Limnogeology Division Newsletter
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THE GEOLOGICAL SOCIETY OF AMERICA

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Welcome: Welcome to the second newsletter of the newly formed Limnogeology Division of the Geological Society of America (GSA). The purpose of the Division is to promote (1) the research on both ancient and modern lakes around the world, (2) the collaboration of scientists from all disciplines on lake research, (3) the presentation and publication of lake research, and (4) students in performing research or wishing a career in lake studies. Any GSA Member, Fellow, Honorary Fellow, Associate, or Affiliate who is in good standing may affiliate with the Limnogeology Division. To effect such affiliation, an applicant must express his/her desire in writing to either the Secretary of the Division or to the Executive Director of the Society. All Division members, except GSA Affiliates and Associates, may vote and hold office in the Division. GSA Affiliates and Associates may serve on committees as conferees.

(continued on p. 2)

Table of Contents

Editor's Message (continued from p. 1)

Your Newsletter: We have decided that the newsletter will appear on a semi-annual basis around January and June each year (hence this issue!) If we don't get sufficient information to present, we will go back to an annual newsletter. So please send me articles and information for the newsletter at <mrosen@usgs.gov>. The Division encourages both members and non-members to send information on meetings, field trips and other limnogeology related subjects. Short articles about interesting limnogeology topics would also be welcomed. This newsletter is not a formal publishing option, but summaries or other provocative scientific information could be included in the newsletter. The newsletter will be available on the GSA Limnogeology Division website (notification of posting will be sent to Limnogeology Division members via email) but will also be sent out by mail to the Division members who do not have GSA email access.

I hope you enjoy this second issue. Any comments or questions would be most welcome.

Michael Rosen
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Big Soda Lake Nevada, one of my favorite lakes. Active modern tufa (about 1 m tall) forming because of active ground water input mixing with lake water. Microbes are also involved in the precipitation process.

Feature Article

LacCore

National Lacustrine Core Repository in Full Swing

by Doug Schnurrenberger <schno005@tc.umn.edu>

LacCore, the National Lacustrine Core Repository <http://lrc.geo.umn.edu/LacCore/laccore.html> has been in operation since August, 2000 with funding from the National Science Foundation and the University of Minnesota. The repository and associated Limnological Research Center (LRC) Core Lab serves the limnogeologic community by providing access to state-of-the-art equipment, expertise and archival facilities. Use of the LacCore and Core Lab facilities are free of charge for repository users; a nominal fee is accessed to non-repository visitors.

The repository is run on a day-to-day basis by the curator (Doug Schnurrenberger) under the direction of the LRC Director (Emi Ito). Operations of the facility are overseen and directed by an External Advisory Group composed of five members. Visiting investigators are assisted by a repository lab scientist (Anders Noren) and the Core Lab manager (Amy Myrbo). Undergraduate technicians are available as needed on an hourly basis.

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LacCore (continued)

LacCore activities to date have involved three primary areas 1) participation in the Global Lakes Drilling (GLAD) program, 2) participation in recovery, documentation and curation of lacustrine cores from other programs, and 3) providing access and expertise to investigators who use the Core Lab and its equipment.

The GLAD200 on Hvitarvatn, Iceland (photo courtesy of Gifford Miller).

GLAD Program

Beginning with the scientific drilling and engineering trials on Great Salt Lake in 2000, a total of four GLAD drilling projects have been successfully carried out to date. With funding from the International Continental Drilling Program (ICDP ; http://icdp.gfz-potsdam.de/) and national funding agencies, shallow and deep lakes have been drilled from 14°S to 64°N latitude. The GLAD lake drilling systems are owned and operated by DOSECC (Drilling, Observation and Sampling of the Earth's Continental Crust; http://www.dosecc.org) a non-profit, NSF funded corporation under the direction of some 50 research institutions. The innovative, customized drilling rigs and platforms constructed by DOSECC engineers have ushered in an era of cost effective lake drilling that can finally provide the high-quality, long lacustrine records necessary for documenting long and short-term continental climate change.

The GLAD800 on Lake Titicaca.

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LacCore (continued)

LacCore personnel have participated in the four GLAD projects to date (GLAD1-GLAD4; Table 1). Lac Core personnel have assisted GLAD projects by providing curatorial expertise during the drilling process, with Initial Core Descriptions (ICD) in the LRC Core Lab, and providing curation and archival space.

