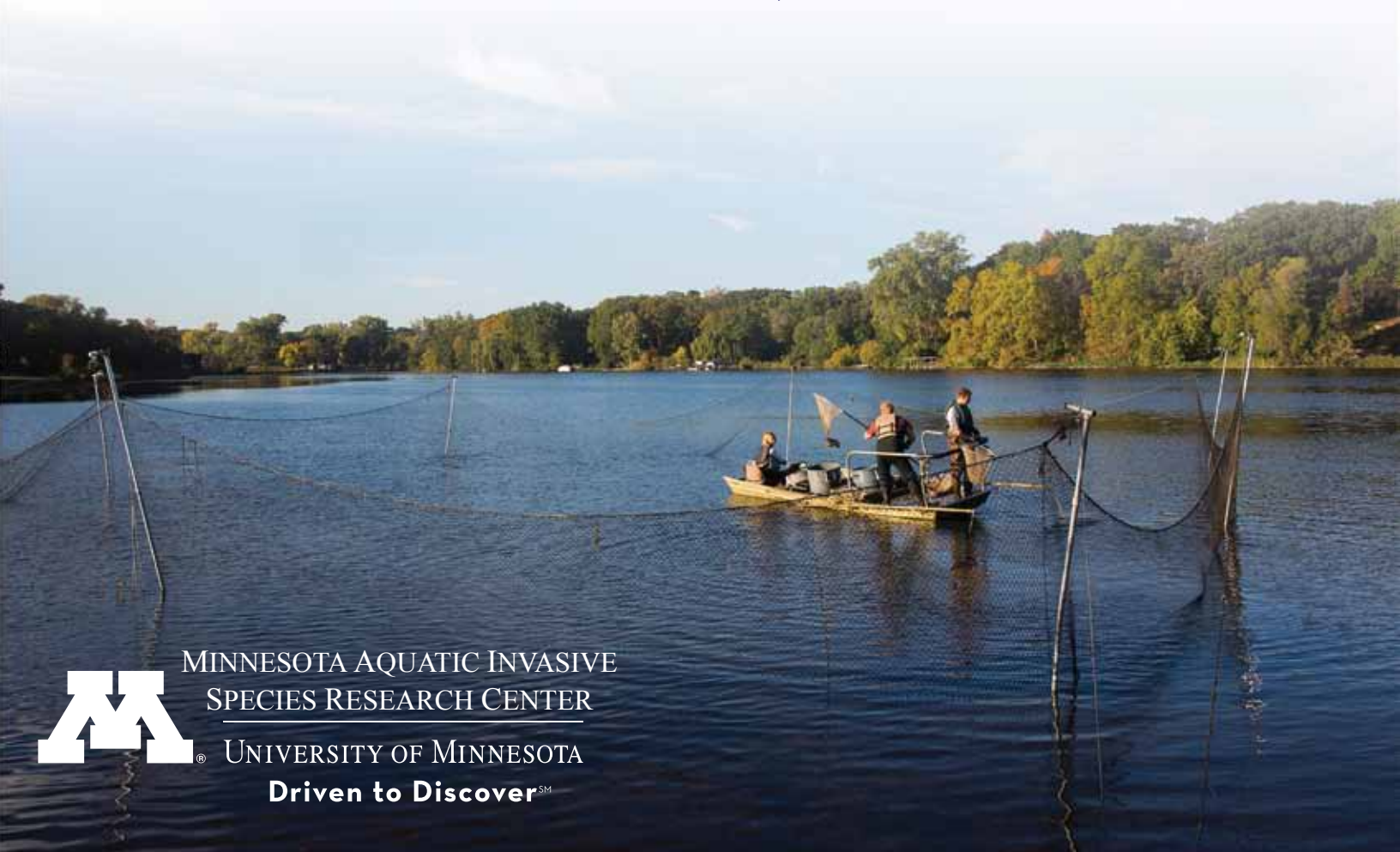


MINNESOTA AQUATIC INVASIVE SPECIES RESEARCH CENTER

STRATEGIC PLAN 2015 — 2025

Reducing AIS risks by advancing
research-based solutions

November 4, 2015



MINNESOTA AQUATIC INVASIVE
SPECIES RESEARCH CENTER

UNIVERSITY OF MINNESOTA

Driven to DiscoverSM

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OUR 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.

OUR VISION:

The Minnesota Aquatic Invasive Species Research Center is a vibrant and durable research enterprise that advances the knowledge and builds the capacity that Minnesota needs in order to reduce the impacts of aquatic invasive species on our cherished lakes, rivers, and wetlands.



