

# ASC

## Aquatic Sciences Chronicle

aqua.wisc.edu/chronicle

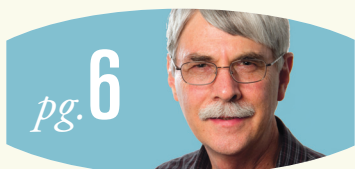
UNIVERSITY OF WISCONSIN SEA GRANT INSTITUTE UNIVERSITY OF WISCONSIN WATER RESOURCES INSTITUTE

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*A Little From a Lot*



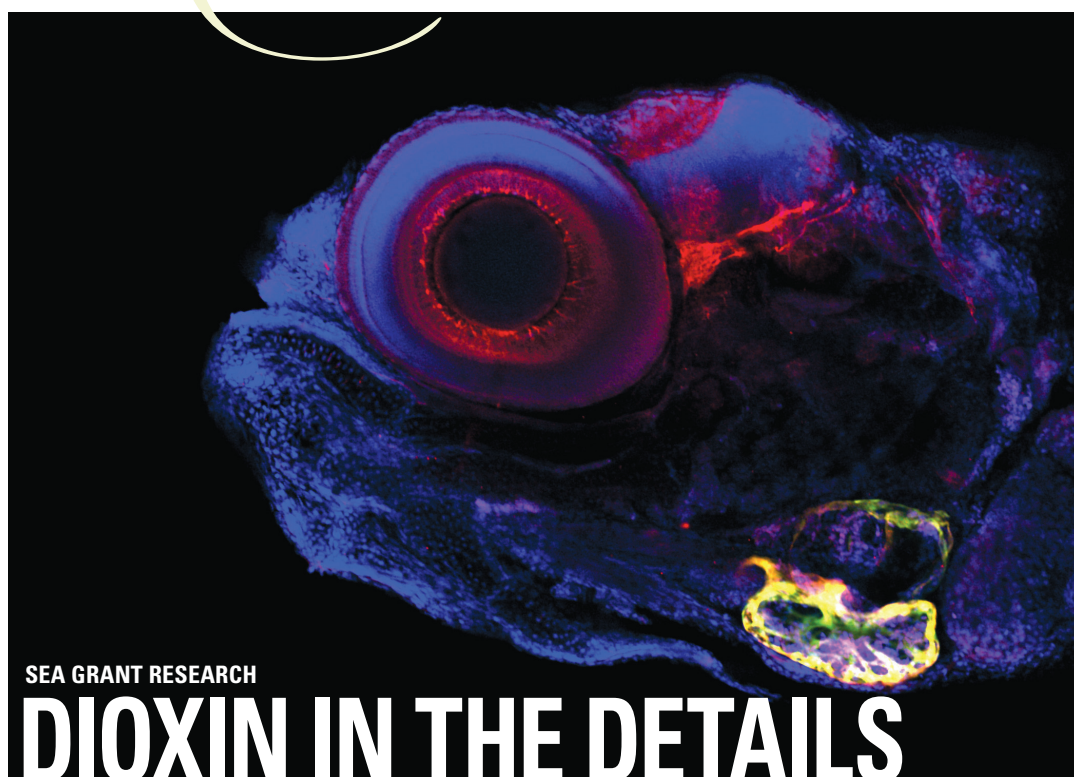
pg. 6

*We ♥ Gene Clark*



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*Coastal Storms Grant*



SEA GRANT RESEARCH

## DIOXIN IN THE DETAILS

This confocal microscope image of a four-day-old zebrafish shows the epicardium (in fluorescent green) typical of a normal zebrafish.

**U**nder the powerful eye of the confocal microscope, the evidence is incontrovertible. It's right there before our eyes—or, in other cases, not there—in a splash of bright fluorescent green.

That green is a colorful artificial protein that indicates the presence of cells that form the outer layer of the heart (also known as the epicardium) of the common zebrafish embryo. And as research by Warren Heideman and Richard Peterson, professors at the UW-Madison School of Pharmacy, is showing, that green glow is a genetic indicator that reveals whether the embryo has been exposed to 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), a deadly dioxin produced as a contaminant in herbicides and by burning plastics.

To get a sense of just how powerful TCDD is, know that it's found in Agent Orange.

