13	1998	1995-1999	206					8.99	*CLMP*
8	19	1998	1995-1999	206					8.00	*CLMP*
8	27	1998	1995-1999	206					8.50	*CLMP*
	060724	2006	2005-2008	SEASTAD CREEK						DNR Fisheries, Aitkin
6	17	2006	2005-2008	209					11.51	*CLMP*
6	26	2006	2005-2008	209					12.50	*CLMP*
6	28	2006	2005-2008	209					12.50	*CLMP*
7	7	2006	2005-2008	209					14.01	*CLMP*
6	10	2006	2005-2008	213					12.99	*CLMP*
6	11	2006	2005-2008	213					10.50	*CLMP*
6	24	2006	2005-2008	213					10.99	*CLMP*
7	16	2006	2005-2008	213					10.99	*CLMP*
7	22	2006	2005-2008	213					10.50	*CLMP*
9	3	2006	2005-2008	213					8.99	*CLMP*
7	18	2006	2005-2008	ML-1			0.019	3.39	8.30	*Band*
9	13	2006	2005-2008	ML-1			0.013	4.86	8.50	*Band*
7	18	2006	2005-2008	ML-20			0.018	3.49	9.51	*Band*
9	13	2006	2005-2008	ML-20			0.019	8.01	7.50	*Band*
7	18	2006	2005-2008	ML-24			0.017	4.21	8.20	*Band*
9	13	2006	2005-2008	ML-24			0.019	5.53	8.50	*Band*
7	18	2006	2005-2008	ML-6			0.020	2.98	8.98	*Band*
9	13	2006	2005-2008	ML-6			0.016	6.20	9.00	*Band*
7	18	2006	2005-2008	ML-CE			0.020	4.11	8.26	*Band*
9	13	2006	2005-2008	ML-CE			0.021	5.91	8.50	*Band*
7	18	2006	2005-2008	ML-DITCH 36			0.018	3.53	5.80	*Band*
9	13	2006	2005-2008	ML-DITCH 36			0.021	6.48	5.00	*Band*
7	18	2006	2005-2008	ML-GARRISON			0.025	5.24	5.90	*Band*
9	13	2006	2005-2008	ML-GARRISON			0.022	8.30	5.30	*Band*
7	18	2006	2005-2008	ML-MALONE			0.017	3.59	8.36	*Band*
9	13	2006	2005-2008	ML-MALONE			0.015	5.07	7.00	*Band*
7	18	2006	2005-2008	ML-NE			0.020	3.90	8.69	*Band*
9	13	2006	2005-2008	ML-NE			0.018	6.96	7.50	*Band*
7	18	2006	2005-2008	ML-NSHORE			0.020	3.59	7.08	*Band*
9	13	2006	2005-2008	ML-NSHORE			0.020	8.94	7.50	*Band*
7	18	2006	2005-2008	ML-NW			0.021	3.70	8.07	*Band*
9	13	2006	2005-2008	ML-NW			0.019	7.06	8.50	*Band*
7	18	2006	2005-2008	ML-PETERSON			0.016	3.29	9.38	*Band*
9	13	2006	2005-2008	ML-PETERSON			0.031	5.53	8.00	*Band*
7	18	2006	2005-2008	ML-SE			0.019	3.39	8.13	*Band*
9	13	2006	2005-2008	ML-SE			0.020	6.39	9.00	*Band*
7	18	2006	2005-2008	ML-SEVENTEEN			0.019	2.16	8.53	*Band*
9	13	2006	2005-2008	ML-SEVENTEEN			0.017	7.72	8.50	*Band*
7	18	2006	2005-2008	ML-THAINS			0.019	3.23	5.90	*Band*
9	13	2006	2005-2008	ML-THAINS			0.017	5.74	5.40	*Band*
7	18	2006	2005-2008	ML-VINELAND			0.018	2.36	9.51	*Band*
9	13	2006	2005-2008	ML-VINELAND			0.020	4.10	8.50	*Band*
	070723	2007	2005-2008	CEDAR CREEK			0.035	14.4		DNR Fisheries, Aitkin
	070723	2007	2005-2008	IZATYS			0.065	9.6		DNR Fisheries, Aitkin
	070723	2007	2005-2008	NORTH GARRISON			0.053	60.9		DNR Fisheries, Aitkin
	070723	2007	2005-2008	RUM RIVER			0.033	7.5		DNR Fisheries, Aitkin
	070723	2007	2005-2008	SEASTAD CREEK			0.056	11.5		DNR Fisheries, Aitkin
	070723	2007	2005-2008	STN ?			0.033	15.8		DNR Fisheries, Aitkin
	070723	2007	2005-2008	STN ?			0.029	8.2		DNR Fisheries, Aitkin
	070723	2007	2005-2008	STN ?			0.033	21.6		DNR Fisheries, Aitkin
	070723	2007	2005-2008	STN ?			0.028	10.3		DNR Fisheries, Aitkin
	070723	2007	2005-2008	STN ?			0.030	9.1		DNR Fisheries, Aitkin
	070723	2007	2005-2008	STN ?			0.029	9.7		DNR Fisheries, Aitkin
	070516	2007	2005-2008	STN ZO1			0.036	8.2		DNR Fisheries, Aitkin
	070516	2007	2005-2008	STN ZO2			0.037	8.7		DNR Fisheries, Aitkin
	070516	2007	2005-2008	STN ZO3			0.037	8.2		DNR Fisheries, Aitkin
	070620	2007	2005-2008	STN ZO3			0.028	9.1		DNR Fisheries, Aitkin
	070516	2007	2005-2008	STN ZO4			0.034	8.6		DNR Fisheries, Aitkin
	070516	2007	2005-2008	STN ZO5			0.040	8.9		DNR Fisheries, Aitkin
	070620	2007	2005-2008	STN ZO5			0.033	8.4		DNR Fisheries, Aitkin
	070516	2007	2005-2008	STN ZO6			0.036	8.2		DNR Fisheries, Aitkin
	070620	2007	2005-2008	STN ZO6			0.023	6.2		DNR Fisheries, Aitkin
	070723	2007	2005-2008	STN ZO6			0.044	16.9		DNR Fisheries, Aitkin
	070516	2007	2005-2008	STN ZO7			0.037	7.8		DNR Fisheries, Aitkin
	070723	2007	2005-2008	STN ZO7			0.032	7.0		DNR Fisheries, Aitkin
	070620	2007	2005-2008	STN ZO8			0.025	8.2		DNR Fisheries, Aitkin
	070516	2007	2005-2008	STN ZO9			0.040	9.4		DNR Fisheries, Aitkin
	070620	2007	2005-2008	STN ZO9			0.026	6.3		DNR Fisheries, Aitkin
	070912	2007	2005-2008	WQ 1			0.030	7.3		DNR Fisheries, Aitkin
	070814	2007	2005-2008	WQ 11			0.030	16.2		DNR Fisheries, Aitkin
	070814	2007	2005-2008	WQ 12			0.034	21.6		DNR Fisheries, Aitkin
	070814	2007	2005-2008	WQ 13			0.027	14.9		DNR Fisheries, Aitkin
	070814	2007	2005-2008	WQ 14			0.039	22.2		DNR Fisheries, Aitkin
	070814	2007	2005-2008	WQ 15			0.031	13.4		DNR Fisheries, Aitkin
	070814	2007	2005-2008	WQ 16			0.030	11.0		DNR Fisheries, Aitkin
	070814	2007	2005-2008	WQ 17			0.029	12.0		DNR Fisheries, Aitkin
	070814	2007	2005-2008	WQ 18			0.032	13.4		DNR Fisheries, Aitkin
	070912	2007	2005-2008	WQ 2			0.036	11.0		DNR Fisheries, Aitkin
	070912	2007	2005-2008	WQ 3			0.033	10.5		DNR Fisheries, Aitkin
	070912	2007	2005-2008	WQ 4			0.028	9.6		DNR Fisheries, Aitkin
	070912	2007	2005-2008	WQ 5			0.025	7.0		DNR Fisheries, Aitkin
	070912	2007	2005-2008	WQ 6			0.027	6.4		DNR Fisheries, Aitkin
	070912	2007	2005-2008	WQ 7			0.028	8.8		DNR Fisheries, Aitkin

Table 8: 1970-2008 Mille Lacs Lake Water Quality Data

Table Notes:

Cl	Chloride (ppm)
TN	Total Nitrogen (ppm)
TP	Total Phosphorus (ppb)
CHLA	Chlorophyll a (ppb)
SD M	Seechi Disc (feet)

Band - Mille Lacs Band of the Ojibwe, various programs and dates.
secchi depth data collected in the 1990's
Mille Lacs Lake Watershed Management Project (2000)
Surface Water Quality Monitoring for Long Term Trend Analysis (2005-2006)
Band-CLP - Mille Lacs Environmental Program, Mille Lacs Band of Ojibwe. Includes Clean Lakes Project (CLP) data (1992)
CLMP - Citizen Lake Monitoring Program, various dates (1974-2006).
MPCA - MPCA Lake Monitoring Program Project (1981).

Month	Day Date	Year	Year Group	SITE	Cl (ppm)	TN (ppm)	TP (ppm)	CHLA (ppb)	Secchi Rdg (ft)	Source
5	27	1992	1990-1994	ML-20			0.024	1.60	10.66	*Band-CLP*
5	29	1992	1990-1994	ML-20					12.30	*Band-CLP*
6	23	1992	1990-1994	ML-20			0.019	3.20	7.54	*Band-CLP*
7	8	1992	1990-1994	ML-20			0.026	2.67	8.69	*Band-CLP*
9	4	1998	1995-1999	206					8.50	*CLMP*
5	3	1998	1995-1999	211					18.01	*CLMP*
5	11	1998	1995-1999	211					14.01	*CLMP*
5	30	1998	1995-1999	211					13.48	*CLMP*
	070912	2007	2005-2008	WQ 8			0.028	9.4		DNR Fisheries, Aitkin
	070620	2007	2005-2008				0.025	6.7		DNR Fisheries, Aitkin
	070620	2007	2005-2008				0.025	6.6		DNR Fisheries, Aitkin
	070620	2007	2005-2008				0.024	6.4		DNR Fisheries, Aitkin

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Band - Mille Lacs Band of the Ojibwe, various programs and dates.
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Band-CLP - Mille Lacs Environmental Program, Mille Lacs Band of Ojibwe. Includes Clean Lakes Project (CLP) data (1992)
CLMP - Citizen Lake Monitoring Program, various dates (1974-2006).
MPCA - MPCA Lake Monitoring Program Project (1981).

Month	Day Date	Year	Year Group	SITE	Cl (ppm)	TN (ppm)	TP (ppm)	CHLA (ppb)	Secchi Rdg (ft)	Source
7	20	1992	1990-1994	ML-20			0.027	3.20	6.56	*Band-CLP*
8	3	1992	1990-1994	ML-20			0.020	3.74	6.56	*Band-CLP*
8	17	1992	1990-1994	ML-20			0.029	6.23	5.90	*Band-CLP*
8	31	1992	1990-1994	ML-20			0.027	1.78	4.59	*Band-CLP*
9	14	1992	1990-1994	ML-20			0.019	4.27	6.56	*Band-CLP*
10	6	1992	1990-1994	ML-20			0.025	3.34	6.56	*Band-CLP*
10	29	1992	1990-1994	ML-20			0.019	3.74	6.56	*Band-CLP*
7	6	1992	1990-1994	ML-22			0.030			*Band-CLP*
7	21	1992	1990-1994	ML-22			0.024	5.87		*Band-CLP*
8	4	1992	1990-1994	ML-22			0.040			*Band-CLP*
8	17	1992	1990-1994	ML-22			0.020	5.34		*Band-CLP*
8	28	1992	1990-1994	ML-22			0.049			*Band-CLP*
9	14	1992	1990-1994	ML-22			0.025			*Band-CLP*
10	30	1992	1990-1994	ML-22			0.019	2.67	7.54	*Band-CLP*
7	6	1992	1990-1994	ML-23			0.027			*Band-CLP*
7	21	1992	1990-1994	ML-23			0.028	5.34		*Band-CLP*
8	4	1992	1990-1994	ML-23			0.039			*Band-CLP*
8	17	1992	1990-1994	ML-23			0.020	4.45		*Band-CLP*
8	31	1992	1990-1994	ML-23			0.037	5.34		*Band-CLP*
9	14	1992	1990-1994	ML-23			0.021			*Band-CLP*
10	30	1992	1990-1994	ML-23			0.022	2.67	7.38	*Band-CLP*
5	5	1992	1990-1994	ML-24			0.023	1.07	13.12	*Band-CLP*
5	27	1992	1990-1994	ML-24			0.018	1.60	11.48	*Band-CLP*
6	23	1992	1990-1994	ML-24			0.020	7.48	8.20	*Band-CLP*
7	8	1992	1990-1994	ML-24			0.023	3.74	8.53	*Band-CLP*
7	20	1992	1990-1994	ML-24			0.024	4.27	6.56	*Band-CLP*
8	3	1992	1990-1994	ML-24			0.027	2.67	9.84	*Band-CLP*
8	17	1992	1990-1994	ML-24			0.025	5.34	6.56	*Band-CLP*
8	31	1992	1990-1994	ML-24			0.026	1.78	4.92	*Band-CLP*
9	14	1992	1990-1994	ML-24			0.023	3.20	5.90	*Band-CLP*
10	6	1992	1990-1994	ML-24			0.020		6.56	*Band-CLP*
10	29	1992	1990-1994	ML-24			0.026	5.34	6.56	*Band-CLP*
7	20	1992	1990-1994	ML-26			0.024	2.14		*Band-CLP*
8	3	1992	1990-1994	ML-26			0.031			*Band-CLP*
8	17	1992	1990-1994	ML-26			0.018	2.67		*Band-CLP*
8	31	1992	1990-1994	ML-26			0.057	2.67		*Band-CLP*
9	14	1992	1990-1994	ML-26			0.071			*Band-CLP*
10	29	1992	1990-1994	ML-26			0.027	2.67	7.38	*Band-CLP*
7	20	1992	1990-1994	ML-27			0.043			*Band-CLP*
8	3	1992	1990-1994	ML-27			0.033			*Band-CLP*
8	17	1992	1990-1994	ML-27			0.019	2.67		*Band-CLP*
8	31	1992	1990-1994	ML-27			0.028	2.67		*Band-CLP*
9	14	1992	1990-1994	ML-27			0.067			*Band-CLP*
10	29	1992	1990-1994	ML-27			0.028	1.07	7.38	*Band-CLP*
6	21	1992	1990-1994	ML-3			0.038			*Band-CLP*
7	6	1992	1990-1994	ML-3			0.032			*Band-CLP*
7	20	1992	1990-1994	ML-3			0.021	3.74		*Band-CLP*
8	4	1992	1990-1994	ML-3			0.031			*Band-CLP*
8	17	1992	1990-1994	ML-3			0.035	4.45		*Band-CLP*
8	31	1992	1990-1994	ML-3			0.024	1.78		*Band-CLP*
9	13	1992	1990-1994	ML-3			0.022			*Band-CLP*
10	30	1992	1990-1994	ML-3			0.024	2.14	7.22	*Band-CLP*
6	22	1992	1990-1994	ML-32			0.032	4.81	6.56	*Band-CLP*
7	7	1992	1990-1994	ML-32			0.025	2.14	7.54	*Band-CLP*
7	20	1992	1990-1994	ML-32			0.026	3.20	8.20	*Band-CLP*
8	3	1992	1990-1994	ML-32			0.024	3.74	6.56	*Band-CLP*
8	17	1992	1990-1994	ML-32			0.027	3.56	5.90	*Band-CLP*
8	31	1992	1990-1994	ML-32			0.031	2.67	4.26	*Band-CLP*
9	14	1992	1990-1994	ML-32			0.030	5.34	5.25	*Band-CLP*
10	5	1992	1990-1994	ML-32			0.024	2.00	4.92	*Band-CLP*
10	29	1992	1990-1994	ML-32			0.025	1.60	6.56	*Band-CLP*
5	6	1992	1990-1994	ML-38			0.025	1.60	9.84	*Band-CLP*
5	27	1992	1990-1994	ML-38			0.022	1.60	9.84	*Band-CLP*
6	16	1992	1990-1994	ML-38			0.029	2.00	6.99	*Band-CLP*
6	23	1992	1990-1994	ML-38			0.022	2.67	7.54	*Band-CLP*
7	6	1992	1990-1994	ML-38			0.026	3.74	8.50	*Band-CLP*
7	18	1992	1990-1994	ML-38			0.021	2.67	7.51	*Band-CLP*
8	1	1992	1990-1994	ML-38			0.024	4.27	8.00	*Band-CLP*
8	15	1992	1990-1994	ML-38			0.017	7.12	6.49	*Band-CLP*
8	31	1992	1990-1994	ML-38			0.020	2.67		*Band-CLP*
9	12	1992	1990-1994	ML-38			0.025	5.87	4.26	*Band-CLP*
10	30	1992	1990-1994	ML-38			0.017	1.60	7.54	*Band-CLP*
6	23	1992	1990-1994	ML-39			0.020			*Band-CLP*
7	6	1992	1990-1994	ML-39			0.030			*Band-CLP*
7	18	1992	1990-1994	ML-39			0.027	4.27		*Band-CLP*
8	4	1992	1990-1994	ML-39			0.027			*Band-CLP*
8	16	1992	1990-1994	ML-39			0.018	3.56		*Band-CLP*
9	1	1992	1990-1994	ML-39			0.027	3.56		*Band-CLP*
9	12	1992	1990-1994	ML-39			0.020			*Band-CLP*
10	30	1992	1990-1994	ML-39			0.022	1.94	4.92	*Band-CLP*
6	21	1992	1990-1994	ML-4			0.041			*Band-CLP*
7	6	1992	1990-1994	ML-4			0.036			*Band-CLP*
7	20	1992	1990-1994	ML-4			0.028	3.74		*Band-CLP*
8	4	1992	1990-1994	ML-4			0.026			*Band-CLP*
6	10	1998	1995-1999	211					18.01	*CLMP*
6	20	1998	1995-1999	211					19.48	*CLMP*
6	29	1998	1995-1999	211					16.50	*CLMP*
7	4	1998	1995-1999	211					16.01	*CLMP*
7	14	1998	1995-1999	211					14.99	*CLMP*
7	20	1998	1995-1999	211					14.50	*CLMP*
7	31	1998	1995-1999	211					11.51	*CLMP*
8	14	1998	1995-1999	211					10.50	*CLMP*
8	30	1998	1995-1999	211					9.51	*CLMP*
9	16	1998	1995-1999	211					10.50	*CLMP*
9	27	1998	1995-1999	211					11.51	*CLMP*
10	7	1998	1995-1999	211					12.99	*CLMP*
5	23	1998	1995-1999	213					14.50	*CLMP*
5	24	1998	1995-1999	213					14.99	*CLMP*
6	7	1998	1995-1999	213					14.50	*CLMP*
7	3	1998	1995-1999	213					16.01	*CLMP*
7	26	1998	1995-1999	213					12.00	*CLMP*
8	8	1998	1995-1999	213					9.51	*CLMP*
8	16	1998	1995-1999	213					9.51	*CLMP*
8	23	1998	1995-1999	213					8.99	*CLMP*
8	30	1998	1995-1999	213					10.50	*CLMP*
	990713	1999	1995-1999	COZY COVE			0.042	7.7		DNR Fisheries, Aitkin
	990713	1999	1995-1999	IZATYS			0.099	20.4		DNR Fisheries, Aitkin
	990713	1999	1995-1999	NORTH GARRISON			0.075	22.0		DNR Fisheries, Aitkin
	990713	1999	1995-1999	RUM RIVER			0.051	12.5		DNR Fisheries, Aitkin
	990713	1999	1995-1999	SEASTAD CREEK			0.047	3.8		DNR Fisheries, Aitkin
5	27	1999	1995-1999	206					8.50	*CLMP*
6	3	1999	1995-1999	206					10.00	*CLMP*
6	12	1999	1995-1999	206					8.50	*CLMP*
6	22	1999	1995-1999	206					7.51	*CLMP*
6	30	1999	1995-1999	206					6.99	*CLMP*
7	11	1999	1995-1999	206					10.00	*CLMP*
7	19	1999	1995-1999	206					7.51	*CLMP*
7	24	1999	1995-1999	206					8.99	*CLMP*
7	29	1999	1995-1999	206					7.51	*CLMP*
8	8	1999	1995-1999	206					7.51	*CLMP*
8	14	1999	1995-1999	206					7.51	*CLMP*
8	21	1999	1995-1999	206					6.99	*CLMP*
8	27	1999	1995-1999	206					8.00	*CLMP*
9	4	1999	1995-1999	206					8.00	*CLMP*
5	9	1999	1995-1999	211					11.51	*CLMP*
5	30	1999	1995-1999	211					10.99	*CLMP*
6	12	1999	1995-1999	211					8.00	*CLMP*
6	29	1999	1995-1999	211					6.49	*CLMP*
7	4	1999	1995-1999	211					6.49	*CLMP*
7	16	1999	1995-1999	211					6.99	*CLMP*
7	23	1999	1995-1999	211					8.50	*CLMP*
8	14	1999	1995-1999	211					7.51	*CLMP*
9	3	1999	1995-1999	211					9.51	*CLMP*
9	23	1999	1995-1999	211					10.00	*CLMP*
5	22	1999	1995-1999	213					9.51	*CLMP*
6	1	1999	1995-1999	213					10.00	*CLMP*
6	13	1999	1995-1999	213					8.50	*CLMP*
6	26	1999	1995-1999	213					8.99	*CLMP*
7	10	1999	1995-1999	213					8.50	*CLMP*
7	11	1999	1995-1999	213					8.99	*CLMP*
8	1	1999	1995-1999	213					8.99	*CLMP*
8	7	1999	1995-1999	213					8.00	*CLMP*
8	29	1999	1995-1999	213					9.51	*CLMP*
9	12	1999	1995-1999	213					10.99	*CLMP*
5	17	1999	1995-1999	215					16.01	*CLMP*
5	29	1999	1995-1999	215					14.01	*CLMP*
6	9	1999	1995-1999	215					10.50	*CLMP*
6	25	1999	1995-1999	215					8.00	*CLMP*
7	4	1999	1995-1999	215					8.00	*CLMP*
7	14	1999	1995-1999	215					6.99	*CLMP*
7	29	1999	1995-1999	215					8.00	*CLMP*
7	13	1999	1995-1999	216					8.50	*CLMP*
7	17	1999	1995-1999	216					8.99	*CLMP*
8	19	1999	1995-1999	216					7.51	*CLMP*
9	17	1999	1995-1999	216					10.99	*CLMP*
	000717	2000	2000-2004	CEDAR CREEK			0.049	8.7		DNR Fisheries, Aitkin
	000717	2000	2000-2004	IZATYS			0.087	13.1		DNR Fisheries, Aitkin
	000717	2000	2000-2004	NORTH GARRISON			0.066	12.2		DNR Fisheries, Aitkin
	000717	2000	2000-2004	RUM RIVER			0.037	6.1		DNR Fisheries, Aitkin
	000717	2000	2000-2004	SEASTAD CREEK			0.052	9.0		DNR Fisheries, Aitkin
	000613	2000	2000-2004	SHA BUSH KUNG				4.0		DNR Fisheries, Aitkin
	000629	2000	2000-2004	SHA BUSH KUNG				3.2		DNR Fisheries, Aitkin
	000713	2000	2000-2004	SHA BUSH KUNG				4.3		DNR Fisheries, Aitkin
	000726	2000	2000-2004	SHA BUSH KUNG				7.4		DNR Fisheries, Aitkin
	000915	2000	2000-2004	SHA BUSH KUNG				8.5		DNR Fisheries, Aitkin
	000926	2000	2000-2004	SHA BUSH KUNG				9.6		DNR Fisheries, Aitkin
	000613	2000	2000-2004	WEALTHWOOD				3.9		DNR Fisheries, Aitkin
	000629	2000	2000-2004	WEALTHWOOD				3.4		DNR Fisheries, Aitkin
	3/27/2007	2007	2005-2008	ML-1	1.95	0.420	0.009	0.76		*Band*
	6/21/2007	2007	2005-2008	ML-1	3.15	0.489	0.018	2.62	8.5	*Band*
	8/8/2007	2007	2005-2008	ML-1	3.34	0.575	0.024	5.61	7.5	*Band*
	9/26/2007	2007	2005-2008	ML-1	3.42	0.499	0.02	3.15	10.0	*Band*
	3/27/2007	2007	2005-2008	ML-20	1.94	0.337	0.005	0.57		*Band*
	6/21/2007	2007	2005-2008	ML-20	3.15	0.506	0.022	4.03	9.5	*Band*
	8/8/2007	2007	2005-2008	ML-20	3.33	0.576	0.03	12.11	7.0	*Band*
	9/26/2007	2007	2005-2008	ML-20	3.38	0.482	0.02	3.9	10.5	*Band*
	3/27/2007	2007	2005-2008	ML-24	2.43	0.413	0.006	0.45	25.4	*Band*
	6/21/2007	2007	2005-2008	ML-24	3.16	0.494	0.02	4.36	10.5	*Band*
	8/8/2007	2007	2005-2008	ML-24	3.41	0.578	0.026	10.75	8.5	*Band*
	9/26/2007	2007	2005-2008	ML-24	3.4	0.469	0.018	3.74	11.0	*Band*
	6/21/2007	2007	2005-2008	ML-24 Dup	3.13	0.491	0.02	2.62		*Band*
	3/27/2007	2007	2005-2008	ML-6	1.99	0.474	0.007	0.48	23.2	*Band*
	6/21/2007	2007	2005-2008	ML-6	3.14	0.461	0.015	2.36	10.5	*Band*
	8/8/2007	2007	2005-2008	ML-6	3.37	0.556	0.023	7.15	8.0	*Band*
	9/26/2007	2007	2005-2008	ML-6	3.38	0.469	0.015	3.21	11.0	*Band*
	8/8/2007	2007	2005-2008	ML-6 (Field Rep.)	3.41	0.569	0.026	6.76	9.5	*Band*
	3/27/2007	2007	2005-2008	ML-6 Field Rep	1.64	0.490	0.006	0.33		*Band*
	3/27/2007	2007	2005-2008	ML-CE	2.38	0.487	0.009	0.47	23.4	*Band*
	6/21/2007	2007	2005-2008	ML-CE	3.13	0.503	0.019	3.33	11.5	*Band*
	8/8/2007	2007	2005-2008	ML-CE	3.37	0.539	0.023	6.83		*Band*
	9/26/2007	2007	2005-2008	ML-CE	3.46	0.479	0.019	4.12	10.0	*Band*
	3/27/2007	2007	2005-2008	ML-Ditch 36	1.64	0.722	0.035	2.2		*Band*
	6/21/2007	2007	2005-2008	ML-Ditch 36	3.17	0.514	0.018	2.57		*Band*
	8/8/2007	2007	2005-2008	ML-Ditch36	3.31	0.633	0.023	12.14		*Band*
	9/26/2007	2007	2005-2008	ML-Ditch36	3.4	0.471	0.016	2.48		*Band*
	3/27/2007	2007	2005-2008	ML-Garrison	2.51	0.457	0.007	0.48		*Band*
	6/21/2007	2007	2005-2008	ML-Garrison	3.17	0.546	0.024	1.38		*Band*
	8/8/2007	2007	2005-2008	ML-Garrison	3.46	0.550	0.024	4.62	7.0	*Band*
	9/26/2007	2007	2005-2008	ML-Garrison	3.43	0.530	0.025	5.65		*Band*
	3/27/2007	2007	2005-2008	ML-Malone	2.51	0.420	0.008	1.54		*Band*
	6/21/2007	2007	2005-2008	ML-Malone	3.16	0.485	0.016	2.11	9.5	*Band*
	8/8/2007	2007	2005-2008	ML-Malone	3.32	0.559	0.02	4.72	9.0	*Band*
	9/26/2007	2007	2005-2008	ML-Malone	3.35	0.498	0.017	3.73	8.5	*Band*
	3/27/2007	2007	2005-2008	ML-NE	2.31	0.433	0.005	0.24	24.7	*Band*
	6/21/2007	2007	2005-2008	ML-NE	3.15	0.514	0.019	4.86	11.0	*Band*
	8/8/2007	2007	2005-2008	ML-NE	3.35	0.524	0.023	7	9.5	*Band*
	9/26/2007	2007	2005-2008	ML-NE	3.39	0.483	0.019	5.02	9.5	*Band*
	3/27/2007	2007	2005-2008	ML-Nshore	2.74	0.433	0.007	0.72		*Band*
	6/21/2007	2007	2005-2008	ML-Nshore	3.16	0.489	0.016	3.16	11.0	*Band*
	8/8/2007	2007	2005-2008	ML-Nshore	3.29	0.509	0.021	6.49	7.5	*Band*
	9/26/2007	2007	2005-2008	ML-NShore	3.37	0.458	0.016	4.26	9.5	*Band*
	3/27/2007	2007	2005-2008	ML-NW	2.33	0.430	0.006	0.38	27.6	*Band*
	6/21/2007	2007	2005-2008	ML-NW	3.14	0.487	0.016	3.75	11.5	*Band*
	8/8/2007	2007	2005-2008	ML-NW	3.37	0.558	0.026	8.18	8.0	*Band*
	9/26/2007	2007	2005-2008	ML-NW	3.41	0.472	0.018	3.43	9.5	*Band*
	3/27/2007	2007	2005-2008	ML-Peterson	2.36	0.772	0.045	2.11	8.8	*Band*
	6/21/2007	2007	2005-2008	ML-Peterson	3.13	0.475	0.019	2.9	10.5	*Band*
	8/8/2007	2007	2005-2008	ML-Peterson	3.34	0.572	0.025	7.3	8.0	*Band*
	9/26/2007	2007	2005-2008	ML-Peterson	3.4	0.473	0.016	3.5	11.0	*Band*
	3/27/2007	2007	2005-2008	ML-SE	2.42	0.520	0.007	0.36	24.1	*Band*
	6/21/2007	2007	2005-2008	ML-SE	3.14	0.476	0.018	3.29	10.5	*Band*
	8/8/2007	2007	2005-2008	ML-SE	3.35	0.583	0.025	5.09	8.0	*Band*
	9/26/2007	2007	2005-2008	ML-SE	3.41	0.458	0.015	3.88	11.0	*Band*
	3/27/2007	2007	2005-2008	ML-Seventeen	2.52	1.137	0.048	1.47	11.7	*Band*
	6/21/2007	2007	2005-2008	ML-Seventeen	3.16	0.509	0.019	3.63	9.5	*Band*
	8/8/2007	2007	2005-2008	ML-Seventeen	3.41	0.581	0.021	3.74		*Band*
	9/26/2007	2007	2005-2008	ML-Seventeen	3.35	0.476	0.017	3.08	9.0	*Band*
	3/27/2007	2007	2005-2008	ML-Thains	3.1	0.610	0.03	2.6		*Band*
	6/21/2007	2007	2005-2008	ML-Thains	3.19	0.573	0.025	2.92		*Band*
	8/8/2007	2007	2005-2008	ML-Thains	3.38	0.584	0.022	3.77	7.0	*Band*
	3/27/2007	2007	2005-2008	ML-Vineland	1.77	0.356	0.004	1		*Band*
	6/21/2007	2007	2005-2008	ML-Vineland	3.16	0.476	0.019	3.41	9.5	*Band*
	8/8/2007	2007	2005-2008	ML-Vineland	3.33	0.579	0.027	7.5		*Band*
	080715	2008	2005-2008	MILLE LACS, WQ 1			0.037	15.0		DNR Fisheries, Aitkin
	080514	2008	2005-2008	MILLE LACS, WQ 11			0.033	7.2		DNR Fisheries, Aitkin
	080618	2008	2005-2008	MILLE LACS, WQ 11			0.016	3.7		DNR Fisheries, Aitkin
	080715	2008	2005-2008	MILLE LACS, WQ 11			0.022	6.9		DNR Fisheries, Aitkin
	080813	2008	2005-2008	MILLE LACS, WQ 11			0.025	7.6		DNR Fisheries, Aitkin
	080909	2008	2005-2008	MILLE LACS, WQ 11			0.026	9.7		DNR Fisheries, Aitkin
	080514	2008	2005-2008	MILLE LACS, WQ 12			0.019	5.5		DNR Fisheries, Aitkin
	080618	2008	2005-2008	MILLE LACS, WQ 12			0.016	3.1		DNR Fisheries, Aitkin
	080715	2008	2005-2008	MILLE LACS, WQ 12			0.022	8.4		DNR Fisheries, Aitkin
	080813	2008	2005-2008	MILLE LACS, WQ 12			0.026	17.2		DNR Fisheries, Aitkin
	080909	2008	2005-2008	MILLE LACS, WQ 12			0.030	11.8		DNR Fisheries, Aitkin
	080514	2008	2005-2008	MILLE LACS, WQ 13			0.022	6.5		DNR Fisheries, Aitkin
	080618	2008	2005-2008	MILLE LACS, WQ 13			0.014	3.1		DNR Fisheries, Aitkin
	080715	2008	2005-2008	MILLE LACS, WQ 13			0.022	7.9		DNR Fisheries, Aitkin
	080813	2008	2005-2008	MILLE LACS, WQ 13			0.023	7.8		DNR Fisheries, Aitkin
	080909	2008	2005-2008	MILLE LACS, WQ 13			0.037	12.7		DNR Fisheries, Aitkin
	080514	2008	2005-2008	MILLE LACS, WQ 14			0.017	7.8		DNR Fisheries, Aitkin
	080618	2008	2005-2008	MILLE LACS, WQ 14			0.014	2.3		DNR Fisheries, Aitkin
	080715	2008	2005-2008	MILLE LACS, WQ 14			0.019	7.5		DNR Fisheries, Aitkin

