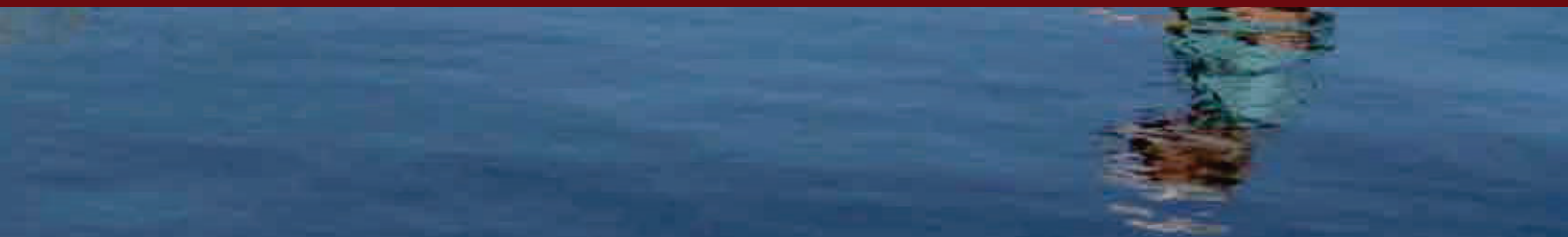
Minnesota Aquatic Invasive Species Research Center

2018 research report




LUND

What a year!

Dear friends,

2018 was an exciting year at the Minnesota Aquatic Invasive Species Research Center! We started the year by receiving 20 submissions to our 2018 Request for Proposals, a new record. We funded seven new projects, including evaluating the efficacy of copper-based control on zebra mussels, an economic analysis of ecosystem services as they relate to common carp, creating a new tool for eDNA collection, research into the genetic control of common carp, and more.

Over the summer, we conducted our biannual Research Needs Assessment, and collected input from over 400 stakeholders. This process directly informed our 2019 Request for Proposals, which will allow us to fund projects starting in July 2019. We hosted 270 lakeshore association members, agency representatives, researchers, and concerned members of the public at our fifth annual AIS Research and Management Showcase in September (Missed it? Save the date for next year: Sept. 18, 2019).

Throughout the year, one of the most frequent questions that I am asked is “can we really do anything about aquatic invasive species?” It’s a big question, but it’s also one of my favorites because it’s why we’re here. MAISRC is working with researchers and stakeholders across the state, region, and world to find solutions to AIS, and I can honestly say that there is reason for hope.

At the core of our approach is the idea that we find better solutions more quickly when we work together. Our successes and opportunities are bolstered by the active engagement of local governments, management agencies, property owners, non-profit organizations, lake service providers, and citizens. The experience, knowledge, and energy that you bring to the table are an important part of the work that we do, and I want to thank you for being a part of this effort.

I’m pleased to share with you this Research Report for 2018 that highlights some of MAISRC’s accomplishments over the last year. We’ve made significant strides in the prevention, detection, and control of AIS in Minnesota and see tremendous opportunity and hope for the future. If you want to learn more, there’s a lot more where this came from at www.MAISRC.umn.edu.

As we move into the new year, I ask that you continue to be an ambassador for AIS research and help us have an even greater impact on the health and vibrancy of Minnesota’s lakes, rivers, and wetlands. Thank you for your dedication and I’ll see you out on the lake in 2019.

Dr. Nicholas Phelps
Director, Minnesota Aquatic Invasive Species Research Center

Invasive plants

- Found that mechanical and algaecide treatments greatly reduced starry stonewort biomass, but that their star-shaped bulbils, which can regenerate into new plants, remained viable after treatment. This reinforces the importance of a multi-pronged approach to starry stonewort control

- Found evidence of hybrid vigor and competitive advantage in hybrid watermilfoil, and sampled lakes around the state to genetically identify hybrid milfoil populations

- Launched laboratory experiments to test the effectiveness of different algaecides and herbicides on starry stonewort

- Conducted field work to better understand the phenology of starry stonewort to guide the timing of management

Big win:

MAISRC researchers published new recommendations for treating invasive Phragmites which will help managers, agencies, and other groups respond to the spread of this damaging wetland plant.

