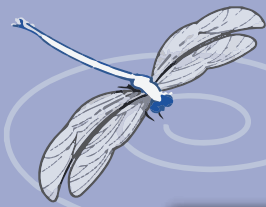


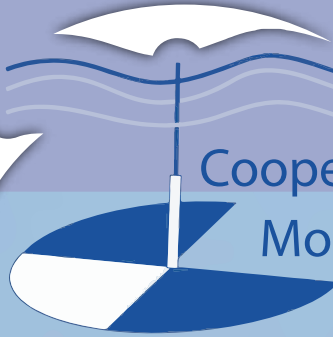
THE MICHIGAN RIPARIAN

WINTER 2025 | VOLUME 61 | NUMBER 1



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50



Cooperative Lakes
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INSIDE

WINTER 2025 | VOLUME 61 | NUMBER 1



FEATURE

A LEGACY OF
STEWARDSHIP | 16

CHAIN LAKE | 22

THROWBACK ARTICLE:
MICHIGAN DNR OFFERS
SELF-HELP PROGRAM FOR
LAKE ASSOCIATIONS | 30



IN EVERY ISSUE

DIRECTOR'S NOTES | 4

ATTORNEY WRITES | 6
Lake Quality

LAKESIDE CHRONICLES | 10
Michigan's Inland Lakes Through the
Lens of Time: Five Decades of Volunteer
Lake Data

ASK THE EXPERTS | 14
Lake and Stream Volunteer Monitoring:
How to Get Involved

FRESHWATER SCIENCE | 26
Thousands of Volunteers Help Collect
Water Quality Data



THE MICHIGAN
RIPARIAN

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DIRECTOR'S NOTES



In the grand scheme of things, I'm certainly a newcomer to the MiCorps Cooperative Lakes Monitoring Program (CLMP). I have been the lead volunteer for just the past few years. My lake, Gravel Lake, has participated in the program pretty consistently since 1980. I know this because I can access the database on the MiCorps website and see all the data from every lake that has participated since 1974—and you can, too. That is just one of the amazing features of this incredible program celebrating its 50th year in 2024.

In the Lakeside Chronicles column of this issue, you will learn more about the history of the program. There is a graph that highlights the Secchi disk readings of Corey Lake in St. Joseph County. This lake has been participating from the very beginning of the program. In 2011, Ralph Vogel from Corey Lake was recognized as the longest-serving volunteer, as he finally retired from his post after 37 years. On the other side of the state, Oakland County thought so much of the MiCorps CLMP program that they paid the enrollment fees for any lake that committed to participating in the program during the 2018 season, and there is talk of continuing that practice in the future.

As part of the team that keeps the MiCorps program running, I have the pleasure of meeting with all the incredibly knowledgeable and dedicated program administrators and coordinators each month: Dr. Jo Latimore and Erick Elgin of Michigan State University; Tamara Lipsey with the Department of Environment, Great Lakes, and Energy (that provides significant funding for the program); and Dr. Paul Steen from the Huron River Watershed Council, as well as the talented MSU IT staff working on our website and database updates, and last but certainly not least, our very own CLMP administrator extraordinaire, Jean Roth. Jean, along with her husband Jim, have been volunteering and working with this program for decades. They build the testing materials with their own hands—that's how dedicated they are! You will get to read about Jean's personal experiences with Chain Lake in the lake feature on page 22. Jean has decided that this is her last season as administrator of CLMP. Her work has been integral to the program for so long. The program and the training at the conference will not be the same without the Roths, so make sure to send Jean some words of farewell before the season ends.

We are committed to bringing the lakes and streams of Michigan at least another 50 years of the Michigan Clean Water Corps programs. If you are a volunteer, thank you. If you are interested in becoming involved with the program, you can find out more in the pages of this issue.

Enjoy your water, and keep it clean! R.

MELISSA DESIMONE | MLSA EXECUTIVE DIRECTOR



MLSA is a 501(c)3 nonprofit, statewide organization dedicated to the preservation, protection, and wise management of Michigan's vast treasure of inland lakes and streams.

OFFICERS

DAVID MATUREN

President

maturenappraisal@aol.com

MARK L. TEICHER

Vice President

marklteicher@aol.com

LON NORDEEN

Secretary

lonnord@aol.com

MIKE GALLAGHER

Treasurer

mike.gallagher@mymlsa.org

DIRECTORS

MELISSA DESIMONE

Executive Director

melissa.desimone@mymlsa.org

CHARLYN PARTRIDGE

partridc@gvsu.edu

REX VAUGHN

rvaughn@tir.com

MICHELLE KANIPES

michelle.kanipes@mymlsa.org

THE MICHIGAN RIPARIAN MAGAZINE STAFF

MELISSA DESIMONE

Production Manager

JAMIE PARAMSKI

Editor

THERESA DUNHAM

Graphic Designer

CLIFF BLOOM

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ATTORNEY WRITES

LAKE QUALITY



CLIFFORD H. BLOOM, ESQ.
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On the 50th anniversary of the Michigan Clean Water Corps Program, it seems appropriate that this “Attorney Writes” column should be devoted to legal issues involving lake quality (including water quality, habitat health, the condition of lands around a lake, and similar matters). The following are the top nine ways that a lake community can protect and enhance lake quality for the body of water that they love.

1. THE IMPORTANCE OF A GOOD MUNICIPAL ZONING ORDINANCE

The positive impacts that a good municipal zoning ordinance can have in a Michigan lake community are vast. Conversely, having no zoning regulations (or poor regulations) for a township, village, city, or county with one or more lakes can be highly problematic. What zoning techniques can protect lakes? Such protections include the following:

- Requiring natural buffers to protect the shoreline and the lakes
- Other shoreline protection provisions
- Minimum lot size, lake frontage requirements, and other density limits
- Soil erosion and stormwater runoff regulations
- “Anti-funneling” or “anti-keyholing” regulations
- Marina regulations
- Potential lake protective overlay zones
- Strong site plan review procedures
- Private road regulations
- Farmland preservation techniques (including Planned Unit Developments, Purchases of Development Rights, and Transfers of Development Rights)
- Dock and boat regulations
- Regulations regarding lake access easements, private parks, etc.

2. OTHER MUNICIPAL NON-ZONING ORDINANCES

In addition to good zoning regulations, municipal lake communities should consider adopting and enforcing a variety of other non-zoning ordinances, which can include the following:

- Dock and boat ordinances
- Fertilizer ordinances
- Soil erosion and stormwater runoff ordinances
- Marina and condominium licensing ordinances
- Environmental impact ordinances

(CONTINUED ON PAGE 7)



3. LAKEFRONT PROPERTY PURCHASER INVESTIGATIONS

When someone buys a waterfront property on a lake, river, or stream in Michigan, it typically involves a significant number of legal documents and disclosures. Those documents can include, but are not always limited to, a deed or land contract, a title insurance commitment and insurance policy, home disclosures, lead paint disclosures, general closing documents, closing statements, mortgage documents, and surveys. However, rarely do such documents indicate the water quality of the lake involved or do purchasers investigate lake water quality on their own. Prior to purchasing a lake, river, or stream parcel, a wise purchaser will investigate:

- The general quality of the lake or river water (i.e. are there chemicals, *E. coli* bacteria, significant sedimentation, etc. in the water?)
- Are there any other sources of pollution or degradation elements or chemicals nearby? That could include a nearby farm with water or fertilizer runoff, nearby commercial or industrial uses, old or operating landfills, buried fuel tanks, or failing septic tanks.
- What is the quality of the lake bottomlands?
- What trophic state is the lake?

Investigating such matters is particularly important if a purchaser is buying property during the winter months, when a body of water may be frozen and it is more difficult to make the above assessments than during the other seasons of the year.

It does not appear that there are many consultants in Michigan who assess lake water quality and potential negative impacts for a given lake property. That is somewhat surprising given the increasing values of lakefront property in Michigan. (That could potentially be a good business venture.)

If you are lucky, the lake you are interested in will have dedicated volunteers who participate in the MiCorps CLMP

program to collect important water quality data. You can search for data collected on your lake in the MiCorps data exchange on its website.