Over 2000 meters of core sections are archived in the LacCore reefers from GLAD1,2 &4 (GLAD3 is archived by the USGS). Cores from GLAD1 and 2 are beyond the moratorium and are available for study by qualified investigators. In addition to the GLAD cores, LacCore archives cores from a number of lakes around the world. This core collection is particularly suitable for investigators wishing to test proxies against sediments from a wide range of lacustrine environments.

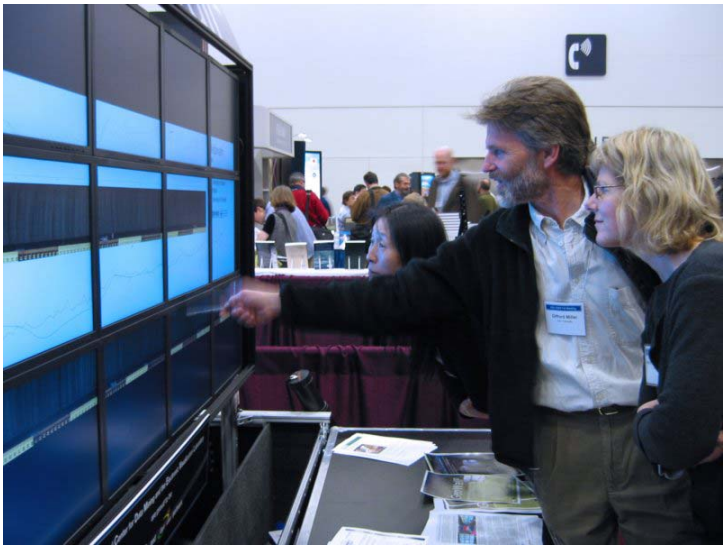
Table 1. Lakes cored in the GLAD program

Expedition	Lake/s	Location	Sponsor
GLAD1	Great Salt Lake, Bear Lake	Utah	NSF
GLAD2	Lake Titicaca	Bolivia	NSF
GLAD3	Englebright Reservoir	California	USGS
GLAD4	Hestvatn, Hvitarvatn, Haukadalsvatn	Iceland	NSF, IRC

In addition to the large GLAD projects, LacCore personnel have participated in a number of smaller projects providing coring expertise with the LRC Kullenberg coring system for recovering long cores from deep lakes, or hand-operated (Livingston/Boliva) corer for shallower lakes. Other visitors bring their cores to use the equipment and space provided in the LRC Core Lab. Visiting scholars from around the world have taken advantage of the state-of-the-art lab equipment and expertise offered by LacCore.

The Core Wall Project

A consortium of computer engineers, scientific visualization experts, JOI Joint Oceanographic Institutions), the Electronic Visualization Lab at the University of Illinois, Chicago and LacCore personnel are working on the construction of a Core Wall – an integrated core logging system permitting full integration of core images, logging data and other data sources in an interactive environment facilitating the description and analysis of core sections from lakes and the oceans. A letter of intent has been submitted to NSF in anticipation of a full fledged proposal in the near future.



Giff Miller, Aslaug Geirsdottir(right) and Emi Ito (left) examining one of their core sections on the CoreWall display at the Fall AGU.

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LacCore (continued)

Investigators interested in using the LacCore and LRC Core Lab facilities or learning more about them can contact Doug Schnurrenberger (schno005@umn.edu) or Amy Myrbo (amyrbo@umn.edu) at 612-626-7889. Below is a list of the equipment available to visiting scholars. Fees are assessed only where chemicals and other supplies are expended.

Lab ICD Equipment

Visiting scholars are welcome to use all equipment and space free of charge. LacCore personnel will assist visitors as required.

GEOTEK Ltd Multi Sensor Core Logger (MSCL) – LacCore was recently funded to purchase a new GEOTEK MSCL. The capabilities of the new machine are: P-wave velocity, gamma ray attenuation densitometry, electrical resistivity, natural gamma, loop and point magnetic susceptibility and core imaging. The new machine should be available by February, 2004.

