

UNIVERSITY OF OKLAHOMA SCHOOL OF GEOSCIENCES

# EARTH SCIENTIST



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# ABOUT THIS ISSUE

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**Did You Know:** The *Earth Scientist* has showcased departmental news since 1982. Its earlier incarnation was known as the Sooner Geologist, which debuted in 1967. Thus, accounting for the rare exceptions of years unpublished, we are now on volume 48 of the

alumni magazine. And, prior to that, we have records of our alumni newsletters dating to 1959.

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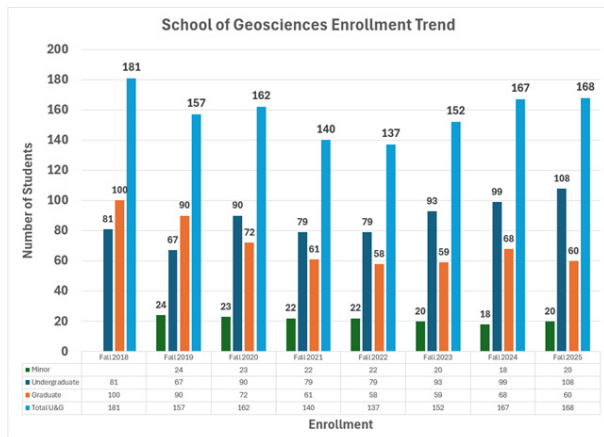
# DIRECTOR'S LETTER

Matthew J. Pranter, Ph.D.



The School of Geosciences had another successful year!

We saw an increase in our graduate applications, and graduate student enrollments are somewhat steady while undergraduate enrollments are increasing. In fall 2025, we will have ~108 undergraduate majors and 60 graduate students for a projected total enrollment of 168. Of the 20 new undergraduates for Fall 2025, the breakdown is: 12 paleontology, two petroleum geology, two environmental geology, and four geology. We continue to see a significant interest in paleontology among our undergraduate majors. Degrees were granted to 14 B.S., 10 M.S., and two Ph.D. students in 2024 and 13 B.S., 18 M.S., and six Ph.D. students in spring/summer 2025.



Many students presented talks or posters at national/international/internal conferences, and several published and/or submitted papers in peer-reviewed journals. Our graduate and undergraduate students received numerous recognitions for excellence in scholarship, teaching, research and outreach that you will see throughout this issue. Among these include the Outstanding Senior for the Mewbourne College of Earth and Energy (Braeden Moreland, B.S. Geology).

For spring 2025, the school merged the former *Spring Student Expo* and *Research Symposium* into a single event – the **Geosciences Student Research Symposium and Expo**. The event was well attended and a great success – it included short courses, lunch, research posters, exhibiting companies and organizations, networking, and an awards reception. It was again sponsored by the AAPG Foundation with significant funding for poster awards from the Oklahoma Geological Foundation. We also greatly appreciate the 13 exhibitors that provided funding for the event. There were 75 registered students representing several universities, 45 posters and four short courses with 65 enrolled students. Molly Turko (Devon), Héctor Lamadrid, Sarah George, Gilby Jepson and Son Dang (MPGE) instructed the short courses. This year, coinciding with the Student Research Symposium and Expo, we held our Graduate Student Visitation Day. Prospective graduate students visited at this time to meet current OU students, faculty and staff, discuss our programs, and tour campus and Norman.

The petroleum industry continues to be the main employer of our graduates for both internships and full-time careers; however, our graduates are pursuing opportunities in a range of fields. Most of our recent graduates started full-time careers in the oil and gas industry with BP, OXY, Shell, ExxonMobil, ConocoPhillips, TotalEnergies, Ovintiv, Devon, Continental, Mewbourne, EOG and SLB, to name a few. Several graduates have started careers in the energy/ environmental field (e.g., Battelle, WSP), state and federal government (e.g., Oklahoma Geological Survey, Illinois Geological Survey, USGS, national labs) and academia. Others are advancing to pursue their Ph.D.s (e.g., Stanford, Tennessee) and some have acquired positions in data analytics with various industries.

In terms of research, in FY2025, the faculty submitted 25 proposals for \$8.5 million. The school



received \$4.1 million in research awards and had \$3.8 million in research expenditures. From 2018 through 2024, our average annual number of peer-reviewed journal articles for the school is 76 and our average annual number of articles/FTE is 3.9. Last year, the faculty published approximately 62 peer-reviewed journal articles and ~50 peer-reviewed abstracts for professional society conferences.

In 2024, we taught 49 regular-graded courses, with an average teaching load of ~3.4 courses and 5,575 credit hours produced (~358 credit hours/faculty). Additionally, our faculty taught 1428 students in General Education courses. In summer 2024, the Bartell Field Camp was attended by 12 geology students (24 students in 2025); we did not hold a geophysics field camp in 2024 or 2025.

As of early spring 2025, the school had 21 tenured or tenure-track faculty (17.89 FTE given several joint appointments). We are conducting a search for an assistant professor in hydrogeosciences and will readvertise the position this summer and interview in Fall 2025. Assistant professor Junle Jiang will be reviewed for tenure and promotion to associate professor this fall 2025-spring 2026. The School of Geosciences will experience a few faculty changes in the next several years. Professors Andrew and Megan Elwood Madden resigned in spring 2025 for administrative and faculty positions, respectively, at Michigan State University. Assistant professors Sarah George and Gilby Jepson resigned and will start positions at the University of North Carolina (Chapel Hill) in July 2025 and January 2026, respectively. We have submitted requests for several new faculty hires and hope to begin these new searches in fall 2025 and 2026.

The School of Geosciences benefits greatly from our alumni, friends and industry donors in terms of substantial financial support and their time. Through their generosity, we have funds to support our faculty, staff and students as well as many of our academic programs, including field camp. We offer numerous scholarships each year, and ~60% of our undergraduate majors and 100% of our graduate students received scholarships totaling \$355,000 and \$140,725, respectively, for 2024-25. In February 2025, the Paul and Natalie Buckthal Endowment fund was established for the School of Geosciences through a generous gift in their memory. Paul and Natalie Buckthal were alumni of the School of Geosciences and the College of Arts and Sciences, respectively. We are very excited that Chevron has been an amazing sponsor of our Bartell Field Camp regional field trip for several years and are pleased

to announce that Shell will sponsor the John D. Pigott Memorial Colloquium Series. We welcome and greatly appreciate donations of any amount to support our programs!

Other notable events:

- Junle Jiang was the recipient of a National Science Foundation CAREER Award! For this research, his team will develop new computational tools that combine geophysical observations and models to better understand megathrust systems and forecast geohazards across multiple scales. The total amount is \$729,600 for 2025–2030.
- Brett Carpenter was awarded the Brian E. and Sandra O'Brien Presidential Professorship.
- Heather Bedle was selected as the inaugural director of the Sustainable Energy System Program. Her director role begins July 1, 2025.
- Ginger Leivas received a Staff Excellence Award for the Mewbourne College of Earth and Energy.
- Davey Wright received a Junior Faculty Fellowship Award from the Office of the Vice President for Research and Partnerships to support his research titled *Fossils and molecular phylogenetics reveal the evolutionary origin and post-mass extinction diversification of crown group Crinoidea*.
- Xiaolei Liu was the recipient of the Hanse-Wissenschaftskolleg Fellowship to conduct research in Germany. The fellowship provides support for up to 10 months and covers airfare and accommodations for the fellow and their family, as well as a salary subsidy for the fellow.

Please see inside for information on other awards, events and programs. I hope you enjoy this issue of the *Earth Scientist*!



Matthew J. Pranter, Director and Eberly Family Chair



# DEAN'S LETTER

John Antonio, Ph.D.



As dean of the Mewbourne College of Earth and Energy, I am excited for you to read this edition of *Earth Scientist!* I am constantly amazed and proud of how the School of Geosciences continues to achieve new levels of excellence. As mentioned in Matt's welcome letter, key metrics for the school such as student enrollment and extramural research awards have been increasing at impressive rates over the past several years. And this trend is also true across the entire college. For the fall 2025 semester, we are projecting that the overall enrollment of the Mewbourne College of Earth and Energy will be 453, which represents a 14% year-over-year increase and more than a 40% increase over the past three years. Likewise, extramural research awards for Mewbourne College have increased by more than 60% over the past three years, breaking records each consecutive year. For fiscal year 2025 (which ends June 30, 2025) research awards for Mewbourne College are projected to eclipse \$16 million.

Excellence in competitive research funding is aligned with, and directly supports, OU's strategic goal of meeting the Association of American Universities quality benchmarks, which will position OU among the top universities in the U.S. By striving for and achieving this level of excellence, the School of Geosciences, in turn, will continue to attract outstanding faculty, students and staff – a cycle of growth and achievement that feeds on itself. The Geosciences faculty and staff have seized on this opportunity in amazing fashion by recruiting outstanding students to our Geosciences programs.

As impressive as the quantitative measures of growth for Geoscience research and academic programs are, so too are the underlying catalysts driving this growth. For example, the paleontology option for the undergraduate degree program continues to be a very popular choice for incoming students. The School of Geosciences has established itself as having one of the premier programs of this type in the region. Our strong partnership and collaboration with OU's Sam Noble Oklahoma Museum of Natural History is an important aspect of this success. A broad portfolio of Geoscience research and academic programming creates a vibrant and exciting environment for all students.

Geosciences of course also continues to expand and build upon our strong legacy of excellence in energy-related topics. Our geosciences students are among the most sought after by the energy sector – our reputation, dedication and leadership tied to this critical industry is second to none.

You may know that Mewbourne College led in the development of a new multidisciplinary sustainable energy systems certificate program, which was launched in fall 2024. Already, there are close to 60 undergraduate students in this program representing a diverse collection of majors from seven academic colleges across OU's campus. The inaugural director for this campus-wide SES program is our very own geosciences associate professor Heather Bedle, who also holds the Lissa and Cy Wagner Professorship and an Edith Kinney Gaylord Presidential Professorship. The overall goal of the SES certificate program is to provide interdisciplinary education from a range of perspectives to equip students with vital knowledge and skills needed to address complex and pressing challenges in a dynamic energy landscape. A companion graduate SES certificate program is being launched in fall 2025, which will be key in recruiting the world's brightest Ph.D. students to OU to pursue research across multiple disciplines and areas of interest.

In summary, OU's School of Geosciences continues to excel in many dimensions. The school has a long legacy of excellence, collaboration and highly values challenging the status quo. It is this spirit of inquiry that drives innovation and makes OU's School of Geosciences such a special place for discovery and dissemination of knowledge. It is my privilege to serve as your dean and support the amazing School of Geosciences!

*John Antonio*  
Dean and Lester A. Day Family Chair



# AAC CHAIR'S LETTER

Jason Currie



Dear Alumni, Students and Faculty,

This past school year has been another exciting and impactful chapter for the Alumni Advisory Council as we continue our purpose to support the students, faculty, and the broader School of Geosciences within the Mewbourne College of Earth and Energy. For over 125 years, the school has stood as a global leader in geosciences research and education—and each of you plays an integral role in that legacy.

Our fall AAC meeting, held on Oct. 15, 2024, welcomed dean John Antonio and director Dr. Matthew Pranter for a strategic discussion on the school's current position and future direction. We were honored to hear from chairman Michael Cawley, who offered a compelling perspective on the OU Board of Regents' efforts in shaping the University of Oklahoma into a leading institution of higher education.

Throughout the fall semester, alumni played a vital role on campus, sponsoring programs and mentoring students preparing for internships and career opportunities. The AAPG-IMAGE 2024 alumni reception was another highlight, bringing together alumni, faculty and students to celebrate achievements and strengthen community ties.

Our spring AAC Meeting on March 14, 2025, marked the election of our new officers for the 2025–2027 term: **President:** Jason Currie, **Vice President:** Devin Dennie, Ph.D. **Secretary:** Kirk Kolar, **Directors:** Stephanie Cook, Zach Williams and Emmitt Lockard

During the meeting, dean John Antonio and director Matthew Pranter provided an update on the State of the School, spotlighting key developments including the launch of the Sustainable Energy Systems Certificate Program, and announcing Heather Bedle as the director of SES, and the unveiling of the new Williams Office Suite in Sarkeys Energy Center. The council also began work on updating its by-laws and aligning strategic goals with the Mewbourne College's Board of Visitors in preparation for our next meeting in September.

We are excited to see our alumni remain engaged throughout the spring semester of 2025. Many participated in the John D. Pigott Colloquium Series, sharing valuable insights on "Life After Graduation" and "Geo-Skills That Matter" with current students. In a special gesture, students in professor Shannon Dulin's Field Methods class were given new protractors—designed by Steve Adams, Ph.D., and provided by the AAC—for their 2025 Bartell Field Camp

experience. We were also honored to attend the Trailblazer Award ceremony to congratulate this year's recipient, Regent Ken Waits, recognizing his outstanding contributions, and we celebrated with guests the announcement of the many academia prestigious awards the geology students have received throughout the year.

Looking ahead, I am excited about the future of the AAC. We are committed to expanding fundraising efforts and deepening alumni engagement to further support our school, its faculty and its students. We invite all alumni to reconnect by mentoring students, providing internship opportunities and strengthening professional networks. There are many ways alumni, that's YOU, can expand your career goals and brighten the Sooner geology spirit by attending a John D. Pigott Colloquium, joining us at the AAPG IMAGE 2025 reception, or engaging with us on social media.

On behalf of the entire AAC, we extend our heartfelt thanks to our board team, whose commitment, integrity and unwavering Sooner spirit have guided our alumni community over the past two years. We offer special recognition to Tiffany Stephens for her outstanding leadership and dedication during her tenure as president. Her time, energy and passion have left a lasting legacy that will shape the future of the AAC for years to come. To past president H.W. "Dub" Peace, we are especially grateful for your exceptional service and continued leadership. Your vision and steady guidance as a Director have been invaluable to the strength and direction of this board. We also thank our directors—Andrew Cullen, Ph.D., Abidin Caf, Ph.D., and Hannah Morgan—for their crucial roles in keeping the AAC strong and focused on its mission of supporting students, faculty, and the School of Geosciences. We are better because of your service, and we thank each of you—deeply—for your time, leadership and continued commitment.

Most importantly, please plan to join us at our next AAC meeting in **September 2025**—we want to hear from you.

Visit our official website to stay updated:  
<https://www.ou.edu/mcee/geosciences/people/aac>

It is an honor to serve as president of the Alumni Advisory Council for the School of Geosciences.

