



Laboratory of Limnology
Lake Mendota

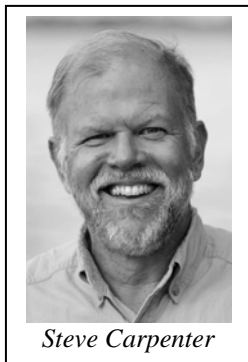
LIMNOLOGY NEWS

University of Wisconsin- Madison
College of Letters and Science



Trout Lake Station
circa 1935

Director's Notes



Steve Carpenter

Big changes are underway at the Center for Limnology. After a decade of successful leadership, Jim Kitchell has stepped down as Director. I am grateful to Jim for building CFL's excellence during his tenure as Director. Jim is continuing as a regular

faculty member at CFL until his retirement in summer 2010. At that time, Pete McIntyre, currently a Smith Fellow at the University of Michigan will join us as an Assistant Professor. We'll introduce Pete in a future issue of CFL News.

Emily Stanley is now the leader of North Temperate Lakes Long-Term Ecological Research program. Though I am no longer leading NTL-LTER, I look forward to ongoing participation as a researcher in the program.

Barbara Benson has retired after serving for 26 years as the Information Manager for NTL-LTER. Barbara bridged the gap between science and information technology, and her innovations put a unique stamp on NTL research. Barbara is succeeded by Corinna Gries, formerly the information manager at Central Arizona-Phoenix LTER. Already it is clear that Corinna is an able replacement and NTL information management is in good hands.

We are experimenting with a new format for the newsletter, and more frequent newsletters through the year. If you would like to receive your newsletter by email, please send a note to Denise Karns (dkkarns@wisc.edu).

Kitch-a-Palooza

A celebration of Jim Kitchell's career will be held at the summer 2010 ASLO meeting in Santa Fe, New Mexico. The meeting will feature a symposium on *Fish in an Ecosystem Context* and a celebratory dinner. Information on how to purchase tickets for the dinner will be posted on <http://limnology.wisc.edu/kitch-a-palooza/>

CFL in the News

Recent science news from CFL covers early warning indicators for ecosystem regime shifts and recent discoveries about invasive species such as red crayfish, rainbow smelt and spiny water flea. Click the hot link for 'CFL in the News' on our main web page <http://limnology.wisc.edu/>

Scientists and Journalists

CFL science was shared widely during the annual meeting of the Society of Environmental Journalists in Madison. Steve Carpenter joined discussions with New York Times reporter Andy Revkin and former Vice President Al Gore. Steve Carpenter and Jim Kitchell led a boat tour of Lake Mendota, where journalists dubbed them the "Click and Clack of Lake Repair."

On a snowy day at Trout Lake, scientists and journalists visited four lakes for discussion of a wide range of science topics – acid rain, climate



Emily Stanley explains carbon storage in Crystal Bog.

change, drought and declining lake levels, woody habitat and fish growth, sensor networks and early warnings of ecosystem change. Steve Carpenter, Susan Knight, Tim Kratz, Jordan Read, Emily Stanley, Jake Vander Zanden and John Walker (USGS) made



Journalists and scientists surround a GELI (Gradual Entrainment Lake Inverter) on the shore of Crystal Lake during a discussion of plans to mix the lake to remove invasive rainbow smelt.

presentations. Over dinner, the journalists joined about 100 scientists visiting the northwoods for a meeting of the Global Lake Ecological Observatory Network. After dinner there was a lively discussion about representation of science in the media. More photos and information from the SEJ meeting are found on the CFL web page.

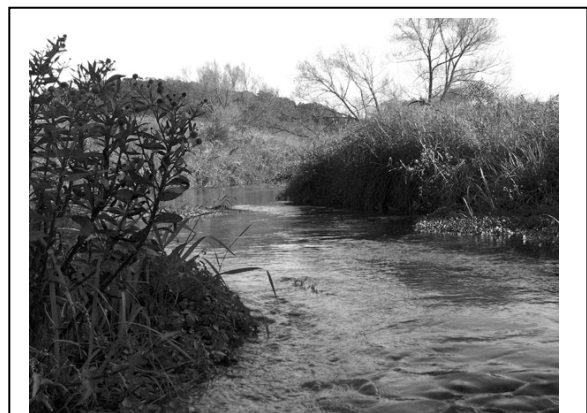
Climate Change and Lakes

The Wisconsin Initiative on Climate Change Impacts (WICCI) has released a new report on adaptation to climate change, including detailed

analyses of climate trends and projections. Dick Lathrop and John Magnuson are among the leaders of WICCI. Their reports, including brilliant graphics, are downloadable from <http://www.wicci.wisc.edu/>

Buffers for Nutrient Inputs to Surface Waters

Jake Vander Zanden and lab members, Matt Diebel and Jeff Maxted, were key participants in the Wisconsin Buffers Initiative. The WBI is a coalition of farmers, environmental groups, state and federal regulators, and researchers who have been working together since 2003 to address the contentious issue of Wisconsin's policy regarding riparian buffers (strips of vegetated land along waterways) aimed at reducing runoff of agricultural pollutants to Wisconsin's waterways. A central question addressed by Vander Zanden and group was how should Wisconsin use limited resources and direct riparian buffers to the places that provide the greatest environmental benefit. More information about WBI, and the final report to the legislature can be found at: <http://bombadil.lic.wisc.edu/WBI/index.htm>.



