

Pharmwaste: A Prescription for Troubled Waters

You can tell we are a society that takes a lot of drugs (legal ones that is) by watching TV commercials. You see ads for anti-depressants, antacids, and a host of other remedies for ailments we just as soon not think about. But, what happens to all the prescription or over-the-counter drugs that are brought home, but for one reason or another, end up unused?

Check out
the HELM's
new look!

"The use of prescription medicine increases and new drugs come on the market every year in this country," said Beth Hinchey Malloy, Illinois-Indiana Sea Grant (IISG) Great Lakes ecosystem specialist. "When people's prescriptions change, their drugs expire or are no longer needed, these medicines are typically flushed or thrown away." These products make their way to our local lakes and streams, posing a potential environmental concern. In 2000, the U.S. Geological Survey sampled downstream from wastewater treatment plants in 30 states and found at least one pharmaceutical in 80 percent of 139 streams.

"Pharmaceuticals thrown in the trash can leach from landfills into the environment; flushed drugs can kill bacteria that breaks down waste in sewage plants, damage septic systems, and contaminate nearby waterways," said Susan Boehme, IISG coastal sediment specialist. Some

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Hollings Scholar Kicks off PPCPs Program

Early on in her internship at Sea Grant in the U.S. EPA Great Lakes National Program Office (GLNPO), Lara Polansky took part in a Chicago area Unwanted Medical Disposal Drive. That day, 50 pounds of unwanted drugs were dropped off at the Metcalfe Federal Building.

Since then, Polansky has been dedicated to the cause of proper disposal of pharmaceuticals. She

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Illinois-Indiana Sea Grant

*Two States Caring
for One Great Lake*

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pharmacies will take back unused medications, but very few provide consistent information to consumers.

For lack of any comprehensive guidance on this growing problem in the U.S., some municipalities and states have started pharmaceutical collection and take-back programs. For example, the Chicago Police Department spearheaded several one-day Unwanted Medical Disposal Drives with drop-off sites throughout Chicagoland. Since 2004, more than three tons of old and unused medicine has been collected in Chicago. These drugs have been incinerated.

Illinois-Indiana Sea Grant and the U.S. EPA Great Lakes National Program Office have developed a "tool kit" for communities that are thinking about starting a take-back program or creating other disposal programs. Lara Polansky, a NOAA Ernest Hollings intern, spent her summer gathering resources that include background information on unwanted medicines, what's known about their impact on the environment, and public education models.

"The next step is to inspire communities to take on the issue and create solutions," said Polansky. Plans are in the works to talk one-on-one with several police chiefs in the region. "As a result of Lara's tremendous progress on this project, we were able to accept invitations to speak at the Illinois Counties Solid Waste Management Association annual meeting in October, the Great Lakes Bi-national Toxics annual meeting, and the State of the Lakes Conference on the issues of unwanted medication disposal," said Hinchey Malloy.

"Our initial goal is to distribute the tool kits to a wide audience of local decision makers, in other words, to educate the educators," said Polansky. "Ultimately, our goal is for permanent collection programs to be in place and to have that reflected in measurable decreases in pharmaceuticals in local waterways."

The **HELM**

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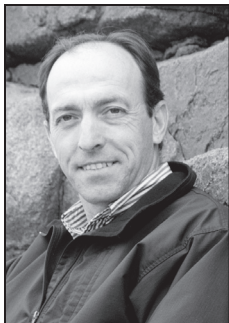
Illinois-Indiana Sea Grant is one of more than 30 programs of the National Sea Grant College Program created by Congress in 1966. Sea Grant is a partnership of universities, government, business, and industry that addresses marine and Great Lakes needs to enhance sustainable coastal economic development. Funding is provided by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA Grant # NA060AR4170079), 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.

Sea Grant
ILLINOIS - INDIANA



Moving Forward with New Leadership

The Illinois-Indiana Sea Grant College Program has officially joined University of Illinois Extension. IISG has resided in the U of I Office of the Vice Chancellor of Research since 2002. Now, with this move to Extension, the program will have enhanced opportunities for connecting with audiences and collaborating on new and existing outreach projects.



