PC Basement

THE COLORADO COLLEGE GEOLOGY DEPARTMENT

2024-2025

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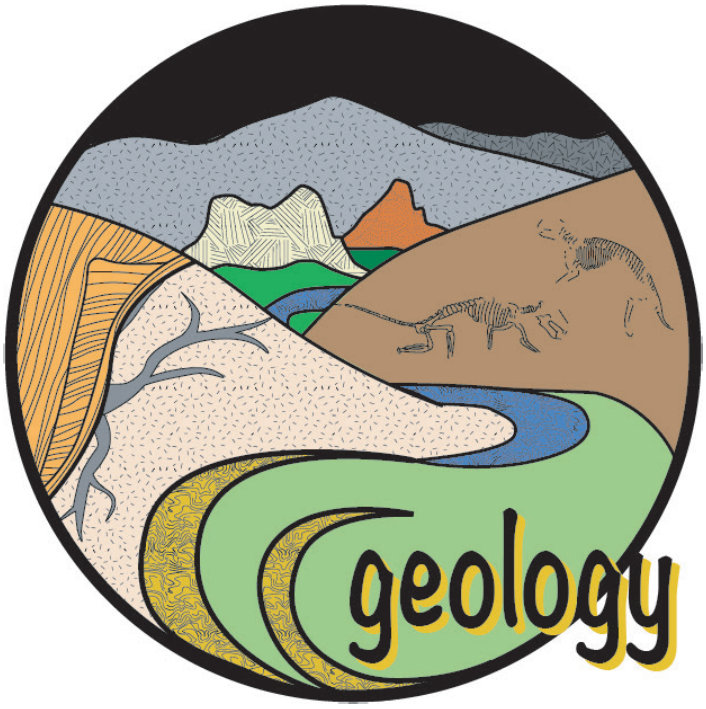
Cover Photo:
GY335 with Henry Fricke at
Cañon City Eco-Park, CO

Taken by:
Katya Nicolayevsky



Colorado College Geology Department Logo designed by Professor Sarah Schanz.

The Precambrian Basement
2024-2025

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Tava Peak and garden of the Gods from Mesa Road Overlook by Lars Leber

Land Acknowledgement

The Geology Department acknowledges that our educational programs are carried out in the homelands of the Ute and other Native peoples and rely on networks of travel paths developed by these peoples. We also acknowledge that Colorado College and our department were founded upon practices of resource extraction and land appropriation that dishonored and diminished the traditional lifeways in this region. These practices displaced indigenous populations, and degraded landscapes, and led to unequal distribution of wealth, health, and opportunity in the Rocky Mountain West. Yet the Ute and Native populations are living people with a present and a future as well as a past, and we strive to learn from their knowledge of Earth systems to create a more inclusive field of study while seeking to redress the exclusions and erasures they have endured.

Anti-racism Commitment

We commit to learning, listening, and working to become an antiracist department and program, in order to offer a welcoming place of study and home department for students of all backgrounds and identities. We acknowledge that a culture of racism often works unconsciously in our thoughts, actions, and words (Hill, 2008), and that without an active awareness of racism we as educators and learners may inflict harm. We recognize that the compositional diversity of the U.S. population as a whole is not represented among students and professionals in STEM fields, a disparity that is even more pronounced in the geological sciences. Addressing this limitation will strengthen the Earth Sciences.

Within the CC Geology Department, we are working to: 1) be engaged and actively aware of racism both in academia and everyday life, 2) counter racist expressions and behavior, and 3) take collective action to change, transform, or augment department policies, practices, and policies to be inclusive and equitable.

Cited work: Hill, Jane H. 2008. The Everyday Language of White Racism. Malden, MA: Wiley-Blackwell.

Greetings from the Geology Department!!

It has been a great year in the department, and we have lots of good news to share. Everyone is going full bore! Here are some of the highlights. First, we congratulate Michelle Gevedon on a successful completion of her third-year review. She is on sabbatical this fall and working all-out on her research program. She also resubmitted a proposal to the National Science Foundation (NSF) for a research-grade field emission scanning electron microscope. This $1.1+ million instrumentation grant has faculty co-investigators from several other Natural Science departments on campus, and the first submission had great reviews with very high ratings, so we all have our fingers crossed. Second, Sarah Schanz is up for tenure this year and we expect there to be no problems, given her stellar record for the last six years. Christine, Henry and I are all working away on projects and are continuing to teach the courses that we love. Christine is back to work full time after her sabbatical going great guns on various research projects, and Henry is working on the mysteries of Dinosaur diets, among many other things.

Another piece of news is that I have decided to retire at the end of this school year, and the Dean has given the go-ahead to hire my replacement. Interviews will take place this winter and hopefully my replacement will be in place and be ready to teach Block I next school year. I look forward to seeing who the department hires and will wish them the very best as they will be joining a great group of colleagues.

As most of you know, we initiated a fund-raising campaign to help with the purchase of a new suite of microscopes, both for students and for research. The last time that the department purchased student microscopes was back in the 1980s and those have reached the end of their life. We were tremendously gratified with the response we had to our request. Many alumni donated money, from small gifts to large gifts up to ~$15K. The larger gifts included those from the Hightower Fund, Steve Weiss ('78), Jamie King ('68), and Jack Wold ('75). Given the cost of microscopes these days, we were still far from what we needed, and we thought that we would be buying them piecemeal for a while into the future. However, the Witter Family came to the rescue with a remarkably generous gift of $300k to cover everything we needed. Words can scarcely express our enormous gratitude to the Witter Family, and all the other donors, for helping us completely modernize our petrographic microscopes and allow students to learn on up-to-date technology. It was heartwarming to see so many names of alumni from the department on our list of donors.

Our department could not operate without our visitors and support staff. For the third consecutive year, Tyler Grambling has been a full-time visiting faculty member. We wish him the best in the future and hope to see him gainfully employed in his academic dream job. Technical Director Elizabeth Erickson continues her makeover of our facilities and is providing help in many facets of our operation. We are grateful for all she does, which is a lot!

We are happy to report that Eric Leonard visits his office in the department with regularity, which means we get to talk science and hear about his life in retirement, and it sounds great! Jeff Noblett stops by on occasion, and we hear through the grapevine that he is enjoying his retirement as well, spending quality time with his daughter and grandchildren.

Last, and certainly not least, the glue of our department, Mandy Sulfrian. We hear that she plans to retire soon. I breathe a sigh of relief every day, knowing that I am retiring before her! She has kept the chairs of this department on track for a long time now, and I don't know what I would do without her.

This last year the department graduated five majors, but worry not, our sophomore classes have over 20 students in them! The senior class was a small but very high-powered group. Their original research was remarkable, as we learned on Geology Day when they gave their talks and posters. Many of them presented the results of their work at national geological meetings, and we are proud of their achievements. Once again, we are thankful for the support provided by the Buster Student Research Scholarships; Gould, Putnam, Creager, and Charles Rhodes Scholarships; and the Wold Family and the Hannigan Family funds, all of which supported students this last year. A special thanks to the Witter Family for their continued funding of our Witter Internships. This has been a spectacularly successful program, and one that I hope other departments at the college will model.

Department faculty were remarkably active this year on a variety of research projects. Funded research projects took faculty and students to locations around the world. Several members of the department conducted research funded by National Science Foundation grants, and many had students involved in the work. The department also had an active speaker series, with many great talks.
One of the best parts of our job is to help students launch their post-CC careers, and it is wonderful to hear from all our alumni. We take great pride in your achievements. Please let us know when you are in town and drop by the Department for a visit.

- Paul Myrow

PAUL MYROW
(Sedimentology/Stratigraphy)

I should start by saying that I am going to retire at the end of the school year! I am eternally grateful to my colleages and all the wonderful students that I have had the privilege of teaching over the years.

I had a great year working on a multitude of projects. My colleague Nigel Hughes (UC-Riverside) and I traveled to Cambodia last December and looked at rocks that were mapped as Cambrian–Devonian. It came as quite a shock when my students Sadie Almgren '26 and Oliver van Linder '26 went to Princeton University and dated an ash bed from the succession as Cretaceous! I guess we may write a paper about Cretaceous rocks…ha!

This last year, CC alumnus Michael Hasson '19 (now at Stanford) and colleagues (including CC students George Fowlkes '18 and Gerry Ramirez) published two papers about the rocks of Dinosaur National Monument. Collaborations with Bob Gaines from Pomona College led to two Science Advances papers this year, one of which proposed an explanation for the first major extinction of the Phanerozoic, and the other was about a Cambrian succession in south Australia with soft-bodied fossils. I traveled to Kangaroo Island this summer with CC student Oliver van Linder to continue work on these strata. This year also saw the publication of a paper with CC alumni Mingxi Hu (Penn State) and Woody Fischer at Caltech (CC '00) on middle Paleozoic strata of Wyoming and Montana. As a serious departure from the norm, I co-authored two papers in the Irish Journal of Earth Sciences about enrolled trilobites from the Pennsylvanian of central Colorado. Some of you may have been in Bond, CO with Historical Geology when we collected the samples. I began working with Steve Getty (Director, Colket Center) looking at the Dawson Formation in Colorado Springs.

I am continuing my work in Payson, AZ on the Cambrian Tapeats Sandstone with Bob Gaines. We hope to publish both a sedimentology paper and a short one in which we propose that animals colonized freshwater environments on land much earlier than presently thought. I also spent nearly two weeks in China with Jitao Chen (Nanjing Institute) and his students and colleagues. Some of you might remember Jitao from his time as a postdoc at CC. I then led this same group on a field expedition through Montana, Wyoming, and Utah later in the summer.

My wife Natalia and I are enjoying life and doing some travel; will head to Buenos Aires this fall. I am working on my extensive collection of cars (need to trim the herd soon!). I am still playing guitar and learning new material. That's about it. Please keep in touch!

CHRISTINE SIDDOWAY
(Structural Geology)

Hello, Geo friends! First news, first: We have a new puppy in the Siddoway household! Her name is HAZEL. Mike received some sort of earthly or heavenly 'missive,' that a new litter of chocolate Lab puppies had arrived in Pueblo, CO. Soon thereafter, Hazel joined our clan-- a very strong-minded female who withstands daytime dognaps, Hazel is on the go, all the time. I expect that Hazel soon will 'feel the field' (magnetic field), becoming a good field dog who will make new Colorado geology discoveries. The new pup won't be as much help with my work on sediment cores materials from offshore West Antarctica (if only she would take some naps)—but my work on geochron and thermal histories of iceberg-rafted debris (IRD) is ongoing and ever-more involved. Lately, I did wrap up one of the NSF projects, a collaboration with a micropaleontologist… that helped me achieve the conceptual shift to young geologic records (Pliocene to present) and climate linkages (IRD fertilization of open ocean in the Amundsen Sea).

Not my usual focus, and an utterly interesting shift! Other projects focus in on records of older ice sheets in Colorado: the Tava sandstone received some exciting media coverage (including some 'banter' between Denver Fox News anchors (!), due to successful U-Pb dating of hematite by CU Boulder colleagues. Work on recent pubs (see below), was helped last year by my Spring sabbatical ; thank you, CC.

For field courses and new field work at CC, I've adopted StraboSpot2 tablet-based software (strabospot.org – thank you, Univ. Wisconsin, Univ. Kansas, and Texas A&M PIs!). The software is in use for tablet-based mapping for Structural Geology (GY315) and Earth as a Physical System (GY212), in order to align with FAIR principles (Findable, Accessible, Interoperable, and Reuseable digital assets) to report/publish geological data only in analog forms, which aren't readily shared nor integrated into online databases and servers.

A photo of GY400 team using classtime (while at CU-Boulder for LA ICP MS activities) to complete the works you requested from them!

HENRY FRICKE
(Geochemistry)

Message to ChatGTP: "Write a Precambrian Basement update in the style of Henry Fricke."

"Hello from Palmer Hall! This update seems to be falling right on the heels of my last update, and I suppose this reflects how time speeds up as you get older. Sigh. Looking back at what happened in the classroom over the last year, last winter saw me take GY335 in a slightly different direction, this time focusing on soils and 'the critical zone.' I discovered there are too many bio/organic processes taking place in soils for my liking, but otherwise it was a fun approach to geochemistry, especially when bringing in paleosols & paleoecosystems. My other courses in the spring & this fall (GY150, GY211, CC100) were relatively unremarkable, although in CC100 I enjoyed adding discussions of 'western' versus 'indigenous' science and discussing the role of early geologists/surveyors in spearheading the colonialization ("settling") of western North America by the United States.