Wisconsin Sea Grant is currently funding two Heideman and Peterson research projects that deal with dioxins and zebrafish. The first involves tracking the toxic responses in adult zebrafish that were exposed to sub-lethal TCDD doses as embryos. The second involves exploring TCDD's role in causing a deadly condition called blue-sac syndrome in fish.

*continued on page 8 >>*

## Aquatic Sciences Chronicle

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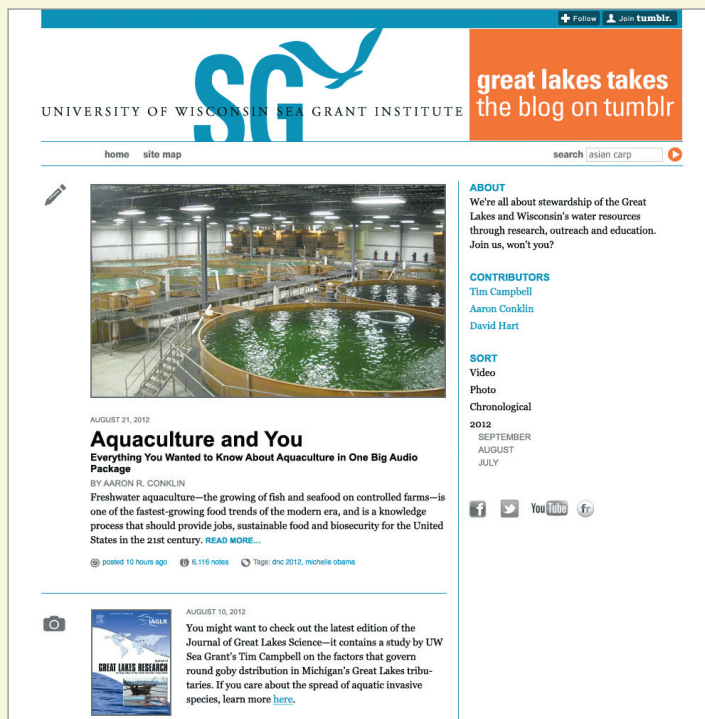


## FEATURED SOCIAL MEDIA + WEB

# Introducing Great Lakes Takes

[uwiscseagrant.tumblr.com](http://uwiscseagrant.tumblr.com)

By now, you're aware that UW Sea Grant's website, [seagrant.wisc.edu](http://seagrant.wisc.edu), is a repository of scientific information on key Great Lakes topics, from aquatic invasive species and aquaculture to coastal communities and climate change. But sometimes there's material that doesn't quite fit the hard news and science format of our home on the Web. That's why we've created Great Lakes Takes, a Tumblr blog designed to showcase the stuff that doesn't qualify as strict scientific research—photographs, impressions, news posts, etc., that shine a more casual and timely spotlight on our talented outreach specialists and showcase the activities our staff and funded researchers are tackling in the field. Whether it's a collection of five things you didn't know about a quagga mussel or a running blog that paints the scene of our efforts to educate anglers about preventing the spread of aquatic invasives, there's always something new and interesting. Surf over and check it out at [uwiscseagrant.tumblr.com](http://uwiscseagrant.tumblr.com). And if you're a regular Tumblr user, be sure to add it to the list of blogs you follow.



## Need a gift idea?

[seagrantwisc.edu](http://seagrantwisc.edu)

With the holidays right around the corner, here's a gift idea to honor the researcher, angler or water enthusiast in your life. Through the *Wisconsin Sea Grant and Water Resources Institute Fund*, you play a direct role in safeguarding and sustainably using Wisconsin's aquatic treasures. Support multidisciplinary research, education and outreach by making a tax-deductible gift.

Visit [seagrantwisc.edu](http://seagrantwisc.edu) and select the "make gift" button or contact Brian Hettiger at the University of Wisconsin Foundation at 608-265-5893. Your gift helps us maintain a link to research and resources for healthier Great Lakes, for all who work, live or play here.





Eric Booth/UW-Madison College of Engineering

## A LITTLE FROM A LOT

**S**troll through any standard-issue suburban subdivision and you'll likely key in on the familiar hallmarks: large homes with large driveways, lots of green space, a general lack of sidewalks. You probably won't see what Steven Loheide, a professor at the UW-Madison's College of Engineering, sees: how the design of these lots is affecting the area's water budget.

