Limnology News
Center for Limnology
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COLLEGE OF LETTERS & SCIENCE

This Lake's Got the Blues

by Adam Hinterthuer and Ali Branscombe

On a cloudless summer afternoon, Ryan Batt rows a boat out into the middle of Ward Lake, dips a bucket into the water and pulls up a quarter-gallon of what looks like bright blue Gatorade.

At the surface, Ward Lake is like any small bog - tall trees and sedges reflect in its dark surface, beaver-gnawed branches jut out at odd angles from shallow water near shore. Nothing seems too remarkable. But inside the white gallon bucket, the water sparkles like a sapphire.

Ryan Batt & Megan Tomamichel on Ward Lake. Photo: Ali Branscombe

If you have ever seen a golf course pond, you've probably witnessed the effects of adding Aquashade to the water. It is a concentrated liquid formula that is similar to blue food coloring. People use it in lakes and ponds to block light rays from penetrating deep into the water, reducing photosynthesis and prohibiting algae from growing, which is exactly what Batt, a UW-Madison graduate student (Carpenter), did to this small body of water located just over the Wisconsin border in Michigan's upper peninsula.

What Batt learns from this little lake may contribute to a growing scientific discussion. It's been thought that freshwater bodies in the Northern hemisphere are growing darker, Batt says. "There are a lot of ideas about why that's the case, from acid rain to melting permafrost in the Arctic but, either way, water's getting darker. We wanted to know how that affects the food web."

The zooplankton in Ward Lake are heavy grazers of bottom-growing, or benthic, algae. That zooplankton is then eaten, passing energy up to higher trophic levels. Batt's whole-lake experiment was designed to monitor how the animals of Ward Lake reacted in the absence of the base of their food web. Specifically, could fish and zooplankton use terrestrial sources of food, things like dissolved organic carbon, leaf litter and even unfortunate insects carried into the lake, to supplement their diets when algal production went south?

Lake water with Aquashade. Photo: Ali Branscombe

Batt says the Aquashade successfully limited light penetration in the lake and took the benthic algae away as a food source. Since every morsel consumed by the fish and zooplankton of Ward Lake has a distinct elemental chemistry, or isotopic signature, Batt and his team were able to use specific isotopes as tracers moving through the food web, which told them what animals were eating and where that food originated.

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Notes from the Director

by Stephen Carpenter

Professional trajectories of many scientists were strongly influenced by their undergraduate experiences with research. For me, a summer spent mapping trees in Glacier National Park opened the door to ecology as a career. That encounter with hands-on science led to another research project on aquatic plants in a stream in Massachusetts, which launched a lifetime of work on freshwater ecosystems. Most of the professional scientists I know tell similar stories about the early days of their careers.

Stephen Carpenter, Director

Undergraduate research is vital to CFL and provides life-changing experiences for 40 to 50 U.W.-Madison undergraduates each year (see box next page for highlights). Undergraduates work on field crews, measuring everything from physics to fish. Often their summer experiences lead to faculty-directed research projects or undergraduate honors theses in the following academic year. Sometimes undergraduate projects are published in scientific journals. These projects are supported by research grants and gift funds; none are supported by instructional funds.

Many of our students are interested in science communication. The CFL blog (limnology.wisc.edu/blog) provides an opportunity for undergraduate science writers to sharpen their skills with coaching from expert journalist Adam Hinterthuer. This year, Emily Hilts wrote a popular series on "Muckraking Mendota" (limnology.wisc.edu/thelifeaquatic/). Meanwhile Aisha Liebenow covered the northern lakes (limnology.wisc.edu/blog/northwoods/).

Fellowships supported by gifts provide the most prized opportunities for undergraduate research. CFL is fortunate to have Chase-Noland, Jean and Tug Juday, and Jack and Patricia Lane summer fellowships supported by generous donors. These fellowships provide the recipients with flexibility to follow their curiosity under the mentorship of a faculty member.

