



*View of Clew Bay, County Mayo, Ireland. Image courtesy of Grace Hong.*

## Linking Lakes from the Bottom Up

*by Adam Hinterthuer*

This past October, limnologists, ecologists, computer scientists and engineers from 23 different countries convened in a hotel on Ireland's north-western shore to talk about the world's lakes. In the days that followed, attendees formed small working groups, openly shared their data and brainstormed new areas of research. It was the 14th meeting of the Global Lake Ecological Observatory Network (GLEON), a grass-roots organization made up of 350 members who share the common goal of building a network of lake ecology observatories and an atmosphere of scientific collaboration throughout the world's lakes.

GLEON has been a constant presence in the academic career of Cayelan Carey, a new post-

doctoral researcher at the CFL who also serves on the GLEON steering committee. In 2008, then an undergraduate student at Dartmouth, Carey found herself helping a lake association install a buoy in nearby Lake Sunapee. Years later, in Sweden, Carey again found herself helping a GLEON-affiliated research site install a buoy. And their efforts made sense, she says.

"In traditional limnology you go out into a lake and take measurements one day and if you want to do a cross-lake analysis, you have [other researchers] take the same measurements on their lake on the same day," she says "But [buoys] are always collecting data continuously."

However, buoys posed a different problem - at the first GLEON meeting in 2005, scientists were using Microsoft Excel spreadsheets that, at the time, Carey notes, "could only handle 60,000 rows of data, while their buoys were churning out millions of lines of data a year."

It takes a village to sift through so much information, and that's where GLEON comes in. "We need engineers to handle the buoys, we need tech people to handle the data structure, we need information managers to handle the data flow, we need limnologists and ecologists to process the data," she says "and we're doing this across 40 different countries and 50 different research sites all with different languages and geographic and cultural differences."

Paul Hanson, a research professor at the CFL, is currently co-chair of GLEON's steering committee. Hanson has been with GLEON since its inception in 2005. He says the organization not only promotes a new, more open, model of data sharing and global network-building, but it also

*(GLEON article continues on page 4)*



*Scientists and engineers from 23 different countries came together to talk about improving lake research. Image courtesy of Grace Hong.*

## Notes from the Director

by Stephen Carpenter

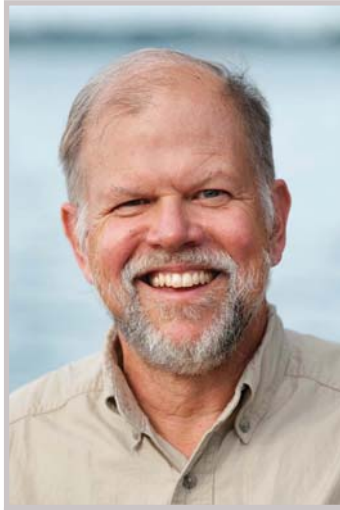
Ecologists and environmental scientists are well aware of climate change. Here at the CFL, our global interest became local during 2012 as the Midwest experienced severe drought. In the Madison area, the drought was the most notable in about 25 years. Northern Wisconsin, including the Trout Lake region, has been under drought conditions since about 2006.

Drought is good for water quality of lakes that are polluted by manure and eroded soil. Water clarity of the Madison-area lakes was above average this year. On the other hand, drought exposes shorelines and compacts sediments. It leaves near-shore habitat high and dry, depriving fishes and invertebrates of critical resources. Loss of habitat can be good or bad, depending on your point of view. Invasive rusty crayfish are harmed when cobble habitat is lost due to declining lake levels, according to research by Gretchen Hansen. On the other hand, research by Jereme Gaeta shows that valued populations of largemouth bass and yellow perch decline when woody habitat is stranded by falling lake levels.

Currently, Gretchen and Jereme are part of a CFL team that investigates the expansion of black bass and decline of walleye in northern Wisconsin lakes. As discussed elsewhere in this issue, the causes are multiple and complex, but likely involve drought as well as other factors.

