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Aquatic Sciences Chronicle

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

INSIDE:

3 REMEMBERING PHIL KEILLOR



4 HOISTING THE SAILS



4 STURGEON BOWL



Milwaukee's Growing Power

FISH AND PLANTS GROW UNDER THE SAME GREENHOUSE ROOF

Sprouts, spinach, and salad greens aren't the only things growing under the greenhouse glass at a place called Growing Power on Milwaukee's north side. Tilapia and yellow perch swim under the same roof as the tomatoes at this innovative nonprofit organization.

Growing Power is on the cutting edge of an urban agriculture movement. Will Allen, chief executive officer, founded the organization 16 years ago and is sharing his knowledge and enthusiasm with groups across the nation and the world.

"Everyone wants this system," said Allen. "People need food now and we can't wait years for it to happen."

Allen, who grew up on a farm in Maryland, started the Milwaukee operation by growing vegetable crops on his plot of land and in greenhouses in the city. He also raised tilapia, a fast-growing warmwater fish in three, 55-gallon drums. Over the years, Allen became interested in developing a system in which plants and fish could help support each other, reducing the need and costs for water, fertilizers, and chemical treatments.

At the nearby UW Great Lakes WATER Institute, Fred Binkowski became intrigued with Allen's aquaculture operation. Binkowski, Wisconsin Sea Grant's aquaculture outreach specialist, wondered if yellow perch could be raised in such a system. The first collaboration

continued on page 7 >>

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

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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. www.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. www.wri.wisc.edu



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We're pleased to announce that **Mary Stanosz** has joined the Aquatic Sciences Center as an administrative assistant. Stanosz takes over for **Patrick Sweeney** who, after 18 months at ASC, moved on to a new position more closely related to his area of expertise.

Wisconsin's Water Library (<http://aqua.wisc.edu/waterlibrary/>) won the 2008 Wisconsin Library Association Media and Technology Section's Webbies award in the "Most Accessible Web Site" category. Congratulations to the ASC staff who teamed up to create the site—Librarian **Anne Moser**, Web Developer **Tom Dellinger** and Art Director **Tina Yao**.

The Wisconsin Section of the American Water Resources Association (AWRA) recently presented its Distinguished Service Award to ASC Assistant Director for Research and Outreach **Jim Hurley**. The award is presented at the annual meeting to an individual who has made exceptional contributions to education in water resources, significant scientific contributions towards improving the water resources of Wisconsin, and dedicated service to the AWRA organization.



Remembering Phil Keillor

With deepest sorrow we note the passing of Phil Keillor, Wisconsin Sea Grant's coastal engineering specialist for nearly 30 years. Keillor died Feb. 27 of injuries sustained while ice skating with his daughter and granddaughter. He was 71.

During his three decades with Wisconsin Sea Grant, Keillor earned a national reputation for the technical assistance, guidance, and educational services he provided to coastal communities along Wisconsin's shores, throughout the Great Lakes, and beyond. Along the way, he deeply impressed colleagues and co-workers with his competence, his integrity, and his respect for everyone he encountered, on the job and off.

Keillor was the only coastal engineer in the Great Lakes states during his career, and one of very few such specialists in the country. If you struggled with any of the challenges that arise from living or working along the coast, Phil was ready to help. Over the years, his work protected coastal infrastructure from the onslaughts of howling winds, pounding waves, eroding sand and soil, and col-

lapsing bluffs. Yet he also helped protect many miles of natural Great Lakes shoreline from the relentless pressures of development. Phil warned swimmers about rip currents when few people realized they exist in the Great Lakes. He helped communities and government agencies wrestle with the technical and economic challenges of dredging harbors and cleaning up contaminated sediments.

But Phil brought far more than wide-ranging knowledge and competence to his work. As many city and county planners, other government officials, and home and business owners have attested, he approached every problem, every project, every phone call with remarkable thoughtfulness and care. His research was always thorough, his advice was always well-reasoned, his commitment unfailingly complete. To those who knew Phil professionally, it came as no surprise that he remained very active after his retirement in 2003, informing the Great Lakes community about climate change and serving on the board of the Great Lakes Observing System.

