CALIFORNIA STATE UNIVERSITY
BAKERSFIELD™

Geological Sciences

MESSAGE FROM THE DEPARTMENT

Dear CSUB Geology Friends,

The year has passed quickly, and we are excited to share with you the many stories and updates from all our activities. You may have noticed that we shifted the newsletter release from winter/spring to late summer/early fall. We made this decision to align the newsletter release with the end of the academic year. With this change, we have more time to reflect on the busy academic year and put together a (very packed!) newsletter for you.

Thank you for being a friend and supporter of our students, faculty, and staff. **Enjoy!**

CSUB Department of Geological Sciences

Big skies, big ideas—breathtaking views in Owens Valley fuel our students' curiosity and exploration spirit.

Learning by doing—our students are constantly having hands-on experiences like at Red Rock Canyon State Park.

Beautiful and practical—our students soak in supervolcano scenery as they learn about the science of geothermal energy, from petrology to tectonics to geophysics.

THE GEOLOGY TEAM

In January 2025, we welcomed a new Geology Instructional Support Technician: **Shauna Van Grinsven**. Shauna picked up the job quickly and connected with the faculty, staff, and students here. Welcome to the best department at CSUB, Shauna!

Our Administrative Support Coordinator, **Cecily Rink**, plans department activities, communicates with other units on campus, works with the chair to build schedules, and handles *a lot* of paperwork. On top of that, she is working toward a degree in Geology! We are proud of Cecily and happy to have her on the team!

Our curriculum is constantly being adapted and refreshed to reflect the rapidly changing topics and tools in Earth Science. We could not do this without our excellent part-time instructors: **Lisa Alpert**, **Jason Cotton**, **Robert Crewdson**, **Larry Drennan**, **Scott Frystak**, **Alyssa Kaess**, **Steve Kiouses**, **Pam Knight**, **Nick Moreno**, **Brian Pitts**, **Gregg Wilkerson**, and **John Yu**. We are incredibly grateful for their work in teaching a wide variety of Geology courses.

Finally, our full-time faculty round out the team: **Anna Cruz**, **Adam Guo**, **Matt Herman**, **Chris Krugh**, **Katie O'Sullivan**, **Tony Rathburn**, and **Liaosha Song**. They have been busy with teaching, research, outreach, service, and creating an exciting new environmental science curriculum. You will hear a lot about them throughout the rest of the newsletter!

CSUB Geology Club Photo Contest Winners: (Left) 1st: Yosemite Waterfall by **Brooklyn Macross**. (Top Right) 2nd: Convict Lake by **Elijah Swanson**. (Bottom Right) 3rd: Red Rock Canyon State Park by **Erika Ransom Walker**.

THANK YOU TO OUR DONORS!

We would like to extend our sincere gratitude to the individuals and organizations who have supported the Department of Geological Sciences. Their generous contributions enable us to provide our students with enriching experiences and valuable resources that enhance student learning outcomes and academic success.

We want to send a special thank you to our scholarship donors: the **Church**, **Gonzalez**, **Strange** and **Weddle** families. These scholarships represent an annual commitment to academic excellence and investment in the future of our students. Their support directly impacts the lives of emerging geoscientists and empowers the next generation of leaders.

We are deeply grateful to friend of the department, **Steve Collett**, for his thoughtful in-kind donation of a fossil palm. This beautiful sample is a valuable addition to our teaching and outreach collections, and serves as a centerpiece for visitors to view as part of the improvements to the Science II third floor hallway.

We also send our sincere thanks **Chris Krugh** and **Matt Herman** for their annual contributions to the department. These funds continue to enhance our programs and student opportunities.

If you are interested in donating to the department, please see the information on the last page of this newsletter. We have a number of scholarships, as well as funds for field activities, student research, and general department needs.

Thank you again to all our donors for your support!

DEPARTMENT OF
GEOLOGICAL SCIENCES
CSU BAKERSFIELD

STUDENT SUCCESS

Eder Tavera Inducted into Student Leader Hall of Fame

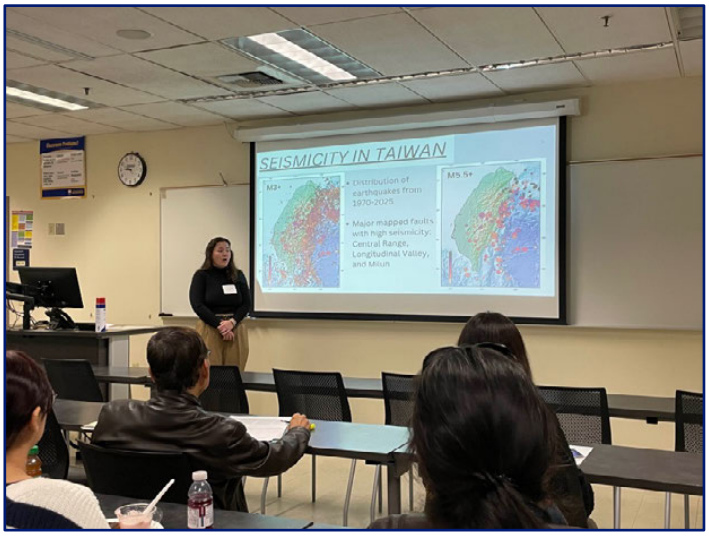
Congratulations to **Eder Tavera** on being inducted into the Student Leader Hall of Fame, CSUB's highest recognition of student leadership. This honor is awarded to no more than 20 students each year to recognize exceptional integrity, leadership, community involvement, campus engagement, and academic achievement. Eder is a war veteran who has been very active in supporting other veteran students at CSUB with the Veterans Success Center and the Veterans Club. Eder's dedication and impact clearly set him apart as an exemplary student leader.

Eder Tavera is honored by **CSUB President Vernon Harper** and **Vice President for Student Affairs Thomas Wallace** at the Student Leader Hall of Fame ceremony.

Geology Students Explain Their Research to Local Community

CSUB Student Research Competition

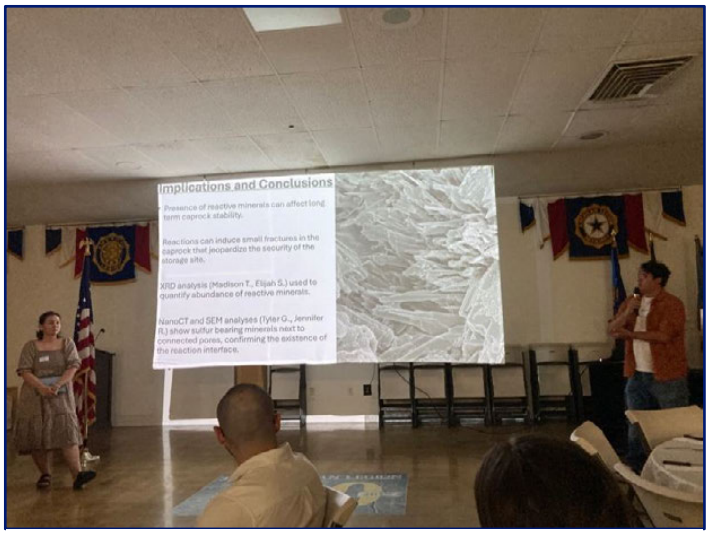
The annual CSUB Student Research Competition (SRC) provides a platform for students to communicate their work to peers, professors, and staff from across the university. In March 2025, two Geology students presented at the SRC in the Physical and Mathematical Sciences session. **Maggie Izumi** discussed her findings about the faulting characteristics of the 2024 Taiwan earthquake sequence. **Brooklyn Macross** talked about her work on mine tailings as a potential sink for atmospheric CO_2. Both students gave excellent presentations and addressed tough, insightful questions from the judges.



Maggie Izumi and **Brooklyn Macross** expertly and confidently explain their research findings at the 2025 CSUB Student Research Competition.

San Joaquin Geological Society Student Night

The San Joaquin Geological Society (SJGS) is the regional organization for Geology professionals and enthusiasts. They hold a monthly dinner talk, with one of the Spring dates reserved as a student night. **Maggie Izumi** and **Tyler Garza** gave a talk at the Spring 2025 SJGS Student Night about their DOE-funded project at Lawrence Berkeley National Laboratory on caprock characterization for carbon and hydrogen storage. Several other CSUB students presented research posters at this event, showcasing their work for the local professional geology community.



Maggie Izumi and **Tyler Garza** take the stage at SJGS Student Night to share their carbon and hydrogen storage research with the local geoscience community.

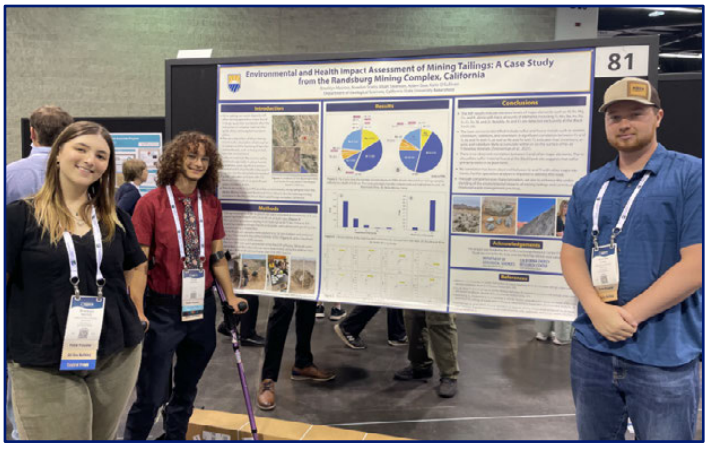
Braedon Scarry presents his research at SGJS Student Night. CSUB Emeritus faculty **Rob Negrini** wore his CSUB Geology Club T-shirt especially for the occasion.

Geology Students Present Research at International Science Meetings

GSA 2024 Annual Meeting

CSUB Geology students and faculty attended the Geological Society of America (GSA) Annual Meeting held in Anaheim, California, in October 2024. **Brooklyn Macross**, **Braedon Scarry**, and **Elijah Swanson** (mentored by **Adam Guo** and **Katie O'Sullivan**) presented their research on using mine tailings to mitigate climate change. Fellow undergraduates **Joshua Barnes** and **Tyler Garza** (mentored by **Tony Rathburn**) presented their field research and internship experiences at sea and at the Smithsonian Institution. Research on using the Monterey shale as a potential caprock for carbon and hydrogen storage was presented by Geology students **Tyler Garza**, **Maggie Izumi**, and **Madison Tarpley**, and CSUB Engineering student **Olivia Arias**. Their project was also discussed in a talk by their faculty mentor, **Liaosha Song**.