With the support of the Water Resources Institute, Loheide and a small team of UW-Madison students are trying to document how stormwater runoff and groundwater recharge are

could contribute to the development of parcel-scale strategies for controlling surface runoff and groundwater recharge in urban areas."

Variables like lot configuration, soil properties and local climate will all likely affect the data findings. Even so, Loheide thinks the results could be surprisingly counterintuitive.

"Everyone thinks that with urbanization, you increase stormwater runoff, and that's true," Loheide said. "But you also think that you decrease groundwater recharge. I'm not certain that has to be true in all cases."

**"The most interesting part of the project is learning how very small changes to the layout of a yard can have a large impact on the urban water balance."** JEFFREY MILLER, UW-MADISON STUDENT

affected by what property owners do (and don't do) on a lot scale. Loheide calls the project "urban ecohydrology."

Typically, hydrologists think of water budgets in terms of a lot's impervious area—more impervious area equals more stormwater runoff. Loheide's research is looking at something a little more small-picture: the connectivity of that impervious area. Things like whether the home's downspout connects directly to the storm sewer system, whether the sidewalk is immediately adjacent to the curb or whether there's a green-space separation. Even the slope of the driveway, and whether it encourages increased runoff matters.

Working with UW-Madison students Jeffrey Miller, Carolyn Voter and Sam Zipper, Loheide has installed moisture sensors in the lawns of several lots in both urban and suburban settings. The sensors are stationed in strategic areas—near a sidewalk, away from a downspout—to better outline the differences in moisture dynamics.

"The most interesting part of the project is learning how very small changes to the layout of a yard can have a large impact on the urban water balance," says Miller, a graduate student from Pittsburgh. "It would be exciting if our work

Depending on whether precipitation that falls on a roof is directed to pervious portions of the lot, the water may penetrate past the root zone, creating focused recharge.

"In a perfect world, you could design a lot where you have no stormwater runoff," Loheide said.

Loheide's team is still collecting and uploading data from the test sites. The next step is also the project's ultimate goal: developing archetype models that have all the real-world system characteristics of a typical home in a particular setting (high urban density, subdivision, etc.).

"Within that we can then experiment with different amounts of connectivity between downspouts, sidewalks and driveways," said Loheide. "We want to see how different arrangements would affect the water balance of that archetype lot."

Getting there is a complicated process that involves coupling models of surface runoff with subsurface moisture flow. When the mathematical formulas have been sorted out, Loheide's team will have both 2D and 3D models of water flow that could change the way developers and homeowners think about water budgets—by getting them to think about the hydrologic process in the first place. —ARC



## Jane Harrison: Social Scientist



Jane Harrison

Wisconsin Sea Grant Institute has hired its first-ever social scientist: Jane Harrison, joined the organization's outreach specialist staff in Milwaukee this October.

Harrison received her Ph.D. from Oregon State University, has spent much of her time in the Pacific Northwest studying and working with communities that have been forced to adapt over time to globalization and changes in supply and demand

for the forest products upon which

their economies have traditionally been based. She's fascinated by the ways in which communities use a concept called "social capital"—the social norms of behavior and relationships that facilitate collective action. She sees several parallels between the issues faced by the forest-based communities of Oregon and the water-based communities in Wisconsin.

"The crux of my research is really trying to understand how people solve problems," said Harrison. "Much of the research Sea Grant supports is really interested in changing behavior. The social side of that is so utterly important: How do social networks and norms influence natural resource decision-making?"

**"The crux of my research is really trying to understand how people solve problems."**

JANE HARRISON

Harrison put her own imprint on her career specialty, adding an emphasis on international studies and world economics, honing in on the push and pull between economic development and sustainable use of natural resources. Harrison gravitated toward sociology because, as she put it, "It does a better job of looking at the diversity of experience. We have to recognize how important interactions are between people. One of the key questions I think social science can help frame is 'Where are people coming from?' It's always in the back of my mind—how can we approach people where they are?"

Harrison is happy to be settled in Milwaukee, where she's quickly begun forging her own interactions, with Sea Grant staffers, researchers and stakeholders. "Sea Grant is poised to be a neutral advisor, providing scientific perspective on several really important issues. I'm hoping I can help as much as possible in consensus building."

You can follow Harrison on Twitter at @GreatLakesJane.