Most of our undergraduate researchers are based in northern Wisconsin and participate in the weekly research seminar at Trout Lake Station. Evening courses at TLS on graphing data, basic statistics, how to give a scientific presentation, applying to graduate school, and other topics are popular. These 2- to 3-hour courses are taught by graduate students and staff as volunteers.

As undergraduate research at CFL has grown, our system for recruiting and mentoring the students has changed. Recruitment and organization of undergraduates for the coming field season occupy a significant amount of time for staff, faculty and graduate students each spring semester. All faculty, and most graduate students and postdocs, are now mentoring undergraduate researchers. A top priority now is to seek gift funds for a graduate student position to coordinate undergraduate researchers at Trout Lake Station during the summer months.

While CFL is known internationally for research, few outsiders realize that undergraduates make key contributions. These students receive excellent preparation in science. Perhaps more importantly, they have memorable experiences that inspire their careers. Your gift to the CFL endowment helps sustain these opportunities for Wisconsin undergraduates.

Undergraduate Research Sampler

Cal Buelo (Carpenter) spends his summers in northern Wisconsin on a NSF-funded study of early warning signals of changes in food webs. A double major in Biology and Math, Cal's undergraduate research investigates whether fish management actions suppress early warning signals and thereby leave fished stocks vulnerable to unexpected changes.

Nick Gubbins (Stanley), a Biochemistry major, investigates methane production in northern Wisconsin streams. Nick was involved in an intensive field campaign during summer to measure formation of methane bubbles, and now is studying the organic molecules that may serve as fuel for this gas production using elemental analyses and nuclear magnetic resonance spectroscopy.

Lauren Hennelly (McIntyre) studies one of the great puzzles of evolutionary biology: the history of form and function of the vertebrate eye. Her work uses the latest vertebrate evolutionary tree to understand the linkages between the ecology of over 150 vertebrate species and the structure of their eyeballs.

Emily Hilts (Vander Zanden) spent two summers at Trout Lake Station conducting field surveys of aquatic invasive species. In addition, she conducted her own independent research on the role of fish predation and habitat type in suppressing populations in invasive rusty crayfish.

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The most surprising finding, he says, was the reaction of zooplankton. Research has shown that zooplankton in lakes that rely on terrestrial sources of food will happily switch over to eating algae if it begins to become abundant. But, Batt says, the reverse is not true. Algae-eating zooplankton aren't able to make the switch.

When it came to terrestrial food resources, Batt says, Ward Lake's zooplankton "wouldn't touch the stuff" and their populations plummeted. "We know that zooplankton in lakes no more than a kilometer away get half their food from terrestrial sources," Batt says. "What I saw in the food web of Ward was truly surprising."

When ecosystems undergo major change, there are always "winners" and "losers." Some species of invertebrates and fish can switch seamlessly to alternate food sources. But, for others, it spells real trouble, which is especially problematic when the "losers" are the zooplankton that sustain the diets of numerous other species.

His research shows, says Batt, that better understanding of the terrestrial-aquatic connection is needed. Consider a bass that has eaten some terrestrial animal, like a shrew, Batt says. "We already knew that if a shrew was in your bass, then you can't manage the fish and forget about the forest. Now we know that, even if you don't see a shrew in your bass today, you still can't forget about the forest. Tomorrow that shrew might be all that bass has got."

Adam Hinterthuer is the Outreach and Media Specialist for the Center for Limnology; Ali Branscombe is an undergraduate student researcher.

Fish Migration is a Hot Topic for McIntyre Students

by Adam Hinterthuer

We marvel at the distances birds fly to get from winter habitat to northern breeding grounds. But not many people know that below the murkier surface of the world's inland waterways similar stories unfold.

Undergraduate technician Joe Brooks (center) and graduate student Dan Oele capture an adult pike heading back to Green Bay after spawning. Photo: A. Hinterthuer

Research directed by Peter McIntyre here at the CFL is at the forefront of understanding freshwater fish migrations. Pete and his students are working to track fish that travel thousands of miles each year, understand when and why fish move these long distances, identify barriers to their successful spawning and help fisheries managers better conserve threatened species.

