UNIVERSITY OF WISCONSIN SEA GRANT INSTITUTE




Request for Proposals

2020-22

PREPROPOSALS

An informational webinar for prospective investigators will be from 12-1 p.m. CST on November 15, 2018 - Go to seagrant.wisc.edu/rfp for WEBEX connection information.

DUE DATE - Friday, January 11, 2019, 3 p.m. CST

SEE APPENDED GUIDELINES FOR PREPROPOSALS

FULL PROPOSALS

An informational webinar for prospective investigators will be from 12-1 p.m. CDT on March 11, 2019 - Go to seagrant.wisc.edu/rfp for WEBEX connection information.

DUE DATE - Friday, April 26, 2019, 3 p.m. CDT

All Sea Grant project funds are awarded via a highly competitive process involving external peer reviews and the recommendations of external advisory panels.

Our next two-year grant period begins on FEBRUARY 1, 2020.

seagrant.wisc.edu/rfp

To SUBSCRIBE to our RFP email list, send email to: join-rfp_aqua@lists.wisc.edu. You do not need to add a subject or message to the email message.

2020-22 Request for Proposals

UNIVERSITY OF WISCONSIN SEA GRANT COLLEGE PROGRAM

The University of Wisconsin Sea Grant College Program is inviting research and education project proposals for the next two-year grant period that begins on February 1, 2020. The process involves two steps:

1) Prospective investigators submit a preproposal by **3 p.m. CST, Friday, January 11, 2019.** See appended Guidelines for Preproposals.

2) Prospective investigators submit a full proposal by **3 p.m. CDT, Friday, April 26, 2019**.

To be eligible to submit a full proposal, applicants MUST submit a preproposal by the preproposal deadline. All Sea Grant project funds are awarded via a highly competitive process involving external peer reviews and the recommendations of external technical and advisory panels.

HOW TO PROCEED

Please review the 1) Program Description (appended) for information about Wisconsin Sea Grant, including its mission, vision and values, and 2) Research and Education Priorities (appended) for a detailed description of research and education priorities listed below. For questions related to research proposals, please contact Jennifer Hauxwell (assistant director for research and student engagement, jennifer.hauxwell@aqua.wisc.edu, 608-263-4756). Prior to submitting an education proposal, please contact Anne Moser (education coordinator, akmoser@aqua.wisc.edu, 608-262-3069). See more information at seagrant.wisc.edu/rfp.

Wisconsin Sea Grant solicits research proposals for up to $100-120k/year[1] in the following areas:

Wisconsin Targeted Focus Areas, including:

- Green Bay Restoration Research
- Emerging Contaminants
- Great Lakes and Water Literacy Assessment

Wisconsin Base Focus Areas, including:

- Healthy Coastal Ecosystems

[1] All research proposals are for up to $120k/year for Wisconsin researchers, except the Michigan-Illinois/Indiana-Wisconsin joint call at $100k/year for Wisconsin researchers. For joint calls with other state Sea Grant programs, these limits are for each state, resulting in a total of $240k/year for the joint call with Minnesota Sea Grant and up to $300k/year for the joint call with Michigan and Illinois-Indiana Sea Grant.

- Sustainable Fisheries and Aquaculture
- Resilient Communities and Economies

Special Joint Calls for Proposal with other state Sea Grant programs, including:

- Minnesota-Wisconsin Joint Call for Proposals
- Michigan-Illinois/Indiana-Wisconsin Joint Call for Proposals

In addition, Wisconsin Sea Grant solicits education proposals for up to $25k/year to address our fourth priority base focus area for:

Environmental Literacy and Workforce Development (Non-research Education Projects)

We welcome original, innovative proposals on any targeted or base focus area or special call. We are also especially interested in receiving proposals from new and/or under-represented faculty. You are encouraged to visit the UW Sea Grant website and/or download a copy of our 2018–20 Directory of Projects and People for an overview of the types of projects funded by our program.

Please note, we encourage proposals that:

- Support students and connect them with our Wisconsin Sea Grant fellows program to provide opportunities to practice stakeholder engagement and actionable science
- Engage stakeholders and end users throughout all phases of a research study, including the preproposal stage when defining the question to be addressed, approach, and deliverables
- Connect with our Sea Grant outreach and communications staff to increase relevance and exposure of the work to relevant audiences
- Strive to promote the ideals of diversity and inclusion

An informational webinar on the focus of and process associated with submitting preproposals will be provided November 15, 2018, from 12-1 p.m. CST. This webinar will be recorded and available through the preproposal deadline. Go to **seagrant.wisc.edu/rfp** for WEBEX connection information.

An informational webinar for prospective investigators interested in submitting full proposals will be from 12-1 p.m. CDT on March 11, 2019. Our staff will discuss the full proposal process and offer advice and options for incorporating outreach and education activities within research proposals. This webinar will be recorded and available through the full proposal deadline. Go to **seagrant.wisc.edu/rfp** for WEBEX connection information.

Thank you for your interest. We look forward to learning more about your ideas for tackling our shared Great Lakes challenges!

James P. Hurley, Director

Guidelines for Preproposals

This information is intended for faculty members (or persons having principal investigator status at their institution) in the University of Wisconsin System or other Wisconsin colleges or universities. Investigators submitting to the special joint competitions should follow the guidelines listed near the end of this Wisconsin RFP here for the Minnesota-Wisconsin joint call and here for the Michigan-Illinois/Indiana-Wisconsin joint call. Supporting information and resources are at seagrant.wisc.edu/rfp.

Wisconsin investigators must submit preproposals via the UW Aquatic Sciences Center (administrative home of the Sea Grant College Program) online proposal submission system, eDrop (https://edrop.aqua.wisc.edu/) by 3 p.m. CST on Friday, January 11, 2019. Notification of preproposal status will be sent in late February 2019.

Evaluation criteria

Preproposals will be reviewed by panels of experts with input by Sea Grant staff and the Wisconsin Sea Grant Advisory Council. [Preproposals resulting from joint calls with other state Sea Grant programs will also be reviewed by their staff and advisors.]

