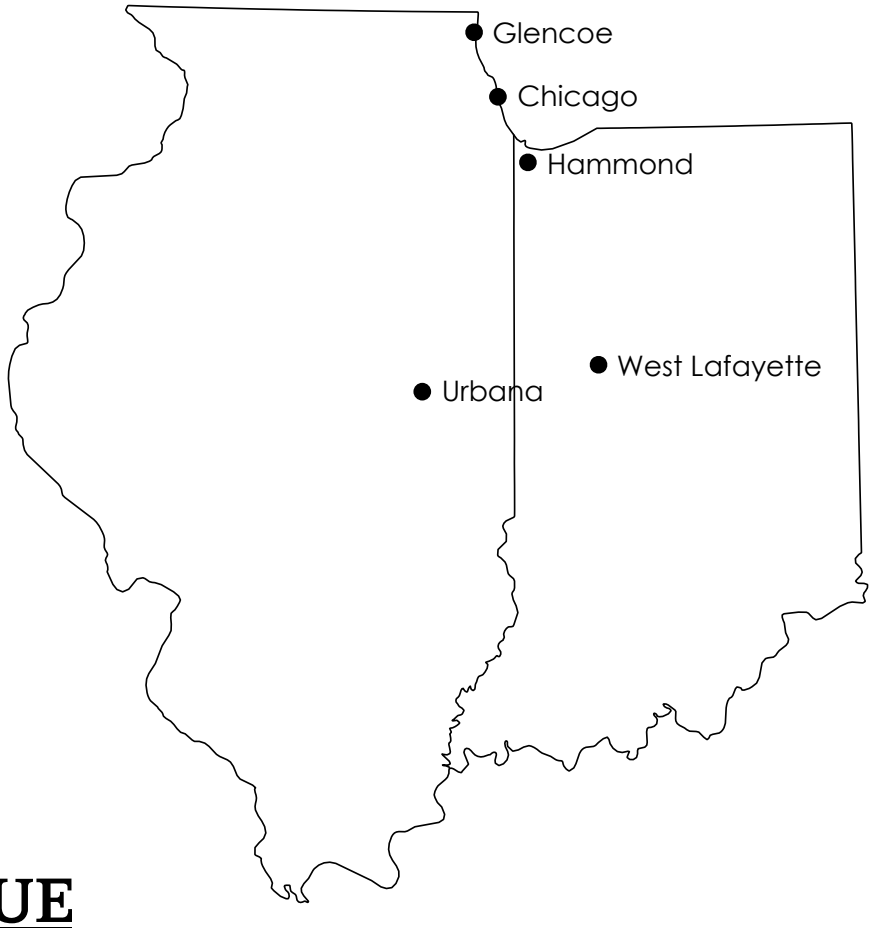
IMPACTS 2014-2015

two great states caring for one great lake

Sea Grant
ILLINOIS - INDIANA

IMPACTS 2014-2015

two great states caring for one great lake



PURDUE UNIVERSITY

UNIVERSITY OF ILLINOIS EXTENSION

Sea Grant ILLINOIS - INDIANA

Funding is provided by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA Grant #COM NA14OAR4170095). Office of Sea Grant, University of Illinois at Urbana-Champaign and Purdue University, West Lafayette, Indiana. University of Illinois and Purdue University offer equal opportunities in programs and employment. IISG-16-013

Dear Friends,

It is with great pride that I share with you the impacts Illinois-Indiana Sea Grant has had in our region in 2014-2015. Our work is helping communities conserve water supplies, create sustainable plans, and grow economically and ecologically resilient. We have helped mitigate invasive species, pharmaceuticals, and algae-feeding nutrients in our local waters, the Great Lakes, and the Gulf of Mexico. And we are fostering a life-long sense of place as well as knowledge about coastal habitats in elementary and middle school students.

This is a chance for me to thank our partners—we work together to achieve common goals. IISG is administratively housed in and shares positions with University of Illinois Extension, Purdue University Extension, and several Purdue University academic departments. We share positions with University of Illinois Prairie Research Institute, Midwest Regional Climate Center, and Purdue University Northwest.