DIRECTOR'S MESSAGE

I'm pleased to present to you the Minnesota Aquatic Invasive Species Research Center's (MAISRC) 2015-2025 Strategic Plan, which sets out the Center's overarching goals and strategies for helping the state respond to the threats of invasive species in the next ten years. With zebra mussels entering the rapid acceleration phase of spread, new reportings of spiny water flea infestations, and the impending advance of Asian carps up our rivers, it is clear that the threat to Minnesota's fisheries, aquatic ecosystems, and outdoor heritage is real and growing. To be effective in its response, Minnesota must be equipped with better information, have more useful tools, and be able to mobilize more people who care about the quality of our lakes, rivers, and wetlands.

In this document, we present mission and vision statements that will serve as the beacon and the bounds of our work for the next ten years. A good mission statement should clearly state our core purpose. Ours remains true to the promise made at the time of our founding and puts research and solutions first and foremost, while also recognizing the essential role of translating findings to build capacity for action. Our vision statement communicates the desired future state resulting from our work, and is meant to provide internal guidance and inspiration. The vision presented herein recognizes the ultimate goal for all of us: to protect our lakes, rivers, and wetlands from the harm caused by AIS.

MAISRC undertook an inclusive process to develop this strategic plan. With our advisory board and faculty members at the helm, we engaged a range of perspectives, both internal and external to the University, to help us envision MAISRC's future. We are grateful to all who generously participated, and to the time and passion they committed. We also appreciate all those who participated in a separate Research Needs Assessment process that helped identify specific research priorities for the coming year. That process will be informed by this strategic plan, and will be conducted biennially in order to stay on top of the most current AIS knowledge and threats.

The strategic plan is organized around a set of five themes that emerged through the strategic planning process as the key elements of MAISRC's work. The themes provide context to the more specific goals that follow. The goals are MAISRC's priorities for the next 5-10 years and are followed by specific strategies for accomplishing these goals. Strategies and goals are not listed in priority order; rather they are listed to create a logical flow of ideas. Given the rate of AIS infestation in Minnesota as well as the critical — and still formative — stage of MAISRC's existence, the

timing for implementation of all strategies should be immediate unless otherwise specified.

As a University-based research center, MAISRC will offer the scientific rigor, an independent voice, and the capacity to reach among disciplines in order to solve the complex problems associated with AIS. We will offer the leadership needed to assess risks, identify priorities, and inform policy and we will provide the education and training for preparing natural resource professionals to implement innovative solutions. This strategic plan is critical for charting our course to conduct — and sustain — all of this vital work.

Even with a strong strategic plan in place, however, MAISRC will not be able to solve Minnesota's AIS problems alone. Aquatic invasive species issues are massive; solutions will require not only scientific advancement but also personal responsibility, adaptation of norms, informed policy, and effective agency management. MAISRC is one piece of this puzzle. It is essential that we work together with Minnesota Department of Natural Resources, watershed districts, and other agency partners; natural resource professionals; lake associations; and others to understand the problems and to create and promulgate the knowledge needed to solve them.

The state legislature, the Environment and Natural Resources Trust Fund, and the Clean Water Fund gave us the opportunity to begin this critical AIS work in 2012. Since then, numerous research projects have been launched and exciting discoveries have been made. Strategic planning takes MAISRC to the next level by determining the path for our future: a vibrant and durable research enterprise committed to advancing the knowledge and building the capacity that Minnesota relies on to reduce the impacts of aquatic invasive species on our cherished lakes, rivers, and wetlands. For the sake of our resources, I invite you to move forward with us in alliance.



Dr. Susan Galatowitsch, *Director*
Minnesota Aquatic Invasive Species Research Center



THEME I:

Advancing knowledge and developing research-based solutions for AIS

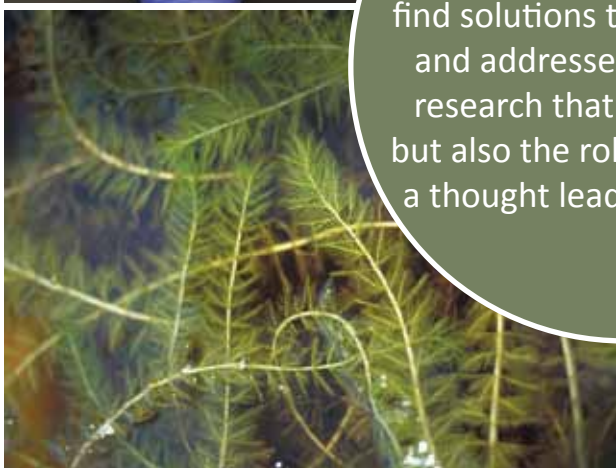
There are nearly three dozen AIS — about an equal number of plants, fish, invertebrates and bacteria & viruses — that MAISRC currently considers high risk for Minnesota and in need of research into their detection, prevention and control. The research needs for these species vary greatly depending on their status — for AIS that are already well-established in the state, MAISRC needs to focus on developing or improving control methods to reduce or eliminate populations of AIS, while protecting co-occurring native species. For those that are beginning to spread, we need to determine pathways of movement to inform prevention programs. For species “at our doorstep,” we need to offer tools to improve early detection and rapid response efforts. Central to the success of implementing most AIS strategies is understanding the human dimensions of AIS problems. Consequently, MAISRC’s research scope should include both natural and social science research.

