Review of the

University of Minnesota
Sea Grant College Program


Chris J. Benson

Briefing Book
January 27-28, 2015


Great Lakes Sea Grant Network


Chris J. Benson

Sea Grant Minnesota

Contents

Chris J. Benson

Welcome to the University of Minnesota Sea Grant Program!

During the last four years we have built bridges, moved mountains and joined forces to deliver Superior science to a wide array of stakeholders. Buoyed by the support of taxpayers, the National Oceanic and Atmospheric Administration (NOAA), and University of Minnesota administration on two campuses, Minnesota Sea Grant has contributed to 26 new science degrees, supported 18 research projects and 34 peer-reviewed journal articles. We have successfully competed for over $3 million in external funding, and over 83,000 people have heard at least one of our staff members talk about coastal economies and ecology.

We did all this and more with an energetic staff that, to a person, is committed to the Sea Grant mission.

Did Ja Know? *Minnesota Sea Grant is based out of the UMD campus in Duluth, Minnesota. The Program is about 1,500 miles from the nearest ocean and about 5 miles from one of the busiest inland ports in the world, by tonnage.*

Lake Superior

A product of volcanic fury and glacial scouring, Lake Superior is a 10,000 year-old remnant of a huge ancient lake that covered parts of North America's Upper Midwest. This remnant is still sizable. It holds 10% of the Earth's fresh surface water and is the largest lake by surface area in the world.

The U.S. and Canada share the lake and its basin with First Nation and Native American Ojibwe. Roughly 670,000 people live within the Lake Superior watershed. That watershed is approximately 493,000 miles^2 of predominantly forested land. The coastal communities of Lake Superior grew up around its natural resources (timber, iron ore, fisheries) and transportation (shipping, rail) and more recently, tourism.

Over the last four years, Minnesota's Lake Superior region has felt the impacts of extreme storms, extreme cold, and unusual warmth. Lake Superior's basin is a relatively simple ecosystem, comparatively free from urban development. As such, it often serves as a benchmark for understanding and evaluating the entire Great Lakes system. Lake Superior plays an important role as a testing ground for interdisciplinary research and the application of science to policy and management decisions.

Program Management and Organization

Management Team

- Director (Jeff Gunderson)
- Program Leader (Jesse Schomberg)
- Research Coordinator (Valerie Brady)
- Communications Coordinator (Sharon Moen)
- Fiscal Officer (Connie Post transitioning to Peter Thibault)

Jeff Gunderson, Director

***!** Spoiler Alert: Gunderson is planning to retire in April. The committee responsible for finding a new director for Minnesota Sea Grant has begun the search process.*

Minnesota Sea Grant's Director, **Jeff Gunderson**, has been associated with Sea Grant for almost 40 years. As a Master's Degree candidate, he worked on a Sea Grant-funded project benefitting the lives of commercial fishermen. Gunderson joined Minnesota Sea Grant in 1979 as the program's first fisheries outreach specialist. After multiple stints as Interim Director, Gunderson became the director in 2009. Over his time with Sea Grant, he remained constant in his view that Sea Grant succeeds because of its balance of research, outreach and education.

The other members of the leadership team are equally tied to the Minnesota Sea Grant mission: *To facilitate interaction among the public and scientists to enhance communities, the environment and economies along Lake Superior and Minnesota's inland waters by identifying information needs, fostering research, and communicating results.*

Jesse Schomberg joined Minnesota Sea Grant in 2002. Because of his enthusiasm and charisma, National Sea Grant extension educators turn to him for advice and guidance. As evidence, Schomberg is on several Sea Grant executive committees and is the reason Sea Grant Academy - Part 2, was held in Duluth, MN in 2013.

Valerie Brady oversees research projects for Minnesota Sea Grant and conducts cooperative research at UMD's Natural Resources Research Institute. Her joint appointment, an even split, keeps Sea Grant well connected to the academic research communities.

Sharon Moen has worked for Minnesota Sea Grant for over 16 years. She served as the Chair of the National Sea Grant Communication Network in 2013 and is still an active part of the Sea Grant Association's Growth Committee. On the side, she is writing a book about Athelstan Spilhaus, Sea Grant's founder.

Peter Thibault was hired in 2013 as the program's fiscal officer. Connie Post, who held that post for decades is easing into retirement as she works with Thibault to ensure that Minnesota Sea Grant's financial matters are secure.

Staffing **Located on the University of Minnesota campus; ** Located in the Chanhassen office*

2014	Time on SG Mission (%)	SG Funds (%)	O&M and ICR Funds (%)	Outside Funds (%)
Research and Administration				
Jeffrey L. Gunderson, Director	100	71	24	5
Valerie Brady, Research Coordinator	50	91	9	
Megan Bock, Front Office Specialist	100	77	23	
Peter Thibault, Fiscal Officer	75	16	84	
Debbie Bowen, IT & Business Manager	100	49	51	
Extension and Education				
Jesse Schomberg, Extension Program Leader & Coastal Communities Ext. Educator	100	37	37	26
Brent Schleck, Coastal Storms Outreach Coordinator**	50			100
Cynthia Hagley, Environmental Quality Extension Educator	100	12	46	42
Dale Bergeron, Maritime Extension Educator	100	98	2	
Doug Jensen, Aquatic Invasive Species Program Coordinator	100	53		47
Hilarie Sorensen, Climate Change Extension Educator	100	43		57
John Bilotta, Water Resource Mgmt & Policy Extension Educatorr*	50	65	25	10
Marte Kitson, AIS Specialist & NPS Liaison	75			100
Communications				
Sharon Moen, Communications Coordinator	100	67	22	11
Chris Benson, Web Developer & Graphic Designer	100	79	20	1
Dee Angradi, Program Analyst	50	82	16	2

Organizational and Institutional Setting

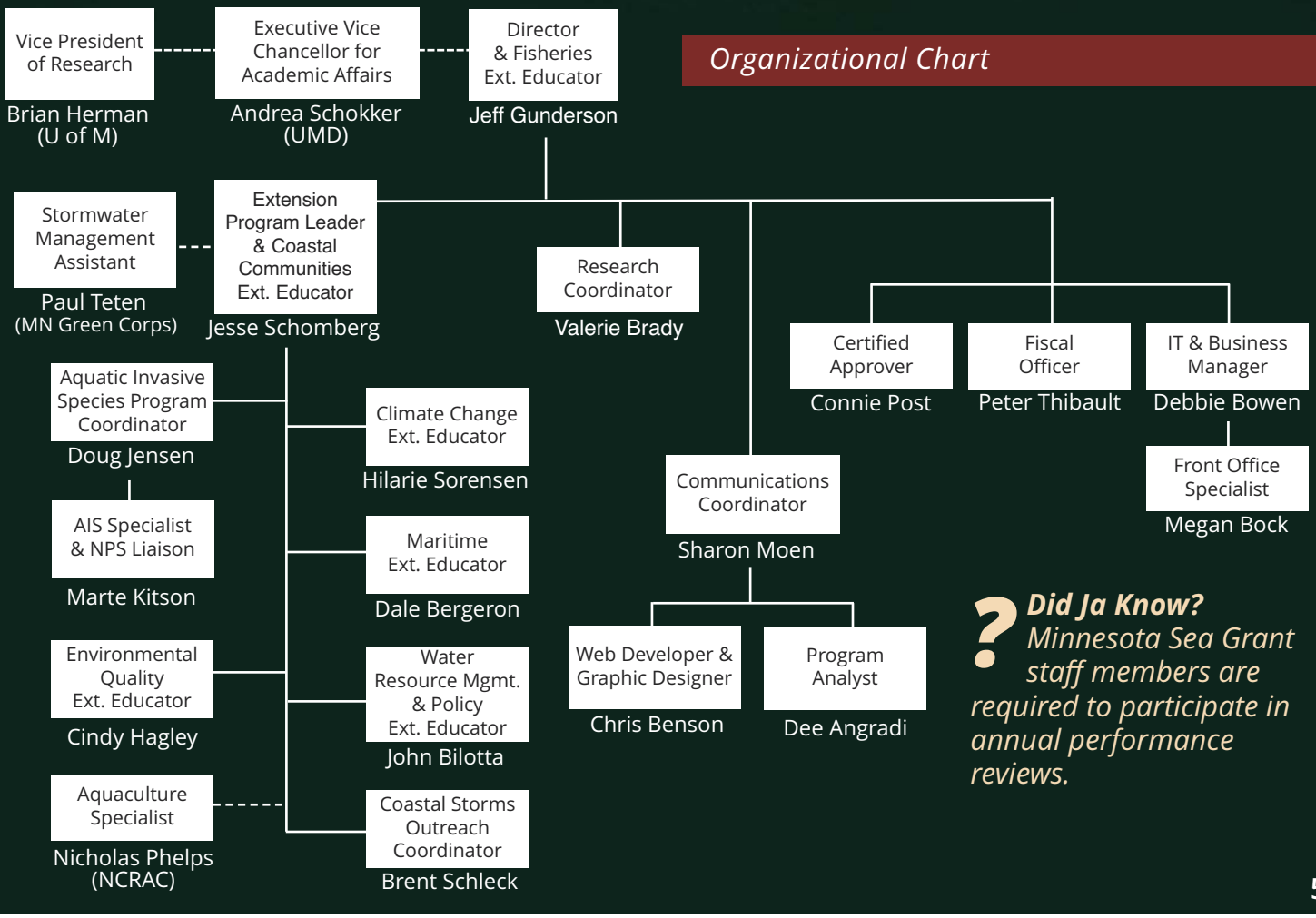
Minnesota Sea Grant is organized to be effective, efficient and nimble at responding to emerging challenges. One of the Program's champions is Dr. Lendley (Lynn) Black, the Chancellor of UMD. Before you meet Dr. Black, you should know that he values Sea Grant so much that the program is included in UMD's vision statement: *The University of Minnesota Duluth will build upon its unique land-grant and sea-grant traditions to become a premier comprehensive university recognized as world class for its learning-centered student experiences, research, creative activities, and public engagement.*