4. PUBLIC ROAD WATER RUNOFF AND DRAINAGE

Virtually every lake, river, or stream that is adjacent to or near a public road (gravel or paved) in Michigan has a drainage pipe or culverts running from that road to the body of water. Public road water runoff drainage pipes, ditches, etc. act as large funnels transporting and concentrating water runoff with salt, gas, and oil from roads, bacteria, and other chemicals into lakes, rivers, and streams. Quite often, when a lake resident finds out how many drainage pipes are emptying into their lake from area roads, parking

(CONTINUED ON PAGE 8)

BUYING AND SELLING WATERFRONT PROPERTY

BY
CLIFFORD H. BLOOM



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LAKE QUALITY

(CONTINUED FROM PAGE 7)

lots, and similar uses, they are stunned. It is not unusual for even a small or modest-sized inland lake to have five, 10, 20, or even more drainage pipes emptying into the lake from nearby roads and parking areas.

Of course, re-routing such public road and parking area runoff is, in almost all cases, expensive. Unfortunately, there is sometimes almost no practical alternative to lake stormwater structures. However, in many situations, stormwater can be diverted to retention basins or other areas where the negative lake impacts will be much less. Such corrective measures can sometimes be paid for by grants, special interest legislation, or local special assessment districts.

5. LAKE LEVEL ORDERS

Frequently, where a lake water level is too high or too low, it leads to lake water quality problems and habitat degradation. In order to alter a lake level artificially, the local county circuit court must issue a lake level order pursuant to what was referred to in the past as the “Michigan Inland Lake Level Act”, which can now be found at MCL 324.30701 *et seq.* For more information about lake level regulations, please see my earlier “Attorney Writes” column in the Fall, 2024 issue of *The Michigan Riparian* magazine.

6. PROHIBITING NEW OR EXPANDED CANALS, CHANNELS, AND LARGE BOAT WELLS

Until fairly recently, most riparian experts believed that the inland lake channel and canal battles of 50 years ago or so were long since resolved. Unfortunately, the last decade has seen an increased number of homes and cottage property owners on lakes successfully create or expand canals, channels, and large boat wells. Today, such actions are rarely associated with a new development whereby the developer desires to “create” new lakefront property, but rather involve wealthy cottage, cabin, or homeowners who wish to extend the lake further into their property or create private boat wells, boathouses, etc. Why are some of these efforts to create or expand such canals, channels, or large boat wells successful today? There are generally three reasons. First, it appears that the Michigan Department of Environment, Great Lakes, and Energy (EGLE) has been more permissive regarding artificially expanding waterways. That may be a function of the underfunding of that state agency. Second, many local governments do not have zoning ordinances or other ordinances that adequately regulate and prevent new or expanded canals and boat wells. Finally, for some, there does not seem to be an appreciation of maintaining a lake community in as natural of a condition as possible and living in harmony with neighbors.

(CONTINUED ON PAGE 9)



7. EXTENDING PUBLIC SANITARY SEWER SYSTEMS AND PRIVATE SEPTIC SYSTEMS

Lake pollution from inadequate or failing private septic systems is becoming an increasingly significant problem in Michigan. The overwhelming majority of lake properties in Michigan do not have the benefit of a public sanitary sewer system, such that individual properties must use private septic systems. Michigan has few regulations governing the maintenance, testing, and upgrading of private septic systems. Although many municipalities statewide and state officials have spoken of the need for periodic private septic system testing (particularly at the time a lot or parcel is sold), most municipalities in Michigan do not have such regulations in place.

There are many lake communities where an existing public sanitary sewer system should be expanded to a lake or a new public system should be created. Unfortunately, the costs associated with those projects are usually quite high. In some instances, grants may be available. Many of those new or expanded systems are financed (at least in part) by special assessments on the benefited properties.

8. BUBBLERS AND WAKE BOATS

As readers of this magazine are aware, past articles have discussed the potential adverse environmental and other effects that bubblers and wake boats can have on lake quality. At the current time, bubblers can be regulated by local municipal ordinances, while wake boats likely cannot. Bubblers and wake boats are just two examples of how private recreational decisions can significantly (and oftentimes negatively) impact lakes throughout Michigan.

9. AQUATIC INVASIVE SPECIES TREATMENTS

Some prospective purchasers of inland lake properties may like to know whether the lake is chemically treated to control aquatic invasive species. Many property owners support such treatments, but others are concerned about the impact of artificial chemicals and other artificial undertakings. Typically, information can be obtained regarding such matters from the local municipality (a city, township, or village) or the lake association if there is such an organization. MiCorps includes a parameter called “Exotic Aquatic Plant Watch” that allows volunteers to monitor and report invasive species found in a lake. *R.*

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MICHIGAN'S INLAND LAKES THROUGH THE LENS OF TIME

FIVE DECADES OF VOLUNTEER LAKE DATA

ERICK ELGIN | MICHIGAN STATE UNIVERSITY EXTENSION
DR. JO LATIMORE | MICHIGAN STATE UNIVERSITY

Fifty years can feel like the shortest, yet longest time. For some it was just yesterday, while others were not even born yet. Time confronts us with many stressors that can change who we are, yet we also remain resilient. In the last 50 years, Michigan's 11,000 inland lakes have similarly experienced the march of change, from the slow development of shorelines to the fast development of algae that can occur from a warm calm week in summer. Species have been lost, such as cisco, a coldwater-loving fish, from some of our deep lakes, and species have been gained in others with introductions such as the invasive Eurasian watermilfoil plant. Other changes have been deliberate with some lake communities enhancing lake resilience by installing sewer systems or restoring adjacent wetlands.

With all of these stressors and projects acting on our lakes over time, it can be difficult to evaluate how a lake is doing or why it is the way it is. One proven method is to collect reliable scientific data through time. Long term data on lakes provides context for what we see today and establishes baselines for reference. In ecological systems such as lakes, it is far more common to only have snapshot data, that is, isolated data collected over a short time scale. For example, a two-year university research project or a one-time lake assessment may collect data over only a year or two. This information is certainly valuable and can advance our understanding of lakes, but these short-term studies are not designed to detect gradual change over decades (e.g., eutrophication and oligotrophication), and may mischaracterize what is happening due to the lack of a long-term perspective (e.g., a brief study done during two years of unusually early ice-off may misinterpret those

conditions as typical). Established monitoring programs also allow us to capture unexpected events and their unforeseen cascading impacts. For example, a lake water quality monitoring program begun in the 1970s can help us understand the impact of the arrival of invasive zebra mussels in the 1990s.

Volunteers across Michigan have been collecting consistent and valuable limnological data for 50 years as part of the MiCorps Cooperative Lakes Monitoring Program (CLMP). Launched in 1974 as the "Self Help Program", Secchi disk water transparency, where volunteers lower a black-and-white disk into the water to measure water clarity, was the foundational parameter. Other additional measurements were added in the 1990s (spring and summer phosphorus, chlorophyll a) and 2000s (dissolved oxygen, temperature, and aquatic plant mapping). The most recent additions were invasive plants in 2011 and the characterization of shoreline habitat in 2015. Collectively this data has become a very important component of understanding our lakes, and for most lakes, it is the only data collected consistently through time.

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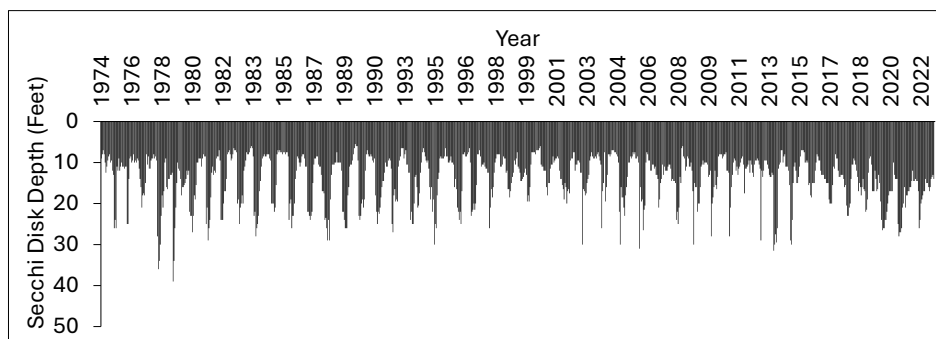


FIGURE 1. SECCHI DISK WATER TRANSPARENCY MEASUREMENTS FOR COREY LAKE, ST. JOSEPH COUNTY, MICHIGAN. THESE 898 READINGS REVEAL A PATTERN OF HIGHER VALUES COLLECTED IN THE SPRING OF ALMOST EVERY YEAR.