Brenda Pracheil, a recent post doc in the lab, has explored the large-scale movements of fish species in the Mississippi Basin and made the case for "swimways," similar to the federally established "flyways" for migratory birds. Currently, fish are managed on a state-by-state basis. Some species listed as "threatened" on one side of a river, might be commercially harvested by the state on the opposite bank. In other research, Brenda highlighted the importance of big-river tributaries, like the Wisconsin River, in providing crucial habitat for fish like paddlefish, catfish and gar.

Working on the other side of the state, Dan Oele, a recent CFL grad student and Solomon David, currently a post doc working at Chicago's Shedd Aquarium, are piecing together the story of northern pike in Green Bay. Pike head inland to spawn and then out to the bay for their adult years.

Dan's work has helped establish that pike don't return to their "natal" waters like salmon, but that they do need access to quality spawning grounds to thrive. Solomon is currently tracking the success of young pike as they head downstream toward their adult lives in the bay. Both are important research topics that can help state agencies and conservation groups protect and grow the fishery.

Also on the Lake Michigan side of the state, Evan Childress is exploring the annual migration of the white sucker. Suckers may be "trash fish" to fishermen, but Evan is showing that, each spring, the massive sucker spawning runs bring crucial nutrients to upstream ecosystems.

Even small road culverts like this can prove to be impassable to many migrating fish species. Photo: Stephanie Januchowski-Hartley

Meanwhile, halfway across the globe, Aaron Koning is mapping out the movements of catfish in the Mekong River delta as he works to understand how current and proposed dams impact populations of fish that serve as a major source of protein for millions of people.

And, back in the lab, post doctoral researchers Stephanie Januchowski-Hartley, Tom Neeson and Margaret Guyette are busy making maps of the kinds of barriers fish face in their migrations. From giant hydroelectric dams to tiny road culverts, the team has mapped every single barrier in the Great Lakes Basin. They hope their efforts will allow fisheries managers to focus on high-reward areas and realize that simply removing a dam won't do much good if a dozen road culverts still prevent fish from getting to upstream spawning grounds.

Someday, perhaps, fish migrations will be common knowledge. People will talk when and where certain species head out on their long journeys. And, if that day comes, we'll have a lot of tireless and talented CFL students to thank.

Standing Room Only...for Science?

by Tim Kratz, Associate Director, Trout Lake Station

This past February, two hundred people braved a snowy winter evening and crammed into the upstairs lounge of the Minocqua Brewing Company. They weren't there for a band. They weren't there for a football game. They were there for science. Improbable? Yes. Especially since it was our very first production of our science café series, "Science on Tap Minocqua" (SOTM). Still, two hundred people turned out to discuss long-term change in Northwoods ecosystems. Since the first program, Science on Tap has offered area residents a relaxed, informal opportunity to talk about a range of topics: from the local effects of climate change, to the natural history of loons, to the future of Wisconsin fishing.

For years I've tried to find ways to engage the public in conversations about the research we do at Trout Lake Station and how our results help inform the often contentious debates about local, statewide or even national environmental issues. My wife and I were talking about ways to do just that on a trip last winter when we stopped at the local microbrewery in Ashland, Wisconsin, for lunch. After a trip to the restroom, my wife returned to the table and said she'd seen a flyer taped to the back of the stall advertising something called "Science on Tap." Curious, I excused myself for a trip to the Men's room and, sure enough, right above the urinal was the flyer announcing a monthly science discussion sponsored by a local citizens' group. My wife and I thought that was something we could do in Minocqua, a small town close to Trout Lake. I approached the owners of the Minocqua Brewing Company and they asked me a few questions, including what the expected attendance might be. I thought back to a few of the public lectures the Station had given in the past and said that we might attract 25 people. They could handle that size audience and we soon had an agreement to give it a try.

Agreement in hand, I reached out to Tom Steele, superintendent of the UW's Kemp Natural Resources Station, to see if he wanted to partner in the event. Tom was enthusiastic and he wasn't the only one. He had been having discussions with Mary Taylor, the local librarian, and Hank Roessel and Gary Simmons, leaders of the local chapter of the alumni association, about starting a speaker series. Before we knew it, Tom and I were standing in front of that February throng, talking about long-term change in the Northwoods and marveling at the turnout. Who could've expected such interest and engagement?

