

IOWA



DEPARTMENT OF EARTH & ENVIRONMENTAL SCIENCES

FALL 2023 NEWSLETTER

MESSAGE FROM DEO DAVID PEATE

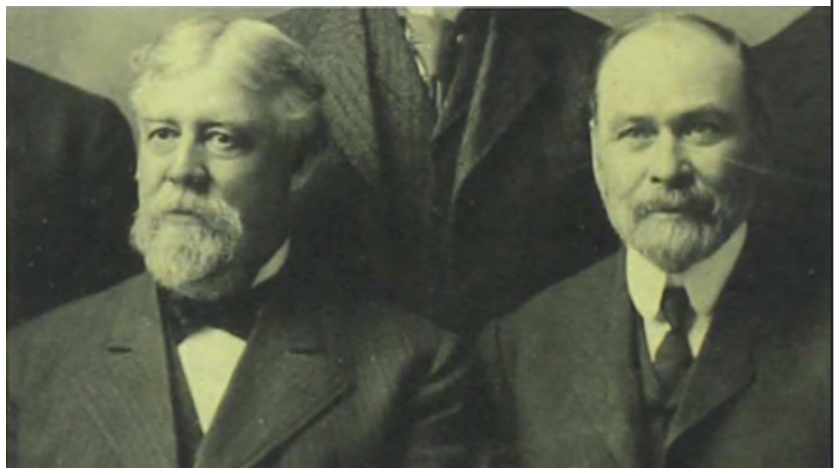


*"...2024 will be the
150th anniversary
of the founding
of the department..."*

A timeline of the [history of the department](#) is now available on the recently revamped department web site; thanks to Amy Sullivan (past Chair of the EES alumni board) for compiling this history. You will see that 1874 was the year when Samuel Calvin became the UI Chair of Natural History and the first head of the Geology Department. This means that 2024 will be the 150th anniversary of the founding of the department. We are planning an alumni gathering over the homecoming weekend (tentatively scheduled for Oct 7th, 2024) to celebrate this historic anniversary. We hope to see many of our alumni visiting Iowa City for this celebration. We are in the process of developing a schedule of events, and there will be more details available in the Spring 2024 alumni newsletter and on the department website soon.

Geology as a discipline has changed over time, and broadened to encompass environmental aspects, and this has been reflected in the changes to the department name since 1874, becoming the Department of Geoscience in 2001 and then the Department of Earth and Environmental Sciences in 2013. This evolution is continuing. We are currently finalizing details of a new structure for 'environment'-related teaching and research in the College of Liberal Arts and Sciences (CLAS) that will allow us to maintain core discipline strengths in Geoscience and Geography and expand expertise in environmental science and policy areas. These are areas where there is significant potential for future growth in majors given the level of student interest in 'environment'-related issues, and because of this, the College is planning to invest new resources, with several new faculty hires planned for next year.

Thanks to all alumni and friends for your continued support for the Department of Earth & Environmental Sciences, and I hope to see many of you in Iowa City at next year's 150th birthday celebration.



Samuel Calvin (right) with friend Thomas Macbride (left) in 1905, who together made up the two-man faculty in 1879.

Great science and old friends at GSA Connects 2023

The EES department had a big footprint at the annual Geological Society of America Meeting this year. Twenty-seven people from our department gave presentations, including everyone from undergraduates to graduates to post-docs to faculty. Even the Dean of the College of Liberal Arts and Sciences was in attendance! We also hosted an alumni event which was well-attended by graduates from all generations.

Adrain, J.M., et al., The origin of horseshoe crabs: Discovery of three-dimensionally preserved Xiphosuran species in the Lower Tremadocian (Lower Ordovician) of the Great Basin, Western USA

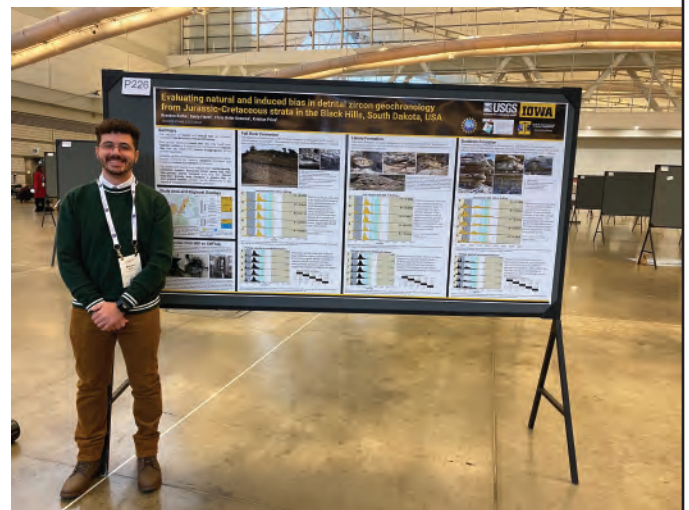
Bley, E. et al., Encrinurid trilobites from the Upper Ordovician (Katian) of northeastern Iowa

Botha, B. et al., Evaluating natural and induced bias in detrital zircon geochronology from Jurassic–Cretaceous strata in the Black Hills, South Dakota, USA

Bruxvoort, S. et al., New geologic mapping of the Phillip Smith Mountains A-1 NW 7.5' quadrangle, Central Brooks Range, Alaska

Collins, M., et al., Understanding water table response in a loess-dominated hillslope

Cramer, B., The critical role of continental drilling to



MS student Brandon Botha (advised by Dr. Emily Finzel) standing at his poster at the GSA Connects meeting.