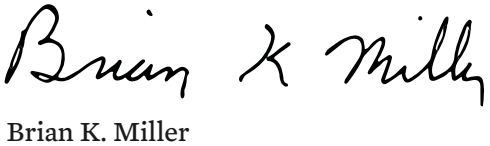
The U.S. EPA Great Lakes National Program Office provides support, with the assistance of the U.S. Geological Survey, for specialists, educators, and communicators who help to bring EPA science to the public. The Chicago Metropolitan Agency for Planning, Chicago Botanic Garden, McHenry County Extension, and Loyola University Chicago provide office space and administrative support for our specialists as well.

We also share personnel and coordinate programming with the U.S. Geological Survey sponsored Illinois Water Resources Center. This partnership has served both organizations well over the last 20 years and is now a national model for efficient use of federal resources.

Our partners, and the federal and state funding they help us leverage, support our specialists, educators, and communicators as they work collaboratively with our research coordinators to connect the latest science to outreach programming. In total, the IISG staff is around 40 strong.

I hope you enjoy reading this publication. If you have ideas for future ventures or partnership, or if you see a natural resource problem that our research and outreach capabilities could address, please let us know.

With warm regards,



Brian K. Miller
Director

CONTENTS

01

Natural lawn care reduces pesticides and nutrient pollution

Relevance

Increasing urbanization across the Great Lakes basin means that more land is devoted to lawns and landscapes. More water is used and more runoff is associated with their maintenance. Many landscapers and residents are managing lawns and other landscapes incorrectly by over using chemical fertilizers, pesticides, and water.

Response

The Illinois-Indiana Sea Grant-led Lawn to Lake program joined with organizations across the region to promote natural, low-input, lawn care practices to reduce the use of lawn care chemicals and water for lawn irrigation. Through workshops, displays, and educational materials, homeowners, school groundskeepers, lake managers, community gardeners, and golf course superintendents learned about natural lawn care.

Results

Over the course of 2014, Lawn to Lake informed over 6,300 residents. As a result, nearly 1,300 lawns have been impacted. This translates to a reduction of nearly 175,000 lbs. per year of weed and feed products. Along with that is a 1,300 lbs. per year reduction of pesticides, 8,600 lbs. per year reduction in phosphorus, and 8,800 lbs. per year of nitrogen.

02

Natural lawn care practices save a billion gallons of water each year

Relevance

Predicted population growth in northeastern Illinois could create water shortages as demand outpaces supply. The average American family uses 320 gallons of water per day, about 30 percent of which is devoted to outdoor uses. More than half of that outdoor use is wasted due to inefficient watering. Natural lawn care practices can reduce the need for lawn irrigation by up to 50 percent.

Response

The Illinois-Indiana Sea Grant-led Lawn to Lake program joined with organizations across the region to promote natural, low-input, lawn care practices to reduce the use of chemicals and water. Through workshops, displays, and educational materials, landscape professionals, homeowners, teachers, school groundskeepers, and master gardeners learned about natural lawn care. IISG also helped inform the Northwest Water Planning Alliance (NWPA) outreach efforts on water conservation in the region.

Results

Between 2011-2015, the Lawn to Lake program reached over 300 lawn care professionals, 400 Master Gardeners, and 2,000 homeowners with training and information on natural lawn care. Surveys revealed that 25,000 lawn acres were converted to natural lawn care, which led to a water savings of one billion gallons every year.

03

Community project leads to $1.1 million in green infrastructure support

Relevance

The Cal-Sag Channel in southern Cook County is becoming a popular waterway for Chicagoland kayakers and nature lovers, but it runs through dense residential and industrial areas that are potential sources of pollution—including runoff from lawns treated with fertilizers and pesticides. Managing stormwater in Blue Island, a suburb intersected by the channel, can go a long way towards stopping contaminants before they flow into the Cal-Sag.

