

ASC

Aquatic Sciences Chronicle

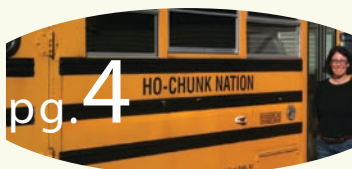
aqua.wisc.edu/chronicle

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

INSIDE:



Profiling Groundwater Movement



Watery Story Hours



Our New Website Unveiled



SEA GRANT RESEARCH

New Atlas Coasts Into Wisconsin

Wisconsin's new coastal atlas is nothing like yesterday's oversized books full of colorful maps. In fact, it isn't a book at all. The Wisconsin Coastal Atlas is digital and contains far more than any hard-covered book possibly could. The atlas is more like an electronic toolbox filled with a variety of Web applications designed to help guide decision-making about coastal management on the Great Lakes.

The Wisconsin Coastal Atlas is a Web-based resource, serving as the single entry point to a multitude of databases and learning opportunities. The general public, coastal managers and policy developers will find the new coastal atlas an essential tool for making decisions about issues ranging from coastal erosion to community planning.

The digital format is appealing because the Great Lakes' coasts are constantly changing, according to David Hart, geographic information systems specialist at Wisconsin Sea Grant. Information is quickly outdated when erosion changes the physical coast, properties change hands, or development takes place. If agencies that create data keep

continued on page 7 >>

Walking barefoot allowed David Hart to traverse a muddy, flooded trail to get photos of the North End Trail on Madeline Island.

Aquatic Sciences Chronicle

University of Wisconsin Aquatic Sciences Center
1975 Willow Drive
Madison, WI 53706-1177

Telephone: (608) 263-3259
E-mail: chronicle@aquawisc.edu

The Aquatic Sciences Center is the administrative home of the **University of Wisconsin Sea Grant Institute** & the **University of Wisconsin Water Resources Institute**.

Communications Manager
Moira Harrington

Editor
Elizabeth A. White

Writers
Carolyn Rumery Betz, Aaron Conklin,
Moira Harrington, Anne Moser

Art Director and Designer
Tina Yao

Circulation Manager
Linda Campbell

University of Wisconsin Sea Grant Institute is part of a national network of 32 university-based programs funded through the National Sea Grant College Program, National Oceanic & Atmospheric Administration, U.S. Department of Commerce, and through matching contributions from participating states and the private sector. seagrant.wisc.edu

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. wri.wisc.edu



SUBSCRIBE

E-mail chronicle@aquawisc.edu to request a no-cost subscription to the "Aquatic Sciences Chronicle," a quarterly publication. Please specify whether you prefer a mailed print edition or electronic delivery to an e-mail in-box.

GET ASC NEWS ALERTS BY E-MAIL

You can receive e-mail notices about new postings to the Chronicle Online. Sign up at aquawisc.edu/chronicle.

GET CONNECTED WITH UW SEA GRANT



In addition to the new website (p. 6), tech-savvy readers have three more quick and easy ways to connect to the Aquatic Sciences Center's research and outreach/education efforts online.

It begins with a new Facebook page for Wisconsin Sea Grant and the Water Resources Institute (WRI). Check out news and photos, get grant information and click to view interviews with researchers and videos of research in action. Think of it as an expanded companion to the news arriving four times a year through the Chronicle. It's also a great way to interact with staff.

Want info even faster, and in smaller 140-character bites? Click and follow us on Twitter, either by clicking on the Twitter icon on the ASC website, or by searching for the handle "@UWiscSeaGrant" on Twitter.

Finally, head on over to the UW Sea Grant and WRI YouTube channel youtube.com/user/UWASC where staff videographer John Karl has posted great footage of the stories you've been reading about in the "Aquatic Sciences Chronicle." You can also view them on the Chronicle's website, aquawisc.edu/chronicle.



Hurley Leaves ASC

In February, Jim Hurley assumed the role of director of the environmental health division at the State Lab of Hygiene. In this position, he will lead scientific and research activities in the areas of environmental chemistry and microbiology, radiochemistry, toxicology and chemical emergency response.

