



Fall 2012

Newsletter of the

Archaeological Geology Division of the

Geological Society of America

FROM THE NEWSLETTER EDITORS

We welcome featured research and news from the membership, as well as ideas and suggestions for making the newsletter a more valuable resource. Please send us your stories, photos, opportunities, information, and ideas. We hope everyone has an excellent winter. Send us your summer field plans and we'll feature them in the spring newsletter!

- Cynthia Fadem (fademcy@earlham.edu)
& Judson Finley (judson.finley@usu.edu)

UPCOMING MEETINGS

INTERNATIONAL CONFERENCE ON THEORY & METHOD IN THE PREHISTORIC ARCHAEOLOGY OF CENTRAL EUROPE

October 24th-26th, 2012

Mikulov, Czech Republic

<http://theoryandmethod.gofs.cz/>

NATIONAL MEETING OF THE GEOLOGICAL SOCIETY OF AMERICA

4-7 November 2012

Charlotte NC

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

**GSA Archaeological Geology Division Business Meeting
& Awards Reception: Monday, 5 November 2012,**

5:45 PM-7:45 PM in Charlotte Convention Center 201AB

**Archaeological geology-themed & AGD co-sponsored
sessions:**

T11. New Developments and Applications in Sclerochronology

*GSA Archaeological Geology Division; Paleontological
Society*

C. Fred T. Andrus, Donna Surge

Sclerochronology, the study of physical and chemical records in accretionary skeletons, is increasingly important in several disciplines. This session will highlight new geochemical methods, species validation studies, and applications in archaeology, ecology, paleoclimatology, and paleontology.

T12. A Healthy Dose of Quaternary Geochronology at the Shoreline: Applications of Luminescence and Other Dating Techniques to Resolving the Timing of Coastal, Estuarine, and Lake Shore Processes

*GSA Quaternary Geology and Geomorphology Division;
GSA Archaeological Geology Division; GSA
Environmental and Engineering Geology Division;
Geochemical Society*

Shannon A. Mahan, Kenneth Lepper

We encourage presentations on applications and refinements for dating methods, such as OSL, ESR, fission track, radiocarbon, and cosmogenics, with a focus on constraining the timing and rates of Quaternary geologic processes around coastal shorelines.

T13. Geoarchaeological Approaches to Paleoenvironments and Landscapes

*GSA Archaeological Geology Division; GSA Quaternary
Geology and Geomorphology Division*

Katherine A. Adelsberger, Justin A. Holcomb

Geoarchaeologists utilize a variety of proxy records as primary evidence for landscape and environmental change in archaeological contexts. This session welcomes interdisciplinary papers focused on understanding human interactions with past environments throughout the Quaternary.

T14. Archaeological Geology (Posters)

GSA Archaeological Geology Division

Katherine A. Adelsberger

This session welcomes poster presentations on interdisciplinary topics in geoarchaeology.

T22. Using Buried Soils to Reconstruct Past Climates: Opportunities and Considerations

*GSA Quaternary Geology and Geomorphology Division;
GSA Archaeological Geology Division; SEPM (Society for
Sedimentary Geology)*

Holly A. Meier, Jessica LB Monson, Ashley B. Zung

This session aims to (1) further investigate "soils as archives of past climates" using preserved pedogenic features, and (2) evaluate developed proxies for modern and ancient systems.

T24. Geomorphology of the Anthropocene: The Surficial Legacy of Past and Present Human Activities
GSA Quaternary Geology and Geomorphology Division; GSA Geology and Society Division; GSA Archaeological Geology Division

Anne J. Jefferson, Karl W. Wegmann, Anne Chin
This session explores the legacy of human activities and land use on earth surface processes and landforms. Studies on the impacts of agriculture, mining, urbanization, and forestry in prehistoric, historic, and modern times are welcome.

T117. Submerged Shorelines: Field Evidence and Computer Modeling of Former Sea Levels

James Andrew Cooper
The record of postglacial sea-level change is drowned on the continental shelf, but growing numbers of stratigraphic and geomorphic observations are revealing a record that is at odds with numerical simulations.

