

Michigan Sea Grant Strategic and Implementation Plan 2010 through 2013

University of Michigan and Michigan State University

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INTRODUCTION

Mission:

Michigan Sea Grant supports research, outreach, and education to enhance the sustainable use of Great Lakes resources to benefit the Michigan, Great Lakes and national economy, the environment, and quality of life.

Our vision is healthy and sustainable Great Lakes resources achieved through an integrated program that engages universities, public and private sectors.

Program Administration and Management

Michigan Sea Grant is a cooperative program of University of Michigan and Michigan State University. It is part of the National Sea Grant College Program, a network of 30 university-based programs in coastal states across the country. The Michigan Sea Grant College Program (Sea Grant) receives core funding from National Sea Grant within the National Oceanic and Atmospheric Administration (NOAA). Matching funds come from the University of Michigan, Michigan State University, other Michigan universities and other non-federal sources. The Sea Grant Management Team receives guidance from three primary sources: the Advisory Committee, the Executive Committee, and Sea Grant constituents.

Management Team:

Day-to-day operational decisions are made by a four-person Management Team, which consists of two representatives each from the University of Michigan – Director and Assistant Director, and Michigan State University – Associate Director and Extension Program Leader.

Michigan Sea Grant Advisory Committee:

Acting upon a recommendation from the last program evaluation, the Management Team restructured the Policy Committee into an Advisory Committee to take better advantage of strong constituent support. To ensure broad programmatic and geographic representation, Management Team sought input from program staff to identify committee members that would include linkages to our partners' existing councils such as Michigan State University Extension. The Advisory Committee is, therefore, composed of key client stakeholders and senior university administrators. The Advisory Committee provides strategic advice, guidance and feedback on existing and future programs and specific feedback on our Strategic Plan. Advisory Committee members serve as program advocates by identifying opportunities for collaboration and support, both internal to the member's organizations and external to them, particularly with state and federal agencies and legislators. The Advisory Committee is co-chaired by the Vice Presidents for Research of the University of Michigan and Michigan State University.

Michigan Sea Grant Executive Committee:

The Executive Committee is a subset of the Advisory Committee, composed primarily of university administrators and constituent representatives. The Advisory Committee is able to act in lieu of the full Committee when necessary. The Executive Committee provides tactical and operational guidance to the Michigan Sea Grant Management Team.

Sea Grant Constituents:

Michigan Sea Grant interacts with a wide-variety of individuals and organizations that work, live and play on Michigan's coasts. Ranging from business owners to local, state and tribal government officials,

these constituents are the people with whom Sea Grant extension educators, communicators and Management Team work on a daily basis. Meeting the needs of these coastal constituents is Sea Grant's primary mission and daily engagement ensures that programs and projects are planned to meet constituent needs. Additionally, the program seeks periodic formal input, e.g., via regional focus groups or surveys, from this broad group to ensure that program direction continues to meet the needs of most constituents.

Integrated Assessment

Over the past four years, 2005-09, Michigan Sea Grant has fully integrated research with outreach and education functions through the development of an Integrated Assessment program. Integrated Assessment (IA) involves a comprehensive analysis of natural and social scientific information in the context of a specific policy or management question. The purpose 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 IA 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.

In 2006 Sea Grant directed all available competitive research funding toward IA projects that addressed particularly challenging coastal resource management and/or policy issues identified by partners from local, state and federal management agencies. During each biennial proposal cycle Sea Grant personnel engage with local, state and regional decision-makers, other program constituents and Sea Grant extension educators to identify a suite of issues that can be addressed by IA. The specific projects that Sea Grant research will support is therefore very fluid and dependent upon the needs identified by our constituents, extension educators and other regional leaders at any point in time.

Addressing Emerging Issues

Michigan Sea Grant is able to respond quickly and efficiently to rapidly changing issues and circumstances. Issues are identified through collegial and other professional contacts as well as from field educators who provide input based on their interaction with constituents. Michigan Sea Grant personnel scan existing and developing circumstances to ascertain how conditions have evolved and assess which issues can be best addressed through research, education, and outreach. The Management Team considers emerging issues at monthly meetings and initiates programs and activities to address them. New initiatives might include establishing a task force to analyze specific priority issues; preparing policy briefs to enlist the support and resources necessary to further address critical issues; inviting research proposals to evaluate issues identified in the scanning process; and mobilizing public awareness and understanding of the issues as they evolve. Throughout, Sea Grant staff work closely with other agencies, organizations, and institutions as Great Lakes issues emerge and needs are identified.

Strategic and Implementation Planning Process

The program's strategic and implementation plan is developed in consultation with technical and scientific experts, managers, and policy makers who help identify priority issues for which Michigan Sea Grant has particular capabilities. Sea Grant staff members, Management Team and Advisory Committee review the strategic plan and offer input. The Sea Grant Staff provide additional focused effort on the implementation plan, offering specific strategies and measurable objectives to reach program goals. The program is formally reviewed every four years through the National Sea Grant College Program.

Work on this strategic plan began in July 2008 with a program-wide retreat where staff members discussed initiatives they developed in response to Management Team's decision to focus on economic development over a two-year period. There was considerable high-level discussion related to program direction and potential action areas for the strategic and implementation plan. A strategic planning sub-committee consisting of the assistant director, extension program leader and communication director and education co-leader developed a constituent survey in December 2008. This survey will serve as a base-line and be repeated every four years. The survey was based on the focus areas and goals of the National Sea Grant College Program Strategic Plan. Sea Grant personnel identified a broad range of constituents to survey and the survey was administered between January and March 2009; summary results are presented below. Based on constituent input, as well as requirements for strategic plan alignment provided by the National Sea Grant College Program (NSGCP), the sub-committee drafted this strategic and implementation plan. They sought and incorporated input from the program's Management Team, program staff and the program's Advisory Committee.

Constituent Survey:

Commencing in late January, 1,472 constituents, identified by Sea Grant educators and Management Team, were sent a post card, with information about accessing the web-based survey. Two follow up reminder emails (late February and March) were sent to the initial non-respondents, for whom we had valid email addresses (550). Sea Grant continued to collect survey results until March 31. A total of 313 individuals completed the online survey, resulting in a response rate of 20.9%. Additionally, Sea Grant collected ten unsolicited survey responses from individuals who had accessed the program website for other reasons. Since there was no significant difference between the unsolicited and solicited responses, all were included in the survey totals.

