Water Column

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The Invasion of the LFOs

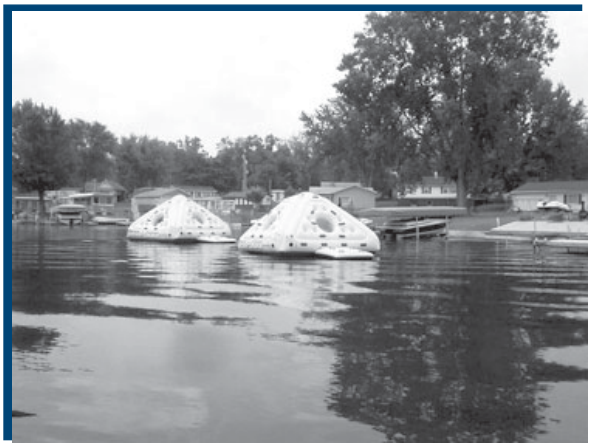
Have you noticed the increase in large water toys dotting our lake shorelines? Water trampolines, floating rafts, and other LFOs (large floating objects) seem to be on every lake I've worked on this summer. Kids obviously have lots of fun on them. Norm Mears, President of RAVE Sports, Inc., tells me that the idea of a floating water trampoline has its roots going back to at least the mid-1980s but was not commercially available until his firm began making the Aqua Jump™ in the late 1990s.

I've heard people complain about the impact of LFOs on shoreline aesthetics and question their affect on littoral zones. However, Mr. Mears explains that his products are colored so brightly to offer the highest visibility and safety to boat traffic and he adds that the trampoline woven mesh allows light enough to penetrate to reach living organisms underneath. The Aqua Jump™ is also offered in a forest green and sand color to better blend in with the shore. Most LFOs I've seen on Indiana lakes aren't transparent so these can shade out littoral plants.

The Aqua Jump™ (courtesy photo)

Mr. Mears also writes that, "It is advised that prior to the purchase of a water trampoline the lakeshore property owner question the local authorities regarding any regulations that might impact their purchase decision. For instance, some states require any swim raft or water platform to be registered with the county sheriff for a modest fee. In Wisconsin, the very largest sizes require a permit. Good judgment is always needed when placing personal property into the public domain. The swim raft or water trampoline should always be placed in safe proximity to one's own dock or pier and never in a position that obstructs navigable waters. While in the vast majority of cases there are no restrictions, it is advised that local ordinances be investigated and followed."

Miscellaneous LFOs (photo by Bill Jones)



12-foot square, 7-foot high Sea-Doo Paradise Mountain Water Floats (Photo by Jed Pearson)

Recreational user surveys often show that "enjoying the quiet beauty" of the lake is the highest valued lake activity of respondents. According to Bob Korth of the Wisconsin Lakes Partnership, the aesthetics of simply looking out at the lake or stream remains probably the most overlooked and under-appreciated use of our waters. LFOs certainly contribute to lakeshore aesthetics, more likely in a negative way.

The water toy industry is still in its infancy but most signs point to water toys and tow-behinds as one of the major areas of growth in water recreation manufacturing over the coming decades. The question is how will we blend these and any other new uses into our water culture? What do you think about them? We'd like to hear from you. Please drop me an e-mail and we might share your opinions in a future issue of *WaterColumn*.

Toxic Algae Plague Midwestern States

Several Midwestern states have recently reported multiple incidents of toxic blue-green algae in lakes. Numerous dog deaths have been attributed to the toxic algae.

The Nebraska Department of Environmental Quality has tested more than 40 lakes across the state for toxic blue-green algae this summer and has issued health advisories or alerts for more than two dozen. Five lakes are under a health alert designation, meaning that the public should avoid full-body recreational activities such as swimming or water skiing. Some experts believe the outbreak may be related to the continuing drought.