Over the past 50 years, more than 1,000 lakes have participated in the program. Among them, over 300 lakes have collected 10 or more years of Secchi data, and an esteemed 13 lakes have data records exceeding 40 years! Together, thousands of dedicated lake monitoring volunteers across the Lower and Upper Peninsula have collected more than 100,000 Secchi measurements, 8,000 phosphorus samples, and 13,000 chlorophyll a samples. CLMP volunteers have detected 332 occurrences of invasive plants, measured 1,100+ dissolved oxygen/temperature profiles, and counted over 13,000 docks while completing the Score the Shore procedure. To celebrate the last 50 years of Secchi data collection, here we present some seasonal and long-term trends in Michigan's inland lakes.

SEASONAL TRENDS REVEALED

In the CLMP, volunteers collect a minimum of eight Secchi water transparency measurements from May to September. This high-frequency sampling schedule is necessary to capture the dynamics of lake processes through the summer. In many lakes across Michigan, if we were to measure Secchi disk transparency only in May or June, we would interpret the data to say that Michigan has many very clear lakes. However, springtime sampling alone does not show the full picture. There is an ecological phenomenon that can create a brief and spectacular moment called the spring clear water phase. During this phase, small filter feeding invertebrates called *Daphnia* emerge from their resting eggs and if conditions are suitable, they can explode in population. As their population increases, they feed on floating algae at an amazing rate and subsequently can create a period of incredibly clear water. This strong seasonal pattern is clearly illustrated in Figure 1 where Secchi readings can be 3 times deeper in the spring than later in the summer. We can study the magnitude and timing of clear water phases to gain insight into how a lake may be evolving due to changes in fisheries, land use, and even climate change.

LONG TERM WATER CLARITY TRENDS

When we average CLMP Secchi data from the last 50 years, we get a sense of how Michigan's lakes may be changing collectively through time. Year-to-year variation is common due to weather patterns like high or low precipitation years, but trends may arise as we look over the span of decades.

(CONTINUED ON PAGE 12)

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MICHIGAN'S INLAND LAKES THROUGH THE LENS OF TIME

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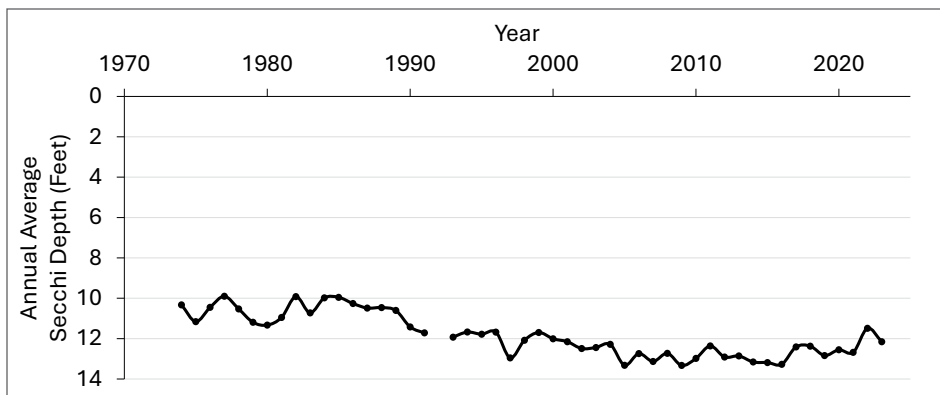


FIGURE 2. ANNUAL AVERAGE SECCHI DISK WATER TRANSPARENCY MEASUREMENTS DERIVED FROM ALL LAKES IN THE MICORPS COOPERATIVE LAKES MONITORING PROGRAM. NOTE THE TRENDS OF INCREASING WATER TRANSPARENCY THAT BEGINS AROUND 1990.

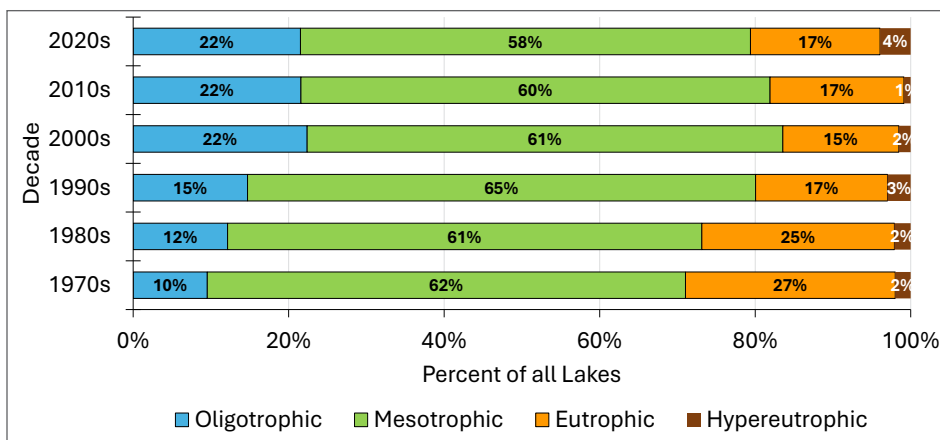


FIGURE 3. PERCENTAGE OF LAKES IN EACH TROPHIC STATUS CATEGORY FOR EACH DECADE. TROPHIC STATUS WAS CALCULATED FROM SECCHI DISK WATER TRANSPARENCY. IN GENERAL, THE PERCENTAGE OF OLIGOTROPHIC LAKES HAS INCREASED OVER TIME.

So, what can we see? Figure 2 indicates that from the mid-1970s through the turn of the century, our lakes have increased overall in water clarity. Secchi measurements in the 1970s and 1980s averaged around 10.5 feet. Clearing began in the early 1990s and continued until the maximum Secchi average of around 13.25 feet was reached in 2009. We can speculate that this clearing trend could be from a combination of factors, possibly including the widespread invasion of zebra mussels, the ban of phosphate in detergents, effects of laws and regulations like the Clean Water Act, improved stormwater management, or changes in fish and plant communities. In recent years, the trend has reversed, and average water clarity has declined slightly to around 12.25 feet. Higher concentrations of both summer and seasonal phosphorus (a nutrient that supports plant and algae growth) mean chlorophyll a (an estimate of algal density in the water column) collected

by CLMP volunteers follow this more recent Secchi pattern. We can speculate that the recent decline in water clarity may have been caused by the incredible high precipitation years Michigan experienced around 2021, which could have increased shoreline erosion and nutrient loading from riparian properties and the surrounding landscape. Other causes may also be at work.

TROPHIC PATTERNS THROUGH THE DECADES

We can use Secchi disk transparency to calculate the trophic status of a lake, which is a useful way for us to understand, classify, and evaluate lakes in a standardized way. There are three main categories of trophic status – oligotrophic (low algae and plant growth), mesotrophic (medium amount of plant and algae growth), and eutrophic (high algae and sometimes plant growth). When comparing the last five decades in Figure 3, we can see that the proportion of CLMP lakes that are mesotrophic has remained fairly constant. However, in recent decades the proportion of lakes that

are oligotrophic has risen whereas the proportion of lakes that are eutrophic has declined. This change can be attributed to the general increase in water clarity we are finding in lakes across Michigan.

CELEBRATING VOLUNTEER EFFORTS

It's rare and exciting to be part of the long-term data collection of any ecosystem. This volunteer-derived lake data is truly invaluable for understanding a lake and showcases some amazing dynamics statewide. As the current manager of the CLMP, I thank every one of the thousands of volunteers, past and present, for investing their time and energy into this unparalleled dataset. *R.*

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ANSWER:

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Each year MiCorps volunteers collect valuable water quality and habitat data on inland lakes and streams statewide. This information is used by individuals, local communities, researchers, and state agencies like the Michigan Department of Environment, Great Lakes, and Energy and the Department of Natural Resources to better protect and manage Michigan's waters and the fish and wildlife that rely on them.