Paleozoic research and the realities of not having a shipboard scientific team

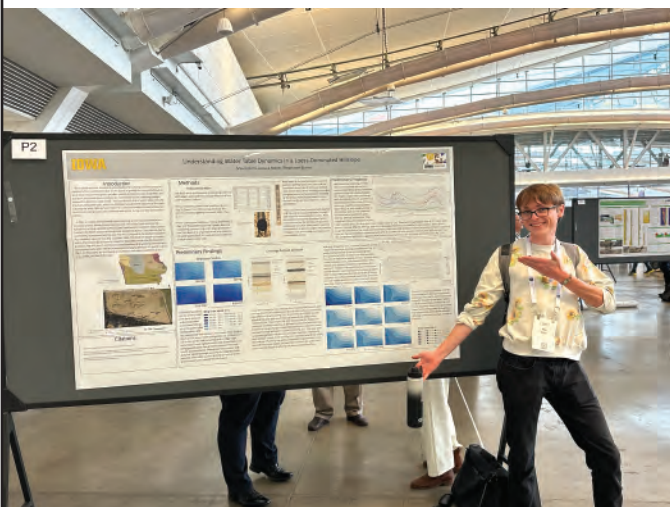
Das, S. et al., What does an aquifer code mean?

Finzel, E.S. et al., Chronological framework for the Lower Cretaceous Section in southwestern Montana based on detrital zircon U-Pb geochronology from multiple lithologies

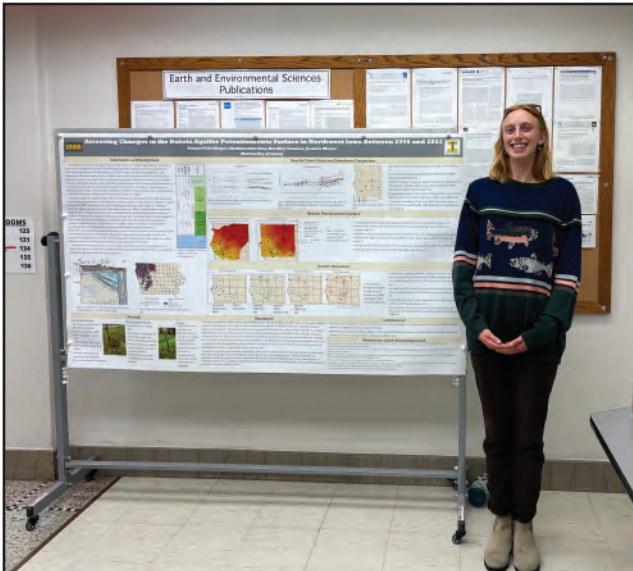
Finzel, E.S. et al., Late Paleozoic sediment dispersal across Laurentia through detrital zircon U-Pb geochronology

Hammen, N. et al., Phosphorous and the Ireviken biogeochemical event

Holesinger, E. et al., Assessing changes in the Dakota Aquifer potentiometric surface in northwest Iowa between 2008 and 2023



Undergraduate student Max Collins (advised by Dr. Jessi Meyer) standing at his poster at the GSA Connects meeting.



Undergraduate student Emma Holesinger (advised by Dr. Jessi Meyer) standing with her poster preparing for the GSA Connects meeting.

Kroeger, M. et al., OAE2 and the eastern extent of the Western Interior Seaway in Iowa

Laird, J. et al., Between-habitat dissimilarity (beta-diversity) response of trilobites to the end-Ordovician mass extinction: a mechanism to maintain within-habitat richness (alpha-diversity)

Malone, J. et al., Continental-scale glaciation during the Paleoproterozoic: detrital zircon evidence from the Snowy Pass Supergroup, Wyoming

McClelland, W.C., et al., Linking MDA estimates, pluton emplacement and deformation in the North Slope Subsurface, Alaska, with LA-ICPMS and CA-TIMS: Implications for Devonian orogenesis in the Brooks Range

Meyer, J. et al., Drive point multilevel systems for characterizing attenuation of wastewater derived contaminants in a small effluent dominated stream

Mure-Ravaud, S. et al., Articulated Cambrian (Guzhangian) trilobites from the Weeks Formation, Utah: revision and reassessment of the species proposed by Charles Walcott

Olson, T., The challenges of being a graduate student and teaching assistant with adult diagnosed autism and ADHD

Payre, V. et al., Intermediate and felsic magmatism in early Mars: implications in the composition of the ancient Martian crust

Perez-Peris, F., et al., Paleoecology of the end-Skullrockian (Tremadocian; Early Ordovician) Trilobite Mass Extinction

Pierce, S. et al., Examining scale dependence of hydraulic conductivity in glacial sediments for improving predictions of contaminant plume response to flow system transients

Ridl, S. et al., Testing the geodynamic controls on sediment dispersal using multi-proxy provenance methods in the Marnoso-Arenacea and Laga basins, northern and central Apennines, Italy