Minocqua Brewing Company is filled to capacity. Photo: Carol Warden

Since then, several CFL folks, including John Magnuson, Steve Carpenter, Gretchen Hansen, Ben Beardmore, Alex Latzka, and myself have presented, as well as other UW and Wisconsin DNR researchers. In September, the second season of SOTM got off to a great start and we look forward to continuing to engage the community in our science.

For more information check out our website at http://scienceontapminocqua.org. If you can't make it to Minocqua, don't worry! Our events are streamed live on the Internet and past events are available on our site. But, if you are in town on the first Wednesday of the month, I look forward to sharing a beer and discussion with you!

Gazing into Crystal Lake to Discern the Future of Invasive Species

by Adam Hinterthuer

As temperatures plummet and Crystal Lake settles in for a long northern Wisconsin winter, Center for Limnology researchers tackle the cold, soggy task of pulling their equipment out of the water for a second offseason. They'll tow the large, rubber-membrane-covered steel frames to shore, make any needed repairs and put them in storage. Then they'll tackle what promises to be a more daunting task.

"We're still putting the pieces together from the data we have," says Zach Lawson, a graduate student working with Steve Carpenter. "We'll sit down this winter and try to figure out what, exactly, happened."

Their hope was that a whole lot of rainbow smelt died this summer. The voracious invasive fish has caused the collapse of native fish populations in Crystal Lake. For the past two field seasons, the Crystal Lake Mixing Crew has kept the lake from stratifying using "gradual entrainment lake inverters," or GELIs.

GELIs resemble large trampolines. They're attached to air hoses that run through an automated buoy that controls which GELI gets air and when. All day, every day, the GELIs rise and fall through the water at the center of Crystal Lake. They bring heat down from the surface and prevent a cold, bottom layer of water from forming. The result is a lake that's warm from its sparkling surface to its silty bottom.

By keeping Crystal Lake a warm, uniform temperature, CFL and Wisconsin Department of Natural Resources scientists hoped to stress the fish beyond survival, allowing warm-water native fish to stage a comeback.

From what scientists know about the native range of smelt, the fish need a cold-water habitat. Jereme Gaeta, a CFL post doctoral researcher who has long worked on the Crystal Mix project, says that previous work indicated that smelt begin to get stressed when water temperature reaches 12 degrees Celsius and, by 18 Celsius, they begin to die - their metabolism so high that they can't eat enough calories to keep up. Lab studies, Gaeta says, indicated that smelt would survive for less than seven hours at 21 degrees Celsius.

These are temperatures the project has approached and even exceeded, Lawson says. However a mild summer this year lessened the effect.

The voracious and invasive rainbow smelt may prove to be more resilient than scientists had hoped. Photo: A. Hinterthuer

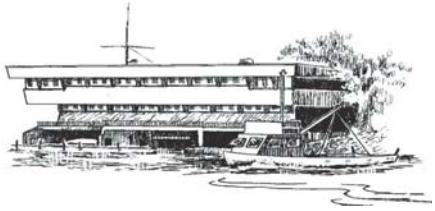
"Last year we were at 21.8 degrees Celsius for a month," he says. "This year we didn't even reach 21, and our highest temperature was only sustained for one day. That's a drastic difference in the amount of stress smelt were under."

Despite the lower temperatures, early results indicate that at least 70% of the adult smelt died this year. That after the population suffered nearly 90% mortality last season. It's clear that the Crystal Mixing Project is dramatically reducing smelt populations, but it looks as if it won't be enough to completely remove the invader from the lake.

"Smelt are a resilient and tenacious invader," says CFL director, Steve Carpenter. "Evidently the Crystal Lake population included many individuals that are tolerant of warm water, which is fascinating basic science, but unfortunate for managing smelt invasions."

Or, as Gaeta puts it, "It appears as though we need to re-evaluate what we think we know about the thermal limits of fishes."

