



UNIVERSITY OF WISCONSIN SEA GRANT INSTITUTE



Request for Proposals 2016-18

PREPROPOSAL

Tuesday, January 20, 2015, 5 p.m. CST

see appended Guidelines for Preproposals

FULL PROPOSAL

Friday, May 1, 2015

seagrants.wisc.edu/rfp

An informational webinar on the focus of and process associated with submitting preproposals will be provided December 15, 2014, from 3-4 p.m. CST.

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, 2016.



2016–18 Request for Proposals

The University of Wisconsin Sea Grant College Program is inviting proposals for the next two-year grant period. The process involves two steps: (1) prospective principal investigators must submit a preproposal by 5 p.m. CST **Tuesday, January 20, 2015** (see appended [Guidelines for Preproposals](#)); and (2) potential principal investigators whose preproposals are encouraged will be invited to submit a full proposal, which will be due by 5 p.m. CST **Friday, May 1, 2015**. 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, 2016.

HOW TO PROCEED

Please review the [2016-18 Base Program Goals and Priorities](#) (appended) and the [University of Wisconsin Sea Grant College Program 2014-17 Strategic Plan](#) for a description of base program focus areas and associated research priorities for proposals. **Base research focus areas for this request for proposals include:**

- Healthy Great Lakes Coastal Ecosystems
- Sustainable Fisheries and Aquaculture in the Great Lakes Region
- Resilient Great Lakes Communities and Economies

In addition to the base research focus areas, the last section of this document contains **three additional special requests for proposals:**

- The first encourages Wisconsin and Minnesota university researchers to submit coordinated proposals for research on Lake Superior and/or its watershed, with priority areas related to both the transport of crude oil in the Great Lakes region and various aspects of the St. Louis River Estuary.
- The second calls for joint investigations from researchers in Wisconsin and Illinois and/or Indiana focused on improving resilience of Lake Michigan coastal communities to severe weather events.
- A third special request involves Integrated Assessments in Wisconsin related to 1) Total Maximum Daily Load (TMDL) implementation in the agriculture sector in the Lower Fox River watershed and 2) climate adaptation in a Great Lakes coastal community.

An informational webinar on the focus of and process associated with submitting preproposals will be provided December 15, 2014, from 3-4 p.m. CST (more information at seagrant.wisc.edu/rfp).

We welcome original, innovative proposals on any program focus area or special calls. We are also especially interested in receiving proposals from new and underrepresented faculty. You are encouraged to visit the [UW Sea Grant website](#) and/or download a copy of our [2014–16 Directory of Projects and People](#) for an overview of the types of projects funded by our program.

We require investigators to incorporate outreach or education activities within their full research proposal plan, but not at the preproposal stage. Investigators whose preproposals are encouraged for full proposal submission will be invited to an early evening workshop in Madison on Wednesday, March 25, 2015, where our staff will discuss the full proposal process and offer advice on options for incorporation of outreach and education activities within research



proposals. Please contact our Assistant Director for Research and Student Engagement, Jennifer Hauxwell (jennifer.hauxwell@aqu.wisc.edu, (608) 262-0905) with questions regarding research proposals.

We are also interested in separate, imaginative education preproposals that address our fourth priority focus for Environmental Literacy and Workforce Development in the Great Lakes Region. Please contact our Education Coordinator, Kathleen Kline (kkline@aqu.wisc.edu, (608) 262-0645) prior to submitting an education-only preproposal; these are also due on January 20, 2015.

Thank you for your interest. We look forward to receiving a preproposal from you.

James P. Hurley, Director

Guidelines for Preproposals

UNIVERSITY OF WISCONSIN SEA GRANT COLLEGE PROGRAM

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. Wisconsin investigators on special joint proposals with Minnesota or with Illinois-Indiana must submit preproposals following guidelines below. This information is also intended for Minnesota researchers for the preproposal stage of the joint Wisconsin-Minnesota request for proposals.