Table 8: 1970-2008 Mille Lacs Lake Water Quality Data

Table Notes:

Cl	Chloride (ppm)
TN	Total Nitrogen (ppm)
TP	Total Phosphorus (ppb)
CHLA	Chlorophyll a (ppb)
SD M	Seechi Disc (feet)

Band - Mille Lacs Band of the Ojibwe, various programs and dates.
secchi depth data collected in the 1990's
Mille Lacs Lake Watershed Management Project (2000)
Surface Water Quality Monitoring for Long Term Trend Analysis (2005-2006)
Band-CLP - Mille Lacs Environmental Program, Mille Lacs Band of Ojibwe. Includes Clean Lakes Project (CLP) data (1992)
CLMP - Citizen Lake Monitoring Program, various dates (1974-2006).
MPCA - MPCA Lake Monitoring Program Project (1981).

Month	Day Date	Year	Year Group	SITE	Cl (ppm)	TN (ppm)	TP (ppm)	CHLA (ppb)	Secchi Rdg (ft)	Source
8	17	1992	1990-1994	ML-4			0.032	7.12		*Band-CLP*
8	31	1992	1990-1994	ML-4			0.024	2.67		*Band-CLP*
9	13	1992	1990-1994	ML-4			0.018			*Band-CLP*
10	30	1992	1990-1994	ML-4			0.020	1.60	6.23	*Band-CLP*
6	23	1992	1990-1994	ML-40			0.025			*Band-CLP*
7	6	1992	1990-1994	ML-40			0.021			*Band-CLP*
7	18	1992	1990-1994	ML-40			0.025	1.07		*Band-CLP*
8	4	1992	1990-1994	ML-40			0.024			*Band-CLP*
8	16	1992	1990-1994	ML-40			0.017	2.67		*Band-CLP*
9	1	1992	1990-1994	ML-40			0.033	1.78		*Band-CLP*
9	12	1992	1990-1994	ML-40			0.014			*Band-CLP*
10	30	1992	1990-1994	ML-40			0.018	1.60	5.90	*Band-CLP*
6	23	1992	1990-1994	ML-41			0.028			*Band-CLP*
7	6	1992	1990-1994	ML-41			0.029			*Band-CLP*
7	18	1992	1990-1994	ML-41			0.024	2.14		*Band-CLP*
8	4	1992	1990-1994	ML-41			0.025			*Band-CLP*
8	16	1992	1990-1994	ML-41			0.014	1.78		*Band-CLP*
8	31	1992	1990-1994	ML-41			0.028			*Band-CLP*
9	12	1992	1990-1994	ML-41			0.015			*Band-CLP*
10	30	1992	1990-1994	ML-41			0.024	2.14	5.58	*Band-CLP*
6	23	1992	1990-1994	ML-42			0.024			*Band-CLP*
7	6	1992	1990-1994	ML-42			0.032			*Band-CLP*
7	18	1992	1990-1994	ML-42			0.023	2.67		*Band-CLP*
8	4	1992	1990-1994	ML-42			0.020			*Band-CLP*
8	16	1992	1990-1994	ML-42			0.014	7.12		*Band-CLP*
8	31	1992	1990-1994	ML-42			0.039			*Band-CLP*
9	12	1992	1990-1994	ML-42			0.022			*Band-CLP*
10	30	1992	1990-1994	ML-42			0.016	2.14	7.22	*Band-CLP*
6	23	1992	1990-1994	ML-43			0.030			*Band-CLP*
7	6	1992	1990-1994	ML-43			0.027			*Band-CLP*
7	18	1992	1990-1994	ML-43			0.025	2.67		*Band-CLP*
8	4	1992	1990-1994	ML-43			0.031			*Band-CLP*
8	16	1992	1990-1994	ML-43			0.022			*Band-CLP*
8	31	1992	1990-1994	ML-43			0.041			*Band-CLP*
9	12	1992	1990-1994	ML-43			0.027			*Band-CLP*
10	30	1992	1990-1994	ML-43			0.022	2.14	6.23	*Band-CLP*
6	23	1992	1990-1994	ML-44			0.036			*Band-CLP*
7	6	1992	1990-1994	ML-44			0.035			*Band-CLP*
7	18	1992	1990-1994	ML-44			0.040	2.67		*Band-CLP*
8	4	1992	1990-1994	ML-44			0.033			*Band-CLP*
8	16	1992	1990-1994	ML-44			0.016	3.56		*Band-CLP*
8	31	1992	1990-1994	ML-44			0.033			*Band-CLP*
9	12	1992	1990-1994	ML-44			0.022			*Band-CLP*
10	30	1992	1990-1994	ML-44			0.026	4.81	6.56	*Band-CLP*
6	22	1992	1990-1994	ML-47			0.035			*Band-CLP*
7	5	1992	1990-1994	ML-47			0.041			*Band-CLP*
7	18	1992	1990-1994	ML-47			0.023	2.14		*Band-CLP*
8	13	1992	1990-1994	ML-47			0.028			*Band-CLP*
8	17	1992	1990-1994	ML-47			0.015	4.45		*Band-CLP*
8	31	1992	1990-1994	ML-47			0.043	7.12		*Band-CLP*
9	14	1992	1990-1994	ML-47			0.023			*Band-CLP*
10	30	1992	1990-1994	ML-47			0.025	2.67	7.54	*Band-CLP*
6	22	1992	1990-1994	ML-48			0.035			*Band-CLP*
7	5	1992	1990-1994	ML-48			0.029			*Band-CLP*
7	18	1992	1990-1994	ML-48			0.023	5.87		*Band-CLP*
8	13	1992	1990-1994	ML-48			0.034			*Band-CLP*
8	17	1992	1990-1994	ML-48			0.023	5.34		*Band-CLP*
8	31	1992	1990-1994	ML-48			0.041			*Band-CLP*
9	14	1992	1990-1994	ML-48			0.018	4.27		*Band-CLP*
10	30	1992	1990-1994	ML-48			0.017	2.67	7.54	*Band-CLP*
6	22	1992	1990-1994	ML-49			0.028			*Band-CLP*
7	5	1992	1990-1994	ML-49			0.031			*Band-CLP*
7	18	1992	1990-1994	ML-49			0.021	5.87		*Band-CLP*
8	13	1992	1990-1994	ML-49			0.029			*Band-CLP*
8	17	1992	1990-1994	ML-49			0.023	6.23		*Band-CLP*
8	31	1992	1990-1994	ML-49			0.036	4.45		*Band-CLP*
9	14	1992	1990-1994	ML-49			0.032			*Band-CLP*
10	30	1992	1990-1994	ML-49			0.023	1.60	7.38	*Band-CLP*
5	6	1992	1990-1994	ML-5			0.022	3.74	9.84	*Band-CLP*
5	27	1992	1990-1994	ML-5			0.023	2.67	9.84	*Band-CLP*
6	22	1992	1990-1994	ML-5			0.056	3.74	8.00	*Band-CLP*
7	6	1992	1990-1994	ML-5			0.023	1.60	8.00	*Band-CLP*
7	20	1992	1990-1994	ML-5			0.021	4.81	8.00	*Band-CLP*
8	4	1992	1990-1994	ML-5			0.023		6.99	*Band-CLP*
8	17	1992	1990-1994	ML-5			0.017	2.67	6.00	*Band-CLP*
8	31	1992	1990-1994	ML-5			0.024	1.78	4.49	*Band-CLP*
9	13	1992	1990-1994	ML-5			0.021	4.27	5.58	*Band-CLP*
10	30	1992	1990-1994	ML-5			0.031	1.60	7.38	*Band-CLP*
5	6	1992	1990-1994	ML-52			0.019	3.74	10.82	*Band-CLP*
5	27	1992	1990-1994	ML-52			0.032	2.14	9.84	*Band-CLP*
6	16	1992	1990-1994	ML-52			0.040		7.51	*Band-CLP*
6	23	1992	1990-1994	ML-52			0.018	1.07	7.54	*Band-CLP*
7	6	1992	1990-1994	ML-52			0.030	5.34	8.99	*Band-CLP*
7	18	1992	1990-1994	ML-52			0.023	3.20	8.00	*Band-CLP*
	000713	2000	2000-2004	WEALTHWOOD				5.2		DNR Fisheries, Aitkin
	000726	2000	2000-2004	WEALTHWOOD				6.9		DNR Fisheries, Aitkin
	000915	2000	2000-2004	WEALTHWOOD				8.8		DNR Fisheries, Aitkin
	000926	2000	2000-2004	WEALTHWOOD				9.6		DNR Fisheries, Aitkin
6	12	2000	2000-2004	206					12.00	*CLMP*
6	18	2000	2000-2004	206					14.01	*CLMP*
6	29	2000	2000-2004	206					12.99	*CLMP*
7	6	2000	2000-2004	206					12.00	*CLMP*
7	15	2000	2000-2004	206					8.00	*CLMP*
7	22	2000	2000-2004	206					8.50	*CLMP*
7	29	2000	2000-2004	206					8.00	*CLMP*
8	4	2000	2000-2004	206					8.00	*CLMP*
8	14	2000	2000-2004	206					6.49	*CLMP*
8	18	2000	2000-2004	206					6.49	*CLMP*
8	27	2000	2000-2004	206					6.49	*CLMP*
9	2	2000	2000-2004	206					6.49	*CLMP*
9	16	2000	2000-2004	206					8.00	*CLMP*
5	2	2000	2000-2004	211					13.48	*CLMP*
6	3	2000	2000-2004	211					11.51	*CLMP*
6	20	2000	2000-2004	211					10.99	*CLMP*
7	3	2000	2000-2004	211					10.00	*CLMP*
7	13	2000	2000-2004	211					10.00	*CLMP*
7	28	2000	2000-2004	211					8.50	*CLMP*
8	8	2000	2000-2004	211					8.00	*CLMP*
8	24	2000	2000-2004	211					7.51	*CLMP*
8	31	2000	2000-2004	211					7.51	*CLMP*
9	12	2000	2000-2004	211					7.51	*CLMP*
9	25	2000	2000-2004	211					6.99	*CLMP*
5	15	2000	2000-2004	213					13.48	*CLMP*
6	6	2000	2000-2004	213					10.99	*CLMP*
6	24	2000	2000-2004	213					14.01	*CLMP*
6	25	2000	2000-2004	213					12.99	*CLMP*
7	2	2000	2000-2004	213					14.01	*CLMP*
7	3	2000	2000-2004	213					11.51	*CLMP*
7	8	2000	2000-2004	213					10.50	*CLMP*
7	15	2000	2000-2004	213					12.50	*CLMP*
7	22	2000	2000-2004	213					36.61	*CLMP*
8	5	2000	2000-2004	213					10.00	*CLMP*
8	13	2000	2000-2004	213					8.99	*CLMP*
8	24	2000	2000-2004	213					12.00	*CLMP*
8	26	2000	2000-2004	213					8.00	*CLMP*
8	27	2000	2000-2004	213					10.50	*CLMP*
9	2	2000	2000-2004	213					10.00	*CLMP*
9	23	2000	2000-2004	213					10.00	*CLMP*
9	25	2000	2000-2004	213					5.51	*CLMP*
5	30	2000	2000-2004	217					9.51	*CLMP*
6	14	2000	2000-2004	217					8.99	*CLMP*
6	28	2000	2000-2004	217					10.00	*CLMP*
7	11	2000	2000-2004	217					8.50	*CLMP*
8	2	2000	2000-2004	217					10.00	*CLMP*
8	16	2000	2000-2004	217					8.50	*CLMP*
8	30	2000	2000-2004	217					8.99	*CLMP*
9	13	2000	2000-2004	217					10.00	*CLMP*
5	31	2000	2000-2004	218					12.00	*CLMP*
6	27	2000	2000-2004	218					11.51	*CLMP*
7	11	2000	2000-2004	218					10.00	*CLMP*
8	2	2000	2000-2004	218					8.00	*CLMP*
9	13	2000	2000-2004	218					10.00	*CLMP*
9	25	2000	2000-2004	218					9.51	*CLMP*
5	30	2000	2000-2004	ML-1			0.025	1.85		*Band*
6	14	2000	2000-2004	ML-1			0.017	3.19		*Band*
6	29	2000	2000-2004	ML-1			0.014	4.02		*Band*
7	14	2000	2000-2004	ML-1			0.012	4.96		*Band*
8	4	2000	2000-2004	ML-1			0.017	5.54		*Band*
8	22	2000	2000-2004	ML-1			0.022	6.44		*Band*
9	8	2000	2000-2004	ML-1			0.014	4.70		*Band*
10	18	2000	2000-2004	ML-1			0.009	2.56		*Band*
5	30	2000	2000-2004	ML-20			0.021	1.68		*Band*
6	14	2000	2000-2004	ML-20			0.012	3.89		*Band*
6	29	2000	2000-2004	ML-20			0.013	2.49		*Band*
7	14	2000	2000-2004	ML-20			0.022	7.47		*Band*
8	4	2000	2000-2004	ML-20			0.016	3.74		*Band*
8	22	2000	2000-2004	ML-20			0.017	5.06		*Band*
9	8	2000	2000-2004	ML-20			0.018	5.68		*Band*
10	18	2000	2000-2004	ML-20			0.012	3.32		*Band*
5	30	2000	2000-2004	ML-24			0.030	1.73		*Band*
5	30	2000	2000-2004	ML-24			0.019			*Band*
5	30	2000	2000-2004	ML-24			0.026			*Band*
6	14	2000	2000-2004	ML-24			0.018	2.58		*Band*
6	14	2000	2000-2004	ML-24			0.022			*Band*
6	14	2000	2000-2004	ML-24			0.022			*Band*
6	29	2000	2000-2004	ML-24			0.013	3.92		*Band*
6	29	2000	2000-2004	ML-24			0.021			*Band*
6	29	2000	2000-2004	ML-24			0.018			*Band*
	080813	2008	2005-2008	MILLE LACS, WQ 14				7.6		DNR Fisheries, Aitkin
	080909	2008	2005-2008	MILLE LACS, WQ 14				11.4		DNR Fisheries, Aitkin
	080514	2008	2005-2008	MILLE LACS, WQ 15				5.5		DNR Fisheries, Aitkin
	080618	2008	2005-2008	MILLE LACS, WQ 15				2.5		DNR Fisheries, Aitkin
	080715	2008	2005-2008	MILLE LACS, WQ 15				8.3		DNR Fisheries, Aitkin
	080813	2008	2005-2008	MILLE LACS, WQ 15				8.9		DNR Fisheries, Aitkin
	080909	2008	2005-2008	MILLE LACS, WQ 15				11.0		DNR Fisheries, Aitkin
	080514	2008	2005-2008	MILLE LACS, WQ 16				5.1		DNR Fisheries, Aitkin
	080618	2008	2005-2008	MILLE LACS, WQ 16				5.2		DNR Fisheries, Aitkin
	080715	2008	2005-2008	MILLE LACS, WQ 16				7.4		DNR Fisheries, Aitkin
	080813	2008	2005-2008	MILLE LACS, WQ 16				7.5		DNR Fisheries, Aitkin
	080909	2008	2005-2008	MILLE LACS, WQ 16				10.9		DNR Fisheries, Aitkin
	080514	2008	2005-2008	MILLE LACS, WQ 17				3.8		DNR Fisheries, Aitkin
	080618	2008	2005-2008	MILLE LACS, WQ 17				2.8		DNR Fisheries, Aitkin
	080715	2008	2005-2008	MILLE LACS, WQ 17				14.0		DNR Fisheries, Aitkin
	080813	2008	2005-2008	MILLE LACS, WQ 17				9.0		DNR Fisheries, Aitkin
	080909	2008	2005-2008	MILLE LACS, WQ 17				9.7		DNR Fisheries, Aitkin
	080514	2008	2005-2008	MILLE LACS, WQ 18				5.7		DNR Fisheries, Aitkin
	080618	2008	2005-2008	MILLE LACS, WQ 18				3.0		DNR Fisheries, Aitkin
	080715	2008	2005-2008	MILLE LACS, WQ 18				6.6		DNR Fisheries, Aitkin
	080909	2008	2005-2008	MILLE LACS, WQ 18				11.7		DNR Fisheries, Aitkin
	080813	2008	2005-2008	MILLE LACS, WQ 19						DNR Fisheries, Aitkin
	080715	2008	2005-2008	MILLE LACS, WQ 2				5.4		DNR Fisheries, Aitkin
	080715	2008	2005-2008	MILLE LACS, WQ 3				6.0		DNR Fisheries, Aitkin
	080715	2008	2005-2008	MILLE LACS, WQ 4				16.6		DNR Fisheries, Aitkin
	080715	2008	2005-2008	MILLE LACS, WQ 5				8.0		DNR Fisheries, Aitkin
	080514	2008	2005-2008	WQ 11				7.2		DNR Fisheries, Aitkin
	080514	2008	2005-2008	WQ 12				5.5		DNR Fisheries, Aitkin
	080514	2008	2005-2008	WQ 13				6.5		DNR Fisheries, Aitkin
	080514	2008	2005-2008	WQ 14				7.8		DNR Fisheries, Aitkin
	080514	2008	2005-2008	WQ 15				5.5		DNR Fisheries, Aitkin
	080514	2008	2005-2008	WQ 16				5.1		DNR Fisheries, Aitkin
	080514	2008	2005-2008	WQ 17				3.8		DNR Fisheries, Aitkin
	080514	2008	2005-2008	WQ 18				5.7		DNR Fisheries, Aitkin
	3/26/2008	2008	2005-2008	ML-1	3.69	0.450	0.006	1.49		*Band*
	6/24/2008	2008	2005-2008	ML-1		0.429	0.011	1.4		*Band*
	8/13/2008	2008	2005-2008	ML-1	3.56	0.455	0.015	2.98		*Band*
	9/24/2008	2008	2005-2008	ML-1	3.76	0.590	0.023	7.52	5.5	*Band*
	3/26/2008	2008	2005-2008	ML-20	3.43	0.433	0.008	2.16		*Band*
	6/24/2008	2008	2005-2008	ML-20		0.468	0.017	0.85	13.5	*Band*
	8/13/2008	2008	2005-2008	ML-20	3.42	0.541	0.021	7.03	10.0	*Band*
	9/24/2008	2008	2005-2008	ML-20	3.76	0.000	0.028	7.1	6.5	*Band*
	3/26/2008	2008	2005-2008	ML-24	3.44	0.459	0.009	3.52	19.2	*Band*
	6/24/2008	2008	2005-2008	ML-24		0.414	0.01	1.01	19.5	*Band*
	8/13/2008	2008	2005-2008	ML-24	3.45	0.521	0.019	4.93	12.0	*Band*
	9/24/2008	2008	2005-2008	ML-24	3.73	0.000	0.026	5.57	7.0	*Band*
	3/26/2008	2008	2005-2008	ML-6	3.49	0.439	0.008	1.65	19.9	*Band*
	6/24/2008	2008	2005-2008	ML-6		0.431	0.009	0.56	18.0	*Band*
	8/13/2008	2008	2005-2008	ML-6	3.55	0.484	0.021	4.06	10.0	*Band*
	9/24/2008	2008	2005-2008	ML-6	3.65	0.553	0.022	5.51	6.5	*Band*
	3/26/2008	2008	2005-2008	ML-6 Field Rep	3.49	0.434	0.009	1.16		*Band*
	6/24/2008	2008	2005-2008	ML-6 Field Rep		0.396	0.01	0.98		*Band*
	8/13/2008	2008	2005-2008	ML-6 Field Rep	3.54	0.473	0.019	5.15		*Band*
	9/24/2008	2008	2005-2008	ML-6 field rep	3.69	0.499	0.022	4.02		*Band*
	3/26/2008	2008	2005-2008	ML-CE	3.44	0.422	0.01	2.16	25.5	*Band*
	6/24/2008	2008	2005-2008	ML-CE		0.414	0.015	0.69	16.0	*Band*
	8/13/2008	2008	2005-2008	ML-CE	3.45	0.449	0.017	2.58	12.0	*Band*
	9/24/2008	2008	2005-2008	ML-CE	3.79	0.498	0.023	7.14	6.5	*Band*
	3/26/2008	2008	2005-2008	ML-Ditch 36	3.79	0.490	0.012	2.05		*Band*
	6/24/2008	2008	2005-2008	ML-Ditch 36		0.426	0.013	1.84		*Band*
	8/13/2008	2008	2005-2008	ML-Ditch 36	3.46	0.468	0.021	2.65		*Band*
	9/24/2008	2008	2005-2008	ML-Ditch 36	3.70	0.522	0.022	6.83		*Band*
	3/26/2008	2008	2005-2008	ML-Garrison	3.78	0.524	0.014	7.98		*Band*
	6/24/2008	2008	2005-2008	ML-Garrison		0.440	0.016	0.92		*Band*
	8/13/2008	2008	2005-2008	ML-Garrison	3.60	0.475	0.024	5.04		*Band*
	9/24/2008	2008	2005-2008	ML-Garrison	3.53	0.510	0.021	5.94	6.5	*Band*
	3/26/2008	2008	2005-2008	ML-Malone	3.81	0.526	0.018	4.04		*Band*
	6/24/2008	2008	2005-2008	ML-Malone	3.46	0.460	0.016	2.38		*Band*
	8/13/2008	2008	2005-2008	ML-Malone	3.43	0.471	0.017	2.97	10.0	*Band*
	9/24/2008	2008	2005-2008	ML-Malone	3.55	0.539	0.022	5.48	6.0	*Band*
	8/13/2008	2008	2005-2008	ML-N Shore	3.60	0.491	0.024	4.63	10.5	*Band*
	9/24/2008	2008	2005-2008	ML-N Shore	3.64	0.497	0.021	4.63	6.5	*Band*
	3/26/2008	2008	2005-2008	ML-NE	3.44	0.442	0.01	4.09	18.4	*Band*
	6/24/2008	2008	2005-2008	ML-NE	3.38	0.397	0.011	0.69	17.0	*Band*
	8/13/2008	2008	2005-2008	ML-NE	3.46	0.462	0.019	5.62	8.5	*Band*
	9/24/2008	2008	2005-2008	ML-NE	3.65	0.503	0.023	6.82	6.0	*Band*
	3/26/2008	2008	2005-2008	ML-NShore	3.55	0.433	0.007	1.32	17.8	*Band*
	6/24/2008	2008	2005-2008	ML-NShore	3.40	0.446	0.019	1.21	11.0	*Band*
	3/26/2008	2008	2005-2008	ML-NW	3.48	0.427	0.009	1.26	21.3	*Band*
	6/24/2008	2008	2005-2008	ML-NW	3.48	0.432	0.015	0.88	15.5	*Band*
	8/13/2008	2008	2005-2008	ML-NW	3.53	0.467	0.02	6.33	10.5	*Band*
	9/24/2008	2008	2005-2008	ML-NW	3.62	0.489	0.021	5.61	8.0	*Band*
	3/26/2008	2008	2005-2008	ML-Peterson	3.67	0.468	0.008	0.92	20.8	*Band*
	6/24/2008	2008	2005-2008	ML-Peterson	3.53	0.436	0.014	0.8	13.0	*Band*