**Boomer Sooner—and keep hiking those geology trails!**

Jason Currie  
President, Alumni Advisory Council





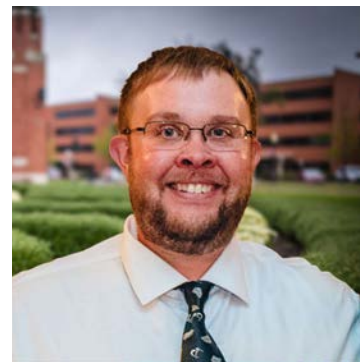
**MATTHEW PRANTER**

Director and Eberly  
Family Chair,  
Professor



**HEATHER BEDLE**

Associate Professor,  
Lissa and Cy Wagner  
Professor,  
Edith Kinney Gaylord  
Presidential Professorship



**BRETT CARPENTER**

Associate Professor  
Willard L. Miller Professor



**SELINA "LENA" COLE**

Assistant Professor,  
Assistant Curator of  
Invertebrate Paleontology, Sam  
Noble Oklahoma Museum of  
Natural History



**SHANNON DULIN**

Assistant Professor,  
Chris J. Cheatwood  
Director, Bartell Field Camp



**ANDREW S. ELWOOD  
MADDEN**

Joe and Robert Klabzuba Chair,  
Director, Samuel Roberts  
Noble Microscopy Laboratory



**MEGAN E. ELWOOD  
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Robert & Doris Klabzuba Chair,  
Stubbeman-Drace Presidential  
Professor of Geosciences  
Director, Center for  
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**MICHAEL ENGEL**

Clyde Becker Chair



**TIM FILLEY**

Professor,  
Director, Institute for Resilient  
Environmental and Energy  
Systems





**SARAH W.M. GEORGE**

Assistant Professor



**CAITLIN HODGES**

Assistant Professor



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**JUNLE JIANG**

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**HECTOR LAMADRID**

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**XIAOLEI LIU**

Norman R. Gelphman  
Professor  
Associate Professor



**JACQUELINE LUNG MUS**

Assistant Professor,  
Assistant Curator of Vertebrate  
Paleontology,  
Sam Noble Oklahoma Museum  
of Natural History



**RICHARD LUPIA**

Frank and Henrietta Schultz  
Chair,  
Associate Professor,  
Associate Director and Head  
Curator, Sam Noble Oklahoma  
Museum of Natural History 9



# GEOSCIENCES FACULTY



**LYNN SOREGHAN**

Edward L. McCollough Chair,  
David L. Boren Professor



**MICHAEL J. SOREGHAN**

Professor  
James Roy Maxey Chair



**DAVID F. "DAVEY" WRIGHT**

Assistant Professor  
Assistant Curator of  
Invertebrate Paleontology, Sam  
Noble Museum Oklahoma of  
Natural History

## EMERITUS FACULTY

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JUDSON L. AHEARN  
R. DOUGLAS ELMORE  
M. CHARLES GILBERT  
CHARLES W. HARPER, JR.  
G. RANDY KELLER  
DAVID LONDON  
KURT J. MARFURT  
SHANKAR MITRA  
R. PAUL PHILP  
ZE'EV RECHES  
BARRY L. WEAVER  
STEVE WESTROP



# GEOSCIENCES STAFF



**REBECCA FAY**

Academic Program Coordinator



**GAIL HOLLOWAY**

Instructor and Undergraduate  
Recruiter



**STEPHEN HOLLOWAY**

Lab Technician



**GINGER LEIVAS**

Financial Analyst



**LEAH MOSER**

Manager of Operations



**ASHLEY TULLIUS**

Senior Student Program  
Coordinator







# SEG STUDENT CHAPTER

## NATALIE KONGABLE, PRESIDENT

The 2024–2025 academic year has been one of exciting growth, new opportunities and strengthened connections for our student chapter. Through a wide array of technical talks, networking events, volunteering initiatives and fun activities, we have continued to expand our reach and impact within both the university and the professional geosciences community — all while staying true to our mission.

The objective of our organization is to promote interest in and knowledge of the sciences of geophysics and allied fields, as well as to foster friendship and cooperation among those passionate about the geophysical sciences. This year, every event, collaboration and new initiative reflected this commitment in action.

We hosted an impressive lineup of technical speakers, giving our members direct access to leading voices in the geosciences. Jake Walter, Ph.D., from the

Oklahoma Geological Survey kicked off our series, followed by an inspiring talk from AAPG President Deborah Sacrey. We were also fortunate to welcome David Lubo, Ph.D., of the AASPI Consortium, along with Hao Hu, Ph.D., Heather Bedle, Ph.D., and Emily Hincey from the University of Oklahoma. Additionally, professionals from EOG Resources shared valuable industry insights, and we organized a LinkedIn workshop to help students polish their professional profiles and build connections with future employers.

Recognizing the critical importance of industry engagement, we created multiple networking opportunities for our members. We strengthened our collaboration with the AAPG Student Chapter and partnered with EOG Resources for a technical talk that provided students with invaluable exposure to current industry practices.

Beyond academic and professional development, our chapter committed to making a positive impact in the community. We participated in the Little Event, a university-wide community service initiative, and volunteered at IMAGE, a major geosciences conference, where our members played an important role in helping to ensure the event's success. We were also thrilled to participate in departmental events such as Geosciences Day, MCEE Welcome Back, the OU Leadership Summit, and a couple of outreach events to local schools.





Balancing hard work with fun, we also celebrated several major achievements. One of our SEG Challenge Bowl teams had an outstanding year, advancing to the world's round at IMAGE and finishing 15th overall. During SEG Week, we hosted a series of events celebrating geophysics and hosted a fun night of bowling. Our Game Night offered a relaxed and enjoyable space for members to unwind and strengthen friendships. To cap off the year, we organized an outing to an OKC Comets baseball game, giving members a chance to celebrate the year's accomplishments together outside of the classroom.

at university events promoting student organizations and professional development opportunities.

We continued to strengthen our partnerships with groups such as the AAPG and Soil and Water Conservation student chapters and worked to deepen our relationships with the local industry. By creating more opportunities for students to meet professionals, develop career-launching skills and grow their networks, we are truly living our objective and preparing our members for successful futures.



This year, we made a dedicated effort to broaden our membership by welcoming students from a variety of disciplines, including geology, geologic engineering, petroleum engineering, and related fields. We also enhanced our visibility across campus by maintaining a strong presence

A huge thank you goes to the officers of this year, our faculty advisor and the department for their continued support and encouragement of our chapter. As we look ahead, we remain committed to promoting geophysics, building community and inspiring the next generation of geoscientists.





A photograph showing a group of students and a faculty member at a water treatment facility. In the foreground, a student wearing a white baseball cap and a blue t-shirt is looking towards a large circular tank. Other students are visible in the background, some leaning on a railing. A man in a grey polo shirt is standing near the tank, gesturing with his hands. The facility has various pipes, railings, and buildings in the background under a clear blue sky.

# SOIL AND WATER CONSERVATION SOCIETY

## MACKENZIE FLYNN, PRESIDENT

The 2024–2025 academic year marked a transformative period for the University of Oklahoma’s Soil and Water Conservation Society student chapter. Building on the foundation of previous years, we significantly expanded our outreach, programming and membership — hosting more events than ever before and making meaningful contributions both on and off campus.

We began the year with a major milestone: becoming an *officially recognized student chapter* of the national SWCS organization. With that recognition came a renewed sense of purpose, and our officers quickly established clear, strategic goals to guide our efforts:

1. Strengthen and expand our membership
2. Increase visibility and improve relationships within and beyond Sarkeys Energy Center
  - a. Related majors (GIS, Environmental Science/Engineering, Biology, Anthropology, etc.)
  - b. Partnerships outside the university
3. Host a diverse set of events each semester (i.e., educational, outreach, recreational)

We are proud to report significant progress in each of these areas. From journalism to civil engineering, SWCS was able to nearly **triple** its membership on OU’s Engage platform. Through a combination of strategic marketing and active participation in campus-wide and local events, we made ourselves visible at events such as Camp Crimson, Fall Fest, Howdy/Welcome Week’s involvement fair, the Mewbourne College Welcome Back, OU Green Week’s Earth Day event, and the Norman Earth Day

Festival, along with future recruitment events such as Geosciences Day.

Our second goal was to develop partnerships throughout the OU community and beyond. As such, our officers sought to build connections by attending events as representatives of SWCS. This included the WaTER Symposium, Research as Relationship Symposium, OU Leadership Summit, and Geosciences Student Research Symposium. These events served as springboards for developing new collaborations and securing high-quality speakers for our programs.

One of our most impactful partnerships this year was a recurring stream cleanup effort in collaboration with the Environmental Science Student Association and Sooners Without Borders. Together, our volunteers removed over 900 pounds of trash from local waterways, directly contributing to improved watershed health and promoting a culture of environmental responsibility within the university community. SWCS also joined forces with student organizations such as Pick and Hammer, AAPG and SEG to take part in campus-wide service efforts, including OU’s Big Event and Little Event.

Guided by member feedback, we prioritized speaker events that highlighted the many career pathways within environmental work. For example, we welcomed Laura Brunson from *Water for People*, who shared her inspiring transition from OU engineering student to a global nonprofit leader providing water, sanitation and hygiene to areas without established infrastructure. Another highlight came from member interest in the Tar Creek Superfund Site, leading us to host two in-depth “Lunch &





Learn” sessions. The first featured representatives from the Quapaw Nation’s Environmental Protection Agency and the Oklahoma Department of Environmental Quality to discuss the history of the site, permitting process and current remediation efforts. The second brought in Robert “Bob” Nairn, Ph.D., and his team from OU’s Center for Restoration of Ecosystems and Watersheds, who discussed their passive remediation work at the site. This series culminated in an April field trip to Tar Creek, where our members explored the site firsthand, toured CREW’s remediation system and engaged in a powerful conversation with environmental advocate Rebecca Jim, Tar Creekkeeper and founder of the Local Environmental Action Demanded (L.E.A.D.) Agency.

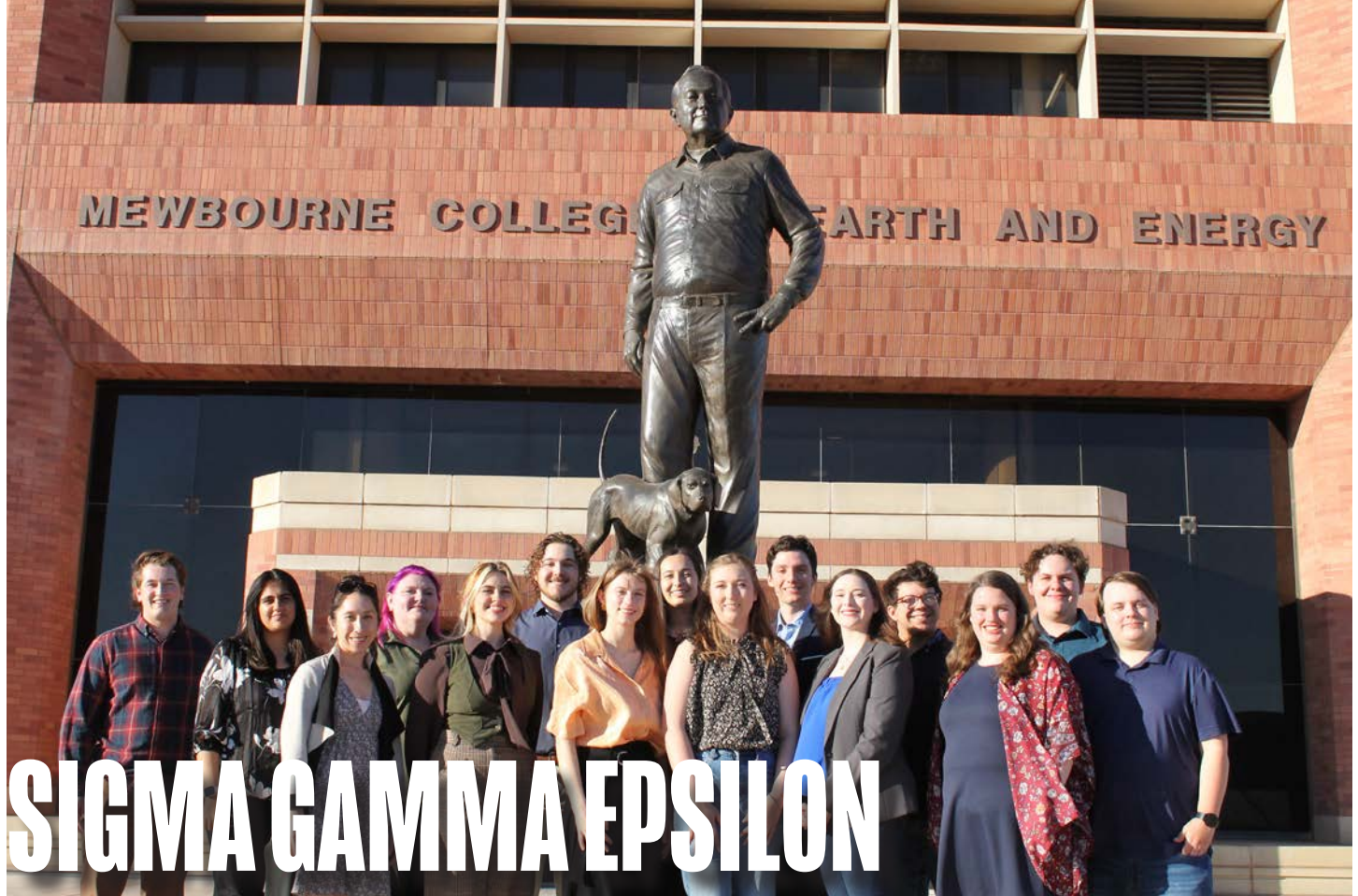
Our chapter also organized other hands-on learning experiences. Early in fall semester, we took a camping trip to the Pensacola Dam, Oklahoma’s first hydroelectric facility, where we received a guided tour from the Grand River Dam Authority and learned the inside scoop about environmental monitoring and energy generation. In the spring semester, we visited the Norman Water Reclamation Facility, tracing the journey of used water through various treatment stages and conducting

sampling to observe the system’s effectiveness in real time.

These experiences were made possible through the generous support of the Mewbourne College of Earth and Energy’s Student Life Committee, whose funding allowed us to offer all field trips and events free of charge to our members. Their support enabled our student members to access professional development opportunities, experiential learning and cross-state trips that would otherwise be inaccessible and gave them the opportunity to take a closer look at the soil they walk on, the water they drink and the state they live in.

As we look ahead to continuing our mission, we’re proud to introduce our officer board for the upcoming year: President Ben Matsumura, Vice President Alexis Griner, Treasurer Brittany Moehnke, Secretary Parker Lynn, and Social Media and Outreach Coordinator Mackenzie Flynn. On behalf of the SWCS student chapter, we extend our sincere thanks to our members, faculty and staff advisors, and community partners. With your continued support, we hope to grow our capacity, deepen our impact and remain a voice for environmental education, service and collaboration at the University of Oklahoma.





## ALYSHA ZAZUBEC, PRESIDENT

The University of Oklahoma is home to the Gamma Chapter of Sigma Gamma Epsilon, a National Honor Society for Earth Sciences. The recently reactivated chapter aims to foster collaboration among researchers, promote academic excellence and advance professional development.

Spring 2025 brought in the Gamma Chapter's revival with newly elected officers: President: Alysha Zazubec, Vice President: Sean O'Neill, Secretary: Aubrey Weed, Treasurer: Noor Ul Huda Choudhry and Historian: Em Elder, along with the initiation of 19 new members! We celebrated by taking professional headshots before having dinner together at BJ's Restaurant & Brewhouse. New members received graduation honor cords, pins and lifetime membership certificates a few weeks later.

