Fall 2021

Newsletter of the Geoarchaeology Division of the Geological Society of America

EDITORS:
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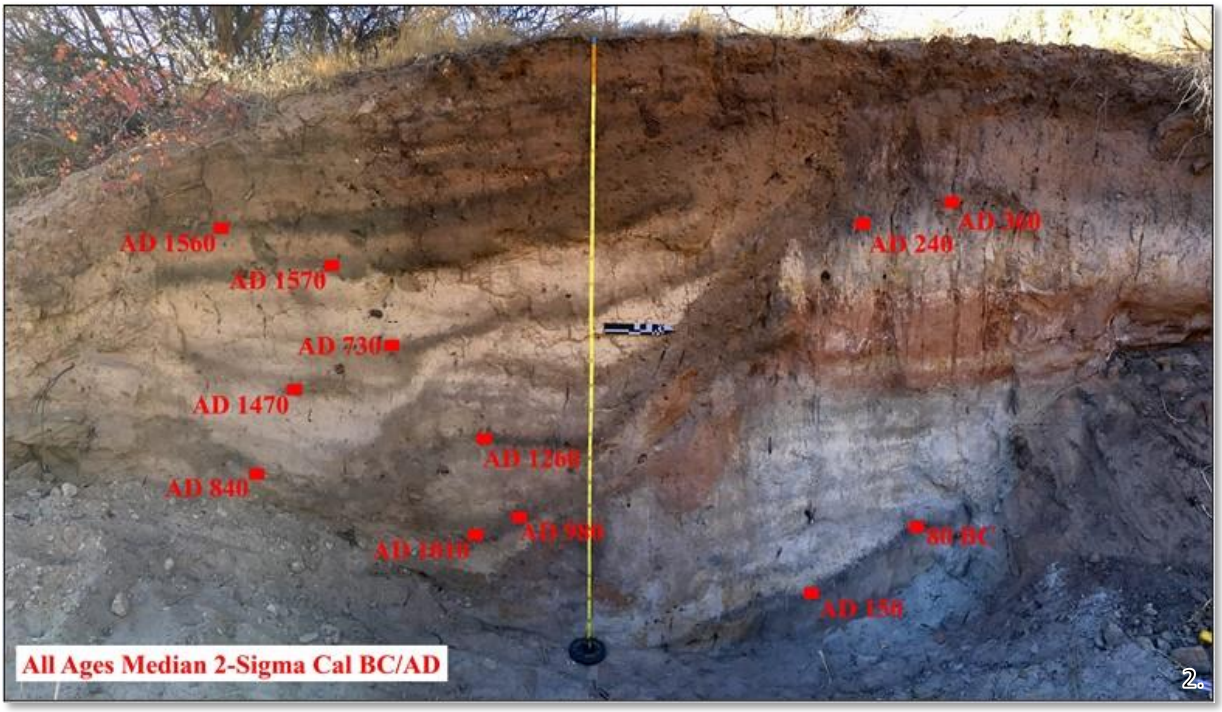
Double Feature Issue:

Alice Kelley describes her citizen science project, "Midden Minders" (*right*, pg. 12).

Judson Byrd Finley updates us on his research into Holocene arroyo dynamics and dryland agriculture in Dinosaur National Monument, Utah (*below*, pg. 13)

<u>Plus, everything you need to know about GSA Connects 2021 (pg. 3)</u>



(1) Glidden Midden, Newcastle, Maine. Composed primarily of oyster shells, the three to four-meter-high midden is the largest on the US Atlantic Coast north of Georgia (credit: Alice Kelley). (2) Cut-and-fill sequence of a paleochannel at Cub Creek Alluvial Locality I, Utah (see more inside, credit: Judson Byrd Finley).

Contents

NOTES FROM THE CHAIR

I first learned of the "Archaeological Geology" division (AGD) of GSA in 2005 when I was trying to figure out how in the world to combine my love for both archaeology and geology in graduate school. I came across one of the first iterations of the "Graduate School Guide" on the former AGD website the division used to manage. After becoming a graduate student at one of those programs listed in the guide—the University of Kansas—I became an informal AGD "student representative" (before GSA had official student representatives for divisions), took over as "Website Chair," and helped the division become an early adopter of social media. Over the years, I worked with division leadership to cultivate a strong social media presence, and helped transfer our renamed "Geoarchaeology" division (GD) content onto the GSA web platform where the Graduate School Guide continues to exist. Little did I know that my background working for so many years on virtual content with GSA would help guide me through my time as Chair of the GD during the COVID-19 pandemic. It goes without saying that this is NOT how I envisioned my two-year term as Chair: first shepherding Geoarchaeology sessions through 2020 GSA Connects Online meeting, and now managing the new challenges with the hybrid 2021 Portland meeting. We all lost an immeasurable amount this past year-and-a-half in our personal and professional lives, and I thank you all for maintaining your involvement in the division however you could. I particularly appreciate everyone who came together for the 2020 GSA Connects Online meeting to celebrate with **Dr. Gail Ashley**, winner of the 2020 Rip Rapp Award. I look forward to celebrating with many of you in-person this year in Portland, where we will honor **Dr. Joseph Schuldenrein**, the 2021 Rip Rapp Award recipient.

Included in our losses this year, I share with deep regret the recent passing of **Dr. Bonnie Blackwell**. Bonnie was a member of the division since 1986; she served on many committees over the years and also served as Chair of the division in 1993. Bonnie received her B.A. from McMaster University in 1978, her M.Sc. in 1980 studying U-Series dating under Prof. Henry Schwarcz, and her Ph.D. from the University of Alberta in 1987. She then returned to McMaster for post-doctoral work with Prof. Schwarcz, at which time she began her research using electron spin resonance (ESR) as a dating technique. Almost all her professional work relates to ESR dating, but she will also be remembered in this division for her work mentoring high school students in geo-archaeological research through the RFK Science Research Institute. For over 20 years she sought out promising students and gave them serious, publishable projects—and, as many know, she had these students present each year at GSA meetings, to include the submission of two student abstracts for the 2021 Portland meeting. Bonnie's energy and enthusiasm led to a significant body of work in paleoanthropology, paleontology, and geology while cultivating the next generation of geoarchaeologists. Here, Bonnie (far left) is pictured in 2008 with a group of students and her husband, **Dr. Joel Blickstein**, also a geologist, who passed away in his sleep one week after Bonnie's passing. Bonnie had a significant impact on our lives and discipline; we have lost a researcher and mentor that still had much to contribute to our understanding of the past.