Core Splitting System – Dual mounted cast-saws on a mobile track for making the initial incision. The final cut is made with box cutters on a specially designed core splitting table.

DMT (Deutsche Minen Technologie) Core Imaging System – A line scanner capable of scanning split cores up to 1.6 meters in length at resolutions of 5, 10 or 20 pixels/mm.

Core Description Cradles – custom-made core cradles with slots for up to four cores of 1.5 m length.

Smear Slide Description Station – complete layout for preparation of smear slides and examination with a Wild petrographic scope.

Core Section Curation – station for wrapping cores efficiently and stowing material in D-tubes. Includes foam for filling gaps and sample holes and label maker for labeling end-caps.

Analytical and Sample Preparation Equipment

Freezer
Freeze-dryer
Centrifuges
TIC/TC coulometer
Binocular scopes for coarse fraction viewing or microfossil picking
Compound microscopes for pollen or diatom analysis
Pollen processing lab
Thin section preparation station
Biogenic silica analysis station
14C AMS prep line
Programmable muffle furnace
Drying ovens
XRD prep station

Field Equipment

LRC field systems and coring expertise by LacCore and LRC personnel are available to visiting scholars and collaborators. Our fleet includes a pontoon designed for four-point anchoring with a central moonpool, a rowboat and canoes, and the Kullenberg coring platform.

For deep lakes (>25m), we have employed the LRC/ETH Kullenberg coring system in projects ranging from Chile to Manitoba. Cores can be recovered from up to approximately 140m water depth with lengths up to 12 m. The entire system can be shipped to overseas locations where necessary.

For shallower lakes we have several drive rod coring systems (Livingstone) that can be used with plastic tubing (2 5/8") with a steel barrel and extrusion (2"). Also available are a gravity coring system (MUCK), freeze corer and a variety of water sampling equipment including a hydrolab.

ICDP International Workshop Report

Scientists Ponder Drilling China's Largest Lake

This report submitted by An Zhisheng, Institute of Earth's Environment, Xi'an, China and Steven M. Colman, U.S. Geological Survey, Woods Hole, MA USA on behalf of the organizing committee, which included Francoise Gasse, Ulrich Harms, Peter Molnar, Jörg Negendank, Dennis Nielson, Stephen Porter, and Takayoshi Kawai.

An ICDP international workshop entitled "Scientific Drilling at Lake Qinghai on the northeastern Tibet Plateau: High-resolution paleoenvironmental records of eastern Asia and their significance for global change" was held at Xining, China, October 20-24, 2003. The workshop was sponsored by the Institute of Earth Environment, Chinese Academy of Sciences (IEE-CAS) and financially supported by the International Continental Drilling Program (ICDP), the CAS, and the Natural Science Foundation of China (NSFC). The aim of the workshop was to discuss drilling goals and selection of drill sites on the basis of existing data, scientific goals, technical feasibility, and project management. It was attended by a diverse group of about 50 scientists representing a range of countries and scientific disciplines. The majority came from China and the United States, but Japan, Austria, France, Germany, England, and Australia were also well represented. The officers of Qinghai provincial government and officials of CAS and NSFC also attended.

Lake Qinghai is the largest lake in China, and at 3,194 m altitude, is one of the highest large lakes in the world. It covers an area of 4,400 km^2, has an average depth of 21 m, a maximum depth of 27 m, and a drainage area of about 29,660 km^2 on the northeast part of the Qinghai-Tibetan Plateau. During the period from 1908 to 2000, lake level declined from 3205 m to 3193 m at an average rate of 12.7 cm/yr, and the area of lake shrank by about 302 km^2. The lake occupies a "piggy-back basin," a closed tectonic depression on the upper plate of a major, active thrust fault, and the basin is bound to the north by the Qilian Mountains, which constitute the northeastern margin of the Tibetan Plateau. The lake basin thus is intimately related to the active tectonics of the Tibetan Plateau. Seismic-reflection data show that in parts of the basin, the lake sediments are tectonically deformed, but that in other parts, the lake sediments are largely undeformed and should record at least the timing of regional tectonism.

