



Newsletter of the Geoarchaeology Division of the Geological Society of America

Fall 2025



Featured research:

“Late Holocene Anthropogenic Influences on Soil Chemistry in the Southern Gulf Lowlands, Veracruz, Mexico”

By: **Cristina Leschhorn, M.S.**, University of Memphis; Earth Sciences Department

Photo credit: Matt Gush

Newsletter by Gwen Olivier (TXST) and Denay Grund (Anchor QEA, LLC.)

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NOTES FROM THE CHAIR

Over the past year, geoarchaeology has continued to expand its reach and deepen its impact. What was once considered a boundary field between geology and archaeology has matured into an essential, integrative science that links stratigraphy, geochemistry, geophysics, geomorphology and other geoscience subdisciplines with questions of human behavior and environmental change. The pace of innovation in 2025 has been remarkable, and I am delighted to highlight several trends and developments that reflect the vitality of our discipline and the important role our Division plays within GSA.

Geoarchaeology has become a truly interdisciplinary practice. This year's landmark study at Karnak Temple in Egypt combined sediment cores, geomorphological mapping, and ceramic analysis to rewrite the environmental history of the Nile floodplain. Parallel advances are occurring worldwide: drone-based LiDAR and photogrammetry studies at many locations are revealing the presence and extent of archaeological sites such as the Late Bronze Age site of Dmanisi Gora in the Caucasus, while water chemistry studies in the Maya lowlands illuminate how Classic Maya communities responded to prolonged drought. Together, these projects show that the most powerful insights arise when we merge data across scales and disciplines. Today, geoarchaeology stands not as a supporting science, but as a central interpretive framework for understanding the human past.

Looking forward, advances in machine learning, spatial modeling and artificial intelligence promise to further transform the way geoarchaeologists collect, analyze, and interpret data. From automated classification of sediment thin sections and drone imagery to predictive modeling of site formation processes, Data Science and AI offer the potential to accelerate discovery while revealing subtle spatial and temporal relationships that might otherwise go unnoticed. As these tools evolve, our challenge will be to ensure that they remain transparent, ethically applied, and grounded in sound geological and archaeological reasoning.

Across the globe, geoarchaeologists are documenting and helping communities respond to rapid environmental change. Studies of wildfire impacts to cultural resources in Greece, accelerated

sedimentation in floodplains in Poland, and rapid shoreline change around heritage sites in coastal Georgia all show that the same processes that shaped ancient landscapes are still active today. Increasingly, geoarchaeological methods are informing cultural resource management and environmental planning by offering long-term perspectives on resilience and landscape evolution.

As our analytical tools become more sophisticated, so too must our commitment to training, accessibility, and open science. Across GSA and partner societies, workshops and webinars now offer practical experience in coring techniques, GIS, geochemical analysis, aerial survey, and photogrammetry. The Division also encourages members to strengthen open-access data sharing through GSA's Figshare platform (<https://gsapubs.figshare.com/>) and other data repositories that promote reproducibility and transparency. In addition, mentorship programs continue to connect students, early-career researchers, and professionals, supporting our shared goal of cultivating a collaborative, inclusive, and data-literate geoarchaeological community.

From sediment cores to the cosmos, geoarchaeology in 2025 is more integrative, reflexive, urgent, expansive, and open than ever before. The Geoarchaeology Division continues to foster this energy through topical sessions, student awards, and outreach initiatives that bring together geoscientists and archaeologists.

I invite all members, both new and long-standing, to get involved. Propose a GSA session, share your research highlights at conferences and within your local community, and help us strengthen the visibility of geoarchaeology across the geosciences. Together, we can ensure that our Division remains a leading force in shaping how Earth scientists and archaeologists understand the record of human interaction with the planet.

Thank you for your continued enthusiasm and support. I look forward to seeing many of you at GSA Connects and to another year of discovery, innovation, and collaboration.

Scott Pike, Chair, Geoarchaeology Division

GSA CONNECTS 2025 MEETING GUIDE

THE GEOLOGICAL SOCIETY OF AMERICA

October 19-22, 2025

San Antonio, Texas

<https://community.geosociety.org/gsa2025/home>

GSA Geoarchaeology Division Business Meeting

Monday, October 20, 2025

5:45-7:30 PM

Grand Hyatt - Presidio A

Short Courses of Interest

Introduction to Field Safety Leadership

Sat., 18 Oct., 8:00 AM

Mastering Quantitative Analysis Using XRF, XRD, and X-ray CT

Sat., 18 Oct., 1:00 PM

Field Trips of Interest

Kirk Bryan Field Trip & The Hydrology of the Edwards Aquifer and the Geoarchaeology of Spring Lake, South-Central Texas

Sat., 18 Oct., 7:30 AM

Building San Antonio: Geology, water and building resources in the historic 'Valley of the Missions'.