Research review panel(s) will address the following questions when determining whether to encourage a full proposal:

- What is the importance of the proposed project for Wisconsin and is it relevant to the priorities listed in the RFP?
- What is the scientific merit of the proposed project?
- What are the qualifications of the investigators?
- What are the likely outcomes or impacts (environmental, educational, social, economic, etc.) that could result from the proposed project? Are stakeholders engaged in the process and potential outcomes associated with the proposed work?
- Does the budget estimate seem adequate, or too high/too low? Does the project seem a good value?
- [For proposals resulting from joint calls with other state programs, panels will also consider the regional importance of the work, how the proposal addresses the priorities listed in the joint calls, and how well the proposal is integrated, given researchers from different state programs.]

The education review panel will address the following questions when determining whether to encourage a full proposal:

- Rationale and Methods: Is this a sound education research study/education project? Are the objectives and methods appropriate? Are the investigators qualified to execute the project/study?
- Meeting Wisconsin Sea Grant's Education Priorities: For the education research preproposals, how well do they address the targeted focus area "Great Lakes and Water Literacy Assessment" described in the Request for Proposals? For the education project preproposals, how well do they address at least one of the six education priorities (numbers 30-35) identified in the Request for Proposals?
- Impact: Will this research study or project make a significant impact on its target audiences? Is its scope appropriate? Have the investigators identified critical partnerships?
- Budget/Value: Does the budget estimate seem adequate, or too high/too low? Does the project seem a good value?

Instructions for submitting a preproposal

Detailed instructions for submitting a preproposal are outlined below.

Applicants should contact Tom Xiong at tomxiong@aqua.wisc.edu or 608-262-6170 with any difficulties associated with the proposal submission process using eDrop.

STEP 1

Go to seagrant.wisc.edu/rfp and download the Pre-Proposal Description template and the CV template. These forms are needed for you to complete your preproposal.

STEP 2

Provide the required information in the Pre-Proposal Description template. Once completed, save the document - you will use the information to copy and paste into various eDrop fields described in Step 6.

STEP 3

Provide the required information in the CV template by deleting the text within brackets and replacing it with investigator information. Rename file(s) using investigator name(s) in the following format: "Lastname_CV.doc" and convert to PDF(s) using the format "Lastname_CV.pdf". You are required do this for the lead principal investigator listed on the preproposal and are encouraged to do this for all investigators. CVs for multiple investigators will result in separate PDF files. You will upload CV file(s) as described in Step 7.

STEP 4

Navigate to eDrop (https://edrop.aqua.wisc.edu/) and login or register for a new account. Instructions on the site will assist you in entering your proposal package. Note to new users – the registration process involves a two-step verification, requiring you enter both an email address (step one) and phone number (step two) to receive two different verification codes that you must enter in order to complete the registration.

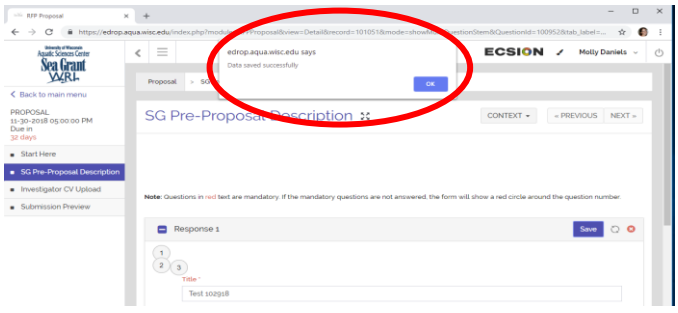
STEP 5

Once you are logged in, click on "Add Proposal" under Request for Proposals (Sea Grant 2020-2022 Pre-Proposal). Enter a title and click "Create New". If you are returning to edit your preproposal, simply click on the title you gave your submission. Click on "NEXT" in top right to proceed to the next section.

STEP 6

Complete the SG Pre-Proposal Description form in eDrop using the Pre-Proposal Description template you saved in Step 2 by copying and pasting sections from your document into the corresponding form fields.

You do not need to upload your entire preproposal package in a single session; however, you must hit the "SAVE" button to avoid losing anything you enter AND as you navigate between pages in eDrop. Do not hit the "NEXT" button until you have successfully saved your information. We encourage you to frequently SAVE your updates. If you exceed word limits, then SAVEs



will not be successful, and you can lose data. A successful SAVE is indicated by the prompt depicted here.

Your account will remain active through the submission deadline, and you may edit each section until the submission deadline.

You will copy and paste information from your word processing file into form fields (text boxes) labeled:

- **Title** [Use uppercase only for the first word in the title and for proper nouns.]
- **Principal Investigator – Name, Affiliation (Department and Organization), Percent Effort Committed to Project, and Email Address**
  (For joint calls with other state programs, please provide a Lead investigator for each state.)
- **Co-Principal Investigator(s) – Name(s), Affiliation(s) (Department and Organization), Percent Effort Committed to Project, and Email Address(es)**
- **Associate Investigator(s) – Name(s), Affiliation (Department and Organization), and Email Address(es)**
- **Begin Date (select from the drop-down menu)** [Projects will normally begin on February 1, 2020. It may be possible to begin a project on February 1, 2021.]
- **End Date (select from the drop-down menu)** [Maximum project duration is two years.]
- **Name of Campus Administering Project**
  (For joint calls with other state programs, please provide the name of the campus in each state administering the project.)
- **Focus Area** [These areas are presented as a drop-down list in eDrop. Select one Wisconsin Targeted or Base Focus Area or Special Joint Call from the dropdown menu.]
- **Specific Program Priority** [Include the priority or priorities as listed under "Priority research (or education) areas include:" within the appropriate Wisconsin Targeted or Base Focus Area or Special Joint Call included in the RFP.]
- **Statement of Problem or Opportunity to be Addressed** [350-word limit.]
- **Overall Project Goal, Objectives and/or Hypothesis to be Tested** [350-word limit.]
  (For joint calls with other state programs, clearly indicate the portion of the project that is associated with each state investigative team.)
- **Approach** [350-word limit.]
  (For joint calls with other state programs, clearly indicate the portion of the project that is associated with each state investigative team.)
- **Applications** [350-word limit. How will the proposed project address the problem/opportunity? Identify potential users of project results (e.g., specific businesses, industries, coastal communities, state and federal government agencies, etc.) and how they have been involved in defining the question and proposed approach.]
- **Approximate Year 1 Budget Request** [Projects will normally begin on February 1, 2020 or 2021. Though funding is on a year-by-year basis, project preproposals should be written to cover the entire period of time necessary to fulfill the proposed objectives. Wisconsin Sea Grant projects may have durations of one year to a maximum of two years.]
- **Approximate Year 2 Budget Request**
- **Budget Justification** [Submitted budgets are to include lump sums as well as an estimated breakdown of costs across these categories: a) Salaries; b) Fringe benefits; c). Equipment; d) Supplies; e) Field travel; f) Publications; g) Other costs to include printing, mailing and workshops, contracts/subawards and shiptime; and h) Indirect costs. Contracts and subawards must be managed at the institution of the

primary Principal Investigator. Sea Grant does not cover costs associated with conference travel. For joint proposals with Minnesota Sea Grant or Michigan-Illinois/Indiana Sea Grants, please clearly indicate the portion of the budget associated with Wisconsin investigators and the portion associated with investigators from other states.

