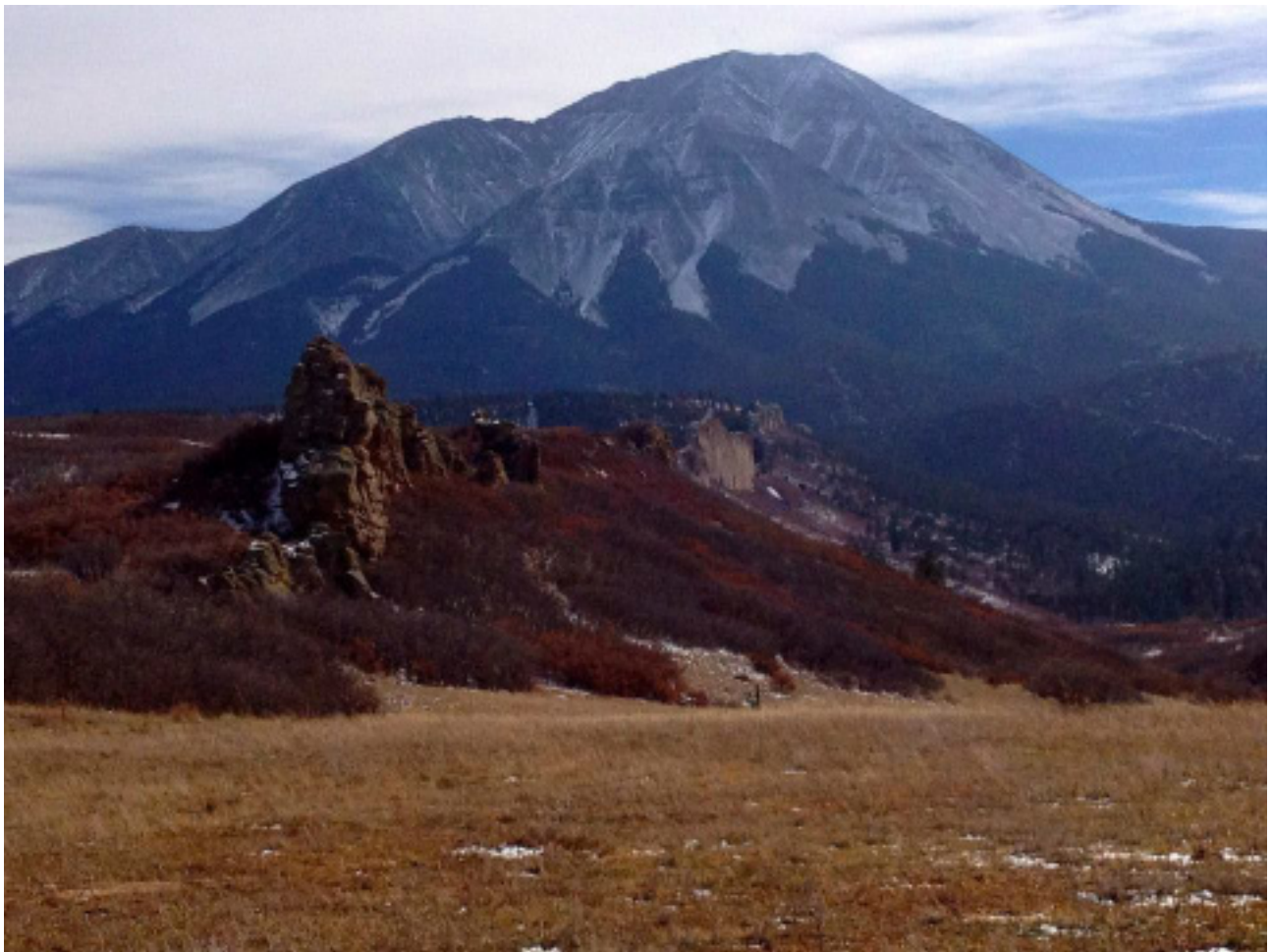


Basement

THE COLORADO COLLEGE GEOLOGY DEPARTMENT



2014-2015
Volume XVI

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Cover Photo:

Spanish Peaks, CO, where students worked on an independent research project for GY308 Introductory Geophysics during Block 3. Photo by Emily Beckham ('16).

The Precambrian Basement
2014-2015

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Hello Everyone! It is time once again for a new issue of the Precambrian Basement. For good or for bad, it is the last one that will include a letter from me as Chair of the department. After three and a half years of herding cats and signing forms, I am retreating back to the life of a 'gentleman scholar'. I won't say I will miss the job, but I will admit that it has been a really good learning experience. In particular being Chair has given me an opportunity to learn what current students think of their studies, what alumni have been doing since leaving CC, and what my colleagues have been doing behind my back.

The most recent example of how being Chair can be a learning experience came in the form of our recent External Review. In preparation for this review, I spent a lot of time gathering student & alumni survey data (thanks to all of you who participated!), going over graduation statistics, reading curriculum vita of the faculty, tapping Eric's 'institutional memory', and putting everything into a summary document for the external reviewers to consider prior to their visit. I came away from the process even more impressed with our department than I was before, and I wanted to share some of the highlights with you:

- * department faculty have 126 years of combined teaching experience. This goes along with Steve's 20 years (!) as Technical Director and Mandy's 5 years as Staff Assistant (I didn't scare her away - yeah!).

- * from 2003-2008 CC Geology faculty were first authors on 31 papers and co-authors on another 28 papers, and from 2009-2014 CC Geology faculty were first authors on another 20 papers and co-authors on another 52 papers (with Myrow and Siddoway leading the way).

- * over the last twelve years we have averaged 15 majors/year with a nearly equal split between men and women. After graduating, these folks have gone on to become medical doctors, teachers, research scientists, parents, lawyers, energy producers, and business leaders, not to mention a whole host of other occupations.

- * over the last twelve years 135 of our 181 graduates (75%) have undertaken original research. As a result, 84 different majors (46%) have been co-authors on a total of 107 papers or posters presented at professional meetings, and 53 different majors (29%) were first author/presenter on 62 of those presentations. During the same time period, 21 majors (11%) were coauthors on a total of 21 papers published in refereed professional journals, including three papers on which they were first authors (one of them in Geology, one in GSA Bulletin, and one in Geological Magazine).

- * our graduates have had successful academic careers, with ~30 obtaining PhDs in the Earth Sciences since 2001, making CC third among all liberal arts colleges in the number of such degrees awarded to their graduates over this period. Since 1990, 19 of our alums (10 men, 9 women) have become faculty members at a university or college, and 5 of our alums (4 men, 1 women) are now in senior research positions at universities, museums, or federal institutions.

Wow. Our department has been, and continues to be, a special place, and I thank every one of you for making it so.

Let me end this Chair's letter with a final few announcements and some additional thank yous. First, I am happy to report that Megan is back from her sabbatical leave, as is Jeff Noble (Jeff may a little nervous after 8 years away from the classroom, but I've seen him preparing to teach crystal systems, so the students better be ready). Megan and Jeff had a quick chance to say hello to Paul before he left on his own sabbatical leave, which he is spending in Spain and other places unbeknownst to me. We hired Carrie Tyler, who is an invertebrate paleoecologist, to take Paul's place as a visiting faculty member, and she is doing admirably in adapting to the Block Plan.

When it comes to 'thanks', we definitely have to give a shout out to paraprofs Lauren and Vikki for all the work they have done already to help our classes run smoothly. I would also like to thank Matt Gottfried, the GIS Technical Director, for all the help he has provided our students and faculty with class work and research over the past year. And finally, and as usual, no 'thanks' would be complete without acknowledging everything that Steve 'he's-been-doing-it-for-20-freakin'-years!' Weaver and Mandy 'in-it-for-5-in-it-for-the-long-haul' Sulfrian do for the department every day.

Now on with the PCB, and have a great year!!

Henry Fricke
Geology Department Chair



MEGAN ANDERSON
(Geophysics)

Spring of 2014 was a fun time. I spent ~2 months at the U.S. Geological Survey in Menlo Park, CA hanging out with friends and colleagues and putting together a manu-

script ("Boundaries and structure of Siletzia in the Puget Lowland:

Imaging an obducted plateau and accretionary salient with potential fields" to be submitted to the journal *Tectonics* this spring) coming out of my postdoc work. I also had fun shopping at the local farmer's markets and cooking a lot and mountain biking in the California coast ranges. Leah Bedoian ('10) and I met up in San Francisco for some great Ethiopian food (mmmm...) and caught up on her news. At the end of my time in California, my husband, Tom met me and we took a 10-day road trip through northern California and Oregon to hike, bike, and taste some wine and microbrews! We ended up in Seattle area where I met Ryan Kroner ('16) for a stint of field work near Monroe, WA.