While Lawson and his colleagues process samples and crunch numbers this winter, they'll be adding important information to what's known about rainbow smelt in real-world situations. But they'll also be hoping that, come next spring, we'll all be talking about a smelt die-off that no one saw coming.



Field Samples: Trainee Research

by Adam Hinterthuer

Alex Latzka (Vander Zanden)

Alex Latzka studies bioeconomics, or the place where human endeavor meets ecological impact. The fourth-year PhD candidate is currently "trying to understand how different aquatic invasive species are able to invade lakes, reach high abundances, and potentially have negative impacts." Answering those questions, he says, would help focus limited resources on specific lakes, like those likely to be invaded or more apt to experience negative impacts. "We've got 15,000 lakes in Wisconsin," Latzka says. "If you're a manager charged with reducing the impacts of invasive species, that's a pretty big assignment."

Alex is from Massachusetts and did his undergraduate work at Cornell but, with a Sconnie mom and Minnesotan dad, he's no "fish out of water." Fishing, boating and being outdoors "were always my interests," Alex says, "it's not like I just adopted them when I moved." Alex plans to continue studying new aspects of the social/environmental interface after obtaining his degree.

Ben Beardmore (Long Term Ecological Research Project)

Ben Beardmore is also interested in the intersection of economics and ecology. A research specialist for the Long Term Ecological Research and Coupled Natural and Human Systmes (CNHS) projects, Ben is tasked with surveying shoreline homeowners and Wisconsin boaters. For the past two summers, Ben and several undergraduates spent their days hanging around Wisconsin boat landings convincing boaters to complete "diaries" of their trips out on the water. "One main point is to model boater behavior so we can predict where they're likely to bring invasive species," he explains.

Ben is in the final stages of completing his PhD, an endeavor he began back at Simon Fraser University in British Columbia. "What brought me here," he explains, "was marrying a girl from Wisconsin who was desperate to move back." Ben lives in Monroe, where he's trying to instill a love of lakes in his two young children. Which is easier said than done in Monroe, he adds. "I had to pick the county with the fewest lakes in all of Wisconsin!?"

Jake Walsh (Vander Zanden)

Jake Walsh started his academic career as a pre-med student at Minnesota's Hamline University. A hospital-volunteer stint convinced him he was on the wrong track and, luckily for us, he switched gears. Jake and his wife moved to Madison for graduate school and they've reported no hard feelings from their supposed "rival" state. "It's not like our teams are ever good at the same time," he explains.

Jake's PhD research is on how the invasive spiny water flea is impacting native zooplankton communities in Lake Mendota and how that affects water clarity "which," he adds, "is obviously a big deal here." Spinies prey on algae-eating *Daphnia* and Jake worries they could "unravel" water quality gains we've made in the lake. Jake is also an ambitious mentor of aspiring scientists, with a half-dozen students helping him collect and analyze plankton during any given semester. "I really enjoy mentoring students through research projects and giving them some scientific experience," he says. Besides, "if I'm going to be counting *Daphnia* all day, I want someone there with me so I can complain about it."

Catching Up With Alumni

Pat Soranno

(M.S. 1991 and Ph.D. 1995, Carpenter; Post-doc 1995-1996 Kratz) Pat Soranno is a Professor in Fisheries and Wildlife at Michigan State University, although she studies neither fish nor wildlife. Nevertheless, she finds the department to be an excellent fit for her approach to science that she learned from her time at the CFL – one in which both basic and applied research is necessary to solve problems, communication and engagement with stakeholders is valued, and where science is fun (or, at least should be). She is leading a recent NSF-funded Macrosystems Biology grant (with a few folks from the CFL currently) to further develop the ideas of landscape limnology and to use lakes as model systems for helping to develop the emerging field of Macrosystems Ecology.

