MAISRC NEWSLETTER

MINNESOTA AQUATIC INVASIVE SPECIES RESEARCH CENTER

VIEW ONLINE

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NEW TOOL HELPS LAKE MANAGERS TRACK WATERMILFOIL STRAINS ACROSS THE U.S.

A new web-based application is making it easier than ever for lake residents, managers, researchers, and applicators to understand the distribution and management implications of watermilfoil strains across the United States. **MilfoilMapper** provides a centralized, interactive map that brings together genetic and herbicide-response data to support science-based aquatic plant management decisions.

Developed through a collaborative effort involving researchers from **Montana State University and the University of Minnesota**, including Ashley Wolfe, Alex Bajcz, Ryan Thum, and Ray Newman, the tool is described in a recent publication detailing how **MilfoilMapper helps inform management of Eurasian watermilfoil and its hybrids** across the country.

What is it?

MilfoilMapper displays a map of the lower 48 states, with **circular markers representing lakes where genetic surveys have identified specific watermilfoil strain**s. Users can click on any marker to open a pop-up containing detailed information about the lake, including:

- State and county
- Lake name and waterbody ID
- The strain or strains present
- Available herbicide response information

For strains with herbicide data, a clickable button reveals **how that strain responded** to tested herbicides. These details appear alongside relevant citations, helping managers understand the scientific context behind the results.

The tool includes filters that allow users to narrow results by state, county, lake, waterbody ID, taxa, or even individual strains. This makes it possible to **quickly identify where a specific strain occurs** or to generate a list of lakes that share similar genetic profiles.

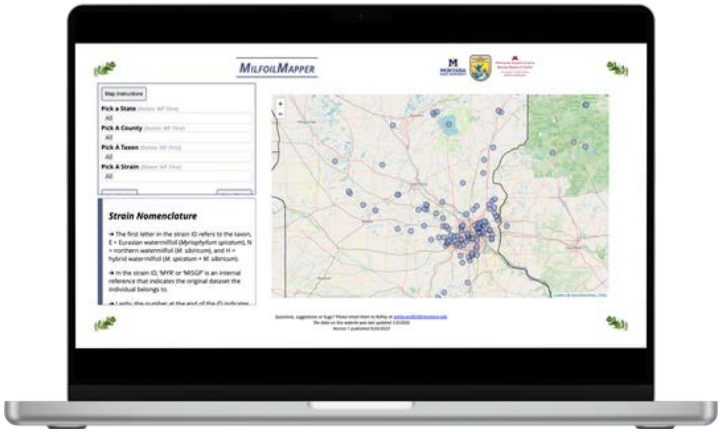

Image of MilfoilMapper

Right Tool for the Right Job

Watermilfoil isn't a single, uniform invader. The database highlights the distribution of Eurasian, northern, and hybrid watermilfoil genotypes, information that can directly influence management decisions. While many Eurasian and hybrid watermilfoil strains remain susceptible to herbicides, some strains have shown resistance to products such as 2,4-D or fluridone. Having access to this information allows managers to tailor control strategies based on the biology of the plants in their own lakes rather than relying on a one-size-fits-all approach.

"MilfoilMapper allows lake residents, managers and applicators to make better informed management decisions and helps users compare the strain(s) present in their lake with those found across the country."

- Dr. Ray Newman, project lead

Continued..

A Resource for Minnesota

More than a quarter of the lakes currently represented in the database are located in Minnesota, making the tool especially valuable for local decision-makers. Currently, **users can explore strain-level information for 118 Minnesota lakes**, including several herbicide-resistant strains that have implications for treatment planning.

MilfoilMapper reflects available survey data, but **not every lake in the United States has been genetically surveyed**. Survey coverage is strongest in the Midwest due to research partnerships and funding, meaning additional strains may exist beyond those currently displayed. **The database is continually updated** as new sampling and herbicide-response data become available.

If a lake is not yet represented, users can contact the research team or visit the Thum Lab for additional information about potential sampling opportunities.

"MilfoilMapper was created to help **improve management of Eurasian and hybrid watermilfoil strains** by supporting the integration of widespread genetic surveying and monitoring to identify, prioritize and characterize strains with documented or potential herbicide responses." explains researcher Ashley Wolfe. "**The research team welcomes user feedback** on website features and function to help make this app more user friendly."