"Illinois Extension looks forward to working closely with Sea Grant," said Dennis Campion, Extension director. "Illinois-Indiana Sea Grant has a distinguished record of impact-oriented outreach and research, and of successful partnerships that help sustain these impacts over the long term. We expect that the alignment of Extension and Sea Grant will benefit both organizations and, ultimately, the citizens of Illinois and Indiana."

More than 2.5 million Illinois residents take part in Extension programs each year, including nearly 300,000 who participate in 4-H youth programs. Each month, U of I Extension Web pages draw more than 10 million page views, and people in more than 200 countries access to Extension's Web-based information. U of I Extension is based in the College of Agricultural, Consumer and Environmental Sciences.

Since May, Phil Mankin has served as IISG's interim director. As a researcher for many years with the U of I, Dr. Mankin has studied the interaction of human activity and wildlife from many perspectives. For the past four years, he has been Illinois-Indiana Sea Grant's research coordinator. "Dr. Mankin is a well known and highly respected member of the Sea Grant community and in many other communities of practice that connect to natural resource management," said Dick Warner, U of I Extension assistant dean and former IISG director. "His well-honed people skills and leadership style have proven to be a great benefit to Sea Grant."

One Stop Shopping for Great Lakes Research Information

The Great Lakes are the focus of many research, education, and outreach projects through a variety of organizations and institutions, both in the U.S. and Canada. The new Great Lakes Regional Research Information Network (GLRRIN) will bring these projects together in one comprehensive database.

"This bi-national clearinghouse for Great Lakes information will be a great resource and will add value to individual projects," said Phil Mankin, IISG interim director. "Our plan is to develop an individual network of stakeholders for each Great Lake, and an overall network for the Great Lakes region. GLRRIN will also identify research priorities, which will provide a powerful tool for efforts to acquire funding, encourage collaboration, and have the most impact."

In addition to Mankin, Lake Michigan coordinators include Anders Andren, director of Wisconsin Sea Grant, Stephen Brandt, director of NOAA Great Lakes Environmental Research Laboratory, and Paul Horvatin, chief of the Monitoring and Reporting Branch of the U.S. EPA, Great Lakes National Program Office. For each lake, the coordinators include two from the world of academics and two from federal or provincial agencies.

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Educators Get Immersed in Great Lakes Issues

Illinois-Indiana Sea Grant co-sponsored this year's Great Lakes Institute, a workshop that included the participation of 19 educators from schools and educational institutions in Illinois and Indiana. The Indiana Dunes Environmental Learning Center hosted the workshop, which was funded in part by COSEE Great Lakes. In this lakefront environment, teachers learned about current Lake Michigan issues, including water quality and beach contamination, aquatic invaders, and wetland degradation. Scientists from the National Park Service, USGS, Annis Water Resources Institute and educators from Illinois-Indiana Sea Grant, the NPS Great Lakes Research and Environmental Center, and the Alliance for Great Lakes engaged teachers in discussions about lake research and management.

In a post-workshop survey one informal educator commented that she discovered great ideas for creating new programs at nature centers. She noted that these ideas would be useful for after-school clubs or classes or for creating a public program for families to learn about Great Lakes issues.



Teachers at the Great Lakes Institute learned that fish contaminants can lead to serious health effects when consumed by pregnant and nursing mothers and young children. Nonetheless, fish are important to a healthy diet.

Regional Research *continued from page 3*

GLRRIN is funded through NOAA and is based on the Lake Erie Millennium Network (LEMN), which was created in 1998 to provide a single point of contact for scientists on Lake Erie. "We have set priorities, developed strategies, and have brought together academic and agency scientists," said Jeff Reutter, Ohio Sea Grant director. "It's helpful for academic scientists, especially younger scientists, to understand how Great Lakes management organizations work."