## The Great River

The Mississippi River Basin is the largest river system in North America, flowing 2,530 miles from northern Minnesota to the Gulf of Mexico. Its rich history dates back thousands of years. Many stories have been written about its importance as a route of trade and travel and as the backbone of many of North America's inland waterways. Check out some great tales about a great river.

### **MIGHTY MISS: A MISSISSIPPI RIVER EXPERIENCE**

By Gary Hoffman. Chanhassen, Minn.: Mighty Miss Press, 2009.

This story of a father-and-son canoe expedition on the mighty Mississippi River is filled with adventures and misadventures.

### **RISING TIDE: THE GREAT MISSISSIPPI FLOOD OF 1927 AND HOW IT CHANGED AMERICA**

By John M. Barry. New York: Simon & Schuster, 1997.

An American epic of science, politics, race, honor, high society and the Mississippi River, "Rising Tide" tells the riveting and nearly forgotten story of an enormous natural disaster.

### **THE FLOATING BOATHOUSES ON THE UPPER MISSISSIPPI RIVER: THEIR HISTORY, THEIR STORIES**

By Martha Greene Phillips. Alta, UT: Boathouse Books, 2009.

Full of color photographs, art and archival pictures, this book focuses on the 160-mile span of the river from Red Wing, Minn., to Prairie du Chien, Wis., where 600 boathouses remain "in twos, threes and strands."

### **THE MISSISSIPPI: A VISUAL BIOGRAPHY**

By Quinta Scott. Columbia: University of Missouri Press, 2010.

A photographic documentation of the Mississippi River, this book illustrates the geographical and botanical features of the river and its wetlands. Using 200 color photographs and accompanying vignettes, Scott explains how we have changed each site depicted, how we try to manage and restore it, and the wildlife that occupies it.

### **WICKED RIVER: THE MISSISSIPPI WHEN IT LAST RAN WILD**

By Lee Sandlin. New York: Pantheon Books, 2010.

A chronicle of the Mississippi River in the first half of the 19th century—before it was tamed by commerce and technology—draws on firsthand accounts to describe life along the river, natural and man-made disasters, acts of piracy and cultural celebrations.

If you wish to see more books on this topic, visit our recommended reading list at [aqua.wisc.edu/channel/31](http://aqua.wisc.edu/channel/31).

Anyone in Wisconsin can borrow these books. Just email [askwater@aqua.wisc.edu](mailto:askwater@aqua.wisc.edu).



# 2012 Carl J. Weston Memorial Scholarship Recipients

One is using a new way to process scientific data that could help keep beaches safe and clean. The other is helping to map the effects invasive zebra and quagga mussels are having on the food web in Green Bay.

Both Morgan Rose Schroeder and Kaitlyn Taylor are recipients of the 2012 Carl J. Weston Memorial Scholarship. The annual Weston Scholarship, established in 1995, awards \$750 to undergraduate students who are involved in a Wisconsin Sea Grant-supported project.

## MORGAN ROSE SCHROEDER

For the past year, Schroeder, a UW-Madison senior from Janesville, Wis., has been working closely with Sandra McClellan at the UW-Milwaukee School of Freshwater Sciences, using a specialized computer program called TRINE to process DNA sequence samples. It's a quick and efficient way to identify and isolate the most common bacteria found in the sands of Milwaukee-area beaches.

"These sequences tell us how much bacteria is in each sample," explained Schroeder. "Once we've identified them, we can use them as markers to compare to other data samples."

Schroeder is a math major with computer science skills who became interested in applying those skills to microbiology. She eventually hopes to pursue a master's degree in computational biology. Her ability to quickly process bioinformatics is already proving invaluable to McClellan's work.

## KAITLYN TAYLOR

Taylor, a UW-Madison junior from Madison, Wis., is focusing her studies on biological systems and environmental studies. She spent her summer in the field, assisting Bryan Althouse, a graduate student in UW-Madison Zoology Professor Jake Vander Zanden's lab.

Twice a week, Taylor and Althouse collected zooplankton and algae samples from the bay, key pieces in a plan to map the entire ecosystem through lab analysis. Given the massive changes the invasion of filter-feeding zebra and quagga mussels have wrought on the bay's food web and nutrient loading, Taylor's work takes on an added importance.