Using research to find solutions that can reduce the impacts of aquatic invasive species is the central purpose of MAISRC’s existence. Our success as a Center will be judged primarily by the number of detection, prevention, and control tools we have developed; the number of tools in use; and the translational partnerships we have formed. Through our strategic planning process, we learned there is also high trust in and support for MAISRC to *set priorities, develop science that leads to policy, “be the go-to organization on [the science of] AIS,” and “frame the conversation.”*

What is an aquatic invasive species?

→ *AQUATIC species are those adapted to habitats that are regularly or permanently inundated, including lakes, rivers, and many kinds of wetlands.*

→ *INVASIVE SPECIES are those that when moving into a new locale tend to spread rapidly, outcompete resident species, and cause — or likely cause — ecological or economic harm or harm to human health.*



This theme focuses on the core MAISRC responsibility to find solutions to AIS problems and addresses not only the research that is conducted, but also the role of MAISRC as a thought leader in the field.

GOAL 1.1:

MAISRC will enhance the effectiveness of AIS control in Minnesota by improving current methods and devising new methods for control of species causing — or likely causing — the greatest harm to the state’s water resources.

STRATEGIES:

Support research with high potential to result in new or improved methods for control of high-priority, established AIS, including (but not limited to) zebra mussels, common carp, heterosporis, curly-leaf pondweed, Eurasian watermilfoil, and hybrid cattail.

The scope of control research includes fundamental biological and ecological studies needed to determine key vulnerabilities of species or ecosystems, development of new control technologies (e.g., biocontrol, genetic technologies), evaluations of mechanical, chemical and biological control options, studies of non-target impacts of treatments, and development of methods to evaluate treatment response.

The scope also includes social science studies to understand likely barriers to implementation, including

issues related to policy, economics, government relations, and human behavior.

MAISRC will support research on the control of at least 6-7 species in the next five years.

What is the difference between control and management?

→ In this strategic plan, we use the word **CONTROL** for actions intended to directly reduce the abundance of a population of a particular invasive species.

→ We use **MANAGEMENT** to mean actions undertaken to change ecosystem attributes or processes, which are not limited to treatments that cause AIS mortality. Management also commonly includes actions to address environmental degradation or problematic species interactions, or to improve people’s experience using aquatic resources.

GOAL 1.2:

MAISRC will improve Minnesota’s capacity to respond to emerging AIS threats by advancing approaches to spread prevention, early detection and rapid response.

STRATEGIES:

- A. Support research with high potential to result in new approaches for spread prevention, early detection and rapid response for high priority AIS whose arrival is imminent or that are actively spreading.

This research should include development of new detection tools, prevention approaches, rapid response options, and/or studies of spread pathways, for at least 6-8 species in the next five years, covering the full range of AIS organisms (bacteria & viruses, fish, invertebrates, and plants). Understanding pathways of spread and

how to respond to limit spread requires interdisciplinary research at the interface of natural and social sciences.

- B. Host an annual coordination meeting of state AIS experts from Minnesota Department of Natural Resources, MAISRC, and other agencies (together, the “MAISRC Technical Committee”) to identify new AIS threats to Minnesota that should be high priorities for research on early detection, rapid response and/or spread prevention. This will inform the biennial Research Needs Assessment.

GOAL 1.3:

MAISRC will become a recognized leader in the state and nation for AIS research and an authoritative resource for AIS policy and planning.

STRATEGIES:

- A. Set the AIS research agenda for Minnesota by continuing the biennial, comprehensive research needs assessment. Follow the process already established for assessing species-specific research needs and improve consideration of “cross-cutting” (i.e., not species-specific) research needs. Continue to involve AIS managers in the assessment process and the proposal review process to ensure research meets needs of practical importance.
- B. Encourage research excellence by transitioning to a competitive process to award MAISRC-funded research grants.
- C. Encourage and support high-risk, high-reward research projects that: 1) integrate searching for new solutions with advancing the understanding of AIS biology and ecology, and/or related human dimensions, 2) are innovative and novel, and 3) are highly collaborative and multi/inter-disciplinary.
- D. Promote a Center culture of “research responsiveness” to Minnesota’s AIS needs by establishing robust procedures to evaluate progress and productivity of MAISRC-supported research projects.
- E. Create forums, incentives, and assistance for researchers to effectively disseminate AIS research advances and knowledge to state, local and federal policy-makers and planners and in the media. Include action steps for this work as part of the MAISRC communications plan.