Let's all continue to take care of each other and support each other as researchers, mentors, and friends. See you in Portland, or perhaps online!
- Dr. Laura R. Murphy, Chair

GSA CONNECTS 2021 MEETING GUIDE

THE GEOLOGICAL SOCIETY OF AMERICA
October 10–13, 2021
Portland, Oregon
https://community.geosociety.org/gsa2021/home

GSA Geoarchaeology Business Meeting & Awards Ceremony**
Monday, October 11, 2021
5:45-7:30pm
Oregon Convention Center - A106.
***Virtual meeting attendance will not be supported at the 2021 Geoarchaeology Division business meeting*

Sponsored Short Courses

518 – Forensic Geochemistry: Contaminant Sources/Release Ages and Aquifer Continuity in Soil/Groundwater Systems using Stable Radiogenic Isotopes of Strontium (Sr) and Lead (Pb).
Monday, 4 October, 9 a.m. to 3 p.m.

527 – Introduction to Drones (sUAS) in the Geosciences
Saturday, 9 October, 8 a.m. to 5 p.m.

Field Trips

*** Student Funding Opportunity! ***
The first 6 students to sign up for the sponsored field trip will receive a $100 subsidy. Send proof of field trip registration to murphy.geoarch@gmail.com

407. A Slice into Time: Stories Written in the Walls of the Columbia River Gorge.
Friday, 8 October

409. Pleistocene Landscapes and Geoarchaeology of the Oregon Coast.
Friday-Saturday, 8-9 October

Sign up for the meeting, courses, and field trips at:
https://community.geosociety.org/gsa2021/registration

Geoarchaeology Sessions

All times in Pacific Daylight Time

Sunday, October 10

T127. Advances in Geomorphology: Understanding How Interactions among Climatic, Tectonic, Fluvial, and Hillslope Processes Drive Topographic Change I
Session 16 (8:00 AM - 12:00 PM)
Oregon Convention Center - Portland Ballroom 254 (Hybrid Room)

T137. From the Caspian to Mediterranean: Environmental Change and Human Response during the Quaternary (INQUA IFG POCAS, IGCP 610) I
Session 17 (8:00 AM - 12:00 PM)
Oregon Convention Center – ONLINE

T177. Solving Paleoenvironmental Problems with Isotopes: New Advances and Ongoing Challenges in Soils and Geoarchaeology
Session 20 (8:00 AM - 12:00 PM)
Oregon Convention Center - Portland Ballroom 253 (Hybrid Room)

T127. Advances in Geomorphology: Understanding How Interactions among Climatic, Tectonic, Fluvial, and Hillslope Processes Drive Topographic Change II
Session 46 (1:30 PM - 5:30 PM)
Oregon Convention Center - Portland Ballroom 254 (Hybrid Room)

T137. From the Caspian to Mediterranean: Environmental Change and Human Response during the Quaternary (INQUA IFG POCAS, IGCP 610) II
Session 47 (1:30 PM - 5:30 PM)
Oregon Convention Center – ONLINE

D4. Recent Advances in Geoarchaeology (Posters)
Session 54 (2:30 PM - 6:30 PM)
Oregon Convention Center - Exhibit Hall A

Monday, October 11

T156. Building Trust Using Science Communication and Education within Diverse Communities
Session 83 (8:00 AM - 12:00 PM)
Oregon Convention Center - B112

D3. Recent Advances in Geoarchaeology
Session 98 (1:30 PM – 5:30 PM)
Oregon Convention Center - B111

T141. Reconstruction of Quaternary Paleoenvironments at Regional and Global Scales: A Tribute to Eric C. Grimm (1951–2020)
Session 112 (1:30 PM - 5:30 PM)
Oregon Convention Center - D136 (Hybrid Room)

Tuesday, October 12

T105. Reading the Record of Volcanic Tephra and Tuff in Geoarchaeological Site Studies and Drill Core Records
Session 145 (8:00 AM - 12:00 PM)
Oregon Convention Center - Portland Ballroom 253 (Hybrid Room)

T133. Weathering and Soils: Advances in Understanding Rates, Mechanisms, Controlling Factors and Feedbacks
Session 180 (1:30 PM - 5:30 PM)
Oregon Convention Center - D139/D140

Wednesday, October 13

T65. Karst Sedimentary, Paleoclimate, and Historical Records
Session 210 (8:00 AM - 12:00 PM)
Oregon Convention Center - D135

T140. Paleoclimate, Paleoenvironments, and Paleoceanography of Northwestern North America
Session 215 (8:00 AM - 12:00 PM)
Oregon Convention Center - Portland Ballroom 256 (Hybrid Room)

Be sure to stop by the Exhibit Hall and visit the Soils and Soil Processes Division and Geoarchaeology Division booth 1039 to purchase a fleece hat and bandana!

UPCOMING CONFERENCES AND WORKSHOPS

2021 Soil Science Society of America (Joint Meeting with the American Society of Agronomy and the Crop Science Society of America)
Salt Lake City, Utah, or Limited Virtual
November 7–10, 2021
https://www.acsmeetings.org/

Archaeological Institute of America Meeting
San Francisco, CA
January 5–8, 2022
https://www.archaeological.org/meeting/about

The Association of American Geographers Annual Meeting
New York, New York
Feb. 25–March 1, 2022
https://annualmeeting.aag.org/

2022 Society for American Archaeology 87th Annual Meeting
Chicago, Illinois
March 30–April 3, 2022
https://www.saa.org/annual-meeting

European Geosciences Union General Assembly 2022
Vienna Austria
April 3–8, 2022
https://www.egu22.eu/