Survey questions were designed to gather input about our strategic plan. We devised questions to ascertain the level of importance our constituents placed upon issues reflective of the four NOAA-NSGCP Focus Areas, as well as several cross-cutting themes, including: climate change, ocean literacy, and informed decision making. Respondents were asked to indicate their agreement or disagreement with a series of statements describing important Michigan coastal and Great Lakes issues. A scale of 1-4 (1 = strongly agree, 4 = strongly disagree) was used to obtain a numerical value for each response.

All focus areas and cross-cutting themes were well received by Michigan constituents. The average response ratings ranged between 1.30 and 1.94, indicating that respondents agreed with the issues summarized by Sea Grant. Respondents indicated that these issues were important to them individually and appropriate for Michigan Sea Grant to address. For every issue area, a minimum of 83% of the respondents agreed or strongly agreed that it was an important coastal issue (Table 1).

Based on the responses summarized in Table 1, there appears to be significant constituent support for Michigan Sea Grant's work in all national focus areas and cross-cutting themes. The results are not

surprising, since Michigan Sea Grant has a long history of involvement with these issues and constituencies. Sea Grant’s investment in previous, similar activities demonstrates the capability of the program to continue or strengthen involvement in these focus areas.

Survey Question/Statement	Focus Area or Theme	Average Response (1= strongly agree)	Percent Agree
1. Competing stakeholder interests often get in the way of solving Michigan's coastal/Great Lakes problems. Sea Grant can contribute to the reduction of conflicts between stakeholders .	Cross Cutting	1.77	95%
2. Understanding the connection between the Great Lakes ecosystem and the economic sustainability of Michigan's coastal communities is essential. Sea Grant can increase decision-maker awareness of this interrelationship.	Sustainable Communities	1.40	100%
3. The introduction of invasive species has disrupted the Great Lakes ecosystem and unfavorably impacted beneficial uses of Michigan's coasts. Sea Grant should promote education about the need to adapt to these ecosystem changes.	Healthy Ecosystems	1.30	99%
4. Lingering questions about the safe consumption of Great Lakes fish have hampered the growth of sport and commercial fisheries that are important to Michigan. Sea Grant can help build and diversify markets for fish by providing consumer education about healthy seafood choices.	Safe Seafood	1.65	92%
5. Climate change has profound impacts on Michigan and the Great Lakes. Sea Grant can assist in identifying these climate impacts to inform decision-making and should provide tools to help ensure that climate change is incorporated into coastal community planning.	Cross Cutting	1.74	89%
6. Michigan's coastlines can be dangerous for those who recreate or work near the Great Lakes. Sea Grant should play a role in better equipping stakeholders with the information about avoiding coastal hazards (e.g., rip currents, fishing nets).	Hazard Resiliency	1.94	83%
7. Stewardship implies an understanding about Michigan's coastal Great Lakes resources, the impact an individual has on these resources and what one can do to encourage the wise use of coastal resources. Sea Grant's efforts should promote enhanced individual stewardship of Michigan's coasts and the Great Lakes.	Cross Cutting	1.44	98%
8. The loss of critical coastal habitat , including wetlands, fishery habitat, natural watersheds and sand dunes is negatively impacting Michigan's resources. In order to restore or sustain these resources, Sea Grant should contribute to education to enhance understanding about critical habitats.	Healthy Ecosystems	1.39	97%
9. The development of alternative energy sources is critical to Michigan and the nation. Currently, there are proposals to locate alternative energy facilities in the Great lakes region. Sea Grant should use its expertise to support well-informed decision-making about the location of such facilities in Michigan's coastal areas.	Sustainable Communities	1.48	96%

Table 1. Results from each strategic direction question, including the relevant theme, weighted average, and percent of respondents who agreed or strongly agreed (n=313).

Program Evaluation and Assessment

Evaluation and assessment are ingrained in program planning, implementation and management. The program utilizes a wide range of appropriate approaches and technologies to monitor implementation success. Sea Grant staff have developed a comprehensive evaluation plan for documenting the impacts of our work, identifying areas where we can improve our services, and ensuring that we continue to be responsive to our constituent needs.

Every four years, in advance of undertaking the next iteration of strategic planning, Sea Grant plans to conduct a comprehensive constituent survey about Sea Grant's focus, program areas, and impacts. This survey will be based upon the survey administered in 2009 and modified, as necessary, to reflect current national and/or state-specific needs but retaining enough material from the original survey to allow for the development of trend analyses. Building on our success with this approach, Sea Grant staff will annually evaluate a program or constituency in the intervening years. The methods employed will be modified to match the desired outcomes of the program area, for example an online survey of teachers using Sea Grant's curriculum, or an analysis of the professional networks before and after an Integrated Assessment project. The results of these surveys will provide additional performance measures.

Michigan Sea Grant's evaluation strategy includes assessment of several types of impacts anticipated along a logical progression. Program activities are designed to promote the knowledge and attitudes that will lead to behavior changes. Without tangible changes in knowledge and behaviors the program cannot achieve quantifiable end results. Therefore, it is critical to evaluate acquisition of knowledge and behavior changes, as well as to measure quantifiable end results in order to evaluate program performance. For example, Sea Grant consistently surveys all teachers participating in the ship and classroom based Great Lakes Education Program and all adults attending the Summer Discovery Cruises. Because 80% of teachers and approximately 15% of the adults are returning to these programs, we are able to ask questions about possible changes that resulted from past participation as well as. These results help demonstrate program impacts and improve future program activities.

Alignment with the National Sea Grant College Program Strategic Plan

While the current strategic plan was under development, the National Sea Grant College Program instituted an alignment process designed to align strategic plans for all the state programs with the national plan. As a result, the strategic plan sub-committee chose to follow the National Sea Grant Strategic Plan very closely when developing goals, strategies and implementation actions. In most cases, the language for goals and strategies was adopted directly from the National Plan with only those changes necessary to reflect on-the-ground realities in Michigan. The Michigan Sea Grant Strategic Plan therefore closely aligns with the national plan.