Sat., 18 Oct., 8:30 AM

Geoarchaeology Sessions

All times in Central Time

Sunday, October 19

**63 – T27. Geoarchaeology of Sites to
Landscapes: Current Research on Long-Term
Water and Soil Management and
Maladaptation (Posters)**

8:00 AM - 5:30 PM (Author Availability 3:30
PM - 5:30 PM)
HBGCC - Hall 1

4 – T203. Recent Advances in Soil and Paleosol Science

8:00 AM - 12:00 PM

HBGCC - 212AB

7 – T18. A Change in Focus for Sustainability in Geoscience Education

8:00 AM - 12:00 PM

HBGCC - 214B

60 – T69. 2YC and 4YCU Geoscience Student Research Poster Showcase

8:00 AM - 5:30 PM (Author Availability 3:30
PM - 5:30 PM)

HBGCC - Hall 1

45 – D3. Geoarchaeology

1:30 PM - 3:00 PM

HBGCC - 214D

40 – T184. Aeolian Systems in Time and Space

1:30 PM - 5:00 PM

HBGCC - 212AB

Monday, October 20

164 – T25. Advances and Applications of Geochemistry in Archaeology

8:00 AM - 12:00 PM

HBGCC - 214D

84 – T27. Geoarchaeology of Sites to Landscapes: Current Research on Long-Term Water and Soil Management and Maladaptation, Part I

8:00 AM - 12:00 PM

HBGCC - 214D

79 – T191. Soil, Dust, and Everything in Between: Current, Quaternary and Earlier Geological Processes and Records

8:00 AM - 12:00 PM

HBGCC - 212AB

80 – T182. Recent Advances in Glacial Geology, Geomorphology, and Chronology
8:00 AM - 12:00 PM
HBGCC - 213AB

126 – T27. Geoarchaeology of Sites to Landscapes: Current Research on Long-Term Water and Soil Management and Maladaptation, Part II
1:30 PM - 5:00 PM
HBGCC - 214D

Tuesday, October 21

161 – T20. Dynamics of Natural and Built Environments
8:00 AM - 12:00 PM
HBGCC - 214A

202 – T30. Timestamped Biomineralized Structures in Coastal Environmental Monitoring and Cultural Research
1:30 PM - 5:00 PM
HBGCC - 214D

215 – T154. Coprolite Happens: Insights into Geobiology
1:30 PM - 5:00 PM
HBGCC - 304B

Wednesday, October 22

267 – T183. Advances in Fluvial Processes and Sediment Transport (Posters)
8:00 AM - 12:00 PM
HBGCC - Hall 1

276 – T185. Natural and Urban Channel Responses to Disturbance, Management, and Restoration
1:30 PM - 5:00 PM
HBGCC - 211

Upcoming Conferences and Workshops

2025 CANVAS (formerly the ASA, CSSA, SSSA International Annual Meeting and Jointly hosted by the American Society of Agronomy, the Crop Science Society of America, and the Soil Science Society of America)

Salt Lake City, Utah and Limited Virtual
November 9-12, 2025

<https://www.sciencesocieties.org/canvas?q=canvas/>

Association for Environmental Archaeology
Stavanger, Norway
December 4-6, 2025

<https://envarch.net/conferences>

GIG Interest Group Speaker Session: Urban Geoarchaeology and Coring
December 11, 2025
Open to SAA GIG members

Archaeological Institute of America Meeting
San Francisco, California
January 7-10, 2026

<https://www.archaeological.org/programs/professionals/annual-meeting/>

International Conference on Geoarchaeology and Environmental History
Montevideo, Uruguay
January 12-13, 2026

<https://waset.org/geoarchaeology-and-environmental-history-conference-in-january-2026-in-montevideo>

The Association of American Geographers
Annual Meeting
San Francisco, California
March 17-21, 2026

<https://www.aag.org/events/aag2026/>

**2026 Society for American Archaeology
91st Annual Meeting**
San Francisco, California
April 29-May 3, 2026
<https://saa.org/annual-meeting>