Preproposals **must be submitted** via the online proposal submission system, [iPROPOSE](#), which will be available for input on December 1, 2014. Detailed instructions for submitting a preproposal and a template that can be prepared in advance of using the iPROPOSE system can be downloaded at seagrant.wisc.edu/rfp.

Preproposals should contain the following information (* indicates a 350 word limit):

- **PREPROPOSAL TITLE, PRINCIPAL INVESTIGATOR(S), CAMPUS ADDRESS, PHONE AND EMAIL ADDRESS**
- **STATEMENT OF PROBLEM OR OPPORTUNITY TO BE ADDRESSED***
- **RELEVANT WISCONSIN FOCUS AREA OR SPECIAL REQUEST THE WORK WILL ADDRESS**
- **SPECIFIC RESEARCH PRIORITY**
Selected from the 2016-18 Goals and Priorities or Special Request included in this RFP.
- **OVERALL PROJECT GOAL, OBJECTIVES, AND/OR HYPOTHESIS TO BE TESTED***
- **APPROACH***
- **APPLICATIONS***
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.). ***For Integrated Assessments, see also the requirement on p. 12 to include additional elements here (e.g., Integrated Assessment Topic, Project Team, Key Stakeholders, and Summary of Existing Data and Studies) – word limit does not apply for Integrated Assessments.***
- **TIME FRAME AND APPROXIMATE ANNUAL BUDGETS**
Projects will normally begin on February 1, 2016 or 2017. 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. UW Sea Grant projects may have durations of one year to a maximum of two years. Annual research proposal budgets for funding by UW Sea Grant are limited to: Base focus areas - \$120,000; joint Wisconsin-Minnesota - \$120,000; joint Wisconsin-Illinois/Indiana - \$100,000; Integrated Assessment - \$150,000. Education proposals are limited to \$25,000 per year. This limit includes all costs (salaries, fringe benefits, equipment, supplies, field travel, contracts, ship time and indirect costs). Budgets can be shown as lump-sum figures for each of the budget years proposed up to two years, but please indicate if the budget will involve substantial capital equipment items, subcontracts or ship time. For joint proposals with Minnesota or Illinois-Indiana, please clearly indicate the portion of the budget associated with Wisconsin investigators and the portion associated with investigators from other states.

DEADLINE: TUESDAY, JANUARY 20, 2015 (5 p.m. CST)

Notification of preproposal status will be sent in early March, 2015.

2016-18 Base Program Goals and Priorities

UNIVERSITY OF WISCONSIN SEA GRANT COLLEGE PROGRAM

The National Sea Grant Program offers this strategic approach to managing coastal resources in ways that balance human use with environmental health:

- Better science-based information about how coastal ecosystems function and how human activities affect coastal habitats and living resources;
- Citizens who understand the complexities of coastal environments and the interactions between human use and coastal ecosystem health;
- Management and decision-making processes that are based on sound information, involve citizens who have a stake in America's coastal resources and include mechanisms to evaluate trade-offs between human and environmental needs; and,
- Incorporation of social science, including quality of life and sustainable economic development, into ecosystem-based management decisions.

Further, the National Sea Grant College Program strategic plan identifies four focus areas, all of which are generally applicable to Wisconsin:

- Healthy Coastal Ecosystems
- Sustainable Fisheries and Aquaculture
- Resilient Communities and Economies
- Environmental Literacy and Workforce Development

Below we describe the four base focus areas of the University of Wisconsin Sea Grant College Program:

1) Focus Area: Healthy Great Lakes Coastal Ecosystems (HCE)

Keeping Great Lakes coastal ecosystems healthy is a challenge because of the diversity of stressors each system faces. This is further complicated because ecosystems do not adhere to political boundaries. Responsible management of these systems requires new kinds of thinking and actions, often termed ecosystem-based management¹. Ecosystem-based approaches require unprecedented levels of coordination among federal, state, local, and tribal 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, greater demands on fisheries resources, climate change and other human activities are leading 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 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.

