Sea Grant
Michigan

BRIEFING BOOK

October 28-29 2014






MICHIGAN SEA GRANT COLLEGE PROGRAM REVIEW

NOAA

MICHIGAN STATE UNIVERSITY | Extension

UNIVERSITY OF MICHIGAN

MICHU-14-101

INDEX

Introduction

Michigan is the only Sea Grant program in the region that is entirely within the boundaries of the Great Lakes watershed. With 99 percent of watersheds in Michigan draining to lakes Michigan, Superior, Huron and Erie, our connection to the Great Lakes is undeniable. Sea Grant continues to extend research efforts, respond to coastal needs and connect with a broad base of stakeholders and partners located throughout the 3,200 miles of Great Lakes coastline.

Our physical presence within two of the largest university campuses in the State of Michigan allows us to connect with top scientists in a variety of disciplines, including natural resources, law, business, agriculture, urban planning, engineering and more. The University of Michigan (UM) has 19 schools and colleges, more than 3,000 faculty, an annual research budget of more than $1 billion and more than 40,000 students. Michigan State University (MSU) is a land grant university, with 17 schools and colleges, 4,700 faculty and academic staff, an annual research budget of $477 million and nearly 50,000 students.

The University Research Corridor, including UM, MSU and Wayne State University, received nearly $300 million in awards for research and outreach targeted at advancing water innovation from 2009-2013.

In this report, you will find selected examples of how Michigan Sea Grant (MSG) has supported research, education and outreach efforts to contribute to Great Lakes science. MSG has developed tools and leveraged technologies to help others make informed decisions, educate students, change policy and support sustainable coastal communities, businesses and industries.

MSG has been successful leveraging our core NOAA-National Sea Grant support, receiving $6,416,176 total support from regional and national competitions between 2010 and 2013.

For instance, MSG contributed to the largest restoration effort in the Great Lakes region, the Great Lakes Restoration Initiative (GLRI). As a leader in efforts to improve fish habitat, manage invasive species and protect water quality, MSG received more than $4.7 million in competitive GLRI funding from the National Oceanic and Atmospheric Administration (NOAA), the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (USFWS), and the U.S. Geological Survey (USGS).

MSG has contributed to significant state strategies, such as the Michigan Department of Environmental Quality (MDEQ) Coastal Zone Management Program's Section 309 Strategy, focusing on water quality, fisheries, coastal hazards (e.g., rip currents), climate adaptation, sustainable coastal communities, public health and safety and more.

Michigan describes itself as the Great Lakes state, and our border is largely defined by these watersheds. The Great Lakes provide industry, domestic water, transportation and recreation to millions of citizens. Almost 20 percent of the world's surface freshwater is found in the Great Lakes. They are a global treasure; maintaining and enhancing their quality is the primary goal of MSG. We provide research, education, outreach, and leadership in promoting Great Lake resources, and are proud of our accomplishments, some of which we describe in the following sections.

Program Management and Organization

LEADERSHIP: MANAGEMENT TEAM COMPOSITION

UNIVERSITY OF MICHIGAN (UM)

- Program Director
- Research Program Manager
- Communications Program Manager

MICHIGAN STATE UNIVERSITY (MSU)

- Associate Director
- Extension Program Coordinator

MANAGEMENT TEAM RESPONSIBILITIES

The management team interacts with a variety of state and federal partners and stakeholders, including state and federal agencies, universities and non-government organizations. The team is responsible for overseeing all functional areas of the program, including research, education and outreach, as well as stakeholder and partner engagement and program assessment.

PROGRAM DIRECTOR

Dr. James Diana is a Professor of Fisheries and Aquaculture in the UM School of Natural Resources and Environment (SNRE). Diana is the Michigan Sea Grant principal investigator who, along with other management team members, provides intellectual leadership for the program. He has a 50 percent appointment and is responsible for program implementation and fiscal management, as well as interfacing with the Michigan Sea Grant Advisory Committee. He is a liaison with UM academic administration, including SNRE deans and the Office of Vice President for Research. He also represents the program externally as a member of the National Sea Grant Association.

ASSOCIATE DIRECTOR

Dr. William Taylor is a University Distinguished Professor in Global Fisheries Sustainability, Department of Fisheries and Wildlife and Center for Systems Integration and Sustainability at Michigan State University. Taylor has a 20 percent appointment, serves as the Michigan Sea Grant co-principal investigator and as an academic liaison with Michigan State University Michigan Greening Institute, as well as deans, and the Office of Vice President for Research and Graduate Studies. Taylor also represents the program externally as a member of the National Sea Grant Association.

RESEARCH PROGRAM MANAGER

Dr. Catherine Riseng is an Assistant Research Scientist based at UM-SNRE. Riseng has a 50 percent appointment and provides management for the Research Program. She oversees the selection of Integrated Assessment and traditional science research projects and the peer review process. Riseng is an aquatic ecologist and conducts research on fluvial and the Great Lakes ecosystems. She is the lead PI on several research grants to develop a Great Lakes geospatial database and habitat classification framework, and the design and implementation of a management-oriented decision support system.

EXTENSION PROGRAM COORDINATOR

Dr. Heather Triezenberg is based at MSU and manages the Sea Grant Extension educators and other specialists. She is responsible for program planning, evaluation, staff training and financial oversight at MSU. Triezenberg's area of expertise includes applied human dimensions research in support of Great Lakes aquatic policy and management. She is interested in resilient coastal community development, citizen involvement in research, and the application of quantitative methods to better understand behaviors that lead to decision making.

COMMUNICATIONS PROGRAM MANAGER AND EDUCATION PROGRAM CO-LEAD

Elizabeth LaPorte is based at UM-SNRE. She has a 100 percent appointment and is responsible for overseeing communications and education services efforts. LaPorte oversees the development of public outreach campaigns, curriculum and training tools and media outreach. She has led a number of local and regional grant projects. Her areas of expertise include project management, public outreach and education about coastal hazards, water quality and the impact of climate change on water quality.

ADDITIONAL LEADERSHIP

FISCAL OFFICER

Elyse Larsen serves as fiscal manager and oversees all aspects of grant budgeting, submission and reporting, including coordinating efforts with MSU. She works with the program director to lead the administration aspects of the program, including data management and major events.

EDUCATION PROGRAM CO-LEADER

Steve Stewart, senior Extension educator, serves as director of the Great Lakes Education Program and as liaison to the regional and national education networks on behalf of MSG.

ADVISORY COMMITTEE MEMBERSHIP AND FUNCTION

The Michigan Sea Grant Advisory Committee is composed of key stakeholders and senior university administrators. The committee meets as a group at least once a year and is

co-chaired by the vice presidents for research of the University of Michigan and Michigan State University. In addition, members attend local events and may engage with the MSG management team, as well as MSG staff on a variety of issues.