Our students also participated in GSA-led field trips. **Madison Tarpley**'s experience took her to a better-known Anaheim destination: Disneyland! The tour of the park was educational and fun. Finally, our students proudly represented the department at the CSUB booth, where they advertised the exciting opportunities going on in our department to the GSA community.



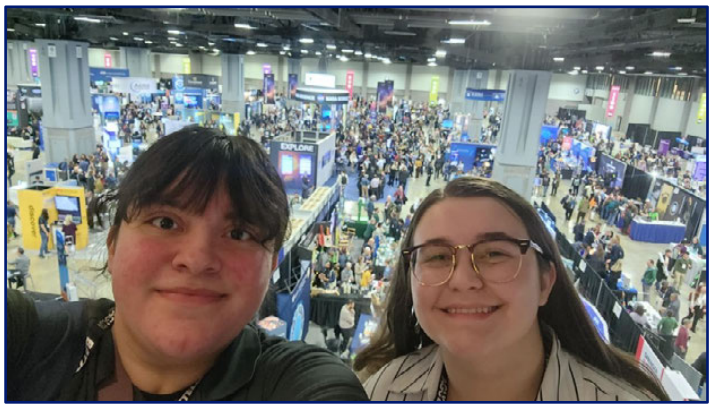
Brooklyn Macross, **Elijah Swanson**, and **Braedon Scarry** present their research on mine tailings in the GSA 2024 Annual Meeting poster session.

Maggie Izumi, **Tyler Garza**, and **Elijah Swanson** engage with GSA 2024 attendees at the department's booth.

AGU 2024 Fall Meeting

In December 2024, CSUB Geology students had the opportunity to present their research at the AGU Fall Meeting in Washington, D.C. This conference is the largest annual gathering of Earth and space scientists, attracting researchers from around the world. Our students rose to the occasion, sharing their findings with a global audience and engaging with scientists and professionals across disciplines. With research presentations, networking opportunities, field trips and more, the conference gave CSUB student geologists the chance to connect and learn more about a wide range of topics in their field.

Geology students **Tyler Garza**, **Maggie Izumi**, **Jennifer Rubalcaba**, and **Madison Tarpley**, and CSUB Engineering student **Olivia Arias** attended the meeting. Tyler, Maggie, Madison, and Olivia presented research from their work at Lawrence



(Right) Big smiles and big science! **Jennifer Rubalcaba** and **Madison Tarpley** at the AGU 2024 Fall Meeting.

Berkeley National Laboratory on various aspects of the characterization of Monterey shale caprock for carbon and hydrogen storage. These projects were done under the mentorship of LBNL scientists and CSUB faculty, including **Liaosha Song** (PI on the project), **Adam Guo**, and **Matt Herman**.

GSA 2025 Cordilleran Section Meeting

Geology students **Garret Cooper** and **Nayeli Cerda** presented their research at the Geological Society of America (GSA) 2025 Cordilleran Section Meeting, held in Sacramento, CA. Their research, conducted in the CSUB Geochemistry Laboratory under the supervision of **Anna Cruz**, explored land-sea interactions by examining variations in sediment input linked to hydroclimate shifts over the past 11,000 years. Their work reflects a strong dedication to climate science and coastal and marine geochemistry.

Garrett Cooper and **Nayeli Cerda** explain the oceans at the GSA 2025 Cordilleran Section Meeting.

Braedon Scarry and Maggie Izumi Receive NSME Awards

In Spring 2025, two of our students were awarded at the College of Natural Sciences, Mathematics and Engineering Honors Recognition Ceremony. **Braedon Scarry** was named the Outstanding Undergraduate of Geology for his academic achievements, including his high GPA, research

Tyler Garza and **Maggie Izumi** energetically share their research at the AGU 2024 Fall Meeting.

participation with **Adam Guo**, **Katie O'Sullivan**, and **Matt Herman**, and commitment to the Geology Club and Veterans Success Center. **Maggie Izumi** received the Outstanding Undergraduate — Published Paper Award for her peer-reviewed conference presentation at the 2024 American Geophysical Union Fall Meeting titled "Characterization of Rock Properties for Geologic Storage of H2 and CO2 Using Electromagnetic Methods". She worked on this project at Lawrence Livermore National Laboratory with expert mentors there, and was co-advised by **Liaosha Song** and **Matt Herman** at CSUB. Congratulations, Braedon and Maggie!

The 2025 NSME student awardees smile for their photo op, including our own **Braedon Scarry** (back row, second from the right) and **Maggie Izumi** (front row, on the right).

FACULTY SCHOLARSHIP

Grants & Funding

New Grants

We had another successful year in acquiring new funds! These awards drive cutting-edge research and provide hands-on opportunities for our students to engage in meaningful scientific work alongside faculty and collaborators.

Tony Rathburn, in partnership with **Matt Herman**, received a grant from the California Air Resources Board (CARB) to develop a protocol for documenting carbon capture and storage (CCS) projects across California. This initiative will involve students, such as **Brooklyn Macross**, in field-based research and data collection related to air pollution and emissions monitoring.

Matt Herman also received funding from the Statewide California Earthquake Center (SCEC) in a collaborative project with Dr. Kevin Furlong (Penn State). They will develop a new 3-D model of plate boundary deformation along the San Andreas from the Bay Area to northern California. This research will advance understanding of seismic hazards in the region.

Anna Cruz received an internal grant from the CSUB Office of Research, Scholarship, and Creative Activity and the Research Council of the University to support her research ocean dynamics in southern California. This funding will support her students' hands-on research, where they will develop laboratory skills—sample preparation, data analysis, and other techniques—and use the advanced Inductively Coupled Plasma Mass Spectrometer for trace element analysis.

Chris Krugh once again received a CSUB Instructionally Related Activities grant to fund department activities and field trips that are essential to the quality education offered by our program. These experiences provide valuable hands-on learning and are an important instructional component for all students enrolled in our program.

Continuing Grants

A Department of Energy Reaching a New Energy Sciences Workforce grant continues to support student research on hydrogen storage led by **Liaosha Song** (PI), with co-PIs **Adam Guo**, **Matt Herman**, and **Tony Rathburn**. This program funds summer research placements at Lawrence Berkeley National Laboratory and supports student presentations at national conferences like the GSA Annual Meeting and the AGU Fall Meeting.

In March 2024, **Adam Guo** and **Katie O'Sullivan**, together with CSUB Engineering faculty **Luis Cabrales** and **Zhongzhe Liu**, received a National Science Foundation Instrumentation and Facilities Program grant to acquire an advanced X-Ray Fluorescence system. The instrument was successfully installed in Spring 2025 and is now fully operational, enhancing research and teaching capabilities across multiple disciplines.

Adam Guo and **Katie O'Sullivan's** newly acquired XRF instrument sits proudly as the next state-of-the-art piece of equipment in our research and teaching arsenal.

A technician came to train everyone (including **Jennifer Rubalcaba, Ryan Tengelsen, Garrett Cooper**, and **Shauna Van Grinsven**) on the new XRF.

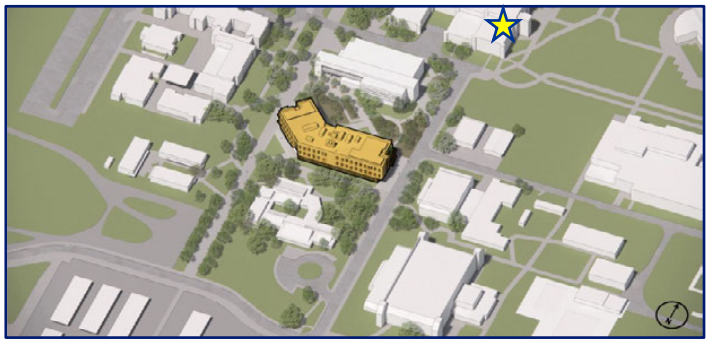
The National Science Foundation Marine Geology & Geophysics grant awarded to **Tony Rathburn** and collaborators at Woods Hole Oceanographic Institution and the University of Delaware launched its first year of fieldwork. Following extensive preparation, the research team, including several CSUB students (**Garrett Cooper**, **Ryan Tengelsen**, **Trace Hicks**, and **Joshua Barnes**) joined the R/V Roger Revelle this summer to collect porewater and sediment samples. Their project aims to refine our understanding of deep ocean circulation and its role in past climate variability. Of course, travel, adventure, and foraminiferal research are also on the agenda! The blog for the trip can be found at SEALS 2025 website.

Tony Rathburn (holding the trip's mascot, Frankie the seal) with CSUB students, former students, and colleagues from other institutions on a Summer 2025 research trip to the Labrador Sea and Arctic Ocean.

CSUB GEOLOGY ON & OFF CAMPUS

Breaking Ground on the Energy Innovation Building

Ground-breaking for the construction of the new Energy Innovation Building (EIB) on campus is anticipated for Fall 2025. Funding for the building was made possible largely through a 2022-2023 State budget allocation of $83 million by Governor Gavin Newsom and the State Legislature. The building will be located just south of the Science III building on campus.



Planned location of the new Energy Innovation Building (yellow). The star shows the current location of the Department of Geological Sciences in Science II.

The NSME EIB Committee met with architects and other planners throughout the year to provide input on the layout and design of EIB labs and offices. The EIB Committee consisted of NSME Dean **Jane Dong** and professors, including CSUB Geology faculty **Liaosha Song** and **Tony Rathburn**, who provided essential input on the design of new California Energy Research Center lab spaces. The CSUB Board of Trustees has now approved the design; the building will have a 240-seat multipurpose room, four adaptable CERC laboratories, and numerous offices. Although the Department of Geological Sciences will not have dedicated offices or labs in this building, we will be working closely with the new CERC Director. We expect to make collaborative use of the CERC labs in the EIB for energy-related research projects. For more information on the project, check out this Campus News story from Jennifer Self!

Department Upgrades

Our new support technician, **Shauna Van Grinsven**, has been working hard with **Cecily Rink** and a host of student workers to organize, clean up, and enhance the department. The third floor Science II classrooms (rooms 353 and 355) look much better now, with new furniture, new sample cases (that either hold or replace the various knickknacks that were stacked along the edges of the rooms), and fresh coats of paint. Room 336 is now ready as a multi-purpose research, teaching, and outreach space, with many of our cool teaching tools poised for action in there, including the stream table, augmented reality sandbox, an army

The renovated room 336 is ready to be a classroom again. With its new removable top, the stream table is pulling double-duty as a classroom table.

A new fossil palm tree—cut, polished, and donated by **Steve Collett**—is the centerpiece of the welcoming Science II third floor entrance area.

of microscopes, teaching globes, and—of course—more sample cases!

