

Basement

THE COLORADO COLLEGE GEOLOGY DEPARTMENT



2015-2016

Volume XVII

www.ColoradoCollege.edu/academics/dept/geology

**Cover Photo:
Photo from the Regionals 2015 Trip to
Glacier National Park, MT**

Taken by Stephen G. Weaver

The Precambrian Basement

2015-2016

Editors-in-chief:
Madison Andres & Betsie Hopper

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

Contact: precambrianbsmt@coloradocollege.edu
Facebook: GeoDept ColoradoCollege

Greetings Everyone!

We hope you are all doing well and that you will enjoy the enclosed stories about your geology faculty and what our current students are up to (within the realm of geology!).

One would think I would have learned better, but after my eight-year term as Associate Dean of the Faculty, I have served for one year as Chair of the Organismal Biology and Ecology department and now serve as chair of Geology for two years. But the department as a whole is providing significant support to the college. In the past three years, four geology faculty have chaired three college departments and programs. Paul is now chairing Organismal Biology and Ecology, Eric served three years as Director of Southwest Studies, and of course Henry chaired Geology. In addition, Megan is a critical member of the Faculty Executive Committee and chairs the Budget Subcommittee and Christine just completed service on one of the President's Strategic Planning Committees. So overall, the faculty are being recognized college-wide for their leadership skills.

In recent issues, we have shared with you some of the resounding academic success students have had- from worthy thesis projects to the increasing number of PhDs and university faculty coming from CC (third among all liberal arts colleges over the last decade, second in the last five years). We continue to sustain an extensive field-based program with our students resumes indicating anywhere from fifty to well over a hundred days of field experience. We have also developed projects that engage our students in working towards solving societal problems through geological mapping, geophysical techniques, and related applications. The close mentoring of our students is a high priority for us.

This fall, the department received an extraordinary gift that will allow us to provide stipends to students to undertake geology-focused internships. The department is very excited about being able to: 1) show its students the more practical aspects of geology within government, industry, non-profit, or research universities; 2) identify meaningful projects or internships for rising sophomores and juniors; and 3) provide a bridge of support immediately after Geology majors graduate. Internships' durations may range from a few weeks during a block off within the academic year to ten weeks during the summer. We will of course continue to support original research experiences for our students, but we are looking forward to providing even more ways in which we can help each student in the ways that may have the most impact for that individual.

We wrote you each independently before Christmas about this opportunity for alumni to support our students, by providing places where they could undertake these internships (that letter is copied later in this issue). We have received some good feedback from some of you (thank you!) and would love to invite even more of you who still have geology connections to consider what you might do to assist current students as they prepare to move into the geological workforce. Please let me know if you have positions in future years (or during the academic year) that might be appropriate for student interns. We really appreciate all you can do for our students.

Jeff Noblett, Geology Department Chair



MEGAN ANDERSON
(Geophysics)

I had a busy summer in 2015, working with 5 CC students and one alum (Gray Ritger '15) doing studies of the water table at the U.S. Air Force Academy in Colorado Springs and applying gravity data to understanding active faulting in the Puget Lowland (my 10th year working on that project!). Our group working at the USAFA were mapping the water table within the Dawson formation utilizing seismic refraction and electrical resistivity underneath a new geothermally heated building constructed at the engineering lab on the campus. They wanted to know the depth to determine feasibility of installing a ground water circulation system through the building's foundation, but Matt Hess ('16) collected extra seismic refraction data extending down to Monument Creek to gain a broader understanding of the aquifer under that region. The group working in the Seattle area collected new data for both understanding where active faults extend in the region and for defining the shape and depth of the Seattle basin—a big bowl of sediment sitting right under Seattle—problematic for increasing ground movement, should they experience a large-magnitude earthquake (and yes, this project is exactly to do with the problems described in the New Yorker article this year). Collecting gravity data was a blast, driving forest roads back up into the Cascades, but we didn't mind sampling an array of fantastic Washington microbrews either.

For those of you who understand my running addiction, I did another sprint-distance triathlon this year. My swim time improved by over 4 minutes! But my bike time declined by about 4 minutes, so my time was about the same as last year, in total. But never mind

that—it was great fun, and I really enjoyed the swim this year. On my way out to Seattle for our research, my husband Tom took the passenger seat and we hit some mountain ranges on the way out, doing some mountain biking and hiking. The Snowy Mountains, Wind River Range, Sawtooths, and Mt. Hood were all on the list...what fantastic scenery we saw! If you've never been to the Snowy Range, it comes highly recommended, really a hidden gem.

Once again AGU pub night was fantastic—thanks to everyone who attended, and hope those that didn't make it can come next year.



ERIC LEONARD
(Geomorphology)

I'm on sabbatical, so this is going to be a short one.

After a January family trip to Baja, during the spring semester I finished up my three-year stint as Director of the Southwest Studies program. It was an interesting three years, but I was ready to get back to being a geologist full time. Probably the biggest disappointment of the year was the cancellation of the course I was going to teach in Nepal last summer—a wise decision though, since Nepal was not in great shape after the earthquakes and the College was understandably a bit hesitant to send a group of students. Instead, my summer featured a few short field projects in the Colorado mountains (sampling for cosmogenic radionuclide dating of the last glacial maximum and deglaciation in the Sawatch Range, a return to the Spruce Creek Rock Glacier to work on a 30th (!) anniversary survey. Amazingly, we were able to find all of the markers we last repainted about 15 years

ago).

You would think that after 30 something years at this job, I would have a good understanding of how sabbaticals are supposed to work – but no! Block 2 found me teaching the senior regional geology class again, this time along with Paul Myrow. We decided to brave late September-early October in northern Montana and were rewarded with a couple of horrendous days, but a much larger number of good ones, lots of spectacular geology (tremendous fold-thrust belt structures), some great hikes, and a great group of senior majors.

Since block 2 I have settled down to serious sabbatical business. First a junket to the Czech Republic, Berlin, and Poland on my way to GSA in Baltimore! Since then I have been hiding out in an undisclosed campus location switching back and forth between paper writing on my Mac and numerical modeling on a PC. My plan for the next three months is to continue that work. In the spring, Lisa and I will be heading off for a month of “fieldwork” in southern Spain, followed by two months of actual work at the University of Bergen in Norway.

Julia is still living and working as a political and non-profit media consultant, in Washington, DC, and loving it (yeah – she’s 25 years old – makes you feel old, doesn’t it?). Susan, now a junior at Bates College, spent the fall in Prague (hence my trip to the Czech Republic), but will be returning to Maine just in time for the worst of the winter weather there. Lisa is doing great, but she needs to stop working so hard.



PAUL MYROW
(Sedimentology/
Stratigraphy)

Best wishes from CC. Back at work after a year-long sabbatical. Last fall I was sitting in an office at the University of Barcelona (when I was not enjoying the city!), and in the spring I was in the corner of a basement laboratory at the University of Pennsylvania. Both semesters were great opportunities for me to finish writing up the results of completed research and start new collaborations.

Most exciting was the publication of a paper that has been hanging over my head for a long time, namely the hypothesis that changes in fault movement at ~16 Ma led to changes in the Os and Sr isotopic composition of the world’s oceans from that point to the present. This paper was co-authored with CC alumnus Lou Derry (Cornell University). I published two papers, co-authored with CC students Devon Cole ('14) and Anne Hakim ('15), on uppermost Devonian strata from western Laurentia. I also published a paper in GSA Bulletin, which is the first to come out of my work in Inner Mongolia, with a post-doctoral fellow Jitao Chen, who was at CC for two several month long stints. This paper has CC alumnus ('13) Zach Snyder as a co-author. We describe the depositional and tectonic history of rocks from that part of the North China block, and speculate as to the paleogeographic relationships of that part of North China to adjacent tectonic blocks. I spent another field season in Inner Mongolia this past summer, and had a long field season in the high Himalayan Spiti Valley, a location I visited on my first trip to India in 2000. Here, I worked on an Ordovician–Silurian section with Indian colleagues, and saw a lot of landslides on the way home...some of which

blocked our roads for short times.

I co-authored two papers with my colleagues on Indian strata, one on an outlier of Proterozoic phosphatic rocks, and the other a monograph on brachiopods from the Himalaya. I continue work on an experimental sedimentology NSF project to analyze disequilibrium behavior of wave ripples. We published one paper in JGR this year that uses numerical models to explain some of the geometric changes associated with transitions from one bedform equilibrium state to another. I am also continuing work on a NASA grant aimed at understanding the environmental, ecological, and diagenetic aspects of the latest Proterozoic Ediacaran biota.

