

IMPACTS 2019

two great states caring for one great lake





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Illinois-Indiana Sea Grant specialists in five locations across both states work to help southern Lake Michigan communities through research, outreach, and education. We bring the latest science to those who can best use the information, empowering people to solve problems in sustainable ways.

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A blurred background image of a beach scene. In the foreground, there is a sandy beach. In the middle ground, a person is sitting on a beach chair under a large blue umbrella. The background shows the ocean and a clear blue sky.

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Dear Friends,

For over 36 years, Illinois-Indiana Sea Grant (IISG) has been working to foster a healthy environment and economy in the southern Lake Michigan region. We have a long record of leading research, outreach, and education in areas such as pollution prevention, Great Lakes ecosystem health, and aquaculture. We develop decision tools for communities and their residents, maintain two real-time monitoring buoys in nearshore Lake Michigan, and help bring Great Lakes science to students.

We do this work with the support and collaboration of our partners. IISG is administratively housed in and shares positions with University of Illinois Extension, Purdue Extension, and Purdue University academic departments, including the Department of Forestry and Natural Resources. We share positions with the U of I Prairie Research Institute, Midwestern Regional Climate Center, Illinois Water Resources Center, and Purdue University Northwest.

The U.S. EPA Great Lakes National Program Office provides support, with assistance from the U.S. Geological Survey, for specialists and educators who help bring EPA science to the public. The Chicago Metropolitan Agency for Planning, Chicago Botanic Garden, and McHenry County Extension provide office space and administrative support for our specialists as well. Our successes would not be possible without these and many other partners.

This publication describes some 2018 impacts, which include training communities to address flooding concerns through green infrastructure, informing the decision process to address the threat of aquatic invasive plants beyond the two states, and having a positive effect on the careers of researchers, and especially their students. As the IISG director, I am pleased to share them with you.

Sincerely,

Tomas Höök
Director



Proactive water supply strategies help inform the Chicago comprehensive regional plan

Relevance

Despite sitting along Lake Michigan, the Chicago region faces water shortages. This urban environment also has its share of flood damage and degraded aquatic ecosystems. Lake Michigan withdrawals are limited by a permit system, and groundwater withdrawals happen at twice the natural recharge rate. Drinking and wastewater pipes need repair and replacement, while stormwater infrastructure is stressed from growing development and storm intensity. Integrating comprehensive planning with water, wastewater, and stormwater management is necessary to sustain the region's economy, environment, public health, and quality of life.

Response

Illinois-Indiana Sea Grant assisted the Chicago Metropolitan Agency for Planning (CMAP) in developing water resources strategy recommendations for the Chicago region. Water, wastewater, and stormwater management guidance was integrated into the ON TO 2050 regional comprehensive plan, which was officially adopted by the CMAP board in 2018.

Results

The regional comprehensive plan influences how the seven counties and 284 communities in the Chicago region grow—guiding what capital and infrastructure projects receive funding as well as what local regulations and planning options are implemented. Integrating water resource management strategies into the regional comprehensive plan benefits over 8 million residents. It ensures planning for abundant and high-quality water resources for the greater Chicago metropolitan area is put into action.



Rain garden training and installations reduce runoff by 320,000 gallons

Relevance

In many communities, growing urbanization combined with larger storms has led to more flooding. Additionally, rainwater that hits pavement and runs into drains, and then flows into nearby water bodies, picks up pollutants along the way. One approach to reduce flooding and to protect water quality is installing green infrastructure, including rain gardens. These gardens help runoff soak into the ground and allow pollutants to be filtered by plant roots.

Response

Illinois-Indiana Sea Grant continues to collaborate with Purdue Extension on the Rainscaping Education Program. Through this program, Master Gardeners and other community members learn about rainscaping techniques. In addition to creating a demonstration rain garden, participants are encouraged to bring rainscaping back to their communities, to engage in public education, and to provide technical assistance. In 2018, the rainscaping team conducted four workshops in Steuben, Lake, Boone, and Warrick counties—for 51 participants.