The rest of the semester consisted of several guest talks from influential geologists and paleontologists (who also just happened to be SGE members). The first of these was a grant and application writing workshop with professor Selina "Lena" Cole, assistant professor and assistant curator of invertebrate paleontology at the Sam Noble Museum.







She discussed tips and tricks for scientific communication in grant writing, and how those skills can be used for job or internship applications as well.

The final talk of the semester was by Devin Dennie, Ph.D., a principal geologist at Devon Energy. He has been featured on several Science Channel productions and written children's books on rocks and minerals. As an OU alum who is very passionate about geoscience education and outreach, he was thrilled to lead a talk on how to make the most of opportunities, such as conferences, to enhance networking skills and drive a career path forward.

We participated in OU's Geoscience Day. We set up a table and talked with high school students interested in pursuing a degree in geoscience about the benefits of participating in SGE events. We hope to continue to promote the importance of geoscience education to high school students for many more Geoscience Days at OU.

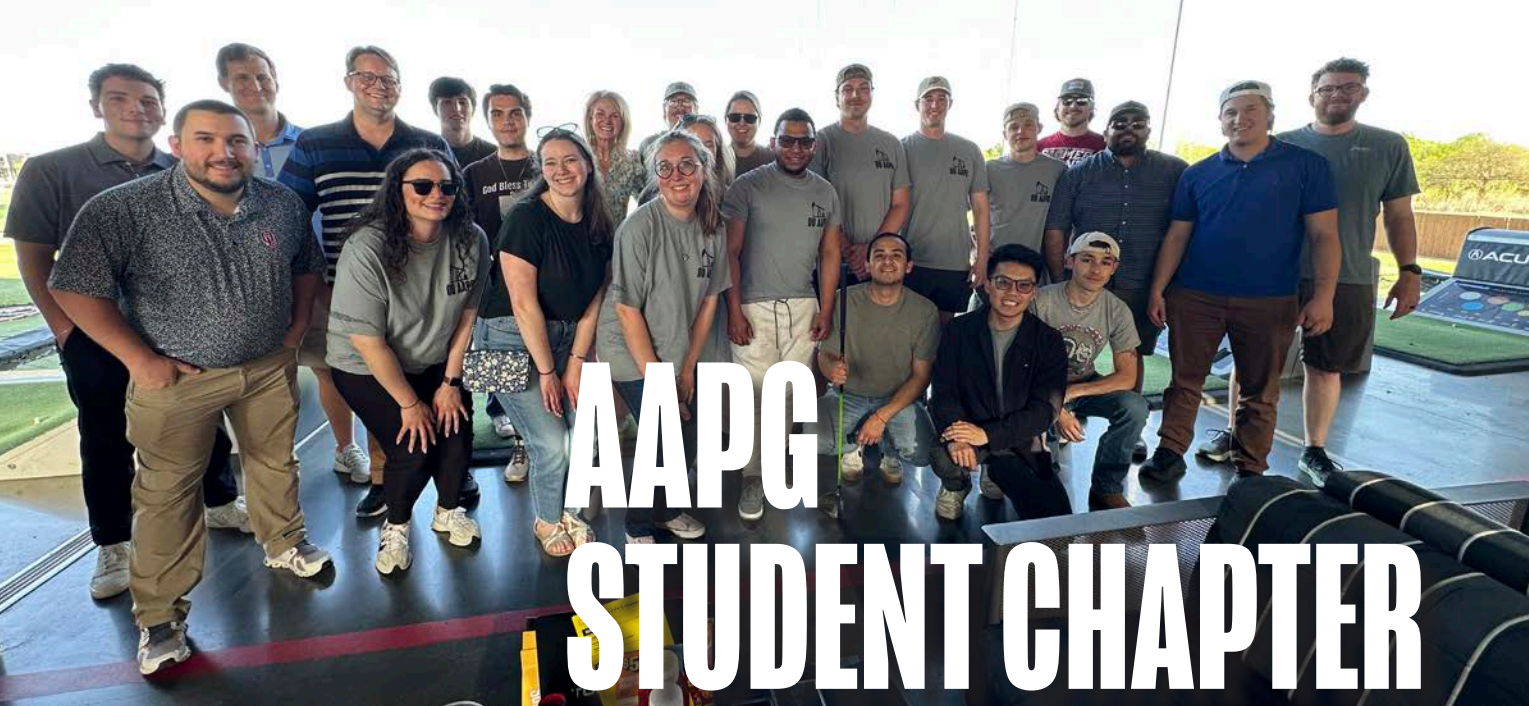


SGE – Gamma Chapter is excited about plans for the 2025-2026 academic year. The officers have been discussing more diverse discipline talks. OU has a strong presence with oil industry professionals, but not every geologist wants to take that path. Our goal next year is to host a series of talks from industry professionals from a broad range of disciplines. The hope for this series is to provide our members with a look into the vast number of careers open to geoscientists. We hope to provide a glimpse of what those careers look like, from day-to-day tasks to broad political and societal impacts.



The Gamma Chapter is excited to be active again and we are eager to host more events in the coming academic year. We hope to lay solid foundations for this organization to continue growing and expand on the opportunities we can provide for members in the years to come.





## JOE MORRELL, PRESIDENT

As we wrap up another academic year, I am thrilled to share that the AAPG student organization at the University of Oklahoma has had a tremendous year filled with conferences, technical talks and networking opportunities.

We began the year by attending the annual IMAGE conference in Houston, where we proudly represented the University of Oklahoma School of Geosciences. At this event, we engaged in technical sessions, supported our fellow classmates who presented their research and networked with industry professionals. One of the highlights was participating in the alumni reception, where we enjoyed visiting with alumni and sharing laughs and stories from their time at school.

Following the IMAGE conference, we hit the ground running with a series of technical talks and lunch-and-learns. Shelby Plitzuweit from Occidental Petroleum joined us for an online session to present “Petrophysics 101.” We were then honored to host the AAPG president, Deborah Sacrey, who delivered a compelling presentation on “Finding Hydrocarbons with Machine Learning.” Michael

Pyrzcz, Ph.D., from the University of Texas at Austin also joined us to share two insightful talks titled “Integrating Geostatistics into Data Analytics and Machine Learning” and “Deep Learning for Building Subsurface Models.”

Next, we participated in a new event in Midland, Texas, where we attended the Daniel Energy Partners Permian Basin BBQ competition. Several students from different universities were invited to attend fireside chats with industry leaders and professionals while enjoying the BBQ competition. We are immensely grateful to Mewbourne Oil Company for sponsoring our attendance at this exciting event.

Towards the end of the academic year, GVERSE - GeoGraphix came to give us a presentation on their software, which is widely used throughout the oil and gas industry.

We capped off our year with AAPG Energy Week, which featured several fun events and technical lunch-and-learns. We started the week with doughnuts and coffee, then transitioned into a “Life After Grad School” Q&A session with Richard Brito, Ph.D., from Ovintiv,







who shared invaluable insights for entering the workforce. Following that, Buddy Price, Ph.D., from Devon Energy gave a technical talk titled “New Insights on the Importance of Bottom Currents in Deepwater Deposition.” We also had a happy hour with pizza and beverages featuring Abidin Caf, Ph.D., from Devon Energy, who provided more tips for joining the workforce after graduation. To celebrate, we hosted a bowling night and concluded Energy Week with a Topgolf social sponsored by Mewbourne Oil Company, where we networked and enjoyed meeting with representatives from the Mewbourne OKC office.



All in all, it has been a fantastic year packed with exciting discussions, networking opportunities, and invaluable advice from industry professionals on how to succeed in our field. I want to personally thank all of our members for making this such a wonderful year and acknowledge our hardworking team that put everything together.

Thank you for your support, and I look forward to even more success in the coming year!







# PICK & HAMMER CLUB

**BRAEDEN MORELAND, PRESIDENT**

Coming out of the gates, the 2024-2025 academic year was again full of high hopes for the Pick and Hammer Club. After coming off the biggest year of outreach since the pandemic, with several thousand students being reached through the club's outreach endeavors across Oklahoma and Kansas, this year's officers had big shoes to fill to continue building the outreach program that had been successfully revitalized by the last three officer groups. With the work of President Braeden Moreland, Vice President Xander Margheim, Treasurer Aelin Johns, Secretary Parker Lynn, Lead Outreach Coordinator Stacey Love, Assistant Outreach Coordinator Rylan Lopez and Archivist Ryne Andrews, the club was excited to continue and further expand upon the fantastic work of the past groups during the 2024-2025 academic year, looking to surpass the most successful outreach year in recent memory and raise the outreach program to new highs.

Pick and Hammer prides itself on delivering geoscience-based outreach and learning opportunities to students, adults and numerous organizations across the state of Oklahoma in order to spread the word about the amazing field of geoscience and hopefully inspire the next generation of geoscientists. With the connections and relationships established during the past several years with numerous schools and organizations, as well as many new connections established throughout this academic year, we were able to, once again, participate in countless fantastic outreach events that gave us the opportunity to teach thousands of students and adults about geology, and we were even able to expand the magnitude of our role within several of these events that enabled the club to have an even greater

impact. Among these events that we were able to further expand our role in was the Oklahoma Science Olympiad, which graciously invited us back for another year to create and proctor tests to help foster learning of the geosciences among middle and high school student participants. Last year, the club's role was expanded to have us write and monitor tests in three different categories – Fossils, Dynamic Planet and Geologic Mapping - for each of the invitationals and regional Science Olympiad tournament events. This year, our role was further expanded to include writing the tests for the state tournament, and we were able to successfully write different versions of the tests for each individual invitational, regional, and state tournament event, thanks to the countless hours devoted by Vice President Xander Margheim.

The Pick and Hammer Club is most proud to announce an immense increase in the number of outreach school visits performed, which totaled even more than the last several years combined! Through the connections established with schools by Lead Outreach Coordinator Stacey Love and Assistant Outreach Coordinator Rylan Lopez, the club was able to perform school visits with numerous personalized lessons, including those covering fossils, volcanoes, rock types, petroleum and careers in geology. School visits were performed across the state, including at Verden Elementary, Okemah middle and high Schools, Calera Junior High, Vinita Elementary, Ravia and Mannsville elementary schools, and Elgin Middle School, amongst many others. The club also performed numerous outreach visits with homeschool groups, including in McAlester, Oklahoma City, Mustang and Tulsa. We were also able to maintain our school visits





to the state in Kansas, thanks to Xander Margheim's connections in his home state. Our outreach coordinators established so many new connections that we are even beginning to plan school visits for the upcoming year! In addition to school visits to classrooms, the club was also able to set up education tables at several STEM Nights hosted at schools around Oklahoma, including the OERB STEM Night at Bridge Creek, Kingfisher Upper Elementary STEM Night and the Mid-Del STEM Night hosted in Midwest City.

Additionally, the club and our officers were once again quite busy this year with numerous other outreach visits and tabling events that allowed us to teach geology to people of all ages. Among these events were Camp Crimson, Fall Fest, the Mewbourne College Welcome Back, the Oklahoma City Geological Society's Gem and Mineral Show, the Green Week Earth Day Fair on the SOVAL, the Norman Earth Day Festival, Geekapalooza at Rose State College, the Plaza District's annual Plaza Fest, and the OU Biological Station's COSTEM event, to name a few. The club was even able to maintain connections for STEM nights with Norman Public Libraries.

With the reestablishment of our outreach box building last year with funding from RKI Energy Resources and Halliburton, which we designed to provide a guided geology-themed activity box for students to perform numerous fun experiments at home, the club was able to continue to build outreach boxes to hand out to students at several outreach events throughout the year. We hope to continue growing these outreach box efforts further in the coming years. In total, paired with the school visits and testing events, Pick and Hammer was able to provide geoscience education to nearly 6,000 K-12 students across Oklahoma this academic year alone, in addition to thousands more adults to teach tens of thousands of people total across the state about the geosciences. This is a major milestone in the growth of the club's outreach program, as the student numbers alone were higher than those of the past three years combined!

Outside of our outreach endeavors, the 2024-2025 academic year was one of our most exciting years in recent memory for club activities for our members. Alongside our monthly meetings, we were able to host numerous game nights, movie nights and rock swaps that allowed our club members to have a blast and build a community around

our love for the geosciences. This year, Pick and Hammer was also able to more than double the number of hiking events than the previous year, which included hikes at Lake Thunderbird and three in the Wichita Mountains. With the connections of several of our officers, we were even able to co-host several of these hikes with other student organizations across campus, such as the Entomology Club and STEM in the Sun. The club was also able to host a successful selenite crystal dig for a large group of members at the Salt Plains State Park (though we unfortunately had to cancel our spring dig due to weather). We were even able to establish connections and tour a quarry in the Arbuckle Mountains near Davis, which we hope to do again in future years. Two of the biggest steps made in terms of club activities were the reestablishment of our Eat and Greet events and the club's Spring Break trip. Though we were not able to host as many as hoped due to conflicting schedules, we were able to host several Eat and Greets in the fall semester to introduce geoscience students to professors and their research, as well as potentially help establish connections for undergraduate research. With inspiration from pre-pandemic officer groups, Pick and Hammer also took a group hiking and camping trip over Spring Break to Big Bend National Park! Furthermore, in April, the club was able to host another successful annual campout trip! This time, the club opted to explore Sequoyah State Park to explore Oklahoma geology and enjoy fun lake activities to strengthen our club community. We are also thankful to say that we were able to hold four more wildly successful mineral sales and auctions that have provided the club with funding to fuel many future outreach endeavors to teach those all around the state about our wonderful field of geosciences, as well as award our members with exciting activities as a thank you for their constant help. We are very grateful for all who have supported us at our auction events and want to give a big THANK YOU!

Overall, Pick and Hammer was able to have another fantastic year in regard to our outreach endeavors, activities within the School of Geosciences, and building and maintaining connections around the state for the future. We have another fantastic group of officers that will be coming in for the upcoming academic year, and we are excited to keep building upon the foundations laid by the groups before and further spread our love for the geosciences in hopes of inspiring a new generation. As always, rock on!





# GEOSCIENCES DAY

**GAIL HOLLOWAY,  
UNDERGRADUATE RECRUITER**

While attendance was down from last year's high, I think our fourth annual Geosciences Day was the best one yet! On March 7th the school hosted 12 students and their guests to highlight our programs, meet our professors and current students and learn about our research opportunities. High school and community college students were invited to attend from all over Oklahoma and the surrounding states and attendees represented a variety of majors and grade levels.

A generous grant from the Oklahoma Geological Foundation allowed us to provide participants with a quality experience. Matt Pranter started the day with an information session, presenting the highlights of the undergraduate experience in the school and allowing participants to ask questions. As the student panel is always a highlight, we expanded it for this year. In addition to five current undergraduates representing all the different majors within the school, ranging from

sophomores to seniors, we asked two recent alumni to join the panel as well: Hannah Morgan (B.S. '18 & M.S. '21) from Devon Energy and Riley Woodrow (B.S. '23) from the Oklahoma Department of Environmental Quality. It was wonderful to hear how their experiences at OU impacted their job searches and subsequent careers. The informal lunch allowed participants to talk one-on-one to students and faculty. All five of the school's clubs had tables at the lunch, allowing them to showcase their events, interests and activities. At least 11 faculty, seven club officers and numerous current students attended to talk to participants and partake in lunch.