Table 8: 1970-2008 Mille Lacs Lake Water Quality Data

Table Notes:

Cl	Chloride (ppm)
TN	Total Nitrogen (ppm)
TP	Total Phosphorus (ppb)
CHLA	Chlorophyll a (ppb)
SD M	Seechi Disc (feet)

Band - Mille Lacs Band of the Ojibwe, various programs and dates.
secchi depth data collected in the 1990's
Mille Lacs Lake Watershed Management Project (2000)
Surface Water Quality Monitoring for Long Term Trend Analysis (2005-2006)
Band-CLP - Mille Lacs Environmental Program, Mille Lacs Band of Ojibwe. Includes Clean Lakes Project (CLP) data (1992)
CLMP - Citizen Lake Monitoring Program, various dates (1974-2006).
MPCA - MPCA Lake Monitoring Program Project (1981).

Month	Day Date	Year	Year Group	SITE	Cl (ppm)	TN (ppm)	TP (ppm)	CHLA (ppb)	Secchi Rdg (ft)	Source
8	1	1992	1990-1994	ML-52			0.025	3.20	8.00	*Band-CLP*
8	15	1992	1990-1994	ML-52			0.023	4.45	6.99	*Band-CLP*
8	31	1992	1990-1994	ML-52			0.026	3.56		*Band-CLP*
9	12	1992	1990-1994	ML-52			0.020	4.27	5.58	*Band-CLP*
9	29	1992	1990-1994	ML-52					8.50	*Band-CLP*
10	30	1992	1990-1994	ML-52			0.015	1.60	7.38	*Band-CLP*
5	6	1992	1990-1994	ML-53			0.022	2.14	10.82	*Band-CLP*
5	27	1992	1990-1994	ML-53			0.031	1.60	10.66	*Band-CLP*
6	16	1992	1990-1994	ML-53			0.028	2.67		*Band-CLP*
6	23	1992	1990-1994	ML-53			0.023	1.60	7.54	*Band-CLP*
7	6	1992	1990-1994	ML-53			0.026			*Band-CLP*
7	18	1992	1990-1994	ML-53			0.022	7.48		*Band-CLP*
8	1	1992	1990-1994	ML-53			0.030	3.74		*Band-CLP*
8	15	1992	1990-1994	ML-53			0.021	4.45		*Band-CLP*
8	31	1992	1990-1994	ML-53			0.024	2.67		*Band-CLP*
9	12	1992	1990-1994	ML-53			0.019	4.27		*Band-CLP*
10	30	1992	1990-1994	ML-53			0.026	1.60	7.54	*Band-CLP*
5	6	1992	1990-1994	ML-6			0.026	4.81	11.48	*Band-CLP*
5	27	1992	1990-1994	ML-6			0.028	1.60	9.84	*Band-CLP*
7	14	2000	2000-2004	ML-24			0.028	7.83	8.00	*Band*
7	14	2000	2000-2004	ML-24			0.023			*Band*
7	14	2000	2000-2004	ML-24			0.027			*Band*
8	4	2000	2000-2004	ML-24			0.016	8.01	7.50	*Band*
8	4	2000	2000-2004	ML-24			0.016			*Band*
8	4	2000	2000-2004	ML-24			0.032			*Band*
8	22	2000	2000-2004	ML-24			0.022	4.70	8.00	*Band*
8	22	2000	2000-2004	ML-24			0.027			*Band*
8	22	2000	2000-2004	ML-24			0.024			*Band*
9	8	2000	2000-2004	ML-24			0.014	4.83	9.00	*Band*
9	8	2000	2000-2004	ML-24			0.018			*Band*
9	8	2000	2000-2004	ML-24			0.016			*Band*
10	18	2000	2000-2004	ML-24			0.012	4.49	11.50	*Band*
10	18	2000	2000-2004	ML-24			0.013			*Band*
10	18	2000	2000-2004	ML-24			0.011			*Band*
5	30	2000	2000-2004	ML-6			0.011	1.53		*Band*
5	30	2000	2000-2004	ML-6			0.016			*Band*
5	30	2000	2000-2004	ML-6			0.015			*Band*
6	14	2000	2000-2004	ML-6			0.014	1.80		*Band*
8	13/2008	2008	2005-2008	ML-Peterson	3.56	0.477	0.02	2.41	10.5	*Band*
9	24/2008	2008	2005-2008	ML-Peterson	3.68	0.544	0.022	4.46	5.5	*Band*
3	26/2008	2008	2005-2008	ML-SE	3.55	0.435	0.006	1.55	19.7	*Band*
6	24/2008	2008	2005-2008	ML-SE	3.56	0.448	0.014	0.78	16.0	*Band*
8	13/2008	2008	2005-2008	ML-SE	3.36	0.466	0.019	3.17	13.0	*Band*
9	24/2008	2008	2005-2008	ML-SE	3.58	0.500	0.021	6.89	6.5	*Band*
3	26/2008	2008	2005-2008	ML-Seventeen	3.60	0.453	0.009	1.54		*Band*
6	24/2008	2008	2005-2008	ML-Seventeen	4.51	0.467	0.017	1.44	11.5	*Band*
8	13/2008	2008	2005-2008	ML-Seventeen	3.45	0.479	0.021	3.47	10.5	*Band*
9	24/2008	2008	2005-2008	ML-Seventeen	3.68	0.518	0.02	3.85	5.5	*Band*
3	26/2008	2008	2005-2008	ML-Thaines	3.79	0.505	0.014	4.9		*Band*
6	24/2008	2008	2005-2008	ML-Thaines	3.62	0.547	0.022	4.49		*Band*
8	13/2008	2008	2005-2008	ML-Thains	3.52	0.492	0.017	3.55		*Band*
9	24/2008	2008	2005-2008	ML-Thains	3.70	0.525	0.021	6.84		*Band*
3	26/2008	2008	2005-2008	ML-Vineland	3.57	0.436	0.009	1.1	19.8	*Band*
6	24/2008	2008	2005-2008	ML-Vineland	3.36	0.394	0.011	0.74	15.5	*Band*
8	13/2008	2008	2005-2008	ML-Vineland	3.60	0.460	0.018	3.83	10.8	*Band*
9	24/2008	2008	2005-2008	ML-Vineland	3.81	0.501	0.021	5.56	6.5	*Band*

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Figure 1

Mille Lacs Lake and Watersheds

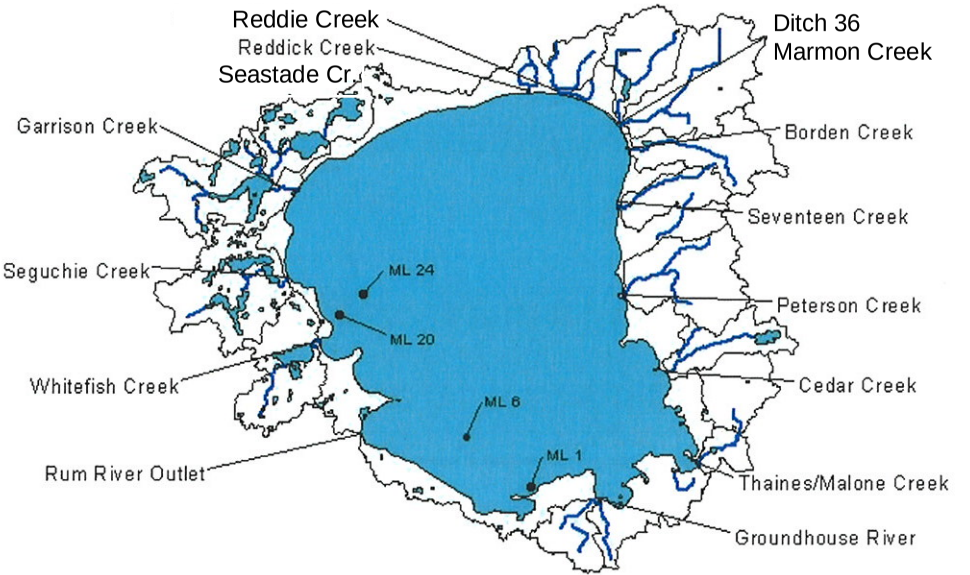


Figure 2

2007 & 2008 Tributary Sample Dates

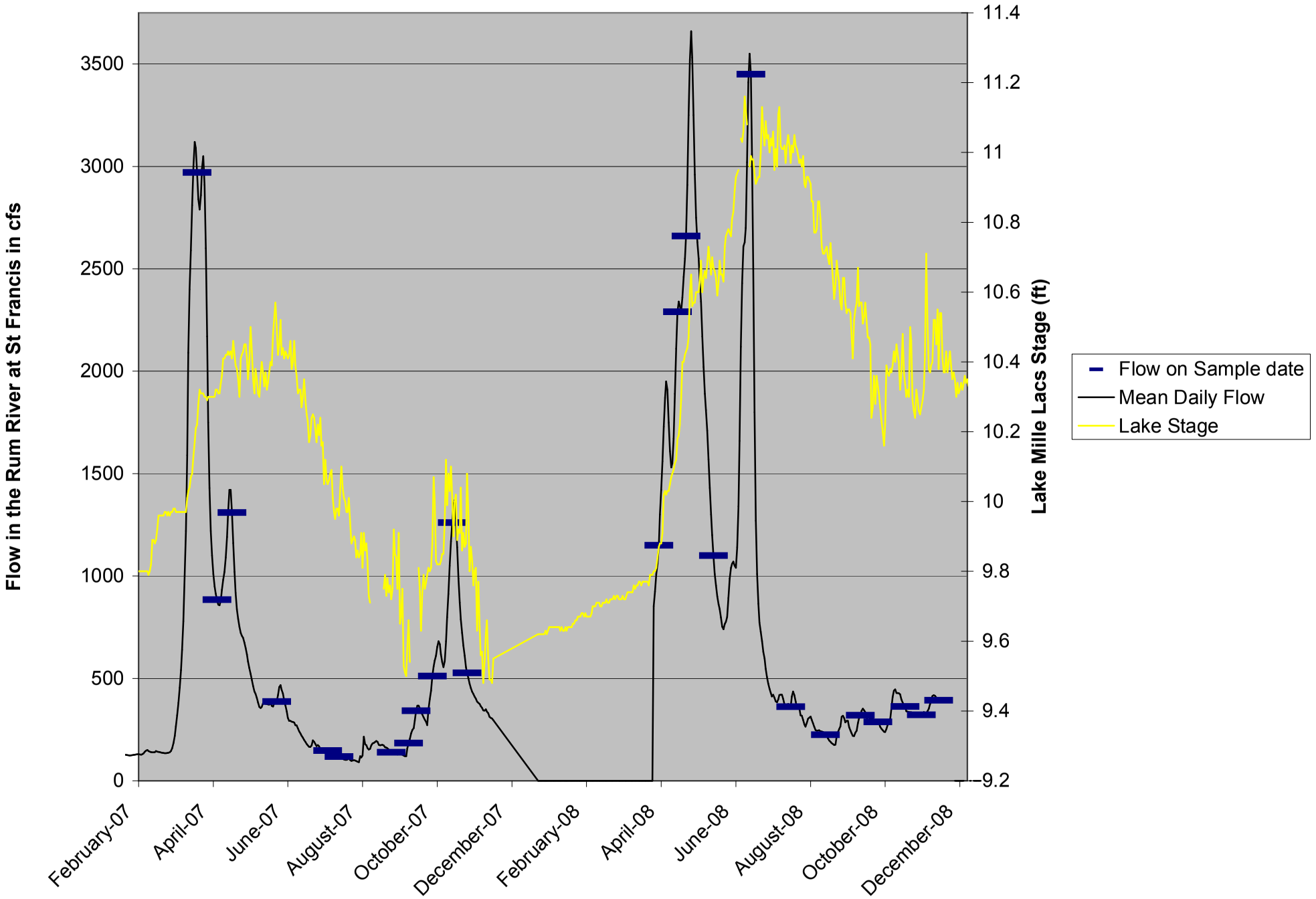


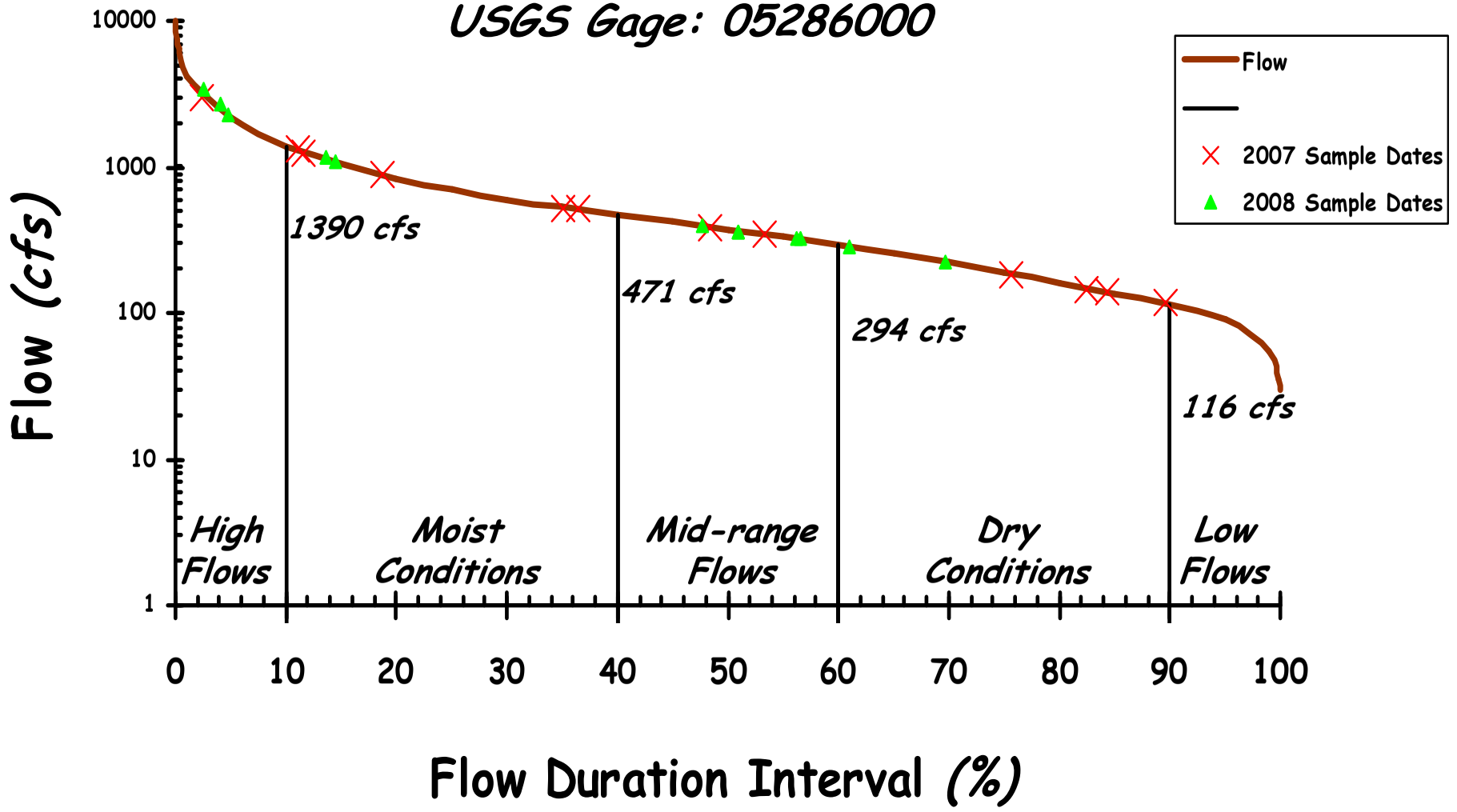
Figure 3

Rum River at St Francis, MN

Flow Duration Curve

(1929-2008)