¹ 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 current approaches that usually focus on a single species, sector, activity or concern; it considers the cumulative impacts of different sectors.

HCE Research Priorities

1. Develop and calibrate new standards, measures and indicators of Great Lakes ecosystem sustainability.
2. Identify critical uncertainties that impede progress toward achieving sustainability of Great Lakes ecosystems and the goods and services they provide.
3. Identify biological, physical and chemical factors that threaten the sustainability of Great Lakes ecosystems and the services they provide.
4. Develop data, models, and policy information that support ecosystem-based planning, decision-making and management approaches.
5. Develop baseline data, standards, methodologies and indicators to assess the health of ecosystems and watersheds.
6. Evaluate ecosystem-based management approaches for planning.
7. Develop technologies and approaches to assess degraded ecosystems and solutions to improve ecosystem health.
8. Develop an environmentally friendly and effective live well and bilge treatment that is easy to use and dispense to prevent aquatic invasive species spread by anglers and boaters.

2) Focus Area: Sustainable Fisheries and Aquaculture in the Great Lakes Region (SFA)²

The overall economic impact of the commercial, recreational and for-hire fisheries and aquaculture industries in the region is \$7 billion annually. In Wisconsin, 1.4 million fishing licenses are issued each year, and fishers and the fishing industry deliver \$2.75 billion in economic impact and 30,000 jobs every 12 months. 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—additional opportunities for job creation and contributions toward meeting the demand for finfish. The Midwest consumes more than one billion pounds of seafood products per year but less than 4 percent comes from aquaculture operations in the region.

SFA Research Priorities

9. Develop and improve practices and techniques for aquaculture, including aquaponics.
10. Enhance the nutritional value, shelf life, sustainability and cost of fish food
11. Develop methods and enhance the ability to diagnose and prevent disease and pathogens.
12. Develop new approaches to fish product handling, packaging and marketing.
13. Develop innovative technologies and approaches to wild Great Lakes fish harvest, including those that reduce by-catch or improve fuel efficiency.
14. Develop methods to reduce the environmental impact of aquaculture and wild fish harvesting operations.
15. Enhance the fuel efficiency of Great Lakes fishing vessels.
16. Identify new, native species for aquaculture.
17. Evaluate the benefits and risks of consuming Wisconsin-sourced wild, commercially caught and farm-raised fish for various populations.

² 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."

3) Focus Area: Resilient Great Lakes Communities and Economies (RCE)³

Coastal communities provide vital economic, 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. Population migration has also transformed many natural coastal habitats into urban landscapes and intensified the use of finite coastal resources. From 2000 to 2010, the population in the 15 counties bordering Wisconsin's Great Lakes grew by 57,500. This population increase and developmental pressure has resulted in greater vulnerability of coastal communities and environments to natural⁴ and technological⁵ hazards. To accommodate more people and activity while balancing demands on coastal resources, Wisconsin must develop innovative policies, institutional capacities and management approaches to increase community resilience.

RCE Research Priorities

18. Document the socioeconomic values of open-water and coastal tourism and related businesses and other water-dependent industries.
19. Conduct valuation of Wisconsin's Great Lakes natural coastal resources.
20. Develop or enhance community planning and visualization tools that demonstrate the benefits, risks and consequences of urbanization on the coastal environment.
21. Assess the economic and social well-being of Wisconsin coastal communities to document improvements in quality of life related to implementation of coastal development plans and other mitigation strategies.
22. Assess the impacts of human activities on Great Lakes watersheds, water quality and supply.
23. Evaluate the impacts of increased climate variability and change, including intensity and frequency of rainfall and storm events on coastal community infrastructure.
24. Develop visualization tools so that communities can understand the consequences of alternative development and stormwater mitigation scenarios.
25. Develop the ability and means to predict coastal hazards and warn residents and recreationists of the risk.