Developing International Geoarchaeology
July 2023
DIG 2023 is scheduled to coincide with the July meeting of the Geoarchaeology Group of South America in São Paulo, Brazil. Current plans are for a hybrid in-person/virtual conference.
More information will be available at:
https://www.developinginternationalgeoarchaeology.org/

XXI INQUA Congress 2023
Rome, Italy
July 13–20, 2023
http://www.inquaroma2023.it/

GEOLOGICAL SOCIETY OF AMERICA REGIONAL SECTION MEETINGS

https://www.geosociety.org/GSA/Events/Section_Meetings/GSA/Sections/Home.aspx

2022 GSA South-Central Section
(56th Annual Meeting)
March 14–15, 2022 • McAllen, Texas
Abstracts Due: December 7, 2021
https://www.geosociety.org/GSA/Events/Section_Meetings/GSA/Sections/sc/2022mtg/home.aspx

2022 Joint Section Meeting
GSA North-Central Section (56th Annual Meeting)
GSA Southeastern Section (71st Annual Meeting)
April 7–8, 2022 • Cincinnati, Ohio
Abstracts Due: July 8, 2021
https://www.geosociety.org/GSA/Events/Section_Meetings/GSA/Sections/nc/2022mtg/home.aspx

2022 Joint Section Meeting
GSA Rocky Mountain Section (72nd Annual Meeting)
GSA Cordilleran Section (118th Annual Meeting)
March 15–17, 2022 • Las Vegas, Nevada
Abstracts Due: June 22, 2021
https://www.geosociety.org/GSA/Events/Section_Meetings/GSA/Sections/cd/2022mtg/home.aspx

2022 GSA Northeastern Section
(57th Annual Meeting)
May 20–22, 2022 • Lancaster, Pennsylvania
Abstracts Due: December 14, 2021
https://www.geosociety.org/GSA/Events/Section_Meetings/GSA/Sections/ne/2022mtg/home.aspx

AWARDS

GEOLOGICAL SOCIETY OF AMERICA

Claude Albritton, Jr., Award

Under the auspices of the Geoarchaeology Division, family, friends and close associates of Claude C. Albritton, Jr., have formed a memorial fund in his honor at the GSA Foundation. Awards up to $650 are given in support of thesis or dissertation research, with emphasis on the field and/or laboratory aspects of the research.

Eligibility: Applications will be accepted from students currently enrolled in a graduate program. Residents of the US and foreign countries are eligible. Membership in the GSA and the Geoarchaeology Division are not required.

For more information contact: gsa.agd@gmail.com

Application guidelines:
https://community.geosociety.org/geoarchdivision/awards/student/albritton

Submission deadline: March 15, annually.

Congratulations to our 2021 awardee, Benjamin Deans (Central Washington University). Benjamin's research involves geomorphic, stratigraphic, and paleoflood analysis of a Columbia River alluvial terrace sequence associated with an archaeological site.

Funding & Contributions: Initially, the fund was set up with a gift of several thousand dollars. Members of the division, other GSA members, and those who know Claude are being asked to consider contributing to this fund. 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

Richard Hay was a long-standing member of the Geoarchaeology Division and had a long and distinguished career in sedimentary geology, mineralogy, and geoarchaeology. He is particularly well known for his work on the Olduvai Gorge and Laetoli hominid-bearing sites and was awarded the Division's Rip Rapp award in 2000. The grant is a travel grant awarded to an undergraduate or graduate student presenting a paper or poster in geoarchaeology at the annual GSA 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.

Eligibility: Applicants must be a graduate or undergraduate student presenting a paper or poster at one of the Geoarchaeology Division's sessions at the annual meeting.

For more information contact: gsa.agd@gmail.com

Application guidelines:
https://community.geosociety.org/geoarchdivision/awards/student/hay

Submission deadline: August 30, annually.

Funding & Contributions: To contribute to the Hay Award, send your gift to the GSA Foundation, designating the gift for the Geoarchaeology Division Fund.

Rip Rapp Award

George "Rip" Rapp, Jr. was one of the primary individuals responsible for establishment of the Division and generously established a division award fund with the GSA Foundation. The award recognizes outstanding contributions to the interdisciplinary field of geoarchaeology.

Materials Required: Nominations should be sent to gsa.agd@gmail.com and should include a biographical sketch, a statement of outstanding achievements, and a selected bibliography and/or CV for the nominee.

Application guidelines:
https://community.geosociety.org/geoarchdivision/awards/riprapp

For more information contact: gsa.agd@gmail.com

Nomination deadline: February 15, annually

Congratulations to our 2021 awardee, Joseph Schuldenrein (Geoarcheology Research Associates)!

Society for American Archaeology

Douglas C. Kellogg Fellowship for Geoarchaeological Research

The Douglas C. Kellogg Award provides support for 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: Recipients of the Kellogg Award will be students who are (1) actively pursuing a Ph.D. degree in earth sciences or archaeology; (2) applying earth science methods to archaeological research and (3) members of the Society for American Archaeology.

Materials Required: The application should consist of a research proposal no more than three pages long that describes the research and its importance to the discipline of geoarchaeology, a curriculum vitae, and one letter of support from the chair that certifies that the student is conducting the proposed research along with the expected date of completion of the degree. Applicants should send their proposal and CV as a single PDF to the committee chair. File names must include the applicant's surname or last name, SAA member number, and the award (*Kellogg Fellowship*) must be clearly indicated in the proposal. Applicants should instruct their advisors to send recommendation letters directly to the Awards Committee chair.

For more information contact:
Katherine A. Adelsberger (kadelsbe@knox.edu)

Application guidelines:
https://www.saa.org/career-practice/awards/awards-detail/douglas-c.-kellogg-fellowship-for-geoarchaeological-research

Submission Deadline: December 01, 2021

Congratulations to 2021 awardee Helen Thompson (University of Sheffield) for her project using ceramic technology and provenance to investigate colonial impacts in South America during the fifteenth to seventeenth centuries!

Fryxell Award for Interdisciplinary Research

The Fryxell Award is presented in recognition for 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 category for the 2023 Fryxell Award is "Earth Sciences."

Eligibility: Any professional archaeologist may submit nominations for this award. Nominees do not need to be members of the SAA. The committee does not accept self-nominations.

