

Illinois' busy coast gets aboard clean marina program

by Anjanette Riley

Changes are underway at Chicago's largest marina. Employees are learning more about how to safeguard the nearby lake, instructions for making boating activities environmentally friendly are going up across the harbor, and new equipment is being installed to prevent oil and fuel spills.



31st Street Harbor is Chicago's newest and cleanest marina.

Courtesy of Matt Knighton

With the work done, 31st Street Harbor will become the first certified clean marina in the state. The Illinois Clean Marina Program, launched in May of this year, provides marina personnel with how-to information and training on simple steps they can take to protect aquatic ecosystems and improve water quality. Marina personnel can use these same tips to help boaters make green

decisions while on the water and at dock.

"The program changes people's mentality," said Michael Dimitroff, green initiatives project manager for the Chicago Park District (CPD). "Marina staff members are increasingly focused on the environmental impacts of every activity before they act. And thinking of the end result first is half of what it means to 'Go Green.'"

The voluntary program is part of larger state and national efforts tackling nonpoint source pollutants like stormwater runoff from maintenance areas, drips from fuel docks, and bacteria from poorly maintained sewage systems. These pollutants can degrade water quality, harm aquatic wildlife, and force beach closures.

Continued on page 6

The word on invasive species: Page 3
Transport zero

Stream contaminants travel Page 4
via salmon

Nanomaterial changes stream Page 4
bacteria

Illinois-Indiana Sea Grant

Two States Caring for One Great Lake

Brian Miller, Director

374 NSRC, 1101 W. Peabody
Urbana, IL 61801
217-333-6444

Lisa Merrifield

Assistant Director

The
HELM

Irene Miles

Editor

Anjanette Riley

Writer

Susan White

Graphic Designer



Printed on Recycled Paper

IISG online:

iiseagrant.org

lakesideviews.blogspot.com

twitter.com/ILINSeaGrant

facebook.com/ILINseagrant

youtube.com/iiseagrant



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. Funding is provided by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA Grant # NA10OAR4170068), Office of Sea Grant, University of Illinois at Urbana-Champaign, and Purdue University. The University of Illinois and Purdue University offer equal opportunities in programs and employment.



New video offers insight into Great Lakes investment

Revitalizing Local Waterfront Economies: The Great Lakes Legacy Act is a new video that welcomes people and partners to the benefits of restoring degraded rivers, harbors, and lakes.

Before modern-day environmental regulations, Great Lakes waterways became blighted by decades of industrial discharges. The Legacy Act was established in 2002 to clean up contami-

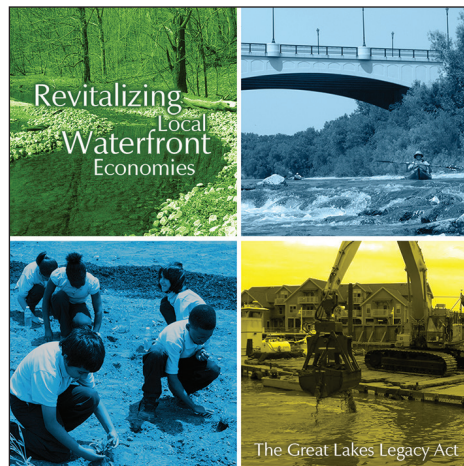
nation in these places, known as Areas of Concern. The Legacy Act is helping to revitalize local waterfront economies through strong partnerships with states, municipalities, and businesses.

Altogether, the Legacy program has removed or capped 2.4 million cubic yards of sediment. But more waterways need to be cleaned up, and community involvement is essential. "This video can help simplify and personalize the sediment cleanup process, which at first glance may seem too complex and scientific," said Caitie McCoy, IISG environmental social scientist. "The Great Lakes Legacy Act has been incorporating community values with technical science for more than a decade.

"Cleaner lakes and rivers improve human health, fish and wildlife health, recreation, tourism, and redevelopment so that residents can better capitalize on these opportunities," added McCoy.

The 10-minute video was produced by IISG and Wisconsin Sea Grant with funding from U.S. EPA Great Lakes Restoration Initiative. You can find it online at youtube.com/iiseagrant. To order a DVD copy (pictured above), go to Coastal Restoration in the Products section at iiseagrant.org.

If you would like more information about the Great Lakes Legacy Act, visit epa.gov/glla.