Response

Through its Lawn to Lake program, Illinois-Indiana Sea Grant was one of five lead partners in the Blue Island, Blue Water project to reduce stormwater overflow and flooding. IISG conducted teacher and homeowner workshops on green infrastructure practices and other strategies for managing and reducing stormwater runoff. More than 140 volunteers installed 33 rain barrels around Blue Island, and more than 1,000 plants and nearly 100 trees were put in the ground.

Results

In 2014, Gov. Pat Quinn announced that Illinois would invest $1.1 million to expand and improve the suburb's stormwater management efforts based on the early successes of the Blue Island, Blue Water project. The bulk of the grant money was invested in green infrastructure projects along one of Blue Island's major roadways, which will reduce flooding, improve local water quality, and beautify the community. Remaining dollars were used to restore an 11-acre wetland in a northeast detention pond.

04

Chicago suburb adopts lawn watering ordinance to implement conservation

Relevance

Lake Michigan provides clean and affordable water, but the lake's capacity to serve local demand is restricted by law. Groundwater dependent parts of the region face less certain supplies over the long term, plus water quality challenges, and in some sites, environmental impacts from over pumping. Conservation and efficient use of water, as well as investing in infrastructure, are top priorities for the greater Chicago region.

Response

Illinois-Indiana Sea Grant collaborated with the Northwest Water Planning Alliance (NWPA) and other partners to produce the *Conserving Water Outdoors* brochure. IISG also worked with stakeholders to conduct a needs assessment for a water conservation curriculum for the NWPA region.

Results

McHenry, Illinois unanimously adopted the NWPA lawn watering ordinance, joining six other communities in the region. These municipalities are part of a movement to implement uniform watering hours and drought status criteria across the five-county region to ensure a sustainable water supply.

05

New Illinois water rules lead to conservation of Lake Michigan resource

Relevance

Lake Michigan provides clean and affordable water, but the lake's capacity to serve local water demands is restricted by law. Nonetheless, millions of new people are expected to join the Chicago area by mid-century. Full-cost pricing is fundamental to addressing aging water infrastructure, conservation, and efficient use of water.

Response

Illinois-Indiana Sea Grant and regional partners provided input to the Illinois Department of Natural Resources (IDNR) to improve water management through their authority to issue conditions of permit to communities using Lake Michigan water.

Results

IDNR amended rules governing lake allocations to include a focus on water conservation and efficiency. This has helped drive a reduction in domestic water use of about 300 million gallons per day in the Chicago metropolitan area. Going forward, these rule changes for Lake Michigan water will compel significant infrastructure modernization, and encourage adoption of full-cost pricing to help support this. Through the new rules, Illinois has also reinvigorated statewide water planning.

06

Dead zone data helps resource managers protect Lake Erie fisheries

Relevance

In recent years, Lake Erie saw a reemergence of algal blooms and the growth of the hypoxic zone. Hypoxia influences the distribution of fish populations, which, in turn, can dramatically alter catch rates for commercial fisheries. As such, understanding large scale fluctuations of the hypoxic zone throughout the summer and early fall is of utmost importance in Lake Erie.

Response

Working with U.S. EPA Great Lakes National Program Office and state and federal managers, Illinois-Indiana Sea Grant helped obtain and deploy an array of dissolved oxygen sensors in Lake Erie. This three-year investigation of dissolved oxygen levels suggests that dead zones can spring up across the lake and disappear just as quickly.

Results

The Ohio Department of Natural Resources and the U.S. Geological Survey have made changes to their annual surveys based on study recommendations. Field researchers now plan to monitor dissolved oxygen levels more extensively throughout the survey to determine whether a nearby dead zone is triggering unusually high or low catch results.

07

Four Great Lakes communities address environmental tipping points

Relevance

To protect natural resources and enhance community resilience in the Great Lakes region, it is crucial to determine the tipping points at which sustainability is threatened due to human induced stresses. Watershed managers, land use planners, and community leaders require data and tools to identify land use limits, evaluate the environmental impacts of proposed land use scenarios, and identify critical areas requiring protection or restoration to improve ecosystem health.