In February, Phil Moy became the acting assistant director for research and outreach. Moy has been the advisory services manager for UW Sea Grant and the outreach specialist working on fish and fisheries, and aquatic invasive species.

Before moving on, Hurley offered two self-identified highlights of his ASC tenure: creation and implementation of the 2006-10 Sea Grant outreach work plan, and the 8th International Conference on Mercury as a Global Pollutant, which took place in Wisconsin.

Hurley also believes he will be able to soften the blow of departure from activities and people he has valued through the years. He said, "There are still plenty of collaborative opportunities with Sea Grant, the Water Resources Institute and my new job," citing environmental monitoring and research as overlapping organizational missions. Plus, he intends to keep a hand in national and statewide climate change initiatives.

"Through my time at ASC, I hope we made a difference by supporting research, education and outreach that promotes sustainable use of Wisconsin's water resources," Hurley said.



A team of University of Wisconsin Water Resources Institute researchers conducting field work on groundwater-test and municipal wells around the state are proof there is a connection between tuning in the HBO vampire series “True Blood” and turning on a kitchen faucet.

Fiber optic cable can not only deliver entertainment, it can also be used in empirical pursuits. In this case, it is crucial to a study on a new and potentially economical method for profiling groundwater movement. Jean Bahr, a UW-Madison geoscience professor, and David Hart of the Wisconsin Geological and Natural History Survey (not the same person as the ASC’s David Hart) are leading the year-long analysis.

Bahr said urbanization is, in part, driving the need for this research. As development pushes outward, municipal water systems are called upon to tap different and multiple aquifers to meet demand. It is important to know the effects of water withdrawals from layers of bedrock, including shale and sandstone, particularly if they affect critical discharge zones such as springs.

“One of the big challenges in hydrogeology is the geology – how the different rocks conduct water. Water can move much faster in some layers than in others. It depends on how the rocks were deposited. What’s challenging about that is this is all happening underground and we can’t see it,” said Andrew Leaf, a former UW-Madison graduate student on the project. “Temperature is one way to measure the movement of water because water carries heat with it as it moves.”

Bahr explained, “Older water, coming through longer flow paths and that’s gone deeper, is generally warmer than newer, near-surface recharge water.”

To see how the water flows, Bahr and her team can force hot water down a well. The hot water

becomes a kind of liquid sherpa, providing insight about the terrain. But the question remains: Beneath turf and topsoil, where is the sherpa and what path is it blazing? That’s where a method called distributed temperature sensing (DTS) comes in.

DTS provides nearly continuous measurement of temperature in time and space along fiber optic cable. A sensor box pulses a laser light the entire length of sinuous cable feeding temperature readings to an above-ground computer – yielding a profile of geologic framework. It provides “a level of detail we haven’t been able to get before,” Leaf said.

Using fiber optic cable for non-entertainment/non-communication purposes isn’t new. Cable has monitored dams’ structural integrity and buildings’ fire risk for the last 25 years, for example. Yet this study is innovative. “We’re pioneering its application down-hole, in a more hydrogeologic setting,” Leaf said. “That’s an unusual use for this technology.”

“We’ll be seeing DTS used more and more in the future,” predicted researcher David Hart. Plus, the cost is economical when stacked against more common mapping tools.

In this study, the cable cost approximately \$3,000, and another university loaned the sensor box. The boxes can be expensive, perhaps \$20,000 apiece, Hart said. However, he said lower costs are within reach due to an economy of scale as DTS is increasingly adopted, particularly when compared with the electromagnetic flow meter method and its \$70,000 price tag. —MH

Andrew Leaf (above right) used hot water to measure groundwater flow through aquifers for his master’s thesis in geology at UW-Madison. Jean Bahr (above left) was his thesis advisor.



Watch video at aqua.wisc.edu/chronicle.



Native Americans and the Environment – Recommended Reading

Wisconsin's Water Library has many resources in its collection that represent a variety of cultural and historical perspectives from different Native-American communities in the Great Lakes area. Here are just a few.