The word on invasive species: Transport zero

“Be a Hero—Transport Zero” is a new statewide Illinois program to raise awareness about how the public can help prevent the spread of invasive species on land and in waterways. These plants and animals, when introduced into new environments, have resulted in significant economic and ecological costs.

This campaign kicks off in May on television and radio, and in print, as well as at boat shows and boat landings, targeted to recreational water users who might unknowingly spread these species from one water body to another.

“When people trailer their boats after a day on the water, they could be carrying aquatic invasive species, which could accidentally be introduced into a new waterbody,” said Sarah Zack, IISG AIS specialist. “Our message emphasizes three actions to help them prevent this from happening—remove, drain, and dry. Remove plants, animals, and mud from all equipment, drain water, and dry everything.”

Over 180 non-native species have been introduced into the

Great Lakes region. Some of these—such as the zebra mussel, Eurasian watermilfoil, and round goby—have flourished, and as a result, have pushed out native species and caused hundreds of millions of dollars of economic damage. More aquatic invasive species such as these lurk on the horizon as threats to Lake Michigan and inland waters.



Be a Hero—Transport Zero is designed to address the spread of invasive species on land, as well. “It conveys a unifying message that gets the point across. It’s a simple and catchy way to inform many in the general public, including hikers,

campers, hunters—anyone who is engaged in the natural world,” said Chris Evans, biologist with the Illinois Department of Natural Resources.

This summer and beyond, the new message will be promoted on WGN Radio, *Illinois Outdoors* and *Outdoor Traditions* TV programs, and *Illinois Outdoor News* magazine. As the campaign progresses, look for the Be a Hero—Transport Zero message at trailheads and in hunting guides and pamphlets at natural areas throughout the state.

This campaign is funded through Illinois-Indiana Sea Grant and a Great Lakes Restoration Initiative grant to the Illinois Department of Natural Resources. For more information visit transportzero.org.

Stream contaminants travel via salmon

The biggest source of pollution in streams that flow into Lake Michigan is probably not what you would expect. In some of these areas, salmon bring high levels of contaminants to resident fish.

This is the conclusion David Janetski, a graduate student at University of Notre Dame at the time, reached after testing fish

cals, such as PCBs, in their body tissues than where salmon are blocked by dams—high enough in some places to potentially merit state warnings against eating the fish. Contaminant levels were highest in Lake Michigan streams, where salmon are more abundant and have higher PCB levels than in other lakes.

The key to the salmon's potency lies in its life-cycle. Unlike other migratory fish, salmon die soon after spawning. When resident fish eat the dead salmon or their eggs, they also ingest the chemicals that have built up in the salmon over its lifetime.

Janetski's IISG Discovery Grant findings may have important implications for state efforts to

ensure food safety. The high chemical concentrations suggest that states along Lake Michigan need to closely monitor streams with salmon.

"One of the most important conclusions from this study is that brook trout in certain streams may require some kind of consumption advisory," said Janetski, now a post-doctoral researcher at Michigan's Grand Valley State University. "States do not usually monitor brook trout, but tests should be done to see whether an advisory is needed."

The results could also complicate any future dam removal projects. Tearing down dams would restore the natural flow of the river and open new habitats. But removing the barrier would allow salmon to spread contaminants to new environments.



Researchers catch resident stream fish to test for contaminants.

Courtesy of David Janetski

living in streams throughout the Great Lakes region. In areas with spawning salmon, fish, like brook trout and sculpin, had higher concentrations of toxic chemi-

Nanomaterial changes stream bacteria

John Kelly, a biologist from Loyola University Chicago, saw an opportunity for researchers to get a jump on a new pollution source while levels are still low. He and his colleagues from Loyola and Northwestern University designed a study to learn how bacteria living on stream floors are affected by a nanomaterial common in cosmetics and sunscreen. What they found



Artificial streams give researchers a close look at bacterial communities exposed to nanomaterials.

Courtesy of John Kelly

could be used to prevent nanomaterials from damaging aquatic environments.

Their IISG Discovery Grant study used artificial streams in a lab to get a close look at what happens when bacterial communities taken from a Chicago-area stream are exposed to nanotitanium dioxide (NTD), the most commonly used nanomaterial. As with all nanoma-

A closer look at how Asian carp impact food webs



Courtesy of Jonathan Freedman

Asian carp, which jump out of the water when startled, are a common sight on the Illinois River.

