

ILLINOIS-INDIANA SEA GRANT COLLEGE PROGRAM

*Strategic and Implementation Plan*  
*2006 - 2010*



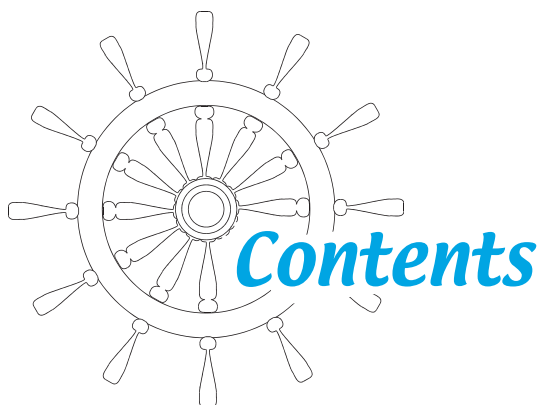
ILLINOIS-INDIANA SEA GRANT COLLEGE PROGRAM

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TWO STATES CARING FOR ONE GREAT LAKE



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## Introduction

In Illinois and Indiana, Lake Michigan comprises 104 miles of heavily urbanized and industrialized shoreline. One third of the population of the Great Lakes resides along these shores between Milwaukee, Wisconsin and Michigan City, Indiana. It is the largest population center outside of New York City and Los Angeles. And, the impact of the region extends well beyond the borders of the Great Lakes—the majority of the watersheds of Illinois and Indiana influence the Mississippi River Basin and the Gulf of Mexico.

As this thriving region continues to grow, it faces inevitable threats to resource sustainability, water quality, and ecosystem and human health. The Illinois-Indiana Sea Grant College Program (IISG) addresses these critical concerns.

Illinois-Indiana Sea Grant is one of 30 programs constituting the National Sea Grant Network. The national program is dedicated to using research, education, and outreach to promote the wise use of our nation's coastal, ocean, and Great Lakes resources for a sustainable environment and economy.

IISG is jointly sponsored by the University of Illinois and Purdue University. The program promotes partnerships with universities and institutions throughout the bi-state area.

The program serves the following groups:

- Resource users—coastal residents, coastal businesses and industries, lake food consumers, tourists, and recreationists
- Policy makers—government and municipal officials at all levels
- Information users—natural resource professionals, museum and aquarium planners and visitors, environmental organizations, industry managers, media, citizen groups, retailers, aquaculture producers and marketers, educators, and university researchers

## Mission

*Illinois-Indiana Sea Grant sponsors and conducts research, education, and outreach that empower citizens and communities in the Lake Michigan region to secure a healthy environment and economy.*

This strategic and implementation plan is designed as one cohesive and comprehensive document. The strategic component describes the goals and objectives of Illinois-Indiana Sea Grant for 2006-2010. It provides details of activities that will achieve the thematic/functional area goals and objectives. The overall direction and focus of the plan are based on input from a wide range of stakeholders, including government and non-government agencies and organizations, private citizen groups, and educational institutions in the region. It also reflects the views and suggestions of formally appointed advisory groups. The implementation component is integrated throughout this document. This approach to strategic implementation provides an opportunity to provide, in one document, the action steps and general strategies needed to carry out the objectives identified for each thematic area. We discuss our plan for review, revision, mid-course corrections, evaluating progress, and integrating and interacting with other programs. We also identify the resources needed to complete the objectives. Our performance measures are identified within our smart objectives and action steps needed to collect performance data and evaluate progress are described.

## *Organization*

IISG activities are organized into three overarching functional areas: research, education, and outreach. These functional areas are largely defined by the mission of the National Sea Grant College Program.



IISG focuses its resources on local topics, which also address priorities outlined in the National Oceanic and Atmospheric Administration (NOAA) and National Sea Grant Program Strategic Plans, thereby maximizing the program's impact. Over the next five years, IISG will address local and regional needs and opportunities in four thematic areas: Habitats and Ecosystems, Water for Our Future, Coastal Cities, and Nourishing Healthy Communities.

The administration, in the form of the Program Management Team (PMT), facilitates the activities of all functional and thematic areas and provides support and leadership in developing opportunities to expand the scope of the program. The PMT interacts with the host institutions to ensure continuing financial and logistical support for the Sea Grant Program.

The PMT also promotes Sea Grant's mission of research, education, and public service, as well as the creation, dissemination, and transfer of research results to the public in a meaningful way. The program's communications component is also designed to support all functional and thematic areas.

## *Administration*

In support of its mission, the Illinois-Indiana Sea Grant College Program has organized its administrative functions to address three principal elements: program management, program development, and research coordination. In assisting researchers and staff in pre- and post-award management of their grants, the administration aims to provide efficient and timely service. IISG strives to develop creative research and scholarly outreach programs; assist faculty and staff in identifying potential funding sources; assist in organizing multi-disciplinary proposals; and promote graduate education and fellowships. Research coordination includes fostering partnerships that address the priorities of the program and the needs of the region, as well as leverage additional resources. IISG identifies, tracks, and facilitates expected actions and impacts from funded research projects.