Research proposal budgets for funding by UW Sea Grant are limited to:

- Targeted and base Wisconsin focus areas - $120,000/year
- Joint Minnesota-Wisconsin - $120,000/year for Wisconsin portion and $120,000/year for Minnesota portion (with match requirement for Minnesota investigators – see details here)
- Joint Michigan-Illinois/Indiana-Wisconsin - $100,000/year for Wisconsin portion and $100,000/year for Michigan portion and $100,000/year for Illinois-Indiana portion (with match requirement for Michigan and Illinois-Indiana investigators – see details here)

Education (non-research) proposals are limited to $25,000/year.]

When you are satisfied with the information you have entered in the eDrop Pre-Proposal Description form, click the “SAVE” button.

STEP 7

Navigate to the Investigator CV Upload page. Upload the PDF version(s) of your CV template(s) on the “Investigator CV File Upload” page. Be sure to click the “SAVE” button after you upload the PDF files.

STEP 8

When ready to submit, click on the **Submit Proposal** button in the “Submission Preview” tab. Until you have clicked on the Submit Proposal button you can log back in to eDrop and make changes to your preproposal. Note: Your preproposal is not officially submitted until you click on the “SUBMIT” button in the “Submission Preview” tab.

Program Description

INTRODUCTION

The physical properties of the Great Lakes parallel the enormity of responsibility Wisconsin Sea Grant undertakes with its efforts to foster the sustainable use of the lakes' resources through science and outreach. We highlight our research and education priorities in this 2020-22 request for proposals.

Just as the lakes are impressive — 6 quadrillion gallons of water, 95 percent of the nation's supply of surface fresh water, according to the Great Lakes Information Network — so too is the task of ensuring that top-level actionable science is employed to safeguard and enhance the world's largest freshwater system, which supports a $62 billion economy.

The lakes are a dominant part of the history and culture of this country and remain vital to the region's nearly 35 million binational and diverse people who call the 10,900-mile coastline home, as well as the epicenter of their recreational pursuits and benefactor of their livelihood, including subsistence living for 35 federally recognized tribes living in the Midwest region. In fact, the region supports more than 1.5 million jobs in the shipping, mining, manufacturing, fishing, tourism and agricultural sectors — all driven by the bounty of inland seas. All of this takes place within a tapestry of diverse cultural and economic backgrounds, orientations, genders and races — Wisconsin Sea Grant strives to prove responsive and relevant to that diversity.

To maintain and enrich the Great Lakes region, Wisconsin Sea Grant is committed to the concept of actionable science: science that 1) is conducted with the highest standards for quality and integrity, 2) is valued by and, in fact, dependent upon a strong relationship with stakeholders, 3) is coupled with effective outreach and communication, and 4) results in information or decision-support frameworks that can inform likely outcomes of various challenges or potential decisions.

ABOUT SEA GRANT

The National Sea Grant College Program has funded cutting-edge research at the nation's leading academic institutions, forming a network of 33 programs, for more than 50 years. More than 375 Sea Grant outreach and education specialists share that research with businesses, educators, policymakers, diverse communities and citizens to enhance the practical use and conservation of Great Lakes, ocean and coastal resources to create a sustainable economy and environment. More than 3,000 university scientists, outreach specialists, educators and students participate in the program each year. Administered by the National Sea Grant Office of the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce, Sea Grant's university-based programs are fundamental to the development of tomorrow's aquatic resources scientists and managers. Sea Grant thus provides integrated research, outreach and education programs that provide tangible benefits for ocean, coastal and Great Lakes environments and the communities they support.

Established in 1968, the University of Wisconsin Sea Grant College Program is one of the oldest and most vibrant programs in both the national and Great Lakes Sea Grant networks. Wisconsin Sea Grant's multidisciplinary research agenda has made it a national leader on the topics of toxic contaminants, aquatic invasive species, data visualization for effective resiliency planning, coastal engineering, water quality, urban aquaculture and fisheries management. As an objective, non-advocate source of science-based information, the program reaches across Wisconsin and the Great Lakes basin, building bridges and fostering partnerships with businesses and industries, local communities, tribal entities and management agencies.

SEA GRANT MISSION, VISION AND VALUES – FROM DISCOVERY TO APPLICATION

Wisconsin Sea Grant undertakes all endeavors in pursuit of its mission to ***promote the sustainable use of Great Lakes resources through research, education and outreach***. That is done to fulfill a vision of ***thriving coastal ecosystems and communities*** and drawing on the core values of ***service, science-based discovery to application, and research and outreach that are academically grounded, collaborative, inclusive of diversity, educational and visionary***.

These concepts of mission, vision and values complement those of the National Sea Grant College Program. That program supports a future in which people live along the coasts in harmony with and in understanding of the environment and natural resources that attracted and sustain them. This is a vision of a coastal America that uses these natural resources in ways that capture the environmental, economic, social and recreational benefits they offer while preserving their quality and abundance for future generations. This vision reinforces what is articulated in NOAA's Next Generation Strategic Plan: "NOAA's mission of science, service, and stewardship is directed to a vision of the future where societies and their ecosystems are healthy and resilient in the face of sudden or prolonged change."

Both the National and Wisconsin Sea Grant College Programs advance NOAA's mission "to understand and predict changes in Earth's environment and conserve and manage coastal and marine resources to meet our nation's economic, social and environmental needs."

These organizations support the integration of research with constituent engagement. They have been pioneers in the translation of research — from discovery to application — and going forward will continue to ensure objective, science-based information is disseminated to diverse audiences in ways that encourage actionable science.

