

# MSU Extension Water Programs

Lakes  
Streams  
Watersheds

MICHIGAN STATE  
UNIVERSITY

Extension

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# Improving Michigan's lakes and streams through education and engagement

In Michigan we are the proud stewards of the Great Lakes and countless inland lakes, rivers, and a vast groundwater resource. Regardless of their size, these bodies of water enhance Michiganders' quality of life by providing clean drinking water, food, beauty and recreational enjoyment. For communities, these water resources are an invaluable asset and offer a sense of place and a rich economic resource. However, with such astounding resources comes responsibility.

Michigan residents can support the protection, wise use and long-term monitoring of their favorite waterways by becoming involved with Michigan State University (MSU) Extension water programs. Local communities often struggle to protect and manage these valuable aquatic resources in a way that incorporates the best available knowledge and resources. MSU Extension has developed numerous educational programs to help communities address these concerns.

Dive in and learn what MSU Extension has to offer!



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# Something for everyone!

Interested in protecting shorelines on lakes? Want to learn more about local and state policies that affect lakes and streams? Looking for an opportunity to improve your communication and leadership skills to protect the environment? You are in the right place. MSU Extension has something for everyone!

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# Let's Go Back to the Classroom

Lakes are complex ecosystems that are often negatively impacted by the people that use or live near them. Frequently, local communities struggle to protect and manage inland lakes in a way that incorporates the best available knowledge and resources. Concerned citizens, local leaders, resource professionals and lakefront property owners can learn about inland lake management and protection by enrolling in Introduction to Lakes.

Introduction to Lakes is a six-week online course designed for citizens and professionals interested in learning about inland lakes. From the comfort of home or office, participants have 24/7 access to six online units featuring closed captioned video lectures, interactive activities, resource lists, discussion forums, quizzes, and webinars with classmates and MSU Extension educators. Through this convenient format, participants increase their knowledge and understanding of lake ecology, watersheds, shorelines, law, aquatic plants and citizen involvement.



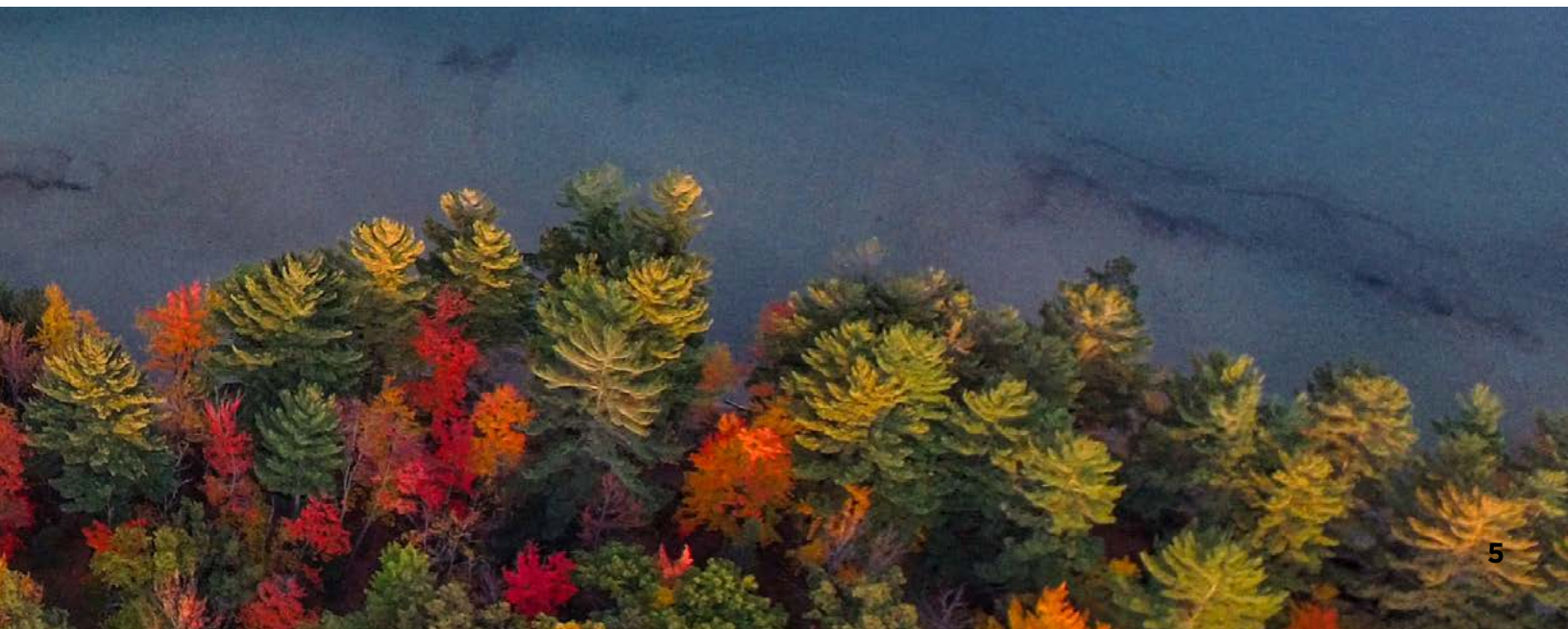
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Local water issues, such as diverse land uses, changing climate patterns, and non-point source pollution have long-term implications for water quality. Citizens have asked for stronger governance to protect water resources, but access to information and resources are barriers to community water management improvements.