This four-year (2010-2013) ***Strategic and Implementation Plan*** outlines the strategies Sea Grant will follow to address the following cross-cutting goals and focal areas:

- The three *cross-cutting goals* are: development of sound scientific information, facilitation of an informed public, and support for inclusive decision-making processes.
- The four *strategic focus areas* are: healthy coastal ecosystems, sustainable coastal development, safe and sustainable seafood supply, and hazard resilience in coastal communities.

Within each cross-cutting goal and strategic focus area, the plan describes how Sea Grant's programs will achieve the desired outcomes and measure success within this area. The following elements are outlined in this Strategic and Implementation Plan.

Goals: The desired future conditions for Michigan's ecosystems and communities. These goals closely mirror the national strategic plan.

Strategies: The principles used by Michigan Sea Grant to design program activities and develop objectives. These strategies reflect the unique needs and opportunities of Michigan.

Measurable Objectives: Specific, measurable, achievable, realistic and time bound objectives or actions that Sea Grant staff will complete in order to reach identified desired outcomes.

Outcomes: The anticipated results of the proposed strategies and programmatic activities. The outcomes are specific to Michigan and are aligned with the national Sea Grant program outcomes.

Performance Measures: Specific measures that Michigan Sea Grant will track on annual basis to evaluate the extent to which Sea Grant activities are resulting in actual impacts for Michigan's ecosystems and communities. These measures are aligned with the eleven performance measures used by the National Sea Grant College Program to monitor and demonstrate the impacts of all program activities.

CROSS-CUTTING GOALS

Sea Grant's core activities are research, education and outreach, which are employed through an integrated approach to achieve the desired outcomes. The cross-cutting goals influence our core program activities within each focus area. The cross-cutting goals, as outlined in the national strategic plan, are directly relevant to Michigan's needs. Managing coastal and Great Lakes resources in ways that balance human needs with environmental health requires progress in three fundamental areas:

1. Better information about how Michigan's coastal and Great Lakes ecosystems function and how human activities affect our coastal and Great Lakes habitats and living resources;
2. Citizens who understand the complexities of coastal environments and the interactions between human use and the health of coastal ecosystems;
3. Management and decision-making processes that are based on sound information, involve everyone who benefits from the beauty and bounty of Michigan's coastal resources, and include mechanisms to evaluate trade-offs between human and environmental needs.

Goal A: Develop sound scientific, including economic, information to:

- 1. Advance understanding of the nature and value of coastal and Great Lakes resources to the Michigan economy;**
- 2. Identify new ways to conserve and use these resources;**
- 3. Support evaluation of the environmental impacts and socio-economic trade-offs involved in coastal decision-making, and**
- 4. Assist in Michigan’s economic transformation.**

Strategies	Measurable Objectives	Outcomes
<ul style="list-style-type: none"> • Support interdisciplinary research teams that incorporate natural science, social science and policy analysis to evaluate pressing questions related to Michigan’s coastal and Great Lakes resource conservation, use, and management (i.e., Integrated Assessment). • Encourage Integrated Assessments and other Sea Grant programs to evaluate both ecological and socio-economic trade-offs and assess risks to the future health and productivity of Michigan’s coastal and Great Lakes resources. • Collaborate with researchers engaged in Integrated Assessments to strengthen partnerships between researchers, resource managers, and decision makers, ensuring that each project invites the participation of a full range of stakeholders and the results are relevant to decision making. • Integrate, translate, and disseminate research findings, technological discoveries and decision-support tools to the citizens, industries, and leaders who need them to capitalize on opportunities and make wise management decisions. 	<p>Beginning in 2009, all new Integrated Assessment projects will include relevant socioeconomic data and analyses in their final report.</p> <p>Each Integrated Assessment project will result in the implementation of at least one new policy or action within four years of the project end date. The policies and actions are unique to each project and are identified by stakeholder during the assessment. Potential policies or actions might include a new ordinance, regulatory change, business initiative, or coordinated approach to resource management.</p>	<p>Increased public understanding of the environmental and socio-economic trade-offs involved in coastal decision-making.</p> <p>Increased availability of information and tools to evaluate ecological and socio-economic trade-offs involved in coastal decision-making.</p> <p>Increased use of scientific and socio-economic information and tools in coastal decision-making.</p>

Performance Measures – Science to Support Decision Making

1. Number of agency divisions supporting IA process, e.g., by providing project ideas, feedback on the RFP and reviews of pre-proposals.
2. Number of projects and programs including socio-economic analyses.
3. Number of actions and policies implemented as a result of an Integrated Assessment.

Goal B: An informed Michigan public that understands the value and vulnerability of coastal, ocean, and Great Lakes resources; a public that demands science-based decisions about the conservation, use and management of these resources; and a well-trained workforce that will make this a reality.

Strategies	Measurable Objectives	Outcomes
<ul style="list-style-type: none"> • Collaborate with NOAA and other local, state, federal, tribal and regional partners to build public awareness about critical coastal and Great Lakes issues using the integrated research, outreach and education capacities of Sea Grant’s network. • Evaluate and improve learning opportunities for Michigan’s students, including the Great Lakes Education Program, Summer Discovery Cruises, 4-H Great Lakes Camp, and the Life of Lake Superior Camp. • Use Sea Grant’s university partnerships to develop information products and training opportunities that will help build Michigan’s workforce capacity for coastal-related jobs and professions. • Encourage more teaching of Great Lakes content by providing teacher training opportunities and improving Sea Grant’s curriculum resources, including Fisheries Learning on the Web and Teaching with GLOS. 	<p>By 2010, Michigan Sea Grant will complete the development of the GLOS curriculum website.</p> <p>By 2013, the Great Lakes Education Program curriculum will be updated and aligned to the State of Michigan’s Content Expectations (educational benchmarks and standards).</p> <p>By 2013, K-12 educators in Michigan will be more aware of aquatic science resources and how to incorporate Great Lakes content into their classrooms, as evidenced by a 15% increase in the number of Sea Grant curriculum resource downloaded or requested, compared to 2008 levels.</p> <p>When surveyed after a program, 50% of adult learners and students will demonstrate increased awareness of Great Lakes issues and 25% will exhibit positive behavioral changes as a result of participating in the Summer Discovery Cruises, Great Lakes Education Program, Great Lakes 4-H Camp and other Great Lakes events.</p>	<p>Increased public understanding Great Lakes resources and the steps individuals can take to conserve and wisely use coastal, Great Lakes and environmental resources.</p> <p>Improved teacher access to valuable information on Great Lakes research, coastal environments and current issues.</p> <p>Increased opportunities for youth to learn about the Great Lakes and develop skills and interests related to Great Lakes careers</p>