The network has been an effective instrument for getting things done. "Recently, LEMN worked closely with U.S. EPA to coordinate development of a cohesive group of proposals to enhance our understanding of the changing Lake Erie ecosystem," said Reutter.

Now each lake will have its own comprehensive network. "GLRRIN will facilitate the transfer of information about research results, needs, and priorities to the general public and decision-makers in a form that is readily understandable by non-scientists," added Reutter.

The first step in the new GLRRIN effort is to develop a list of research scientists on each lake and a list of stakeholders, which includes universities, private institutions, non-for-profit organizations, and federal, state, and local agencies. A list of research priorities will be developed and GLRRIN will assist the International Joint Commission's Council of Great Lakes Research Managers in implementing a research strategy for the region. All information will be available on the GLRRIN Web site (www.canamglass.org/glrrin).

Vitamin E Relieves the Effects of Aquaculture Stress

Life is stressful, we all know that. For fish raised in aquaculture ponds, a stressful life can mean slow growth and a compromised immune system, which contributes to higher rates of disease and death.

Natural source vitamin E can help restore the battered immune system of sunshine bass in aquaculture environments, according to a team of researchers that included Illinois-Indiana Sea Grant's 2004 Industry Fellow. "Vitamin E in general can help bolster the

to that the stress of being frequently netted, and it all takes its toll on the fish's immune system.

"With high doses of natural source vitamin E we were able to increase disease resistance in sunshine bass," said Trushenski. "We were pleased to discover several other benefits from our approach. The vitamin E content in the fish fillets was increased, adding to their nutritional value, and the product's shelf life was enhanced."



immune system, but natural source vitamin E, which is produced by plants, proved more effective and consistent than the synthetic form," said Jesse Trushenski. Synthetic vitamin E is typically used in animal feeds.

Stress-related diseases remain a significant problem for the aquaculture industry. Sunshine bass (also known as hybrid striped bass), as with most farm-raised fish, live in an environment where water quality and population density are not always ideal. Add

The Sea Grant Industry Fellowship provides support for graduate students who are pursuing research and development projects in topics of interest to a particular industry or company. Trushenski, who is finishing her doctorate at Southern Illinois University (SIUC), worked closely on the vitamin E project with principal investigator Christopher Kohler at the Fisheries and Illinois Aquaculture Center at SIUC and Mamduh Si-fri at Archer Daniels Midland Company.

"With this fellowship, I've learned the industry perspective on research, which is somewhat different than in academia," said Trushenski. "Industry researchers are more focused on whether results are applicable and marketable. Regulatory issues are also more relevant. Since aquaculture research is never really separate from industry, this experience has been very useful."

Trushenski and Kohler have two articles published in the *North American Journal of Aquaculture* from their research on natural source vitamin E and sunshine bass: "Vitamin E requirements of sunshine bass as met by the natural source, d-alpha tocopherol acetate" (68: 186-191) and "Challenges and opportunities in finfish nutrition" (68: 122-140).

The Future is up to You!

It's the only time of year when you can find deviled eggs on a stick, country stars rockin' out, and information about protecting the environment all in the same place. The 2006 Illinois State Fair hosted Illinois-Indiana Sea Grant's exhibit where approximately 2,500 people stopped by to learn about their environmental future. "The exhibit theme, "The Future Is Up to You," featured a fortune teller, plasma ball, and tarot cards," said Susan White, IISG graphic designer. "Our message was that people shouldn't release fish or aquatic plants into ponds and rivers; that way we might all have a healthier environmental future."

The exhibit, which was located in Conservation World, offered information from the Habitattitude™ campaign, which addresses the threat of invasive aquatic species in local waterways. Habitattitude™ is sponsored by several federal agencies and the pet industry, which have teamed up to provide information on better options to releasing aquatic fish and plants into local ponds and rivers. "Fairgoers learned that donating unwanted fish or water plants to schools, pet stores, and friends is an excellent way to encourage a healthy aquatic environment," added Jennifer Fackler, IISG program specialist.