"Collecting these samples will allow us to do some multi-dimensional scaling, comparing the algae production through space and time," said Taylor. "We'll be able to tell which types of algae are being produced in abundance."

Mapping an ecosystem is no small task, and Vander Zanden is glad to have a Weston scholar on the job. "Kaity is bright and has lots of enthusiasm," said Vander Zanden. "We're delighted to be able to give her a chance to get hands-on research experience with freshwater ecosystems."

Taylor hopes to work in the natural sciences field one day, perhaps doing community outreach. In warmer weather, she's enjoyed the field work. "Being outside several times a week, in Green Bay and Door County, that was a pretty great work environment," said Taylor.



Morgan Rose Schroeder



Kaitlyn Taylor



In the first case, the dock was simply too large.

In the second, the design proposal was missing an important piece.

In the third, a natural disaster was involved.



# Gene Clark, Go-To-Guy





In each case, Gene Clark, coastal engineering outreach specialist for Wisconsin Sea Grant, used his expertise to prevent or solve major problems.

It's all in a day's work for the 58-year-old Clark, who works out of UW Sea Grant's Lake Superior Field Office in Superior, Wis. Clark is known as a go-to-guy by local city officials, homeowners and Wisconsin Department of Natural Resources (WDNR) officials who have questions about issues and projects that affect the coastline.

### THE CASE OF THE LARGE DOCK

Last fall, Mark and Bonnie Matuseski noticed that the 250-foot dock their former neighbor had installed on Madeline Island's Sunset Bay was changing the shoreline for the worse. The bay's wave and water patterns were being disrupted, and the shoreline was eroding at an alarming rate.

When attempts to resolve the matter privately proved unfruitful, the Matuseskis contacted the WDNR's John Spangberg, who turned to Clark for the advice he needed to resolve the issue. Clark's coastal engineering review of the situation stood the test of a top environmental law firm, a second coastal engineer and a professional hydrologist. The new property owners were ordered to extensively modify and shorten the dock.

The Matuseskis couldn't have been happier with the results—or with Clark's contributions.

"Mr. Clark addressed our problem with scientific method and astute observation skills," they wrote in a letter to Jim Hurley, UW Sea Grant's director. "Not only did he make his coastal engineering survey but also was a constant resource for us. In email, conversation and site visits he answered questions and taught us coastal processes. He was thorough, thoughtful and exemplary in his professionalism."



Although it is not known whether Gene Clark, Wisconsin Sea Grant's coastal engineering outreach specialist, can leap tall buildings in a single bound, it is clear that he is a hero to those troubled by mysterious coastal problems. Photos by Marie Zhuikov.

Clark. "I couldn't answer their question because the model didn't look at these conditions. I helped them understand that the modeling report was an expensive mistake."

### THE CASE OF THE NATURAL DISASTER

After a record-breaking spring rainfall hit Superior, Wis., WDNR and Douglas County officials asked Clark to put his Great Lakes coastal engineering prowess to work to help two homeowners on the St. Louis River. The combination of stormwater running off the land and a flooding river washed away large sections of the property owners' backyards. They were losing sleep worrying about their homes falling into the

Clark's landmark efforts are also changing how the WDNR approaches pier and dock permits throughout the state. Plans are in the works for a workgroup to rewrite the process.

As the Matuseskis state, "Sunset Bay is on the mend, thanks to Gene Clark and the Wisconsin Sea Grant Institute."

### THE CASE OF THE MISSING DESIGN PIECE

In the town of Sister Bay, local officials had been looking to add an amenity every other Door County harbor already offers—a public beach. The design model was in place and builders were ramping up to get started, but local WDNR representatives still had concerns about the size of the beach design and the possible risk of encroaching on and affecting Sister Bay's adjacent private yacht club and marina.

Enter Clark, who was quickly able to see that the coastal structures the design model needed to keep the beach from eroding weren't drawn to the same scale as what was originally proposed—they were too big.

"They asked me, 'Will these structures create hazardous waves that will affect the marina sedimentation?' " recalled

river and wanted advice on how to fix the erosion.