Response

Illinois-Indiana Sea Grant led the development of *Tipping Points and Indicators*, a new web-based, data-driven decision support system for Great Lakes communities. The program helps local decision makers easily access data and model projections about land use choices, evaluate the aquatic ecosystem impact of these choices, and work through a process to develop action strategies and an implementation plan that move their watersheds to a healthier state.

Results

Great Lakes Sea Grant specialists worked with four communities to complete watershed action plans, facilitating the process of selecting strategies to sustain water quality and ecosystem integrity while meeting other local values. Local planners learned whether their community is near or exceeding environmental tipping points, and steps to best address these critical measures. Illinois-Indiana Sea Grant worked with Hobart, Indiana as the city updated its comprehensive plan with actions steps to address local tipping points.

08

Buffalo River clean-up leads to economic upswing

Relevance

The Buffalo River has been an economic drag on Buffalo, New York, but especially to the adjacent neighborhood, where housing prices have been depressed for some time. As a Great Lakes Area of Concern, perception of the river as unhealthy has fostered this downward market.

Response

Through the Great Lakes Legacy Act, cleanup of this historic pollution is now complete. Illinois-Indiana Sea Grant helped keep the community informed throughout the process, communicating with community leaders and the media, and at public events.

Results

Nearly one million cubic yards of contaminated sediment were removed from the Buffalo River. A 2002 IISG study provides some guidance on the economic benefits of this project. It revealed that overall, Buffalo residents would be willing to pay $118 million more for property near the river if it is cleaned up. About $1.2 million of the economic impact is due to the efforts of IISG to help inform the community and update perceptions.

09

The Grand Calumet River cleanup gives the region a boost

Relevance

At its worst, the Grand Calumet River has been called the most polluted river in America. Indeed, it's the only Great Lakes Area of Concern site that was able to claim all 14 beneficial use impairments. This degraded river flows through a very populous and economically struggling area in northwest Indiana.

Response

Through the Great Lakes Legacy Act, this waterbody is undergoing a significant clean-up. Illinois-Indiana Sea Grant is helping keep the community informed throughout the process, communicating with community leaders and the media, through classroom activities, and at public events.

Results

More than 2,000,000 cubic yards of sediment have been removed from the Grand Calumet River. About $600,000 of the larger economic improvement in the area is due to IISG's efforts to update local perceptions of the status of the river.

10

Be a Hero campaign increases AIS prevention behavior in recreational water users

Relevance

Recreational water use is one of the primary ways aquatic invasive species (AIS) spread. Over the decades, many AIS have entered new Great Lakes habitats after hitching a ride on boats, trailers, and other gear or in bilges, live wells, and bait buckets. These invaders can hinder recreation, disrupt aquatic food webs, and block out sunlight needed by other species.

Response

In its second year, Illinois-Indiana Sea Grant's Be a Hero – Transport Zero information campaign provided a useful way to connect with recreational water users about preventing the spread of AIS through a media campaign, presentations, and one-on-one interactions.

Results

Radio spots, streaming and banner online information, and a targeted magazine campaign led to 4.5 million audience impressions for the Be a Hero campaign in 2014. Through talks and one-on one interactions, about 6,000 people learned directly about preventing the spread of invasive species. A survey of recreational water users found that high numbers of people report participating in AIS prevention behaviors. The survey also found that people are more likely to take prevention steps if previously exposed to the Be a Hero campaign.

11

New Illinois and Indiana take-back programs help keep 48,000 pounds of pharmaceuticals out of waterways

Relevance

How we choose to use and dispose of pharmaceuticals and personal care products impacts water quality—the water that we drink, bathe in, and use for recreation. Most of us do not use all of the medication that we buy. But using the toilet or trash to dispose of medicine can put people, animals, and the environment at risk.

Response

In 2014-2105, 12 new medicine collection programs were started in Illinois and Indiana. Illinois-Indiana Sea Grant provided technical assistance on how to start a take-back program and purchased the collection boxes, which are available in local law enforcement offices. IISG also joined with Purdue Pharmacy to launch the Yellow Jug Old Drugs program at Purdue University, a partnership that will provide research as well as a community service.