Materials Required: Nominators must submit a letter describing the nature, scope, and significance of the nominee's contributions to American archaeology, as well as the nominee's curriculum vitae. Support letters from other scholars are helpful (4-6 suggested). Please send submissions to the committee chair.

For more information contact:
Vance Holliday (vthollid@arizona.edu)

Application guidelines:
https://www.saa.org/career-practice/awards/awards-detail/fryxell-award-for-interdisciplinary-research-for-2020

Nomination/Submission Deadline: February 25, 2022

Congratulations to 2022 awardee Dolores R. Piperno (Smithsonian National Museum of Natural History)!

Geoarchaeology Interest Group Paul Goldberg Research Award (formerly the M.A./M.S. Research Award)

The Geoarchaeology Interest Group Paul Goldberg Research Award provides support for thesis research, with emphasis on the field and/or laboratory aspects, for graduate students in the earth sciences and archaeology.

Eligibility: Recipients of the Geoarchaeology Interest Group Paul Goldberg Research Award will be students who are (1) actively pursuing the MA or MS degree in earth sciences or archaeology (please indicate which on application); and (2) applying earth science methods to archaeological research.

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 vitae, and two letters of support, including one from the committee chair that certifies that the student is conducting the proposed research along with the expected date of completion of the degree. Electronic submissions as pdfs sent to the committee chair are preferred. File names must include the applicants surname or last name and the award you are applying for must be clearly indicated in the proposal.

For more information contact:
Katherine A. Adelsberger (kadelsbe@knox.edu)

Application guidelines:
https://www.saa.org/career-practice/awards/awards-detail/paul-goldberg-award

Submission Deadline: December 1, 2021
Congratulations to 2021 awardee Rachael Smith (Indiana University of Pennsylvania)! Rachel's project used portable X-ray fluorescence to distinguish individuals in a commingled assemblage of human remains.

NEW: Geoarchaeology Interest Group Julie Stein Award for Undergraduate Travel

The Geoarchaeology Interest Group funds the Geoarchaeology Undergraduate Travel Award to support travel to the SAA Annual Meeting for an undergraduate student presenting a research paper or poster in geoarchaeology.

Eligibility: Recipients of the Geoarchaeology Interest Group Julie Stein Award will be students who are (1) actively pursuing a B.A. or B.S. degree in Earth sciences or archaeology (please indicate which on application); and (2) applying earth science methods to archaeological research, and (3) members of the Society for American Archaeology.

Materials Required: Complete applications for the Geoarchaeology Undergraduate Travel Award consist of (1) the conference abstract accepted by SAA for presentation at the Annual Meeting, and (2) a letter of support from the research or academic advisor that includes certification that the student conducted or is conducting the research to be presented.

Applicants should send their paper or poster abstracts as a PDF to the Geoarchaeology Awards Committee chair. File names must include the applicant's surname and SAA member number. Applicants should also instruct their advisors to send recommendation letters directly to the committee chair.

For more information contact:
Katherine A. Adelsberger (kadelsbe@knox.edu)

Application guidelines:
https://www.saa.org/career-practice/awards/awards-detail/geoarchaeology-undergraduate-travel-award

Submission Deadline: November 1, 2021

Society for Archaeological Sciences

R.E. Taylor Student Poster Award

This prestigious award acknowledges innovative student contributions to archaeological research through the use of scientific methods and has enhanced the careers of prominent young scholars and professionals for more than

a decade. The award is named in honor of Professor Emeritus R. Ervin Taylor of the University of California at Riverside for his outstanding contributions in the development and application of radiocarbon dating in archaeological research and his dedication to the founding of the Society for Archaeological Sciences; his leading role as President (1980) and General Secretary (1981-2002) of the Society; and his committed service as editor of the SAS Bulletin. Professor Taylor's many valuable contributions were recognized by the SAA in 2004 with the Fryxell Award for Interdisciplinary Research. The award will be given at the 43rd International Symposium on Archaeometry, 2022, and consists of $200 US, a one-year SAS membership and subscription to the SAS Bulletin.

Eligibility: Entries will be judged on the significance of the archaeological problem, appropriate use of methods, soundness of conclusions, quality of the poster display, and oral presentation of the poster by the student, who should be the first author to be considered. Students should submit an email application to Tatsuya Murakami (tmurakam@tulane.edu). Applications must include the title and abstract of the poster, evidence that you have registered for the ISA meeting, and proof of your status as an undergraduate or graduate student.

For more information contact:
Tatsuya Murakami (tmurakam@tulane.edu)

Application guidelines:
https://socarchsci.org/awards/r-e-taylor-awards.html

Submission deadline: May 7, 2022, tentative (see website)

Congratulations to 2021 awardee Benjamin Smith (University of Florida) for his project using pXRF to obtain the first geochemical characterization of the Baantu obsidian quarry in SW Ethiopia.

NEW: Student and Early Career Research Support Award

The SAS announces a new, more flexible, research funding program to support the work of its student and early career members during the COVID-19 pandemic. The SAS Research Support Award temporarily replaces the existing Student Research International Travel Award and a Postdoctoral Conference Travel Award that was to have debuted in 2020. In light of most in-person conferences, symposia, and workshops being postponed or canceled, we have decided to channel the budget that was originally allocated for the two above travel awards to a more flexible research funding scheme to cover laboratory and fieldwork expenses.

Eligibility: The applicants must be either graduate students or early career researchers who are current dues-paid members of the SAS at the time of application. In the case of early career researchers, they must have been awarded their PhD within the previous eight years at the time of application. Exceptions may be made for the applicants with a career break, such as but not limited to parental leave, long-term illness or disability, or national service. The circumstances for exceptions must be clearly indicated in the application.

Application guidelines:
https://socarchsci.org/awards/student-travel-award.html

Submission deadline: December 20, 2021

GEOARCHAEOLOGY: AN INTERNATIONAL JOURNAL

Geoarchaeology's impact factor has once again risen. The number of submissions continues to increase and the impact factor has substantially increased over the past 10 years reflecting growth in the discipline and enhanced prestige of the journal. The current IP is at 1.882 and climbing thanks to the quality manuscripts received and the prompt and generous time and efforts of our peer reviewers. The interdisciplinary journal continues to be published six times per year without any page charges to the authors. The journal presents the results of original research at the methodological and theoretical interface between archaeology and the geosciences.