INTERNATIONAL WORKSHOP AND JOINT COST-INTIMATE - CELL-50k MEETING
12-15 November 2012

Hungarian Natural History Museum, Budapest
<http://cost-es0907.geoenvi.org/activities/intimate-events/910-upcomming/94-first-international-workshop-and-joint-cost-intimate-cell-50k-meeting>

ANNUAL MEETING OF THE SOCIETY FOR AMERICAN ARCHAEOLOGY
3-7 April 2013
Honolulu HI

<http://www.saa.org/AbouttheSociety/AnnualMeeting/tabid/138/Default.aspx>

There will be sessions co-sponsored by the Geoarchaeology Interest Group, so keep an eye out for the final conference program!

CONGRATULATIONS!!

Congratulations to AGD member and geoarchaeologist Dr. Rolfe Mandel, University of Kansas, who received a Higuchi-KU Endowment Research Achievement Award: the Irvin Youngberg Award for Applied Sciences!

Rolfe Mandel, a long-time member of the AG Division, is among four professors in Kansas Board of Regent institutions to be honored with the state's most prestigious recognition for scholarly excellence: the Higuchi-KU Endowment Research Achievement Awards. He was selected for the 2012 Irvin Youngberg Award for Applied Sciences. Rolfe is Senior Scientist and Executive Director of the Odyssey Geoarchaeology Research Program and Professor in the KU Department of Anthropology.
<http://www.news.ku.edu/2012/october/10/higuchi.shtml>

INTERNATIONAL SYMPOSIUM ON CHERT & OTHER KNAPPABLE MATERIALS
20-24 August 2013
University of Iasi, Romania
<http://arheoinvestsymposium.uaic.ro/stone>

DEVELOPING INTERNATIONAL GEOARCHAEOLOGY MEETING
5-7 September 2013
&
WORKSHOP ON ARCHAEOLOGICAL SOIL MICROMORPHOLOGY
3-4 September 2013
University of Basel, Switzerland
<http://www.developinginternationalgeoarchaeology.org/first.html>

Contact Christine Pümpin (Christine.Puempin@unibas.ch) for details of the workshop.

FUNDING OPPORTUNITIES

THE DOUGLAS C. KELLOGG AWARD FOR GEOARCHEOLOGICAL RESEARCH

The Douglas C. Kellogg Award provides support for thesis or dissertation research, with emphasis on the field and/or laboratory aspects of this research, for graduate students in the earth sciences and archaeology. Under the auspices of the SAA's Geoarchaeology Interest Group, family, friends, and close associates of Douglas C. Kellogg formed a memorial in his honor.

Eligibility & Nominations: Recipients of the Kellogg Award will be students who have an interest in (1) achieving the M.S., M.A. or Ph.D. degree in earth sciences or archaeology; (2) applying earth science methods to archaeological research and (3) pursuing a career in geoarchaeology.

Nomination/Submission Materials Required: The application should consist of a research proposal no more than three pages long that describes the research and its potential contributions to American archaeology, a curriculum vita, and two letters of support, including one from the dissertation chair that indicates the expected date of completion of the dissertation. Electronic submissions as pdfs sent to the committee chair Sarah C. Sherwood (Sherwood@sewanee.edu) are preferred.

Award Amount: \$500

Nomination/Submission Deadline: 29 November 2012

For more information:

<http://www.saa.org/AbouttheSociety/Awards/DouglasCKelloggFellowshipforGeoarchaeologica/tabid/174/Default.aspx>

CLAUDE ALBRITTON, JR. AWARD

The Albritton Award Fund provides scholarships and fellowships for graduate students in the earth sciences or archaeology for research. Recipients of the award are students who have (1) an interest in achieving a Master's or Ph.D. degree in earth sciences or archaeology; (2) an interest in applying earth science methods to archaeological research; and (3) an interest in a career in teaching and academic research. Awards are given in support of thesis or dissertation research, with emphasis on the field and/or laboratory aspects of the research.

Congratulations to our 2012 awardee!

Jill Onken, University of Arizona, *Paleoenvironmental Context of Ancestral Puebloan Demographic and Subsistence Change in West-Central New Mexico*.

Award amount: \$650

For further information contact:

Rolfe D. Mandel (mandel@ku.edu)

Application guidelines and forms can be found at <http://rock.geosociety.org/arch/studentawards.html>.