After returning to Colorado in July, I struggled to acclimatize before my second-ever sprint-distance triathlon in Steamboat. It was great fun and I didn't drown, but I sure did look silly in my wetsuit. I'm going to do another one this coming summer—I'm really enjoying getting into the pool for my workouts, and I've also been skating at the rink on campus—always fun to throw something different into the mix!

Fall was busy with teaching GY212, GY445—back in CA with Eric Leonard, and GY308. In California, we met up with Leah again and had some really great weather for our giant figure-8 loop through the Owens Valley, Yosemite, SF Bay Area, Santa Barbara, Salton Trough, and Transverse Ranges/LA area.

Fortunately (unfortunately?!), we did not get too much fodder for the "Smooth Move" Award, though we did have a raccoon party in camp (and a van!) one night.

Thanks to everyone who attended the AGU pub night—so great seeing everyone...it was a fun time! Watch your email next year if you are attending AGU—we'll get together again!



ERIC LEONARD
(Geomorphology)

I am now in the middle of my third (and last!) year as Director of Southwest Studies. It has been fun (well ... interesting), but I am getting ready to be back as a

full-time geologist. What could be more fun than being around all of those crazy Geology faculty, staff, and majors 24/7?

Speaking of 24/7 – earlier this fall, Megan and I taught the regional geology course in California. I loved visiting the places I knew in my pre-geology days – high school and college hangouts in the Bay Area and the Sierra Nevada – and finally learning something about their geology. It was a great trip, with a great group of senior majors – 20-strong this year – even if we did have to spend a little time in Los Angeles. Other teaching over the last year (I am teaching only 2/3 time while I am at Southwest Studies) included GY212 – our new Physical Processes second-level course – which I team-taught with Christine, and Geomorphology, which I team-taught with 2003 grad Ryan McKeon (aka "Thumbs"). It is really fun team-teaching with my amazing faculty colleagues and alums.

We are just winding up a four-year NSF-funded project on the last glacial maximum and deglaciation along the crest of the Rocky Mountains from northern Montana to central New Mexico. Nine CC Geology majors and nine majors from SUNY-Geneseo were involved in the project. Now that the field work and most of the cosmogenic radionuclide (CRN) geochronology and computer modeling work is done, it is time we get down to serious writing. Twelve professional meeting talks and published abstracts from the project, but no papers yet. Stay tuned.

My work with the Denver Museum of Nature and Science Snowmastodon Project (see article elsewhere in this newsletter) has resulted in a paper that just came out in Quaternary Research on numerical modeling of the Bull Lake Snowmass Creek glacier and the climate of the penultimate (Bull Lake) glaciation. This work is really the first attempt at providing quantitative estimates of climate in the Rockies during the Bull Lake Glaciation. Another paper is in the works on the use of multiple geochronometers (Uranium-series dating, amino acid racemization, Sr isotope stratigraphy) to resolve uplift patterns and rates along the coast of Chile.

I am looking forward to what I hope will be a productive and, possibly a little relaxing, sabbatical year in 2015-16. Relaxing? -- well maybe not, since I will be kicking it off by teaching a 4-week summer course in Nepal. It will be interesting to return to areas there that I last visited in 1988. Things will, I suspect, be very different with more roads into formerly very remote areas and with significantly smaller glaciers. Still – Himalayan geology will be as spectacular as it was then, I think. Plans for the rest of my sabbatical year are just beginning to come into focus, with some likely time in Spain and Norway. I'll catch you up on all of that in next year's PCB.

Julia is more than two years out of college

and Susan is in her second year in college. Julia is still living and working as a political and non-profit media consultant, in Washington, DC. She's having a great time there, and trying to shake off the results of the midterm election. Susan is at Bates College in Maine – liking it a lot (as a likely Psych major), but wishing that both the weather and the skiing there were better. Lisa is doing well, keeping me sane and trying to keep herself sane. She works way too many hours as a community outreach nurse and is over committed in lots of other ways. But she really likes what she is doing.



PAUL MYROW
(Sedimentology/
Stratigraphy)

Hello to everyone, this time from Barcelona! I am on sabbatical this year, and have spent the fall in Barcelona, but will move to Philadelphia for the spring,

where I will be working at University of Pennsylvania. Living in Spain has been a great experience on many levels. Besides the obvious benefits of being in Barcelona, I have been able to see some of the great geology of Spain, mainly in the Pyrenees. Much of my time has been spent sitting quietly in an office at U. of Barcelona writing manuscripts. I have no interruptions at the office since the entire faculty office complex is behind a locked door; that would probably not work at CC!

The last year has been great on all fronts. My paper on large (> 7 M) earthquakes recorded in Cambrian seismites in the Dotsero Formation of Glenwood Canyon was published in Sedimentology. This was co-authored with Jitao Chen (Nanjing Institute), who was a visiting scholar at CC last spring. He and I went back to Inner Mongolia this last summer

with a rising sophomore from CC, Lea Linse, to finish work on the Cambrian–Ordovician successions there. We are hoping to locate the large Cambrian isotope excursion SPICE in these rocks. In the meantime, I submitted a paper with several co-authors, including CC alumnus (2013) Zach Snyder, to *GSA Bulletin* on the strata in this region, and that paper is now in revision.

My work on the Devonian continued this year, although I may be winding it down. I had a paper published this year on U-Pb geochronologic ages of ash beds in latest Devonian strata in Poland with two co-authors from MIT, two Polish geologists, and CC alumnus Annie Hanson. Recent graduate Devon Cole ('14), who is now a graduate student at Yale, and I submitted two papers this spring on Upper Devonian to Mississippian rocks in Utah and Montana. Senior Anne Hakim is a co-author on both of these papers. I am also working with my student Alex Hager on Triassic to Jurassic sections in the Comanche National Grasslands near La Junta, CO that have spectacular dinosaur footprints preserved in oolite. He is working on U-Pb dating of ash beds with colleagues at MIT. Also on the research front, I co-authored a paper (*Journal of Sedimentary Research*) with a German oceanographer from Adelaide, Australia named Jochen Kaempf that featured numerical models of high-density mud suspensions and cross-shelf transport. Colleagues at MIT and I have a paper in press on experimental and numerical model results on how wave ripples change their spacing. I also had three publications this year on aspects of Indian geology, including one published in *Geology* about animal evolution (with a postdoctoral student at Yale, Ryan McKenzie) that got a lot of press. Finally, the bane of my research life for the last five years, a paper I wrote on changes in Neogene ocean chemistry (Os and Sr isotopes), is in revision with EPSL. If there is a God, I will get this paper published! I was awarded a three-year NASA grant with

a colleague at UC Riverside, Mary Droser: "Catching the 'Second Wave' of the Ediacara Biota: Assessing the Role of Environment, Ecology and Diagenesis". We will start work this winter in Death Valley.

The rest of my life has been great. I had vacations to Stockholm and Rome this year with my girlfriend, and had a wonderful time on both trips. I played a number of shows in the spring with my band at Rico's (Poor Richards wine bar) and Front Range Barbeque in Old Colorado City. I have plenty of my last CD left, so contact me if you want a copy, or you can download the songs from iTunes, CD Baby, or Amazon. If you are in Philadelphia this spring look me up! Best wishes to everyone and keep in touch!



HENRY FRICKE
(Geochemistry)

Greetings from the southwest corner of Palmer Hall! 2014 was a busy year that seemed to go by really, really fast. Winter and spring saw me alternating

teaching with administrative duties and family activities. In Geochemistry we focused on a series of small projects and datasets to illustrate how different methods work and how data are interpreted. Results were mixed, and I think a big problem is the difficulty students have in mastering difficult concepts over short periods of time. So I will continue to tweak this class next year, perhaps with a greater emphasis on reading and writing. By the time I retire, I will get this class exactly the way I want it! I also taught GY140, which I enjoy doing more and more. The reason is that the course allows me to seek out new places to take students, and thus learn new things about the regional geology that I didn't know before. When not teaching and not doing other 'professor' stuff, I spent a lot

of time skiing with the family in the mountains. The kids are getting super good, and we are able to spend a lot of quality time together.

Summer saw a mix of travel, research and other stuff. Our big family trip involved 8 days rafting on the Colorado River, through the Grand Canyon. We did it with two other families from the neighborhood, and it would have been a fantastic experience no matter what. But you add all the geology into the mix, and 'wow'. Other parts of the summer we visited Pennsylvania and New Hampshire, and I was able to visit family and friends and places I hadn't seen for awhile. It was nostalgic, and fun.