Submerged Eurasian watermilfoil; photo by Megan Weber

Eurasian watermilfoil; photo by Megan Weber

Easy to Explore

The interface is designed with usability in mind:

- Click markers to view lake and strain details
- Use filters to refine searches by geography or strain
- Remove "All" before selecting filter options
- Create lists of lakes by strain, state, or county

The result is a practical, accessible platform that turns complex genetics and treatment data into actionable solutions for people managing aquatic invasive species in their area.

Learn more

The research describing MilfoilMapper can be found in a recent publication on Eurasian watermilfoil management:

Wolfe, A. L., Bajcz, A. W., Newman, R. M., & Thum, R. A. (2025). MilfoilMapper: A web-based tool to inform Eurasian watermilfoil (Myriophyllum spicatum) management. *Invasive Plant Science and Management*, 18, e31. Cambridge Core. https://doi.org/10.1017/inp.2025.10032

MILFOILMAPPER

AIS DETECTOR UPDATES

AIS DETECTORS
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WEBINARS

Date	Topic	
Thursday March 12, 1:00pm CST	**Safeguarding Amphibians from the Invisible Invaders** Presented by: Amy Kinsley	Register
Wednesday May 6, 1:00pm CST	**Genetic options for controlling invasive carp species** Presented by: Michael Smanski	Register
Wednesday July 8, 1:00pm CST	**Genomic surveillance of zebra mussel populations using genotyping by sequencing** Presented by: Daryl Gohl	Register

AIS DETECTORS CORE COURSE

Ready to be part of the solution to aquatic invasive species (AIS) problems? **The AIS Detectors Core Course is the class for you!** During this course you can expect to learn some basic aquatic ecology, **how to identify high priority invasive species for Minnesota**, impacts AIS can have on the environment, how to report AIS sightings, Minnesota AIS regulations, and how to search for AIS on your own.

The course consists of two parts:

- 1st: A self-paced online course (approximately 8 hours)
- 2nd: A live workshop (one full day for in-person options and two 3-hour sessions for the all-virtual option)

The time to take the self-paced online course can vary from person to person, so depending on your learning style it may take more or less than the 8 hours planned.

To learn more about the AIS Detectors Core Course and read the FAQs, visit our website at **z.umn.edu/AISCoreCourse**

Dates to remember:
March: Registration Opens
May 8: In-Person Plymouth
May 20 & 21: Virtual
June 5: In-Person Cass County

RESEARCH PROJECTS CONTINUING INTO NEW PHASES

MAISRC has seven projects moving forward into a new phase of research. Several projects focus on improving control technologies, including enzyme-based coatings to prevent zebra mussel attachment, native revegetation strategies to increase ecosystem resistance to AIS, and continued development of self-limiting genetic control methods for common carp.

Prevention and early detection efforts include evaluating CO_2 and acoustic deterrents to limit establishment of bighead carp and silver carp in the Mississippi, and expanding statewide surveillance and eDNA-based risk modeling for chytrid fungus affecting amphibians.

Additional research examines how zebra mussels and starry stonewort alter mercury cycling and fish contamination risk, and assesses the threat of starry stonewort to wild rice to inform culturally and ecologically responsive management.

These projects strengthen Minnesota's capacity to slow AIS spread, reduce ecological and economic impacts, and guide targeted management investments. Visit their project pages below to learn more.

Enzyme-Based Coatings for Sustainable AIS and Biofouling Control
Project lead: Mikael Elias

AIS and mercury: understanding pathways and potential solutions
Project lead: Gretchen Hansen

Evaluating CO2/sound deterrents in model lock/dam
Project lead: Allen Mensinger

Cultivating resilience: native revegetation for AIS resistance
Project lead: Dan Larkin

Starry stonewort and wild rice: assessment and response
Project lead: Dan Larkin

Surveillance and Risk Management of Chytrid Fungi in Amphibians
Project lead: Amy Kinsley

Genetic control of invasive fish
Project lead: Mike Smanski

LAB TO LAKES: CATTAIL COLLABORATIVE

LAB TO LAKES Project Manager: Sarah Unruh, labtolakes@umn.edu

This project, part of the Lab to Lakes initiative, is testing invasive cattail management across Minnesota lakes; restoring native nearshore habitats, reconnecting lake ecosystems, supporting healthy fish communities, and empowering local management through participatory science.