This volunteer monitoring opportunity gives you an inside look into what's happening in your favorite lake and stream and allows you to actively contribute to their conservation. You can get involved by choosing from one of MiCorps' three programs: the Volunteer Stream Monitoring Program, the Cooperative Lakes Monitoring Program, and the Volunteer Stream Cleanup Program.

MONITOR A STREAM NEAR YOU

Volunteers participating in the Volunteer Stream Monitoring Program (VSMP) work with local organizations to monitor stream quality by examining the aquatic invertebrate community and stream habitat. MiCorps supports these local organizations by providing training and assistance with all aspects of a scientific, high-quality stream monitoring program, including an online database where the public can access stream data collected by volunteers. MiCorps also awards grant funding to nonprofit organizations and local units of government to create and maintain stream volunteer networks around the state.

Local MiCorps Stream Monitoring groups are always searching for more volunteers. To get involved, find a stream monitoring group near you and ask how you can help. Find local stream monitoring groups by visiting: <https://micorps.net/stream-monitoring/volunteer-stream-monitoring-organizations/>.

If you are a non-profit or local government organization, MiCorps offers grants to help launch, implement, and maintain your stream monitoring efforts. Visit <https://www.micorps.net/stream-monitoring/stream-grants/> for grant details.


BECOME A VOLUNTEER LAKE MONITOR

Volunteers participating in the Cooperative Lakes Monitoring Program (CLMP) monitor water quality, shoreline habitat, and invasive and native aquatic plants to document changes in lake quality over time. CLMP volunteers have been collecting high-quality data since 1974. MiCorps provides CLMP volunteers with detailed training in scientific monitoring protocols and ongoing expert support. MiCorps also manages an online public database and generates annual summary reports for each lake enrolled.

Want to begin monitoring a lake near you? Start by visiting MiCorps.net. New volunteers will need to create an account, select their lake, and choose from a menu of monitoring activities. As part of this program, you'll receive detailed instructions, training, and equipment to collect this valuable data. Visit our Become a Volunteer webpage to begin enrollment at <https://www.micorps.net/lake-monitoring/become-a-volunteer/>.

CLEANING STREAMS

In addition to our monitoring programs, the MiCorps Volunteer Stream Cleanup Program (VSCP) offers grants for local governments to support events to clean up trash from Michigan's rivers, streams, and creeks. Grants can pay for equipment, trash pickup, staff time, and volunteer appreciation items. Learn more about our Stream Cleanup grants at <https://www.micorps.net/stream-monitoring/stream-grants/>.

STILL NOT SURE WHERE TO START?
SEND US AN EMAIL AT
MICORPS@MSU.EDU. 



64TH ANNUAL
Michigan Lakes & Streams Association
Conference

The Future of Michigan's Water

Friday, April 25 & Saturday, April 26
Muskegon, MI

REGISTER TODAY AT MYMLSA.ORG

A photograph of a person with short blonde hair and sunglasses, wearing a black jacket and khaki shorts, standing on a boat. They are holding a long vertical pole and a yellow measuring tape, appearing to measure the water depth. The background shows a calm blue lake with a line of green trees on the far shore under a clear blue sky. The boat's white railing is visible in the foreground.

A Legacy *of Stewardship*

THE HISTORY OF VOLUNTEER LAKE AND STREAM
MONITORING IN MICHIGAN

DR. JO LATIMORE | MICHIGAN STATE UNIVERSITY
ERICK ELGIN | MICHIGAN STATE UNIVERSITY EXTENSION
DR. PAUL STEEN | HURON RIVER WATERSHED COUNCIL



Did you know that volunteers have been monitoring Michigan's waters for more than 50 years? Without the efforts of thousands of volunteers, we would know far less about the quality of our lakes and streams and how they have changed over time. Dive in with us as we explore the history of volunteer lake and stream monitoring in Michigan!

50 YEARS OF LAKE MONITORING

2024 marked the 50th anniversary of the Cooperative Lakes Monitoring Program (CLMP). Volunteers have been collecting high-quality data on Michigan's inland lakes since 1974, contributing to one of the nation's richest long-term lake datasets. Originally a water clarity monitoring program, today volunteers can choose from a variety of water quality and habitat attributes to monitor depending on their interests.

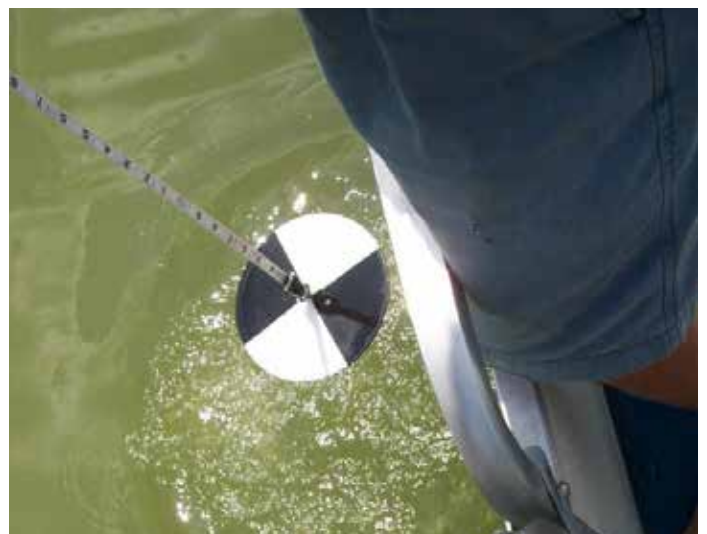
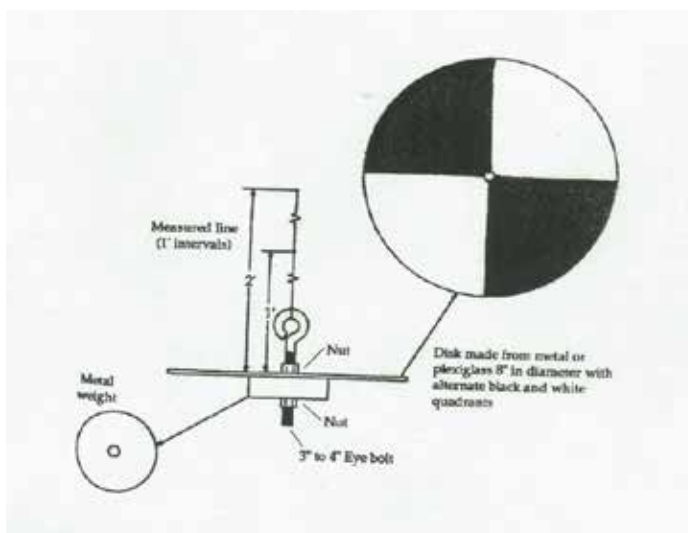
In **1974**, the Michigan Department of Natural Resources (DNR) invited volunteers to collect water clarity data from their lakes using a Secchi disk. The program was called the Self-Help program. Also in the 1970s, volunteers could collect water samples to be tested for chlorophyll a levels; the amount of chlorophyll a in the water revealed the amount of algae in the water column. The program team built all the necessary equipment themselves; the chlorophyll a sampler from the 1970s will look familiar to today's volunteers, who still receive samplers built by program staff! Volunteers mailed chlorophyll a samples to the University of Michigan Biological Station for analysis.

In **1978**, the DNR assumed responsibility for laboratory analysis of chlorophyll a samples. In **1983**, chlorophyll a monitoring was dropped from the Self-Help program due to budget cuts for laboratory support and some concerns about data quality, but Secchi water clarity monitoring continued.

In **1992**, the DNR partnered with Michigan Lake and Stream Associations (MLSA; now known as the Michigan Lakes and Streams Association), who took over the administrative tasks including enrollment, paperwork, records, and reporting.

Between 1993 and 1998, the Advanced Self-Help Program was developed, which included monitoring for total phosphorus (an important nutrient that promotes plant and algae growth) and chlorophyll a sampling was reintroduced. Also during this period, staff biologists began visiting volunteers on lakes to collect samples alongside them to assure the quality and accuracy of volunteer data. Known by staff as "side-by-sides", these visits have proven

(CONTINUED ON PAGE 18)



A LEGACY OF STEWARDSHIP

(CONTINUED FROM PAGE 17)



the reliability of data collected by dedicated and well-trained volunteers. In **1998**, the name was changed to the Cooperative Lake Monitoring Program (CLMP), by which it is still known today.