In between these trips I was able to spend some time in the field, doing a variety of stuff. Probably the most fun was going to Wyoming with GIS Technical Director Matt Gottfried and the 'Drone Crew' (that included Noah Cutter, a geology-computer science major). Outside of Kaycee, WY, they undertook video surveys of a dinosaur dig using the drone helicopter, and with this experience under their belt we all went to Worland, WY, where they undertook video survey of a larger area where the oldest primates in North America are being collected. The hope is that we can build on these first drone flights and make remote imaging and data collection an integral part of paleontology, and Noah will be pursuing this avenue of research further this coming year. On the same trip Dylan Vonieff collected paleosol nodules from a PETM section near Worland. Along with Betsie Hopper, who is focusing on post-PETM hyperthermal events, she is studying how the geochemistry of these nodules can be used to infer hydrological changes during hyperthermal events. Later in the summer Betsie and I made a quick trip to the Piceance Basin west of Glenwood Springs to try and locate post-PETM hyperthermals outside of the Bighorn Basin. A preliminary carbon isotope survey indicates we found at least two of them (!), and I am excited to get back out

there this summer to confirm this identification and see what we can learn by making inter-basinal comparisons. Lastly, I drove out to the Grand Staircase-Escalante National Monument with Erica Evans to meet up with the fossil-hunting crew from the Denver Museum of Nature & Science (including Ian Miller, CC geo class of '99). Vikki Crystal (CC geo class of '14) worked out there last year, and Erica is going to build on her work by investigating niche partitioning among herbivorous dinosaurs. I left Utah after a few days, but Erica stayed for a few weeks - I think she has the dino bug! Not surprisingly, all this time driving around to new places kept me from writing any papers, but I can't seem to help myself - chasing down new research leads is too enjoyable!

In the fall I got back into the classroom with another section of GY140 - also fun - and a block of EV128 'Introduction to Global Climate Change'. I taught the latter with Becca Barnes, who is an aqueous biogeochemist hired last year to teach in Environmental Science. Although Becca is in the EV program, she has a foot in geology, and she may - finally - offer hydrology to CC science students on a regular basis (yeah!). Other than teaching, I spent a lot of time in the fall preparing for the External Review of the department (see my Chair's letter for some highlights), and I was able to make it to the GSA meeting in Vancouver. There were CC alums all over the place up there, with locals Betsie, Matt, Nancy, Dan & Jenny making sure I ate and drank well when not listening to talks. We also had a fun alumni get together one evening - thanks to everyone who came by!

On the Home Front it has been a year of changes. Eli is in his last year of middle school, he is taller than several of his aunts, and his feet are almost as big as mine; so his 'change' has been ongoing, and generally upward. Annaliese will finish elementary school this year, and is likewise tall. She is also galloping towards tweendom, in all its eye-

rolling glory. Erin happily changed jobs, and is getting used to her new digs and responsibilities. The sad family change is that Buddy-the-dog finally passed on to the ol' 'Badlands in the Sky', where rabbits are plentiful and they aren't so hard to catch. We got Buddy the day we moved to Colorado Springs 15 years ago, he was a good friend from that day on, and his company will be greatly missed.

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 NOBLETT
(Igneous Petrology)

Greetings,
The sabbatical flew by much too fast and I am back in the classroom while chairing the new Organismal Biology and Ecology Department. I

did get my main classes prepared- lecture notes typed into word docs, variety of cool figures added to these, exercises and labs re-developed- and a student version of the lectures prepared- that is given the quality of my handwriting (which has not actually improved over the years), and the advantage of having detailed notes in outline form, I am seeing how well it works to hand students roughly half of the notes (the top parts of the outline with all the figures) so they have a choice of uploading the notes electronically onto their laptops and typing (or printing and writing) in the missing sections as I go through them in class or ignoring this and taking notes from scratch. Hope they find the varied options useful. Had a lot of fun when odd questions came up in class setting the students the task of seeing who could google an answer fastest- and sharing insights and

relevant sites with one another. Plan to develop this in a way that builds well on texts and lecture.

The second half of the sabbatical was filled with re-invigorating my passion from graduate school studying volcanoes in various tectonic settings. That original work was on Eocene volcanics in a subduction zone setting in Oregon. I worked on an article last year on slightly younger volcanics that formed during the shifting tectonic regimes from subduction to rifting (Rio Grande Rift) in central Colorado. I am revising that article in light of unpublished ages that will enhance our understanding of the tectonics. I did enjoy three roughly two-week trips to volcanic country last spring and summer. The first was a tour through the Rio Grande Rift from Kilbourne Hole and Aden Crater (which are now part of the newest National Monument and off-limits to hammering, camping and wild parties); then up through the Emory Caldera, McCarthy's Flow, Mt Taylor, Albuquerque volcanics, Jemez Mountains, Taos Plateau, into Summer Coon, and the Spanish Peaks. Some changes in roads and outcrops over the years but most of the exposures are still good. I also spent two weeks in Hawaii (Maui and the Big Island) with my wife, Jenny, visiting various volcanic features (and snorkeling a bit when Jenny commented we had to be among the few visitors to Hawaii who spent our first days climbing volcanoes without seeing the beaches! Missed the older eruptions and left before the recent one this summer, but did hike out to the green sand beach- lovely cone and beach. Then this summer we went to Iceland to scout out a possible block class to teach there. Found some great project sites (very cool mapping project where the Mid-Atlantic Ridge rises onto Iceland with a variety of volcanic features) and a route that should be available during the academic year- just need to

figure out reasonable ways to handle costs (camping not really viable during the academic year and youth hostels running about \$75 per night!) and see who is interested in a year or two.

Getting back into the classroom with a group of 16 First-Year students eager to do whatever the professor asks to succeed at college was a wonderful experience. Clearly I have missed the interaction with students this past decade. Taught a class that blended the Introduction to Physical Geology (field and mapping projects) with an Environmental Geology class that included discussions in deep ecology, ecofeminism, environmental racism, as well as how the Earth System works, international perspectives, and future availability of mineral and energy resources. As I write this I am preparing projects for Igneous Petrology and really looking forward to meeting our current students. I am working with one senior on a trace element study of Aden Crater, and looking forward to finding students who want to extend the examination of trace elements during the rifting to some of the other sites that remain unstudied, or work on the multiple generations of dikes in the Wet Mountain area and ways we might sort out their history, or 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.

Not sure quite how, but I did agree to Chair the new Organismal Biology and Ecology (OBE to friends) Department for one year before stepping in for Henry for Geology in a year. The college has divided the former Biology Department into two new departments: OBE and Molecular Biology. For the first three years in each new department, the college decided to ask an outside person to Chair, so that faculty could focus on classes

and students during the transition. So far we have managed to move forward with alacety.

Hope you are all doing well. jeff



CHRISTINE SIDDOWAY
(Structure)

Greetings, everybody! The new/old Tava sandstone in Colorado generated lots of interest and consumed a lot of my attention this year, that's for certain. But... "you heard it here

first" in the **Precambrian Basement**, in 2014! No need to subject you to more about the Tava (but if wanted, you can go to <http://arstechnica.com/science/2014/10/a-maverick-sandstone-that-calls-a-granite-home/> for a spirited synopsis!). One exciting update, though, is that I can now show that vestiges of this Precambrian sedimentary rock exist outside the Pikes Peak region – showing that it once had broader extent across Colorado. Another is that senior Alec Lee is investigating the history of hydrocarbon migration through the mature quartz sandstone, for his thesis. Sally Shatford, another senior, has detrital zircon results that shed new light on the timing of formation of the Great Unconformity in CO!

Three utterly new areas of research and teaching are demanding a majority of attention this year. One is an NSF collaborative proposal to Antarctic Integrated Systems science, for aerogeophysical surveys and modeling of the sub-Ross Ice Shelf environment. It's been nearly a year and the proposal still is pending... but the work (codename: ROSETTA) feels urgent, in light of the effects of ocean and atmosphere warming on ANT

ice shelves! I'm hopeful that NSF will resolve complex funding issues, and we'll soon be contributing critical knowledge of the sub-RIS lithosphere and oceanographic system. In a possibly related vein—environmental issues—in CC teaching, I've been kicking into gear with new courses that bear on campus sustainability and Front Range environmental issues. One course, **Introduction to Geodesign**, teaches GIS methods and applies them to campus landscape design. I developed and taught this together with studio art professor Carl Reed, and the students embraced the subject with such enthusiasm that **CC made a showing at the Geodesign Summit** conference at ESRI headquarters, in January! A second course, Digital Mapping for Society, employs diverse GIS software to examine and educate about issues in our broader region, with specific focus on geological factors in the Fountain Creek watershed. More work on those two classes is in store for 2015-16!