As in previous years, most of the day served to highlight the labs and research facilities. With the wide variety of professors participating and disciplines represented, we had something for all aspects of the geosciences. Before lunch, students started with a geophysics tour that combined Junle Jiang showcasing real-world applications of geophysical techniques and Jake Walter from the Oklahoma Geological Survey demonstrating seismic techniques. For the afternoon, students rotated through seven different research spaces. Brett Carpenter demonstrated stress relationships, Andrew and Megan Elwood Madden showcased different methods of mineral identification, Caitlin Hodges worked with soil samples, Shannon Dulin and graduate student Katherine Sluder opened the sample collections with both hand samples and thin sections under the microscopes, Hector Lamadrid demonstrated experimental petrology, Matthew





Pranter showed core samples, and Mike Soreghan discussed climate and sedimentation.

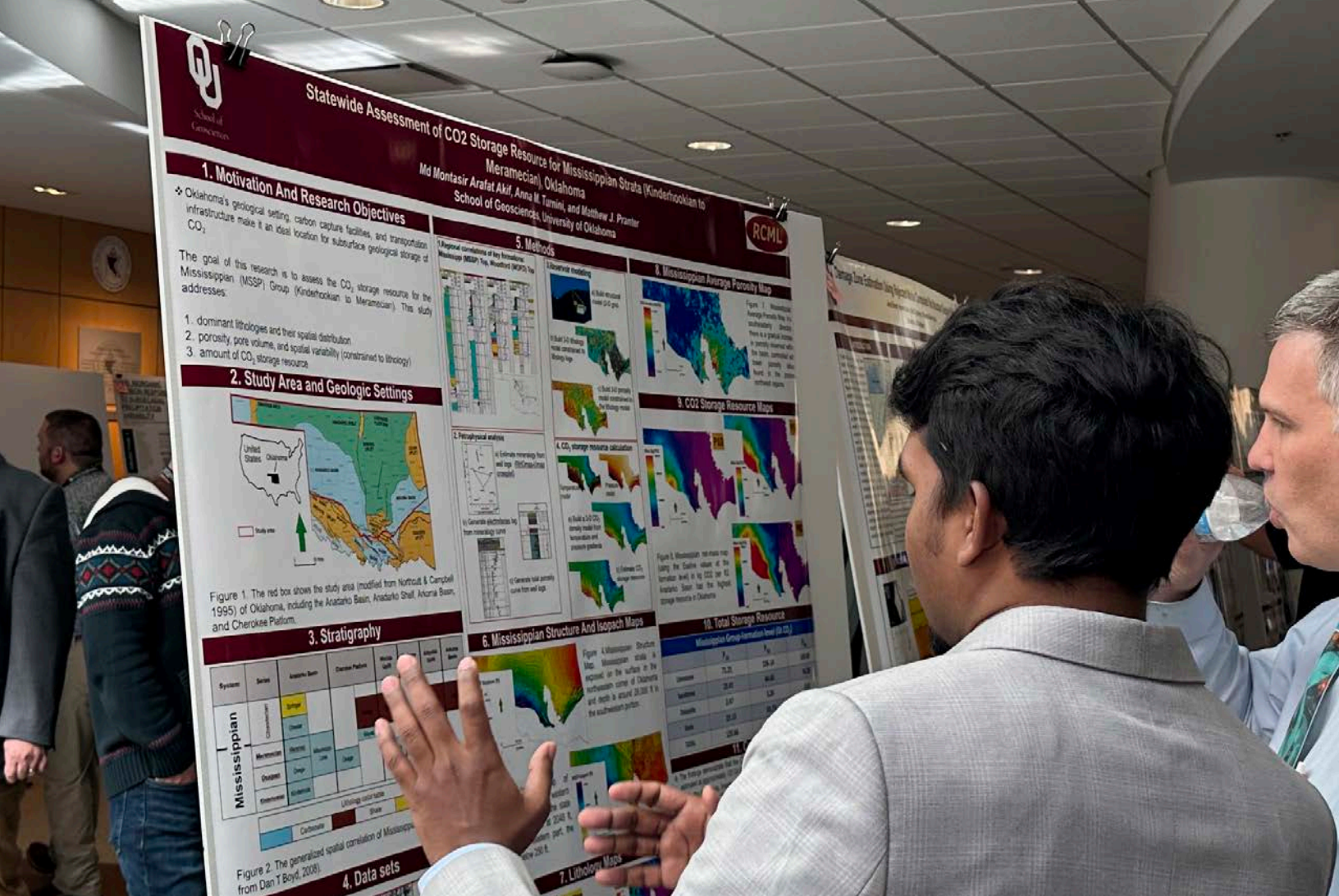
With so many students interested in paleontology in recent years, we again offered an optional tour of the research labs at the Sam Noble Oklahoma Museum of Natural History led by Lena Cole, Rick Lupia and Davey Wright. It was extremely popular when we first offered it last year, so it was wonderful to be able to offer it again!

The lab tours, and specifically the Sam Noble tour, were the definite highlight of the day for the attendees. One student wrote that their highlight was “Getting to view the different labs.” My favorite comment was “I loved it!” as this is definitely what we hope to achieve!

After four years of hosting this event, it is wonderful to see the impact it has on undergraduate recruiting. From our first year in 2022, 25% of those attending matriculated at OU as freshmen that fall and another 12.5% applying for the following fall. These numbers increased in 2023, with 32% of the participants starting that fall as freshmen and another 10% applying the following fall. In 2024, 21% committed to OU to start in fall 2024 as freshmen, with another 12.5% applying for fall 2025. From this year, a quarter have applied to enter this fall. Transfer students are a little harder to track in the OU systems, but hopefully many of this cohort will also be students in our school in the semesters to come. I follow up with students through emails and mailings to encourage attendees to apply.







# STUDENT RESEARCH SYMPOSIUM AND EXPO

The AAPG Student Research Symposium and Expo was held on March 14 at the National Weather Center. Four short courses were taught by OU Geosciences, faculty, alumni and friends. In addition, 11 companies exhibited at the Expo: AAPG, BP, Continental Resources, Devon Energy, Expand Energy, EOG Resources, Matador Resources Co., Mewbourne Oil Co., AAPG Mid-Continent Section, Oklahoma City Geological Society, Oklahoma Environmental Services, Oklahoma Department of Environmental Quality and Ovintiv!

Forty-five students presented their research in the poster competition. The Oklahoma Geological Survey served as judges and awarded the top three students in each category prizes for their outstanding posters. A special thank you to the AAPG Foundation for their tremendous support of this event!







## **UNDERGRADUATE:**

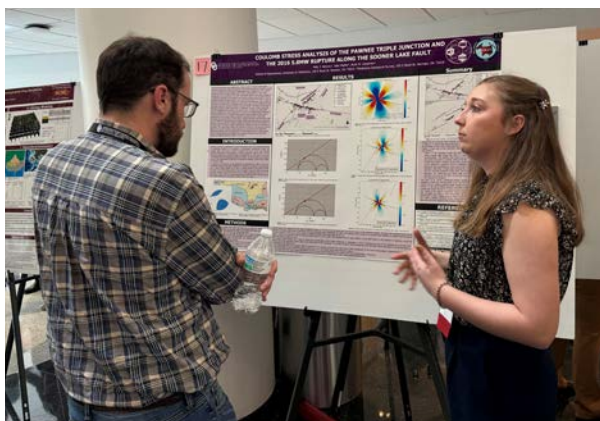
Aubrey Weed  
Abrar Almaamari  
Sophia Tanner

## **MASTER'S:**

Declan Martin  
Morgan Levrets  
Charlotte Filipovich

## **PH.D.:**

Anna Turnini  
Marcus Maas  
Luis Muñoz Santos







The School of Geosciences celebrated the end of the semester with our annual spring picnic on April 24. Although the weather didn't cooperate, we didn't let the rain stop us from having a blast! With some quick thinking, we pivoted to bring the event indoors with a variety of games, and of course food. Don't worry - our annual kickball game will be back next year!

Additionally, we recognized the following students for their achievements:

**ASPEN HEIN AND DEVIN RACHELS**

*Outstanding Freshman*

**AIDEN JACKSON**

*Outstanding Sophomore*

**EM ELDER**

*Outstanding Junior*





**EM ELDER**



**BRAEDEN MORELAND**



**BEN MATSUMURA**



**DILLON TAYLOR**



**KIERA CROWLEY**



**JOSE VITERI LOPEZ**



**MARCUS MAAS**



**MACKENZIE FLYNN**

**BRAEDEN MORELAND**

*Charles Gould Award for Outstanding Senior in Geology*

**SALIM AL HARASI**

*Alan Witten Award for Outstanding Senior in Geophysics*

**BEN MATSUMURA**

*David Sterns Award for Outstanding Achievement*

**DILLON TAYLOR**

*Estwing Hammer Award for Excellence*

**KIERA CROWLEY**

*Stan Cunningham Excellence in Teaching Award*

**JOSE VITERI LOPEZ**

*Ben Hare Excellence in Research Award (M.S.)*



**PARKER LYNN**

*Staff Rock*

**MARCUS MAAS**

*Ben Hare Excellence in Research Award (Ph.D.)*

**MACKENZIE FLYNN**

*Frank A. Melton Memorial Research Award*





# STUDENT AWARDS AND HONORS

• **Braeden Moreland** and **Kyle Fakhreshafaei** were elected to Phi Beta Kappa.

• **Braeden Moreland** was selected as the Outstanding Senior for the Mewbourne College of Earth and Energy.

• **Natalie Kongable** was awarded the Stephen E. Collins Memorial Scholarship from the SIPES Foundation.

• **April Moreno-Ward** and **Noor Choudhry** placed second and third, respectively, in the graduate student division at OSU TechFest.

• **Em Elder** was awarded the Black Field Camp Grant from the Oklahoma Geological Foundation.

• **April Moreno-Ward** and **Kiera Crowley** received the Gilson Educational Fellowship from the Oklahoma Geological Foundation.

• **Tiffany Legg** was named the Suzanne Takken Memorial Award recipient from the Oklahoma Geological Foundation.

• **Tiffany Legg** placed in the top 10 of the Three Minute Thesis competition.

• **Lima Akter Choiti** and **Charlotte Filipovich** received the Oklahoma Geological Foundation Graduate Geology Fellowship.

• **Grimm Vannoy, Ben Matsumura and Silas Snead** were awarded the J. David Lowell Field Camp Scholarship from the Geological Society of America.

Sixteen students were awarded field camp grants from the Oklahoma Geological Foundation:

- Nick Evett
- Alexa Gomme
- Alexis Griner
- Kaitlyn Hahn
- Faith Hylton
- Aaron Jones
- Gyllian Leblanc
- Parker Lynn
- Jerusha Pearson
- Callie Ray
- Silas Snead
- Ally Stitt
- Joy Suttles
- Madelyn Szyal
- Aiden Trumble
- Grimm Vannoy



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# SCIENCE SALON

IAN TAYLOR, PH.D. STUDENT

As graduate students, it's easy to forget why we chose this path in the first place. We become so deeply enmeshed in our own research—our datasets, our field sites, our oddly specific statistical models—that we sometimes lose sight of the bigger picture. What is it, really, that we're doing here? What are we learning? What are we leaving behind for those who come after us?

Science, at its core, is a shared enterprise. But in the day-to-day grind, it can start to feel isolating. We dig deep into our specialties, and over time the walls around our disciplinary silos grow higher. It becomes harder and harder to climb out, to take a step back and look not just at our work, but at *why* we're doing it. What does it mean to contribute to a field, to a conversation, to an idea bigger than any single dataset?

Professor Shannon Dulin's Science Salon is a rare and needed breath of academic fresh air. It's a space where we're invited to *look up*, to wander across disciplines, to think expansively, even weirdly. It's a space that reminds us science is not just what we do in the lab or in the field, but how we engage with the world—and each other.

Here, students lead discussions not on their theses, but on topics that capture their curiosity. We've explored everything from the *Three-Body Problem*—both as a physics concept and as a metaphor for complexity and chaos—to the nature of time itself, and whether it might be modeled with the same tools we use to study rivers (a proposed framework affectionately called “fluviotemporality”). We've examined the use and implications of AI in academia, asked what it means to integrate algorithmic tools into professional geoscience, and debated the balance between innovation and ethical caution. We've also delved into the science and philosophy of trauma—how it echoes not just in individual bodies but in entire societies.

And yes, we learned that a chemical used to color nacho cheese Doritos can render mouse skin translucent. Which is both horrifying and, in a way, kind of beautiful.

This class isn't just about expanding what we know—it's about expanding *how* we think. It's a reminder that curiosity doesn't need to stay inside the lines of our degree programs. That respectful, enthusiastic dialogue across disciplines can yield surprising insights. And that sometimes, the best way to understand our own research is to momentarily step away from it and engage with someone else's.

In short, Science Salon is a call to be curious, generous, and weird—to remember that science is not just a job, but a conversation.

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# CONGRATULATIONS

## TO OUR 2024-2025 GRADUATES

### **B.S. GEOLOGY**

JOSHUA CHANDLER  
ALEXIS GRINER  
ALISON JOHNS  
PIPER JOSTRAND  
BRYSON FETTERS  
BRAEDEN MORELAND  
SCOTT OWENS  
ALYSSA PASCOE  
CALLIE RAY  
JACKIE RICHARDSON  
GRIMM VANNOY

### **B.S. GEOPHYSICS**

ISSA AL AAMRI  
SALIM AL HARASI  
ABRAR AL MAAMARI  
SAID AL MUZAHMI

### **M.S. GEOLOGY**

GRACE BARBER  
SOPHIA BARTH  
BRIGID BERNIER  
JAMIE BOWIE  
A. BOYD  
DANIELLE BRUNIG  
JARAH BURDETTE  
CHARLOTTE FILIPOVICH  
MACKENZIE FLYNN  
FAITH GRAYSON  
CASSIE KENYON  
NATALIE KONGABLE  
MORGAN LEVRETS  
BRITTANY MOEHNKE  
JOE MORRELL  
DODGER STANKEWITZ  
DANI STORMS

### **M.S. GEOPHYSICS**

ALEX CORDERO  
MILLY HENCEY  
EVAN JOWERS  
HY TRAN  
JOSE VITERI

### **PH.D. GEOLOGY**

OLAWALE ALO  
ITUNU APALARA  
AUSTIN MCGLANNAN  
ANNA TURNINI

### **PH.D. GEOPHYSICS**

MARCUS MAAS  
RUI ZHAI





# SUSTAINABLE ENERGY SYSTEMS PROGRAM UPDATE

**HEATHER BEDLE, PH.D.**

The University of Oklahoma has launched an ambitious new Sustainable Energy Systems program, addressing one of the most pressing challenges of our time through a comprehensive, multidisciplinary approach to energy education and research.

