MINNESOTA AQUATIC INVASIVE SPECIES RESEARCH CENTER
UNIVERSITY OF MINNESOTA
Driven to Discover℠

Request for Research Proposals

For New Lines of Research

The Minnesota Aquatic Invasive Species Research Center (MAISRC) at the University of Minnesota is seeking proposals for research studies to advance control and management, prevention of establishment and spread, risk assessment, and early detection of aquatic invasive species (AIS) in Minnesota.

Through this competitive proposal process, MAISRC will administer an estimated $1,800,000 to fund high-priority research needs focused on new lines of research and continuation of existing projects. MAISRC conducted a thorough and systematic needs assessment in 2020 that included AIS managers, researchers, and the public, to identify and prioritize research needs that will develop science-based solutions to Minnesota's AIS problems. This RFP is focused on 18 research priorities that were identified in this process and considered for new lines of research. For information on the proposal submission process for continuation projects, see separate RFP.

Proposals are invited from investigators at any Minnesota-based academic or governmental research institution for work that proposes to build capacity in and benefit Minnesota. Researchers who have not previously been supported by MAISRC are especially encouraged to submit proposals. Research collaborations and multi-investigator projects are also strongly encouraged. Research teams may include expertise outside of Minnesota if needed. However, please note that some restrictions apply for use of grant funds out of state.

Projects are expected to use state-of the-art techniques and approaches and must produce both peer-reviewed publications in high-quality journals as well as technical publications. Resources within the MAISRC Containment Laboratory may be available for use in association with funded projects. In addition, MAISRC communication and research-outreach staff can assist with the development and implementation of stakeholder engagement activities. Anticipated funding availability is January 1, 2023 through December 31, 2024.

Pre-proposal instructions and selection process

The funds to support research solicited in this announcement primarily originate from the Environment and Natural Resource Trust Fund (ENRTF), administered by the Legislative-Citizen Commission on Minnesota Resources (LCCMR). Therefore, eligible expenses for pre-proposals are the same as LCCMR's.

Pre-proposals will be reviewed by a committee consisting of MAISRC's Director, two members of MAISRC's Advisory Board, and two technical reviewers. Evaluation will be based on degree the pre-proposal fits research priorities, likelihood the research project will result in important new information useful for solving AIS problems in Minnesota and demonstrated capacity of the collaboration to perform the proposed research. Demonstrated support from end users of the research and ability to leverage additional funding will also be considered.

Investigators invited to submit full proposals will provide detailed research plans that will undergo scientific peer-review. Funding is available upon final approval of a work plan and budget, following peer-review and revisions.

For UMN proposals: Please do not submit through SPA. We recommend, however, that you discuss your pre-proposal with your finance team, department head, and others who would eventually need to approve your proposal so that we can avoid problems down the road if you are invited to submit a full proposal.

Pre-Proposal Components:

1. Project proposal – *submit in one PDF; template available for download*
    - Cover Sheet – *1 page limit; included in template*
    - Pre-proposal Narrative – *3 page limit; included in template*
    - Researcher Qualifications – *provide a CV for all primary investigators; 2 page limit each*
    - Project Manager's Organization Description – *1 page limit*
    - Citations
2. Project Budget – *submit in MS Excel; template available for download*
3. Optional Attachments – *letters of support, etc.*

The deadline for pre-proposals is March 1, 2022 at 9:00 AM. Submit all documents to maisrc@umn.edu. Please contact MAISRC Director, Dr. Nick Phelps, with questions about research priorities and the proposal process, or discuss research ideas – phelp083@umn.edu or 612-624-7450.

Research Priorities

Proposals for research on the following topics will be considered for funding. Like AIS problems in general, these problems are complex. To be effectively addressed, many of these topics will benefit from innovative research approaches, research scope spanning fundamental and applied, and/or multidisciplinary expertise. The topics are not listed in priority order. If not specifically addressed below, the species studied must be included on the MAISRC 2021 species priority list. Research not focused on addressing one of the following priorities will not be considered for funding.

A: Early detection and preventing the establishment of priority species

1. Develop, optimize, and validate field-based diagnostic assays for the rapid detection of high priority harmful microbes. Assays should be useable by technical experts (i.e., diagnostic laboratories) and non-experts (i.e., citizen scientists, aquaculture producers).
2. Characterize and quantify high-risk and poorly understood pathways of AIS spread within Minnesota, such as non-transient boat movement, water-related equipment, etc. to prioritize AIS prevention, education, inspection, and enforcement activities.
3. Conduct a comprehensive pathway assessment of trade and transport of aquatic invasive species and pathogens into Minnesota, including the aquarium trade, aquaculture, water gardens, etc., to determine the relative risk and hazards of various pathways.
4. Investigate the efficacy and practicality of non-physical barriers and deterrent technologies at strategic field locations to reduce movement of bighead carp, grass carp, silver carp, common carp, black carp, and northern snakehead in small and large waterways.
5. Experimentally and observationally measure effectiveness of prevention methods and boater education activities at changing behavior and preventing spread of AIS.

6. Develop, optimize, and test novel methods for efficacious disinfection of fomites and/or fish eggs for priority harmful microbes in aquaculture, bait harvest, commercial fishing, and recreational settings.

B: Creating and improving options for control of priority species

1. Develop innovative and environmentally safe control technologies for established AIS populations, with an emphasis on novel and cost-effective biochemical products or genetic approaches. Proof of concept and early-stage research is encouraged.
2. Develop an environmental risk assessment for the use of pathogenic or genetic biological control strategies for high priority species in MN aquatic systems. Risk assessment should include metrics that will inform and describe the potential effects on rare resources (such as endangered and threatened species), water resources, wildlife populations, and other natural resources. This assessment could act as a scoping or reference document for use in future environmental review processes.
3. Assess the prevalence of high priority AIS throughout Minnesota with probabilistic sampling to better inform early detection, prevention, and rapid response efforts.
4. Generate lake-specific predictions of suitability of Minnesota lakes for AIS under future climate scenarios, including (1) potentially high impact species that are in the live trade business that are currently limited by climate, and (2) established species that are likely to spread or contract their range and local abundance.
5. Develop and evaluate effective removal methodologies for rusty crayfish, particularly in ecosystems where high population densities are noted and impacts to specific native plant populations, such as wild rice, are possible.

C: Understanding impacts to prioritize management actions

1. Evaluate the effects of high priority AIS and AIS management on wild rice under current and future climate scenarios.
2. Study the reproductive biology of starry stonewort to understand how management might be used to disrupt life cycles and deplete propagule banks.
3. Determine the presence and/or prevalence of novel/emerging baitfish pathogens in Minnesota's wild, farmed and retail baitfish populations to inform risk-based management.
4. Quantify short- and long-term impacts and benefits of herbicides (Endothall and Diquat) and pesticides (copper) on non-target organisms including fish, invertebrates, and native plant communities in natural systems.
5. Determine to what extent common carp removal and re-establishment of macrophytes increases atmospheric carbon sequestration in sediments of shallow lakes.
6. Investigate if temporal or short-term reductions in faucet snail abundance can reduce/eliminate waterfowl mortality in Minnesota lakes.
7. Evaluate the economic impact of priority AIS introductions under current and future climate scenarios on property values, business and tourism, and subsistence use over time to inform cost-benefit analyses, communication efforts, and management decisions.