Hyperlinks within the above text:

<https://www.coloradocollege.edu/dotAsset/b6d9099e-e41e-4427-b15c-e49e44a8e310.pdf>

<http://www.esri.com/esri-news/arc-watch/1214/geodesign-for-a-complex-world>

<http://t.co/2rZpVUFpKX>



STEVE WEAVER
(Technical Director)

It has been another great year as Geo Tech Director supporting faculty and students in many class and research endeavors. Student and faculty field and lab

based activity remains high with the analytical facilities getting lots of use. We recently acquired a new Claisse LeNeo Fluxer for

making glass disks for major element analysis of rocks in our XRF unit and it is turning out be much better and more efficient than our old fusion instrument!

I continue to be active with my photography. My wife and I spent two weeks in Glacier Bay National Park last summer cruising on her sister's boat. The photography there was fabulous and we saw many sea otters, humpback whales, orcas, Alaskan 'brown bears and lots of birds. The glaciers and mountains also were incredible and the weather was reasonable with not too much rain! Watching the Margerie Glacier calving in beautiful 6:00 AM sunrise light with no other boats around was a special experience! 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)

Hello! This has been a great year and, as usual, passes way too quickly. We started off with a bang and haven't slowed down since September 1. We have a

bumper crop of budding geologists and it's been great getting to know them better.

My family is well. My Mom moved to Colorado Springs in November and it was wonderful to spend Thanksgiving with her for the first time in 40 years! Our grandkids just keep growing and changing and I'm still an adoring Nana. Charlie has been traveling a lot this fall and I'm looking forward to field season ending and spending a nice quiet winter with him at home.

Stop by and say hi when you're in Colorado Springs. I love to catch up with alums and hear all your news.



CARRIE TYLER
(Paleontology)

I've enjoyed spending this year with the Geology Department here at Colorado College. Teaching in the field and visiting world renowned places like Colorado National Monument, The National Ice Core Laboratory, Dinosaur Ridge, the K/Pg boundary layer, and Florissant has been wonderful. My research on the fidelity of the fossil record, the focus of my recent post-doc, continues, and I still have many exciting projects to work on in expanding our understanding of the completeness of the fossil record. So far, our results have been positive, and despite preservation biases, death assemblages appear to provide a reasonable representation of ecosystem structure. I am beginning work on a new project examining ancient food webs with a colleague at the National Academy of Sciences. Have ecosystems become more complex or stable through time? Given the current biodiversity crisis, understanding what controls ecosystem structure is critical for maintaining the ecosystem services on which we rely. I'm looking forward to the next year, wherever I end up.

Department Publications and NSF Grants

Megan Anderson

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Paul Myrow

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What Geology Means to Me

George Fowlkes '18

Emily Cain '18

When asked to choose my top 8 choices for my First Year Experience (FYE), I consulted my sister, Bailey Fowlkes, a recent graduate of Colorado College. As a veteran of the block plan, I knew she would be able to pinpoint the best class. Most options came and went without much discussion. After our fourth phone call, however, she asked if there was a Geology course. When I responded yes, she immediately told me to put it as my first choice. With her certainty, I had no doubt that it was going to be a great class.

Colorado Springs is one of the best places in the nation to learn Geology and the freedom of the block plan made hands on learning easily accessible. Our professor, Jeff Noblett, made it clear that we would take full advantage of our surrounding environment through field trips and assignments that required us to understand the geology of the region. Morning lectures, afternoon labs, and frequent field trips made the course challenging, engaging, and all consuming. Information taught in the classroom was almost always applied in the field, helping to solidify our understanding of the material. Unlike almost any other class, I was able to see real world examples of what I learned in the classroom. That alone was exciting!



FYE students found a scenic lunch spot while mapping in Bear Creek.

Our first field trip was the defining moment for my enthusiasm for Geology. On a hot September day, Jeff told us to be in the parking lot at 8:00 AM. Already struggling to adjust to having class at 9, I knew that it was going to be a long day. After having a three and half hour lecture at one road cut looking at the Manitou Limestone formation, we broke for lunch. Following lunch, Jeff took us on a four hour hike where we walked through all of the major hogbacks in the Colorado Springs region. When the hike ended at 4 PM, we all expected to head back to campus, but Jeff told us he was taking us to a Mesa Overlook where he would, “quickly go through the entire geologic history of the area in a short, 45 minute, lecture.” With some silent groans, we all filed out of the van and took our notebooks out just to sit in the sweltering heat listening to what I thought was going to be the most boring lecture ever. As Jeff spoke, however, I started to become interested. I forgot about how miserably hot and tired I was as I became fully focused on what Jeff had to say. After that lecture, I knew that I had picked the best FYE. I couldn't wait to dive deeper.

When Bailey recommended Geology to me she mentioned that other people who picked the course would likely be fun and adventurous. Once again, she was right. My fellow classmates were a huge reason for my love for Geology. Hours spent working collaboratively on the afternoon labs, helped us bond quickly. During our overnight field trip to the Cabin, we all enjoyed the sunset on the deck and a midnight hike with our headlamps illuminating the path. We socialized outside of class and started to develop the name, “The Geo Crew”. Everyday I woke up excited to go to class, of course to learn, but also to see my friends. By the end of the second block, everyone in the Geology FYE was my friend.

Because of how great the material was and how great Jeff and the rest of my classmates were, taking the Geology FYE was the

best possible way to start my Colorado College career. Because of this class, I am seriously considering majoring in Geology and I know that the people I met will forever be friends of mine.



Professor Jeff Noblett discusses the local geologic history at the Mesa Overlook.

Geology alums take part in CC Alumni Climate Forum

Eric Leonard

Three Geology alums were among nine CC graduates who took part in the first Alumni Climate Forum on campus on November 6 and 7, 2014. The Forum, organized by Economics Professor Mark Smith and alumnus Matt Banks (class of 1997 – American Political Economy), was aimed at familiarizing CC students with potential career opportunities addressing climate-change issues. The alumni spoke about their current work, how CC influenced their careers, and the advice they could offer current students. The forum also provided a great opportunity for students to meet and interact with the alums, and for both students and faculty to discuss internships and other collaboration possibilities with them.

The alumni spoke on three panels – one devoted to climate-change science, one to climate policy, and one to climate activism. The science panel (moderated by Geology Professor Eric Leonard) featured two Geology alums – Cathy Whitlock (1975),

a fire ecologist and paleoecologist now at Montana State University, and Natalie Kehrwald (1999), an ice-core scientist working on both paleoclimate and water-supply issues at the University of Venice. The policy panel involved another Geology alum, James Bradbury (1995), a climatologist by graduate training, who has since moved into the policy arena and is now a senior science-policy advisor at the U.S. Department of Energy.

The Forum was sponsored by the President's Office - CILET Action Team, the Environmental Science Program, the Economics and Business Department, the State of the Rockies Project, the Southwest Studies Program, the Office of Sustainability, and the Rocky Mountain Field Institute.

Department Students, Faculty, and Alums Involved with the Denver Museum's Snowmastodon Project

Eric Leonard

The fall 2010 discovery of a remarkable high-altitude middle-to-late Pleistocene fauna near Snowmass, Colorado, led to a major field and lab research effort to understand the biota, environment, and climate of the Colorado Rockies during the penultimate (Bull Lake) glaciation, and the last interglacial. This is a time period for which little detailed information was available prior to the project, and the findings of the project, which were published as a special issue of *Quaternary Research* late in 2014 (<http://www.sciencedirect.com/science/journal/00335894>), represent a tremendous breakthrough in our understanding of that time period here in the Rockies. The project was spearheaded by the Denver Museum of Nature and Science, with the participation of a large group of scientists from the USGS

and from several colleges and universities, student interns, and community volunteers. CC Geology students, faculty, and alumni have been involved with the project from the start. Ian Miller (CC Geology class of 1999), the Curator of Paleontology at the Denver Museum, co-directed the entire project and was involved in several aspects of the scientific research. CC Geology Professor Eric Leonard led the glacier modeling effort on the project, contributing to the analysis of paleoclimatic conditions at the site. Saxon Sharpe (CC Geology class of 1976), Associate Research Professor, Desert Research Institute, led an effort using mollusks and ostracods to reconstruct the paleohydrology of the fossil site. Two CC students (now alums), Gussie Maccraken (Biology 2011) and Adam Freiermann (Geology 2012) were among nine nationally selected student interns working on the project during 2011. The CC participants on the project are lead authors on three of the papers in the special issue and co-authors on three others.