**European Geosciences Union General
Assembly 2025**
Vienna, Austria and Virtual
May 3-8, 2026
<https://www.egu26.eu/>

XXII INQUA Congress 2027
Lucknow, India
February 20-28, 2027
<https://www.inquaindia2027.in/>

Geological Society of America Regional Section Meetings

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

**2026 Joint Section Meeting
GSA Southeastern Section (7th Annual
Meeting)**
**GSA North-Central Section (60th Annual
Meeting)**
**GSA South-Central Section (60th Annual
Meeting)**
March 8-11, 2026 • Memphis, Tennessee
Abstracts Due: [Check website for updates](#)

**2026 GSA Northeastern Section
(61st Annual Meeting)**
March 21-26, 2026 • Hartford, Connecticut
Abstracts Due: [Check website for updates](#)

**2026 GSA Cordilleran Section
(122nd Annual Meeting)**
April 21-24, 2026 • Loreto, Baja California Sur,
Mexico
Abstracts Due: [Check website for updates](#)

**2026 GSA Rocky Mountain Section
(76th Annual Meeting)**

May 17-20, 2026 • Albuquerque, New Mexico
Abstracts Due: [Check website for updates](#)

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. The Albritton Award Fund provides scholarships and fellowships for graduate students in the Earth sciences and archaeology for research. Recipients of the award are students who have (1) an interest in achieving a Master's or Ph.D. 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 in the amount of \$650 are given in support of thesis or dissertation research, with emphasis on the field and/or laboratory aspects of the research. **Anticipated submission deadline: 04/26**

For information regarding eligibility and application guidelines: [Claude C. Albritton, Jr. Award - GSA Geoarchaeology Division](#)

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 knew Claude are 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.

For 2025, the Awards Committee selected two recipients for the Claude C. Albritton Scholarship. Congratulations to Gabrielle

Perry, a PhD student at Colorado University Boulder, for her research project *Resource Availability in Kodiak During the Ocean Bay Period*. Congratulations are also sent to Thomas Ulrich, a PhD student at Vanderbilt University, for his research project *Human-Facilitated Sediment Storage on the Andean Coast, Peru*.

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. **Anticipated submission deadline:** 08/26

Application guidelines, eligibility, and required materials: [Richard Hay Award - GSA Geoarchaeology Division](#)

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

Congratulations to our 2025 awardee, Freya Cordell, a triple-major undergraduate student from the University of Alabama.

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. **Nomination deadline:** February 15, annually

Nomination guidelines, eligibility, and required materials:

[Rip Rapp Archaeological Geology Award - GSA Geoarchaeology Division](#)

Congratulations to our 2025 awardee, Dr. Sheryl Luzzadder-Beach, University of Texas at Austin for her transformative contributions to geoarchaeology through her pioneering studies of hydrology, geomorphology, and human–environment interactions in the Maya Lowlands, Central America using field investigations, laboratory analysis, remote sensing, and geostatistical modeling.

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. **Submission deadline:** 01/01/26

For more information regarding eligibility, materials required, chair contact, and application guidelines: [Douglas C. Kellogg Fellowship for Geoarchaeological Research](#)

Congratulations to 2025 awardee Jordan J. Thompson, Washington State University.

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 2027 Fryxell Award is "Plant Sciences." **Nomination/Submission Deadline:** 02/24/26

For more information regarding nomination submissions/materials, eligibility, chair contact, and award guidelines: [Fryxell Award for Interdisciplinary Research for 2027](#)

Congratulations to 2025 awardee in Physical Sciences, David Meltzer, Southern Methodist University.

Geoarchaeology Interest Group Paul Goldberg 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. **Submission deadline:** 01/01/26

For more information regarding eligibility, materials required, chair contact, and application guidelines: [Paul Goldberg Award](#)

Congratulations to 2025 awardee Erin Mathison, Texas State University.

Geoarchaeology Interest Group Julie K. Stein Award for Undergraduate Travel

The Geoarchaeology Interest Group funds the Julie Stein Award for Undergraduate Travel (Geoarchaeology Undergraduate Travel Award) to support travel to the SAA Annual Meeting for an undergraduate student presenting a research

paper or poster in geoarchaeology. **Anticipated submission deadline:** 01/2026

For more information regarding eligibility, required materials, chair contact, and application guidelines:

[Julie K. Stein Geoarchaeology Undergraduate Travel Award](#)

Congratulations to 2025 awardee Macayla Sauser, Texas A&M University.