→ While MAISRC needs to focus research on priority species, it's important not to lose sight of stressors that degrade ecosystems, creating favorable conditions for multiple aquatic invaders. Research that addresses the underlying causes of aquatic invasions has potential to reduce the incidence of multiple AIS.

→ Most people surveyed feel there is a greater risk to the Center working on too many species rather than too few. But which ones? There are nearly three dozen AIS that are already well-established in the state, spreading, or highly likely to arrive.



THEME II:

Building statewide capacity for AIS response

Effectively responding to AIS is only possible if the capacity exists in society to use the best approaches in the best ways possible. As a research center at a land-grant university, we have dual responsibilities to develop new approaches for AIS response AND to equip people to understand and be able use the best information available, as it becomes available. This latter responsibility requires that we provide ongoing educational and training opportunities for those responsible for responding to AIS threats – now and in the future.

Theme two focuses on the ways MAISRC will provide these professional-level educational and training opportunities. Currently, AIS response depends primarily on AIS managers, professionals typically employed by government agencies or service providers, who plan and implement AIS response – from prevention and early detection to control and management.

To expand this capacity, MAISRC will offer programs to train AIS paraprofessionals (“agents”) to assist with labor-intensive and geographically expansive efforts, notably early detection and monitoring. With a well-established network of lake associations, Minnesota’s potential for a volunteer AIS paraprofessional corps is tremendous. Programs for both professionals and paraprofessionals will be offered in partnership with University of Minnesota Extension and implemented in close collaboration with Minnesota Department of Natural Resources and local government.

Through its research enterprise and connections to graduate academic programs, MAISRC will be the “engine” for producing the next generation of AIS researchers and professionals. Minnesota’s future research and professional capacity depends on the M.S. and PhD-level natural and social scientists with expertise in AIS that the U of M produces.



This theme focuses on the ways MAISRC will provide professional-level educational and training opportunities to most effectively help others respond to AIS issues.

GOAL 2.1:

MAISRC will provide Minnesota's AIS managers and agents with skill- and knowledge-building opportunities to prepare them for the most effective and impactful response to AIS threats.

STRATEGIES:

- A. Continue to hold an annual research showcase focused on MAISRC's recent research advances, research methods, and applications of research to policy, prevention, control and management.
- B. Develop and offer regular training for public and private sector professionals on aspects of AIS response that require a high level of research-based knowledge to be fully effective (e.g., emerging methods in AIS surveillance, adaptive management, integrated pest management for AIS).
- C. Create a volunteer corps of AIS paraprofessionals to augment the work of agency professionals. In partnership with Minnesota Extension, develop and regularly offer training programs for AIS early detection, control and management that rely on up-to-date, research-based information. Provide leadership for ensuring the work performed by trained volunteers ("agents") is competent and closely coordinated with key state and local AIS managers.
- D. Collaborate with state and local AIS managers who are undertaking AIS control projects to share information and expertise, for the benefit of both decision-making and research. Develop and host data repositories for pre/post control monitoring information collected by AIS managers and agents using MAISRC protocols. Use data to inform research agenda and drive management decision-making.
- E. Continue to have professional AIS managers as a significant part of the membership of MAISRC's Center Advisory Board, Technical Committee, and Research Needs Assessment Team.
- F. Ensure findings of all research supported by MAISRC are readily accessible to AIS managers through a variety of forms of technical assistance, such as online, downloadable fact sheets and responding to specific inquiries.

Who is an AIS manager?

→ Professionals employed in the public or private sector directly or indirectly responsible for implementing AIS prevention, control, and management actions.

Who is an AIS agent?

→ Paraprofessionals who have attained technical knowledge and skills capable of performing professional-level AIS response, particularly AIS prevention, detection, and monitoring. Paraprofessionals assist professionals or are closely coordinated by them.

What is capacity-building?

→ Strengthening the knowledge, ability, will and skills to initiate, plan, manage, and evaluate AIS prevention, detection, control efforts.

(Modified from the United Nations Development Program.)



MAISRC will address the national need for more professionals and researchers with AIS expertise by providing students at the PhD, MS, and BS levels with educational and practical opportunities.

STRATEGIES:

- A. Prioritize support of graduate students and post-docs in MAISRC-sponsored research budgets.
- B. Actively recruit high-caliber prospective graduate students to the University by communicating research progress and opportunities at national/international meetings and other relevant outlets as well as attracting and retaining students from under-represented populations (e.g., race, gender, ethnicity).
- C. Provide a stimulating and productive research environment for students. Include graduate students and post-doctoral associates in major MAISRC committees. Provide all MAISRC-affiliated students with professional development opportunities appropriate to their career levels, such as support for travel to national meetings and training events, and opportunities for networking with AIS professionals.
- D. Promote graduate student advising best practices (e.g., time to degree, publication norms) among MAISRC-supported faculty in partnership with Directors of Graduate Studies of key graduate programs.
- E. Explore incentives that encourage interdisciplinary and multi-disciplinary scholarship through collaborations across research teams.