INDIAN NATIONS OF WISCONSIN: HISTORIES OF ENDURANCE AND RENEWAL

BY PATTY LOEW. MADISON, WIS.: WISCONSIN HISTORICAL SOCIETY PRESS: 2001.

With a focus on oral traditions and primary sources, this collection explores Wisconsin history from a Native American perspective, including tribal histories and photographs of Wisconsin Indians.

LINES DRAWN UPON THE WATER: FIRST NATIONS AND THE GREAT LAKES BORDERS AND BORDERLANDS **WATERLOO, ONT. : WILFRID LAURIER UNIVERSITY PRESS: 2008.**

This volume of essays explores how the border between Canada and the United States has strongly influenced the First Nations living in the Great Lakes watershed.

NATIVE PEOPLE OF WISCONSIN

BY PATTY LOEW. MADISON, WIS.: WISCONSIN HISTORICAL SOCIETY PRESS: 2003.

Loew introduces the 12 Indian nations that live in Wisconsin, with an emphasis on the various ways native people remember the past, including the value of oral tradition.

WALLEYE WARRIORS: AN EFFECTIVE ALLIANCE AGAINST RACISM AND FOR THE EARTH

BY RICK WHALEY AND WALTER BRESSETTE. PHILADELPHIA: NEW SOCIETY PUBLISHERS: 1994.

An empowering account of how the Chippewa in Wisconsin and Minnesota fought alongside local residents and activists against the racism that was interfering with their treaty rights to harvest walleye.

WILD RICE AND THE OJIBWAY PEOPLE

BY THOMAS VENNUM, JR. ST. PAUL, MINN.: MINNESOTA HISTORICAL SOCIETY PRESS: 1988.

The author of this far-reaching book uses travelers' narratives, historical and ethnological accounts, scientific data and the words of Indian people to examine the importance of this wild food to the Ojibway people.

Please visit the Water Library at aqua.wisc.edu/waterlibrary for more information. Anyone in Wisconsin can borrow these books. Just e-mail askwater@aqua.wisc.edu.



Left to Right: ASC Librarian Anne Moser; Dennis Cherney, Harbor Master at Port Washington Marina, standing by a new rain barrel that collects potentially polluted rooftop runoff for use in watering the marina landscape; fish cleaning station; Port Washington Marina is one of 11 Wisconsin marinas to be certified a "clean marina."

OUTREACH



Water-Themed Story Hours Make a Splash

Wisconsin's Water Library is croaking, swimming and quacking its way around southern Wisconsin as it conducts story hours with preschools, elementary schools and public libraries as part of its outreach mission. The library has a top-notch children's collection that includes books, videos and DVDs focusing on everything related to water, including the critters that live in or around water.

The story hour road show developed in support of the 2010 statewide summer reading program, "Make a Splash—Read." But the effort is also a reflection of Special Librarian Anne Moser's initiative to reach underserved populations around the state. These include groups that may not have high literacy rates or use their community's public library often.

Focusing on the theme of waterfowl, Moser recently visited the Ho-Chunk Nation Head Start Program in Wisconsin Dells. A dozen children aged three through five sat on the alphabet rug and enthusiastically listened to several books and poems about ducks, swans and cranes. After singing and acting out a song about ducks, the children moved to two tables where they created their own ducks using paper plates, construction paper, scissors, glue sticks and markers.

Moser brought a frog-themed story and craft hour to the Ho-Chunk Youth and Learning Center's after-school program in Baraboo, which serves students from multiple Ho-Chunk schools in the region. The middle-school children at the center were able to act as mentors to the younger children involved in the story and craft activities, especially in folding origami frogs.

Moser was also able to collaborate with the Baraboo Public Library last summer and continues to work with the youth librarian during its preschool story hour. She has presented programs at multiple libraries in southern Wisconsin and hopes one day to branch out to other parts of the state using a Great Lakes theme.

"Libraries like special guests to come and do special programming, especially during the summer. I

see this as a great opportunity to bring science and literacy together," she said.

