



# Limnogeology Division Newsletter

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#### From the Editor

#### Peter Drzewiecki Storrs, CT

#### Greetings!

Spring is here, and in my world, that means another academic year is winding down. It also means it is time to get the spring edition of the Limnogeology Newsletter out before the start of the field season.

This edition of the Newsletter contains an article by Jack Ridge and Jacob Benner regarding the North American Varve Chronology and Glacial Varve Project in which they are involved. It also contains updates and information on the following:

- The status of the division in a message from your division chair.
- The citation for the 2011 Israel C. Russell Award and response from the recipient, W. Berry Lyons
- An announcement of the Kerry Kelts Student Research Award winner,
- Limnogeology-related sessions at the 2012 Annual GSA Meeting, and, as always,
- A list of upcoming limnogeology-related meetings.

The invitation to send me any information or announcements that you want published in the Newsletter is still out there. As always, we are continually looking for more technical articles for the Newsletter.

Cover Photo: Bubble Pond (Bubble mountains in the background), Acadia National Park, ME (photograph by Louanne Cooley)

# Message from the Chair

Daniel Deocampo Atlanta, GA

Dear Friends of Lakes and Paleolakes,

The 2011 GSA National Meeting in Minneapolis was a landmark meeting for the Limnogeology Division. We sponsored or co-sponsored a total of 15 topical sessions, presenting 149 talks and 107 posters. LacCore, the National Lacustrine Core Repository at the University of Minnesota, generously and enthusiastically hosted the Fourth Limnogeology Division Core Workshop, an informative and fun time at their facility. We got to see everything from core splitting to TMI (see https://tmi.laccore.umn.edu/, it's not too much information!) It was a wonderful week of lakes and paleolakes, from carbonates to clays, from Glacial Lake Agassiz to Mars. Congratulations to the limnogeology community for coming out in record numbers to present exciting research results from around the world!

We were also privileged to celebrate W. Berry Lyons (Ohio State University) as the second recipient of the Division's I.C. Russell Award, honoring his truly significant and continuing contributions to the discipline. If you missed it, the citation from Scott Tyler (University of Nevada, Reno) and Berry's gracious response are both reproduced in this newsletter.

The Division also presented the Kerry Kelts Student Research Award to Laurel Stratton, University of Nevada, Reno, to support her study "Diatoms as Proxies for Hydrographic Variability in a Small, Subalpine Lake, Sierra Nevada Mountains, Northern California."

We look forward to Laurel's update on her research in the fall newsletter!

We received several excellent proposals for the Kelts Award, and it is unfortunate that we only have enough funds to support one student project. However, we believe that the proposal process is extremely helpful for early researchers to develop their craft of inquiry, hypothesis-testing, and problem solving. Your donations make this happen!

Dan, surrounded by one of his favorite things on Earth – mud!

In the eleven years since Kerry's death, this fund has supported 19 students solving problems from Antarctica to Alaska. Help us grow the program! When you renew your GSA membership, please select the Kerry Kelts Student Research Award at the Foundation for a special donation. No gift is too small - please support the future of our Division and our discipline! We continue to fund the student awards from our general operating budget (your division dues), but once the Kelts Fund is self-sufficient, we can consider using member funds to support students and the discipline in other ways. We continue to hover around 200 members - it is good that we are stable, but we hope to increase these numbers.

The upcoming national meeting in Charlotte is sure to be exciting - check out the list of lake-related sessions in this newsletter. In addition to those topical sessions, as always we will have our broad limnogeology poster session that is always a lot of fun. We will meet as a Division again together with the Sedimentary Geology Division (thanks Rip!) at 6PM on Tuesday evening November 6. Come out to share an evening of fun and celebrate the 2012 I.C. Russell Award and Kelts Student Award recipients!

Be sure to get your abstracts in by **Tuesday August 14**, and remember to either vote early or file for your absentee ballot! See you in Charlotte!

Sincerely yours,

Dan Deocampo Limnogeology Division Chair



# The North American Varve Chronology and Glacial Varve Project

#### **Jack Ridge and Jacob Benner**

Dept. of Earth and Ocean Sciences, Tufts University, Medford, MA 02155

#### **Ernst Antevs' Masterpiece**

Beginning in the 1920's, with an expedition led by Gerard De Geer, Ernst Antevs (1922, 1925, 1928, 1931) assembled several long varve chronologies from the time of recession of the last ice

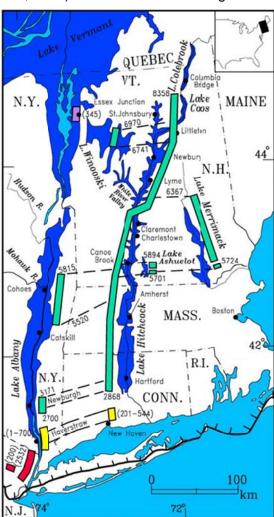


Figure 1. Consolidated and matched varve sequences of the revised NEVC or NAVC (AM 2700-8358 in green) along with other not yet connected long sequences in the northeastern U.S.

sheet in the northeastern United States and southern Canada. This included the New England Varve Chronology (NEVC), compiled from mostly measurements of varves from glacial Lake Hitchcock (Figure 1). Although not calibrated the NEVC was instantly a valuable tool for determining relative ages and rates of deglaciation across New England where Antevs documented a systematic recession of ice. Unfortunately, an alternative view of ice receding by regional stagnation (Flint, 1929, 1930, 1932, 1933), raised doubts about the validity of the varve chronology. Later, the first radiocarbon ages in New England (Flint, 1956) seemed to contradict the varve count and references to Antevs' work in New England were omitted from the later two editions of Flint's (1957, 1971) widely used textbooks on glacial geology.