This fall Eric Leonard and I led the Regional Geology class through Wyoming and Montana, and we went to some of the outcrops that my past Canadian Rockies regional geology classes have visited, including the Belt Supergroup rocks with Don Winston, my old friend from U. Montana.

On a personal front, I am rehabilitating my left index finger, which I had surgery on after jamming a large cactus spine into it last winter. I hope to gain full range of motion so that I can play guitar at the same level I did prior to the accident. I am spending time in Philadelphia with my girlfriend, a city that is far nicer than I remember it when I was younger. I have played few musical shows but hope to get back to it shortly. I invite anyone traveling through Colorado to look me up and generally keep in touch!



HENRY FRICKE
(Geochemistry)

Hello everyone! After much of the usual prodding, I am finally sitting down to write this update. In doing so, it has occurred to me that 2015 saw my 15-year anniversary at CC (I arrived the summer of 2000). When I first got here I was in awe of the two decades of service that Eric and Jeff had under their belts, and now I am closing in on the same. Yikes. I still can't grow a beard though, so at least I am not turning into them (although I am turning into my dad). And of course I can't thank all of you who made your way through the department during my time here enough for making these 15 years so fulfilling and so enjoyable.

As for year fifteen, my definite highlight was handing off the Chair position to Jeff and three-plus years. Although I really learned a lot about how the college works - by going to meetings - about how the department works - by having meetings - and I got to know every major - by meeting each one of them when they declared - it is really nice to have a break from meetings.

Now that I don't meet so much, I am trying to get back into the swing of science writing, which has been tough, but I'm getting there. This is good because students and I have been working on a lot of fun and interesting projects that either (1) need to be written up and published or (2) need some grant support to keep growing. For example, Vikki Crystal and now Erica Evans and Jed Ball have done some great - groundbreaking really - work on surface processes taking place on late Cretaceous landscapes of western North America, particularly in Utah. Some of the highlights include evidence for methane

formation in soils, niche partitioning by dinosaurs, variations in soil drainage between river channels and the role of floods, and finally evidence for closed-canopy forests, all of which needs to get published (thanks for the prodding, Vikki!). On the 'getting started' side of things, work in the Piceance basin is beginning to take off and an NSF proposal is on the horizon. Fischer Hazen spent the fall producing a fantastic chemostratigraphic curve that allows us to identify the ETM2 (and subsequent!) Paleogene hyperthermal events in the basin. These events have also been recognized in the Bighorn basin, thus my collaborators and I (including Katie Snell '02, who is now at CU Boulder!) plan to submit a proposal to compare impacts of these events between basins. Research that is sort of in the middle stages of life include studies of paleoelevation of the Central Rockies during the latest Eocene such as that being done by Gabi Rossetto; this work could use some follow-up data before being ready for publication.

On the teaching side of things I once again had a great opportunity to co-teach GY140 during block 1, this time with Perry Spector (who is filling in for Eric while he is on sabbatical). I learned a bunch about geomorphology – ice and glaciers in particular - and how to bring more of it into GY140. GY335 Geochemistry was a challenge this year, with 25 (!) students and (unfortunately) lots of snow that made adding a field component difficult. I learned later that there is a lot of great geochemistry to be done on snow, and as a result I incorporated some of this work into my EV128 block in block 4. I may do the same next time GY335 comes around, and thus conquer snow (and teaching in block 6) once and for all! My absolute teaching highlight of the year, however, came in the form of co-teaching GY140 with Christine in Tuscany (!). We spent a few weeks living in a hilltop castle, studying how Italy formed (Christine) and how geology influences wine

making (me). Guess what – I want to do it again next year!

Away from CC it has been a busy year for the family. Our big event was moving up Tejon Street, away from the Uintah corner to a bigger house with a garage and nice big yard. Although it was not a long move distance-wise, it definitely ate up a lot of the summer getting one house ready to sell, packing up once it was sold, and then unpacking everything in the new place. You can bet we won't be moving again any time soon. Other family stuff included skiing, travel to visit family in Seattle, New York City, Delaware and New Hampshire. Eli is a freshman in high school this year, and Annaliese is plowing through her first year in middle school. Our last bit of family news is that we got another dog. I was ready for a break from pets after Buddy, but once Erin discovered that animal shelters post photos online, it was all over. His name is Watson, he is 5 or so, and unlike Buddy he is more of a sleeper than a runner. But he lets the kids sleep with him, and that's all it took for him to become an integral part of the family.

Well, I think this is pretty much my year in a nutshell! As usual I hope all is well out there in alumni land, and I hope that you stop by and visit the department if you can!



JEFF NOBLET
(Igneous Petrology)

Greetings,
This year has been a Tale of Two Departments. I served as chair for the Organismal Biology and Ecology for its first year (a separation of the old Bi-

ology department into its two major components) and had a good time getting to know faculty and staff in that department. It was a year for careful consideration of the needs of the two new departments (Mario Montano is chair for the new Molecular Biology department) and division of everything from budget and assigned classrooms for teaching, re-organization of space to accommodate new faculty and their research needs, all the way to counting pens in the old office to be divided between the new offices! I think there were at least ten drafts of all proposed divisions, but in the end we reached consensus agreements. Paul Myrow now gets to chair OBE for two years with an eye towards the future- new directions the faculty may go to enhance their offerings, especially in the field. We have seen one instance of this in the First-Year Experience class proposed by our Megan and Emilie from OBE to be team-taught in the Salton Sea- nice start to a college experience for these first-years. I must admit things are much calmer in Geology and really appreciate the hard work Henry did for the last three-plus years to keep the department on track. Hopefully I will be able to fill his shoes well.

I have taught most of the classes I will teach for the next few years now- including that blend of science and philosophical perspectives in the Physical and Environmental Geology First-Year experience, the new 211 version of the Earth as A Chemical System, Igneous Petrology, and Ecofeminism. Hope to add Volcanology in the near future, espe-

cially since New Mexico is such an amazing locale to illustrate the range of continental volcanic products. I'm working with three research students this year. Two started their theses during their study abroad program in New Zealand. One is synthesizing work on a young intraplate volcano near Canterbury studying about sixty thin sections and about one hundred XRF chemical and a dozen microprobe mineral analyses. She is able to model a system with a half-dozen shallow magma chambers that undergo fractionation from picritic basalt to hawaiiite, mugearite, and benmoreite (kudos to any of you who at least recognize these rock names!), each periodically replenished by a deeper magma chamber, as evidenced by changes in the chemistry of the minerals and rocks. Another started working on that same volcano and was examining unusually over-thickened flows when he recognized one of the flows is a nephelinite. He is working on quantifying the physical parameters that would allow normally low-viscosity lava to be considerably thickened. The third worked on a Keck project and spent two weeks observing spatter cones that produce clastogenic flows- flows that are poorly understood and potentially hazardous. She added a week's work at Syracuse University experimentally reproducing these flows. She is currently developing a quantitative model for all the factors she can identify and their interactions to understand when a clastogenic flow might develop. I continue to be interested in working with students on local projects including the examination of trace elements in flows within the Rio Grande Rift, work on the multiple generations of dikes in the Wet Mountain area and ways we might sort out their history, on the infilling of a magma chamber within the Pikes Peak Batholith that created layered granite, or on mineral control of the magma mingling within Proterozoic sites in Colorado, etc.

My wife, Jenny, is happily engaged as Direc-

tor for the Math Excel Center and teaching graduate math classes in topology and geometry at UCCS. My son-in-law's fancy concrete patio/driveway business is booming and my daughter Jenny is happily working as a housewife taking our six-year old granddaughter, Arden, to kindergarten and trying to keep up with the very active two-year old Daphne. Hope you are all well and will drop in anytime! jeff



CHRISTINE SIDDOWAY
(Structure)

Hi, Everyone! As I write this, I'm just back from the Fall AGU meeting – a highlight of which was the festive CC Geo alumni get together. Absolutely wonderful

to see all who turned out—and an especial pleasure to catch up with those whose life endeavors are in realms unfamiliar to the rest of us. Greg Schorr '96, for example, investigates diving behavior of marine mammals, and attended a professional conference in San Francisco that fortuitously coincided with AGU. Greg developed small recoverable satellite tags that allowed him and his partner Erin Falcone to document astonishing [long-duration deep dives](#) by Cuvier beaked whales—research that is causing quite a stir. Another is [Sarah DeWitt](#), employed in science communication by NASA: last year, she spurred NASA to adopt its first agency-wide science communication leadership program. All the earth-science developments are also amazing – we love to get ALUMNI NEWS posts of every kind to the [GeoDept ColoradoCollege](#) Facebook page. Don't be bashful!

