

2014 Minnesota Aquatic Invasive Species Research and Management Showcase

Presented by the Minnesota Aquatic Invasive Species Research Center and University of Minnesota Extension

Location: St. Paul Student Center, University of Minnesota

Date: November 19, 2014 10:30 AM - 4:00 PM

Cost: \$15 for lunch; Registration required (200 maximum)

SESSION LOCATION KEY:

SPSC = St. Paul Student Center

EFL = Engineering and Fisheries Lab**

Hodson = Hodson Hall Room 132**

**A session leader will walk participants to these locations around campus

10:00 AM	Check-in begins – North Star Ballroom (SPSC)
10:30 - 11:00	Brief Welcome – North Star Ballroom (SPSC) Coffee and Light Breakfast
11:00 - 11:45	SESSION 1 (Select one workshop from this list) <ul style="list-style-type: none"> ● Getting your feet wet: fundamental tools of invasive fish management (EFL) ● Time travel and parallel universes: the power of simulation (location TBD) ■ The good, the bad and the ugly: what you should know about the plants in your lake (SPSC) ■ Are they dead yet? Monitoring zebra mussel control efforts (SPSC) ◆ Assessing risks to inform AIS management (SPSC) ◆ Developing new approaches for the biological control of Eurasian water milfoil (SPSC)
11:45 - 12:30	Lunch – North Star Ballroom (SPSC) Brief remarks from University of Minnesota Extension Dean Beverly Durgan ■ The role of research in solving AIS problems in Minnesota – Sue Galatowitsch
12:30 - 1:15	SESSION 2 (Select one workshop from this list) <ul style="list-style-type: none"> ● “Push and Pull”: using chemical attractants and acoustic deterrents to move invasive carps (EFL) ● Time travel and parallel universes: the power of simulation (location TBD) ● Smelling something fishy: Pheromone attractants as an approach to control fishes (Hodson Hall) ■ The good, the bad and the ugly: what you should know about the plants in your lake (SPSC) ◆ Evaluating the effectiveness of AIS management in Minnesota (SPSC) ◆ Developing prevention and control strategies for invasive carps (SPSC)
1:30 - 2:15	SESSION 3 (Select one workshop from this list) <ul style="list-style-type: none"> ● Getting your feet wet: fundamental tools of invasive fish management (EFL) ■ Fish get sick too - invasive disease threats to fish health in Minnesota (SPSC) ■ Are they dead yet? Monitoring zebra mussel control efforts (SPSC) ◆ Developing prevention and control strategies for invasive carps (SPSC) ◆ Using environmental DNA to detect and quantify AIS (SPSC) ◆ Assessing risks to inform AIS management (SPSC)
2:30 - 3:15	SESSION 4 (Select one workshop from this list) <ul style="list-style-type: none"> ● “Push and Pull”: using chemical attractants and acoustic deterrents to move invasive carps (EFL) ● Smelling something fishy: Pheromone attractants as an approach to control fishes (Hodson Hall) ■ Fish get sick too - invasive disease threats to fish health in Minnesota (SPSC) ◆ Evaluating the effectiveness of AIS management in Minnesota (SPSC) ◆ Developing new approaches for the biological control of Eurasian water milfoil (SPSC) ◆ Using environmental DNA to detect and quantify AIS (SPSC)
3:20 - 4:00	Concluding Conversations—North Star Ballroom (SPSC) Brief remarks Casual time with opportunity for interactions between researchers and attendees

See next page for descriptions of concurrent sessions (including symbols)

“Behind the Scenes” with MAISRC Researchers

Participants in these sessions will get a close-up look at some of the methods MAISRC researchers use to advance what we know about invasive species detection and control. These sessions require a short walk from the St. Paul Student Center to research locations elsewhere on campus.

- **Getting your feet wet: fundamental tools of invasive fish management *** – Nate Banet, Joey Lechelt, Justine Koch, and Reid Swanson
To control invasive fish, managers must have basic information on the life history of the organism as well as the population's current status. How many fish are in the population? Are fish moving? Is the population spreading? At this workshop, you will learn about some of the essential “tools of the trade” used to address these questions for common carp. Demonstrations will include electrofishing, radio telemetry, and fish aging
- **Smelling something fishy: pheromone attractants as an approach to control fishes** – Ratna Ghosal
Pheromones, chemical cues that animals release and use to identify and find each other, have special promise as attractants for invasive fishes. This is especially true for invasive carps, which live in poorly lit waters for which very few sampling and control mechanisms exist. In this session, participants will be shown how researchers use electro-physiological recordings to determine how carp smell pheromones and respond to them in an underwater maze. We'll also explain how pheromones are being developed for invasive fish control.
- **“Push and pull”: using chemical attractants and acoustic deterrents to move invasive carps** – Aaron Claus, Clark Dennis III, and Dan Zielinski
Controlling the distribution of an invasive fish in a species specific manner is a critical component to management. Non-visual sensory cues like sound and smell are especially promising for guiding Asian and Common carp, because they have highly developed sensory systems and live in dark and turbid waters. Chemical cues, like those found in food, can be used as species specific attractants. Conversely, acoustic stimuli can be used to deter carp. This session will introduce participants to the Engineering and Fisheries Laboratory and methods we use to determine how sound and chemical cues impact Asian carp behavior. An overview of the newly installed Asian carp acoustic deterrent system at Lock and Dam #8 (Genoa, WI) will also be presented.
- **Time travel and parallel universes: the power of simulation** – Paul Venturelli & Grace Loppnow
Simulation models are an inexpensive, rapid, and safe way to use current AIS understanding to predict long-term effects of a single control option, or simultaneously evaluate a variety of control options. This session will introduce you to MAISRC's current and future modeling efforts through demonstrations and hands-on activities that put you in the driver's seat.