Today, early doubts about the validity of the NEVC are unfounded. During and since the 1940's detailed mapping of glacial deposits by the USGS using the morphosequence concept (Jahns and Willard, 1942; Koteff, 1974; Koteff and Pessl, 1981) clearly documents the systematic south to north retreat of the last ice sheet in New England. Also, it is now known that the original interpretations connecting radiocarbon ages to New England's glacial history were incorrect, as documented by many recent radiocarbon ages (Ridge and Larson, 1990; Ridge, 2004; Stone and Ridge, 2009; Ridge, 2012) that when calibrated (Stuiver and others, 2005; Reimer and others, 2009) are in agreement with the length of the varve time scale. In addition, several pioneering paleomagnetic studies on sedimentary deposits

took advantage of the varve chronology (McNish and Johnson, 1938; Johnson and others,

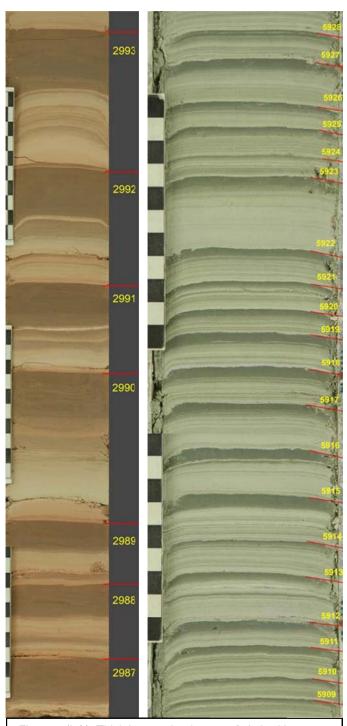


Figure 2 (left). Thick ice-proximal varves (stitched images of AM 2987-2993) from a deep core at Glastonbury, CT where varves from Lake Hitchcock are red as a result of glacial erosion of source rocks in the Mesozoic Hartford Basin. Red lines indicate varve couplet boundaries at the tops of winter (non-melt season) clay layers that have a dark color on partially dried cores. Scales in centimeters. Figure 3 (right). Ice-distal varves (stitched images of AM 5909-5928) from a deep core at North Hatfield, MA. Glaciation of metamorphic rocks in northern New England accounts for the gray color of the sediment. Scales in cm.

# The North American Varve Chronology

More than 90 years after Antevs began his work on varves in North America there is renewed interest in varve chronology. With a detailed study of key varve sections we have accomplished the first update of the NEVC, which we call the North American Varve Chronology (NAVC: Figure 1), and are optimistic that the chronology will soon spread to other areas of the northeastern U.S. and Quebec. NSF funding for the recovery of subsurface cores (Figures 2-5) of glacial varve sections (up to 50 m) has allowed us to fill a major gap in the NEVC near Claremont, NH. The chronology has been extended into late glacial time, with the measurement of almost 1300 paraglacial varves at Newbury, VT (Ridge and Toll, 1999) and North Haverill, NH (Figure 6), representing a time when ice was no longer feeding meltwater to the Connecticut Valley. The drilling project has provided us with cores that replicate most of Antevs chronology from central Connecticut to northern Vermont and New Hampshire. With careful core splitting, preparation, and digital imagery this has allowed us to make corrections to parts of the chronology where Antevs may have had difficulty defining the boundaries of thin varves on outcrops of very moist sediment (Figure 4). Given the field conditions under which Antevs measured varves the reproducibility of the old NEVC is astounding and we have had to make very few corrections. Our project has also accumulated many new radiocarbon ages from the varves that now total 54, span 4800 varve years, and have established a more accurate calibration. The new NAVC is a renumbered continuous 5659 year sequence (NAVC numbers 2700-8358) dating from 18,200-12,500 yr BP.

Several projects and findings have been the outgrowth of the new NAVC. The

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revised varve chronology and new cores have expanded the deglaciation record of New England that is linked to a calibrated time scale and has served as a local calibration tool for cosmogenic dating (Balco and others, 2009). The varves provide a precise chronology that records flood events that were triggered by the release of water from icemarginal tributary lakes and drops in lake level. The varve stratigraphy chronologically constrains isostatic rebound that decanted water from postglacial lakes in the Connecticut Valley.

The new cores will allow a detailed analysis of the intraannual layering of varves from a wide variety of glaciolacustrine environments. Varves in the Connecticut Valley range in thickness from a few meters in ice-proximal areas (Figure 5) that transition to subcentimeter varves in ice-distal and paraglacial settings

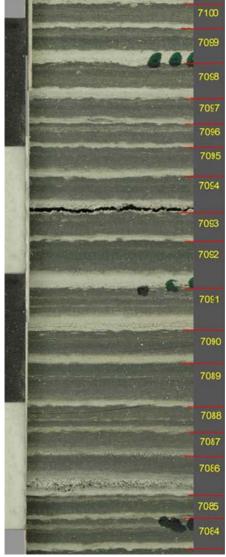


Figure 4 (above). Ice-distal varves (AM 3375-3387) from an outcrop core collected in the clay pits of Redlands Brick Company in South Windsor, CT. Varve 3384 was missed by Antevs' original NEVC and was included as a part of the varve beneath it. This new varve has been included in the revised numbering of the NAVC. Antevs' measurements did include varve 3377, which is also very thin. Scale in cm.

Figure 5 (right). Ice-proximal varves (stitched images of AM 6273-6277) from a deep core in the Perry Hill basin in North Charlestown, NH. The dark bluish-green layers are winter layers. The bottoms of the summer (melt season) layers show muddy diurnal units deposited at the beginning of the melt season when glacial meltwater discharges were relatively low and night time temperatures probably dropped to below or near freezing. Scale in cm.

(Figures 4 and 6). The varves also record valley side and tributary embayment vs. deep basin deposition, and have also been collected from prodeltaic and shoaling environments. This analysis is greatly aided by our ability to capture high-resolution digital images of partially dried cores that show the details of intra-varve stratigraphy. We should be able to add tremendously to the pioneering analysis of varve deposition in Lake Hitchcock

conducted by Gail Ashley (1972, 1975) nearly four decades ago, a heroic effort at a time when the validity of the varve chronology was not generally accepted.