STRATEGIC IMPLEMENTATION

Wisconsin Sea Grant's 2018-21 Strategic Plan is structured in accordance with the National Sea Grant College Program's 2018-21 Strategic Plan, which capitalizes on Sea Grant's unique capacities and strengths and allows for flexibility and creativity on the part of state Sea Grant programs. Wisconsin Sea Grant embraces the challenges and opportunities inherent in identifying goals and outcomes and deploying strategies within four focus areas critical to a viable Wisconsin future — Healthy Coastal Ecosystems, Sustainable Fisheries and Aquaculture, Resilient Communities and Economies, and Environmental Literacy and Workforce Development.

In accordance with the National Sea Grant College Program, Wisconsin Sea Grant further commits to three principles in pursuit of coastal and freshwater conservation and use. These principles are:

- Cultivating partnerships
- Enhancing diversity and inclusion
- Expanding organizational excellence

In order to achieve positive, measurable outcomes, we connect researchers with the Wisconsin Sea Grant outreach and communications staff to make available and deliver research-derived information and findings to resource managers, policy- and decision-makers and public stewards — a clear demonstration of actionable science.

Built on this foundation, the Wisconsin Sea Grant strategic planning approach was a bottom-up process in which program priorities underwent review. The plan was richly informed by surveyed stakeholder input, along with numerous facilitated discussions with involved parties, and it benefitted from the advice of a statewide advisory council. The plan is also, importantly, primed for review and any possible realignment so as to guarantee a precisely calibrated response to evolving Wisconsin needs and priorities. The research and education priorities described in the following pages were identified through this strategic planning process.

Research and Education Priorities

On the following pages we describe the Wisconsin targeted and base research focus areas and education priorities as well as our special joint calls for research proposals with other state Sea Grant programs.

Wisconsin Sea Grant strongly encourages proposals that:

- Support students and connect them with our Wisconsin Sea Grant fellows program to provide opportunities to practice stakeholder engagement and actionable science.
- Engage stakeholders and end users throughout all phases of a research study, including the preproposal stage when defining the question to be addressed.
- Connect with our Sea Grant outreach and communications staff to increase relevance and exposure of the work to relevant audiences.
- Strive to promote the ideals of diversity and inclusion. For example, Wisconsin Sea Grant encourages applicants to recruit and engage with students and fellows from underrepresented racial and ethnic groups, individuals with disabilities and individuals from economically or educationally disadvantaged backgrounds that have inhibited their ability to pursue a career in STEM and encourages applicants to clearly identify how this research will have broader societal impacts on the coastal community including stakeholders from underrepresented or underserved communities.

Wisconsin Sea Grant solicits research proposals for up to $100-120k/year[2] in the following areas:

Wisconsin Targeted Focus Areas, including:

- Green Bay Restoration Research
- Emerging Contaminants
- Great Lakes and Water Literacy Assessment

Wisconsin Base Focus Areas, including:

- Healthy Coastal Ecosystems
- Sustainable Fisheries and Aquaculture
- Resilient Communities and Economies

Special Joint Calls for Proposal with other state Sea Grant programs, including:

- Minnesota-Wisconsin Joint Call for Proposals
- Michigan-Illinois/Indiana-Wisconsin Joint Call for Proposals

In addition, Wisconsin Sea Grant solicits education proposals for up to $25k/year to address our fourth priority base focus area for:

Environmental Literacy and Workforce Development (Non-research Education Projects)

[2] All research proposals are for up to $120k/year for Wisconsin researchers, except the Michigan-Illinois/Indiana-Wisconsin joint call at $100k/year for Wisconsin researchers. For joint calls with other state Sea Grant programs, these limits are for each state, resulting in a total of $240k/year for the joint call with Minnesota Sea Grant and up to $300k/year for the joint call with Michigan and Illinois-Indiana Sea Grant.

Wisconsin Targeted Focus Areas

Wisconsin Sea Grant solicits proposals that address the following targeted focus areas for up to $120k/year:

Priority research areas include:

1) Green Bay Restoration Research

The legacy of striving for healthy coastal ecosystems and resilient communities and economies is a strong one for Wisconsin Sea Grant. A keystone effort was two decades of comprehensive, multidisciplinary research focused on Green Bay, Lake Michigan, making it one of the most rigorously studied estuarine systems of its size in the world (see recent Special Section on Green Bay Ecosystem in Journal of Great Lakes Research volume 44, issue 5). That baseline data has informed, for example, the U.S. Environmental Protection Agency's landmark national Green Bay PCB Mass Balance Study, which for the first time developed an input-output model of all sources, movement and fates of a chemical contaminant in an aquatic system. That work was completed more than 20 years ago, and Wisconsin Sea Grant continues in a leadership role for the promotion of a healthy and resilient Green Bay ecosystem and surrounding community, and at other Wisconsin Great Lakes sites.

While Green Bay has been studied extensively and much is known about its ecology, questions and challenges remain. The bay is recognized as the largest freshwater estuary in the world and, as such, is a natural resource of regional and international significance. The water of Green Bay is notably different from the remainder of Lake Michigan because it is nutrient-rich and high in biological productivity. This productivity and habitat richness make the bay an important area for many fish species and migratory birds. The bay is also known for high levels of phosphorus and sediment, mainly delivered from the watershed of the Lower Fox River, which cause high turbidity, eutrophication and hypoxia. Since the 1970s, improvements in water quality and habitat have been made as a result of advances in water treatment, ongoing cleanup of toxic sediments and coastal habitat restoration projects. Larger issues remain related to non-point source pollution, harmful algal blooms and the fishery. Important research questions include but are not limited to the following:

- To what extent do cyanobacteria and harmful algal blooms (HABs) impact the Lower Fox River and Green Bay and how can we improve our ability to monitor and predict HAB occurrence (location, frequency and severity)?
- How do HABs in Green Bay impact public health and coastal economies? What are impacts of HABs on surrounding communities and people who fish and recreate on Green Bay? How can these impacts be mitigated?
- What are the social and economic impacts of current or improved water quality conditions in the Lower Fox River and Green Bay on the region and its communities?
- What innovative and cost-effective approaches are available to meet water quality and habitat goals for Green Bay and its entire watershed?
- What social science approaches and technologies exist to engage agricultural producers in meeting the Lower Fox River Total Maximum Daily Loads for phosphorus and total suspended solids?
- How will climate change impact the ecosystem and restoration of the Lower Fox River watershed and Green Bay?