Lake Qinghai is extremely sensitive climatically, lying in a critical transitional zone between the humid climate region controlled by the East Asian monsoon and the dry inland region affected by Westerly winds. Climatic conditions in the Lake Qinghai region result from the interaction of three major circulation systems: first, the winter monsoon, induced by Siberian high pressure and associated high-latitude ice cover; second, tropical moisture from low latitudes, carried by the East Asian summer monsoon; and third, climatic changes in the North Atlantic region, the effects of which are inferred to be transmitted via the Westerlies. Major scientific questions exist concerning the climatic history of this area and the changes in importance of its several climatic systems. A great deal of scientific excitement was generated at the workshop concerning these questions. The workshop participants concluded that Lake Qinghai is an outstanding, world-class location for high-resolution records of the climate and environmental history.

Two days of the workshop were devoted to presentations about the setting and prior work on Lake Qinghai, results from other lake drilling projects, and analyses that will be useful on the proposed cores. Workshop discussions were broken up by a one-day field trip, led by Steve Porter, which circumnavigated the lake and examined various late Quaternary landforms and deposits on the lake margin. The last day of the workshop was devoted to working groups and plenary sessions discussing the details of logistics, the selection of drill sites and their relative priorities, and planning for analytical work on the cores. As many as four drill sites are planned, some to depths of as much as 700 m, reaching sediments as old as Pliocene. Drilling operations, to be conducted by DOSECC, Inc., are planned for the summer of 2005, pending the outcome of proposals to ICDP and to Chinese funding organizations.

Upcoming Limnogeology Meetings

The following meetings include at least some sessions on limnogeology, but *the entire meeting may not be focused only on limnogeology.*

May 12-14, 2004 - Geological Association of Canada, Brock University, St. Catharines, Ontario. Contact: Dr. Greg Finn, Earth Sciences. Session on: Paleoecology in the Great Lakes. Post-meeting field trip to Crawford Lake, led by J. H. McAndrews, Royal Ontario Museum.

May 25-29, 2004 - International Association for Great Lakes Research, University of Waterloo, Waterloo, Ontario. Contact: Dr. Robert Hecky, Biology. Sessions organized by Paul Karrow (Earth Sciences) and Mike Lewis (G.S.C. Dartmouth, NS) on: The Greater and Lesser Great Lakes (definite), and Geochemical history of the Great Lakes (possible). Paper submissions are invited.

Sunday August 8th - Saturday August 14th 2004 - Finnish Limnological Society. The Organising Committee, the Finnish Limnological Society, the University of Helsinki, the City of Lahti and the Finnish members of SIL invite you to participate in the 29th Congress of the International Association of Limnology in Finland. The International Association of Theoretical and Applied Limnology (Societas Internationalis Limnologiae, SIL) is the key scientific organization concerned with the understanding and management of inland aquatic ecosystems worldwide. Finland, the country of thousands of lakes, is also rich in rivers and ground waters and is partly surrounded by the Baltic Sea, a large brackish water system. The City of Lahti, gateway to the Finnish Lake District, will provide an inspiring congress venue for discussion, debate and evaluation of the scientific progress of limnology as well as the environmental issues raised by the use or abuse of fresh waters. While there will be numerous sessions of interest to salt lake researchers, please consider the following special session dedicated to conservation, biodiversity and management issues of saline lakes. Abstracts are due **February 29, 2004.**

INLAND SALINE LAKES: BIODIVERSITY, CONSERVATION, AND MANAGEMENT. Inland saline lakes are widespread throughout the arid and sub-arid regions of the world and constitute ~45% of the volume of inland waters. They include a diverse array of aquatic ecosystems of considerable ecological importance, especially to migrating and breeding birds and endemic species. They are also threatened throughout the world by an array of impacts. While the limnology of saline lakes shares much with their freshwater counter-parts, this session will address biodiversity, conservation, and management issues specific to saline lakes.

For more information on this session contact: **Robert Jellison** <**jellison@lifesci.ucsb.edu**>, Marine Science Institute, University of California, Santa Barbara, CA 93106, U.S.A. For more information on the meeting in general go to: <**http://www.palmenia.helsinki.fi/congress/sil2004/home/welcome.asp**>.

November 7-10, 2004 - Geological Society of America Annual Meeting, Denver, CO

Important dates for this meeting in 2004:
April 1st: Electronic abstract form posted at <www.geosociety.org>.
April: First announcement in *GSA Today*.
June: Second announcement in *GSA Today*.
July 13th: Abstracts due by midnight, MST.
mid-August: Technical Program schedule finalized.
Sept. 1st: Accepted abstracts posted (with links to speakers.)