The summary of my research over the past year is very similar to that from the year before, differing mostly in destinations. Early summer saw me spending time in the San Juan Basin (earliest Eocene) and then in July taking a wonderful scientific-social loop through South & North Dakota (K-Pg boundary), Montana (Campanian-Cretaceous) & Wyoming (Eocene). The highlight was the week spent in the Dakotas, which was organized by the Denver Museum of Nature & Science. Because my daughter - Annaliese - was interning for the museum I got to see her every day, and more importantly she finally got to see what all my summer field trips were about (and she got to dig a lot of trenches, which builds much character).

This fall Katya Nicolayevsky '24 presented the results of her carbon isotope investigation of earliest Paleocene forests from the Denver Basin at the GSA in Anaheim, and Annie Breyak '25 described her carbon isotope study of K-Pg mammals at the Society of Vertebrate Paleontology meeting in Minneapolis (where I also gave a talk about carbon isotopes & dinosaurs). Annie & I also had an opportunity to do some laser-based analytical work at the University of Oregon (full disclosure: Annie did the work, and I watched).

While my teaching and research over the last year has been par for the course, what did come as somewhat of a surprise was Paul's announcement that he would retire at the end of the 2024-25 academic year. This set in motion the process of trying to replace yet another pillar of the department, a process that is going on as we speak. I'll have more to say about Paul in a later PCB update but suffice it to say that it is a joy to watch him get ready for his next stage in life even as he continues to teach, mentor & lead the department.

Away from CC, Erin and I have done a lot of traveling both for vacation (e.g. Bahamas, Delaware, Santa Fe, Los Angeles) and in support of family (e.g. helping kids move cross-country, visits to ailing parents), yet we still find time to work in the garden (Erin), go for flowy bike rides (Henry) and walk the dog (Finn = dog #3 in case you're counting). Speaking of which, I better shut down the ol' computer and get us outside with Finn before the sun gets completely hidden by the peak! Take care, Henry."

SARAH SCHANZ
(Geomorphology)

Happy fall! The weather is just starting to change here, reflected in the striking yellow aspens and the sudden and constant need for lotion.

As I write this, I'm settling back into a calmer routine after a week at GSA in Anaheim, California. So much science! So many Mickey Mouse ears! I presented a poster on evidence-based mentoring; this collaborative project is nearing the end of funding, and our focus has shifted to dissemination in meetings, workshops, and webinars (if you have mentees, come join our AGU Mentoring365 Circle this December-February to learn about mentor ecosystem mapping). Zhilin Shi '23 and Nathaniel Cutler '25 presented their thesis work on bedrock meandering rivers and avalanche-derived large wood in rivers, respectively, and ten students who worked with Michelle and I this summer presented at their very first GSA!

Speaking of, the highlight of this summer was collaborating with Michelle on our Keck summer research project! We had ten students coming from all over the US to work with us and investigate the source and transport of dust in the San Luis Valley. In a mere five weeks, they collected field data, learned and applied new analytical and experimental techniques, and created GSA posters and abstracts. It was intense, with some notable highs and lows, such as realizing that Baca Campus in June is 90% mosquitos and 10% DEET. I got to learn how to use an SEM and tried out my brand-new abrasion mills. Some notable findings: the Crestone Conglomerate breaks down really quickly in streams and there's a lot of chemical weathering creating potential dust.

Summer work also included some interesting river terrace analyses with Annie Breyak '25, who conducted meticulous terrace mapping of the Smith River, OR, and found puzzling breaks in terrace characteristics that likely have to do with climate and sea level changes. We are waiting on OSL dates to test this theory. Nathaniel Cutler '25 also kicked off his thesis this summer after several years contemplating the

morphic effect of avalanches and large wood. Nathaniel is building a depositional framework for large wood in avalanche-prone areas; despite the importance of these wood deposits for water quality, beaver habitat, natural fire cycles, and carbon transport, Nathaniel is one of the first people to work on this subject!

On the teaching end, Visiting Professor Tyler Grambling and I had a large class of 22 students in our GY212 Earth as a Physical System in Block 5! Despite the January time frame, we had the best weather I've ever had on field trips. Over two weeks of work, students conducted field mapping, GIS analysis, and geodynamic calculations to examine mountain building in the Cañon City region. All this work built on a 2023 paper out of Colorado State University, and I'm very proud of all our students for learning the field and computational methods to expand that 2023 work into a bigger regional picture!

GY320 collecting streamflow data on Monument Creek upstream of Woodmen Road.

Working in a similar region, GY320 Landscape Processes and Evolution started the first of what is hopefully a long-lasting collaboration with the Fountain Creek Watershed District. The District has led projects that stabilize and restore geomorphic and ecologic function to Fountain Creek; after a major flood event, they needed to assess how their projects held up. GY320 students visited these project sites, conducted mapping and topographic surveys in the field, and outlined recent change in aerial photographs. We presented findings to the Citizen Advisory Group at the City of Fountain's City Hall: overall, project sites are functioning as they should, though some erosion has occurred. The GY320 students did an amazing job and received many complements from the Citizen Advisory Group on the depth and accessibility of their work!

Deciding where to set up dust traps during Michelle and Sarah's Keck summer research, with the Sangre de Cristo Range looming in the background.

On the home front, I spend a lot of my time replacing the grass in my garden with native plants and pretending I have enough carpentry skills to build bookcases. Arthur is 1 ½ now and is thriving at the Colorado College daycare. One of his new words is 'rock' and he loves examining every pebble we come across. Trevor (husband) and Oliver (dog) are also doing well; they both work from home, though Oliver's work mostly involves testing the comfort of various sunspots.

MICHELLE GEVEDON

(Geochronology, Crustal Formation, Igneous Petrology)

This year seems as though it has flown by! This summer was a busy but exciting and productive time, during which I co-taught my first ever REU through the Keck Consortium with Sarah Schanz! We spent 5 weeks with 10 rising sophomores ("The Dust Detectives") from schools around the country focused on better understanding the sources of and processes that are responsible for increased dust production, which has implications for climate change in southern Colorado's San Luis Valley. This project highlighted really fun, unique, and societally relevant links between igneous and metamorphic petrology, geomorphology, sedimentology and climate change! The Dust Detectives reunited to present their findings at the annual GSA Connects meeting, this year held in Anaheim, CA, and it was so exciting to see everyone at the top of their game sharing their science with our geology community! The trip was capped off by a geologic field trip to none other than Disneyland (no kidding, there is a GSA field guide and everything!) where the geologic inspiration for many of the attractions and world building took center stage. Growing up in SoCal I was a frequent Disneyland visitor, but I never realized that one of the permineralized giant sequoia stumps from Florissant Fossil Beds National Monument, a frequent and favorite field trip stop in GY140 and CC100, is featured prominently within Disneyland!

I've been glad to be on my half-year pre-tenure sabbatical for the past few months (Fall '24). I've spent the time… in my lab and office, there are a lot of student projects going on! Lucy Rogers '25 is working on her senior thesis investigating the geology of the Cow Creek metamorphic pendant in the Southern Sierra Nevada mountains; Lucy did field work, complete with bears, wildfires, and impromptu visits to a giant sequoia forest in July and visited the Arizona LaserChron Center in October to collect U-Pb data in zircon. Charlie Hite '25, Jesús Lara Rivas '25, and David Mims '25 are working on complementary senior thesis projects focused on rodingites and serpentinites from Dun Mountain Ophiolite belt in Aotearoa New Zealand; they spent almost 2 weeks collecting Sr, Ca, and O isotope data while visiting the University of Texas at Austin in May. Anders Pohlmann '25 is working to understand fluid sources in some Utah skarns and is gearing up to collect isotopic data this spring. I did take some time to collect data for a project that is just for me, and it was a fantastic week visiting the lab at University of New Mexico filled with good friends, good food, and good dogs. A lot of time was spent plotting, err I mean writing, proposals to fund new projects and new science, and planning new classes and field trips, and writing new papers, but you'll have to stay tuned for details on those.

We began DIY renovating a bathroom in my house over the summer, so you can imagine how much of my fee time was spent during this time. Finally, though, we did make it to Maui and the peak of Haleakala for some quiet and relaxing time with family this past December, it's been a good recharge to head into 2025, mahalo!

Dr. Michelle Gevedon in the field with "The Dust Detectives" exploring how geology impacts climate change.

TYLER GRAMBLING

(Visiting Professor/ Structural Geology/ Tectonics)

Another year, another update from the same old visitor! I couldn't be happier to be in this amazing department for another year. While the eternal search for a permanent position continues, I could not imagine a better position to have occupied for the past few years. The academic year licked off with a sub-seismic slip in my GY370 Rheology and Microtectonics class. I had a wonderful group who enjoyed diving into strain localization using the Slide Lake shear zone as a case study in crystal-plastic deformation. We capped off the block with a 4-day trip to the 10th Mountain Division Hut outside of Leadville, CO. We spent our time translating thin section observations into outcrop relationships along the splays of Slide Lake shear zone. We even were able to spend a day examining the low angle shear zone on the Homestake peak ridgeline after making it over the summit of Homestake peak. I'm looking forward to teaching Regional Studies with Paul in Block 4 and working towards whatever the future holds from here!

Beyond the classroom, I've been busy in the lab and with research. I was able to spend a (very warm) week with Lachlan McCallum ('25) conducting detailed structural analysis of the footwall shear zone within the Ruby-Humboldt detachment for his thesis project. Michelle and I also spent a week in the Wet Mountains outside of Silver Cliff, CO with our colleague Ruth Aronoff from Furman University working to kick off an interdisciplinary project in that area. On the lab front, I've been bouncing between time at Dan Ibarra's stable isotope lab at Brown University working on a project to better understand the evolution of fault rocks as a paleoaltitude archive and at the Shared Instrumentation Facility at Colorado School of Mines conducting EBSD analysis on mylonites for Lachlan's project and some ongoing work in Peru.

It's been a good year for publications. In May, I had an article come out in Geosphere titled "Magmatic conditions aiding synconvergent extension above the Peruvian flat slab", and last month, I had a one-off collaboration on Andean spring chemistry come out in Chemical Geology titled, "Tracing the orogenic sulfur cycle in the Andes using stable isotope composition of dissolved sulfate in thermal springs." I have a few others in the pipeline that should be going out for review in the next few months, assuming I can manage to pull myself away from the classroom long enough to get the final details together!

I've also been fortunate enough to present seminars on a few different topics throughout the past year. I was able to present some interesting work on the variability in preservation of the paleoelevation archive of different isotopic systems and proxies at Brown University in March; gave a seminar on initiation, stabilization, and exhumation during orogenic extension at James Madison University; and will be giving a talk on fault-fluid interactions at CU-Boulder in early October.

I have also been serving as the managing editor for a thematic collection for the Journal of the Geological Society of London, which has exposed me to some amazing work on the structural evolution of the High Himalaya, Andean Plateaus, Caledonian-Appalachian orogeny, and Proterozoic Laurentia. Diving into the editorial side of the publishing world has been an adventure, but it's nice to see the view from the other side!

As for life outside of Academia, my spouse, Nadine Grambling, wrapped up an east coast-based postdoc in August, and is lecturing at Pikes Peak State College—we're thrilled to be together in one place after a few years more apart than together. I'm also on the tail end of rehabbing a fairly major snowboarding injury and looking forward to getting back onto the slopes and into the backcountry in a few more months!

MANDY SULFRIAN
(Adminstrative Assistant)

It's been a busy year in the Precambrian Basement of Palmer Hall – time flies and another Fall is beginning! It's been so hot this summer that I'm looking forward to cooler weather. We have another great group of geo majors. There are 30 majors this year, which is the most we've had since before Covid. YAY!