Flooding, the opposite extreme from drought, degrades water quality in lakes that are afflicted by agricultural runoff. In the forested watersheds of northern Wisconsin lakes, wet years wash crucial ions and organic matter into lakes. Flooding raises lake levels and increases shoreline erosion, especially in lakes that are heavily used by high-speed motorboats. Flooding can inundate the Hasler Lab; many CFL alumni remember volunteering for flood control in the basement.

We expect variability in lake water budgets. Growing uncertainty, however, is something new. The present no longer resembles the past. Projected precipitation, evapotranspiration and runoff for the



*Stephen Carpenter,  
Director  
UW-Madison Center for  
Limnology. Photo courtesy  
of UW Communications*

next few decades are highly uncertain. The only thing we know for sure is to expect the unexpected. In the Madison area, Elizabeth Katt-Reinders and I are developing future scenarios for the Yahara watershed and Madison-area lakes to 2060. In our reports, we hope to capture the diversity of climate, land use, and lake management conditions that might occur.

Most people associate climate change with hotter temperatures, and temperature is more predictable than precipitation. John Magnuson's analyses of warming using lake ice records are well known. Higher temperatures also have bad and good implications for lakes. Sea lamprey in Lake Superior (which is heating rapidly) will kill more lake trout and other desired species as the lake warms, according to Jim Kitchell's bioenergetics model. On the

other hand, warmer temperatures are being created deliberately in Crystal Lake by CFL researchers led by Jake Vander Zanden, in an innovative attempt to limit the spread of invasive rainbow smelt.

Climate change, along with growing demand for food and fiber from expanding human needs, will place new and unpredictable stresses on freshwater resources. The problems are urgent and create many scientific puzzles. The Center's Global Lake Ecological Observatory Network (GLEON) inaugurated a cyber-enabled workshop for graduate students to address the challenges of climate change and other trends by integrating data from hundreds of lakes around the world. In Africa's Lake Tanganyika, Pete McIntyre and his students are exploring effects of climate change and fishing in an ancient lake. Closer to home, Emily Stanley and colleagues are comparing lakes across the Great Lakes region to determine effects of climate and land use change on ecosystem states.

CFL is deeply engaged in the science questions prompted by global change. We look forward to talking with you about it at scientific conferences, open houses at the Hasler Lab and Trout Lake, or through comments on our blog (<http://limnology.wisc.edu/blog/>).



## A Tale of Two Fishes: CFL Post Docs on the Case of Bass/Walleye Mystery

by Adam Hinterthuer

Below the surface of Wisconsin's northern lakes, a big mystery is brewing. Walleye populations are struggling, while black bass thrive. Over the last several years, the Wisconsin DNR has fielded complaints from fishermen and requests from regional fisheries managers to stock more walleye and lift size-based restrictions on the harvest of smallmouth and largemouth bass - the assumption being that bass are eating walleye and killing more bass would let walleye populations rebound.

But blaming bass for walleye declines doesn't exactly close the case, says Jereme Gaeta, a post-doctoral researcher at the Center for Limnology. For starters, Gaeta has done some recent work showing that 96% of bass caught in northern Wisconsin waters are released, making the suggestion that eliminating length limits would result in more bass harvest a dubious proposition.

Secondly, it's not yet even clear that bass are eating a ton of walleye. "Bass are generalists," eating anything from crayfish to frogs to fish Gaeta says. Of course they would eat any young walleye that swam into view, but "they're not going to specifically hunt walleye."

Gretchen Hansen, another CFL post-doc and researcher on the bass/walleye study, says to only focus on bass is to miss the bigger picture. "This is a broader issue of changing environmental conditions," she says. "Whether it's climate change related or temperature increases or lower water levels or water clarity changes, there are a lot of things going on that affect both species and affect the way they interact. If we can identify certain types of lakes where walleye continue to thrive in spite of the multitude of environmental changes, these might be areas on which to focus our limited resources."

While the Wisconsin DNR has already lifted minimum length limits for bass on 20 lakes and in two northern counties, it is also not satisfied with the bass predation explanation. Last year, the DNR began a research project involving its own scientists and fisheries managers, researchers from UW-Stevens Point and CFL faculty members, Steve Carpenter and Jake Vander Zanden, along with Gaeta and Hansen. With added funding from the U.S.