Results

During these workshops, participants installed demonstration rain gardens and interpretative signage, in partnership with local agencies. Participants are also using program resources to launch rain garden education programs in their communities. On their own, the rain gardens installed as part of training workshops have the capacity to reduce runoff from the sites by nearly 320,000 gallons—calculated using average rainfall and rain garden area. Rain gardens that have been designed, facilitated, or installed by participants, or their partners, will reduce runoff even more.



Simply place your
unwanted prescription or
over-the-counter medicines
into this drop box.
The drugs will be
disposed of properly.

**OFF OF THE STREETS...
OUT OF THE WATER!**

ITEMS ACCEPTED

- ✓ Prescription medications (including controlled)
- ✓ All over-the-counter medications
- ✓ Pet medications
- ✓ Vitamins & Supplements
- ✓ Medicated ointments, lotions, creams, and oils
- ✓ Liquid medication in leakproof containers

ITEMS NOT ACCEPTED

- ✗ Needles/sharps
- ✗ Syringes with needles
- ✗ Thermometers
- ✗ IV Bags
- ✗ Bloody or infectious waste
- ✗ Personal care products
- ✗ Empty containers
- ✗ Hydrogen Peroxide
- ✗ Aerosol cans
- ✗ Full Inhalers
- ✗ Illegal drugs



Four new take-back programs help keep nearly 25,000 pounds of medicine out of waterways

Relevance

Most of us do not use all of the medications that we buy, and many of these chemicals are not regulated for safety, long-term health impacts, or environmental damage. Using the sink, toilet, or trash for disposal can put people, animals, and the environment at risk.

Response

Illinois-Indiana Sea Grant joined with local law enforcement to help establish four new permanent community medicine collection programs—in Gibson City and Farmer City, Illinois; in Bloomfield, Indiana; and in Shiocton, Wisconsin. IISG provided technical support about how to start a take-back program and how to properly dispose of collected medicine, and financial support toward the purchase of a collection box.

Results

Altogether, IISG has helped establish 55 permanent medicine collection programs (51 are still in operation). The 24,968 pounds of unwanted medicine collected in 2018 brings the total amount to a whopping 236,328 pounds, which equates to over 118 tons of properly disposed of medicines.



Ohio joins Illinois and Indiana to ban the sale of invasive plants

Relevance

Many plants sold for water gardens and aquariums in the Great Lakes region are non-native, and some of these turn out to be invasive when they end up in local waters. Unfortunately, once invasive species are established in a water body, eliminating or controlling them is expensive and difficult. The best way to reduce the impact of aquatic invasive species (AIS) is to prevent their introduction from the start.

Response

Based on risk assessments developed by the Indiana Aquatic Plant Working Group—led by Illinois-Indiana Sea Grant—AIS specialists provided guidance as both Illinois and Indiana banned the sale of more than two dozen invasive plants. A researcher from the Indiana working group shared risk assessment information with the Ohio Invasive Plant Council, taking this Great Lakes Restoration Initiative-funded work beyond the two states.

Results

The success of this work in Indiana helped inspire a similar process in Ohio. In 2018, the state of Ohio banned the sale of 38 invasive and destructive plants—14 of those are aquatic species.



Limno Loan program helps 22 educators bring real-world science and enhanced lessons to 1,283 students

Relevance

Learning science through real-world experiences provides students with an opportunity to do what scientists do—collect data, analyze it, and interpret the results. Students who are able to collect and analyze real water-quality data with actual equipment used by scientists in the field can experience a rich sense of the scientific process and a connection to their environment. Exposing students to aquatic science, technology, and science careers is an important step in creating a Midwest population literate and engaged with the Great Lakes.

Response

In partnership with U.S. EPA Great Lakes National Program Office, Illinois-Indiana Sea Grant has coordinated the Limno Loan program for seven years. Through this program, educators from around the Great Lakes can borrow the Hydrolab, water-quality monitoring equipment used by scientists, for classroom and field use. To maximize this opportunity, educators also have access to training and website resources.