I am honored to serve as the inaugural director of the SES program, beginning July 1, 2025. Our vision for the SES program extends beyond traditional energy education, as we aim to prepare students to navigate the complex energy landscape, understanding not just the technical aspects of different energy sources, but also their environmental impacts, economic implications and societal effects. Whether students are interested in advancing renewable energy technologies, improving the sustainability of conventional energy systems, or developing innovative usage, storage and distribution solutions, the program aims to provide the essential background knowledge and skills to enhance any degree major at OU.

## ***Program Launch and Early Success***

The SES program officially began with the launch of our undergraduate certificate in fall 2024, and the response has been remarkable. Over 50 students from across campus participated in the program's first year, representing diverse majors from the Gallogly College of Engineering,



College of Atmospheric and Geographic Sciences, Mewbourne College of Earth and Energy, Dodge Family College of Arts and Sciences, Gibbs College of Architecture, and Price College of Business. This enthusiastic participation demonstrates the strong student interest in sustainable energy education that transcends traditional disciplinary boundaries.

The program is built around a multidisciplinary foundation that brings together expertise from science, technology, engineering, business, law, policy and social sciences. Our approach recognizes that sustainable energy solutions require collaboration across many fields and perspectives to address the complex technical, economic, environmental and societal challenges involved.

The SES certificate programs are structured around core courses that provide all students with fundamental knowledge, complemented by elective courses that allow specialization in areas of interest. The undergraduate program features two core courses: SES 2113 (Fundamentals of Earth Systems, Energy & Sustainability) and SES 2123 (Energy in Society: A Systems Perspective on Energy Transitions), along with three elective courses chosen from over 40 options across campus.

In Geosciences, Assistant Professor Hector Lamadrid in Geosciences has been instrumental in helping teach one of the undergraduate courses and worked closely with our development team. His expertise in energy systems has been valuable in shaping our curriculum. Faculty in many other disciplines have also lent their knowledge and expertise, really strengthening SES's interdisciplinary goals.



### **Graduate Certificate Launch in Fall 2025**

Building on the success of our undergraduate program, we will launch the SES graduate certificate in fall 2025. This 15-hour program is designed for graduate students



seeking to enhance their disciplinary expertise with comprehensive sustainable energy knowledge. The graduate program includes courses in life cycle analysis, techno-economic assessment, and a seminar series that I will lead, that exposes students to diverse perspectives from across the energy sector.

### **New Facilities**

We invite all alumni to visit our newly remodeled SES suite located in the R-corridor near the Youngblood Library in Sarkeys Tower. The space has been thoughtfully designed to foster collaboration and innovation, featuring modern offices, meeting rooms and collaborative workspaces. The facility will serve as the hub for our growing community of SES students, faculty and staff.

### **Looking Ahead**

The SES program represents OU's commitment to addressing global energy challenges while building on our traditional strengths in energy education and research. As we continue to grow, we welcome opportunities to connect with alumni who share our interest in sustainable energy solutions. Whether through guest lectures, industry partnerships, or simply sharing insights from your professional experience, alumni engagement enriches our program and provides valuable perspectives for our students.

The energy landscape is evolving rapidly, and we believe the SES program positions OU to lead in preparing the next generation of energy professionals. We look forward to continuing this important work and welcome the ongoing support of our alumni community!



# ZEN AND THE ART OF DEPOSITIONAL STRATIGRAPHY

**BEN MATSUMURA, UNDERGRADUATE STUDENT**



To onlooking motorists travelling along I-40, it would be a safe assumption that the charter bus proudly displaying BOOMER OU across its sides carried an athletics team to their next match. But this bus instead contained a team of roughly 30 student geologists, headed for their first stop in Alamogordo, New Mexico. Led by professor Lynn Soreghan, the students of her Depositional Systems and Stratigraphy class were on the first leg of their four-day journey through New Mexico and Texas. Having learned about ancient reefs and carbonate mounds in class, it was time to test their observational skills in the field.

After a long 10 hours of napping and chatting with friends the group reached their stop. The Sacramento Mountains standing tall to the east were a testament to the ancient microbes and marine organisms who had built them. Following a short lesson, the class travelled north to Alamo Canyon for their first hike of the trip. The canyon views allowed for closer examination of the Waulsortian mud mounds and demonstrated how small changes in location held great significance for their Carboniferous friends. Racing against the clock to make their final stop of the day, the team descended the trail and drove out to White Sands National Park, just in time to see the mountains silhouetted by a golden sunset.







The second morning started strong with a free hotel breakfast, which would power the class through their most academically challenging day. Sandwiched between roadside stops to observe more carbonate and algal mounds was an intense few hours of mapping out La Luz Canyon. Teams worked in the hot New Mexico sun to gather data for what would become their final lab project, a hand-drawn stratigraphic column and accompanying report. But the students were once again rewarded for their work with beautiful sunset views from atop a Pennsylvanian mound.



Having heeded warnings about overindulgence at the questionable hotel bar, the class smoothly departed the next morning for their most rigorous day of hiking. An 8-mile hike up the Permian Reef Trail tested both strength and will, but also offered students a perfect way to walk through geologic history. At each of the 21+ stops on the way up, Lynn pointed out details for the class to discuss and use while deciphering the reef's formation. After finishing their hike, the group was given a 45-minute reprieve for their shaky legs on the bus ride to their final stop. Appropriately nicknamed "Thighmaster," the climb up Slaughter Canyon gave students the opportunity to see large-scale progradation along the reef, all while working on their physiques.

Now fully rested and rehydrated from the previous day, it was time to return to familiar, flatter Oklahoma. But there was one final stop on the way back. The enchanting Carlsbad Caverns National Park had students no longer climbing but descending deep into the ground. An elaborate network of caves and geologic features gave the class one last chance to admire the beauty of New Mexico, and to remind themselves just how amazing earth is.







# SUBSURFACE METHODS FIELD TRIP

**MATTHEW PRANTER, PH.D.**

Students in Subsurface Methods had a great learning experience on the fall 2024 field trip to the Piceance Basin near Grand Junction, Colorado. We visited several localities to analyze outcrops of world-class Cretaceous fluvial and shallow-marine deposits that are analogs to subsurface reservoirs. Javier Tellez, Ph.D., and Rex Cole, Ph.D., both professors at Colorado Mesa University in Grand Junction, assist with leading the trip.

The Upper Cretaceous Iles and Williams Fork formations (Mesaverde Group) are exposed around the perimeter of the basin and form major natural gas reservoirs in the subsurface as close as 10-50 miles from the outcrop. For comparison, we also visited outcrops of the Lower Cretaceous Burro Canyon and Dakota formations. The area is an excellent outdoor laboratory to view and discuss the deposits in outcrop that the students will later characterize, map and model during the course using core, well logs and outcrop data from the same area. The field experience supports the 3D geological modeling work we do later in the course. The trip helps students apply field concepts and data to interpret the subsurface stratigraphic and structural framework, lithological distribution, petrophysical properties and reservoir quality. Generally, about 10-15 geoscience and petroleum engineering students take the course.

The field trip was run in late September, which is generally a nice time of year regarding the weather – and this time the weather was outstanding. For the field trip, we traveled together as a class to Denver (direct flight from OKC) and drove from Denver to Grand Junction with several stops along the way to discuss the geology and areas. So that everyone







has a chance to acclimate to the higher elevation, we first stopped at Red Rocks Amphitheater to put our hands on the Great Unconformity, describe the stratigraphy and structure of the area, and discuss the oil and gas reservoirs of the Denver Basin from a nice overlook at the park. We then made our way west along I-70 toward Grand Junction with a few stops to rest and to observe the geology. For lunch, we stopped at Dillon Reservoir, which has a beautiful view and a nice park and picnic area. After lunch, we make our way over Loveland and Vail passes and, after entering the eastern margin of the Piceance Basin, drive to Rifle Gap to view the near-vertical Cretaceous Mesaverde Group (near White River Uplift). From there, we traveled ~60 miles to Grand Junction. Most of these same Cretaceous formations we view on the western margin of the Piceance Basin in the Grand Junction area are relatively flat-lying and only dip about 5-10 degrees to the east into the basin. We made several stops near and within Coal, Main and Plateau Creek canyons near Palisade, Colorado, to evaluate the Upper Cretaceous Iles and Williams Fork formations and visited several of the canyons along the Gunnison River, between Grand Junction and Delta, Colorado, to study the Lower Cretaceous Burro Canyon and Dakota formations.

On the trip, the students discussed aspects of the stratigraphy, sedimentology and structure, and dimensional/spatial characteristics of the deposits, gained an appreciation for the significance of the different scales of heterogeneity that exist, and related this to subsurface reservoir characteristics.





# CATASTROPHIC SEDIMENTATION

**SHANNON DULIN, PH.D.**

My graduate students convinced me this spring to teach a grad course that I had not taught in a long time: GEOL 5970 Catastrophic Sedimentation. It just sounds like an exciting course, and it definitely was, made even more exciting by the field trip we took to see many of these catastrophic event deposits. The course began by discussing the fluid dynamics associated with sediment movements in general, and then how extreme circumstances can lead to maximum flow states that are able to cause what we defined as “catastrophic.” The survey course continued with students choosing and presenting on both modern processes and ancient deposits that qualified as catastrophic. These topics ranged from seismic induced liquefaction and turbidity currents, hurricanes and their deposits, floods, mass wasting of all types, meteor impacts, landslides and we even studied an event from a tornado that was recorded in the sediments!

Our field trip led us out west on a whirlwind tour of Arizona and Nevada, where each student presented at a location based upon their interests. We visited the Grand Canyon, where we discussed lava dams and mass wasting, along with the devastating Colorado River flood that occurred in 1983 (catastrophic events from this flood are told in the book *The Emerald Mile* by Kevin Fedarko, which many of the students also read). We stayed in Arizona to visit Barringer Crater and see the sedimentation and destruction caused 50,000 years ago by the Canyon Diablo meteorite. Sunset Crater is a different kind of crater, a cinder cone, that had devastating consequences for indigenous populations in the area near Flagstaff. We crossed the border into Nevada, where we toured the Hoover Dam, and then visited a not-so-catastrophic, but sedimentarily breathtaking landscape at the Valley of Fire State Park.





# FIELD TRIP



The students (as well as myself) learned many new aspects of sedimentation, what constitutes a catastrophic event, and how that manifests itself in the rock record. Perhaps the biggest lesson of all came from our camping experiences. At one campsite, we were awoken by the sound of sprinklers—the campground was watering the grass at 2 AM! This would not have been a problem except for the lows that night were in the 20's and we were frozen inside our tents in the morning! Another cold evening, on the slopes of Mt. Charleston (northeast of Las Vegas), we arrived to find our campsite that we had reserved was closed! No worries—we found an alternative, but we later discovered it had been closed due to landslides! That seemed a fitting end to our catastrophic sedimentation field trip.





# FIRST YEAR

## DAY 1

### CAÑON CITY, CO

*"We started this trip by walking and touring camp and getting to know one another, cracking jokes and making loads of fun memories along the way."*



## DAY 2

### GREAT SAND DUNES NATIONAL PARK AND ZAPATA FALLS

*"We traveled to the peak of the dunes and had a blast getting to travel all the way up! I would say it was the most fun I've had in my life! After the dunes we got to see the beautiful glacier at Zapata Falls and got to taste the delicious mineral-rich water."*





# FIELD TRIP

## DAY 3

### FLORISSANT, CO

*"We got the chance to visit the Florissant Fossil Beds and dig up fossils. Everyone was smiling and overall having a great time - I collected 18 fossils!"*



## DAY 4

### GARDEN OF THE GODS



## DAY 5

### CRIPPLE CREEK, CO



*"This trip has done so much for me, from helping come out of my shell and branch out to new people to making me more excited to go into the field of geology! This trip has helped me visualize geological features in the field. Time spent with staff was valuable and they gave me a better understanding of expectations for field camp and graduate school."*







# BARTELL FIELD CAMP

SHANNON DULIN, PH.D.

This year's class of 23 students descended upon Bartell Field Camp on May 20 to begin their capstone course, which calls upon their hard-gained geologic knowledge of the last four years to produce geologic maps and stratigraphic columns. This class came to camp with amazing attitudes and unbridled excitement at getting out into the field in Cañon City. The weather was incredibly wild this year, with scorching hot days followed immediately by rainy and chilly days, giving the students a chance to try out all of their field gear!

We had another successful regional trip, led by our departing faculty members Sarah George and Gilby Jepson. Their expertise in the tectonics and associated sedimentary systems of the Laramide and Sevier Provinces will be missed in the coming years. The students studied these systems throughout Utah and western Colorado, then came back "home" to map the Mixing Bowl, which isn't much of welcome home due to the complexity of the rocks there!

This year the students experienced a new (for field camp) week of curriculum, led by vertebrate paleontologist Jacqueline Lungmus. The students learned all the intricacies involved in identification and collection of fossils in the field, associated federal and state regulations, and the storied history of paleontology that took place right in Cañon City. The famous "bone wars," orchestrated by scientists Othniel Charles Marsh and Edward Drinker Cope during the late 1800s, led to Garden Park, just north of Cañon City, where numerous vertebrate fossils were extracted in quarries set up by Cope and Marsh. This race to collect led to violence and sabotage by the scientists and their teams, which forever changed the field of paleontology. This exciting story is worth looking into if you don't know about it and then come to Bartell Field Camp and visit Garden Park and Cañon City's numerous dinosaur museums for more information.

We wrapped up the year with a final mapping project. This project has been made even more accessible by our wonderful neighbors around Bartell Field Camp, who opened more access to rocks so the students can now safely study the Cenozoic history of the area. I was also invited by the Cañon City Geology Club, the oldest rock hounding club in Colorado, to give a talk, which I titled "Oklahoma and Colorado: A Friendship One Billion Years in the Making." The club is very active, and invited me, adjunct professor Steve Adams and the head of Oklahoma State's Les Huston Geology Camp Brandon Spencer to a field trip to visit the local pegmatite quarry. Every year Cañon City feels more like home to me, and this exceptional cohort of students, the extremely gifted professors, and the local citizens made 2025 the best field camp for me yet!





# OU FIELDWORK TO EXPLORE THE ROLE OF MOUNTAIN EROSION ON DRAWING-DOWN ATMOSPHERIC CO<sub>2</sub>

GILBY JEPSON, PH.D.



Researchers in the School of Geosciences have been attempting to demonstrate the role Earth Sciences can play in mitigating the current climate crisis. In January, OU professors Gilby Jepson and Sarah George and OU postdoctoral researcher Natalie Tanski travelled to the Spanish Pyrenees in Spain to collect samples from the Paleocene – Eocene Thermal Maximum. The PETM is a period of past global warming that is considered analogous to present day. The goal of this research project is to use OU's low-temperature thermochronology laboratory to quantify the magnitude of erosion which occurs during periods of extreme global warming.

The OU team flew into Barcelona and travelled to the town of Tremp, Catalonia in the Tremp-Graus basin. Part of the Tremp-Graus basin preserves high-resolution section of the PETM. Here, OU researchers completed a 150 m measured section and performed dense sample collection for later low-temperature thermochronology analysis back at the OU laboratory.