Performance Measures – Great lakes Literacy

1. Number of participants in Summer Discovery cruises.
2. Feedback from participants in Summer Discovery cruises.
3. Number of print and online publications distributed annually.
4. Number of subscribers to upwellings newsletter.
5. Number of pageviews to Sea Grant website. (See appendix two for details.)
6. Number of media pieces that highlight Sea Grant outreach and education initiatives, as well as funded research.
7. Number of participants in Sea Grant-led workshops (reported based on which focus area addressed).
8. Number of curriculum resources downloaded per year (e.g., Fisheries Learning on the Web).
9. Number of Michigan teachers that participate in professional development opportunities through the Fishery Trust-funded program.
10. Feedback from teachers about Sea Grant programs and resources (e.g., curriculum, classroom products)
11. Number of K-12 students participating in Great Lakes Education Program cruises
12. Number of K-12 students participating in Great Lakes 4-H camp.

Goal C : Decision-making processes that involve the full-range of coastal interests, that integrate efforts of public and private partners at the federal, regional, state, and local levels, and provide mechanisms for establishing common understandings and generating outcomes that balance multiple interests.

Strategies	Measurable Objectives	Outcomes
<ul style="list-style-type: none"> • Strengthen partnerships by promoting an integrated, socio-economic and natural-science-based approach to the toughest coastal resource issues in order to support more effective and integrated coastal decision-making. • Use Sea Grant’s research, outreach, and education capabilities to encourage and support the creation of public decision-making processes that minimize overlap, maximize effectiveness, and provide an integrated response to coastal problems and opportunities. • Build consensus on complex issues such as coastal land use, energy development, public access, invasive species control, and climate change impacts by building broader understanding among various constituency groups, and convening diverse groups of stakeholders to work together to find common solutions. • Bring constituencies together to address common issues, linking potentially impacted individuals and communities with decision-making processes. 	<p>By 2011, Sea Grant will begin at least one new initiative tackling a controversial issue (e.g., cormorants).</p> <p>By 2012, at least seven Sea Grant funded Integrated Assessments will be sponsored by a state or local government partner and will engage the full range of affected individuals and constituents.</p> <p>By 2014, at least one additional integrated assessment will be funded primarily from outside sources.</p>	<p>All decision making in which Sea Grant is involved or supporting will involve the full range of coastal interests, integrating public and private partners, using mechanisms to establish common understanding and generating outcomes that balance multiple interests.</p> <p>Michigan citizens, through their legislative representatives and agency decision makers, will seek out Sea Grant personnel and Sea Grant developed information to support science based decision-making.</p>

Performance Measures – Inclusive Decision Making

1. Number of Sea Grant funded Integrated Assessments sponsored by a state or local government.
2. Percentage of constituents reporting Sea Grant supported collaborations resulted in positive outcomes, including new policies, partnerships and learning, during the comprehensive constituent survey.
3. Number of new Sea Grant initiatives tackling a controversial issue (e.g., cormorants).
4. Number of additional integrated assessment funded primarily from outside sources.

HEALTHY COASTAL ECOSYSTEMS

Healthy coastal ecosystems provide the foundation of life along the coast. However, rapid coastal development and other human activities often lead to water quality degradation, wetlands loss, decline of fisheries, proliferation of aquatic invasive species, and a host of other challenges that need to be understood in order to restore and maintain these ecosystems. Ecosystem functioning does not respect traditional political boundaries, and responsible management of ecosystems requires new kinds of thinking and actions.

Goal 1.1: Widespread use of ecosystem-based approaches to manage land, water and living resources in coastal areas.

Strategies	Measurable Objectives	Outcomes
<p>Beach Health: Establish a mechanism and metrics to assess the benefits and impacts of coastal water quality and harmful algal blooms; and connect stakeholders with public health officials.</p>	<p>Beginning in 2010, Sea Grant will offer annual workshops for West Michigan beach managers and stakeholders to help them better understand the dangers of HABs and utilize the available tools for forecasting beach water quality. (Four workshops over four years.)</p> <p>By 2011, Sea Grant will develop a mechanism and metrics to assess the benefits and impacts (e.g., public health risk) of coastal water quality.</p>	<p>MSG constituents will have a variety of ways of planning, implementing, evaluating and improving ecosystem-based approaches to managing their use of Great Lakes coastal resources.</p>
<p>Promoting Best Practices: Promote, participate in, and facilitate initiatives, forums and integrated assessments designed to improve ecosystem-based management and sound decision making about Great Lakes natural resources.</p>	<p>During our comprehensive constituent survey conducted every four years, state agencies and other organizations will report that Sea Grant's collaborative work resulted in positive outcomes, including partnerships, new policies and better management decisions. (First survey in 2009, next survey 2013)</p>	<p><i>(More Under Cross-Cutting Goal A)</i></p>
<p>Observing Systems: Support the development of regional coastal observation systems, and other collaborative efforts that advance our capability to predict the effects of human activities and environmental changes on coastal resources, in order to take steps to mitigate their effects.</p>	<p>By 2010, the Sea Grant Coastwatch website will expand to provide information about real time coastal conditions, utilizing a variety of observation-based tools and NOAA products, designed to support recreational and commercial boating.</p> <p>By 2011 a Great Lakes Observing System (GLOS) implementation plan that includes contributions from Michigan Sea Grant personnel and constituents will be in place.</p>	

Focus Area 1: Healthy Coastal Ecosystems

<p>Great Lakes Awareness: Provide life-long learning opportunities for people of all ages that enhance understanding of coastal, ocean and Great Lakes environments and promote stewardship of healthy ecosystems.</p>	<p>By 2013, there will be a fifteen percent increase in the annual number of Sea Grant publications distributed compared to the number distributed in 2008. (116,000 were distributed in 2008.)</p> <p><i>(More Under Cross-Cutting Goal B)</i></p>	<p>Michigan residents, coastal industries and resources managers will understand coastal and Great Lakes environments and the need for stewardship of healthy ecosystems.</p>
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Goal 1.2: Restored function and productivity of degraded ecosystems.