Staff Update

Aquatic Invaders, an entertaining, educational program that demonstrates simple steps to avoid the spread of invasive species, was honored by Coastal America during a recent national meeting of the Association of Zoos and Aquariums (AZA). The project is a partnership between the Sea Grant network and AZA. Illinois-Indiana Sea Grant shares in this award through Robin Goettel, who provided background content for the project based on IISG's Nab the Aquatic Invader Web site. She served as a program reviewer and is a member of the advisory committee.



Robin Goettel, who has been with IISG for 23 years as the program's communications coordinator, has been promoted to associate director for education. Over the years, Goettel has established and grown the IISG education program. She has developed projects that have led to teacher-inspired curriculum, community stewardship, and new educational Web sites.

IISG has hired Irene Miles as its new communications coordinator. She has been the program's public information specialist for the past five years, serving as the editor of the *HELM* and writing IISG's media releases. Now, in addition, she oversees the communications component of the program.



Martin Jaffe, IISG environmental planning specialist, was recently appointed director of the graduate program in Urban Planning and Policy at the University of Illinois at Chicago. During this three-year term he will continue to play a valuable role addressing Sea Grant issues such as water quantity and infrastructure planning and will continue his fellowship appointment in UIC's Great Cities Institute.

Hollings Scholar *continued from page 1*

has been instrumental in the development of the pharmaceuticals and personal care products (PPCPs) resource kit, which provides a bounty of information to communities that want to initiate take-back programs. "There is so little information out there for the public and this issue is a growing concern," said Polansky.

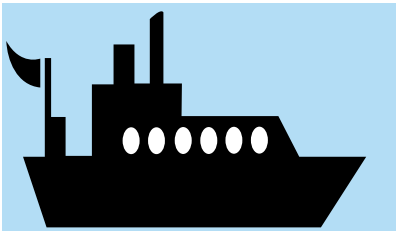
Polansky, a senior at the University of Miami in Florida, was in the first round of NOAA Ernest Hollings Undergraduate Scholars. This new scholarship provides up to \$8,000 of academic assistance and a paid summer internship. Polansky spent ten weeks this summer working with Sea Grant's Susan Boehme and Beth Hinchey Malloy at U.S. EPA GLNPO, focused on the issue of PPCPs disposal. At the end of her internship, she presented her project to NOAA officials in Silver Springs, Maryland.

"Lara's hard work has definitely advanced our pharmaceutical disposal project to a state of near completion this summer—something that would never have happened if we didn't have her working with us," said Susan Boehme. "This issue is getting a lot of national interest, so it is great to be able to respond to requests with resources that she has created."

Although Polansky is finished with her internship, she is not done with her work on PPCP disposal. "Lara has also taken the initiative and realigned her senior project at the University of Miami to continue the work she has begun this summer here in Chicago," said Boehme. For her senior project, Polansky will be investigating the impact of waterborne pharmaceuticals on gulf toadfish.

COSEE Catches On

Beth Hinchey Malloy, IISG Great Lakes ecosystem specialist, accompanied the *R/V Lake Guardian* this past June on the inaugural Great Lakes Centers for Ocean Sciences Education Excellence (COSEE) cruise. The primary



goal of COSEE is to foster collaborative relationships between scientists and educators to enhance ocean and Great Lakes literacy so the U.S. EPA Great Lakes National Program Office (GLNPO) vessel toured Lake Erie with 17 teachers, six scientists, and three Sea Grant educators.

As a result of her onboard experience, Louise Palermo of the Great Lakes Science Center invited Hinchey Malloy and U.S. EPA GLNPO scientist Jackie Adams to Cleveland. There, they led a water quality monitoring techniques training workshop for the Great Lakes Science Center staff members and volunteers. The two guided the educators in using a secchi disc, measuring dissolved oxygen, and collecting and identifying zooplankton. Palermo's new programming, inspired by the limnology sampling techniques she first learned aboard the *R/V Lake Guardian*, will bring hands-on and scientifically sound Great Lakes experiences to thousands of weekend visitors and high school groups who visit the center each year.

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