Minnesota Sea Grant's director reports to the Executive Vice Chancellor for Academic Affairs at UMD. This position was held by Dr. Vince Magnuson, a champion for Sea Grant who retired in 2011. The position is now held by Dr. Andrea Schokker, whom you will meet at the site visit.

Chris J. Benson

The University of Minnesota is one of the "Big 10", but more than sports, it is a crucible for learning. With five campuses, 65,000 students and 25,000 employees, the University of Minnesota system spreads across the state and interacts with a global community. Minnesota Sea Grant operates from the Duluth campus and maintains an office in St. Paul on the Twin Cities campus. Minnesota Sea Grant also cooperates with the NOAA Office of Coastal Management to support an extension professional (Coastal Storms Outreach Coordinator Brent Schleck) located in the NOAA offices in Chanhassen, Minnesota.

Organizational Chart



? *Did Ja Know?*
Minnesota Sea Grant staff members are required to participate in annual performance reviews.

Advisory Committee

To make Minnesota Sea Grant an intellectual and practical leader in Great Lakes issues, the program recruits talented staff and then supports their activities with advice from an accomplished and diverse Advisory Committee. In addition to this Committee that contributes to the program's research process and strategic planning, Minnesota Sea Grant employees serve on committees, boards, and commissions *(see page 11).* They also conduct formal evaluations to determine needs and quantify impacts. With such a programmed, team approach, Minnesota Sea Grant is so successful that our work is regularly noted for honor, including Sea Grant's Research to Application Award 2014 (shared with Wisconsin Sea Grant), the Len Anderson Environmental Stewardship Award for Cindy Hagley's "passionate leadership in educating and inspiring citizens" and Doug Jensen's Outstanding Invasive Species Outreach and Education Award presented in Washington, D.C. *(see page 17).*

The Advisory Committee is made up of leaders representing government, businesses, agencies, academia, and other Sea Grant audiences. Their three-year terms are staggered so that one-third of the committee is replaced or re-appointed every year. This allows the committee to become reinvigorated while maintaining institutional continuity. Most of the business of the Advisory Committee is conducted via e-mail with two face-to-face meetings per year.

Stephen Dahl, Commercial Fisherman and Advisory Committee Member

Support

Although challenged by the modest amount of federal Sea Grant funding our program receives (we fell 30th out of 33 programs in core funding on a table NOAA Sea Grant provided in 2012), **every one of our metrics came in higher than NOAA Sea Grant expected**; in several categories we ranked in the top 1/3 of all programs. Minnesota Sea Grant relies on University of Minnesota operations and maintenance money and indirect cost recovery to meet the required 1/3 state match. To supplement core funding and exceed national expectations, our award-winning staff successfully compete for grants from entities like NOAA, the U.S. Environmental Protection Agency, the U.S. Department of Agriculture, and the U.S. Department of the Interior.

? Did Ja Know?

Minnesota Sea Grant managed over $3.8M in grants. These grants are in addition to the program's core funding of about $6.5M over the same timeframe (see Site Review PIER Information document, Table B-page 1, and B-last page).

Advisory Committee

Charles Anderson
Fisheries Research Program Supervisor
Minnesota DNR

Stephen Dahl
Commercial Fisherman

Suzanne Hanson
Regional Manager
Minnesota Pollution Control Agency

Tom Huntley
State of Minnesota House of Representatives (Retired)

Janet Keough
Associate Director for Science
U.S. Environmental Protection Agency Midcontinent Ecology Division

Jack LaVoy
Executive Director
Great Lakes Aquarium

Joe Mayasich
Director of Environmental Services
Western Lake Superior Sanitary District

Nancy Schuldt
Water Protection Coordinator
Fond du Lac Reservation

Nelson Thomas
U.S. Environmental Protection Agency (Emeritus)

Donald Schreiner
Duluth Area Fisheries Office (Retired)
Minnesota DNR

James Sharrow
Facilities Manager
Duluth Seaway Port Authority

Erika Washburn
Reserve Manager
Lake Superior National Estuarine Research Reserve

Recruiting Talent

Funding Research Projects

By Jeff Gunderson (adapted from Funding Research Projects,* Seiche*, Sept. '13)

Every two years we put out a call for research proposals, thus beginning a long process of review and selection. About Sept. 2012 our selection process for 2014-16 projects began. Tight federal budget conditions make it impossible for us to fund as many projects as we did a decade ago. Consequently, selecting MNSG research projects has taken on even more gravity. We work to identify the most promising, relevant research that fits Sea Grant's mission. This isn't as easy as it might sound. For one thing, we receive proposals from a variety of disciplines including oceanography, microbiology, analytical chemistry, physics, and population dynamics ... and more recently, social science disciplines wishing to explore social and economic aspects of sustainable coastal ecosystems.

How do we decide which projects to fund? First, we seek three reviews from researchers around the country and, in some cases, around the world who are familiar with the type of study proposed. These "peer reviewers" provide us with a professional opinion regarding the rationale, relevance, scientific merit, appropriateness of the methods, and innovativeness.

The peer reviewers provide feedback to us as a professional courtesy, free of charge. Lining up proposal reviewers is arduous. Scientists are no different than other people, there are tough graders, easy graders, and there are occasionally disagreements. To deal with some of these discrepancies, we enlist a Technical Advisory Committee (TAC).

The TAC members are selected for their expertise and are asked to be the primary reviewer on 2-3 proposals and a secondary reviewer on 2-3 other proposals. We provide a small honorarium for this time consuming work. We meet by conference call to go over each proposal. The TAC provides us with a written summary of the scientific merit of each proposal.

But we're not done. Though the research may have technical merit, it might not be relevant to our mission. Our Advisory Committee reviews the proposals deemed scientifically sound by the TAC for their relevance to Minnesota Sea Grant. The proposal summary, the peer reviews and the TAC summary generally provide our advisors with enough information for them to ascertain whether the research is relevant locally and regionally.

As director, I look at the input from all of these sources along with reviews from the MNSG staff. Usually the projects to fund stand out. I then submit a letter of intent to our national program officer (who participated in the TAC meeting) and wait for his "OK."

The multiple reviews and filters help solidify our funding decisions. MNSG support is important to science and scientists. Especially when scientists are starting out, our grant can serve as "seed money" allowing the scientist to win further funding for a unique line of work that could have big payoffs. Our funding supports graduate students needing a professional and financial boost to become the scientists of the future. Our grants pay the wages of technicians, and our grants help support the economies and ecology of Lake Superior and Minnesota's coastal communities. Selecting research projects to fund is not glamorous; it's not quick; and it's not easy. However, it is so very worthwhile.

Researcher Jay Austin launches a data-collecting buoy.

? *Did Ja Know?*

Minnesota and Wisconsin Sea Grant have been issuing a joint RFP to combine their resources to fund projects of shared interest since 2009.

Developing RFP Priorities

Minnesota Sea Grant develops its Request for Proposals (RFP) through a facilitated discussion with the program's Advisory Committee, input from staff, and with attention to emerging issues. The Advisory Committee identifies research needs, opportunities, and priorities that match Sea Grant's mission and strategic focus areas. To ensure that we are addressing issues of greatest concern, as well as complimenting but not duplicating other research efforts, staff also review Great Lakes research priorities developed by other organizations. Examples of other research priorities considered when developing our RFP include those from the Great Lakes Fisheries Commission (GLFC), the Lake Superior Technical Committee of the GLFC, the Binational Program, EPA's Great Lakes National Program Office, the St. Louis River Alliance, the Lake Superior National Estuarine Research Reserve, and the Great Lakes Environmental Research Laboratory. The RFP is written and reviewed by our staff and Advisory Committee and publicized to our research community.

Review Process

1) Researchers submit a preproposal. Preproposals are reviewed by staff for consistency with the RFP. If inconsistent, researchers are provided with suggestions to improve their proposal. Researchers who submit a preproposal are eligible to submit a full proposal.

