

in the drift

The NABS Newsletter



Times of loss and renewal for NABS

The 2008-2009 winter has brought many changes to NABS. We lost a young and passionate scientist from our numbers when Christy Fellows passed away in Brisbane at year's end (see p. 4). This has been difficult news to digest, but at the same time, inspired creativity is blossoming at NABS.

Judy Li is working on a program to promote cultural diversity within NABS, the Grand Rapids meeting will be greener than ever before, and we've got another NABS Facebook group (search fb for "F-NABS": thanks to Simon Linke, it's not just for students anymore!).

- **Grand Rapids early registration deadline: 31 March!**

In the spirit of creative and imaginative thinking, we have a feature story on art and benthology this issue (p. 3), with another installment to follow next issue, and the

JNABS article spotlight highlights a Rosemary Mackay paper (p. 2).

Unfortunately, the website has not yet made its anticipated "migration," so this and past issues of *in the drift* are temporarily available for download courtesy of Walter Dodds's website (http://www.k-state.edu/dodds/ab/nabsnews/NABS_newsletters.htm - copy and paste the url). Thanks to Walter and to Dolly Gudder!

Finally, Deb and Julie need more help with the newsletter (obviously: this issue is 2 months late!). Have you ever fantasized about being a science journalist? If so: pretend to be one here, like we do! If you'd like to take charge of one small section per issue (a fun way to funnel your creative energy in not too much time!), email Deb for info: debra.finn@eawag.ch.



issue 4:

Winter 2009

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Did you know... ? (if you didn't, check the Fall Bulletin on the website!)

- Did you remember to renew your membership for 2009? If not, Nick Aumen may contact you personally...
- NABS 57th Annual Meeting will be held May 17-22 in Grand Rapids, MI. We hope to see you there!
- The 2009 annual meeting is being planned as a green event. Plans are still in the works, but include carbon offsets, reusable china at all meals, composting food waste, and distributing reusable water bottles with registration materials. But, no tote bag this year—so be sure to bring your own!
- Do you have any aquatic or benthic-themed stuff lying around? Are you artistic or crafty? If so, the GRC needs your donations for this year's auction in Grand Rapids! Contact James Ramsey (jbramsey@bama.ua.edu), who also has important advice regarding some simple information you need to provide for NABS's accounting purposes. Money raised is matched dollar-for-dollar by the society for the NABS Endowment!
- Judy Li is planning a NABS Diversity Forum to address issues for under-represented minorities in North America. One goal is to create a network that will support new members from under-represented groups during and after the annual NABS meeting. For more information contact Judy at (what we hope is not her junkmail box): lijunk@comcast.net

benthos.org

JNABS article spotlight: Snails the dinosaurs saw

Dillon & Robinson, JNABS 28: 1-11

This issue's article spotlight features the latest Rosemary Mackay Fund paper. We stray a bit from the "traditional" approach this time, with a direct contribution from first author Rob Dillon (thanks, Rob!)...



"Robbie Tom sure do love to play in the crick" my Grandma once remarked to my father, as they sat rocking on her front porch at the foot of Virginia's Blue Ridge Moun-

tains. I was about 25 years old at the time, sampling *Goniobasis proxima* from the stream in her back yard for my PhD research.

In one sense, the Rosemary Mackay Fund instigated the project that John Robinson and I presented in our "dinosaur" paper. Our hypothesis that a large group of freshwater snails evolved on the slopes of the towering ancient Appalachians in central Pangaea hundreds of millions of years ago, then passively rode the mountains down as they eroded westward is simply too wild to publish as a conventional paper. But in a second, broader sense, I've been working on this project for 40 years.

Because Grandma was right. For as long as I can remember, I have been playing in southern Appalachian

streams, where the most conspicuous element of the macrobenthos is the pleurocerid snails, including the three focal species of our paper: *Leptoxis carinata*, *Goniobasis proxima*, and *Goniobasis catenaria*.

Common sense suggests that these populations must be ancient. The snails have such limited dispersal capabilities that I've seen significant genetic differences across a three-meter culvert. Yet *G. proxima* populations are common in almost every creek draining both sides of the present Appalachian divide from southern Virginia to northern Georgia.

So perhaps my colleague, Bob Frankis, and I should not have been surprised



Leptoxis carinata

by the first DNA sequence data we obtained for three populations of *G. proxima* in the summer of 2000. We found tremendous genetic diversity both between and within populations – up to 16.9% sequence divergence between two *G. proxima* individuals collected from the same rock in a Virginia stream. To us, these results suggested both that populations must be ancient, and that natural selection might have acted to distribute gene frequencies across distant adaptive peaks.