From Our Labs to Your Lakes: Skills You Can Use

These sessions focus on some of the basic skills participants need to work on AIS problems.

- **Are they dead yet? Monitoring zebra mussel control efforts** – Mike McCartney
Lakes with early infestations of zebra mussels show good promise as candidates for treatment with chemicals, or Zequanox, to prevent populations from exploding. Participants in this training will learn how to estimate population sizes, both pre- and post-treatment, of mussels and veligers. We'll also discuss how to estimate mortality rates from treatment. In short, we'll cover the ABC's that will help you find out whether your lake treatment is working.
- **The good, the, bad and the ugly: what you should know about the plants in your lake** – Mary Blickenderfer (Extension) and John JaKa
Most of the aquatic plants in your lake are a valuable part of that ecosystem—they provide critical habitat for fish, they stabilize soft lake bottoms and limit shoreline erosion from wave impacts, they take up nutrients making them less available for algae. But some plants—those that are invasive—can do more harm than good. In this session, you'll learn to identify both beneficial and problematic aquatic plants common in Minnesota lakes and how they respond to common management practices.
- **Fish get sick too –Invasive disease threats to fish health in Minnesota** – Nick Phelps
High profile fish diseases, such as viral hemorrhagic septicemia, are on Minnesota's doorstep and others are currently spreading within the state causing sickness and death to fish populations. This session will cover how to identify important fish diseases and what research is showing can be done to offset the risk.

Advancing AIS Knowledge

Each of these sessions consists of several research talks summarizing recent advances relevant to AIS prevention and control programs, followed by Q & A.

- ◆ **Assessing risks to inform AIS management** – Adam Kokotovitch
Which invasive species pose the greatest risk? Which AIS management actions should be prioritized? Ecological risk assessment is a decision making tool used by scientists and managers to help inform these and other management decisions related to AIS. This session will introduce participants to the basics of ecological risk assessment and will provide examples of how ecological risk assessment is being used to inform AIS management in Minnesota.
- ◆ **Controlling invasive common and Asian carps** – Przemek Bajer and Peter Sorensen
This presentation will introduce invasive carps, the damage they cause, and how we are developing new ways to control them. After a brief introduction to the carp problem, we will briefly summarize our past research on common carp, a now well-established invader, and how they have led to new control strategies. In the second part of the talk, we will explain the science of slowing down the invasion of Asian carp that are presently advancing up the Mississippi River and lessons we have learned from the common carp.*
- ◆ **Developing new approaches for the biological control of Eurasian water milfoil** – Ray Newman, Chanlan Chun
Eurasian watermilfoil is one of the most troublesome invasive aquatic plants in Minnesota, occurring in over 280 waterbodies. New center research will quantify factors limiting biological control with herbivores and determine the importance of sunfish predation in limiting herbivores. Strategies to reduce the effects of sunfish and enhance biological control with herbivores will be developed. Research on the potential for microbial control of Eurasian watermilfoil will also be conducted. Genomic studies will be conducted to identify candidate control agents and efficacy trials will be conducted to assess potential.
- ◆ **Evaluating the effectiveness of AIS management in Minnesota** – Mike McCartney and Sue Galatowitsch
There are very few established, reliable methods to control AIS, and, as innovations arise and new treatment agents are considered, their effectiveness needs to be evaluated. One promising way to rapidly advance what we know about best practices for AIS is to gather data from all treatment attempts across Minnesota and analyze this information. This seminar will introduce participants to MAISRC's data repository for AIS treatments. It will include instructions on how lake managers can contribute information, and discuss the benefits of contributing.
- ◆ **Using environmental DNA to detect and quantify AIS** – Jessica Eichmiller and Loren Miller
Sampling aquatic organisms including AIS is extremely difficult and expensive. Environmental DNA (or eDNA) is genetic material that is released by organisms into their environment. Measuring eDNA could potentially serve as a sensitive, rapid detection tool. This session will give an overview of current and future eDNA monitoring efforts for Asian carps in the Mississippi and St. Croix Rivers. In addition, we will present our progress and perspective on eDNA obtained through ongoing research to optimize this tool.
- **The role of research in solving AIS problems in Minnesota** – Sue Galatowitsch
The Minnesota Aquatic Invasive Species Research Center (MAISRC) was established in 2012 to develop science-based solutions to the growing number of introduced species that threaten our lakes, rivers and wetlands. How is MAISRC addressing this research challenge? What does MAISRC hope to accomplish in the next 10 years? This presentation will provide an overview of the center's research agenda and its role in combatting AIS in Minnesota.

Funding for the MAISRC is provided by the Clean Water Fund, private donations, and the Environment and Natural Resources Trust Fund as recommended by the Legislative Citizen Commission on Minnesota Resources.

*This talk also features work funded through the following: Riley Purgatory Bluff Creek Watershed District, Ramsey Washington Metro Watershed District, Minnehaha Creek Watershed District, National Science Foundation, and/or U.S. Geological Survey.