Michigan Water School: Essential Resources for Local Officials addresses these issues. This policy-neutral, fact-based, two-day program provides local decision-makers at all levels with the information needed to understand Michigan's water resources. Participants learn the fundamentals of water science to support sound water management decisions and increase their awareness of local and state water issues.

Participants gain a focused understanding of the role of local government in providing leadership in water management and develop new attitudes, knowledge and confidence in their ability to make decisions.

The curriculum includes in-class presentations, hands-on learning activities, interactive demonstrations and field trips covering topics such as water quantity, water quality, economics, finance and planning, water policy and local water issues. Participants also gain access to the Water School Policy Toolbox with information about the federal, state, tribal and local laws and rules that make up Michigan's water policies.



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# Become a Citizen Scientist



Vernal pools are small, shallow, seasonally flooded water bodies or wetlands that fill with water in the spring or fall and dry out during the summer or from drought. They may be physically small, but they play an enormous role in forest health and provide habitat for more than 500 animal species. They also provide critical breeding habitat for many forest-dwelling amphibians and invertebrates, which form the base of the food chain. As part of the forest ecosystem, vernal pools are key to nutrient cycling, water storage and infiltration, groundwater recharge, and flood control. However, they are vulnerable to a number of threats and are not well-protected under current wetland laws and regulations.

The Vernal Pool Patrol relies on trained citizen scientists, educators, and community partners to identify and map locations of vernal pools in their communities and collect information about their biological and physical characteristics. This information is entered into a statewide database used to assess the status, distribution and ecology of vernal pools and to inform management and protection. The Vernal Pool Patrol also provides a place-based education program for students with opportunities to contribute to a real-world research and management issue.

## Michigan Natural Features Inventory

The Vernal Pool Patrol is one of many programs coordinated by the Michigan Natural Features Inventory (MNFI), a program of MSU Extension. MNFI aims to deliver the highest quality information that contributes to the conservation of biodiversity, especially rare and declining plants and animals and the diversity of native ecosystems. To do so, MNFI conducts biological surveys and provides conservation planning services to a variety of municipalities and state and federal agencies.

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MiCorps is a network of lake and stream volunteer monitoring programs in Michigan. Data collected by volunteers are used in their local communities and by the Department of Environmental Quality (DEQ) for use in water resources management and protection programs.

## Cooperative Lakes Monitoring Program

Cooperative Lakes Monitoring Program volunteers monitor the water quality of their lakes to document changes over time. Participants collect data on a variety of different parameters including: Secchi disk transparency, total phosphorus, chlorophyll a, dissolved oxygen, temperature, shoreline habitat, aquatic plant identification and mapping, and monitor for invasive plants. Staff provide training and support to volunteers.