Results

In 2018, 22 educators borrowed the Hydrolab, reaching 1,283 students. Many educators are repeat customers, but nine were new to the program. Twelve educators created a new classroom lesson or enhanced an existing lesson as part of working with the Hydrolab. Most educators incorporated specific Great Lakes information in their classroom work and 14 educators spent extra time—from 2 days to 2 months—teaching about aquatic science.



Shipboard Science workshop turns 14 educators into Great Lakes scientists

Relevance

The Great Lakes are under-represented in school textbooks and other educational resources. Many educators are neither comfortable with nor confident in teaching about the Great Lakes, aquatic science, or the scientific method. Teachers who have a good understanding of these topics are more likely to integrate Great Lakes and water quality information into their lesson plans.

Response

The Center for Great Lakes Literacy, a consortium of seven Sea Grant programs, conducts the annual week-long Shipboard Science workshop for educators to work side-by-side with scientists on the U.S. EPA R/V *Lake Guardian*. Teachers explore lake ecology, geology, geography, and chemistry. They are introduced to Great Lakes and ocean literacy resources, and they build networks with educators and scientists. Illinois-Indiana Sea Grant is a part of the planning team every year, providing continuity and sharing lessons learned.

Results

Fourteen educators from across the Great Lakes basin participated in the Lake Ontario workshop. All reported gaining new knowledge and increased confidence about Great Lakes concepts, and all planned to integrate them into lessons in the coming school year, reaching 2,145 students. The educators' knowledge of the scientific method increased as well their confidence in explaining scientific concepts and research. In a follow up evaluation, educators described organizing field trips, incorporating new curricula, and bringing real-world Great Lakes issues to the classroom.



Grand Calumet River Stewardship Day increases sense of place for 40 students

Relevance

The Grand Calumet River was once called the most polluted river in America. Through Great Lakes Legacy Act funding, 2 million cubic yards of river and wetland sediment have been removed or capped and 84 acres of habitat have been restored. However, many schoolchildren who live near this natural area have not spent time exploring it. In fact, many have never been there.

Response

Illinois-Indiana Sea Grant, along with The Nature Conservancy, hosted the annual Grand Calumet River Stewardship Day. As part of a school field trip, about 40 fourth grade students visited nearby Seidner Dune and Swale to experience science in the outdoors. These students participated in four stewardship stations where scientists and experts guided them through bird watching, learning fish species, identifying macroinvertebrates, and planting trees.

Results

Evaluated both before and after the visit, the students clearly increased their “sense of place” related to the Grand Calumet River. Sense of place is a well-established social science concept that captures a person’s place attachment, and it is predictive of future environmental stewardship at that place. Increasing sense of place provides additional assurance that a \$200 million government investment in restoration will be maintained by a new generation of stewards.



Sea Grant efforts help address public concerns during Muskegon, Michigan wetland cleanup

Relevance

The waters in U.S. Areas of Concern that go through the Great Lakes Legacy Act cleanup processes are situated alongside communities who live through the remediation, restoration, and revitalization processes. In Muskegon, Michigan, a wetland near the old Zephyr Oil Refinery was slated for cleanup to remove decades of petroleum- and lead-contaminated sediment.

Response

Before the cleanup, Illinois-Indiana Sea Grant interviewed residents to understand people's perceptions of the remediation. This needs assessment revealed that some residents were confused about the cleanup and that many were very concerned about possible odors from digging up petroleum-soaked sediment. These findings helped shape how the public was informed as well as how the cleanup process was undertaken.

Results

Altogether, 50,000 cubic yards of contaminated sediment were cleaned up near the old Zephyr Oil Refinery and 16 wetland acres were restored with native plants. To address odor concerns, during the cleanup EPA installed an air monitoring system and established a hotline for residents to report odors. The process was also timed to take advantage of cooler months when people typically have closed windows. Onsite, dredgers used odor-suppressing foam and quickly trucked away the smelliest sediment.