4) Focus Area: Environmental Literacy and Workforce Development in the Great Lakes Region (ELWD)

Wisconsin will build on a renowned K-12 public education system that consistently produces students who, taken together, best the national average ACT composite score, and rank among the top three states in well-performing students. Wisconsin also has a wealth of institutions of higher learning—33 public and private four-year colleges and 29 two-year colleges. Included in that group is the University of Wisconsin-Madison, one of the top five research schools in the country. The school also holds, as a critical tenet, the Wisconsin Idea. The Wisconsin Idea is a public-service concept that the boundaries of the university extend to the boundaries of the state and beyond. This principle is also the heart of Wisconsin Sea Grant's efforts.

³ 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.

⁴ Natural hazards include hurricanes, northeasters, tropical storms, extreme rainfall events, flooding, wildfires, tornadoes, droughts, tsunamis, blizzards and heat waves.

⁵ Technological hazards include chemical and oil spills and nuclear reactor accidents.

ELWD Research Priorities

26. Work with education partners to develop K-12 curricula that address the Great Lakes Literacy Principles and adhere to science and environmental education standards approved by the Wisconsin Department of Public Instruction.
27. Engage Sea Grant-supported graduate students, scientists and informal educators to help develop educational demonstrations for Great Lakes issues and topics to promote Great Lakes literacy.
28. Engage the public and lifelong learners through a Great Lakes seminar series that draws upon the expertise of Sea Grant and agency researchers.
29. Assess the applicability of new and traditional media tools—as well as innovative learning tools such as virtual globes or Augmented Reality Interactive Storytelling (ARIS) platforms—to reach relevant audiences, and apply those tools to build marine-science literacy.
30. Engage and train graduate and undergraduate students about Great Lakes coastal resources.

Special Joint Request for Proposals

Minnesota and Wisconsin Sea Grant College Programs announce a Special Joint Request for Proposals for 2016–18

The Minnesota and Wisconsin Sea Grant College Programs are issuing a special joint solicitation for research proposals. Projects can begin on February 1, 2016. **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, with each program providing up to \$120,000 per year (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.

The goal of the research program for both Minnesota and Wisconsin Sea Grant is to fund innovative projects that provide scientific information to help solve coastal and aquatic resource problems and foster economic sustainability. Proposed projects should support our mission to enhance the environment and economies along Lake Superior and inland waters. Priority research areas are:

- **Environmental, economic, and social implications of crude oil transport near or on the Great Lakes**
- **Determining and communicating the value (economic and social) of cleaning up and restoring contaminated/degraded waters and shorelines, using the St. Louis River Estuary as a case study**
- **Research that increases our understanding of the St. Louis River Estuary, including research on social and economic topics as well as the other sciences**

We are particularly interested in proposals that integrate ecological with economic or social science questions pertinent to Lake Superior coastal communities in the states of Minnesota and Wisconsin, and especially communities bordering the St. Louis River Estuary. By understanding ecological process and the social processes, policies, practices and institutions that impact resource use, we expect to be able to improve the stewardship of our water resources. Social science research proposals may pertain to the cultural, psychological, economic or political drivers that affect the use and management of the St. Louis River Estuary, Lake Superior and/or its tributaries. Our research priorities complement those of the Lake Superior National Estuarine Research Reserve, our NOAA partner.

Wisconsin Sea Grant will be administering this joint RFP. All deadlines and submissions must follow Wisconsin Sea Grant standards.