Geological Survey, the group hopes to get to the bottom of the murky walleye mystery.

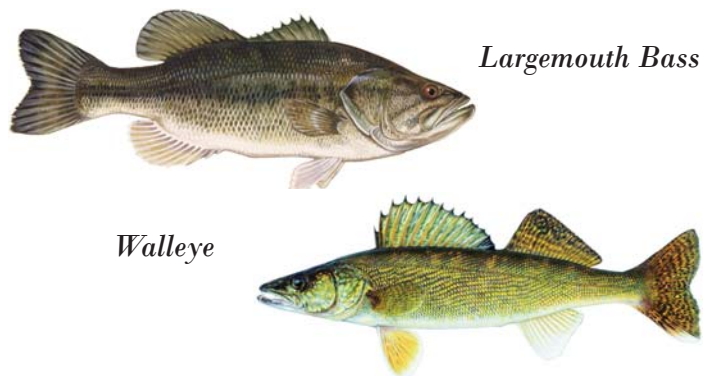
Gaeta explains "It's a unique project. It's really a state-wide project that goes from management to fieldwork to modeling. Phase one for me is testing the hypothesis that it's just bass eating walleye."

Using computer models to explore population dynamics and different scenarios where 'x' number of bass eat 'y' number of walleye, Gaeta will be able to use the data from the researchers in Stevens Point to say "Okay, here's two real lakes ... [Is] the hypothesis of bass eating walleye enough to do damage to the population at large?"

For her part, Hansen will look at the spatial extent of the bass/walleye phenomenon. Walleye declines and bass booms have been reported from Minnesota to Ontario. Hansen will focus on state and regional data, asking questions like "Do we actually see walleye declining everywhere, or do we see them declining in only certain types of lakes, for example shallow lakes with high water clarity?"

Over the last several years, she says, Wisconsin's northern lakes have endured extended drought, rising water temperatures, invasive species and increased water clarity, to name a few. All of these could be playing a role in the population dynamics of both bass and walleye.

Of course, even if black bass, habitat loss, or drought are causing the decline in walleye, that doesn't mean walleye will be restored by simply removing those stressors. "We might need to manage northern lakes in new ways to maintain walleye fisheries in a time of global change," says Carpenter.



*Largemouth Bass*

*Walleye*





## Help Limnology go “Viral!”

If you're not following the Center for Limnology online blog, you're missing out! Launched in January of this year, the blog offers weekly coverage of all things CFL. We follow our researchers as they track spawning pike, chemically alter experimental lakes, and apply paint to snail shells in one of Africa's giant rift lakes. We also chronicle faculty and student awards and explain lake processes like algae blooms and ice cover through posts, videos, podcasts and slideshows.

In just under a year, the CFL blog has had almost 15,000 page views and 10,000 different visitors from across the U.S. and countries as far-flung as Brazil, Norway, Australia and Japan.

For more, head to the blog at [www.limnology.wisc.edu/blog](http://www.limnology.wisc.edu/blog) – you can even subscribe in the upper right hand corner of the page and get an e-mail notification when we post new stories each week. You can also follow @WiscLimnology on Twitter, or “Like” the “UW Center for Limnology” on Facebook.

Follow along to see what we get up to in 2013!



Graduate student Alex Latzka and friend from “Limnology in Action: Taking Crayfish for a Walk” (blog post 7/24/12, 347 page hits)

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### *GLEON continued from page 1*

gives today's lake scientists a leg up in areas like publication of scholarly articles, software development to tackle floods of data and the all-important arena of fund-raising.

“There's almost no money for small projects anymore,” Hanson says. Funders prefer to leverage their money with larger organizations with lots of affiliates. But, says Hanson, “ecologists, and many scientists, have almost no training for writing grants that are interdisciplinary and reach across departments and disciplines. GLEON can help with that.”

While GLEON is helping current scientists build bridges and embrace globalization, it's also actively recruiting and training the next generation of lake scientists.