Sanders, S., Supporting faculty in addressing student mental health

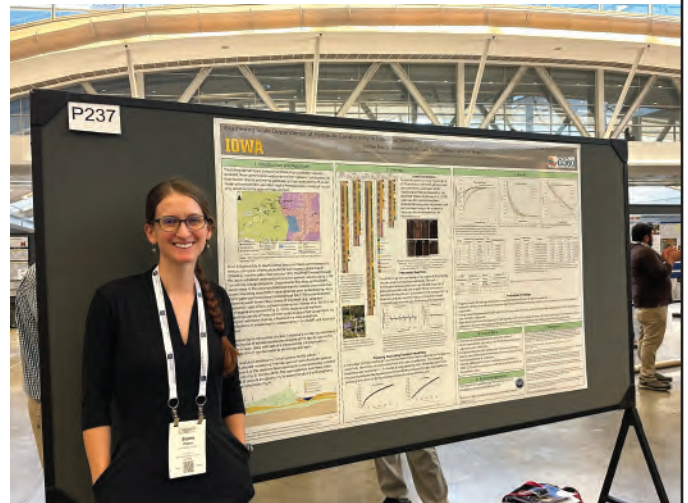
Shanks, R. et al., Reevaluation of agnostoid arthropod morphology and reassessment of trilobite affinity using silicified specimens from the Great Basin

Stolfus, B. et al., New $\delta^{71}\text{Li}$ data across the Llandovery-Wenlock boundary of Gotland, Sweden

Symanski, K. et al., Geochemical correlations of Lower Pennsylvanian strata in the Forest City Basin of south-central Iowa

Weirich, F. et al., The use of high frequency ground penetrating radar (HFGPR) to evaluate the rate of recovery of fire-impacted watersheds in southern California

Wyatt, J. et al., Soil core analysis of the Ashton Research Prairie, Iowa City, Iowa



MS student Sophie Pierce (advised by Dr. Jessi Meyer) standing at her poster at the GSA Connects meeting.

GSA Alumni Event



(Top) Group photo at Condado Tacos. (Middle left) From L to R: Carsyn Ames (MS '18), Kris Symanski (BS '23), Ben Howard (BS '21), and Allison Kusick (BS '20). (Middle left) From L to R: Jennifer Thines (PhD '20), Jack Malone, Tim Stroope (PhD '12), Shay Ridl (PhD candidate), Matt Braun (PhD '22). (Bottom left) From L to R: Neo McAdams (PhD '16), Erica (MS), Jennifer Thines (PhD '20). (Bottom right) From L to R: Dyanna Czeck (BS '95), John Jens (BA '70) and spouse.

GREAT STORIES START *here*

This year we welcomed eight new graduate students to the department from different parts of the country and the world. Read their stories here.



Schaffer Finney



Nikka Hubert



Talia Hill

Schaffer Finney

I graduated from the University of Iowa in 2022 with a Geoscience BS. Post graduation I accepted a position with UIowa MATFab to take care of daily operations and management of the semiconductor/thin-films fabrication laboratories. While in my undergrad I worked with Tom Foster to explore P/T histories of metapelite samples in the Rangeley Range in Maine. My current project is looking into the conditions which led to bi-modal garnet growth in the Adula Nappe in the Swiss Alps, also under the guidance of Tom Foster. My long-term goals are loose, but I plan to explore mapping opportunities and instrument development.

Nikka Hubert

My name is Nikka (Ronikka) Hubert, and I received my undergraduate degree in geology from Guilford College in Greensboro, NC, in 2020. I received my master's in geospatial information technologies from Delta State University in Cleveland, MS, in July 2023. During my undergraduate studies, I researched heavy metal contamination in Lake Champlain, VT soil sediment samples. My master's thesis was on land use changes in Maricopa County, AZ, regarding rapid agricultural land decline and the effects of urbanization in the area. Dr. Jonathan Adrain is my adviser, and I am doing trilobite research from the upper Ordovician. I chose to come to UIowa because Dr. Adrain is an expert in the field, and I wanted to learn from the best. After leaving UIowa, I hope to teach geology and paleontology at the collegiate level.

Talia Hill

I received my B.S. in Geoscience from the University of Iowa in 2023, along with a B.A. in History. While an undergraduate student, I worked with Dr. Brad Cramer, and I am excited to continue working with him for my MS. My research interests are related to ocean chemistry, specifically changes in the chemical composition of the ocean during extinction events. Eventually, I would like to pursue a career dedicated to increasing equity and access to STEM education for everyone.



Protiti Roy

My name is Protiti and I am a PhD student in Dr. Valerie Payré's Planetary Exploration Group. I pursued my bachelor's degree with an Honours in Geology from the University of Calcutta, India. I obtained my master's degree in Applied Geology from IIT (ISM) Dhanbad, India. After completion of my master's degree, I assisted in research in an ISRO funded project for a year at Planetary Geology and Image Analysis Laboratory, Asutosh College, India. While working there, I realized that I love working on Mars. I am currently studying minerals in the Chaos regions of Mars using JMARS. I analyze CRISM data using ENVI with CAT and inspect HiRISE images. I am intrigued by how minerals can speak a lot about the igneous history intertwined with several sedimentary processes in the past. This helps me to infer how Mars used to be in the past and even answer the water situation back then. When I am not busy looking at Mars, I love to spend my time painting and sketching, reading story books and cooking!