Results

This brings the number of permanent collection programs in the two states that are assisted by IISG to 49. Altogether, these programs collected and properly disposed of 48,000 pounds of medication in the two years.

12

University of Illinois Extension partnership leads to four permanent medicine collection programs

Relevance

Pharmaceuticals can help people and animals live healthier lives, but their use can also cause unintended consequences. Medications that are improperly used, stored, or disposed of are associated with accidental poisonings; drug misuse and abuse; and contamination of rivers, lakes, and drinking water. Having best management practices based on the latest research is critical to a health society and environment.

Response

With grant funding from University of Illinois Extension, Illinois-Indiana Sea Grant informed each Extension county director about medicine disposal issues and new research on pharmaceuticals in the environment. As part of this initiative, Extension educators from around Illinois joined IISG in informing audiences about establishing medicine collection programs and other best management practices.

Results

In 2015, IISG trained educators and outreach specialists and started four new permanent medicine collection programs in Illinois.

13

Indiana man rescued from Lake Michigan waters with new safety equipment

Relevance

Dangerous currents and breaking waves are common in the Great Lakes, with Lake Michigan being the deadliest, due to its swift currents. Rip currents and those currents found near piers are extremely dangerous for swimmers. In 2014, 24 people drowned in Lake Michigan.

Response

Several Great Lakes Sea Grant programs teamed up to survey beach managers along the shores of Michigan, Wisconsin, Illinois, and Indiana to find out what safety equipment is most needed for their location. With funding from NOAA, equipment such as life vests, throw rings, and rescue boards was purchased and distributed in 2015.

Results

In Whiting, Indiana, equipment distributed through this project was instrumental in saving the life of a 30-year old man. He jumped off a pier into Lake Michigan, and in the 25-feet deep waters he became distressed and went into an active drowning phase. First responders, armed with a life ring and throw bag, were able to engage in a successful rescue.

14

"Sense of place" provides a useful measure of one's connection to natural areas

Relevance

As budgets tighten, it is more important than ever for Sea Grant programs to clearly demonstrate their impact in a defensible way. Sea Grant social scientists are in a unique position to provide guidance to their programs on incorporating metrics that are grounded in social science theory and literature.

Response

Illinois-Indiana Sea Grant led the way in metric development, providing a novel approach to quantitatively measure the outcome of place-based education. "Sense of place" is a well-established concept that captures a person's place identity, place attachment, and place dependence, and is predictive of future environmental stewardship at that site. IISG's social scientist refined a tool, created a guidance document, and presented this work nationally to the Social Science Community of Practice and regionally to the Great Lakes Sea Grant network.

Results

A new tool empowers Sea Grant programs across the nation to assess a meaningful, outcome-based metric that is statistically and quantitatively defensible. The effort sets a new standard for evaluation, inspiring programs to look beyond traditional, less effective measures.

15

Middle school students come to feel a sense of place at Roxana Marsh

Relevance

Roxana Marsh along the Grand Calumet River is a recently remediated natural area located in an urban northwest Indiana environment. Many of the students from West Side Middle school in East Chicago who were brought to Roxana Marsh for a class stewardship project in 2015 were surprised that the site was so close to their school and their world.

Response

The 29 sixth graders participated in four stewardship and science stations over two hours at Roxana Marsh. They looked for birds, sampled macroinvertebrates, installed native plants, and cleaned up litter.

Results

Evaluated before and after the visit, the students clearly developed a “sense of place” related to Roxana Marsh. Sense of place is a well-established concept that captures a person’s place attachment, and is predictive of future environmental stewardship at that place. Increasing sense of place provides additional assurance that a $48 million government investment in restoration will be maintained for a generation by new stewards that care.