For more information:

Wisconsin Sea Grant: contact Jennifer Hauxwell, jennifer.hauxwell@aqu.wisc.edu, (608) 262-0905

Minnesota Sea Grant: contact Valerie Brady, vbrady@umn.edu, (218) 726-8714

Special Joint Request for Proposals

Illinois-Indiana and Wisconsin Sea Grant College Programs announce a Special Joint Request for Proposals for 2016–18

The Illinois-Indiana and Wisconsin Sea Grant College Programs issue this joint call for proposals to address knowledge and data gaps related to coastal community resiliency in response to severe weather events. Preproposals must demonstrate plans for collaboration between at least one Illinois- or Indiana-based researcher and at least one Wisconsin-based researcher. Investigators should prepare one preproposal document to submit to both Sea Grant programs. Wisconsin-based partners should submit a preproposal to Wisconsin Sea Grant (guidelines [here](#) and at seagrant.wisc.edu/rfp). Illinois- and Indiana-based researchers should submit an identical preproposal to Illinois-Indiana Sea Grant (guidelines [here](#)). The deadline for submission to both programs is January 20, 5 p.m. CST. Please contact Jennifer Hauxwell (jennifer.hauxwell@aqu.wisc.edu) or Carolyn Foley (cfoley@purdue.edu) with questions.

Research is to be conducted in the 2016–2017 biennium. Up to \$100,000 per year for two years will be available for funding each of the Illinois-Indiana and Wisconsin portions of research projects. The funds requested by Illinois and Indiana researchers must be matched by at least one non-federal dollar for every two federal dollars requested.

This competition responds to pressing knowledge gaps for: **1) increasing resilience of Lake Michigan coastal communities to severe weather events** and **2) advancing risk-based weather forecasts and communications for the Great Lakes region**. In particular, we seek proposals that:

- Incorporate iterative learning from impacts and outcomes of past weather events (including those outside of the Great Lakes basin) and subsequent adaptation strategies. Research outputs should assist Lake Michigan coastal communities as they strive to decrease vulnerability (e.g., of infrastructure, people, natural systems and resources) to severe weather events over time through improvements to community planning and/or communications.
- Couple local data on infrastructure vulnerability with event-based weather forecasting. In order to be most effective, meteorological forecasting models require local-scale, weather-related risk assessments of critical facilities and infrastructure. Projects should generate data for the National Weather Service and/or other stakeholders that would assist local emergency managers and meteorologists in effectively communicating relative risk to resources under varying weather events.

Research teams are encouraged to incorporate social science questions (e.g., economic impacts, community structure, impacts of local-scale events on broader communities) into their project plan, as well as generate final products (science tools and communications) that can be used by stakeholders (e.g., planners, managers, meteorologists) to improve community preparedness and resilience. Projects should strive to understand the role of spatial and/or temporal variability in their research question and/or demonstrate how studies performed at a small scale could be used to understand similar processes across a broader scale. Additional background for proposal development and collaboration may be found through NOAA's Weather-Ready Nation Program (<http://www.nws.noaa.gov/com/weatherreadynation/>) and NOAA's Coastal Storms Program (<http://www.coast.noaa.gov/csp/>).

Special Request for Integrated Assessment Proposals

Overview

Wisconsin Sea Grant is soliciting preproposals for up to two Integrated Assessment research projects for up to two years at up to \$150,000 per year. The Integrated Assessment approach develops information, tools and partnerships that will help decision makers better address a particularly challenging environmental issue.

2016-18 Integrated Assessment Topics

Two Integrated Assessment topics developed by Wisconsin Sea Grant outreach specialists through collaboration with government agencies and associated partners and stakeholders are:

1. **TOTAL MAXIMUM DAILY LOAD (TMDL) IMPLEMENTATION IN THE AGRICULTURE SECTOR IN THE LOWER FOX RIVER WATERSHED**
2. **CLIMATE ADAPTATION IN A GREAT LAKES COASTAL COMMUNITY**

General background information related to Integrated Assessments is provided below followed by a detailed description of the two focus areas.

Integrated Assessment Approach

The Integrated Assessment process brings together citizens, industry representatives, scientists and policy makers to define and evaluate policy or management options related to particularly difficult — or “wicked” — environmental problems. Wicked problems are encountered where facts may be uncertain, values are in conflict, stakes are high, decisions are urgent and community representation is required for resolution of the relevant issues.