## Volunteer Stream Monitoring Program

MiCorps provides technical assistance to local units of government and nonprofit entities for water quality monitoring in wadeable streams and rivers through the Volunteer Stream Monitoring Program. The monitoring typically consists of an evaluation of benthic invertebrate communities (aquatic “bugs”) and stream habitat. The program also supports road-stream crossing inventories. Staff provide training, support, and assistance with developing quality assurance project plans to the participants, helping them to reach a professional level of monitoring. The resultant data are used by local communities and the DEQ to identify waterways requiring more detailed assessment and to inform water resource management.



Left: MiCorps staff provide aquatic plant training to lake monitoring volunteers.

Right: Volunteers examine nets for aquatic macroinvertebrates.



# Live, Learn & Lead

The Michigan Conservation Stewards Program is a volunteer leader training program designed for individuals interested in learning about Michigan's ecological foundations, history of conservation activities, aquatic and terrestrial ecosystems and the threats they currently face. The core curriculum is centered around an ecosystem-based management approach that prepares participants to carry out and lead community-based volunteer conservation management activities and to share their knowledge with others to help restore and sustain healthy ecosystems throughout Michigan.

It is delivered via a combination of online coursework and evening and all-day field sessions held in a variety of ecologically diverse locations in the county where the program is offered. Instruction is provided by MSU Extension, natural resource agencies and a variety of local conservation partners.

Participants complete:

1. Classroom and field-based training led by experts in various fields of conservation and natural resources.
2. Self-paced online learning modules.
3. 40 hours of volunteer service including activities related to the completion of an in-class capstone project and other conservation activities of interest.



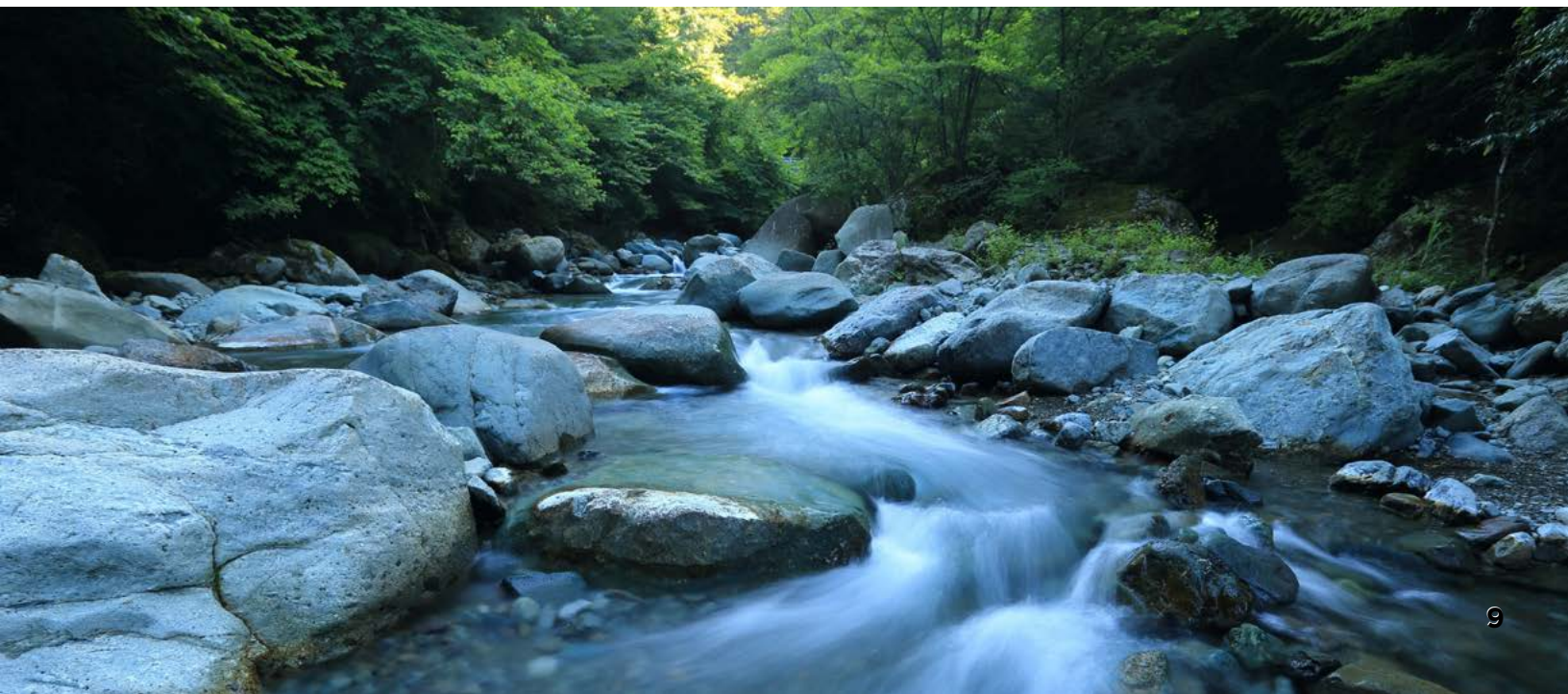
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Concerned citizens, local leaders, resource professionals and waterfront property owners can learn to be more effective stewards of Michigan's waterways at the Lake and Stream Leaders Institute.