2) Researchers submit full proposals, which are reviewed by three peers with the relevant expertise from universities or agencies outside of Minnesota. The review focuses on scientific merit.

3) Reviews and proposals are forwarded to Minnesota Sea Grant's ad hoc Technical Advisory Committee. Typically five panel members are selected from outside Minnesota to match the technical disciplines represented in the proposals. Panel members rank the proposals according to scientific merit and consistency with the RFP. Our NSGO monitor participates in the process. In 2013 we also joined with WI and IL/IN Sea Grant to form a Social Science Technical Advisory Committee that reviewed each state's social science proposals. This worked extremely well because we were able to include expertise from five social science disciplines.

4) Proposals deemed to have sufficient scientific merit to warrant potential funding are reviewed by our Advisory Committee. They evaluate the proposals with respect to relevancy to our program, perceived needs, and significance to stakeholders. Sea Grant staff members also provide comments and rank proposals. Funding decisions are made by the Director and are based on all reviews, rankings, and financial feasibility.


Brett Groehler

Number of Institutions Represented Throughout the RFP process

In response to our 2011 RFP, we received preproposals from eight institutions, with seven institutions represented at the full proposal stage, and seven institutions were funded. Similarly, for our 2013 RFP process, we received preproposals from 13 institutions, with ten institutions represented at the full proposal stage, and six institutions were funded.

New vs. Continuing Projects and Principle Investigators

Of the 11 projects funded in 2012 and 2014, nine were new, with only two being what we consider continuing. Of the 11 lead Principle Investigators funded for these projects, five were new to Minnesota Sea Grant.


Chris J. Benson

Projects

Core Research

- Examining the Ability of Enterococci Bacteria to Live in Soils and Sands of the Great Lakes Microbiology | UMN | $243,322
- Uncultured: Improvements on Beach Monitoring and Tracking Sources of Fecal Bacteria using DNA Methods Microbiology | UMN | $260,743
- Community Resilience in Response to Flooding Forestry Resources | UMN | $212,636
- Decision-Support Tools to Address North Shore Tourism and Climate Change Forestry Resources | UMN | $327,532
- Risk, Response and Weather Natural Resources Research Institute (NRRI) | UMD | $267,003
- Do Vertically-Migrating Animals Fertilize the Deep Chlorophyll Layer of Lake Superior? Large Lakes Observatory | UMD | $205,510
- Low Light, Eyesight and Deepwater Foraging Success Biology | UMD | $227,093
- What Fuels Lake Superior's Food Webs? Large Lakes Observatory | UMD | $350,375
- Endocrine Mimics Disrupt Developing Bass NRRI | UMD | $225,917
- Estuary Hotspots for Microbes Reflect Water Chemistry (Joint project with Wisconsin Sea Grant) Ecology, Evolution and Behavior | UMN | $193,570
- How Nitrogen, Sulfates and Sulfides Influence Wild Rice Biology | UMD | $421,223
- Sediment Analysis Shows How Humans Altered Lake Superior Over Time NRRI | UMD | $217,485
- Rusting Predictor: Understanding the Bacteria that Steals Port Steel Biology | UMD | $285,936
- Examining How Land Use Influences Aquatic Conditions in the St. Louis River Estuary (Joint project with Wisconsin Sea Grant) NRRI | UMD | $243,322
- The History of Aquatic Conditions in the St. Louis River Estuary Biology | UMD | $232,596

Influenced Research

- Great Lakes Biological Monitoring: Paleo-ecology U.S. EPA/GLRI | $1,200,000
- Trout Stream Condition Assessment Legislative Commission on Minnesota Resources | $300,000
- Indicators of Rocky Coastal Condition U.S. EPA/GLRI | $75,000
- Weather, Water and People NOAA Coastal Storms | $28,374

Development Grants

- Bioavailability of PAHs in Stormwater Pond Sediments Civil Engineering | UMD | $5,000
- Lake Superior's Response to the Major Flood of 2012 Large Lakes Observatory | UMD | $5,000
- Induction of Autoimmunity in the Sea Lamprey Biomedical Sciences | UMD | $5,000

Grants for Outreach to MNSG

- Aquatic invasive Species (AIS) Education Outreach U.S. Forest Service | $20,000
- Comprehensive Regional Public Outreach Campaign on AIS U.S. Dept. of Interior | $1,555,234
- Extending a Regional Public Outreach Campaign on AIS U.S. EPA/GLRI | $400,000
- Fishing Tournament Organizers & Professional Anglers Learn About AIS NOAA | $31,400
- Train Local Groups to Inspect and Wash Fishing Tourney Boats AIS | U.S. EPA | $23,846
- Conduct AIS Public Education Along Lake Superior National Park Service | $98,000
- Organisims in Trade Initiative - Research, Outreach and Education AIS | U.S. EPA/GLRI | $133,333
- Organisims in Trade Initiative - Extending the Risk Assessment Project AIS | U.S. EPA/GLRI | $36,081
- International Symposium on Genetic Biocontrol of Invasive Fish AIS | U.S. Fish and Wildlife Service | $75,000
- Delivering Superior Science to Educators Coastal Program: NOAA | $16,277
- Bringing Great Lakes Science to the Classroom via the Lake Guardian NOAA | $30,000
- Increasing Great Lakes Literacy Among Educators NOAA | $18,872
- Shipboard and Shoreline on Lake Superior Lake Guardian Education | U.S. EPA | $25,000
- Teaching with Great Lakes Data, Observing System Education NOAA | $8,700
- Great Lakes Observing System: Great Lakes Network Education & Outreach Program NOAA | $21,371
- Creating, Pilot-Testing and Sharing a Classroom Version of the Northland NEMO Watershed Game Coastal Program: NOAA | $47,458
- Increasing Citizen Involvement and Improving Great Lakes Literacy: Training, Mentoring, and Place-Based Stewardship Education | NOAA | $100,000
- Grand Marais Community Readiness Assessment Hazards | NOAA | $13,940
- Great Lakes Beach Information Communications System Hazards | U.S. EPA/GLRI | $198,140
- Taking Stock in Coastal Communities Hazards | Coastal Program: NOAA | $28,287
- Duluth Community Resilience and Green Infrastructure Hazards | U.S. EPA/GLRI | $30,000
- Land Use Tipping Points Hazards | U.S. EPA/GLRI | $29,952
- Duluth Streams Urban Watershed Restoration and Protection Strategies Hazards | MN Pollution Control Agency | $154,038
- Climate Change and Stormwater Adaptation Hazards | NOAA | $30,000
- Coordintation for Coastal Residents and Communities Hazards | U.S. EPA/GLRI | $100,000
- International Association of Great Lakes Research 2011 Conference Program Sponsorship Coastal Program: NOAA | $5,000
- Ecology of Lake Superior Conference Publications NOAA | $25,000
- Great Lakes Charter Captains Survey U.S. Army Corps of Eng. | $16,480
- Great Lakes Long-Term Fellowship Program/Development NOAA | $23,000
- Lake Superior Day Collaboration Coastal Program: NOAA | $5,000
- Duluth Township Stormwater System Tracking Coastal Program: NOAA | $0; made possible through Sea Grant match
- Developing a Tool for Assessing Excessive Sediment Harm to Streams Coastal Program: NOAA | $0; made possible through Sea Grant/CILER match
- Lake Superior Comprehensive Monitoring: Communication Support Leg. Commission on MN Resources | $20,000
- Rural Road Ditch Maintenance Guidebook/ Amity Creek Project Minn. Pollution Control Agency/GLRI-subaward | $12,402
- Minnesota Extension Service MN Extension Service | $151,404

Sea Grant National Competition

- Climate Adaptation Implementation Assistance for Coastal Communities in Wisconsin and Minnesota NOAA | $50,742
- Conference Support for Expanding NEMO University NOAA | $9,500
- Using Social Science to Assist Local Governments in Coastal Hazard Readiness Hazards | NOAA | $146,589
- Great Lakes Weather, Water and Beach Safety Forecasts and Products Hazards | NOAA | $135,972
- Development of an Observation Forcasting and Warning System for Rip Currents Hazards | NOAA Coastal Storms | $25,126
- Weather Ready Nation Hazards | NOAA | $4,171


Chris J. Benson

Chris J. Benson

Chris J. Benson

Stakeholder Engagement

In addition to successfully competing for leveraged funds, Minnesota Sea Grant's outreach and communications staff is exemplary in building relationships that become meaningful partnerships. Partnerships are an integral part of Minnesota Sea Grant's strength. For example, researchers approached Minnesota Sea Grant's staff for help in extending information about Lake Superior's unprecedented warming; the study placed Lake Superior squarely in the limelight for climate change research and discussions. Many people and organizations, ranging from novelist Danielle Sosin (The Long-Shining Waters, 2011) to members of the National Academy of Science and the U.S. Coast Guard, have credited Minnesota Sea Grant in writing for providing information to support their efforts.