As for my news, I have a new NSF project in Antarctica that bears a lot of resemblance to planetary exploration! It involves geophysical survey data and geospatial analy-

sis, carried out from my computer workstation without a whit of field work. You can learn more about the ROSETTA-ICE or get updates at <http://sites.coloradocollege.edu/csiddoway/rosetta-ice-ross-ice-shelf-project/>. In teaching this year, Henry Fricke organized a Physical Geology block in Italy, as part of CC's Mediterranean Semester, and I got to teach half of it! That was a sensational experience and a great opportunity to renew old friendships at University of Siena, where I did a postdoc, years ago. Sensational geology and teaching location, and a crucial opportunity to regain some facility in speaking Italian. Back on campus, in addition to Structural Geology, I again taught Introduction to Geodesign, that equips students with GIS skills, then applies them to environmentalism on the campus. An upcoming 100-level class, which will have a very stimulating reading list, is In Extinction's Embrace: Reading Non-Fiction on Climate Change, from a Geological Perspective. Very timely for the course, author Elizabeth Kolbert will present the annual [Linneman Lecture](#) during the same block. Looking beyond the spring courses to what the rest of 2016 will bring: a sabbatical year with international field work and some research stints at universities. Bring it on!



PERRY SPECTOR
(Geomorphology)

Hello! 2015 has been a great and diverse year for me. I'm currently a grad student at UW in Seattle researching the glacial history of Antarctica using cosmogenic nuclides. Just about

all of my time in grad school so far has been research focused, so I jumped at the opportunity to come back to CC and teach for the year while Eric Leonard is on sabbatical

(I co-taught one block of GY212 in 2014 with Megan Anderson).

Teaching has been great so far: this fall I taught two Physical Geology courses (one co-taught with Henry) and a Geomorphology course, all of which went really well. Out of the many field trips, week-long stints in both New Mexico and at Baca were particularly memorable. Currently, I'm in the middle of a grand winter break (as I'm not teaching half block or block 5), in which I had a wonderful holiday vacation in Seattle, and I have been prepping for upcoming courses.

This spring I'll be teaching two new courses: 1) Ice and Climate and 2) Geochronology, in addition to another Physical Geology course. Although the two new courses will be largely campus based, I'm looking forward to touring the National Ice Core Laboratory next month in Denver.

This summer it'll be back to Seattle for me. I've probably got another year left at UW before they decide that I've done enough to warrant a PhD. On the horizon for this coming winter is another Antarctic field season (it'll be summer down there). This season will be quite exciting as we'll be drilling few-hundred meter boreholes through shallow parts of the West Antarctic Ice Sheet and recovering subglacial bedrock from beneath the ice. If the ice sheet has been substantially smaller during the Pleistocene, there should be measurable concentrations of cosmogenic nuclides in these samples that will hopefully contain information about the history of past deglaciations.



STEVE WEAVER
(Technical Director)

It has been another great year as Geo Tech Director supporting faculty and students in many class and research endeavors. As of this month (Jan 2016) I have now been at CC for 21 years! It seems sometimes like I just got here. Student and faculty field and lab based activity remains high with the analytical facilities getting lots of use. I enjoyed spending time in the field with students for part of the Senior Regional Geology trip to Wyoming and Montana. I continue to be active with my photography and received several awards including a top 10 Honorable mention in the Nature category in the International Black & White Spider Awards and a top 100 in the North America Nature Photography Showcase awards. As always you can check out my work at my website: www.stephen-weaver.com, and follow me on Facebook and Google+.



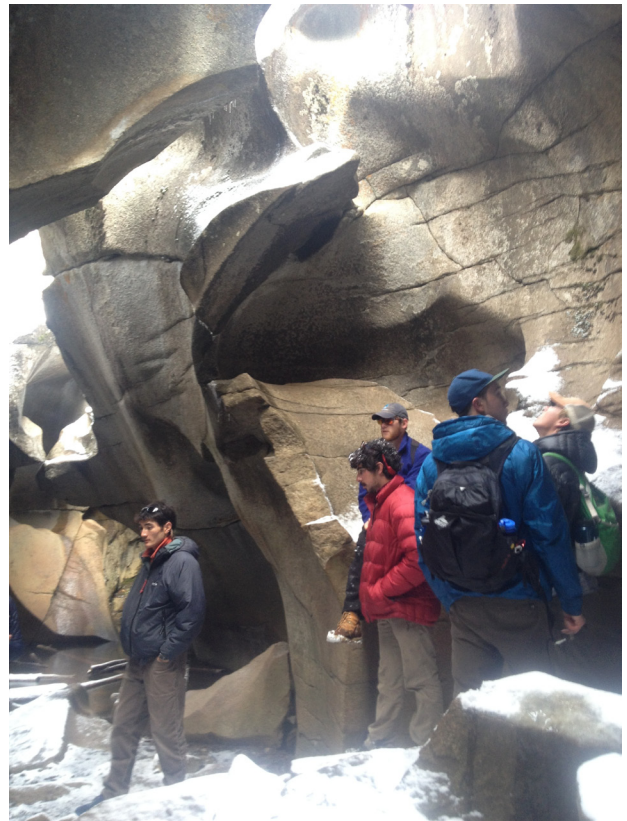
MANDY SULFRIAN
(Staff Assistant)

Wow! Another year has blown past! Cannot believe it. It's been a great year though. Another great group of majors graduated in May; I really enjoyed meeting and visiting with their parents at the Senior Reception the day before graduation. It's bittersweet to get to know the students most during their senior year and then they graduate. I really miss seeing them when they leave. It has been a fun year getting to know our new paraprofs this year, as every year. Betsie and Madison are wonderful and fun to be around.

I was promoted this past year at CC (still in the Geo Department) and part of that meant that I now work full time including the summer. I wasn't sure if I would like working all the time, but it was actually pretty good. Charlie gives me a hard time that it's the first time in 33 years that I have a full time job – between kids and then working for school districts, I didn't work summers at all.

Our family is growing – our daughter, Katie, just had her third baby, so that makes four grandkids. We love it! It's great getting together with our family and watching the grandkids grow and change.

Hope all is well with you and that you are happy and healthy. If you're in Colorado Springs, please do stop by the office. I love hearing how everything is working out for you!



A photo from Perry Spector's Geomorphology field trip to the grottos west of Independence Pass



Image of the paraprof office from Block 1. Guest paraprofs Drew Huemmler ('15, Left) and Virginia Hill ('15, Right) were big helps in getting the year started. Thanks again!

Frontiers Abroad 2015

Emily Beckham ('16)

Ryan Kroner ('16)

For our semester abroad, we participated in the Frontiers Abroad Geology program with a group of other American college students. Frontiers Abroad starts off with a five week field camp in which the students travel all over New Zealand learning first hand about different geological topics ranging from glaciology to volcanology. This was a surreal experience for many reasons; however, the most striking thing about New Zealand was the sheer geological diversity contained within such a small place. The North and South Island combined make up a total geographic area no larger than Colorado, but within this region one can encounter just about every type of geology.



Emily and Ryan at Mt. Ngauruhoe (AKA Mount Doom).

One of the most memorable experiences of this field camp was mapping the lava flows of Mount Ngauruhoe (AKA Mount Doom). The realization that we were mapping an area of active volcanism, combined with the sweeping vistas so familiar from the Lord of the Rings movies, made this exercise one we would never forget. The active nature of the volcano became real to us when

we encountered an outcrop, composed of thin layers of pyroclastic material, that was steaming vigorously and was warm to the touch. Visualizing the subsurface magma that was causing the outcrop to steam completely blew our minds (thankfully not the volcano, though!) Moreover, the warmth emanating from the rock was welcome on this particular day due to the cold wind and rain that was testing the quality of our Rite in the Rain fieldbooks.



Photo taken while tramping in Aoraki/Mount Cook National Park, whose namesake – the tallest mountain in New Zealand – looms in the background.

The mapping project itself was simultaneously familiar and alien. While the techniques we used were the same as those we had employed countless days in the field during geology courses at CC, the geologic features to which they were being applied were entirely new to us. Not only were these fields of young, black basaltic flows new to us, but also were features that we could not have easily observed within the United States.

This marriage of the familiar to the alien was not unique to this mapping exercise. The whole of New Zealand presented numerous opportunities to apply knowledge gained at CC to incredible and foreign environments. From mapping the metamorphic core com-

plex of Gondwanaland to participating in a geohazard exercise simulating a large-scale volcanic eruption and the responses of media and scientists, this semester truly enriched the scope of our geological education.