But to journal reviewers, such results could only mean one thing – cryptic speciation. My 20 years of data



Coauthor John Robinson in the field

demonstrating random mating within local populations of *G. proxima*, and no evidence of reproductive isolation carried little weight. In the community of phylogenetic systematics, the biological species concept has been replaced by a variety of typological concepts, most of which discount data on reproductive relationships. The little paper that Bob and I wrote was rejected by four journals, before I finally managed to get it published in 2004 in the American Malacological Bulletin.

I nearly gave up on the project, but in 2006 I saw Pam Silver's call for "speculative, forward-looking, and philosophical" articles to publish through the Rosemary Mackay Fund. I was also fortunate to have M.S. student John Robinson in my lab at the time. John was blessed with molecular skills far superior to my own, so together we developed a sampling design to extend the results of Dillon & Frankis across 13 populations of three pleurocerid species distributed along the Appalachian divide.

With the support of John's PhD advisor at the University of Georgia, John Wares, we were able to overcome the final hurdle of the project: availability of a high-throughput molecular lab. Dr. Wares was both supportive and indulgent of our project, and our special thanks go to him, in addition to the RMF committee, for helping make this research possible.

Results from the 13 newly-sequenced

(Continued on page 4)



Goniobasis proxima: locally abundant in S. Appalachians.

Pam's JNABS corner



How well do you know JNABS? In this issue, Pam shares the scope and types of articles that are published in our journal. Keep those manuscripts coming, and remember to contact the editor if you plan to submit a special article or are interested in a special series of papers.

Articles found in JNABS

- Promote understanding of benthic communities and their roles in aquatic ecosystems
- Emphasize freshwater inland habitats, but papers on estuarine and marine benthology that address common ecological processes and properties are welcome

JNABS scope

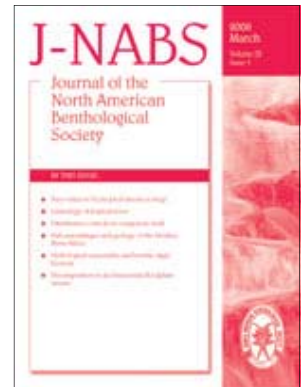
- Physical, chemical properties of lentic and lotic habitats
- Ecosystem processes
- Community structure and function
- Ecology and systematics of organisms, from bacteria to benthic-feeding vertebrates
- Conservation and restoration
- Environmental management and pollution
- Methods for basic or applied work

Types of regular articles

- Descriptive, modeling, or experimental studies
- Theoretical discussions and critical appraisals of rapidly developing research fields
- Reviews and meta-analyses
- Book reviews

Special articles

- **Rosemary Mackay Fund**—promotes speculative, forward-looking, and philosophical articles on any aspect of benthic science. Ideas welcome from any researcher, including students.
- **Perspectives**—express ideas, points of view, or comments on topics of interest to benthologists. New papers or comments on papers already published are welcome.
- **Bridges**—a forum for contrasting or complementary perspectives on new and emerging ideas in aquatic science, particularly topics that build across disciplines.



Benthology and artistic expression —Part 1

Thunderheads rose upstream like frothing and belching steel gods and the floodwaters joyfully rose, sending tiny life forms scurrying for cover.

Have you ever wanted to say something like that in a NABS talk or a paper? Did you get into your field at least in part for the thrill of discovery and the wonder of nature? In addition to science, the more imaginative ways of interpreting the natural world (e.g. art, creative writing) are important means of communication and understanding. At least this is what some new programs to pair artists and scientists are arguing. This blurb is the first of a 2-part (or more, if more examples emerge!) series highlighting such programs in the realm of benthology. Our first subject is Ping Qiu of the Swiss Art-



Part of Ping's toilet fountain by night

ists in Labs (AIL) Program.

The AIL funds year-long lab residencies for artists, recognizing a shared "primary creative force" of both disciplines (art and science) and encourag-

Swiss Artists in Labs Program:
<http://www.artistsinlabs.ch/index.htm>

Ping's short film "Alpine Waters" - inspired by fieldwork with the Robinson lab group - is on youtube:
<http://www.youtube.com/watch?v=q4DGcR-T2j8>

ing direct collaboration between two fields that take fundamentally different approaches to understanding the natural world. In addition to bridging the art-science gap, the AIL program hopes to help bridge the gap between science and the general public.

Ping is an AIL resident artist who spent 2008 housed in the Aquatic Ecology Department at EAWAG, with Chris Robinson as her main host. Among several memorable first-time experiences for Ping at EAWAG were things that NABSters might take for granted:



Ping displayed "Toilet Mirror"- with aquatic themes projecting from the bowl - at EAWAG's Forum Chriesbach.

using a microscope, wading across a glacial stream, learning about the hydrologic cycle and photosynthesis. Ping says that these experiences helped energize her most productive year ever. Among several projects

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In memory: Dr. Christine (Christy) Fellows



Christy and son Eli at Noosa Beach, Queensland

In December 2008, the NABS community lost one of our own, the vibrant and talented Dr. Christy Fellows. A dear friend and colleague to many, and a longtime NABStier, Christy had completed her BS with honors (Summa Cum Laude) at the University of Maryland, finished a PhD in 2000 under Cliff Dahm at the University of New Mexico, then went on to a postdoc and subsequent Lecturer position in the School of Environment at Griffith University, Queensland.