Kiersten Hottendorf

I am Kiersten Hottendorf, a new PhD student in the Planetary Exploration Group working with Dr. Valerie Payre. I have received a Bachelors of Science in Earth Science from The New Mexico Institute of Mining and Technology, and a Master's of Science from the State University of New York at Buffalo. My current research project involves using crystallization experiments to try to imitate igneous rocks on the surface of Venus so we can begin to create a spectral library that can be used when analyzing data from upcoming missions to the planet. After I leave UI with my PhD I hope to enter a postdoctoral position that allows me to continue studying volcanic rocks on multiple solid bodies in our solar system. My overall goal is to find places that allow me to keep researching volcanoes in interesting places until I grow sick of it, which I hope I never do.



Andrew Studzinski

I earned my BS in geological sciences from the Ohio University in Spring 2022. While there, I completed a senior thesis under Dr. Katherine Fornash where I used U-Pb geochronology and trace element data from zircons collected in the Tavşanlı Zone to constrain the timing of subduction initiation and metamorphism in the region. Currently, I am working under Dr. Jonathan Adrain where I intend to conduct cladistic analyses of some trilobite genera while also hopefully doing some paleoecology work. I chose to come to Iowa as I felt most wanted by them. Other schools were sluggish with their responses to my queries whereas the University of Iowa always responded within a reasonable time frame. After earning my MS, I plan to continue my academic career by pursuing a PhD.

Geological mapping experience in the Brooks Range, Alaska

By Bill McClelland

Several EES students spent 3 weeks in July, 2023 making a geologic map of the Philip Smith Mountains A1 NW quadrangle in the Brooks Range, Alaska. The 3-person mapping team included MS student Samson Bruxvoort and undergraduate students Syd Rayburn and Manny Murillo. They joined advisor Bill McClelland and a two-person team from Dartmouth in Fairbanks and drove north on the Dalton Highway to the Toolik Field Station – they were put into the field area from Toolik by helicopter courtesy of the USGS and Alaska DGGS. The students made daily traverses in groups of two or three to cover the field area, generate a geologic map and collect samples for geochronologic, geochemical and paleontological analysis. At the end of the mapping project, the group did a field trip across the Brooks Range on the Dalton Highway and went to examine the Denali fault in the Alaska Range. The project was funded by grants to Bill McClelland from the USGS EDMAP program and National Science Foundation and a GSA Graduate Student Research grant to Samson Bruxvoort. The mapping effort contributes to Samson’s MS thesis studies and provides context for senior theses on Devonian provenance of the Endicott Mountain allochthon by Syd and Manny. The research group presented a poster with the mapping results at the 2023 Annual GSA meeting in Pittsburgh.





Previous page: (Top left) Samson examines bedding-cleavage relationships in the Devonian Beaucoup Formation. (Top right) Syd and Manny putting limestone contacts on the map in the Devonian Beaucoup Formation. (Bottom left) Meal time! (Bottom right) U Iowa mapping team picked up from their field site at the end of the season.

This page: (Above left) Sampling the Clara Creek eclogites near Coldfoot. (Above right) Students on a post-field season field trip to the Denali fault.

SVP: Society of Vertebrate Paleontology Annual Meeting



Front row, L to R: Georgia Knauss (MS '14), Eric Wilberg (PhD '12), Julia McHugh (PhD '12), Stephanie Drumheller (PhD '12), Jennifer Nestler (MS '12). Back row, L to R: Marc Spencer (PhD '13), Shelton Strickler (BS student), Nate Smith (MS '05), Nathan Platt (PhD candidate), John Nguyen (MS candidate), Daniel Leaphart (PhD candidate), Michelle Stocker (MS '08), Chris Brochu (BS '89), Andy Grass (PhD '15).