Members of the committee provide strategic advice, guidance and feedback on existing and future programs and high-level feedback on Great Lakes issues such as the MSG strategic plan, content of the program's biennial request for research proposals, outreach activities and educational programs. Also, committee members serve as program advocates by identifying opportunities for collaboration and support, particularly with state and federal agencies and legislators.

Advisory Committee Members

Jon Allan, *Director Michigan Department of Environmental Quality (MDEQ) – Office of the Great Lakes*

John Austin, *President, Michigan Department of Education*

Jill Bentgen, *Owner, Mackinac Straits Fish Company*

Mark Burnham, *Vice President for Governmental Affairs, MSU*

Margaret Bethel, *Interim Director, Michigan State University Extension*

Tim Eder, *Executive Director, Great Lakes Commission*

Chris Goddard, *Private Citizen*

Tom Gorenflo, *Director, Chippewa Ottawa Resource Authority*

Denny Grinold, *Owner, Fish 'N' Grin Charters and Michigan Charter Boat Association*

Jack Hubbard, *Grand Marais Harbor Master, Burt Township*

Stephen Hsu, *Vice President for Research and Graduate Studies, MSU*

Frank Krist, *Chair, Lake Huron Citizen Advisory Committee*

Robert Lambe, *Executive Secretary, Great Lakes Fishery Commission*

Marie Lynn Miranda, *Dean, UM SNRE*

Bob Neely, *Chair, Lake Erie/St. Clair Citizens Fish Advisory Committee*

Tammy Newcomb, *Senior Executive, Michigan Department of Natural Resources*

Eric Petersen, *President, Michigan Fish Producers Association*

David Poulson, *Associate Director, Knight Center for Environmental Journalism*

Steve Pueppke, *Director of AgBioResearch, MSU*

Gerard Santoro, *Senior Planner, Macomb County Planning and Economic Development Department*

Hans Van Sumeren, *Director, Great Lakes Water Studies Institute*

Volker Sick, *Associate Vice President for Research, UM*

Cynthia Wilbanks, *Vice President for Government Relations, UM*

Arnold Weinfeld, *Chief Executive Officer/Board Chair, Prima Civitas*

PROGRAM SETTING AND REPORTING STRUCTURE

Program Setting

MSG has the support of top university administrators to effectively carry out our mission. The UM School of Natural Resources and Environment and the MSU Extension Greening Institute provide matching funds to carry out programs in Michigan. Also, additional Michigan universities and other non-federal sources provide support.

At UM, the Director of MSG reports to the Dean of the School of Natural Resources and Environment (SNRE). The SNRE Dean and the Associate Vice President for Research serve on the MSG advisory committee. At MSU, the Associate Director of MSG is affiliated with the Center for Systems Integration and Sustainability at MSU. The Vice President for Research and Graduate Studies also serves on the MSG advisory committee.

The state of Michigan and its universities strongly support MSG both through leadership and finances. In 2010, state funds from UM ($346,808), MSU ($504,681) and other universities provided over $940,000 in matching funds to MSG.

The vice presidents for research of UM and MSU co-chair the MSG advisory committee. Members of the advisory committee reflect the broad range of Great Lakes stakeholders with which MSG interacts.

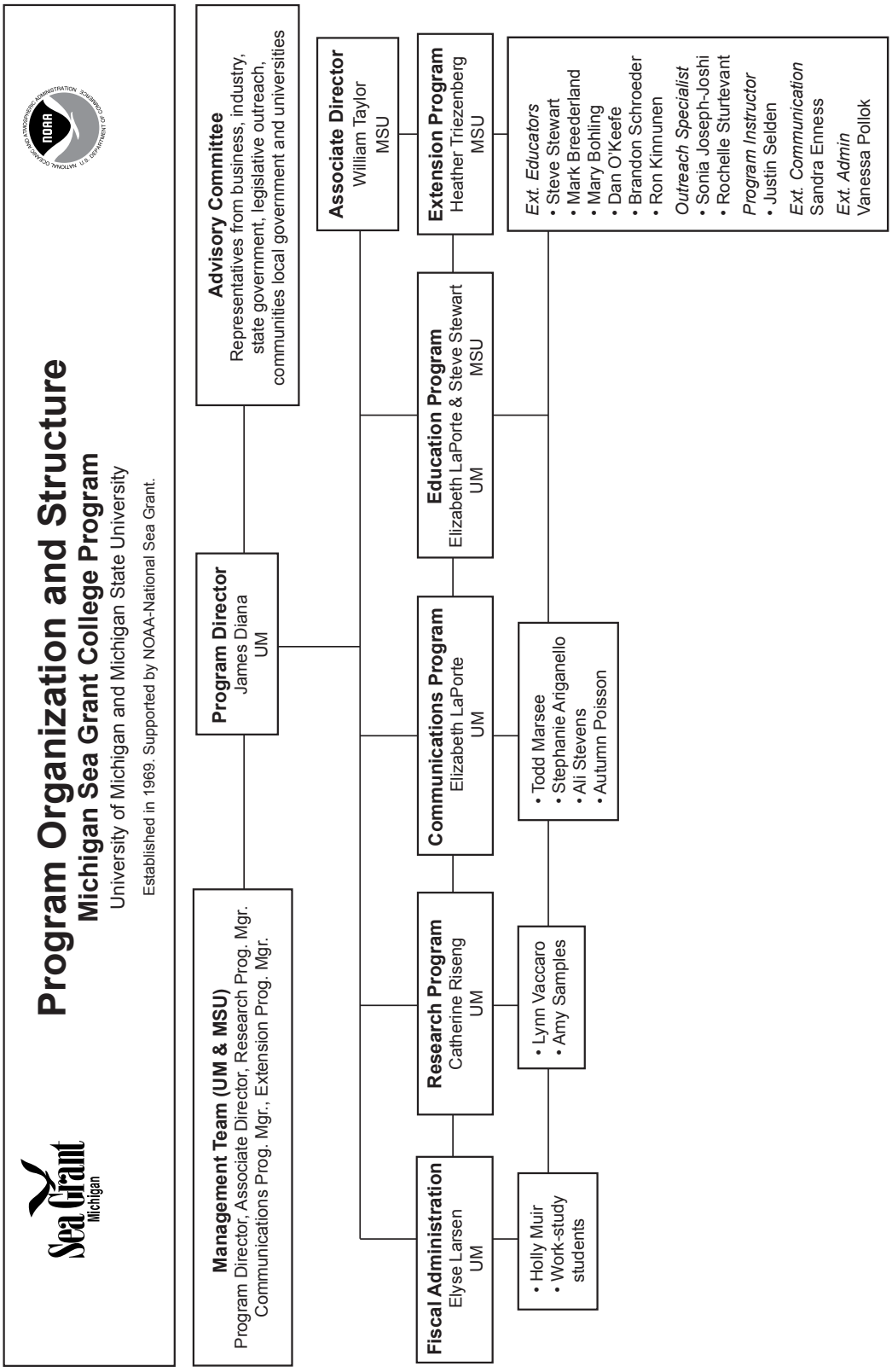
Reporting Structure

Michigan Sea Grant manages offices at UM in Ann Arbor and MSU in East Lansing, as well as offices in coastal communities throughout Michigan. The partnership with Michigan State University Extension provides the framework and infrastructure for MSG Extension.

