

Illinois-Indiana Sea Grant Strategic Plan 2024–2027

Introduction

Illinois-Indiana Sea Grant (IISG) is charged by the National Sea Grant Office to develop a new strategic plan at least every four years. This plan establishes priorities for IISG, and through a two-way, iterative process informs and is, in turn, informed by the National Sea Grant College Program's own strategic plan. Illinois-Indiana Sea Grant's strategic plan guides development of work plans related to our funding from NOAA, which supports our broad research, outreach, and education activities. The strategic plan is also used as the basis for program evaluation by IISG and National Sea Grant.

Through the strategic planning process, we build on our collective past impacts, short-range achievements, and long-range visioning efforts with partners to support successful initiatives and identify innovative new approaches to ensure continued progress in the future.

Vision and Mission

Illinois-Indiana Sea Grant's vision for the Great Lakes and the southern Lake Michigan region is healthy aquatic ecosystems that support resilient and sustainable communities.

Our mission is to provide unbiased, research-based information to foster an environmentally literate population so communities and individuals can make decisions that incorporate environmental priorities along with other societal needs.

The Environment in which We Work

Lake Michigan and the rivers that wind through Chicago and surrounding communities in Illinois and Indiana have been a driving force in the region becoming the largest population center in the Midwest. Historically, southern Lake Michigan has been a resource for drinking water, shipping, recreation, industry, and more. Challenges and conflicts related to the many uses for these local waters are part of the region's evolving economic and environmental legacy.

A classic example of the interrelationship between the economy and environment in this region, as well as the value of healthy waters and water infrastructure, is the reversal of the Chicago River. In 1901, in a feat of engineering, the Sanitary District of Chicago reversed the river, redirecting it away from Lake Michigan toward the Illinois and Mississippi rivers, and ultimately the Gulf of Mexico. Reversing the river greatly reduced the risk of wastewater contaminating Lake Michigan, helping prevent water-borne diseases from sickening the city's ever-growing population. It also shortened and improved what was an important shipping route.

Today, this change is also considered in light of its drawbacks, for example, the easy movement of invasive species from one basin to another. But protecting the city's drinking water helped the region grow and thrive. Today, the greater metropolitan Chicago region is home for more than 12 million people and managing water resources is as critical to success and resilience now, as it has been historically.

Water Resource Challenges

Some water concerns in the region today are inherited from the past and some are due to new threats. For example, in northwest Indiana, legacy pollution from steel and other industries has left waterways contaminated long after most of the businesses are gone. Cleaning up these rivers is key to rejuvenating these economically depressed communities.

Pollution also comes in the form of excess nutrients—from fertilized farmlands and well-tended lawns in the two states, as well as wastewater that flows from metropolitan areas to nearby waterways and beyond.

But a new category of chemicals—contaminants of emerging concern—presents a potential new host of problems. Microplastics, pharmaceuticals, flame retardants, and PFAS (per- and polyfluoroalkyl substances), to name a few, have been found all over, and their impacts on aquatic organisms and, of course, people, are not fully documented.

Human development has also created situations where sometimes water itself poses a threat. As urban regions grow and spread, more buildings and parking lots increase the need for more effective stormwater management. And larger storms are happening more frequently throughout the Midwest.

These bigger storms are a product of climate change, and they can impact beach conditions and cause erosion, as can extremely variable lake levels. Lake Michigan waters have swung from a record low level in 2013 to another record—this time in only seven years to a new high in 2020. Since then, the lake level is quickly dropping again.

Conversely, concerns also loom for the water supply. Lake Michigan provides drinking water to 8.5 million people in Illinois and Indiana, but a proactive commitment to water conservation will be necessary in the region to accommodate increased water demands due to projected population growth and land use changes. Plus, groundwater withdrawals from the deep-bedrock aquifer have generally been shown to exceed the recharge rate and so more communities are looking to the lake to solve their problem.

Finally, perhaps the biggest threat to the lake's food web is the numerous invasive species, especially quagga mussels, which have made the Great Lakes home. More adaptable than zebra mussels that came before them, quaggas are gobbling up resources and spreading across Lake Michigan's bottom in both nearshore and deeper waters.

Going Forward

Communities need to be increasingly resilient by balancing societal, environmental, and economic goals. The value of thriving aquatic ecosystems, improved water quality, and effective water infrastructure systems encompasses human health issues and quality of life as well as a sustainable future.