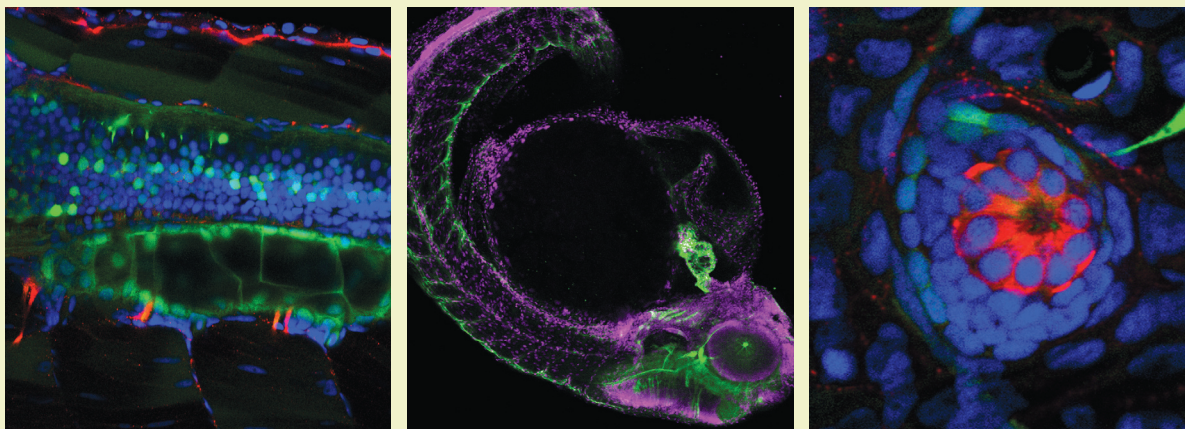
Clark toured the locations and discussed the situations with agency staff, who were then able to provide advice to the homeowners on restoring and stabilizing the banks in the most effective manner to save their homes.

"Gene is readily available and always willing to help," said Christine Ostern, Douglas County conservationist. "He has a wealth of knowledge and experience about coastal erosion issues specific to our area. He seems to always have time for educating local resource managers and decision-makers."

"We appreciated his help with the storm damage sites because those were complicated larger projects that we knew would require his expertise," Ostern said. "It's good to know we have such a great resource nearby."

House falling into the water? Have questions about beach design? Neighbor's dock got you down? If you're an agency representative, Gene Clark is your man. —ARC and MZ

**“We’re worried about the wiping out of populations. ...You don’t get recruitment of young fish, and suddenly the fish are gone.” —WARREN HEIDEMAN**



Jessica Plavicki/UW-Madison School of Pharmacy

On the left, a confocal image of a zebrafish spinal cord shows normal development. The middle image shows a zebrafish with a defect in the Sox9 gene and subsequent disrupted jaw and heart development. The image on the right is of a normal zebrafish neuromast (sensory organ).

#### SEA GRANT RESEARCH

## DIOXIN IN THE DETAILS

*continued from page 1*

“Blue-sac syndrome is an edema of the heart sac,” explained Heideman, who, with Peterson, has been studying zebrafish for more than 15 years. “It’s really a sign of heart failure. In larger fish species where you have larger embryos, the sac is bluish. What will happen is the fish will die—they won’t recover from this situation.”

An earlier UW Sea Grant-funded project discovered that zebrafish embryos have a small window of sensitivity to the presence of TCDD—between 48 hours after fertilization to six days afterward. After 30 days, the adult zebrafish no longer respond to the presence of the toxin at all. This matches the period in which the epicardium normally forms.

Enter Jessica Plavicki, a UW-Madison post-doctoral fellow with some serious imaging expertise. Plavicki, who once thought she’d pursue a career in art, has brought her artist’s eye—and her expertise with the high-resolution confocal microscope—to Heideman and Peterson’s lab. The results have been both scientifically fascinating and visually dramatic. By taking confocal images of zebrafish embryos that have and have not been exposed to TCDD, Plavicki is able to show clearly whether the epicardium is present or not, offering visual proof that there’s a direct connection between exposure and development.

Finding these markers of toxicity in zebrafish has multiple real-world applications.

Heideman and Peterson’s work with zebrafish has identified and isolated the single gene that’s a direct target for TCDD—a gene named Sox9

that is also found in humans. It’s far less common, but humans who have defects with the Sox9 gene have the same types of problems that the zebrafish embryos do: issues with the heart, spinal development and sex reversal. Also like the zebrafish, humans with Sox9 issues don’t survive long.