A four-person team, including the director, research program manager, communications program manager and fiscal officer, manages the Ann Arbor office. The Ann Arbor office team is responsible for overseeing the efforts of research projects, communications projects and grant management (NOAA). The team also leads MSG program promotion and marketing, and the development of educational resources and tools.

A team, including the Extension program coordinator, the Extension communications manager and an administrative assistant, manages the East Lansing office and reports to the associate director. The Extension program coordinator oversees the Extension educators based in southwest, northwest, Upper Peninsula, northeast, and southeast Michigan, as well as two regional outreach specialists based at NOAA's Great Lakes Environmental Research Laboratory (GLERL) in Ann Arbor.

The organizational chart, below, provides an overview of program hierarchy, the relationship between the two universities and how the advisory committee is incorporated into program organization.



RECRUITING TALENT

Since 2007, Michigan Sea Grant has been integrating the program's primary functions — research, outreach and education — through the use of Integrated Assessment as the basis for the program's competitive research funding. Integrated Assessment (IA) involves a comprehensive analysis of natural and social science information in the context of a specific policy or management question.

The purpose of an IA is to:

- Clarify the trends, causes and consequences of a complicated issue.
- Build consensus and new collaborations.
- Identify and evaluate policy options or potential actions for solving the problem.
- Develop tools and information that can guide decision making.

Each project is led by a multi-disciplinary team of researchers who work closely with a group of relevant decision makers and stakeholders. Stakeholder meetings and technical assessment results are intended to help decision makers identify, compare and ultimately implement new policies or actions; e.g., a new ordinance, regulatory change, business initiative or coordinated approach to resource management. Sea Grant outreach professionals help engage stakeholders throughout the assessment, disseminate the results and support the implementation of new ideas after the project ends.

PROCESS TO DEVELOP RFP PRIORITIES

The research team regularly discusses possible IA topics with state agency partners, Sea Grant staff, researchers and others who have an understanding of the most challenging coastal issues Michigan faces. During the year leading up to the release of an RFP, the management team identifies, refines and vets a series of issues that could serve as the focus of a research proposal.

Input into RFP topics is solicited from appropriate local, state and federal decision makers and resource managers, the Advisory Committee, MSG Extension educators, program constituents and others knowledgeable about coastal issues.

Once RFP topics are selected, a policy contact from a federal, state or local unit of government is identified. The policy contact helps refine the topic description in the RFP, reviews pre-proposals and consults with the research team to ensure the project is relevant to decision makers. The policy contact is also encouraged to attend project meetings and support the project by providing staff time, equipment, data, funds or other resources to assist with project outreach or technical analyses.

Topics are selected based on the following five criteria:

1) Relevance to the focus areas and goals outlined in the strategic plan.
2) Importance of the issue to current environmental, social and economic concerns in Michigan.
3) Interest from an appropriate decision maker, resource manager or regulatory body who can authorize or sponsor the assessment, serve as the project's policy contact, and use the results.
4) Complexity of the issue, such that potential solutions require expertise from several disciplines and engagement with stakeholder groups.
5) Availability of data that can provide the basis of modeling and analyses.

NEW DIRECTIONS

With an increase in research funding from National Sea Grant starting in fiscal year 2014, MSG will include more traditional science research in research priorities. In 2014, MSG collaborated with Illinois-Indiana Sea Grant (IISG) to select a research project that will couple with the work of federal agencies and support academic research as part of the Coordinated Science and Monitoring Initiative (CSMI) for Lake Michigan.

Through the Great Lakes Regional Research Information Network, MSG and IISG identified research priorities for understanding changes in the Lake Michigan food web. MSG will fund one research project to support the CSMI in 2015.

REVIEW PROCESS FOR RESEARCH PROPOSALS AND COMPOSITION OF REVIEW PANELS

Pre-proposal Review: Pre-proposals are solicited and reviewed to ensure they meet criteria for an Integrated Assessment. A select number of pre-proposals are invited to full proposal stage. When multiple pre-proposals are submitted for a single topic, the research coordinator solicits reviews and comments by a small committee that includes professionals from local, state or federal government that work on the issue, as well as Sea Grant staff with relevant expertise. For each topic, a single pre-proposal is advanced to full proposal stage, which allows the proposing team to fully engage with the sponsoring agency, policy contacts and other relevant individuals in developing a strong proposal.

Full Proposal Review: Written reviews are solicited for each full proposal from at least three experts in the field from outside Michigan. Reviewers are Ph.D.-level scientists at universities, government labs or non-profit institutions who have specific expertise in the disciplines and issues addressed in the proposal. Because IA proposals are multi-disciplinary, a diverse set of reviewers with experience in applied research is required for each proposal.

Once written reviews are compiled, the program assembles another review panel to discuss and rank each proposal. The review panels are composed of three to four Ph.D.-level experts, again from outside Michigan, who have demonstrated experience integrating natural and social sciences and policy. Recent panelists have worked for the EPA, Extension programs or universities. MSG's management team considers the review panel rankings, available funding and program priorities to determine which proposals receive funding.

NUMBER OF INSTITUTIONS INVOLVED IN PRE-PROPOSAL AND FULL PROPOSAL PROCESS

	2011	2013	2014	TOTAL
PRE-PROPOSALS (OR LETTERS OF INTENT)				
Pre-proposals	13	10	2	**23**
Institutions (lead PI only)	7	6	2	**9**
FULL PROPOSALS				
Full Proposals Submitted	5	5	2	**12**
Institutions (lead PI only)	3	3	1	**5**

Note: During this time period, MSG released two Integrated Assessment RFPs (2011, 2013), and one regional RFP in conjunction with IISG in 2014.

NEW AND CONTINUING PROJECTS AND PRINCIPAL INVESTIGATORS

	2010	2011	2012	2013	2014	TOTAL
New Projects Funded	–	–	3		4	**7**
Continuing Projects	4	4		3	3	**14**
PIs and Co-PIs Funded			15		14	**29**
New PIs and Co-PIs Funded			15		14	**29**
Institutions Funded (including Co-PIs)			5		13	**18**
New Institutions Funded			4		8	**12**

Note: Institutions and PIs are considered "new" if they hadn't previously been funded within this time period (2010–2014). Many proposals include Co-PIs that are not based at universities. These Co-PIs and their institutions are included in this table.