The CREST lab (room 343) has a new conference table, new chairs, and—finally—space for **Matt Herman's** Geodynamics Lab. A new projector system is also scheduled to be installed soon. The computer lab (room 348) is getting brand new PC and Mac computers. The Student Tutoring Center (room 345) is getting a refresh, with new pictures taken by student photo contest winners and a deep clean! Downstairs, the room housing the old and new scanning electron microscopes is being renovated and getting new furniture.

We are gradually improving the appearance of the Science II third floor hallway. Monitors near the office and classrooms show off the people in the department, opportunities for students, and upcoming events. A new palm fossil donated by department friend **Steve Collett**, the department logo, new display lights, and kiosk posters welcome visitors to the department! Display updates are also in progress throughout Science II. **Shauna Van Grinsven** and **Bill Whitaker** fixed the flashing LED lights in the first-floor earthquake display. We also received NSME lottery funds requested by **Matt Herman** to update this unique display to show real-time feeds of global ground motion and seismicity, as well as have a working seismometer where passersby can make their own earthquakes!

Behind the scenes, **Shauna Van Grinsven** has also been documenting our geological equipment, teaching supplies, and field gear, creating an inventory and organizing everything so we absent-minded professors can find stuff when we need it!

CSUB Geologists Visit the Field

Owens Valley (November 2024)

The culminating department field trip of the Fall 2024 semester was to Owens Valley, California's less well-known known plate boundary. **Chris Krugh** and **Katie O'Sullivan** led the trip, bringing

Bob Crewdson, **Katie O'Sullivan**, and **Chris Krugh** describe the origins of sedimentary rocks at Red Rock Canyon State Park during the 2024 Owens Valley trip.

their Physical Geology and Mineralogy & Petrology classes along. **Bob Crewdson** and **Matt Herman** went along for the ride to provide geophysical and tectonic perspectives, as well as comic relief.

Participants braved chilly temperatures to see the cliffs of Red Rock Canyon State Park, the surface rupture of the 1872 earthquake, drive up the Bishop Tuff, touch the frigid waters of Convict Lake, stare down into the Inyo Craters, feel the warm ground next to a geothermal plant, gaze across Mono Lake, and hang out in Fossil Falls. Every night, we returned to White Mountain Research Center to enjoy a home-cooked meal and recharge for the next day of adventures!

Chris Krugh and **Katie O'Sullivan** wax poetic about the igneous and metamorphic rocks of the Sierra Nevada uplifted behind the glacial valley of Convict Lake.

Bob Crewdson shows geothermal resources to a frozen group of students, with **Katie O'Sullivan** holding **Matt Herman's** back-of-the-envelope heat flow calculations in an attempt to feel warm.

Seismic Refraction Survey (March 2025)

Geophysics can be challenging and frustrating, so **Matt Herman** likes to give his students opportunities to release their anger physically. Students got the opportunity to slam the ground with a sledgehammer to generate seismic waves that would allow them to image the subsurface of CSUB. **Nick Brooks** from SensorEra visited to provide professional expertise and seismic instruments, while his colleagues in Texas processed the data in real-time for us. Students got first-hand experience with geophysical survey setup and data collection and were able to pick the brain of an expert in field geophysics.

Nick Brooks from SensorEra explains seismic refraction survey theory and advanced seismic sensing equipment to **Matt Herman's** Geophysics class.

Ernst Quarries/Sharktooth Hill (April 2025)

As part of his Historical Geology course, **Tony Rathburn** took students to Ernst Quarries and Sharktooth Hill near Hart Memorial Park along the Kern River. They spent most of the day digging through Miocene sediments in search of vertebrate fossils. In addition to prized shark teeth, they found whale and other marine mammal bones, stingray teeth, and turtle bones.

Poleta Folds (May 2025)

The Senior Field Seminar course taught by **Chris Krugh** and **Katie O'Sullivan** is the final preparation for students before their intensive field camp

Students go fossil hunting on the Spring 2025 Historical Geology field trip. No dinosaurs found this time...

experience. The course always includes a major field trip to various places where students can practice their mineral and rock identification, apply stratigraphic and structural knowledge in the field, and create maps with accompanying cross-sections. This year, the class went to Poleta Folds near Bishop, CA. Lucky to get beautiful weather, the students successfully mapped, well, folds!

Katie O'Sullivan asks Senior Field Seminar students to investigate the Poleta Folds rocks closely.

Senior Field Seminar students take copious notes and make careful sketches of the Poleta Folds region.

COMMUNITY ENGAGEMENT

Department Seminars

The Department of Geological Sciences and the California Energy Research Center continue to co-host the CRC Energy Transition Lecture Series. An impressive group of speakers came to campus to provide information and insights about a wide range of Earth Science topics and applications.

In Fall 2024, **Bill Bartling**, Director of Regulatory Affairs at Geo2Watts and former Chief Deputy for CalGem (formerly the Division of Oil, Gas, and

Bill Bartling talks about repurposing idle wells in the CRC Energy Transition Lecture Series.

Geothermal Resources), gave a talk to a packed audience about a method to repurpose idle wells. The basic concept is to use clean energy to heat up materials stored in the wells, then use that excess heat energy to generate electricity when it is needed. Bill's fascinating talk was featured in a *Bakersfield Californian* story.

The second Fall semester talk was given by **Jared Kluesner**, Research Geophysicist at the U.S. Geological Survey Pacific Coastal and Marine Science Center in Santa Cruz, CA. His popular presentation focused on the structure, fluid dynamics, and potential slope failure hazards in the Santa Barbara Basin, using state-of-the-art 3-D seismic reflection imaging technology. Jared is **Tony Rathburn's** former student, and he graciously answered student questions about his career pathway, from discovering his love of geology to becoming a professional geophysicist.

Jared Kluesner of the USGS talks about 3-D seismic imaging of seafloor dynamics off the coast of California.

The first speaker of Spring 2025 was **Sarah Saltzer**, Managing Director of the Stanford Center for Carbon Storage at Stanford University. Sarah gave a talk about carbon capture and storage project evolution. The presentation first discussed the need for different approaches towards carbon mitigation, then turned towards the future, highlighting new trends and research initiatives that are changing with the energy landscape.

The second talk of the Spring semester was also the keynote speech at the 2025 CERC Carbon Symposium. **Steve Bohlen**, Senior Director for the Office of Government and External Affairs at Lawrence Livermore National Laboratory, gave a presentation on the urgent need for active carbon management, focusing on how the various scientific, technological, and logistical challenges in fact present opportunities for the future. His talk provided an important historical perspective on the science of climate change, an overview of the current energy transition challenges, and how these issues are being tackled by a combination of organizations, policy-makers, and communities. It was an exciting finale to the CRC Energy Transition Lecture Series and opening to the CERC Carbon Symposium!

The Department of Geological Sciences speaker series also continued, with **Josh Goodwin**, Senior Registrar for Geology and Geophysics at the California Board for Professional Engineers, Land Surveyors, and Geologists. He came to the department to talk about the ins and outs of obtaining a Geologist-In-Training (GIT) certification. Josh spoke to students and community members about how to build a competitive resume, how to prepare for the challenging GIT exam, and the advantages of becoming a California-Licensed Professional Geologist.

Josh Goodwin gives practical tips to those interested in becoming a licensed Professional Geologist.

We look forward to seeing you all at next year's seminars! We plan to have more exciting CRC Lecture Series and Department of Geological Sciences Seminar Series presentations. Stay tuned for announcements, and keep an eye out for the schedule posted on our website.

2025 Community Preparedness Event

The Department of Geological Sciences partnered with the Kern County Office of Emergency Services again in 2025 to host the Community Preparedness Event. Emergency service representatives came to CSUB from around Kern County. Through family-friendly exhibits and hands-on activities, attendees of all ages learned about different emergencies, from natural disasters to industrial hazards, to accidents, and how to prepare for them. **Chris Krugh**, **Matt Herman,** and **Tony Rathburn** were the main organizers from the CSUB side. **Matt Herman** was interviewed on KGET, advertising the interactive exhibits and activities, and especially the geologic hazards that would be explained there.

Over 33 organizations participated, including the Fire Safe Council, Edwards Air Force Base, Central California Animal Disaster Team, the Buena Vista Museum of Natural History and Science, the Kern County Mineral Society, Kern County Environmental Health, among many others. First responders came with their vehicles and gear, including a helicopter

NSME Dean Jane Dong (who is always prepared) visits the Geology booths and fearlessly poses with a vicious velociraptor, played by **Alex Nusbaum**.

that flew in and landed near the other booths. Safe-T-Proof's Quake Cottage provided attendees with the opportunity to safely experience the shaking of a magnitude 8 earthquake (**Matt Herman** requests to add that the Quake Cottage simulates Intensity VIII shaking). Nourishment was provided by food trucks. Attendees were also treated to music provided by KUZZ on site.

The **CSUB Geology Club** set up and operated the ever-popular augmented reality sandbox and the stream table, and showcased rock and mineral displays, "fossil"-making activities, and a "create your own earthquake" activity. The Geology Club

Shauna Van Grinsven shows future geologists the finer points of erosion on the stream table.

Elijah Swanson shows young visitors the educational fun of the augmented reality sandbox.

also brought their velociraptor that walked around and provided photo opportunities for those brave enough to pose with the toothy dinosaur. Other CSUB participants included the Department of Nursing, University Police Department, the Department of Chemistry and Biochemistry, and Safety and Risk Management. For more about the event, check out these links!

Lights, Camera, Action! Geology Acts Out for NSME Promotional Video

The College of Natural Sciences, Mathematics and Engineering is creating a promotional video including each department, so we were visited by professional videographers this spring. Students and faculty became movie stars for a day, showcasing classrooms, research facilities, and outdoor lab activities. We will be available to sign autographs when the video comes out in the fall!

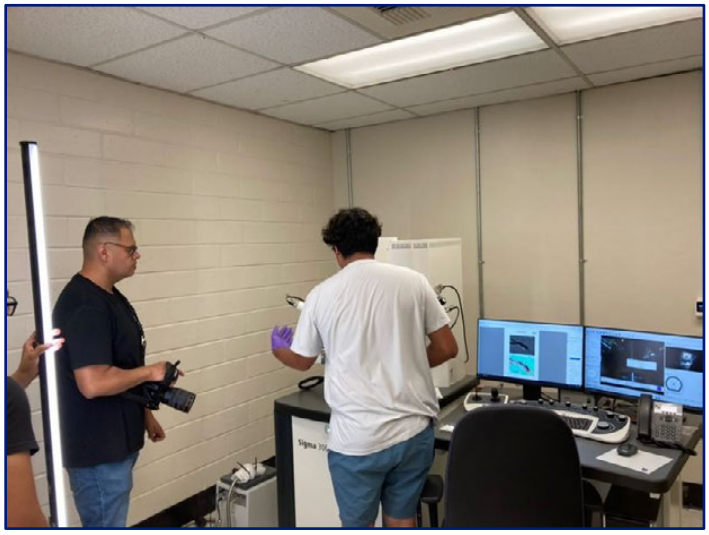
CSUB Geology in the News

While on sabbatical in Tasmania during the 2023-2024 academic year, **Tony Rathburn** gave several research talks, public outreach talks, and live ABC radio interviews about his research on life in Earth's oceans.