Beth Sanderson

(Ph.D. 1998, Magnuson and Frost) Beth Sanderson is a Fisheries Research Biologist with NOAA Fisheries in Seattle, WA. Her research team investigates factors that influence growth, distribution, and survival of commercially and culturally important species such as Pacific salmon. She is using long-term field data collected in the Salmon River Basin, Idaho, to examine linkages between growth & survival of juvenile salmon and habitat condition. Ironically, one of the factors that Beth investigates is the role of popular non-native recreational fish species that were introduced from the eastern US in the early part of last century (smallmouth bass, brook trout, and walleye for example). The lessons she learned volunteering with the 'Baylis Bass Crew' at Trout Lake have proved invaluable in her NW research. Beth visited her parents in Cable, Wisconsin, this summer (along with her husband and two kids) and proudly reports that the first fish caught by her son was a 12 inch smallmouth bass!

Jim Lorman

(M.S. 1975, Ph.D. 1980, Magnuson) Jim Lorman is Professor of Biology at Edgewood College, where he has taught for 32 years. Jim developed an interdisciplinary graduate program Sustainability Leadership at Edgewood in 2010 and currently serves as the lead faculty and Academic Director for that program. This work supports his passion for collaborative community projects aimed at planning and implementing sustainable practices, especially in the area of watershed management. This work is also related to and supported by his leadership in the Friends of Lake Wingra, his previous role as a member of the Dane County Lakes & Watershed Commission, and his participation in a number of community organizations and government-sponsored committees, including the Capital Region Sustainable Communities, Clean Lakes Alliance, Gardens for Empowerment, and Wisconsin Green Tier. Jim and his wife, Anne Forbes (whom he met at the Center for Limnology in 1973 and married in 1981), are enjoying their first grandchild, born this past July.

Alumni:

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

limnology@mailplus.wisc.edu

608-262-3014

Trout Lake Sunset. Photo: A. Hintherthuer

The Lasting Legacy of Individual Support

Earlier this year, the CFL lost a great friend - Eugene Thurston "Tug" Juday. Tug was the nephew of Chancey Juday, who, along with E.A. Birge, helped start the study of limnology in North America and was a central figure in the history of our Center. While Tug didn't pursue a scientific career, he shared the same curiosity about and love for our lakes that drove his great uncle. We here at the CFL benefitted greatly from Tug's interest and passion, as well as his generosity.

Just weeks before he passed away, Tug was able to attend the dedication ceremony for the Tug Juday Conference Facility at Trout Lake Station, a facility named in honor of the man who had done so much for the CFL. Tug was especially proud of the Juday Fellowships, which allow a few undergraduates to spend their summers at Trout Lake getting research experience.

We were also able to celebrate another friend of the CFL this year, inviting Wayland Noland to Trout Lake Station to visit the newly named "Wayland Noland Library." Wayland has been a steadfast supporter of CFL programs, and helped us found the Chase-Noland Fellowship for undergraduate research, which gives aspiring scientists an incomparable opportunity to experience research first-hand.

Tug and Wayland's relationships with the Center for Limnology underscore just how important one person's support can be. We are better able to educate undergrads, hold public events, manage our data and conduct research all because of them.

We are committed to making sure their respective legacies endure. And we look forward to new friends and supporters taking up the torch and helping us educate the next generation of scientists, produce world-class research on aquatic ecosystems, and protect the future of our freshwaters.

To give to the Center for Limnology. . .

Friends may give online through our web site: 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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All contributions are tax deductible.

New Faces at the CFL

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

Nora Casson, research associate (Stanley)
Sam Christel, project assistant (Gries)
Etienne Fluet-Chouinard, research assistant (McIntyre)
Daisuke Goto, research associate (Vander Zanden)
Margaret Guyette, research associate (McIntyre)
Noah Lottig, assistant scientist
Alyssa Luckey Winters, payroll & benefits specialist
Chad Sebranek, associate program analyst
Elliott Shuppy, project assistant, lead librarian
Craig Snortheim, research assistant (Hanson)
Tyler Tunney, research associate (Vander Zanden)

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Recent Degrees and Transitions

Bryan Althouse (MS-Freshwater and Marine Science, Vander Zanden), finished his MS; thesis *Benthic and planktonic primary production along a nutrient gradient in Green Bay, Lake Michigan*

Mireia Bartrons (post doc, Vander Zanden) took a position as Lecturer Professor at Universitat de Vic in Barcelona, Spain.