The steaming outcrop our group encountered while mapping the lava flows of Mount Ngauruhoe.

Geology Alumni Offspring Head to CC

At least six children of Geology Department alums are currently students at CC -- James Langford (father -- Richard "Rip" Langford, class of 1979), Claire Derry (father -- Lou Derry, class of 1981), Lindsay Miller (parents -- Marli Miller, class of 1982 and Julie Bryant, class of 1983), Gordon Gianniny (parents -- Gary Gianniny class of 1983 and Cynthia Dott, Biology major, class of 1985), Morgan Sulger (father -- Teddy Sulger, class of 1984), and Eliza Mott (father -- Greg Mott, class of 1984). None has yet declared a Geology major, but we are hopeful.

Three of their parents were Geology para-profs in the 1980s, four currently hold college/university Geology faculty positions, and a fifth has a Biology faculty position.



Megan Anderson's GY212 Course in the field at Rocky Mountain National Park



Regional Studies course hiking to Grinnell Glacier in the Many Glacier area of Glacier National Park, MT

Regional Studies 2015

Jed Ball '16

We awoke to the sounds of sprinklers and half-awake cries of shock. We really should have known better – this campground had been receiving a healthy dose of water throughout the afternoon. We were far too preoccupied with the thought of starting our geologic adventure the next day than to practice standard waterproofing techniques. It would cost us dearly.

Had it not been for Fischer, his and my things would have certainly been drenched. With great gusto, he darted out of his sleeping bag towards the cooking ware and grabbed the largest pot he could find and proceeded to cover the sprinkler. Our belongings would remain dry. Others were not so lucky...



'Selfie' from Senior Jonathan Zou as students brace themselves for the noise of an oncoming train

And thus began the Geology Regionals Class of 2015 through Wyoming and Montana. It would be a class contained with a visit to two of the most scenic National Parks in America, Yellowstone and Glacier, and pretty much everything in between. It was a trip that would perfectly culminate our time in geology, learning about a variety of topics

that drew from most of our classes while also learning about some of the most outlandish theories on bizarre geologic occurrences that many of us had ever heard.

Our trip began on a crisp Sunday afternoon in mid-September. We drove north to Cody, Wyoming, where one of our classmates realized a lifelong dream of visiting the city that bore his name. This leg of the journey provided us with one of the many absurd geologic theories that we encountered on the trip, the Heart Mountain Detachment Fault. We were all well versed in faults, but this one was special. Instead of displacement happening over the course of millions of years, this happened on a human time scale, perhaps even faster. Due to some volcanic activity, magma seeped in along a horizontal plane, separating a mountain's worth of material from its basal surface. This caused an essentially frictionless surface on which this block would slide. This rock careened through the Wyoming and Montana countryside at alarming speeds. And if this wasn't worrisome enough, the fluidized basal surface caused volcanoes to form on top of this rock. Now, this is still a theory, but despite how impossible it may seem, I want it to be true more than anything.

We carried on north towards Missoula, Montana, where we met up with an old colleague of Paul Myrow. An old, quiet man, who still had his youthful vigor and refused to wear more than a sweater in subfreezing temperatures, Don Winston, he led us through some unusual stratigraphy in western Montana. The heart of his theory was that there was a massive, shallow lake in the Precambrian that behaved like nothing since had. Once again, despite its apparent nonsensicalness, I refused to rule it out because if this trip taught me anything, it is to never say never. We finished off this segment of the trip at Don's idyllic, mountain cabin, where we enjoyed a round of bratwursts, s'mores, and campfire classics such as "Wagon Wheel" (because we all enjoy bluegrass), "Will The Circle Be Unbroken," and per Jonathan's request, "Radioactive" and "Boulevard of Broken Dreams."

Having had our fair share of wild theories, we learned about something that was

widely accepted, though still hard to believe – Glacial Lake Missoula. Lake Missoula was a massive lake that flooded much of western Montana during the Holocene. At several points over its lifespan, the glacial dam burst releasing an enormous amount of water, some 60 times the amount of water than the Amazon River. It inundated much of the northern United States all the way to Washington, stripping much of the top soil off of anything in its path.

We continued towards Glacier National Park, perhaps Eric Leonard's favorite place in the entire world. We took a day trip to one of Glacier's few remaining glaciers, Many



Class Photo at Grinnell Glacier, Glacier National Park

Glacier. Not only did we encounter some geology that Paul Myrow could only describe as "nuts," we also saw a plethora of wild animals in their natural habitat. What an experience it was to lock eyes with a moose! We finished our hike at the lake that the glacier fed into. And having accumulated a weeks worth of grime, dirt and sweat, a few of us decided what better than to take a bath in the balmy waters of the Many Glacier.

With a blizzard on our heels, we headed towards the marquis destination, Yellowstone National Park. Though many of us had been before, Yellowstone is one of those places that require repeated viewings to see everything that there is to offer. Not only are there hot springs, meadows,

volcanoes, and bears (!), we learned of yet another spectacular theory on the formation of Mary Bay on Yellowstone Lake, which was a personal favorite of mine. Roughly, there was this sequence of events: an earthquake happened, which led to a tsunami developing on Yellowstone Lake, which, somehow, triggered a hydrothermal explosion, which was the largest in Yellowstone's history, that obliterated an area the size of a football field, and then, it has been suggested, it happened again. We left the park, relieved that these types of things were no longer happening.

For our last leg of the journey, we ventured west towards the Bighorn Basin, where we met up with Christine Siddoway. Now having three professors, we felt confident enough to set out to glean insights from small-scale structures into the nature of the structure of the Bighorn Mountains through a large-scale mapping project.

We finished the project and because of our hard work and perhaps Paul and Eric's desire to be rid of us, we were told that we would be heading home early! We broke out in jubilation at the thought of sleeping in a bed, not smelling like nature, or not having to eat another sandwich ever again.

Field trips have always been a favorite aspect of my Geology experience at CC, and I imagine that many of my classmates would agree. It is what draws us to the major. While others were sitting in Armstrong staring at a chalkboard, we had class with mountains in the background or waterfall thundering over the sound of our voices. While others stared at the ceiling of their bedroom trying to fall asleep, we could look up toward the night sky. Most importantly, the experience was further enriched by having such great classmates that were all eager to learn and be with each other 24/7 (at least, most of the time). I feel that I can speak for the class, when I say that we are very grateful for Eric, Paul, and Mandy for orchestrating such a wonderful experience for us all.

Witter Family Fund Established; Alumni Support Requested

Over the years many of you have asked if there were something you might be able to do for the department and its current students. The Geology Department has recently received an amazing gift, which with your support will create new opportunities for alumni-student experiences.

Bill Witter '86 has just established the Witter Family Fund for Internships in Geology. This fund will support 8-12 current students annually for the next five years to undertake an internship in geology. If the program is successful, Bill hopes to continue the fund.

In past Precambrian Basement newsletters, we have shared stories of the success we have had over the years in providing research opportunities for CC Geology students. In the past decade, we have also been able to engage students in a number of practical applications, industry experiences, and problem-solving projects in course work and in research with faculty. Recent students have worked on aspects of the fire and floods that devastated Colorado Springs, and last summer several students completed an investigation at the Air Force Academy that helped map the depth to water table beneath a new environmentally designed building. But we have been less successful in placing our students in good internships outside CC, especially since the recent recession.

Bill's gift will allow us to provide stipends to students to undertake geology-focused internships. The department is very excited about being able to: 1) show its students the more practical aspects of geology within government, industry, non-profit, or research universities; 2) identify meaningful projects or internships for rising sophomores and juniors; and 3) provide a bridge of support immediately after Geology majors graduate. Internships' durations may range from a few weeks during a block off within the academic year to ten weeks during the summer. We will of course continue to support original research experiences for our students, but we are looking forward to providing even more ways in which we can help each student in the ways that may have the most impact for that individual.

Here is where alumni participation comes in. We invite you to mentor students, at no cost to you or your employer, and engage bright, enquiring CC students as participants in your work. We would also be delighted if your company had a paid position that we could supplement with travel and living stipend, for example, to allow more students to participate in our internship program.

What we need now is to develop a pool of possible internships that students might select! Please let us know as soon as possible about internships that you might be able to provide, or contacts with people you know in the geological fields who might be able to host a student for work on project(s)! We would like to select a group of students to start this coming summer (2016). Note that these internships could range from those open to sophomores with several geology classes behind them, to summer positions for this year's graduates. Be sure to specify what you are looking for.