Great Lakes Legacy Act video informed potential cost-share partners and inspired an EPA summit to plan for more partnerships

Relevance

The Great Lakes Legacy Act (GLLA) has cleaned up 4.3 million cubic yards at 24 sites in its 16-year existence. The program uses a cost-share mechanism between U.S. EPA and nonfederal sponsors, such as states, industries, and municipalities. Many states have used cleanup dollars and 57 industries have come to the table. With more than 70 contaminated sites remaining, an education campaign is needed for future potential partners.

Response

Illinois-Indiana Sea Grant directed and produced, “A Seat at the Table: Great Lakes Legacy Act,” to explain what it means to be a GLLA cost-share partner with EPA. Through partner interviews, this video describes the benefits and challenges of cost sharing, how cost-sharing works, examples of in-kind services, and the flexibility of partnerships. The video was released with a Twitter campaign, #22SedimentStories, and was shared at three state Areas of Concern (AOC) meetings.

Results

In 2018, “A Seat at the Table” was viewed more than 700 times, including at state AOC meetings. Consultants, partner agencies, elected officials, and others have responded enthusiastically. In fact, the U.S. EPA Great Lakes National Program Office, inspired by the video, planned an industry summit to discuss future cleanup partnership possibilities.



Indiana's Bartholomew County now has a plan and public support to protect Anderson Falls

Relevance

In Indiana's Bartholomew County, the Anderson Falls County Park is home to outstanding natural features including an eight-foot waterfall on the Fall Fork of Clifty Creek as well as a 34-acre nature preserve that is home to more than 200 plant species. However, the park's remoteness makes it subject to vandalism, trash dumping, and other activities that limit enjoyment by responsible users.

Response

Illinois-Indiana Sea Grant and Purdue Extension developed a curriculum and facilitation guide for local leaders to help them evaluate community public spaces in Indiana. In Bartholomew County, the Enhancing the Value of Public Spaces program (EVPS) process began in 2016 with several workshops in which diverse stakeholders considered the best possible future for the park and developed these ideas. In 2017, the EVPS team submitted the final Anderson Falls County Park Engagement Report to the Bartholomew County Park Board.

Results

The Park Board's efforts toward addressing Anderson Falls concerns now have direction and new public support. In 2018, the board began to implement recommendations based on the EVPS report, including increasing security and improving access to the park. The process that led to these changes inspired the park board to resume work to develop a master plan for the entire county park system and it is seeking grant funding to accomplish this goal.



Two Indiana counties identify natural resource issues and create action plans

Relevance

Overall, the health of natural resources affects the quality of life in a community. Natural resources provide economic, ecological, and recreational benefits. Communities are faced with many challenges and a number of these are related to preserving their natural resources.

Response

Illinois-Indiana Sea Grant is collaborating with Purdue Extension to guide community groups, boards, and commissions through facilitated action-planning sessions. These sessions support locally driven natural resource management strategies and policies in Indiana. In 2018, the peer-reviewed curriculum for the Conservation through Community Leadership (CCL) program was finalized and the CCL team worked closely with two pilot counties to develop action plans.

Results

As a result of CCL team efforts in Owen and Dearborn counties, 36 participants worked together to develop community action plans that will guide conservation and management of ecological resources. The Dearborn County Soil and Water Conservation District and Purdue Master Gardeners developed a plan to expand community gardening. The Owen County Soil and Water Conservation District launched a Cooperative Invasive Species Management Area effort as part of their action plan.



Two communities use Tipping Point Planner tool to improve natural resource decision making and create action plans

Relevance

For local planners, balancing community growth and environmental health can be a challenge. Putting down roads, building along waterways, or converting prairies to farmland puts stress on local ecosystems—sometimes so much that it can trigger rapid and potentially irreversible shifts in how they function. When communities are armed with science-based environmental limits, or tipping points, they can identify critical areas requiring protection or restoration to improve watershed ecosystem health.