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 two decades. 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. These awards are typically given yearly at the Society for American Archaeology annual meeting and every other year at the International Symposium on Archaeometry. **Anticipated submission deadline:** 04/26

For more information regarding eligibility, required materials, updated deadline, and application guidelines: [R. E. Taylor & SAS Student Poster Awards](#)

For more information contact:

Tatsuya Murakami (tmurakam@tulane.edu)

Congratulations to 2024 awardee **Samantha Mahan (University of Missouri)** for “Microanalysis of Late Stone Age Rock Art Ochre Pigments in Eswatini.” And an honorable mention to **Nadia Neff (University of New Mexico)** for Tracking the Origins of Animal Management in a Neotropical Foraging-to Farming Population using Carbon Stable Isotope Analysis of Lysine.

Student and Early Career Research Support Award

The Society for Archaeological Sciences (SAS) invites applications for the SAS Student and Early Career Researcher (ERC) Research Support Award. This award is designed to support research activities and dissemination conducted by student and early career members, including laboratory and fieldwork expenses, as well as presentations at conferences, symposia and workshops. **Anticipated submission deadline: 02/26**

For more information regarding eligibility, required materials, updated deadline, and application guidelines: [Student and ECR Research Support Award - Society for Archaeological Sciences](#)

Congratulations to awardees Jayde Hirniak (School of Human Evolution and Social Change Institute of Human Origins, Arizona State University) for their project on understanding how the changing environment or climate played a role in human evolution in South Africa; **Emily Doyle (Stony Brook University, USA Department of Geosciences, Texas Tech University)** for their project on evaluating the evolution of indigenous Iron Age communities through time by analyzing their material culture.

GEOARCHAEOLOGY: AN INTERNATIONAL JOURNAL

Explore the [Geoarchaeology website](#) and what is currently posted on early view.

Geoarchaeology (now in Volume 40, with 6 issues a year) continues to present the results of original research at the methodological and theoretical interface between archaeology and the geosciences. Because the journal is international, authors should present their research within a large scholarly context such that results are of global significance. At this time, manuscripts reporting on research conducted in the Americas, Africa, Asia, Australia, and Polynesia are especially encouraged.

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 Lisa-Marie Shillito and Astolfo G.M. Araujo, who are assisted by a board of expert Associate Editors. For more information, contact the editors at: lisa-Marie.Shillito@newcastle.ac.uk.

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RECENT ISSUE (2025, Vol 40: 5)

New Insights Into Early Islamic Hydro-Agricultural Strategies in Northwest Arabia: A Geoarchaeological Study of al-Bint Dam (Sadd al-Bint). Open Access. Bruno Depreux, Munirah AlMushawh, Stephen McPhillips, Guillaume Chung-To, Sylvain Colin, Elora Chambraud, Kévin Guadagnini,

Saifi AlShilali, Mashael AlDughailbi, Fatimah AlRashidi, Khalid AlKhaldi, Charlotte Faiers, Rémy Crassard, Guillaume Charloux

Paleoenvironmental Reconstruction of the Settlement Area of Ancient Bubastis (Tell Basta), Southeastern Nile Delta (Egypt). Open Access. Philipp Garbe, Amr Abd El-Raouf, Martin Behl, Ashraf Es-Senussi, Eva Lange-Athinodorou, Julia Meister

The Flooding of Lagash (Iraq): Evidence for Urban Destruction Under Lugalzagesi, the King of Uruk and Umma. Open Access. Reed Goodman, Liviu Giosan, Zhixiong Shen, Paul Zimmerman, Andreas Lang, Stefan Constantinescu, Sara Pizzimenti, Zaid Alrawi, Holly Pittman

DIVISION OFFICERS

Past 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. You can follow Sam's research on twitter: [@SoilsandSwamps](https://twitter.com/SoilsandSwamps).