Charlie and I had some trips here and there this year. We went camping at the Sand Dunes with our son and his family. It was the first time I had been there, and it was great! We hiked up to Zapata Falls – what a beautiful place! In July we spent a weekend in Buena Vista, which was nice and relaxing! We also went to Mueller State Park (near Cripple Creek) for a hike in the beautiful changing colors of the trees in September. What a joy! We're going to Taos for Thanksgiving with some friends and that will be fun – no cooking! Then it will be winter before we know it! We are happy that CC hockey is back in full swing, which is our main entertainment. Not a lot else going on this year besides getting together with friends and family and enjoying life.

Picture of Charlie & me at a CC Hockey game in October – GO TIGERS!

Hope all is well with you. Give a shout when you're in Colorado Springs or on campus. I'd love to see you and catch up!

ELIZABETH ERICKSON
(Technical Director)

Hello! I've officially reached two years at CC, and it has gone by fast! We've been making changes around the department with reorganizing how spaces are utilized, how equipment is managed and accessed by students, and some exciting equipment and instrument updates. Most notably is the full overhaul of the field equipment cage with dinosaur mural. Through the hard work of our paraprofessionals, we tackled a big clean out and reorganization of the space, replacement of many declining supplies, and implementation of new field and vehicle safety equipment to help our students spend more quality time in the field.

The rock preparation and mineral separation spaces have also been reconfigured to better facilitate research projects. Students and faculty can now complete the full process of taking a rock from outcrop and processing it to picked and epoxy-mounted samples ready for geochemical analyses.

Associated with those spaces, we have recently started updating our microscopy collection through the generous donations of alumni and affiliates combined

with CC instrumentation funding. Student classes and theses projects have already benefitted from our new teaching suite of stereo microscopes and research-level stereo microscopes.

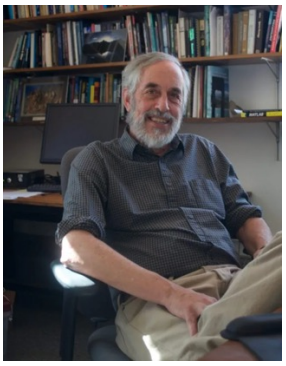
This winter we will also install a new research-level petrographic microscope with advanced software to further expand our microscopy horizons. Our next ambition is to update the full teaching suite of petrographic microscopes, giving students the best access to modern microscopy technologies most used in industry and academia today.

There are many more changes coming down the pipeline as we help Sarah and Michelle settle into their careers at CC while welcoming future faculty and research needs. We hope you'll join us for Geology Day on April 5, 2025. Come see the exciting talks and posters our students have participated in, as well as a lab space open house to see all the changes we've been making.

Outside of the department, my cat and I have been busy with adventures. We recently moved into an apartment from my self-converted van, where I've been living the past six years. It is nice to set down some roots as I settle back into Colorado.

Please come say hello whenever you are near the department! I will gladly give a tour through the changing lab spaces.

Warmly, Elizabeth



ERIC LEONARD
(Geomorphology)

2024 – Quite a year – and I'm not talking just about the election. I've now been retired for five years, and in some ways 2024 feels like I really am retired now. I have nearly finished writing up research that I didn't have a chance to complete while I was still teaching. After publishing seven papers in the first four years of retirement – most with former students as coauthors – things have slowed down a bit on that front. However, I still have stuff to work on and write up – including a big synthesis paper on paleoclimatology of the last glaciation and deglaciation in the Rocky Mountain region, which will have a bunch of CC student coauthors – and I have been giving a series of talks on that and related topics to various geological and archaeological groups.

It's been a year of exploration in other areas. We've always been theater fans and we jumped into that big-time this past year – with a ten-day theater trip to London in January (not a great season to be outdoors in London, but warm and dry enough inside the theaters – or theatres as spell it in London) and a shorter one to Chicago in October. In between we did a combined theater, hiking and a bit of geology trip to southern Utah. Theater in southern Utah? Well yes, and I'd recommend going to the Utah Shakespeare festival in Cedar City if you ever have a chance. We also made a slow, meandering trip, through the southeast states from northern Florida up to Washington DC in the spring. It's a part of the country I didn't really know, and traveling there brought out the historian in me (I was an undergrad history major) and also, I must admit, the Yankee in me. Unfortunately, my alumni trip to Antarctica scheduled for January 2025 has been cancelled – too expensive, I think, to attract enough alums. I'm working now with the alumni association on a combined hiking, geology and wine trip to New Zealand (both islands) for February 2026. It would be great if some of you geo alums would come along. Other travel plans for 2025 (fingers crossed) include Costa Rica and Turkey – and more locally,

Navajo land and California.

Lisa has had a stressful year, commuting back and forth between Colorado and Kansas City to help her 98-year-old father who is still living on his own. Julia is well settled in her co-op apartment in Washington, DC and Susan in her apartment on Alamo Square in San Francisco.

"The Leonard-Noll family on a windy October day on San Francisco Bay. Note the Franciscan Complex rocks in the background. Left-to-right — Lisa, Eric, Julia, Susan and brother Steve"

BRUCE LOEFFLER

Together for 25 years, my husband, Dan O'Brien, and I have been living in Port Townsend, WA since 2017. We love living by the Salish Sea in a fir/cedar/hemlock forest, to which I added a very-Zen understory Japanese garden.

To those of you who don't know me, I taught in the Geology Department from 1977 to 1998. A geochemist and volcanologist, I also taught mineralogy, although Intro was my favorite course by far. I took advising seriously, participated widely across campus, taught in the French department's program in France, took volcanology courses to Hawaii and Costa Rica, also taught American Art, and The Art of Exclusion, about the representation of race in American Art and popular culture. With a high profile as an 'out' gay man at CC and in Colorado Springs, I spoke out against the anti-gay Colorado Amendment 2 in 1992, left Colorado Springs (and Colorado College) as a political refugee in 1997 after the Religious Right took over the town, after the windows in my house were shot out. I took care of my father at the end of his life in Tucson, met my husband, Dan, there, and in 2004 we moved to San Luis Obispo, CA to be with Dan's family. I taught part-time in geology and art history at Cal Poly, San Luis Obispo, and traveled widely, lecturing on international tours.

Now we enjoy a quiet, peaceful life on the Olympic Peninsula, hiking and beach -walking, working in the garden and acquiring art, cooking and eating with friends, enjoying movies at the art-house Rose Theater or by streaming, a good way to while away the longer hours of the winter dark.

A recovered memory in 2018 allowed me to know something my young child's mind erased. So, much of my time in the past six years has been spent in trauma therapy, in deep-tissue body work to move back into the body I abandoned as a child, and in writing a memoir as a very powerful vehicle for healing—writing my way to the truth, writing my way out of shame, writing myself into being. I love writing, write every day, have published personal essays and am working to get the memoir—which won first place in the non-fiction writing contest at the annual meeting of the Pacific Northwest Writer's Association in September—into final form to hand off to an agent.

My healing journey culminated last year in Taranaki, New Zealand, where I received a peha—a Maori warrior tattoo that extends from my knees to my natural waist, front and back—as a mean to reclaim my body for myself. Two powerful Maori men gifted me a tattoo from their colonized culture to help me reclaim my body from its own colonization by others when I was a very young boy.

We plan to submit a short documentary we made about this tattoo healing journey to film festivals. If you are interested in knowing more, here is a QR link to the film:

bruceloeffler.com bruce.loeffler@pobox.com (805) 704 - 5161

Andrew (Andy) S. Cohen

A last-minute piece of sad news. Andy Cohen, professor in the Geology Department from 1982-to-1986, passed away in early February 2025 after a year's battle with cancer. Andy left CC for the University of Arizona and spent the remainder of his career there, where he was University Distinguished Professor of Geosciences and Joint Professor of Ecology and Evolutionary Biology. Andy continued his groundbreaking research work on East African lakes into the last week of his life.

Although Andy was at CC for only four years, he left a strong mark on the Department. A paleontologist and sedimentologist, it was Andy who first sought and received NSF funding for student-faculty collaborative research, taking several of you to Africa to work on his projects there – projects that led to what were probably the Department's first student/faculty collaborative publications. Andy was also an inspirational teacher and a great fun-loving and very funny guy, beloved by all of us who were in the Department with him.

Andy's wife, Debbie Gevirtzman, was also an important figure in the Department – a paraprofessional in 1984-5 and participant the summer East Africa field projects. They have twin sons – Alex and Zach, now 29 years old. If anyone want to contact Debbie, please shoot an email to Eric Leonard (eleonard@coloradocollege.edu) and he will send you her contact information.

GEOLOGY DAY

March 30, 2024, Tutt Science Lecture Hall

Student presentations

Pierce Hayton '24 "The Role of Fault Damage Zones in Structurally Controlled Landscape Evolution, Sevier Fault Zone, Southern Utah"

Emma Revenaugh '24 "Reconstructing Nitrogen Dynamics in Three Minnesotan Lakes Using Stable Isotope Ratios of Nitrogen"

Katya Nicolayevsky '24 "A Carbon Isotope Investigation of Fossil Leaves from Corral Bluffs"

David Mims '25, Jesus Lara Rivas '25, and Galileo Defendi-Cho '24 "XRD & Raman Spectroscopy of Serpentinite Minerals from Nelson, New Zealand"

Annie Breyak '25 "Investigating Tourmaline-Mineralized Mirrored Brittle Faults in Western Antarctica for Seismic Signatures"

Harold Oppenheim '26 "Study of Two Clastic Rock Types Sampled from Glacial Erratics in the Ford Ranges of West Antarctica"

Charlie Hite '25 "Using GIS to Reconstruct Colorado's Paleoenvironments"

Ilene Kruger '25 "Variations in Crystallographic Preferred Orientation within Different Rock Types in the Talkeetna Arc, AK, and Analog Deformation Experiments"

Jake Hams '26 "Constraining the Temporal Onset of Laramide style Tectonics with Monazite and Apatite U-Pb Geochronology"

Department Awards

Annual Awards

Rocky Mountain Association of Geologists Award:
Emma Revenaugh '24

Association of Women Geoscientists:
Piper Kent '24

Estwing outstanding senior geologist:
Pierce Hayton '24

RMAG McKenna Scholarship (for a junior previous year):
Annie Breyak '25

Buster Scholarships:
Annie Breyak '25
Lachlan McCallum '25
Ilene Kruger '25
Oliver van Linder '26
Sadie Almgren '26
Harold Oppenheim '26

Gould Scholarship:
Annie Breyak '25

Putman Scholarship:
Jesus Lara Rivas '25

Charles Rhoads:
Annie Breyak '25
Charlotte "Charlie" Hite '25
Jesus Lara Rivas '25

Wold Family Fund:
Charlotte "Charlie" Hite '25
Baxter Waltermire '24

Creager:
Jesus Lara Rivas '25
David Mims '25

STUDENT UPDATES & RESEARCH

Ilene Kruger, '25

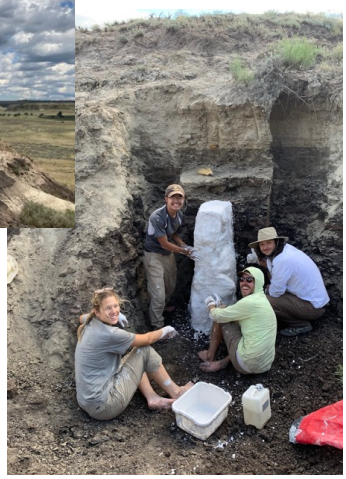
Last summer I participated in an REU program through WashU in St. Louis called RORD: Research Opportunities in Rock Deformation. We first spent a week in California, staying at field camps in Mammoth Lakes and just outside Death Valley National Park. It was awesome to see large-scale deformation features (think drag folds the width of a highway) and test our ability to learn in 100+ degree conditions. All the students then split up and flew to various deformation labs across the country to conduct our own research. I spent the rest of the program working at the Lamont-Doherty Earth Observatory in New York, running rate-state friction experiments related to the April 2024 NJ earthquake and fault stability in the mid-Atlantic. In December, my cohort reunited at AGU to present our findings and celebrate our successes (and challenges). The program was truly a phenomenal experience, from meeting other undergraduates interested in rock deformation to getting professional experience that will guide my future plans. I'm so grateful to the CC geology department for suggesting RORD and making these connections possible!