We look forward to a strong response from you, our alumni, as well as our students. With the

ability to support 8-12 students, we anticipate not all internship opportunities provided will receive a student supported by the Witter Family Fund for internships in Geology this year. We hope that you will be patient as we try to guide our students to any positions you may have, even if it takes some years to find students for all of you. We will reach out annually to you to confirm that your offers are still available and to add new offers as they arise.

We are aware, and celebrate, that many of our alums pursue fields other than geology and may not have the contacts to provide geology internships. Please note the college's Career Center is very active in seeking internships in all fields and in working to match students with appropriate positions. Should you have internship opportunities in other disciplines or fields, please contact Don Bricker, Associate Director of the Career Center at Don.Bricker@coloradocollege.edu or 719-389-6279.

Please, let us know if you have opportunities ready to go this summer, and ones that might be available soon. We will respond to those of you who contact us with a simple form asking for information that we can easily upload into a website and give students a way to compare and consider their options. Students will apply for particular positions to us and we will make initial matches. We will ask the selected students to contact you for a semi-formal interview to ensure that our choices will work for you (and as good practice for the students). If we have several good candidates seeking one position we may ask you to choose your best fit. And we will review student feedback and comments from the intern organizations to make sure they are working well for everyone.

Thank you all for anything you can do now to help us take advantage of this wonderful gift and get our students engaged! One aspect that delights us very much is the prospect of renewing ties with Geology alumni and discovering new connections that arise from current careers and modes of inquiry.

Sincerely,
Jeff Noble

P.S. You may send ideas to either my email or to Mandy Sulfrian, who will doubtlessly be organizing the information!

jnoble@coloradocollege.edu; 719-389-6516

msulfrian@coloradocollege.edu; 719-389-6621

Alumni Spotlight

John (Jack) Coash '47

I came to Colorado College, from Cleveland, Ohio, in Fall 1940, on a work/study grant (dusted every book in Coburn Library). Took Geology to satisfy science requirement and decided to major.

In the fall of 1941, I was playing violin with the college orchestra, at a Theater Dept. production up at Cripple Creek. The production was halted and the announcement was made that the Japanese had bombed Pearl Harbor! I was drafted at the end of December, and served 3+ years in the Army Signal Corps, including 1+ years in India, where I roamed the foothills of the Himalayas. Returned to CC after the war, worked at the Faculty Club and became student assistant to Prof. Don Gould, (where I met Walt Sweet) and gave my first lecture in the "pit". I was a member of Sigma Xi and Phi Beta Kappa. Graduated with honors, June 1947.

Went on to graduate school at CU in Boulder (MS 1949), where I met and married Emily Rocque (Navy nurse). Worked part-time for Conoco, to supplement the GI Bill. We had three children.

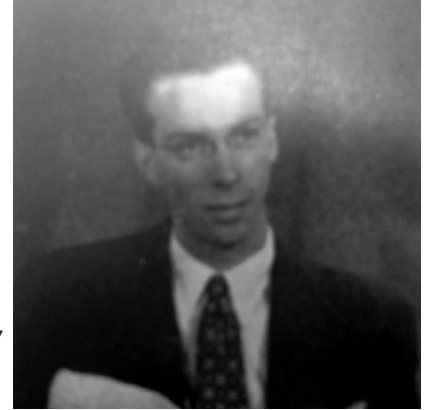
Fall 1949, moved to Ohio, as Assistant Professor at Bowling Green State University. Served there for 17 years as Full Professor, Department Chair, Director of Honors Program, Director of Grants Office, and Director of 2 NSF Summer Institutes for Earth Science teachers. Also attended 2 summer institutes – Oceanography (at Florida State) and History of Geology (British Isles). One year break to attend graduate school at Yale University – PhD in 1954, dissertation on Mt. Velma quadrangle in Northern Nevada, published by Nevada Bureau of Mines. Ran summer field camps for 9 years at the Nevada site (and one year at CC).

During this time, I was a member of AAPG and the Society of Research Administrators, a Fellow of AAAS and GSA, Vice-President of the Ohio Academy of Science, and President of the National Association of Geology Teachers (as well as President and Founder of the EC section). And served several years as an officer in the US Army Reserves, Corps of Engineers (Toledo, Ohio). In addition to the dissertations, there were several papers relating to geologic education, as well as presentations at professional symposia.

In 1966, I was offered a 6-month appointment as supervisor of the AID-sponsored program of summer institutes for college teachers of Geology across India. This led to a position with the National Science Foundation in Washington, DC. Two years later, an offer came to serve as science dean at the new state college in Bakersfield, California. We had two years to build, hire faculty, set up curricula, and recruit students. One of the attractions was that all academic administrators had to teach one course each year. Finally, in 1987, at age 65, I retired as Dean Emeritus of the School of Arts and Sciences, at California State University, Bakersfield (now with enrollment over 10,000).

My last professional activities were a paper on teaching geology of the national parks to non-majors (co-author, S. Smaglik), at the GSA in Denver, 1988, and a paper, "Perceptions of the Early Railroad Surveys in California", published in Earth Sciences History Journal in 1992.

I am most grateful for the start to my career, provided by Colorado College.



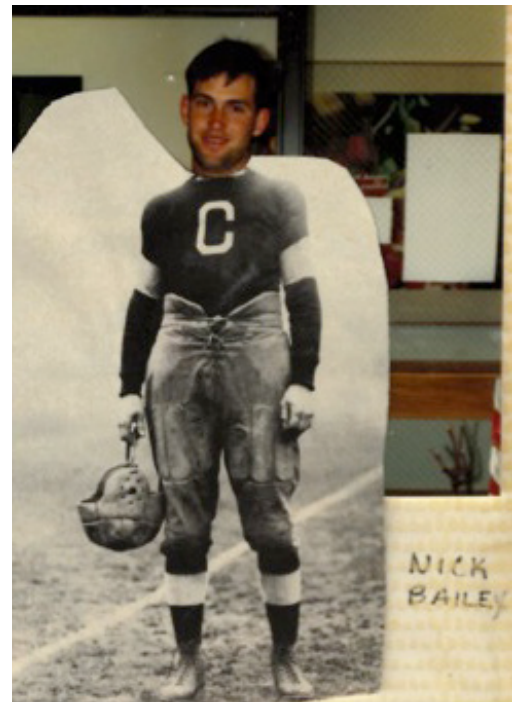
If anyone has been up to the attic of Palmer, they know the treasures that can be uncovered there. This year Madison has included some of the highlights from a binder titled "The Geology Hall of Fame."



Eric Leonard showing off his skills on the court



Poster States: "Steve, April Fools! Thanks for your help, we couldn't have done it without you.-Class of 2000"



Alumni Spotlight

A Conversation with JC Creveling ('06) and Justin Strauss ('06)

This February I had the pleasure of speaking with JC and Justin, both of the class of 2006, about life beyond Colorado College Geology and reflect on some of their highlights during their time here. Enjoy!

Madison Andres (MA): To start, describe your path beyond CC Geology.

Justin Strauss (JS): Well, I paraprof for a year after graduating. That was 2006-2007. And after that I went and worked at a lab in Princeton with a guy named Adam Maloof for about 6 months. I did some field work with Adam and some of his grad students working as a lab technician. And honestly that kind of burned me out so I decided not to go apply to grad school and took 3 or 4 years off. I travelled for a little while, I ski-bummed in Jackson for a little while then I got bored and decided that I was ready to go. Ended up applying and that is how it happened.

JC Creveling (JC): And my route started similar, I left CC and went to work as a technician for a lab at MIT for Sam Bowring. I worked there for a year, hiked around the western U.S. for a bit, and then went to grad school from there.

MA: My next question is what are some of the greatest things that a CC Geology education has equipped you with?

JS: The #1 aspect of CC Geology is the amount of field time that you get. That is wonderful to just have a baseline experience of looking at rocks and interpreting the rock record. That's pretty unique. Beyond that I would say that the collaborative environment at CC. There are a lot of group projects, and this is very powerful when applied to any type of science. In the context as well of having one-on-one time with faculty, getting feedback from them and getting to know them and their lifestyles. It was nice to get that experience and a little bit of inspiration for staying along that academic and geologic track.

JC: I guess in geology, more so than other classes that I took at CC, I feel like we followed a project all the way through, as an example, a thesis or an in-class project. That is the sort of continuity that I think you see in any profession. Whether or not its academic geology, which



Justin Strauss photographed as a paraprof in the '06-'07 Academic Year

I do on a larger scale for my job, but also for other jobs having that structure and understanding how to divide your time and follow through across a whole project is very useful.

MA: My next question is what was your best geology class at CC and your favorite non-geology course?