USGS Gage: 05286000



USGS Flow Data

1360 square miles

Figure 4

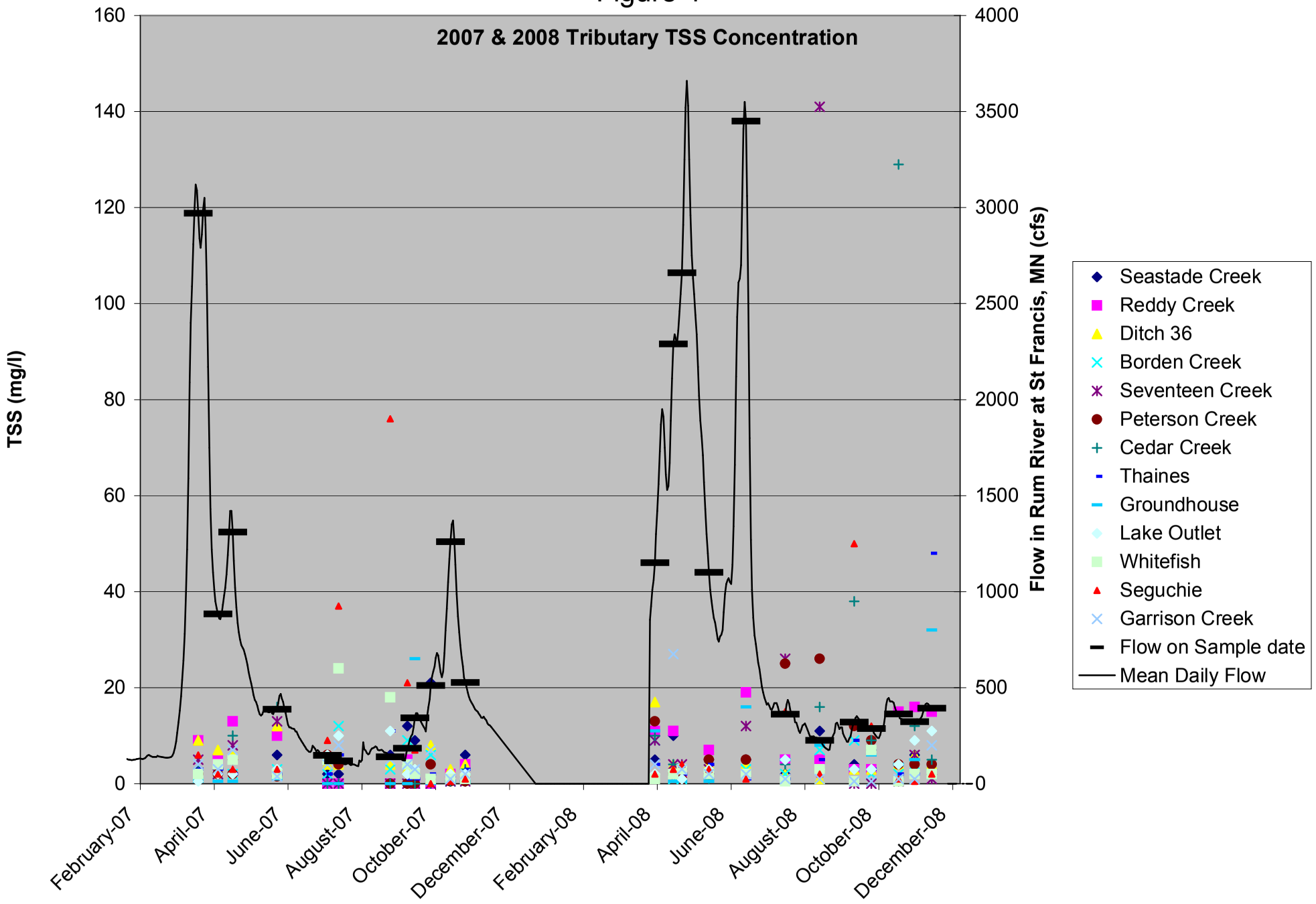
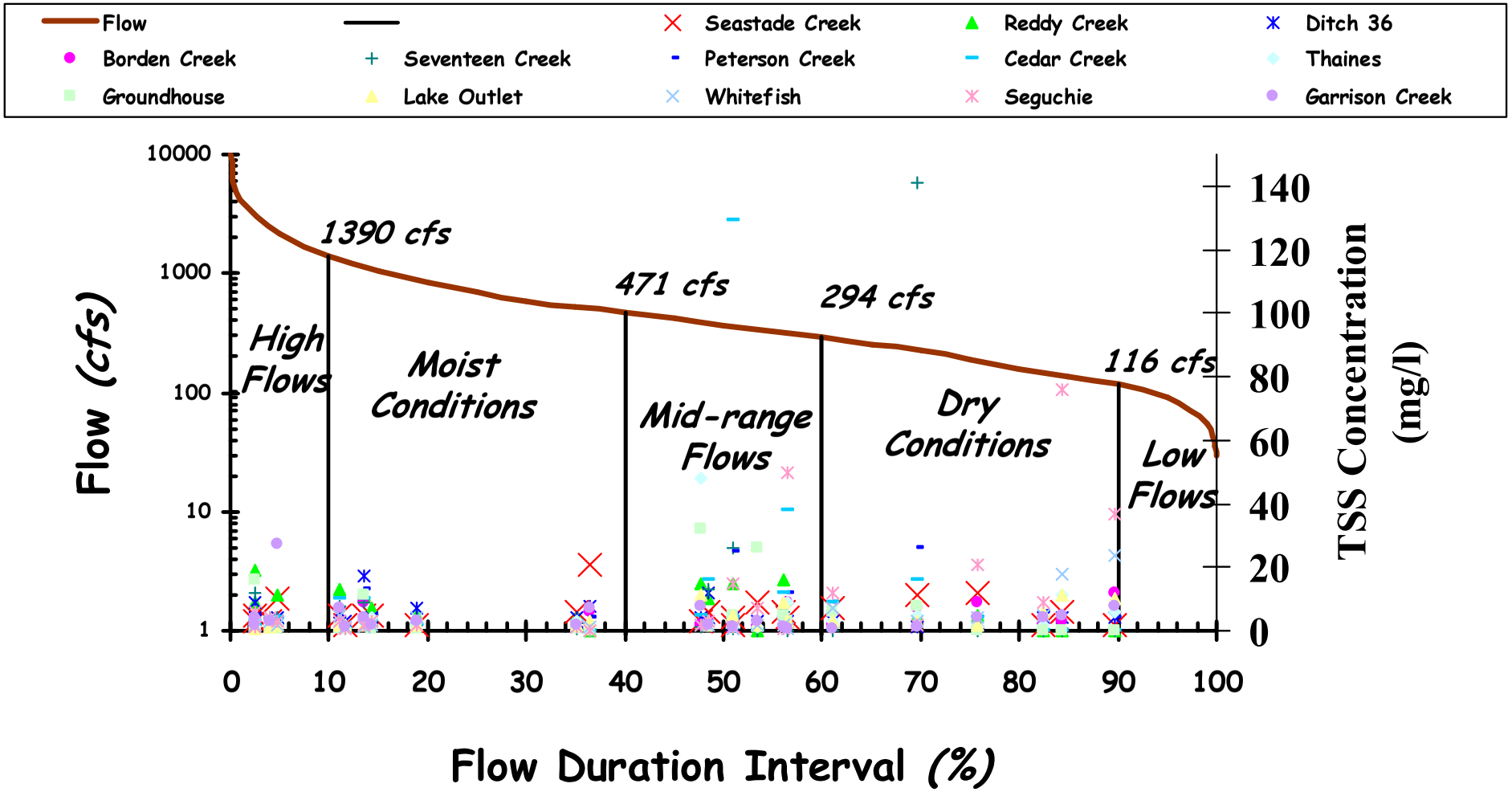

2007 & 2008 Tributary TSS Concentration
TSS (mg/l)
Flow in Rum River at St Francis, MN (cfs)
0
20
40
60
80
100
120
140
160
0
500
1000
1500
2000
2500
3000
3500
4000
February-07
April-07
June-07
August-07
October-07
December-07
February-08
April-08
June-08
August-08
October-08
December-08
Seastade Creek
Reddy Creek
Ditch 36
Borden Creek
Seventeen Creek
Peterson Creek
Cedar Creek
Thaines
Groundhouse
Lake Outlet
Whitefish
Seguchie
Garrison Creek
Flow on Sample date
Mean Daily Flow

Figure 5

Tributary TSS Concentrations: 2007/2008



USGS Flow Data

Figure 6

2007 & 2008 Tributary Chloride Concentration

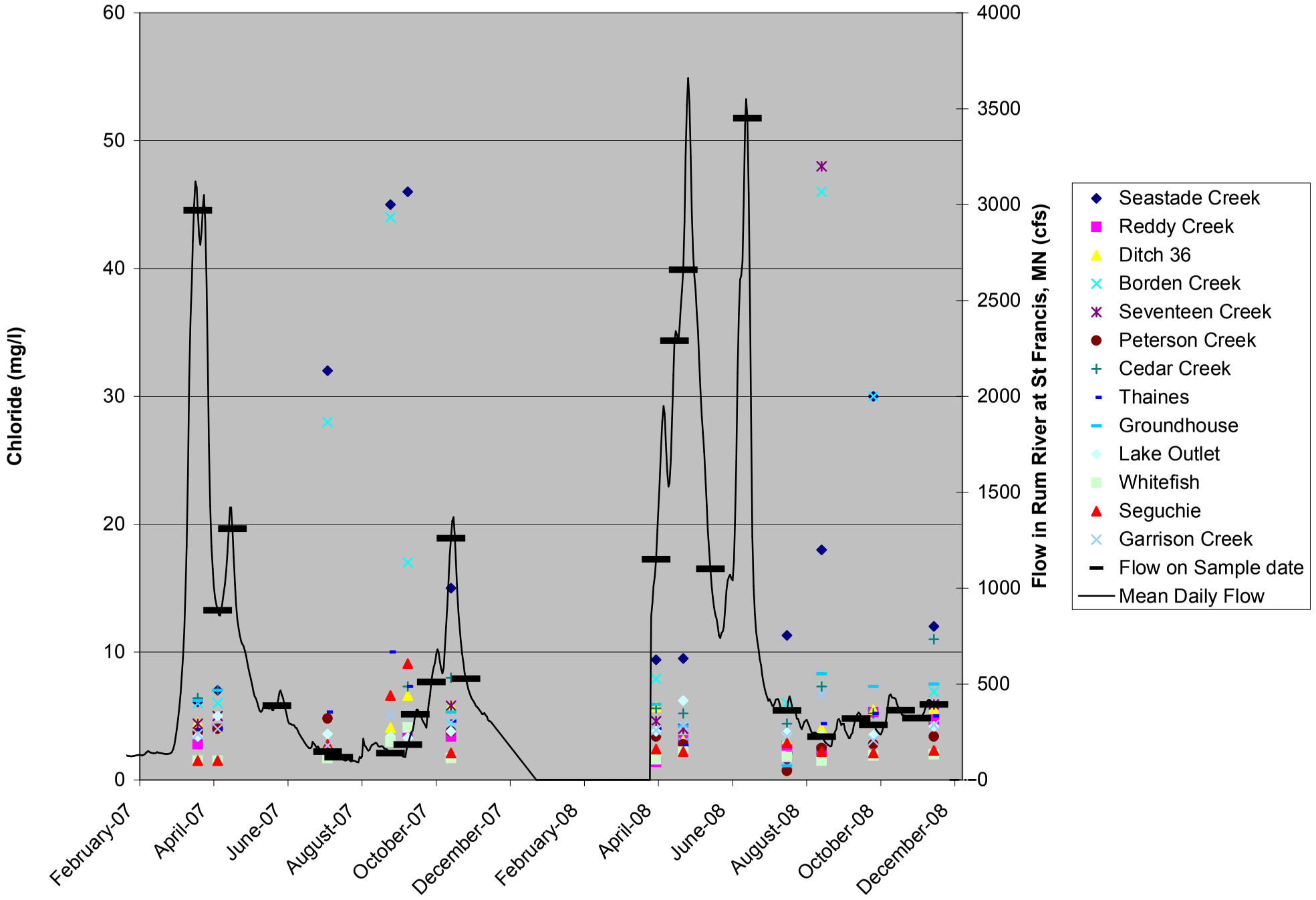
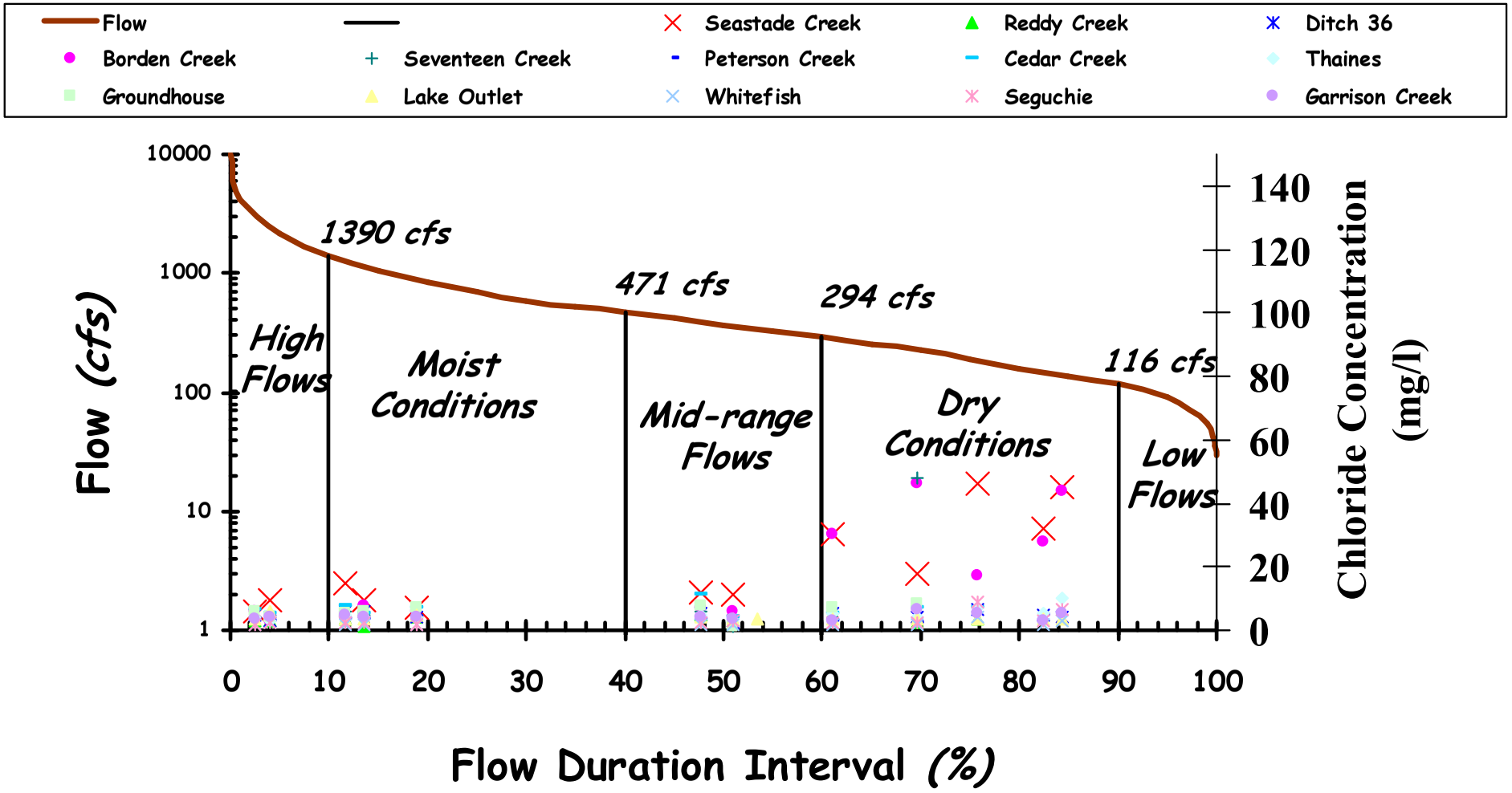


Figure 7

Tributary Chloride Concentrations: 2007/2008



USGS Flow Data

Figure 8

2007 & 2008 Tributary Phosphorus Concentration

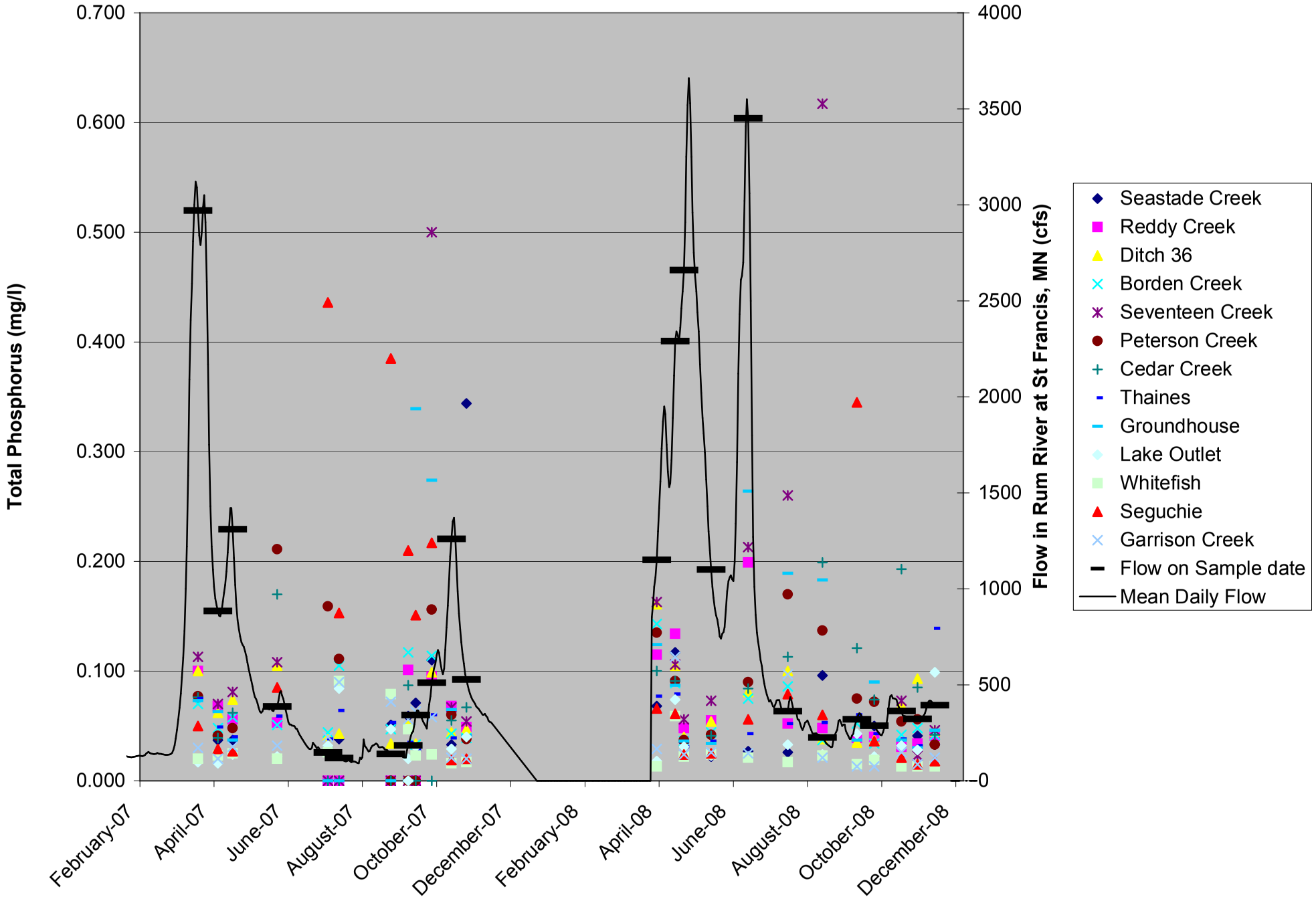
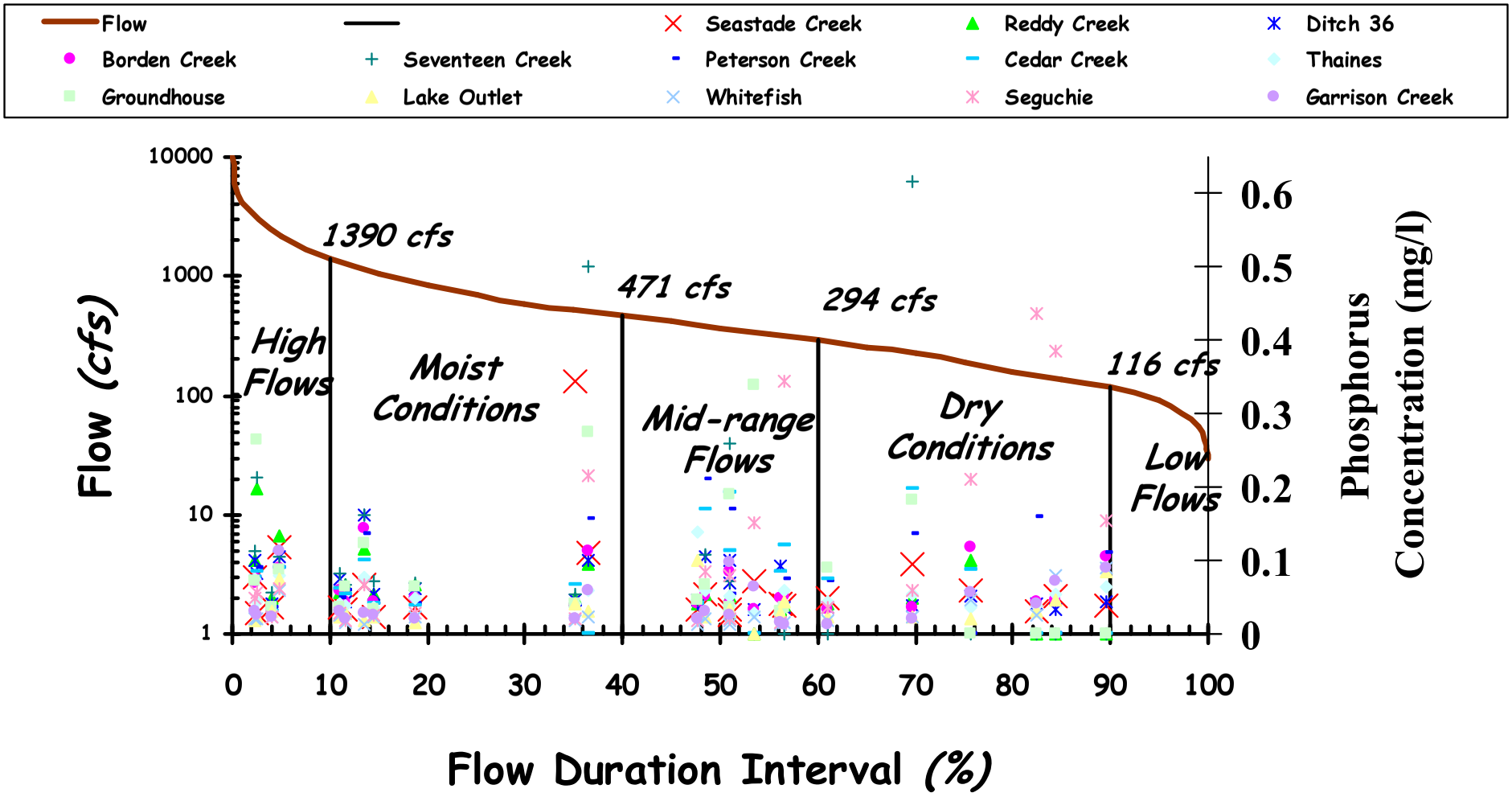