- What is the status of the predator-prey balance, food web and aquatic habitat in Green Bay? Can tools and models be developed to better understand this complex food web while also engaging angling and commercial fishing stakeholders?

Wisconsin Sea Grant encourages interdisciplinary proposals to bridge natural sciences, social sciences and policy studies to support more holistic management and restoration of Green Bay and its watershed.

2) Emerging Contaminants

The scientific and regulatory communities are continually recognizing and adapting to environmental and health impacts of technologies, products, and processes. As new technologies and products are developed for commercial and consumer use, analysis for understanding and managing the human health and environmental impacts must also evolve.

A wide range of products utilize per- and polyfluoroalkyl substances (PFAS), which have only recently been identified as substances with potential adverse human effects. Products containing PFAS include water-repellent or temperature-resistant textiles and cookware, fire-fighting foams, and paper products. PFAS, a complex family of over 3,000 man-made fluorinated organic chemicals have been produced for half a century; while only in the last few years has the scientific community begun to discover their effects. Manufacturers have developed many alternatives to commonly-used PFAS, but it is yet unknown whether these alternatives are more or less hazardous than the "long-chain predecessors." The US EPA, which was first alerted to PFAS in drinking water in 2001, and its collaborators have been identifying PFAS contamination sites in addition to establishing safe levels of PFAS in drinking water. However, more research is needed identifying sites and establishing safe levels. Both PFAS and their alternatives have already been found in several Wisconsin waterways, yet little is known about other potential areas such as private wells, smaller water districts, and other sources of drinking water. In particular, Wisconsin Sea Grant is interested in Great Lakes-connected proposals that improve knowledge related to sampling, detection, analysis, and cycling in the environment.

Microplastics are also flagged as prolific environmental pollutants. Products containing microplastics include personal care products, paints, detergents, and textiles, and routine washing of synthetic fabrics introduces microfibers to local waterways. Larger, and more common, types of debris like plastic bags, containers, and plastic-containing trash break down into microplastics. Plastics can be found in waterways ranging from nano- to micro- to macro-sizes. Research and collaboration is needed to explore exposure and risks for biota and people, fate and transport in the environment, and to characterize effects of microplastics in organisms and systems to understand the environmental and socioeconomic impacts. In addition, there is a need for standardizing national/multi-national microplastics sampling protocols to allow for comparisons temporally and spatially and to identify areas of concern.

Wisconsin Sea Grant seeks proposals developing or improving methodologies, standards of procedures, models or management plans, inventorying sources, transport, fate, and distribution of emerging contaminants in the Great Lakes ecosystems, conducting intensive analyses in Areas of Concern or Species of Concern, examining the interactions with fish populations and impacts on food webs, exploring human health impacts, and supporting and improving testing capacity within the state.

3) Great Lakes and Water Literacy Assessment

Wisconsin is wealthy in water resources, and environmental literacy is central to understanding the economic, environmental and social consequences of decisions about water. Wisconsin Sea Grant's focus group discussions about environmental literacy in Wisconsin revealed that one primary research need is assessment, specifically, determining the current status of Great Lakes and water literacy across the diversity of Wisconsin's students. Obtaining this baseline information would enable a wide variety of water-education professionals and entities in the state — including Wisconsin Sea Grant — to target their education activities toward critical gaps in Great Lakes and water literacy, as well as aid in measuring the effectiveness of education efforts. Proposals should seek to build on previous studies in Great Lakes and water-educational needs assessments, as well as current efforts to measure ocean literacy, while targeting specific needs of Wisconsin educators.

Wisconsin Sea Grant seeks proposals that will provide robust data about the current level of Great Lakes and water literacy in Wisconsin students to serve as a foundation for future education efforts in the state.

Wisconsin Base Focus Areas

Wisconsin Sea Grant solicits research proposals that address the following base focus areas and their associated research priorities for up to $120k/year.

1) Focus Area: Healthy Coastal Ecosystems

Wisconsin has more than 800 miles of shoreline adjoining the vast ecosystems of Lake Michigan and Lake Superior, including the coastal, nearshore, and deep-water environments. In Wisconsin, our healthy coastal ecosystems, sustained by their surrounding watersheds, are the foundation of life along the coast.

Ecosystem health and associated ecosystem services[3] can directly and indirectly affect both human health and socioeconomics at both individual and community scales. Maintaining the health of coastal ecosystems is a challenge because of the diversity of stressors involved as well as the temporal and spatial scales at which systems can be affected. Responsible management of these systems requires a comprehensive way of thinking and acting, often termed ecosystem-based management[4]. Ecosystem-based approaches require coordination among federal, state and local jurisdictions and the active engagement of the people who live, work and play along our coasts. They also require understanding of the characteristics of species, landscapes and their interactions within each ecosystem.

In general, increasingly rapid coastal development, a changing climate, greater demands on fisheries resources, and other human activities have led to water-quality degradation, increased demands on water supplies, changes to fisheries stocks, wetlands loss, proliferation of aquatic invasive species and a host of other environmental, health and socioeconomic impacts. It is essential for decision-makers and Great Lakes coastal residents to understand the interconnectedness and interactions of these systems in order to maintain vital habitats and inform restoration efforts within ecosystems and watersheds.

Likewise, Wisconsin Sea Grant recognizes the challenge of ensuring that ecosystems research is shared beyond the laboratory and makes its way to the settings where it can be used to inform decision-making. The program has committed to bridging the gap between the acquisition of new scientific knowledge, or the validation of a scientific concept or model, and the actions necessary to apply those facts. This practice of actionable science encourages the sharing and use of evidence-based tools and data to inform discussions, debate and decisions for the achievement of healthy coastal ecosystems.

Priority research areas include:

1. Understanding the environmental and socioeconomic effects of current and emerging challenges on Great Lakes ecosystem and human health including, but not limited to, contaminants, aquatic invasive species, harmful algal blooms, bacterial outbreaks,

[3] Ecosystem services include provisioning (food and water), regulating (flood and disease control), cultural (spiritual, recreational and cultural benefits) and supporting (nutrient cycling).