Tony Rathburn talks about his journeys to the ocean and the discoveries made there to an Australia audience.

In October 2024, **Matt Herman** appeared on *Do the Math*, an interactive program that airs twice weekly on the Kern Educational Television Network. He discussed earthquake science and highlighted the role math plays in studying earthquakes. The program offered a great opportunity to spark interest in geoscience and STEM education.

The lightsaber illuminates **Maggie Izumi**, **Elijah Swanson**, **Ryan Tengelsen**, and **Alex Nusbaum** as they act like diligent petrologists for the NSME promotional video.



Tyler Garza demonstrates the capabilities of our new scanning electron microscope to the NSME promotional videography team.

Matt Herman uses hand gestures to explain the math of earthquakes on *Do The Math*, just like he does in his Geophysics class

Adam Guo gave the December 2024 San Joaquin Geological Society Dinner Talk about the impact of wildfire severity on soil properties, focusing on the 2016 Erskine fire. In June 2025, **Matt Herman** gave the SJGS Dinner Talk about the tectonic evolution of the northern San Andreas plate boundary.

Matt Herman also got to be interviewed by local media about earthquakes several times: he talked to Valley Public Radio about the August 2024 Kern County earthquake, KGET about the December 2024 Cape Mendocino earthquake, KBAK about the April 2025 San Diego earthquake, and KBAK again about a small earthquake near Grapevine in May 2025.

Tony Rathburn and **Matt Herman** gave presentations about geology degrees and careers at the Stonecreek Junior High School career fair in March 2025. The students were excited to hear about the opportunities for getting paid to make a difference in their communities, apply science and technology, and travel the world.

Tony Rathburn with an eager student after giving presentations at the 2025 Stonecreek Junior High School Career Fair.

Matt Herman was also invited in March 2025 to give the keynote presentation at the *Spectacular World of Science* hosted by the Buena Vista Museum. His talk on earthquakes in California kept the crowd of kids and their parents engaged!

The SJGS audience had burning questions for **Adam Guo** after his talk on the impacts of the 2016 Erskine fire.

In April 2025, Geology lecturer **Bob Crewdson** was invited to give a talk and serve as a panelist for a Kegley Institute of Ethics panel and brown bag discussion about groundwater and sustainability. Bob's presentation was eye-opening for many, and prompted several questions from the audience.

Bob Crewdson talks to a standing-room-only crowd about groundwater and Kern River water budgets.

CALIFORNIA ENERGY RESEARCH CENTER

2025 CERC Symposium

The 2025 CERC Carbon Management & Energy Innovation Symposium, held in April 2025, was the fourth annual CERC Symposium at CSUB on the future of energy and mitigating climate change. The symposium featured over 20 international speakers and panelists from government, industry,

and academia. Topics included hydrogen ecosystem development and infrastructure, repurposing idle wells, carbon sequestration, economic impacts of the energy transition, CA Senate Bill 905, induced seismicity, monitoring CO_2 containment, and caprock properties.

The event was made possible by donors and many dedicated people from CSUB and the community. The Department of Geological Sciences in particular played a big role in its preparation and execution. In addition to talks and panels, the symposium featured student research posters and booths including CSUB Geology and the augmented reality sandbox. The booth and sandbox were staffed by the CSUB Geology Club, who also helped with the sign-in booth and distributing microphones for audience questions. **Tony Rathburn** sat on the CERC Symposium Organization Committee and **Cecily Rink** was instrumental in the logistics of the event. **Shauna Van Grinsven** also helped with setup and operations. **Matt Herman** emceed the symposium, keeping everything flowing smoothly (it turns out people will do what you tell them if you threaten to withhold lunch!). **Liaosha Song** gave a talk about his research on caprock properties and **Tony Rathburn** conducted an interview with **Natalie Lee**, Assistant Chief of the Industrial Strategies Division of the California Air Resources Board.

The symposium fostered lively conversations about energy-relevant issues, helped forge new collaborations, and generated new information about the future of energy in California. To learn more about the 2025 CERC Symposium (including recordings of the presentations) and previous events, check out the CERC Symposium website!

The department's table dazzles at the 2025 CERC Symposium, where **Garrett Cooper** introduces the augmented reality sandbox to attendees.

Liaosha Song gives a talk on his research about caprock properties for hydrogen storage at the 2025 CERC Symposium.

Emcee **Matt Herman** keeps things moving along at the 2025 CERC Symposium.

New CERC Director

After an intensive search by the hiring committee, including our own **Tony Rathburn**, CERC will have a new, permanent director. Replacing long-time interim director, **Tony Rathburn** (yes, he was happy to find his replacement), **Katy Larson** will be the new CERC Director. She has over a decade of experience in the energy industry, including in carbon sequestration, oil and gas, gas storage, water, hydropower, and infrastructure. Most exciting to us: Katy has a BS and MS in Geology! Welcome to CSUB, Katy!

CALIFORNIA WELL SAMPLE REPOSITORY

In Memoriam: Charles James

The January 2025 passing of **Charles James**, the beloved Curator of the California Well Sample Repository (CWSR), has left us with a profound sense of loss. Charles worked in the petroleum industry for much of his adult life, and after retiring from Aera, he became the CWSR Curator in May 2011. He was insistent when it came to proper handling and processing of cores, cuttings, and data. Charles was instrumental in a great many core-based projects conducted by industry, government, and academia, and he provided hands-on learning opportunities for many CSUB students. Charles was very dedicated to the CWSR and its mission, and he significantly improved the repository's ability to serve the community.

Charles ran a popular volunteering program for CSUB 60+ Club members to contribute to the Repository. As a result of his efforts and engaging personality, there was a waitlist of eager volunteers ready to assist in organizing and indexing samples, well reports, and well logs. He cultivated a sense of belonging and camaraderie by organizing potlucks for the volunteers and students, creating a vibrant and supportive atmosphere that fostered community and teamwork. Charles was also a dedicated mentor to student assistants at the repository, generously sharing his extensive expertise gained from his career in the petroleum industry. Geology student assistants that worked with him stayed connected with Charles long after graduation—a testament to the profound and lasting influence he had on their lives and careers.

Most of all, Charles will be remembered for his warmth, kindness, and infectious positivity. Whether greeting visitors with a smile or filling a room with laughter, he had an unparalleled ability to brighten every space he entered. His cheerful presence, humor, and enthusiasm made working with him a sincere pleasure.

Charles is deeply missed by all who knew him. His legacy of mentorship, dedication, hard work, and joy continue to inspire us all.

Charles James (in blue) tells entertaining stories to students, volunteers, and visitors at the CWSR.

Charles James and **Larry Knauer** stand in front of the CWSR on campus.

Charles James (in grey CSUB hoodie) with CSUB 60+ Club volunteers and geology student assistants.

The Future of the California Well Sample Repository

The passing of beloved California Well Sample Repository curator, **Charles James,** created a gap in services. **Tony Rathburn**, **Liaosha Song**, **Andrea Weikel** from the College of Arts and Humanities, and NSME Dean **Jane Dong** were fortunate to hire **Rochelle Howard** as the new Curator of the CWSR. Rochelle was mentored by Charles and has over 30 years of experience curating core samples for major petroleum companies. She already has the CWSR running smoothly and open for business!

Rochelle Howard is the new curator at the California Well Sample Repository.

We are excited about obtaining a new container full of well data and samples from Long Beach. The container was acquired with help from **Rick Behl** at CSU Long Beach and funding from Berry Petroleum Company, the California Geological Survey, the Pacific Section of the American Association of Petroleum Geologists, and the San Joaquin Geological Society.

The CWSR is the only facility in California providing permanent storage and public use of cores, sidewall samples, drill cuttings, outcrop samples, foundation borings, and minerals, along with associated data. The collection, started in 1975, is housed in two 6,000 square-foot buildings on campus. More space is desperately needed to accommodate new samples, as the CWSR is at capacity! With more samples becoming available (including the samples from Long Beach), this is a critical time to invest in the CWSR so that these unique core and well-sample data can be saved; if they are lost, they can never be recovered!

A concrete pad is poured next to the CWSR for a new container full of well data and samples from Long Beach.

In April 2025, California's Lieutenant Governor, **Eleni Kounalakis**, toured the CSUB campus and visited the CWSR. **Tony Rathburn** talked about the CWSR with the Lieutenant Governor and Executive Officer **Dr. Matthew Dumlao**, before presenting her with a core cutting as a souvenir. Governor **Gavin Newsom's** support of the new Energy Innovation Building and the Lieutenant Governor's interest in the CWSR are very much appreciated!

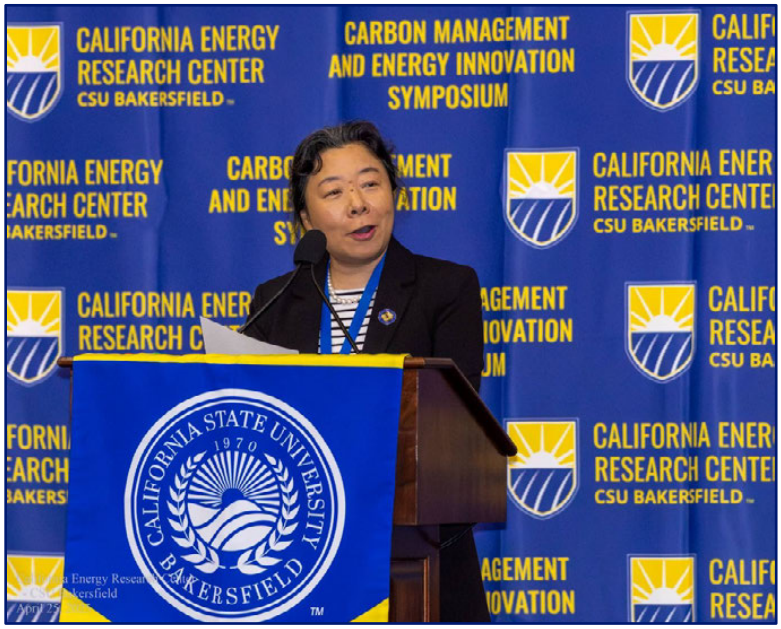
Tony Rathburn shows **CA Lieutenant Governor Eleni Kounalakis** core samples during her April 2025 visit to the California Well Sample Repository.