16

In its first year, Friends of Lincoln Park neighborhood group engages in volunteer activities

Relevance

Phase two of a $43 million project to remediate 171,000 cubic yards of sediment and restore more than 12.5 acres in a Milwaukee County park in Wisconsin came to a close in 2015. This sizable effort created short-term needs for communication about cleanup impacts to the park and long-term needs for community stewardship and sense of ownership to keep the park clean.

Response

Illinois-Indiana Sea Grant helped facilitate the development of the Friends of Lincoln Park, a neighborhood organization that helps residents play a role the restoration of this popular Milwaukee park. The group celebrated its one-year anniversary with a review of the sediment remediation and habitat restoration completed under the Great Lakes Legacy Act as part of the event.

Results

More than 100 neighbors are engaging in park stewardship and neighborhood enrichment and receiving remediation updates as a result of participation in the Friends of Lincoln Park. In its first year, the group organized an invasive plant pull day and river cleanup day for residents to volunteer and take part in taking care of the park.

17

Lincoln Park residents are kept informed about cleanup process

Relevance

In Wisconsin, the Milwaukee Estuary Area of Concern, contaminated with PCBs and other pollutants, has been undergoing a Great Lakes Legacy Act cleanup since 2008. This sizable effort created a short-term need for communication about cleanup impacts to Lincoln Park and long-term needs for community stewardship and a sense of ownership.

Response

Throughout the remediation and restoration process, Illinois-Indiana Sea Grant kept the community informed and helped facilitate ways for residents to play a role in the process—through stakeholder listservs and meetings, through an updated kiosk in the park, and through the Friends of Lincoln Park.

Results

Residents were informed and involved during a $43 million project that remediated 171,000 cubic yards of sediment and restored nearly 13 acres in Lincoln Park.

18

Residents stay informed during remediation of the East Branch of Grand Calumet River

Relevance

The Grand Calumet River, which flows through heavy industrialized cities in northwest Indiana, was designated as an Area of Concern and has been undergoing remediation and restoration through the Great Lakes Legacy Act. This effort has created long-term needs for communication and collaborative planning to ensure habitat protection while providing appropriate access to the public.

Response

Throughout the planning and execution of this project, Illinois-Indiana Sea Grant has played a key role in keeping the community informed through public meetings, emails, the Great Lakes Mud website, student education, and finally, a press event to celebrate the completion of the East Branch remediation and restoration. This led to a radio segment on Lakeshore Public Radio and a blog post from Dig the Dunes, which has more than 3,000 followers.

Results

In 2015, an $88 million project to remediate over 1 million cubic yards of sediment and restore 58 acres of land on the East Branch of the Grand Calumet River was completed. Public officials and the community were kept informed throughout the process.

19

Illinois has a plan to address nutrient pollution in the Gulf of Mexico

Relevance

By most estimates, Illinois is the largest contributor of nutrients to the Gulf of Mexico hypoxia. More than 400 million pounds of nitrate-nitrogen and 38 million pounds of phosphorus from Illinois farm fields, city streets, and wastewater treatment plants are carried to the Gulf each year by the Mississippi River system. Every summer, these nutrients spur algal blooms that leave an area roughly the size of Connecticut all but devoid of oxygen and marine life.

Response

Illinois-Indiana Sea Grant worked together with scientists, government agencies, non-profit groups, agriculture groups, and wastewater treatment professionals to develop and implement a plan for reducing nutrient pollution from point and non-point sources in priority watersheds.

Results

The *Illinois Nutrient Loss Reduction Strategy*, released in 2015, outlines best management practices reduce the amount of nitrogen and phosphorus reaching Illinois waterways by 45 percent. The strategy marks the most comprehensive and integrated approach to nutrient loss reduction in the state's history. Implementation, including the creation of monitoring plans to document water quality improvements, is underway. Scientists are also working to develop numeric nutrient criteria for all state waterways.

20

Public spaces program helps community develop action plans and secure funding

Relevance

Parks, greenways, and town centers define a sense of place and provide sites where residents experience social interactions, explore nature, and purchase goods and services. Public space management decisions made by policymakers, business owners, and residents impact the well-being and livelihood of the community as a whole.