Participants take part in classroom and field sessions designed to help them better understand local water resource management planning and program implementation. Experts from Michigan State University, natural resource agencies and local communities cover topics including watershed management, lake and stream ecology, leadership, communication and working with local and state government. The Institute is conducted through three in-depth sessions held in locations across Michigan.

Participants complete an independent applied project based on what they learn during the Institute sessions. Projects can be designed to match each participant's area of interest. Past examples include organizing public forums and educational programs related to lakes and streams, initiating projects that protect and promote water quality, assisting in local water resource management activities and conducting water quality monitoring studies.

Upon graduation, participants become part of the Institute's Alumni Program which offers networking, educational and service opportunities. Institute alumni include property owners, drain commissioners, professors, nonprofit organization representatives, students, and state and local government personnel.



# Preventing Invasives: One Source at a Time



Local organizations can increase awareness of aquatic invasive species and clean boating practices to prevent their spread by hosting a free Mobile Boat Wash event in their community. Trailer-mounted units use heated high-pressure water that is effective in cleaning most invasive species from boats and trailers. A containment mat prevents runoff back into lakes and rivers.

The Mobile Boat Wash program provides a trailer-mounted washing unit, two staff who operate the unit and talk with boaters and educational materials on aquatic invasive species prevention. Local volunteers assist by coordinating local logistics, promotion and speaking with boaters during the event. The presence of the Mobile Boat Wash provides an opportunity to teach boaters the importance of “Clean, Drain, and Dry” to prevent the spread of aquatic invasive species.

## Preventing invasive species on watercraft is easy:

- ✓ **CLEAN** off aquatic plants, animals and mud from all equipment before leaving the launch site.
- ✓ **DRAIN** water from all equipment and leave drain plugs out during transport.
- ✓ **DRY** all equipment for five days or wipe dry with a towel before using in a new location.



Non-native animals and plants are commonly available for sale at pet stores and garden centers. While a majority of these species are environmentally benign and economically valuable, some become invasive and cause significant harm if released into the wild.

To address this issue, the Reduce Invasive Pet and Plant Escapes (RIPPLE) program offers educational information to aquarium hobbyists and water gardeners about what to do with pet fish and overgrown plants so they do not get accidentally or purposely introduced into lakes and streams. Through RIPPLE, hobbyists and retailers receive aquatic plant and animal handling and disposal information, trainings and educational materials.

Pet and pond professionals, hobbyists, and educators are invited to explore RIPPLE resources and become RIPPLE partners by learning how to prevent invasions and sharing materials and information with their clients and communities.

WORKING TOGETHER  
**IN MICHIGAN  
FOR HEALTHY  
WATER**



**RIPPLE**  
REDUCE INVASIVE  
PET & PLANT ESCAPES



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# Where Water Meets the Land

Shorelines are critical transition zones between land and water that provide habitat, protect water quality and serve as a gateway for people enjoying Michigan's many lakes. Unfortunately, the hardening of our natural shorelines (e.g. installing seawalls and rock) and maintaining manicured lawns next to lakes can have many negative impacts.

In collaboration with the Michigan Natural Shoreline Partnership, MSU Extension assists with the implementation of a variety of shoreline programs that help individuals, professionals and lake communities understand and implement best practices on lake shorelines.