Chris J. Benson

Please see the PIER-generated document for a list of partners and stakeholders Minnesota Sea Grant has cultivated. Some of these partners and stakeholders are evidenced through the breadth and scale of the leadership roles Minnesota Sea Grant staff assume *(see a partial list on the next page)*.


Chris J. Benson

Leadership on Boards and Committees

American Society of Limnology and Oceanography, Education and Outreach Committee **- Cynthia Hagley**

Aquatic Nuisance Species Task Force's Communication Committee, Co-chair **- Doug Jensen**

Clean Water Summit - Green Infrastructure for Clean Water Conference Co-chair **- John Bilotta**

Duluth Green Jobs Planning Process's Built Environment Committee **- Jesse Schomberg**

EPA STAR Fellowship Panel **- Valerie Brady**

Great Lakes Aquarium, Board Member and Education Committee Member **- Doug Jensen**

Great Lakes Panel on Aquatic Nuisance Species At-Large member, and Information and Education Committee Chair **- Doug Jensen**

Great Lakes Sea Grant Network Programs Leaders, Chair **- Jesse Schomberg**

Twin Ports Rip Current Working Group **- Jesse Schomberg (co-founder)**

Great Lakes Seaway Review, Educational Advisory Board **- Dale Bergeron**

Green Marine, Great Lakes Environment Committee and Advisory Board **- Dale Bergeron**

Harbor Technical Advisory Committee (HTAC), Chair **- Dale Bergeron**

Hwy H2O, Science Advisory Board **- Dale Bergeron**

International Low Impact Development Symposium Co-chair **- John Bilotta**

Wildwoods Animal Rehab, Advisory Board **- Cindy Hagley**

International Symposium on Genetic Control of Invasive Fish, Steering Committee **- Jeff Gunderson**

Lake Superior Lakewide Action Management Plan: Superior Working Group, Sustainability Committee, Chair **- Brent Schleck**

Lake Superior National Estuary Research Reserve, Advisory Board **- Jeff Gunderson**

Minnesota Aquatic Invasive Species Research Center, Advisory Board **- Jeff Gunderson**

Minnesota Association of Natural Resource Extension Professionals, Advisory Committee **- Hilarie Sorensen**

Minnesota DNR Statewide AIS Advisory Committee, Ex officio **- Doug Jensen**

Minnesota Invasive Species Advisory Council **- Doug Jensen, Marte Kitson**

Minnesota Water Resources Conference Planning Committee **- John Bilotta**

National Centers for Ocean Sciences Education Excellence Council **- Cindy Hagley**

National NEMO University, Conference Planning Committee **- Jesse Schomberg, John Bilotta**

National Sea Grant Communication Network, Chair **- Sharon Moen**

Northern Bedrock Historic Preservation Corps Board of Directors, Vice-president **- Jesse Schomberg**

Regional Stormwater Protection Team **- Jesse Schomberg (co-founder), Valerie Brady**

Sea Grant Association, Program Mission Committee and External Growth Committee **- Jeff Gunderson, Sharon Moen**

Sea Grant Climate Network, Liaison to Sea Grant Association **- Jesse Schomberg**

Shared Campus Governance, Research and Scholarship Committee **- Valerie Brady**

St. Croix River Aquatic Invasive Species Task Force **- Doug Jensen**

St. Louis River Area of Concern Habitat Committee **- Jeff Gunderson**

St. Louis River Estuary Summit, Planning Committee **- Hilarie Sorensen, Dale Bergeron**

Climate Adaptation Partnership and Statewide Climate Adaptation Conference, Planning Committee **- Hilarie Sorensen**

St. Louis River Technical Advisory Committee **- Hilarie Sorensen**

St. Louis River Quest Planning Committee **- Marte Kitson, Doug Jensen**

Twin Ports Freshwater Folk, Planning Committee **- Valerie Brady**

Great Lakes Sea Grant Social Science Network, Community of Practice Planning Committee **- Hilarie Sorensen**

U of MN Council of Academic and Professional Administrators **- Cindy Hagley**

Upper Midwest and Great Lakes Landscape Conservation Cooperative, Coastal Conservation Working Group **- Brent Schleck**

Upper Midwest Invasive Species Conference, Advisory Committee **- Doug Jensen** (Conference Co-chair)**, Marte Kitson** (Co-chair Program Committee; Chair Volunteer Committee)

Working Waterways and Waterfronts Symposium, Steering Committee **- Dale Bergeron**

8 Examples of Working with Partners and Stakeholders

1. Sea Grant Helps Lake Association Combat the Spread of Aquatic Invasive Species

Minnesota Sea Grant helped the White Iron Chain of Lakes Association to protect the area from aquatic invasive species. The Association established the Kawishiwi Water Protection Program (KWPP) with funding through two grants after assessing the watershed for aquatic invasive species threats. KWPP needed outreach support and asked Minnesota Sea Grant to extend *Stop Aquatic Hitchhikers!* campaign messages across the watershed. Through the partnership, Sea Grant aided the flow of grant money, participated in technical advisory team meetings, facilitated a survey of all 2,200 Kawishiwi watershed property owners, partnered on print runs, and participated in multiple events. *Stop Aquatic Hitchhikers!* is a national campaign conveying consistent guidelines that empower boaters and anglers to prevent the spread of aquatic invasive species by inspecting and cleaning their equipment. By leveraging resources with Wildlife Forever, the campaign reaches over 1,000 people for every $1 spent. Working closely with Minnesota Sea Grant, the Minnesota Department of Natural Resources has fully embraced the campaign and is extending the message along with laws to control the spread non-native organisms.

2. Ballast Water Regulations

Minnesota Sea Grant has gained regional, national, and international visibility as a catalyst for initiating and facilitating the Great Lakes Ballast Water Collaborative (GLBWC). The GLBWC is a partnership among academia, government, NGOs, and industry that uses the best available science and information to address the problem of managing aquatic invasive species in the ballast water of commercial vessels operating in the Great Lakes. The partnership involves 14 Canadian and U.S. government organizations, 10 state and provincial governments, Great Lakes ship owners/operators, federal and university scientists, ballast water treatment system manufacturers, and insurers of ships (Lloyds and ABS). The Collaborative grew from the need to be more intentional about communicating as ballast water regulations became more layered, nuanced, and imminent. Partners in the Collaborative are also working to improve the ability of ship owners to comply with ballast water regulations, and advance the state of ballast water technology in freshwater environments. This work has influenced ballast water legislation throughout the Great Lakes and in California. GLBWC documents are referenced by Federal agencies (i.e. U.S. Coast Guard, EPA, Environment Canada, Great Lakes Panel on Aquatic Nuisance Species), and the International Maritime Organization. The Collaborative effort has also put to rest several lawsuits that were being filed or that were threatening.

3. Coordinated Messaging about Beach Hazards Around the Great Lakes

Working closely with Michigan Sea Grant, the Michigan Coastal Zone Management Program, and other Great Lakes Sea Grant and Coastal Programs, Minnesota Sea Grant is helping to implement a regionally consistent and coordinated strategy for improving beach-goer safety. This is being done by installing beach safety equipment and promoting coordinated communication. During 2013, 21 dangerous current drownings and rescues were reported around the Great Lakes. Experts think the number can be lowered through a risk communication campaign focused on consistent, uniform messaging. Maintaining a coordinated approach is challenging as ongoing and planned work at different sites around the Great Lakes can create duplicate efforts and conflicting messages. To achieve the project objectives, Minnesota Sea Grant is partnering with the funders and implementers of beach hazard risk communication work in the Great Lakes (e.g., federal agencies, Sea Grant programs, academic researchers, state government offices, site specific beach groups, surfers, etc.).


Chris J. Benson

Spoiler Alert: *The winner of the 2014 Lake Superior Fish Classic is planning to show you how completely outstanding cisco taste.*

4. Lake Superior Fish Classic

Minnesota Sea Grant reinvigorated the regional market for Lake Superior's sustainable harvested fish (cisco and lake whitefish) through four professional chef competitions/public tasting events and related public relations. Lake Superior's cisco once provided a livelihood for hundreds of families until the fishery collapsed. After decades of management influenced by Sea Grant research, commercial fishermen are sustainably harvesting this fish. However, the regional market suffered during the ciscoes' 30-year absence and the bulk of the cisco catch is sent out of the region. Minnesota Sea Grant responded to the disconnection between the fishery and consumers by holding professional chef competitions and public tasting events. The first two events (2011, 2012) in Minneapolis created a new awareness about Lake Superior ciscoes. The 2013 and 2014 events in Duluth sold out. In 2013, the Lake Superior Fish Classic, held in partnership with Wisconsin Sea Grant in Duluth, Minn., extended information about how Lake Superior economies are affected by the consumption of ciscoes and lake whitefish. Survey responses in Minneapolis indicated that over 90% learned more about sustainable fisheries by attending the events and that there is a market for ciscoes in the Twin Cities. In Duluth, 86% learned more about sustainable fisheries. Local fish markets and chefs report more cicso and whitefish sales. During the 2013 Fish Classic, the Minnesota Zoo's Fish Smart program produced a video to increase awareness of sustainable seafood issues throughout Minnesota. The Minnesota Department of Natural Resources and the North Shore Commercial Fishermen thanked Sea Grant for showcasing their work in a way that would sustain jobs. Lake Superior Magazine, the 2013 print sponsor, asked to take on the celebration as the magazine's cornerstone event; Sea Grant agreed and became an event sponsor. Because of Sea Grant's events, ciscoes are a seasonal special in at least seven restaurants, and the University of Notre Dame serves hundreds of pounds of this species to students each year. Partners included the American Culinary Federation, FishSmart, Wisconsin Sea Grant, three magazines and others.