Thanks,
Ilene

Andy Sameshima, '26

This summer I was a Witter scholar and participated in the fossil preparation internship at the Denver Museum of Nature and Science. Over the ten weeks I was at the museum, I got hands-on experience handling fossils in all stages of the fossil preparation process, including: using hand saws to open field casts, learning how to use air-hammers, air-scribes and air-abrader to safely remove excess sediment off of fossils, using putty and glue to patch up delicate and broken fossils, and creating plaster cradles to store prepped fossils in collections. Most of the fossils I worked on were Hadrosaur fossils, including Edmontosaurus pubis bones and scapulas and a large Parasaurolophus jacket that included a collection of vertebrae and limb bones. I also participated in a 3D scanning initiative to scan and upload the museum's fossil collection to Morphosource, an online collection of 3D fossil models.

Additionally, I participated in 2+ weeks of fieldwork in North and South Dakota fossil prospecting and soil sampling. During these few weeks, I learned how to recognize fossil rich areas and microsites and identify the different types of fossils in the area including: turtle, crocodile, mammal, fish, and dinosaur fossils. Highlights from the trip include excavating a large chunk of the K-T boundary and uncovering an articulated Triceratops skull. All in all, I got to work with dinosaurs every day, and I really can't think of a cooler summer job out there.



Makena Hatch, '26

I am a recipient of the Noblett-Witter Family Grant and partnered with the American Museum of Natural History this summer. Along with three other Colorado College Geology students, I gained hands-on experience working with Ph.D. students, professors, and career experts, learning new skills in a professional setting. Over 6.5 weeks, my team and I conserved and curated a subset of Columbia University's fossil marine invertebrate collection. Our work involved cleaning specimens, rehousing them in archival boxes, assigning new specimen numbers, photographing them, and updating the museum's database.

A collection of brachiopod, a specimen that takes the shape of a perfect heart, from the AMNH.

Photo provided by Makena Hatch '26.

This process made the collection more accessible to researchers and allowed us to contribute meaningfully to ongoing research efforts. This internship provided invaluable experiences, from building workplace relationships to developing skills in conflict management, collaborative problem-solving, and databasing. I also had many opportunities to network with professionals in my field, all while learning to budget and navigate life in New York City. Exploring the city and making personal and professional connections have been transformative, and the insights I gained will shape my professional journey.

Elizabeth Spradlin '27, Corra Lewis '27, and Makena R. Hatch '26 stand in the Theodore Roosevelt Rotunda before opening during their internship at the American Museum of Natural History in August 2024.

Charlie Hite '25

Hello PCB!
My name is Charlie Hite (she/her), and I'm a geology major graduating this spring! I am delighted to share a brief account of my experience as a Noblett-Witter intern last summer with Applied Natural Sciences Inc. (ANS), as a student researcher with Dr. Michelle Gevedon, and the surprising connection to geology I discovered while studying abroad in Mexico fall 2024. My internship began with meeting the small ANS team at the 2024 Battelle Chlorinated Conference which takes place every other year and was conveniently in my hometown of Denver this summer. ANS was founded several decades ago and specializes in engineered phytoremediation using their patented TreeWell Technology. The main phase of the internship was going to Sandpoint, Idaho June 12th-21st with ANS Vice-President and CC Geology alum, Chris Gale '01, and soil science technician, Kevin Bamber. Groundwater and soil sampling in Sandpoint had revealed that the chemicals used in cellphone pole treatment over 50 years ago had leached into the groundwater. Phytoremediation relies on a tree's natural ability to act as a "vacuum" as evapotranspiration pulls water up through soil capillary spaces and into the root matrix. It is here where tiny organisms and fungi do the work of breaking down contaminants into harmless constituents. In Sandpoint we planted a total of 48 TreeWell units and over the next year natural processes will distribute native grasses so that what once was an abandoned dirt lot will become a forest of aspens and cottonwoods! I jumped in to help with the process of backfilling the holes, setting the piezometers & weather station, and planting the trees. I had brought all pink safety gear to Sandpoint, so I earned the nickname 'Phytoremediation Barbie' which I wore with pride.

Kevin Bamber, Chris Gale '01, and me on-site in Sandpoint, ID

The other geology experience I would like to share is my work with Dr. Michelle Gevedon. For my senior thesis, I am a student researcher on her NSF-funded project studying metasomatic ultramafic rocks from the Dun Mountain Ophiolite in New Zealand. This work uses rodingites as a proxy for studying the process of serpentinization. Serpentinization occurs at the seawater-ocean crust interface, however, properties of the mineral serpentine make it difficult to use as a petrogenetic indicator. The same fluids and pressure-temperature conditions that metasomatize a peridotite and olivine-rich basalts into a serpentinite is proposed to form rodingites, however, due to a difference in parent rock composition, rodingites have a much greater mineralogic diversity, and commonly contain the mineral garnet, known for its refractory geochemical behavior and its ability to preserve information regarding the conditions. My research for Michelle uses stable calcium isotope ratios to better understand the timing and sources of hydrothermal fluid alteration. Last summer, I went with Michelle and several of her other thesis students to the University of Texas at Austin to prepare samples for Thermal Ionization Mass Spectrometry (TIMS). I learned how to do column chromatography and all the work that goes into preparing a sample for analysis. More recently I have been working on interpreting my Ca isotope values and conducting a literature review to get the whole picture of stable Ca isotope behavior in different geologic settings.

In fall 2024, I studied abroad in Mexico for two months, completing my Spanish minor in the Yucatán Peninsula. I lived with a host family in the town of Izamal where I was immersed 24/7 in Spanish and formed close bonds with my new family. The program, through the CC Spanish and Portuguese Department, focused on Mayan culture and language throughout the peninsula. We had the opportunity to meet with locals who shared their indigenous knowledge and crafts with us, as well as many tours of archeological sites, museums, and indigenous communities. I expected to leave geology behind when I went abroad; however, I found myself immersed in geology from an entirely different perspective. Through the people I met and stories I was told about the Mayan empire, it was clear that geology was and continues to be integral to culture and vice versa. I hadn't ever considered that religion and humanity could be so seamlessly integrated into geology. We toured ancient temples and saw how skilled craftsmen carved Mayan gods into the limestone as if they were meant to be there all along (photo 2). I was surprised to find myself looking at rocks in a new light and thinking about what might be missing from Western science when we disregard the stories of people from the samples we study. I will continue to ponder that question, and I hope to integrate Mayan perspectives into my future career as a geologist.
Signing off, Charlie

Archeological zone Kabah, Yucatan, MX

Anders Pohlmann, '25

This past summer I had the incredible opportunity to work as a geology intern at Milford Mining Company Utah (MMCU). Located in Milford, Utah, MMCU is a copper mining company that operates at an open pit copper skarn. The mine has had several different owners in the 21st century but was acquired by the current investment group in late 2023. Currently the mine has an operating mill that is processing tailings to make copper cathode, and it will begin mining in early 2025. Geologically, the Milford Mine is located on the eastern edge of the Great Basin geologic province.

The opportunity to work with the geology team led me to experience a diverse set of responsibilities and experiences. A significant portion of my time was spent analyzing and logging the drill core of the areas where MMCU was planning to mine starting in January. Additionally I gained experience in the mine software Micromine Origin to analyze resource models. At the end of each month I summarized my projects to contribute to the monthly report to company employees and mine investors. My experience at Milford Mining felt like a true professional setting. I was the youngest person on site by 6 years. A typical work week went from 7:00-3:00 Monday through Friday. My housing was in the town of Cedar City, which is located an hour away from Milford. During the 2 hour commute each day I was able to have conversations with the geology team about their career experiences and gained valuable insights during that time.

Field Work with the Milford Mining Company Geology team

The location of the Milford Mine allowed for some great explorations as well. On weekends I was able to visit many national parks/monuments such as Zion, Bryce Canyon, Great Basin, Cedar Breaks, and wherever the road took me! In addition to the career building skills that I developed from this experience, I also was able to bring back samples that can be used for my senior project. I plan to use stable isotope geochemistry in the core samples that I was permitted to bring back to CC from Milford to better understand the fluid sources of the mineralization in the copper skarn. Additionally I have created thin sections out of the core samples to supplement my senior project and eventually provide to Milford with a report detailing the thin section observations. I am so grateful to the Witter Family for making this incredible summer possible!

CC GEOLOGY 24-25

Photo provided by Lenny Lorenz '26

HOTWHEELS BEST ITEM FOR SCALE

**** *WARNING - WE ARE **NOT** SPONSORED BY HOTWHEELS :(*****

Dr. Natalie Kehrwald '99

I always loved experimenting and seeing what would happen. As a kid, I would dig up clay from the backyard and try to make sculptures, create concoctions in an attempt to make soap, and create dubious recipes for baked goods. I never considered these attempts as science, but just thought of them as discovering things for myself. Not until I reached CC did I realize that attempting and trying things is the essential ingredient in science.

In high school I took advanced science classes because I "should" and thought of them as a step towards college, but not a career. I associated science with trying not to break beakers in chemistry labs and with physics problems that seemed to make simple aspects unnecessarily complex. During my move-in to CC, I was walking around campus buildings with my dad and seeing photos pinned up on the bulletin board outside of the Geology Department in Palmer Hall of students in the field. Everyone seemed engaged and happy, and surrounded by stunning scenery. I clearly remember telling my dad, "This is what I always wanted science to be like. I am going to sign up for Intro to Geology for sure."

My Intro class with Paul Myrow was when the course covered two blocks. We went on an extensive field trip across southern Colorado and much of New Mexico. When we were in White Sands National Park, I remember being stunned places this beautiful existed, and that I was lucky enough to be able to study them. With the ability that the Block Plan provides for studying science outside, and continuous hands-on learning, I realized that I loved learning about Earth science. I am not sure if I would have majored in geology elsewhere, without having the structure of Colorado College classes to place science in such a tangible form.

I have always had the approach of applying to as many things as possible, because sometimes things work out, but they can only work out if you actually apply. I was quite fortunate to be awarded a Keck Foundation research opportunity between my junior and senior years at CC. Our research consisted of collecting sea shells on the sea shore of the Nicoya Peninsula, Costa Rica to date marine terrace uplift in the context of regional tectonic geomorphology. This combination of weeks of fieldwork, collaborating with people from other universities, and preparing a paper for publication was a great encapsulation of what life is like as a scientist, and also made me want to continue in science.

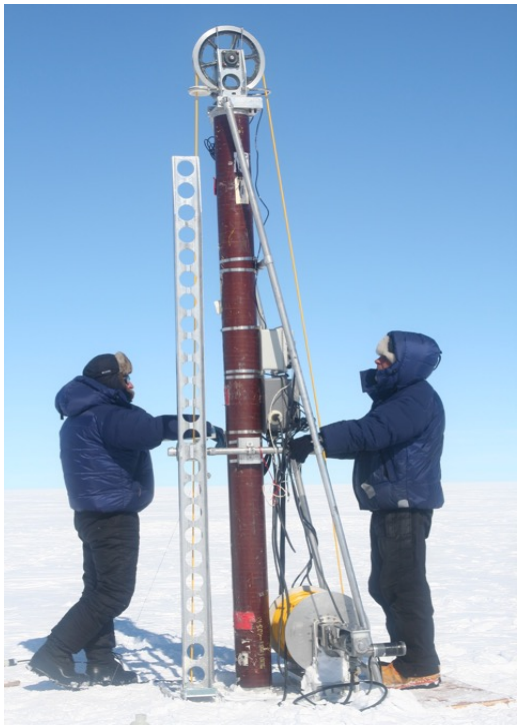
I joined the Peace Corps after CC and served on the Bolivian altiplano, the high plains that extend east of the Andes. I lived on the shores of Lago Poopó, a hypersaline lake that is rapidly disappearing. The town that I lived in used to be a fishing center, but the desiccation of the lake meant that people who had fished for generations had to change their livelihoods and/or move to urban centers.

A back-lit snow pit at WAIS Divide Antarctica shows the stratigraphy within snow that then becomes compressed to form ice.

The lake was, and is, drying due to both decreased freshwater influx from retreating regional glaciers as well as increased water use for mining operations and cities. This experience of seeing the impacts of climate change on people's lives made me want to continue to study geoscience.

Returning to the U.S. after a few years in the Peace Corps, and from a completely unplugged experience to a whirlwind of information, I was struggling to find programs to which I wanted to apply. I was visiting family in Colorado Springs and stopped by the Geology Department. I was lucky to see Paul Myrow, who suggested applying to the University of Massachusetts. As someone who was very focused on the western US, I had never considered UMass, and it turned out to be a wonderful opportunity.