CLMP continued to expand in the 2000s, with the addition of dissolved oxygen and temperature monitoring in **2000** and aquatic plant mapping in **2001**. Two short-lived new programs were also tested during that period: algae sampling and fish age and growth monitoring.

2004 marked the first monitoring season that Michigan's volunteer lake and stream monitoring programs were known by a new name – the Michigan Clean Water Corps, or MiCorps. MiCorps was created by Governor Jennifer Granholm to highlight the contributions of volunteers to water quality monitoring in Michigan and included both the CLMP and Michigan's Volunteer Stream Monitoring Program. MiCorps provided a structure by which both programs could be overseen by the Michigan Department of Environment, Great Lakes, and Energy (EGLE; known at that time as the Department of Environmental Quality, or DEQ) while contracting with external partners to provide

(CONTINUED ON PAGE 19)

program implementation. The Great Lakes Commission initially managed MiCorps with support from MLSA, the Huron River Watershed Council (HRWC), and Michigan State University (MSU). A major accomplishment in the early years of MiCorps was the unveiling of the MiCorps Data Exchange, the online database that provides all fifty years of CLMP data – and stream monitoring data, too! – at your fingertips.

The MiCorps era has seen further growth in the CLMP. In 2011, the CLMP's invasive species monitoring program, the Exotic Aquatic Plant Watch, was added. In 2014, volunteers began receiving custom “individual lake reports” summarizing the data for their lakes each year. The newest addition to the CLMP monitoring options was added in 2018, Score the Shore, which volunteers use to assess the quality of nearshore habitat around their lakes.

In 2021, after a one-year break in volunteer lake and stream monitoring in Michigan due to a funding gap, EGLE contracted with MSU to lead MiCorps in partnership with HRWC and MLSA. New features of the CLMP since that time include an online enrollment system for volunteers and online training options for volunteers. In 2024, the CLMP hit a new record with 326 lakes enrolled!

(CONTINUED ON PAGE 20)

1974 THE YEAR CLMP *began*

US President Richard Nixon/Gerald Ford

Average price of a gallon of gas \$0.53

Average price of dozen eggs \$0.78

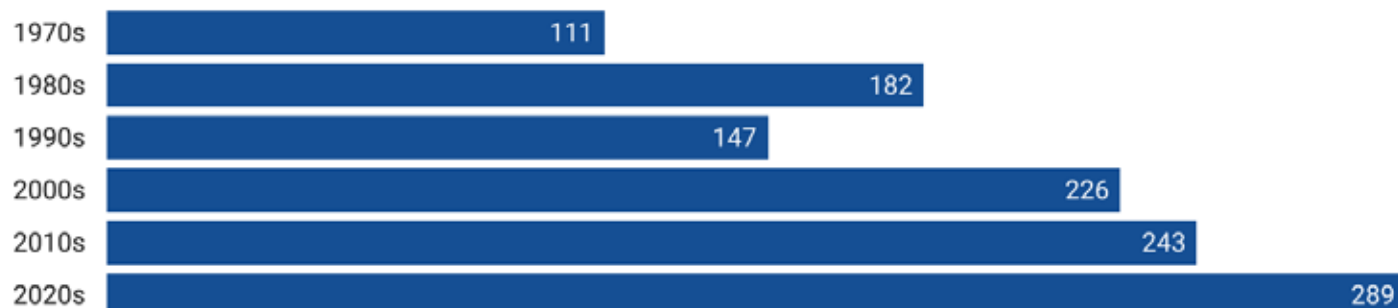
Average price of new car \$4,441

Average home in Michigan \$20,000



CLMP growth across decades

Average number of lakes enrolled in each decade of the Cooperative Lakes Monitoring Program





A LEGACY OF STEWARDSHIP

(CONTINUED FROM PAGE 19)

VOLUNTEER STREAM MONITORING - A REMARKABLE IMPACT

EGLE (then known as the DEQ) established Michigan's Volunteer Stream Monitoring Program (VSMP) in 1998, and like the CLMP, it was incorporated into the new MiCorps program beginning with the 2004 field season. Volunteers assess the health of their local wadeable streams and rivers primarily by collecting macroinvertebrates (insects and other invertebrates visible to the naked eye) that, like canaries in a coal mine, indicate the quality of their surrounding environment. VSMP volunteers also conduct habitat assessments by documenting the conditions of the stream and surrounding landscape along with potential sources of pollution.

(CONTINUED ON PAGE 21)



The MiCorps team supports the VSMP by providing grants for equipment and staff time, training, and support to local organizations like watershed councils and conservation organizations that recruit stream monitoring volunteers in their areas. Over the past 20 years, MiCorps has awarded \$876,259 in grants to 61 different organizations; these organizations partner with even more groups, such as paddling and fishing organizations, scout troops, churches, and conservation groups, along with thousands of unaffiliated individuals who contribute their time and energy. Each program varies in size, from around ten to over 300 volunteers each year. That adds up to tens of thousands – perhaps over 100,000 people – who have been reached with opportunities to combine scientific study with environmental education.

Over the past 20 years, VSMP volunteers have sampled Michigan streams and rivers broadly and frequently:

- ➔ 12,128 macroinvertebrate collections have been made by volunteers
- ➔ 820 unique stream and river locations have been surveyed
- ➔ Each location has been surveyed an average of 14.7 times

In just 2021-24, 1,184 macroinvertebrate collections have been made by volunteers at 446 unique locations, and no fewer than 183,370 macroinvertebrates have been collected, sorted, identified, and counted!



IT'S YOUR TURN!

If you are not already a MiCorps volunteer, we hope we have convinced you to contribute to these efforts. There are always lakes and streams that need monitoring, and we are here to help you find a volunteer opportunity that fits your interests and schedule. Learn more about MiCorps, explore the data, and get involved at www.micorps.net.

Special thanks to Ralph Bednarz, now retired from the DEQ, who compiled a detailed history of the Cooperative Lakes Monitoring Program for his 2021 presentation at the Michigan Lakes and Streams Association conference, "Michigan Inland Lakes Self-Help/CLMP/MiCorps Program Legacy". R.

"The time to make preparations for a flood is not when it's raining."

-Tom Newhof, Co-founder

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CHAIN LAKE

IOSCO COUNTY

JEAN ROTH | MICORPS CLMP ADMINISTRATOR AND CHAIN LAKE CLMP VOLUNTEER

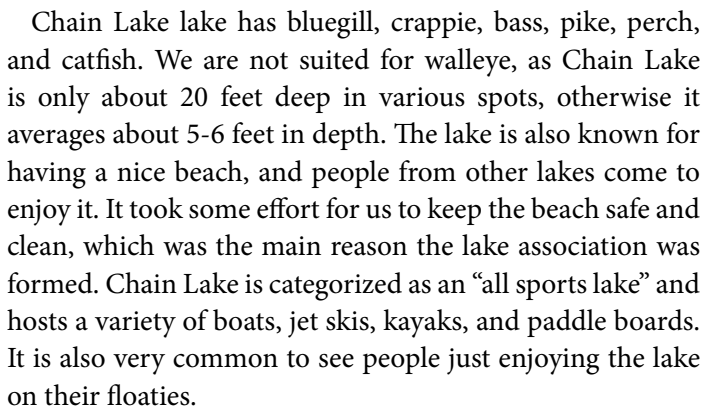
CHAIN LAKE IS A SMALL 72.5-ACRE LAKE LOCATED IN IOSCO COUNTY (PLAINFIELD TOWNSHIP) IN SOUTH BRANCH, MICHIGAN. IT BORDERS THREE OTHER COUNTIES IN NORTHEAST MICHIGAN: ALCONA, OGEMAW, AND OSCODA COUNTIES.

Chain Lake is surrounded by many larger lakes, but those of us who live on the lake or have seasonal homes on it prefer its smaller size because it is quiet. We are close to Lumberman's Monument, Iargo Spring, and the AuSable River. One of the oldest buildings in the area used to be a hotel during the days of lumbering, however, it is now enjoyed as a seasonal home. There are still two lumber companies in our local village of South Branch,

as well as a grocery store, a transmission service garage, Goodar Township Fire Department, and a post office. Around the lake we have about 150 homes and cottages. It's a nice three-mile walk around the lake. Some of us live on the lake year round, while others live on the lake only during the summer months. Other residents come up on weekends throughout the year.