Established in 1986 and published by Wiley, *Geoarchaeology* remains the premier peer-reviewed publication emphasizing our discipline. We invite you to submit your research to *Geoarchaeology*. There are three submission categories: 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, geo-chronology, and geophysics. Because the journal is international, authors should present their research within a large scholarly context such that results are of global

significance. Manuscripts reporting on research conducted in the Americas, Africa, Asia, Australia and Polynesia 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. Manuscripts accepted for publication are processed rapidly and appear on-line in Early View on the Journal's website.

The journal is currently co-edited by Sarah C. Sherwood and Kevin Walsh, who are assisted by a board of expert Associate Editors. For more information, contact: Sarah C. Sherwood (sherwood@sewanee.edu) or Kevin Walsh (kevin.walsh@york.ac.uk).

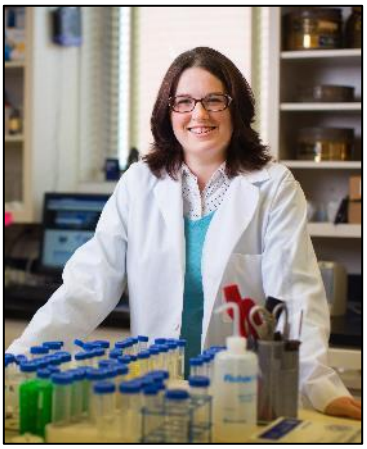
Journal Website & Submission Guidelines:
https://onlinelibrary.wiley.com/journal/15206548

DIVISION OFFICERS

Past Chair

Richard K. Dunn
Professor of Geology
Norwich University
rdunn@norwich.edu

Richard Dunn received his BS in Geology and BA in Anthropology from the University of Minnesota, Duluth ('87), MS in Geology from Wichita State University ('90), and PhD in Geology from the University of Delaware ('98). He was the 1996-97 and 1997-98 Geoarchaeology Fellow at the Wiener Laboratory of the American School of Classical Studies in Athens. Currently, he is Professor and Chair of Earth and Environmental Sciences at Norwich University, Vermont. His research follows three paths: 1) field mapping of surficial geology for the Vermont Geological Survey; 2) sedimentology and stratigraphy of glacial deposits; and 3) geoarchaeology, mostly involving landscape reconstruction at coastal and fluvial sites, with work in Greece, Israel, Cyprus, Portugal, Belize, and Easter Island. He has been a member of GSA since 1988 and has served the Geoarchaeology Division twice in the role of JTPC member, as the Vice-Chair, and as the Division Chair.



Chair

Laura Murphy
Assistant Professor of Anthropology
Washburn University
laura.murphy@washburn.edu

Laura received her PhD in 2015 from the University of Kansas where she studied geoarchaeology; her particular interest is in the late-Quaternary paleoenvironments of the Great Plains. Her involvement in the Geoarchaeology Division began in 2005 as an undergraduate student at Ohio State. Since then, she has worked to promote the Division through the website and social media pages. As Chair, she has continued developing strategies to increase division membership, retention, and diversity, especially at the student level, and to foster affordable opportunities for geoarchaeology students at annual and regional meetings. Contact her if you wish to get involved at any level of the Division!

Vice-Chair

Sam Krause
Assistant Professor of Geography
Texas State University
sam.m.krause@gmail.com

Dr. Sam Krause is an Assistant Professor in Geography at Texas State University. Sam's research focuses on soils, geomorphology, and anthropogenic impacts on environments over the Holocene. Sam spent many years working as a CRM archaeologist and GIS analyst in New Mexico, Arizona, and Texas. Her current research focus

is in central and northwestern Belize, northern and central New Mexico, and western Cyprus. Sam is thrilled to continue to serve the Geoarchaeology Division in the coming years and hopes to continue the tradition of Dr. Laura Murphy in prioritizing diversity, inclusion, and student opportunities within the Division and our geoscience community at large. You can follow Sam's research on twitter: @SoilsandSwamps.

Secretary-Treasurer

Judson Byrd Finley
Associate Professor
Utah State University
judson.finley@usu.edu

Judson Finley is Associate Professor of Anthropology and Chair of the Department of Sociology and Anthropology at Utah State University. Judson joined the USU faculty in 2012 after serving as Assistant Professor of Earth Science at the University of Memphis. He earned his BA at the University of Wyoming (1996) and MA (2002) and PhD (2008) in Anthropology at Washington State University. Judson's recent research explores how Utah's prehistoric Fremont societies used agriculture as a solution to environmental variability over the last 2,000 years.

Student Representative Ex-Officio

Rebecca Taormina
PhD Candidate
Baylor University
Rebecca_Taormina
@baylor.edu

Rebecca Taormina is a PhD candidate in Geology at Baylor University. She studies fluvial geomorphology, soils, and geoarchaeology of Pre-Clovis peoples. In addition to serving as the student representative of the Geoarchaeology Division, Rebecca is the Chair of the Student Advisory Council and a member of council at large. Rebecca has recently started a full time Assistant Professorship of Physical Science at National Park College in Hot Springs, Arkansas.

Editors' Corner: Introducing Your New Co-Editors!

Hi! We (Elizabeth and Jasmine) are the new co-editors for the GSA Geoarchaeology Division and the SAA Geoarchaeology Interest Group affiliated newsletters, with the former co-editors (Sam Krause and Rachel Cajigas) accepting new leadership positions in these respective organizations. Congratulations Sam and Rachel! For content submission or general inquiries, please contact Elizabeth at elizabeth.leclerc1@maine.edu or Jasmine at jasmine_kidwell1@baylor.edu. We look forward to hearing from you!

Elizabeth Leclerc is an Interdisciplinary PhD student and NSF Graduate Fellow in the Anthropology Department and Climate Change Institute at the University of Maine.

Jasmine Kidwell is a PhD student in the Geosciences Department at Baylor University in Waco, Texas.