Find them at www.maisrc.umn.edu/phragmites.

Invasive invertebrates

- Evaluated fishing gear to determine what is most high-risk for accumulating spiny waterflea and found that gear that is pulled through the water is riskier than stationary equipment such as anchor lines
- Completed a predictive risk model for zebra mussels and starry stonewort to inform decision-making and prioritize prevention activities for all Minnesota lakes
- Identified where on a boat zebra mussels may be hiding to recommend decontamination techniques and watercraft redesign options
- Completed a draft of the zebra mussel genome and are now scaffolding the assembly to search for genes that could be targeted for control
- Sampled fish, macroinvertebrates, and zooplankton and found that walleye in their first year grow more slowly in lakes invaded by zebra mussels and spiny waterflea than in uninvaded lakes

Big win:

This summer, MAISRC released an important white paper outlining treatment options for the eradication of limited-scale zebra mussel infestations at various water temperatures.

Find the paper at z.umn.edu/zebramussels.

Invasive fish

- Completed first-of-their-kind controlled experiments and confirmed that bluegills could be harnessed to reduce common carps' reproductive success

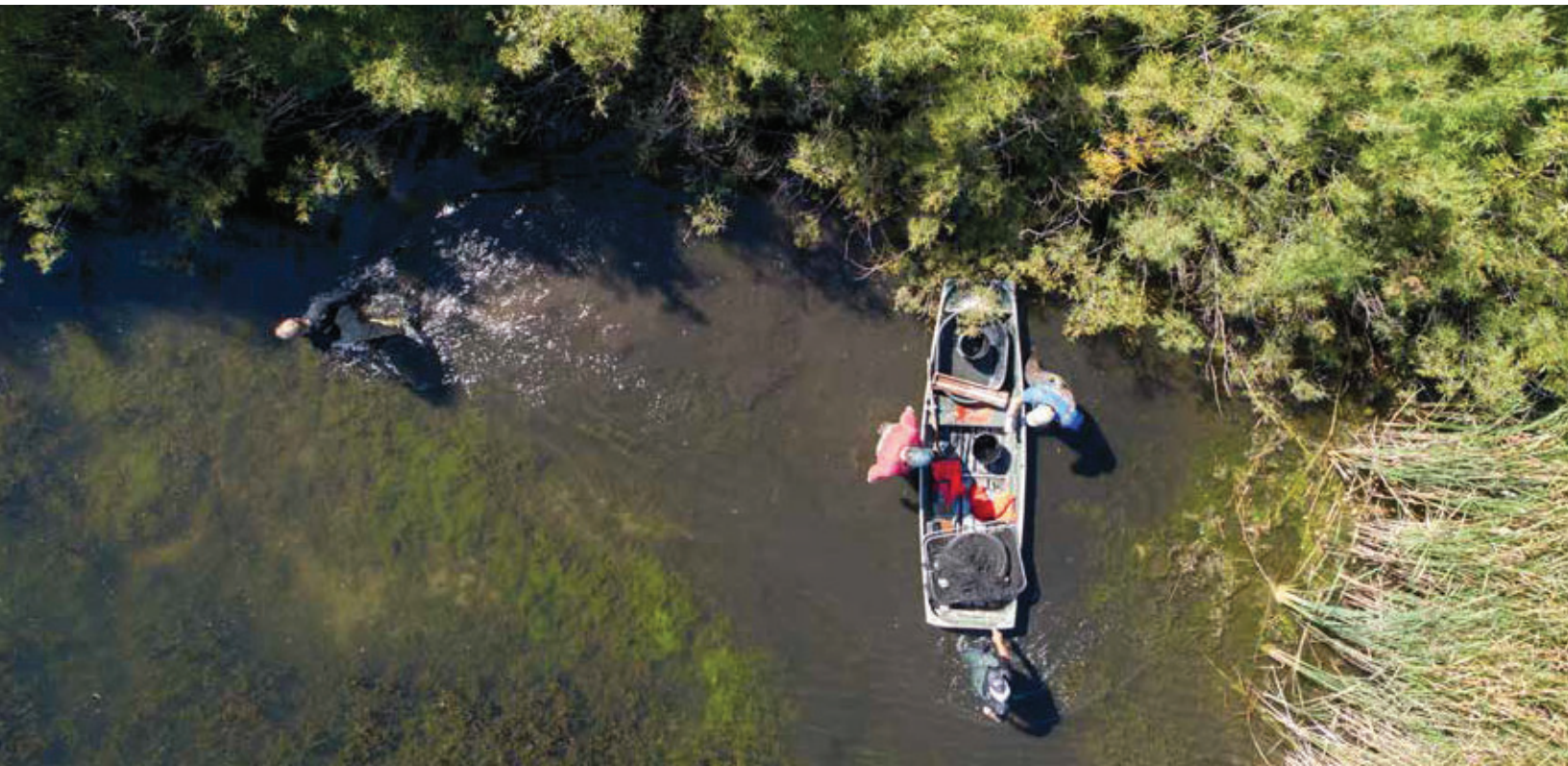
- Evaluated the acoustic deterrent system installed at Lock and Dam 8 to prevent the upstream spread of Asian carp in the Mississippi River