More information about the meeting is available online at: <http://www.geosociety.org/meetings/2004/>.

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GSA 2005 Meeting (continued)

Seven sessions have been proposed that will be sponsored or cosponsored by the Limnogeology Division if enough abstracts are accepted. They are (*Editor's Note* - Session 7 looks good!):

1. Lacustrine Records of Landscape Evolution. [Jeff Pietras, Eric Carson and Alan Carroll, organizers]
2. Frontier in Understanding the Geologic Record of Climate Change: A Session in Honor of William Hay. [Eric Barron and Bob DeConto, organizers]
3. Authigenic Minerals in Modern and Ancient Terrestrial Aquatic Environments. [Dan Larsen and Dan Deocampo, organizers]
4. Aquitard Studies: Understanding Geologic Constraints on Flow and Transport in Groundwater Flow Systems. [Ken Bradbury, Beth Parker, David Hart, and Tim Eaton, organizers]
5. Alkaline Evaporative Lakes and Playas: Insights into Microbial Physiology and Mineral Facies in Semi-Arid Settings. [David Finkelstein, Tom Kulp and Lisa Pratt, organizers]
6. Paleontology and Stratigraphy of the Late Eocene Florissant Formation, Colorado. [Herb Meyer and Dena Smith, organizers]
7. Hydrologic and paleoclimatic significance of non-marine microbial carbonates (tufas, microbialites, stromatolites and thrombolites). (Top. Sess. No. 43) [Michael Rosen and Robin Renaut, organizers]

For a topical session to be run, 12-16 papers must be submitted to the session. Therefore, it is up to you as limnogeologists to prepare abstracts for these sessions if you want to see them at GSA. Please contact the session organizers if you would like more information about a particular session. Look in the April 2004 *GSA Today* for the email addresses of the conveners and their addresses.

April 12-14, 2005 - Late Cenozoic Drainage History of the Southwestern Great Basin and Lower Colorado River Region: Geologic and Biotic Perspectives.
The workshop will be held, with an optional one-day field trip on the 15th, at the Desert Studies Center at Zzyzx, California, about 10 miles from Baker on Interstate 15, halfway between Los Angeles and Las Vegas. All housing and meals will be provided on-site as part of the registration fee. Based on the current fee structure, we anticipate this cost will not exceed $250 (exclusive of your travel and the cost of vehicle rental for the field trip). The workshop will be carefully structured to cover the drainage basins of interest. We plan to focus on three geographic areas: (1) Lower Colorado River, (2) Mojave River / Transverse Ranges (down to Lake Mojave), and (3) basins which had a pluvial lake connection with Death Valley (Owens River chain, Amargosa-Tecopa). Sessions will consist of two invited talks that review pertinent geologic-hydrographic history and biologic evidence for each geographic area, followed by selected talks on current research, followed by a roundtable discussion on the area (and links to the adjacent areas). We do encourage people to propose talks in their areas of interest, but note that we will carefully select those that focus closely on the biologic/geologic theme so that there is plenty of time for discussion and interaction. Other research contributions can be accommodated as poster sessions. Finally, we propose to have breakout sessions to identify promising avenues of future research. We would like everyone to stay for the duration of the workshop (not leave early or come late) in order to maximize the synergy among participants. Organizers: Bob Hershler (email: Hershler.Robert@NMNH.SI.EDU), Marith Reheis (mreheis@usgs.gov), and Dave Miller (dmiller@usgs.gov).

June 5-10, 2005 - CANQUA 2005. The next biennial meeting of CANQUA (Canadian Quaternary Association) will be June 5-10, 2005, in both Winnipeg and Regina, with a mid-Conference fieldtrip across the eastern Canadian Prairies linking the two venues. Various special and general sessions will accompany a session honoring Vic Prest. For more information, consult the CANQUA web site at <http://www.mun.ca/canqua/> or contact: Co-Chairs **Dave Sauchyn <**sauchyn@uregina.ca> **or Jim Teller <**tellerjt@ms.umanitoba.ca>.