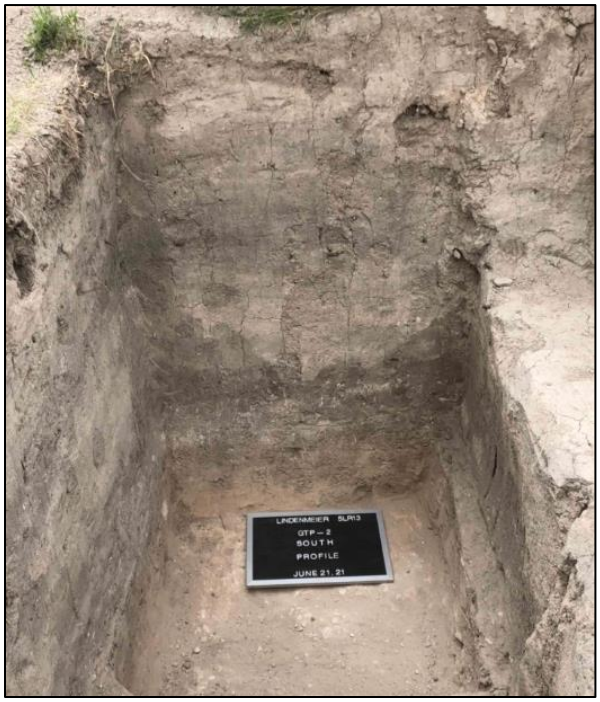
NOTES FROM THE FIELD

Jedidiah Dale (University of Texas at Austin) spent the summer working in Northwestern Belize investigating both the ancient and modern environment as part of his Master's research. Along with **Dr. Timothy Beach** and **Dr. Sheryl Luzzadder-Beach**, collaborators from the Maya Research Program (UT Tyler), and local communities, his team collected new lake cores to assess ancient Maya environmental impacts. He also successfully deployed two new pieces of equipment, an Acoustic Doppler Current Profiler (ADCP) and side scan sonar, to study the modern geomorphology of the Rio

Bravo and help understand its potential influence on past inhabitants. This included interesting insights into the role of woody debris in tropical rivers. Jed is now looking forward to a year of data analysis and lab work!

PhD candidate from the University of Texas at Austin **Lara Sánchez-Morales** spent her last season in the field this summer. Her research compares two catchments in north-central Puerto Rico—the Río Grande de Arecibo and Río Grande Manatí—over the last >5,000 years by looking at landscape changes associated with climate change and human intervention in the region. These two rivers have some of the earliest sites of human settlement identified in the main island along with evidence for early introduction and long-term management of plant domesticates and forests. Over the last few years (2018-21) the methodology consisted of cutbank documentation and sampling and coring of floodplain sediments from both rivers to produce a long-term record of alluvial stratigraphy and environmental change from buried paleosols up to six meters in depth. This summer, in collaboration with **Dr. Timothy Beach** and **Dr. Sheryl Luzzadder-Beach** (UT Austin – Department of Geography) and Lara's amazing team of Puerto Rican graduate students and people from her community, two cores from adjacent Laguna Tortuguero were acquired to replicate and add more lines of evidence to a 1994 study by paleoecologist David A. Burney and colleagues. This study is particularly significant for Caribbean environmental and human history since it produced one of the first microcharcoal records that suggested humans began managing Puerto Rico's landscapes possibly through controlled forest fires by ca. 5,300 cal BP, much earlier than what the archaeological record suggested at the time. Lara hopes to combine the stratigraphic records from Laguna Tortuguero, Manatí, and Arecibo to better understand the impacts of climate change (sea-level rise, hurricanes, precipitation, etc.) upon the region and how these changes intertwined with early indigenous settlement and domestication of Puerto Rican landscapes.

Dr. Laura Murphy, Washburn University, spent several days in June at the Lindenmeier site (5LR13) with **Dr. Jason LaBelle** (Principal Investigator) and his Colorado State University (CSU) archaeology field school students. The Lindenmeier site, located in the Soapstone Prairie Natural Area in northern Larimer County, Colorado, is known for a significant number of Folsom spear points (over 500), hundreds of chipped stone tools, ochre and shell jewelry, potential gaming pieces, and discarded faunal remains. Past excavations (1935-1940) along with intensive surface monitoring and mapping (2006-present) and geophysical survey (2018) guided the 2021 block excavation units. Laura sampled profile walls from three of the units within the site's eastern area for soil, sediment, and paleoenvironmental analyses. This is part of an on-going effort to re-investigate the site and test hypotheses about the paleoenvironment at the time of Folsom activities, as well as site formation processes.



Geologic Test Pit (GTP) 2 at Lindenmeier; the lower dark buried soil in the profile is the former Folsom-age surface.

CSU students preparing to excavate units within the eastern portion of the Lindenmeier site (view to the west).

University of Utah Professor of Geography **Kathleen Nicoll** has been awarded a Global Scholars Fellowship by the Fulbright Foundation for new research in Italy this upcoming academic year (2021-22). Kathleen remains busy on social media for the Division and for the

Facebook Page "Geomorphology Rules." One of her recent publications with colleagues addresses the impact of the pandemic on research and its implications for discovery-based, fieldwork-intensive disciplines like archaeology and the allied Earth sciences. "Field-based sciences must transform in response to COVID-19" was published in *Nature Ecology and Evolution* (Scerri et al, 2020, https://doi.org/10.1038/s41559-020-01317-8). During the pandemic, Kathleen worked with collaborators to publish another Open Access paper that provides the first biography of Elinor Wight Gardiner (1892–1981), the first female geologist who worked and published as a geoarchaeologist! This lady was a great interdisciplinary scientist and someone who deserves more recognition as a founder and practitioner of our discipline since the late 1920s. Gardiner was a genuine "ground-breaker": she studied at Cambridge University before women could be awarded degrees; she worked on important archaeological sites in the Mediterranean and Near East; and she collaborated with many famous people, including Gertrude Caton Thompson, Flinders Petrie, Dorothy Garrod, Dorothea Bate, and Freya Stark. If you are looking to diversify your course syllabi to include important women scientists, please consider including a profile of "Miss G."! The paper, published by *Geosciences*, is freely available at: https://www.mdpi.com/2076-3263/11/7/267/htm.