→ 80% of those asked said it was important for MAISRC to train citizens to collect information to assess AIS control effectiveness, monitor AIS status, or both.



THEME III:

Increasing public awareness of AIS to support research investment

Many approaches for reducing the threat of AIS depend on public support – especially from those who use and value Minnesota’s waters. Research is no different. The level of funding dedicated to AIS research is a measure of the public’s understanding of AIS, commitment to addressing these threats, and awareness of the potential for success that AIS research holds.

While MAISRC conducts research and, together with University of Minnesota Extension, builds the capacity of those who manage our natural resources, we also need to reach a broader population of people who can contribute towards solutions in other ways. This population includes resources users, resource appreciators, and decision makers – University of Minnesota leadership, legislators, and funders.

Sharing information about AIS biology and ecology, weaknesses, and the threats they pose – while also educating people about MAISRC’s research, the needed time horizons, and results – will be critical for sustaining ongoing support of our work. We will accomplish this increased awareness through communications and outreach, coordination with Minnesota Sea Grant, and the Minnesota Department of Natural Resources, and through our science-based programming with University of Minnesota Extension.

*“Public awareness leads to legislative support.”
— Stakeholder comment during strategic plan forum*



Building awareness is an essential part of building support for any effort, including investments in AIS research. Greater public awareness and support will also lead to greater adoption of solutions.

GOAL 3.1:

MAISRC will partner with University of Minnesota Extension, Minnesota Sea Grant, and the Minnesota Department of Natural Resources to increase public awareness of AIS and of the importance of research to AIS response.

STRATEGIES:

- A. Finalize and implement a communications plan for MAISRC, paying particular attention to building broad understanding and awareness of MAISRC's research.
- B. Seek media opportunities for MAISRC researchers to provide the public with in-depth information about AIS biology and ecology and to explain the role of research in developing innovative solutions for AIS.
- C. Continue quarterly coordination of AIS public programming with University of Minnesota Extension, Minnesota Sea Grant, and Minnesota Department of Natural Resources, as specified in the letter of agreement (August 8, 2014), in order to share education planning information, identify unmet needs, and avoid redundancy in programming.
- D. Provide leadership for development of a digital Minnesota AIS information clearinghouse, i.e., a multi-partner portal with up-to-date links for resources available on AIS across Minnesota and adjacent states.
- E. Develop and implement a process for MAISRC affiliation with Extension programs, including review and quality control of AIS educational materials. Regularly communicate research updates to state and county extension educators.

"Just tell them. Over and over and over that research can take decades to produce results."

— Stakeholder comment during strategic plan forum



THEME IV:

Supporting innovative, productive AIS research teams

MAISRC has “jump-started” a significant research-based effort to respond to AIS in Minnesota. Now MAISRC must sustain AIS research momentum at the University of Minnesota, and expand teams to include researchers with critical expertise based in other institutions.

To do so, MAISRC needs to provide the infrastructure, collaboration, and opportunities for growth that stimulate innovation and results by its research teams. New state-of-the-art laboratories and holding facilities will allow researchers to take on more challenging research problems, but efforts are needed to secure essential field equipment as well.

As important as these physical resources are, the productivity and creativity of our research teams hinge as much, if not more, on collaborations. MAISRC’s organizational structure, processes, and incentives need to align in support of a collaborative culture that retains the highest caliber people and also attracts

others who broaden the scope of our expertise.

While MAISRC’s mission is focused on research-based solutions in Minnesota, researchers must simultaneously be supported in their pursuits to publish work in top-tier journals and to disseminate results nationally and internationally as a measure of the quality and rigor of their work. Building the reputation of the researchers and MAISRC in these ways will also improve faculty, post-doc and graduate student recruiting potential, open the door to additional and diverse funding, and increase MAISRC’s chances of support from within the University of Minnesota.

Theme four focuses on the work that researchers and administrative leadership can do to build an intellectually vibrant community, of which it is preferable – and more productive – to be a part of than to work alone.



GOAL 4.1:

MAISRC will attract and support researchers inside and outside academia to address all high-priority research needs.

