Minnesota Aquatic Invasive Species Research Center • MAISRC

# *Responding to AIS: Research for Action*

## Minnesota Aquatic Invasive Species Research Center

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CLEAN WATER LAND & LEGACY AMENDMENT

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND

# *Why is research important?*

**Most responses to AIS fail….**

***…in some cases, because available prevention and control approaches are not used effectively***

***…. in others, because science-based solutions do not exist.***

**We need more tools to address AIS in Minnesota.**

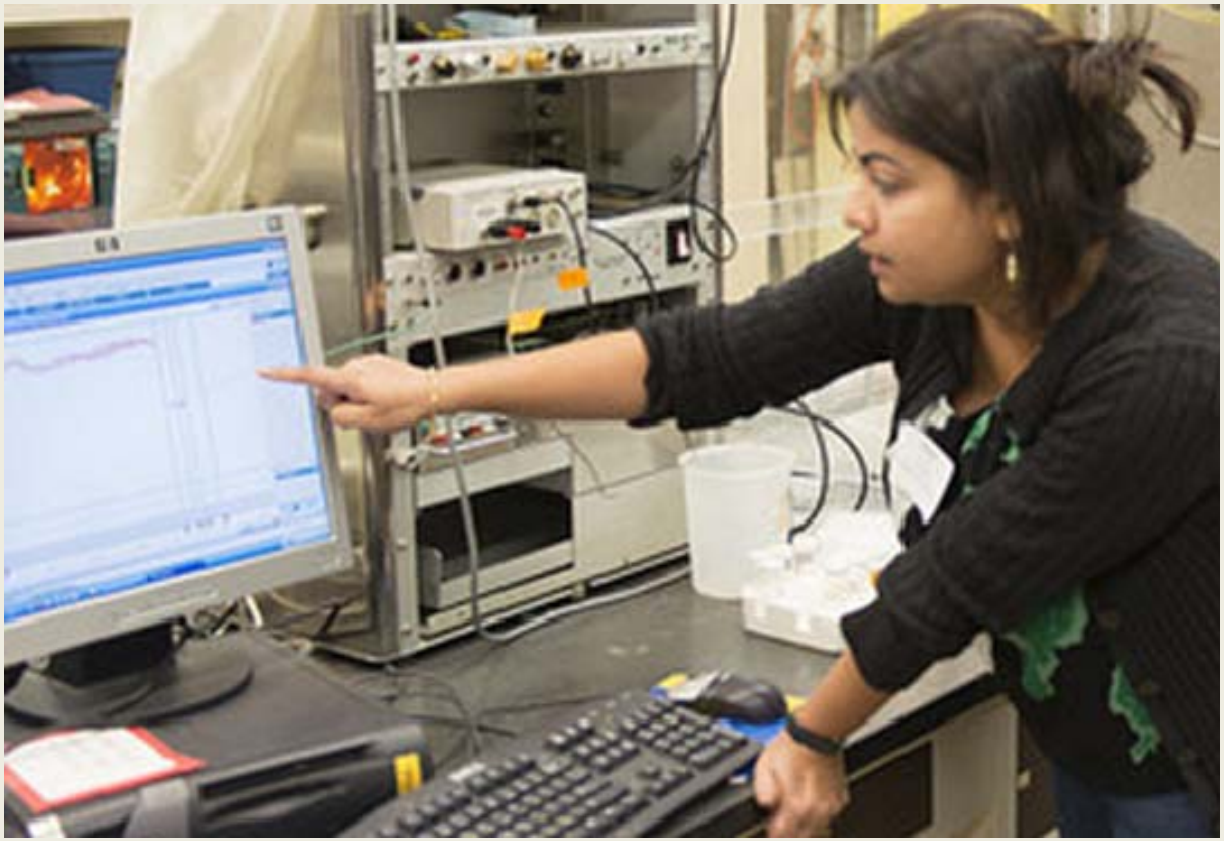
# *Why a University Research Center?*

**Scientific rigor**

**Independent source of information**

**Capacity to do complex research**

**Capacity to train new generation of professionals.**



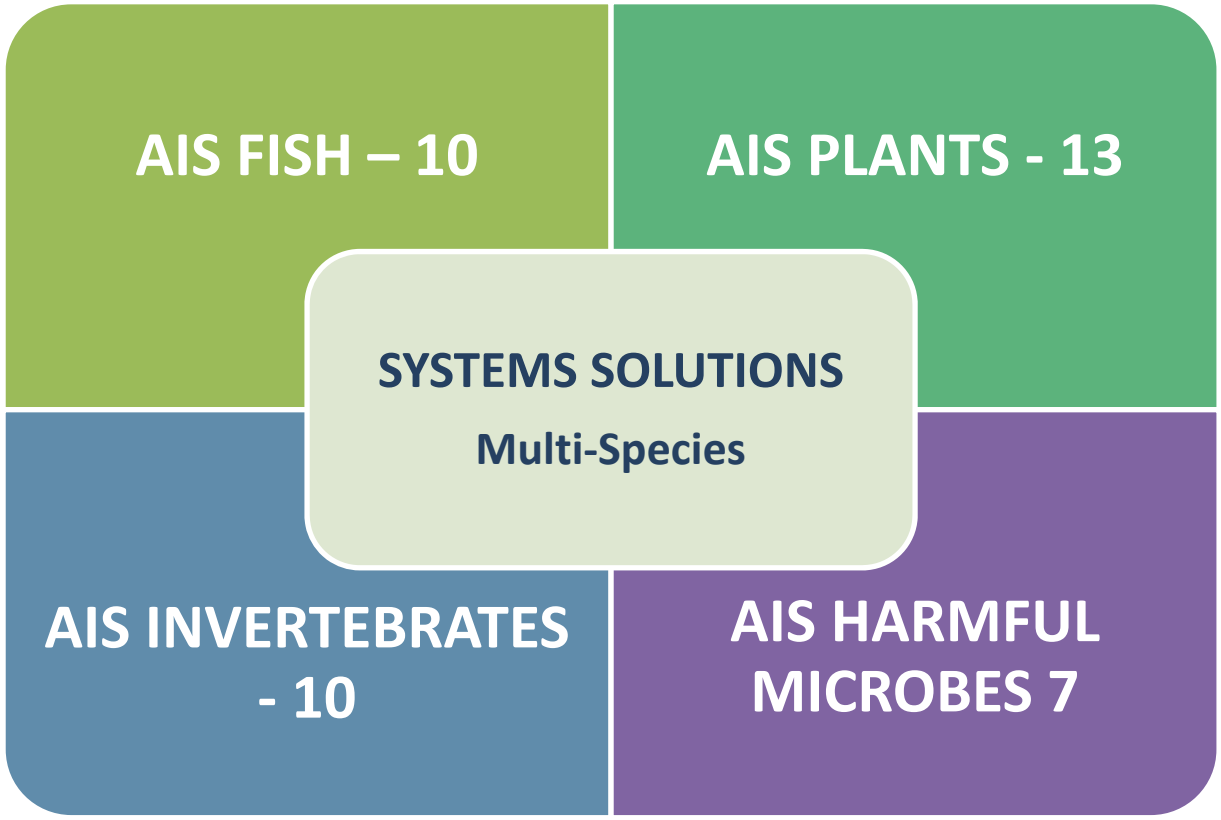
# Mission

*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.*


# AIS High Priority Research Needs

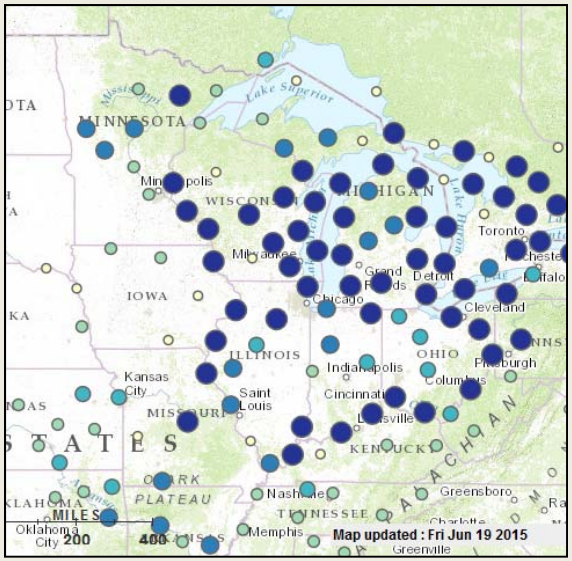
## *Species-Specific and Systems-Based*

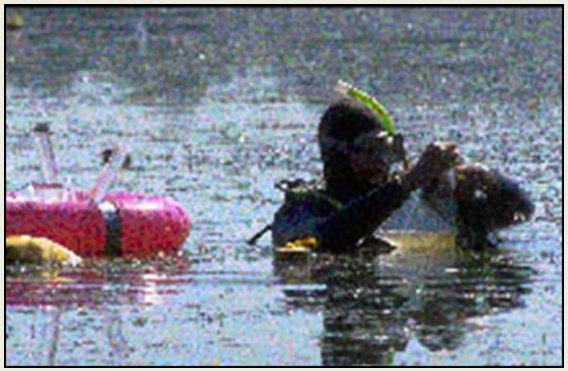
***SPECIES*:**
Spreading
Localized
Arrival
imminent