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FEATURED RESEARCH

Shell Middens and the Maine Midden Minders

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Over 2,000 shell middens (or shell heaps or mounds) dot Maine's island and mainland coasts. These features are a rich archive of past lifeways and environments and a cultural touchstone for the region's Indigenous inhabitants (Figure 1.1). These human-constructed features are composed primarily of clam shells, although several oyster shell heaps are in the Mid-Coast region near

Figure 1.1. Glidden Midden, Newcastle, Maine. Composed primarily of oyster shells, the 3-4 m high midden is the largest on the US Atlantic Coast north of Georgia.

Damariscotta. Archaeological research suggests most remaining Maine shell middens range in age from 1,000 to approximately 3,000 years old. Organic remains (bones, shells, seeds), artifacts (ceramics, lithic and bone), house floors, hearths, and post molds preserved in the middens illuminate past Indigenous coastal adaptations and subsistence strategies.

Currently, virtually all Maine shell heaps are eroding. Many are disappearing or are experiencing significant damage by climate-change-induced impacts. Rapidly rising sea level brings the reach of more frequent and intense storm waves higher along the shore. Increasing numbers of freeze-thaw events serve to destabilize the middens and add to storm-related destruction. Looting impacts middens as collectors prowl uninhabited islands, while increasing coastal development legally removes midden material during construction. These impacts are intensifying just as these features are being recognized as recording important cultural and environmental information.

The Maine Midden Minders, based at the University of Maine, is a citizen science group seeking to document and monitor these impacts, as well as recover information exposed by erosion. Working in cooperation with the Maine Historic Preservation Commission, local Wabanaki communities, conservation groups, school groups, and historical societies, the program is using on the ground measurements, photographs, and geo-referenced drone-based imaging to record change at the middens (Figures 1.2 and 1.3). Additionally, the Midden Minders website (https://umaine.edu/middenminders/), combined with in-person and video presentations, is raising awareness about climate change impacts on cultural resources.

Figure 1.2. Students measuring an eroding clam shell midden, Cobscook Bay, Maine.

Figure 1.3. Recovering a drone post survey.

Late Holocene Arroyo Dynamics and the Evolution of an Early Dryland Agricultural Community in Dinosaur National Monument, Utah

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The relationship between hydroclimate and floodplain incision is important in the resilience of dryland agricultural systems to environmental change. This "arroyo problem" is an old one in American geoarchaeology dating to Kirk Bryan's (1925) pioneering research. At stake in early debates was the role of anthropogenic processes—namely overgrazing—in the rapid formation of steep-sided stream channels. Bryan was quick to note evidence of paleochannels in modern arroyos that likely predated Euroamerican settlement and, thus, a different origin of cut-and-fill cycles. After a century of research, we now understand alluvial epicycles as a complex response that operates at the intersection of precipitation variability, intrinsic geomorphic thresholds, and human land use (Townsend et al. 2019). How alluvial epicycles impacted indigenous farmers, particularly in the interior western North American drylands is likewise highly variable but remains important in geoarchaeology.

Our research explores the arroyo problem in the Fremont cultural area, which dates AD 300-1300 throughout Utah north of the Colorado River. The Fremont record is important because it provides a rare case where we can examine the socio-ecological conditions underwriting the adoption *and* abandonment of agriculture in transitional foraging-farming economies. Our work is in the Cub Creek reach of Dinosaur National Monument (Figure 2.1) where maize agriculture reached its northernmost extent in the foothills of the Uinta Mountains. Cub Creek is a small, low-order, perennial tributary of the Green River that flows near the base of Split Mountain, one of the last major anticlines of the Central Rocky Mountains (Figure 2.2). The slickrock of Split Mountain and its numerous springs and eolian landforms combined with the perennial flow and sandy floodplain of Cub Creek created numerous agricultural niches that were an ideal landscape for a mixed foraging-farming economy. Our coupled radiocarbon dating and precipitation reconstruction (Finley et al. 2020) shows that agriculture first appeared in the archaeological record there around AD 300

Figure 2.1. Cub Creek is within the northern Uintah Basin on the

Utah side of Dinosaur National Monument.

Figure 2.2. Split Mountain and Cub Creek looking north from the summit of Blue Mountain. Buff sandstone of the Pennsylvanian Weber Formation of Split Mountain contrast with the red Triassic Chinle Formation of Blue Mountain in the foreground.

concurrent with peak precipitation variability. Maize agriculture provided a buffer against the dominant 30+/- year precipitation variability pattern except from AD 750-1050 when it stabilized and a pithouse community formed between AD 840-1080. However, in shifting its focus to maize intensification on the Cub Creek floodplain, did the Fremont community become vulnerable to an arroyo-forming event that could have been triggered by the same precipitation conditions that allowed the community's growth?

The Cub Creek floodplain today is characterized by a deep arroyo system triggered in the early 20th Century by modern irrigation practices near the confluence with the Green River (Figure 2.3). During our archaeological survey, we identified a paleoarroyo in a side-channel of Cub Creek on the east end of the valley that was a logical first place to test the hypothesis that precipitation stabilization between AD 750-1050 initiated a cut-and-fill cycle. Cub Creek is ideal for identifying paleochannels because contrasting sources of alluvium make easily traceable marker beds. Most importantly, the Paleozoic Twelve radiocarbon ages from charcoal and paired bulk-sediment samples are mostly in chronological order, although some reversals indicate that old wood is stored in the system. Most importantly, a pair of radiocarbon ages from sediments at the paleochannel base date to approximately AD 1000 indicating that floodplain incision occurred during the Cub Creek village occupation, which ended by AD 1080. These preliminary data support our hypothesis that arroyo formation at Cub Creek corresponded with the same precipitation event that allowed the Fremont community to grow. Preliminary results from a second alluvial locality show a later arroyo-forming event at approximately AD 1600 indicating that

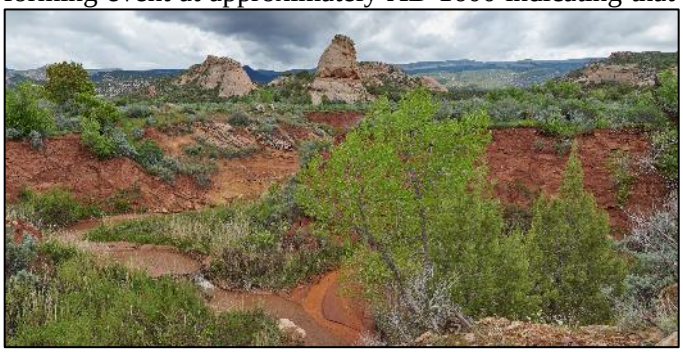

Figure 2.3. The modern arroyo of Cub Creek looking east (upvalley) towards Elephant's Toes and other slickrock formations of Jurassic Nugget Sandstone.