A Glimpse of Colorado's Neoproterozoic

Dave Freedman '14

This Newsletter, the Precambrian Basement, takes its name from the earth's foundation of crystalline bedrock. In Colorado, this footing supports a disproportionately famous sedimentary veneer, including the Garden of the Gods, Red Rocks Park, and the pale hogbacks in Bear Creek. Despite their conspicuous beauty, the real action is found down here, in the country's metamorphic and igneous heart. Pieces of the basement massif comprise the highest reaches of the Pikes Peak alpine region, coring the most prominent high-country in the Front Range. Where it is downthrown on massive Laramide blocks, this plutonic rock underlies the Great Unconformity, whose surface marks the



Professor Christine Siddoway investigates the Tava Sandstone with trusty field assistants Bessie and Pearl.

dawn of life and Manitou Springs's premier tourist attraction (for geologists, at least). Complementing its ubiquitous elegance, the Front Range's basement rocks are home to a truly enigmatic geologic relationship: a series of sandstone intrusions that penetrate into the region's ancient depths in a northwest-trending swarm over 70 kilometers long. This juxtaposition is somewhat contradictory. Why would sandstone, limited to the surface realm by its detrital origins, sit not upon, but discordantly within crystalline rock formed miles below the surface?

This question, in its most recent iteration, is the brainchild of our own Professor Christine Siddoway. After noticing alternating panels of buff sandstone and pink granite in the walls of Cheyenne Canyon, Christine delved into the published literature. The main pillar of these publications, that Cambrian sandstone remained unlithified for over 400 million years until it filled Laramide basement fractures, seems difficult to reconcile with our modern understanding of the Front Range's history. Despite an existing biblical interpretation attributing the features to a divine grouting event, Christine suspected from their distinctive lack of sorting and grading that the conglomeratic sandstones were remnants of ancient processes that are otherwise absent from the local geologic record. To investigate this idea, Christine jumped to involve students in this research. For over

a decade, she encouraged nearly a dozen students to grow confused, captivated, and confused again in focused projects on the subject. With this combined effort the study grew multifaceted as new methods for describing the sandstones were introduced. Graduating early from structural analysis when other interesting properties became apparent, the project emphasized intensive observation and research. It magnified the rock's sediment in attempt to uncover clues of a depositional environment. It morphed into a study of rock-magnetism, detrital provenance, and geochemistry. Christine's most recent publication, which appeared in the Geological Society of America journal *Lithosphere*, presented high-impact figures on the rock's zircon grains, which had been a focus of the study for over five years. Although grain statistics may seem foreign to problems at this stratigraphic depth, the findings effectively answered one of the topic's most basic: the age of the sandstone.

Zircon is a radioactive mineral. Minute concentrations of uranium in its crystal lattice allow for us to date its formation and speculate on its provenance. By comparing distributions of the sandstone's zircons to distributions in Colorado's Phanerozoic sedimentary succession, Christine's work revealed that she was dealing with a distinct and wholly undescribed local unit. These crystalline-hosted sandstones do not share a zircon source with familiar strata, but rather with the Chuar-group sandstones endemic to the Grand Canyon, shed from the east during the Proterozoic Eon. In this way, these sandstone slivers illuminate a mysterious period of Colorado's history; almost nowhere else in the state are rocks of this age exposed at the surface. Christine named the formation "Tava," after the Ute word for sun.

Many residents of Colorado, especially those in the CC community, maintain a strong connection between themselves and the geology that contributes to the state's unique

appeal. Perhaps it was for this reason that Christine's discussion of the truly exceptional Tava Sandstone struck a chord in popular science. Articles appeared on the ARSTechnica, Discovery, and Science Magazine websites. There was a photo shoot. The Colorado Springs Gazette requested an interview, and Christine presented the topic at the Jack Quinn Science Center. This public interest in the work of a small number of CC geology students and faculty reflects the excitement of those who benefitted from their participation in the research. True to style, Christine's findings provoke more questions than they answer. Only pausing to recruit several new students for the project, Christine is already attacking new research on the Tava Sandstone. Never say whoa.

Why I Love Geology

Madison Andres '15

Collecting samples for research can be challenging; a bad day of weather or difficult terrain could halt a days work. At that moment it's important to remember that the sun is



Bathymetry Survey in Lake Josephine, Summer 2014.

shining, you're surrounded by a fresh breeze and enjoying great company of people who also enjoy this work. The appeal of geology can take an array of forms for various geologists, but to me, this immersion in nature

amongst good company is why I love it. This summer I had the amazing opportunity to work on a Keck Geology Consortium Project in Glacier National Park with Kelly MacGregor of Macalester College. For four weeks I learned the basics of lake sediment coring, I gained a better sense of what field research looks like, and I hiked around Glacier to some amazing glaciers. Each day spent on the coring craft was one filled with trials and triumphs. One of the highlights of the trip was dealing with a few stubborn anchors that got stuck onto trees that had fallen to the bottom of the lake via avalanches. There were moments where someone on the craft would suggest giving up and cutting ourselves free, but with some maneuvering and improvisational pulley systems we were able to leave the park with all four anchors. Although there



Image of the beautiful Many Glacier area of Glacier National Park, where the study was conducted.

were many other challenges, they all were made easier by the beauty of Glacier National Park.

After our time in the field, we worked for a few weeks at LacCore Lab at the University of Minnesota. This is where we learned lab bench techniques on our lake core samples and performed initial core descriptions. We then developed our thesis questions that would lead to our research and advanced analysis throughout the upcoming academic year. I chose to do charcoal analysis of lake sediments because of my interest in the eco-

system process and also my relative lack of knowledge on the subject. After I collected samples and tried some of the best food Minneapolis has to offer, I returned to Colorado to continue working on the project.

This year at CC, I am discovering the large amount of time required for a small research project, like my own, but also the variety of questions, observations, and research ideas that can be generated after spending just two weeks in Glacier National Park. I am currently reconstructing fire history in Glacier National Park by looking at charcoal frequency in two meters of lake sediment core we collected. In total, the Keck research group collected almost 90 meters of sediment from the bottom of lakes. It is impressive how many questions can be investigated from such a short time in the field.

Currently, I am in the middle of the process. There are still plenty of discoveries to be made, including dating of the charcoal I have sampled from the core and the full reconstruction of the ecosystem fire history. One of the most important lessons that I have learned is the usefulness of patience throughout the research process. Patience is required of me at every step of the process, from taking tedious one cubic centimeter samples of sediment for my data collection to waiting for samples to dry out in the oven. Compared to Glacier, the scenery in the Labs at CC may not be as breathtaking, but this is an important step in the process towards completing my thesis. I have been so grateful to have this opportunity, and am looking forward to finishing this work throughout the semester.

Regional Studies 2014

Molly Broom '15 & Virginia Hill '15

Senior geology majors from the Class of 2015 embarked on a grand voyage around California for the 2014 regional studies class. The trip started with 20 students and 2 professors lugging packs, map tubes and coolers

packed with camping equipment from DIA to LAX. After a mandatory stop at In-and-Out Burger upon arrival at in Los Angeles, we packed up three vans and headed towards the Owens Valley. Focusing on some of the hydrology (and history of water wars) we also enjoyed breathtaking views of the Sierra. Beautiful roof pendants were glimpsed at the Alabama Hills as we continued past the Long Valley Caldera and Mammoth Mountain and into Yosemite. After camping a packed campground just outside the park, we ventured in to see Half Dome, El Capitan and the glacial polishing in Tuolumne Meadows. A trip to the Sierras wasn't complete without visiting Mono Lake.



Regionals students enjoy the CA beach!

The next leg of the adventure took us to the Bay Area, hometown of Eric Leonard, one of the two professors along with Megan Anderson. After a quick zip

across the Great Valley we arrived in Marin County. We stayed two nights at a beautiful campground in the coastal redwood forest with excursions to Point Reyes (really foggy) and views of the San Francisco Bay (slightly foggy). We enjoyed some California wine and Humboldt Fog local cheese from the famous Point Reyes dairy operations. From there we headed down the coast with stops in Ojai, Ventura, Carpinteria and Malibu. The end of the trip was spent to the east of Los Angeles (Eric's favorite city) in the San Gabriel Mountains.

The trip as a whole was focused on the history of California from an ancient subduction complex to a modern transform boundary. By traversing from the Sierra Nevada Mountains to the west coast we were able to go from orogeny to ophiolite sequence to the

Franciscan complex, and finally the Pacific Plate. Once we made it to the boundary between the North American and Pacific Plates we discussed fault zones and the urban hazards they pose. This took us along the San Andreas Fault to Joshua Tree National Park and the Salton sea, and then back to Los Angeles in the nearby San Gabriel Mountains where we spent the last portion of our trip.

Because we were studying the regional geology of California and not a specific subject, we were able to incorporate many different tools and take a holistic approach to analyzing the area. We used magnetic maps of California to locate ophiolite sequences, which in turn informed our views on fault structures. By using GPS data in Joshua Tree we were able to track plate movement and see the velocity differences that arise further away from the fault zones. These are only a couple of techniques we used, but illustrate how this class truly was a compilation of all of our previous coursework.