The technique could also be used to gauge TCDD’s effects in a species like lake trout, a fish that can’t be easily studied in the lab. Wildlife biologists could sample the range of sensitivity in other fish species in potentially dioxin-polluted environments—instead of tackling the impossible task of performing massive toxicology tests on every fish in the river.

“Our assumption is that at lower concentrations, the fish won’t be killed but will be hurt,” said Heideman. “At this point, we’re working on proving that.”

If sublethal doses of TCDD in the environment (researchers are thinking as low as parts per trillion) are affecting certain species’ ability to develop and reproduce, the impact to the food web could be severe.

“We’re worried about the wiping out of populations,” said Heideman. “Fish with reproductive incapacity don’t reproduce. You don’t get recruitment of young fish, and suddenly the fish are gone. We see this worldwide in a lot of populations. A lot of times it’s overfishing. But how do you know which is overfishing and which is chemical? We’re trying to get data for that.”—ARC





“...we’re looking to capture those new ideas.” JIM HURLEY

Photos left to right by William Karasov/UW-Madison, John Karl/UW Sea Grant Institute, Rich Dellinger/UW Sea Grant Institute and Jim Lubner/UW Sea Grant Institute (below).

## Enhancing Student Experiences

When Jim Hurley assumed the reins of Wisconsin Sea Grant earlier this year, one of his top priorities was to augment the experiences of the undergraduate and graduate students who work side-by-side with the program’s funded researchers.

That process begins now: Wisconsin Sea Grant has offered funding to accepted proposals from faculty members at UW campuses across the state to help create an internal program that will provide additional opportunities for Sea Grant-supported students.

“What I want to do is make the experience of being a student funded by Sea Grant more than just a funding source, a program that supports your research assistantship,” said Hurley. “I want students to be able to take advantage of all that Sea Grant has to offer.”

Depending on the proposals the program receives—the initial application deadline is mid-October—those opportunities could take the form of professional development, student groups that create a sense of shared community across departments and campuses or the chance to schedule distinguished lecturers or put on seminars of their own. Hurley also hopes to connect Sea Grant students

with the program’s team of outreach specialists and communicators and find a way to strengthen their connection with the program.

“I think we have so much to offer these students that can help them as they start their career after leaving us,” explained Hurley. “What I’d like to do is start to recognize them as either Sea Grant fellows or something similar to give them the feeling that they’re as much a part of the program as our administration, outreach and communication staffs as well as our faculty. I think that’s pretty important.”

Hurley noted that Wisconsin Sea Grant’s unique position as a federally funded program that supports applied research allows it to create mentorship and collaborative opportunities for its students, much as it already does with its faculty researchers. Building on that experience could bring the Sea Grant fellow experience to uncharted new levels.

“I’m convinced faculty members will come up with ideas we’ve never even thought of,” said Hurley. “By putting the call out like this, it says we’re looking to capture those new ideas.”—ARC





Vicky Harris, retired Wisconsin Sea Grant water quality and habitat restoration outreach specialist, received the John R. (Jack) Vallentyne Award and the Alumni Earth Caretaker Award this year.



Bob Rashid

## Sea Grant's Vicky Harris Honored

This spring saw accolades for Vicky Harris, retired water quality and habitat restoration outreach specialist with UW Sea Grant's UW-Green Bay office. Harris, whose career spanned 37 years, was honored by the International Association for Great Lakes Research (IAGLR) and by UW-Green Bay.

IAGLR awarded Harris the John R. (Jack) Vallentyne Award, their highest outreach honor, at their annual meeting in Cornwall, Ontario, in May. The award is given to a person or group who has contributed substantially to educating the public and informing policy makers about Great Lakes issues, leading to protection and restoration of great lakes of the world.

"I am honored and humbled," said Harris. "The award is especially meaningful because Jack Vallentyne and some of his contemporaries like Henry Regier, George Francis and John Magnuson had huge influences on me early in my career."

Vallentyne was a Canadian scientist who dedicated decades of work to education and outreach, often in the character of Johnny Biosphere.

This April, Harris was given the Alumni Earth Caretaker Award by UW-Green Bay's Environmental Management and Business Institute during its Green Innovations Conference. The award recognizes alumni who have had influential careers in sustainability and environmental fields. Harris earned degrees from UW-Green Bay in ecosystem analysis (1974) and environmental sciences (1998).