Additionally, the team went and collected samples from the PETM boundary which were exposed to the west of the study area. The section becoming increasingly marine and we were curious what influence that would have on erosion rates. We think that the work conducted here at OU will be important for quantifying how much landscape change we can expect as the global temperature rises.

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Figure 1 (*top left*): View looking east of the Pyrenees close to the border between Spain and France.

Figure 2 (*bottom left*): Overview of the Tremp-Graus basin during a foggy morning.







Figure 3: OU researchers Sarah and Natalie and our external collaboratory hiking in to the PETM section.

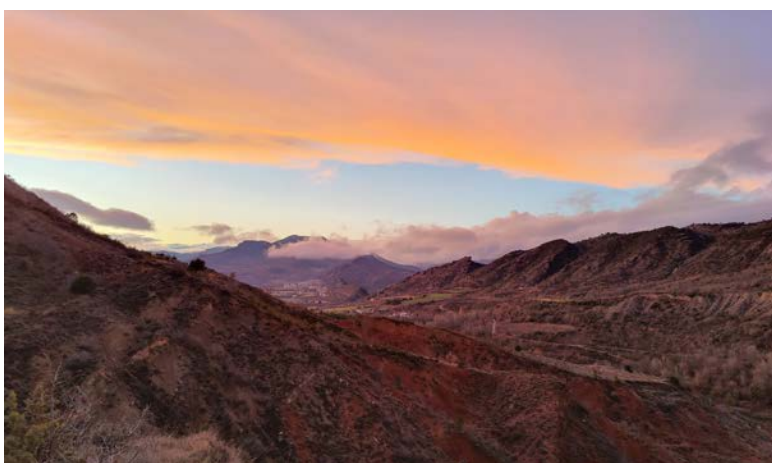


Figure 4: A view of the very muddy PETM section. The town of Aren can be seen at the base of the hill in the distance.



Figure 5: Road through the marine sedimentary rocks in the Spanish Pyrenees.

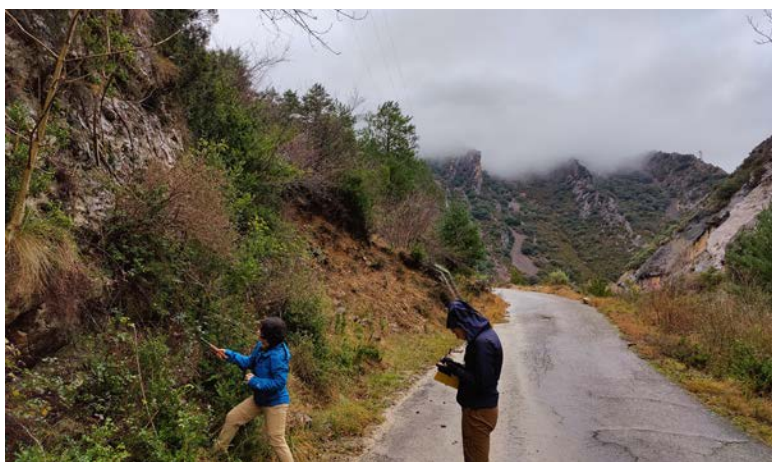


Figure 6: OU PI Sarah George and external collaborator collecting samples from the marine sedimentary rocks.





# RESEARCH PROGRESS: FERTILIZATION POTENTIALS OF ATMOSPHERIC DUST

**NEVIN KOZIK, PH.D., AND LYNN SOREGHAN, PH.D.**

Dust represents an important link among several “spheres” of the Earth system: the geosphere where rock is weathered into fines, the atmosphere, where those fines are transported, and the biosphere, where dust provides critical nutrients to fuel productivity. In marine systems, dust is by volume the largest source of iron, a bioessential micronutrient that plays an important role in regulating the productivity of large swaths of the ocean. However, not all dust is created equal in regards to the quantity as well as the ‘quality’ (bioavailability) of iron. This project attempts to characterize the bio-availability of iron from different types of dust, and as a result, will provide insight into the fertilization potentials of dusts.

To better understand the role of dust, and its ability to control the productivity in marine systems throughout Earth’s history, we

have identified and sampled two Miocene sedimentary successions that are known for their exceptional productivity. Over the last academic year, we have visited fabulously beautiful field sites in southeastern Patagonia (Argentina) and Santa Barbara, California to collect the Rio Negro and Monterey Formations, respectively. With these samples in hand, future work includes particle size analysis to assess the dust components in these strata, fossil lipid analysis to better understand the microbial community shifts associated with the climate changes captured in these strata, and iron speciation to quantify the amount of iron available for microbial metabolisms. This research will further our understandings of the role of atmospheric dust on carbon cycling with potential applications towards efforts in stimulating carbon drawdown in future geoengineering projects.









# BALKANS DUST

**MIKE AND LYNN SOREGHAN, PH.D.**

Mike and Lynn Soreghan, together with Ph.D. student Andrew Oordt, led the first year of their NSF-funded ‘Balkans Dust’ project, an International Experiences for Students (IRES) program. This project brings six undergraduate geoscience students selected from a nationwide applicant pool, for a month-long program of field-based research in Serbia and Croatia. We hosted our first student cohort in summer 2025, and worked with collaborators from the University of Novi Sad, Serbia and University of Zagreb, Croatia, on methods of analyzing modern and ancient dust deposits within the west-central Balkans (Serbia and Croatia) and interpreting their origin and paleoclimate significance. Students completed field work and sampling of Pleistocene loess in northern Serbia, Permian red beds of possible dust origin in southern Serbia, and carbonate-hosted terra rossa soils in northern and central Croatia. Students also had the opportunity to visit a number of cultural sites, including the site of one of the largest collections of Neanderthal fossils and artifacts in Europe, geoheritage sites highlighting the importance of loessitic and terra rossa based soils to peoples from the Neolithic to the modern, Roman ruins, and museums highlighting the history and fragmentation of Yugoslavia. Many of the student participants will visit OU’s sedimentology labs for sample processing with the ultimate goal of conference presentations.





*Figure 1: In southern Serbia studying and sampling Permian redbeds.*

*Figure 2: Goran Durn, Ph.D., and Ivor Perković, Ph.D, from the University of Zagreb worked with students in the lab where they examined soil features in terra rossa paleosols.*

*Figure 3: Visiting Neanderthal site at Krapina, Croatia, the largest known accumulation of Neanderthal remains dated at about 120-130 kyrs.*

*Figure 4: Sampling terra rossa soils around Istria, Croatia.*

*Figure 5: Visit to Bauxite mine in Istria, Croatia which is thought to be the first mined bauxite deposit in the world.*

*Figure 6: We visited vineyards in Serbia and Croatia to study terroir—how terra rossa soils and loessitic soils affect viniculture.*





# ROCKING STRATIGRAPHY: INTERPRETING LIFE IN LAYERS

**ALYSHA ZAZUBEC, PH.D. STUDENT**

In July of 2024, I participated in a 2-week Stratigraphic Paleobiology Field Conference in the Tobacco Root Mountains, hosted by Mark Patzkowsky and Steven Holland. In the final days of the conference, we moved to the Missouri Breaks where we received additional instruction from Ray Rogers and Kristi Curry Rogers. The field conference offered hands-on experience in the application of modern stratigraphic approaches to evaluating the marine fossil record. We learned techniques for collecting paleontological data, gained experience in measurement and correlation of stratigraphic sections, and interpreted the history of stratigraphic sequences through a combination of paleobiology and lithology.

The group visited sites with stratigraphic sequences from the Precambrian to the Early Cenozoic, and

working in teams we recorded lithology and biological occurrences at every site. Being based at Indiana University's Judson Mead Field Station provided access to a shared workspace, allowing the group to regularly come together to process and analyze data. The patterns that emerged tended to be somewhat cyclical and predictable, with certain lithologies correlated with different organisms. The inference was a shifting marine community that moves along with rising and falling sea levels. This concept allows paleontologists to refine their interpretations of first and last occurrences of marine fossil organisms, which impacts our understanding of what mass extinction events look like in the stratigraphic record. Competency in these principles is specifically important to research locations which exhibit a depth gradient.





The stratigraphic principles I studied during the course provided a solid foundation for interpreting similar patterns in my fieldwork on Anticosti Island, Quebec, Canada. This remote island preserves a continuous stratigraphic record from the Ordovician in the north to the Silurian in the south, as well as a distinct depth gradient from east to west. As one of the few places in the world where the Ordovician–Silurian boundary is exposed, Anticosti offers a unique opportunity to study the Late Ordovician Mass Extinction. Applying the principles of stratigraphic paleobiology, researchers have shown that the depth gradient likely causes fossil assemblages within the same formation to differ between the island’s western and eastern sides. These combined temporal and environmental gradients make Anticosti an ideal natural laboratory for investigating extinction and recovery dynamics supported by the

concepts of stratigraphic paleobiology.

The Stratigraphic Paleobiology Field Conference provided not only the tools to refine my research techniques, but also context to more accurately interpret the fossil record. As I move forward with my research on Anticosti Island, I now have a deeper understanding of how stratigraphic patterns, environmental gradients, and extinction events intersect. I’m excited to continue exploring these relationships, contributing to our understanding of Earth’s history, and applying what I’ve learned in a place where time itself is written in the rocks.





# COMPUTATIONAL GEOPHYSICS GROUP UPDATE: NEW HORIZONS FOR A GROWING TEAM

## **JUNLE JIANG, PH.D.**

From earthquake swarms in geothermal fields to megathrust faults beneath the ocean floor, the Crustal Dynamics and Computational Geophysics Group is expanding both our research horizons and our team. This year marks a milestone moment as we've nearly doubled our group size while advancing our mission to study dynamic processes and properties of the Earth over different scales and settings. Our research tools include satellite-based geodetic techniques, seismological observations, and geomechanical modeling. Our team now includes five graduate students, and this spring we welcomed two new postdoctoral researchers and two undergraduate interns. The energy and collaboration within our expanded team are evident in our group photos from the American Geophysical Union fall meeting in Washington, DC, in December 2024 and the recent Student Research Symposium of the school in March 2025.

New team members have brought fresh expertise and energy to our research group. Postdoc SeongJu Jeong (Ph.D., Southern Methodist University) joined our NSF-funded project to study earthquake swarms in geothermal, volcanic, and anthropogenic settings. SeongJu is interested in integrating seismological techniques and cutting-edge numerical tools for simulating fluid-fault-seismicity interactions. Within four months, he has won a competitive postdoc fellowship from the OU Data Institute for Societal Challenges and co-written a USGS proposal to study induced earthquakes in the Permian Basin of West Texas. Postdoc Xiong Zhao (Ph.D., Wuhan University, China) joined our NSF-funded project to study the observations and dynamics of crustal faults, with his expertise in satellite geodesy and statistical inference. Xiong has been studying fault structure and Hormoz salt rheology using 4D geodetic data of an earthquake doublet in Zagros Iran and will develop methods for analyzing faulting-seismicity complexity in other tectonic setting. The postdocs have participated in guest lectures in my courses and advised or co-mentored students. They will provide invaluable support in our research group while advancing their own career paths in the next few years.

Our students have also made impressive progress. Ph.D. students Ganiyat Shodunke and Segun Bodunde are working toward their defenses in the next academic year, having submitted their research for peer-reviewed publications. Ganiyat has started her final dissertation chapter in collaboration with Runar Nygaard, Ph.D., in MPGE on the Tuttle geothermal project and is interning at Carbon Solutions. Segun has started research on modeling Oklahoma's pore pressure, stress, and seismicity evolution for his dissertation and has also embarked on an NSF-funded five-month internship at Fervo Energy to expand his knowledge and skills in enhanced geothermal projects. M.S. student Jose Viteri Lopez developed novel probabilistic methods for characterizing large earthquakes, which have resulted in a successful M.S. thesis defense and a paper currently under review in a high-impact AGU journal. Ph.D. student, Manoj Thapa, in collaboration with the Oklahoma Geological Survey, is advancing landslide mapping capabilities using satellite imagery in Oklahoma and Japan. Manoj passed the General Exam this spring with flying colors and has submitted two papers of his research for publication this year. M.S. to Ph.D. student Zhenyu Kang, in his first semester at OU, was given the rare opportunity of an oral presentation at 2024 AGU for his research on shallow faulting processes. Furthermore, we have undergraduate students, Abrar and Salim, who are studying the geophysical observations of California geothermal fields for their senior theses.

Our research continues to span scales from local to global and from short to long term. We are studying Oklahoma's intraplate crustal strain, induced seismicity, and fault rheology from Pawnee region to state-wide using seismic and GPS networks, satellite imagery, industrial records, and geological databases. We are studying California's geothermal fields and large fault systems to understand natural interplate vs. anthropogenic hazards. We are developing computational models that can simulate seconds to centuries of deformation processes, applicable to various fault systems. These efforts not only advance fundamental science but also



facilitate the development of better products and strategies for resource management and hazard mitigation.

At the national and international stages, our group members and collaborators have presented these research topics at many conferences, including the AGU, GSA, ES-SSA (East Section of the Seismological Society of America), Statewide California Earthquake Center, and National Association of Black Geoscientists conferences.

These broad research opportunities, from supporting the student internship in industry to investigating earthquakes and geothermal fields, reflects the diverse funding support we have received from NSF, NASA, OU DISC, and our school. Importantly, the recognition of a prestigious NSF CAREER award (project beginning in July 2025) will further support our investigations of megathrust fault systems over the next

five years, in synergy with our projects on other solid Earth systems. This award will provide integrated research and education opportunities to graduate students, postdocs, and a visiting student from Chile. We are grateful and committed to education and outreach, including developing new teaching materials with teachers at Westmoore High School and OU to bring modern geophysics research into Oklahoma classrooms.

As our research team grows, so does our capacity to tackle the complex challenges of understanding Earth's dynamic processes and their impacts on society. These opportunities should foster critical thinking, analytical skills, and creative problem-solving in our students and mentees. We look forward to the exciting exploration and progress in the coming year.