Beyond the amazing breadth of geology we were able to see, we also had a great time bonding as a class. Long rides and dance parties in the vans, cooking dinner on the camp stove and swimming in the Pacific Ocean were part of the soul of the trip and remind us why we love the people that are a part of the CC Geology Department. It was an incredible trip where we not only learned a great deal but also were able to visit unique and geologically rich places. We are all very grateful to Megan, Eric and Mandy for all of their hard work creating this unforgettable experience.



Horseback Geology at Bear Basin Ranch

Jessica Badgeley '15 and Betsie Hopper '15

During third block break we received a Venture Grant to visit Gary and Amy Zeigler and study the local geology of Bear Basin Ranch. Located just west of the Wet Mountains and facing the Sangre de Cristos Mountains, we found the landscape, geology, and people both beautiful and welcoming. The unusual



Betsie Hopper '15 takes the strike and dip of foliation in a granitic gneiss



Betsie Hopper '15 and Amy Zeigler

metamorphic rocks, elusive radioactive thorium, and the wealth of inactive mines make the ranch's geology exceptional. We greatly appreciated the warmth and enthusiasm with which Gary, Amy, and Barb welcomed us and the project. We will never forget riding along the ridges to check out abandoned copper and silver mines with Gary, explaining to Barb how igneous and metamorphic rocks form, and herding horses with Amy as we explored the far reaches of the ranch.



Gary Zeigler and Yorrick search for thorium next to an old mining building



Jess Badgeley '15

Congratulations and Thanks!

Paul Myrow was awarded a three-year NASA grant! He and Mary Droser at UC Riverside will soon begin work on their project: "Catching the 'Second Wave' of the Ediacaran Biota: Assessing the role of Environment, Ecology and Diagenesis." Congratulations!

Congratulations to Christine Siddoway for all of her exciting discoveries surrounding the Tava Sandstone! In particular, her paper, "Basement-hosted sandstone injectites of Colorado: A vestige of the Neoproterozoic revealed through detrital zircon provenance analysis," published in *Lithosphere* in 2014.



Professor Christine Siddoway's GY400 Senior Seminar students at the ESRI Geodesign Summit

A **CC Alumni Reunion** happened at GSA's 2015 meeting in Vancouver, Canada! The get together was held at a restaurant near the Vancouver Convention Centre called Rogue Kitchen & Wetbar. There were tasty snacks, delicious drinks and, most importantly, great company! It was wonderful to reconnect with old friends and meet other amazing CC Geo alums! We have so many incredible alums that are doing remarkable things! **Huge thanks** to Betsy Friedlander and Matt Rosales for planning the event!



CC Geo Alums Edward Crawford '14, John Collis '13, Kye Birchard '13, and Andrew Gregovich '14 (photographer) reunite on the slopes near Stevens Pass in Washington.

THANKS to everyone who attended the 2014 Alumni Relations educational trip to the Antarctic Peninsula with Professor Christine Siddoway!

Alumni Spotlight

Robert Schock '61

Professor Thomas "Trobe" Grose, Colorado School of Mines, former CC Geology professor (served for 9 years)

Robert N. Schock is a senior scientific advisor for the Center for Global Security Research, Lawrence Livermore National Laboratory, Livermore, CA, and the World Energy Council, London, U.K. As a scientific advisor, he draws upon his expertise and experience in the field of geology as well as environmental and material sciences to investigate and advise about the application of technology to global policy issues. He has authored or coauthored over 85 scientific papers that report research associated with this work, and other research on pressure effects on solids. He has also been called upon to provide expert testimony to investigation subcommittees of the U.S. House of Representatives and Senate. Earlier in his career, he enjoyed several prestigious fellowships at Research School of Earth Sciences, The Australian National University, Canberra (1980–81); Senior Fulbright Fellow, Mineralogisches Institut der Universität, Bonn, Germany (1973); and Post-doctoral Fellow, University of Chicago (1966 and 1967). His most notable recent achievement that led to high honor is his work on the crucial chapter on Energy Supply in the UN's Intergovernmental Panel on Climate Change (IPCC) report, that led to the award of the 2007 Nobel Peace Prize shared by the IPCC team and Al Gore. Dr. Schock was a coordinating

lead author of Chapter 4 on Energy Supply within the IPCC's comprehensive document. He now serves on the Board of Enerdata, an independent Research & Consulting firm on the global oil, gas, coal, power, renewable and carbon markets, as a scientific board member.



Robert, Susan, and his mother at Baccalaureate in 1961

Robert Schock recently had the privilege of receiving his honorary degree at the Opening Convocation Ceremony at Colorado College on May 19, 2014. After receiving the degree, he remarked about his return to the CC campus and all the memories that came to mind:

"I must admit to significant nostalgia when Jill led us from Armstrong to Palmer and into the basement to form our part of the long procession line. I remember the Geology Department offices were then at the center up the steps on the first floor and that I taught mineralogy lab down in the basement near where we were lined up. A number of other teaching assignments and classes were also nearby including OpMin Lab. I also took my orals up on the first floor to the right of the offices. I was so nervous, after a day and a half of written exams, I was chewing gum and in answering one question the gum came out and landed on the table in front of me, and John Lewis made some smart ass comment about me being nervous and everyone laughed. Talk about breaking the ice!"

Woodward W. Fischer '00

Paul Myrow

Woody Fischer received an honorary degree in 2014 and was also this year's convocation speaker. He is on the faculty at the California Institute of Technology, where he leads a research group that investigates the historical record of Earth's life and environments. He and his collaborators employ foundational methods such as field geology, petrography and geochemical measurements, as well as technically challenging and refined laboratory investigations, in order to understand the metabolism and molecular biology of organisms in deep



As Paraprof 2000-2001

geologic time. Woody and his team use carbon isotopes and lipid biomarkers to address fundamental geobiological issues such as the rise of atmospheric oxygen, by characterizing critical steps in the evolution of oxygenic photosynthesis. The discoveries have implications for contemporary questions relating to the global carbon cycle, perturbations in global atmosphere/ocean chemistry, and climate shifts that may be responsible for major mass extinctions. His research is international in scope and is internationally known. Furthermore, Woody is remarkably prolific in publication, and last year alone (2013), he was coauthor on ten peer-reviewed papers, and, within the past three

years, he published thirty-two articles.

In 2011, Woody received the prestigious Outstanding Young Scientist Award from the European Geophysical Union Division of Biogeosciences, in recognition of his fundamental contributions and originality in investigation of diverse and fundamental biological and environmental transitions in Earth history. In particular, his investigation of the evolution of multicellular life from single-celled organisms which is arguably the most important shift in the history of the biosphere on Earth.

The innovative research of this young scientist is not limited to Earth, but extends also to Mars and Jupiter's moon, Titan. One of his recent publications reports on the nature of water-rock interaction at the Mars Exploration Rover landing sites. Another offers clear evidence of the presence of water on Mars in the deep geological past.

These are just a sampling of Woody Fischer's early career achievements. We in the Geology Department consider it a privilege to have contributed to Woody's education. When he was a student at CC, he traveled to Antarctica with me during his senior year and later was co-author on a journal article that we wrote using the data we collected. He was the first of three CC advisees of mine who went on to graduate school at Harvard to work with advisor Andy Knoll, who oddly enough, was a teaching assistant to Woody's father Dennis, when he was in graduate school at Harvard! We celebrate the fact that a member of the Fischer family (of the Fischer CC alums, numbering at least six!) pursued a career in the discipline of one of our department's most important faculty, Bill Fischer (Woody's grandfather), for whom we named our reading room. We thoroughly enjoyed Woody's term of employment as a Geology paraprofessional in 2000-01, and we look forward to future occasions to team up on research and/or education in the future.



