2019

Lake Water *Quality* Summary

Lakes add to the quality of life and economic stability of the region

INTRODUCTION

The Twin Cities metropolitan area is fortunate to have a large number of lakes. These lakes are important recreational, aesthetic, and ecological resources that add considerably to the quality of life and economic stability of the region. Protecting the water quality of our lakes is a significant citizen concern.

Many state and local agencies have a role in managing and monitoring lake water quality. The Metropolitan Council operates the most extensive lake monitoring program in the region, and has been monitoring metro area lakes since 1980. During the 1980s, the Council typically monitored about 10 to 30 lakes per year.

In 1993, the Council initiated the Citizen-Assisted Monitoring Program (CAMP) to help expand coverage of lake monitoring in the metro area and to provide information to support local water management efforts. This highly successful program collects data on the lakes each year through the efforts of trained, dedicated volunteers and their local sponsors. 2019 was the 27th year of the Council's volunteer program, with 121 citizen volunteers participating in the CAMP. The volunteers were sponsored by local partners, including 11 cities, 12 watershed management organizations and watershed districts, 1 county, 1 basin planning team, and 1 conservation district.

Through the dedicated efforts of the volunteers and local partners, a total of 173 lake-sites on 160 lakes were monitored in 2019 through the CAMP. Metropolitan Council staff monitored an additional 7 lake-sites on 5 lakes. In total, Council staff and CAMP volunteers and sponsors monitored 180 lake sites on 165 lakes in 2019, including 2 lake-sites and 2 lakes that were newly added to the Council's lake monitoring program. Since 1980, the Council's lake monitoring program has monitored 441 lake-sites on 399 lakes.

WHY WE MONITOR

The Metropolitan Council is charged with creating a comprehensive regional development guide that minimizes the adverse impacts of growth, including adverse impacts on the environment. The monitoring data collected by the Council, its partners, and citizen volunteers are used to identify pollution problems, support regional planning efforts, and meet federal and state regulations. This Lake Water Quality Summary provides an annual synoptic assessment of the water quality of many of the metro area's lakes. Also, the Council monitors several rivers and streams in the metropolitan area and prepares reports on data collected by those programs.

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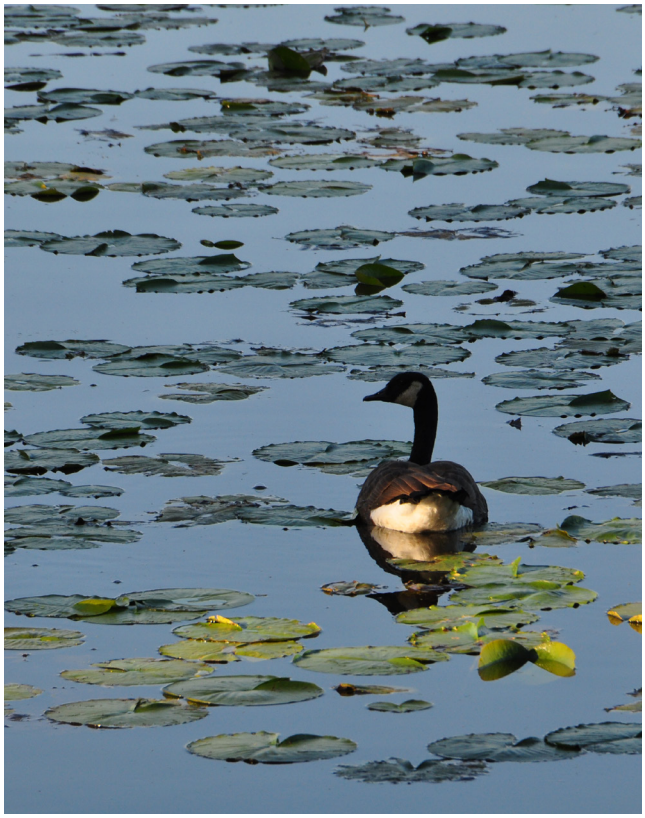
Most of the lake monitoring efforts focus on the assessment of eutrophication, which is the process of nutrient enrichment. Eutrophication increases the biological productivity of a lake by enhancing the growth of algae and other plants. Human activities in the watersheds of lakes (for example, nonpoint sources) increase the delivery of nutrients to lakes beyond what occurs naturally. This acceleration of nutrient enrichment by humans is called cultural eutrophication. During cultural eutrophication, the population of algae increases and water clarity decreases. A variety of other problems may develop, including increases in nuisance algal blooms, odor problems, decreased desirability for recreation, decreased dissolved oxygen, fish kills, changes in the structure of fish and invertebrate communities toward low-oxygen tolerant species, and reductions in biodiversity. Furthermore, eutrophic lakes can develop blooms of toxic blue-green algae (cyanobacteria), which can be a serious health concern for humans and animals (domesticated and wild). Cultural eutrophication is one of the leading water quality concerns facing the region.

METHODS

Lakes monitored by Council staff and volunteers are typically sampled at two-week intervals from mid-April through mid-October. Most lakes are sampled at one station located over the deepest spot in the lake. Field measurements taken during each monitoring event typically include temperature and water clarity (measured with a Secchi disk). In addition, surface water samples are collected for lab analyses, which include total phosphorus (TP), total Kjeldahl nitrogen (TKN), and chlorophyll-a (Chl-a). The routine chemical analyses are performed at the Metropolitan Council Environmental Services laboratory following U.S. EPA-approved methods.