They began by comparing current food webs in the Illinois River, now overrun by Asian carp, with what existed before the invasion. To reconstruct the river's historical food

web, Freedman and his colleagues took tissue samples from fish collected before Asian carp arrived in the early 1990s. They used the chemical make-up of these tissues to determine just what had been eating what. What they found is that Asian carp do more than compete for food. They actually force native fish to change their diets, feeding on species lower on the food chain than they naturally would. In a healthy food web, filter-feeders, like gizzard shad and paddlefish, eat a variety of plankton species, ensuring that there is enough food to go around. But Asian carp have all but wiped out the larger zooplankton in the Illinois River, pushing fish that have historically relied on that food source to turn to smaller zooplankton and phytoplankton for a meal. As the number of Asian carp in an area grows, more and more native fish are left competing for a smaller supply of plankton.

Researchers have long known that Asian carp pose a threat to native fish because they compete for the microscopic plankton that form the base of the food chain. But less is known about what happens to the larger food web when these invaders take up residence in a river or lake. Jonathan Freedman and his colleagues at the Illinois Natural History Survey set out to get a clearer picture of just how Asian carp impact food supplies—and the food web as a result—with the help of an IISG Discovery Grant.

“Asian carp are really knocking back the food resources, especially in the lower river where they are most abundant,” said Freedman. “And it is not just plankton-eaters that are affected. Virtually all juvenile fish feed on plankton at some point in their development. So, Asian carp force all fish in the river, at some point, to move down the food chain to compete for food.”

terials, it is the extremely small size of NTD that makes it both useful and potentially dangerous. Nanomaterials are more reactive than their larger counterparts and can easily penetrate and kill cells. In this study, the NTD changed the makeup of bacterial communities, wiping out species sensitive to the material while leaving ones with greater resistance to flourish in their place. Additional DNA

tests are underway to confirm this discovery.

For aquatic environments, shifts in bacterial populations can be significant. Different species of bacteria play different roles, everything from producing oxygen to breaking down leaves and branches that fall in the water. The wrong mix of bacteria could leave aquatic life without the nutrients they need to survive.

“Research like this could guide the development and production of nanomaterials, and maybe even the laws regulating them, before they are in the environment at problematic levels,” said Kelly. “We could see the opposite of what happened with PCBs, where we didn’t know the impact they have on aquatic environments until they were already there.”

Illinois' busy coast gets aboard clean marina program

Continued from page 1

Nearly a quarter of Illinois' 70 marinas sit along Lake Michigan, making the Illinois shoreline the most active in the Great Lakes region. Millions of people in the Chicago area rely on that same stretch of Lake Michigan for drinking water. Here, even small levels of pollution from marinas can have a significant impact on the lake and the communities that rely on it.

At the heart of the Clean Marina Program are best management practices that make marina operations and boater activities more efficient and environmentally friendly. Practices cover a range of topics,



Courtesy of Matt Knighton

Clean marinas are encouraged to use absorbent pads on fuel pumps to prevent oil from leaking into the water.

from marina construction to vessel maintenance, and most are easy and affordable. Some recommendations, such as how to protect nearby habitats during construction, will help new or expanding marinas develop greener sites from the beginning. And others will help marina person-

nel educate boaters on what they can do to protect and improve the state's water quality. Marinas that adopt the practices will be certified as a clean marina by the Illinois Department of Natural Resources (IDNR) Coastal Management Program.

To help marinas become certified, Illinois-Indiana Sea Grant (IISG), along with IDNR and CPD, put together the *Illinois Clean Marina Guidebook*. In addition to outlining best management practices, the guidebook provides specifics on laws and permits related to marina activities and includes clean boating tip sheets that can be distributed to boaters.

Marina managers will learn how to implement the program's best management practices with the help of the online Clean Marina Classroom developed by Michigan Sea Grant.

"The training is designed to help marina operators reach certification in a self-paced, convenient way," said Kim Kreiling, a natural resource specialist for IDNR and coordinator of the Clean Marina Program. "IDNR will also be there to offer support and answer questions throughout the whole certification process."

Four additional marinas in the Chicago area are expected to join the ranks of certified clean marinas within the year. Boaters at these sites will also pledge to follow clean boating practices like maintaining bilges and using pumpout facilities. The Park District, IDNR, and the marina management company Westrec plan to provide boaters with weekly tips to help them do their part to protect Lake Michigan.