Chair



Scott Pike
Departments of Environmental Science & Archaeology
Willamette University
spike@willamette.edu

Scott Pike is a Professor of Environmental Science and Archaeology at Willamette University in Salem, Oregon. He received his BA in Anthropology from Oberlin College (1989) and PhD in Geology from the University of Georgia (2000). He was a Fulbright Fellow to Greece in 1993-94 which led to a four-year stint at the Wiener Laboratory of Archaeological Science at the American School of Classical Studies at Athens, the final two years (1995-1997) as the lab's Acting Director. Upon returning to the US and finishing his dissertation, Scott taught at Lynchburg College (2001-2005) before beginning his appointment at Willamette. Scott's research follows two broad paths. First, he focuses on the procurement, use, trade and aesthetics of white marble used in the ancient Mediterranean basin by using stable isotopes and other means to discriminate between inter- and intra-quarry sources. Second, Scott is interested in the development and application of portable instrumentation to study the synergistic relationships between societies and their changing landscapes. Current projects include a systematic geochemical study of multi-phased floor samples collected from monumental structures at the Neolithic site of the Ness of

Brodgar in Orkney, Scotland; sourcing the marble quarries exploited for different sculptural and architectural components of the Parthenon; as well as a NSF-supported program to train undergraduate students to design, implement and use drones equipped with RGB, multispectral and LiDAR sensors to identify, record and model ancient white marble quarries in Greece. Scott has been a member of GSA and the Geoarchaeology Division since 1994 and looks forward to serving the geoarchaeology community.

Vice-Chair

C. Fred T. Andrus
Department of Geological Sciences
University of Alabama
Tuscaloosa, AL 35487
fandrus@ua.edu

Fred Andrus is a Professor of Geological Sciences at the University of Alabama. He earned a BA and MA in Anthropology from the University of Georgia, focused on zooarchaeology. He then switched to Geology for his Ph.D., also at Georgia, focusing on sclerochronology and isotope geochemistry of carbonate biominerals. He has also worked as a CRM archaeologist and as a post-doctoral scholar at the Savannah River Ecology Lab. His research questions often center on human-environment interaction over time, analyzing remains found in shell middens. His field areas include the east and west coasts of North America, Bering Sea, Gulf of Mexico, Caribbean, Adriatic, and the Pacific coast of South America. He has been a member of GSA since 1998, GSA Fellow since 2003, and currently serves as vice president/president elect of the Geoarchaeology Division.

Secretary-Treasurer

Rebecca Taormina
Department of Math & Science
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Dr. Rebecca Taormina is a professor at National Park College in Hot Springs, AR and the Field Trip and Short Program Coordinator at the Geological Society of America. Rebecca's research interests include Quaternary geology, fluvial and soil geomorphology, and the peopling of America. Rebecca's primary focus has been on the influence of climate on river terrace formation in the Gulf deltaic plain and beyond over the last 100k years. Currently, Rebecca is expanding her pedagogy at her teaching focused institution and facilitating the development of a larger field excursion and geotourism program through GSA.

Student Representative Ex-Officio

Benjamin Deans
Department of Anthropology
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Congratulations to our upcoming officers!

Chair: Fred Andrus
Vice Chair: Alyssa V. Pietraszek
Secretary-Treasurer: Rebecca Taormina
Student Representative: Cristina Leschhorn

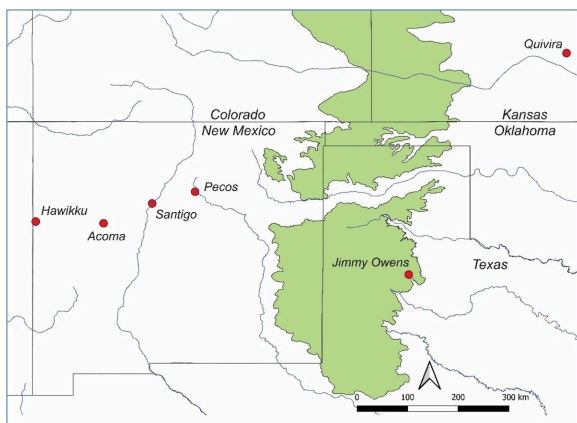
NOTES FROM THE COMMUNITY

Britt Bousman (Texas State) and **Sarah Himes** (Simon Fraser) are developing an allostratigraphic framework for Quaternary alluvial deposits along the Modder River at the Erfkroon site, located in South Africa's western Free State Province. Erfkroon sits on a section of the Modder notable for its highly visible, deeply eroded terrace architecture, particularly the Orangia Terrace, which preserves paleontological specimens and archaeology spanning approximately 120,000 years to

historic times. This study aims to clarify the lateral continuity of terrace landforms, and to elucidate the interplay between sedimentary processes, pedogenesis, and erosion in shaping them. The study integrates optically stimulated luminescence (OSL) dating, micromorphological analysis, bulk sediment, geochemistry, infrared spectrometry, and phytolith analysis across multiple terrace facies to help reconstruct terrace formation history, late Quaternary environmental changes, and subsequent landscape evolution.