MESSAGE FROM THE DEAN

July 1, 2025 marks my three-year anniversary at California State University, Bakersfield—and what an incredible journey it has been. It has been a great pleasure to get to know and work closely with faculty and staff in Geology, a great department that stands out not only for its academic excellence and great student outcomes but also for the critical role it plays in advancing knowledge and serving the needs of our region. I am so impressed by our Geology faculty who worked hard to bring state-of-art instruments through grants to enhance student learning; who served as ambassadors to broaden participation in science and engage the public (like offering guest talks at the Bakersfield Natural History Museum, hosting local youth through Roadrunner Science Fridays, and conducting TV interviews); and who has mentored students in research and supported their professional growth. You are making a long-lasting impact on generations of students and on the local community -and you are part of the exciting momentum building across NSME.

In recent years, NSME has made significant strides, including the advancement of the California Energy Research Center (CERC). With the support of a generous $2.5 million endowment from our industry partner, we have successfully recruited a permanent director, **Dr. Katy Larson**, who will join us on July 21, 2025. We're excited to welcome her leadership and vision as we continue to grow CERC.

Here I want to express my deepest appreciation to **Dr. Tony Rathburn**, who has served with distinction as Interim Director of CERC for the past several years. Tony's dedication, advocacy, and leadership have been instrumental in expanding CERC's reach and reputation. His commitment has laid a strong foundation for future success, and I am truly grateful for all he has done.



Dean Jane Dong addresses the audience at the 2025 Carbon Management and Energy Innovation Symposium.

Another exciting development on the horizon is the Energy Innovation Building, slated for completion in 2027. It will become the permanent home of CERC and will offer modern spaces that foster interdisciplinary research, collaboration among our faculty, and partnerships with national labs and local industry. It will be a hub of innovation and discovery, designed to tackle some of the most pressing energy and environmental challenges of our time.

While it is a challenging time with a lot of uncertainty, I still see endless possibilities ahead, especially with the strength of our team and the momentum we've built. Look forward to continued growth, deeper impact, and shared success in the years to come.

Dr. Jianyu (Jane) Dong
Dean of the College of Natural Sciences, Mathematics and Engineering

GEOLOGY CLUB

The Geology Club at CSUB wrapped up another incredible year, thanks to our members, supporters, and the faculty and staff in the Geology department. We continued our tradition of educational field trips. One of the highlights was a scenic hike at Wind Wolves Preserve, where we explored local geology firsthand while enjoying the natural beauty of the area. Everyone shared their own scientific knowledge with the group, so we all went home having learned something new!

The Geology Club poses at Wind Wolves Preserve.

We also helped at the Emergency Preparedness Fair, raising awareness about geological hazards and disaster readiness in our community. Club members took future paleontologists digging for fossils and making clay casts. We ran the stream table for visitors to build dams and rivers to mitigate flash floods. And we used the augmented-reality sandbox to demonstrate how the landscape affects flooding. Club volunteers arrived early to set up the booth, equipment, and activities, then stayed late to pack everything back up and return it the department!

The club went to Future 'Runner Day at CSUB, introducing prospective students to the exciting world of geology through interactive displays and discussions. We also hosted and visited elementary schools in Bakersfield, inspiring young students with hands-on geology demonstrations and sparking early interest in the earth sciences. These outreach efforts have been central to our club's mission of promoting earth science education and community engagement.

Madison Tarpley, **Ryan Tengelsen**, and **Abdullah Masri** demonstrate the stream table to future scientists.

This year marked the return of the club's photo contest; **Brooklyn Macross** took 1st, **Elijah Swanson** earned 2nd, and **Erika Ransom Walker** received 3rd. We also welcomed **Shauna Van Grinsven** to the department and held a club meeting to talk about field preparedness with her.

Finally, we hosted the 15th Annual Geology Club BBQ, which saw a record-breaking turnout and featured food and fun for students, alumni, and faculty. Every year, we host this event for past members, geologists, friends, and family to reconnect. Local businesses donate items to for our raffle and this year was the largest selection yet. The club raised enough for future field trips, and everyone had a great time!

We look forward to building on this momentum in the year to come. Join us on Instagram or Discord to hear about all our exciting activities!

Everyone enjoys food and friends at the Geology Club BBQ!

FACULTY & STAFF NEWS

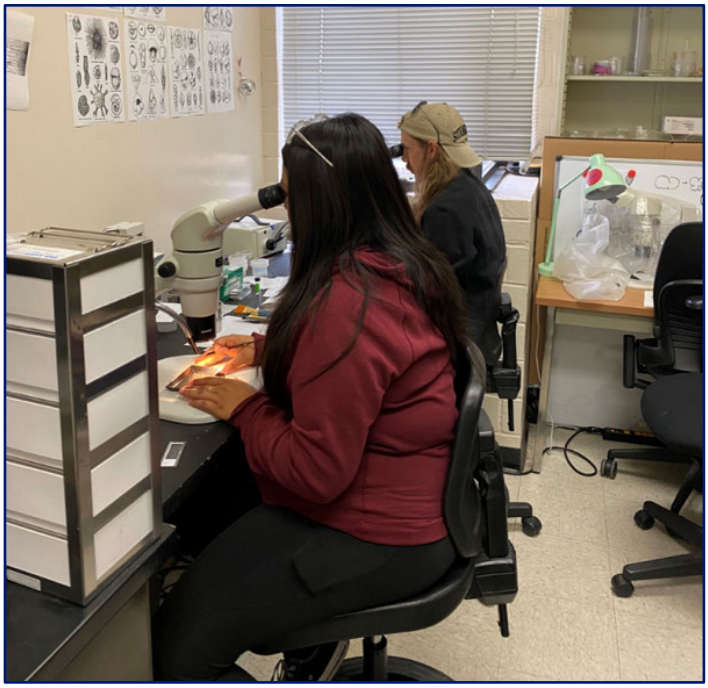
Anna Cruz

This past academic year was a busy and fulfilling one, full of exciting developments in both teaching and research. I had the opportunity to teach several courses, including Geochemistry, California Geology and Society, and Applied Geochemistry. Although these aren't new courses for me, each iteration brings fresh challenges and new opportunities for learning and engagement with students.

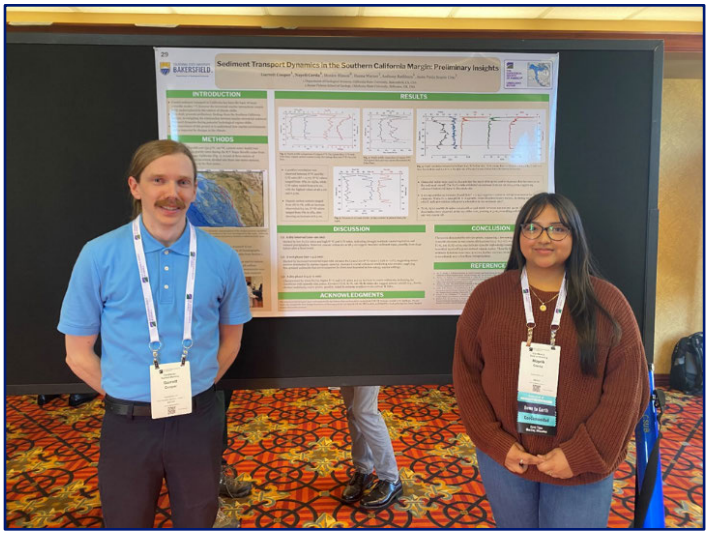
Trace Hicks and **Braedon Scarry** collect water samples with **Shauna Van Grinsven** for Applied Geochemistry.

On the research side, I traveled to Scripps Institution of Oceanography in San Diego to collect sediment cores from offshore the California margin. These cores will help us investigate thermocline dynamics and variations in sediment transport associated with past hydroclimate shifts. Two undergraduate students, **Garret Cooper** and **Nayeli Cerda**, are actively involved in this project. They presented our preliminary findings at the 2025 GSA Cordilleran Section Meeting in Sacramento, CA, where their poster explored land-sea interactions by examining sediment input variability in response to climate change. This is an ongoing project, and we look forward to collecting additional data this summer to support future conference presentations and publications.

In 2024, I also co-authored a paper published in *Marine Micropaleontology* in collaboration with colleagues from the Federal Fluminense University in Brazil. The study used benthic foraminifera to reconstruct paleo-redox conditions in a microbial dolomitic lake in southern Brazil.



Nayeli Cerda and **Garrett Cooper** examine samples in the Micropaleontology Lab.



(Right) **Garrett Cooper** and **Nayeli Cerda** present their research at the GSA 2025 Cordilleran Section Meeting.

On a personal note, my family and I had the chance to travel to Brazil over the winter break. We spent two wonderful weeks reconnecting with family, celebrating Christmas together, and enjoying a few relaxing days at the beach in Arraial do Cabo—known for its white-sand beaches and crystal-clear waters, often called the "Brazilian Caribbean." Benjamin was especially fascinated by the waves!

Adam Guo

It's been a busy and fulfilling year across teaching, research, and service. I taught Sedimentation and Stratigraphy, California Geology, and How the Earth Works, and I also created a new course—Introduction to Soil Science—to help expand our department's offerings. I always enjoy leading the annual field trip for the sedimentation class, as it gives students valuable hands-on experience. In research, a new X-ray Fluorescence instrument acquired through NSF funding was successfully installed and is now in use following training sessions. I continued to mentor students on projects related to energy and the environment, including CO_2 storage in mine tailings and the environmental impact of tailings waste. It was great to see undergraduate students present their research at the GSA Annual Meeting in Anaheim last fall. They worked hard and represented the program well. Outside of teaching and research, I stayed involved on campus through committee service. I served on the NSME Strategic Planning Committee and the NSME Equipment Committee.

From classroom to field—students learn hands-on field sampling methods under **Adam Guo's** expert guidance.

Things are going well at home. Yan and the kids are doing fine. Yushan had a good year and won one gold, one silver, and one bronze medal in three of the ten subjects at the county Academic Decathlon. Belinda finished junior high and is getting ready to start high school. Looking back, I'm thankful for all that 2024 brought. I'm excited for the year ahead—to keep connecting with students, making progress in research, and facing new challenges both at work and at home.

Learning by doing—XRF training brings students and faculty together at the forefront of geochemical analysis.