(CONTINUED ON PAGE 23)



[illegible]

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The Chain Lake Association was formed in 1997, mainly because there were a lot of problems at the swimming area, which is also the boat launch. Boats from the lake and from the launch were coming too close to the swimmers and causing problems with their safety. One of the first things that was accomplished was getting permission to put proper buoys in place. We made our own out of PVC pipes and made sure they had the proper markings to distinguish the swimming area from the boat launch area. Those buoys are still in place, taken out in the fall and put back in the summer. The association also supports our local fire departments (Hale and South Branch) and maintains the beach area, stocks fish every couple of years, and sponsors the annual picnic, where everyone in the area is welcome whether they live on the lake or not. We also have a citizens patrol to keep watch on the properties to keep everyone safe from vandals or break-ins.





CHAIN LAKE

(CONTINUED FROM PAGE 23)

school by having the biology students come to a couple of streams to gather and test the flow of the stream, write down the area we were in, and what we observed (i.e. plant life, animals, birds, etc). We would be working alongside the students, and most of the time we would have a bite to eat after the tests were done. The first year, the one thing we learned (and prevented in the subsequent years) was not to put all the macroinvertebrates in the same bucket because when they got back to the school, half of them had been eaten by the others. We participated in this program for about five years, then the funding ran out. It was a great



A lot of the good health of our lake is also due to the fact that much of the area is not developed and the natural shorelines are still intact.



experience learning with the students, and it was beneficial for them to know that we were their neighbors, not just people who lived on the lake.

About that same time (1997), the association joined the Self Help program, which is a citizens volunteer monitoring program to monitor the water quality of the lake. We needed to know if our lake was healthy and if we had any plants that were invasive. The program is now called MiCorps and is run by the Michigan Department of Environment, Great Lakes, and Energy (EGLE). The MiCorps team is made up of several organizations,

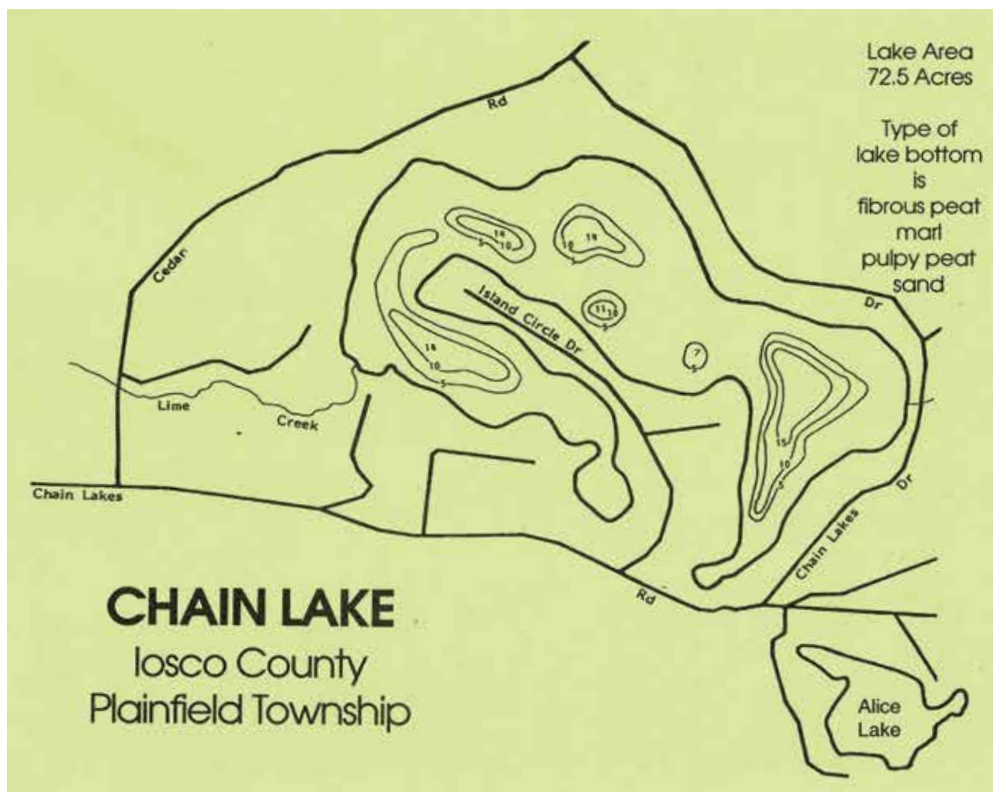


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including EGLE, MLSA, Huron River Watershed Council, and Michigan State University. MiCorps is a two-part program; one side of the organization focuses more on streams, while the other side focuses on lakes. The lake-focused side is called the Cooperative Lakes Monitoring Program (CLMP). The program has been built up over the years. When we first started with the program they had about 125 lakes; this year they have over 360 lakes.

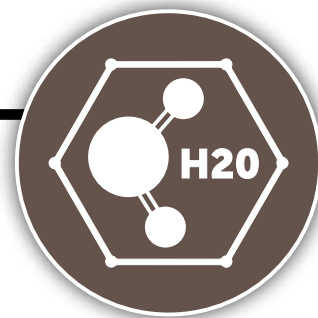
The samples that are taken on the lakes are gathered by volunteers who live on the lake, or who can be there on the proper days to take the water samples. We started out the first few years with just doing the Secchi disk transparency. This test is done with a disk that is about 8 inches around with four alternating black and white quadrants painted on the surface. The disk is attached to a measured line and lowered into the lake until it disappears from view. The water depth at which the disk disappears is the Secchi disk depth, or value, for the lake. The deeper the disk is seen the clearer the water, or the greater the transparency of the lake. Chain Lake averages around 12 feet for most of the year. The tests are always taken from the same spot, which is the deepest on the lake. After a few years we added total phosphorus (spring and summer). These tests are useful for evaluating nutrient enrichment of the lake. Spring total phosphorus is taken within two weeks of ice-out and summer total phosphorus is taken in late summer, usually August or September depending on the area you are in. Then we added chlorophyll a. Chlorophyll is the green photosynthetic pigment in the cells of the plants. Training is required for this parameter as there are a lot of steps that need to be taken to get the proper sample. This test is taken five times a year at certain times for each test. The MiCorps program has other tests, such as dissolved oxygen, exotic



aquatic plant watch and Score the Shore. We are not in those programs at this time, but may add them in the future.

We found through testing these past 27 years that our lake is very healthy. We learned a lot about keeping the lake healthy and how to work together for the common goal of having a clear, safe, enjoyable area that can be used properly all year long. We do have Eurasian watermilfoil by the boat launch, which is being treated each year by an applicator company that is hired through Plainfield Township. The cost of these treatments are paid for through our property taxes. A lot of the good health of our lake is also due to the fact that much of the area is not developed and the natural shorelines are still intact.

If your lake is not in the MiCorps program, I urge you to give it a try. You'll learn a lot and will keep on learning as we have. *R.*



THOUSANDS OF VOLUNTEERS HELP COLLECT WATER QUALITY DATA

MICORPS DATA COLLECTED BY VOLUNTEERS HELPS STATE WATER RESOURCE MANAGERS PROTECT MICHIGAN'S WATER RESOURCES FOR FUTURE GENERATIONS

TAMARA LIPSEY AND SARAH HOLDEN | MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
JOE NOHNER | MICHIGAN DEPARTMENT OF NATURAL RESOURCES

If you are reading this magazine, chances are you enjoy being near the water. You are likely one of the lucky people who either own a home or cottage on the water or recreate on one of the nearly 11,000 inland lakes (that are equal to or greater than 5 acres) or 36,000 miles of rivers and streams that lie within Michigan's borders. Or maybe you recreate on one of the Great Lakes, which are some of the largest freshwater lakes in the world and contain more than 20% of all the freshwater in the world!