Britt Bousman and **Myriah Allen** (Texas State) are developing a predictive stable isotope isoscape model for the Southern Plains and adjacent New Mexican Southwest regions to study the acquisition of horse and cattle by bison hunting Native Americans in the 16th and 17 centuries. These will be based on samples from modern local pasture fed stock provided by cooperating ranchers in both regions. This is linked to a historical study of Spanish mission and colonial settlement history in Northern Mexico, New Mexico and Texas.



Weston C. McCool, Brian F. Coddington, Bridgette Degnan, Claire E. Elbert, Emily S. Johnson, Kenneth Blake Vernon, Kurt M. Wilson, Timothy Beach, Keith M. Prufer, and Douglas J. Kennett recently published “Modeling the rise and demise of Classic Maya cities: Climate, conflict, and economies of scale” in PNAS. Weston et al. (2025) compiled paleoclimate, paleoecological, population, and historical data from the Classic Period Maya (Lowlands) with structural equation modeling, and found that periods of climate downturn, intergroup conflict, and growing economies of scale worked together to drive the parallel development of cities and patron–client social systems. These forces supported the growth of urban centers, strengthened urban institutions, and increased social inequality. Check out their article for more information!

UGA's Geaorchaeology Lab and UGA's Geospatial Center are testing Drone GPR systems for non-contact surveys of stone effigy mounds. The photo below is the prehistoric mound, Rock Eagle, and the drone being prepped to fly.



FEATURED RESEARCH

Late Holocene Anthropogenic Influences on Soil Chemistry in the Southern Gulf Lowlands, Veracruz, Mexico



Photo credit: Matt Gush

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Human activities have significantly altered global soil stability and composition, though impacts on volcanic soils remain less understood (Hunziker et al., 2019). Previous research on anthropogenic soils (Dazzi et al., 2015) suggests that land management practices such as fertilization, composting, or continuous cultivation can significantly alter soil organic matter content and cation exchange capacity. These land management practices, in turn, influence how soil organic carbon is stored, decomposed, and cycled within the soil matrix (Johnston et al., 2004).

In the lowlands of the Sierra de Los Tuxtlas, Veracruz, Mexico, my research investigates how land use, from pre-Colonial maize farming to colonial sugarcane production and modern grazing, has left lasting chemical and isotopic signatures in the soils at the archaeological site of Mazapa (**Figure 1**). Mazapa is a Late Postclassic (AD 900–Today) city center that includes a ballcourt, sunken patio, and residential mounds (**Figure 2**). After the Spanish

conquest, the surrounding landscape was transformed by sugarcane cultivation, irrigation canals, and milling infrastructure. The site sits within the Tuxtla Volcanic Field, where fertile Andisols are shaped by both volcanic eruptions and human activity (Nelson & González-Caver, 1992).

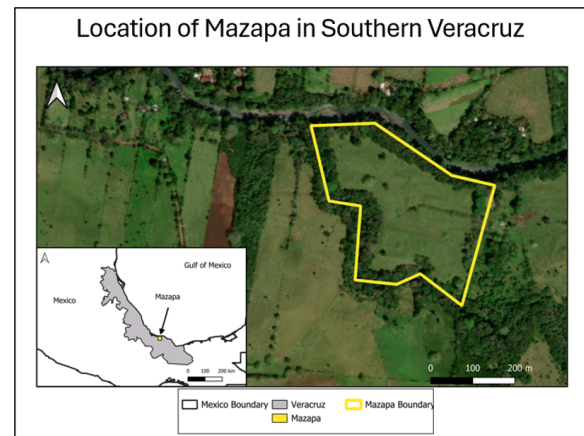


Figure 1. Map of Mazapa within Veracruz, Mexico. The yellow boundary marks the city center.

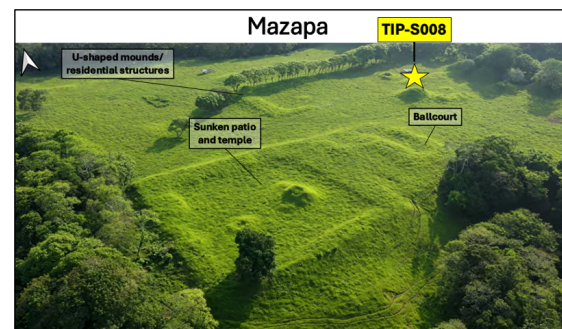


Figure 2. Aerial drone image showing the sunken patio and temple, ballcourt, and U-shaped residential mounds at Mazapa. The location of soil profile TIP-S008 is indicated by a star.