Strategies	Measurable Objectives	Outcomes
<p>Habitat Restoration: Work with tribal, federal, state, local agencies and non-governmental organizations to promote coastal habitat restoration by fostering greater dialogue among stakeholders, providing educational and technical support, and facilitating collaborations that can effectively lead restoration efforts.</p>	<p>By 2011, Sea Grant will begin holding annual meetings to update stakeholders about the progress of Huron Erie Corridor fish habitat restoration efforts.</p> <p>By 2011, annual stakeholder meetings will have participation from a broad range of local, state/provincial, tribal, and federal partners as a result of Sea Grant's outreach efforts.</p> <p>By 2011, Sea Grant facilitated meetings about the restoration of Lake Herring to Lake Huron will include resource managers and recreational and commercial fisherman.</p> <p>By 2011, new web-based materials and <i>upwellings</i> articles will be available about restoration and the importance of key habitat types for both ecological and economic health.</p> <p>By 2013, native fisheries restoration efforts will take place in at least three Michigan river systems designated as Areas of Concern.</p>	<p>MSG constituents will be able to prioritize ecosystem restoration opportunities, have access to science-based restoration techniques, and be able to form effective multi-sectoral partnerships to implement restoration projects.</p>
<p>River Restoration: Support an Integrated Assessment intended to identify new approaches for restoring natural flows within a dammed river system.</p>	<p>By 2013, the Clinton River Integrated Assessment will complete an evaluation of ways to restore a more natural flow regime, and Sea Grant will identify opportunities to support the implementation of new ideas.</p>	

Performance Measures – Healthy Coastal Ecosystems

1. Number of beach managers that participate in harmful algal bloom and beach forecasting workshops.
2. Number of stakeholders who attend Sea Grant fishery workshops and Huron-Erie Corridor meetings.
3. Number of municipalities and/or lake communities promoting new lake level regulations as a result of involvement in the Clinton River integrated assessment
4. Number of Areas of Concern where Sea Grant has helped develop or implement fishery restoration projects.
5. Number of restoration projects supported or coordinated by Michigan Sea Grant.

SUSTAINABLE COASTAL DEVELOPMENT

Various regional efforts have examined the importance of Great Lakes ecological vitality in connection to its economic health.¹ A study by the Brookings Institution pointed out that “the bi-national Great Lakes region can continue to model what economic regions will look like in the global economy—and also how they can thrive. To realize this vision will require leadership and purposeful actions that acknowledge the unique opportunities provided by the Great Lakes economy.”² Fundamental rethinking and re-evaluation of the importance of the Great Lakes to the future economy of Michigan makes it increasingly important that we protect and preserve the coastal resources that will provide the infrastructure for the new economy. Rethinking Michigan’s coastal economies lays the groundwork for retaining and creating Michigan jobs. New economic development in the state will be closely linked to quality of life and the quality of Michigan’s coastal resources. Lieutenant Governor John Cherry’s emphasis on “green jobs for blue waters” while focusing on the water technology sector, is a good example of this concept. Michigan Sea Grant can use collaborative and cooperative methods to bring the coastal communities, agencies, and businesses together to understand the essential relationship between the integrity of Great Lakes, coastal resources, and a sustainable future economy.

Sea Grant implemented a program-wide initiative, *Enhancing the Economic Vitality of Michigan’s Coastal Communities*, for the two-year period fiscal year 2009 and 2010. Through this effort, Sea Grant is working with Michigan’s leaders to balance the need for economic development with the need to maintain the integrity of the state’s natural resources. Sea Grant outreach personnel have developed educational initiatives focusing on sustainable coastal community economic development. These efforts are tailored to meet the needs of specific constituencies and/or regions and to inform decision making about natural ecosystems and communities.

These sustainable development activities help address the goals of all four focal areas and provide a common focus for many of Sea Grant’s research, education and outreach activities. This effort also complements the five strategic priorities developed by Michigan State University Extension targeting critical issues identified by Michigan residents:

- Developing Entrepreneurs;
- Preparing for the expanding Bioeconomy;
- Educating and Supporting decision makers;
- Building leaders for Today and Tomorrow; and
- Promoting Healthy Lifestyles.

¹ Great Lakes Regional Collaboration. 2005. “The Great Lakes Regional Collaboration Strategy to Restore and Protect the Great Lakes.” (downloaded 6-1-09 from, http://www.glrc.us/documents/strategy/GLRC_Strategy.pdf)

² John Austin, Elaine Dezenski and Britany Affolter-Caine, “The Vital Connection: Reclaiming Great Lakes Economic Leadership in the Bi-national US-Canadian Region,” Great Lakes Economic Initiative for the Metropolitan Policy Program at Brookings, March 2008 (downloaded 5-13-09 http://www.brookings.edu/~media/Files/rc/reports/2008/0324_greatlakes_canada_austin/greatlakes_canada.pdf).

Focus Area 2: Sustainable Coastal Development

Goal 2.1: Healthy coastal economies that include working waterfronts, an abundance of recreation and tourism opportunities, and coastal access for all citizens.

