

ASC

Aquatic Sciences Chronicle

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UNIVERSITY OF WISCONSIN SEA GRANT INSTITUTE UNIVERSITY OF WISCONSIN WATER RESOURCES INSTITUTE

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UW WATER RESOURCES RESEARCH

Mercury Accrues, Declines in Fish Quickly



Michelle P. Wassenaar

Mercury threatens wildlife like loons as well as people who eat certain types of fish. A new study published in the Proceedings of the National Academy of Sciences offers good news for reducing levels of mercury in aquatic environments.

A landmark study recently published by an international team of scientists has found that cracking down on air pollution will provide healthier fish for the dinner table.

“This is the first time that we have been able to use techniques that could show that addition of new mercury to a lake directly increased the mercury level in its fish” said James Hurley, assistant director for research and outreach at the UW Aquatic Sciences Center and one of the study’s 24 authors.

Mercury is a powerful neurotoxin that can cause serious health problems, especially in developing fetuses and young children. When airborne mercury lands in lakes and other bodies of water, bacteria transform it to methylmercury, an organic form that accumulates in fish.

This ongoing study uses a remote lake in Canada to track how mercury moves through an ecosystem. The key to the project was adding minute amounts of stable mercury isotopes — which differ only in atomic configuration — directly to the lake and sprayed over the surrounding watershed. These isotopes allowed researchers to track both the source and the timing of methylmercury formation and accumulation in fish.

The potency of mercury has led to countless fish advisories around the nation, and, in response, a growing demand for action. Much of

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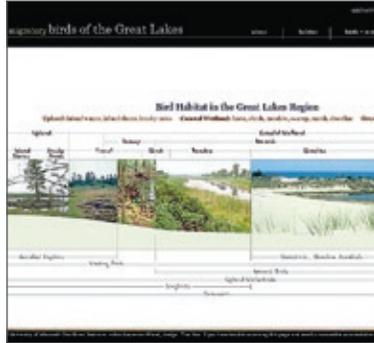
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University of Wisconsin Water Resources Institute is one of 54 Water Resources Research Institutes nationwide authorized by the federal Water Resources Research Act and administered through the U.S. Geological Survey. www.wri.wisc.edu



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FEATURED WEB SITE

Migratory Birds of the Great Lakes

www.seagrant.wisc.edu/birds

Birds may be masters of the sky, but most of them have equally powerful links to water — especially in our Great Lakes region, where the landscape is dominated by lakes, rivers, streams, marshes, and wetlands. This online guide, developed by Ashland freelance writer **Laurence**

Wiland and UW Aquatic Sciences Center Designer **Tina Yao**, features migratory birds common to the Great Lakes region and explores their special relationships with water.

Experienced birdwatchers can learn something new about these unique water connections, and students of all ages will enjoy this beautifully illustrated site featuring detailed bird profiles, a guide to habitat in the Great Lakes region, issues challenging Great Lakes migratory birds, and relevant research funded by UW-Madison and the UW Sea Grant Institute.

Be prepared to be surprised as you see birds from this new angle.



Making a Great Lake Superior

Many people know Lake Superior is a great Great Lake. Keeping it that way is the goal of the “Making a Great Lake Superior 2007” conference Oct. 29–31 at the Duluth Entertainment and Convention Center.

“This conference will focus on the most pressing issues facing Lake Superior,” said conference co-organizer Liz LaPlante of the U.S. Environmental Protection Agency’s Great Lakes National Program Office in Chicago. “We look forward to lively discussions among people from different disciplines. We’ll use facilitated work groups to develop recommendations for research, education, and management.”