The children's collection was started with a grant from the Friends of the UW-Madison Libraries to support a story hour effort for an early-elementary story hour program for an underserved community in Madison. The collection, as with the entire Wisconsin's Water Library, is unique in that it is part of the University of Wisconsin System, but is open to the public. Books or other materials may be requested by patrons and delivered to them via their own local library.

Wisconsin's First Stewards of the Waters

Things are shipshape at the 11 Wisconsin marinas that have tackled and adopted up to 100 best-management practices and been certified as the state's first "clean marinas."

The Wisconsin Clean Marina Program began in July 2010 as a partnership of Wisconsin Sea Grant, the Wisconsin Marina Association and the UW Extension Solid and Hazardous Waste Education Center. The Wisconsin Coastal Management Program of the Wisconsin Department of Administration funded the start-up of the program.

The Clean Marina Program seeks to ensure clean water and fresh air by providing best management practices, compliance/technical information and educational materials to marina operators and boaters. The marinas will benefit from their green reputation and reduced waste disposal costs—not to mention cleaner water, land and air.

The new clean marinas are Port Washington Marina, Port Washington; Skipperbud's Harbor Club Marina and Skipperbud's Quaterdeck Marina, both in Sturgeon Bay; Nestegg Marine, Marinette; the Abbey Marina, Fontana; Harbor Centre Marina, Sheboygan; Gaslight Pointe Marina, Racine Yacht Club, SkipperBud's Reefpoint Marina and Lakeshore Towers, all in Racine; and Manitowoc Marina, Manitowoc.

11 Wisconsin marinas have been certified as the state's first "clean marinas."



Easy on the Eyes, Tonic for the Brain: The Relaunch Sea Grant Website

In January, Wisconsin Sea Grant released a new and improved website. The new site is organized around key topics visitors look for and makes navigation easier and more direct, with improved search capabilities and a site map footer on every page.

Visitors can go straight to information on aquaculture, birds, climate change, coastal communities, coastal engineering, diving, fish and fisheries, frogs, the physical properties of the Great Lakes, habitats and ecosystems, aquatic invasive species, maps, shipwrecks, water sports safety, toxics, water quality, and ports, harbors and marinas. From these main topic pages, visitors can view summaries of all relevant content on deeper-level pages and find links to related material.

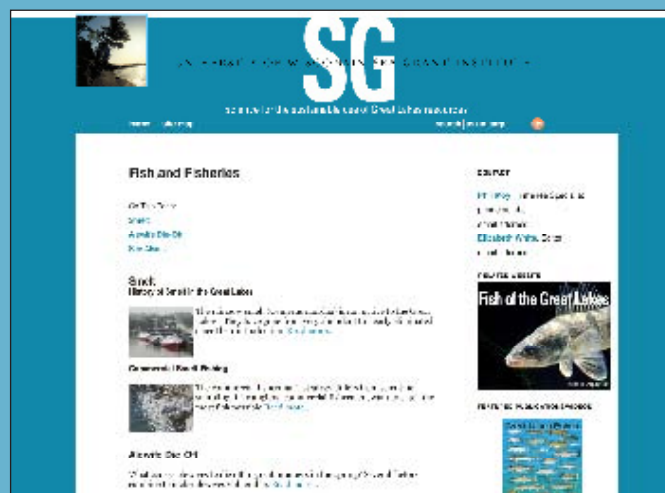
Contact information for Wisconsin Sea Grant outreach specialists in each area is featured, as are related recommended publications in the Aquatic Sciences Publications Store and some additional external links.

Educators, students and researchers will find links on the homepage to portals with content that is especially relevant to their interests.

Detail pages also include links to a suite of top social media tools, including news aggregators, to facilitate the transfer of what's on Wisconsin Sea Grant pages to many different audiences in even greater numbers.



seagrant.wisc.edu





New Atlas Coasts Into Wisconsin *continued from page 1*

them up to date and accessible on the Web, they are available to anyone at any time, rather than being sequestered on individual computer hard drives. Databases can then be integrated efficiently via the atlas portal to solve problems.