Informed resource management and local and regional comprehensive planning that invest in the two states' water resources will help grow economic and environmental resilience for the region's future. Fostering healthy aquatic ecosystems, preventing flooding, planning for future water supplies, and reducing pollution help establish fertile ground for growth. Additionally, raising awareness about safe and responsible water recreation and supporting the aquaculture industry can contribute to quality of life and sustainable fisheries in the region. Resilient communities are better able to adapt to and thoughtfully prepare for contingencies that may arise from an ever-changing world.

Resilient communities recognize that we all need water—to drink, for recreation, to help our cities grow. The actions of planners and decision makers is critical, but so is keeping people of all ages and walks of life informed about how we can play a role. By increasing Great Lakes literacy, we can encourage more southern Lake Michigan residents to become stewards of clean water and healthy aquatic ecosystems.

The National Sea Grant Program

Sea Grant was created by the U.S. Congress in 1966 to be a highly leveraged federal and state partnership to harness the intellectual capacity of the nation's universities to solve coastal problems along our oceans, Great Lakes, and islands. The National Sea Grant College Program engages citizens, communities, scientists, organizations, and governments to sustain and enhance the vitality, value, and wise use of the nation's coastal resources. Administered and supported by NOAA, and implemented through leading research universities, Sea Grant provides unique access to scientific expertise and to new discoveries. Through its scientists and communication, education, extension, and legal specialists, Sea Grant generates, translates, and delivers cutting-edge, unbiased, science-based information to address complex issues.

Sea Grant is a national network of 34 university-based state programs, the National Sea Grant Advisory Board, the National Sea Grant Law Center, the National Sea Grant Library, and hundreds of participating institutions. The Sea Grant network enables NOAA and the nation to tap the best science, technology, and expertise to balance human and environmental needs in coastal communities.

Illinois-Indiana Sea Grant

Illinois-Indiana Sea Grant is focused on the southern Lake Michigan region—104 miles of heavily urbanized and industrialized shoreline in the two states. One third of the population of the Great Lakes lives along the shore of Lake Michigan between Milwaukee, Wisconsin and Michigan City, Indiana.

Based at Purdue University and University of Illinois, IISG works in partnership with key organizations, institutions, and agencies in the region to reach more audiences and multiply opportunities for success. We bring together scientists, educators, policy makers, community decision makers, outreach specialists, business leaders, and the public to work towards a healthy environment and economy.

Our commitment to partnerships is reflected in our annual \$5 million-plus budget. About one third of that funding is through the Sea Grant omnibus. Another third comes from multiple

grants, as well as matching funds provided by the two universities. The final third is from a long-term partnership with the U.S. Environmental Protection Agency Great Lakes National Program Office (EPA GLNPO). Through this funding, IISG uses EPA GLNPO data to engage in research and outreach that supports Great Lakes communities.

Illinois-Indiana Sea Grant includes 34 employees with the equivalent of 31 full time employees dedicated to Sea Grant work. The omnibus supports the equivalent of six staff members, with the rest supported through leveraged funds.

Illinois-Indiana Sea Grant personnel and management duties are split between the two universities. At Purdue, the program is housed in the Department of Forestry and Natural Resources where IISG's director and assistant director are located. Our associate director and assistant director for outreach are positioned in University of Illinois Extension. The IISG management team consists of members from each of the chief functional areas—research, outreach, education, and communication.

Illinois-Indiana Sea Grant activities are guided by two advisory committees.

Administrative Advisory Committee

The administrative advisory committee brings together representatives from the respective universities, colleges, and academic units that govern IISG to provide oversight regarding strategic matters. These include: policy considerations that affect the priorities and long-term directions of the program; guidance in the involvement of partnering institutions and interested parties; sources of matching funds; and a communication strategy for engaging local, state, and federal government entities. The administrative advisory committee meets 2–4 times per year. In addition, IISG's director communicates with advisory committee members individually or collectively as administrative issues arise. Committee members are named based on their university position. When a member leaves that position, their replacement joins this committee.

External Advisory Committee

The external advisory committee is composed of conservation organization, management agency, and business leaders in the bi-state region. These members are focused on Lake Michigan and represent our local partners and users. The committee, which also includes a business owner, helps steer IISG's research and outreach programming, including providing input during the strategic planning process, and facilitates IISG connections with critical partners. The committee convenes quarterly and interacts via video conferencing and email as needed.