The central objective of this study was to identify a soil profile that could serve as a reliable environmental archive that preserves long-term signals of land use changes. To address this, I focused on identifying a composite soil profile. A composite soil profile accumulates over time and contains buried paleosols that act as time markers of environmental change (Morrison, 1967). In contrast, a residual soil develops from a single, continuous parent material that weathers in place (Gerrard, 1992). Because both residual and

composite soils typically show younger radiocarbon ages at the surface and older at depth (Shi et al., 2020), radiocarbon trends alone could not confirm whether a profile captures land use changes.

Composite profile TIP-S008 was selected for detailed analysis because it contains multiple buried horizons and visible transitions in weathering and chemistry that suggest sequential phases of soil formation (**Figures 2 and 3**). Lapilli grains occur throughout the profile and were observed in thin section as another line of evidence to confirm whether the TIP-S008 profile was a composite profile. This data reveals two major zones in the soil record (**Figures 3 and 4**). Lapilli throughout the profile show a clear down-profile transition, from fresh unweathered glass in the modern surface horizons (~100–500 cal yr BP; Zone 2) to glass with thick weathering rinds in the buried horizons (~500–3000 cal yr BP; Zone 1). This increase in alteration is consistent with composite profile development, where older, buried horizons undergo extended pedogenesis while younger horizons form through renewed surface accumulation.

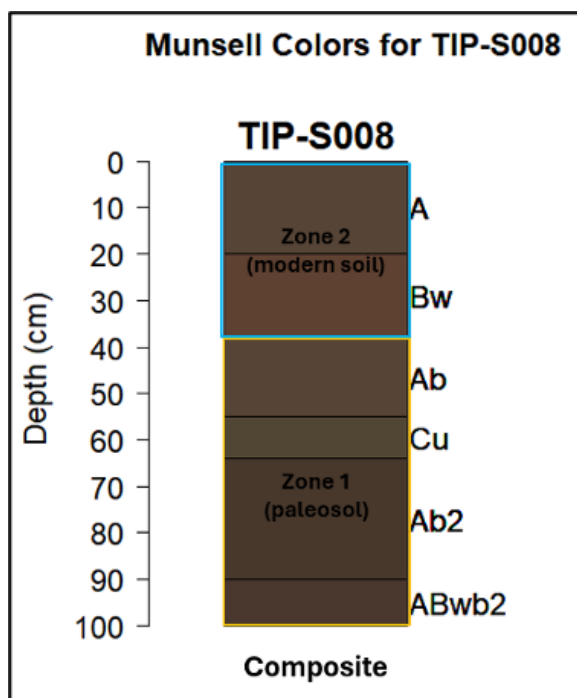


Figure 3. Munsell colors of TIP-S008, illustrating two

major zones: Zone 1 represents buried paleosols, and Zone 2 represents modern surface soils.

These observations indicate that TIP-S008 preserves more than a single phase of soil formation and likely represents a composite profile and serves as an environmental archive. Moving forward, I will continue micro-XRF and $\delta^{13}\text{C}$ analyses in TIP-S008 and compare these data to additional profiles across the Mazapa area to evaluate how widespread these anthropogenic signals are. This research is crucial not only for reconstructing past human–environment interactions in Mesoamerica but also for assessing the long-term stability of soils in the tropics (Veldkamp et al., 2020).

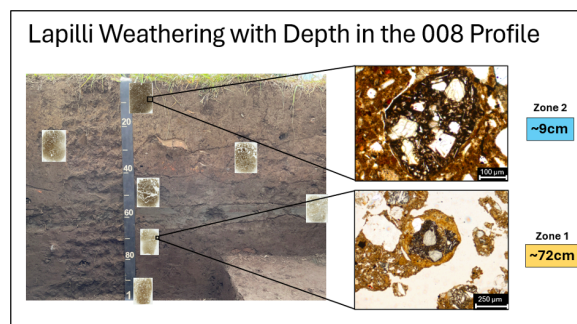


Figure 4. Thin-section photographs in plane polarized light of lapilli from the TIP-S008 profile showing progressive weathering with depth.

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