Integrated Assessments summarize scientific knowledge to build consensus and guide decision making. These projects are assessments because they involve expert review and analysis of existing data and information, rather than additional experimentation. Projects integrate the needs of decision makers, perspectives of stakeholders and expertise from several disciplines, typically physical, biological and social sciences.

Each Integrated Assessment project will follow a unique trajectory depending on the type and scope of the focal issue; however, most projects include the following elements:

1. **Define and refine the policy-relevant question around which the assessment is to be performed.** This often begins with identification of an issue by managers or policy makers that has defied typical and routine action. The focal Integrated Assessment question must be refined with stakeholder input.
2. **Clarify the history, causes and consequences of the issue.** Projects should help clarify aspects of the issue that are uncertain and are impeding action. A description of current conditions and historical trends can enhance understanding and provide a foundation for further analyses. To address the issue effectively, decision makers will need to better understand the probable causes and the environmental, social and economic consequences of the issue.
3. **Identify and evaluate potential options.** Projects should identify potential options addressing the issue, including policies, management actions or new initiatives that are politically, socially and economically feasible. Integrated Assessments help

stakeholders compare and evaluate a suite of options, rather than recommend a single approach.

4. **Develop tools and information that can guide decisions and help implement potential options.** If appropriate, researchers should provide an assessment of certainty levels associated with their findings to help policy makers interpret analyses or identify future research needs.

A key to success of the Integrated Assessment approach is an inclusive stakeholder process that both enables the technical teams to learn from those most affected by the issue and provides useful and accessible information for the stakeholders to learn more about the issue(s) affecting them. It is important that the stakeholder group includes multiple viewpoints and that participants perceive that the group is being convened and facilitated by a neutral party. If the issue is so contentious that it is impossible to provide a neutral assessment team, the team must be able to demonstrate that all sides of the issue are represented so the process itself will be seen as fair.

Additional resources on Integrated Assessments, including a detailed guide on the process and the benefits of adopting this approach can be found at the Michigan Sea Grant website: <http://www.miseagrant.umich.edu/research/approach>. Our decision to include a special request for Integrated Assessments was influenced by Michigan Sea Grant and the Graham Sustainability Institute at the University of Michigan and the language for describing the process is used with permission of Michigan Sea Grant.

Preproposal Elements

In addition to the standard information listed in iPROPOSE, **please also include the following elements in the Applications section:**

- **INTEGRATED ASSESSMENT TOPIC**
Please identify the Integrated Assessment topic selected. For the climate adaptation topic, please identify the name of the community you will work with, as well as the name and title of the local official providing a statement of support for the Integrated Assessment.
- **PROJECT TEAM**
Please provide brief biographical sketches for key members of the project team.
- **KEY STAKEHOLDERS**
Please provide a paragraph identifying the key stakeholders you plan to involve in the Integrated Assessment.
- **SUMMARY OF EXISTING DATA AND STUDIES**
Please provide a short summary of the key existing data sources and studies that will provide a foundation for the Integrated Assessment.

Preproposal Selection Criteria

Preproposals must comply with all submission instructions and guidelines in order to be considered for funding. Compliant preproposals will be reviewed based on the following criteria:

1. **Understanding of context and underlying issues:** Does the preproposal identify underlying issues? Does the preproposal provide the right context for the underlying issues?
2. **Project approach:** Does the preproposal address all of the elements of an Integrated Assessment? If it does not, are exceptions and gaps acknowledged and explained? Is the explanation credible?
3. **Preliminary identification of relevant data sources:** Does the preproposal identify how data will be accessed? Does the preproposal reflect an effort to contact others working on this issue and identify team members or collaborators who bring data or access to data to the team?

4. **Competency of the proposing team:** Does the team have members who can carry out each element of the assessment? Have team members done similar work in the past? They are not required to have Integrated Assessment experience specifically, but provide some indication they are able to assess status and trends and identify causes and consequences of the issue.