Stakeholder Engagement

LEADERSHIP BY MANAGEMENT AND STAFF ON BOARDS AND COMMITTEES

STEPHANIE ARIGANELLO

- National Sea Grant Communications Network, Social Media Committee
- University of Michigan Social Media and Audio/Visual Communications Task Force
- International Environmental Communications Association, founding supporter

MARY BOHLING

- Michigan Statewide Public Advisory Council, chair
- Detroit River Remedial Action Plan Public Advisory Council, chair - state liaison
- MSU Community & Natural Resource Development Association, past-president
- Downriver Linked Greenways Initiative, co-chair
- Detroit Heritage River Water Trail, steering committee
- International Wildlife Refuge Alliance Board
- Michigan Recreation and Park Association Trails and Greenways Committee
- Southern Wayne County Regional Chamber Greening Downriver Committee, chair
- Michigan Great Lakes Coastal Water Trail Working Group, convener
- Lake Erie Percid Management Advisory Group
- U.S. EPA Great Lakes Water Quality Agreement ANNEX 1 Situational Analysis Task Team
- Michigan Trails Advisory Committee Non-Motorized Advisory Workgroup
- MDOT Western Lake Erie Integrated Ecological Framework Transportation Advisory Committee
- St. Clair – Detroit River System Initiative

MARK BREEDERLAND

- Freshwater Roundtable, Grand Traverse Bay Region, past chair
- National Working Waterfront and Waterways Symposium Steering Committee
- National Working Waterfronts Network Executive Committee
- Great Lakes Water Levels Integrated Assessment Advisory Committee, University of Michigan
- Great Lakes Sea Grant Network Liquid Hydrocarbon Transportation Risk Committee
- Northwest Michigan Water Safety Network
- Northwestern Michigan College, Great Lakes Water Studies Institute Advisor
- Fishtown Preservation Society, Information & Education Committee
- Great Lakes Small Harbors Coalition, liaison

JAMES DIANA

- Monterey Bay Aquarium, Seafood Watch Science Advisory Board
- Cooperative Institute for Limnology and Ecosystem Research, Management Council
- North Central Regional Aquaculture Center, Research Technical Committee
- American Fisheries Society, Esocid Technical Committee, North Central Division
- Michigan Department of Natural Resources, Warmwater Regulations Committee
- Michigan Department of Natural Resources, Esocid Technical Committee

SANDRA ENNESS

- Great Lakes Coastwatch Steering Committee
- Michigan Catch & Cook Steering Committee, co-leader marketing and communications

SONIA JOSEPH JOSHI

- Great Lakes Beach Association Board
- Beach Health Interagency Coordination Team

RON KINNUNEN

- North Central Regional Aquaculture Center Extension Technical Committee
- Aquaculture in Michigan Committee
- Legends of the Lakes Cooperative Board
- Mackinac County Water Safety Review Team
- Native Planktivore Task Group of the Lake Michigan Technical Committee of the Great Lakes Fishery Commission
- National Aquaculture Extension Committee

ELIZABETH LAPORTE

- National Sea Grant Communications Network, past chair
- National Sea Grant Education Network
- National Sea Grant Hazards Team
- NOAA Rip Currents Outreach Team
- Michigan Water Safety Working Group, chair
- Michigan Clean Marina Foundation, president
- NOAA Weather Ready Nation Ambassador
- Great Lakes Sea Grant Communications Network
- University of Michigan Communications Network

ELYSEHANH LARSEN

- Society of Research Administrators International, member
- National Council of University Research Administrators, member
- Michigan Chapter Society of Research Administrators, member
- UM Best Practices for Large Complex Projects, Advisory Committee
- Network Advisory Council, committee member
- National Sea Grant Network Fiscal Officers (2010-2012), past vice-chair
- National Sea Grant Network Fiscal Officers (2012-2014), chair

DAN O'KEEFE

- Great Lakes Coastwatch Steering Committee
- Michigan Catch & Cook Steering Committee
- Lake Michigan Citizen Advisory Committee (DNR)
- Great Lake Panel on Invasive Species
- Grand Haven Salmon Festival Committee
- Great Lakes Fishery Commission and Wisconsin Sea Grant on Lamprey Hunters Monitoring Network, collaborator
- Great Lakes Offshore Wind Council, Public Engagement Workgroup
- MDNR Lake Michigan Fisheries Citizens' Advisory Committee
- Muskegon Lake Watershed Partnership, Habitat Committee
- Ottawa County Tourism Council
- Ottawa County Water Quality Forum Planning Committee

TODD MARSEE

- University of Michigan, School of Natural Resources and Environment Staff Rewards Committee
- National Sea Grant Webmasters Network
- University of Michigan Communications Network

CATHERINE RISENG

- Great Lakes Fishery Trust Habitat Steering Committee, co-chair
- North American Benthological Society
- University of Michigan, School of Natural Resources and Environment, Research Committee
- Ecological Society of America
- Washtenaw County Natural Areas Advisory Commission
- City of Ann Arbor, Greenbelt Advisory Commission, chair
- Great Lakes Water Quality Agreement 2012, Nearshore Framework Annex and Habitat and Species Annex Teams

BRANDON SCHROEDER

- Center for Great Lakes Literacy, Great Lakes Sea Grant Education Team
- Great Lakes Fisheries Heritage Consortium
- U.S. 23 Coastal Heritage Route Management Council
- DNR Lake Huron Fisheries Citizen Advisory Committee
- Great Lakes Stewardship Initiative (GLSI) and Northeast Michigan GLSI Network
- Northeast Michigan Collaborative Development Council
- Michigan Alliance for Environmental and Outdoor Education, past president
- DNR Negwegon-Rockport-Thompson's Harbor State Park Citizen Advisory Committee
- City of Alpena Wildlife Sanctuary Committee

STEVE STEWART

- National Sea Grant Education Network, executive committee and past chair
- MSU, All-University Awards Committee, Distinguished Staff Awards

ROCHELLE STURTEVANT

- IAGLR Outreach Committee, past chair
- Great Lakes Panel on ANS, Extension liaison
- Great Lakes Information Information/Education Committee
- Great Lakes Phragmites Collaborative, Steering Committee
- AIS Management Transition Board, Advisory Committee
- National Sea Grant Fisheries Extension Committee
- National Sea Grant Climate Network
- National Sea Grant Social Science Committee
- NOAA Education Regional Workgroup
- NOAA AIS Team

WILLIAM TAYLOR

- Great Lakes Fishery Commission, U.S. Presidential Appointment, U.S. Commissioner (alt)
- FAO-MSU Global Inland Fisheries Conference, chair
- Great Lakes Fishery Commission Board of Technical Experts, chair and state liaison
- Berkley Conservation Institute Conservation Leaders Advisory
- American Fisheries Society, past president council
- Great Lakes Fishery Trust, science advisory team

HEATHER TRIEZENBERG

- National Sea Grant Extension Assembly
- Great Lakes Sea Grant Extension Program Leaders Network
- Great Lakes Sea Grant Network Social Science Panel, member
- The Wildlife Society, Human Dimensions Working Group
- National Sea Grant Social Science Community of Practice
- NOAA Citizen Science Community of Practice

KEY PARTNERSHIPS AND EXAMPLES OF PROGRAM ENGAGEMENT

The Michigan Sea Grant mission is to support research, education and outreach to enhance sustainable use of Great Lakes resources, benefiting the environment, the quality of life, and the Michigan, Great Lakes and national economy. MSG envisions healthy and sustainable Great Lakes resources achieved through an integrated program that engages universities, as well as public and private sectors. Our partners are a key part of that vision.