Core Values

Illinois-Indiana Sea Grant's core values are essential and enduring principles that influence the program and support its mission. Our core values support a culture of integrity and scientific neutrality, enabling IISG to serve as a trusted broker of information.

Sustainability: Advancing environmental stewardship practices that help maintain services that Great Lakes and inland freshwater ecosystems provide to the region.

Accountability: Operating with integrity and transparency while maintaining quality and relevance in all functional areas, including program management.

Non-advocacy: Maintaining a commitment to objective research and programming that avoids bias and advocacy as we develop and deliver information, tools, and services.

Cross-Cutting Principles

These principles create a common foundation for all the work IISG conducts. Our efforts to foster and build on partnerships as well as to prioritize diversity and inclusion enhance IISG's capabilities to meet future needs in Illinois and Indiana and in the Great Lakes region.

Partnerships: To make informed decisions about water resource issues in the region and to make the most of opportunities to connect with a range of relevant audiences, IISG integrates expertise and capabilities from a cross section of people and perspectives. To this end, our specialists work with over 300 partners from government, academia, non-profits, and industry.

Diversity and Inclusion: Illinois-Indiana Sea Grant values diversity, equity, and inclusion in both our program and the communities we serve. Therefore, we strive to make access to research, outreach, education, and employment opportunities available to everyone, regardless of race, color, religion, place of origin, gender, sexual orientation, age, socio-economic status, disability, or veteran status.

The ways in which people interact with natural resources are a function of their beliefs, values, and life experiences. By explicitly incorporating diverse perspectives and inclusively collaborating across stakeholder groups, we can foster more equitable and sustainable natural resource management.

We work to:

- Help communities to address critical natural resource issues, including climate change adaptation, pollution prevention, and safe recreation.
- Provide accessible, free, or reduced-cost programming to diverse audiences, including via ADA-compliant and multilingual publications.
- Expand access to our research grants, fellowships, and internships to include underrepresented and non-traditional groups and individuals.
- Be a leader in equal employment opportunity practices and offering employee training on diversity, equity, and inclusion issues.

This commitment to diversity, equity, and inclusion has shaped our beliefs and practices as we interact with others. Specifically, we:

- Strive to create a welcoming environment, so that each person feels accepted, valued, and safe.
- Insist on respectful behavior because words and actions, or the lack thereof, have powerful meaning.
- Encourage the open expression of ideas.

We recognize that natural resources issues affect everyone, though they do not affect everyone equally. At IISG, we celebrate the diversity of both people and nature as well as the complex interactions between them.

The Strategic Planning Process

Strategic planning is an ongoing process for IISG. Our specialists and leadership team continually listen to user needs, challenges, and goals to incorporate them into our programmatic needs. We engage with collaborators, researchers, federal and state agency professionals, other interested parties, and people at our workshops to help us understand their perspectives.

Our official 2024–27 strategic planning process began with conversations. Through emails and discussions, our specialists engaged with our partners including local or regional planning agencies, environmental agencies, universities, and local health departments, to name a few examples, to solicit their input. Three questions addressed their area of work and opened up conversations:

1. Are there components of my work that you'd like to see me more strongly emphasize?
2. Are there any new directions or opportunities with my work that you'd like to see me pursue?
3. Do you have any additional feedback regarding my future work?

An additional question was focused on the direction of the program as a whole: Please provide any feedback you have regarding topics or areas in which you would like to see Illinois-Indiana Sea Grant engage or become more engaged.

Program management discussed strategic plan priorities with our administrative and external advisory committees to explore emerging issues, challenges, and untapped needs from their perspectives. We also requested input from the public at large on our website's newsroom and through social media. Combined, these multiple approaches allowed us to comprehensively get feedback from interested parties.

We combined all of this information with our core mission, vision, and values to identify the topics that our program should focus on in 2024–27. Our specialists then defined their programmatic goals and objectives considering their conversations with partners and their ongoing efforts.

Illinois-Indiana Sea Grant Focus Areas and Goals

In 2024–27, IISG will direct its efforts in four National Sea Grant focus areas: Environmental Literacy and Workforce Development, Healthy Coastal Ecosystems, Sustainable Fisheries and Aquaculture, and Resilient Communities and Economies. Through these focus areas we will bring information, tools, training, and other resources to decision makers and residents to help foster a healthy and resilient economy and environment.