There's no question that Michigan's lakes and streams are special. They provide a place that gives us joy, where our friends and families gather to create memories. They provide rest and relaxation from our busy lives. They are a place we can go to find peace and explore nature. These waters need to be protected. The Michigan Department of Environment, Great Lakes, and Energy (EGLE) and the Michigan Department of Natural Resources (DNR) both have missions that include protecting Michigan's water resources so that they are safe and clean for public health and recreation, and for the fish and wildlife that rely on our water resources to live.

Unfortunately, the abundance of freshwater provides a challenge when it comes to having enough resources to monitor and protect these water bodies. Luckily EGLE and the DNR have help from people such as those who read *The Michigan Riparian*. The Michigan Clean Water Corps (MiCorps), made possible with funding from EGLE, is a network of volunteer water quality monitoring programs in Michigan. It was created through Michigan Executive Order #2003-15 to assist EGLE in collecting and sharing water quality data for use in carrying out its mission of protecting the state's water resources. MiCorps provides a way the public can have a needed, active role in this mission.

There are two programs that people can get involved with to help collect water quality data: the Volunteer Stream Monitoring Program (VSMP) and the Cooperative Lakes Monitoring Program (CLMP). The data collected as part of each program are entered into a publicly available online database called the MiCorps Data Exchange. The data are used locally and statewide to make watershed management and protection decisions. In this article we will dive into how MiCorps data are used by both EGLE and the DNR to carry out their missions.

MICORPS VOLUNTEER STREAM MONITORING PROGRAM

The MiCorps VSMP provides grants, resources, and training to enable nonprofits to engage volunteers in stream water quality and habitat monitoring through aquatic macroinvertebrate surveys and physical habitat assessments. Aquatic macroinvertebrates are insects and other small animals without backbones that live in our streams and rivers. This includes dragonflies, damselflies, mayflies, stoneflies, snails, crayfish, and more. These creatures are excellent indicators of water quality because some macroinvertebrates are more tolerant to pollution than others. The types and abundance of macroinvertebrates found in a stream can be used to calculate a water quality rating.

Currently there are almost 30 VSMP groups statewide that engage more than 1000 volunteers each year. Since 2005, macroinvertebrate communities and stream habitat conditions have been evaluated at 820 stations and entered into the MiCorps database. Several of the stations are repeatedly sampled twice per year and thus there are more than 12,000 individual samples in the database. These data

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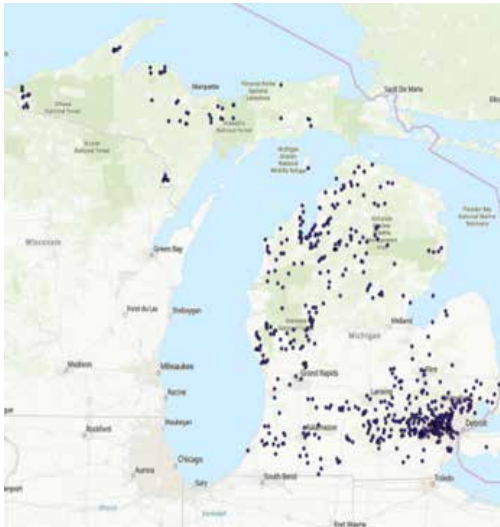


FIGURE 1.
A MAP OF ALL THE MICORPS VOLUNTEER STREAM
MONITORING PROGRAM SAMPLING LOCATIONS
FROM 2005-2023
MAP CREDIT: PAUL STEEN

are used locally by the watershed groups that collect them to better understand the ecological health of the rivers and streams they strive to protect. EGLE staff use the information as a screening tool when planning annual watershed monitoring plans to assess water quality in Michigan's water bodies. If there is a stream or river that has consistently low water quality ratings, it can alert EGLE staff that more investigation may be needed.

Furthermore, several of the MiCorps VSMP groups have discovered invasive species including the New Zealand mud snail. Early detection of invasive species is one of the best defenses against fighting their spread. While EGLE and DNR scientists are often out monitoring our rivers and streams, we cannot be everywhere, all the time. The more eyes on our water bodies and the more data collected, the better we can work together to protect water quality.



FIGURE 2.
MICORPS VOLUNTEER STREAM MONITORING PROGRAM WORKERS HOLD NETS THEY USE
TO CAPTURE AQUATIC MACROINVERTEBRATES
PHOTO CREDIT: PAUL STEEN

MICORPS COOPERATIVE LAKES MONITORING PROGRAM-EGLE'S USE OF DATA

Launched in 1974, MiCorps' CLMP has been an important part of Michigan's water quality monitoring program for 50 years! In 2024, nearly 1,000 volunteers enrolled in the CLMP collected data on approximately 300 lakes. EGLE uses these data to determine water quality conditions in Michigan lakes. For example, EGLE uses three types of CLMP data: Secchi disk measurements (a measure of water clarity), total phosphorus (an important nutrient for plant and algae growth), and chlorophyll a (an estimate of the amount of algae in a lake's water column), to determine the trophic state of a lake. Trophic state is an overall descriptor of the productivity in a lake. In general, nutrient concentrations, algal density, and aquatic plant abundance increase as trophic state increases. Furthermore, water clarity and the amount of well-oxygenated water declines as trophic state increases. If a lake's trophic state is increasing, it may be an indication of human activities causing water quality impairment and there is an unacceptable amount of nutrient expression in a lake.

Another benefit of CLMP data is not only that it is collected at hundreds of lakes, but some parameters are also collected more than once per year, which is extremely beneficial to calculating a more accurate trophic state. Furthermore, many lakes enroll year after year, allowing for the collection of a long-term dataset that can be used to look at changes in productivity.

(CONTINUED ON PAGE 28)

“The more eyes on our water bodies and the more data collected, the better we can work together to protect water quality.”

THOUSANDS OF VOLUNTEERS HELP COLLECT WATER QUALITY DATA

(CONTINUED FROM PAGE 27)

In addition to assessing the trophic state of inland lakes, some CLMP volunteers also choose to collect temperature and dissolved oxygen data that are also used by DNR and EGLE. Michigan's water quality standards indicate specific dissolved oxygen levels that need to be maintained in all Michigan waters. The coldwater dissolved oxygen standard for inland lakes was set to be protective of coldwater fish, which have lower temperature and higher dissolved oxygen requirements than warmwater fish, and are thus the most sensitive to water quality changes. The goal of the water quality standard is to ensure an area of the lake in the late summer that is cold enough and has plenty of dissolved oxygen. In 2024, using temperature and dissolved oxygen data collected by MiCorps volunteers, EGLE identified 23 coldwater lakes as not having the conditions needed to support healthy coldwater fish communities. This information can be used to make land and water management decisions on how to better protect and restore these water bodies.



FIGURE 3.
A MICORPS COOPERATIVE LAKES MONITORING PROGRAM VOLUNTEER COLLECTS DISSOLVED OXYGEN AND TEMPERATURE DATA FROM ONE OF MICHIGAN'S THOUSANDS OF INLAND LAKES
PHOTO CREDIT: TAMARA LIPSEY

Finally, MiCorps CLMP volunteers also collect information on invasive aquatic plants and shoreline habitat in their lakes. The MiCorps Exotic Aquatic Plant Watch Program is an important early detection tool for invasive species that are hard to get rid of once they are established. The program helps empower people to take an active role in AIS monitoring, which is particularly important in the many areas where EGLE scientists simply can't reach due to limited access, time, and other resources. In the MiCorps Score the Shore program, information collected by volunteers on shoreland conditions are used by EGLE and DNR scientists to determine the amount of shoreline development the lake currently has and the cumulative impacts of shoreline development through time.

MICORPS COOPERATIVE LAKES MONITORING PROGRAM-DNR'S USE OF DATA

The DNR's mission is a commitment to the conservation, protection, management, use, and enjoyment of the state's natural and cultural resources for current and future generations. The data collected by MiCorps is incredibly valuable to assist in making fisheries management decisions such as changes in fishing regulations, understanding the causes of fish kills, making fish stocking decisions, and more.

One example is the use of CLMP dissolved oxygen and temperature data for the conservation of cisco. Cisco are an important coldwater fish species that have been identified as a priority for conservation in the DNR Wildlife Action Plan. Due to declines in their populations and the total loss of the species in some lakes, they are now listed as threatened in Michigan. They are an important food source for many species of game fish, and Michigan has about 250 lakes with known, suspected, or extirpated (locally extinct) cisco populations. To successfully manage this important species, understanding which lakes in Michigan provide suitable conditions for their survival and understanding changes in those conditions is critical.