Woody and Professor Christine Siddoway at Opening Convocation, Fall 2014

Geology Day

April 12, 2014, Tutt Science Lecture Hall

David Freedman '14 -- Age, Origin, and Paleoenvironment of the Basement-Hosted Tava Sandstone, Colorado Front Range

Edward Crawford '14 -- Two Distinct Estimates of Last Glacial Maximum Climate On The Pikes Peak Massif, Front Range, Central Colorado, Using Numerically Modelled 2D Paleoglaciers Reconstructions

Will Durrett '14 -- The Effects of Aspect, Lithology, and Vegetation on Critical Zone Development in Southwestern Idaho

Vikki Crystal '14 -- Variations in hadrosaurid behavior, soil processes, forest structure over the Late Cretaceous landscape of southern Utah (Kaiparowits Formation, Grand Staircase Escalante National Monument)

Alexandra Freeman '14 -- Obsidian artifact provenance study of the Piedras Marcadas Pueblo, Albuquerque, New Mexico

Andrew Gregovich '14-- Provenance of Cerro Toledo Obsidian Artifacts Using Magnetic Techniques, Valles Caldera, New Mexico

Lauren Dangles '14 -- Triassic–Jurassic strata of the Colorado Springs region and associated palynoflora

Senior Awards

Annual Awards
Year: 2013-2014

Rocky Mountain Association of Geologists Award:
Victoria Crystal '14

Estwing Outstanding Senior Geologist:
Andrew Pontbriand '14

William A. Fischer Special Recognition:
David Freedman '14

Rocky Mountain Association of Geologists McKenna Scholarship (for a junior the previous year):
Victoria Crystal '14

Buster Scholarships:
John Swisher '15
William Durrett '14
Alexander Hager '15
Anne Hakim '15
Victoria Crystal '14

Gould Scholarship Recipients: Spring 2014
Joseph Grimley '14
Alice Forbes '15
Anne Hakim '15

Putman Scholarship Recipients: Spring 2014
Molly Broom '15
Alexander Hager '15

Creager Field Scholarship:
Alec Lee '15
Madison Andres '15

Rhoades Scholarship:
Alexandra Freeman '14

William A. Fischer Family Scholarship:
Jessica Badgeley '15

Venture Grants:

Alexandra Freeman '14 – “Exploration of Chilean Culture and Landscape through an Artistic Lens”

Anne Hakim '15 – “Trekking the East African Rift Valley: A Geological Exploration of Oldoinyou Lengai”

John Swisher '15 – “Effects of More Variable Temperature on Snow Pack in Falleron, Chile”

Student Conference Presentations 2012-13

AGU in San Francisco, CA, Fall 2014:

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



Students geologize on the beach in GY445 Regional Studies in CA

Seminar Series Spring Semester 2013-14

Block 6 – February 28 - Ned Sterne, Sterne Exploration "The Golden Thrust System – Peculiar Geometries Associated with Backthrusts in a System of Stacked Triangle Zones along the Eastern Flank of the Colorado Front Range"

Block 7 – March 31 - Brandon McElroy, U of WY, "Not all rates are created equally- Quantifying variability in topographic evolution"

Block 8 – April 14 - Betsy Friedlander, Visiting professor for 8th block, "Evolution of Conduit Faults during the 2004-08 Mt St Helens Lava Dome Eruption"

Block 8 – April 25 - Dr. Mike Petronis, Highlands University, New Mexico, "Glacial Activity in Neoproterozoic Svalbard; Investigating ancient ice ages in the present day Arctic"

Block 8 – April 28 - Dr. Christa Placzek, James Cook University, "Life on the edge of tropical moisture belts"

Block 8 – April 30 - Dr. Peter Balaam, Carleton College, "Traveling Geologist: Ralph Waldo Emerson's Reading of Lyell and the 'Science of Experience'"

Seminar Series Fall Semester 2014-15

Block 1 -- September 1, Dr. Woody Fischer, CalTech, "Evolution of Photosynthesis and the Rise of Oxygen"

Block 1 -- September 22, Dr. Perry Spector, Visiting Block 1 Professor "Antarctic ice during warm climates"

Block 3 -- November 4, Dr. Will Yeck, CU Boulder "Anthropogenic seismicity in Colorado: Insights from contemporary cases of fluid injection induced earthquakes"

Block 4 -- December 2, Dr. Toby Minear, U.S.G.S. "Utilizing Terrestrial Laser Scanning for Ecological, Geomorphic and Hydrodynamic Studies"

Block 4 -- December 10, Geology Students Jonathan Zou "The Search for Tsunami Deposits" and John Swisher "Buster Grant Research: Geophysical Surveying in Costa Rica"



Students admire the rocks in Yosemite during GY445 Regional Studies

**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**

Carolne Alden '07

These days I'm at Stanford doing post-doctoral research with the Climate and Earth System Dynamics Group. I am currently working on sensitivity of Amazon Basin carbon dioxide fluxes to temperature extremes and drought. Other than that, I'm living in San Francisco and loving life :) GO TIGERS!

Phil Armstrong '07

Greetings Rockphiles! After a number of years in Colorado I made a big switch to northern California within the last year. I am currently developing renewable energy projects with a company called Recurrent Energy. Aside from getting acquainted with San Francisco, this has been an interesting learning experience with regards to land use in the West, power markets, renewable energy, public policy, and even a little geology once in a while. If you find yourself in the Bay area, please look me up!

Tom Ashley '12

Hi Guys! I just started a PhD at the University of Wyoming with Brandon McElroy. I'm studying bedload flux in the Grand Canyon.

Melissa Barton '06

After working at the National Ecological Resource Network in Boulder, Colorado, as a research assistant for a year, I decided to return to graduate school to aid a career shift towards environmental policy work. I am currently studying for an MSc. in Environmental Science and Policy in an interdisciplinary international consortium program based at Central European University in Budapest, Hungary.

Rob Backlund '05

Presently living in yurt in Kelly, Wyoming avoiding the "real" world. The yurt is co-owned with Tim Barker and Justin Strauss,

CC Geo grads in 2006. Taught geology and ecology for the last 3 years at the High Mountain Institute in Leadville, Colorado. Recently released Shit Bitch 32 to the public.

Christian Baxter '98

I have been in BC for almost 10 years now! We (wife Alex and son Sebastian who is 18 months) live in Vancouver and it is certainly home for the foreseeable future. I work for Teck Resources and am currently directing a project to address water quality around some of our BC operations. It has been a fascinating and great experience with immensely broad scope. I only make it home to Colorado every couple of years but it is certainly in my thoughts much more often.

Drew Beckwith '01 now has two kids, Macy (3.5 yrs) and Miles (0.5 yrs), who get dragged out to cool geo field sites whether they like it or not. Here at "the fan" in Rocky Mountain NP, which reactivated a bit during the Sept '13 floods, messing up the bridge and closing one parking lot. Still working at Western Resource Advocates on water issues, like Colorado's first state water plan. Learn more about our efforts on that at www.waterforcolorado.org.



Leah Bedoian '10

Hey all!

I live in San Francisco. I work for the Golden Gate National Parks Conservancy, a partner to the National Park Service. I have worked for the GGNPC for three years - on and off - building trails, removing invasive plants, and leading volunteers. I also get to hike around on serpentine cliffs monitoring the unique plant communities there. It is amazing becoming a more rounded naturalist, plants do seem to move around and change much faster than rocks. When I'm not working I am out running or finding my way to the mountains. I ran the SF Marathon last year and will run my first trail marathon in January 2015.

That's about it. Keep up the Palmer Family,

Leah

Anthony Barnosky '74 recently published a book entitled, "Dodging Extinction: Power, Food, Money and the Future of Life on Earth." It explains what scientists know about our current extinction crisis, and especially what we can do to stop it. It was named as one of the best science books of 2014 on NPR's Science Friday in December.

Ben Borkan '11

For the past two years, I have been working as a field guide at Open Sky Wilderness Therapy based out of Durango, Colorado. Since working in wilderness therapy, I have discovered how effective the wilderness can be at healing others. Going into my third year of guiding, I am beginning my process of applying to graduate school for a master's degree in social work to open more doors for me to apply myself. Several of the schools I am looking at include University of Michigan - Ann Arbor, Smith College and University of Chicago. UM offers Graduate Student Intern (GSI) positions to help pay for school and I am hoping to intern with the

Earth and Environmental Science Department to contribute the knowledge I gained from majoring in geology at CC. In addition to pursuing the MSW, I am hoping to combine the Peace Corps with my graduate education and travel abroad to serve and experience a different lifestyle. Until then, I am going to continue guiding and experiencing the challenges that wilderness therapy provides on a daily basis.

Bryan Reed Bracken '79

Oct. 3, 1956-Aug.10, 2014

Resident of San Ramon

Bryan Reed Bracken, age 57, entered into rest on August 10, 2014 surrounded by his wife and sons.

Born in Kansas City, Bryan and his family moved to San Marino, California in 1966. He graduated from Polytechnic High School in Pasadena in 1975, and moved on to get his B.A. in Geology from Colorado College in 1979. It was at "CC" that Bryan fell in love with the science of geology, continuing on to earn his M.S. from the University of Texas at Austin in 1982 and his Ph.D. in 1987 from the University of Utah. When beginning his doctorate studies, Bryan uncovered a love to surpass geology when he found Judy, and they married in September 1983.

Bryan was employed by Chevron after the completion of his schooling, starting in Hobbs, New Mexico, then Houston, and finally settling in San Ramon in 1991. His passion and enthusiasm for geology inspired countless students and fellow geologists. Known as an excellent field scientist, Bryan taught and mentored many of his colleagues, leading field schools in the beautiful wilds of Utah, New Mexico and several unique worldwide destinations. During his 27 years with Chevron, he set his sights on long-term goals and never wavered from them, culminating in his dream job in clastic stratigraphy research. At home in San Ramon, Judy and Bryan teamed up to raise three wonderful sons. Bryan was involved in almost everything they

did, from school activities to sports to scouting. A natural teacher, he introduced his sons to his love of nature and the mountains. He had a rare talent for growing the biggest tomato plants in San Ramon! Bryan was happiest when surrounded by his family, whether it was hiking in the mountains or at home watching a movie.