Hart and principal investigator Steve Ventura from UW-Madison are using the state of Oregon's atlas as a model for Wisconsin's product. Using funding for the project from Wisconsin Sea Grant, managers of Oregon's atlas have traveled to Wisconsin as partners in developing the new site.

"Oregon's atlas has been very effective in terms of organizing and presenting information. People will sit around the computer screen, bring up the map, look at the data, and use the map as a common framework to discuss coastal issues. The director of the Oregon Coastal Management Program feels it has brought people together like nothing else before," said an enthusiastic Hart.

Like Oregon's atlas, four components constitute Wisconsin's site: tools, maps, catalog and learn. Each feature has been developed through a team of experts. The tools component, for example, is being developed with help from Wisconsin's new Coastal Management Fellow, Kathy Johnson, funded for two years through the National Oceanic and Atmospheric Administration and the Wisconsin Coastal Management Program.

Hart believes the quality of the map products will be outstanding because of partnerships with UW-Madison's Land Information and Computer Graphics Facility, Cartography Lab, Robinson Map Library and the Wisconsin State Cartographer's Office.

The catalog feature allows users to discover, evaluate and download coastal geospatial data. The learn component, when complete, will provide information about coastal issues and places, as well as place-based games for K-12 educators.

While the initial focus of the atlas is on identifying and mitigating coastal hazards, its open architecture allows for additional tools and components to be added over time. Hart anticipates the Wisconsin Atlas will serve as a template for other Great Lakes states, eventually resulting in an integrated network of sites throughout the region.

The overall project is also addressing six research questions that speak to the science needed to effectively build and link coastal Web atlases, such as how to develop effective archives for coastal geospatial data and how to resolve discrepancies in terminology between jurisdictions.

The groundwork for the Wisconsin Coastal Atlas has been evolving for the past 15 years, but it should be well worth the wait.

"I heard one research scientist say that he spent as much as 80 percent of his time on a project just trying to find the data he needed," said Kate Barrett of the Department of Natural Resources' Office of the Great Lakes, who expects to be a regular user of the atlas. "The Coastal Atlas is an efficient way to discover coastal data over the Internet and run your query." Barrett anticipates using the atlas to prepare regional maps, such as the distribution of existing and potentially restorable wetlands near Lake Michigan.

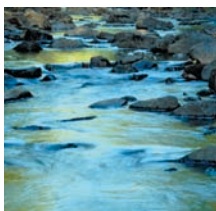
Visit the newly launched Wisconsin Coastal Atlas website at wiscoastalatlases.net.—CRB



University of Wisconsin Aquatic Sciences Center
1975 Willow Drive
Madison, WI 53706-1177

Aquatic Sciences Chronicle

a joint newsletter from UW Sea Grant and UW Water Resources



CALENDAR OF EVENTS

MARCH 3 – 4, 2011

**American Water Resources Association –
Wisconsin Section Meeting**

Appleton, Wis.

state.awra.org/wisconsin/2011meeting.html

MARCH 21 – 24, 2011

GeoTools 2011

Myrtle Beach, S.C.

geotools.csc.noaa.gov

JULY 17 – 21, 2011

Coastal Zone 2011

Chicago, Ill.

doi.gov/initiatives/cz.html

Former Sea Grant-Supported Students – Still Time to Take the Survey and Receive a Free Poster

For those who haven't responded yet to our request to fill out a survey on the progress of your careers, there is still time to do so before our federal Sea Grant program management review in April. Just send us the short written survey (only three questions) you received or fill out the online version instead (aqua.wisc.edu/feedback/2010). As a special thank-you for responding, you will receive a copy of our most popular historic poster, *Partie Occidentale Du Canada ou de la Nouvelle France* and be entered in a drawing for our award-winning "People of the Sturgeon" book.

Save Paper: Read the Aquatic Sciences Chronicle Online

Save paper by signing up for e-mail delivery of the "Aquatic Sciences Chronicle." E-mail chronicle@aqua.wisc.edu and request your subscription be electronic-only. Staff will send you a message each time a new issue is ready