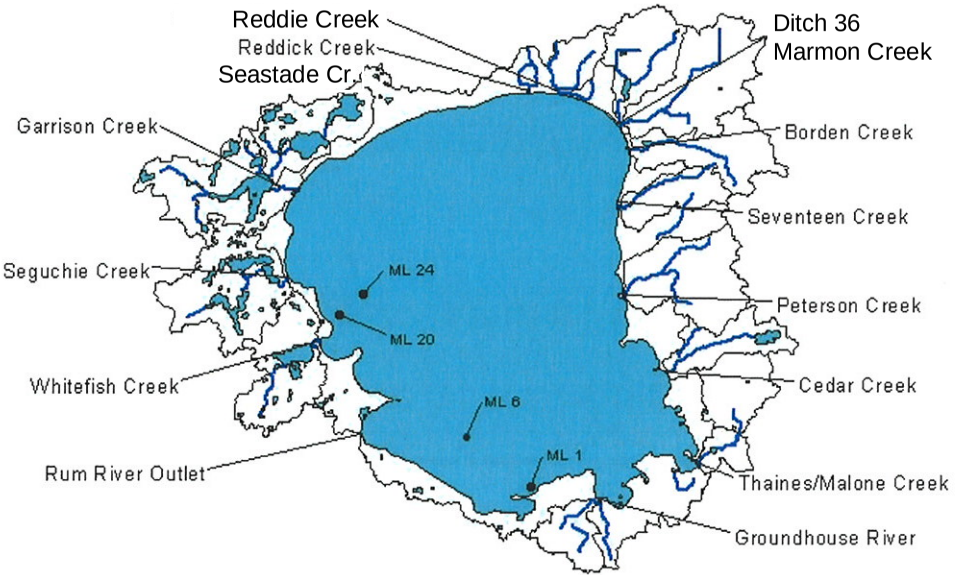
Figure 9

Tributary Phosphorus Concentrations: 2007/2008



USGS Flow Data

Figure 10
MLLWMG Study Lake and Tributary Sampling Sites



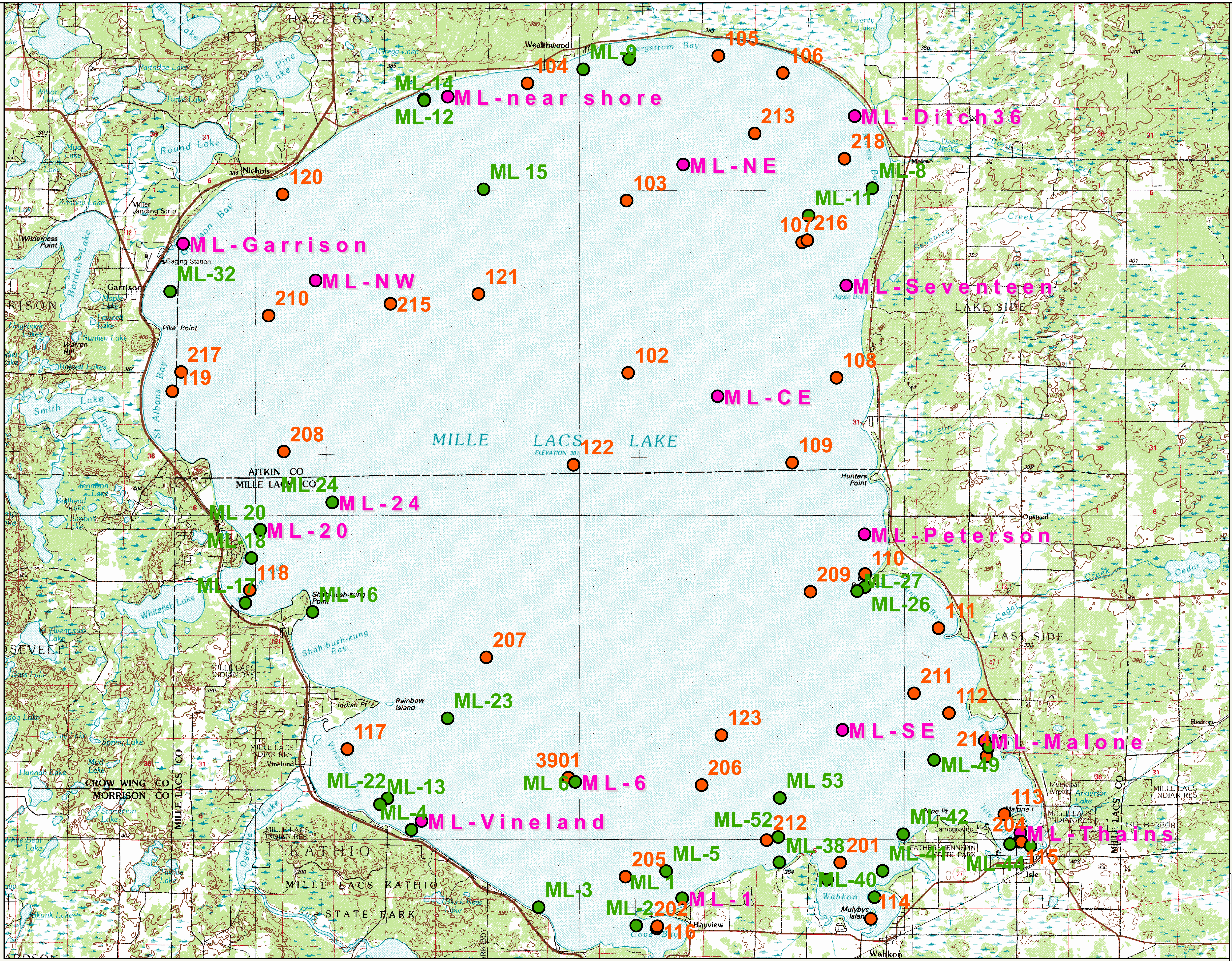


Figure 11
MPCA and MLB Sampling Sites

Legend

- 90_92_pts
- MPCA_data
- Band_data(05-07)

N E S W

Data source: MN DNR Data Deli

Figure 12

DNR Fisheries Sampling Sites

Water Sampling Stations for Mille Lacs lake, 1970-2008

Figure 13

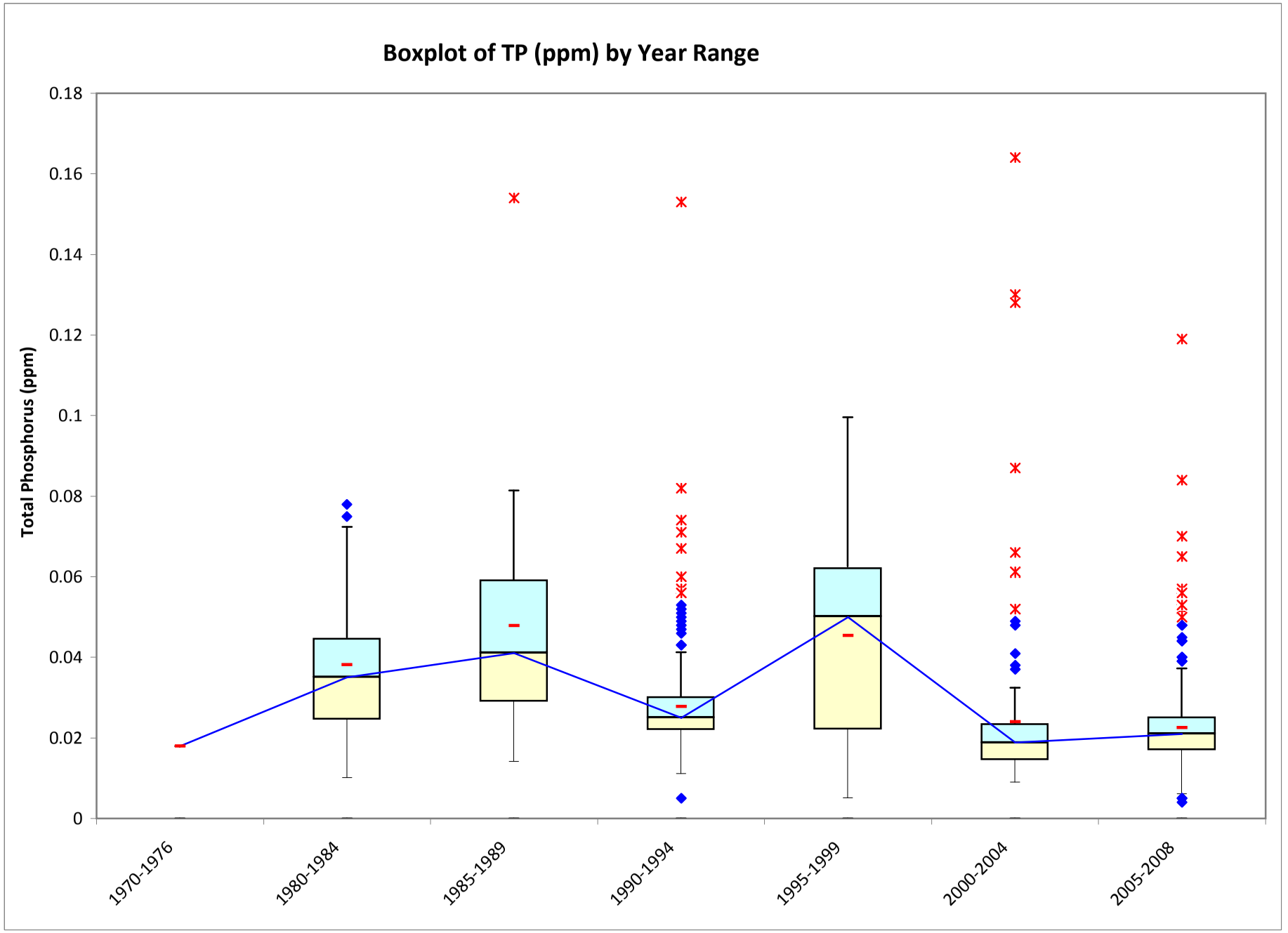

Boxplot of TP (ppm) by Year Range
Total Phosphorus (ppm)
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1970-1976
1980-1984
1985-1989
1990-1994
1995-1999
2000-2004
2005-2008

Figure 14

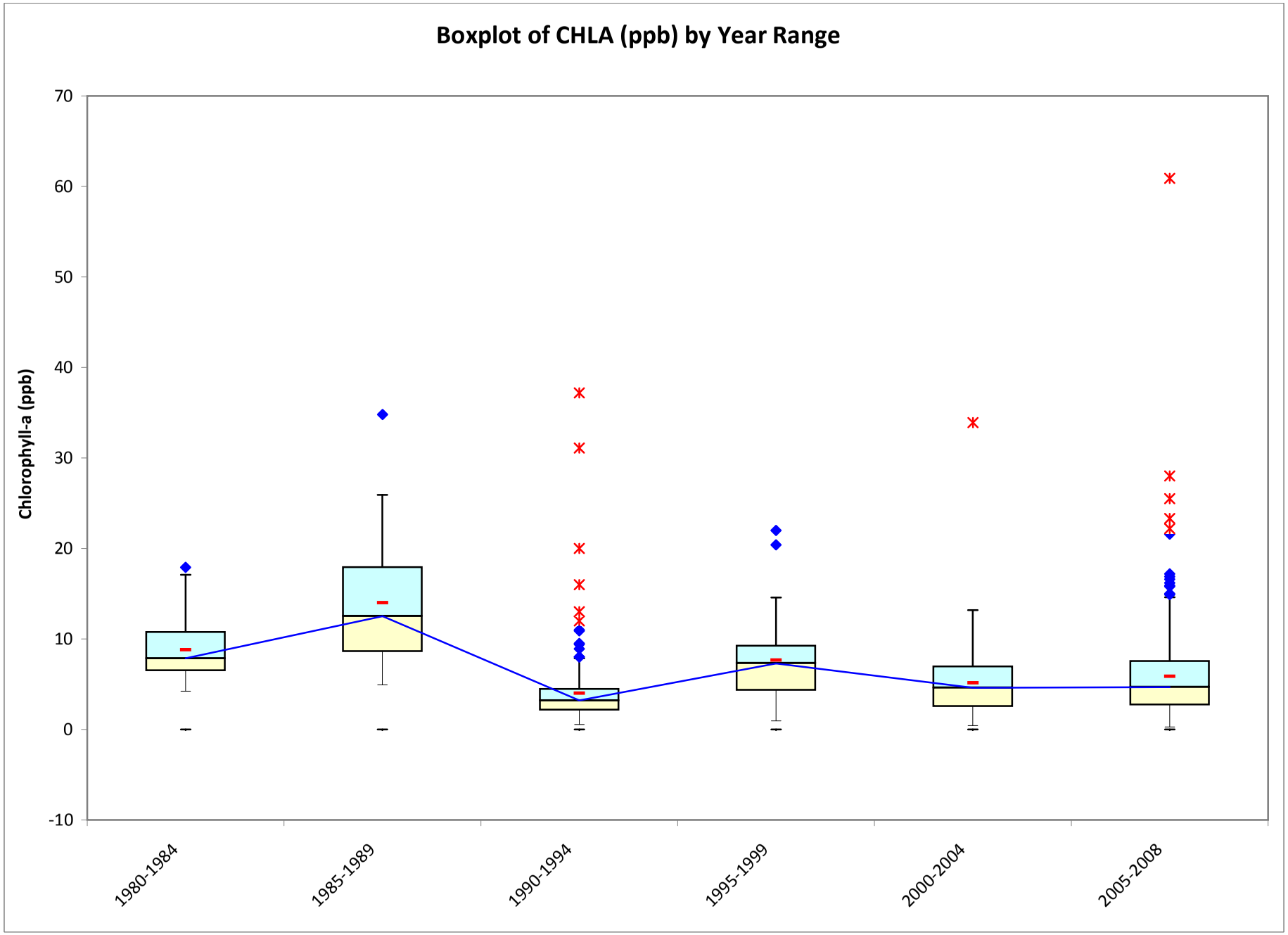

Boxplot of CHLA (ppb) by Year Range
Chlorophyll-a (ppb)
70
60
50
40
30
20
10
0
-10
1980-1984
1985-1989
1990-1994
1995-1999
2000-2004
2005-2008

Figure 15

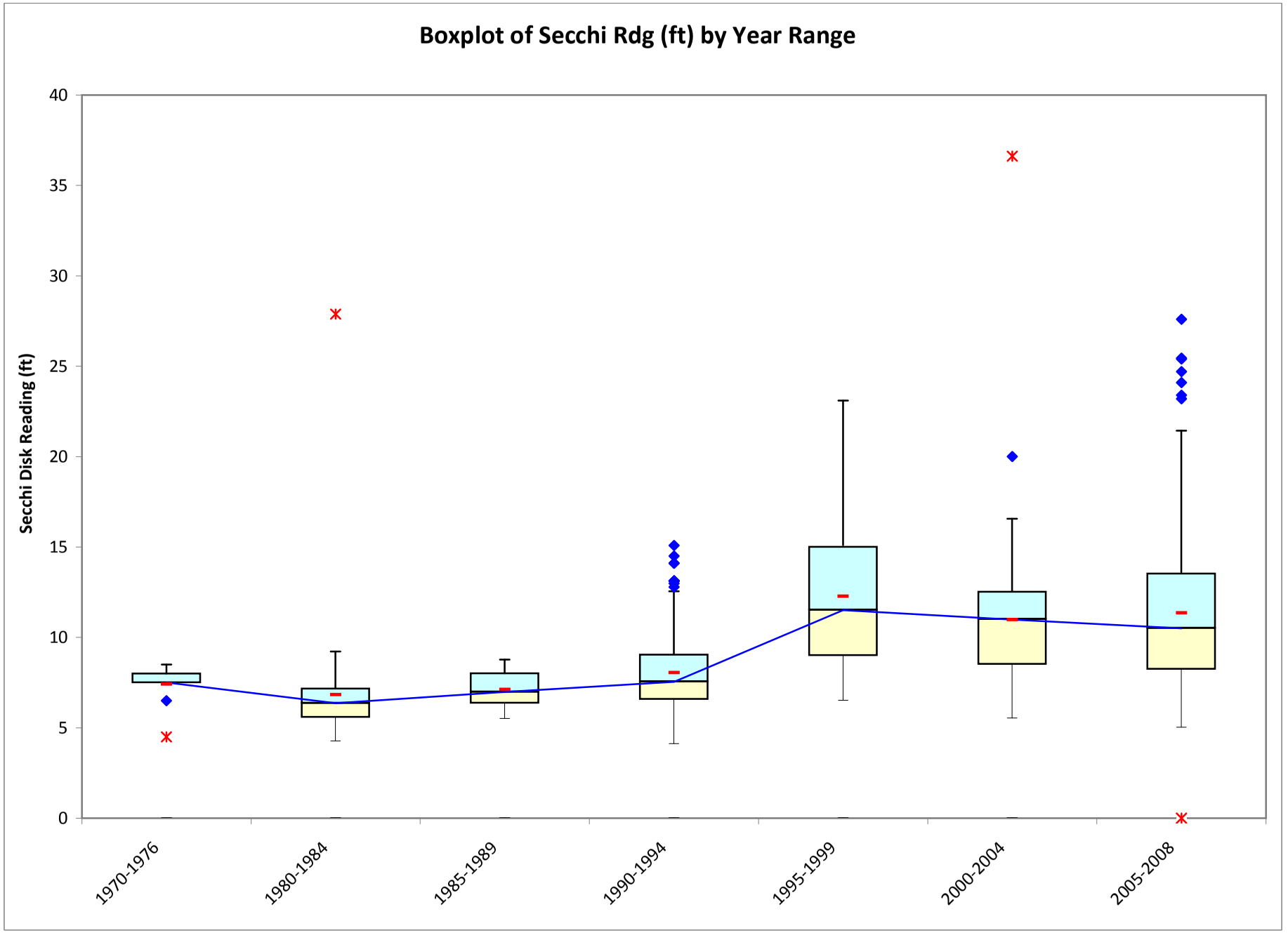

Boxplot of Secchi Rdg (ft) by Year Range
Secchi Disk Reading (ft)
40
35
30
25
20
15
10
5
0
1970-1976
1980-1984
1985-1989
1990-1994
1995-1999
2000-2004
2005-2008