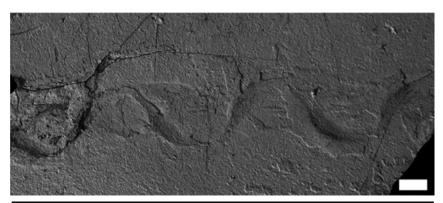


Figure 6 (left). Sub-centimeter paraglacial varves (stitched images of AM 7084-7100) from an outcrop core at North Haverhill, NH. Varves from this time in the Connecticut valley were deposited after the glacier had receded from the basin and varve sediment is derived from runoff and erosion of a newly deglaciated landscape. The winter layers of these varves have tops that were disturbed by bioturbation. The winter layers are also split by a fine sand and silt parting of unknown origin that may be related to fall overturning, which re-energized bottom currents in the lake after the initiation of clay deposition. Scale in centimeters. Figure 7 (above). Piscine trace fossil <u>Undichna unisulca</u> from a varve section at Newbury, VT (from Benner and others, 2009). Scale bar is 2 cm.

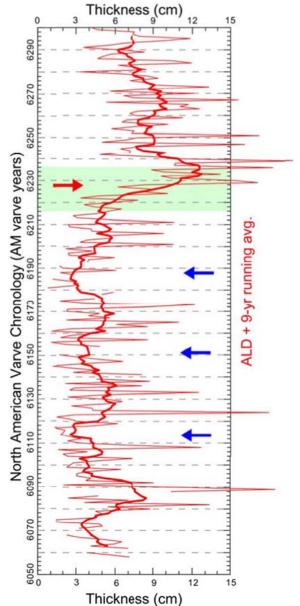
The varves have abundant trace fossils that record the pioneering inhabitants of New England's glacial lakes and drainage systems following glaciation. In addition to the ubiquitous small traces left by insect larvae and nematodes there are large traces left by at least two varieties of fish (Figure 7; Benner and others, 2008, 2009) and a notostracan crustacean (Knecht and others, 2009). Although sometimes sparse in the sediment ostracodes occur in all the varves and may provide ecological or isotopic insights about glacial lake environments of the Connecticut Valley.

Changes in varve thickness that are sometimes abrupt, and have been identified as cyclic (Rittenour and others, 2000) are dominantly related to changes in meltwater production, which is a function of glacial melting and therefore climate. Decreases in varve thickness are associated with cool intervals that stimulated small glacial readvances and the building of end moraines, while sudden increases in varve thickness are associated with dramatic increases in the rate of ice recession to up to 300 m/yr in northern New England at about 14,600-14,000 yr BP (Figure 8). This climate record is similar to a Greenland Ice Sheet oxygen isotope record (GISP2) with not only matching stadial events but very similar patterns at a bi-decadal scale (Ridge and others, in review). The varves are presently being studied for their <sup>10</sup>Be composition to determine if they record the fallout of this cosmogenic isotope thus providing a global correlation of climatic events with unprecedented accuracy.

#### The North American Glacial Varve Project

A complete compilation of the NAVC in addition to many other varve sections is on our project web site ("The North American Glacial Varve Project", see; <a href="http://geology.tufts.edu/varves">http://geology.tufts.edu/varves</a>; Ridge, 2012) that serves as a data repository in addition to serving as an educational and





warming) in a deep varve core from the Aldrich Brook core site in Westmoreland, NH. The sudden warming event terminates a period of small glacial readvances and end moraine construction at North Charlestown, NH and represents the beginning of rapid ice recession at 300 m/yr. A. (left) Stitched images of varves (AM 6216-6236) showing abrupt transition to thicker varves at AM 6229 when meltwater supply to the Connecticut Valley suddenly increased. Scales in centimeters.

B. (above) Plot of varve section (actual = thin line, 9-yr running average = thick line) showing sudden increase in varve thickness (red arrow). Blue arrows indicate times of low varve thickness that correspond to minor readvances and end moraine construction. Green area is time covered by core image.

Figure 8. Abrupt climate change event (sudden

research resource on glacial varves. varve chronology, and methods for studying them. The opening page of the web site features the "Varves of the Month" and a menu linking the user to information and data on the NAVC, information on varve deposition, stratigraphy, field and lab methods, and a glossary of terms associated with varves. All of the varve records associated with the old NEVC in addition to new records from outcrops have been translated to the NAVC numbering system and are available for download in both the NEVC and NAVC numbering system along with all the radiocarbon ages so far obtained from NAVC varves. We also provide information on collecting varve cores and how we produce our high resolution images that allow the detailed study of intra-annual stratigraphy. Users may download the program and its instructions that we use for measuring varve thicknesses on successive varve images from a core. The web site provides many high resolution images and varve plots that may be used for teaching and in the near future we hope to add sections to the web site on varve deposition, varve paleontology, and educational activities.

#### **Acknowledgements**

The authors would like to thank the National Science
Foundation's Sedimentary
Geology and Paleobiology
Program and the Dept. of Earth and Ocean Sciences at Tufts for their support of this project. The drilling services of the USGS enabled the recovery of deep cores. Jacob Benner (Tufts, Earth and Ocean Sciences) has been instrumental in programming the web site.

Special thanks go to the former undergraduate students at Tufts (with current addresses) who worked on this project: Robbie Bayless (Schlumberger D&M), Catherine Beck (Rutgers University), Jody Dean, Laura Carter (Univ. of Bristol, UK), Emily Voytek (Univ. Minnesota Duluth), and Jeremy Wei (Univ. of Massachusetts, Amherst).

#### Image downloads

For high resolution copies of the images in this article please visit the home page of The North American Glacial Varve Project web site at: <a href="http://geology.tufts.edu/varves">http://geology.tufts.edu/varves</a>. Users are free to use the images for educational purposes. Use of the images in other publications or on other web sites is permitted as long as the images are fully cited to this article or to Ridge (2012) in the references below.