On the first day of a paleoclimatology course at UMass, I walked into class, where there was a slide of snow-capped mountain. I exclaimed, "Hey, that's Sajama!" much more loudly than I meant to, which made everyone turn and stare. Sajama is a Bolivian mountain that I could see in the distance on clear days from my Peace Corps town. In Bolivia, I had heard stories of international scientists going to Sajama but did not know what they were researching. In my class at UMass, I learned about ice cores, or cylinders of ice that are drilled from the surface of a glacier to bedrock and provide a climate history of the region.



A lightweight drill that can be separated into parts allows drilling both polar and high elevation glaciers.

This paleoclimatology class was my introduction to ice cores, and I have studied ice cores ever since. While finishing my masters at UMass, I applied to every ice core program that I encountered, and was lucky to be able to work with Lonnie Thompson at Ohio State whose team were the group that drilled and analyzed the Sajama ice cores. I was lucky to be at Ohio State during a time period when we were collecting ice cores from around the world, including the Andes, Himalaya, Greenland and Antarctica. My PhD research examined ice cores from western Tibet and was the first to determine that glaciers as high as 20,000 feet above sea level were losing mass, with implications for regional water availability. These research results were surprisingly similar to the situation of the town in which I lived in Bolivia, where decreased water availability forces people to have to change their lives.

After finishing grad school, I had the chance to teach in Intro to Geology block at CC in the same classroom in which I took my intro course which was a wonderful way to come full circle. We were able to go to some of the same sites and study the same formations, but where this time I had the opportunity to be the professor instead of a student.

In the spirit of applying to multiple opportunities, I had submitted an application to work for the Italian National Research Council after graduate school to study biomarkers in ice cores from around the world. Our research into investigating past fire history recorded in ice cores worked, where we expanded this work across records from seven continents.

Ice cores that were recently drilled and are ready for initial processing including investigating core stratigraphy.

While I loved my time in Italy, I was looking to return to the US. I listed to a webinar hosted by Science on research jobs outside of academia. Marcia McNutt, a CC grad who was the head of the U.S. Geological Survey (USGS), and now is the president of the National Academies of Sciences, Engineering and Mathematics stated that if you are interested in the effects of changing water availability that the USGS is a wonderful place to work. I immediately looked into the USGS, and saw a job posting for someone who researches terrestrial records of climate change in the past few thousand years based in Denver, Colorado. When I arrived for my job interview, I saw that I was in the same building that I had visited during a CC course, which has now become my workplace.

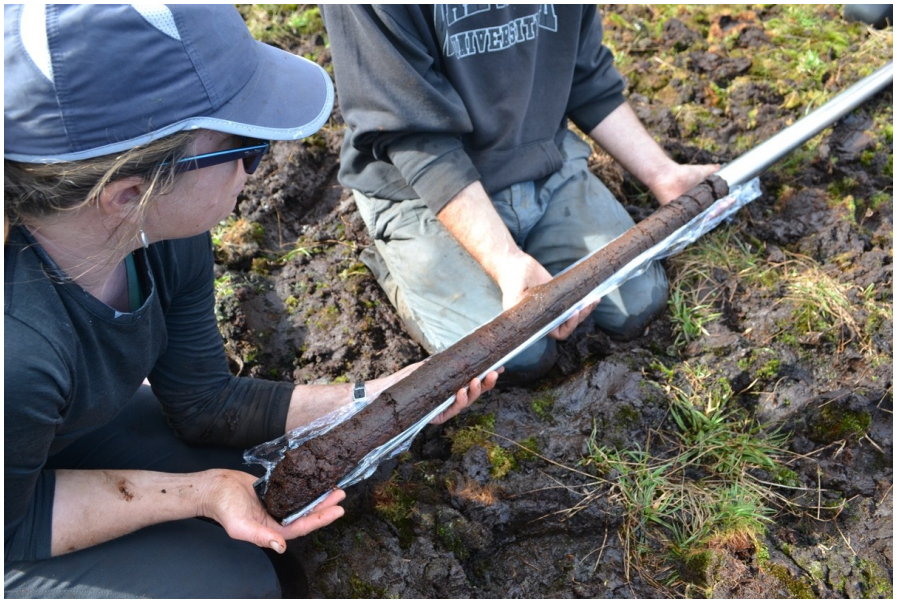
In my research at the USGS, I examine interactions between fire, climate, and human activity using ice and sediment cores. My favorite aspect of my job is having new cores and realizing that our research team gets to be the people who discover the changes in climate and environment that happened at that location. I love that I get to continue to collaborate with CC professors and students and have been lucky to co-teach sections of blocks at the Baca campus.

I use my CC education every day, and credit CC with being a continuous connection throughout my career. I know that I have been very lucky to have had this experience and education, and I would like to keep passing these opportunities forward to others.

YOU NAME IT, DR. KEHRWALD HAS CORED IT

Collecting tree cores provides records of climate and fire over seasonal scales for up to hundreds of years.

Drilling sediment cores at the volcanic crater of Rano Kau on Rapa Nui (Easter Island)



Dr. Robert Jacobsen '10

Hello PCB!

Thank you for this opportunity to share. In recent news, Hannah and I welcomed twins, Maggie and Zoe, in 2023. They love dogs and collecting rocks!

I'm now a teaching professor at the University of Tennessee, Knoxville, where I teach two courses of 150–250 students each semester. These large classes meet in lecture halls 2–3 times a week with smaller laboratory sessions once a week. Can you think of anything less like geology on the block plan? While I have few memories of CC that directly connect to teaching at a large university, the values and experiences from my time at CC profoundly shape how I approach teaching geology in a large classroom.

"In every class I teach, connecting with my students, and connecting them with the subject, depends less on the methods I use than on how I know and trust my selfhood—and am willing to make it available and vulnerable in the service of learning."
–Parker Palmer

On the first day of class, I like to show my students a photo from my first block in Fall 2006. Growing up in central California, I didn't know how to layer clothing for cold weather. Zoom in on my face, and you'll see that I'm freezing! Henry Fricke didn't think I'd survive the rainy first night when he saw me unpack a Coleman-brand cotton sleeping bag.

Over the years, I've associated that experience with a lack of preparation for navigating new environments, a common challenge for (though certainly not unique to) first-generation college students like myself. What got me through those first blocks and other challenges along the way? The faculty, with their understanding, flexibility, and enthusiasm. Without their support, I wouldn't have continued in geology. Their dedication inspires my primary teaching goal: good humaning. For me, this means meeting students with empathy and resources whenever they feel lost, overwhelmed, or doubtful of their ability to succeed in college.

In conversations with my students, I've learned their challenges are significant: many work one or more jobs, some live at home to support family, and others struggle with physical or mental health. I share my first-block photo to let students know that I, too, have faced challenges—and to open the door should they need guidance in their college journey.

"The one who does learns." – John Dewey

The second key aspect of geology on the block plan was how difficult it was to hide in class. CC professors could always tell when I (or the class) didn't understand something. They'd ask follow-up questions, make hand gestures, and even perform interpretive dances to help us wrestle with challenging ideas. Their persistence, combined with countless hours in class, labs, and the field, helped those difficult concepts click.

Hiding is a lot easier in a class of 150–250 students. It doesn't take much for my students to get lost, bored, or distracted. Compounding this challenge is the limited amount of time we have together. To address this, my second teaching goal is to make every moment count by filling class time with activities and demonstrations that leave a lasting impression.

My favorite type of lesson involves crowdsourcing. I introduce a geologic problem—like a potential volcanic eruption or the scarcity of a critical mineral—and students work in teams to gather data, build a picture of the situation, and brainstorm hypotheses and tests. These activities generate energy and excitement, helping students sense the drama inherent in the real-world challenges that geologists face.

Hannah, who works with high school teachers and students, has taught me a lot, notably that supporting students' learning skills is just as important as teaching content. As a result, my classes emphasize guided and creative note-taking and lots of practice with new key terms and concepts.

"The unexamined life is not worth living." – Socrates

When I reflect on my teaching, I see how much I owe to my time at CC. Yet reflection—pausing to examine experiences, uncover meaning, and shape intentions—was not something I practiced often as a student. Today, it is the foundation of my teaching practice and one that I try to instill in my students.

Over the years, my colleagues and I have developed a pyramid model for effective teaching. At its base lies the unique set of experiences and backgrounds that shape who we are as educators. These inform our beliefs and values about what it means to teach well and foster student learning. Like an iceberg, much of this foundation remains unseen, yet it profoundly influences what is visible—our decisions about course content, organization, and teaching strategies. This foundation also shapes the activities we design and what we believe will best support our students' learning. Together, these elements build toward the ultimate goals of teaching: student knowledge, skills, and growth.

Reflecting on this model, I'm reminded that teaching is both deeply personal and profoundly collaborative. My time at CC, with its inspirations and challenges, continues to guide me in building connections, fostering engagement, and supporting student success. By sharing the power of reflection with my students, I hope they, too, will uncover meaning in their experiences and persevere through their challenges. Just as CC shaped me, I strive to create a learning environment where students feel seen, supported, and inspired to grow—both academically and personally.

Image created by Zoe Roueche '24

Nobblet-Witter Family Fund Internships

Summer 2024

STUDENT	HOST ORGANIZATION
Corra Lewis '27	American Museum of Natural History
Elizabeth Spradlin '27	American Museum of Natural History
Makena Hatch '26	American Museum of Natural History
Mac Benjamin Schwartz '27	American Museum of Natural History
Charlie Hite '25	Applied Natural Sciences Inc
Avery Ordner '26	Denver Museum of Nature & Science
April Simmonds '27	Denver Museum of Nature & Science
Andy Sameshima '26	Denver Museum of Nature & Science
Jesus Lara Rivas '25	INSTAAR
Katie Radcliffe '23	Lexicon of Sustainability
Anders Pohlmann '25	Milford Mining Co
Katya Nicolayevsky '24	The University of British Columbia Geography Dept.

Visitor Seminar Series 2024-2025

Spring Semester 2023-24:

Block 5 - January 29, 2024. Dr. Amy Moser, Post-Doc, Massachusetts Institute of Technology "Dating Deformation with Titanite"

Block 6 - March 7, 2024 . Dr. Eric Leonard, Professor Emeritus, Geology Department Colorado College "Glaciation along the crest of the continent: a window into regional paleoclimate"

Block 7 - April 5, 2024. Dr. Avner Vengosh, Distinguished Professor and Nicholas Chair of Environmental Quality, Chair, Division of Earth and Climate Sciences, Nicholas School of the Environment, Duke University, "The energy-water nexus: the transition from fossil fuels to renewable energy"

Block 8 - May 3, 2024. Dr. Liam Courtney-Davies Postdoctoral Associate in Geosciences, CU Boulder, "Dating of ancient iron ores (Australia) and Snowball Earth Meltwater Events (Colorado) Using In-Situ Hematite U-Pb Geochronology"

Fall Semester 2024-25:

Block 3 - October 22, 2024. Dr. Ellen Wohl, Professor, Geosciences, Colorado State University, "Rivers of Carbon: Using River Corridor Science to Understand Carbon Dynamics"

Student, Alumni & Faculty Conference Presentation, 2024

GSA Annaheim, CA, Fall 2024

Students:

Lachlan McCallum '25, "Microstructural and isotopic analysis of the Ruby-Humboldt shear zone at Lamoille Canyon, NV"

Nathaniel Cutler '25, "A framework for in-stream large wood in snow avalanche-prone landscapes"

Alumni:

Zhilin Shi '23, "Lithology erodibility and channel cross-sectional geometry control the evolution of meandering bedrock rivers in uplifted orogens"

Katya Nicolayevsky '24, "Investigating ancient forests using carbon isotope ratios of fossil leaves from Corral Bluffs, Colorado, USA"

Mingxi hu '23, "The paradox of cyclonic storms in a cold pennsylvanian equatorial region"

Faculty :

Sarah Schanz, "Insights from the progress mentoring program: Strategies to retain undergraduate women in the earth sciences"

Paul Myrow, "Tectonic trigger to the first major extinction of the phanerozoic: the early cambrian sinsk event"

Michelle Gevedon, "Transport of mid-crustal fluids to the upper crust through brittle fault networks as revealed by stable isotope ratios of tourmaline-mineralized fault surfaces, West Antarctica"

SVP 84th Annual Meeting, Minneapolis, MN, 2024

Faculty:

Henry Fricke, "Interpreting stable isotope ratios of dinosaur tooth enamel: how to reduce ambiguities by considering results in a larger geochemical context"

Student:

Annie Breyak, "A stable isotopebased investigation of mammalian paleoecology across the Cretaceous/Paleogene boundary in the Denver Basin, Colorado, U.S.A."