Strategies	Measurable Objectives	Outcomes
<p>Coastal Businesses: Assist coastal businesses to make transitions to new markets, opportunities and natural resource realities.</p>	<p>By 2011, Sea Grant will complete a strategic planning process focused on identifying new opportunities for fishing related businesses that have been negatively impacted by the decline of Chinook salmon in Lake Huron.</p> <p>By 2011, a web-based toolbox will be available to support entrepreneurs involved with coastal dependent tourism.</p>	<p>Coastal communities and local businesses will expand both the opportunities available for tourists and the way the coastal region is marketed to visitors.</p>
<p>Working Waterfronts: Work with Michigan’s Coastal Management Program to prepare for and implement anticipated opportunities under federal working waterfronts legislation.</p>	<p>Beginning in 2010, collaborate with agency partners to hold annual conferences about the need and opportunities for protecting working waterfronts at the state and local level.</p> <p>By early 2011, develop a list of policy and economic tools available to address working waterfront issues and ensure public access to the coast.</p> <p>By 2012, develop methods for measuring waterfront conversion rates that will provide consistent results in Michigan and possibly be transferrable to other Great Lakes states.</p>	<p>Coastal land use decision making will preserve options for multiple, long-term uses of waterfronts, including public access.</p>
<p>Small Harbors: Support research and outreach activities that help small harbors pursue coastal dependent activities without diminishing the long-term health of the natural environment.</p>	<p>By 2011, Michigan’s Small Harbor Coalition will expand to include small harbors in other Great Lakes states.</p>	<p>Community leaders are able to evaluate and pursue options for maintaining small harbors.</p>
<p>Natural Area Planning: Work with local greenway and water trail initiatives to develop and implement a local and/or statewide cultural economic development strategy.</p>	<p>By 2011, Southeast Michigan will have a greenway and water trail strategic plan focusing on the economic development potential of these activities for the southeast region of the state.</p>	<p>Coastal communities will inventory their natural resources and develop strategies to enhance the use and protection of natural resources.</p>

Focus Area 2: Sustainable Coastal Development

<p>Waterfront Planning: Build local capacity to evaluate decisions about coastal development and public waterfront areas by helping communities assess the economic value of coastal recreation activities.</p>	<p>By early 2010 land-use decision makers will have at least one additional tool enabling them to quantify the value of coastal dependent recreation activities, such as salmon tournaments.</p> <p>By 2013, Michigan Sea Grant will develop a targeted outreach effort for professional and citizen planners to raise awareness and provide tools needed to preserve working waterfronts and implement waterfront-related smart growth principles.</p> <p>By 2013, work with 3 communities to quantify the potential economic impact of removing or retaining coastal access sites used for recreation activities.</p>	<p>Communities are able to assess the economic value of coastal recreation activities and better evaluate decisions about coastal development and public waterfront areas.</p>
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Goal 2.2: Coastal communities that make efficient use of land, energy and water resources and protect the resources needed to sustain coastal ecosystems and quality of life.

Strategies	Measurable Objectives	Outcomes
<p>Development Options: Support Integrated Assessment projects that engage communities and help decision makers balance environmental sustainability and economic development in the coastal zone.</p>	<p>By 2011, develop print and web materials that illustrate how brownfield redevelopment can be used as a smart growth strategy, highlighting the findings of the brownfield Integrated Assessment.</p> <p>By 2013, communities in southwest Michigan, the Upper Peninsula, and northeast Michigan will have new tools to evaluate the trade-offs associated with permitting wind energy generating facilities in their communities .</p> <p>By 2013, Michigan Sea Grant will complete an Integrated Assessment designed to help the coastal communities of Tuscola, Sanilac, Huron, and St. Clair respond to a changing Lake Huron fishery and Michigan economy.</p> <p><i>(More Under Cross-Cutting Goal A and C)</i></p>	<p>Sea Grant's Integrated Assessment projects will enable communities to better evaluate tradeoffs and make science-based decisions about natural resources and coastal development.</p>

Focus Area 2: Sustainable Coastal Development

Goal 2.3: Coastal citizens, community leaders, and industries that recognize the complex inter-relationships between social, economic and environmental values in coastal areas and work together to balance multiple uses and optimize environmental sustainability.

Strategies	Measurable Objectives	Outcomes
<p>Clean Marinas: Provide Michigan Clean Marina participants and partners with an online suite of educational materials to facilitate the certification process, highlight best practices, and provide consistency in water quality protection practices.</p> <p>Evaluate the economic benefits associated with adopting clean marina practices and becoming certified.</p>	<p>Through 2013, Sea Grant will continue expanding the Clean Marina program in Michigan, certifying an additional 10 marinas a year and helping marinas re-certify after 5 years of participation.</p> <p>By 2013, Michigan Sea Grant will document and publicize the economic benefits realized by Clean Marina participants.</p>	<p>Coastal communities and businesses will be more environmentally and economically sustainable by adopting best management practices that minimize runoff and water pollution, limit the spread of invasive species, and protect natural habitats.</p>
<p>Green Infrastructure: Build partnerships and disseminate the results of the stormwater Integrated Assessment to encourage communities and businesses to implement green infrastructure projects and consider ordinances that promote low impact development.</p>	<p>By 2012, Spring Lake Village and Township will have plans to install a suite of stormwater best management practices to improve the quality of Spring Lake an important tributary to Lake Michigan.</p> <p>By 2013, Michigan Sea Grant will develop targeted outreach efforts for coastal business owners, residents, and municipal officials about how to use green infrastructure and reduce impacts on water quality.</p> <p>By 2013, Michigan Sea Grant will help secure external funding to implement new green infrastructure projects in a coastal community.</p>	<p>Coastal communities will understand how land use decisions impact natural resources and will engage in planning and on-the ground projects that enhance and protect ecological services, such as water quality maintenance.</p>

Performance Measures – Sustainable Coastal Development

1. Number of communities that participate in Sea Grant supported Integrated Assessments.
2. Number of communities that work with Sea Grant specialists to conduct natural resource planning projects (e.g., trail, greenway or heritage zone planning).
3. Number of town officials and professional planners that participate in Sea Grant training related to preserving working waterfronts.
4. Number of communities where Sea Grant staff have helped implement on-the-ground green infrastructure projects (e.g., low impact development, stormwater BMPs, soft shore engineering, or new trail projects).
5. Number of communities that modify or create land use policies, regulations or development incentives to promote green infrastructure, climate change mitigation or adaptation, or preservation of working waterfronts.
6. Number of coastal businesses that adopt new practices making their operations more environmentally and economically sustainable as a result of Sea Grant activities.
7. Annual number of newly certified Clean Marinas in Michigan and total Clean Marina participants.
8. Number of eligible Clean Marinas that re-certify after initial 5-year certification.
9. Average number of BMPs adopted by a certified Clean Marina in Michigan