#### References

- Antevs, E., 1922, The recession of the last ice sheet in New England: American Geographical Society Research Series 11, 120 p. (with a preface and contributions by J.W. Goldthwait).
- Antevs, E., 1925, Retreat of the last ice-sheet in eastern Canada: Canadian Geological Survey Memoir 146, 142 p.
- Antevs, E., 1928, The last glaciation, with special reference to the ice sheet in northeastern North America: American Geographical Society Research Series 17, 292 p.
- Antevs, E., 1931, Late-glacial correlations and ice recession in Manitoba: Geological Survey of Canada Memoir 168, 76 p.
- Ashley, G.M., 1972, Rhythmic sedimentation in glacial Lake Hitchcock, Massachusetts-Connecticut: Amherst, Massachusetts, University of Massachusetts, Geology Department, Contribution no. 10, 148 p.
- Ashley, G.M., 1975, Rhythmic sedimentation in glacial Lake Hitchcock, Massachusetts-Connecticut, *in* Jopling, A.V., and McDonald, B.C., eds., Glaciofluvial and glaciolacustrine sedimentation: Society of Economic Paleontologists and Mineralogists Special Publication no. 23, p. 304-320.
- Balco, G., Briner, J., Finkel, R.C., Rayburn, J., Ridge, J.C., and Schaefer, J.M., 2009, Regional beryllium-10 production rate calibration for late-glacial northeastern North America: Quaternary Science Reviews, v. 4, p. 93-107. doi:10.1016/j.quageo.2008.09.001
- Benner, J.S., Ridge, J.C., and Taft, N.K., 2008, Late Pleistocene freshwater fish (Cottidae) trackways from New England (USA) glacial lakes and a reinterpretation of the ichnogenus *Broomichnium* Kuhn: Palaeogeography, Palaeoclimatology, Palaeoecology, v. 260, p. 375-388. doi:10.1016/j.palaeo.2007.12.004
- Benner, J.S., Ridge, J.C. and Knecht, R.J., 2009, Timing of post-glacial reinhabitation and ecological development of two New England, USA, drainages based on trace fossil evidence: Palaeogeography, Palaeoclimatology, Palaeoecology, v. 272, p. 212-231.
- Flint, R.F., 1929, The stagnation and dissipation of the last ice sheet: Geographical Review, v. 19, p. 256-289.
- Flint. R.F., 1930, The glacial geology of Connecticut: Connecticut State Geological and Natural History Survey Bulletin 47, 294 p.

- Flint, R.F., 1932, Deglaciation of the Connecticut Valley: American Journal of Science, v. 24, p. 152-156.
- Flint, R.F., 1933, Late Pleistocene sequence in the Connecticut Valley: Geological Society of America Bulletin, v. 44, p. 965-988.
- Flint, R.F., 1956, New radiocarbon dates and late Pleistocene stratigraphy: American Journal of Science, v. 254, p. 265-287.
- Flint, R.F., 1957, Glacial and Pleistocene geology: New York, John Wiley and Sons, 553 p.
- Flint, R.F., 1971, Glacial and Quaternary geology: New York, John Wiley and Sons, 892 p.
- Jahns, R.H. and Willard, M., 1942, The Pleistocene and recent deposits in the Connecticut Valley, Massachusetts: American Journal of Science, v. 240, p. 161-191 and p. 265-287.
- Johnson, E.A., Murphy, T., Torreson, O.W., 1948, Pre-history of the earth's magnetic field: Terrestrial Magnetism and Atmospheric Electricity (now Journal of Geophysical Research), v. 53, p. 349-372.
- Koteff, C., 1974, The morphologic sequence concept and deglaciation of southern New England, *in* Coates, D.R., editor, Glacial Geomorphology: Publications in Geomorphology, State University of New York, Binghamton, p. 121-144.
- Koteff, C. and Pessl, F., Jr., 1981, Systematic ice retreat in New England: United States Geological Survey, Professional Paper 1179, 20 p.
- Knecht, R.J., Benner, J.S., Rogers, D.C., and Ridge, J.C., 2009, *Surlichnus bifurcauda* n. igen., n. isp., a trace fossil from Late Pleistocene glaciolacustrine varves of the Connecticut River Valley, USA, attributed to notostracan crustaceans based on neoichnological experimentation: Palaeogeography, Palaeoclimatology, Palaeoecology, v. 272, p. 232-239. Doi:10.1016/j.palaeo.2008.10.013
- McNish, A.G., Johnson, E.A., 1938, Magnetization of unmetamorphosed varves and marine sediments: Terrestrial Magnetism and Atmospheric Electricity (now Journal of Geophysical Research), v. 43, p. 401-407.
- Reimer, P.J., Baillie, M.G.L., Bard, E., Bayliss, A., Beck, J.W., Blackwell, P.G., Ramsey, C.B., Buck, C.E., Burr, G.S., Edwards, R.L., Friedrich, M., Grootes, P.M., Guilderson, T.P., Hajdas, I., Heaton, T.J., Hogg, A.G., Hughen, K.A., Kaiser, K.F., Kromer, B., McCormac, F.G., Manning, S.W., Reimer, R.W., Richards, D.A., Southon, J.R., Talamo, S., Turney, C.S.M., van der Plicht, J., and Weyhenmeyer, C.E., 2009, IntCal09 Northern Hemisphere atmospheric radiocarbon calibration curve: Radiocarbon, v. 51, p. 1111-1150. <a href="http://intcal.qub.ac.uk/calib/">http://intcal.qub.ac.uk/calib/</a>
- Ridge, J.C., 2004, The Quaternary glaciation of western New England with correlations to surrounding areas, *in* Ehlers, J. & Gibbard, P.L., editors, Quaternary Glaciations Extent and Chronology, Part II: North America: Developments in Quaternary Science, vol. 2b, Amsterdam, Elsevier, p. 163-193.
- Ridge, J.C., 2012, "The North American Glacial Varve Project": (<a href="http://geology.tufts.edu/varves">http://geology.tufts.edu/varves</a>), sponsored by The National Science Foundation and The Geology Department of Tufts University, Medford, Massachusetts. Accessed March, 2012.
- Ridge, J.C. and Larsen, F.D., 1990, Re-evaluation of Antevs' New England varve chronology and new radiocarbon dates of sediments from glacial Lake Hitchcock: Geological Society of America Bulletin, v. 102, p. 889-899.
- Ridge, J.C. and Toll, N.J., 1999, Are late-glacial climate oscillations recorded in varves of the upper Connecticut Valley, northeastern United States?: Geologiska Föreningens i Stockholm Förhandlingar, v. 121, p. 187-193.