MAISRC's Lab to Lakes initiative is launching a new effort to move research into action by partnering with state, tribal, and local groups to implement and test its science-based invasive cattail removal protocol. The **MN Cattail Collaborative** will take place on 20–25 Minnesota lakes with local partners. Partners will **identify plots of invasive cattail stands for mechanical removal on their lake in order to stimulate native plant recovery, reconnect nearshore and open-water habitats, and support healthier lake food webs.**

The project combines **hands-on restoration with participatory science**, equipping local volunteers and managers to collect standardized data that will evaluate ecological outcomes and inform best practices.

Researchers will also **map the extent of invasive cattail across Minnesota** using genetic tools and field identification methods, addressing a major knowledge gap, while engaging communities through workshops and field visits focused on the **importance of resilient, native nearshore plant communities.**

Learn more: z.umn.edu/cattail-collaborative

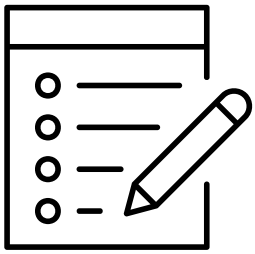
MAISRC researchers use a quadrat to survey nearshore conditions
Photo by Amy Schrank

Get involved!

Project leaders are currently recruiting people who are interested in removing cattails from their lakeshore to restore native vegetation and are willing to collect and share data from the removal sites.

Interested in joining the Cattail Collaborative? Fill out this form:

INTEREST FORM



PUBLICATION

Quantifying aquatic plant commonness and co-occurrence across scales to support ecological understanding and management

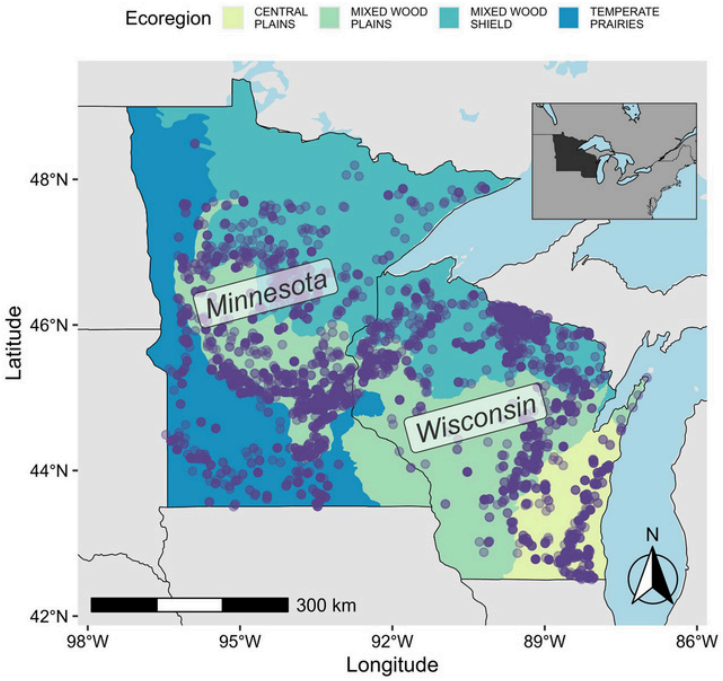
Larkin, D. J., Verhoeven, M. R., Walsh, J. R., & Johnson, J. A. (2026). Quantifying aquatic plant commonness and co-occurrence across scales to support ecological understanding and management. Journal of Ecology, 114(2), e70268. Badger, J., et al (2025). Coproducing a Technology Readiness Level framework for non-persistent genetic biocontrol of aquatic invasive species. *Journal of Environmental Management*, 391.

Click here to read the full article!

A two-decade analysis of aquatic plant communities across the Midwest

After analyzing 20+ years of aquatic plant surveys from lakes across Minnesota and Wisconsin (nearly 1 million sampling points!) MAISRC researchers **identified clear patterns in which species are common, rare, and most likely to coexist with others.**

By quantifying species occupancy at regional and local scales and measuring how often species co-occur with diverse plant communities, MAISRC researchers developed an objective framework for understanding how aquatic plants are distributed across lakes.



Map of study lakes (circles) in the U.S. states of Minnesota and Wisconsin, which span four major ecological regions (Omernik and Griffith 2014).