Another CFL post-doctoral researcher, Emily Kara Read, is heading up GLEON's new graduate student fellowship program. Next year, up to a dozen students from around the world will begin a year and a half program where they'll learn how to work as a team, collaborate on a research project and get trained on how to be thriving members in the world of “network science.”

As Carey puts it, “We are moving away from a model of a scientist working in a solitary kind of way within their own lab to [a place] where, if we really want to learn about lake dynamics, we have to ... collaborate.”

While we at the CFL are often proud of our ability to reach across disciplines to tackle tough question, it's hard to hold a candle to GLEON, where it's not unusual to find Chinese, Taiwanese and American limnologists sorting through their data with help from a Scottish computer scientist as they work together on a manuscript.

GLEON points to a brave new future of network science – one where limnology is going global.



## 2012: A Year of Open Houses and Outreach at the CFL

by Adam Hinterthuer

After the success of last year's first-ever public open house at Trout Lake Station, we decided to open the doors to both CFL labs in 2012. Once again, we can happily report that interest in Wisconsin waters is running high.

On the afternoon of June 22nd, about 125 people filed through Hasler Lab for hands-on introductions to macrophytes, fish, and plankton, as well as rides aboard the *Limnos*. On August 2nd, Trout Lake Station was absolutely swarmed by Northwoods visitors. By the end of the afternoon, 212 people had visited a dozen stations, ranging from research on rusty crayfish, to an update on the Crystal Mixing Project, to a look inside an instrumented buoy.

We ended our summer of outreach by joining other UW departments for "UW Day" at the Wisconsin State Fair on August 8th. All day long, a steady stream of interested citizens paused at our booth for hands-on demos of Secchi disks, Van Dorn bottles and Ekman dredges as well as to check out aquatic invertebrates under the microscope. The highlight of the day came when a mother rushed over to tell her daughter that the UW marching band and cheerleaders were about to parade by our tent. "Mom," the girl sighed exasperatedly, "I'm looking at a mayfly larva!"

Combined with Grandparents University, College for Kids and numerous talks to lake groups, classrooms and other interested members of the public, the CFL personally introduced a little of what we do to more than a thousand people this year.

You can see some of the highlights here. To see more, visit our blog at [www.limnology.wisc.edu/blog](http://www.limnology.wisc.edu/blog) and search for "Open House."



*Top image: Luke Winslow (grad student) demonstrates a Van Dorn bottle for some visitors to the Hasler Lab. Top left, Lindsey Sargent (grad student) talks about the rusty crayfish experiment during the Trout Lake Station open house. Middle left: John Magnuson hosts visitors aboard the *Limnos* for a "research cruise."*

*Middle right: A young limnologist is serious about her research. Bottom: Carly Broshat (undergraduate) and Jake Walsh (grad student) demonstrate use of the Secchi disc while at the State Fair.*





## Summers with the CFL on Africa's Great Lake

by Ellen Hamann, excerpted from her blog at [ellenatlarge-ejh.blogspot.com](http://ellenatlarge-ejh.blogspot.com)

A few years ago, there were two things I would have said with absolute certainty: One - I would never again live in the Midwest and, Two - Someday I would go back to Africa. I was only half right.

Since 2011, Wisconsin has become home, but as a researcher with the Lake Tanganyika Ecosystem Project, I now spend my summers in Tanzania. Along with Dr. Peter McIntyre and graduate student Ben (locally known as 'Benja') Kraemer, we abandon the comforts of life in America each June to spend the field season in, on, and around one of the most incredible ecosystems on this planet: Lake Tanganyika.

So... what's so special about this particular body of water? It's Africa's oldest and deepest rift lake, and the Big Question we're trying to answer is how such a nutrient-poor system can support such high benthic primary productivity and species diversity. To get at that, we do things like collect fish pee in plastic bags (to assess how fish regulate nutrient cycling); isotopically label snails and paint their shells with fingernail polish (to see whether maternal investment in producing young reflects the quality of the mother's diet); and play "water cowboys" by herding fish into gillnets and sampling muscle tissue (to determine food web structure).