- Ridge, J.C., Balco, G., Bayless, R.L., Beck, C.C., Carter, L.B., Dean, J.L., Voytek, E.B., and Wei, J.H., in review, The new North American varve chronology: A precise record of southeastern Laurentide ice sheet deglaciation and climate: 18.2-12.5 kyr BP: American Journal of Science, provisionally accepted pending revisions.
- Rittenour, T.M., Brigham-Grette, J., and Mann, M.E., 2000, El Niño-like climate teleconnections in New England during the Late Pleistocene: Science, v. 288, p. 1039-1042.
- Stone, J.R. and Ridge, J.C., 2009, A new varve record and <sup>14</sup>C dates from the southern basin of glacial Lake Hitchcock: Geological Society of America Abstracts with Programs, v. 41, no. 3, p. 36.
- Stuiver, M., Reimer, P. J., and Reimer, R. W, 2005, CALIB 6.0. [WWW program and documentation] http://intcal.qub.ac.uk/calib/
- Verosub, K.L., 1979a, Paleomagnetism of varved sediments from western New England: Secular variation: Geophysical Research Letters, v. 6, p. 245-248.
- Verosub, K.L., 1979b, Paleomagnetism of varved sediments from western New England: Variability of the recorder: Geophysical Research Letters, v. 6, p. 241-244.

#### News from the NSF

The following update was sent to us by Lisa Park Boush, Program Director in Sedimentary Geology and Paleobiology Program at the U.S. National Science Foundation, and founding Treasurer of the G.S.A. Limnogeology Division.

News from NSF Lisa Park Boush Washington, D.C. 28 April 2012

#### **Transitions**

The final report of the TRANSITIONS workshop entitled "TRANSITIONS: The Changing Earth-Life System--Critical Information for Society from the Deep Past," has been released. If you are not aware, this workshop was chaired by Judy Parrish and a committee of SGP-related scientists (see list in the appended report) and attended by a broad representation of the SGP community. The report's purpose was to synthesize recommendations from numerous workshops held over the last decade into a single document that identifies common priorities and directions for the deep time/sedimentary crust communities (i.e., paleontology, stratigraphy/sedimentology, paleoclimatology, geochronology, etc). The Transitions Committee's workshop report and synthesis effort included 3 recent SGP-funded National Research Council (NRC) studies: 1) "The Geological Record of Ecological Dynamics: Understanding the Biotic Effects of Future Environmental Change," 2005; 2) "Understanding Climate's Influence on Human

Evolution," 2010; 3) "Understanding Earth's Deep Past: Lessons for Our Climate Future," 2011. Recommendations from all four of these publications were captured in the recent NRC report entitled, "New Research Opportunities in the Earth Sciences" (NROES). NROES is an NRC decadal sequel to "Basic Research Opportunities in the Earth Sciences" (BROES), 2002, from which CZOs, Earthscope, and Geobiology have emerged. Such NRC studies play a key role in future funding directions within NSF and the focus of NROES on the Earth-life system has laid the 2012-2022 foundation for the deep time/sedimentary crust community. This future opportunity is in the hands of the community and thus, it is important for people to become aware of these reports and get involved in supporting them in any way they can.

Hard copies of the attached document can be obtained upon email request to Judy Parrish at <u>iparrish@uidaho.edu</u>. The NRC studies mentioned above can be purchased at:

http://dels.nas.edu/Report/Research-Opportunities-Earth/13236 NROES
http://dels.nas.edu/Report/Understanding-Earth-Deep-Past/13111 Understanding
Earth's Deep Past
http://dels.nas.edu/Report/Understanding-Climate-Influence-Human/12825
Understanding Climate's Influence on Human Evolution
http://dels.nas.edu/Report/Geological-Record-Ecological-Dynamics/11209 The
Geological Record of Ecological Dynamics

#### **EarthCube**

The goal of EarthCube is to transform the conduct of research by supporting the development of community-guided cyberinfrastructure to integrate data and information for knowledge management across the Geosciences. There have been a number of activities in the past year—Webinars, a Charette, an EAGER competition and a future **June event** followed by a solicitation. There is a website <a href="http://earthcube.ning.com/">http://earthcube.ning.com/</a> set up to foster community collaboration, and it will provide updated information, resource documents, and discussion forums so that community groups, consortia, researchers, and educators can share ideas, introduce concepts, and find and develop collaborative efforts. On this website, you can check out the currently funded projects list of the 26 EAGERS and workshops from the first 'scoop' of the competition which included topics such as governance, semantics and ontology, workflow, data mining, data access, data discovery, brokering, interoperability, layer architecture, web services and Earth system modeling. Through this "ning" site you can join any of these groups and be part of the discussion.

We're also requesting that potential end-users help us out by filling out a questionnaire (available at http://tinyurl.com/ec-priorities) to provide additional insight to NSF and the community to help rate a set of potential capabilities that may be offered by the EarthCube project. Follow us on Twitter -- #earthcube

#### **Division Director Search**

The Division of Earth Sciences within the GEO Directorate is completing its search for a new Division Director (DD). Interviews of candidates have occurred and a decision

likely will be made within the coming weeks. Announcement of the new Director should be expected before July 1.