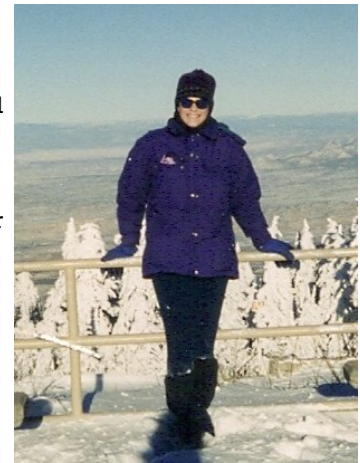
Although 3600 km from her home, she immediately embraced her new Australian arid-land study system and proceeded to make numerous contributions to the study of nutrient cycling and ecosystem metabolism in both basic and applied realms. Christy's postdoc advisor Stuart Bunn testified that her "dazzling smile and good humor in spite of heat, flies and grumpy company" even once convinced him to miss out watching the AFL grand final in order to help her with sampling in "a muddy waterhole."

After becoming Lecturer in 2003, Christy also had a profound impact on education at Griffith and beyond. Her infectious enthusiasm for the environment was an inspiration for the wide diversity of students that she mentored, from high school to postgraduate. She enthusiastically taught a wide variety of undergraduate courses and developed a new, integrative bachelor's degree in Water Resources. The degree was designed to produce graduates equally qualified in water science, resource management, and pol-

icy and was Australia's first such program. Christy's efforts in research and teaching did not go unnoticed, and she recently was offered a tenured faculty position. She also had begun nurturing a new generation of researchers as a postgraduate advisor. Devastatingly, Christy passed away in the same week she was to see Sarra Hinshaw, her first PhD student, graduate.

For the colleagues and friends closest to Christy, it seems there are few words suitable to describe the passion and integrity of the life she lived or to ameliorate the sense of deep loss in her absence. Our love and thoughts are with her husband and friend Wade Hadwen and their son Eli.

Ron Hellenthal and Cliff Dahm are moving forward with plans to establish a special NABS endowment in Christy's memory. It will be used to help fund an Australian student to attend the annual NABS meeting and will involve raising \geq \$5000 in contributions - which will be met dollar for dollar by the society - over the next three years. Ron, Cliff, and Stuart will provide more information on this memorial endowment at the meeting in Grand Rapids.



Christy on Sandia Peak, New Mexico

Thanks and thoughts to Stuart Bunn and Cliff Dahm for their contributions.

(Continued from page 2: Snails the Dinosaurs Saw)

populations supported our original findings on a broader spatial scale. The hypothesis we are advocating is exciting: it challenges basic assumptions of molecular phylogenetics (i.e. that most genetic variation is neutral), and it might upset most geomorphologists, who today think it unlikely that the Appalachian divide has migrated significantly, and most malacologists, who postulate independent origins for African and American cerithiaceous snails, and cryptic species in every creek.

But setting aside potential controversy, John and I hope that our paper brings forward some assumptions that all we benthologists probably carry in the back of our minds, but may not examine as often as we should. Many elements of the freshwater biota are much older than those of the terrestrial environments that surround them. All the ancient orders of aquatic insects, for example, probably evolved long before the seed plants that provide most primary production for the rivers they inhabit today. Standing at creek side, looking down, we look back millions of years. Even if our snails didn't see dinosaurs, that's an important thing to keep in mind.



Ping experiencing field benthology in the Val Roseg

(Continued from page 3: Benthology and Art)

completed at EAWAG were two major toilet-themed installations (see photos). Ping sees the toilet as a symbol of the natural water cycle combined with the complex impact that humans have on it. Another project titled "Eggs (Breath)" depicts gigantic, pulsating, air-balloon eggs inspired by a microscopic view of living caddisfly eggs. Beyond the unseen beauty of life revealed at 40X, microscopy moved Ping at another level. She says she realized that "even after I die I will still be alive!"

The scientists also have been inspired by the artistic insight of their work provided by Ping's projects - for many this has been a first-time experience. After learning about primary production, Ping says she sees herself as an autotroph. No, you say, of course she is not an autotroph! Who has been teaching her this? But Ping (translated from Chinese as "little green thing that lives on the water") learned that autotrophs make very important products from very simple building blocks. Ping does that too, with her art.