Estimated Level of Effort by Focus Area

Environmental Literacy & Workforce Development	Healthy Coastal Ecosystems	Sustainable Fisheries & Aquaculture	Resilient Communities & Economies
20%	35%	10%	35%

Using both the National Strategic Plan as a guiding document and the specific goals and objectives of IISG specialists, we outlined goals in each of the Sea Grant focus areas presented in this document.

Focus Area: Environmental Literacy and Workforce Development

The Great Lakes face many threats—invasive species, pollutants, and climate change, among others, however, many residents in the region may not have a good grasp of the characteristics, functioning, and value of these water bodies. The science and history of the lakes are also woefully underrepresented in school textbooks and other educational resources.

The Sea Grant program’s strength is in translating and delivering cutting-edge, science-based information to address complex issues and is, therefore, well suited for filling this literacy gap. A Great Lakes-literate public could better contribute to the environmental, economic, and social sustainability of the region.

Increasing literacy across diverse audiences can be accomplished in many ways, though one of the most effective and efficient ways is through working with educators who bring new knowledge to their students. In turn, these students are often inspired to engage in community stewardship—helping improve their local environment and inform their neighbors. Of many possible impacts these efforts can inspire future scientists who conduct aquatic research or resource managers who guide the responsible use and conservation of Great Lakes ecosystems.

What’s more, IISG education efforts go beyond the classrooms, into museums, at fairs, and in workshops, where audiences of all ages learn about Great Lakes conditions and concerns.

Through program specialists and funded researchers, IISG provides opportunities for undergraduate and graduate students to gain applied experiences in the field, or in labs, agencies, or communities. These students participate in research, project development, or problem-solving experiences that can be a vital step on their career paths.

Goal: A diverse, environmentally literate public participates in lifelong formal, non-formal, and free-choice learning opportunities.

Goal: A diverse, skilled, and environmentally literate workforce that is engaged and able to build prosperous lives and livelihoods in a changing world while addressing critical local, regional, and national needs through traditional and innovative careers.

Focus Area: Healthy Coastal Ecosystems

The health of the region is intrinsically tied to the health of the Great Lakes themselves. When the lakes and nearby waterways become degraded by contaminants or invasive species, the toll is taken not just on fragile food webs, but also on communities that depend on these resources for drinking water, shipping, recreation, and quality of life.

Legacy contaminants from industry and other activities along Great Lakes waterways have left many lakes and rivers impaired. While most manufacturers have moved on, they left behind PCBs, mercury, and other toxic pollutants that impair the health of the waterway as well as adjacent communities.

At the same time, contaminants of emerging concern, such as pharmaceuticals and microplastics, pose new threats to Great Lakes ecosystems. Illinois-Indiana Sea Grant research has detected a cocktail of medicines, as well as plastic microfibers, in southern Lake Michigan waters. Add to that, the waters and shores of the Great Lakes are increasingly laden with litter.

Perhaps the most significant threat to the Great Lakes food web is aquatic invasive species (AIS). These species have caused major disturbances affecting the integrity and stability of the lake ecosystems as well as those of inland waterways.

We are engaged in addressing these ecosystem threats through a variety of approaches. As the Great Lakes Restoration Initiative provides support for cleaning up Great Lakes Areas of Concern, IISG is working with EPA GLNPO to keep residents engaged throughout the process. Armed with the latest scientific research, IISG's Pollution Prevention program is creating an educated public—one that makes decisions that consider the potential environmental and societal impacts of aquatic pollution. And IISG's AIS team is the go-to group for natural resource managers as well as water gardeners and other audiences for information and tools on preventing the spread of AIS.

Illinois-Indiana Sea Grant is also working with EPA GLNPO to improve the effectiveness of monitoring programs by developing ways to make Great Lakes data collection and analysis more efficient, dependable, and precise. In addition, the program is leading efforts to coordinate agency and university scientists as they come together to study the Great Lakes in a systematic and comprehensive fashion.

Goal: Coastal and Great Lakes habitats, ecosystems, and the services they provide are protected, enhanced, and/or restored.

Goal: Land, water, and living resources are managed by applying science, tools, and services to sustain resilient coastal and Great Lakes ecosystems.

Focus Area: Sustainable Fisheries and Aquaculture

In the United States, seafood is the second largest natural resources trade deficit behind oil. In Illinois and Indiana, as around much of the country, aquaculture producers compete for customers with suppliers of imported seafood, which comes at a much cheaper price.