A riparian buffer along Elvers Creek, Dane County, WI (photo: Matt Diebel).

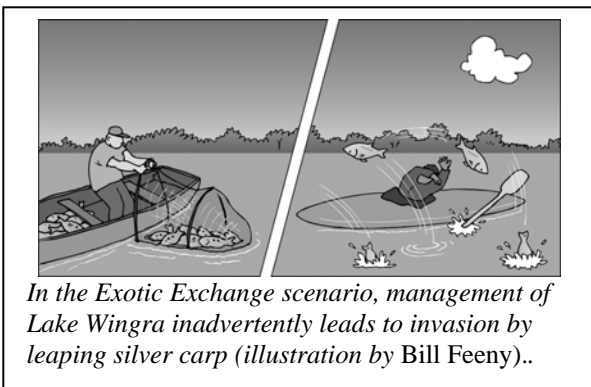
Graduate Education Gets Real

Solutions to many pressing environmental problems require scientific information but also require skills that are not traditionally taught in science curricula. These include acknowledging diverse values and worldviews, dealing with uncertainty in clear and open ways, and working in collaborative interdisciplinary teams.

Scenario planning is a tool for teaching these skills at the graduate level, as a complement to traditional scientific training.

In a graduate seminar led by Steve Carpenter, 13 students from diverse backgrounds created a set of scenarios for Lake Wingra. The scenarios were developed in collaboration with a non-profit, community-based organization, Friends of Lake Wingra (FOLW). Alumni Anne Forbes and Jim Lorman are active in FOLW and made important contributions to the collaboration. Students used interviews with lake users and managers in developing the scenarios.

The students wrote four scenarios for the future of Lake Wingra, addressing issues such as climate change, green technology, conflict among user communities, and challenges posed by water quality and invasive species.



This novel approach to graduate education was eye-opening for students, faculty and stakeholders. It culminated in a public presentation by the students to a packed house. The students summarized their experiences in a recent article in *Frontiers in Ecology and the Environment* (Biggs et al., published online 2009, DOI 10.1890/080075).

Spiny Water Flea Invades Mendota

Undergraduates in a Limnology class made an unwelcome discovery during a routine sampling trip on the *Limnos* in September: spiny water fleas (*Bythotrephes longimanus*) had invaded

Lake Mendota. Jake Vander Zanden, an instructor for the class, quickly verified the discovery. Already it appears that spiny water fleas have reduced numbers of *Daphnia* and may jeopardize the improvements in water quality that followed the biomanipulation in 1987. CFL researchers will watch Lake Mendota closely to determine impacts of the invasion.

John Havel Tackles Mystery Snails

CFL's strength in aquatic invasive species research is augmented by the visit of John Havel, Professor at Missouri State University. Havel's sabbatical research at CFL focuses on invasions of exotics, particularly the Chinese mystery snail. John couples field studies of CMS distribution in Wisconsin with experiments on dispersal mechanisms (desiccation tolerance and resistance to flow) in order to understand the factors controlling invasion among and within drainages.

Networks to Knowledge

Paul Hanson leads a team of scientists from the CFL, UW Civil and Environmental Engineering, UW Computer Science, SUNY Binghamton, and Western Australia aiming to generate new ecological insights from billions of records collected by the Global Lake Ecological Observatory Network (<http://GLEON.org>). Using novel technologies such as signal processing and internet harvesting, this project will address questions about timing and location of harmful algal blooms and heterogeneity in carbon processing by lakes. The project is funded by NSF through the Cyber-enabled Discovery and Innovation program.

Economics of Invaders

How do policies to prevent the spread of aquatic invasive species affect the decisions and economic welfare of lake users? Do the policies affect the spread of the invaders, and if so how? These questions are the focus of a new project funded by the Coupled Natural and Human Systems program at NSF to economists Bill Provencher, Dave Lewis and Kate Anderson,

together with limnologists Jake Vander Zanden and Steve Carpenter.

Deuterium to Trace Land-Water Links

How much organic matter do terrestrial plants contribute to lake consumers and sediments? Compared to organic matter of aquatic origin, terrestrial organic matter is highly enriched in deuterium. Studies using natural abundance of deuterium as a tracer could resolve some persistent mysteries of how aquatic food webs are supported. Steve Carpenter and Jim Kitchell, together with collaborators at the Cary Institute of Ecosystem Studies and University of Virginia, received a grant from the Ecosystem Studies program of NSF to evaluate deuterium as a tracer.

Dam Removal Scrambles Fish Communities

A dam in Big Spring Creek near Briggsville, Wisconsin separates an upstream cold water fish assemblage dominated by creek chubs, sticklebacks, sculpins and mudminnows from a warmwater downstream assemblage of largemouth bass, bluegill, yellow perch and white suckers. The dam was removed in late 2008 and the impoundment is gone. How will fish communities reorganize following the dam removal? Jim Kitchell, graduate student Steve Powers and postdoc Brian Weidel plan to find out, using a new grant from NSF.