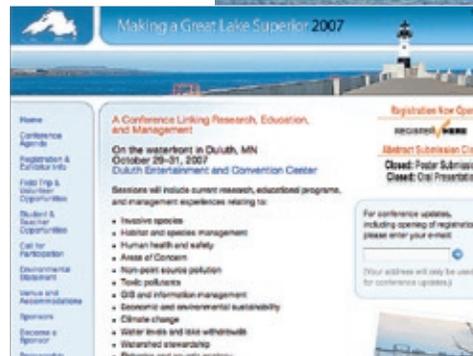
Lake Superior Basin residents, educators, resource managers, and researchers are invited to attend this meeting. The two-and-a-half-day program will include a mixture of plenary presentations, contributed sessions, exhibits, posters, evening socials, pre-conference community gatherings, and post-conference field trips.

In an effort to practice what it preaches, “Making a Great Lake Superior” will be the first carbon-neutral conference of its size ever held in Duluth. Organizers are reducing the event’s carbon dioxide footprint by several means, including using locally produced products and reducing waste.

“This is the first major conference on Lake Superior in five years, and there’s a lot of interest and a lot of energy going into this event,” said Wisconsin Sea Grant’s Gene Clark, a member of the conference planning work group. “We’re pleased to lend our support and be a part of it.”

For information, visit the conference Web site at www.seagrant.umn.edu/superior2007 or call Minnesota Sea Grant at (218) 726-8106.

Conference organizers include the U.S. Environmental Protection Agency, Environment Canada, and University of Minnesota Sea Grant College Program. Twenty-six organizations are sponsoring the event, including U.S. and Canadian government agencies, international organizations, tribal organizations, watershed groups, academic institutions, and the Wisconsin, Minnesota, and Michigan Sea Grant College programs.



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Great Lakes Researchers Invited to Join One-Stop Information Network

Great Lakes research scientists are invited to join a new online network (www.glrrin.info) that connects them with potential collaborators, upcoming workshops and funding sources. The **Great Lakes Regional Research Information Network** (GLRRIN) was initiated by NOAA and the National Sea Grant College Program. To join the GLRRIN, visit the Web site at www.glrrin.info.

STAFF NEWS

• **Chris Babiarz**, an assistant scientist at the UW-Madison Water Science & Engineering Laboratory, will be working part time at the ASC assisting with WRI activities during the coming year while Assistant Director for Research & Outreach **Jim Hurley** is at NOAA Sea Grant in Silver Spring, Md.

- **Laura Braun**, who started at the ASC as a limited-term employee in May 2006 and became a university services associate last November, left in May to live in Mexico.
- **Patrick Sweeney**, a former Wisconsin Corrections officer, was hired in April to replace her.
- **Liz Albertson**, a graduate student employee who coordinated the Web site for the international mercury conference last year, graduated last May and took a position in Atlanta, Georgia.



Mercury Accrues, Declines in Fish continued from page 1

this attention has been focused on coal-burning power plants — the main source of mercury pollution today in the United States.

But there is “old” mercury in the environment as well. It’s been emitted into the air since the industrial revolution and used in everything from dental fillings to kids’ sneakers.

With so much of this “old” mercury already in the environment, policymakers have debated whether spending billions of dollars to reduce air emissions will actually make fish healthier and people safer.

The results of the study finally provide an answer.

Researchers found that methylmercury levels in fish increased during the first three years of the study and that essentially all of the increase came from mercury deposited directly to the lake surface. That, they said, means methylmercury in fish should decrease quickly if mercury deposition is reduced.

“We can say conclusively that if you reduce mercury emissions it will result in less mercury in fish,” said study co-author Vincent St. Louis of the University of Alberta.

Wisconsin’s portion of the study was funded by the National Institute for Water Resources, Electric Power Research Institute, Wisconsin Department of Natural Resources, and Wisconsin Focus on Energy. — KSK

Watch video at www.aqua.wisc.edu/chronicle



Engineering Students Dive into Field Work

Expect the unexpected — and remember the duct tape. Those were big lessons for ten UW–Madison students who learned to use coastal engineering instruments in the field last summer. The course was taught by Civil and Environmental Engineering Professors Chin Wu and Dante Fratta and by Geology Professor David Mickelson.