Sea Grant works closely with NOAA and other Sea Grant programs, focusing efforts on critical Great Lakes issues central to NOAA's current and future needs. Our key partnerships with NOAA-GLERL, NOAA-NWS and NOAA-Coastal Storms have increased our capacity to leverage NOAA science, including new tools and technologies to focus on coastal hazards, sustainable communities and coastal ecosystems.

Our partnerships help us implement our strategic plan by addressing the goals and objectives of our focus areas. These connections also allow MSG to build and grow relationships at all levels — local, state, regional and national — with partners in academia, government, business and non-profit sectors.

Partnerships also help leverage MSG's funding. For example, in 2012, MSG research funds for one Integrated Assessment were matched by a $75,000 cash contribution from a collaborating foundation that helped identify the focal issue; and in 2014, three state agencies awarded $105,000 to MSG to support an Integrated Assessment on small harbor sustainability. Partners invested in MSG research help guide the project so the process and results ultimately improve the management of Great Lakes coastal resources.

Michigan Sea Grant also collaborates with tribal organizations and other federal agencies, such as USEPA, USGS and the USFWS, and with state agencies, such as the MDEQ and MDNR. Business and industry partnerships include the Michigan Boating Industries Association (MBIA) and the Michigan Charter Boat Association, as well as local decision makers and special interest groups, such as Sturgeon for Tomorrow.

Partnerships at a Glance:

- MSG routinely works with more than 500 partner organizations at all levels. That includes:
  - 164 government organizations
  - 56 industry and business organizations
  - 120 academic institutions
  - 125 non-governmental organizations
  - 21 other Sea Grant programs, including National Sea Grant
  - 5 Tribal associations
  - 24 other groups and organizations
- Because of existing relationships, expertise and an engaged constituency, MSG is often in a position to be the first organization to identify coastal issues of importance.
- Stakeholder and partner organizations regularly approach MSG with requests to address emerging coastal issues throughout the state and the Great Lakes region.

FEDERAL, NATIONAL AND INTERNATIONAL PARTNERSHIPS

MSG has partnered with many government, business, academic and non-governmental organizations at the federal and international level. For example, the organization routinely works with:

- 44 federal government agencies and organizations
- 5 international government agencies
- 11 national and international industry and business organizations
- 4 national and international NGOs
- 4 national and international academic institutions

Those organizations include NOAA-NWS, Department of Commerce, The Nature Conservancy; USFWS; Ontario Ministry of the Environment; Environment Canada; Fisheries and Oceans Canada; EPA; U.S. Army Corps of Engineers; National Association of Marina Industries; and many others.

Example: Habitat Restoration

The Huron-Erie Corridor Initiative received a 2013 Department of the Interior Partners in Conservation award, one of the highest recognitions bestowed on organizations by the U.S. Secretary of the Interior. (The HEC Initiative has since been renamed the St. Clair-Detroit River System Initiative.)

"These partnerships represent the gold standard for how Interior is doing business across the nation to power our future, strengthen tribal nations, conserve and enhance America's great outdoors and engage the next generation," said Secretary of the Interior Sally Jewell.

MSG is a founding member of the initiative's steering committee, which includes federal, tribal, state, provincial, local and non-governmental partners.

The projects have been successful. For example, many citizens have taken notice and have participated in several events surrounding the restoration and post-restoration assessment has found more than 14 native fish species, including lake sturgeon, lake whitefish and walleye are using the newly built reefs to spawn.

Michigan Sea Grant's Role:

- MSG has been the lead organization for three fish habitat restoration grants and is overseeing reef construction efforts at two additional sites.
- In total, MSG has managed more than $3.7 million to support the restoration and evaluation of fish spawning habitat in the St. Clair-Detroit River System.
- By the end of 2014, partners will have created nearly 10 acres of deep water, rocky spawning habitat for lake sturgeon, walleye and lake whitefish, helping boost populations.
- MSG also contributed group facilitation, conference planning, website development, research coordination, education and outreach, and grant management.

REGIONAL

Since Great Lakes issues do not stop at state borders, a collaborative, regional effort is needed to tackle concerns like water quality and invasive species prevention. MSG has been involved in and pioneered many key regional initiatives with a wide variety of regional partners.

Example: Great Lakes Clean Marina Network

MSG facilitated a regional collaborative network to bring together Great Lakes states' Clean Marina programs. The goal of Clean Marina programs is to help reduce or eliminate pollution from entering the Great Lakes through boating and marina activities in order to maintain or improve water quality.

The project has resulted in 69 Clean Marina certifications, approximately 5,000 best management practices implemented, and more than 2,200 individuals participating in Clean Marina workshops. EPA supported the work through the Great Lakes Restoration Initiative. Marina operators, representatives from regulatory agencies and others throughout the region joined the network.

STATE

MSG has strengthened partnerships across the state with industry and government groups, educational institutions and NGOs. For example, partners include the Michigan Boating Industries Association; MDEQ; MDNR; Northeast Michigan Council of Governments; Michigan Coastal Management Program (MDEQ); Michigan League of Conservation Voters; Michigan Steelhead and Salmon Fishermen's Association; Michigan Department of Agriculture and Rural Development; Michigan Department of Transportation; Michigan Association of Planning; Michigan State Board of Education and others.

Example: Examining the Aquaculture Industry

An MSG-funded assessment is effectively enhancing aquaculture in Michigan by providing new economic tools and a strategic plan, catalyzing collaboration among state agencies and industry and elevating the importance of aquaculture development among state legislatures.

The project produced a suite of strategies and tools, including detailed enterprise budgets for operations suited for Michigan's climate and resources, as part of the strategic plan.

As a result, thus far:

- Three state agencies signed a Memorandum of Understanding to work collaboratively to define roles and responsibilities for aquaculture development and formed a group to assist with new permit applications and regulatory issues.
- Two new bills were passed by the Michigan State Senate to provide tax breaks for new or expanded indoor aquaculture operations.
- Eight new aquaculture facilities were licensed in the past year (a 14% increase).
- Two new applications for discharge permits were filed for commercial-scale aquaculture operations.