The reflections and reminiscences offered here are a modest tribute to an inspiring friend and colleague who left us too soon. —JK

"I worked with Phil on many Great Lakes issues. His positive influence on coastal communities is immeasurable. More than anything, I will miss Phil as a friend. I cannot think of a person who did not enjoy just being around him. He was thoughtful, kind, spiritual, humorous, and sometimes a little mischievous. He will always be remembered as a man of true integrity, professionalism, and kindness."
— *Anders Andren*, director, UW Sea Grant

"I worked with Phil for over 25 years. He was our primary source of information on shoreline erosion and protection measures, and he was critical in getting shoreline protection and preservation factored into land use decisions in the area. We were lucky to have him, and he will be missed."
— *Robert Biebel*, chief environmental engineer, Southeastern Wisconsin Regional Planning Commission

"Phil was a mentor for me for 20 years. He was a huge resource for information, and he always had a clear, thorough way of thinking. He helped you understand things, never made a decision for you. When you asked him about a problem, he'd look at you with that twinkle in his eye, and then out would come this guidance, this wise counsel, that would make perfect sense."
— *Gene Clark*, coastal engineering specialist, UW Sea Grant

"Personally, I think about what a principled man he was. He wanted to do things the right way for people. If Phil offered an opinion, it was well thought out. And he always wanted to be constructive. In my time here, I've really tried to emulate him."
— *Mike Friis*, director, Wisconsin Coastal Management Program

"I already miss Phil's thoughtful pauses and occasional mischievous grin. Phil taught me valuable lessons about public service, and I saw firsthand how much effort Phil put into every request for technical assistance he received. He was such a great role model for public service."
— *David Hart*, geographic information systems specialist, UW Sea Grant

"It was a true honor to present Phil with the William Q. Wick Award for Visionary Career Leadership through Programming on behalf of the Assembly of Sea Grant Extension Program Leaders in 2004. I remember Phil telling me before the banquet that he thought it was odd to give someone an award for simply doing their job. But the people he worked with thought he did so much more."
— *James Hurley*, assistant director for research and outreach, UW Sea Grant



"His positive influence on Great Lakes coastal communities is immeasurable. . . . He will always be remembered as a man of true integrity, professionalism, and kindness."

*Anders Andren, director
UW Sea Grant*



wisconsin's **waterlibrary**

Rain Gardens Reading List

April showers bring rain gardens! Plant a rain garden for your May flowers and prevent potentially polluted runoff from going down a storm sewer. Rain gardens capture runoff in a shallow depression planted with water-tolerant vegetation that absorbs and filters the water as it seeps into the ground. This recharges local groundwater supplies and helps protect the water quality of our lakes and streams. To learn how to start, check out the following titles from Wisconsin's Water Library.

RAIN GARDENS: MANAGING WATER SUSTAINABLY IN THE GARDEN AND DESIGNED LANDSCAPE

By Nigel Dunnett and Andy Clayden. Portland, Oregon: Timber Press, 2007. Rain gardens can be used to capture, channel, divert, and make the most of the rain and snow that fall on a property. Using the innovative and attractive approaches described here, it is possible to enhance outdoor spaces and minimize the damaging effects of drought, stormwater runoff, and other environmental challenges.

RAIN GARDENS: A HOW-TO MANUAL FOR HOMEOWNERS

By Roger Bannerman. Madison, Wisconsin: Wisconsin Dept. of Natural Resources, 2003. This manual provides homeowners and landscape professionals with the information needed to design and build rain gardens on residential lots or even roof runoff at commercial and institutional sites. However, they are not appropriate for parking lots, busy streets, and other heavily used paved areas.

RAIN GARDENS: A HOUSEHOLD WAY TO IMPROVE WATER QUALITY IN YOUR COMMUNITY

By Roger Bannerman. Madison, Wisconsin: Wisconsin Dept. of Natural Resources, 2002. This pamphlet is a shorter version of *A How-To Manual for Homeowners*.

DESIGN GUIDELINES FOR STORMWATER BIORETENTION FACILITIES

By Dustin Atchinson, Ken Potter, and Linda Severson. Madison, Wisconsin: UW Water Resources Institute, 2006. This publication provides guidelines and presents a numerical model that can be used for designing bioretention facilities to meet a specified objective, such as maintaining recharge volumes.

WATER GARDENS

By Susan Lang, T. Jeff Williams, and the editors of Sunset Books. Menlo Park, California: Sunset Books, 2004. From planning and designing a water feature to basic construction techniques and installing wiring and lights, this lushly photographed volume covers everything needed to create and maintain the inviting sights and sounds of water gardens.

THE BLUE THUMB GUIDE TO RAINGARDENS

By Rusty Schmidt and David Dods Dan Shaw. River Falls, Wisconsin: Waterdrop Innovations, 2007. Thoroughly researched and beautifully illustrated, this book is approachable for beginners, yet contains detailed information for landscape professionals.

THE RAIN GARDEN PLANNER

By Terry Wallace. Atglen, Pennsylvania: Schiffer Publishing Ltd., 2008. Rain gardens to suit any style or size of property are within anyone's reach with this clear and detailed guide to creating a beautiful and enjoyable home garden while preserving the natural environment.

Please visit the Water Library at

<http://aqua.wisc.edu/waterlibrary> for more information.