**SYSTEMS:**
Ecosystems,
Economics
Common
pathways
Agency
process

# Example: Research Response for Zebra Mussels



Hire Faculty, Staff

Ren-ovate Facilities

Launch Research:

Detection

Pathways

Control

+ Outreach Partnerships

# Example: Research Response for AIS Plants


**Capacity – building**

Faculty, staff, facilities

**Research Scoping:**

--Established species: EWM, CLP, Hybrid cattail, P. Loosestrife

--Spreading species:

Phragmites, Butomus

--Arriving species:

Hydrilla

**Launching research and extension programs:**

Control methods,

Spread prevention,

Rapid response,

Early detection


# MAISRC Research Teams

## AIS FISH

4.5 PIs
4 Postdocs
5.5 Graduate Students
1.6 Staff

## AIS PLANTS

2.5 PIs
1.5 Postdocs
1 Graduate Student

## SYSTEMS

1.5 Staff

## AIS INVERTEBRATES

1.5 PIs
1.5 Postdocs
1 Graduate Students

## AIS HARMFUL MICROBES

1 PI
1 Postdoc
0.5 Graduate Students

# A few examples of our current work

- ✓ Assessing Asian carp swimming abilities in order to optimize gate operations of Mississippi River lock & dams to better deter these fish
- ✓ Determining that low dose, early season endothall treatment of curly leaf pondweed appears relatively safe for native aquatic plants
- ✓ Predicting the spread and impact of the emerging *Heterosporsis* disease on game fish in order to target prevention
- ✓ Sequencing the genome of zebra mussels and using this information to understand most important pathways of spread


# MAISRC's Major Projects: 2012-2016

| TITLE | STATUS |
|---|---|
| VHSs screening | Completed |
| Zebra mussel pathways | In Progress |
| Asian carp risk assessment | In Progress |
| Carp control w/pathogens | In Progress |
| Asian carp barriers | In Progress |
| Carp early detection | In Progress |
| AIS plant herbicide effectiveness | In Progress |
| Milfoil biocontrol | In Progress |
| Milfoil, ZM control w/ microbes | In Progress |

| TITLE | STATUS |
|---|---|
| *Heterosporis* effects | In Progress |
| Carp control w/attractants | In Progress |
| Common carp management solutions | In Progress |
| AIS plant management | Launching |
| AIS Detectors & Trackers | Launching |
| Predicting spread (multi-species) | Launching |
| ZM control treatments | Launching |
| Spiny water flea impacts on native game fish | Launching |