Cub Creek rapidly filled its channel in the following centuries. The dryland alluvial landscapes of the Northern Colorado Plateau are truly dynamic, and the arroyo problem must be considered as a fundamental challenge to the robustness-vulnerability thresholds of dryland agricultural systems past and present. Weber Formation from sources north of Cub Creek contributes buff sands while the Triassic Chinle Formation delivers red fine sand and silt from the south. A truncated deposit of Chinle alluvium initially signaled the presence of the paleochannel (Figure 2.4). Abundant, discrete, charcoal layers are also important marker beds while providing ample materials for radiocarbon dating. This 2.5-meter sequence dates to the last 2,000 years, which is coeval with the Fremont occupation (Figure 2.4).

Acknowledgement. This work was funded by the Geological Society of America's Quaternary Geology and Geochronology Division Gladys W. Cole Research Award and was conducted with permission from Dinosaur National Monument. Erick Robinson (Boise State University) and R. Justin DeRose (Utah State University) are my team members who provide technical expertise and constant feedback on this project

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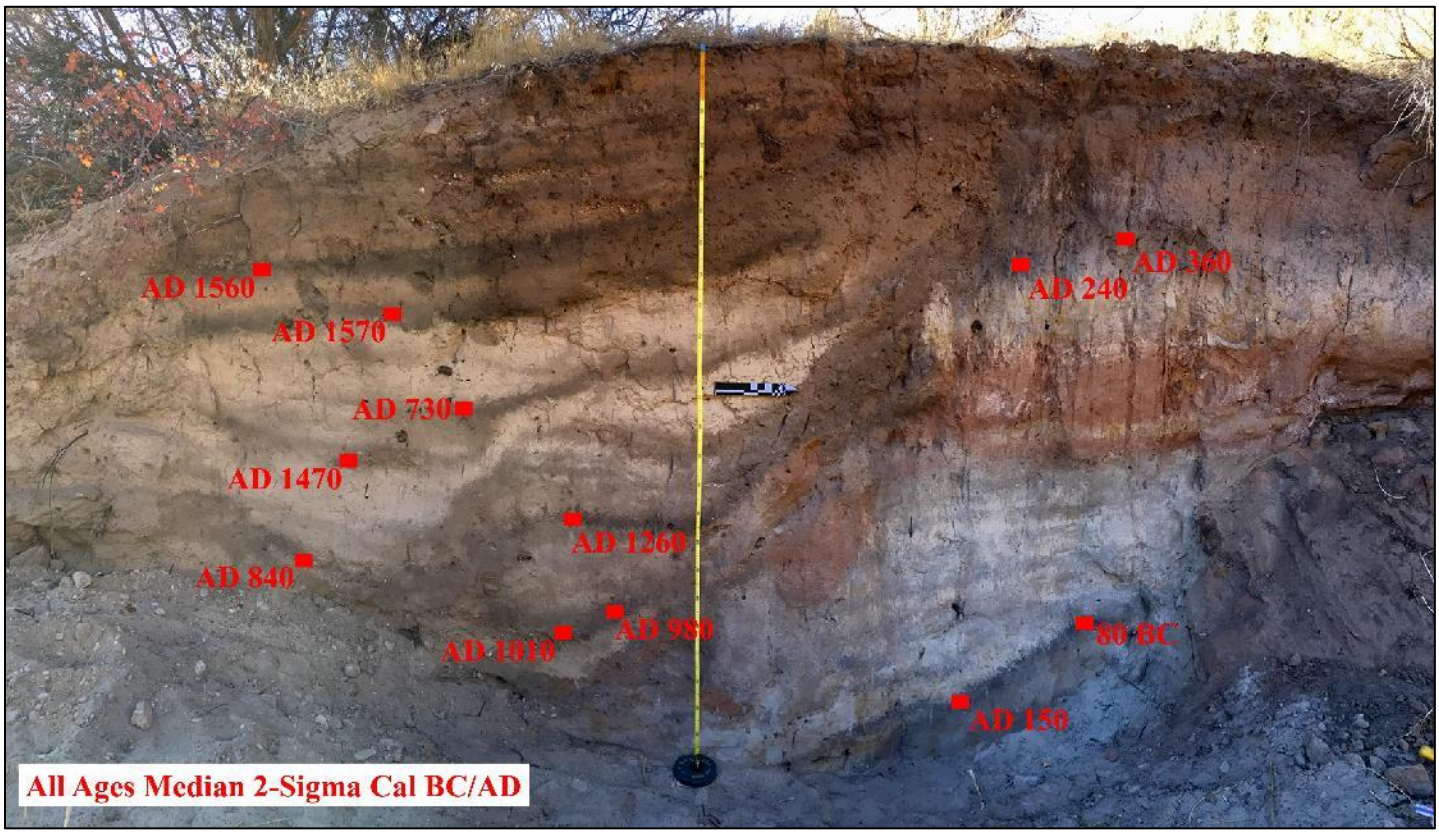

Figure 2.4. Cub Creek Alluvial Locality I with a paleochannel and 12 radiocarbon ages constraining the cut-and-fill sequence. Note the contrast of alluvium sourced from the Weber and Chinle formations, particularly the bed of Chinle alluvium cut off on the right of the paleochannel.