Response

Illinois-Indiana Sea Grant's Tipping Point Planner is a web-based decision-support system for communities to explore policy and management interventions that help keep aquatic ecosystems from reaching critical tipping points and moving to unstable conditions. In 2018, the decision support system was upgraded and the website redesigned. The Tipping Point team also conducted two community programs in Michigan and Ohio. Each meeting series included an education and visioning session with local stakeholders and each included action-planning meetings with steering committees comprised of local experts.

Results

The Tipping Point Planner team collaborated with the communities of Au Gres, Michigan and Perrysburg, Ohio to improve land-management decision making and restoration. They focused on nutrient loading and land use practices that impact Great Lakes food webs, algal blooms, and tributary fishery values. As a result, 113 participants used the Tipping Point Planner decision-support tool to evaluate ecosystem services and these two communities developed action plans to guide conservation and management of ecological resources.



Photo courtesy Kentucky State University

Aquaculture guidance helps Illinois and Indiana producers improve their production

Relevance

Illinois and Indiana aquaculture producers compete for customers with suppliers of imported seafood, which comes at a much cheaper price. Local producers need the most up-to-date knowledge and technology to help ensure the profitability of their aquaculture businesses.

Response

In 2018, Illinois-Indiana Sea Grant visited approximately 30 aquaculture and aquaponics operations in Illinois and Indiana, ranging from small-scale operations to large commercial outfits. One goal of these visits was to gather data on the types of species produced, quantities sold per year, and facility designs. IISG also provides producers with up-to-date research information and connects them with other producers and suppliers.

Results

Through IISG guidance, several farmers have improved their operations, identified production bottlenecks, changed fish feed formulations, and improved capacity. These interactions with local producers also help inform future outreach to aquaculture and aquaponics operators in Illinois and Indiana.



Illinois-Indiana Sea Grant's 37 summer interns experienced invaluable working-world opportunities

Relevance

It is often difficult for undergraduates to obtain experience that helps build their résumés and provides real world knowledge. Also, students aren't always aware of the breadth of job possibilities within their area of studies, including the potential to work in outreach and extension.

Response

Illinois-Indiana Sea Grant established a summer internship program seven years ago for undergraduate students to work closely with program specialists on ongoing projects.

Results

In 2018, three interns—bringing the seven-year total to 37—worked directly with IISG specialists in invasive species, pollution prevention, and Great Lakes cleanups. These three interns studied genetics, planned social media campaigns, and led students in stewardship. One intern continued for four months beyond the summer, helping develop outreach tools. Another was accepted as a graduate student to the Bren School of Environmental Science and Management at the University of California, Santa Barbara. She sees her internship as having meaningfully enhanced both her experience and her application.



Illinois-Indiana Sea Grant funding supports innovative research and provides career boosts for early-career scientists and students

Relevance

Illinois-Indiana Sea Grant has funded more than 175 research projects since the program began in 1982, supporting 65 projects with \$3.35 million omnibus or minibus funds since 2009. All of these projects supported innovative ideas or trained early-career scientists, most including undergraduate or graduate students, as well as post-docs. What has been the impact of this funding on the research trajectory and careers of these scientists and their students?

Response

IISG designed a survey to assess how program funding over the years has influenced the scientists and their teams. From 84 valid researcher email addresses, 31 researchers filled out the survey, a 37 percent response rate.

Results

Nearly all responding researchers agreed or strongly agreed that IISG funding had a positive effect on their career and their success as well as that of their students. In fact, they reported a slightly stronger sense that the funds benefited their students' careers over their own. A University of Notre Dame graduate provides a ready example. After her work on an IISG project for her dissertation, she was hired in a post-doc position with USDA Agricultural Research Service in 2018. She explained, "I wouldn't have received this post doc without the training that I received as part of the Sea Grant project."



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Illinois-Indiana Sea Grant is one of more than 33 programs of the National Sea Grant College Program created by Congress in 1966. Sea Grant is a partnership of universities, government, business, and industry that addresses marine and Great Lakes needs to enhance sustainable coastal economic development.