All questions related to this special request for Integrated Assessment proposals, whether technical or content-related, should be submitted to Assistant Director for Research and Student Engagement, Jennifer Hauxwell (jennifer.hauxwell@aqu.wisc.edu, (608) 262-0905). A webinar will be held on Monday, December 15, 2014 from 3-4 p.m. CST to provide more information on the request for proposals, including the Integrated Assessment process. This webinar will be recorded for later viewing (more information at seagrant.wisc.edu/rfp). Sea Grant personnel are not allowed as Principal Investigators or Co-Principal Investigators and cannot request salary through this competition. They will however, be available to provide advice and input to investigators or teams developing both preproposals and full proposals. Sea Grant outreach specialists will be actively engaged in the Integrated Assessment process.

1) TOTAL MAXIMUM DAILY LOAD (TMDL) IMPLEMENTATION IN THE AGRICULTURE SECTOR IN THE LOWER FOX RIVER WATERSHED

Why does this topic represent a wicked problem?

In the late 1980s, Lower Green Bay and the section of the Fox River below the DePere Dam were designated an Area of Concern (AOC) by the International Joint Commission. Green Bay suffers from many beneficial use impairments (BUIs) including degradation of fish and wildlife populations, eutrophication or undesirable algae, as well as restrictions on drinking water and swimming. Point source and runoff pollution account for a primary cause of eight of the 13 BUIs listed as impairments in this AOC. In 1988, the Wisconsin Department of Natural Resources (WDNR) worked with community stakeholders to develop a Remedial Action Plan to outline the key actions and recommendations necessary to restore the AOC. Since that time, many studies have been undertaken with the goal of restoring these beneficial uses, but nutrient and sediment loading from upstream continues to be an issue.

In 2012, Total Maximum Daily Loads (TMDL) for Total Phosphorus (TP) and Total Suspended Solids (TSS) in the Lower Fox River and Lower Green Bay Watershed were developed by the WDNR and approved by the Environmental Protection Agency. Achieving the average annual TMDL for both TP and TSS will require more than a 50% total reduction from in-basin loads. The [2013 State of the Bay Report](#) lists the status of TP and TSS indicators in Green Bay as poor and the trend is unchanging.

The TMDL process determined that agriculture was the source of 46% of the TP and 66% of the TSS in this watershed. Unlike pollution that originates from a point source, such as industrial and sewage treatment, and is highly regulated, agricultural non-point pollution is dispersed across the landscape making management complex and often voluntary. In addition, most of the TP and TSS that impacts Green Bay result from just a handful of large storm events annually, indicating that climate will continue to play an important role in pollution loads to the river and bay.

How does this topic relate to Wisconsin Sea Grant's 2014-17 strategic plan?

The Healthy Coastal Ecosystems focus area of the 2014-17 strategic plan includes goals that Great Lakes ecosystems and their habitats are protected, enhanced or restored and that

ecosystem-based approaches are used to manage land, water and living resources. Strategies include:

- Improving and enhancing stakeholder access to and understanding of data, models, policy information and training that support ecosystem-based planning, decision-making and management approaches.
- Developing and sharing materials, websites, training and workshops to help residents, resource managers, businesses and industries understand the effects of human activities and environmental changes on coastal resources.
- Collaborating with local, state, tribal and regional agencies and non-governmental organizations to implement strategies.
- Supporting efforts to involve stakeholders in resource management decision-making processes and to help resource managers incorporate public input in resource management decisions.

Why is this topic of interest to our partners and what would an Integrated Assessment on this topic accomplish?

The implementation of TMDLs will play a critical role in improving Wisconsin's impaired water bodies. Agriculture contributes almost 50% of TP and more than 60% of TSS in the Lower Fox River Basin making it an important sector in TMDL implementation. However, current participation of agricultural producers in meeting TMDLs varies greatly within the basin.