AGU, Washington, DC, Winter 2024

Faculty:

***Christine Siddoway*, "**Multichronometer dating of dropstones and ice-rafted debris (latest Miocene through Pliocene) recovered from IODP drill cores offshore West Antarctica, to extend knowledge of bedrock geology and past ice sheet extent"

Students:

Oliver van Linder, "Structure and Physical Properties of Fens in the Valles Caldera, New Mexico"

Ilene Kruger, "Frictional Properties of Simulated Fault Gouge From the Ramapo Seismic Zone, NY/NJ"

Faculty Publications 2023-2024

Paul Myrow (* = CC student or alumnus)

Betts, J.M, Claybourn, T.M., Holmer, L.E., Skovsted, C.B., Myrow, P.M., Stemmerik, L., Topper, T.P., Park, T.-Y., Hughes, N.C., and Brock, G.A., in press, Integrated chronostratigraphy of the lower Cambrian Byrd Group, Transantarctic Mountains: Gondwana Research.

Craddock, J.P., Paulsen, T., Schmitt, R. de S., Johnston, S.T., Myrow, P.M., and Hughes, N.C., 2023, Amalgamation of Gondwana: Calcite Twinning and Finite Strains from the early to late Paleozoic Buzios, Ross, Kurgiakh, and Gondwanide Orogens: Geological Society of London, Special Publications, 531, p. SP531-2022.

Gaines, R.R., García-Bellido, D.C., Jago, J.B., Myrow, P.M., and Paterson, J.R., 2024, Emu Bay Shale: a unique early Cambrian Lagerstätte from a tectonically active basin: Science Advances, 10, eadp2650.

Hughes, N.C., Kolenko, R., Myrow, P.M., and Houck, K., in press, Carboniferous trilobites from Colorado: systematics, morphology, and enrolment: Irish Journal of Earth Sciences.

*Hu, M., Myrow, P.M., Fike, D.A., Di Pasquo, Zatoń, M., Fischer, W.W., and Coates, M., 2024, Depositional History of Devonian to Lower Mississippian Strata, northern Wyoming and southern Montana: Geological Society of America Bulletin, v. 136, p. 3311-3334.

Myrow, P.M., Goodge, J.W., Brock, G.A., Betts, M.J., Park, T.-Y.S., Hughes, N.C., and Gaines, R.R., 2024, A tectonic trigger to the first major extinction of the Phanerozoic: The early Cambrian Sinsk Event: Science Advances, v. 10, p.eadl3452.

Myrow, P.M., Hasson, M., Taylor, J.F., Tarhan, L.G., Ramirez, G., Fowlkes, G. and Chen, J., 2023, Structural control of Cambrian paleotopography and patterns of transgression in western Laurentia: Geology, v. 51, p. 521-526.

Myrow, P.M., *Hasson, M., Taylor, J.F., Tarhan, L., Fike, D.A., *Ramirez, G., *Fowlkes, G., Popov, L.E., Liu, H., and Chen, J., 2023, Revised Paleozoic depositional history of the central Rocky Mountains: Sedimentary Geology, v. 449, p. 106373.

Myrow, P.M., Hughes, N.C., and Singh, B.P., 2023, Ordovician strata of the Indian Subcontinent: Geological Society, London, Special Publications, v. 533, p. 397-414.

Opitek, K., Zatoń, M., *Hu, M., Schiffbauer, J.D., Selly, T., Myrow, P., in press, Morphology and mode of life of a peculiar Devonian microconchid tubeworm Aculeiconchus from Wyoming, USA: Lethaia.

Schoenneman, B., Jughes, N.C., and Myrow, P.M., in press, Eye structure and function in Ameura (Trilobita, later Carboniferous), from Bond Colorado: Irish Journal of Earth Sciences.

Wernette, S.J., Hughes, N.C., Myrow, P.M., and Sarsud, A., 2023, Trilobites of Thailand's Cambrian-Ordovician Tarutao Group and their geological setting: Papers in Paleontology, p. 1-100, doi: 10.1002/spp2.1516.

Xin, H., Chen, J., Li, F., and Myrow, P.M., 2023, Spatio-temporal distribution of the Cambrian maceriate reefs across the North China Platform: Palaeogeography, Palaeoclimatology, and Palaeoecology, v. 614, p. 111429.

Xin, H., Chen, J., Li, F., and Myrow, P.M., 2023, Spatio-temporal distribution of the Cambrian maceriate reefs across the North China Platform: Palaeogeography, Palaeoclimatology, and Palaeoecology, v. 614, p. 111429.

Sarah Schanz

Schanz, S.A. and Yanites, B.J., 2024. Reconciling rapid glacial erosion and steady basic accumulation rates in the late Cenozoic through the effect of glacial sediment on fluvial erosion. Journal of Geophysical Research: Earth Surface, 129(8), p.e2024JF007721.https://doi.org/10.1029/2024JF007721.

Tyler Grambling

Grambling, Tyler A., Dennis L. Newell, Karen G. Lloyd, Coleman D. Hiett, Heather Upin, Peter H. Barry, Donato Giovannelli, et al. "Tracing the Orogenic Sulfur Cycle in the Andes Using Stable Isotope Composition of Dissolved Sulfate in Thermal Springs." Chemical Geology 669 (December 5, 2024): 122365. https://doi.org/10.1016/j.chemgeo.2024.122365.

Grambling, Tyler, Micah Jessup, Dennis Newell, Nadine Grambling, and Coleman Hiett. "Magmatic Conditions Aiding Synconvergent Extension above the Peruvian Flat Slab." Geosphere, May 17, 2024. https://doi.org/10.1130/GES02741.1.

Eric Leonard

Quirk, B.J., Huss, E., Laabs, B.J.C., Leonard, E.M., Licciardi, J.M., Plummer, M.A., Caffee, M.W., 2022. Late Pleistocene glacial chronologies and paleoclimate in the Northern Rocky Mountains, western Montana, U.S.A. Climate of the Past 18, 293-312. https://doi.org/10.5194/cp-18-293-2022

Leonard, E.M., Laabs, B.J.C., *Robertson, A., Plummer, M.A., Ibarra, D.E., Caffee, M.W., 2023. Late Pleistocene glaciation in the southernmost Sangre de Cristo Mountains, New Mexico – chronology and paleoclimate. Quaternary Science Advances 9, 100070. http://doi.org/10.1016/j.qsa.2023.100070

Leonard, E.M., Laabs, B.J.C., Marcott, S.A., *Crawford, E.E., *Mackall, B.T., Ibarra, D.E., Osman, M.B., Plummer, M.A., Caffee, M.W., 2023. Chronology and climate of the Last Glacial Maximum and the subsequent deglaciation the northern Medicine Bow Mountains, Wyoming, USA. Quaternary Science Advances 12, 100109 https://doi.org/10.1016/j.qsa.2023.100109

Alexie Millikin '17

I hope that putting together the PCB is going well! I just wanted to send a quick update to include: This Fall I successfully defended my dissertation at Yale University using geochemistry and geochronology to understand Precambrian environmental change. I am back in Colorado and will be starting a Post-Doc at CU Boulder in January!

Best,
Alexie Millikin (class of 2017 and paraprof in 2017-2018)

Dr. Millikin teaching a course in Arizona, "Geology of the National Parks"

Kayla Bronzo '18

I adore rocks. I even seriously considered becoming a geologist. While most people see this at odds with a career in medicine, I have found the fields to be remarkably similar.

In college, I followed my love for rocks into a major in geology. We would have lectures on geophysics, geochemistry, structural geology, sedimentation and mineralogy, and then we would go out into the field and apply that knowledge. We would all pile out of the van at a road cut, and our job was to use everything we learned in the classroom to make sense of what was in front of us. We had to be detail oriented, taking note of the bedding of the rock, the type of rock, what minerals were present, how they were juxtaposed, any fault lines, and the layers. Then we would move onto testing - measuring strike and dip, applying diluted HCl, measuring bedding widths. All these physical clues would then allow us to hypothesize how the outcrop formed.

The parallels here with medicine are striking. When I see a patient, I must combine their story and any information from testing and imaging with my prior knowledge base in order to come up with a hypothesis of why the patient is ill. While these analytical processes may mirror each other, I have discovered that there is nothing that compares with the moving human dimensions of medicine.

Hope all is well!

Class of 1984 Alumni Reunion

These 1984 Geology Grads gathered at a local Colorado Springs brewery to tell stories (and lies) during their 40th reunion at CC on November 1st and 2nd, 2024. Lots of laughs and some embarrassment were had. If you were part of the geology class of '84, please reach out to the department with your email. Some of those stories were about you (the non attenders) and we would like to put you in the loop if you are game.

Pictured from left to right are: Harry Hamill, Peter McCarville, Peter Jensen, Chris McCluskey Jensen, Professor Eric Leonard, Professor Jeff Noblett, and Steve Wood. Charlie Stanzione attended but is not pictured.

Thomas B. Neilson '10

Hi All,

I enjoy reading updates from the CC geo department every year in the PCB, but I think this might be my first time contributing.

After graduating from CC, I spent a couple of years whitewater kayaking and working on research and sail training ships before landing at University of Vermont to get a master's degree in Geology. After grad school I moved back to my home state of Maine, and have been working as a consulting geologist ever since.

These days I live in Bowdoinham, Maine with my wife Becca and am a Senior Geologist/Hydrogeologist with a small-ish (100-person) consulting firm based in Maine, and I help lead our Water Supply Group, dealing primarily with water supply wells for municipal water and aquaculture from Maine to New Jersey and Pennsylvania. I really enjoy the "art" of water supply wells - how to drill them, build them, and keep them running. For most people a well is just a pipe in the lawn that gets in the way of the mower, but there is a lot more to it than that. Understanding the finer points of how to build a 1,500 foot deep water supply well that can produce 2 million gallons of water per day for the next 75 years is complicated, and I've enjoyed every minute of the process thus far.

Sometimes old technology is the way to go - drilling a spring water production well in an esker deposit in the western Maine mountains using a cable tool rig from the 1940's.

My CC geology education has served me well countless times at this point in my career - I still often find myself thinking back, or sometimes actually referring back, to books and notes from my time at CC, and the foundational skills I was taught in field work has been a tremendous asset.

If anyone finds themselves interested in water supply work don't hesitate to email (thomas.neilson@sme-maine.com), I am always interested in meeting of CC folks, especially if they are interested in wells!

Drilling a 24-inch water supply well on a military base in northern NJ with a dual-rotary rig.

Using unconventional tools to remove large cobbles from a well being drilled using flooded reverse rotary in the upper Potomac-Raritan-Magothy aquifer in southern NJ.

Dr. Gabi Rosetto-Harris, '15

Dr. Rosetto-Harris, '15, is now a Paleontologist at Florissant Fossil Beds National Monument! Her research explores fossil plants to study how life responds to climate and paleogeographic changes, using paleoecologic, taxonomic, and biogeographic methods. She has investigated topics ranging from Central Rocky Mountain paleoelevation to fossil plants from Argentine Patagonia and the Paleocene Castle Rock, CO flora.

Gabi Rosetto-Harris '15 and Sergio Perez '16.

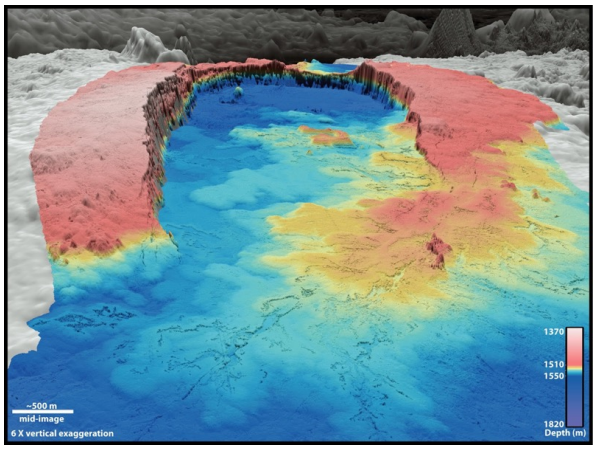
Both are federal employees working in Colorado!