Submission deadline: 5 March (annually)

To contribute to the Albritton Fund, send your gift to the GSA Foundation, indicating that the gift should go toward this award.

RICHARD HAY STUDENT PAPER/POSTER AWARD

The Richard Hay Student Paper/Poster Award is a travel grant awarded to a student presenting a paper or poster at the GSA's annual meeting. The grant is competitive and will be awarded based on the evaluation of the scientific merit of the research topic and the clarity of an expanded abstract for the paper or poster prepared by a student for presentation in the Division's technical session at the meeting.

Congratulations to our 2012 awardee!

Kevin Coffey, University of California-Los Angeles, *Comparing Zircon Crystallization Ages Between Volcanic Ash In Maya Ceramics And Tierra Blanca Joven Pumice (Ilopango Volcano, Central American Volcanic Arc)*.

Application guidelines and forms can be found at <http://rock.geosociety.org/arch/studentawards.html>.

For more information contact:

Rolfe D. Mandel (mandel@ku.edu)

Submission deadline: 20 September (annually)

To contribute to the Hay Award, send your gift to the GSA Foundation, designating the gift for the Archaeological Geology Division Fund.

**SOCIETY FOR ARCHAEOLOGICAL SCIENCES
STUDENT RESEARCH INTERNATIONAL TRAVEL
AWARD**

The Society for Archaeological Sciences is pleased to announce the creation of the SAS Student Research International Travel Award. Up to \$1000 is now available to help with costs of international travel for laboratory or field research to students who have been SAS members for more than one consecutive year. Applications will be accepted from undergraduates in their final year of study who are planning to attend graduate school as well as Masters degree and PhD students. Research must be undertaken in a different country than that of their home institution. Funds may not be used to attend at conferences, field schools, classes and/or training courses.

Application deadlines: 1 February & 1 September (annually)

**UNIVERSITY OF TÜBINGEN DOCTORAL POSITION
IN GEOARCHAEOLOGY**

The Geoarchaeology working group in the Institute for Archaeological Sciences, University of Tübingen, announces a doctoral position in geoarchaeology to begin as soon as possible. The position is a funded (1/2 E13) studentship for three years within the framework of the project "Late Glacial landscape development and human repopulation of the Ach and Lone Valleys, Baden-Württemberg, Germany," funded by the Baden-Württemberg Ministry of Culture and Science.

The Ach and Lone valleys of southwestern Germany contain numerous Paleolithic cave sites that preserve archaeological sequences spanning the Middle Paleolithic through the Mesolithic. Although considerable geoarchaeological work has been done on the world-famous caves, virtually no work has been conducted on the recent geological histories of the two valleys. This project

will investigate the sedimentological processes of these valleys during and after the LGM, when the region underwent significant environmental and demographic changes. The student will use GIS, geophysics, coring and micromorphology to reconstruct the geomorphological processes of the valleys, focusing on how these processes influenced sedimentation within the caves, and how changing landscapes would have influenced the repopulation of the area following deglaciation.

The ideal candidate should have a completed master's degree, or equivalent, in the field of geology, geography, earth sciences, or archaeology/anthropology. The candidate should have a demonstrated ability for independent research and experience with working in the field. Candidates with proven experience with GPR, coring, or micromorphology are preferred. Knowledge of German is not necessary, but preferred.

Interested parties should submit the following: cover letter, CV, and an example of writing (e.g., thesis chapter). In the cover letter, please include the names of two academic referees with contact information. If English or German is not your first language, please submit evidence of fluency in either language.

Send all requested information as a pdf to:
Christopher Miller (christopher.miller@uni-tuebingen.de)

Deadline for submission: 30 November 2012

The University of Tübingen is an equal opportunity employer. Women and members of minority groups including disabled persons are strongly encouraged to apply.

EVOLVING EARTH FOUNDATION STUDENT RESEARCH GRANT

The 2013 cycle of the annual Evolving Earth Foundation student research grant program has started. A total of ten grants are available, for amounts of up to \$3000 per grant. Undergraduate students, graduate students, and post-doctoral researchers at accredited U.S. colleges and universities or research institutions are eligible to apply for grants.

