

2016 Minnesota Aquatic Invasive Species Research and Management Showcase

Monday, September 12 • 8:30 a.m. – 4:00 p.m. • Continuing Education and Conference Center, St. Paul

Session key:



Invasive fish



Aquatic plants



Harmful microbes



Invertebrates

Breakout sessions



Starry stonewort: what's known, what's unknown, what we're doing about it

Speaker: Dan Larkin

Dr. Larkin will present on Minnesota's newest aquatic invasive species, the macroalgae starry stonewort. He will describe what we know about this species, what we need to know, and how research at MAISRC is filling in the gaps.



Can new zebra mussel infestations be eradicated?

Speaker: Jim Luoma

Despite aggressive educational outreach, routine inspections, and equipment disinfection stations, zebra mussels continue to rapidly expand their range within Minnesota's inland lakes. Recent attempts to eradicate localized zebra mussel infestations in Christmas Lake and Lake Independence were complicated by a lack of knowledge of what treatment would be effective for killing zebra mussels during times of low and falling water temperatures. This talk will discuss a recently initiated cooperative research project designed to provide critical temperature-dependent data on four molluscicidal compounds that have potential use for eradication of localized dreissenid mussel infestations.



How concerned should we be about Heterosporosis?

Speakers: Paul Venturelli and Megan Tomamichel

Learn about heterosporosis, an invasive disease in Minnesota that impacts the number of fish that we can catch and eat. In this session, you will learn about the disease and its history in Minnesota. You will hear about past research, and a MAISRC project that is addressing fundamental gaps in our knowledge of the biology of this disease and how it is impacting our fisheries. You will get a glimpse into what fisheries and management might look in a heterosporosis-positive future, and how you can help to shape this future by reporting cases of the disease, minimizing its spread, and contribute to our ongoing project.



Bait and switch: new ways to control invasive carp

Speakers: Przemek Bajer and Josh Poole

Common carp have a key weakness: they like food that other fish don't – grains – and can be trained to aggregate in specific areas of lakes by using carp-specific baits. This creates two new management opportunities: 1) training carp to aggregate and then be selectively removed with clever traps, and 2) training them to consume carp-selective bait, which is then switched with one that contains a toxin. In this talk we will explain how we are developing and testing these new control strategies.



Get involved! Detecting and tracking AIS for management

Speakers: Megan Weber



Attend this session to learn about new citizen scientist programs being developed by University of Minnesota Extension in partnership with MAISRC and try your hand at some hands-on "detecting" on campus. **AIS Detectors** will learn about AIS issues in Minnesota and how to identify selected AIS of concern. Trained detectors will get the opportunity to help DNR respond to new AIS reports, conduct new detection surveys, and help MAISRC, Extension, and DNR with other AIS outreach and field projects. **AIS Trackers** will learn scientific methods to help monitor sites that have been treated for AIS to inform researchers, lake managers, and more on factors that lead to the most successful treatments.



Zebra mussel veliger transport via the nooks and crannies in watercraft

Speaker: Adam Doll

Minnesota boaters know to "Clean, Drain, and Dispose" when transporting their recreational watercraft, but is there still an additional risk of spreading zebra mussels? This study is focused on collecting residual, or leftover, water that can be trapped inside watercraft even after all drain plugs have been pulled. This project is just finishing its first season of data collection and will discuss initial findings, next steps, and potential solutions through new boat design.



Locating the invisible: new approaches to detect, attract, and quantify carp

Speaker: Ratna Ghosal

This session will provide an overview and update of MAISRC's project aimed at using food and sexual cues to attract carp, and induce aggregations. The project uses both eDNA and pheromones as biomarkers to reliably measure the induced aggregations of carp. This kind of integrated approach will improve the detection and management of the invasive species.



A better future for Minnesota lakes: Analyzing the footprints of invasions past and present, hidden in the DNA of zebra mussels

Speakers: Mike McCartney and Sophie Mallez

In this presentation we describe our studies of highly variable genetic markers to analyze the footprints of zebra mussel invasions – past and present – and thereby pinpoint lake and river sources and pathways of spread for zebra mussels infesting Minnesota inland lakes. For example, one *source* would be pools in the Mississippi River, and a *pathway* would be spread from these pools to Lakes Mille Lacs or Minnetonka by trailered boats. This research will help advise and focus DNR and county AIS prevention programs. For example, a finding of chronic spread from the Mississippi or St. Croix Rivers would trigger focus on geographic "pinch points" to better intercept this traffic, and perhaps shifts in policy that could include increased surveillance.