JS: Best non-geology class was my FYE, which I took with JC, in Chemistry. It sounds kind of strange to be an exciting class, but that was a fantastic class. Sally Meyer is a great teacher. I ended up not taking too many classes outside of science actually, for better or for worse. Despite that I found Sally to be one of the best professors that I had at CC. For classes within geology, that is a tough call, I really liked our regional studies course. We went to the Caribbean and sailed around the Lesser Antilles Arc. It doesn't get much better than that for regional geology. I have to say that I loved historical geology. That was a fantastic course taught by Paul, and I think that is the course that really hooked me into geology.

JC: In geology, Justin and I took a lot of classes together, so I'll echo that historical was really a class that made me become a major. And regionals was a class that made me really appreciate the people around me in the major and also what all the perks of our job are, in terms of travel. I also really like the geochemistry course that Henry taught. He taught it as a seminar style course, so we would read geology literature and had never seen anything like that as an undergrad. It was my first taste of how you could incorporate research into education instead of just textbooks. Outside the major, I took an elective on pilgrimage in the religion department and that was probably the best course I took. Part of why I liked it is that I think the subject is interesting. I forget who taught it, but I had an awesome time [with fellow seniors in the course talking about pilgrimage]. It was a great course that was intellectually challenging but also a bit of a break. I really appreciated it.



JC photographed with a course in Cave of the Winds in 2004

MA: I know you both mentioned your regionals trip, but what was your favorite field trip or block break trip?

JC: Every year I would go on Sally Meyer's first block break trip out to this farm in Kansas called the Land Institute. And it was a weeklong seminar in a barn about sustainable agriculture and there were always awesome barn bands. She would always organize a handful of people to go out there and I always looked forward to that.

JS: I had an epic field trip with Paul Myrow's invertebrate paleontology class. I remember

some really amazing adventures and that was my favorite field trip. We went down to New Mexico and El Paso, TX. Then we headed back up, we were supposed to cross over part of the Sangre De Cristos and got stuck in the snow. It was an upper-level class, not necessarily my favorite course but that field trip will always stick out as one of the better trips I ever did, even though it was a complete disaster. Block breaks are tough-I had a lot of good block breaks, but every year me and my friends would cram into a hotel room in Jackson Hole, WY, cook food on the balcony of Motel 6, ski all day and drink beer. Those were some great block breaks.

MA: Last question for you guys, what is some advice that you have for a more recent graduate who is considering pursuing geology in the academic realm?

JS: I would say that 1) it's pretty rough right now, in industry especially, and your connections are critical. Talk to your academic advisors and get their advice and as much support from them as possible. They can connect you to other folks who are interested in working with you. A lot of good geology is about good connections and trust between people, so if you are really into it that helps a lot. And in reality those advisors at CC know you the best so they are going to be the best resource for you.

JC: Yeah, I definitely would agree with that sentiment. I talk to a lot of people, partly now from being in the position of trying to accept graduate students, I know less about the industry. I think it's easy to know that you want to go to graduate school or what industry you want to go into, but I think it's hard to do the soul searching to try and find a project and let more specific things that you are interested in float to the top. It's a hard place and you have to keep your head down, focus and commit to something for a long time. It's worth it upfront to think about the skills you want to gain and the kind of people you want surrounding you through that. It's important to check with your advisor to see who is going to be that supportive advisor that will help you navigate to your career.

JS: I will say one other thing and that's don't go to grad school unless you are really fired up and really ready to commit. Take time off. I think that that's really important and I think advisors who are looking to students coming in respect folks that did something and have a bit more maturity.

JC: Yeah, definitely. Grad school, especially if you follow a PhD program, you are going to live somewhere and work there through most of your 20's. And that is sort of a shocking thing when you are 21 or 22. You have to think more about the life you want to have rather than just the questions that you are following.

MA: Great, thank you guys so much for taking the time out of your days today. It will be much appreciated for our readers of the Precambrian Basement.

Geology Day

March 28, 2015, Tuttle Science Lecture Hall

Student Presentations:

Madison Andres '15 "Fire Frequency in the Last Millennium in the Grinnell Glacier and Swiftcurrent Lake Drainage Basins, Glacier National Park, Montana"

Sally Shatford '15 "Along-strike variations in detrital zircon provenance of Tava sandstone injectites, Colorado Front Range: insights into terrestrial paleoenvironments of Rodinia"

Jessica Badgeley '15 "Geophysical evidence for englacial brine associated with Blood Falls, McMurdo Dry Valleys, Antarctica"

Erica Evans '16 "Last Glacial Maximum in the Culebra Peak Area of the Colorado Sangre De Cristo – Results of Paleoglacial Numerical Modeling"

Alex Hager '15 "Geochronology and stratigraphy of Comanche National Grasslands, CO"

Anne Hakim '15 "Sedimentology, Chemostratigraphy, Biostratigraphy, and Sequence Stratigraphy of Middle Ordovician Strata, Inner Mongolia, China"

Carolyn Nuyen '15 "Lithospheric deformation along the southern and western suture zones of the Wyoming Province"

Sam Elkind '16 "Mapping the known extent of the Tava Sandstone"

Lauren Williamson '16 "Latitude and Growth Rate in Pliocene *Glycimeris americana*"

Dan Butler '15 "Trace Element Geochemistry and Petrology of Aden Crater and the Albuquerque Volcanoes"

Colin Chupik '16 "Paleoseismology Analysis of the Hope and Wairau Faults Using LIDAR, South Island of New Zealand"

Dylan Voneiff '15 "Changes in groundwater geochemistry during the PETM: an analysis of major and trace element concentrations in authigenic carbonate nodules, Bighorn Basin, Wyoming"

Betsie Hopper '15 "Climate Change during ETM2 and H2: exploring terrestrial carbonate nodules as a proxy"

Zach Keskinen '15 "An Examination of Controls on Moulin Microclimatology, Kennicott and Root Glaciers, Alaska"

Alec Lee '15 "Paleo fluid-flow in Neoproterozoic sandstone injectites - Evidence for the migration of hydrocarbons in the Colorado Front Range"

Austin Miller '15 "A geochemical investigation of oxygenation in the early Ediacaran oceans at the type section of the Sheepbed Formation, Mackenzie Mountains, Northwest Territories, Canada"



Seniors Eric Goosman, Emily Beckham, and Ryan Kroner at the 2015 GSA Meeting in Baltimore, MD

Senior Awards

Annual Awards
Year: 2014-2015

Rocky Mountain Association of Geologists
Award:
Jessica Badgeley '15

Estwing Outstanding Senior Geologist:
Anne Hakim '15

William A. Fischer Special Recognition:
Austin Miller '15

Rocky Mountain Association of Geologists
McKenna Scholarship (for a junior the previous year): Austin Miller '15 and Betsie Hopper '15

Buster Scholarships:
Daniel Butler '15
Charlotte Cadow '16
Samuel Elkind '16
Alexander Hager '15
Virginia Hill '15
Zachary Keskinen '15
Alec Lee '15
Gabriella Rossetto '15
Sally Shatford '15
John Swisher '15
Dylan Voneiff '15
Lauren Williamson '16
Jonathan Zou '16

Gould Scholarship Recipient: Spring 2015
Alice Forbes '15

Putman Scholarship Recipients: Spring 2015
Colin Chupik '16
Noah Cutter '16
Benjamin Justman '16
Lauren Williamson '16

Rhoades Scholarship:
Noah Cutter '16
Benjamin Justman '16
Lauren Williamson '16

William A. Fischer Family Scholarship:
Erin Hightower '16

Hannigan Family Fund:
Erica Evans '16

Venture Grants:
Jessica Badgeley '15 and Betsie Hopper '15
"Horseback Geologic Survey of Bear Basin Ranch"
Colin Chupik '16 "Earthquake Hazard Assessment Through Trenching Along the Alpine Fault, New Zealand"
Andrew Huemmler '15 and Austin Miller '15
"Building Practices and Erosional Impacts on Mountain Biking Trails of the American Southwest"
Fischer Hazen '16 and Ben Justman '16
"Comparative Snowpack Assessment and Analysis: An Exploration of the Canadian Rockies"
Hannah Marshall '17 "Glacial Dynamics and Expedition Training on the Juneau Ice Field"

Student and Recent Alumni Conference Presentations 2015

GSA in Baltimore, MD, Fall 2015

Ryan Kroner '16 presented "Composition and Rheology of over-thickened lava flow units on Banks Peninsula, NZ"

Erik Goosmann '16 presented "Geologic map of the Caloris Basin, Mercury"

Emily Beckham '16 presented "Shallow magmatic recharge in an intraplate volcanic complex, Akaroa, Banks Peninsula, New Zealand"

Austin Miller '15 presented "A geochemical investigation of oxygenation in the early

Ediacaran oceans at the type section of the Sheepbed Formation, Mackenzie Mountains, Northwest Territories, Canada”

Madison Andres '15 presented “Fire frequency during the last millennium in the Grinnell Glacier and Swiftcurrent Valley Drainage Basins, Glacier National Park, Montana”

Sally Shatford '15 presented “Laurentia Intracontinental breakup structures and paleogeography, illuminated by detrital zircon age spectra from Neoproterozoic-Cambrian sandstones of regional extent in Colorado, USA”

AGU in San Francisco, CA, Fall 2015

Jessica Badgeley '15 presented “Imaging englacial brine within a -17 C polar glacier: Blood Falls, McMurdo Dry Valleys, Antarctica”

Seminar Series Spring Semester 2014-15

Block 7 -- April 3, Dr. Katie Snell, Asst Professor CU Boulder Geological Sciences, will present “Hot and high times in the western US: paleoclimate and paleoelevation 80 Ma to Present”.