Illinois joins Michigan, Ohio, Indiana, Minnesota, and Wisconsin in a regional effort to protect the Great Lakes and local waterways through a clean marina program. The Illinois program was developed by IDNR, CPD, IISG, and representatives from the marine industry. Funding for the program and the guidebook comes from a grant through the U.S. Environmental Protection Agency Great Lakes Restoration Initiative.

The *Illinois Clean Marina Guidebook* can be found online—search for Illinois Clean Marina Program.

Staff update



Robin Goettel, IISG's associate director for education, was recently awarded the University of Illinois College of Agricultural, Consumer and Environmental Sciences (ACES) Paul A. Funk Recognition Award. This award is the College of ACES' highest honor. Goettel has spent her career raising awareness about water issues using science concepts, activities, curricula, and more in students and teachers in Illinois and the Great Lakes region. She is pictured here with Brian Miller, IISG director.

Each year the Illinois Lakes Management Association (ILMA) recognizes one outstanding professional or volunteer for their significant contributions to preserving and protecting the quality of Illinois lakes. This year, IISG's Pat Charlebois, AIS coordinator, was selected for the Lake Guardian Award for her outreach efforts to prevent the spread of aquatic invasive species. She is pictured here with ILMA President Bryan Cross.



Full-cost water pricing makes sense

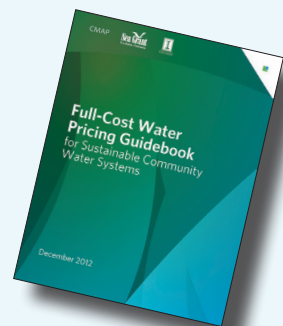
Illinois communities that rely on Lake Michigan for drinking water are being encouraged to take a closer look at how they set water prices. This effort is driven by the need to secure long-term water supplies in a region with aging systems and a growing population. The Illinois Department of Natural Resources is hoping to connect this recommendation to permits that allow cities to pull water from the lake.

IISG, in partnership with the Chicago Metropolitan Agency for Planning (CMAP), developed the *Full-Cost Water Pricing Guidebook* to help communities adopt prices that fully reflect water costs. The guidebook introduces a range of implementation strategies and gives local decision makers ways to customize rates to their community needs. It is one of the most comprehensive water-pricing resources available for community leaders.

"Setting the right price is the first step to ensuring that future demand for water won't outpace supply," said Margaret Schneemann, IISG water resource economist. "Prices that incorporate the full cost of water give users incentives to conserve and use water more efficiently. They also ensure that communities have the money needed to detect leaks and repair aging infrastructure."

Full-cost pricing is one of several conservation strategies recommended in regional water supply plans like CMAP's *Go To 2040* and *Water 2050: Northeastern Illinois Regional Water Supply/Demand Plan*.

To order a copy of the *Full-Cost Water Pricing Guidebook* go to Water Resources in the Products section at iiseagrant.org.



University of Illinois at Urbana-Champaign
Illinois-Indiana Sea Grant College Program
374 NSRC, MC-635
1101 W. Peabody Dr.
Urbana, IL 61801

Non-Profit Organization
U.S. Postage Paid
Permit No. 453
Champaign, IL 61820



Pledge to practice natural lawn care

Just in time for summer, homeowners and landscapers can help prevent pollution from entering waterways by pledging to adopt natural lawn care practices. With the Lawn to Lake Pledge, local residents can show their commitment to protecting water resources in the Great Lakes region.

In particular, landscapers and residents who take the pledge are committing to care for their lawns without the use of pesticides or chemical fertilizers with phosphorus. Overusing or misapplying lawn products can weaken plants, promote disease, and invite pests. They can also be washed into nearby

lakes and rivers in stormwater runoff.

“What we put on our lawns ends up in our water,” said Margaret Schneemann, water resource economist for IISG. “Pollution from fertilizers and pesticides can lower water quality and negatively impact the health of aquatic wildlife.”

The Lawn to Lake Pledge is part of a larger regional effort to promote practices that foster healthy lawns while reducing chemical runoff and conserving water. Tips include applying nitrogen fertilizer in the fall instead of the summer,

removing weeds by pulling and hoeing, and letting your lawn go dormant in times of drought.

Lawn to Lake is a collaboration between IISG, Safer Pest Control Project, Lake Champlain Sea Grant, and University of Illinois Extension. The project is funded by a grant from the U.S. EPA Great Lakes Restoration Initiative.

To learn more about natural lawn care practices and to take the Lawn to Lake Pledge, visit lawntogreatlakes.org.



LAWN TO LAKE