#### **DOSECC Workshop**

The DOSECC Annual meeting will occur at NSF May 20-22. A variety of topics will be covered, including discussion of a potential continental drilling facility and the role of the ICG in continental drilling. In addition, theme-based workshops to galvanize, organize and energize the community will be discussed in the following areas: *Drilling Earth's sedimentary crust and deep time* (biodiversity, extinctions, climate), *Drilling active tectonics and magmatism* (volcanics, fault zones, Geoprisms, post-SAFOD), *Drilling energy and the environment* (SEES, SEP), *Drilling the shallow subsurface CZ (Critical Zone*) (CUAHSI), and *Drilling core and data management*. If you would like to be involved in any of these activities, please contact Andy Cohen (cohen@email.arizona.edu) or Julie Brigham-Grette (juliebg@geo.umass.edu).

#### **Lake Drilling Workshops**

There have been two drilling workshops that have been held in the past few months—one that focused on East Africa and the other that focused on the Mexico Basin (see below for summaries).

#### East African Drilling Workshop

An international group of scientists and students convened in Providence, Rhode Island in January to discuss various lake drilling targets in East Africa. Lakes Tanganyika, Turkana, and Albert were specifically discussed with respect to questions related to tropical climate variability and change, rifting processes, paleobiology, and human evolution. Among these lakes, Tanganyika stood out as an extraordinary opportunity due to the presence of continuous, deep-water sedimentary records spanning the Pliocene to present, as well as the nexus of interest in the lake basin from paleoclimatologists, to seismologists, to evolutionary biologists. The 36 workshop participants were uniquely enthusiastic about moving forward and agreed on several benchmarks to begin a continental drilling project on that lake. For more information about the workshop, please contact James Russell (james russell@brown.edu).

#### Mexico Basin Drilling Workshop

In March 4-8, a group of 40 scientists and students from ten countries met in Mexico City to plan a program of continental drilling that will address a wide range of ongoing issues and hazards facing the Mexico City region. The initial impetus for the workshop was investigation of the long and continuous climate and ecological record preserved in lake sediments underlying the city. Workshop attendees included others with scientific interests in sediment core and borehole instrumentation in this region, including experts in volcanology, seismology, hydrology and the associated geological hazards. This interdisciplinary working group is preparing a number of follow-up discussions and workshops to further develop the project. For more information, please contact Erik Brown (etbrown@d.umn.edu).

# 2011 Kerry Kelts Award

The 2011 Kerry Kelts Student Research Awardee is Laurel Stratton, in the Graduate Program of Hydrologic Sciences at University of Nevada, Reno, for the project titled "Diatoms as Proxies for Hydrographic Variability in a Small, Subalpine Lake, Sierra Nevada Mountains, Northern California".

Laurel was presented with this award at the annual Division Business Meeting on Oct. 11. Congratulations, Laurel!

Thanks to all the students who submitted proposals, and good luck as you continue your research in Limnology, Paleolimnology, and Limnogeology.

#### 2011 Israel C. Russell Award

The recipient of the 2011 Israel C. Russel Award is W. Berry Lyons, from Ohio State University! This award was established to honor those who have made significant career contributions to lake research and education. The winner was announced at the annual Division Business Meeting on Oct. 11, 2011.

Below is the citation and response for the award.

#### Citation by Scott W. Tyler:

It is an honor and a tremendous pleasure for me to

major contributions to the field of limnogeology to my

present the citation for the Israel Cook Russell award for dear friend and colleague, Berry Lyons. Berry has been a leader in the broad field of environmental geochemistry, and is



recognized internationally as an expert in wide range of areas, including trace element

transport in the environment, geochemical evolution of lakes and lacustrine sediments and global climate change in the Polar Regions. His diversity of interests and expertise is phenomenal; he has conducted seminal work on the geochemical evolution of saline lakes and in the same year, published groundbreaking work in the sediment fluxes to the oceans. Berry has published over 180 research papers covering some of the broadest topical areas I have ever seen. He has collaborated with a tremendous group of colleagues from around the world, including his accomplished wife and colleague at the Ohio State University, Dr. Anne Carey. Berry has also served tirelessly on editorial boards of journals ranging from Applied Geochemistry to Water Resources Research, National Academy panels, all while serving as PI and Chief Scientist for a decade, of the National Science Foundation's Long Term Ecological Research Site at the McMurdo Dry Valleys in Antarctica. He has been widely recognized by his peers including Fellow of the American Geophysical Union, the Geological Society of America, the AAAS and the Explorers Club.

I have had the pleasure to know and work with Berry for almost the same amount of time, and every meeting is joy and exciting. My emotions are shared by all of Berry's colleagues, and I would like to read to you a few of their words and their appreciation for Berry's contributions, collaboration and friendship.

"Berry is a gung-ho scientist who finds great joy in discovery and collaboration. He is as much of a people person as he is a scientist. This combination makes working with him a wonderful experience both from a professional perspective and for just having fun"

"He combines the people-skills with a rigor for organization and setting reasonable goals. As such he has a wonderful ability to create a team out of a group of self-directed and focused scientists.

"Berry is able to take in the big picture and motivate group goals such that everyone has a buy-in"

"Berry, your generosity, humility and friendship has been enduring and valued in more than 20 years of collaboration"

"Berry Lyons is a true friend to many and a wonderful scientist who epitomizes the term interdisciplinary in every way."

"Hurray for Berry!"

Berry's accomplishments could fill this lunch hour easily, but as you heard from his colleagues and students, his spirit of discovery, camaraderie and energy are those of a truly a great scientist, educator and colleague. I cherish the collaborations and friendship that I have been fortunate to have with Berry Lyons, and ask that you join me in recognizing and congratulating the Limnogeology Division's 2011 Israel Cook Russell Awardee, Dr. William Berry Lyons.

#### Response by W. Berry Lyons:

Thank you Scott for your gracious and very generous words. I would like to begin by thanking the Limnogeology Division of GSA for this wonderful honor. It is particularly gratifying to me to follow my long-time colleague Bill Last as the second awardee, as Bill

and I collaborated on the investigation of Canadian Prairie lakes in the late 1980's. It is extremely humbling to be honored by your peers and I found it difficult to reflect on my linmogeological career in just a few words.