This summer we expanded the scope of our research, joining forces with The Nature Conservancy and temporarily moving our base of operations to the



Ellen Hamann, Ben Kraemer, and Pete McIntyre prepare for a day of work. Photo courtesy of Ellen Hamann.

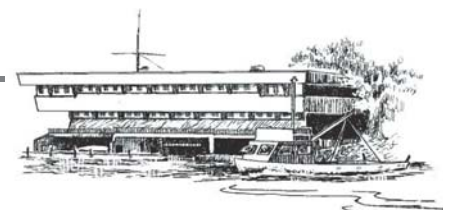
Mahale Mountains, one of Tanzania's most remote national parks. We were charged with developing a baseline for conditions in the nearshore waters both inside and outside Mahale. While daily encounters with hippos, chimpanzees, and water cobras became our New Normal, the most striking feature of the trip occurred under water. The size, diversity, and densities of the fish communities thriving inside the park were unlike anything we'd ever seen in the lake. But just outside park boundaries, the impacts of heavy fishing pressure and deforestation were immediately evident in the radically changed fish communities and heavy sedimentation.

Field seasons are...hard (no matter where you work), but Doing Science in the developing world poses a unique set of challenges. In addition to daily battles with equipment and weather, there's the added difficulty of attempting conversations in a language that you can barely speak intelligibly, re-appropriating technology to replace something you forgot to pack and can't buy locally, and trying not to get malaria or amoebas or any number of Scary Diseases you were supposedly inoculated against before leaving Madison. Some days you measure success by how many project goals you accomplished, but most of the time you're just giddy if you haven't gotten struck by lightning, soiled your wetsuit while diving, or sunk the boat.

It's never easy. But as I look back on this frustrating/soul-crushing/gratifying field season, I can't help but be grateful for the time I spent in what's become one of my Favorite Places On Earth. And I can't wait to go back.



Ben Kraemer slips a fish into a bag for an experiment on nutrient cycling. Photo courtesy of Ellen Hamann.



## Field Samples: Graduate Student Research

by Adam Hinterthuer

### John Crawford (Stanley Lab)

John Crawford is never quite sure where he's headed next. Not only does the first year PhD candidate split his time between Emily Stanley's lab at the CFL and his job as an ecologist for the U.S. Geological Survey, but, after a summer spent backpacking Alaska's back country collecting data, he still needs to conduct fieldwork in Vermont, Georgia, Rocky Mountain National Park and Puerto Rico over the next two years. John's research is part of the USGS Water, Energy and Biogeochemical Budgets Program. He's studying the role streams play in the global carbon cycle (the scope of their contributions might surprise you). "I really like the whole process of conceiving of a project and following it all the way through to submitting a manuscript," John says, which means he's in the right field! Originally from Oregon, John has fully embraced life in Wisconsin, taking up our non-downhill version of skiing as well as deer hunting. Regarding the deer, he's currently "at 3 and counting."



### Alison Mikulyuk – Vander Zanden Lab

Ali Mikulyuk also splits time between the CFL and a second job. A second-year graduate student in the Vander Zanden Lab, Ali is also a research scientist for the Wisconsin Department of Natural Resources. Ali studies aquatic macrophytes (plants), especially the invasive kind. Research in the Vander Zanden lab has found that, from a landscape perspective, the abundance and distribution of invasives aren't much different than native species. Yet a single lake can be overrun with something like Eurasian water milfoil while the lake next door is home to the plant but not the invasion. Ali hopes to learn why. "Management isn't as strategic as it could be," she says, "If you can identify really vulnerable lakes, you can allocate resources where it will make the greatest difference in preventing invasions." Like John, Ali is also "going native." In fact, she recently got her first hunting rifle, but is still debating what to hunt. "I'll probably take the easy way out and go for a squirrel," she says, "or a turkey."