The Evolving Earth Foundation is dedicated to an increased understanding and awareness of the geologic and biologic processes that shape our earth. Award emphasis will be on research topics that relate to the mission and priorities of the foundation.

Please visit the grant section of the Evolving Earth Foundation Web site for full grant program details: <http://www.evolvingearth.org/evolvingearthgrants/grantsmain.htm>

AWARDS

RIP RAPP AWARD

The Division requests nominations for its annual Rip Rapp Archaeological Geology Award. The award is given for outstanding contributions to the interdisciplinary field of archaeological geology. Nominations should include a biographical sketch, a statement of outstanding achievements, and a selected bibliography of the nominee.

For further information contact:

Rolfe D. Mandel (mandel@ku.edu)

Nomination deadline: 15 February (annually)

FRYXELL AWARD FOR INTERDISCIPLINARY RESEARCH

The Fryxell Award is presented in recognition of interdisciplinary excellence of a scientist who need not be an archaeologist, but whose research has contributed significantly to American archaeology. The award is made possible through the generosity of the family of the late Roald Fryxell, a geologist whose career exemplified the crucial role of multidisciplinary cooperation in archaeology. The award cycles through zoological sciences, botanical sciences, earth sciences, physical sciences, and general interdisciplinary studies. The 2014 Fryxell Award will be in the area of physical sciences. The award consists of an engraved medal, a certificate, an award citation read by the SAA president during the annual business meeting, and a half-day symposium at the Annual Meeting held in honor of the awardee.

Eligibility & Nominations: Any professional archaeologist may submit nominations for this award. Nominees must be SAA members by the time of their nomination.

Nomination/Submission Materials Required: Nominators must submit a letter that describe the nature, scope, and significance of the nominee's contributions to American archaeology, as well as the nominee's curriculum vita. Support letters from other scholars are helpful. Four to six are suggested. Please email submissions in pdf format to the committee chair.

Nomination/Submission Deadline: 4 February 2013

For further information contact:

Michael Glascock (glascockm@missouri.edu)

R.E. TAYLOR STUDENT POSTER AWARD

As a result of a collaborative effort with the Society for American Archaeology, the Society for Archaeological Science acknowledges an outstanding student poster for its innovative contribution in the use of scientific technologies to archaeological research by granting the R. E. Taylor Award, consisting of 100 US dollars and a one-year subscription to the SAS Bulletin.

Students must submit an application via email to Destiny Crider (destiny.crider@asu.edu) by February 15, 2013 to be considered for this award. Applications in form of an email message must include the title and abstract of the poster, proof that you have registered for the SAA meetings (email from the SAA), and proof of your status as an undergraduate or graduate student (usually appears on your SAA registration). An email confirmation that your application has been received will be sent to you. Please keep this email confirmation. Students will also submit a .pdf version of their poster on or before February 15, 2013. This will give the judges adequate time to evaluate your posters. Judges will be present in person at the SAA meetings to judge posters and to ask students questions about their research. Prizes will be awarded at the SAA meetings following the end of the last poster session (final program is pending).

Submission deadline: 15 February 2013

GEOARCHAEOLOGY:

AN INTERNATIONAL JOURNAL

Geoarchaeology is an interdisciplinary journal published six times per year that presents the results of original research at the methodological and theoretical interface between archaeology and the geosciences. It remains the premier peer-reviewed publication emphasizing our discipline. In 2012 Geoarchaeology began publishing in a larger format with accompanied changes in text and layout. The new format combined with recent improvements in paper quality

has increased the size and clarity of images published in the journal. Also in 2012, a new virtual issue was assembled by Gary Huckleberry, Vance Holliday, and Rolfe Mandel titled Paleoindian Geoarchaeology that contains seventeen papers representing some of the best examples of Paleoindian research previously published in

the journal. This and previous virtual issues are currently accessible on-line at the journal's website (<http://onlinelibrary.wiley.com/journal/10.1002/%28ISSN%291520-6548>). All virtual issue articles are free for downloading.