Matt Herman

As I scanned through my computer searching for the things I wanted to tell you about from this last year, I realized a whole lot happened in my life and career! I apologize, dear reader, for the length. I guess someone has to vie with the department chair as the wordiest.

I was very scientifically productive last year! My peer-reviewed chapter for an AGU Geophysical Monograph on earthquakes in the Shumagin Islands (Alaska) was finally published. This project led to invitations to the Seismological Society of America Annual Meeting in Anchorage, AK, in April 2024, a subduction zone workshop organized by the U.S. Geological Survey in Seattle, WA, in January 2025, and most recently to the Japan Geoscience Union Meeting in Chiba, Japan, in May 2025. [I got to check "Visiting Japan" off my bucket list!] After the deadly earthquake in Myanmar in March 2025, I worked with colleagues at the USGS and other institutions to develop a dynamic geonarrative of the tectonics of the region and the details of the earthquake.

Because I am the local earthquake expert and—I like to think—a great media personality, I also got to give several interviews and public talks about earthquake science. I discussed earthquakes on Valley Public Radio, KGET, and KBAK (maybe you saw me on TV!). I went on the Kern Education Television Network show *Do The Math* to talk about the math involved in studying earthquakes. And I was the keynote speaker at the Spring 2025 Buena Vista Museum of Natural History and Science Spectacular World of Science. Whenever there is an opportunity to talk to the public about earthquakes, I drop everything I am doing so I can educate people and show everyone how cool the work we are doing at CSUB is!

A behind-the-scenes look at **Matt Herman's** interview about the 2024 Cape Mendocino earthquake.

The most attentive audience member at **Matt Herman's** talk at the Buena Vista Museum Spectacular World of Science is the girl with pigtail braids: **Evie Herman**!

Students working on research with me also continue to make great progress. **Maggie Izumi** received scholarships from the Geological Society of America and the CSUB NSME Career Pathways Research Program for her work on the 2024 Taiwan earthquake. She presented this work at the CSUB Student Research Competition. Maggie also attended the Geological Society of America Annual Meeting in Anaheim, CA, and the American Geophysical Union Fall Meeting in Washington, DC, to present results from her research at Lawrence Berkeley National Laboratory (which I co-advise from CSUB) on characterizing reservoir and caprock electrical properties. She is continuing the work this summer, and learning Matlab to model and interpret the results. **Braedon Scarry** took a crash course in geodynamic modeling and graphics, culminating in exploring one of my previous deformation models of southeast Asia. He also started work on developing a 2-D deformation model for the northern San Andreas plate boundary system. Braedon has applied to become a Masters student in Fall 2025, and will hopefully be continuing these efforts. **Jeremiah Hanna** also began his geodynamics journey with earthquake modeling and graphics tools. He took a slightly

different path, focusing on the great 1906 San Francisco earthquake. Finally, I started working with **Lucila Iraheta**, an undergraduate at Chico State, who looked at historical patterns of seismicity in southeast Asia and specifically on the Sagaing fault in Myanmar.

Of course, doing science without money is challenging, so I am always looking to obtain funds for myself, my students, and my lab. In Fall 2024, **Tony Rathburn** asked me if I wanted to collaborate on an opportunity with the California Air Resources Board to track carbon capture and storage projects in California. In Spring 2025, we were awarded a $188,582 contract to work with CSUB students, including **Brooklyn Macross**, on this project over the next 18 months. **Kevin Furlong** at Penn State and I were awarded $25,000 from the Statewide California Earthquake Center to develop a new 3-D model of plate boundary deformation along the San Andreas from the Bay Area to northern California.

I also try to keep myself involved in the broader research community. I am a member of the SZ4D Modeling Collaboratory for Subduction and I became the designated institutional representative for CSUB as we become a Participating Institution of the Statewide California Earthquake Center.

I continue to work towards making my courses as engaging and exciting as possible. I now have 72 (!!!) students at a time in my Natural Disasters course, which means I need help with the labs! **Alyssa Kaess** did an amazing job leading a lab section in Spring 2025, learning the style of my exercises and teaching on the fly as I maneuvered the course to cover current events. In Spring 2025, Geophysics students got to measure minute (~0.0005%) changes in gravity as they climbed the stairwell in Science II; they used high-end GNSS receivers obtained by **Chris Krugh** to locate themselves within about a centimeter on campus; they worked with **Bob Crewdson** to measure the electrical conductivity of near-surface rocks in the big field along Stockdale Highway; and they got to work with **Nick Brooks** from SensorEra (who provides seismic imaging technology and expertise for CRC) to generate a seismic image of the subsurface near the library with sledgehammers. I also got to teach a course on Advanced Topics in Tectonics to **Maggie Izumi** and **Tyler Garza** in Fall 2024, which prepared them well for success in Geophysics in Spring 2025.

Geophysics students **Dyanna**, **Sal**, **Brooklyn**, **Elyssa**, and **Eli** precisely locate themselves on campus.

Nick Brooks from SensorEra shows Geophysics students **Jose Z.**, **Braedon**, **Javier**, **Tyler**, **Maggie**, **Alyssa**, **Dyanna**, **Eder**, and **Sal** real-time results from their seismic imaging survey.

I also had several fun opportunities to teach outside of CSUB. I co-taught a short course with **Kevin Furlong** from Penn State and **Kirsty McKenzie** from James Madison University at the Geological Society of America 2024 Annual Meeting in Anaheim, CA, on constraining mountain building processes from temperature-related data. One of the most attentive students was CSUB Geology's

own **Chris Krugh**! I also co-organized a field trip to the central San Andreas plate boundary for the San Joaquin Geological Society with CSUB lecturer **Gregg Wilkerson**, CSUB alum **Kari Hochstatter**, and **Mike Ponek**. We went to Coalinga, Parkfield, Wallace Creek, and the McCittrick oil seeps. I was thrilled to finally see these sites, and the trip led to my presentation at the June 2025 SJGS Dinner Talk about the building of the San Andreas plate boundary. I have really enjoyed being more involved with SJGS, and I am excited for excellent SJGS field trips in the future!

2025 SJGS Field Trip attendees stand on the San Andreas Fault at Wallace Creek.

I did a lot of random stuff at CSUB too: I gave a talk at an NSME workshop on how to enhance student engagement; I took over as the CSUB Geology Club faculty advisor; I joined the CSUB Academic Affairs Committee and the Faculty Advisory Committee for Research, Scholarship, and Creative Activity; I co-organized the 2025 Community Preparedness Event with **Tony Rathburn**, **Chris Krugh**, and the Kern County Office of Emergency Services; I was the emcee at the 2025 CERC Carbon Management and Energy Innovation Symposium; I have been working with **Anna Cruz**, **Chris Krugh**, and **Tony Rathburn** to build a new Environmental Science degree program (coming soon!); and **Chris Krugh** and I have been rebuilding the department website.

I think I have the best job in the world and would do all these activities anyways, but it is nice to be recognized for my efforts. In the spring I received the CSUB Promising New Faculty Award. And even more exciting, in June 2025 I learned that I would be receiving tenure and promotion to Associate Professor a whole year early!

Most importantly, my family continues to be amazing. Kate's accomplishments in education and teacher training make mine pale in comparison. Evie is four and three quarters, as she likes to tell every single person she meets (which is why we have not told her about social security numbers yet). Keeping up with her is a challenge since she is so bright! And Lou just turned two, so he learns everything Evie can teach him! Evie and Lou love visiting the department and in general make my life much happier (if much more hectic and occasionally disease-filled). I am so excited that they are budding scientists. They love solving problems, using tools and technology, and especially looking at rocks!

Whew! I kept this to only three pages!

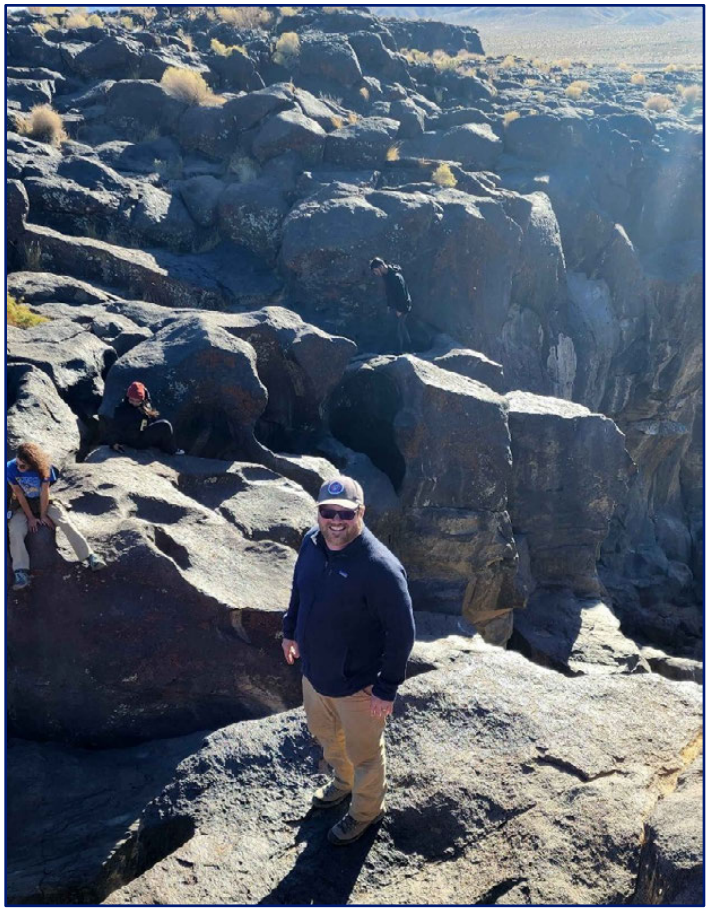
The **Herman family** enjoys the Paleozoic/Mesozoic sedimentary rocks and Mesozoic/Cenozoic thick-skinned tectonics of Red Rocks Amphitheatre in Colorado. Everyone loves the Geology lesson!

Chris Krugh

Last year was another busy one… After my "relaxing" year as interim department chair, I dove right back into teaching with two sections of GEOL 2010 Physical Geology in Fall 2024. Hard to imagine that it was my first time teaching this course at CSUB! It was a good group of students, and I hope that I was able to convince some of them (mostly engineering majors) to realize the error of their ways and become geology majors. The GEOL 2010/GEOL 3000 field trip to the Owens Valley and the White Mountain Research Center hopefully helped in this regard. **Dr. Crewdson**, **Dr. Herman**, **Dr. O'Sullivan**, and I took turns geologizing at the many world-class field trip stops along the Owens Valley (see additional pictures and text elsewhere in this newsletter). In Fall 2024, I also taught GEOL 3070 Structural Geology with a field trip to Rainbow Basin where we collected detailed structural data of faults and fractures in the Basin and Range / Eastern California Shear Zone. I was quite pleased to see a faint glimmer of recognition on student's faces when a Mohr Diagram showed up in a department seminar given by a visiting scientist during Spring Semester.