[4] Ecosystem-based management is an integrated approach to management that considers the entire ecosystem, including humans. The goal of ecosystem-based management is to maintain an ecosystem in a healthy, productive and resilient condition so that it can provide the services humans want and need. Ecosystem-based management differs from past approaches that focused on a single species, sector, activity or concern; it considers the cumulative impacts of different sectors.

physical processes, climate change and changes to biodiversity and ecosystem structure
2. Improving Great Lakes ecosystem health through innovations in measurement, predictive modeling and potential treatment or management approaches for current and emerging challenges
3. Developing tools and approaches for preserving and restoring Great Lakes ecosystems that can also be used for outreach to stakeholders
4. Improving and enhancing stakeholder access to and understanding of socioeconomic and environmental data, models and policy information in Wisconsin and the Great Lakes region that support ecosystem-based planning, decision-making and management approaches
5. Supporting research to develop dynamic and interoperable information systems to support adaptive management of Great Lakes ecosystems
6. Helping residents, resource managers, businesses, industries and the agricultural sector understand the effects of human activities and environmental changes on coastal resources

2) Focus Area: Sustainable Fisheries and Aquaculture [5]

The nation has witnessed the decline of many of its major fisheries while seafood consumption has increased and continues to be encouraged because of its health benefits. To fill the gap between seafood demand and domestic harvests, the U.S. imports 90 percent of what is consumed, leading to a seafood trade deficit of more than $11.2 billion per year. With global wild fisheries harvests at a plateau of around 185 million tonnes, further increases in seafood production will have to come from aquaculture. Currently, more than 50 percent of seafood consumed globally is now produced from aquaculture. Since 2013, global seafood production has surpassed global beef production. There are no projected increases in wild-capture fisheries, but global aquaculture is predicted to increase by 33 percent over the next decade. These projections create opportunities for an expanded Great Lakes basin aquaculture industry and for innovative marketing strategies for the wild fisheries industry.

The overall economic impact of the commercial, recreational and for-hire fisheries and aquaculture industries in the Great Lakes region is $7 billion annually. In Wisconsin, 1.4 million fishing licenses are issued each year, and anglers and the fishing industry deliver $2.75 billion in economic impact and 30,000 jobs annually. There are 70 commercial fishers in Wisconsin who rely on fewer than 10 species and have a combined harvest of $5 million annually.

Wisconsin's aquaculture industry contributes $21 million in annual economic activity and more than 400 jobs to the state. There is definitely room for growth in food fish aquaculture — additional opportunities exist for job creation and meeting the demand for finfish. The Midwest consumes more than 1 billion pounds of seafood products per year but less than 4 percent comes from aquaculture operations in the region.

Wisconsin Sea Grant continues to play a leadership role in developing innovative technologies for all sectors of the seafood industry. In particular, the program has fostered the growth of urban aquaculture through research and outreach in the region's metropolitan areas. It has also

[5] We use a working definition of "seafood sustainability" that is based on the NOAA Fishwatch concept. Sustainability involves "meeting today's needs without compromising the ability of future generations to meet their needs. In terms of seafood, this means catching or farming seafood responsibly, with consideration for the long-term health of the environment and the livelihoods of the people who depend upon the environment."

capitalized on educating consumers interested in the buy-local movement. Wisconsin Sea Grant's partnership with NOAA, state and tribal fisheries managers, seafood processors, fishing associations, the aquaculture industry and consumer groups will ensure safe, secure and sustainable supplies of domestic seafood, decreasing a reliance on seafood imports now and into the future.

Priority research areas include:

7. Better understanding our Great Lakes fisheries, including status and trends, measurement and modeling techniques, future scenarios, and socioeconomic costs and benefits under different management approaches and environmental conditions
8. Advancing an environmentally sustainable and robust recreational, commercial and subsistence Great Lakes fishery
9. Understanding threats to Great Lakes fisheries, including, but not limited to, nutrient enrichment, invasive species, food web changes and climate change as well as effective responses
10. Identifying and better understanding the barriers to expansion of the aquaculture industry in Wisconsin and implementing innovative partnerships to address scientific, business, economic, policy and legal challenges
11. Collaborating in identifying Great Lakes regional aquaculture opportunities and best-management practices
12. Better understanding the benefits and risks of consuming Wisconsin-produced fish
13. Encouraging the application of behavioral and consumer sciences, consumer perception and preferences, food safety, labeling and certifications, seafood demand studies and promotion of local seafood
14. Developing and improving economically viable and environmentally sustainable aquaponics operations, with an emphasis on business planning, risks and socioeconomics
15. Developing and improving commercially viable and environmentally sustainable aquaculture practices and techniques, including nutritional value of feeds, broodstock selection, water supply and quality, husbandry and disease, and pest and pathogen prevention and diagnosis
16. Developing environmentally and economically sustainable aquaculture through workforce development and trainings, K-12 education and technical assistance
17. Expanding urban aquaculture into new markets and providing knowledge resources to existing operations
18. Investigating emerging species suitable for food fish aquaculture in Wisconsin

3) Focus Area: Resilient Communities and Economies [6]

Coastal communities provide crucial economic, subsistence, social and recreational opportunities for millions of people within the Great Lakes basin. A 2011 study completed by the University of Michigan reported that more than 1.5 million jobs, generating $62 billion in wages are tied to the inland seas. The job breakdown is 994,879 in manufacturing; 217,635 in tourism; 118,550 in shipping; 118,430 in agriculture, fishing and food production; 38,085 in science and engineering; 10,980 in utilities; and 10,003 in mining. In Wisconsin, 173,969 jobs can be linked to the Great Lakes. To accommodate more people and activity while balancing demands on

[6] Resilience is determined by the degree to which a community is capable of organizing itself to increase its capacity for learning from past economic, natural or technological disasters.

coastal resources, Wisconsin must develop innovative policies, institutional capacities and management approaches to increase community resilience.

Wisconsin Sea Grant will continue to support cutting-edge research in the areas of marine-related energy sources, climate change, coastal processes, energy efficiency, hazards mitigation, stormwater management and tourism. In Wisconsin, Sea Grant will engage diverse and shifting coastal populations in applying the best-available scientific knowledge to address increased resource demands and vulnerability. Ultimately, Wisconsin Sea Grant will bring its unique research and engagement capabilities to support the development of resilient coastal communities – both human and natural -- that sustain diverse and vibrant economies, effectively respond to and mitigate natural and technological hazards and function within the limits of their ecosystems.