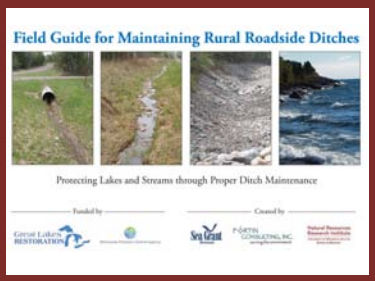
5. Hazard Analysis and Critical Control Point Program Targets Aquatic Invasive Species

Sea Grant's Aquatic Invasive Species-Hazard Analysis and Critical Control Point (AIS-HACCP) trainings, workshops and manual led to a U.S. Fish and Wildlife program. Problematic species, diseases, and parasites have been known to move through federal and state aquaculture operations. Minnesota and Michigan Sea Grant staff published an instructional manual for wild baitfish harvesters and fish farmers (both private and public) who raise baitfish or fish for stocking into public and private waters. The 80-page manual and corresponding workshops identified pathways through which non-target aquatic species could enter aquaculture and baitfish operations, and methods to prevent accidental transfer of these species to new areas. Following a training by Minnesota Sea Grant, the U.S. Fish and Wildlife Service began offering its own courses at the National Conservation Training Center in West Virginia. As of 2013, the US FWS registered 181 AIS-HACCP plans from 30 states on their website (www.haccp-nrm.org/plans.asp). As a result of AIS-HACCP training for Ontario Ministry of Natural Resources personnel by Minnesota and Michigan Sea Grant staff, every bait dealer in Ontario must now have an AIS-HACCP Plan.

? ***Did Ja Know?*** *Minnesota Sea Grant's John Bilotta was one of 28 selected from a national search to participate in NOAA's Teacher-at-Sea Program, June 2014.*

6. Field Guide for Maintaining Rural Roadside Ditches

Because townships and small communities need to keep an eye on rural ditches but might struggle to do so, the University of Minnesota Duluth's Natural Resources Research Institute and Minnesota Sea Grant recently published a field guide that provides ditch maintenance tips for rural communities. The guide was funded through the Great Lakes Restoration Initiative and the Minnesota Pollution Control Agency. It offers best practices about reducing sediment and pollution buildup in waterways while preventing erosion and maintaining the flow of water. Roadside ditches in the Arrowhead are especially susceptible to erosion and sediment buildup because over 50% of its roads are unpaved. Jesse Schomberg, Program Leader at Minnesota Sea Grant, said, "We created the field guide with township managers, county road crews and contractors in mind. The main thing I learned through this process was that a properly designed ditch takes skill and careful engineering; and even small changes, like a bigger culvert, or different culvert material, can lead to significant problems." Making a roadside ditch isn't a "do-it-yourself" project. Neither is properly maintaining one. If the slopes, culverts, and drops aren't well thought out, a cascade of trouble can follow. Copies of the Guide are free and available through Minnesota Sea Grant (online PDF and physical copies).



7. Beach Information Communication System Project

The Beach Information Communication System is a Great Lakes Restoration Initiative-funded project led by Minnesota Sea Grant and conducted in collaboration with Wisconsin and Michigan Sea Grant programs, and the NOAA Center of Excellence for Great Lakes and Human Health. Because of the project, beach goers along Park Point Beach in Minnesota have access to weather, water and beach safety information via mobile devices, the Internet and mass media. ParkPointBeach.org is a public service website designed to be a single-point of information (available at a glance) about air, water, and safety conditions along Minnesota's busiest Lake Superior beach, a 7-mile sandbar within the City of Duluth. Data and predictions are assembled from the National Weather Service and other organizations, like the Great Lakes Observing System. Beach goers to Lake Superior beaches like Park Point, are often shocked by how different the conditions can be to those in outlying areas. Additionally, they are not always aware of the rip current status before they get to the beach. Similar websites have been developed for Grand Haven beach (Michigan) and for Milwaukee County (Wisconsin) through this project.

8. Climate Change Extension Grows

Minnesota Sea Grant is helping communities prepare for a different climate regime. In 2012, an epic "500-year flood" swamped Duluth and raised Lake Superior by 3 inches. In 2013/2014, the Polar Vortex iced the region and created propane shortages. Sea Grant is organizing local stakeholders to form the Twin Ports Climate Coalition with the goal of fostering communication and collaboration among professionals in the region to address impacts from a changing climate. Members of the Coalition are interested in supporting community resilience and preparedness planning through information sharing and collaborative learning. In addition to Coalition activities, Minnesota Sea Grant is partnering with the Great Lakes Coastal Storm Program and Oconto County Hazard Mitigation Planning team to conduct the Community Self-Assessment to Address Climate Adaptation Readiness. Results from the Assessment will be incorporated into the county's updated hazard mitigation plan. Minnesota Sea Grant also participated on the Statewide Climate Adaptation Conference planning team in 2013 and 2014 to gather a range of stakeholders to highlight climate adaptation planning throughout the state.

! ***Spoiler Alert:*** *The reason Minnesota Sea Grant can show an impressive array of impacts and accomplishments is because, to paraphrase B. A. Stanley's (1911) thoughts on success, Minnesota Sea Grant has won the respect of intelligent persons, we've earned the approbation of honest citizens, and we strive to leave the world a bit better.*

4 Examples of Education and Training

1. Center for Great Lakes Literacy

Established in 2012, the Center for Great Lakes Literacy (CGLL) is a collaborative effort of Sea Grant Educators throughout the Great Lakes watershed. CGLL promotes informed and responsible decisions that advance basin-wide stewardship by providing hands-on experiences, educational resources, and networking opportunities that promote Great Lakes literacy among an engaged community of educators, scientists, and citizens. Signature opportunities include annual Great Lakes Shipboard Science Workshops that connect educators with scientists aboard the EPA's *R/V Lake Guardian* and land-based watershed workshops that facilitate strong community and school partnerships. Minnesota Sea Grant's work involves the Great Lakes Sea Grant Network, the EPA, the Lake Superior National Estuary Research Reserve and the University of Minnesota Duluth's Large Lakes Observatory. In 2011, funding from the Center's predecessor (COSEE GL) and EPA Great Lakes National Program Office (GLNPO) allowed MNSG to "immerse" 15 educators and five scientists on a weeklong Lake Superior research cruise aboard an EPA vessel, which was featured on the national homepage of the EPA website and through the EPA's social media conduits. Minnesota Sea Grant leveraged the opportunity by developing partnerships so that six more educators and three scientists could work together in a companion workshop along the St. Louis River. A remote connection from the ship to an educator workshop at the Chicago Museum of Science and Industry engaged another 20 educators. Participants established a network for sharing information and changes in their teaching. After six months, over 90% of educators surveyed reported sharing what they learned with other educators and 64% continued interacting with the scientists they met.

2. Science Institute for Educators

Minnesota Sea Grant partnered with the Great Lakes Aquarium, Wolf Ridge Environmental Learning Center, the Minnesota Department of Natural Resource's MinnAqua Program, and Minnesota's Lake Superior Coastal Program so that K-12 educators interested in incorporating Great Lakes science into their lessons could attend free workshops. Through the workshops, middle school educators discussed Lake Superior topics with regional experts and were given access to lesson plans and activity kits. Minnesota Sea Grant sought and received external funding to supplement the Science Institute for Educators series, allowing the workshops to be held at a second site during the academic years of 2012-2013 and 2013-2014, making them more accessible to rural educators. During the workshops, a scientist or expert on a Lake Superior topic gave a presentation, and educators worked to create a lesson plan and activity kit to complement it. The activity kits remain available for loan through the Great Lakes Aquarium Teacher Resource Library. Thirty-seven educators were trained, and through them, approximately 936 students were reached. Minnesota Sea Grant created presenter videos that have been viewed over 1000 times on YouTube. Survey results reveal that educators benefitted from this effort by learning about locally relevant topics, gaining access to educational resources, and by markedly increasing their familiarity with Great Lakes literacy principles. After participating, most presenters felt they had a better understanding of outreach and that they were better equipped to work with educators.