Gabi is employed at Florissant Fossil Beds National Monument (after having been a 2014 intern there, during college) and Serge works for the Dept of Interior, based out of the Denver Federal Center.

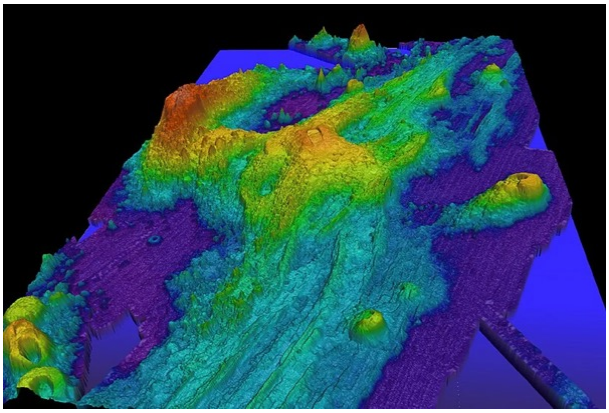
Bill Chadwick '81

Bill Chadwick '81, is leading groundbreaking research on Axial Seamount, the most active submarine volcano in the northeast Pacific. Located off the Oregon coast,

Axial's predictable eruption patterns make it an ideal site for studying volcanic forecasting. Chadwick's work has focused on tracking inflation and seismic activity, which have steadily increased since early 2024, signaling a potential eruption before the end of 2025. This research, presented at the 2024 American Geophysical Union meeting, aims to refine eruption predictions and enhance understanding of volcanic behavior globally.



Axial Seamount's summit features a caldera that measures 3 km wide, 8 km long, and up to 100 m deep. Its floor lies approximately 1500 m (three-quarters of a mile) below the ocean's surface.



Axial Seamount is now "fully re-inflated" and ready to blow.

Pierce Hayton '24
Pierce stopped by the office on the way to start his new job at the Bureau of Reclamation in Sacramento, CA. Thanks!

Ed Simmons '79
Ed Simmons here class of 1979. I recently semi-retired from a long career on wall street in technology. I am currently living in Newark NJ.

Best,
Ed Simmons

Rowan Hill, '09
Hi Everyone!
It's been an exciting year for me. I'm living in Wheat Ridge and got married last September. I have been working with the same company for almost 8 years now, as the Training Director for a Behavioral Health Treatment company called Sandstone Care. My wife is starting up her own business as a Functional Medicine practitioner, calling it ThriveRX because she aspires to help people truly thrive in their health journeys, not just survive. My mom came out of retirement to take over the directorship of the international boarding school in Switzerland again, which is where I grew up, so very proud of her for doing that in a time the school needed her leadership. If anyone wants to send their kids to a life-changing place for high school even for a year, reach out to me.

Finally, I'm very into biking these days and have set some ambitious goals in terms of a few mountain bike races I'd like to complete in 2025. If anyone else is racing their mountain or gravel bike in CO this year, hit me up, I'd love to connect.

Not sure if this is the format you're looking for. I'm not sure I have been receiving the PCB updates myself, but would love to make sure I'm getting those.

Thank you,
Rowan Hill (Paraprofessional, '09)

Fiona Swope '22
Hello!

Hope everything is well (and not TOO chaotic) in the CC geology department.

I am continuing working full time as a Hydrogeologist at BBA water consultants, learning more about Colorado water rights, ground water availability, and the process of drilling municipal wells all over the state. As a new employee I got to spend a lot of time with our intern Jacob this summer - doing field work, teaching him about the industry, and collaborating on projects. I am currently living in Denver with 3 other Colorado College Alums (Go Tigers!) and love that I get to bike to work most days. I am also excited to report that on clear days I can see in the distance the hazy outline of Pikes Peak from my office window.

Me (Fiona Swope '22) performing a general well investigation with our Summer 2024 Intern, Jacob, in July.

Jon Rotzien, '07

Greetings Tigers from the oil patch of Houston, Texas. Sending a Happy New Year to All! Deepwater oil and gas exploration, appraisal and development continues to do well, with new discoveries in the Gulf of Mexico, offshore Africa, North and South America and Asia-Pacific detailed in Charles Sternbach's latest edition of AAPG's Giant Fields of the Decade: 2010-2020 co-authored by a CC grad, John Dolson '71. The book I co-authored with 61 of my deepwater colleagues detailing the process of deepwater oil and gas exploration and production, Deepwater Sedimentary Systems: Science, Discovery and Applications (Ist edition, Elsevier, 2022), is now available in almost every STEM university worldwide. Written during the Pandemic, this book came to life after teaching deepwater training courses for years, particularly one work trip to Stavanger with HOT Energy Group.

The follow-up book, The Explorer's Mindset: Lessons in Leadership in Applied Geoscience and the Energy Industry (Amazon KDP, 2023), examines what makes exceptional explorers and the collaboration among the energy industry, academia and government agencies. Those of you who know me well know these books are surprising to me, too, as I never imagined I'd write so much; now the books are featured in industry short courses co-taught with several colleagues including Rich Sears, Cindy Yeilding, Lori Fremin, Lisa Goggin, Anshuman Pradhan, Ryan Weber and many others.

Through years of consulting and training courses mostly in deepwater exploration, our teams have built up what we think is a good amount of sage information to write about for the energy world. One particular chapter of the deepwater book that has garnered much attention is Chapter 21 titled The Next 100 Years of Deepwater, a chapter brainstormed and written by Cindy A. Yeilding, former SVP of bp, and one heck of an explorer (see Thunder Horse Field in the US Gulf of Mexico). This chapter examines future scenarios for offshore exploration, not only for oil and gas, but many aspects concerning the human experience. Friends have told me this is the first chapter they read in the book.

I continue to spend the winter and summer holidays teaching field geology mapping courses in New Zealand, the Black Hills of South Dakota and the French Alps, largely with my structural colleague Dr. Yann Gavillot of Montana Tech, known to many as the state earthquake geologist of Montana. It has been truly awesome to get to work with Yann and under the leadership of Professors Nuri Uzunlar and Chris Pellowski at South Dakota Mines to deliver these field camps. The Conjugate Basins, Tectonics and Hydrocarbons Research Group at University of Houston led by Professor Paul Mann continues to graduate top level MS and PhD students, largely going to work in exploration/ new ventures in the energy industry.

Senator Kay Bailey Hutchison, along with the schools of Business, Law, Engineering and now Geosciences at University of Texas at Austin, developed the premier energy program in the USA over the last decade, the KBH Energy Center. The KBH Energy Center hosts many programs, with symposiums that draw hundreds of professionals and students involved in every aspect of the energy industry to Austin every spring and fall. The course I teach in this program, Valuing Natural Resources (FIN 337), focuses on understanding how the energy industry works, both domestically and internationally, how it is financed and how deals are made.

The Drifters Research Group has now moved to Granada, Spain, full-time, and is led by the incredible F. Javier Hernández-Molina and his research associates. The Drifters hosted the firstever Advanced Course in Deepwater Sedimentary Systems week-long course in September '24 in Granada to a sold out audience. Javier's global and very collaborative research program has pioneered groundbreaking advancements in turbidite-contourite and mixed deepwater systems. Is the original Bouma turbidite actually a contourite? Will get back to you on that one. AAPG-SEG IMAGE, GeoGulf, Perkins-Rosen, NAPE, EAGE and other conferences are a highlight of the year to get to present recent observations on basin analysis and exploration. One of the most interesting times of 2023 was talking deepwater sedimentation with Professor Paul Myrow at the 39th Annual GCSSEPM Perkins-Rosen Research Conference at Equinor US in Houston. He gave an

invited presentation on mixed carbonate-siliciclastic deposits in Mongolia that challenged our thinking on sediment transport and the resulting morphology of continental slopes.

For multisport racing, I'm taking a short break from racing XTERRAs, Breck Epic, and ocean open water swimming races this year, just doing a few fun 5Ks in The Woodlands, but hope to be back racing the longer distances in 2026. If you'd like to catch up in Houston, Texas to Hokitika, New Zealand (where Chris and Eric took us way back in 2007 for Regional Geology, one of the best classes ever in my mind) please let me know. I'd be delighted to get a coffee or lunch, or attend a good service at Faith Bible Church in The Woodlands on a Sunday, and talk rocks and energy – and Old Testament or New Testament.

Go Tigers.

Lowe Billingsley, '88

Hello to all CC geos! I always look forward to receiving the PCB to see what everyone and the department is up to. My degree has led me on an amazing career journey in the mining industry the past 37 years and I'm still at it. I've had the opportunity to see many parts of the world with my work and have truly enjoyed all the different cultures and landscapes that I've been fortunate to visit across Africa, Australia, North and South America – with the most important part being all the great people that I've met and become friends with in all those places.

My wife and I currently live in SE Montana. We're fortunate to be only about a two-hour drive from Yellowstone National Park and about one hour from the stunning Beartooth Highway. Amazing geology in every direction! We enjoy taking family and friends into the mountains and YNP every change we get. If you're ever in the neighborhood, please look us up!

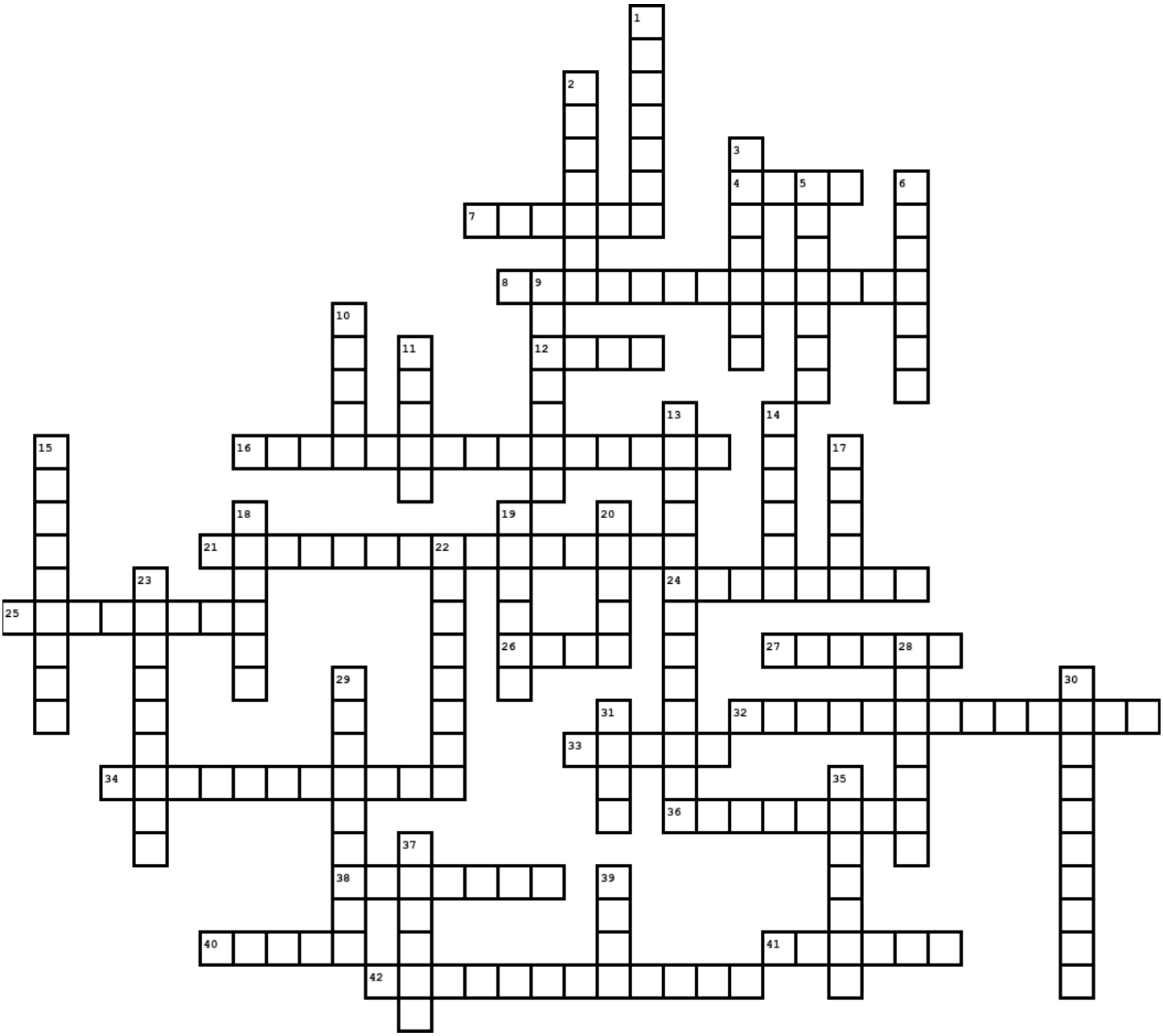
Lowe Billingsley
Loweb.co@gmail.com

Zion Klos, '09

Hi CC geo family! I've grown from paraprof to tenured professor and chair of the environmental program here at Marist College. I live a boat-filled life of student research and outdoor fun along the Hudson in upstate New York. I'm teaching geology, hydrology, and climate courses, and I take my students for a backcountry block course to Iceland or Alaska year-after-year – loving it here! I just finished a teaching sabbatical in Italy for our branch campus – but let me know if you want to join-in(!!) for some rafting-based fieldwork and adventure out West during my research sabbatical this next summer/fall 2025 – the Colorado, Salmon, Green, etc.