## Shoreland Stewards Program

This online self-assessment enables lakefront property owners to see how well they are protecting their lake through environmentally friendly shoreline practices, and provides ideas on how to improve their shoreline.

## Shoreland Stewards Ambassadors Program

This volunteer program prepares individuals to promote best shoreline practices within their lake communities and to assist their neighbors with the Shoreland Stewards Program.

## Certified Natural Shoreline Professionals

This certification program provides contractors and landscape professionals with the information and skills needed to implement natural shoreline and bioengineered erosion control techniques to protect inland lakes.



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Approximately 43 percent of Michigan residents rely on on-site wastewater (septic) systems to handle the wastewater from their homes and businesses. That's over 1.2 million septic systems in use in Michigan today. It is estimated that at least 10 percent of these systems are in some level of failure. Many on-site wastewater systems are located in environmentally sensitive areas, such as adjacent to a lake, river or stream, and have the potential to pollute water.

MSU Extension partners with county health departments, industry consultants and other organizations to provide educational programs on the proper use and maintenance of these systems to protect the health of families, communities and the environment.

Septic system use and maintenance programs are offered in partnership with county health departments around the state. These programs give participants information and resources on how a septic system operates, best management practices to protect the system, signs of trouble and steps to take if a problem occurs. These programs are offered in person and online.

## Decentralized Wastewater Treatment: Continuing Education for Design and Install Professionals

Professionals in the on-site wastewater field need continuing certification credits to remain in business. MSU Extension partnered with local consultants and developed an online course allowing participants an opportunity to gain continuing certification credits at their convenience. Classes are offered several times a year so professionals can update certifications in a timely manner.



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The Michigan Sea Grant College Program supports research, outreach and education to enhance sustainable use of Great Lakes resources, benefiting the environment, the quality of life, and the Michigan, Great Lakes and national economy. Michigan Sea Grant Extension provides educational outreach in many areas.



## **Fishery Workshops**

Fishing, whether for recreation or profit, makes an important contribution to Michigan's economy. The impact of sport fishing is estimated to be in excess of \$4 billion annually and provides more than 38,000 jobs. Michigan Sea Grant Extension, in partnership with fisheries agencies and stakeholder organizations, holds workshops to discuss the latest research findings, lake management updates, and fishing trends. Workshops provide valuable information for anglers, commercial fishers, charter captains, resource professionals, and others. In addition, attendees have the opportunity to weigh in on important fisheries management issues and interact with scientists.

## **Place-Based Education Summer Teacher Institute**

Each year the Lake Huron Place-Based Education Summer Teacher Institute offers a chance for educators to get their feet wet with Great Lakes science experiences while learning about place-based education strategies and best practices. As a part of the Northeast Michigan Great Lakes Stewardship Initiative, the institute is designed to help teachers gain a better understanding of the Great Lakes and our interconnections with them. Educators gain practical experience in enhancing student learning and involvement through stewardship. Also, teachers learn how to strengthen partnerships between schools and community members.

## **Take a Discovery Cruise with Michigan Sea Grant**

Summer Discovery Cruises provide educational tours on Lake St. Clair, the Detroit River, and Lake Erie. Whether you are interested in lighthouses, shipping and shipwrecks, wetlands or waterfowl, you'll find cruises that match your interests. Summer Discovery Cruises are an enjoyable way for the whole family (ages 6 and up) to have fun while becoming more informed about our Great Lakes.



# Michigan State University Extension Bookstore



## Continue learning from home!

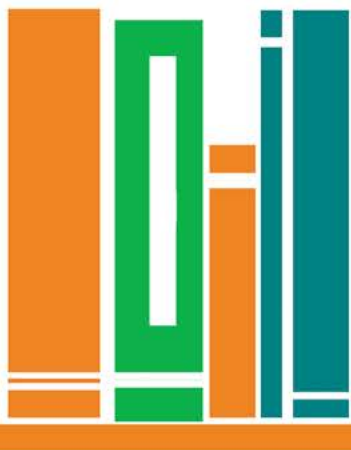
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We offer online resources and books you can order from the comfort of your home!

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2019 Edition  
Layout and design by Paige Filice



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