The goal of administration is to increase overall program efficacy, scope, funding, and visibility through collaborative research, extension, education, and communications efforts. The administration promotes the concept of multi-state/regional research and outreach activities and actively seeks interagency partnerships to address the resource and information needs of the southern Lake Michigan region. The program is designed to promote resource sharing, creativity, and collaboration between staff and project partners.

The PMT recruits and retains productive staff by fostering creativity and imagination. The Illinois-Indiana Sea Grant College Program encourages professional development for all staff members. This includes promoting memberships in professional societies, funding travel to conferences, funding additional training, and encouraging pursuits of higher educational degrees.



## Communications

Communication expertise is essential for reaching a broad base of coastal clients and for transforming scientific information into outreach and education products. Sea Grant communications staff craft press releases, products, exhibits, Web sites, and a variety of publications to provide useful and accessible information to resource managers, policy makers, industry representatives, and the general public. Through these efforts, individuals and organizations can make informed choices related to coastal concerns. Communication efforts often go beyond the borders of Illinois and Indiana, disseminating information to a worldwide community. The communications component of IISG supports the program functional areas as well as efforts to effectively convey information from each of four thematic areas. The goal of IISG communications is to increase client accessibility to Sea Grant information and products and to increase public awareness of IISG and its resources.



## Research, Outreach, and Education

The program's three overarching functional areas—research, outreach, and education—are fully integrated and managed to facilitate the attainment of program goals and objectives in all four thematic areas.

The research functional area of IISG addresses critical knowledge gaps in the bi-state region. Through the understanding of abiotic, biotic, and sociological processes and their interactions, research can lead to the development of new technologies. Research also provides the first step in a process that ultimately leads to the attainment of the program's vision of discovering and applying unbiased science-based information to solve contemporary problems. As researchers design and conduct projects, IISG encourages them to consider likely research impacts and how their results will be used by others. Sea Grant outreach and administrative personnel (guided by input from external groups and clients) provide guidance and logistical outreach assistance to researchers as their projects progress through the discovery, engagement, and learning phases.

New knowledge and understanding derived from research drives the outreach component of the program. IISG has formal processes in place to integrate research and outreach programs. Program staff members meet with scientists and identify actions steps needed to translate research results into impacts. With this approach, the outreach (also referred to as extension or engagement) functional area of IISG provides a vital link between researchers and information users.

IISG employs specialists with expertise in the program's thematic areas to interact with funded researchers and to lead and conduct outreach programming. Using this research-driven outreach expertise, IISG engages policy makers and resource users, empowering them to take full advantage of research findings as they make decisions and solve local problems. Extension specialists assemble the expertise and knowledge needed by client groups and work with communications specialists to package the information into a usable form. Engagement is further accomplished by providing technical information, training, and continuing education to a variety of resource professionals.

Sea Grant's education programming is directly linked to the primary goals of the K-12 educational system and the U.S. House Committee on Science (Sep 24, 1998 Report to Congress). The goals of the education functional area of IISG are to create a sound foundation for those who will enter the workforce; enable youth to become tomorrow's leaders; and foster responsible consumers and citizens who practice behaviors and make decisions that protect and sustain coastal resources.

The IISG education program is composed of projects and partnerships with education leaders in Illinois and Indiana to develop resources that support the National Sea Grant College Program's education initiative. Such resources provide continuing education opportunities, training packages, and classroom support materials for teachers of grades K-12 on topics such as aquatic invasive species and fish consumption guidelines. In addition, IISG researchers collaborate in education programs for teachers and youth, thereby delivering the latest research to our future scientists.





Our approach to education also includes a strong emphasis on partnering with the National Sea Grant Office Fellowship Program and creating extensive opportunities for graduate and undergraduate student participation in our research projects and other program activities. IISG actively supports research projects that provide the opportunity for graduate student education and training.

### *Interaction and Integration with Other Programs*

Illinois-Indiana Sea Grant engages extensively in partnerships to connect with and serve our clients. Administrative arrangements with over 12 institutions, agencies, departments, or units provide facilities, housing, and matching salary support for program staff. A partnership with the U.S. EPA Great Lakes National Program Office (GLNPO) provides salary, housing, and program support for two extension specialists. This partnership provides the platform necessary for outreach staff to reach stakeholders around the Great Lakes and Canada. As a result, IISG outreach staff members now have access to a large body of U.S. EPA research and expertise that can be transferred and applied to better serve clients in the Great Lakes region.



Program staff members are active in the Great Lakes Sea Grant Network and participate in network projects. Currently, program outreach staff members participate in at least three funded regional Sea Grant projects and lead one of them. The program developed and maintains two National Sea Grant Web sites that serve clients around the world. Program staff has assumed leadership nationally in Sea Grant organizations serving as a member-at-large of the Sea Grant Educators Network from 2004-2007. The associate director serve as a technical expert and an invited teacher for the NOAA Coastal Services Center's training course for NOAA staff on how to plan and evaluate programs to have positive impacts for clients. The communications coordinator serves on the National Exhibits and Events Task Force for the Great Lakes region.