3. Watershed Game

The Minnesota Sea Grant-led Watershed Game is a highly effective curriculum that has been embraced across the state and in many other regions of the country to build the knowledge of local leaders and thereby protect water quality. The Watershed Game is an interactive simulation where local leaders and other participants examine water quality goals and apply practices, plans, and polices towards meeting those goals. The game is available in three published versions, lake, river and stream. Partners are in the process of creating a classroom version. Minnesota Sea Grant developed and continues to refine the Watershed Game curriculum with the University of Minnesota Extension. The Watershed Game is a foundational component of many community-based workshops and educational efforts for leaders responsible for water and land use management. The Watershed Game curriculum has been featured at several regional and national conferences. Participant evaluations consistently indicate that knowledge and skills have increased greatly. Train-the-trainer programs continued to support and increase the capacity of the more than 100 Watershed Game leaders in 14 states.

? ***Did Ja Know?*** *Leah Sharpe and Brooke White, graduate students from the University of Minnesota, received 2012 John A. Knauss Marine Policy Fellowships.*

4. NEMO for the St. Croix River Watershed

Nonpoint Education for Municipal Officials (NEMO) is a program that provides local elected and appointed officials and community leaders with education and training about how land use and management decisions and policies impact water quality and natural resources. In Minnesota, the Northland NEMO Program is led by Minnesota Sea Grant in collaboration with the University of Minnesota Extension and with the support of multiple state and local agencies and partners. Through NEMO, communities and their elected leaders along the St. Croix River, a National Scenic Riverway, reviewed and revised stormwater ordinances to preserve and improve the water resources. On-The-Water NEMO workshops brought local leaders out on the St. Croix River for training. Local leaders experienced vantage points of land-use seen from an on-the-water perspective to witness the impact their policies can have towards meeting clean water goals. The program has also used other interactive methods to effectively engage local leaders such as design charrettes, comprehensive plan and ordinance review workshops, and Lessons Across the Landscape and land-based tour workshops. These model approaches have been shared with and used by Sea Grant partners in other states.

People representing diverse groups (from coastal community leaders to news media to government to non-profit organizations) go out of their way to seek Minnesota Sea Grant's perspectives and research results on coastal hazards. This is a gratifying testament that Minnesota Sea Grant is doing something right. Minnesota Sea Grant outreach and communication specialists strive to be purveyors of unbiased information based on science. As such, we have become respected in the contentious arena of regional climate change and leaders in many coastal topics throughout the Great Lakes.

Collaborative Network / NOAA Activities

Minnesota Sea Grant has cultivated impressive collaborations that belie the program's modest size. A genuine interest in working across borders and managing multi-state and multi-national projects is evident especially through the program's aquatic invasive species outreach and Great Lakes-St. Lawrence Seaway maritime work. Minnesota Sea Grant has been a leader in organizing opportunities for educators throughout the Great Lakes region and also in facilitating meetings and hosting conferences. Over the last four years, Minnesota Sea Grant has managed over $2.8 million in Great Lakes Restoration Initiative funding on behalf of the Great Lakes Sea Grant Network.

In addition to the one dozen examples offered in the Stakeholder section of this document, Minnesota Sea Grant staff is pleased to offer you ten more that emphasize the nature of the program's collaborations.

10 Examples of Collaborations

1. Lake Superior National Estuary Research Reserve

The National Estuary Research Reserve (NERR) system is a partnership of NOAA and coastal states to study and protect vital coastal and estuarine resources. Minnesota Sea Grant is collaborating with the Lake Superior NERR in multiple ways, including participating in the newly announced NOAA Habitat Blueprint focused on the St. Louis River Estuary to strategize program and partner activities. Minnesota Sea Grant's director is on the Lake Superior NERR advisory board and, together with Wisconsin Sea Grant, Minnesota has funded research projects that align with NERR objectives. The most recent success has been the launch of the St. Louis River Estuary: The Stories and Science website. This website enhances spatial awareness and stewardship of the estuary. The stories are told through vignettes of resource activities. The science is based on stressor gradient research, incorporating factors such as population and road density, pollutants, and land use.

2. Twin Ports Rip Current Workgroup

The Twin Ports Rip Current Workgroup was formed in 2009 after a joint Minnesota Sea Grant-National Weather Service rip current conference in Duluth, MN. Minnesota Sea Grant provides leadership to this group, which has instituted rip current educational and outreach programs in the cities of Duluth and Superior and in surrounding communities. Accomplishments include developing a beach flag system, training lifeguards, hosting an annual water safety expo, participating in the River Quest program for area 6th graders, and developing the website ParkPointBeach.org. Due to the workgroup's sustained messaging, since 2006 Minnesota's Lake Superior beach goers are much more aware of rip currents and now 92% of the beach goers can correctly explain how to escape from a rip current (up from 67% in 2006). According to the Great Lakes Current Incident Database there have been no deaths along the beaches in western edge of Lake Superior due to rip currents since 2003. In the past two years, rescue personnel are finding that by the time they get to the beach after a call about a rescue, someone else who knows about rip currents has already rescued the individuals.

3. Assessing Crude Oil Movement

In its infancy, this initiative is being spearheaded by Minnesota Sea Grant's maritime extension specialist in cooperation with New York Sea Grant, federal regulators and the maritime industry. The purpose of the initiative is to examine the way oil is transported in and around the Great Lakes, especially as it moves from Bakken oil fields eastward. With accurate information and a solid risk analysis the collaborators expect that better decisions and policies will allow for protecting the Great Lakes while enabling industries to succeed.

4. Lake Superior Stream Science Symposium

This Symposium, held in Duluth, Minn., in 2014, was financed by the Coastal Zone Management Act, NOAA's Office of Ocean and Coastal Resources Management, and held in cooperation with Minnesota's Lake Superior Coastal Program. It was organized by the Minnesota Department of Natural Resources, the US Forest Service, the US EPA, Minnesota Sea Grant, UMD's Natural Resources Research Institute, Lake Superior Coldwater Coalition, Trout Unlimited, and Laurentian Resource Conservation and Development Council. Researchers, resource managers, and others gathered to discuss regional water research to help guide future research and management. Participants defined stressors influencing the normal flow and function of Lake Superior's tributaries and left with a better understanding of how to incorporate scientificinformation and cost-effective methods into planning for and managing the Lake Superior watershed. Proceedings can be found here: www.lrcd.org/stream-science-symposium.html.

5. Second Conference on Climate Adaptation: Building Minnesota's Capacity for Climate Adaptation

The 2014 Conference on Climate Adaptation was held in Minneapolis, Minn., in Nov. 2014. It was designed for local officials, planners, engineers, natural resource practitioners and others who wanted to know more about climate adaptation strategies. Participants talked about plans that have been implemented or tested in various sectors, including human health, local governmental entities, college campuses, resources, recreation, and agriculture. Keynote speakers provided updates on the increasing number of severe storm events. The conference was produced by the Climate Adaptation Partnership, a network of researchers, educators, implementers, policy makers and others, including Minnesota Sea Grant.

6. Comprehensive Aquatic Invasive Species Communication and Education Campaign

Sea Grant collaborates to protect water resources from the spread of aquatic invasive species by working with teachers, boaters, anglers, aquarists, water gardeners, youth, and the baitfish and aquaculture industries. People can inadvertently spread harmful aquatic invasive species, which damage environments and economies. The Great Lakes Sea Grant Network, led by Minnesota, conducted a comprehensive outreach initiative targeting 15 pathways aimed at preventing the spread of aquatic invasive species. The project features *Stop Aquatic Hitchhikers!*, Nab the Aquatic Invader, *Habitattitude*, and AIS-HACCP, and new web-based social networking

components. Funding through the Great Lakes Restoration Initiative enabled the Great Lakes Sea Grant Network to work with 300 partners to generate 17.5 million exposures to messages about preventing the spread of aquatic invasive species since 2010; of these, Minnesota Sea Grant generated over 2.4 million. Since 2010, partnerships created a savings of $126,300 through buy-ins on the production runs of materials. The simple and consistent messaging avoids duplication of effort and fosters sustained preventative actions by watercraft users, consumers, educators and students. 2013 surveys indicated that the Stop Aquatic Hitchhikers! campaign raised boater awareness by 50% and that 100% of respondents were willing to protect U.S. waters by following the "clean, drain, dry" campaign guidelines.

7. The Great Lakes Coastal Storms Program
Minnesota Sea Grant's Coastal Storms Outreach coordinator is collaborating with the entire Great Lakes Sea Grant Network to award program development funds. So far, ten projects (totaling more than $1M) have been funded through a competition administered through Ohio Sea Grant. The program works with the cross-NOAA Coastal Storms Program team, including representatives from the National Weather Service, the National Ocean Service, the Office for Atmospheric Research, the National Marine Fisheries Service, and the National Environmental Satellite, Data, and Information Service.