EES:3001 **Third Year Field Trip**

Badlands National Park, South Dakota



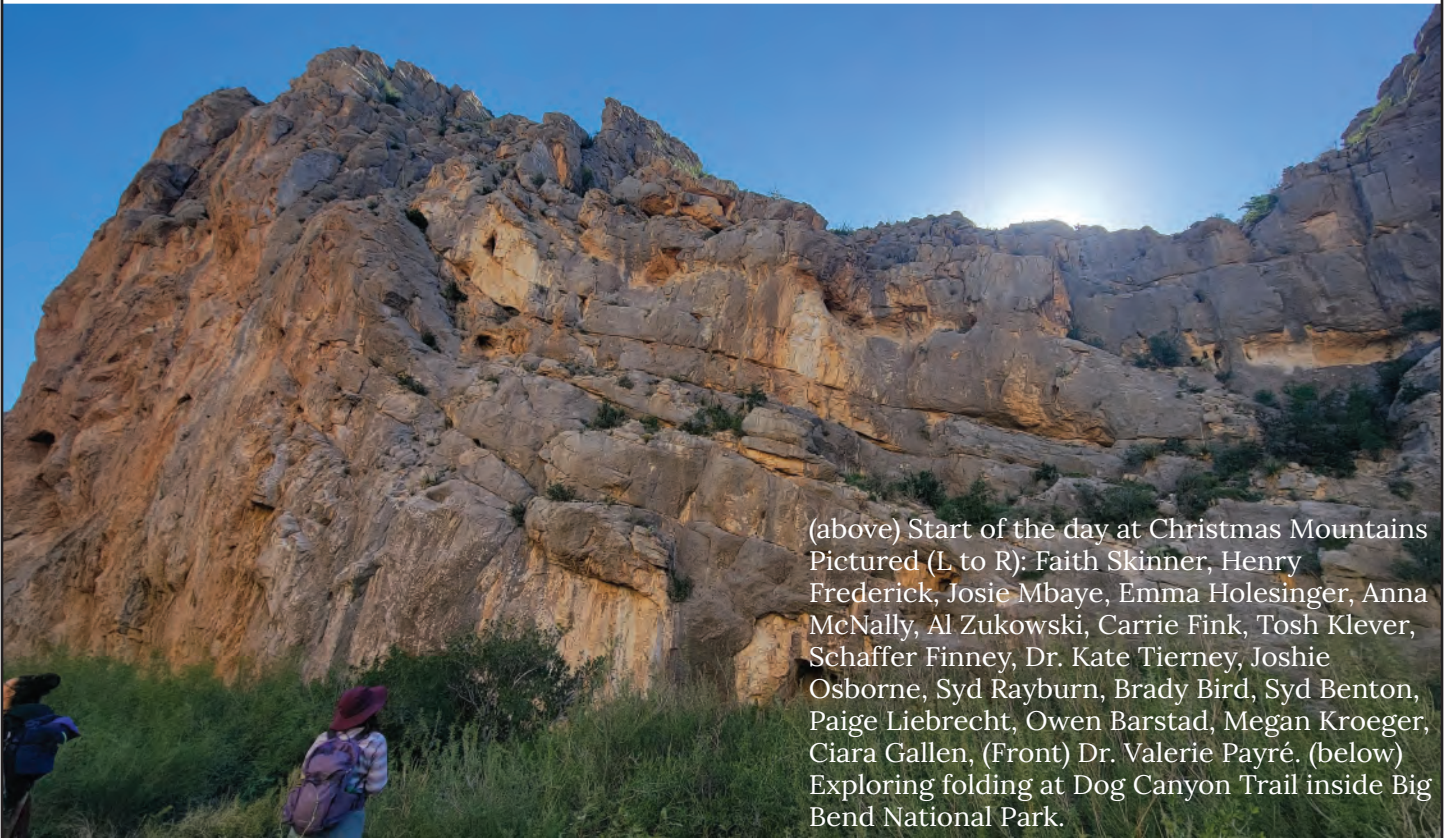
(left) Group photo after completing the Notch Trail hike (front to back): Dr. Kate Tierney, Vivian Slack, Carrie Fink, Ellie Filippone, Spencer Howell, Abbey Stoddard, Emily McGowan, Ethan Smyke, Anna McNally, Emma Walz, Evie Niemuth, Morgan Havens, Isabella Howsare, Noah Beem, Carter Jensen, Brianna Haynes, Avery Newman, Paige Liebrecht, Brady Bird, Owen Barstad. (right top) Mid-day lecture led by Dr. Ben Swanson about the processes that shaped the heavily eroded sedimentary landscape. (right bottom) Chilly early morning breakfast preparation.



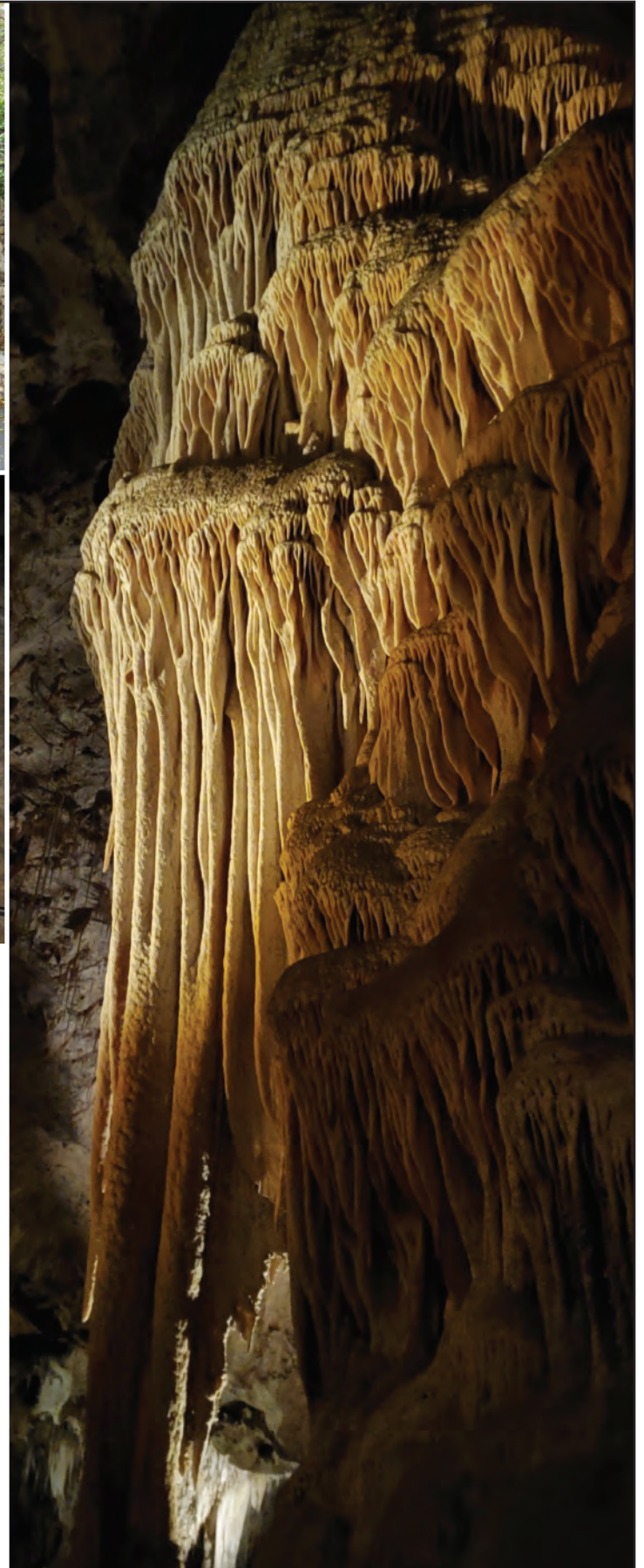
(top) Lecture at the Ancient Hunters Overlook led by Dr. Ben Swanson detailing the history of the region and its people followed by a discussion of the importance of being able to utilize the area as a resource. (bottom) End of day group photo. Back row (L to R): Paige Liebrecht, Anna McNally, Emily McGowan, Ellie Filippone, Vivian Slack, Dr. Kate Tierney, Morgan Havens, Avery Norman, Carter Jensen, Brady Bird, Owen Barstad, Dr. Ben Swanson. Front row (L to R): Evie Niemuth, Isabelle Howsare, Noah Beem, Spencer Howell, Ethan Smyke, Emma Walz, Carrie Fink, Abbey Stoddard, Ella Mastin.