Detecting novel pathogens: what it means for the control of invasive carp

Speaker: Sunil Kumar Mor

One possible approach to controlling invasive carp would be through the introduction or promotion of species-specific pathogens. Through this project, we have collected samples of common, silver, and bighead carps from across Minnesota and Illinois. Samples were screened for both known and unknown viruses and pathogens. This session will explain the importance and implication of what we found.



Restoring native plants: a key to the long-term success of invasive plant control

Speakers: Ray Newman and Melaney Dunne

Restoration of native macrophyte communities is often an aim of ecologically based control of invasive plants such as curly-leaf pondweed or Eurasian watermilfoil, and long-term success in suppressing invasives often requires development of a robust native plant community. Failure to do so often results in an endless treadmill of treatments that cannot be stopped. We will discuss the need for re-establishing native plants and some approaches to promoting native plant communities.



Let's prevent a flea circus!: Stopping Minnesota's invasion by spiny waterflea

Speaker: Donn Branstrator

This talk will outline the current state of knowledge on the status of spiny waterflea (*Bythotrephes*) in Minnesota's inland waters. Impacts, current range distribution, and prevention methods to stop dispersal of *Bythotrephes* will be covered with an eye toward what we know and what we don't regarding the ecology of this invasive species.



Unraveling the microorganisms associated with aquatic invasive species: Potential candidates for biological control?

Speaker: Mike Sadowsky

This talk will introduce how high-throughput DNA sequencing technologies are being used to characterize microbes (bacterial and fungal) associated with Eurasian watermilfoil and zebra mussels. The audience will be updated on major research findings, including the effect of AIS on water quality status.



A solution for Asian carp

Speakers: Peter Sorensen

This session will provide an overview of several projects in the Sorensen research team and how they have identified a solution to the Asian carp problem. The solution focuses on balancing and slightly accelerating water flows through key Mississippi River locks and dams to selectively block carp movement while adding sound deterrents to their locks system to deter these highly sound-adverse species. By linking several locks and dams together and enhancing predatory fish communities while monitoring fish abundance with novel DNA technologies, an efficiency of over 99% is expected at low cost which could also benefit native fisheries.



Why me? Understanding potential pathways for AIS spread in Minnesota

Speakers: Nick Phelps and Luis Escobar



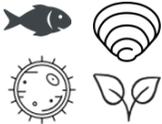
MAISRC researchers are currently developing mathematical models aiming to understand way an AIS may be found in one place, but not in another. We found that the environmental conditions across Minnesota, and the connection between lakes (e.g., river, boater movement) are essential for AIS spread. Our approach may help to explain past and future routes of aquatic invasive species infestation and can be a tool to determine high-risk areas to develop early warning systems and guide prevention and control efforts.



Risk assessment findings: Understanding the impacts from Asian carp for Minnesota

Speaker: Adam Kokotovich

This talk will discuss findings from the Minnesota Bigheaded Carps Risk Assessment, a project that brought together state and federal agency personnel, expert researchers, and stakeholders to assess the risks from silver and bighead carp for the state of Minnesota. For each of the four selected watersheds, risk assessment participants characterized the likelihood of establishment and resulting abundance of bigheaded carps, as well as the severity of their impact on game fish, non-game fish, species diversity/ecosystem resilience, and recreation (from the silver carp jumping hazard). The implications of this project for the state's response to bigheaded carps will be discussed.



Tour the renovated MAISRC Lab with demos on milfoil weevils, spiny waterflea, heterosporosis, and flying carp

Speakers: Donn Branstrator, Ray Newman, Megan Tomamichel, Clark Dennis

Note: You must have pre-registered for this tour at the time of ticket purchase

MAISRC's on-campus lab and holding recently underwent a total renovation, making it one of the most state-of-the-art aquatic research facilities in the country. The new space – with nearly one hundred fish tanks and aquaria, four plant growth chambers, four living streams, and dedicated space for research on invasive plants, invertebrates, fish, and pathogens – will be home to cutting-edge research on aquatic invasive species. Attend this session to get an inside-peek at real research projects and hear from researchers.

- See adult and larval milfoil weevils and their damage to watermilfoil plants, including Eurasian, native northern, and hybrid
- Get an up-close look at live spiny waterfleas and learn more about their life cycle and predatory habits
- Check out the new circular raceway tank and learn how acoustics factor into Asian carp control
- View the damaging effects of heterosporosis up close and learn what you can do to help

Note: This session is approximately a five-minute walk from the Conference Center. Please meet in the lobby registration area and a leader will walk everyone to the lab.



Research conducted at the Minnesota Aquatic Invasive Species Research Center is possible through the support of the Clean Water Fund, the Environment and Natural Resources Trust Fund, watershed districts, lakeshore associations, and other private and public sources.