On Minnesota's Lake Benton, four dogs died one-half to one and one-half hours after drinking from the lake. Residents reported that while the lake didn't have a thick scum floating at the surface, the water looked like opaque green paint. "You could have taken it out and painted your house with it," said one man, whose dog looked like it had been dipped in paint after emerging from the lake. At least two dogs were confirmed dead at Fish Lake. An autopsy performed on one of these dogs indicated heart hemorrhage, liver damage, and other internal injuries. The Minnesota Department of Natural Resources sent water samples from Crystal Lake to a qualified lab for algal toxin analysis. The results were some of the highest they had ever seen. Microcystin-LR levels were 5,160 µg/L (parts per billion). Microcystin-LR is a powerful liver toxin produced by a common, blue-green algae called *Microcystis*. The World Health Organization has established a guideline value of 1 µg/L of Microcystin-LR in *drinking* water.

Lake Restrictions Make Lakeshore Property More Valuable

People are willing to pay more to live on a lake that's protected from degradation, often related to lakeshore development.

These findings are part of a report from an interdisciplinary team of researchers at the University of Wisconsin-Madison, which investigates the ways human beings create and respond to environmental change.

This rise in property value is just one of the preliminary findings presented at the annual meeting of the American Association for the Advancement of Science (AAAS). Taken together, the initial results point to the importance of understanding the reciprocal interaction between ecological and human systems—something the Wisconsin scientists argue is key to developing effective management strategies.

One of the emerging environmental issues in Wisconsin is the development of the state's Northwoods region (also known as the Northern Highland Lake District) that's speckled with thousands of freshwater lakes. A decade ago, before the area's population grew by 15 percent, anglers on nearly any of the region's lakes could dip their lines into the water and quickly catch fish. But, as more residents have moved into the area, fish abundance has declined, threatening many qualities of the lakes that attract people to the area.

Development tends to have a homogenizing effect across an area, giving lakes similar water qualities and similar fish and plant communities, says Stephen Carpenter, a UW-Madison limnology professor and one of the project's leaders.

But, as he and his colleagues note, identifying exactly how humans alter these lakes is only one part of the equation. To understand how lakes change over time and to develop effective management strategies to mitigate predicted changes, researchers must determine how people—particularly fishermen and lakeside residents—may respond to changes in these freshwater ecosystems.

"When most people think about the dynamics of ecological systems, they think only of how humans influence them," says Tim Kratz, a senior scientist at UW-Madison's Center for Limnology and the group's presenter at the AAAS meeting. "But lakes also influence human activities and behaviors. They guide, for example, where people fish or where they decide to build their cabins."

As Carpenter and UW-Madison economist William Brock learned through mathematical modeling, the collapse of the fish population at one lake can ripple to nearby lakes—anglers, wanting to hook as many fish as possible, are likely to move to another lake that promises more nibbles on the line. Once overexploited, the anglers are likely to move again, until fish populations in all area lakes are depleted, says Carpenter.

But not all human responses to changes in a lake's ecosystems are negative, according to research by one scientist in the group. In fact, some can lead to a "win-win" situation that protects the lakes while increasing the value of the property surrounding those lakes.

When the quality of lakes begins to break down, lakefront property owners can respond in two ways, says Bill Provencher, an environmental economist at UW-Madison. "They can take action collectively, such as by forming associations that govern lake use, or they can take action privately by moving off the lake."

In 1999, residents in Vilas County decided to take collective action: They enacted and continue to enforce a lake classification system that customizes development restriction on a lake based on its level of development and sensitivity to environmental change. The regulations, for example, require new lots on ecologically sensitive, undeveloped lakes to be at least 300 feet wide along the lakeshore, compared to the state minimum of 100 feet.

Good zoning with sufficient buffers equals improved land values and cleaner lakes.

Because the county ordinance is one example of how people have responded to the changes in the environment, the interdisciplinary team of UW-Madison researchers wanted to evaluate the economic and ecological outcomes of these regulatory actions.

Provencher focused on property value, which he says is an indirect marker of the economic value of the ordinance. Property value, he explains, can capture competing positive and negative effects of the ordinance on lakeshore residents, such as the assurance that the lake will be protected from future overdevelopment, but also limitations on how residents can use their property.