You are invited to submit your research to Geoarchaeology. There are three categories for submissions: research articles, short contributions, and review papers. Manuscripts should examine the interrelationship between archaeology and the various disciplines within Quaternary science and the Earth Sciences more generally, including, for example: geology, geography, geomorphology, pedology, climatology, oceanography, geochemistry, geochronology, and geophysics. We also welcome papers that deal with the biological record of past human activity through the analysis of faunal and botanical remains and palaeoecological reconstructions that shed light on past human-environment interactions. The journal also welcomes manuscripts concerning the examination and geological context of human fossil remains as well as papers that employ analytical techniques to advance understanding of the composition and origin or material culture such as, for example, ceramics, metals, lithics, building stones, plasters, and cements. Manuscripts reporting on research conducted in Africa, Australia, and South America are especially encouraged.

Manuscript submission and review is fully electronic and processed through Manuscript Central, a web-based program for managing documents in the peer-review process. For more information, go to the "Author Guidelines" link at the journal's website or contact Co-Editor Gary Huckleberry at ghuck@email.arizona.edu.

CONTENTS: Volume 27, Issue 6 (November/December 2012)

Research Articles

The Paleoenvironment and Lithic Taphonomy of Shi'Bat Dihya 1, a Middle Paleolithic Site in Wadi Surdud, Yemen. *Luca Sitzia, Pascal Bertran, Stéphane Boulogne, Michel Brenet, Rémy Crassard, Anne Delagnes, Marine Frouin, Christine Hatté, Jacques Jaubert, Lamya Khalidi, Erwan Messager, Norbert Mercier, Alain Meunier, Stéphane Peigné, Alain Queffelec, Chantal Tribolo and Roberto Macchiarelli.*

New Insights into the Evolution of an Intervalley Prehistoric Irrigation Canal System, North Coastal Peru. *Gary Huckleberry, Frances Hayashida and Jack Johnson.*

Rock-Magnetic and Archaeointensity Investigation of Pottery and a Burned Floor at the Tzintzuntzan Archaeological Site, Western Mexico. *Juan Morales, Avto Goguitchaichvili, Bertha A. Aguilar-Reyes, Modesto Pineda, Claire Carvalho, Laura Beramendi-Orosco, Galia González-Hernández and Arturo Oliveros.*

Book Reviews

The Earth's Land Surface: Landforms and Processes in Geomorphology. Kenneth J. Gregory, 2010. *David L. Cremeens.*

The Technology of Maya Civilization. Political Economy and Beyond in Lithic Studies. Zachary X. Hruby, Geoffrey E. Braswell and Oswaldo C. Mazariegos (Editors.), 2011. *Shawn G. Morton.*

Cro-Magnon: How the Ice Age Gave Birth to the First Modern Humans. Brian Fagan (Ed.). 2011. *Fiona Coward.*

The Climate Connection – Climate Change and Modern Human Evolution. Renée Hetherington and Robert G. B. Reid, 2010. *Kathleen Nicoll.*

FEATURED RESEARCH

GEOARCHAEOLOGICAL STUDY & DATING OF PREHISTORIC CANALS IN TUCSON, AZ

Tammy Rittenour (tammy.rittenour@usu.edu) & Gary Huckleberry (ghuck@email.arizona.edu)

An important moment in human prehistory is the point at which people began to manipulate stream flow for irrigation agriculture. In the North American Southwest, that appears to have occurred *ca.* 1500 BC. Canal irrigation was a way for farmers to expand and increase production of maize and other domesticated plants, thus eventually leading to increased sedentism, population, and sociopolitical complexity. Some of the earliest canals thus far identified are located in southern Arizona, particularly in the greater Tucson area. Directly dating prehistoric canals has proven challenging due to complex formation processes and problems of reworked organic matter within canal channel fill yielding apparently old ages. In an effort to more accurately date the earliest canals in southern Arizona, Tammy Rittenour from the Department of Geology and the Luminescence Laboratory at Utah State University in Logan has been collaborating with geoarchaeologists Gary Huckleberry (independent consultant) and Fred Nials (Desert Archaeology, Inc.) on

cultural resource management projects associated with water reclamation facilities in Pima County. The goal is to obtain more accurate ages for the region's earliest canals using single-grain optically stimulated luminescence (OSL) dating.