# Thematic Area Goals and Objectives

Thematic area and subject matter priorities for IISG are identified by the program’s advisory committees, research scientists, agencies, and outreach specialists who work with clientele with wide ranging interests. Within the program’s thematic areas, specific research topics and outreach activities are organized and integrated. As new issues emerge that are consistent with the program’s strategic direction, IISG is positioned to respond and to expand activities within the four thematic areas: Habitats and Ecosystems, Water for Our Future, Coastal Cities, and Nourishing Healthy Communities. There are many topics within each thematic area that need support.



Each of the thematic areas has its own goals as well as research, outreach, or education objectives. Research objectives are inherently less specific than outreach objectives; much depends on the nature of the research proposals received and the interest on the part of investigators to respond to RFPs. Therefore, research objectives are worded as statements of problems identified as needing solutions.

All objectives in the outreach and education portions of this strategic plan are specific, measurable, audience directed, realistic, and time bound and were developed using the logic model. The realistic nature of each objective was determined by input from advisory committees, specialists, and clients. Unless otherwise noted, success or failure in achieving an objective will be determined by direct observations or comparisons of numbers obtained from readily available secondary data sets.

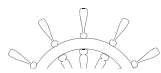
## *Review, Revision, and Results*

Primary responsibility for each outreach and education objective appearing in this plan are assigned to one or more program staff members. These objectives appear in each individual's annual plan of work. Progress toward each measurable objective is monitored by the associate director through the annual performance appraisal process. Compensation and funding decisions for work plans and subcontracts are based on reasonable progress toward the accomplishment of strategic plan objectives.

Program accomplishments and impacts are compiled through the annual reporting process and disseminated in the program's annual report, which is both published and placed on the program Web site. Impact statements are developed every four years, documenting the results of the implementation of this strategic plan. These impact statements are widely distributed and used by a Program Assessment Team appointed by the National Sea Grant Office every four years to evaluate the Illinois-Indiana Sea Grant Program. Program merit funding will be awarded to IISG at the conclusion of this strategic plan period based on the level of success obtained in achieving strategic plan objectives.

Modifications in the strategic plan goals and objectives and in the implementation steps will be made after the second year of this strategic plan cycle. They will be reported when funding for the third and fourth year of this project period are requested. Mid-cycle changes in this strategic plan and associated implementation steps will be in response to changing conditions and emerging issues unforeseen at this time. Changes will be made through consultation with program advisory committees, administrative advisory committees, and program staff.

Results from research and outreach projects are reported in scientific publications; presented at professional meetings; published on the program's Web site; highlighted in special program publications; and distributed to general audiences through press releases, media articles, and publications in the popular press.



## Habitats and Ecosystems

The deep waters of Lake Michigan support a rich ecosystem with a complex food web and a variety of habitats and species. Despite its vastness, however, the health of Lake Michigan, the Great Lakes, as well as nearby wetlands, rivers, and streams are vulnerable to threats posed by external forces. These threats impact the health of ecosystems as well as the fishery, other industries, and quality of life in the region.

Nonindigenous aquatic invasive species (AIS) such as the lamprey, alewife, and zebra mussel have tremendous impact on the Lake Michigan ecosystem and its reliant industries (e.g., commercial fishing, electrical power generation). Several of these species also threaten our inland waters. The potential introduction of additional species, such as the Asian carp, may have further environmental and economic impacts on the Lake Michigan region. Water users and resource managers require new methods to prevent future introductions and more environmentally friendly and efficient methods to control existing infestations.

Within the Illinois and Indiana coastal region of Lake Michigan, there are numerous areas where decades of industrial pollution have contaminated sediments. Current proposals for remediation of these toxic sediments are very expensive. A comprehensive assessment of the benefits of remediation is difficult and is needed in the Great Lakes region. Likewise, the restoration of rivers, streams, wetlands, and beaches requires careful planning and up-to-date information.

### Research Needed to Solve Contemporary Problems

1. Develop management solutions for specific fish species and their food resources in critical and sensitive coastal habitats.
2. Design solutions to decrease the impacts of contaminants, including complexing chemicals (e.g. toxins) on coastal and wetland communities.
3. Develop protocols, decision tools, techniques, and policy options to prevent the dispersal and introduction of existing and new invading species.

### Goals

- ⊙ Enhance the quality of the Lake Michigan ecosystem, inland aquatic systems, and the lives of coastal and shoreline residents by reducing the introduction, spread, and economic harm of AIS.
- ⊙ Improve both the biological and human aspects of the Lake Michigan fishery through attainment, transfer, and application of knowledge concerning the lake's food web and ecosystem dynamics.
- ⊙ Improve the health and abundance of valuable fish species.
- ⊙ Reduce the ecological and economic impacts of contaminated sediments.

## Outreach Objectives

1. ***By 2006, a model rapid response protocol for aquatic invasive species will be developed and adopted in Illinois.***

IISG will work with the Aquatic Invasive Species Task Force, the Great Lakes Commission, and agency administrators in Illinois to work toward the adoption of the protocol.

2. ***By 2010, Indiana and Illinois will augment policies that prohibit possession of species (including those not currently in trade) that are capable of invading southern Lake Michigan.***

IISG funded a study (Lodge and Kohler, 2004) that identified species most likely to invade the southern Lake Michigan ecosystem. IISG will work with the Aquatic Invasive Species Task Force and state AIS coordinators in Illinois and Indiana, agency managers, and interested stakeholder groups to consider the inclusion of these species in possession and trade policies.