The Wisconsin economist says the "win-win" outcome—when the lake classification scheme is both economically and ecologically beneficial—depends on whether the positive economic effect of the ordinance outweighs the negative economic effect.

To determine the overall effect of the classification system on property value, the Wisconsin economist and his collaborators looked at the actual market sales of more than 1,100 lakefront properties sold in Vilas County from 1997 to 2001. For transactions occurring after the zoning restrictions were implemented in 1999, the researchers compared the relationship between selling price and level of development restriction.

The economic effect of the ordinance is generally positive, as reflected in higher property prices, says Provencher, referring to preliminary findings.

The findings show, for example, that the zoning restrictions for Trout Lake—a less-developed, 3,816-acre lake in the Northwoods—raises the value of land along the lake from $633 to $715 (about 12.6 percent) per foot of shoreline. Similarly, the price of land around Presque Isle Lake—a smaller and even less-developed lake in the region—increased from $410 to $510 per foot (24 percent).

Provencher says the preliminary results suggest that the lakefront homeowners, willing to exchange rights and money to live on a healthier lake, value environmental preservation. At the same time, they also suggest that preservation is valuable economically because it enhances the worth of land surrounding restricted lakes.

This positive connection between the environment and economics could encourage more people to respond collectively to ecological change in northern Wisconsin, notes Provencher: "Economics is the language of public policy. If a policy makes people better off financially, while protecting the environment, it's an easier sell."

WATER COLUMN

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Whether or not more lakeshore communities will adopt restrictions to protect the value of their lakes and homes, the UW-Madison group says that more research should consider how humans may react to ecological change, as they are players both acting and being acted upon by their environment.

"We want to be able to understand the causes of long-term changes observed in ecological systems, and we want to develop effective mitigation or management strategies," says Kratz. "We will have little chance of doing this if we don't understand how humans influence and respond to ecological change." (University of Wisconsin Press Release)

New IDEM Watershed Specialists Cover the State

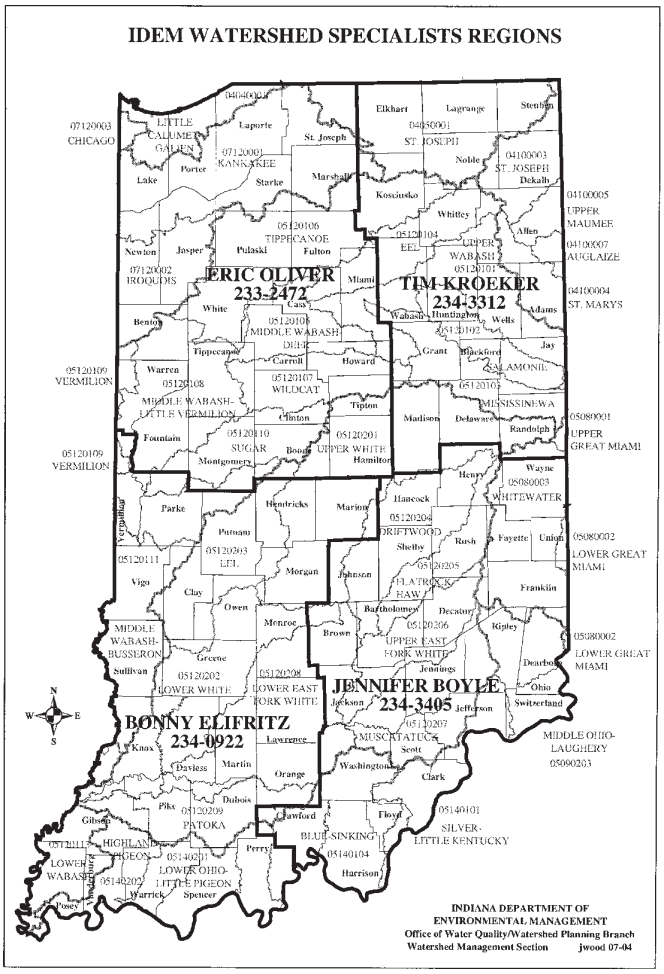
IDEM is pleased to announce that beginning August 2, 2004, IDEM's Office of Water Quality (OWQ) will have four Watershed Specialists. Each of the four specialists is responsible for working independently to coordinate watershed management activities within a multi-county area of the state. These senior environmental managers will act as liaisons between different state and local programs and officials, to facilitate watershed planning and total maximum daily load (TMDL) development activities. Currently, the specialists will be based in Indianapolis, but most of their day-to-day work will be accomplished in the field. The four Watershed Specialists include:

Jennifer Boyle (e-mail: jboyle@dem.state.in.us). Originally from the suburbs of Chicago, Illinois, Jennifer received her Bachelor of Science in Forestry degree (specializing in wildlife management) and Master of Science (specializing in wetland policy) degree from Purdue University. After almost three years working in the environmental arena in the DC area, she returned to Indiana. For the past three years, Jennifer has held the position of Director for the Johnson County Soil and Water Conservation District. During this time, she has overseen two 319 watershed grants and has worked on numerous conservation programs and committees. Jennifer has extensive experience in planning and coordinating field days and workshops, preparing budgets and informational materials, communicating effectively to a wide range of audiences, and coordinating with other organizations such as RC&Ds, NRCS, and IDNR.

From left: Elifritz, Boyle, Oliver, Kroeker

Bonny Elifritz (e-mail: belifrit@dem.state.in.us). Bonny has a B.S. in Natural Resources from The Ohio State University. She focused her studies on wetlands and water quality, and during her senior year, worked as an intern with the Ohio EPA conducting wetland vegetation surveys in preparation for the development of the Ohio wetland water quality standards. Bonny worked for EMH&T in Ohio as an environmental technician assisting in the preparation of Phase I Environmental Assessments, and with SePRO Corporation in Carmel, Indiana, as the Regulatory Specialist prior to coming to IDEM. For the past four years, Bonny has been with IDEM's Watershed Management Section, where she has worked with communities, agencies, elected officials, universities, and consulting firms statewide on projects involving watershed planning, assessment, education, research, and technical assistance, as well as with many IDEM OWQ program support projects. Bonny also enjoys volunteering to educate children and communities about environmental protection.

Timothy S. Kroeker (e-mail: tkroeker@dem.state.in.us). Tim obtained his undergraduate liberal arts degree in 1987 from Taylor University with a major in Biology. Upon graduation he spent three years as a Senior Research Technician for the Krannert Institute of Cardiology in Indianapolis. Tim then decided to change careers and obtained a Master of Science in Environmental Science degree from the School of Public and Environmental Affairs (SPEA) at Indiana University, Bloomington. While at SPEA, he conducted research on constructed wetlands to treat non-point source pollution, and was lab manager and conducted sampling for Indiana's Clean Lakes Program. Upon graduation, he spent five years working for the Indiana Department of Natural Resources Division of Water as a Water Planner. His duties included evaluating water use and availability throughout the state on a watershed basis with a focus on ground- and surface-water quality.



In 2000 he became an Environmental Manager for the Indiana Department of Environmental Management, Office of Water Quality's Total Maximum Daily Load (TMDL) Program. His responsibilities included acting as project manager for several studies and TMDL projects; conducting research; field testing, sampling, evaluating data, and developing reports concerning the chemical, biotic, and physical parameters of Indiana surface waters; giving presentations to internal and external interest groups; acting as lab manager for the TMDL lab and *E. coli* mobile laboratory; and developing the 2002 and 2004 303(d) lists of impaired waters as mandated by the Federal Clean Water Act.