Figure 16

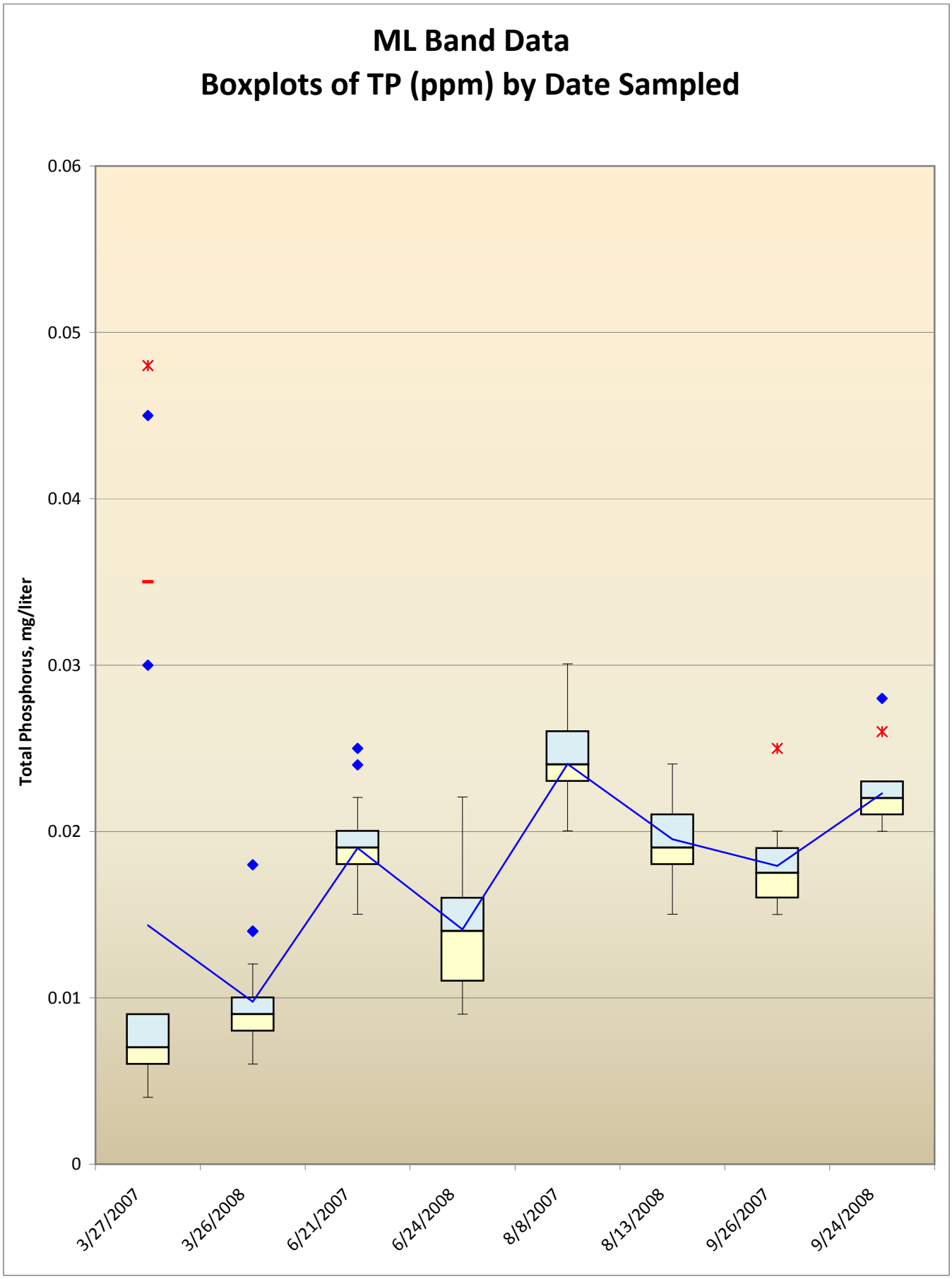

ML Band Data
Boxplots of TP (ppm) by Date Sampled
Total Phosphorus, mg/liter
0.06
0.05
0.04
0.03
0.02
0.01
0
3/27/2007
3/26/2008
6/21/2007
6/24/2008
8/8/2007
8/13/2008
9/26/2007
9/24/2008