### Zach Lawson – Carpenter Lab

Zach Lawson grew up in what he calls "Greater Wisconsin" which is "Wausau" to the rest of us. Zach got started with the CFL as an undergrad at UW-Madison, taking jobs up north on things like Sparkling Lake's crayfish removal, Little Rock Lake's coarse woody habitat survey and, finally, Crystal Lake's thermal mixing/smelt eradication experiment. After several years of basically living at Trout Lake Station and working on other people's PhD projects, Zach decided he should get his own degree. The first year master's candidate now finds himself in the Carpenter Lab with the unenviable task of trying to make sense of all the Crystal Mixing data. He's also excited to work on new material like the role walleye stocking might play in removing invasive smelt. "I love Crystal," he says, "but I've seen a lot of Crystal." When Zach's not doing research on a lake, he's probably out fishing on a different one. Zach's always out chasing his next big musky or his next big buck. For some reason, deer hunting seems to be a pre-requisite for CFL graduate study!



## Catching Up With Alumni

### Philip Cochran

(Ph.D. 1984, Kitchell) Phil Cochran has been Chair of the Biology Department at Saint Mary's University of Minnesota in Winona, Minnesota since 2004 and is now serving as Associate Dean of Sciences and Mathematics. Although he continues to do some research with lampreys, he is also working with timber rattlesnakes and the history of natural history and human interaction with selected species in the Midwest.

### Alumni:

Please let us know about address updates, job changes, and other noteworthy events!

limnology@mailplus.wisc.edu

608-262-3014

### Pieter Johnson

(Ph.D. 2006, Carpenter) Following a postdoctoral researcher position at the CFL with Jake Vander Zanden, Pieter accepted a position with the Ecology and Evolutionary Biology Department at the University of Colorado, Boulder, where he has enjoyed working since 2007. His lab, which has swelled to six graduate students and three postdocs, has focused increasingly on the community ecology of infectious disease, for which he recently received an NSF CAREER grant to pursue related questions in California wetlands over the next five years. When not advising his students, Pieter and his wife Stefanie are reveling in the discoveries of their first child, Katelyn, who was born on November 3rd, 2011.

### Darren Bade

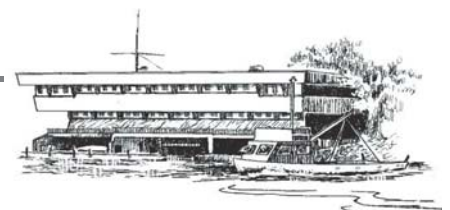
(Ph.D. 2004, Carpenter) Darren Bade is a faculty member at Kent State University in Kent, OH. His research since leaving the CFL has transitioned from focusing on carbon to nitrogen and phosphorus, and from small lakes to large. His most recent grant, from Ohio Sea Grant, will examine the role of nitrogen fixation by cyanobacteria in Lake Erie. He hopes to contribute to the debate on the role of nitrogen in controlling algal biomass and eutrophication. He has also been studying other aspects of the N cycle including nitrification and denitrification. Darren was also a co-PI on an NSF-IGERT (Integrative Graduate Education and Research Traineeship) grant that is now in its last year. This grant, training students in various aspects of using automated sensors in the environment, benefited from connections with the Global Lake Ecological Observatory Network and colleagues at the CFL. Darren continues to enjoy fishing, having recently purchased a lakefront home on one of the few natural lakes in Ohio, Sandy Lake.

### Kathy Cottingham

(Ph.D. 1996, Carpenter) Kathy Cottingham, Professor of Biological Sciences, has been at Dartmouth since 1998. She is currently very interested in the causes and consequences of cyanobacterial blooms in oligotrophic lakes, and wants to know more about the *Gloeotrichia echinulata* bloom in Trout Lake this summer. She has recently expanded her research program to include studies of arsenic exposure via both food and water in pregnant women and children, and lab members now joke about studying either P or pee.... Kathy is proud to report that she currently has two alumnae back at the "mother ship" in Madison - Cayelan Carey is a CFL post doc with Paul Hanson and Cristina Herren is a first-year graduate student with Tony Ives.