Eric Oliver (e-mail: eoliver@dem.state.in.us). Eric graduated from Purdue University with a B.S. in Aquatic Science. After graduation he began working for a chemical company where he worked with private pond owners as well as state regulators throughout the Midwest on aquatic plant management. Since 2000, Eric has been in the Wellhead Protection Program at IDEM working with community drinking water systems to proactively protect their drinking water resources. Through this program over 650 communities in Indiana have began to work to prevent drinking water pollution instead of waiting to treat the pollution. In addition to his involvement in the Wellhead Protection Program he has over eight years of experience working in the agricultural community. His experiences include working on hog and dairy farms as well as grain operations. Through the agriculture and aquatic plant management work he has learned hands-on experience in dealing with many aspects of watershed protection and cooperation.

Got a question about your lake? Or lakes in general? Or about something you've read? Write to us at the WaterColumn and we will do our best to answer it.

MEETINGS

November 3-5, 2004. NALMS 2004: 24th International Symposium of the North American Lake Management Society. Victoria Conference Centre – Victoria, British Columbia. Contact: NALMS, PO Box 5443, Madison, WI 53705-0443; Phone: (608) 233-2836; Fax: (608) 233-3186; e-mail: nalms@nalms.org.

December 12-15, 2004. 65th Midwest Fish & Wildlife Conference, The Westin Hotel, Indianapolis, Indiana. For more information: http://www.in.gov/dnr/midwest2004/wildlife.htm.

April 8-9, 2005. 17th Annual Indiana Lakes Management Conference, Marriott Hotel and Resort, South Bend, IN. For more information, contact co-chairs, Marianne Giolitto via e-mail: emgioitto@indianalakes.org, or 574-586-3400, or Mark Mongin at 317-216-8312, or via e-mail: presidentelect@indianalakes.org. Web site: www.indianalakes.org.

USEFUL TOOLS

Map Your Waters

EPA's Office of Water has just released a new version of EnviroMapper for Water (http://www.epa.gov/waters/enviromapper). EnviroMapper for Water provides a Web-based mapping connection to a wealth of water data. You can use it to view and map data, such as the uses assigned to local waters by your state (fishing, swimming, etc.), waters that are impaired and do not support their assigned uses, the reasons why waters are impaired, water quality monitoring information, closures of swimming beaches, and the location of dischargers. Maps can be viewed at

the national, regional, state or local levels. This latest release of EnviroMapper for Water (Version 3.0) features several new layers of water data including EPA's national water quality database STORET, National Estuary Program study areas, and the location of nonpoint source projects. Other enhancements make it easier to locate and view these data, and instructions are included describing how to incorporate the resulting map into your own Web page. For more information, contact Tommy Dewald at dewald.tommy@epa.gov or 202-566-1178.

Riparian Buffers All the Rage

Is your locality considering adopting a buffer ordinance? Are you a homeowner thinking of converting your streamside lawn to a buffer? South Carolina is now offering riparian and vegetated buffer publications that can help you. The Department of Health and Environmental Control's Ocean and Coastal Resources Management (OCRM) Planning Division staff recently reviewed and compiled current literature on vegetated buffers. The review resulted in two easy-to-read informative booklets: one for both local government officials and citizens of South Carolina, entitled *Vegetated Riparian Buffers and Buffer Ordinances* (www.scdhec.net/ocrm/pubs/buffers.pdf), and a second for homeowners, entitled *Backyard Buffers for the South Carolina Lowcountry* (www.scdhec.net/ocrm/pubs/backyard.pdf). Although written for South Carolina, these documents present information applicable to a wider audience. To further assist local government officials and the public, OCRM also offers *A Model Riparian Buffer Ordinance* (www.scdhec.net/ocrm/oubs/model.pdf), which lists suggested components of a buffer ordinance. For more information, or to request copies of these publications, please contact Ward Reynolds, SCDECOCRM, 1362 McMillan Avenue, Suite 400, Charleston, SC 29405; Phone: 843-744-5838; e-mail: reynoldsww@dhec.sc.gov.

Perspectives

"Water is the most critical resource issue of our lifetime and our children's future. The health of our waters is the principal measure of how we live on the land."

—Luna Leopold

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