The DNR analyzed temperature and dissolved oxygen profiles to assess the quality of coldwater habitat for cisco and other fishes in lakes

(CONTINUED ON PAGE 29)



FIGURE 4.
PHOTO OF A CISCO FISH
PHOTO CREDIT: JOE NOHNER, MICHIGAN DNR

throughout the state. CLMP data makes up 64 percent of the available data. The DNR is using this assessment to help inform decisions on lake-specific management, regional and statewide planning, and to track trends over time. With the data that MiCorps volunteers submit, more informed decisions can be made by DNR fisheries management staff.

The data collected by volunteers taking part in MiCorps is an invaluable source of information that is needed by EGLE and the DNR to protect Michigan's thousands of inland lakes and thousands of miles of rivers and streams. By participating in MiCorps, volunteers learn more about the ecology of the beautiful water bodies that we enjoy.

If you would like to become a volunteer, consider enrolling today on the MiCorps website. Volunteers and state scientists alike can use the information collected about water quality to make educated decisions about the management of the water bodies and the landscapes that impact them. Data collected through MiCorps are posted

TEMPERATURE/DISSOLVED OXYGEN PROFILES COLLECTED 2000-2023

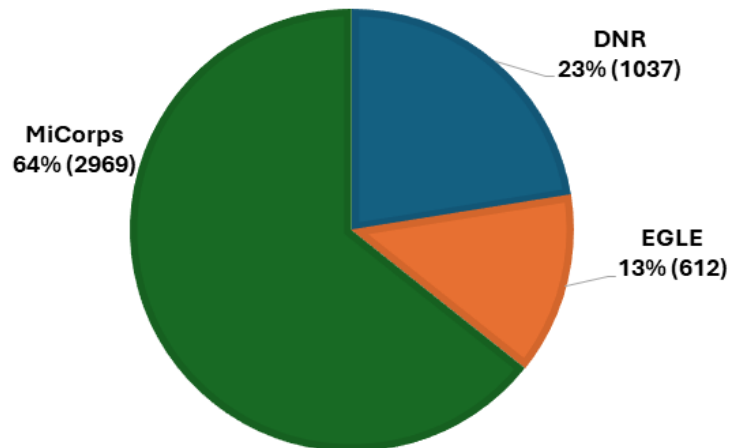


FIGURE 5. THE PERCENTAGE (AND COUNTS) OF DISSOLVED OXYGEN AND TEMPERATURE READINGS COLLECTED FROM MICHIGAN INLAND LAKES BETWEEN 2000-2023 BY DNR, EGLE, AND MICORPS VOLUNTEERS

on the program's website and are available for public use. We thank all MiCorps volunteers for helping to protect our water resources for future generations! *R.*



WATER RESOURCES

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The Michigan Riparian

a magazine for waterfront property owners

The only magazine devoted to protection, preservation and improvement of Michigan waters, and to the rights of Riparian owners to enjoy their waterfront property.

IN THIS ISSUE —

- STRANGERS IN THE WATER
- INLAND LAKE ZONING (PART TWO)
- HOW SAFE ARE NUCLEAR PLANTS?
- WHO NEEDS BUREAU OF WATER MANAGEMENT?
- ATTACK ON ACT 137

Michigan DNR Offers Self-Help Program for Lake Associations

From The Michigan Riparian, Winter 1974 issue

For several years ML&SA has been trying to interest the state in working with member associations in regard to water quality testing and combating eutrophication of inland lakes. Such help is now being offered. Read what Dr. Dennis P. Tierney, Bureau of Water Management, has to say:

"The Department of Natural Resources, Bureau of Water Management, would like to know the degree of interest lake associations have in participating in a Recreational Inland Lake Self-Help program with the state. Briefly, the long-range program has been designed for the purpose of keeping track of water quality changes in Michigan's recreational lakes, so the degree and rate of eutrophication (nutrient enrichment and increased aquatic plant growth) can be determined.

An exhaustive water quality evaluation for all of Michigan's inland lakes is beyond the financial and logistical capabilities of this Bureau. Yet a practical, but effective, lake evaluation program can be carried out if local lake associations will participate on a routine basis.

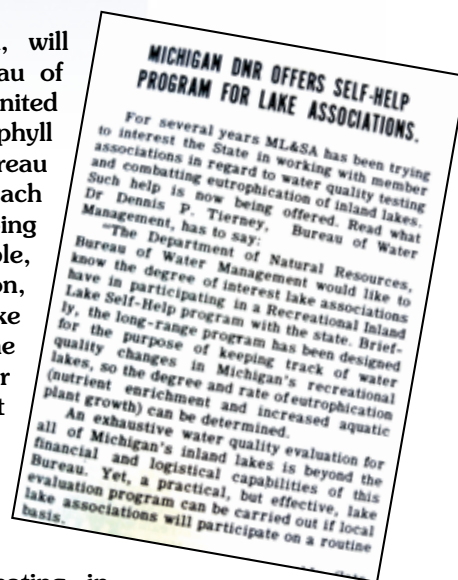
The program involves the weekly (late April/May-early November) measurement of the transparency of lake water and collection of a water sample in the deep basin(s) of each lake. The water sample will be analyzed for the chlorophyll a content. Chlorophyll is a chemical substance within algal cells and by determining the quantity present in the samples an estimate of algal abundance in the lake can be obtained.

Data on the water transparency and chlorophyll concentrations can be obtained very simply by individual lake associations. What little equipment that is needed can be constructed by each association at a nominal cost. Plans for construction of the equipment will be provided by the Bureau of Water Management upon request. Water

samples, once collected, will be shipped to the Bureau of Water Management via United Parcel Service for chlorophyll a determination. The Bureau is requesting that each association pay the shipping costs, or when possible, members of the association, if they commute to the lake on the weekends, bring the sample with them on their return to Lansing. Exact locations for sample shipment will be provided at a later date.

If your association is interested in participating in such a program, please contact the Michigan Department of Natural Resources, Bureau of Water Management, Water Quality Appraisal Section, Stevens T. Mason Building, Lansing, Michigan 48926 by mail or call 517-373-8000. It would be most helpful if notifications would be on or before March 15, 1974. The degree of response indicated will indicate the size of the program and feasibility of including all respondents. Our main goal now, is to determine your interest and the potential for such a program. Provided interest is sufficient and the logistics can be quickly handled, it would be possible to initiate the program in late April of this year.

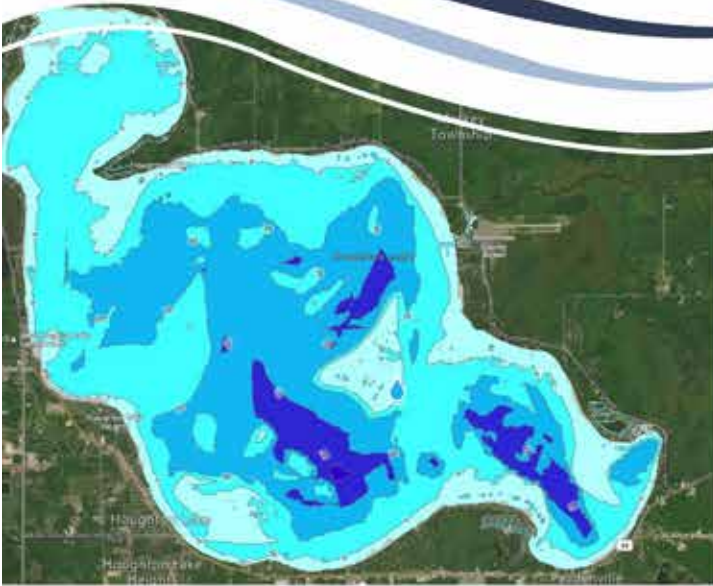
The Bureau of Water Management would annually provide a report to the lake associations. The data collected will be interpreted by aquatic biologists and limnologists to assess the relative eutrophic conditions of the lakes. These reports will assist the associations in better understanding the water quality of the lakes." R.



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