Zion Klos teaching an annual block course in Iceland

Puzzling Rocks



Across

4. The coolest word Arthur knows
7. Volcanic rock with a low density
8. The clouds in Henry's sketches are always sad; they are __
12. Institution in CO's capital that displays fossils and conducts paleontology research
16. Sheet silicate also known as ___
21. Most visited field trip destination in the department

Down

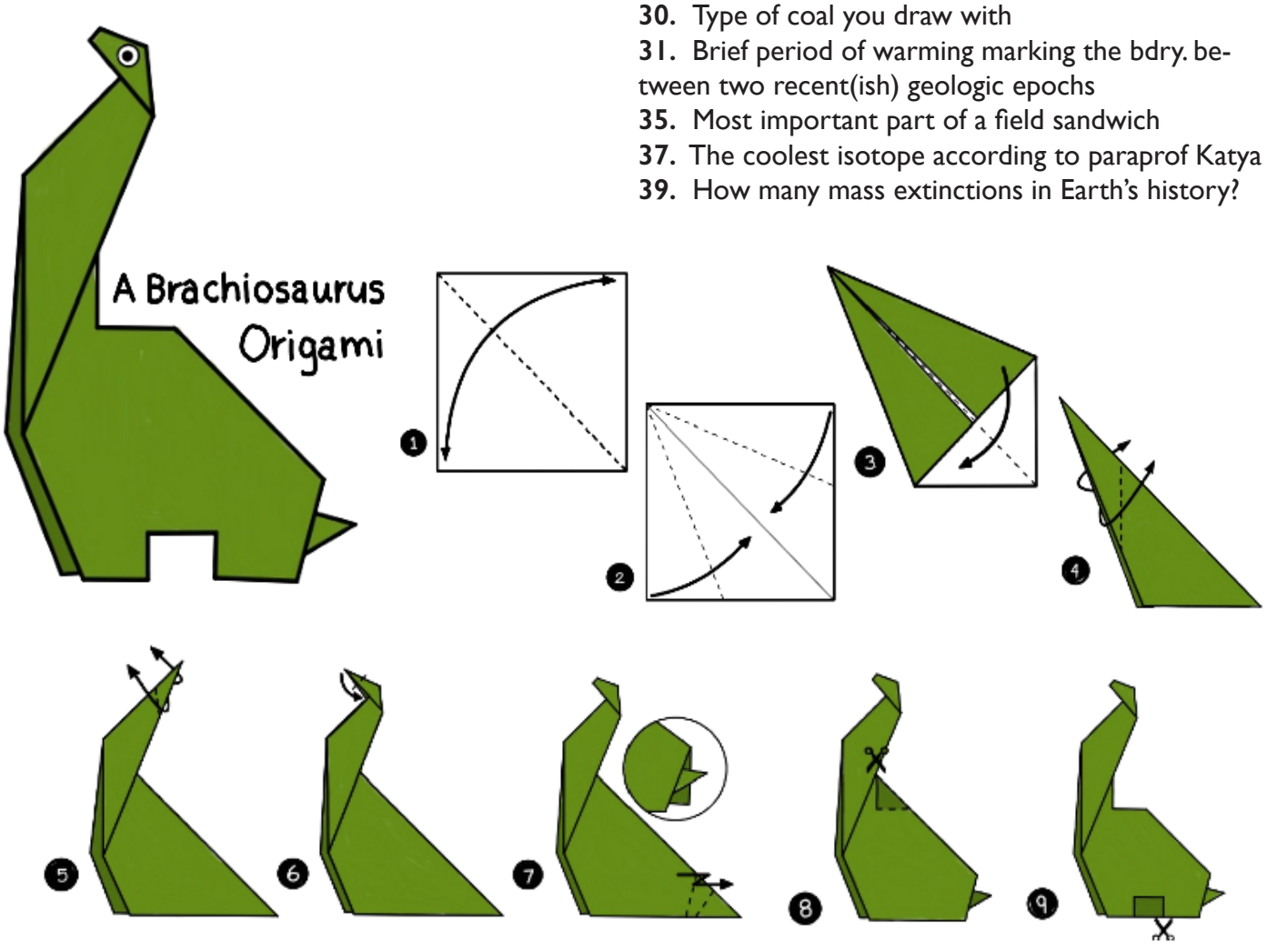
1. A type of fault where the hanging wall moves up relative to the footwall
2. Paraprof Baxter's favorite mineral
3. Peanut ___ OR a deformation style
5. Author of Henry's blurb
6. Best baseball team ever
9. Coolest supercontinent
10. Christine's new puppy

Across cont.

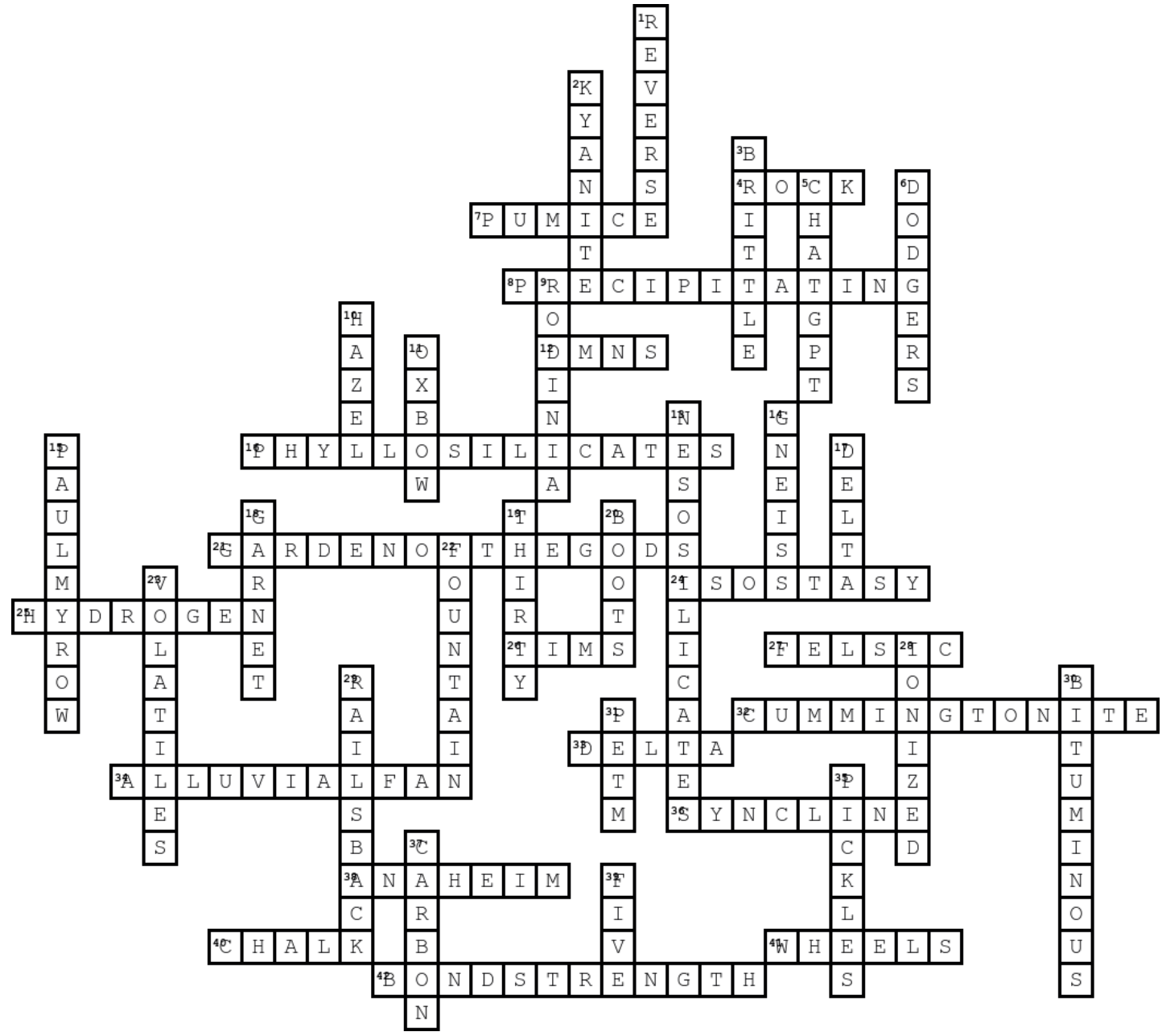
24. The state of balance between tectonic forces and the Earth's crust
25. The coolest isotope according to Tyler Grambling
26. Type of mass spec. that when abbr. sounds like someones name
27. Rock with a cool composition?
32. $(Mg,Fe)_2(Mg,Fe)_5Si_8O_{22}(OH)_2$
33. A geologic term for a river that splits into smaller branches before entering the sea
34. Depositional env. of Bacon rock
36. Downward-arching fold
38. City where 2024 GSA conference took place
40. Talc or __
41. Hot ___, important theme of the '24/'25 academic year
42. Answer to all the geochemistry questions (not really)

Down cont.

11. A structure formed when a river cuts through a meander
13. Silicate structure of Olivine
14. WOW! That is a ___ rock
15. Professor retiring this year
17. A geologic term for a river that splits into smaller branches before entering the sea
18. Michelles's Gevedon favorite mineral
19. Number of geology majors in the department this year
20. The department's most ornery member, and Elizabeth's assistant
22. Bacon Rock Fm.
23. Gases trapped in Earth's crust, often found in magma
28. Electrically charged
29. Author of "An Earth Scientist's Periodic Table of the Elements and Their Ions"
30. Type of coal you draw with
31. Brief period of warming marking the bdry. between two recent(ish) geologic epochs
35. Most important part of a field sandwich
37. The coolest isotope according to paraprof Katya
39. How many mass extinctions in Earth's history?



Crossword Puzzle Answer



Paint Mines Interpretive Park in El Paso County, photo by John Naschinski

Dear Colorado College Geology Alum:

We hope you have enjoyed the 2024-25 edition of the Precambrian Basement, CC Geology's annual alumni newsletter. We would love to hear what you're up to, where you've been, and where you are now. Please fill out this form and return it to:

The Precambrian Basement
Colorado College
Geology Department
14 E. Cache La Poudre St.
Colorado Springs, CO 80903

OR: email us at precambrianbsmt@coloradocollege.edu
We love pictures!

Last Name_____First Name_____

Maiden Name or Nickname_____Year of Graduation_____

Current Address (street)_____

City_____State_____Zipcode_____

Home Phone_____Business Phone_____

Email_____Website_____

Current Employment or Graduate School Info:

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Recent Events, Exciting Adventures, and other Comments

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