LOCAL

With Extension educators positioned in coastal regions around the state, and a strong core team of research support, communications and education, MSG stays tuned in to the concerns of local leadership, businesses and citizen organizations.

MSG has partnered with more than 230 local government, industry, university, education, NGO, tribal and other groups on Great Lakes issues over the past five years. Those groups include: Thunder Bay National Marine Sanctuary and Underwater Preserve; Fishtown Preservation Society; Besser Museum for Northeast Michigan; Michigan Maritime Museum; Keweenaw Bay Indian Community; Michigan Technological University; Grand Valley State University; Torch Lake Public Advisory Council; Harrietta Hills Trout Farm; Watershed Center Grand Traverse Bay; Northeast, Eastern and Southeast Michigan Council of Governments; Northeast Michigan Great Lakes Stewardship Initiative; Oakland County Water Resources Commission; Huron-Clinton Metroparks Authority; U.S. 23 Heritage Route Committee; Calypso Charters; Bay Port Fish Company; Mackinac County Water Safety Review Team; Lake Huron Citizen Fishery Advisory Committee; Downriver Linked Greenways Initiative and many others.

Example: MSG Works with Partners to Restore Marshes

MSG partnered with several key organizations in order to eradicate invasive *Phragmites* strongholds from coastal areas along Lake St. Clair, a historically important marsh region. Actions included aerial spraying of herbicide and a prescribed burn to remove the dead stalks and allow native plant seeds to germinate in the restoration area. MSG undertook the *Phragmites* removal and education project with specialists from Huron-Clinton Metroparks, the MDNR and MDEQ, and Ducks Unlimited.

MSG and partners restored 864 acres of coastal marshes along the Lake St. Clair coast. Marsh plants and animals have begun to return to the area, including sensitive and threatened species. Anne Hokanson, a Great Lakes coastal wetlands ecologist for the MDEQ Water Resources Division, was recently quoted in the *Great Lakes Echo* as saying:

"The *Phragmites* removal is indeed a success story... Because multiple layers of ecology are all connected, you're going to have multiple benefits. For instance, *Phragmites* removal is focused on vegetation, but you're also going to get benefits to amphibians and reptiles, birds, and fish."

MSG helped plan the restoration, worked with natural resource professionals to help document the process during and after the removal, and executed outreach on the project.

> ***"As a co-operative agency working with Sea Grant on educational efforts for school and public participants, we are able to offer programs that would be nearly impossible for us to do otherwise. In other words, Sea Grant has enabled us to fulfill a key part of our educational mission."***
>
> ***— 2012 Stakeholder Survey Response***

> ***"Sea Grant is an ESSENTIAL partner working hand-in-hand with the USCG, DNR, MCBA and the general public in all matters concerning the welfare of the Great Lakes. It is, from what I have witnessed over 35 years of involvement in the Great Lakes fisheries, one of the most critical agencies we have to assist us."***
>
> ***— 2012 Stakeholder Survey Response***

IMPORTANT STAKEHOLDERS AND EXAMPLES OF ENGAGEMENT

For 45 years, Michigan Sea Grant has interacted with a broad range of Great Lakes stakeholders. Program specialists work to bring groups together to find common ground, as well as provide resources, bridge gaps and facilitate constructive and relevant solutions to address complex Great Lakes issues.

Michigan Sea Grant recognizes the need to have its programs represent and reach all Michigan citizens. To this end, research, outreach and education programs make special efforts to include non-traditional audiences.

Part of what makes the mission of MSG wonderful, yet challenging, is the scope and needs of the program's stakeholders. The audiences are wide and varied with different requirements and levels of involvement.

16 WAYS MICHIGAN SEA GRANT HAS ENGAGED STAKEHOLDERS

The heart and soul of Michigan Sea Grant is working with many different stakeholders. The MSG team ensures the work is relevant and useful to stakeholders by conducting needs assessment and constituent surveys and through a variety of other outreach efforts. The following 16 examples were highlighted because they show the scope of MSG's program.

1. MSG has been educating the public about dangerous currents in the Great Lakes by working with natural resource professionals, as well as developing lessons and a web portal that includes NOAA data for decades.
2. The Salmon Ambassadors program, developed by MSG, enlisted anglers to gather information on Chinook salmon caught over the course of a year, helping biologists understand how stocked and wild fish contribute to fishing success during the fishing season.
3. Twenty teachers from the Lake Huron watershed basin engaged in a week-long experience to explore coastal wetlands and native fish species using robotic tools. Teachers learned how to apply their new Great Lakes knowledge in the classroom.
4. MSG worked with a fisheries researcher to develop an online decision-support tool that has educated more than 200 fishery stakeholders about how climate change is likely to affect whitefish populations in the Great Lakes.
5. MSG facilitated the Great Lakes Fisheries Heritage Consortium of Michigan museums to broaden the preservation efforts of fisheries artifacts within the state.
6. To help charter operations meet food-handling requirements, MSG developed a seafood safety and handling training video based upon the U.S. Food and Drug Administration's Hazard Analysis and Critical Control Points principles.
7. MSG's leadership and collaboration in the development of a unique lake-to-plate tourism program provided continued economic growth to the state's charter fishing and restaurant industries, and was recognized by the state tourism industry as innovative and collaborative.
8. MSG's research is helping shape the careers of new professors and transforming the way university personnel collaborate and tackle complex real-world issues through Integrated Assessment research.
9. MSG-supported research found that unidentified sources of contamination still exist in the Torch Lake Area of Concern. The project combined environmental engineering and anthropological data to persuade authorities to work together and to address PCB contamination.
10. MSG developed a beach safety kit for parks with high incidence of dangerous currents along Lake Michigan to help save lives and create awareness of coastal hazards.
11. An MSG research project is helping the Grand Traverse Bay area understand and prepare for the likely impacts of climate change on their water resources, crops and waterfronts.
12. MSG developed a tool to address sustainable tourism development for Northeast Michigan. These communities recognize the economic potential of coastal tourism development but also worry about damage that could accompany an influx of visitors.
13. Outreach educators from the Great Lakes region participated in a training workshop to learn more about climate change and adaptation tools that could be incorporated into outreach.
14. MSG research led to improved water flows in a highly managed river system, and the modeling tools are being used in other similar river systems.
15. MSG helped Michigan's dwindling whitefish industry by supporting development of a cooperative that shifted focus from a single commodity to value-added products and increased earnings.
16. MSG worked with fisheries specialists to create an easier-to-read and more engaging version of *The Life of the Lakes* as a vehicle to build Great Lakes literacy throughout the region.

Collaborative Activities and Projects Involving Sea Grant, NOAA and other Agency Partners

REGIONAL ACTIVITIES AND PROJECTS

The lands and waters of the Great Lakes are like no other place. In a world where fresh surface water is increasingly in demand, the region contains 20 percent of it. The Great Lakes region is significant also because of the economic punch it provides the nation.