Block 8 -- April 27, Dr. Emmett Evanoff, University of Northern Colorado, “Terrestrial Records of the Eocene-Oligocene boundary from the White River Sequence”.

Block 8 -- May 4, Dr. Jim McCalpin, Paleoseismologist, “Tectonic Geomorphology in Colorado, 1972-2015; A Long Strange Trip”.

Seminar Series Fall Semester 2015-16

Block 1 -- August 26, Professor Rick Aster, Colorado State University, “Under the Ice; the Geophysical Unveiling of the Antarctic Con-

continent”.

Block 1 -- September 8, Darren Gravley, Director, Frontiers Abroad, “Frontiers Abroad: An Adventure in Field and Research Education in New Zealand”

Block 2 -- October 9, Fransiska Dannemann '12, “Improving Infrasound Event Locations in the Western US using Atmospheric Modeling”

Block 3 -- November 4, Roger Clarke, SW Geospatial Information Officer at Peterson Airforce Base, “Digital mapping and 3D geospatial construction of the urban landscape: examples from the Colorado Front range and applications to disaster management”

Block 3 -- November 5, Tom Ashley '12, Grad student at University of WY, “Improving estimates of sediment flux on the Colorado River: a morphodynamic approach”

Block 4 -- December 7, Colin Chupik '16 will present “Surficial geomorphology mapping and slip rate analysis of the Wairau Fault, South Island, New Zealand”. Grace Guryan '17 will present “Approaches to Hydrology at the United States Air Force Academy and Crested Butte, Colorado”.



This year's geology FYE, receiving their first field lecture on Colorado Springs Geology with the beautiful backdrop of Garden of the Gods and Pikes Peak

Thanks to all the alumni who have sent updates in this year! We really appreciate it. You can always send us updates at precambrianbsmt@coloradocollege.edu

Sarah Andrews '73

Sarah Andrews was announced as the recipient of the President's Medal from the Geological Society of America at the annual meeting this fall in Denver, CO. The Geological Society of America established and commissioned the President's Medal to recognize those whose impact has profoundly enhanced the geosciences profession: through supporting and contributing to the Society; by advancing geosciences, enhancing professional growth, and/or promoting geosciences in service of humankind; and/or by significantly enlarging the range of scientific achievement for the growth of our profession.

Penny Arentsen '96

My husband Paul and I are loving our rural life in Joseph, Oregon. We are enjoying running our whitewater rafting & fly fishing business (Winding Waters River Expeditions) here and raising our family. We added 1 more kiddo to the mix a year and a half ago, so we now have Linden (age 5) and Britton (age 18 months). If you ever find yourself lost near Hells Canyon, come visit us in Joseph!



Ryan Bennett '97

I am living in Marin California with my wife Jessica and two daughters, Luci (4) and Si-ena (1). I am still working in renewable energy, developing and financing wind and solar. Hope everyone is doing great!

Marion Berg '85

Alas still no professional geology work - but at least I do get to occasionally tell patients they have kidney stones or gallstones in my emergency medicine career. Also since I now have a toddler son and a newborn daughter my paleontology knowledge is drastically improving due to watching "Dinosaur Train" on PBS. I have now relocated back in "LA" (that would be Lower Alabama) and am working hard on regaining my (charming) southern accent.

James Bradbury '95

Hard to believe that I've been in DC for nearly a decade, with my wife Jenny and two girls: Zoe and Ella. Life is good. In the fall of 2014, I loved my visit to CC for the climate policy colloquium organized by Eric Leonard and Mark Smith. My favorite part was connecting with other CC alum working on climate science and policy. Hopefully there will be other chances to engage with all of you and CC students, in the future. Meanwhile, please let me know if you are headed to the nation's Capitol. I'm in the policy office of the U.S. Department of Energy and I'd love to (re)connect. Keep on rockin'.

Vikki Crystal '14

Hello Readers of the Precambrian Basement! It doesn't seem that long ago that the 2014-2015 issue of the PCB came out! I miss paraprofing and the CC Geology Department, but I am having fun in my first year of graduate school at CU Boulder navigating my way through taking classes without the block plan

and TA-ing Paleobiology and Rocks for Jocks (Intro to Geology Lab).

Fransiska Dannemann '12

I'm finishing up my M.S in Geophysics at Southern Methodist University this summer. I'm studying the applications of infrasound to nuclear monitoring and verification and hope to continue my research in a governmental or consulting position in the fall. I visited the department over homecoming weekend and had a great time catching up with everyone! Dunes is 13 and I've added another dog, Shiner, to the mix as well. I've started sewing geology-themed dog bandanas, so if you're interested let me know (fransiska.dannemann@gmail.com) Love from Texas!



Elle Emery '12

This year, I began teaching 5th and 6th grade at the Teton Valley Community School in Victor, ID (just over the pass from Jackson Hole). The school follows a "project-based" curriculum, so students drive their own learning through project topics that they choose. It just so happens that my students chose to study the geology of the Teton Region! We spent many days in the field studying rock

outcrops, observing, and making conclusions about the geology we were seeing. The past few months have been such a wonderful flashback to my CC geo experience! Beyond teaching, I finished my MA in Education and Human Development from University of Colorado Denver in August and since then, I have been focussing a lot of my free time on my artwork (watercolor/acrylic paintings and woodblock prints). The Tetons are my home for awhile, so be in touch if you find your way in this fantastic outdoor playground!

Doug Haller '88

After years of teaching, research, and consulting, I recently took a position as a program and product designer and teacher professional development provider for Creative Learning Systems. CLS designs, builds, and supports STEM education environments designed to inspire, engage, and educate students and prepare them for careers and college in the 21st century.

Robert Jacobsen '10

I'm pushing to the end of my dissertation and planning to graduate in 2016. It was great to see some of you at GSA Baltimore! This year I interviewed with an oil major and learned a lot during their short course in the Guadalupe Mtns. There I met Caty Tems! We enjoyed representing CC well and reminiscing the block plan life.



Caty Tems (2008) and Robert Jacobsen (2010) in the Sacramento Mtns, NM, part of a short course on hydrocarbon basin assessment. The outcrop on right consists of prograding reef mounds and in the background are the White Sands.

Beth Kochevar '10

Hi there!

I've been traveling quite a bit the last few years for school, work, and fun. In 2014 I received an M.S. in Natural Resources and Environmental Education from the University of Idaho. Since then, I've spent the summers raft guiding in the Sawtooths in central Idaho, and seasonally teaching outdoor environmental science in Hong Kong and presently for NatureBridge in Olympic National Park. Our campus is a short distance from amazing outdoor learning laboratories throughout the Olympic Peninsula, including the Elwha River. The largest dam removal in U.S. history was completed on the Elwha in 2014, and I most enjoy teaching the scientific, cultural, and political stories of the Elwha River Restoration with students of all ages. Send good vibes for those salmon to make it back to the headwaters! It's been a fun learning curve to teach about an ecosystem so vastly different from arid Colorado and Idaho, too. Besides teaching, I've been excited to have

time to play on many western rivers and mountains. Here are some photos from a March, 2015 trip down the Grand Canyon with a crew of CC alumni. We also had an unrivaled time at Wedfest '15 celebrating Zion Klos and Lucy Holtsnider's wedding in June!



Anna Kutkiewicz '11

For the past three years I've been working as an exploration geologist in the minerals and mining industry along the Viburnum Trend (The Doe Run Company). Since starting this position I've had the opportunity to do exploration work on various deposits all over the world (which has been an amazing adventure in itself!), running drill programs, geophysical surveys, field mapping, performing resource modeling, and completing due diligence processes. The field portions of CC's geology classes have certainly come in handy for me.