SAFE AND SUSTAINABLE SEAFOOD SUPPLY

The Michigan commercial fishery is composed of State licensed operations and Native American tribal licenses. Approximately 45 Michigan licensed operations, 105 Chippewa/Ottawa Resource Authority managed fisheries, and 32 (large and small boat) fisheries administered by the Great Lakes Indian Fish and Wildlife Commission constitute the fishery. The fishery harvest is split evenly between state licensed and tribal fisheries. The major catch is composed of Lake whitefish (*Coregonus clupeaformis*), lake trout (*Salvelinus namaycush*), walleye (*Sander vitreus*), smelt (*Osmerus mordax*), yellow perch (*Perca flavescens*), bloater chub (*Coregonus hoyi*), lake herring (*Coregonus artedii*) and many other cold and coolwater species. Total production in 2007 in U.S. waters exceeded 18 million lbs. Whitefish harvest was the major fishery, constituting more than 50 percent of total catch. Through the use of its research, outreach, and education capacities, Sea Grant will support the kind of informed public and private decision-making that will lead to a sustainable supply of safe seafood into the future.

Goal 3.1: A sustainable supply of safe seafood to meet public demand.

Strategies	Measurable Objectives	Outcomes
<p>Native Fish Habitat: Use Sea Grant’s research, extension, education, and communication capabilities to develop and disseminate essential knowledge about natural and human threats to the long-term viability of wild fish populations.</p>	<p>By 2013, Sea Grant will produce a suite of educational materials about fish habitat restoration in partnership with Huron Erie Corridor Initiative partners.</p>	<p>Constituents will be more knowledgeable about fisheries threats, including habitat loss, invasive species and water quality.</p>
<p>Aquaculture: Conduct outreach and education activities to support the growth of Michigan’s aquaculture industry, native and state-licensed commercial fisheries. Conduct these activities with acceptable environmental impacts, in ways that are consistent with national objectives, building on the leadership role Sea Grant plays in this area.</p> <p>Work with regional and federal aquaculture partners to apply industry bio-security principles to the development of Hazard Analysis & Critical Control Points (HACCP) plans, develop model plans, and conduct workshops for the aquaculture industry.</p>	<p>By 2011, Michigan Sea Grant will work with the Michigan Aquaculture Association to facilitate the development of a strategic plan outlining a comprehensive vision for an aquaculture industry in Michigan.</p> <p>By 2013, twenty aquaculture facilities will have bio-security plans in place.</p>	<p>Michigan Aquaculture Association will have a strategic plan for aquaculture in Michigan that reflects input from a range of stakeholders.</p> <p>Aquaculture facilities in Michigan will minimize the risk of releasing diseases and exotic species, ensuring a sustainable aquaculture industry.</p>

Goal 3.2: A healthy domestic seafood industry that harvests, produces, processes, and markets seafood responsibly and efficiently.

Strategies	Measurable Objectives	Outcomes
<p>Sustainable Fishing Practices: Create opportunities for collaboration and communication between natural resource managers and sport, commercial and charter fishers to promote the use of sustainable fishing practices.</p>	<p>Through 2013, Michigan Sea Grant will offer at least three workshops a year for recreational and commercial fishers, focusing on current issues, sustainable fishing practices and effective marketing strategies.</p>	<p>Fishery stakeholders will continue to work together and when needed develop strategies collaboratively.</p>
<p>Safety Training: Continue to work with Michigan’s commercial fishing industry to conduct HACCP workshops and in-plant consultations, ensuring compliance with state and federal seafood safety guidelines.</p>	<p>By 2013, approximately 80 businesses will participate in Sea Grant sponsored HACCP activities resulting in 20 new and revised HACCP plans.</p>	<p>Baitfish operations and fish processing businesses will develop and implement Hazard Analysis & Critical Control Point (HACCP) plans to minimize human health risks and the release of invasive species.</p>
<p>New Fishery opportunities: Work with Michigan’s commercial fishing industry and regional fishery management agencies to evaluate opportunities to enhance Great Lakes fisheries and develop new fish products.</p>	<p>By 2011, Sea Grant will help complete a feasibility assessment for using siscowet to produce nutraceutical-grade fish oil.</p> <p>By 2013, host a conference on state of the art technology and production of nutraceutical-grade fish oil and its application within Michigan.</p>	<p>Michigan will support an economically viable and environmentally responsible commercial fishing industry.</p>
<p>Expanding Markets: Work with Legends of the Lake whitefish cooperative to increase the availability and profitability of sustainably harvested local seafood.</p>	<p>By 2011, Legends of the Lakes whitefish cooperative will introduce at least one new product, expand membership by 25%, and double the number of stores featuring its products. (The cooperative began in 2007 and in 2008 4 operations were members. Currently, 12 retail locations feature Legends of the Lake.)</p>	

Focus Area 3: Safe and Sustainable Seafood Supply

Goal 3.3: Informed consumers who understand the importance of ecosystem health and sustainable harvesting practices to the future of our domestic fisheries, who appreciate the health benefits of seafood consumption, and who understand how to evaluate the safety of the seafood products they buy.

Strategies	Measurable Objectives	Outcomes
<p>Consumer Education: Work with the Great Lakes whitefish industry to inform targeted audiences and the general public about the value of choosing locally caught seafood.</p>	<p>By 2011, the number of web visitors to Great Lakes Whitefish website will have grown by 50 percent.</p>	<p>Chefs, culinary students, food services professionals and seafood consumers will be aware of the benefits of eating Great Lakes whitefish.</p>
<p>Consumer Education: Develop new and support existing materials to educate the public about the nutritional value of seafood and ways to minimize health risks.</p>	<p>By 2013, consumers will be able to download or request a print copy of updated publications about purchasing, preparing and preserving Great Lakes Fish in order to maximize nutritional value and minimize health risks.</p>	<p>Consumers will have access to updated information about purchasing, preparing and preserving fish while minimizing health risks.</p>
<p>Consumption Advisories: Work with the Sea Grant-funded fish consumption advisory Integrated Assessment team and community health agencies to understand and communicate the benefits and risks of consuming sport fish.</p>	<p>By 2011, culturally appropriate signage and web content will inform anglers about fish consumption advisories for the Detroit River.</p>	<p>Sport fishers and interested members of the public on the Canadian and US sides of the Detroit River will be provided with clear and consistent fish consumption advisory information for the Detroit River.</p>

Performance Measures – Safe, Sustainable Seafood Supply

1. Number of whitefish products developed and marketed by the Legends of the Lake cooperative.
2. Number businesses that participate in Sea Grant sponsored HACCP workshops and consultations.
3. Number of new and revised HACCP plans.
4. Number of aquaculture facilities that develop bio-security plans.
5. Number of whitefish fishermen who join the Legends of the Lake cooperative.
6. Number of stores featuring Legends of the Lakes whitefish.
7. Number of visitors to the Great Lakes Whitefish website. (See appendix two for details.)