Warm Lakes, Warm Lampreys

Water temperatures of Lake Superior have warmed rapidly since 1980. How will warming affect sea lamprey growth, food demand and impacts on lake trout and other game fishes? Jim Kitchell and postdoc Brian Weidel are tackling this problem using new funding from the Wisconsin Sea Grant Institute.

Zebra Mussels and Productivity

Zebra mussels are spreading throughout the waters of North America, yet little is known about how they alter an ecosystem's overall productivity. Is the decrease in phytoplankton that typically follows invasion offset by an increase in bottom-dwelling algae such as the

nuisance filamentous alga *Cladophora*? Jake Vander Zanden and CFL postdoc Scott Higgins received a grant from the Wisconsin Sea Grant Institute to examine this question in the Green Bay of Lake Michigan. Their work will take advantage of the strong trophic gradient in Green Bay.

In Memoriam: Stanley Dodson

Stanley Dodson, who trained many students in plankton ecology and taught the summer limnology course for many years, died in a bicycle accident in Colorado on 23 August. In a synthesis of Dodson's accomplishments published in *Hydrobiologia*, John Havel writes

Stanley is widely known by limnologists and ecologists for his groundbreaking work on the effects of size-selective predation on the structure of zooplankton communities, early studies on inducible anti-predator defenses, analyses of factors influencing species richness in lakes, and patient studies of cladoceran and copepod systematics. To his students and friends, Stanley will be remembered as an imaginative and gentle teacher and enthusiastic naturalist, with an ever-present smile and easy laugh.

Dodson's loss is deeply felt by many CFL people, past and current.

New Students and Postdocs at CFL

Ryan Batt, graduate student (Carpenter)

Erika Nilsson, postdoc (Vander Zanden)

Monika Papes, postdoc (Vander Zanden)

Marit Sallstrom, graduate student (Vander Zanden)

Sapna Sharma, postdoc (Vander Zanden)

Amanda Stone, graduate student (Carpenter, Hanson)

Luke Winslow, graduate student (Carpenter, Hanson)

Recent Degrees and Transitions

Jereme Gaeta (M.S., Carpenter) "Shoreline development and growth of largemouth bass (*Micropterus salmoides*): A cross lake

comparison.” Jereme is continuing at the CFL, working toward a Ph.D.

Amy Kamarainen (Ph.D., Carpenter) “Long-term trends in aquatic pollutants: Chloride and phosphorus dynamics in lakes embedded in urban and agricultural watersheds.” Amy is currently a post doc at the Harvard University Graduate School of Education.

Noah Lottig (Ph.D., Stanley) “Regional Aquatic Biogeochemistry of the Northern Highlands Lakes District.” Noah is currently a post doc with North Temperate Lakes LTER at Trout Lake Station.

Nick Preston (Ph.D., Carpenter) “Climate and carbon: external drivers of lakes.” Nick is a postdoc with the HealthScapes Program directed by Jonathan Patz at the Center for Sustainability and Global Environment, U.W.-Madison.

Jeff Watters (2009, Kitchell) “Implications Of Sea Turtle Bycatch In The Hawaii Longline Fishery: A Case Study Of Environmental Conflict.” Jeff is working as a Legislative Assistant to Senator Cantwell (D-Wa), Chair of

the Senate's Sub-committee on Oceans and Fisheries

Brian Weidel (Ph.D, Kitchell) “Sources and regulators of energy supporting north temperate fishes” Brian is a post doc at the CFL on two projects: early warnings of regime shifts in lakes and food web studies of Lake Superior fisheries.

Awards

Anna Grant Birge Awards were given to graduate students: Eric Booth (Limnol. & Marine Sci.), Jereme Gaeta (Limnol. & Marine Sci.) Gretchen Hansen (Limnol. & Marine Sci.), Natalie Huisman (Envir. Chemistry and Tech.), Emily Kara (Civil & Envir. Engr.), Khurram Kahn (Civil & Enivr. Engr.) Matt Kornis (Limnol. & Marine Sci.), Steve Powers (Limnol. & Marine Sci.), and Reese Zulkifly (Botany)

Juday Awards were given to undergraduate students Michael Balliett, Alex Gorazlski, and Zach Lawson.

The 2009 Chase Nolan Award was given to Steve Klobucar.

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Giving to CFL:

Please consider donating to the Center for Limnology. All donations support our mission of education, research, and outreach services, and allow us to provide opportunities for continued excellence that would not be available through the regular UW budget.

YES, I would like to make a tax deductible contribution to the CFL:

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Name: _____ Address: _____

Phone: _____ Email: _____

Please make your check payable to “University of Wisconsin Foundation” and mail care of: Steve Carpenter, UW Center for Limnology, 680 North Park Street, Madison WI 53706.

For more information on donating to the CFL, visit our webpage <http://limnology.wisc.edu/>

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