During Winter Break I traveled to Brazil (along with **Dr. Cruz** and our son Benjamin) to spend time with family, eat fantastic food, and experience southern hemisphere summer in the tropics. We had a great time and were able to spend a few days at Arraial do Cabo - Prainha (little beach) over New Years and even went to a concert by Menos é Mais. In Spring 2025, I co-taught senior field seminar with **Dr. O'Sullivan**. The activities of this course included several map interpretation projects and field trips to Lake Isabella and Poleta Folds. On the outreach side of things, I once again helped to organize the CSUB Emergency Preparedness Event in co-operation with the Kern County Office of Emergency Services. This year's event was the largest and most successful one yet! I also attended a career fair at Cesar E. Chavez High School in Delano and tried to interest some of the students into becoming geology majors at CSUB.

Dr. Krugh and **Dr. Cruz** enjoy a giant pastel during a family trip to Brazil—though their son (Benjamin) clearly had his eye (and hands!) on the prize!



Dr. Krugh and students explore the stunning volcanic landscape of Fossil Falls during a field trip to Owens Valley.

This year, the department was allocated funding as part of a multi-year U.S. Department of Education grant awarded to CSUB (PI **Dr. Charles Lam**, Mathematics) for the enhancement of STEM education. This grant, along with some additional

department and donor funding, allowed us to update facilities and equipment that is available for CSUB student use during coursework and research projects with faculty. On the sample preparation and analysis side of things, we purchased a 10" Covington trim saw, a Buehler SimpliVac for making epoxy mounts under vacuum, and a Buehler PetroThin cutoff saw/grinder to aid in making thin sections. The department also purchased a Leica C5 camera and high-definition monitor to allow for the display and documentation of images collected using one of our Leica DM750P petrographic microscopes. The department was also able to acquire a suite of modern survey equipment that will be particularly useful in my teaching and research activities with students. We obtained two survey-grade Leica GS18 GPS/GNSS receivers for collecting real-time kinematic GPS/GNSS data, a Leica TS10 total station, and a senseFly eBee X fixed-wing drone for making digital elevation models of Earth's surface using Structure from Motion photogrammetry. With this survey gear, we will be able to make digital surface models and digital terrain models that can be used to quantify landscape changes that may be due to tectonics (e.g., fault scarps, knickpoints, etc...) and/or surface processes (e.g., erosion, deposition, etc...). High resolution images collected by the drone can also be used to aid in mapping bedrock fracture networks, fault scarps, and debris flow lobes on alluvial fans. I am looking forward to getting out into the field with this equipment and putting students to work.

Dr. Krugh and Benjamin pose in front of a search and rescue vehicle at the Emergency Preparedness event.

Katie O'Sullivan

This past year started off with teaching field camp for Sac State again. This time, the class was offered to CSUB students and with no tuition fee! Seniors **Ryan Tengelsen**, **Alyssa Montejo**, **Dyanna Oregon**, **Abdullah Masri**, and **Leonardo Menchaca** were brave enough to sign up for the 4-week class that took place in Eastern California. We mapped a few different types of geology, including the Cambrian Poleta formation in Poleta Folds and the Quaternary Tahoe glacial deposits near June Lake. This was my third year teaching the class and I learn something new each time I map an area. I look forward to teaching field camp again this coming summer.

In the Fall I attended the GSA annual meeting in Anaheim, complete with a geological tour of Disneyland. Who knew there could be so much science in fake rock! At the meeting, undergraduates **Brooklyn Macross**, **Braedon Scarry**, and **Elijah Swanson** presented two posters on their research led by myself and **Dr. Guo**.

Fall ended with a department trip to Owens Valley, where the Earth Materials class joined the Physical Geology class in a tour of the Mammoth area. **Dr.**

Earth Materials students stand with **Dr. O'Sullivan** on one of the youngest volcanoes in California.

Crewdson and **Dr. Herman** joined in on the fun as well. Students got to see and feel (the heat!) of an active volcano, as well as the very old rock that forms the Sierra. In the Spring semester, **Dr. Krugh** and I led the Senior Seminar students in mapping trips to Lake Isabella and the Poleta Folds.

As part of the regional GSA meeting in Sacramento in April I was able to attend a professional field trip to the Sutter Buttes. The Sutter Buttes have been on my geology bucket list ever since I chose it for my class project in **Dr. Negrini's** geophysics class at CSUB in 2006. The field trip included VIP access to outcrops on private land and was a highlight of my geology year for sure.

Dr. Crewdson explains how a volcano could grow taller than himself.

Dr. Krugh ponders whether he is sitting on a granite or a tonalite on the Lake Isabella field trip.

Ryan Tengelsen, **Madison Tarpley**, and **Dr. O'Sullivan** pose in front of the fake rocks of Disneyland.

Dr. O'Sullivan enjoying the geology of Sutter Buttes with trip leader **Dr. Brian Hausback**.

No rock hammers allowed...who ever heard of such a thing?

Next year I'll be creating a geology-themed YouTube channel as my sabbatical project. Stay tuned for more details!

Tony Rathburn

For me, this was a year of transition back to the department from my year-long sabbatical leave. I resumed my roles as Department Chair, interim Director of the California Research Center, and Co-director of the California Well Sample Repository. My job as chair and my other roles would be impossible without the teamwork, dedication, and support from everyone, including **Cecily**, **Shauna**, **Chris**, **Adam**, **Liaosha**, **Katie**, **Matt**, **Anna**, **Alyssa**, **Jason**, **Larry**, **Pam**, **Bob C.**, **Brian**, **Bill**, **Maria**, and **Andrea W.**

The second half of my sabbatical in Tasmania (Spring 2024) was as exciting as the first half. My sabbatical combined research with community outreach and professional development forged in an immersive, collaborative academic environment located in the Institute of Marine and Antarctic Studies (IMAS) at the University of Tasmania (UTAS), Australia.

As an Adjunct Senior Research Scientist at IMAS, I worked with scientists and students on the uptake of trace element contaminants by benthic foraminifera living in the Derwent Estuary. The main goals of the project were to conduct original, impactful marine and environmental research to expand collaborations, explore biogeochemical applications, and lead to publications and proposals. Professional development goals included learning about educational techniques used by instructors at IMAS. As a result of my

One of the many interesting geological features on Maria Island, a Tasmanian nature reserve, where **Tony** helped teach a week-long field course.

A mother wombat and her baby at the beach on Maria Island where **Tony** helped teach a University of Tasmania field research course.

teaching interests and expertise, I was invited to help teach field research to students in a week-long UTAS marine biology course ("A Practical Introduction to Temperate Marine Biology") that was conducted on an island wildlife reserve. I was also invited to help teach a week-long, international marine science course (IODP Master Class) at University of Queensland (UQ) and Queensland Institute of Technology (Brisbane, Australia), and was able to exchange field teaching strategies with UQ and QIT instructors. Working with IMAS research scientists, including mentoring IMAS undergraduates, graduate students, and post-docs, enabled me to inform them about research and educational opportunities at CSUB, including Geology's new Environmental Science program (coming soon). Giving another live ABC radio interview and another free-to-the-public community presentation (to a total of over 300 in-person attendees) in the second half of my sabbatical enabled me to convey my science to a wide international audience. My sabbatical has led to new collaborations with scientists from three universities in Australia, and Cambridge University and the University of Southampton in the United Kingdom, as well as the opportunity to talk about the work at the NSME Teacher-Scholar Lecture Series at CSUB.

Since the last newsletter, I co-authored three research papers in international journals and four published conference abstracts (AGU and GSA meetings). One research paper was written in collaboration with an international group of scientists (Hoogakker et al., 2024, *Quaternary Science Reviews*). This paper reviewed state-of-the-art knowledge about the isotopic geochemistry of foraminifera and applications for paleoceanography. It was rewarding to work with such a prestigious group of scientists from around the world (United Kingdom, Germany, Japan, and the Netherlands). I also published a paper with two former students and international authors (Germany and Australia) that focused on samples collected off the coasts of Australia (Burkett et al., 2025, *Micropaleontology*). Finally, I co-authored a

Trace Hicks and **Ryan Tengelsen** pack research gear for the Labrador Sea/Arctic Ocean research voyage.

paper reviewing morphological aspects of benthic foraminifera (Corliss et al., 2025, *Diversity*).

At CSUB in the 2024/25 academic year, I taught Research Methods (graduate level), a GE course entitled "Dinosaurs: Paleoecology, Evolution and Extinction", and Historical Geology. In addition to the public talks that I gave in Australia, my CSUB-based community engagement activities included helping to organize the Emergency Preparedness Event on campus and the CRC Energy Transition Lecture Series. As part of my final year of duties as interim Director of the California Energy Research Center (CERC), I was on the search committee for a new director and was the Chair of the organizing committee for the Annual CERC Symposium.

My currently active collaborative grants include: a 2023-2026 NSF award co-funded by Marine Geology & Geophysics and Chemical Oceanography (Co-PI with Sophie Hines at Woods Hole Oceanographic Institution and Chandranath Basak at University of Delaware), titled *Collaborative Research: A porewater perspective on benthic sources of neodymium to the North Atlantic*. My budget on the project is $349,919; a 2023-2026 Department of Energy award (Co-PI with **Liaosha Song**, **Matt Herman**, and **Adam Guo** from CSUB Geology, **Tat Acharya** from Engineering, and **Benjamin Gilbert**, **Harrison Lisabeth**, **Yuxin Wu**, **Abdullah Cihan**, **Colette Flood**, and **Laleh Cote** from Lawrence Berkeley National Laboratory), with a total budget

of $1,687,500; and 2022-2025 California Bioenergy award as PI, titled *California Energy Research Center Student Research Opportunities*, with a budget of $36,000. This year, **Matt Herman** and I are starting a new project through a contract with the California Air Resources Board (CARB) that involves students creating a carbon capture and storage project database. The project, titled *Developing protocols to track carbon capture, utilization, and storage projects in California*, has a budget of $188,582.

Tony Rathburn on the research vessel, *Roger Revelle*, conducting seafloor research in the Labrador Sea and Arctic Ocean at sunset.