Figure 17: Borden Creek Historical Water Quality Data

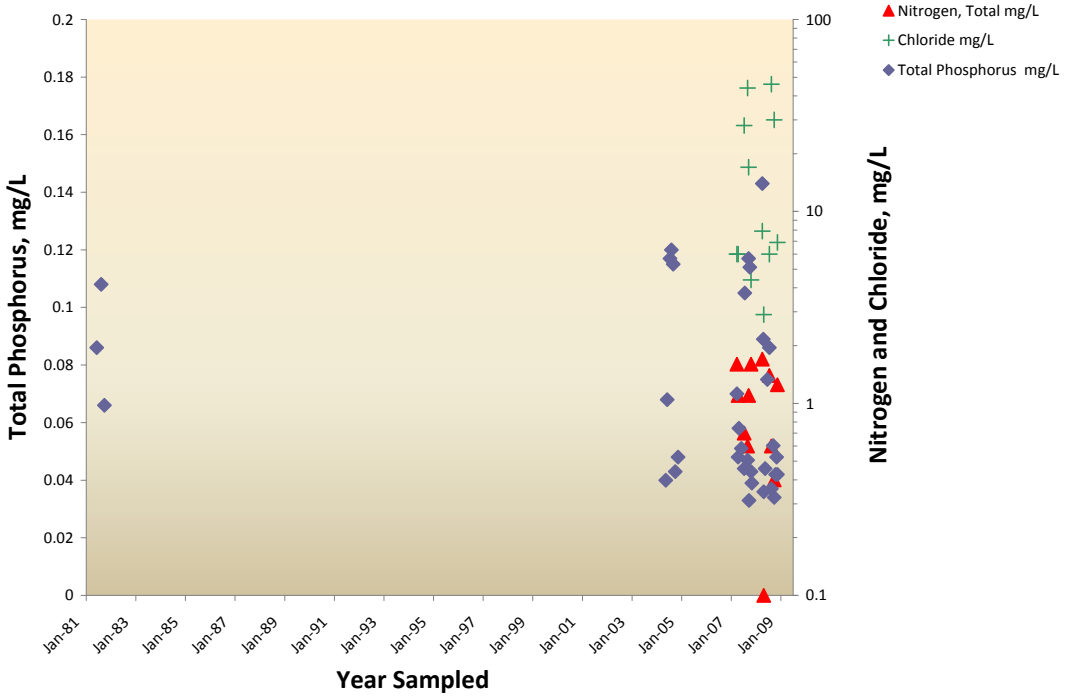


Figure 18: Cedar Creek Historical Water Quality Data

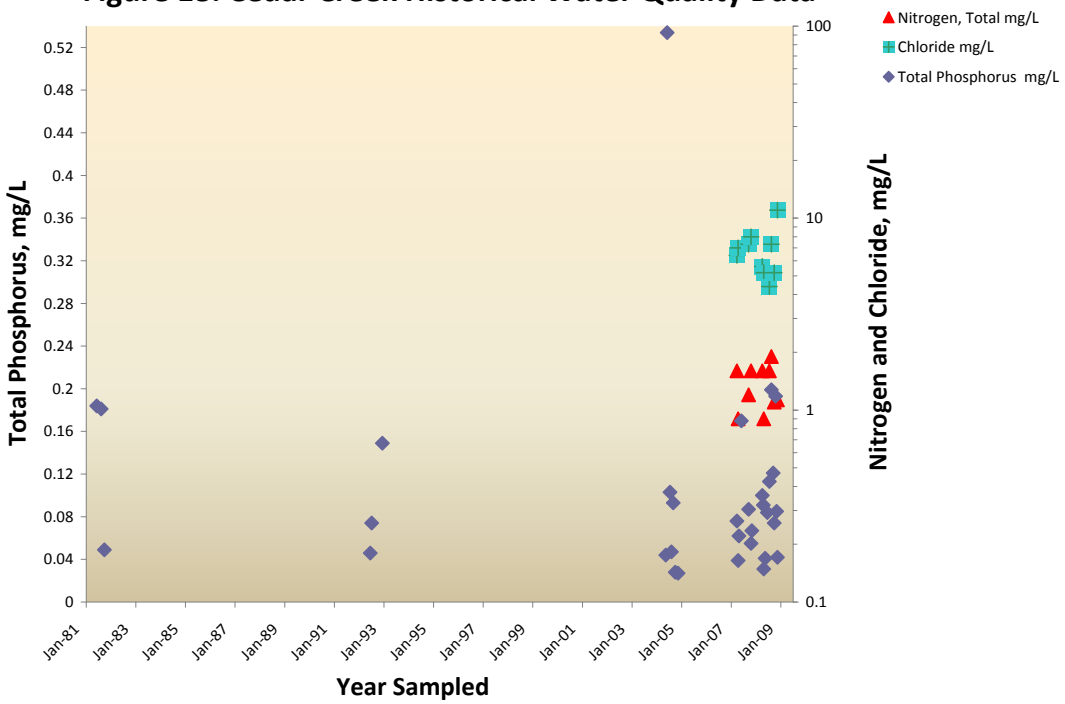


Figure 19: Garrison Creek Historical Water Quality Data

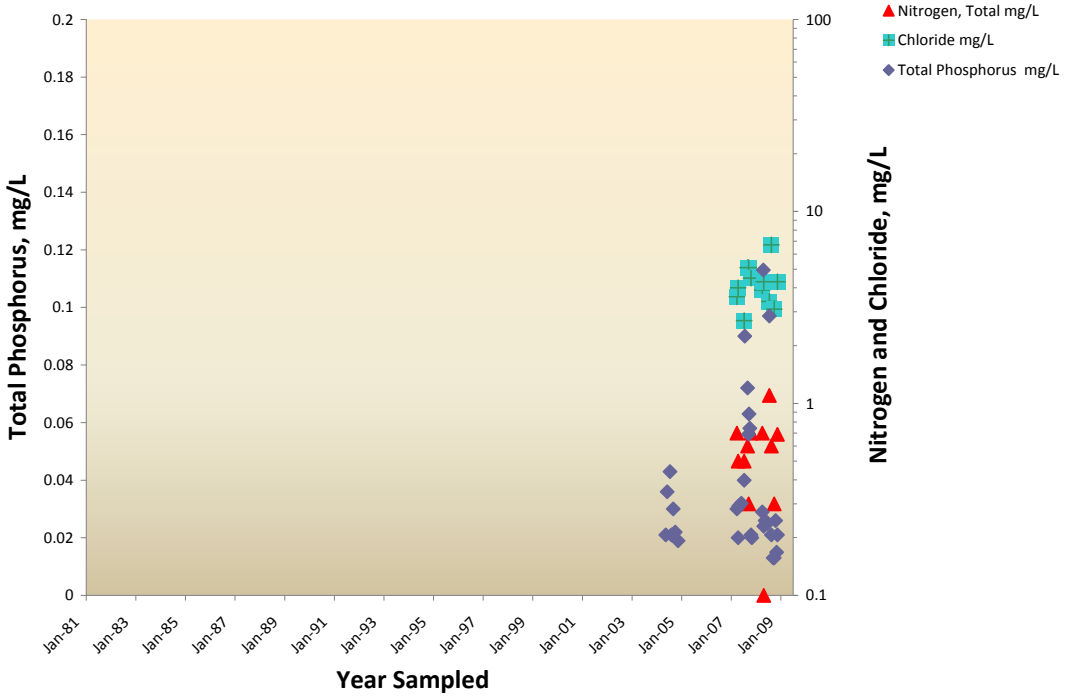


Figure 20: Groundhouse Creek Historical Water Quality Data

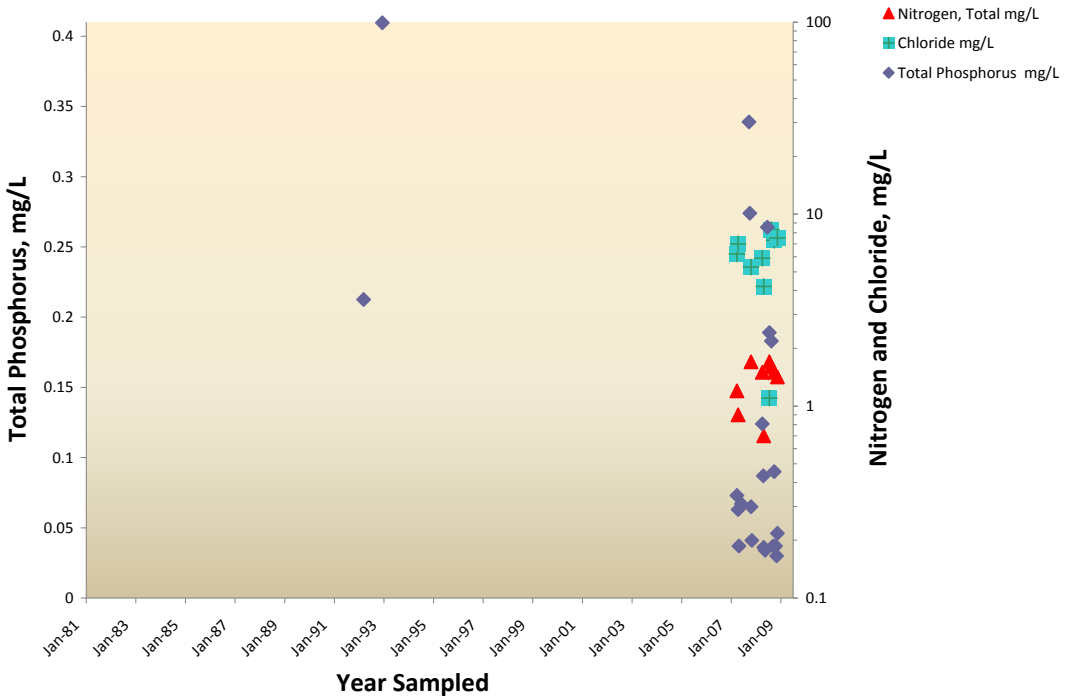


Figure 21: Malone/Thaines Creek Historical Water Quality Data

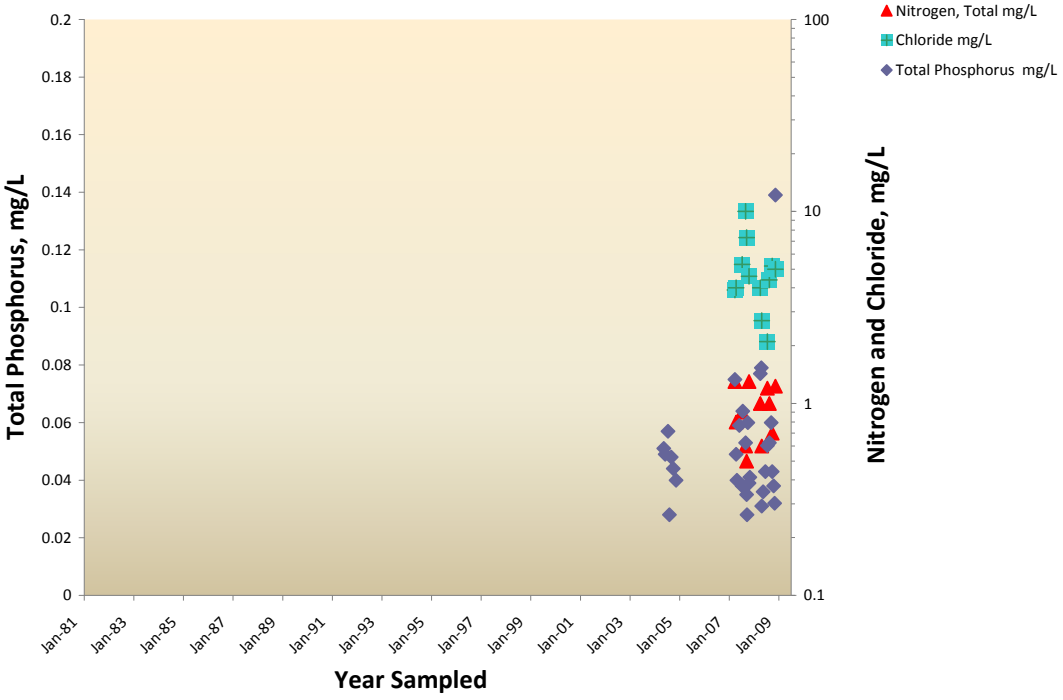


Figure 22: Ditch 36/Marmon Creek Historical Water Quality Data

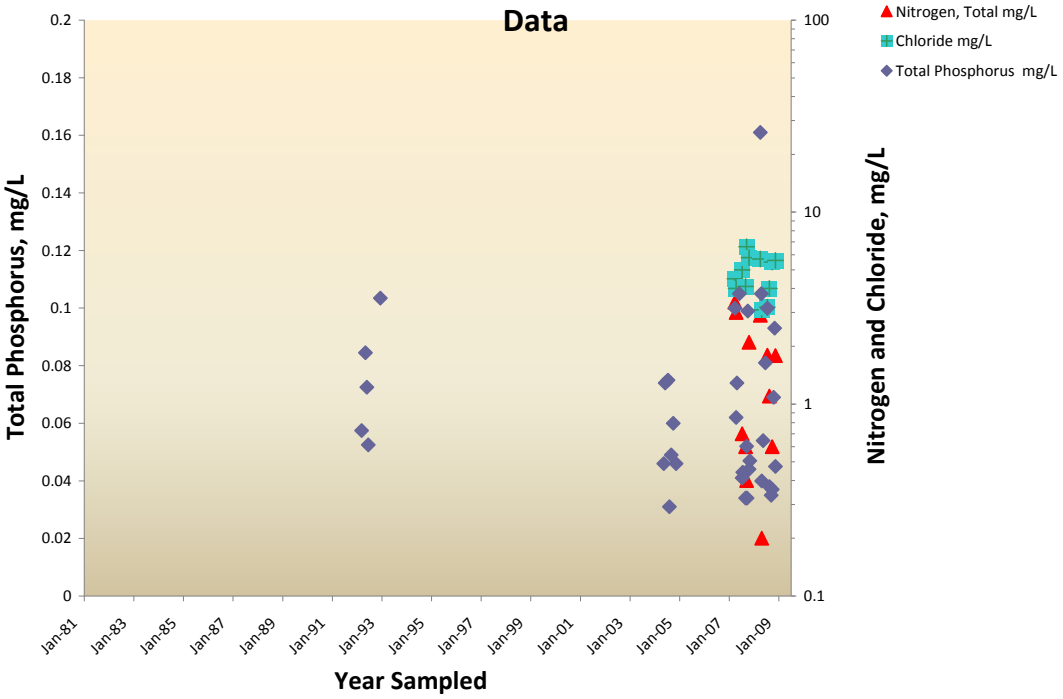


Figure 23: Peterson Creek Historical Water Quality Data

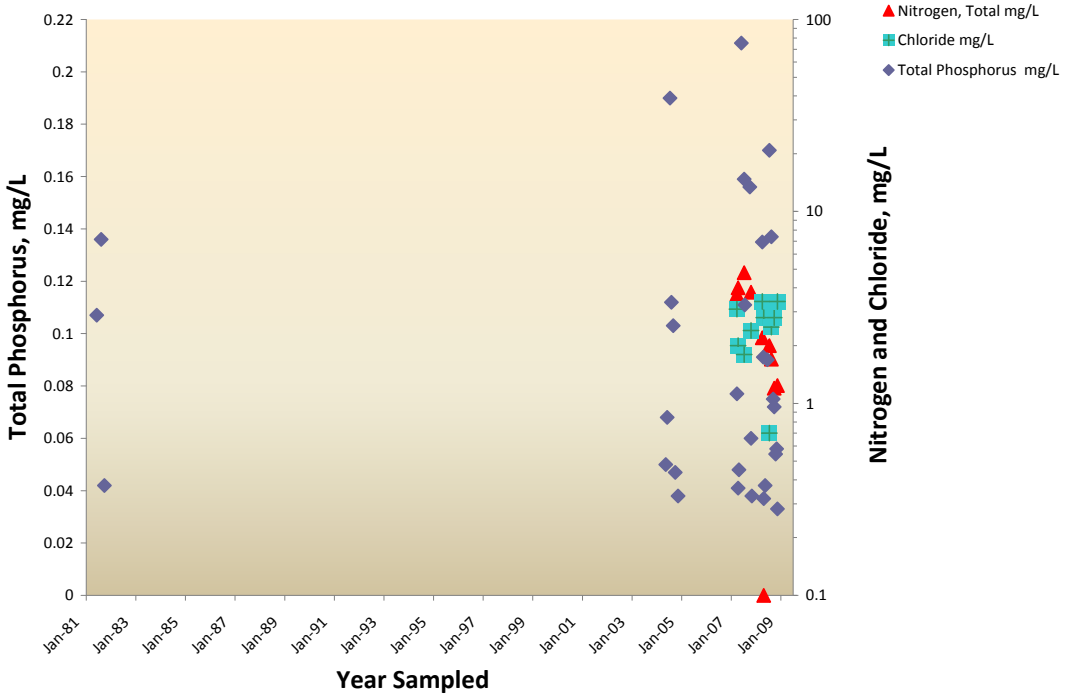


Figure 24: Reddie Creek Historical Water Quality Data

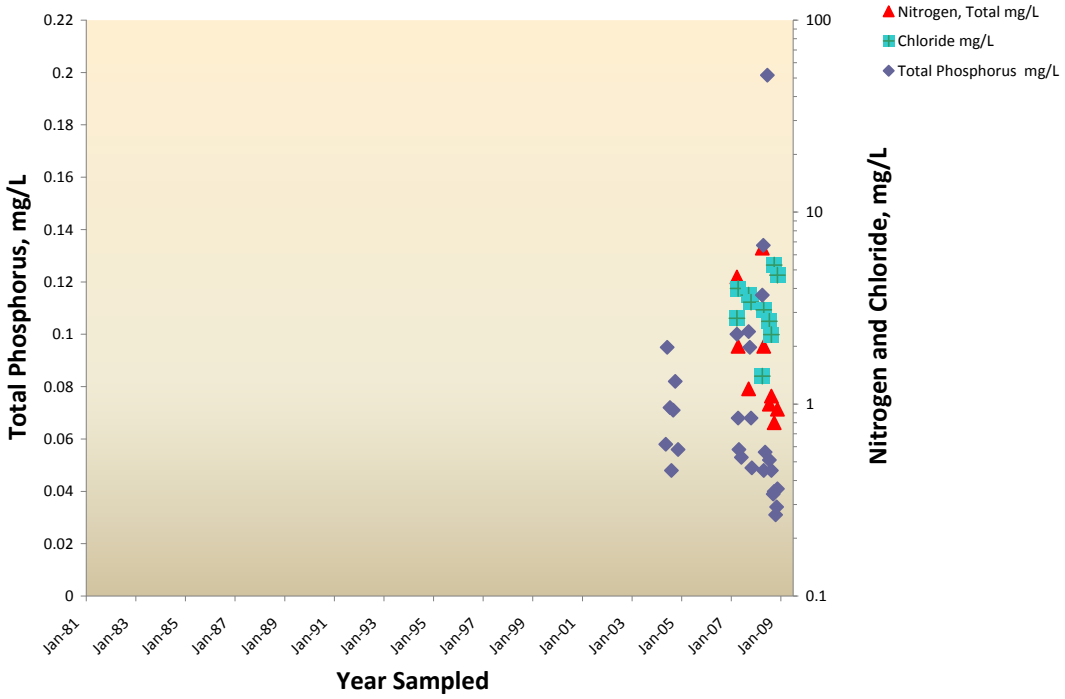


Figure 25: Seastade Creek Historical Water Quality Data

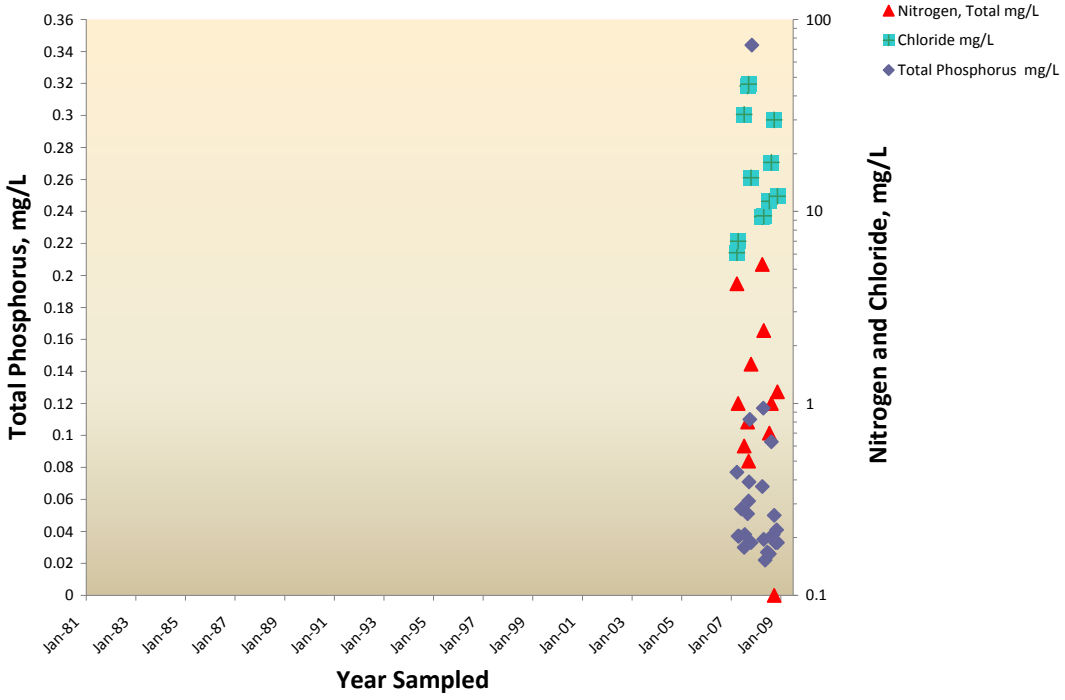


Figure 26: Seguchie Creek Historical Water Quality Data

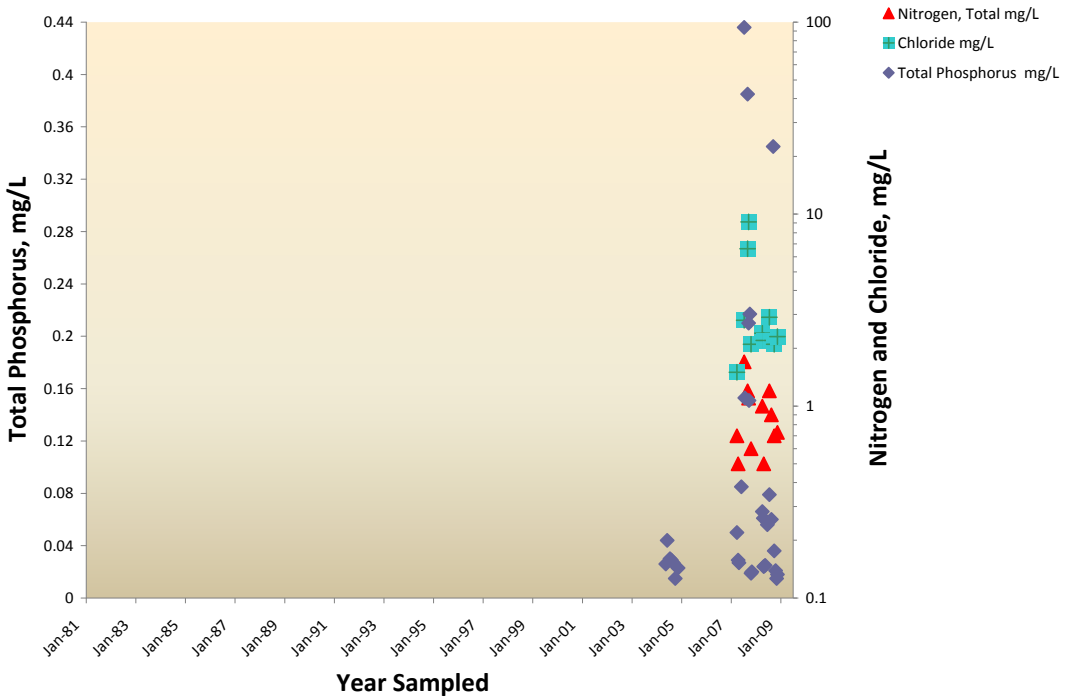


Figure 27: Seventeen Creek Historical Water Quality Data

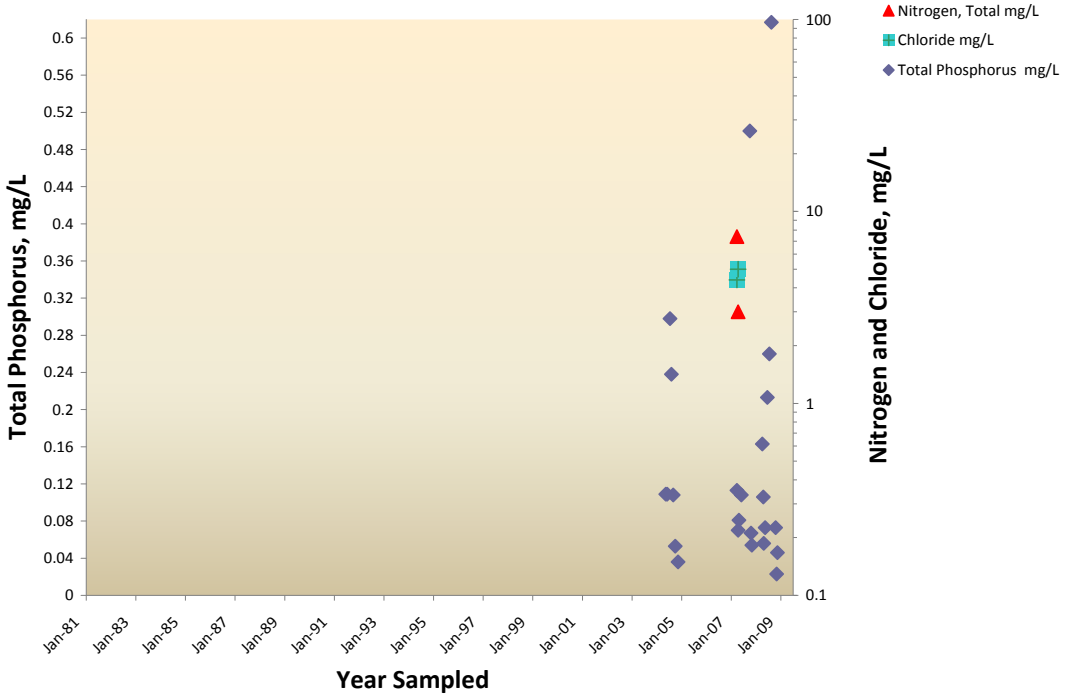
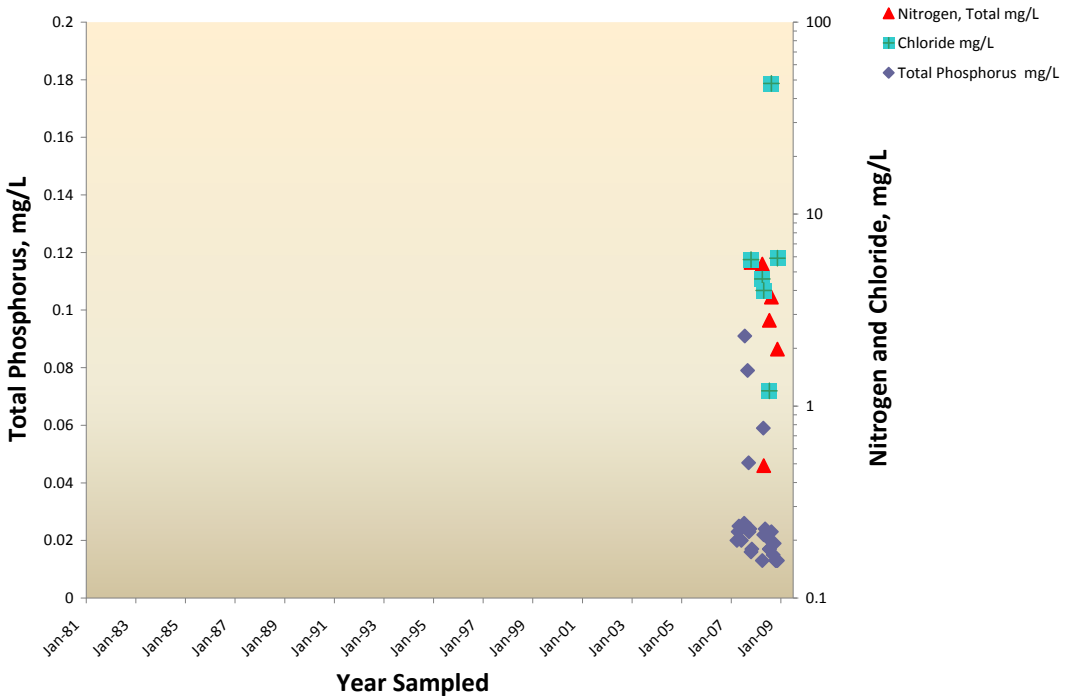


Figure 28: Whitefish Creek Historical Water Quality Data



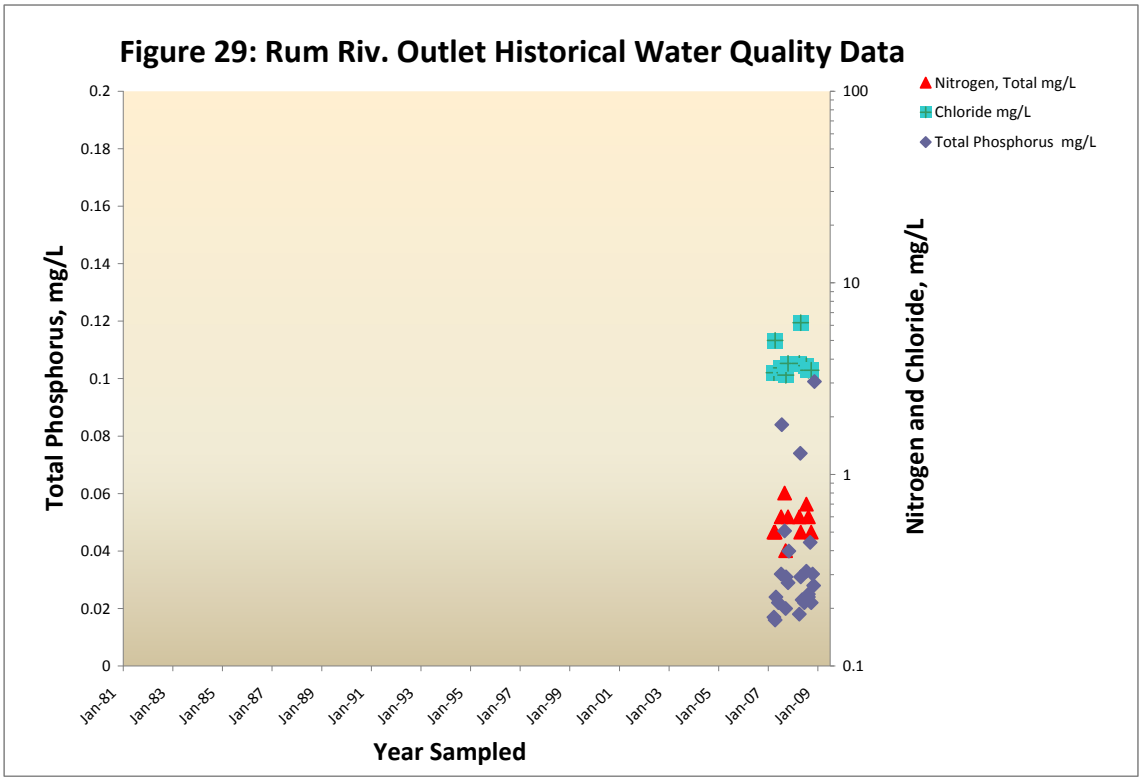


Figure 29: Rum Riv. Outlet Historical Water Quality Data
Nitrogen, Total mg/L
Chloride mg/L
Total Phosphorus mg/L
Total Phosphorus, mg/L
Nitrogen and Chloride, mg/L
Year Sampled
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
100
10
1
0.1
Jan-81
Jan-83
Jan-85
Jan-87
Jan-89
Jan-91
Jan-93
Jan-95
Jan-97
Jan-99
Jan-01
Jan-03
Jan-05
Jan-07
Jan-09

Figure 30
Borden Creek, Total Phosphorus vs. Transparency Reading
2007 and 2008 Data

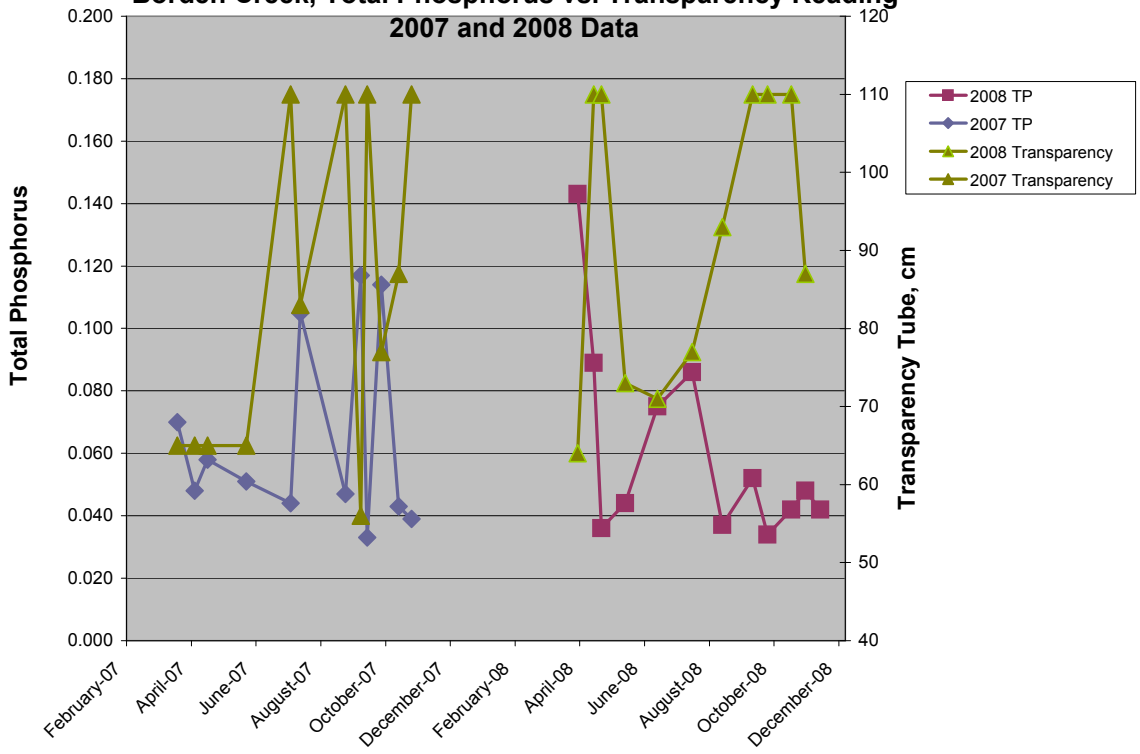


Figure 31
Cedar Creek, Total Phosphorus vs. Transparency Reading
2007 and 2008 Data

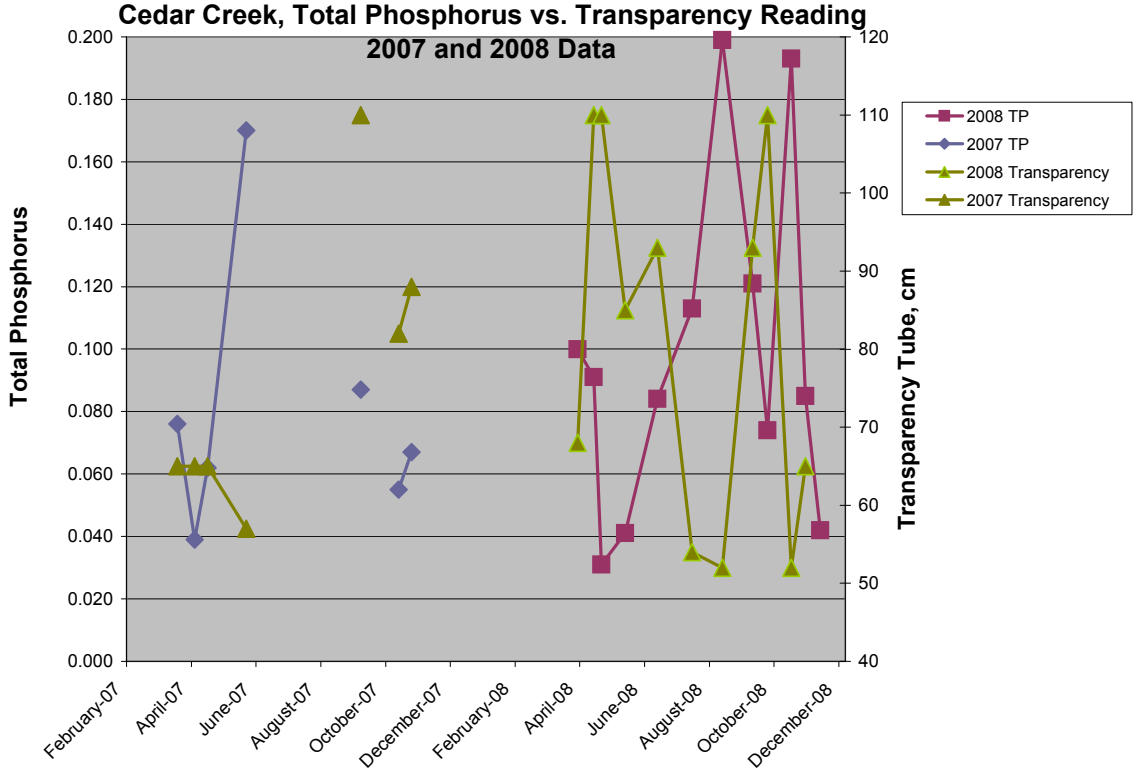


Figure 32
Ditch 36, Total Phosphorus vs. Transparency Reading
2007 and 2008 Data

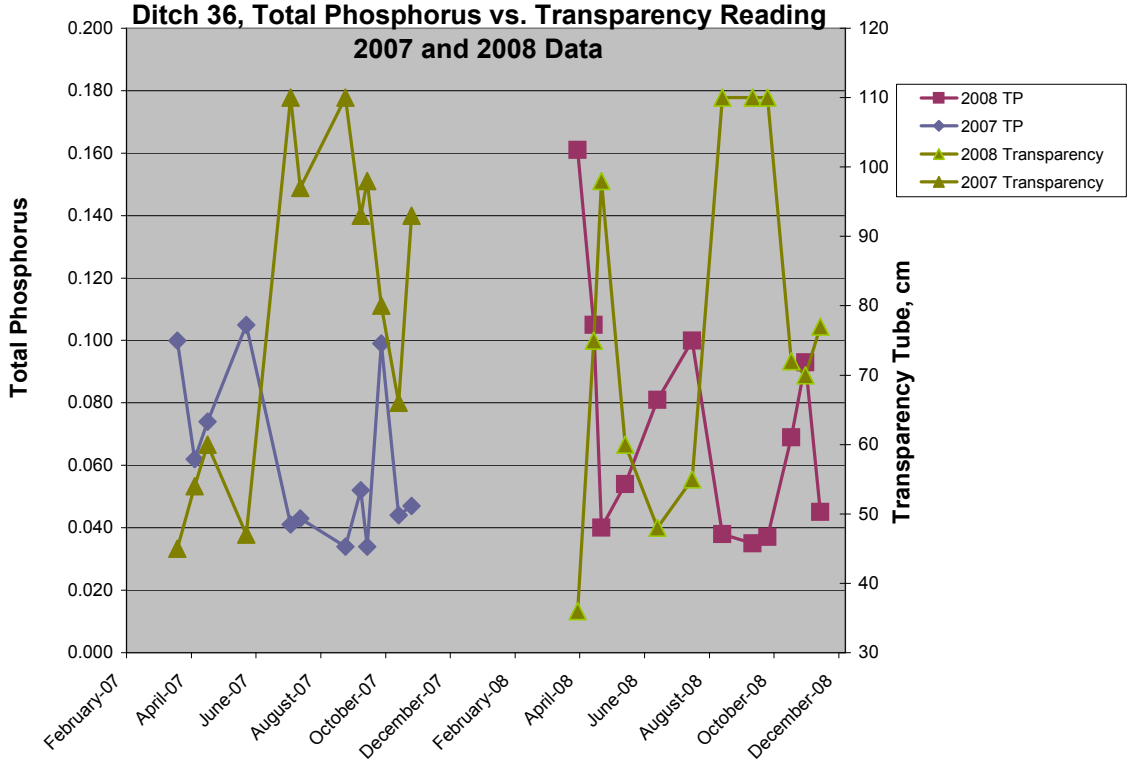


Figure 33
Garrison Cr., Total Phosphorus vs. Transparency Reading
2007 and 2008 Data

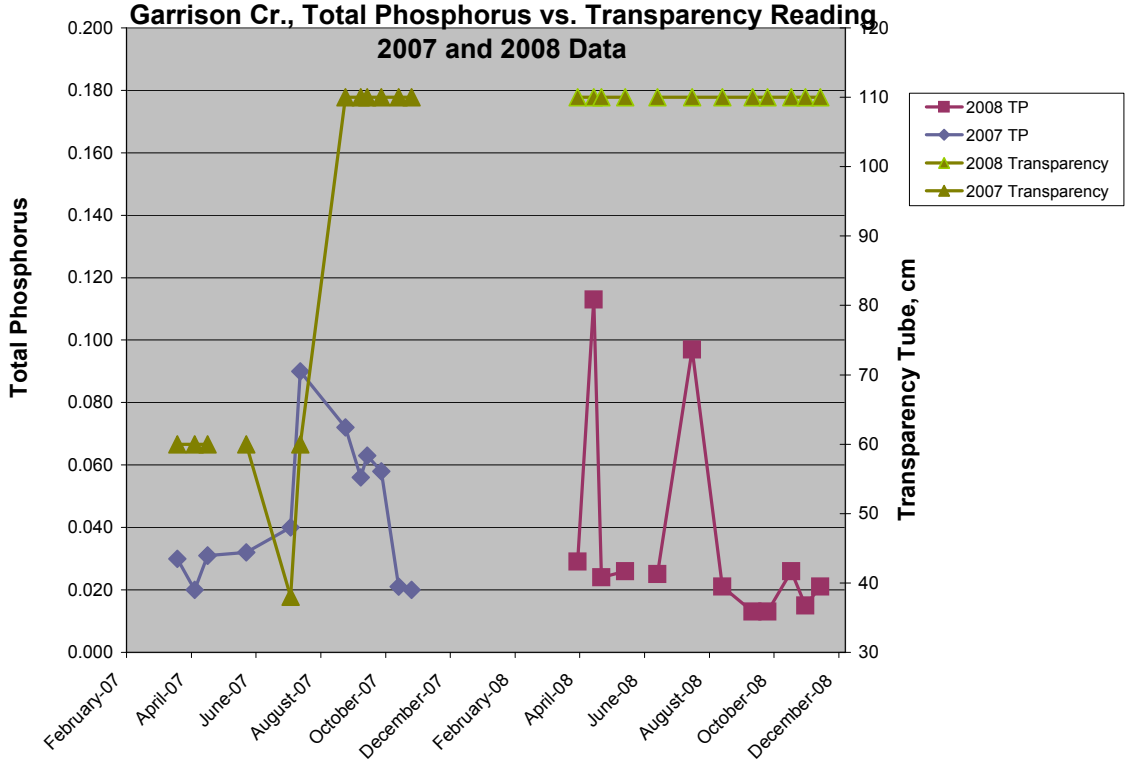


Figure 34
Groundhouse, Total Phosphorus vs. Transparency Reading
2007 and 2008 Data