3. ***Through 2010, the percentage of inland water recreational users that routinely practice precautionary steps to prevent the spread of AIS from their recreational activities will be maintained at 85 percent.***

IISG will develop a variety of programs and products (based on latest research) for recreational water user audiences. Programs will include conferences for inland lake associations and presentations at sport and travel shows. Products will include Web site development for information sharing and reporting of AIS; development and placement of signs at boat ramps; fact sheets; and informational products designed for recreational water users that provide steps to reduce the spread of AIS. These last products will be delivered through bait, tackle, and boat dealerships; exhibits at state fairs; and farm progress shows. Questions appended to a creel survey that is conducted every two years will be used to monitor the percentage of recreational users routinely practicing precautionary steps to prevent the spread of AIS.

4. ***By 2007, 50 percent of trained agency sampling crews and conservation officers will incorporate HACCP (Hazard Analysis Critical Control Point) practices designed to reduce the introduction of AIS into Indiana and Illinois.***

Workshops will be conducted in conjunction with inland lake association meetings and will be designed for conservation officers, sampling crews, researchers, and other personnel that move equipment from one water body to another. Participants will be trained to use HACCP procedures to reduce the probability of spreading AIS in our inland waters. Natural resource professionals that attend these training sessions will be surveyed approximately one year later to determine how often HACCP practices are incorporated into their daily procedures.

5. ***By 2007, leading pet and aquarium dealers in Indiana and Illinois will become partners in the Habitattitude™ campaign, thereby promoting responsible behavior to their clients that will help prevent the spread of AIS into natural ecosystems.***

IISG will participate in a network-wide Habitattitude™ project in partnership with U.S. Fish and Wildlife Service and the Pet Industry Joint Advisory Council. In addition, project personnel will work with leading pet and aquarium dealers in both states to become full partners in this nationwide information and education effort whereby vendors deliver these science-based products and messages to their customers.



6. ***By 2010, leading water garden suppliers in Indiana and Illinois will adopt management practices that help prevent the spread of AIS into natural ecosystems.***

IISG will work with individual nurseries as well as state nursery association representatives to distribute IISG-produced water garden materials and help them join the Habitattitude™ campaign. Suppliers actively participating in the Habitattitude™ campaign will document the adoption of management practices that help prevent the spread of AIS. Follow-up summative surveys, as required, will also be conducted.

- 7. By 2010, 500,000 researchers, students, and water users in 130 countries will access scientific publications and outreach products on AIS that are useful in their work and everyday lives.***

IISG will partner with Wisconsin and New York Sea Grant to maintain and enhance the Sea Grant Nonindigenous Species (SGNIS) Web site for scientists, students, and water users. Additional partnerships with international AIS scientists will allow SGNIS to expand by adding literature written in other languages. New partnerships will also facilitate the transfer of research on U.S. native species to countries experiencing invasions of these organisms. Web usage will be documented through automated Web statistics using Web Trends software.

- 8. Through 2008, 50 natural resource professionals in Indiana and Illinois will annually receive the latest scientific information relative to stream restoration and dam management to assist in more effective restoration and management efforts.***

IISG will partner with the Chicago Wilderness Consortium to conduct an annual conference that draws upon national experts who will present the latest scientific findings on stream restoration and dam management to natural resource managers in Indiana and Illinois. A steering committee composed of resource managers in both states will help identify key topics and organize the conferences.

- 9. By 2010, five communities in U.S. EPA's Great Lakes Areas of Concern will make informed decisions about contaminated sediment removal or management practices and will begin to implement selected steps.***



IISG will work with GLNPO scientists to develop outreach products and programs designed to help communities assess their risk from contaminated sediments and to weigh management options that address the human health and ecosystem impacts of these contaminants. Facilitation will be provided and programs will be held in partnership with local citizen action groups in Areas of Concern who are considering Legacy funding to address sediment removal in their community. Community action in response to programming will be documented by response to and participation in the Legacy Program.

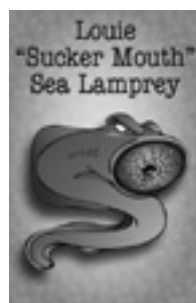
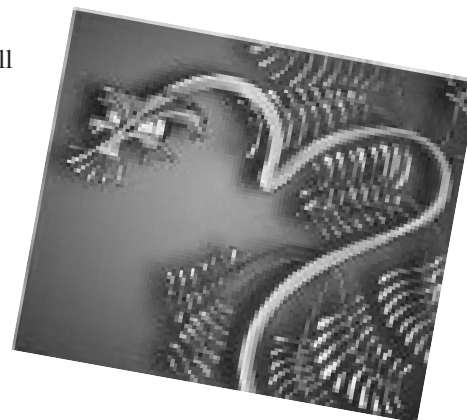
## Education Objectives

1. ***By 2010, over 50,000 families from the local area who visit Chicago museums and aquariums will have the knowledge to make behavior changes that help reduce the spread of AIS to our ecosystem.***

IISG will partner with Chicago area museum exhibit planners to create and support activity stations that raise awareness of AIS problems and provide guidance on public action to prevent the spread and new introductions of AIS. Survey instruments will be created to measure resulting behavior changes.