STRATEGIES:

- A. Extend the research needs assessment process to identify researchers, match them to priority research, and encourage collaborations.
- B. Communicate MAISRC's research needs broadly and open up MAISRC's competitive awards process to potential investigators across the state and region, inside and outside of academia.
- C. Foster collaborations to pursue additional external funding for high-priority research projects.
- D. Identify opportunities (existing and potential) for sharing facilities, equipment, space and computing resources. Develop usage policies that consider time-sensitivity of experiments, seasonality of AIS work, equitable access for both new and established MAISRC faculty, and need to generate revenues to sustain Center research infrastructure.
- E. Create and implement a facilities-use policy and fee structure for external researchers interested in using MAISRC research facilities but who are not affiliated with the Center.
- F. Support opportunities for MAISRC faculty, post-doctoral associates and graduate students to strengthen their expertise, networks, and standing in national and international research communities. This includes providing funding for travel to scientific/academic meetings to present MAISRC research, travel to other institutions to learn new skills, and costs associated with publishing in research journals.
- G. Establish a regular, MAISRC-led seminar series or symposium to share Center research ideas and findings with other researchers and AIS professionals. Explore possible options, including campus-based seminar series, day-long research symposia, and sessions held in conjunction with regional AIS meetings, such as the Upper Midwest Invasive Species Conference.

→ For current and prospective MAISRC research faculty, the three most important reasons to affiliate with a center are for collaborations, for stable resources for long-term research, and for access to excellent laboratory and experimental facilities.



MAISRC will foster research collaborations, which are critical as a central strategy for solving complex AIS challenges.

STRATEGIES:

- A. Formalize what it means to be a “MAISRC researcher,” including expected contributions of faculty members to Center affairs as well as expected benefits, such as priority access to facilities and support for collaborative work and professional development.
- B. Reorganize MAISRC’s internal coordination structure to improve cohesion among research faculty, reduce the administrative burden associated with establishing new MAISRC research projects, and increase involvement of post-docs and graduate students in Center affairs.
- C. Create incentives for researchers to build collaborations through selection criteria used to award MAISRC-led research grants.
- D. Create opportunities for regular collegial and scientific exchange among MAISRC researchers, students, and staff.
- E. Promote and facilitate visits by researchers for short-term (several weeks) or sabbatical (6-12 month) stays as opportunities arise. Explore ways to identify and attract researchers with high potential to address MAISRC research needs and be part of collaborative teams. Communicate research opportunities for visiting faculty on the MAISRC website and in relevant academic forums.

What are MAISRC’s core values?

→ *Our work and behavior will be collaborative, scientific, innovative, solutions-oriented, forward-thinking, and responsive.*

→ *The top reason people cited for the importance of MAISRC being part of a major university is scientific rigor: “MAISRC has science-based credibility.”*

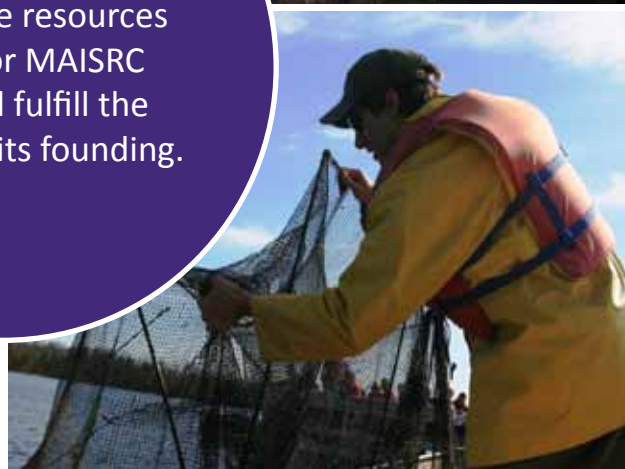
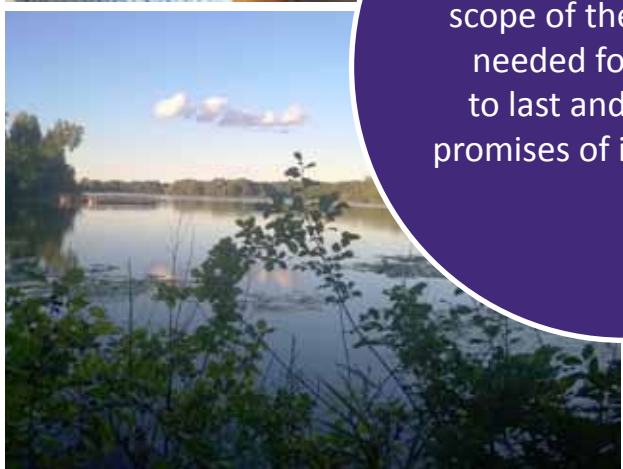


THEME V:

Sustaining the research center

In 2012, the Minnesota Legislature identified a need for a dedicated and coordinated research effort on AIS solutions. With funding from the Environment and Natural Resources Trust Fund and the Clean Water Fund, and with support of the Legislative Citizen Commission on Minnesota Resources, they invested in the leadership, infrastructure, and support needed to create and run a research center for its first six years of existence. The University has also made significant investments in human resources and facilities improvements for the establishment of this research center.

What is needed to ensure MAISRC exists beyond this initial support? MAISRC must be able to provide stable resources for outstanding research faculty and their teams; maintain modern laboratories and equipment; sustain capacity-building and outreach functions; and have dedicated administrative leadership to facilitate continuous progress toward the strategic vision and goals of the center. Theme five focuses on the scope of the resources needed for MAISRC to last and fulfill the promises of its founding.