8. Nonpoint Education for Municipal Officials (NEMO)
Minnesota Sea Grant collaborated and led a Minnesota and Wisconsin team to carry out annual NEMO programming for communities. The collaboration also included state agencies, the National Park Service, watershed units of government, communities and other organizations. The collaboration has led to funding that has supported the review and revision of stormwater ordinances in communities, and education and training programs for community local leaders and staff.

Spoiler Alert: *With regard to coastal storms and climate change, we're not being dooms-dayers, we're being opportunistic and pro-active. Minnesota Sea Grant is building capacity to assist Lake Superior communities as they face stormwater issues and different climates. The new extension educators could save communities time, money, and environmental headaches.*

9. Collaborations that Address Climate Change
Minnesota Sea Grant worked with the NOAA Office of Coastal Management and local partners on the economic assessment of flood impacts and green infrastructure strategies to reduce flood losses study that focused on the Chester Creek watershed in Duluth, Minn. Minnesota Sea Grant also partnered with the Great Lakes Sea Grant Social Science Network and the National Weather Service Central Region to evaluate an Impact Based-Warning tool developed for the Service as part of NOAA's Weather-Ready Nation.

10. Great Lakes Restoration Initiative
Minnesota Sea Grant is providing technical assistance to the suite of NOAA Climate Projects being conducted through funding by the Great Lakes Restoration Initiative. Sea Grant's role includes facilitation, technical assistance (reporting, budgets, organization), and project assistance.

Number and Types of Collaborative Projects

See the projects table on page 9.

Success in Sea Grant National Competitions

(Please also refer to the Projects Table on page 9.)

Climate. The Climate Adaptation grant to Minnesota and Wisconsin Sea Grant enabled Minnesota Sea Grant to hire a Climate Change Extension Educator to work on developing resources for communities and businesses around Lake Superior to help them to prepare for and adapt to a changing climate.

Great Lakes Coastal Storms. Great Lakes Weather, Water and Beach Safety grant enabled Minnesota Sea Grant to hire a Coastal Storms Outreach Coordinator. Brent Schleck, the person in this position, is expanding dangerous current awareness, as well as access to severe storm warnings and forecasts around the Great Lakes. He is providing technical assistance and outreach on Coastal Storms Program and climate projects to enhance region-wide collaboration.

The Forecasting and Warning for Rip Currents grant came to Minnesota and Wisconsin Sea Grant via the NOAA Coastal Storms Program. It is funding innovative beach hazard forecasting technology to improve rip current identification, forecasting and public notification. The ParkPointBeach.org website is one of the products of this funding developed by Minnesota Sea Grant.

Weather-Ready Nation. This funding brought the Great Lakes Sea Grant Network and National Weather Service staff together in a way that improved communication and understanding about shared interests. Minnesota Sea Grant contributed two of the three case study videos (What is the Great Lakes Sea Grant Network; Raising Awareness about NEMO). Minnesota Sea Grant also partnered with the Great Lakes Sea Grant Social Science Network and the National Weather Service Central Region to evaluate an Impact Based-Warning tool developed for the Service as part of NOAA's Weather-Ready Nation.

Social Science Outreach. The grant, Using Social Science ... in Coastal Hazard Readiness, is led by Minnesota Sea Grant and shared by Illinois-Indiana, Pennsylvania, and Michigan Sea Grant programs. The collaboration is working on a process to identify particular barriers that might prevent a community from adapting to climate change. They will then evaluate tools to address those barriers in three pilot communities.

Social Science Research. The research grant, Risk, Response and Weather, was made possible through NOAA Sea Grant's incentive to fund social science research in 2014. Minnesota Sea Grant was able to support this additional research project after two other social science research projects were awarded funding. The success of the other proposals prompted NOAA Sea Grant to augment Minnesota Sea Grant's funding to make this project possible.

NEMO U. NOAA Sea Grant bore some of the cost of the NEMO conference that was held in Duluth, Minn., in 2012. NEMO University, or NEMO U, is the national conference of the NEMO Network held every 18 months. The focus of the conference is to provide opportunities for NEMO program leaders, partners, funders and NEMO friends to network with one another, share successful approaches, and learn about new technologies and techniques.

Awards

National Sea Grant Research to Application Award to Minnesota and Wisconsin Sea Grant Programs for their work in helping determine cause and solution for the Duluth-Superior harbor corrosion.

Association of Natural Resource Extension Professionals: Bronze Award Mixed Education Materials to Bilotta, Hagley, Schomberg and others for the Northland NEMO Watershed Game.

Association of Natural Resource Extension Professionals: Innovative Programming Bronze Award to Bilotta, Hagley, Schomberg and others for the Northland NEMO Watershed Game Train-The-Trainer Program.

Association and Natural Resources Extension Professionals, Gold Award for Series of Articles to Bilotta and others for producing the newsletter From Shore to Shore

16th Annual Summit Creative Awards Bronze winner for Art Direction and Graphic Design to Bilotta, Hagley, Schomberg and others for the Northland NEMO Watershed Game.

Environmental Initiative 2013, Partnership of the Year to Schomberg, Hagley and Brady for their work with the Weber Stream Restoration Initiative.

Great Lakes Sea Grant Network Superior Outreach Award to Bilotta, Hagley, Schomberg and others for the Northland NEMO Watershed Game.

Great Lakes Sea Grant Network Outstanding Project Award to Bergeron and Moen for their work in support of the Great Lakes Ballast Water Collaborative.

Great Lakes Sea Grant Network Mid-Career Award to Jensen for a record of collaborations that raised public awareness capacity and funding to combat the spread of aquatic invasive species.

Sea Grant Extension Assembly Outstanding Achievement Award to Schomberg and others for Sea Grant Academy IV.

Minnesota Association of Natural Resource Extension Professionals, Excellence in Programming Award to Bilotta for innovation in evaluation - A View from the Big River Minnesota Northland NEMO Program.

National Invasive Species Council Outstanding Invasive Species Outreach and Education Award to Jensen for outreach and education efforts to prevent, monitor and control aquatic invasive species.

Stop Aquatic Hitchhikers! ***Achievement Award from Wildlife Forever*** to Jensen for creating policy, programs and partnerships in support of the SAH campaign.

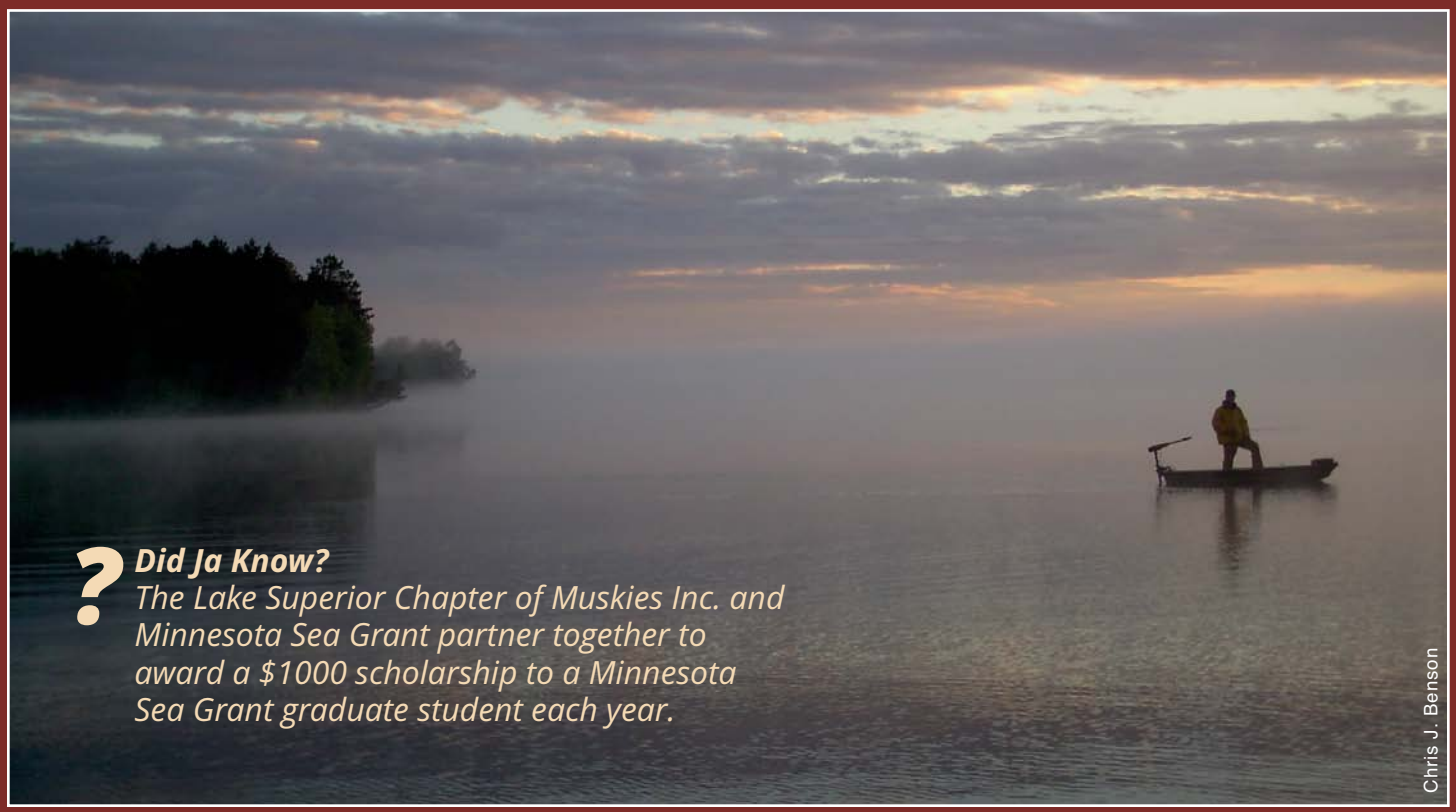
APEX Awards (2) for Publication Excellence to "Towards Sustainable Tourism;" and Moen and Benson.