Anyone in Wisconsin can borrow these books. Just email askwater@aqua.wisc.edu



More than 100 Students Compete in Lake Sturgeon Bowl

After a day of intense competition, the Marshfield High School team (top photo) won the varsity division of the Seventh Annual Lake Sturgeon Bowl, Wisconsin's regional competition of the National Ocean Sciences Bowl, on February 21 at UW-Milwaukee. More than 100 students competed in teams from around the state.

The championship team won an all-expenses-paid trip to Washington, D.C., in April to attend the National Ocean Sciences Bowl competition, as well as several days of related field excursions in the Norfolk, Virginia, area.

Milwaukee's Inland Seas School of Expeditionary Learning took first place in the junior varsity division, winning the opportunity to be research assistants during a one-day scientific voyage on the UW-Milwaukee research vessel Neeskay. The team will collect data as part of a research project led by Carmen Aguilar and Russell Cuhel of the Great Lakes WATER Institute at UW-Milwaukee.

The UW Sea Grant Institute is one of the financial sponsors of the Lake Sturgeon Bowl.

photos: Alan Magayne-Roshak, UW-Milwaukee UITS Visual Imaging

Students Learn While Hoisting Sails

UW-Milwaukee's January 'Winterim' provided the opportunity for students to get their sea legs while becoming well grounded in the natural sciences. Seven students from UW-Milwaukee and UW-La Crosse earned three credits in geosciences sailing between Florida and the Bahamas aboard the Denis Sullivan, a recreation of a 19th century Great Lakes three-masted schooner.

The 15-day course, offered by UW-Milwaukee's study abroad program, is an introduction to oceanography and marine and nautical sciences. Wisconsin Sea Grant's education outreach coordinator, Jim Lubner, served as the faculty director for the excursion.

The program was enhanced through a partnership with the Harbor Branch Oceanographic Institute in Ft. Pierce, Fla., where the tour began and finished, and the Caribbean Marine Research Center on Lee Stocking Island in the Bahamas, the sailing destination. Staff scientists provided the students with a solid foundation in ocean sciences and field and laboratory methods.

While aboard the ship, the students acted as crew, steering by compass, plotting positions, hoisting sails, and setting anchor just as sailors had done on Great Lakes schooners in the 1800s. For their final projects, students made presentations on a variety of topics ranging from using the Gulf Stream as an alternative energy source to piracy in the Bahamas.

"It was really exciting to see the students get such a good grounding in the oceanographic and nautical sciences," said Lubner. "But we're always open to the teachable moments that come frequently in a program like this."



Students learn nautical science skills while aboard the Denis Sullivan.

Joe Ewing

Navigating Great Lakes Harbors on the Web

The Great Lakes Observing System (GLOS) HarborView pilot project features an integrated, Web-based viewer that provides data on nearshore currents, winds, waves, and prevailing weather for more than 200 Great Lakes harbors. The project is designed to enhance commercial and recreational navigation on the Great Lakes by bringing together overviews of current conditions, information on features of interest in the region, and real-time views of the harbors themselves. Based on the interest shown in these products, the project may expand to include other harbors within the Great Lakes region. GLOS is the only freshwater component of the U.S. Integrated Ocean Observing System, a nationwide federal initiative of NOAA.



Fred's Free Fish Fry

UW Sea Grant Aquaculture Specialist Fred Binkowski recently helped donate nearly 500 pounds of frozen yellow perch filets to the Hunger Task Force of Milwaukee's food bank, which gives free food to the hungry through a network of food pantries, soup kitchens, and homeless shelters. "This is the first time that Hunger Task Force has received a donation of fresh fish," said Director Sherrie Tussler. "To several of our network pantries serving specific cultures, this gift is truly valuable." Binkowski and his staff grew the fish from eggs to market size in the indoor aquaculture research center at the Great Lakes WATER Institute at UW-Milwaukee, where Binkowski studies faster, more cost-effective ways to raise the popular Wisconsin fish fry staple. photo: USFWS



Lubchenco Named to Head NOAA

President Barack Obama has named Oregon State University Professor Jane Lubchenco, one of the nation's most prominent marine biologists, to head the National Oceanic and Atmospheric Administration (NOAA). Lubchenco's area of expertise concerns the interactions between humans and the environment: biodiversity, climate change, sustainability science, ecosystem services, marine reserves, coastal marine ecosystems, and the state of the oceans and of the planet. Lubchenco also founded the Aldo Leopold Leadership Program, which aims to turn talented young scientists into effective communicators with the media and policymakers. Lubchenco is the first female administrator of NOAA (and U.S. under secretary of commerce for oceans and atmosphere).

photo: Jane Lubchenco



Milwaukee's Growing Power continued from page 1

involved setting up a 5,000-gallon tank with 800 market-size yellow perch to see if they could survive. After one year, the successful operation was consumed by all partners during a few Friday-night fish fries.