As I write this, I am on a research vessel in the Labrador Sea. I will be at sea for a month with research colleagues and CSUB students as part of my collaborative NSF-funded project whose focus is to look at the geochemistry and microfauna of seafloor sediments. Three of my previous students (one graduate student and two professors) are also onboard. Most of the scientific party on the vessel will focus on geochemical aspects of the water and sediments for applications in paleoceanography. The focus of the CSUB group will be to collect seafloor sediments to examine living and fossil seafloor-dwelling foraminifera (single-celled organisms that have an internal "shell" that can be preserved as a microfossil). We will be at sea for a month, and end the cruise in Iceland, where we plan to spend a few days admiring the geology. I will hopefully have lots of interesting results and observations to report in the next newsletter.

Cecily Rink

As another year in the department comes to a close, I'm amazed at how quickly time has flown. It still feels like I just arrived! It has been a rewarding year filled with growth, collaboration, and exciting opportunities.

We are thrilled to welcome **Shauna** to the Geology Department. Her dedication and enthusiasm have already made a noticeable impact, and we're fortunate to have her on our team.

On a personal note, I'm proud to share that I've officially become a Geology student. Completing my first year has been both challenging and inspiring (I got to hold a piece of the moon!!), and I'm eager to continue learning in the 2025–2026 academic year—especially through upcoming field trips and hands-on experiences.

This year, I had the pleasure of once again participating in the CERC Symposium and supporting the Emergency Preparedness Event. These events highlight the strength of our community, and I'm grateful to all the students and volunteers who make them possible.

Outside of academics, I ran my first 5K in January at Disneyland and Disney's California Adventure.

Touching the Moon—**Cecily's** experience is out of this world!

While my time wasn't record-breaking, the experience-especially exploring behind-the-scenes areas of the parks-was unforgettable. I even ran in costume with a colleague and one of our students, **Madison Tarpley**. I'm now training for another 5K over Labor Day weekend and couldn't be more excited.

Here's to another fantastic year!

Magic miles! **Cecily** and friends take on their first 5K at the Happiest Place on Earth.

Liaosha Song

Last year was full of exciting progress in my research on geologic hydrogen storage. My work focuses on caprock integrity, a critical factor in ensuring that hydrogen remains securely stored underground over long periods. With major support from the U.S. Department of Energy, I've been investigating how hydrogen interacts with minerals under subsurface conditions.

During my recent sabbatical at Lawrence Berkeley National Lab (LBNL), I ran experiments on how hydrogen reacts with brine and minerals. It was an amazing experience, and last summer, I brought four CSUB undergraduate students with me to LBNL for research internships. They did great work

Big day ahead! **Cecily** on her way to her very first day of school.

that resulted in several conference abstracts. I've also shared our research at GSA and AGU conferences and was honored to be invited to speak at the CSUB CERC Carbon Management & Energy Innovation Symposium.

CAL-EPIC team visits the Advanced Light Source in June 2024: **Harrison Lisabeth**, **Arun Bhattacharjee**, **Liaosha Song**, and CSUB students **Olivia Arias**, **Tyler Garza**, **Madison Tarpley**, and **Maggie Izumi**.

Liaosha Song presents CAL-EPIC research at GSA 2024.

Liaosha Song with the other presenters in the GSA 2024 session on Synchrotron X-ray and Neutron Applications.

This work helped launch the CAL-EPIC program, which I created to give our students long-term research mentorship, summer internships at national labs, and hands-on experience with top-notch scientific tools. The program also led to the creation of a new General Education course on sustainable energy and environment.

Outside of teaching and research, I direct the California Well Sample Repository, the biggest archive cores, cuttings, and well documents in California. It is a vital geological resource hub for researchers, industry partners, policy makers and students. Sponsored by Berry Petroleum, Pacific Section AAPG, and California Geological Survey, the facility recently underwent significant upgrades to support expanded storage capabilities. This year, the repository will welcome a large shipment of well samples from the Los Angeles Basin Subsurface Data Center at CSU Long Beach. These samples will enhance regional research on sedimentary basins and subsurface energy storage.

Shauna Van Grinsven

Hello there! There has been a sighting of a new face wandering the halls with pockets full of tools or on trips chasing after lizards, snakes, or other herpetofauna. My name is **Shauna Van Grinsven** and I am the new Geology Instructional Support Technician (IST)! I started working in the department this January, but I already feel so welcomed by faculty, staff, and students. Originally, I studied Biology with emphasis on conservation, ecology and the environment, but I am dedicated to learning everything I can about Geology. Luckily, there is a large overlap between the two disciplines, and I feel like I'm catching on quickly. I know that I still have much to learn, but I am grateful to work with such amazing people.

I've been working hard to help with community event days like the Emergency Preparedness Day, Future Runner Day, and the CERC Energy Innovation Symposium as well as the renovations and installation of new things around the department. I am looking forward to what this upcoming year has in store for the Geology Department and students!

On display: **Shauna Van Grinsven** immerses herself in the desert geology display.

Rob Negrini (Emeritus)

Rob Negrini, emeritus professor and CSUB Faculty Hall of Famer, co-authored a 2025 paper in *Quaternary International* with **Rachel Tiner**, one of his last MS students. The paper focuses on alluvial fan deposition downstream of the lakes they studied in the Andes. The paper discusses a pulse of alluvial sedimentation that supported Rachel's conclusion that the 8.2 ka event leaked into the southern hemisphere as predicted earlier by a climate model. Their well-cited 2018 paper was also based on Rachel's MS thesis. Rob led the CREST grant that supported the research in both articles

STUDENT AWARDS

San Joaquin Geological Society Scholarship

SJGS raises funds throughout the year in large part to support local students. They provide generous scholarships to geology majors, many of whom use the funds to attend field camp, a requirement of the BS in Geology at CSUB.

SJGS Scholarship Winners ($1,000 each)

Garret Cooper
Tyler Garza
Maggie Izumi
Henry Sanchez
Braedon Scarry
Elijah Swanson
Madison Tarpley
Eder Tavera

Society of Exploration Geophysicists Pacific Coast Section Outstanding CSUB Geology Major

The PCS-SEG award recognizes an outstanding geology major, which typically goes toward their summer field camp. The award demonstrates the commitment from PCS-SEG to encourage the educational development of high-performing students in the Department of Geological Sciences.

PCS-SEG Award Winner ($500)

Eder Tavera

Kern County Mineral Society Field Camp Award

KCMS was established in 1935 by individuals who shared a common interest in collecting, displaying, and sharing their knowledge of rocks and minerals. Their award to CSUB geology students reflects the interest of KCMS in helping young people pursue careers in geology.

KCMS Award Winner ($1,500)

Garret Cooper

Garrett Cooper receives the KCMS Award. **James May,** President of KCMS; **Garrett**; **David Schaad**, KCMS Scholarship Committee Chair; and **Tony Rathburn**.

The 2025 SJGS Scholarship winners from CSUB (**Elijah**, **Garrett**, **Tyler**, **Maggie**, **Braedon**, **Henry**, **Eder**, and **Madison**) are recognized at SJGS Student Night.

Department Awards

The Department of Geological Sciences honors students with merit-based awards established through the generosity of donors with ties to CSUB and the local community. Students are selected for these awards by the department faculty.

Herman W. Weddle Scholarship

This scholarship was established by James Weddle in honor of his father, Herman, a geologist with Standard Oil Company, to support CSUB students majoring in geology. Awards are given to geology majors who work on well core or well samples and/or make use of the California Well Sample Repository.

Weddle Scholarship Winners ($758.75 each)

Garrett Cooper
Tayler Garza
Maggie Izumi
Brooklyn Macross

H. Victor and Virginia C. Church Scholarship

This scholarship was established in honor of Dr. H. Victor Church, a geologist and founding member of the Well Sample Repository at CSUB, and his wife Virginia C. Church, a former teacher, to support CSUB students majoring in Geology.

Church Scholarship Winner ($1,475)

Braedon Scarry

C.E. Strange Scholarship

This scholarship was established by Mr. C. E. Strange, a local geologist, who wanted to provide financial assistance to undergraduate students majoring in Earth Science.

Strange Scholarship Winners ($953.57 each)

Garrett Cooper
Tayler Garza
Maggie Izumi
Henry Sanchez
Madison Tarpley
Eder Tavera
Braedon Scarry

Sam Gonzalez Memorial Scholarship

The family of Sam Gonzalez and friends funded this scholarship to honor their son and friend by supporting geology majors in pursuit of an undergraduate degree and a career in the field of geology.

Gonzalez Scholarship Winner ($1,081)

Eder Tavera

2025 GRADUATES

Congratulations to our 2025 graduates! We are excited to see what you will do next!

Bachelor of Science in Geology

Angel Cardoso
Eder Tavera
Madison Tarpley
Ryan Tengelsen
Braedon Scarry

Master of Science in Geology

Elizabeth Duginski

Eder Tavera, **Braedon Scarry**, **Ryan Tengelsen**, **Angel Cardoso**, and **Madison Tarpley** dress for success at Spring 2025 Graduation.

DONATIONS TO THE DEPARTMENT

We are committed to preparing students to become successful, contributing members of the community. In addition to requiring field camp for the BS in Geology degree, the department offers outreach activities, field experiences, and other educational initiatives to recruit students and enhance student learning. These programs and the students involved in them depend on your support.

Please consider donating—every dollar makes a difference! As a result of budget cuts and changes in priorities, many geology departments across the country have lowered their standards, removed expensive field activities, and reduced experiential learning and skill development in their programs. Please support the department that is working hard to give our students the integrative, high-quality education they need to be successful geologists.

Donations allow us to maintain our high-quality curriculum and enrich student experiences beyond what state funding alone can provide. You can help students with their field camp expenses (thousands of out-of-pocket dollars not covered by CSUB tuition), donate to an established scholarship, start your own annual scholarship, or specify what you want donated funds to the department to be used for.

You can also visit the NSME Giving site; just make sure to select "Geology Department" from the menu titled "I want to support" specifying that your donation will come to us!

If you have questions, please reach out to **Tony Rathburn** at arathburn@csub.edu.

Thank you for your support!

Name (if you wish to be identified):

_____

Affiliation (if applicable):

_____

Address:

_____

_____

City, State, ZIP Code:

_____

Email:

_____

Amount to donate:

$20 $50 $100 $500 $1,000

Other:_____

Fund to support:

☐ **Specific Scholarship** (please indicate the name from the list earlier in this newsletter)

_____

☐ **General Scholarship Funds** (to be added to the C.E. Strange Scholarship Fund)

☐ **Field Activities** (to be added to the Claude Fiddler Field Endowment)

☐ **Undergraduate Student Research**

☐ **Unrestricted (**to support needs identified by the Department of Geological Sciences)

☐ **Other**

_____

Return to the address below:

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