This theme focuses on the scope of the resources needed for MAISRC to last and fulfill the promises of its founding.

GOAL 5.1:

MAISRC will build a sound portfolio of funding sources that provides stable and robust support for MAISRC research and operational functions.

STRATEGIES:

- A. Formulate an annual center budget that would fully support strategic goals. Use this budget to build rationale for MAISRC fundraising initiatives.
- B. Explore and pursue mechanisms for securing a stable operating budget through special state appropriation. Identify legislative champions to advocate for the Center.
- C. Develop incentives for faculty to seek external grants for AIS research that leverage MAISRC funding, build collaborative teams, support graduate students and post-docs, and help maintain the Center's research infrastructure (equipment and facilities), operations, and ICR (indirect costs) when possible.
- D. Submit at least one major external research grant proposal every two years to support multiple investigators and their teams, and to help maintain MAISRC's research infrastructure (equipment and facilities), operations, and ICR (when possible).
- E. Create and implement a comprehensive development plan for the Center. Coordinate planning with collegiate and university development officers.
- F. Proactively manage existing donor relationships and provide outstanding stewardship, including periodic reports to donors on use of funds.
- G. Conduct a research space and facilities assessment to identify critical needs for research infrastructure improvements. Communicate these needs to key decision-makers who set university and collegiate priorities (i.e., HEAPRR requests to the legislature, provost and Office of Vice President of Research initiatives).
- H. Establish communications mechanisms targeted to key MAISRC stakeholders (internal to university and external) that keep them abreast of notable MAISRC activities, accomplishments, and awards. As part of this initiative, we will produce an annual report, highlighting research advances and other noteworthy MAISRC accomplishments.



MAISRC will strengthen its leadership and organizational capacities to ensure a dynamic and impactful future.

STRATEGIES:

- A. Re-evaluate the makeup of the Center Advisory Board to determine if current board composition, roles, and responsibilities provide adequate support for achieving strategic planning goals. Revise the MAISRC external MOU accordingly.
- B. Transition MAISRC directorship to a full-time (administrative and research appointment) tenured faculty member whose primary responsibility is to MAISRC.
- C. Evaluate optimal positioning of MAISRC within the University, considering MAISRC's mission, scope of research, resource needs, stakeholders, and funding opportunities.
- D. Expand faculty capacity with expertise and interest in AIS at the University by working with academic departments to retain productive faculty members, replacing positions upon retirement, and seeking opportunities to create new faculty positions in critical areas.
- E. Ensure ample staffing for central functions such as communications and facilities support.
- F. Evaluate progress on strategies annually and goals every three to five years.

→ MAISRC was established with \$12.5m in funding from state appropriations, intended to “develop and implement an Aquatic Invasive Species Cooperative Research Center, including equipment and facility development...to collaborate with the commissioner of natural resources in developing solutions to control aquatic invasive species...and...[to] educat[e] and engag[e] citizens on preventing the spread of aquatic invasive species.” These funds must be used by 2019 and the Center must find new and additional funding for support.



PROCESS FOR DEVELOPMENT OF THE MAISRC STRATEGIC PLAN

MAISRC's strategic planning effort was initially inspired by the Center's Advisory Board ("CAB"), scoped as an open and collaborative process, and as a result, was fed with the energy and commitment by its many participants.

The entire effort occurred over an eight-month period and – following an organizational meeting where the process and goals were identified, discussed, and endorsed – began with an analysis of MAISRC's numerous stakeholders. The Center Faculty Group ("CFG") and the Center Advisory Board ("CAB") served as the strategic planning working group ("working group") and were asked to identify all internal and external stakeholders who they believed were able to "lay claim" to MAISRC's work, either because they are a direct beneficiary of the work or because they simply care about the state's resources as impacted by AIS.

Additionally, the strategic planning working group was asked to identify what these stakeholders needed from MAISRC, what MAISRC needed from these stakeholders, and to evaluate the stakeholders' level of engagement with the center. Through individual assignments as well as a half-day work session, the working group generated a list of 66 unique stakeholder groups. This list was then prioritized to 15 groups that could be considered key, active stakeholders of the entire MAISRC and the range of issues and species the MAISRC addresses. The working group then developed questions for these stakeholders that would inform the future direction and work of the MAISRC. They also identified specific individuals from whom to solicit input and the methods (surveys, interviews, or focus groups) to be used for seeking this input.

The working group convened to hear from the Center's founder about the efforts, messages, and issues surrounding the establishment of the MAISRC. The working group then reviewed, and in some cases developed, draft statements for MAISRC's vision (our preferred future), mission (what are we here to do and why), and values (how do we operate and what do we care about) to be tested and refined, as needed, through the strategic planning process.