For example, 4.3 million recreational boats registered in the 8 Great Lakes states generate nearly $16 billion in spending on boating in a average single year. That spending directly supports 107,000 jobs, a figure that grows to nearly 250,000 when secondary impacts are considered.

With 83 million people, the region produced 27 percent of the gross domestic product and 24 percent of country's exports in 2009. The Great Lakes basin is home to 38 percent of the Fortune 500 companies and one of the largest concentrations of research universities in the world. Great Lakes colleges and universities award 32 percent of the nation's advanced science and engineering degrees, providing the human capital needed for innovation and entrepreneurship.

Overall, a Michigan Sea Grant analysis of economic data showed that more than 1.5 million jobs are directly connected to the Great Lakes, generating $62 billion in wages (based on 2009 data). The numbers are considered a conservative estimate because they only take into account direct employment related to the Great Lakes in manufacturing, tourism and recreation, shipping, agriculture, science and engineering, utilities and mining.

In addition, the Great Lakes region also has a strong cultural identity buoyed by the natural resources of the lakes, as well as the habitats they support. All of these pieces combine to form a strong bond, one MSG does not take for granted. As part of that connection, Michigan Sea Grant consistently works with regional NOAA offices and partners, as well as other Sea Grant programs, to address Great Lakes issues. MSG is part of the Great Lakes Sea Grant Network (GLSGN), which leads to collaboration on projects and other initiatives, including a meeting every two years to bring together the regional partners to discuss ongoing and new projects.

The following section identifies how we have worked together with our regional partners, including NOAA and other Sea Grant programs.

SUCCESS IN NATIONAL SEA GRANT COMPETITIONS

	2010	2011	2012	2013	TOTAL
John A. Knauss Marine Policy Fellowship	88,000	46,000	98,000	52,500	284,500
Coastal Management Fellows *		64,000	96,000	64,000	224,000
Great Lakes Commission - Sea Grant Fellows *	42,000	42,000	42,000	42,000	168,000
Totals	**$130,000**	**$152,000**	**$236,000**	**$158,500**	**$676,500**

**MSG placed candidates in these fellowships, but the funds did not flow through the program*

SUCCESS IN OTHER NATIONAL COMPETITIONS					
	2010	2011	2012	2013	TOTAL
Centers for Ocean Science and Education Excellence (NOAA and NSF)	654,880				654,880
Helping Marina & Harbor Operators Respond to Climate Change (NOAA)				49,999	49,999
Education/Outreach for the Great Lakes Marsh Restoration Project (USFWS)	80,000				80,000
Beach Safety Kits (NOAA – Coastal Storm)				10,000	10,000
Helping Marina & Harbor Operators Respond to Climate Change (NOAA)				49,999	49,999
Fishing Tournament Organizers & Professional Anglers: Extending AIS-HACCP & the Stop Aquatic Hitchhikers Campaign (NOAA)			26,006		26,006
Increasing Citizen Involvement & Improving Great Lakes Literacy through Training, Mentoring, Community-Building-Shore Workshops (NOAA)			30,602	34,699	65,301
HABS, Bacteria & Beach Quality Forecasting for the Great Lakes Ocean and Human Health Center (NOAA)			73,815	59,028	132,843
Monitoring & Forecasting Cyanobacterial Blooms for Public Health Protection and Response (NOAA)		68,028	33,563		101,591
Tipping Points Projects (NOAA)			21,821		21,821
Developing Great Lakes Literacy & Stewardship in Urban Southeast MI through the Great Lakes Education Program (NOAA – B-Wet)			35,600		35,600
2011 Great Lakes Charter Captains Survey (NOAA)			14,031		14,031
Connecting Huron-to-Erie Corridor Education & Research (USGS)		50,000			50,000
Understanding the Impact of GL on Regional (EPA)		14,906			14,906
Extreme Events Impacts on Water Quality in the Great Lakes (NSF)		11,813		195,511	207,324
Teaching with Great Lakes Science (GLOS)	75,000	30,000		31,891	136,891
Extending Regional Public Outreach Campaign – AIS (EPA – GLRI)		53,999			53,999

SUCCESS IN OTHER NATIONAL COMPETITIONS					
	2010	2011	2012	2013	TOTAL
Coordinated Onboard Education & Outreach (EPA – GLRI)			79,998		79,998
Great Lakes Sea Grant Network – Organisms in Trade Initiative – Research, Outreach and Education (EPA – GLRI)				25,200	25,200
Restoration native fish spawning habitat in the St. Clair Delta (Middle Channel) in the St. Clair River Area of Concern (EPA – GLRI – NOAA)	1,053,039				1,053,039
Green Marina Education & Outreach (EPA - GLRI)	478,262	213,590			691,852
Fish Habitat Restoration in the St. Clair River (EPA – GLRI – USGS)				1,613,244	1,613,244
Connecting Huron-to-Erie Corridor Education & Research (EPA – GLRI - USGS)		50,000			50,000
Fort Wayne Reef: Restoring Fish Spawning Habitat in the Detroit River (EPA – GLRI – NFWF)				799,226	799,226
Anchor Bay/St. Clair Flats Wildlife Phragmites Control Project (EPA – GLRI)				36,430	36,430
Beach Information Communication System (EPA – GLRI)		26,149			26,149
Coordinated Lake Specific On-Board Education and Outreach Project (CLOEOP) (EPA – GLRI)	93,309				93,309
A Comprehensive Regional Public Outreach Campaign on AIS (EPA – GLRI)		167,845			167,845
Microbial Source Tracking Technology for Improving Beach Monitoring for Bacteria Project (EPA – GLRI)				31,355	31,355
Bringing Great Lakes Science to the Classroom/ Lake Guardian and other Dynamic Professional Development Experiences to Strengthen the Educators/Scientists Community of Practice (EPA – GLNPO)		20,014	11,662	11,662	43,338
Totals	**$2,434,490**	**$706,344**	**$327,098**	**$2,948,244**	**$6,416,176**

In addition to the total national competitions listed above Michigan Sea Grant also received a total of $1,062,643 of non-competed funding.

SELECTED MSG REGIONAL AND MULTI-PROGRAM PROJECTS BY FOCUS AREA

Healthy Coastal Ecosystems

NOTE: From 2010-2013, Michigan Sea Grant included Great Lakes Literacy accomplishments and impacts in the Healthy Coastal Ecosystems focus area. As a result, the selected project examples below include educational efforts focused on healthy coastal ecosystems, as well as other focus areas and topics.

Project Examples:

- Partnered with the NOAA-NOS for an ecological forecasting initiative about harmful algal blooms, pathogens and hypoxia.
- Developed a nearshore habitat action plan for EPA-Great Lakes Restoration Initiative (GLRI).
- Developed an outreach and education program for the upper Trenton Channel site remediation in collaboration with USGS, EPA and Canada.
- Coordinated education and outreach about harmful algal blooms in western Lake Erie and Saginaw Bay.
- Coordinated a citizen science effort through the Great Lakes Sea Grant Harmful Algal Bloom Network.
- Contributed to EPA-GLRI Action Plan II for the Nearshore Health and Nonpoint Source Pollution Focus Area.