### Lars Rudstam

(M.Sc. 1983 Magnuson, PostDoc 1989-1992 Kitchell and Carpenter) Lars Rudstam, Professor in Fishery and Aquatic Sciences at Cornell University, recently completed a sabbatical term at his other alma mater, Stockholm University. He continues work on food web interactions, spatial ecology and analysis of long term data sets, primarily in Lake Ontario and Oneida Lake but also in other lakes around the globe including helping with a book on acoustics in Lake Baikal and a week on Lake Superior. He is now living both in Ithaca, New York, close to the Cornell campus, and at the Cornell Biological Field Station by Oneida Lake, for which he is the director. CFL was a great place to be a student and postdoc says Rudstam, after singing some songs with past CFLers at the recent American Fisheries Society meeting in Minneapolis.





## Why Give to the Center for Limnology?

*A Note from Our Director*

Your donations are crucial to the CFL mission. Gifts from supporters let us offer students personal, hands-on research experiences they are unlikely to get anywhere else and enable the CFL to undertake novel experiments that may change the way we think about and manage our lakes. For example, the Crystal Lake Mixing Project and Trout Lake Station's summer student fellowships wouldn't be possible without private gifts from individuals. Neither would this newsletter, our open houses, or other outreach activities. Gifts to the CFL allow us to plug gaps between our research grants and our declining state funding, enabling us to do things that are essential to our outreach and education. To really give a kid a quality research experience, we've got to have an endowment. And to have an endowment, we have to have friends like you. We here at the CFL are grateful for all of the support we've received over the years and we look forward to rewarding that support by producing important, world-class research right here in Wisconsin.

Sincerely,

Steve Carpenter



*Shoreline of Trout Lake in Wisconsin.*

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### To give to the Center for Limnology...

Friends may give online through our web site: [http://limnology.wisc.edu/Friends\\_and\\_Support.php](http://limnology.wisc.edu/Friends_and_Support.php), or mail this form along with a check payable to "University of Wisconsin Foundation" to:

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My Gift of \$ \_\_\_\_\_ to the Center for Limnology is enclosed.

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I wish to remain anonymous.

All contributions are tax deductible.



## New Faces and Transitions at CFL

We welcome the following new staff to the CFL, as well as new appointments for continuing staff:

Cayelan Carey, post doc (Hanson)  
Elizabeth Droessler, associate research specialist  
Jereme Gaeta, post doc (Vander Zanden)  
Gretchen Hansen, post doc (Carpenter)  
Carol Jenkins-Espinosa, financial specialist  
Jason Kurtzweil, associate research specialist  
Zachary Lawson, research assistant (Carpenter)  
Luke Loken, research assistant (Stanley)  
Tom Neeson, research associate (McIntyre)  
Samantha Oliver, research assistant (Stanley)  
Emily Kara Read, post doc (Hanson)  
Colin Smith, research assistant (Vander Zanden)  
Jon Viau, payroll & benefits specialist

**Stay in Touch!**

**Via our blog at**  
[limnology.wisc.edu/blog/](http://limnology.wisc.edu/blog/)

**or on Facebook**  
[www.facebook.com/Limnology](http://www.facebook.com/Limnology)

**or on Twitter: WiscLimnology**

## Recent Degrees and Transitions

**Tim Cline** (associate research specialist) is now a graduate student at the School of Aquatic and Fishery Sciences, University of Washington.

**Jereme Gaeta** (PhD, Carpenter), thesis *Identifying, quantifying, and mitigating direct and indirect anthropogenic effects on north temperate game fishes*, is a post doc on the Climate Change and Resilience of Sport Fisheries in Lakes Project, Steve Carpenter, lead PI.

**Gretchen Hansen** (PhD, Vander Zanden), thesis *A multi-faceted approach to understanding drivers and consequences of aquatic invasive species impacts*, is a post doc on the Climate Change and Resilience of Sport Fisheries in Lakes Project, Steve Carpenter, lead PI.

**Elizabeth Krznarich** (grad student, Library and Information Studies) is a project assistant as a web developer at CALS. She's also a trainer at Software Training for Students.

**Steve Powers** (PhD, Stanley), thesis *River nutrient uptake and transport across extremes in channel form and drainage characteristics*, is a post doc with the Environmental Change Initiative at the University of Notre Dame.

**Valerie Seidel** (payroll & benefits specialist) took a position as Administrative Assistant for the Village of Sherwood.