In the beginning of 2015, I started working on my Master's in Economic Geology under Dr. Ross Large at CODES (Center for Excellence in Ore Deposits, University of Tasmania, Australia). My thesis focuses on using Laser Ablation ICP-MS to map trace elemental distribution within chalcopyrite and other copper mineral phases along the Viburnum Trend (carbonate-hosted Pb-Zn-Cu). This has involved multiple flights back and forth

from St. Louis to both Perth and Tasmania for coursework and lab work, while continuing to work for Doe Run in the USA. The jet leg never gets better but it is all absolutely worth it- It has been a thrill to mingle with the most influential researchers in the field, and it has certainly inspired me and provided me with enormous drive to continue doing what I do. I also certainly don't mind the opportunities for weekend trips to the west coast Australia beaches, or oceanside rock climbing along the Tasmanian coast!

Bonita Lahey '69

I am working on primary research projects in geology at the Denver Museum of Nature and Science. I am currently finishing up one project (end Devonian) and working on another (Permian/Triassic). I work for Dr. James Hagadorn, Curator of Geology and Invertebrate Paleontology. It is great to be using my geology degrees in retirement.

Paul Osmundson '83

I am still working in San Francisco as a real estate developer, mostly on urban regeneration projects along the waterfront with historic buildings. I am a partner in a new restaurant called Atwater Tavern, right next to the San Francisco Giants ballpark, which will open next year. Drop by for a beverage when you are in town! One of our partners is former Giants Manager Dusty Baker. My wife Cappi now works for Sonoma State University (where our kids all went to school, and have almost graduated) in the athletic department doing fundraising. The nest is empty so we are going to start planning some trips that don't involve college soccer matches. A throwback photo is enclosed for kicks -1979 intramural football champions "CC and Water". There is at least one other Geology major in this photo. (Opposite Column)



Anna Phelps '10

In August, I finished my M.S. in Geology at the University of Montana in Missoula on the facies, stratigraphic architecture, and sequence stratigraphy of the Sappington Formation (Bakken-equivalent) in the Bridger Range, Montana. I am currently working as an exploration geologist for SM Energy in Billings, Montana. Since my move to Billings, I've enjoyed getting involved with the Montana Geological Society, the AAPG Imperial Barrel Award Competition, and STEM Billings. Give me a shout if you are ever in Billings!

Pam Polite Fisco '77

Greetings from beautiful Rome where Dennis and I are off on another biking adventure to Sardinia! I continue to keep busy educating children about Earth and Planetary Sciences through my geology program "Rocks Talk" in Marin County. I teach in the classroom, lead field trips through the hills, and generally share "rock talks" with anyone who is willing to listen. I have added a new dimension to my educational endeavors as I am a certified California Master Gardener so I help local gardeners create and maintain healthy, water wise gardens in our Mediterranean climate. I continue to travel and hunt for new rocks around the world with recent trips to South Africa, the north slope of Alaska, southern France, and Mallorca. Our three children are all doing well, the oldest, Gavin,

is a geologist and lives in San Francisco, our daughter Dana is a marine biologist living and working in Florida, and our youngest, Peter, is in Real Estate and lives in San Francisco as well.

Maisie Richards '11

Hi! I'm currently finishing up the final semester of a Master's degree in fluvial geomorphology at CSU. My research aims to quantify human impacts to a large, glacially-fed braided river in Denali National Park, AK. My grant proposal for this research recently won the Arthur D. Howard award from the Quaternary Geology and Geomorphology Division of GSA. In order to celebrate this honor (and procrastinate my proposed research) I'm taking off on a private rafting trip down the Grand Canyon for 23 days in March. After defending in June, the next step will either be river work in the desert Southwest or in coastal Maine.



Matthew Rosales '08

Hello from Northern Ontario! I'm currently working on the Timmins Porcupine West gold project for Teck Resources, mapping and logging 2690Ma folded, thrust and sheared turbidites and granodiorites - slightly older basement than what we had in Colorado Springs. In this photo I'm standing on a classic bouma sequence that is isoclinally folded about that quartz vein with a com-

plete facing reversal over less than 1m. Woa! You can tell the bugs weren't that bad this day because the sky is blue rather than black, haha. When I'm not in the bush, I'm trying to maximize my ski seasons out west and including frequent meet-ups with CC alums in the backcountry! Vancouver, BC is still my home, drop me a line if you're passing through.



Steve Spear '69

Since I have been retired I have become most serious about wine pairings with rocks I have collected in past few years. Here is a full-bodied chardonnay from Trefethen Vineyards (in a Buttonwood glass) paired with a rhyo-dacitic tuff breccia from Oatman, Arizona. (Opposite Page)



Ted Starns '07

I've been in Anchorage about three years now working as a Development Geologist for ConocoPhillips. I work on a team that supports a coiled tubing drilling rig in the Kuparuk River oil field on the North Slope. We identify development opportunities and plan and execute horizontal wells.

Justin Strauss '06

My wife (Elena Mihaly, Class of 2007) and I are moving to Hanover, NH in January where I will be starting an Assistant Professor position in the Department of Earth Sciences at Dartmouth College. We are psyched about the established and growing community of Tigers in the NE, so please come visit if you find yourself in the neighborhood!

Lynne Westerfield '00

I'm still running Leadville's environmental non-profit here in the Colorado Mountains. We've got so many great projects going on from compost in the schools to our energy

efficiency work, to our newly planned Leadville farm. I'm also guiding a few river trips on the Grand Canyon in the summer so I get to lightly use my geology background, so many rock layers!

David Williams '86

My most recent book, *Too High and Too Steep: Reshaping Seattle's Topography*, was published in 2015. The book explores Seattle's early grand engineering projects, including the building of the Lake Washington Ship Canal and Locks, filling in the tideflats of the Duwamish River, and regrading Denny Hill. I am also at work on my next book, which will be a walking guide to Seattle. The 18-20 walks focus on the human and natural history of the city.

Van Wombwell '85

I made it down to Peru to check on El Niño; ran into him at about 18k' in the Cordillera Blanca as the wet season came early.



Steve Wood '84

CC Alumni Steve Wood (class of 1984, LAS major, combining geology and art) recently created a mosaic mural for the Sunwater Spa in Manitou Springs. The mural depicts the geologic column from the PPG up through the Manitou Limestone, and focuses on the origin of Manitou's famed springs.

Steve worked with Claire Renault (geology major from class of 1984, and current co-owner of a geology-consulting firm in New Orleans) on the mural design and technical issues like depicting rock and rock formations in a mosaic and ceramic tile form.

The mural was commissioned by Kat Tudor, class of 1977, and principal behind the Sunwater spa. Kat has been active in creative and community circles in Colorado Springs, with her non-profit the Smokebrush Foundation. Kat last commissioned Steve to create the geologically-inspired mosaic for the Uncle Wilber Fountain in Acacia Park in downtown Colorado Springs. This mosaic is a cross-sectional map of an idealized geologic column, showing faulting, intrusions, and the formation of springs. Steve created a 9th grade geology curriculum for the mosaic, which is still used by classes to this day.

The alums also connected with CC professors Christine Siddoway, Jeff Noblett, Eric Leonard and Paul Myro for consultations, and CC alum Michael Hannigan assisted with collecting rocks, designing the wall, and installing tiles.

Claire's CC thesis was on this part of the strata, so it was fun for her to explore the new research on these sedimentary environments, and Steve enjoyed delving back into geology...a break from his work with the community-building non-profit Concrete Couch.

Dan Woodell '09

Hi everyone! I just started my PhD project at the University of Vienna in Austria - I'm focusing on numerical modeling of caldera collapse structures (with related field work of course!). Prior to this I've been teaching at the University of British Columbia for several years, spending time with other CC grads in the Vancouver area. And this past summer I even had the chance to teach a block at CC - GY135 Geology of the Pike's Peak Region! I had a really wonderful experience teaching at CC, and have new appreciation for all the hard work the professors put in! Stop by for a visit if you're ever in Vienna!



Sasha Carney Woods '86

Class of '86 Geology grads, come to celebrate our 30 year reunion this coming October!!



Photo by Stephen G. Weaver

Dear Colorado College Geology Alum:

We hope you have enjoyed the 2015-16 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:

Recent Events, Exciting Adventures, and other Comments

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

Non-Profit Org.
U.S. Postage
PAID
Colorado Springs, CO
Permit No. 745