2. ***By 2010, the Nab the Aquatic Invader! Web site will be accessed by 2,000 class rooms. As a result, teachers and students around the country will learn about issues related to AIS and 500 students will be empowered to develop community-based stewardship projects.***

IISG will conduct teacher-training workshops in Illinois and Indiana and will partner with Sea Grant programs and educators in at least five other coastal states to develop new education activities for the Web site. In addition, the “Top 10 Suspects” list will be expanded to include aquatic invasive organisms from the Pacific, Atlantic, and Gulf coasts, as well as an enhanced component on freshwater aquatic invaders. IISG staff will also work with its partners to provide teachers with science-based information that allows them to help their students create community-based stewardship projects. Sea Grant, along with participating teachers, will present the Web site at national, regional, and state education conferences. Throughout the project, assessments will be developed to track the effectiveness of this instructional technology and to document community stewardship projects conducted by students inspired by the Web site.

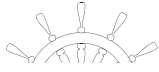




### *Personnel*

Four technical specialists, two Web specialists, and an education specialist, comprising a total of 4.65 FTEs, contribute to this thematic area. In addition, three communications specialists and the outreach coordinator assist in program and product development. Outreach Objectives 1-6 will be led by the program's two aquatic invasive species specialists (0.45 FTE and 0.50 FTE). Objective 7 will be conducted by the program's chief Web officer (0.60 FTE) and Web technology specialist (1.00 FTE). Outreach Objective 8 will be conducted by our aquatic ecology specialist (0.75 FTE). Outreach Objective 9 will be led by the program's coastal sediment extension specialist (1.00 FTE). Education Objectives in this thematic area will be conducted by the program's education specialist and communications coordinator (0.80 FTE).





## Water for our Future

Water is essential for human consumption, industry, recreation, and the quality and diversity of the environment in which we live. Water quality and sustainability influence the health and well being of a community and its citizens and define its economic base.

Growing populations and heavy development pressure can lead to increased runoff and flooding, increased contaminated runoff, and reduced groundwater recharge. In the southern Lake Michigan region, communities planning development in the face of this growth need information so they can consider choices that protect water quality and sustainability. For example, Lake Michigan is being used to its legal limit in Illinois, requiring expanding communities to deplete groundwater resources at an increasing rate.

Bacterial and viral contamination of coastal waters in southern Lake Michigan are common occurrences during the summer, leading to beach closings or signage that warn swimmers of the health risks. This can result in an immediate loss of tourism dollars and in additional economic losses. Municipalities need science-based information that amplifies detection capabilities necessary to ameliorate or treat the health risks associated with this issue. Currently, information is lacking as to the source of the contamination; the vectors that disperse the contamination; effective methods for real time assessments; and effective methods to treat the contamination.

The Wingspread Tri-State Regional Accord, in which four planning agencies have committed to address environmental, transportation, and economic issues, was originally initiated through a grant from IISG. Subsequent funding from IISG helped to support Wingspread activities and the creation of the Southern Lake Michigan Tri-State Water Consortium (a collection of agencies, communities, local and state governments, and industries in three states working together to develop and implement a sustainable water supply plan within the area encompassed by the Wingspread Accord). These initial investments by IISG have been leveraged through support from the Johnson Foundation, the Joyce Foundation, and others that sustain these activities today. IISG will continue to further these important efforts over the next four years.

## Goals

- ⊙ Enhance the health of coastal residents by reducing the risks from contaminants and coastal pathogens.
- ⊙ Improve water quality by reducing non-point source pollution stemming from increased land development.
- ⊙ Provide solutions for ensuring the water supply for future users of the water resources of Lake Michigan and adjacent watersheds.

## *Research Needed to Solve Contemporary Problems*

1. Determine the fate and effect of toxic chemicals and biological contaminants in near shore waters, in the wetlands of southern Lake Michigan, and in selected inland waters.
2. Develop water resource data in sufficient detail so as to enable the regional planning commissions to develop a water budget for the Wingspread Tri-State Accord region (northeast Illinois, northwest Indiana, and southeast Wisconsin), including the potential for consumer water conservation.
3. Develop simplified water supply planning methods and analytical procedures necessary to generate a reasonably accurate mid-term (20 year) water budget for the southern Lake Michigan basin.
4. Develop clear and easy-to-use planning guidelines for local officials to responsibly consider appropriate water supply policies for their communities.
5. Quantify sources of non-point source pollution from agriculture, urban runoff, and shoreline development; quantify trophic level impacts; and develop improved control procedures.

## *Outreach Objectives*

The numbers of communities and states considering or making management or policy changes as a result of outreach programming outlined in this thematic area will be documented through one-on-one working relationships with decision makers as they interact with program specialists. When necessary, summative surveys may be used to identify changes made based on IISG programming.

1. ***Contaminants that cause beach closures in Indiana and Illinois will be reduced through the accomplishment of the following objectives:***
  - 1a) *By 2009, planning commissions in the four Indiana coastal counties will review their onsite waste treatment ordinances and make changes necessary to reduce the number of failing systems that contribute bacterial disease and pathogens to surface waters.*

The Planning with POWER program will present research-based information regarding the risks posed by current onsite waste management systems to planning commissions, watershed groups, and other interested parties. Research-based alternatives will be explored and case studies of management and policy options will be presented. Facilitation and continued technical support will be provided to working committees in each county as they consider and address this issue in their counties.