**Colleen Sylvester** (associate research specialist) works in Hayward, CA, at Aurora Algae.

**Limnology News** is published by the UW-Madison Center for Limnology for its alumni and friends, and is printed through gift funds administered by the UW Foundation. Comments on the newsletter and future articles are welcome. Editors: Adam Hinterthuer, Steve Carpenter, and Marilyn Larsen. Layout and mailing support by Denise Karns. Contact: Limnology News, Center for Limnology, 680 North Park Street, Madison WI 53706, USA. Phone 608-262-3014, Fax 608-265-2340, email [limnology@mailplus.wisc.edu](mailto:limnology@mailplus.wisc.edu) Website at [limnology.wisc.edu](http://limnology.wisc.edu)



## Awards

**Pam Fashingbauer, Dave Harring, Denise Karns and Mike Pecore** received **Discretionary Merit Compensation Awards** in recognition of their exceptional performance and support in the College of Letters & Science, Center for Limnology.

**Anna Grant Birge Memorial Scholarships** were awarded to Agronomy student **Sam Zipper**; Atmospheric and Oceanic Sciences students **Gosia Golub** and **Darren Pilcher**; Civil and Environmental Engineering students **Lucas Beversdorf, Ben Crary** and **Trevor Ghylin**; Limnology and Marine Science students **Bryan Althouse, Evan Childress, John Crawford** and **Luke Winslow**; and Zoology students **Kara Cromwell** and **Aaron Koning**.

Undergraduate **Lauren Hennelly** was the recipient of a **Chase-Noland Scholarship**. She was also the recipient of a **Wisconsin Hilldale Undergraduate/Faculty Research Fellowship** with Pete McIntyre as her faculty collaborator.

Undergraduate **Emily Hiltz** was awarded a **Holstrom Environmental Scholarship** with Jake Vander Zanden as her faculty collaborator.

**Jake Vander Zanden** was awarded a University of Wisconsin-Madison **2012 Distinguished Teaching Award**. Limnology and Marine Science student **Alison Mikulyuk** was awarded a **2012 Graduate Research Fellowship** through the National Science Foundation.

Zoology student **Aaron Koning** was awarded a summer scholarship from the **Dorothy Powers Grant and Eugene Lodewick Memorial Fund**.

**Susan Knight** was awarded the **2012 Robert and Carroll Heideman Award** for Public Service and Outreach from the University of Wisconsin-Madison.

**Jean B. and E.T. Juday Awards** were given to undergraduates **Emily Hiltz, Weston Matthews** and **Tom Thalhuber**.

**Jasmine Jolitz** was awarded a **John and Patricia Lane Summer Research Scholarship**.

The **Kenneth W. Malueg Limnology Scholarship** was awarded to Limnology and Marine Science student **Alex Latzka**.

Limnology and Marine Science student **John Crawford** was the recipient of a **Charlotte Stein Student Travel Award**.

## In Memory - Frank Eustice

by *David Balsiger*

Frank Eustice, former mechanic at the Center for Limnology, passed away in December 2011. He was 99 years old.

Prior to his employment at the Limnology lab, Frank owned and operated a tool and die shop in La Crosse for many years. Frank had a remarkable ability for making things, fixing things and keeping things running. His tenure in the boat slip was the time of Navy surplus Jeeps, the bathysphere, the original fish shocking barge, as well as the arrival and initial outfitting of the Limnos. He drove an old Cadillac Sedan de Ville which he kept running like a dream. Frank was full of life and humor and was a good friend to graduate students and faculty. He was a skater, going to the rink for roller-skating every Monday night for years, and impressing us occasionally with his technical figures on a patch of ice cleared in front of the lab. Frank wasn't a fisherman, but he enjoyed being in the woods in the guise of bow hunting for deer. He modified an old beer truck into a camper for these outings. Frank retired from his Lake Lab position in 1974. After his retirement, he spent many summers traveling with a carnival, maintaining the several carnival rides owned by his daughter. Frank was one-of-a-kind and is remembered fondly by those who knew him.



*Frank Eustice, age 98. Photo courtesy of David Balsiger.*





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# Limnology News

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Center for Limnology

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