Bill mentioned last year in his response that having grown up within meters of Lake Michigan that he had always been fascinated by lakes. I grew up within a few kms of the ocean and as I grew into adulthood knew that I wanted to be an ocean scientist. My oceanographic career ended abruptly in the early 1980s as I became more interested in terrestrial aquatic systems, especially salt lakes. Also as I taught aquatic geochemistry for the first few times, I became intrigued by the seminal work by Hardie and Eugster on closed-basin lake chemical evolution, and soon began to think about how elemental variation in lake systems was reflected by both watershed and in-lake biogeochemical processes. Two other career changing influences occurred soon after that increased my desire to refocus my research interests on lacustrine geochemistry—both of these connected my oceanographic past to my limnological future. The first was the reading of a paper by Karen van Damm and John Edmond that essentially asked the question-What would the chemistry of the oceans look like without mid-ocean spreading centers? The answer in their minds was to look to alkaline, saline lakes in Africa. The second epiphany came from the work of Bill Green and his students who approached the understanding of Antarctic saline lake evolution by applying an oceanographic perspective on solute mass balance. About this same time Mark Hines, Andy Herczeg, John McArthur and Dave Long and I were working on acid lake systems in Australia and Bob Wharton asked me to become part of the McMurdo Dry Valleys LTER project, where I had the great opportunity to conduct research on these fascinating and unusual closed-basin lakes at 78°S.

So from the late 1980's one of my major research and teaching interests has been the study of the geochemical behavior of lakes. Along the way, I have literally been blessed to have been associated with many hard-working, inspiring, and life-sharing colleagues, collaborators, post-docs and students. I am proud to say that I have never had a single authored publication- the life's work that you have honored for today has really been the work of many. Although I do not have nearly the space or time to acknowledge them all, I will note a few! These include the Australian work with Mark, Andy, John and Dave noted above, my brief, but greatly rewarding work in Lake Naivaska, Kenya with Bwire Ojiambo and Bob Poreda, my interest in Great Basin lakes I owe to individuals such as Karen Johannesson, Larry Benson and Scott, and my two decades of Antarctic work I have shared with many wonderful colleagues and students including, to name just a few, Kathy Welch, Peter Doran, Klaus Neumann, Becki Witherow, Sarah Fortner and a major source of knowledge and dedication—John Priscu. I am also grateful to my wife and colleague of over 25 years, Anne Carey, for her support, understanding and collaboration.

Let me finish by adding my astonishment to be associated with the 'likes of Israel C. Russell. In the introduction to 1895 book on lakes he summarized what processes and linkages a scientist had to understand to discern a lake's history.

"The history of a lake begins with the origin of its basin and considers among other subjects the movement of its waters, the changes it produces in the topography of its shore, its relations to climate, its geological functions, and its connections with plant and

animal life." He was clearly a man ahead of his time, with a truly interdisciplinary perspective on lacustrine environments. We can only hope to uphold this tradition.

I am greatly appreciative and grateful to the Limnogeology Division for receiving the IC Russell award. Thank you all very much.

# *ILIC* 6Sixth International Limnogeology Congress



Photo by Michael Marfell from Beautiful Places to Visit.

The Sixth International Limnogeology Congress (ILIC 6) sponsored by the International Association of Limnogeology will be held in the summer or fall of 2015 along the shores of Lake Tahoe, Nevada, USA. Dr. Michael Rosen (USGS) is the meeting chair.

#### Mark your calendars!

# Announcement for the 2012 GSA Annual Meeting

Peter Drzewiecki Storrs, CT

# Geosciences: Investing in the Future



(http://www.geosociety.org/meetings/)

The 2012 annual meeting of the Geological Society of America will take place from November 4-7, 2011, in Charlotte, North Carolina. The theme for the conference is *Geosciences: Investing in the Future*. The meeting website is:

http://www.geosociety.org/meetings/2012/

A circular for the meeting is found at:

http://www.geosociety.org/meetings/2012/documents/2012GSA-1stAnnc.pdf

There are a number of technical sessions (some sponsored by the Limnogeology Division) and field trips that may be of interest to limnogeologists. These include:

- T8. Hydrochemistry and Biogeochemistry of Tropical Mountainous Rivers and Estuaries Steven Goldsmith, Russell Harmon, Ryan Moyer
- T67. Innovative Classroom Approaches to Teaching Biogeochemistry Steven Goldsmith, Sarah K. Fortner, Stephen Levas
- T89. Groundwater–Surface Water Interactions: Approaches for Improved Decision Making for Water Resource Issues
  Brewster Conant, Donald O. Rosenberry

T108. Modern and Ancient Saline Lakes

GSA Limnogeology Division

Daniel Deocampo, Cynthia M. Liutkus

T109. Wetlands: Form, Function and History

GSA Limnogeology Division; GSA Quaternary Geology and Geomorphology

Division; GSA Hydrogeology Division Michelle F. Goman, Gail M. Ashley

T110. New Perspectives on Modern and Ancient Rift Lakes

GSA Limnogeology Division

David B. Finkelstein, Elizabeth Gierlowski-Kordesch

T111. Lake Systems Through Space and Time

GSA Limnogeology Division; SEPM (Society for Sedimentary Geology); GSA

Sedimentary Geology Division

Elizabeth H. Gierlowski-Kordesch

T112. Lacustrine Microbialites Past and Present: Hydrology, Water Chemistry,

Sedimentology, and Stratigraphy

GSA Limnogeology Division

H. Paul Buchheim

# **Upcoming Meetings**

#### Geological Society of America (GSA) Annual Convention

November 4-7, 2011

The **Geological Society of America** will hold its Annual Meeting in Charlotte, North Carolina, USA. The conference theme is Geosciences: Investing in the Future. Abstract Deadline was <u>August 14, 2012.</u>

The meeting website is: <a href="http://www.geosociety.org/meetings/2012/">http://www.geosociety.org/meetings/2012/</a>

Future Meetings are scheduled for:

2013 - Denver, Colorado, USA: 27–30 October

2014 - Vancouver, British Columbia, Canada: 19–22 October

2015 - Baltimore, Maryland: 1-4 November

## International Association of Theoretical and Applied Limnology (SIL)

SIL 2013 Congress

The **32<sup>nd</sup> Congress of the International Society of Limnology** will take place in Debrecen, Hungary in 2013. The 33<sup>rd</sup> congress will be held in Turin, Italy, in 2016. For more information about these meetings, see the SIL website: <a href="http://www.limnology.org/">http://www.limnology.org/</a>

SIL announced the 13<sup>th</sup> EWRS International Symposium on Aquatic Plants & the 2<sup>nd</sup> International SIL Workshop of Working Group on Macrophytes (27-31 August 2012) in Poznan, Poland. For information, please contact Dr. Krzysztof Szoszkiewicz (kszoszk@au.poznan.pl)

#### North American Lake Management Society (NALMS)

November 7-9, 2012

The 32<sup>st</sup> International Symposium of the North American Lake Management Society will take place in Madison, Wisconsin, USA. The Abstract Deadline is June 1, 2012

The website is: <a href="http://www.nalms.org/home/conferences-and-events/2012-nalms-symposium/nalms-symposium.cmsx">http://www.nalms.org/home/conferences-and-events/2012-nalms-symposium/nalms-symposium.cmsx</a>

#### **International Lake Environment Committee (ILEC)**

Information on the next conference is not yet available

The **14<sup>th</sup> World Lakes Conference (WLC)** took place in Austin, Texas (USA) in 2011. No information is available about the next conference, which occurs every two years.

The ILEC website is: http://www.ilec.or.jp/eg/index.html

# International Paleolimnology Association (IPA)

August 20 – 24, 2012

The 12<sup>th</sup> International Paleolimnology Symposium of the International Paleolimnology Association will take place in Glasgow, UK. An abstract deadline has not yet been posted. The IPA is currently soliciting ideas for themes.

The IPA Symposium website is: <a href="http://www.paleolim.org/index.php/symposia/">http://www.paleolim.org/index.php/symposia/</a>

## American Society of Limnology and Oceanography (ASLO)

#### 2012 ASLO Summer Conference (June 6-13, 2012)

The summer conference of the American Society of Limnology and Oceanography will be held in Portland, OR, USA. Abstract deadline: <u>Not published yet.</u>

#### 2013 ASLO Aquatic Science Meeting (February 17-22, 2013)

The aquatic science meeting of the American Society of Limnology and Oceanography will be held in New Orleans, Louisiana, USA. Abstract deadline: <u>Not published yet.</u>

#### **2014 ASLO Summer Conference (May 18-23, 2014)**

The summer conference of the American Society of Limnology and Oceanography will be held in Lake Biwa, Otsu, Japan. Abstract deadline: Not published yet.

#### 2014 ASLO Ocean Sciences Meeting (Feb 23-28, 2014)

The Ocean Sciences Meeting of the American Society of Limnology and Oceanography will be held in Honolulu, HI, 2014. Abstract deadline: Not published yet.

The website listing all these conferences is: <a href="http://www.aslo.org/meetings/aslomeetings.html">http://www.aslo.org/meetings/aslomeetings.html</a>

# American Association of Petroleum Geologists Annual Conference and Exhibition

April 22-25, 2012

The **2012** Annual Conference and Exhibition of the American Association of **Petroleum Geologists** will take place in Long Beach, California. Abstract deadline was Sept. 22, 2011.

The conference website is: http://www.aapg.org/longbeach2012/

The **2013** Annual Conference and Exhibition of the American Association of **Petroleum Geologists** will take place in Pittsburgh, Pennsylvania from May 19-22, 2013.

#### **Desert Symposium 2012**

April 20-23, 2012

The **26<sup>th</sup> Annual Desert Symposium** will take place in the Desert Studies Center, Zzyzx, California. The theme for the 2011 meeting is "Life in the Desert: Adaptations to Environmental Extremes". No information is available about the 27<sup>th</sup> symposia

The conference website is: <a href="http://biology.fullerton.edu/dsc/school/symposium.html">http://biology.fullerton.edu/dsc/school/symposium.html</a>

# 6<sup>th</sup> International Limnogeology Congress

July, 2015

The 6th International Limnogeology Congress (ILIC6) will be held at Lake Tahoe, Nevada/California, USA. Stay tuned for details. Michael Rosen, from the organizing committee, is seeking volunteers to help organize the conference and field trips. Please contact him (below) if interested.

For information contact Dr. Michael Rosen (USGS): mrosen@usgs.gov

# International Association for Great Lakes Research (IAGLR)

May 14-18, 2012

The 55<sup>rd</sup> Annual Conference of the International Association for Great Lakes Research (IAGLR) will take place in Cornwall, Ontario, Canada.

The conference website is: http://iaglr.org/conference/

## International Society for Salt Lake Research (ISSLR)

Was May 8-16, 2011

The 11<sup>th</sup> International Conference on Salt Lake Research (ISSLR) took place in Miramar, Cordoba, Argentina, on May 8-16, 2011. No information about a future meeting is available.

ISSLR's website is: <a href="http://www.isslr.org/index.asp">http://www.isslr.org/index.asp</a>

# Great Plains Limnology Conference / Oklahoma-Texas Aquatic Research Group (GPLC/OTARGISSLR)

October 28-29, 2011

The third joint meeting of GPLC and OTARG was at the University of Oklahoma Biological Station on October 28-29. No current information is available for future meetings.

The conference website is: <a href="http://www.ou.edu/uobs/OTARGregistration.htm">http://www.ou.edu/uobs/OTARGregistration.htm</a>

# Go to the Limnogeology Division website at:

http://rock.geosociety.org/limno/index.html

To get the latest information on other Limnogeology meetings and workshops...

David Warburton, Webmaster

If you don't have access to our website, please contact a Division officer for a list of meetings.

If you have any news you would like to be sent out to the division, please submit it to Peter Drzewiecki at drzewieckip@easternct.edu