EES:4001 **Fourth Year Field Trip**

Big Bend National Park, Carlsbad Caverns National Park,
Guadalupe Mountains National Park



(above) Start of the day at Christmas Mountains
Pictured (L to R): Faith Skinner, Henry
Frederick, Josie Mbaye, Emma Holesinger, Anna
McNally, Al Zukowski, Carrie Fink, Tosh Klever,
Schaffer Finney, Dr. Kate Tierney, Joshie
Osborne, Syd Rayburn, Brady Bird, Syd Benton,
Paige Liebrecht, Owen Barstad, Megan Kroeger,
Ciara Gallen, (Front) Dr. Valerie Payré. (below)
Exploring folding at Dog Canyon Trail inside Big
Bend National Park.



This page: (top left) Entrance to Carlsbad Caverns (L to R) Owen Barstad, Brady Bird, Syd Benton, Joshie Osborne, Syd Rayburn, Sadie Richter, Dr. Kate Tierney, Ciara Gallen, Anna McNally, Megan Kroeger, Emma Holesinger, Josie Mbaye, Faith Skinner, Paige Liebrecht, Henry Frederick, Tosh Klever, Al Zukowski, Dr. Valerie Payré. (bottom left) Emma Holesinger, Al Zukowski, Syd Rayburn, Faith Skinner and Syd Benton inside the Big Room in Carlsbad Caverns. (right) Snapshot of one of the many incredible examples of ribbon stalactites or "cave bacon" on display inside Carlsbad Caverns. Next page: (top) Joshie Osborne, Owen Barstad, Dr. Kate Tierney, Brady Bird, Dr. Valerie Payré, Faith Skinner on the summit of Guadalupe Peak. (bottom left) Walking into the mouth of the Santa Elana Canyon after crossing Terlingua Creek within Big Bend National Park. (bottom right) View from the "Top of Texas" after summiting the Guadalupe Peak. The 8.4 mile round trip hike covered 3,000 feet of elevation and walked students through reef, back-reef, fore-reef and basin sediments.



Field Methods and Field Analysis

Field Methods and Field Analysis are beginner and advanced, respectively, three-week courses that run simultaneously and provides a total of 6 weeks of field camp instruction for our majors. Field Methods spends the entire three weeks in Dillon, MT, whereas Field Analysis spends 2 weeks in Dillon and 1 week in the thrust belt south of Glacier National Park as a capstone experience.



(left top) Field Methods class at Kelley Reservoir with thumbs up from TA Gwen Barnes. (left bottom) Field Methods class photo. (right top) Field Methods students recording data at a stream gauging exercise. (right bottom) Field Methods class discussion beneath a structure in the Triassic Dinwoody Formation.



News Briefs



Welcome Back!

The Department hosted a Welcome Back event for incoming and returning geoscience and environmental undergraduate majors. Dr. Brad Cramer led an informational session prior to the event for incoming freshmen or new transfer students. Approximately 50 students attended the event along with various faculty and staff.



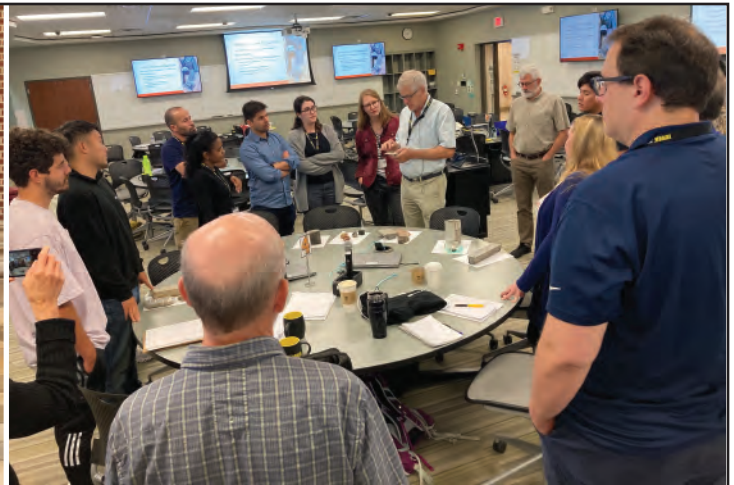
Earth Science Week

Earth Science Week was October 8-14 this year with a theme of “Geoscience Innovating for Earth and People”. The department, along with staff from the Department of Geography and the Iowa Geological Survey, provided an opportunity for the public to learn about the many ways that the geosciences are helping communities create healthier and more sustainable lives, while innovating environmental problem-solving around the world.