# RCML

## RESEARCH GROUP UPDATE

**MATTHEW PRANTER, PH.D.**

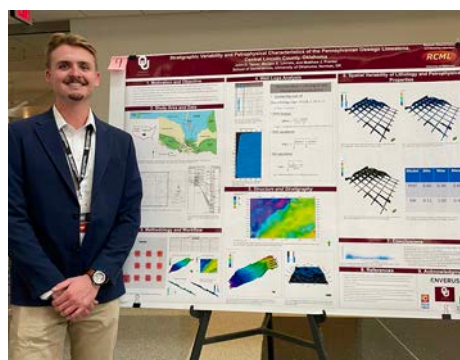
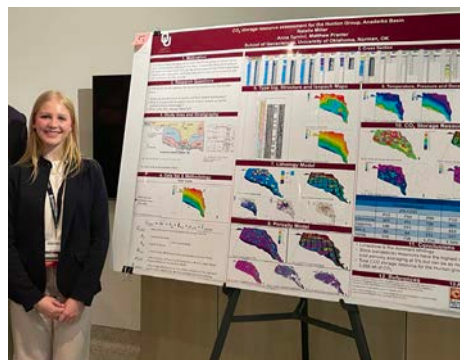
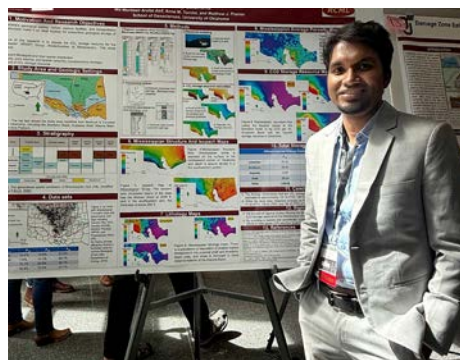


Top row, left to right: Ph.D. students Anna Turnini, Rui Zhai, Lima Akter Choiti and Md. Montasir Akif. Bottom row, left to right: M.S. students Grace Barber, Faith Grayson, Morgan Levrets, and B.S. students Dillon Taylor, and Natalie Miller

The Reservoir Characterization and Modeling Laboratory had another very rewarding year! I completed the final year of my three-year term on the American Association of Petroleum Geologists Executive Committee and as AAPG editor – my term ended June 30, 2025. It was a great experience, and I was very glad to give back to AAPG. Serving as editor of the AAPG Bulletin was a continuous time commitment and every week there was something to accomplish! I also completed the second year as director of the School of Geosciences and Eberly Family Chair.

My student Anna Turnini (Ph.D. candidate) presented a talk on the statewide assessment of CO<sub>2</sub> storage resource for the lower Paleozoic strata of Oklahoma at the 2025 SWS AAPG Conference in Fort Worth, Texas. At the 2024 IMAGE Conference in Houston, Rui Zhai and Montasir Akif (Ph.D. candidates) presented on the quantitative lithology prediction of turbidite deposits of the Bone Spring Formation, Delaware Basin, and the statewide assessment of CO<sub>2</sub> storage resource of Mississippian strata in Oklahoma, respectively. Master's students Faith Grayson and Morgan Levrets also presented at the 2024 IMAGE on aspects of the regional stratigraphy, depositional systems, and petrophysical properties of the Pennsylvanian Prue Sandstone in Lincoln County, Oklahoma.

Anna, Akif, Faith, Morgan and two undergraduate students in the RCML, Dillon Taylor and Natalie Miller, presented posters at our 2025 Geosciences Research Symposium and Expo at the National Weather Center.



Anna was awarded first place in the Ph.D. student category for her poster on CO<sub>2</sub> storage potential in Oklahoma and Morgan was awarded second place in the M.S. student category for her poster on the Pennsylvanian Prue Sandstone.



Ph.D. students Anna Turnini and Rui Zhai and M.S. students Morgan Levrets and Faith Grayson successfully defended their dissertations and theses and graduated this May 2025.







Students in my Subsurface Methods (GEOL 4233) course enjoyed the fall 2024 field trip to the Piceance Basin near Grand Junction, Colorado. We visited several localities to analyze world-class fluvial and shallow-marine outcrops. Later in the semester, the students analyzed subsurface data from the Piceance for these same formations to construct and evaluate 3D reservoir models. Javier Tellez, Ph.D., Rex Cole, Ph.D., and I co-lead the trip. Javier and Rex are both professors at Colorado Mesa University in Grand Junction



During this last year, my students and I had several manuscripts that were accepted for publication or published:

- Duarte, D., R. Pires de Lima, D. Devegowda, M. J. Pranter, accepted, Semi-supervised workflow to generate petrofacies logs from thin sections and XRF data, Interpretation.

- Turnini, A. M., and M. J. Pranter, accepted, Statewide assessment of CO<sub>2</sub> storage capacity for the lower Paleozoic strata, Oklahoma: Hunton Group, Viola Limestone, and Simpson Group, AAPG Bulletin.
- Turnini, A. M., and M. J. Pranter, accepted, Statewide assessment of CO<sub>2</sub> storage capacity for the

lower Paleozoic strata, Oklahoma: Arbuckle Group, AAPG Bulletin.

- Caf, A. B., M. J. Pranter, Z. A. Reza, D. Lubo-Robles, H. Bedle, K. M. Marfurt, accepted, Seismic-constrained reservoir modeling and simulation for CO<sub>2</sub> sequestration potential assessment of the Arbuckle Group: Wellington Field, Kansas, AAPG Bulletin.
- Ortiz Sanguino, L., H. Bedle, M. J. Pranter, S. Verma, 2025, Revealing Channelized Features Through Multi-Scale Workflows in A Mixed Carbonate Siliciclastic Setting, Grayburg and San Andres Formations, Midland Basin, TX, Interpretation, Interpretation, vol. 13, no. 2, T405-T425, <https://doi.org/10.1190/INT-2024-0115.1>.
- Caf, A. B., D. Lubo-Robles, K. J. Marfurt, H. Bedle, M. J. Pranter, 2024, Characterization of seismic-scale petrofacies variability in the Arbuckle Group using supervised machine learning: Wellington Field, Kansas, Interpretation, vol. 12, no. 3, T341-T354, <https://doi-org.ezproxy.lib.ou.edu/10.1190/INT-2023-0093.1>



# AASPI

## RESEARCH GROUP UPDATE

### HEATHER BEDLE, PH.D.

The Attribute-Assisted Seismic Processing and Interpretation Research group has had a productive year with continued progress in software development, student research, and applications to emerging energy sectors. The 2024-2025 academic year brought notable software updates, several student graduations, and expansion into new research areas.

#### *Consortium Activities and Software Development*

The AASPI consortium continues to support student education and research through industry sponsorship, which enables our students to develop and refine seismic interpretation tools while pursuing their graduate degrees. This year, our students and researchers made progress on improving the software platform, including updates to 3D visualization capabilities and enhancements to our machine learning framework. These developments help keep AASPI relevant in the evolving energy industry and ensure our consortium remains valuable to our sponsors who fund student research and education.

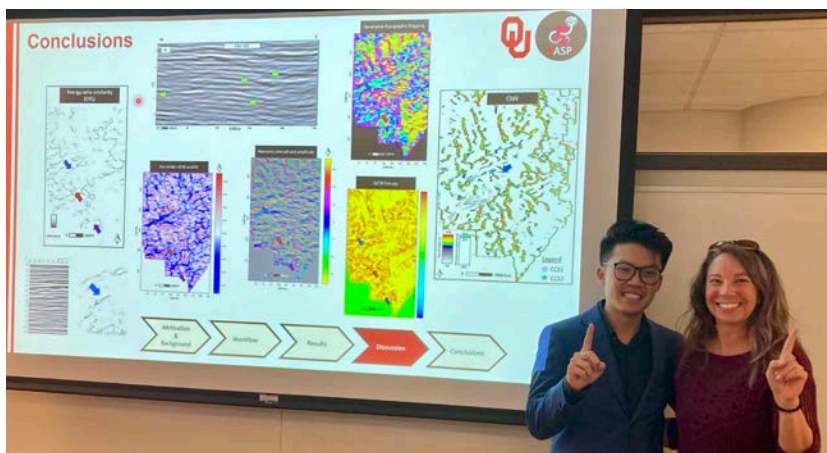
We always welcome AASPI alumni to stay connected with our research group by reaching out to [aaspi@ou.edu](mailto:aaspi@ou.edu) to join our newsletters and receive updates on student progress and new developments.

#### *Student Progress*

We graduated three students this academic year. **Hy Tran** completed his M.S. thesis "It Is Not Our Fault Yet: Multi-Attribute and Machine Learning Study for Improved Upper Basement Fault Detection in an Area of Carbon Capture Utilization and Storage: Decatur, Illinois, USA." **Marcus Maas** earned his Ph.D. with his dissertation "Application of Post-Stack Seismic Attributes, Well Dynamic Data, and Machine Learning for Carbonate Reservoir Facies and Productivity Prediction for Upstream Optimization." **Evan Jowers** finished his M.S. work on "Application of 4D Seismic Attributes to Monitor Reservoir Fluid Movement and Production Discrepancies: Maui Field, Taranaki Basin, New Zealand."

New students joining the group include M.S. students **Yasin Uzum**, who is looking at the application and use of inversion attributes in ML seismic facies reservoir characterization; **Ruhi Sahin**, who is investigating AVO attributes as additional input for ML reservoir classification; and **Hilmi Putra**, who is focusing on optimization of attribute selection and use of explainable AI (SHAP) for unsupervised ML seismic facies classification.

Our Ph.D. program added **Noor ul huda Choudhry** (fall 2024), who is working on optimization and application of distance quadrant attributes for fluid and sedimentary feature detection in seismic; **Danial Mansourian** (fall 2024), who is studying volcanic facies discrimination in





seismic; and **Aniq Ahmad** (spring 2025), who is developing segment anything models for seismic facies and horizon picking in seismic.

### **Research Applications**

We continue to expand AASPI applications beyond traditional oil and gas exploration. Our work in carbon capture, utilization, and storage (CCUS) includes basement fault fracture assessment and aberrancy testing for carbon storage fields. We have applied AASPI methods to electrical resistivity tomography (ERT) and ground-penetrating radar (GPR) data, demonstrating the adaptability of our attribute-based approaches.

Geothermal applications represent a growing area of research where our multi-attribute analysis and machine learning methods are being tested for subsurface characterization. We are beginning to explore applications in hydrogen storage as well.

### **Publications and Conferences**

The group published research in journals including *Interpretation*, *Geophysics*, *The Leading Edge*, *Journal of Applied Geophysics*, among others. AASPI researchers presented nine papers at the IMAGE 2024 Conference in Houston, TX, with additional presentations at EAGE spring 2024 and we will have quite a few presentations at IMAGE 2025 in August.

Research topics covered uncertainty assessment in machine learning methods for deepwater channels, reservoir productivity prediction approaches, and seismic

attribute applications for fault interpretation and carbon storage assessment.

### **Outreach and Resources**

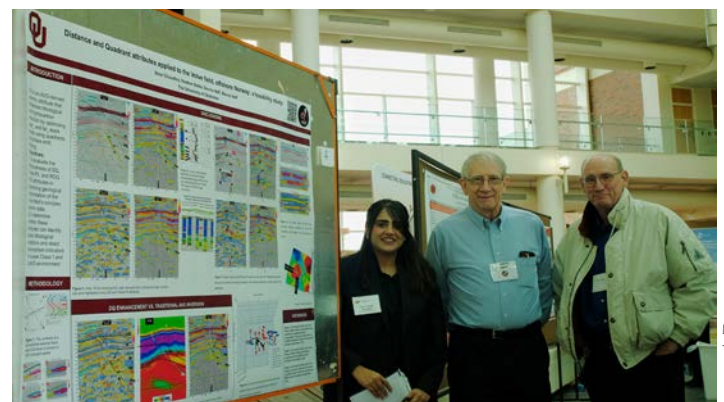
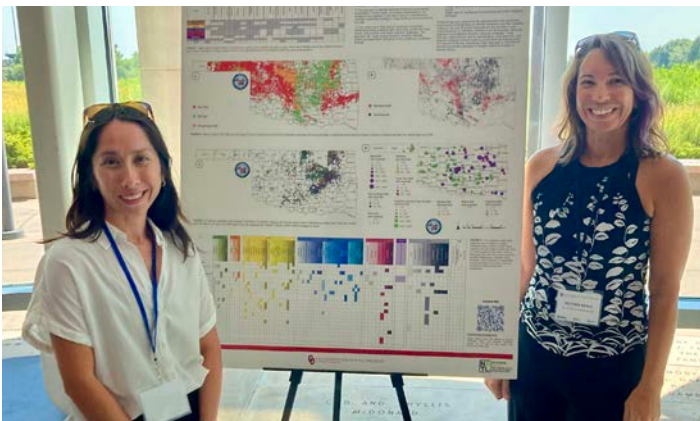
We have updated our digital presence to better serve the AASPI community:

- **Website:** Our redesigned website at <https://ou.edu/mcee/labs/aaspi> includes documentation, software access, and research updates
- **LinkedIn:** Our company page at <https://www.linkedin.com/company/aaspi-ou> provides industry updates and networking opportunities
- **YouTube:** Our channel at <https://youtube.com/@aaspi> features workflow demonstrations, tutorials, and application examples

These platforms help distribute our developments and connect AASPI users.

### **Future Directions**

Our 2025 plans include continued work on well log integration, synthetic seismic capabilities, and visualization improvements. We plan to further develop machine learning algorithms and expand applications in renewable energy sectors while maintaining our core focus on seismic attribute development and interpretation methods.







# ECHINODERM ECOLOGY & EXTINCTION (E<sup>3</sup>)

## RESEARCH GROUP UPDATE

**LENA COLE, PH.D.**

How have ecological interactions affected the evolution and extinction of life through geologic time? And how have extinction events altered ecosystems or restructured ecological communities? These are the driving research questions that my lab group aims to address using the fossil record of crinoids and other echinoderms.

In 2024, collaborators and I were awarded an NSF grant to continue field-based research on the first mass extinction, which occurred around the end of the Ordovician. Along with co-PI David Wright, OU graduate students A. Zazubec, K. Crowley, and C. Filipovich assisted with collecting fossils and stratigraphic data from the Ordovician mass extinction boundary on Anticosti Island in Quebec, Canada. This work will allow us to better understand the timing, magnitude, and long-term effects of the Late Ordovician mass extinction. Thus far, our Anticosti field collections have led to the description of a new genus and species of fossil crinoid that will be published in *Journal of Paleontology* later this year. Descriptions of several other new fossil species are



*Nicolas Bell photographs fossil crinoids at the Musée de paléontologie et de l'évolution in Montreal.*

ongoing, which have been supported by a SEIP grant led by D. Wright that will allow new fossil preparation equipment to be installed in the Invertebrate Paleobiology Lab. Ph.D. student Alysha Zazubec is now investigating how community composition on Anticosti Island changed across the extinction event, and has received competitive grants from the Geological Society of America and the American Museum of Natural History to support this research. Undergraduate Joy Suttles also began working on field collections from Anticosti to understand how extinction affected crinoid body size.





*A spectacular example of fossilized ecological interactions, where one crinoid has anchored itself in place by attaching to another crinoid.*

Ongoing research on echinoderm paleoecology has focused on better understanding how crinoids and other stalked echinoderms fed and interacted with each other in ancient communities. Research led by former undergraduate Colby Higdon (B.S., '24) developed a new model for quantifying feeding ecology in bizarre, Ordovician-aged fossil echinoderms from Oklahoma and evaluated whether they may have competed for food resources. This research was recently accepted for publication in *Journal of Paleontology*. MS student Nicolas Bell is investigating whether feeding strategies in crinoids vary across different sedimentary environments. Nicolas recently travelled to the Musée de paléontologie et de l'évolution in Montreal to collect data from the Ordovician-aged Neuville

Lagerstätte, which preserves many incredible examples of interactions between crinoids and other echinoderms.