Priority research areas include:

19. Promoting development and implementation of green infrastructure practices
20. Supporting research and outreach for sustainable and resilient ports, harbors and marinas, including beneficial use of dredged materials
21. Developing innovative geodesign methods to promote resilient coastal communities and understanding the consequences of alternative development scenarios
22. Working with management and regulatory agencies, tribal entities and vulnerable and at-risk communities to reduce vulnerability to fluctuating water levels, storm impacts and a changing climate
23. Understanding the value of and opportunities for subsistence, tourism and commercial and recreation-related activities in coastal communities
24. Documenting and preserving cultural and historical resources in coastal and marine areas, including those within or adjacent to the proposed marine sanctuary
25. Developing or enhancing community planning and visualization tools that demonstrate the benefits, risks and impacts of land use on the coastal environment
26. Evaluating the impacts of increased climate variability and change on coastal communities
27. Assessing and sharing the impacts of human activities on Great Lakes water quality and supply, as well as coastal and nearshore habitats
28. Protecting the supply and quality of fresh water using environmental and socioeconomic research approaches
29. Documenting the socioeconomic contributions of water-dependent industries

Environmental Literacy and Workforce Development

Wisconsin is well equipped to meet the literacy-building and workforce development demands posed by a state, region and nation transitioning to a new era of sustainability and job creation. Wisconsin has a strong K-12 public education system, as well as a wealth of institutions of higher learning — 33 public and private four-year colleges and 29 two-year colleges. Wisconsin Sea Grant, along with our complementary Wisconsin Water Resources Institute, is further well positioned to leverage the K-12 and university resources in the state through partnerships and collaborations, and research support.

An environmentally literate person is someone who has a fundamental understanding of the systems of the natural world, the relationships and interactions between the living and non-living environment and the ability to understand and use scientific evidence to make informed decisions regarding environmental issues. Moreover, a Great Lakes literate person understands the essential principles and fundamental concepts about the characteristics, functioning and value of the Great Lakes; can communicate accurately about the Great Lakes' influence on systems and people in and beyond their watershed; and is able to make informed and responsible decisions regarding the Great Lakes and the resources of their watershed. Wisconsin Sea Grant advances these literacy principles in formal and informal learning environments throughout the state to produce a diverse and skilled workforce that is engaged and able to address critical Great Lakes needs.

Wisconsin Sea Grant solicits non-research education proposals for up to $25,000 per year to address one or more of the following education priorities. As a reference, NOAA's Designing Education Projects *(http://www.noaa.gov/sites/default/files/atoms/files/DEP Manual_2ndEdt_Final.pdf)* provides a useful framework based on needs assessment and project planning, implementation and evaluation.

Priority education areas include:

30. Promoting Great Lakes literacy principles within formal and informal learning environments
31. Developing Pre-K-12 resources that address the Great Lakes literacy principles and support state and national educational standards
32. Supporting education projects that incorporate innovative technologies or practices in Great Lakes education
33. Promoting the intersection of the arts, sciences and humanities to inspire a science-informed society
34. Promoting place-based learning as a way to engage citizens in local stewardship
35. Identifying and promoting Great Lakes-related career pathways in Wisconsin

Special Joint Request for Proposals
Minnesota and Wisconsin

The Minnesota and Wisconsin Sea Grant College programs announce a special joint solicitation for research proposals. By working together, we can support larger-scale projects to tackle regional challenges and develop collaborations across state lines that can enrich the expertise of our within-state research teams. We are particularly interested in innovative proposals that integrate environmental and socioeconomic approaches toward solving problems for Lake Superior coastal communities in the states of Minnesota and Wisconsin, including communities bordering the St. Louis River Estuary. By understanding ecological and social processes, policies, practices and institutions that impact resource use, we expect to be able to improve the stewardship of our water resources and foster coastal community resilience. Our research priorities complement those of the Lake Superior National Estuarine Research Reserve, our NOAA partner.

Priority research areas include:

1. Better understanding sediment transport and storm effects, including erosion and sediment plumes, pollutant dynamics and ecological effects
2. Assessing environmental, economic and social tradeoffs and optimization of various activities to maintain balance between working waterfronts and a healthy St. Louis River Estuary and Lake Superior, including, but not limited to:
    - Spatiotemporal windows for minimizing negative effects of dredging on aquatic systems, including fisheries
    - Individual and combined effects of saline marine ballast water exchange and land-based road salt applications on estuarine and lake salinity and ecology
    - Environmental and socioeconomic approaches to assessing and communicating the values of cleaning up and restoring contaminated/degraded waters and shorelines
3. Advancing socioeconomic approaches to understand effects of emerging challenges and industries in the Lake Superior basin on water use, quality and quantity
4. Environmental, economic and social implications of petroleum product transport near or on the Great Lakes, including risk and hazard assessment and scenario planning
5. Understanding fish community dynamics and connections between the St. Louis River Estuary and Lake Superior

For this special solicitation, only projects involving both Minnesota and Wisconsin researchers will be considered. The Sea Grant programs plan to fund one or two projects for up to two years beginning February 1, 2020, with each program providing up to $120,000 per year to the investigators in their respective states (this to include the cost of graduate students) for a total of up to $240,000 annually. Our expectation is that we will receive proposals that demonstrate significant involvement by research personnel from both Minnesota and Wisconsin.

Wisconsin Sea Grant will be administering this joint RFP. All deadlines and submissions must follow Wisconsin Sea Grant standards with joint state researchers submitting one joint preproposal using the submission guidelines here. Minnesota Sea Grant requires a 30% match, and Minnesota PIs should contact Minnesota Sea Grant for budget calculation assistance prior to submission.

A research review panel will address the following questions when determining whether to encourage a full proposal:

- What is the importance of the proposed project for the region and is it relevant to the priorities listed above?
- What is the scientific merit of the proposed project?
- What are the qualifications of the investigators?
- What are the likely outcomes or impacts (environmental, educational, social, economic, etc.) that could result from the proposed project? Are stakeholders engaged in the process and potential outcomes associated with the proposed work?
- Does the budget estimate seem adequate, or too high/too low? Does the project seem a good value?
- How well integrated is the project, given researchers from different state programs?

The deadline for preproposals is Friday, January 11, 2019, 3 p.m. CST (4 p.m. EST).