Congratulations Samson!

Samson Bruxvoort received the John T. Dillon Research Award at the annual GSA meeting in Pittsburgh for his 2023 GSA Graduate Student Research proposal.



4th School on Sandstone Diagenesis

Dr. Emily Finzel hosted a school focused on sandstone diagenesis from July 30 August 3, 2023, in collaboration with The Applied Sedimentology group at the GeoZentrum NordBayern (FAU Erlangen Nuremberg) in collaboration with Geocosm LLC and Getech Group Plc. Normally offered only in Europe, this was the first time it was held in the United States. The school was attended by students and faculty from academia, as well as industry researchers from around the globe. The school integrates theoretical understanding, practical experience, and exercises with emphasis on data acquisition, compositional data processing, and diagenetic modelling and reservoir quality prediction.



Fall Graduates

Emily Copple, BS Geoscience

Emma Carmichael, BA Environmental Sciences, CER Nonprofit Leadership and Philanthropy

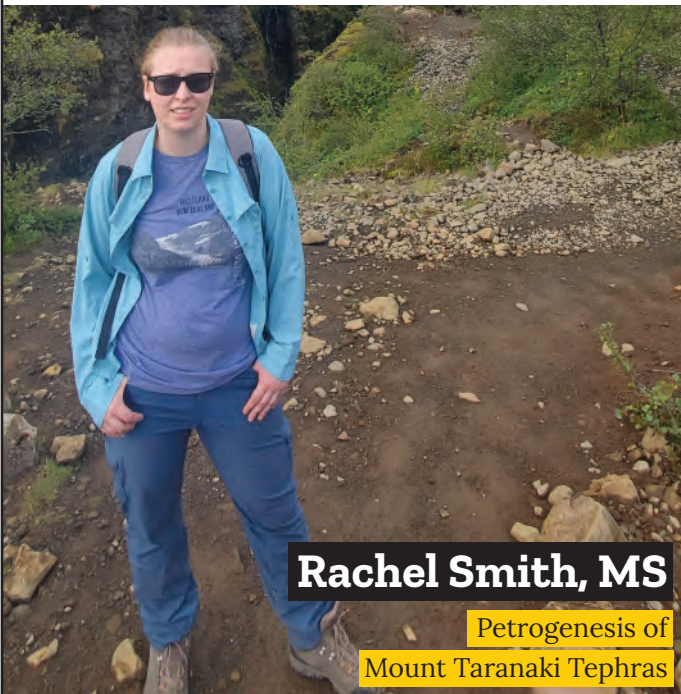
Grace Clark, BS Sustainability Science, Minor Environmental Science

Madeline Johnson, BS Environmental Science, BA Music

Nick Rasmussen, BS Environmental Science

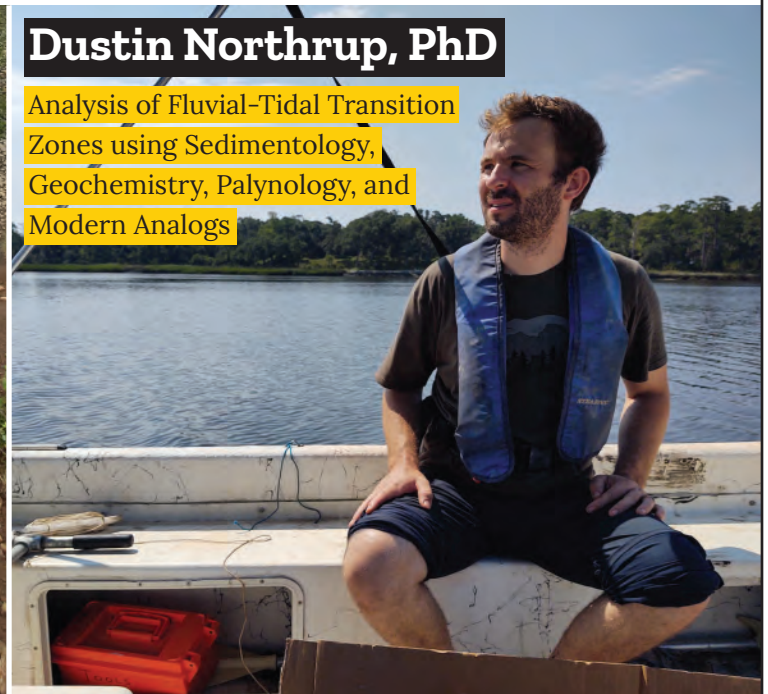
Emma Schima, BS Environmental Science, Minor Chemistry, Minor Psychology

Athena Sheridan, BS Environmental Science



Rachel Smith, MS

Petrogenesis of
Mount Taranaki Tephra



Dustin Northrup, PhD

Analysis of Fluvial-Tidal Transition
Zones using Sedimentology,
Geochemistry, Palynology, and
Modern Analogs

Earth & Environmental Sciences Alumni Board News

by Lee Phillips, EESB Chair

Dear Fellow Alumni,

It continues to be a great pleasure to serve as Chair of the Earth and Environmental Sciences Alumni Advisory Board. We strive to help the department that we dearly love to continue to have an amazing impact on student learning through efforts that promote excellent teaching, community outreach, and world-class research. Each of us learned so much about our surrounding through highly engaged lectures, labs, and field trips/courses. Many of us have continued to work in the discipline, while others have used our abilities to think critically, solve complicated problems, work well in teams, and communicate effectively to happiness in other career and/or life situations. I am forever grateful to be able to share understandings about our surroundings and how our planet works.