1b) *By 2010, research and monitoring that address beach contamination issues will be improved.*

IISG will continue to be active on the E. coli Interagency Task Force and chair the outreach subcommittee. New funding to address beach issues will be generated based on the Water Quality Assurance Plan written by IISG staff. IISG will continue to work with Indiana Department of Environmental Management, the Indiana Dunes National Lake Shore, Indiana University Northwest, and other project partners to implement improved research and monitoring needed to address the beach contaminant issue. These implementations will be documented and reported through grant documentation.



1c) *By 2010, at least five local and regional plans will address combined sewer overflow issues in the southern Lake Michigan basin through best management practices and structural strategies.*

IISG will continue to work with municipalities, county stormwater agencies, and regional planning commissions to incorporate research-based best management practices (such as water conservation measures and the reduction of impervious surfaces) and structural strategies (such as promoting on-site stormwater detention by using rain gardens, green roofs, and on-street storage) that can be retrofitted within developed urban areas to reduce the overloading of combined sewer systems discharging into the Great Lakes basin.

2. *By 2010, policy makers and resource managers from three Great Lakes states will incorporate science-based research knowledge as they begin to address policy or management changes that will reduce the amount of mercury, atrazine, or PCBs entering Great Lakes waters to sustainable levels.*

IISG will work with GLNPO scientists to deliver Lake Michigan Mass Balance Program research results to policy makers and resource managers in all states surrounding Lake Michigan. Follow-up publications and workshop sessions will be conducted in partnership with GLNPO, management agencies, legislators, and citizen groups as states consider management and policy options to address contaminant levels of mercury, atrazine, or PCBs entering Lake Michigan from their states.

3. ***By 2010, policy makers in three Great Lakes states will consider science-based research from the Great Lakes monitoring and trend data and begin to consider policy or management options that improve the surface waters in their state for swimming, fishing, or drinking.***

IISG will work with GLNPO and Environment Canada to transfer State of the Great Lakes Ecosystem Conference (SOLEC) results, which identify environmental risks still impairing the safety of Great Lakes drinking water, swimming, and fish consumption, to legislators and agency managers in all Great Lakes states. IISG will work with decision makers and help them access the latest scientific data as they consider future priorities and action steps in their decision processes.

4. ***By 2006, regional planning commissions will develop and adopt a shared and consistent policy framework as well as methodology for assessing water supply resources and needs within the tri-state southern Lake Michigan basin.***

In addition to participating on the steering committee for the 2005 “Straddling the Divide” conference, IISG moderated a session at the conference that provided the foundation for future water supply planning activities. Through graduate research assistance and communications support, IISG will help advance these activities and will assist the Northeastern Illinois Planning Commission (NIPC) to sustain and further the activities of the Tri-State Water Consortium.

5. ***By 2007, regional planning commissions will adopt water supply plans and policies for their region that are consistent with their policy frameworks and water budgets.***

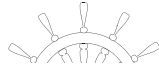
IISG will help NIPC and the Tri-state Water Consortium write, facilitate, and produce the water supply plans.

6. ***By 2008, regional planning commissions will develop planning guidelines and procedures for the 19 counties in the southern Lake Michigan basin and will begin working with county officials in the development of local water supply plans. The outreach component of this initiative will include the water supply module developed by NIPC for their “Paint the Town” software package.***

IISG will help in the development of these planning guidelines in partnership with NIPC. IISG will provide technical and facilitation assistance to local communities as they consider implementing these guidelines.

### ***Personnel***

Four technical specialists, comprising 3.5 FTEs contribute to this thematic area. In addition, four communications specialists and the outreach coordinator assist in program and product development. Outreach activities in Objective 1a will be led by the program’s Planning with POWER Program director (1.00 FTE). Objective 1b will be conducted by the program’s aquatic ecology specialist (0.75 FTE). Objectives 1c and 4-6 will be conducted by our coastal business and environment specialist (0.75 FTE). Outreach Objectives 2-3 will be led by the program’s ecosystem extension specialist (1.00 FTE).



## Coastal Cities

### Goal

- © Enhance the quality of life in Illinois and Indiana by supporting ecologically sound and sustainable coastal economic development.



An important concern to the Great Lakes region are the impacts that urban land use practices have on the quantity and quality of the water resources. Increasing development and urban sprawl places additional demands on drinking and wastewater systems.

The growth of the region's economy provides increasing benefits to Illinois and Indiana. This growth also imposes costs on society—costs that might not be readily apparent to those making land use change decisions. The expansion of commercial, industrial, and residential areas into agricultural lands or open space will bring changes in the way that water is allocated in the region.

An increased need for water services will require increased public expenditures to develop the necessary infrastructure. Additionally, the disposal of waste is expanding, requiring mitigation and remediation of waste in the region's watersheds. Land use changes are leading to increases in non-point source loading, impacting water quality throughout the region. Decision makers and citizens must understand the long term costs to society of land use choices.