LITERACY AND STEWARDSHIP PROJECTS

- NOAA-COSEE-Great Lakes project supported teacher professional development through new curriculum resources and weeklong workshops, in collaboration with the GLSGN.
- NOAA-B-WET projects in northeast and southeast Michigan engaged citizens in Great Lakes science.
- Facilitated the Great Lakes Fisheries Heritage Consortium, expanding regional opportunities including partnering with the NOAA-Thunder Bay Marine Sanctuary.
- NOAA Fisheries Extension effort developed science-based classroom materials about Great Lakes fisheries, habitat, watersheds and other topics.
- Increased citizen involvement in training, community-building and place-based stewardship about the Great Lakes, in collaboration with the GLSGN and EPA.
- Promoted knowledge of Great Lakes science in partnership with the Center for Great Lakes Literacy in collaboration with the GLSGN.
- Increased boater education efforts by developing new tools through the Great Lakes Clean Marina Network, facilitated in collaboration with the GLSGN.
- Developed the Lake Erie Islands Water Trail.
- Identified Michigan's water trail priorities, challenges and opportunities.
- Developed Northeast Michigan Great Lakes Stewardship Initiative, a regional place-based education network to engage teachers and students.
- Performed Aquatic Invasive Species outreach and education, in collaboration with the GLSGN.
- Developed an interactive GIS-based mapping tool to engage citizens in collecting and sharing data, working with USGS and National Geographic Education.

Hazard Resilient in Coastal Communities

- Developed a regional Coastal Water Safety Network with NOAA (CZM, NWS), Minnesota and Wisconsin Sea Grants, securing state and federal funds focusing on distilling science (e.g., nearshore monitoring of rip events), changing policies and targeted public outreach.
- Leading climate impact on water quality outreach for multi-state/institution research project, supported by NSF.
- NOAA-Coastal Storms project to assist local governments in coastal hazard preparedness and resiliency planning, in collaboration with Minnesota Sea Grant.

Sustainable Coastal Development

- Partnership in the National Working Waterfronts Network of businesses, governments and communities, universities, Sea Grant and others to preserve and enhance working waterfronts in the nation.
- Clean Marina EPA-GLRI project increased the number of certified facilities in the region, provided consistent technical training about best management practices, and developed new public outreach tools about pollution prevention and recycling, in collaboration with the GLSGN.

Safe Sustainable Seafood Supply

- Organisms in Trade project to prevent the transport of AIS, in collaboration with the GLSGN.
- AIS-HACCP (Seafood Safety) Aquaculture Biosecurity in collaboration with North Central Regional Aquaculture Center (NCRAC) and GLSGN.
- Leading AIS-HACCP (Seafood Safety) Certification/ Verification Program in collaboration with the baitfish industries, NCRAC, University of Minnesota, Michigan Department of Agriculture and MDEQ.
- Seafood HACCP, in partnership with the Great Lakes Indian Fish and Wildlife Commission.
- Salmon Ambassadors Angler Science Program in partnership with Wisconsin Sea Grant.
- Great Lakes charter industry study and manuscript development with the GLSGN.
- Asian Carp Regional Coordinating Committee effort with the GLSGN.
- Fisheries Extension Network initiative with the GLSGN to enhance fisheries education and stakeholder outreach.
- Stop Aquatic Hitchhikers project with the GLSGN to consistently communicate methods to stop the spread of AIS through boating and other recreational activities.
- Tournament anglers in collaboration with Wisconsin Sea Grant and the National Sea Grant Fisheries Extension Committee.

Program Changes Resulting from Previous Review

RESPONSE TO PREVIOUS SITE REVIEW OF APRIL 15-16, 2010

As a result of the last site visit, one recommendation and four suggestions were provided. Here we respond to the one recommendation as suggested in the briefing book guidance. The recommendation involved better tracking of the academic success of university researchers funded for IAs, particularly focused on their success in tenure and other university decisions.

This is somewhat difficult to analyze due to small sample size, but all indicators we can evaluate demonstrate that the faculty involved have been equally or more successful in their careers than their peers who have not done IAs at a number of Michigan universities. Here we will limit our analysis to those main investigators who proposed each project and were associated with a university.

On the promotion issue, since inception of IAs, there have been 17 researchers who were principal or co-principal investigators. These include two who have now had two different funded projects. These faculty members span the faculty ranks — with six Professors, two Associate Professors, five Assistant Professors, one Aquaculture Extension Specialist and three Research Associates. All but one of these faculty members remain employed at their original universities (one left to become a Program Director at Arizona State University), indicating at least that there have been no dismissals due to poor performance.

Four of the Assistant Professors (Erik Nordman, Donna Kashian, William Welsh and Robert Jones) have been promoted to Associate Professor with tenure since they completed their IA project indicating early academic success. One researcher (Christine Vogt) was promoted from Associate Professor to Professor after completing the project, while another (Dan McCole) is currently being considered for promotion to Associate Professor with tenure. Two of them applied once again and have been granted another MSG-funded project, indicating their satisfaction with the IA process and willingness to do another project.

One researcher (Erik Nordman) was given a Fulbright Fellowship to continue his work on wind energy. We have not collected statistics on subsequent funding of projects after completion of an Integrated Assessment, but know that several researchers have used these projects to leverage further funding in interdisciplinary programs. These results are another indicator of academic success.

IA are also gaining recognition in peer-reviewed publications. Four of our researcher groups (Donna Kashian, Erik Nordman, Christine Vogt and Alan Steinman) have published their IA results in *Freshwater Science*, *Integrated Environmental Assessment and Management* and J*ournal of Park and Recreation Administration*, while the *Journal of Environmental Studies and Sciences* published work done on IAs written by MSG staff. This list does not include other publications that emerged from these studies, but did not evaluate the entire assessment. These and other new journals are recognizing the importance of science application and the usefulness of IA in sustainability research.

It is also difficult to quantitatively evaluate how universities in our state accept the concept of IA as academic achievements. The expansion of IA at the University of Michigan — including projects in several schools and colleges — indicates that this is becoming a common academic product.

Promotions of faculty who were funded by MSG have occurred at four out of seven universities funded, again indicating more widespread acceptance of the academic rigor of IAs. Multiple faculty members have been funded at Michigan State University, Wayne State University, Grand Valley State University and Eastern Michigan University, again indicating that faculty members consider IAs a valuable research tool and seek funding for these projects to further their careers. It appears universities are becoming more willing to consider academic achievements from IAs, as well as from more traditional research, and that this is spread across a number of campuses in Michigan.