Agricultural practices are driven by many factors, including economic forces, federal/state/local policies and regulations, climate and cultural values. Therefore, there is no "one size fits all" approach for TMDL implementation. Current regulations such as agricultural performance standards (e.g., nutrient management plans), incentive-based policies (e.g., conservation programs and water quality trading), new business/market creation, farmer-led community organizations and technology could all be used to help the agricultural sector meet water quality goals. Interdisciplinary research should focus on strategies that improve TMDL implementation in the Lower Fox River watershed.

An Integrated Assessment for this topic would bring together agricultural producers and associated industries, resource management agencies, and other coastal stakeholders to identify and evaluate policy/regulatory alternatives, economic markets, educational and community-based programs and technologies to meet water quality goals for the Lower Fox River watershed and Green Bay. The Integrated Assessment team would bridge natural sciences, social sciences, and policy studies to: 1) engage stakeholders and refine the policy-relevant questions; 2) synthesize existing data, studies and models from across North America to provide an objective description of current conditions and trends, as well as the probable causes and the environmental, social, and economic consequences of the issue; 3) identify desired outcomes and evaluate various policy options; and 4) provide technical guidance for implementation. These products would be useful not only in the Lower Fox River watershed, but also across the state in watersheds with similar TMDL implementation issues.

2. CLIMATE ADAPTATION IN A GREAT LAKES COASTAL COMMUNITY

Why does this topic represent a wicked problem?

Climate change poses a variety of challenges to Wisconsin's Great Lakes coastal communities. Climatologists project warmer temperatures, less ice cover, increasing wind speeds, along with more frequent and intense rainstorms for the Great Lakes region. Lake levels vary naturally and are difficult to predict over extended time periods. These climatic and water level changes will

affect both built and natural environments. Some structures and habitats are more vulnerable than others. The coasts of Wisconsin's Great Lakes are home to some of the most fragile ecosystems in the state. The economic health of Wisconsin is also closely linked to the Great Lakes coasts. In 2011, Great Lakes-related jobs accounted for more than 37,000 employees, \$743 million in wages and \$1.65 billion in goods and services in the 15 coastal counties. Infrastructure, including stormwater delivery systems and harbor and marina structures are aging and deteriorating. Some port facilities are built on timber foundations that date back to the late 1800s and recent persistent low water levels on the Great Lakes exposed this infrastructure to accelerated deterioration.

How does this topic relate to Wisconsin Sea Grant's 2014-18 strategic plan?

The Resilient Communities and Economies focus area of the 2014-18 strategic plan includes a goal that coastal communities adapt to the impacts of hazards and climate change. Strategies include:

- Supporting research that evaluates the impacts of increased climate variability and change, including intensity and frequency of rainfall and storm events on coastal community infrastructure.
- Developing visualization tools and making them available to communities so that they can understand the consequences of alternative development and storm-water mitigation scenarios.
- Collaborating with regulatory agencies, tribal entities and communities to help them understand the vulnerability of coastal properties to storm impacts.
- Making communities aware of products and tools that can help them adapt to changing coastal storm and climatic conditions.

Why is this topic of interest to our partners and what would an Integrated Assessment on this topic accomplish?

Local government officials face many challenges in today's economic climate - meeting increased demand for services in a time of decreased revenue and growing mandates, maintaining infrastructure, and balancing economic opportunities with environmental risks. In addition to these challenges, local government officials in Great Lakes communities face an array of issues related to a dynamic coast and a changing climate. This Integrated Assessment will synthesize existing climate research from groups such as the Wisconsin Initiative on Climate Change Impacts and the National Climate Assessment and translate them to strengthen the resilience of a particular Great Lakes community in Wisconsin. The Integrated Assessment team must secure a statement of support from a local government official who has the authority to make or influence management decisions relative to climate adaptation. The Integrated Assessment will utilize a multidisciplinary approach to generate policy alternatives to strengthen the resilience of the chosen coastal community to climate variability and provide a blueprint that can be adopted by other communities.