An initial strengths, weaknesses, opportunities, and threats (SWOT) analysis resulted in additional questions for testing with stakeholders 16 assumptions about the MAISRC. The consulting team and MAISRC leadership team further developed these questions and the list of individual stakeholders.

The consulting team gathered input on these questions, as well as on the draft vision and mission statements, from these individuals accordingly: they conducted 16 interviews of 22 individuals; 4 focus groups with 30 individuals; and sent 8 tailored online surveys to 80 individuals. The overall response rate on the surveys was greater than 45 percent.

In addition, we conducted interviews with three other invasive species research institutions in Florida, South Africa, and Australia to collect benchmarking information on priorities, operational structure, funding, and services, and to learn about any "lessons" they were willing to share.

Results were anonymized, aggregated, and reviewed independently by each of the two members of the consultant team and the two members of the MAISRC leadership team. After a collective discussion, emerging themes were identified. Key findings were summarized and organized according to the 16 draft SWOT assumptions and then shared with the working group, along with the emerging themes.

A final half-day session with the working group was held to discuss these findings, to identify the most important issues, and to begin developing short, medium, and long-term goals and strategies based on the critical input gathered from the key internal and external stakeholders. Initial work was distributed electronically following the meeting so additional individual input could be provided.

The Director led further development and refinement of the goals and strategies, with support from staff and consultants. The final draft strategic plan, including the revised mission, vision, values, themes, and goals was shared with the working group and MAISRC students and staff for feedback.

MAISRC leadership carefully considered this feedback and incorporated appropriate changes into the strategic-planning document. Comments were itemized and responded to in a document that was made available to all those providing feedback. The final MAISRC 2015–2025 Strategic Plan: *Reducing AIS Risks by Advancing Research-Based Solutions* was endorsed by the CAB on November 4, 2015.

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ADDITIONAL INTERNAL AND EXTERNAL STAKEHOLDERS

Input in the strategic planning process was also sought from the following key stakeholders:

STATE AND FEDERAL AGENCIES:

State and Federal Agencies
Minnesota Department of Natural Resources
Minnesota Pollution Control Agency
National Park Service
U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service
U.S. Geological Survey

LEGISLATIVE:

Legislative-Citizen Commission on Minnesota Resources

COUNTIES:

Becker County
Beltrami County
Crow Wing County
Douglas County
Hennepin County
Itasca County
Koochiching County
Lac Qui Parle County
Lake County
Lake of the Woods County
Lincoln County
Ramsey County
Winona County

LAKE SHORE ASSOCIATIONS:

Association of Medicine Lake Area Citizens
Big Sandy Lake Association
Christmas Lake Homeowner's Association
Gull Chain of Lakes Association
Lake Detroiters Association
Otter Tail Lakes Property Owners Association
Pelican Lakes Association
Sportsmen's Club of Lake Vermillion
Whitefish Area Property Owners Association

AIS CONSULTANTS:

SePRO Laboratory Services
Barr Engineering
Blue Water Science
Fortin Consulting, Inc.
Freshwater Scientific Services, LLC
Lake Restoration, Inc.
Lonza Group
Navico
Osgood Consulting, LLC
PLM Lake & Land Management Corp.
Wenck Associates, Inc.

LOCAL UNITS OF GOVERNMENT:

Coon Creek Watershed District
Lake Minnetonka Conservation District
Minneapolis Park and Recreation Board
Minnehaha Creek Watershed District
Pelican River Watershed District
Ramsey-Washington Metro Watershed District
Rice Creek Watershed District
Riley Purgatory Bluff Creek Watershed District
Sauk River Watershed District
Three Rivers Park District

NONPROFIT ORGANIZATIONS:

Conservation Minnesota
Minnesota Coalition of Lakeshore Associations
Minnesota Conservation Federation
Minnesota Lakes & Rivers Advocates

ACADEMIC AND RESEARCH ORGANIZATIONS:

Concordia College Department of Biology
Florida Center for Invasive and Aquatic Plants
Minnesota State University Mankato – Water Resources Center
Stellenbosch University – Centre for Invasion Biology
University of Melbourne – Centre of Excellence for Biosecurity Risk Analysis
University of Minnesota – College of Food, Agricultural, and Natural Resource Sciences
University of Minnesota – Department of Agronomy and Plant Genetics
University of Minnesota – Department of Fisheries, Wildlife, and Conservation Biology
University of Minnesota – Department of Forest Resources
University of Minnesota – St. Anthony Falls Laboratory
University of Minnesota Duluth – Department of Biology
University of Minnesota Duluth – Large Lakes Observatory
University of Minnesota Extension
University of Minnesota – Office of Academic Affairs and Provost
University of Minnesota – Office of the Vice President for Research
University of Minnesota – Department of Veterinary Population Medicine
Winona State University – Large River Studies Center

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