Cayelan Carey (post doc, Hanson) is an Assistant Professor in the Department of Biological Sciences at Virginia Tech.

Gretchen Hansen (PhD, Vander Zanden; post doc, Carpenter) took a position as Research Scientist at the Wisconsin Department of Natural Resources in Madison.

Derek Hogan (post doc, McIntyre) is an Assistant Professor in Marine Biology, Department of Life Sciences, Texas A&M-Corpus Christi.

Dan Oele (MS-Freshwater and Marine Science, McIntyre) took a position as Natural Resources Scientist at the Wisconsin Department of Natural Resources after completing his MS thesis, *Tracking breeding migrations of native fish in Great Lakes tributaries: if we restore it, will they come?*

Brenda Pracheil (post doc, McIntyre) took a postdoctoral Research Associate position at the School of Natural Resources, University of Nebraska-Lincoln.

Lori Steckervetz (grad student, Library and Information Studies) continues to work on campus at the reference desk at College Library.

Jon Viau (payroll & benefits specialist) has accepted a human resources position at Madison College.

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 distribution 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, website at limnology.wisc.edu

Awards

Anna Grant Birge Memorial Scholarships were awarded to Civil and Environmental Engineering students Trevor Ghylin and Ben Oyserman; Environmental Chemistry student Megan McConville; Geology student Megan Haserodt; Freshwater and Marine Science students Ryan Batt, Evan Childress, John Crawford, Etienne Fluet-Chouinard, Gosia Golub and Luke Loken; and Zoology students Kara Cromwell and Jake Walsh.

Undergraduate Emily Hilts was the recipient of a Chase-Noland Scholarship.

Zoology student Jake Walsh was awarded a summer scholarship from the Dorothy Powers Grant and Eugene Lodewick Grant Memorial Fund.

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

Undergraduate students Paul Schramm and Matt Bodin were awarded John and Patricia Lane Summer Research Scholarships.

The Kenneth W. Malueg Limnology Scholarship was awarded to Freshwater and Marine Science student Luke Winslow.

Fresh Water and Marine Science student Alex Latzka was the recipient of a Charlotte Stein Student Travel Award.

Zoology student Aaron Koning was awarded a 2013 Graduate Research Fellowship through the National Science Foundation.

Freshwater and Marine Science student Ali Mikulyuk received the Wisconsin Lakes Partnership's 2013 Wisconsin Lake Stewardship Award.

Jake Vander Zanden received a Romnes Faculty Fellowship.

Elena Bennett (Ph.D. 2002, Carpenter) was McGill's 2013 recipient of the Carrie M. Derick Award for Excellence in Graduate Teaching & Supervision. She also received an award for undergraduate teaching on campus in the past year, and was selected as one of the top 40 scientists under 40 by the IAP Global Network of Science Academies.

Graeme Cumming (Post Doc 1999-2001, Carpenter) received the South African Association for the Advancement of Science British Association Medal for 2013.

Pieter Johnson (Ph.D. 2006, Carpenter) has been named an Early Career Fellow by the Ecological Society of America (ESA). He also received ESA's George Mercer Award for his 2012 paper in the Proceedings of the National Academy of Sciences.

In Memory - Gregory Capelli (1948-2012)

by John Magnuson

Greg Capelli received his Ph.D. for Limnology through Zoology with John Magnuson in 1975. He began the trend of crayfish research at our Trout Lake Station with his study of the distribution, life history, and ecology of crayfish in Northern Wisconsin. After his graduation, he was on the faculty of the College of William and Mary for 38 years; at his retirement he became Emeritus Professor of Aquatic Biology. The course he developed on human nature explored how biology informs human thought and behavior. His focus was always on the students who, through his influence and dedication to excellence, became informed and thoughtful citizens. Greg championed efforts to preserve the College Woods and Lake Matoaka for teaching and research. He was instrumental in the establishment of the Keck Environmental Laboratory on the lake, and on his retirement the College dedicated Capelli Cove in his honor.

Greg with a gar, at Lake Makaoka. Photo: John Magnuson