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# From Research to Response

*Research is one piece of the AIS response "puzzle"*

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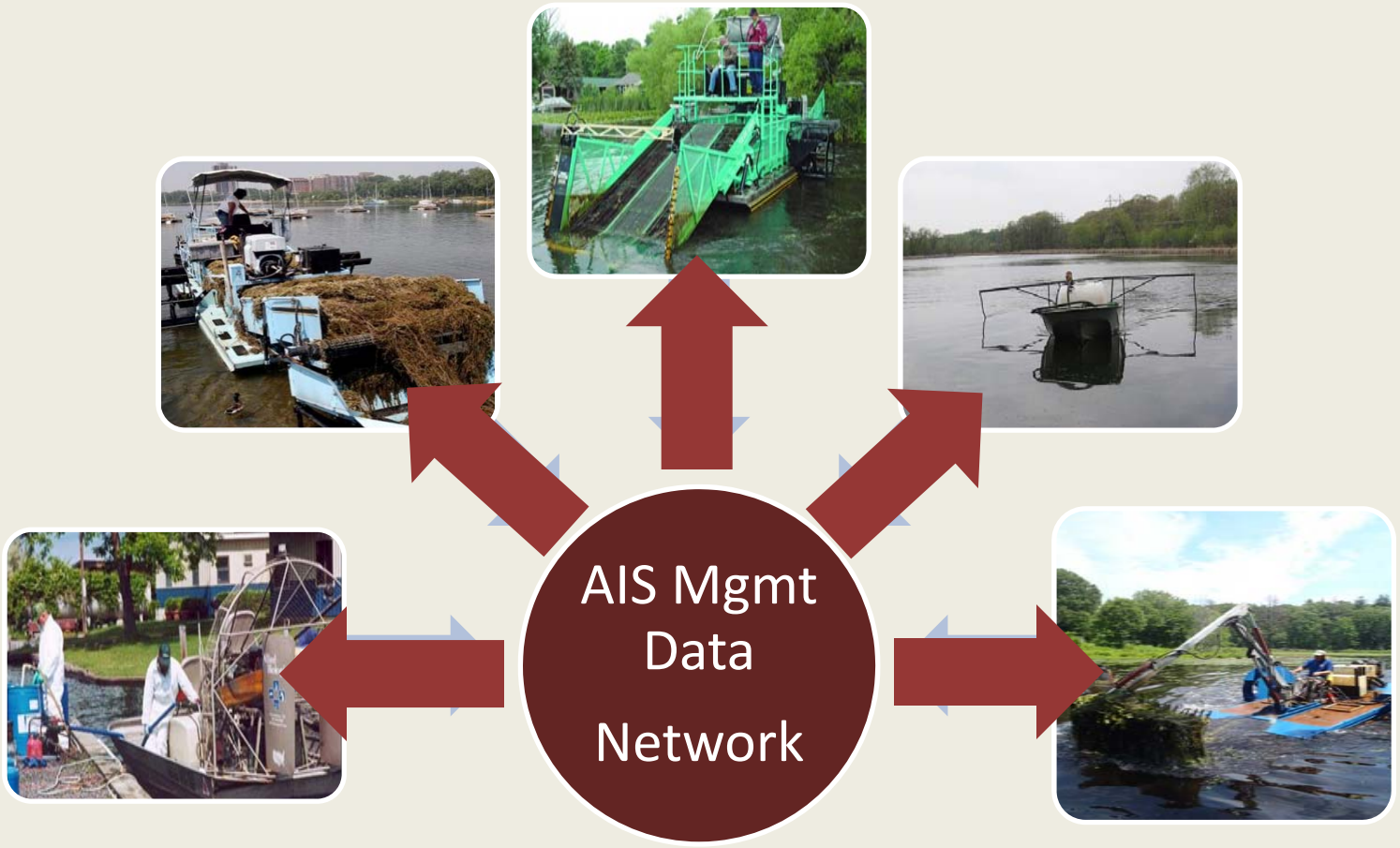


**Gather data from all treatment attempts across Minnesota;**

**Analyze information to find patterns in treatment effectiveness;**

**Share findings – both treatment recommendations & major uncertainties**

## *Over the longer term….*

## How will we know if MAISRC is making a difference?

Do AIS managers have access to more science-based information on AIS relevant to decision-making?

Are there more science-based AIS tools available for detection and control?

Do AIS managers have greater certainty when they select options for AIS response?


# Thank you to our funders & collaborators!

- Ada Lake Association
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- Minnesota Legislature
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- Mr. Todd Ladwig
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- Stop Carp Coalition
- The MAISRC Center Advisory Board
- The MAISRC Technical Committee
- The National Science Foundation
- Tonka Bay Marina
- U.S. Geological Survey


**For more information on MAISRC, please visit:**

**http://www.maisrc.umn.edu**

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