The current experiment involves raising about 10,000 yellow perch fingerlings and plants together in a uniquely designed three-story recirculation system. This system consists of an 8,000-gallon tank on the bottom for the fish, a middle layer that contains a gravel filtration bed and watercress, and a top layer (about eight feet above the fish) for vegetable plants.

The challenge of the recirculating system is detoxifying the fishy, ammonia-rich wastewater before pumping it up to the potted plants. The gravel middle layer allows bacteria to convert the ammonia to less-toxic nitrates, and watercress provides secondary filtration at this level.

The less-toxic water is then pumped to the upper deck, where salad greens are grown in pots filled with compost, worm castings, and coil, a wicking agent that can efficiently deliver nutrients to the greens.

The partnership between UW Sea Grant and Growing Power is also mutually beneficial. Along with the perch, Growing Power has gained Binkowski's university-based aquaculture expertise. Binkowski now spends about four hours a week at Growing Power, monitoring the fish and water quality.

"Universities haven't traditionally operated in low-income communities," Allen said. "The community is getting a tremendous amount of value from the experience Fred brings."

Binkowski sees urban aquaculture as a new initiative for Wisconsin Sea Grant.

"Aquaculture traditionally takes place in rural settings requiring ponds, wells, and raceways," he said. "Urban aquaculture can cut transportation costs, create jobs, and take advantage of abandoned warehouses that are cheaper to convert to food production than to condos."

Both men agree that urban aquaculture can grow and deliver seafood products right where consumers live. Growing Power already markets its fresh fish and vegetables to local farmers' markets and restaurants and through Community-Supported Agriculture shares.

"We are learning every day how to make this work. It takes a long time to get it right, but the community is ripe for this. We want to build systems to help farmers make a living," said Allen.

Allen was awarded a "Genius Grant" in 2008 by the John D. and Catherine T. MacArthur Foundation. The \$500,000 grant, allocated over five years, will allow Allen to boost his productivity and spread the word even faster. —CRB



Sea Grant Aquaculture Outreach Specialist Fred Binkowski (left), and Will Allen, CEO of Growing Power, are venturing into aquaponics, a combination of hydroponics and aquaculture by growing fish and plants in the same greenhouse facility in Milwaukee.

Remembering Phil Keillor continued from page 3

"During my 21 years with MN Sea Grant Phil and I did cooperative programming together on numerous occasions in both MN and Wisconsin. I will always remember Phil as the finest Coastal Engineer that I knew, as well as a true gentleman, and a friend. Sea Grant was very fortunate to have a Phil Keillor for so many years."

— Dale Baker, associate director, New York Sea Grant

"He gave one heck of a field trip. I remember going on a very interesting, very thorough tour of Wisconsin coastal sites with him years ago. He obviously knew the sites well, what was working and what wasn't. Phil was a true professional. He was passionate about professional coastal engineering."

— Spencer Rogers, coastal construction and erosion specialist, North Carolina Sea Grant

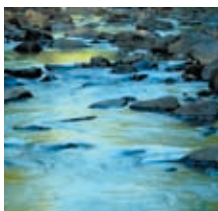
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a joint newsletter from UW Sea Grant and UW Water Resources



CALENDAR OF EVENTS

IAGLR'S 52ND ANNUAL CONFERENCE ON GREAT LAKES RESEARCH

MAY 18-22

Toledo, Ohio

<http://iaglr.org/conference>

GREAT LAKES SEA GRANT NETWORK CONFERENCE

JUNE 14-17

Alexandria Bay, New York

www.nyseagrant.org/glsnconf/glsnconf.htm

INTERNATIONAL SYMPOSIUM ON GENETIC BIOCONTROL OF INVASIVE FISH

JUNE 21-24

Minneapolis, Minnesota

www.seagrant.umn.edu/ais/biocontrol

JOINT MEETING: SOCIETY OF WETLAND SCIENTISTS, WISCONSIN WETLANDS ASSOCIATION, AND WETLAND BIOGEOCHEMISTRY SYMPOSIUM

JUNE 22-26

Madison, Wisconsin

www.sws.org/2009_meeting/index.mgi

VISIT THE ONLINE STORE

During his years with UW Sea Grant (and after), Phil Keillor authored or co-authored:

Coastal Processes Manual: How to Estimate the Conditions of Risk to Coastal Property from Extreme Lake Levels, Storms, and Erosion in the Great Lakes Basin

Living on the Coast: Protecting Investments in Shore Property on the Great Lakes

Stabilizing Coastal Slopes on the Great Lakes

Working with Engineers and Contractors on Shore Protection Projects

Deciding About Sediment Remediation: A Step-by-Step Guide to Making the Decisions

View any of these publications for free online at <http://aqua.wisc.edu/publications>

For additional information, please visit the coastal natural hazards web site at <http://www.seagrant.wisc.edu/coastalhazards>