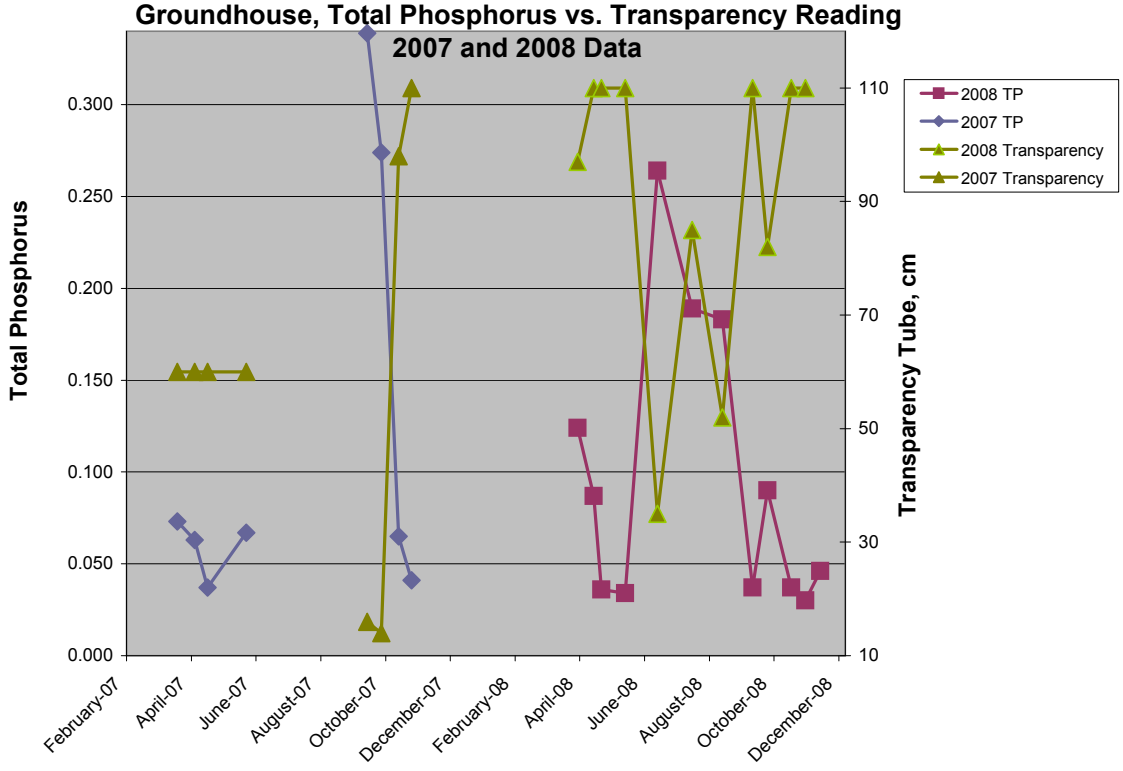


Figure 35
Peterson Cr., Total Phosphorus vs. Transparency Reading
2007 and 2008 Data

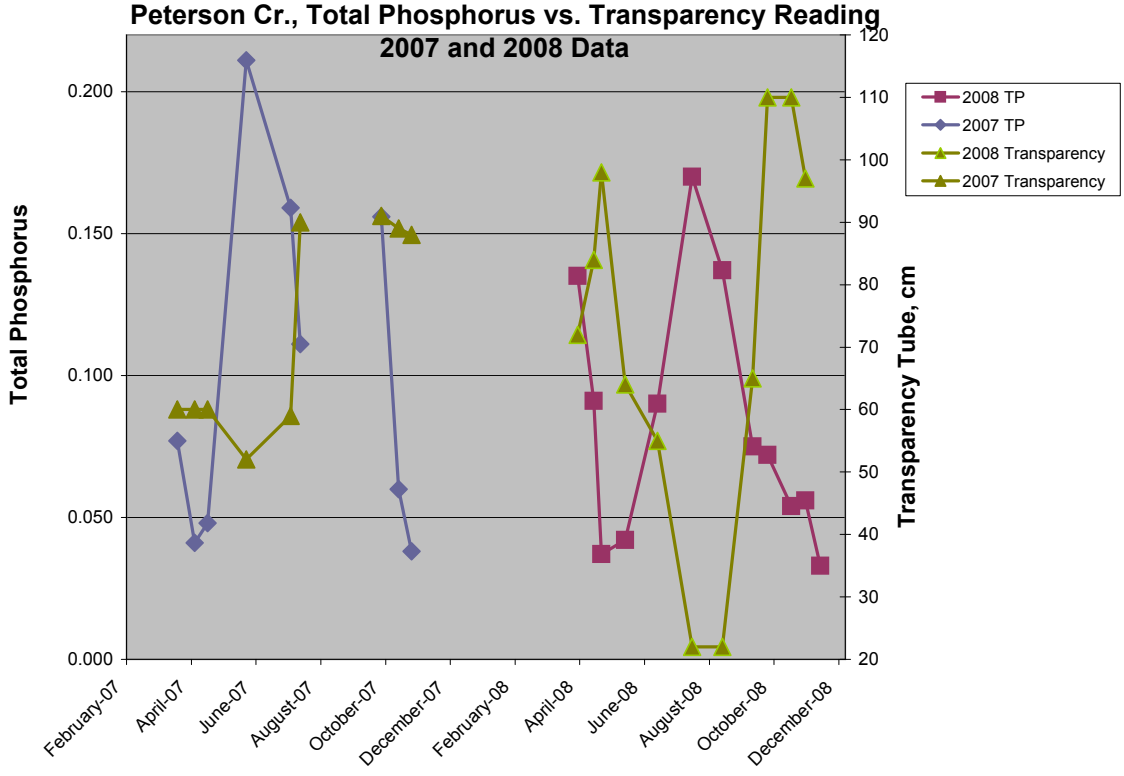


Figure 36
Reddy Cr., Total Phosphorus vs. Transparency Reading
2007 and 2008 Data

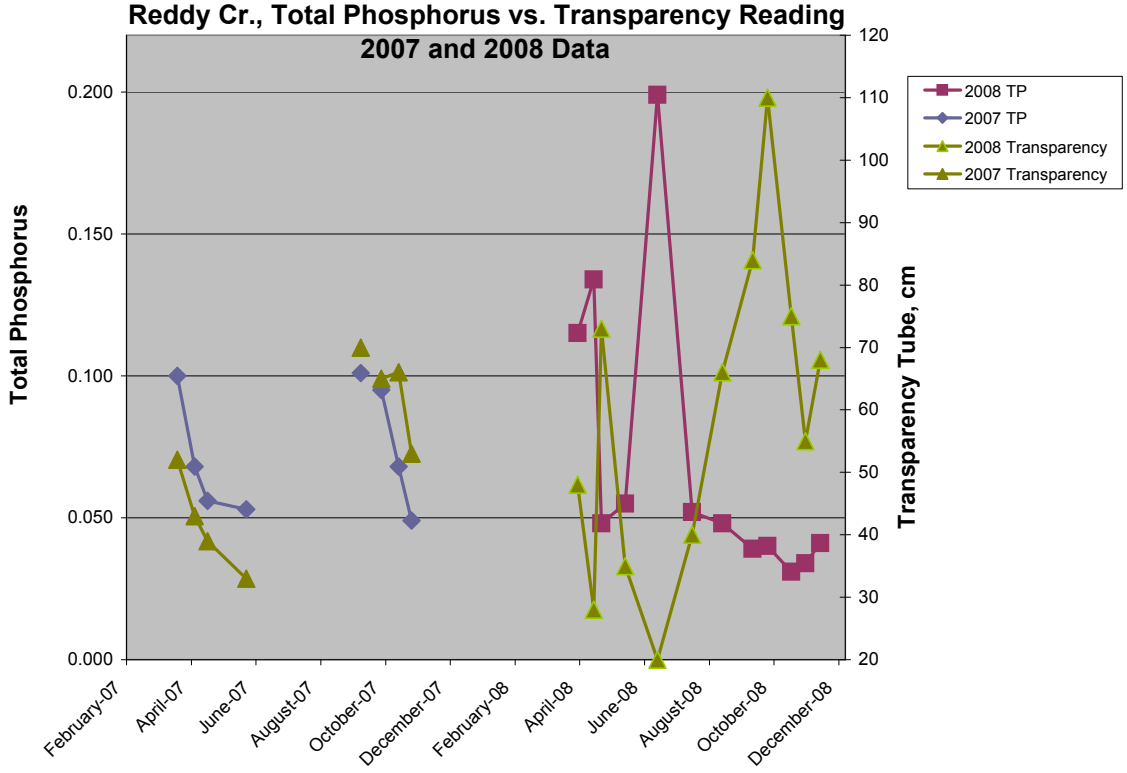


Figure 37
Seastade Cr., Total Phosphorus vs. Transparency Reading
2007 and 2008 Data

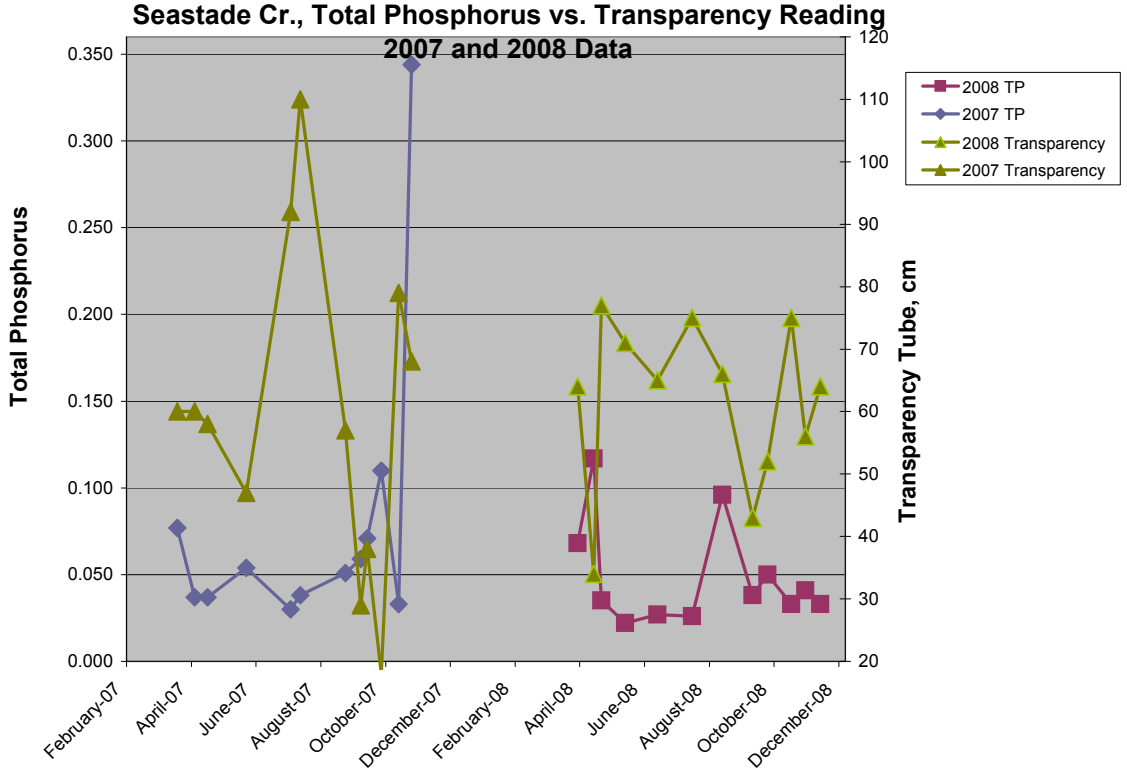


Figure 38
Seguchie Cr., Total Phosphorus vs. Transparency Reading
2007 and 2008 Data

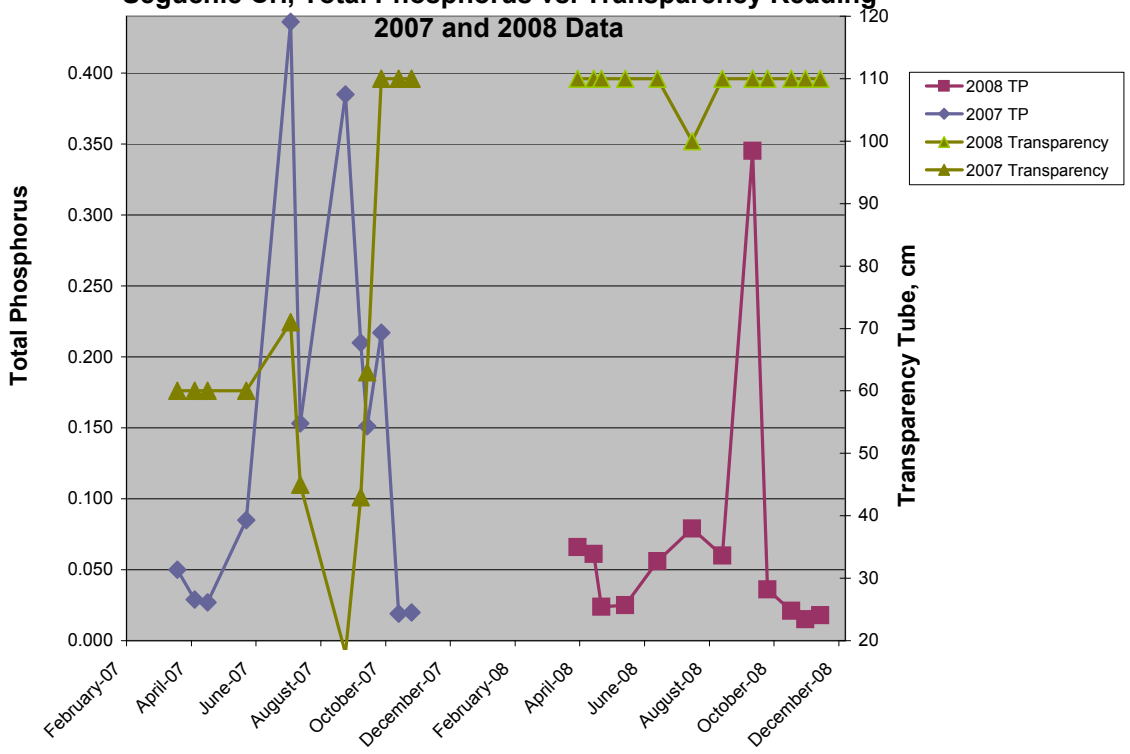


Figure 39
Seventeen Cr., Total Phosphorus vs. Transparency Reading
2007 and 2008 Data

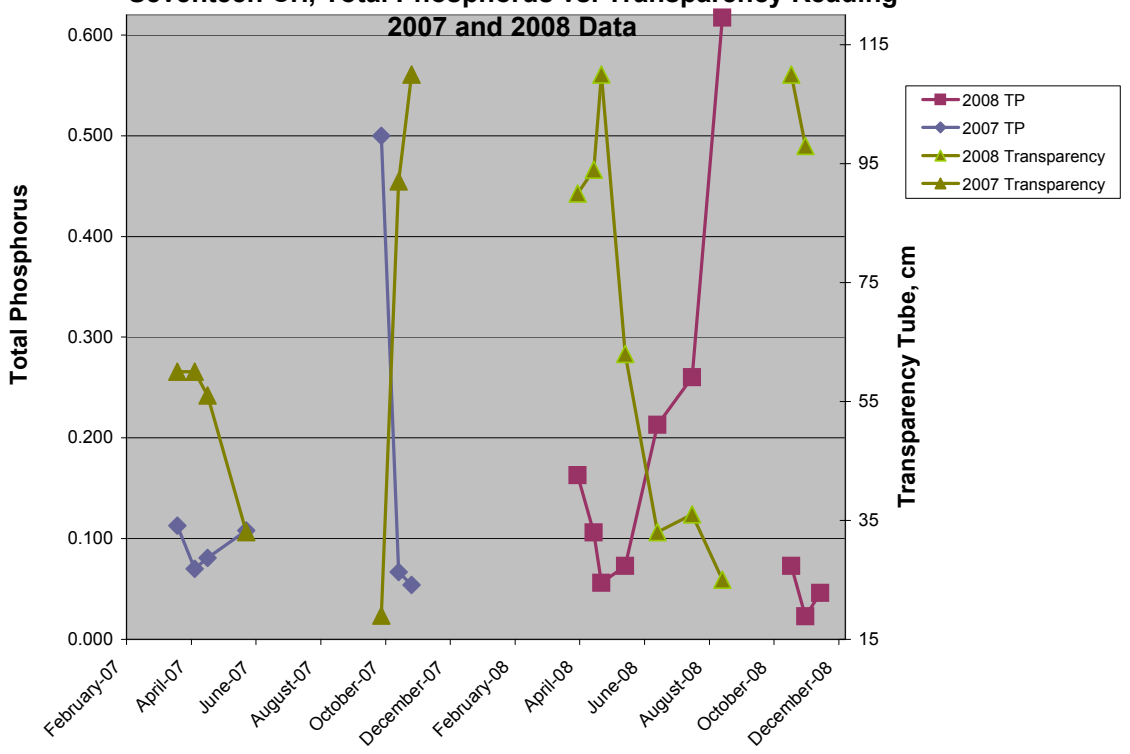


Figure 40
Thaines Cr., Total Phosphorus vs. Transparency Reading
2007 and 2008 Data

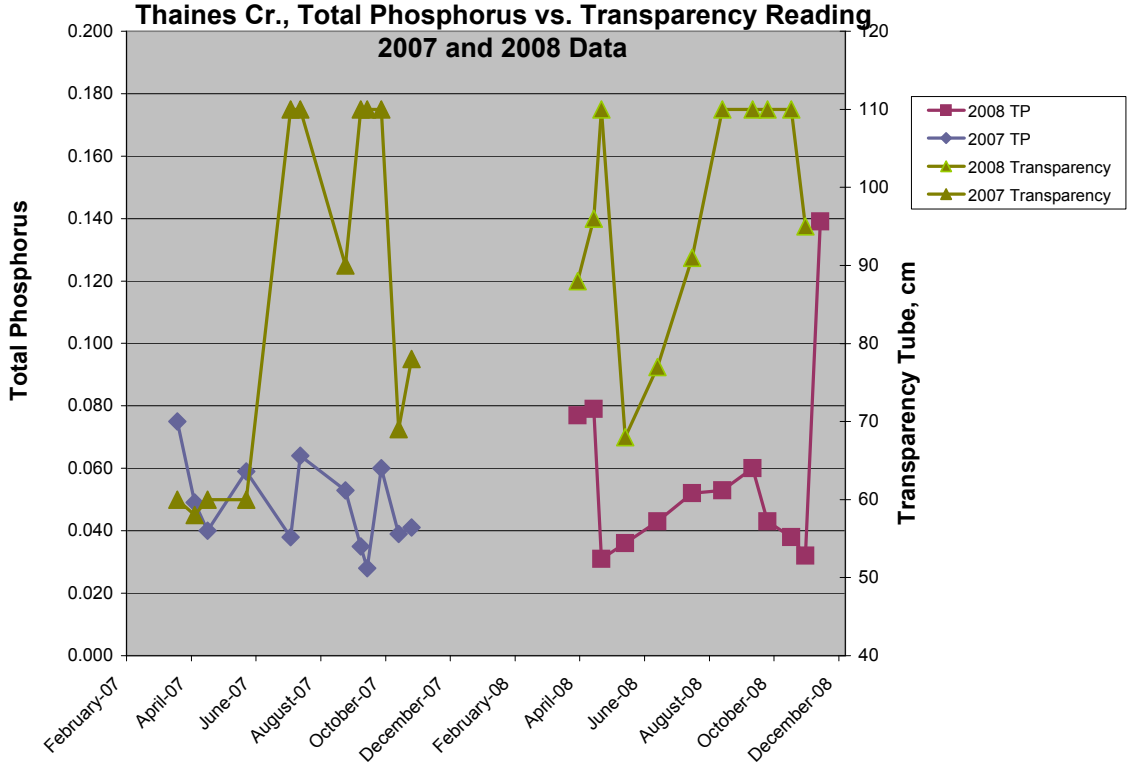


Figure 41
Whitefish Cr., Total Phosphorus vs. Transparency Reading
2007 and 2008 Data

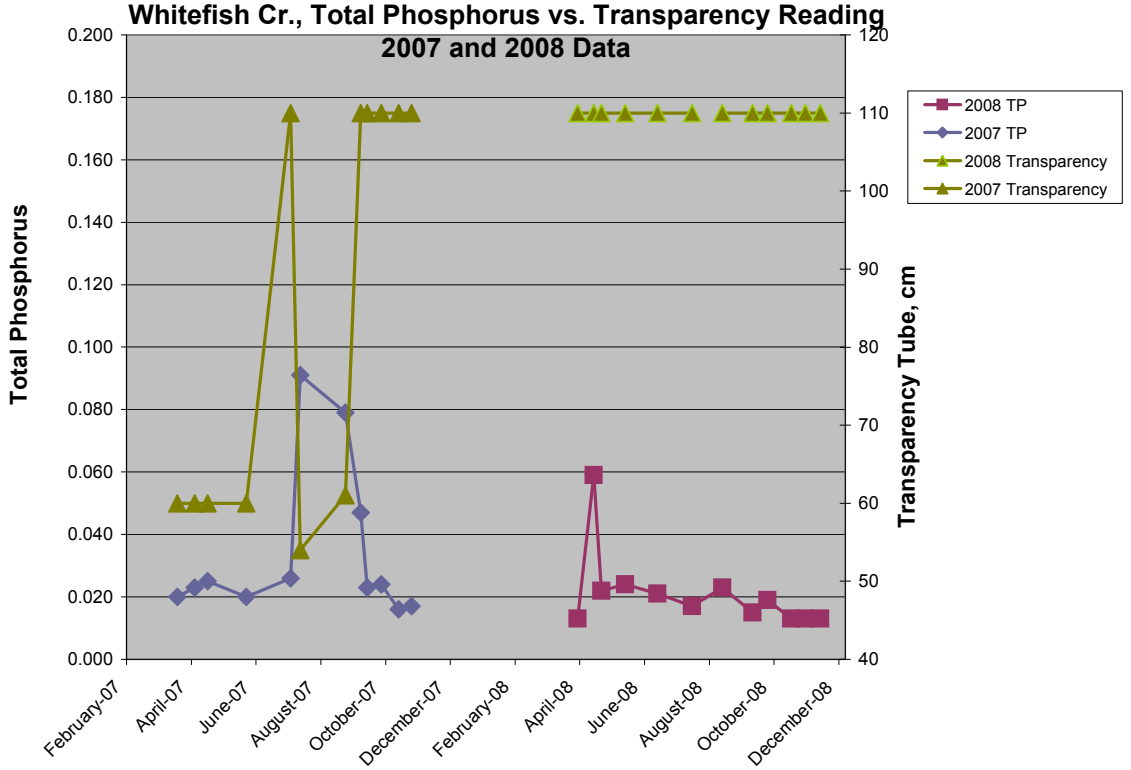


Figure 42
Lake Outlet, Total Phosphorus vs. Transparency Reading
2007 and 2008 Data