Len Anderson Environmental Stewardship Award from St. Louis River Alliance to Hagley for connecting teachers to the Great Lakes through Centers for Ocean Sciences Education Excellence.

Lake Superior Binational Forum, Environmental Stewardship Awards Program, Outstanding Educational Programming for Youth and Teachers Award to Hagley for her work with the Centers for Ocean Sciences Education Excellence Great Lakes.

International Association for Great Lakes Research 2011 Conference Appreciation Awards to Bowen, Brady, Moen and others for helping to create a successful conference.

UMD Outstanding Service Awards (3) to Benson, Moen and Zomerfelt.



? Did Ja Know?
The Lake Superior Chapter of Muskies Inc. and Minnesota Sea Grant partner together to award a $1000 scholarship to a Minnesota Sea Grant graduate student each year.

Chris J. Benson


Chris J. Benson

Program Changes Resulting from November 2010 Site Review

The Minnesota Sea Grant Site Review Team (SRT) of November 2010 identified eight Best Management Activities and had wonderful things to say about Minnesota Sea Grant. They left us with one recommendation and several suggestions.

Recommendation

The SRT recommends that the advisory board position held by the member from University of Minnesota System be considered a non-voting member to avoid a possible misinterpretation of a conflict of interest when reviewing and approving the program research competition and proposals.

Response: *Minnesota Sea Grant immediately requested that the member in question step down from the Advisory Committee. University administration supported the request and that person graciously left the Advisory Committee after the site visit.*

Suggestions

Funding

The program has done an excellent job leveraging funds from external sources. The SRT suggests that they keep working on collaborating with new stakeholders, maybe through the advisory committee, to find new sources of funding.

Response: *Minnesota Sea Grant has been especially successful in receiving funding from new external sources. On behalf of the Great Lakes Sea Grant Network, we have taken the lead on three aquatic invasive species and one beach safety Great Lakes Restoration Initiative (GLRI) grants totaling over $2.5M, and we have participated on other GLRI grants totaling over $300K. We successfully competed against other Great Lakes Sea Grant programs to receive funding for the Great Lakes Coastal Storms Outreach Coordinator position. We have received funding to support staff for the first time from the National Park Service, the US Forest Service, the NOAA Coastal Storms Program, the NOAA Office of Coastal Management, U.S. Army Corps of Engineers, and St. Louis County.*

? ***Did Ja Know?*** *NOAA's Office of Ocean and Coastal Resource Management and the Office of Coastal Management joined forces to become the new Office for Coastal Management.*

The SRT suggests that the program work in growing and building a stronger collaboration and partnership with other departments in the University of Minnesota system. The SRT suggests that MNSG duplicates the model of a shared staff position with U of M Extension.

Response: *Minnesota Extension continues to pay for a portion of five Sea Grant staff positions. More significantly and despite their increasingly tight budget, Extension has provided additional funding for half of our full time Climate Change Extension Educator. In addition, Sea Grant was successful in convincing Extension to fund a portion of an Aquaculture Specialist after Gunderson was hired as director and no longer had time for aquaculture extension. While no money is changing hands, we have also built a stronger relationship with the University of MN Aquatic Invasive Species Research Center and the MN Department of Natural Resources through a signed MOU relating to cooperative outreach on aquatic invasive species.*

Stakeholders

The SRT suggests that there is fertile ground to increase collaboration with other local, state and federal agencies. These new collaborations could also yield further research funding. For example, the SRT sees an opportunity for MNSG to engage the tourism agencies and the boating associations to explore potential partnerships and collaborations.

Response: *While we have not received money directly from other sources to fund research, our new relationships with the National Park Service, the US Forest Service, the NOAA Coastal Program, EPA, and St. Louis County, as well as our GLRI-funded grants and others, help cover the salary of our outreach and communications staff. This allows us to fund more research out of our core Sea Grant dollars. With respect to engaging recreation associations, we have partnered with the Lake Superior Chapter of Muskies Inc. to fund an annual scholarship for MN Sea Grant graduate students. Discussions with the U of MN Tourism Center led to meetings with Duluth area tourism professionals and the Arrowhead Tourism Association, to explore tourism needs in relation to*

climate change. Minnesota Sea Grant subsequently funded a research proposal on this issue (2014). Two researchers have leveraged their Sea Grant funding to secure additional Minnesota Pollution Control Agency support for their investigations.

The SRT suggests the MNSG program increase and develop new partnerships with Minnesota's Coastal Zone Management Program.

Response: *Over the last four years Coastal Program and Minnesota Sea Grant staff cooperated on:*

- *Planning four conferences*
- *Two search committees*
- *The Regional Stormwater Protection Team and Climate Adaptation Partnership*
- *Developing the Clean Marinas program and a local Climate Coalition*
- *The technical advisory committee for the Field Guide for Maintaining Rural Roadside Ditches*
- *The "Planning and Facilitating Collaborative Meetings" training*
- *Project criteria for land and water management to sustain healthy aquatic ecosystems in a changing climate*
- *Seven projects funded by the Coastal Program (see page 9)*
- *Four tasks through the Coastal Storms Program with other Great Lakes state coastal programs:*
  1. *Environmental impact assessment for a potential grant in WI*
  2. *Beach Hazard Communications in MN, WI, MI, OH, and IN/IL*
  3. *Presentation at the 2013 Great Lakes CZM Program Managers meeting*
  4. *Strategic planning for the IN Lake Michigan Coastal Program*

Advisory Board

Develop a charter, criteria or guidelines that define the role, composition and goal of the advisory board.

Response: *We completed a Charter for our Advisory Committee in September 2011 with their input. It can be found on our website www.seagrant.umn.edu/downloads/mnsg_advisory CommitteeCharter.pdf.*

Research

The program has done a very good job implementing their research portfolio. The SRT suggests that they keep working in collaborating with new educational institutions to increase the pool of research proposals received and funded outside the University of Minnesota system.

Response: *Minnesota Sea Grant held a seminar for researchers to solicit social science proposals and attract researchers from other institutions in 2013. We received and funded social science proposals (for the first time) and attracted proposals from new investigators. We held another special seminar for researchers and broadcast it over the Web in an effort to reach more institutions in January 2015. We send our request for proposals to all 4-year colleges in the state, and we update our email list with new college and university departments.*

The SRT suggests that the program enhances the tracking methodology for the "induced" research as a result of their education, communication and extension efforts.

Response: *Due to the reporting requirements for impacts and accomplishments, we are continually looking for results from our outreach efforts. For example, MN and WI Sea Grant won the Research to Application award presented at the last Sea Grant Week. It was a result of work we began in 2004 to address a $120M problem associated with accelerated corrosion of 13 miles of steel structures in the Duluth Superior Harbor. You can read more about this award in our last newsletter. www.seagrant.umn.edu/newsletter/2014/12/program_updates.html*

Another example are the synthesis papers that resulted from a 2010 Minnesota Sea Grant Symposium, Genetic Biocontrol of Invasive Fish. The Symposium and these papers published in Biological Invasions (2014) significantly contributed to the understanding of legal, policy, social, and technological issues related to genetically modified fish.

The SRT suggests that the program enhances the tracking methodology for technology transfer of the research portfolio the program supports.

Response: *Minnesota Sea Grant tracks its products by entering them into the PIER reporting system administered by NOAA Sea Grant. We use the "tagging" option in PIER to link products, accomplishments, and impacts to a project. Every 4 years we send out a questionnaire to our researchers from the last 10 years (or so) asking them to update us on "tech transfer" of the products and results from the research that we funded.*

Did Ja Know? *Starting in 2012, MN Green Corps volunteers have been working with the Minnesota Sea Grant staff in Duluth for one-year stints. The focus of these positions is to conduct stormwater education in the Duluth-Superior area with the Regional Stormwater Protection Team. The positions were made possible through a partnership with the Minnesota Pollution Control Agency and the Americorps Program.*

UMD

NOAA

Sea Grant
Minnesota