The coastal areas of Illinois and Indiana provide many recreational opportunities, including fishing, boating, beach going, and nature hiking. A measure of the economic value of these opportunities is not available to local and regional authorities. This lack of information makes it very difficult for municipal officials to make choices that effectively and sustainably balance the competing goals of conservation of coastal ecosystems and the development of coastal areas.

Short- and long-range planning is a positive step toward reaching goals and making difficult policy decisions. Unbiased, science-based information is necessary for the planning process.

## Research Needed to Solve Contemporary Problems

1. Develop dynamic, useful models of how coastal resources connect with and are impacted by the development of the regional economy.
2. Conduct specific cost-benefit assessments of individual local policy changes and public and private investments/interventions that impact coastal resources quality.
3. Estimate the use and non-use values of coastal recreational resources and provide measures of the contribution of these resources to the regional economy.

## Outreach Objectives

1. ***By 2010, the regional growth plan for the Chicago metropolitan region will contain provisions and implementation steps to sustain coastal resources and associated open space.***

IISG will participate in NIPC-facilitated regional planning activities; will participate on the Sustainability Team as part of the Chicago Wilderness Consortium; and will help write the NIPC 2020 Plan.

2. ***By 2010, two coastal communities in Indiana and Illinois will make policy and management changes designed to sustain local natural resources and open space in compliance with regional growth, watershed management, and biodiversity recovery plans through the following objectives:***

2a) By 2006, the Illinois Environmental Protection Agency (IEPA) will have adopted and evaluated watershed protection plans and management guidelines for one urban and one rural area within the Chicago metro area, pursuant to its newly adopted watershed planning regulations.

IISG will serve as a technical resource to IEPA, providing planning and research-based ecosystem expertise that contributes to the development of watershed management plans.

2b) By 2008, two communities will adopt watershed management plans deemed by IEPA to be consistent with the state's watershed protection guidelines.

IISG will continue to provide technical input and oversight for proposed water-





shed planning. As Illinois moves from a state-level sewer extension policy to a locally-based watershed planning activity, IISG will provide technical guidance to local communities.

3. ***By 2008, the Calumet Ecological Management Plan, designed to enhance the economic development in the region, will be developed.***

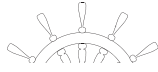
IISG will continue to serve as a member of the City of Chicago Government Working Group and will work with the City of Chicago to implement the Calumet Ecological Management Plan and the Calumet Stewardship Initiative. The ecologically-based planning expertise provided by IISG will help achieve a sustainable balance between environmental and economic objectives.

4. ***By 2008, eight Indiana counties (encompassing 2,987 square miles) will have “Planning with POWER committees,” recognized as advisory committees to the county plan commissions or other local land use decision-making bodies that revise policies and ordinances to sustain open space and natural resources as their counties grow.***

IISG will provide Planning with POWER presentations to county planning officials, watershed management planning groups, and interested stakeholders in counties throughout Indiana. Counties interested in incorporating natural resource-based planning into comprehensive plans will receive continued technical and facilitation support. Counties seeking to make substantial changes to zoning ordinances and comprehensive plans will be encouraged to empower a local workgroup to undertake this task. Planning with POWER will work closely with these workgroups as they incorporate science-based management practices and principles into local policies.

### ***Personnel***

Two technical specialists, totaling 1.75 FTEs, contribute to this thematic area. In addition, four communications specialists and the outreach coordinator assist in program and product development. Outreach Objectives 1-3 will be led by the program’s coastal business and environment specialist (0.75 FTE). Objective 4 will be conducted by the program’s Planning with POWER Program director (1.00 FTE).



## Nourishing Healthy Communities

The opportunities for enhanced quality of life are many through the wise use of southern Lake Michigan resources and agriculture. The Midwest has the potential to be a rich source of seafood for the region and to have a well-informed population regarding the benefits and risks of eating fish. The Great Lakes also provide a potential source of cutting-edge biomedicine. Just as there are potential medicines from the sea, there may be opportunities in the Great Lakes for similar discoveries.

Chicago is one of the five largest U.S. seafood markets in the U.S. and imports 99 percent of the products consumed in the Midwest. Right now, less than one percent of the farm-raised seafood consumed in the U.S. is produced in the Midwest, but with such a large consumer base, these numbers are expected to increase. The region also can boast of a ready supply of corn and soybeans for low cost fish feed and potential producers receptive to diversifying their existing farm operations.

Many fish species found in Lake Michigan and nearby waters contain contaminants that exceed U.S. EPA advisory levels for consumption. The Chicago region and northwest Indiana are culturally diverse areas inhabited by many non-English speaking and lower income families who consume Lake Michigan fish for subsistence. These residents are in need of understandable information that will enable them to interpret and evaluate the potential health risks of consuming this food source.

Biotechnology and biomedicine play important roles in developing techniques and methodologies that can benefit human health and the health of the environment. These can include tools to improve feed for farm-raised fish; use reproductive strategies for nuisance species; determine ecological risks; and develop pharmaceuticals. The benefits of an ecologically sustainable technology industry in Illinois and Indiana are enormous and the need for further research is evident.