- Found that common carp do not have the ability to avoid bait that contains toxins, a precursor to using the bait-and-switch method for control

- Developed state-of-the-art carp transgenesis capabilities in our Containment Lab so researchers have year-round access to young carp embryos for research into developing a synthetic barrier to reproduction that will lead to sterile offspring

Big win:

MAISRC confirmed the presence of Carp Edema Virus for the first time in Minnesota. We are learning more about this virus, along with Koi Herpes Virus, and considering their potential as biocontrol agents for carp. Learn more about this at www.maisrc.umn.edu/khv-faqs.



Outreach

- Engaged hundreds of volunteers for Starry Trek, a statewide search for starry stonewort and other invasive species. The event resulted in the detection of starry stonewort, zebra mussels, and Eurasian watermilfoil in three different lakes, which is critical to enable rapid response

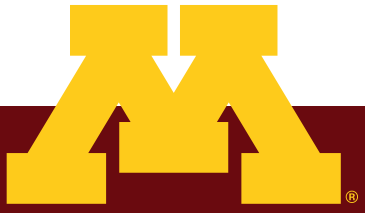
- Published 19 peer-reviewed scientific papers, on topics such as zebra mussel control, common carp management, using pathogens against Eurasian watermilfoil, treating starry stonewort, and more

- Had our research and outreach programs featured in nearly 100 news stories around the state and country and created six videos highlighting our research impacts

- Pilot-tested the AIS Trackers program with one lakeshore association and will be launching the program more widely in 2019

Big win:

In the second year of the program, MAISRC certified 97 new Aquatic Invasive Species Detectors. This brings our total to 220, all across Minnesota. Want to join this network and be part of the solution? Visit www.AISDetectors.org.



THANK YOU

The Minnesota Aquatic Invasive Species Research Center thanks all of the federal, state, local, and private support that makes our research possible; especially the Environment and Natural Resources Trust Fund as recommended by the Legislative-Citizen Commission on Minnesota Resources. We couldn't do this work without you.

JOIN US

If you would like to support the research and outreach programs going on at the Minnesota Aquatic Invasive Species Research Center, please visit www.MAISRC.umn.edu/donate. Gifts of any size are appreciated and help us develop and advance research-based solutions to aquatic invasive species.

KEEP IN TOUCH

Stay up to date on all the research from the Minnesota Aquatic Invasive Species Research Center by visiting www.MAISRC.umn.edu, signing up for our newsletter at z.umn.edu/AISnews, and by following us on Facebook and Twitter.

MINNESOTA AQUATIC INVASIVE SPECIES RESEARCH CENTER

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