This framework translates biodiversity monitoring into practical management guidance. It helps:

- Identify species that are rare at both regional and local scales and may be most vulnerable to disturbance.
- Flag invasive species that are common across scales and pose elevated ecological risk.
- Inform restoration by identifying broadly tolerant "workhorse" species suitable for lake recovery efforts.

This new framework **turns long-term monitoring data into practical guidance** for conservation, invasive species risk assessment, and lake restoration planning, helping managers prioritize actions to protect Midwest lakes.

Key findings:

- All combinations of regional and local rarity and commonness occur, but clear patterns emerge.
- Species in high-diversity lakes tend to be regionally and locally uncommon.
- Species in low-diversity lakes are often common at both scales.
- Invasive species are typically widespread and associated with species-poor lakes.
- Highly conservative native species show the opposite pattern.
- Year-to-year variability is greater for occupancy than for community diversity and declines as species become more widespread.

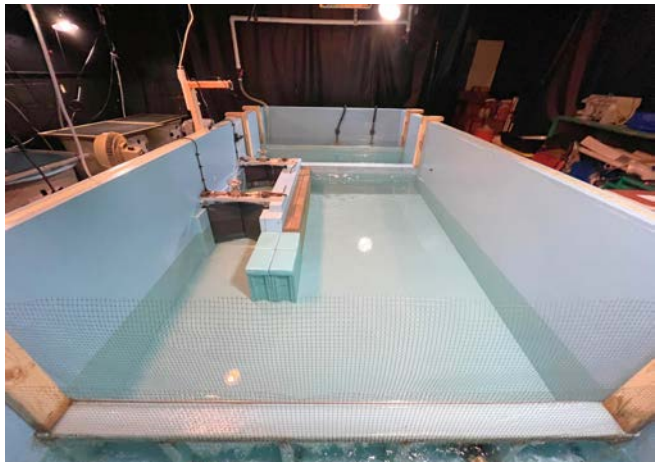
UPCOMING EVENTS

MAISRC LAB TOURS

Get up close and personal with aquatic invasive species with a **free tour of the MAISRC Containment lab!** You'll get an inside look at our **state-of-the-art facility** and discover the innovative research underway.

REGISTER

The tours are free, but space is limited and registration required.



- **March 12, 2026: AIS Detectors webinar:** Safeguarding Amphibians from the Invisible Invaders**, presented by: Amy Kinsley**
- **May 6, 2026: AIS Detectors webinar:** Genetic options for controlling invasive carp species**, presented by: Michael Smanski**
- **July 8, 2026: AIS Detectors webinar: Genomic surveillance of zebra mussel populations using genotyping by sequencing, presented by Daryl Gohl**
- **September 9, 2026: AIS Detectors webinar: Restoring our underwater forests: Can native revegetation enhance invasion resistance in lakes? Presented by Abha Panda**
- **October 28, 2026: Save the Date: AIS Research and Management Showcase**

IN THE NEWS:

- Aquatic invasive species use boats to travel across Minnesota lakes, Water Resources Science, by Molly Tilsen
- New Genomic Study Reveals Hidden Pathways Driving Minnesota's Zebra Mussel Spread, Daryl Gohl and Michael McCartney interviewed, *(UMN News)*
- Frog patrol: How scientists, students, and community members are guarding Minnesota's wetlands from disease, Amy Kinsley interviewed, *(UMN Vet Med)*
- University of Minnesota survey finds Minnesotans concerned about health of lakes, rivers, Nick Phelps and Gretchen Hansen interviewed, (MPR News)
- Invasive rusty crayfish trapping offers lake benefits, and a tasty meal, Valerie Brady interviewed, (Outdoor News)
- Minnesotans' water worries run deep, see science as a solution, Nick Phelps and Gretchen Hansen interviewed, (UMN News)

MAISRC'S MISSION

MINNESOTA AQUATIC INVASIVE SPECIES RESEARCH CENTER
UNIVERSITY OF MINNESOTA

Created in 2012 through funds from the Minnesota legislature, the Minnesota Aquatic Invasive Species Research Center's mission is to **develop research-based solutions** that can reduce the impacts of aquatic invasive species in Minnesota by **preventing spread, controlling populations, and managing ecosystems**; and to **advance knowledge** to inspire action by others.

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND

MINNESOTA

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