Although Harris is retired, she remains active with Sea Grant projects and the environmental scene. She is spearheading the Wisconsin Clean Marina program, a statewide effort to promote environmentally responsible boating and marina management practices.

## Groundwater and Aquaponics on Water Row

Around 350 Wisconsin State Fair visitors stopped by to learn about groundwater and aquaponics at the joint display of Wisconsin Sea Grant and the Water Resources Institute. The event was part of a "water row" of exhibits at the UW-Madison Day at the State Fair in August. Photos by John Karl and Moira Harrington / UW Sea Grant Institute.







## University of Wisconsin Sea Grant Lands Coastal Storms Grant

Massive storms like the one that pounded Superior, Wis., last June bring chaos and destruction to Great Lakes coastal communities. Using a three-year grant from the National Oceanic and Atmospheric Administration (NOAA) Coastal Storms Program, the University of Wisconsin Sea Grant Institute hopes to bring some order to fight that chaos—in the form of an outreach coordinator to integrate resources across NOAA to help communities better prepare for dangerous storms and recover from them after they hit.

“NOAA is looking for us to help them get the word out that they have these resources that help people in coastal communities improve their resilience to coastal storms,” said Phil Moy, UW Sea Grant’s assistant director for research.

Three Sea Grant programs are involved in the overall NOAA Coastal Storms grant. In addition to UW Sea Grant’s coastal storms outreach coordinator, Minnesota Sea Grant will hire a coastal storms specialist in its Minneapolis office, and Ohio Sea Grant will eventually administer a program of small grants related to coastal storms resiliency.

The new position will be based in UW Sea Grant’s Green Bay field office and will incorporate water quality and habitat restoration responsibilities. Moy anticipates filling the posi-

tion in early 2013 and expects it to continue beyond the duration of the grant.

David Hart, UW Sea Grant’s coastal communities outreach specialist, pointed to the coastal hazards resilience index that came out of a NOAA Coastal Storms Program project on the Gulf Coast as an example of the type of tool that the new outreach coordinator could adapt for local officials in the Great Lakes region.

“The bigger mission and picture is that it will help people use NOAA information to be better prepared for coastal storms,” Hart said. “In our case, I think there’ll be a strong flood inundation perspective, as well as stormwater management and developing green-based infrastructure.”

Coordinating with existing groups and resources will be key to the position’s success, said Hart. “We’ve got some good skills to build on in Wisconsin, but it’s really important to acknowledge that this won’t just be an effort in our state,” said Hart. “This is a real regional effort. We have a strong legacy in Wisconsin of promoting comprehensive planning, but we have a lot to learn about how to implement effective plans to promote resilience to coastal hazards.”



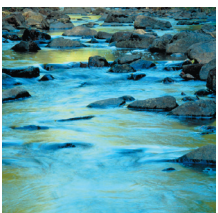




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# Aquatic Sciences Chronicle

a joint newsletter from UW Sea Grant and UW Water Resources



## CALENDAR OF EVENTS

**JAN. 30 – FEB. 1, 2013**

**International Marina and Boatyard Conference**  
Fort Lauderdale, Fla.  
[marinaassociation.org/imbc](http://marinaassociation.org/imbc)

**FEB. 1 – 2, 2013**

**Lake Sturgeon Bowl**  
Milwaukee  
[glwi.uwm.edu/sturgeonbowl](http://glwi.uwm.edu/sturgeonbowl)

**FEB. 12 – 14, 2013**

**Wisconsin Wetlands Association Wetland Science Conference**  
Sheboygan, Wis.  
[wisconsinwetlands.org](http://wisconsinwetlands.org)

**MARCH 7 – 8, 2013**

**American Water Resources Association –  
Wisconsin Section Meeting**  
Brookfield, Wis.  
[awra.org/state/wisconsin](http://awra.org/state/wisconsin)

**MARCH 25 – 27, 2013**

**American Water Resources Association Spring Specialty  
Conference –Agricultural Hydrology and Water Quality II**  
New Orleans, La.  
[awra.org/meetings/spring2013](http://awra.org/meetings/spring2013)

**APRIL 18 – 21, 2013**

**National Ocean Sciences Bowl**  
Milwaukee  
[nosb.org](http://nosb.org)



## “People of the Sturgeon,” AN AUDIO ADAPTATION

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