HAZARD RESILIENCE IN COASTAL COMMUNITIES

Hazard resilience in the Michigan context implies living with a dynamic coastal ecosystem. With uncertain climate change scenarios for the Great Lakes there may be more frequent storm events, heavier stormwater run-off, and a wider and more rapid range of water level fluctuation. Sea Grant will focus its resources to help constituents plan for and thrive in the midst of this changing climate.

Goal 4.1: Widespread understanding of the risks associated with living, working, and doing business along Michigan’s coasts, including a better understanding of how those risks will be affected by the climate change.

Strategies	Measurable Objectives	Outcomes
<p>Safe Swimming and Boating: Increase the availability and usefulness of hazard-related information and forecasting for citizens, industries, and decision-makers in coastal communities.</p>	<p>By 2010, Sea Grant will collaborate with NOAA and public safety agencies to identify poorly understood swimming hazards and develop new channel currents information.</p> <p>By 2011, Sea Grant will develop multi-media outreach/promotional methods designed to increase awareness (e.g., print and PSA) of existing hazards websites, such as nets and currents.</p> <p>By 2013, 100% of state park beaches and 25% of other public beaches along Lake Michigan will post signs about dangerous currents and safe swimming practices.</p>	<p>Coastal residents, visitors and businesses have access to information about coastal conditions, dangerous currents, fishing nets, and proper safety precautions for boating and swimming.</p>
<p>Evaluating Impacts: Facilitate a collaborative effort between NOAA’s Great Lakes Environmental Research Lab (GLERL) scientists and the Great Lakes Sea Grant Network to assess potential climate change impacts for Great Lakes industries and develop useable planning tools.</p>	<p>By 2013, identify forecasting needs, and apply climate change models for specific Great Lakes users, such as marina operators.</p> <p>By 2013, develop priority scenarios and quantify the economic impacts associated with climate change for Great Lakes communities and industries.</p>	<p>Coastal decision-makers and coastal businesses will have access to climate change information that is easy to interpret, relevant to their needs, and connected to specific response options.</p>
<p>Climate Change Education: Work with the Great Lake Sea Grant network to develop and implement an effective strategy for educating the public about climate change.</p>	<p>By 2010, complete the development and through 2013 continue to update the website, Climate Change in the Great Lakes, which provides climate change information developed by NOAA’s Sectoral Applications Research Program (SARP) and all Great Lakes Sea Grant programs.</p> <p>By 2011, complete a strategic plan that identifies key information needs and effective communication methods related to climate change.</p>	

Goal 4.2: Assist Michigan’s coastal communities in preparing for and responding to hazardous events and climate change.

Strategies	Measurable Objectives	Outcomes
<p>Lake Levels: Work with NOAA-GLERL, the US Army Corps of Engineers, Michigan Coastal Management Program and the International Joint Commission to help public and private coastal property owners recognize and adapt to water level fluctuation.</p>	<p>By 2013, Sea Grant will work collaboratively to develop an outreach strategy about anticipated water level fluctuations and ways coastal businesses and residents can adapt.</p>	<p>Coastal residents, visitors and businesses will understand that the Great Lakes go through natural cycles of high water and low water years and they should plan for on-going variability.</p>
<p>Climate Change Adaptation: Collaborate with NOAA-GLERL and other scientists to refine and distribute planning tools and information about how communities can reduce the risks of anticipated climate change and related catastrophic events.</p>	<p>By 2011, Sea Grant will produce new web content and outreach materials for a variety of audiences about climate change impacts and ways to use green infrastructure as a “no regrets” adaptation strategy.</p> <p>By 2012, Sea Grant staff will be trained about cutting-edge climate adaptation resources and tools.</p>	<p>Coastal decision-makers will utilize the best available information and planning tools to minimize the risks associated with climate change.</p>

Performance Measures – Hazard Resilience in Coastal Communities

1. Number of visits per year to web pages about dangerous currents, fishing nets and beach safety. (See appendix two for details.)
2. Number of visits per year to web pages about climate change impacts.
3. Number of participants in workshops about adapting to climate change and water level fluctuations.
4. Percentage of state park beaches on Lake Michigan that post signs about dangerous currents.
5. Percentage of all public beach areas on Lake Michigan that post signs about dangerous currents.

APPENDIX ONE

Michigan Sea Grant's Operating Principles

Strategic input and feedback: Michigan Sea Grant routinely seeks input and feedback from external advisors. The program uses both formal and informal advisory structures that are program-based, agent-based or issue-based. The primary source of formal advice is the Advisory Committee; however advisory groups are also formed for specific program and project needs.

Open competition and peer review: Support for research is available to all qualified, university-based researchers in the state of Michigan. Biennially, the program solicits proposals relevant to the strategic plan. Projects are selected for funding based on rigorous peer-review and ranking by a panel of independent scientific and technical experts.

Consensus Building: Michigan Sea Grant interacts with a broad range of Great Lakes stakeholders. Because of the complexity of issues that surround coastal resources, stakeholders sometimes disagree on the substance of issues. Sea Grant works to bring these groups together to find common ground. An engaged constituency that puts aside individual interests while working on common goals is more effective.

Inclusiveness: 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.

APPENDIX TWO

Tracking the Use of Michigan Sea Grant's Web Resources

Michigan Sea Grant uses Google analytics to track the usage of our web resources. We monitor three types of statistics for a particular time period, typically one month or one year.

1. **Pageviews** = number of individual pages within the website that were viewed.
2. **Web visits** = number of unique and returning visitors to website.
3. **Unique web visitors** = number of unique visitors to website. Each distinct user is counted only once during the selected time period.