Each lake is assigned a lake grade using an A-through-F grading system as originally developed by Council staff in 1989. The objective of the lake grade system is to provide a tool for assessing lakes on a regional basis. The grading system allows comparisons of lake water quality across the metro area, yet is understandable to the public and nontechnical audiences. The grading system uses percentile ranges of the summertime (May-September) average values for three water quality indicators: total phosphorus, chlorophyll-a, and Secchi depth. Total phosphorus is a key nutrient measure; chlorophyll-a is a measure of algal abundance; and Secchi depth is a measure of water clarity. The lake's water quality grade is calculated as the average grade for the three individual parameter grades. Only lakes with a sufficient quantity of data are assigned a lake grade.



RESULTS

In 2019, 44% of the lake sites received a grade of "A" or "B", meaning that they had relatively good water quality. Another 33% of lake sites received a water quality grade of "C". The remaining 23% of lake sites received a water quality grade of "D" or "F", meaning that they had relatively poor water quality. Similar to that of past years, there was no distinct pattern within the TCMA as to where lakes with specific water quality are located.

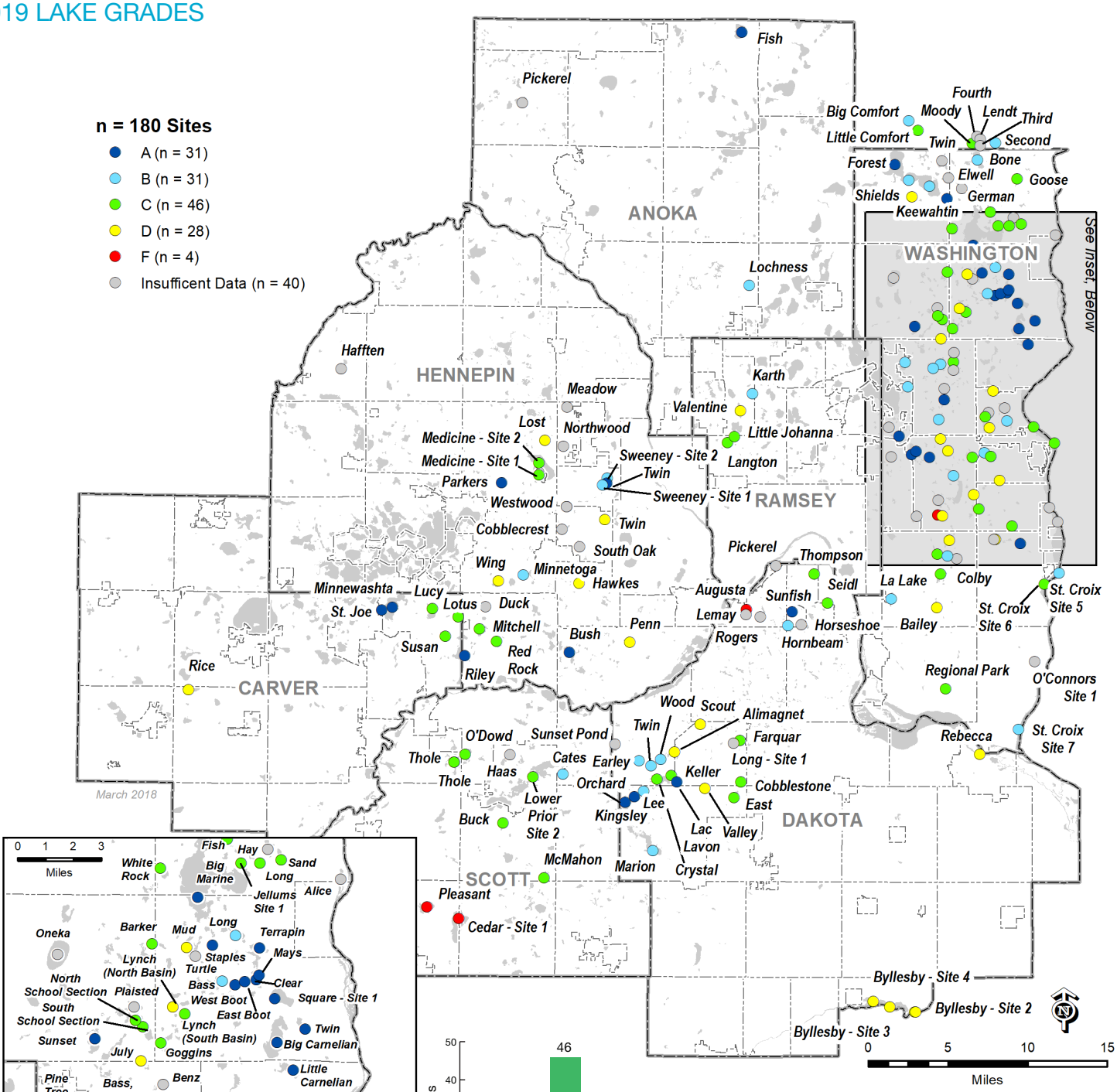
The Annual Lake Water Quality Summary Report, in addition to other lake, stream, and river reports can be accessed online at:

https://eims.metc.state.mn.us/Documents

All of the Council's lake, stream, and river monitoring data can be accessed online using the Council's Environmental Information Management System at:

https://eims.metc.state.mn.us

2019 LAKE GRADES



Distribution of lake grades in 2019. Grades were assigned only for lake sites with an adequate database.

WATER QUALITY GRADING SYSTEM				
Grade	Total Phosphorus (ug/l)	Chlorophyll -a (ug/l)	Secchi Depth (m)	(ft)
A	<23	<10	>3	>9.8
B	23-32	10-20	2.2-3.0	7.2-9.8
C	32-68	20-48	1.2-2.2	3.9-7.2
D	68-152	48-77	0.7-1.2	2.3-3.9
F	>152	>77	<0.7	<2.3

(ug/L) is an abbreviation for microgram per liter