For more information:
Wisconsin Sea Grant: contact Jennifer Hauxwell (jennifer.hauxwell@aqua.wisc.edu, 608-263-4756)
Minnesota Sea Grant: contact Valerie Brady (vbrady@umn.edu, 218-726-8714)

Special Joint Request for Proposals
Michigan, Illinois-Indiana and Wisconsin

Understanding and Communicating Coastal Hydrodynamics and Nearshore Sediment Transport Processes on Lake Michigan to Promote Resilient Coastal Communities

Property owners, communities, and coastal resource managers face significant challenges related to the management of the Lake Michigan shoreline. Concern is growing about the condition and integrity of Lake Michigan beaches and other coastal areas given recent extreme fluctuations in water levels and changing sediment supplies and movement. Decisions about shore protection are typically made by individual property owners who stay within the constraints of local and regional regulations, but may not give significant consideration to larger-scale ecological systems and hydrodynamic processes. Nonetheless, management decisions about shore protection and beach nourishment not only affect physico-chemical and ecological processes, but also have clear impacts on social and economic values across multiple scales.

While sediment budgets have been completed for a limited number of specific sites along the Lake Michigan shoreline, coastal sediment inventories are not readily available at broader scales. In addition, key knowledge and information gaps for the Lake Michigan coast include identifying locations and characteristics of coastal sediment resources, expanding and improving sediment budgets, and identifying approaches that would allow for more holistic management of Lake Michigan coastal sediments.

To address these gaps, specific needs include 1) inventories of coastal sediment budgets and hydrodynamic models of sediment transport, 2) identification of areas with high erosion potential, 3) identification of the primary sediment traps or diversions alongshore, and 4) assessment of the cumulative impacts of small-scale shore protection structures on the sustainability of beaches along the Great Lakes. There is also a need to 5) present information about coastal processes in a manner that can more effectively guide decision-making towards the aim of resilient communities and economies. In particular, it is crucial to encourage property owners and local officials to adopt shoreline management practices that can lead to an overall more resilient Lake Michigan coast. Integrating research about coastal processes with social science and policy or planning studies will promote an interdisciplinary approach that could be more effective in guiding decision-making about coastal resilience.

The Lake Michigan Sea Grant programs, including Wisconsin Sea Grant, Michigan Sea Grant, and Illinois-Indiana Sea Grant, seek integrated proposals to better understand coastal hydrodynamics and nearshore sediment transport processes on Lake Michigan, to help effectively communicate this information to promote sustainable shore protection, and to increase the integrity of beaches and stabilize bluffs. The result would be more resilient coastal communities and economies.

Research is to be conducted in the 2020–22 biennium. Up to $100,000 per year for two years will be available for funding each of the Michigan, Wisconsin, and Illinois-Indiana portions of a joint research project (i.e., up to $300,000 per year total). Michigan and Illinois- or Indiana-based partners must demonstrate a 50 percent match (1 non-federal dollar for every 2 dollars requested). Match is not required for Wisconsin partners. By partnering, the three Lake Michigan Sea Grant programs can support broader-scale projects to tackle challenges at a regional scale. In addition, generating collaborations across state lines can enrich the expertise of our in-state research teams. Preproposals must demonstrate plans for collaboration between researchers from two (2) or three (3) of the state programs. The amount of funding available to the research

team depends on the number and nature of collaborating partners; e.g., a researcher from Michigan and a researcher from Wisconsin could submit a proposal together for up to $400,000; researchers from Michigan, Wisconsin, and Illinois could submit a proposal together for up to $600,000.

Preference will be given to proposals that include collaborators from all three state programs and/or describe multidisciplinary approaches to the issue. This funding could support a variety of methods including, but not limited to, modeling efforts, GIS or remote sensing, field surveys, laboratory studies, social science assessment of attitudes and perceptions related to behavior change or adoption of new policies, or economic analyses. In addition, we are interested in supporting projects that use and test new technologies to assess and map sediment transport and deposition over time and space and refine methods for future assessments of coastal sediment dynamics in the Great Lakes and other systems. Given our desire for multidisciplinary approaches to this issue, the Lake Michigan Sea Grant programs are interested in promoting conversation between researchers. If you have interest in this topic and/or skills that would be relevant to a research team but you are not sure who to connect with in other states, contact Carolyn Foley (info below). She can provide a Google doc link that is a resource to connect researchers who may be interested in partnering. Listing your information in this Google doc is not a requirement for submission to this RFP. It simply serves to help researchers find relevant partners.

The intent of this call for proposals is to ultimately provide stakeholders with information and choices to promote sustainable shore protection and bluff stabilization. Given this, the potential for applied impact of the proposed work will be evaluated at the preproposal stage. Preproposals should clearly identify both the expected communication method as well as at least one stakeholder group with whom they will engage. For example, proposals could identify at least one Lake Michigan coastal community in each state as the intended audience; proposals could consider web-based communication to reach out to the whole basin. Applicants are encouraged to think creatively about the most appropriate engagement method for their work.

A research review panel, assembled by and attended by representatives of all three state programs, will address the following questions when determining whether to encourage a full proposal:

- What is the importance of the proposed project for the region and is it relevant to the priorities listed above?
- What is the scientific merit of the proposed project?
- What are the qualifications of the investigators?
- What are the likely outcomes or impacts (environmental, educational, social, economic, etc.) that could result from the proposed project? Are stakeholders engaged in the process and potential outcomes associated with the proposed work?
- Does the budget estimate seem adequate, or too high/too low? Does the project seem a good value?
- How well integrated is the project, given researchers from different state programs?

Investigators from different state programs should prepare one preproposal document to submit to Wisconsin Sea Grant using the submission guidelines here. In this preproposal document, clearly indicate the portion of the project and budget that is associated with each state investigative team. **The deadline for preproposals is Friday, January 11, 2019, 3 p.m. CST (4 p.m. EST).** Applicants will receive feedback on their preproposals by the end of February 2019. Full proposal guidance will also be provided at this time. The deadline for full proposals is Friday, April 26, 2019, 3 p.m. CDT (4 p.m. EDT). To be eligible to submit a full proposal, applicants MUST submit a preproposal by the preproposal deadline.

For more information:
Wisconsin Sea Grant: Jennifer Hauxwell (jennifer.hauxwell@aqua.wisc.edu, 608-263-4756)
Michigan Sea Grant: Catherine Riseng (criseng@umich.edu, 734-936-3622)
Illinois-Indiana Sea Grant: Carolyn Foley (cfoley@purdue.edu, 765-494-3601)