Two archaeological projects conducted by Northland Research, Inc. and Tierra Right of Way Services in 2008-2010 and 2009-2011, respectively, resulted in the identification of three early (pre-ceramic) irrigation canals buried within the floodplains of Rillito Creek and the Santa Cruz River. Two of the three canals are filled with high-energy sands indicating that they were destroyed by flooding. One of the Rillito Creek canals (Figure 1) was filled with sands from uncontrolled flooding, re-excavated, used again for irrigation, and subsequently filled with flood sands again. AMS-¹⁴C ages from this canal range 1900-600 BC indicating problems associated with the fluvial redeposition of charcoal. Single-grain OSL ages on quartz sand indicated that the true age of the canal is 800-200 BC. In all three canals, AMS-¹⁴C ages on charcoal predated OSL-dated quartz sands within the channel fill, in one case predating a charcoal age by 1000 years.

Excavations conducted 2009-2012 by Desert Archaeology, Inc. at the Las Capas site resulted in the spectacular identification of agricultural fields with elevated borders deeply buried in the Santa Cruz River floodplain. Previous archaeological work and ¹⁴C dating of thermal features at Las Capas indicates that these fields and their associated canals date *ca.* 900-800 BC based on stratigraphic correlation. However, more direct chronometry is needed. Dr. Rittenour is working with Fred Nials in obtaining single-grain OSL ages from key stratigraphic levels at this site.

Determining the age of the earliest canals is important for understanding the origins of water management and the transition from foraging to intensive agriculture in the North American Southwest. A geoarchaeological approach that combines AMS ¹⁴C and single-grain OSL methods is proving increasingly effective for obtaining accurate and precise ages for these indigenous agricultural features.

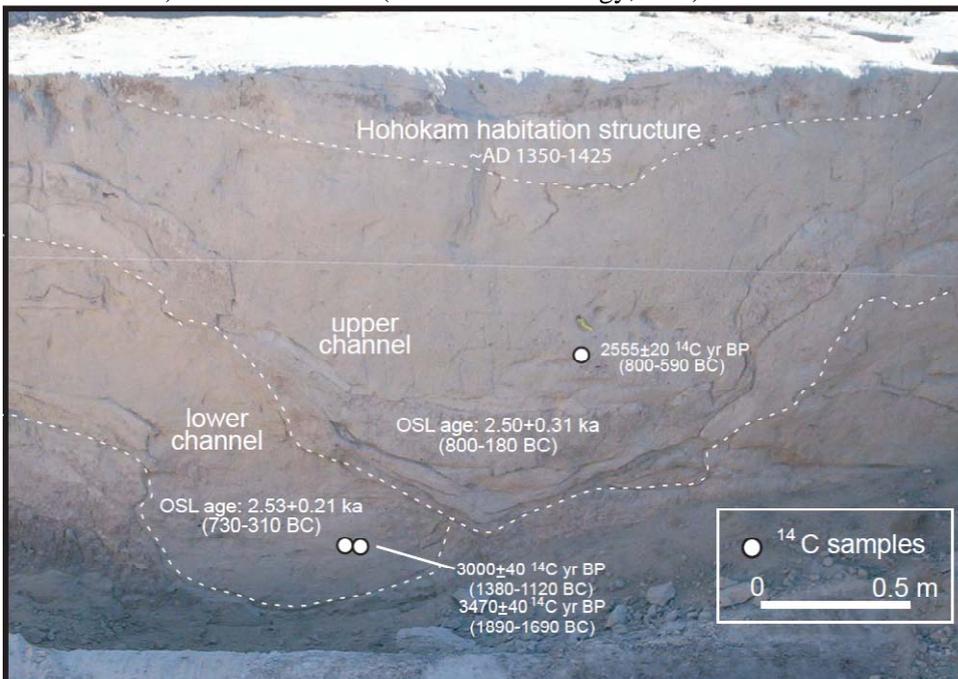


Figure 1. Canal Feature 6 at the Rillito Fan Site in Tucson, AZ. Lower channel represents early use of canal that was later filled with flood sands. Upper channel represents later use of the canal that again was eventually filled with flood sands. Radiocarbon dates predate the actual construction and use of the canal due to reworking of older charcoal. Single grain OSL ages (collected ~ 15 m downstream) confirm that the canal operated 800-200 BC. Approximately 1500 years later, a Hohokam habitation structure was constructed over the buried canal alignment. Today, the site is crossed by Interstate-10.