### Goals

- ⊙ Increase the safety and quality of seafood and aquaculture products produced, processed, and consumed in the United States.
- ⊙ Increase the use of aquaculture information in secondary education.
- ⊙ Improve the profitability of aquaculture industries in Illinois and Indiana.
- ⊙ Provide resources and opportunities for the growth of biotechnology and biomedicine.
- ⊙ Improve the understanding and application of fish consumption advisories by anglers and consumers.

## Research Needed to Solve Contemporary Problems

1. Develop methods and tools for improving aquaculture marketing in Indiana and Illinois.
2. Determine the social behaviors leading to acceptance and use of technical information on the safety of fish consumption.
3. Conduct a needs assessment for limited resource families to identify the reasons for subsistence fishing and fish consumption habits (wild caught versus commercial and primary species consumed).
4. Evaluate the impacts of fish consumption education programs.
5. Develop cost effective analytical techniques and develop strategies for eliminating or remediating contaminants and pathogens in fish for consumption from Lake Michigan.
6. Develop innovative fish and crustacean culture strategies of cool water species that improve human food production via biotechnology, culture system engineering, product development, and economics.



## Outreach Objectives

1. ***By 2007, all producers contemplating an aquaculture venture will have access to decision tools, information, and technical assistance needed to select appropriate species for production, develop enterprise budgets, and evaluate their start-up costs and profit potentials.***

IISG will partner with aquaculture industry associations, Purdue University, and University of Illinois (U of I) Extension to produce a single source of information for first-time aquaculturists that may include a workbook and an enterprise budget worksheet.

2. ***By 2010, aquaculture producers in Illinois and Indiana will have access to established markets for two species suited to production in the Midwest.***

IISG will partner with the aquaculture industry associations in Indiana and

Illinois, Purdue University, and U of I Extension to identify appropriate species and to contribute to the development of markets for those species.

3. ***By 2010, 10,000 underserved families in the southern Lake Michigan region will change their fish consumption habits to protect the health of themselves and their children.***

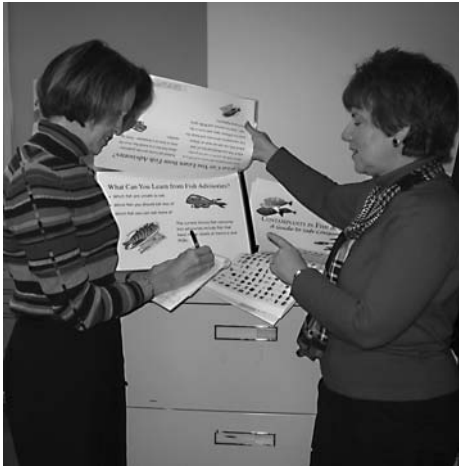
IISG will develop training resources with IEPA, Illinois Department of Natural Resources, and Illinois Department of Public Health for U of I Extension nutrition educators. These resources will be used to inform limited-resource families in the Chicago region about health issues pertaining to subsistence fishing in southern Lake Michigan so that they can make educated decisions about fish consumption. IISG will update materials and documents and will monitor success through the analysis and interpretation of audience use data gathered by U of I Extension.

4. ***By 2010, 2,550,000 people in 160 countries will access aquaculture science publications and outreach products that may prove useful in their careers and businesses.***

IISG partners with Mississippi-Alabama Sea Grant Consortium to provide aquaculture-based research and outreach materials through the AquaNIC Web site. The AquaNIC team also coordinates with the World Aquaculture Society to provide online resources for employment. The site hosts discussion groups that facilitate the gathering and dissemination of aquaculture-based information. In addition to a vast link section, AquaNIC has an extensive contact directory supplying e-mail addresses and a calendar of aquaculture events around the world. Web use will be documented through automated Web statistics using Web Trends software.

## **Education Objectives**

1. ***By 2007, 30 community outreach projects will be conducted to educate families (representing underserved populations including Hispanic, African American, and Korean) in the Chicago Public School System and Gary and Hammond, Indiana, school districts about the benefits and risks of consuming fish.***



IISG will partner with Building a Presence Program (Illinois Science Teachers Association), GLNPO, and Purdue University Calumet to conduct a teacher training program designed to educate participants about the benefits and risks of fish consumption from lakes and rivers as well as from retail outlets. Middle and high school teachers will deliver this information to students resulting in science-based projects that will be presented at school and community events. IISG will also develop pages on the program Web site to provide current information on fish nutrition topics. This information will also be delivered via professional educator meetings. This project will be designed so teachers can report community outreach projects that result from their classroom activities using resources generated by this project. Projects will be highlighted on the project Web site and may also be developed into a publication that will provide ideas for other students around the country. Follow-up correspondence with teachers attending the teacher-training program will be used to identify community outreach projects resulting from this initiative.

### *Personnel*

Two technical specialists, one Web specialists, and an education specialist, comprising 3.15 FTEs, all contribute to this thematic area. In addition, three communications specialists and the outreach coordinator assist in program and product development. Outreach Objectives 1-2 will be led by the program's aquaculture marketing specialists (1.00 FTE). Objective 3 activities will be conducted by our aquatic ecology specialist (0.75 FTE). Objective 4 will be conducted by the program's chief Web officer (0.60 FTE). Activities conducted under the Education Objectives in this thematic area will be conducted by the program's education specialist and communications coordinator (0.80 FTE).



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