Students in the lab have also been very proactive in securing funding and professional development opportunities. Zazubec and Bell both presented their research at the annual Geological Society of American conference in Anaheim, CA, and were awarded multiple grants to support their graduate research. Zazubec also participated in a two-week field course in Wyoming that integrated sequence stratigraphy with paleontology, continued working with the National Park Service to update their "Prehistoric Life in the National Parks" coloring book, and received an honorable mention for her outstanding application to the NSF Graduate Research Fellowship Program.







# PALEOBIOLOGY

## RESEARCH GROUP UPDATE

### DAVEY WRIGHT, PH.D.

The science of paleobiology is thriving at the University of Oklahoma's School of Geosciences. My research and teaching focus on understanding the major features of biological evolution using a combination of the fossil record and computational modeling.

I have just completed my third academic year here at OU as an assistant professor of geosciences and curator of invertebrate paleontology at the Sam Noble Oklahoma Museum of Natural History. This year in particular has been very exciting, with numerous grants and awards, research activities and expeditions, and student accomplishments to report.

On the funding front, I am delighted to report my colleagues and I were awarded a major grant (\$1.17 million) from the National Science Foundation to investigate macroevolutionary patterns of biodiversity change and biogeographic turnover in early Paleozoic marine ecosystems (PIs: Selina Cole and David Wright, OU School of Geosciences; Melanie Hopkins, American Museum of Natural History). Research surrounding the NSF grant involves a combination of fieldwork on Anticosti Island (Quebec, Canada), which preserves a unique window of geologic time spanning the end-Ordovician mass extinction, and global-scale statistical and phylogenetic analyses of trilobite and echinoderm species. Ultimately, this work will help us better understand the causes and consequences of Earth's first major mass extinction event, as well as provide research opportunities and field-based experiences for graduate students in OU paleobiology.

I was also awarded a ~\$40,000 grant (with co-PI: Selina Cole) via the OU VPRP Strategic Equipment Investment Program to revitalize our invertebrate fossil prep laboratory equipment for enhanced species discovery and

paleobiological informatics. The new lab equipment will significantly improve our capacity to process fossil specimens resulting from fieldwork, and will provide a unique "hands on" experience for OU students interested in working with fossil specimens at the nexus of fieldwork and natural history museums.

On the final note about funding and awards, this spring I received a Junior Faculty Fellowship from the OU Research Council to study how life responds to the aftermath of mass extinction events. Specifically, this research investigates large-scale evolutionary patterns in crinoid echinoderms from the end-Permian mass extinction to the present day. By integrating fossil and geological data with DNA sequences from living species, I'll be able to map the evolutionary relationships of species to a geological timeline and examine not only how species survived the end Permian mass extinction, but also how these events from the geological past continue to shape biodiversity today. This award received attention from the press, including an interview and article featured in *The Norman Transcript* about how understanding Earth's geologic history may help us predict how species respond to global change and other anthropogenic threats to biodiversity.

Research activities this year resulted in numerous scientific publications, including the discovery of six new species of fossil crinoids, two new genera of Jurassic starfish, and one new species of Ordovician brachiopod. I also made significant progress researching methodological advancements in paleontological phylogenetics. Of these projects, I'm particularly excited about a paper assessing the impact of character evolution modeling on phylogenetic and macroevolutionary inferences from fossil data. Setting the specific results aside and skipping to their

implications for the broader discipline: future paleontologists increasingly need to be rigorously trained in *both* (1) traditional geology and knowledge of fossil groups, and (2) a variety of applied mathematical and computational skills. Lucky for OU geoscience students, plenty of opportunities for training in these areas are offered and emphasized in our programs!

This has also been a big year for student activities. In fall 2024, Kiera Crowley (M.S. student) joined my lab to investigate evolutionary dynamics of Ordovician—Silurian crinoids using phylogenetic and macroevolutionary modeling. Kiera graduated *summa cum laude* from Cornell University, where she double majored in geological sciences and evolutionary biology, and previously worked at the Paleontological Research Institute in Ithaca, NY on Cretaceous to Cenozoic molluscs. Kiera experienced an exciting start at OU, as her first activity as a graduate student was to participate in remote geologic fieldwork on Anticosti Island, Canada! By the end of her first year, Kiera received a teaching award from the School of Geosciences, a student research grant from the Paleontological Society, and an Honorable Mention on her National Science Foundation Graduate Research Fellowship Program proposal. Our lab was also joined by undergraduate Aelin Johns (B.S., '24), who completed significant work using GIS to georeference past and future fossil collections made by OU paleontologists. Finally, I'm happy to report postdoc Marine Fau completed her fellowship and accepted a position at the Muséum d'Histoire Naturelle in Geneva, Switzerland. I'm looking forward to next year and am hopeful my funding opportunities will help recruit another Ph.D. student into the OU Paleobiology Research Group!

**Figure 1:** Fieldwork on Anticosti Island: (left to right) Dr. Wright, Lyndsey Farrar (Invertebrate Paleontology Collections Manager), Kiera Crowley (M.S. student)

**Figure 2:** Dr. Wright at the most famous unconformity in the history of geology

**Figure 3:** Paleobiology graduate students Kiera Crowley (Wright lab) and Nicolas Bell (Cole lab) after collecting fossils on a field trip to the Ordovician Bromide Formation of Oklahoma

**Figure 4:** Biotic interactions in the fossil record: a well-preserved specimen of the Ordovician crinoid *Ectenocrinus* with numerous juvenile blastozoan echinoderms attached



# PROBE THE EARTH: SEISMIC TOOLS POWERING GEOTHERMAL ENERGY

HAO HU, PH.D.

Beneath the land we are living, lies a tremendous and steady energy source — the Earth's own heat from deep. For thousands of years, this geothermal energy has floated to the surface in volcanoes, hot springs, and geysers, but today it is becoming an emerging clean energy source. Thanks to cutting-edge innovations in science and engineering, we are learning how to utilize this resource on Earth from a broad region. The kernel of this revolution is Earth scientists, using geophysical tools to probe the Earth's subsurface and unlock its thermal potential.

## ***From Hot Springs to High-Tech Wells***

Our ancestors recognized the Earth's hidden power. In places like Yellowstone's Firehole River (figure 1), they discovered springs so hot they could be used directly for warming homes or for bathing. These natural wonders hinted at an energy source far beneath our feet. Today, the conventional approach of extracting geothermal energy relies on hydrothermal systems. These are regions where nature has already done much of the work for us: heat

from the Earth's underground reservoirs of water, and underground permeable structures allow that hot water or steam to rise toward the surface. Wells drilled into these reservoirs bring the heat up, spinning turbines to produce electricity or piping heat directly into homes and businesses.

However, hydrothermal systems are rare, clustered mostly along tectonic plate boundaries and volcanic zones. To expand the utilization of geothermal energy, scientists and engineers are turning to innovative approaches that go beyond those naturally favorable locations.

One innovation is Enhanced Geothermal Systems, where water is injected into deep, hot rock at



fractures and engineered reservoirs. This method allows us to tap into the Earth's heat even in regions without surface natural hydrothermal activity. The U.S. Department of Energy launched the Utah Frontier Observatory for Research in Geothermal Energy project in 2015, leading the demonstration of how EGS can make geothermal energy viable beyond volcanic regions (figures 2 and 3).





Pushing even further is the concept of Advanced Geothermal Systems or closed-loop geothermal. Instead of relying on natural or fractured reservoirs, AGS circulates a working fluid through a sealed underground loop, exchanging the heat without interacting directly with the rock. This approach promises to deliver geothermal energy while minimizing environmental risks and water consumption.

### Why Seismic Tools Are Essential

Whether working with hydrothermal, EGS or AGS systems, understanding the subsurface is critical. The key is in the underground structures and

fractures—pathways that allow heat and fluids to move. And this is where seismic tools could contribute.

Similar to medical imaging allows doctors to see inside the human body, seismic imaging enables geoscientists to

map the subsurface in detail. During the exploration phase, seismic surveys help identify faults, fracture networks, and layers of rock that could store and transform heat and water. In the development phase, monitoring fracture growth guides engineers as they create and manage artificial reservoirs in EGS projects. Even in AGS systems, seismic techniques are vital for tracking subtle changes in underground stress and heat flow.

By “listening” to vibrations traveling through the Earth’s subsurface, scientists can not only see where

geothermal potential exists but also ensure these systems operate safely, sustainably, and environmental friendly.

### Imaging the Invisible: My Recent Work

In my research, I have focused on using seismic tools to illuminate two critical elements of geothermal systems: subsurface structures and fracture networks.

Through advanced seismic imaging, I map major fault zones and geological boundaries that shape how heat and fluids flow underground. Complementing this, I use techniques called double-beam fracture characterization to visualize fracture patterns for selected subsurface targets (figure 4). Fractures are the lifelines of geothermal systems, and understanding them helps us optimize energy production while minimizing drilling risks.

This work directly supports projects like Utah FORGE and contributes to the development of AGS systems, where monitoring underground conditions is crucial for long-term success.

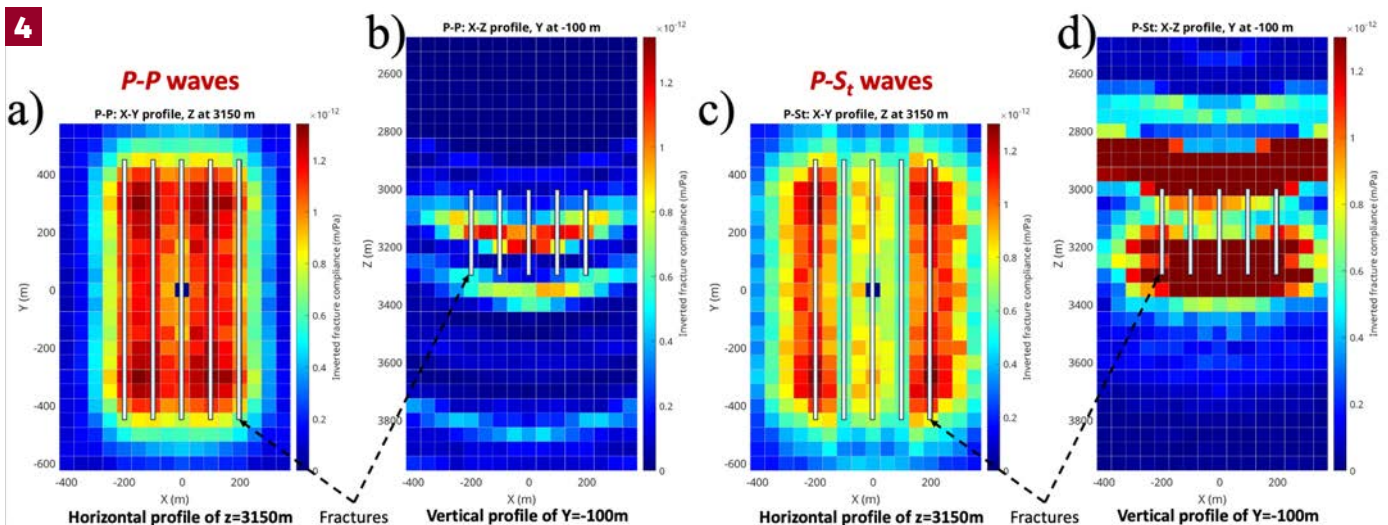


Figure 1: Steam rising from the Firehole River in Yellowstone National Park, where naturally heated waters emerge at the surface. Photo by the author, 2017.

Figure 2: Geothermal well drilling by Fervo Energy near the Utah FORGE site. Photo by the author during a field trip to Utah geothermal sites, summer 2025.

Figure 3: The Utah FORGE power plant, a demonstrating site for EGS research and development. Photo by the author during a field trip to Utah geothermal sites, summer 2025.

Figure 4: Inverted fracture compliance strength maps derived from surface seismic data. (a) Horizontal (x-y) profile and (b) vertical (x-z) profile from P-P wave inversion. (c) and (d) show corresponding profiles from P-S<sub>t</sub> wave inversion. White bars with black outlines indicate the true fracture planes.



# MEMORIALS

*In memory of our alumni gone too soon*

Kenneth E. Bewley  
Eugene J. Blazenko  
Jack P. F. Bowles  
Bruce Ned Cheatham  
Robert Travis Clarke  
James R. Cox  
Thalia Eddleman  
Betty Hauser  
R. L. Hunt  
John C. Kinard  
Thomas Jay Long  
Kenneth Lance Lowe  
John Mitchell Markas  
Robert I. McCutcheon

Michael Mershon Moore  
Daniel Lynn Pearson  
Charles D. Pierce  
Bill Kirk Reed  
Robert Theodore Robison  
Kermit Paul Schafer  
David Skinner  
Charles E. Stark  
Laurence Edward Thomas  
Sally Rahe Thomas  
Frank Cameron Thompson  
Jack Edward White  
Larry Allen Willis

*\*as reported to OU Advancement through June 2025*



# A TRIBUTE TO RICK MAYNARD

**MICHAEL ENGEL, PH.D.**

Rick and I met in 1984. Rick was working on his Ph.D. in engineering physics and I had started working on a research project with Rick's advisor. Rick already had an M.S. in electrical engineering and was curious about the new type of isotope lab that I was building. Rick became more interested in my type of work and decided to accept a technician position to help run my laboratory, which he did for forty years! Rick was like a mother hen with the instruments and had the electrical engineering background to keep things running smoothly while I spent more time raising the funds for the research projects that kept us afloat. Over the years Rick helped literally hundreds of students and professors acquire the stable isotope data that they needed for their various research projects. For the first 20 years, our instruments were not automated and Rick and I spent many long nights together running the samples that he had prepped earlier in the day. Lots of late night veggie burgers and Greek gyros to keep us going. Things got better in 2006 (at least sleep wise) when I was able to purchase our first automated stable isotope system. It was always funny to me that Rick was an expert at running such complex instrumentation and the software that it required but was always more comfortable in his personal life driving that old 1974 Datsun truck, as he did not trust the "computers" in modern vehicles. He also never really cared for cell phones and other types of electronics that most people take for granted these days.

Rick and I had a very special scientific relationship that you rarely ever see. People in our scientific community here at OU and the other labs that we collaborated with in the U.S. and abroad have been shocked and saddened to hear of Rick's passing.

I spent the last few months trying to figure out the easiest way to let Rick know that I planned to retire in a couple of years, as I am already 74. Rick said he never wanted to retire, and lo and behold, he never did! I am still in shock over Rick's passing and send my sincerest condolences to the family.





# SUPPORT



# GEOSCIENCES



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## FIELD TRIPS

**We are especially in need of funding to support our annual field trips.** Many courses incorporate field trips that allow our students to get hands-on experience. Recent and upcoming field trip destinations include: Montana, the Texas Gulf Coast, Book Cliffs and eastern Utah, Florida Keys, Guadalupe Mountains and Piceance Basin, Colorado. We also lead a First-Year Field Trip and New Graduate Student Field Trip each year.



## PIGOTT COLLOQUIUM SERIES

John D. Pigott ("Dr. P") was a professor of geology and geophysics at the University of Oklahoma for more than 41 years (1981–2023). He was a strong advocate of the School of Geosciences and, importantly, was a champion of the weekly Colloquium Series. Therefore, this endowed fund to support the Colloquium is named in his honor.

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