Response

Illinois-Indiana Sea Grant and Purdue University Extension developed a curriculum and facilitation guide for local leaders to help them evaluate community public spaces. The Enhancing the Value of Public Spaces Program combines statistics with public involvement to guide the design of an action plan that will improve public spaces and, ultimately, enhance quality of life. The program is being fully executed in six Indiana communities.

Results

In Frankfort, Indiana, the Enhancing Spaces team helped the town create a 5-year action plan that led to a $40,000 award to redevelop its downtown from the Indiana Office of Community and Rural Affairs. With this funding, Frankfort is designing multi-use trails through its downtown as well as other community amenities.

21

Great Lakes literacy partnership leads to educator-scientist connections

Relevance

A Great Lakes-literate public can contribute to the environmental, economic, and social sustainability of the Great Lakes. These lakes, however, are woefully underrepresented in school textbooks and other educational resources.

Response

With EPA funding, Sea Grant education specialists in the region formed the Center for Great Lakes Literacy (CGLL). CGLL runs educational programs in all of the Great Lakes states, providing hands-on experiences, educational resources, and networking opportunities that promote Great Lakes literacy among an engaged community of educators, scientists, and citizens. Illinois-Indiana Sea Grant has provided leadership for CGLL since its inception.

Results

Through eight workshops in 2015, CGLL partners reached 372 educators, with the potential to reach around 20,000 students each year. Thus far, 66 educators have integrated Great Lakes literacy information into their classroom. For example, an Indiana teacher now incorporates outdoor learning, CGLL videos, in-class experiments, and more into his teaching. And a Minnesota teacher engages his students in monitoring streams, creating research posters, developing engineering projects, and engaging in discussions about Great Lakes science.

22

Classroom videocasting opens the door for students and scientists to connect

Relevance

The Great Lakes face many threats, whether it is invasive species, pollutants, or climate change, among others. These lakes, however, are woefully underrepresented in school textbooks and other educational resources. A more literate citizenry are better stewards of this resource as they can make informed decisions.

Response

Illinois-Indiana Sea Grant connects U.S. EPA R/V *Lake Guardian* scientists with students through long-distance videocasting. The students can ask scientists about the health of the Great Lakes, how research is conducted offshore, careers in the environmental field, and what life is like aboard the ship. The researchers have talked with students while in the U.S. EPA offices or even on the ship where they provided a tour, discussed onboard research, and interviewed members of the crew.

Results

Since 2013, 14 scientists engaged in 65 videocasts with educators in Great Lakes states, reaching around 2000 students. Many of the 17 teachers have incorporated videocasting as part of their activities. One commented, "I think the future of education is going to change based on the video conference format that you have introduced us to. We actually video conferenced with 12 scientists this year. What a treat for my students." Talking with scientists had impact on the class. One student said: "Personally I would like to get into a career like this myself!"

23

Lake Michigan teacher workshop inspires new resources and hands-on activities

Relevance

For students in the region—as youths and later as adults—to be able to make informed choices that help protect the health of the Great Lakes, they need to understand critical issues facing these waters. Teachers who educate these students need to bring to the classroom a good understanding of current Great Lakes issues, plenty of resources, and their creativity and enthusiasm.

Response

Through the Center for Great Lakes Literacy (CGLL), Illinois-Indiana Sea Grant led a week-long science workshop for 15 educators aboard the U.S. EPA R/V *Lake Guardian*. The educators worked alongside scientists as they collected samples from Lake Michigan using state-of-the-art equipment to study plankton, benthic organisms, and water quality. Teachers explored lake ecology, geology, geography, weather, and biochemical processes and learned how to bring the lessons to life for their students.

Results

All 15 teachers reported that the experience greatly increased their knowledge of Lake Michigan and their confidence in explaining Great Lakes concepts to their students. The teachers engaged students through stewardship activities, field trips, stream monitoring, and real-world restoration. Two teachers made 13 YouTube videos that are a new resource for their classroom and others about life on the ship and Great Lakes science.

Sea Grant
ILLINOIS - INDIANA