UW Sea Grant Coastal Engineering Specialist Gene Clark provided logistical support and real-world perspectives. The students started in the UW Engineering Lab and then moved out to Lake Mendota and ultimately to the Great Lakes. Clark arranged for the class to use the research vessels *L.L. Smith*, out of Duluth-Superior, and *Neeskay*, out of Milwaukee. Aboard the vessels, Clark described issues associated with aging infrastructure in the Duluth-Superior harbor, dredging methods in the Milwaukee Harbor, and bluff and lake bottom

erosion along Lake Michigan’s west coast. UW Sea Grant supported the ship time.

From ship and shore, the students deployed specialized instruments to measure wave height, current strength and direction, sub-bottom structure, and other coastal parameters. They also designed and built support equipment to adapt the instruments to Great Lakes applications.

On the shores of Lake Superior, the students dealt with winds over 40 miles per hour.

“They soon realized that collecting measurements in the field can be totally different from merely studying instruments in the lab,” Clark said.

Wu said the students’ progress was clear.

“In the beginning, they were using duct tape a lot,” he said. “At the end, not at all.”

Recreational boating on the Great Lakes is big business. Just how big is detailed for the first time in a summary report of boating's economic impacts recently released by the Great Lakes Commission. One of the findings: the 4.3 million recreational boats registered in the eight Great Lakes states generate nearly \$16 billion in spending on boats and boating activities in a single year. The full report is available online at www.glc.org/recboat.



The "bloody-red shrimp" (*Hemimysis anomala*) is one of the most recent ballast water invaders in the Great Lakes. It is native to the Ponto-Caspian region of Eastern Europe—the same area from which zebra mussels originated. The shrimp was first reported in the Great Lakes by NOAA in samples collected in Muskegon, Mich., in November 2006 in waters connected to Lake Michigan. It has also been found in samples taken in Lake Ontario off Oswego, N.Y. In both locations, adults, juveniles, and pregnant females were found, indicating that this species is reproducing in the Great Lakes. Finding the bloody red shrimp in two separate locations suggests that the species may be widespread, and experts expect that it will be seen in additional locations as people begin actively looking for it. For more information, see <http://seagrant.wisc.edu/AIS/>.

New rules and recommendations designed to provide a more accurate measurement of groundwater pumped out of Wisconsin aquifers took effect Sept. 1. Under the rules, owners of all 9,000 high-capacity wells in the state are required to report annually how much water they pump. In addition, applicants for new high-capacity wells are required to submit more information and face environmental review for wells proposed within 1,200 feet of trout streams and other high-quality waters. For more information, see <http://dnr.wi.gov/org/water/dwg/gac/>.

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a joint newsletter from UW Sea Grant and UW Water Resources



CALENDAR OF EVENTS

OCTOBER 29-31, 2007

Making a Great Lake Superior 2007

Duluth, Minn.

www.seagrant.umn.edu/superior2007

OCTOBER 29, 2007

2007 Great Lakes Regional Data Exchange Conference

Ottawa, Ont., Canada

<http://rdx.glc.org/07/>

NOVEMBER 12-17, 2007

27th Session of the Intergovernmental Panel on Climate Change

Valencia, Spain

www.ipcc.ch

MARCH 6-7, 2008

Annual Meeting of the American Water Resources Association – Wisconsin Section

Brookfield, Wis.

www.wri.wisc.edu/conference.html

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publication details

Mercury 2006 T-Shirt - Japan Design - Adult Size Large

Japan Design, Adult Size Large, 100% Cotton, Short-sleeve, Black T-Shirt

[Click here to see design](#)

As part of the Eighth International Conference on Mercury as a Global Pollutant, students in Brazil, Canada, China, Japan, Slovenia, Sweden and the U.S. participated in the Youth Art Project.

Conference organizers conceived of the Youth Art Project as a way of educating young people about the problem of mercury pollution. Students were given presentations and handouts about mercury pollution and poisoning. They were then asked to use what they learned about mercury to create a piece of art work to display at the conference.

Eight designs were selected to create the Mercury 2006 T-shirts.