This year, we recognized the career and contributions of Dr. Kathleen Woida (1991) through the Distinguished Alumni Award. Kathy grew up in northern Michigan on her family's farm. She had a varied career that culminated with her service to the US Department of Agriculture, Natural Resources Conservation Service in Des Moines, IA. In retirement, she wrote and published a fascinating book on, "Iowa's Remarkable Soils." Please read more about Kathy on the [EES DAA Website](#).

Most of us cherish the time we got to explore the world outside the confines of Trowbridge Hall. I certainly reflect on the many fieldtrips regularly because, ... that's where a lot of the learning happened. Decreases in the financial support for field-based experiences prompted us to focus efforts on helping the Department raise money that would subsidize the expenses students incur to learn in this most meaningful way. During [One Day for Iowa](#) last spring, we (all of us) were able to raise a little more than \$10,000 that was used to support field-based learning. We're going to focus on this important mission again next spring, and I encourage you to mark your calendar for March 27, 2024. Gifts of ANY size make a huge difference.

During the 2024 Homecoming, the Department and the Alumni Advisory Board will celebrate 150 years of Earth Science at The University of Iowa. Please make plans to join us for the fall meeting of the EESB and the Departmental Celebration on October 4th and 5th. More information will be provided as available.

I'd like to close with a big thanks to all the [Alumni Board Members](#) and, especially, to Rhawn Denniston (2000) for his service as Board Secretary for the past three years.

We could use your help and here are some ways:

- Volunteer to be a mentor
- Become an Alumni Advisory Board Member; we could benefit from your talents.
- Nominate your favorite colleague to be recognized as an [Iowa Geode Star](#) and/or the [EES Distinguished Alumnus Awardee](#).

Go Hawkeyes!
Lee Phillips, Ph.D. 2004
Chair – EES Alumni Advisory Board



FURF: Fall Undergraduate Research Festival



Sydney Benton

Comparison of Intentionally Planted Species to Observed Population: Survey of Plant Biodiversity at Ashton Prairie Living Laboratory Prairie Restoration

Major: Environmental science

Graduation: Fall 2024

Mentor: Dr. Benjamin Swanson

Krishna Bharadwaj

Scientific illustration of a crocodylidae skull

Major: Geosciences and Biomedical engineering

Graduation: 2027

Mentor: Dr. Christopher Brochu (Earth and Environmental Sciences)

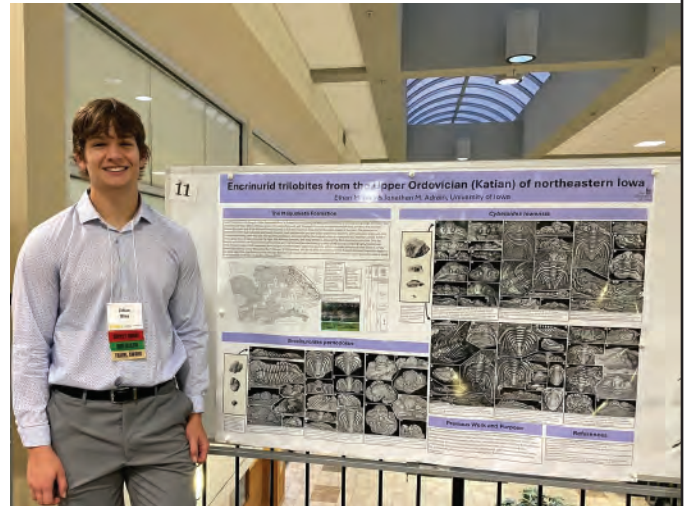
Ethan Bley

Encrinurid trilobites from the Upper Ordovician (Katian) of northeastern Iowa

Major: Geoscience, Environmental Science

Graduation: Summer 24

Mentor: Dr. Jonathan Adrain



Ethan Bley at his poster at the FURF.

Makenna Schinstock

Comparison of Intentionally Planted Species to Observed Population: Survey of Plant Biodiversity at Ashton Prairie Living Laboratory Prairie Restoration

Major: Environmental Science Biosciences

Graduation: Fall 2024

Mentor: Dr. Benjamin Swanson

Science Communications

Dr. Emily Schoening led the "Communication Workshop" on November 8. Participants learned how to describe and explain their research to the public without the use of sciency jargon. They worked on their voice intonation and physical expression to show positiveness and confidence to the audience. The last part of the workshop was designated to build new skills to deescalate situations when member(s) of the audience are responsive in a negative way to the outreach topic. From role playing to find new ways of diverting conflicts, participants learned a lot at the workshop.

Dr. Emily Schoening





Department of Earth & Environmental Sciences
The University of Iowa
115 TROWBRIDGE HALL
IOWA CITY, IA 52242

EARTH & ENVIRONMENTAL SCIENCES

Fall 2023

Anything you would like to see in the newsletter? Please send an email with any suggestions or requests to clas-ees@uiowa.edu!