Illinois and Indiana provide a great location for aquaculture due to the rich supply of raw materials of fish food and access to large markets. But, growing aquaculture in the two states entails enhancing the viability and profitability of these businesses. To that end, it is essential that aquaculture producers recognize marketing opportunities that sustain and enhance their businesses. They also need to make smart production choices in their efforts and investments, which means having the most up-to-date knowledge and technology.

Illinois-Indiana Sea Grant brings research-based production techniques and marketing recommendations to potential or established aquaculture and aquaponic producers to help them increase their profits. Whether it's connecting with potential processors, restaurateurs, or consumers, or engaging in niche marketing, IISG helps fish farmers make the most of what their products offer to consumers—fresh, locally-grown seafood that is raised using environmentally responsible practices.

From a regional standpoint, IISG is a partner in the Great Lake Aquaculture Collaborative, bringing together seven Great Lakes Sea Grant programs and the National Sea Grant Law Center. The collaborative is identifying barriers that inhibit industry growth and is providing science-based initiatives that support an environmentally responsible, competitive, and sustainable aquaculture industry.

While the Lake Michigan waters of Illinois and Indiana do not support a commercial fishing industry, angling is an economically, environmentally, and socially important pastime there. In the past few decades, the Lake Michigan ecosystem has been changing due to invasive species and habitat degradation, which have put sustainable fish populations and fisheries at risk. Scientists and managers are working to understand and mitigate the changes that anglers are experiencing firsthand.

We bring together anglers, scientists, reporters, and resource managers in the southern Lake Michigan region to discuss fisheries and the factors impacting them. Through workshops, publications, and two fisheries data websites, anglers and others can stay informed on Lake Michigan issues.

Goal: Domestic fisheries, aquaculture, and other coastal and freshwater natural resources supply food, jobs, and economic and cultural benefits.

Goal: Natural resources are sustainably managed to support fishing communities and industries, including commercial, recreational, subsistence fisheries, and aquaculture.

Focus Area: Resilient Communities and Economies

Many communities face the struggle of embracing growth while also ensuring resilience and sustainability, particularly in the face of climate change. Knowing what is at stake, what is of value, and what is necessary are key to successful planning and decision making. And, while we can all do our part to protect water resources, many actions are more effective and efficient taken on as a community. Indeed, some can only take place on a community level.

Illinois-Indiana Sea Grant continues to provide expertise and tools to help local decision makers protect natural resources and plan for economic development as they strive for

resilience going forward. For example, local planners can use our web-based decision support system to explore policy and management options that can keep aquatic ecosystems from reaching critical tipping points that threaten sustainability in their watershed.

Many water resource challenges that communities face are becoming more urgent as conditions intensify. For starters, larger storms are happening more frequently, leaving stormwater infrastructure often insufficient to prevent flooding. More development and the never-ending growth of sprawl pile on to the problem.

We are helping communities install more greenery or permeable pavement to absorb rainwater where it falls. We have funded research to help communities optimize the siting of green infrastructure and are developing a toolkit to make this process accessible. And we provide hands-on rain garden training for Master Gardeners and others to bring to their communities.

In the greater Chicago metropolitan area, ensuring an adequate supply of affordable drinking water will require bringing a variety of interested parties together and creating a combination of strategies. But having information is also key, so IISG has developed dashboards and other resources that enable community access to data for managing water pricing, sustainability, and affordability wisely.

Lake Michigan water levels fluctuate from year to year, but in recent times, that has become more extreme. The results include more erosion and risks to roads and property. Illinois-Indiana Sea Grant is developing resources that can help local decision makers as they face the challenges and the impacts of high or low Lake Michigan water levels. We have also supported studies of historical erosion rates and the physical and social impact of water levels and large storms on beaches and communities.

The southern Lake Michigan shores are a magnet for tourists and residents alike, but these waters are considered the most dangerous in the Great Lakes in terms of drownings. Our buoys and water safety educational resources help inform recreationists about weather conditions and provide best practices so they can make wise choices about their outdoor activities, especially with regards to Lake Michigan.

Goal: Coastal and Great Lakes communities have the capability and resources to prepare for and adapt to extreme and chronic weather and coastal hazards, climate change, economic disruptions, and other threats to community health and well-being.

Goal: Water resources are enhanced, sustained, and protected to meet existing and emerging needs of the communities and economies that depend on them.