As an Eagle Scout himself, Bryan served as a leader of his sons' scout troop for several years and enjoyed adventurous outings in the mountains and oceans. He continued mentoring young men as they worked up to their Eagle Scout rank even after his sons were no longer in the troop. Bryan lived his scout values daily and was an excellent example to his sons and countless other young men.

After Bryan was diagnosed with cancer in 2009, he continued to work and enjoy a full life until about six months ago. He endured several years of various treatments, never complained, and remained positive and upbeat throughout those years, serving as a model of strength and resilience to all of us. Bryan is survived by his wife Judy of 31 years, sons Cameron, 28, Ryland, 25, Stewart, 23, mother Janice Bracken, five nieces and seven nephews. He outlived his father Dan Bracken (1919-1971), his sister Frances Gay Kohen (1958-2005) and his brother Dan (1955-2012).

Bart Cerf '11

Hi Geology Department! Since graduation I've been living in San Francisco and for the past two years I've been working for SiriusDecisions, a research and advisory firm based in Wilton, CT. Although I'm not practicing Geology, the skills I learned at CC have proved to be invaluable to me in my current role. I spend most of my weekends outside hiking, mountain biking and/or camping. This past June I was fortunate enough to be able to visit South Africa with my Dad and Germany with my brother during the World Cup!

A few months ago I participated in a

CC alumni event, Books on the Beach, with Jimmy Singer (class of 2011) where I had a chance to catch up with Christine Siddoway, which was great!

I hope all is well and if you're ever in the Bay Area don't hesitate to reach out.

Thanks for all the great work you do! Some of my fondest memories of CC are from Palmer and spending time in the field with the Geology department.

Ann Clarke '72

Just returned from hiking in Scotland after retiring from NASA. After a climb across a steep slope clinging to heather we moved on to a defined trail across the Cliffs on western Skye overlooking the ocean on a brilliantly clear day. (See picture.). The geology was

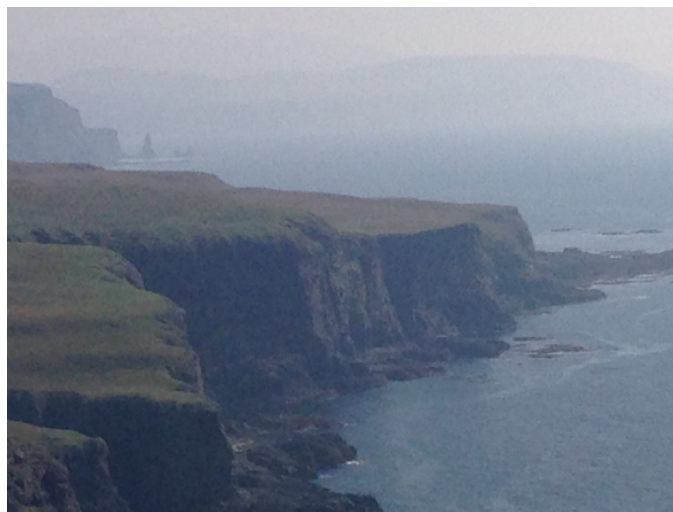


Photo from Ann's trip to Scotland

spectacular and the history interesting especially in light of the debates over Scottish independence. The next day we climbed in the Black Cuillin Hills (volcanic) and the following day the Quiraing with quite different geology.

John '71 and Debbie Hingston Dolson '73 are enjoying 'phasing into' retirement as they continue to work and travel globally as part of DSP Geosciences and Associates, which John founded in 2008. John has also joined Delonex Energy (London) as a Senior Advisor

and shareholder, with oil and gas exploration activity in Africa. His clients remain primarily in the UK, Egypt, Azerbaijan and India but he has also completed projects in Argentina and Suriname, as well as domestically in a number of plays. They both remain grateful for the liberal arts education they got at CC and for the chance to grow up in such a stimulating environment where you could 'stretch your wings' for four years and develop some lifelong friendships not just with students, but teachers. John is writing more, with 3 papers in press or finished in 2014 and several more on the way and a contract in place with Springer-Verlag for book on techniques for interpreting and oil and gas shows and seals. In June, he will receive a lifetime Distinguished Service Award from the American Association of Petroleum Geologists and have a chance to get back down to CC for a visit. He also is continuing to teach petroleum geology as an Adjunct Professor at the University of Miami. With their kids grown up and pursuing careers in the wine industry (Josh) and teaching (Kristin), next year should bring a bit less travel and more time home in the states.



This photo was taken on a trip to Baku, Azerbaijan in 2013, where John was teaching a course for BP and catching up with old friends from his first visits in 1992-1994.

Perhaps most illuminating for us with travel overseas six months of the year, is discovering that we have more friends scattered around the globe than we do in the US, and every country we visit reunites us with people Deb has either taught with in London, Cairo or Moscow or John has met through AAPG and business. It truly is a 'small world' out there.

Alexander Durst '93

I continue to work hard in real estate in NYC. Contending with subsurface contamination continues to play a large role in my day to day responsibilities.

Betsy Friedlander '07

Attached is a photo of Matt Rosales (08), Jenny Haywood (06) and me (07) up on a Zn/Pb exploration project in the Western Brookes Range of Alaska working with Teck Resources. We all live in Vancouver together. Jenny and I both are carrying out the mapping and structural interpretation of the fold and thrust belt geology of the property! Matt was up helping with geophysical surveys and assisting in mapping.



Caitlyn Florentine '07

I just started my second year as a PhD student at the University of Montana, studying glaciology with Joel Harper. Our research group is working on sliding and deformation mechanics of the Greenland Ice Sheet so I got to spend three weeks living on the big

ice this summer. My quantitative muscles have been getting intense daily workouts as I learn to program and take more math classes than my 20-year-old CC geology major self would have dreamed. Life in Missoula, Montana is busy with these nerdy efforts but I try to squeeze in some outdoorsy endeavors like biking, skiing, and trail running. I also hearken back to my liberal arts roots by reading books from CC Buddhism classes and practicing yoga on a (semi) regular basis. I think often and fondly of you geo folks working away in the basement of Palmer hall and of my fellow geo alums out doing marvelous things in the big wide world. Go ice – I mean, go rocks!



Sarah Geisse '13

After an amazing year paraproping I moved back to California to work in the wine industry. I started as a harvest viticulture intern for the 2014 vintage. My job consisted of soil sampling (getting a little geo in there), lots of grape sampling, and night picks. They have kept me on after harvest to fill in for their enologist, so now I am doing lots of wine chemistry and things I am probably not qualified to do. Not so much geology is involved anymore, but I am learning a lot about wine-making. As for what is next, I would like to try to work out in the vineyards again and am looking into going to grad school to study Viticulture and Enology. Cannot wait to come

back to Colorado soon and visit everyone in the Geology Department!
Thanks! Miss you all!

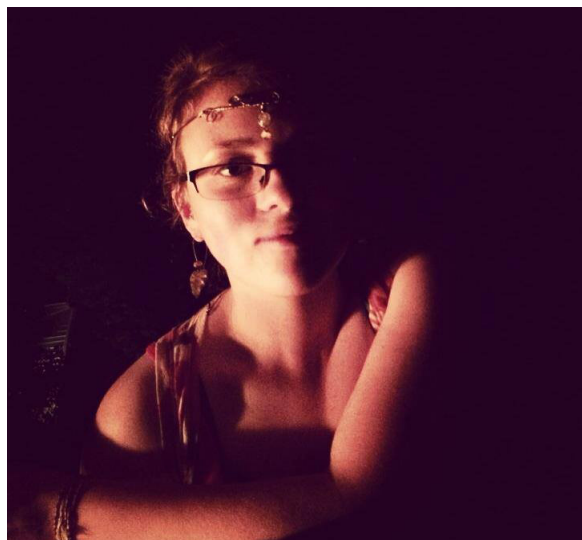
Steven Gray '81

While my career has taken me down many different paths, to this day I enjoy geology. My geologic background has come in handy when least expected. I was elected to the board of our home owners association in Golden, CO when a crack formed in one of the streets with water bubbling out of it. The county geologist tried to blame it on poorly compacted fill dirt, but a quick check showed that the crack formed where the road was cut into the side of the hill, not on fill dirt. Further inspection of geologic maps revealed that the road was situated on the Denver formation in a known landslide hazard area. Field inspection and aerial photos further revealed that they had built four, three quarter of a million dollar houses on an existing landslide slump. It was further complicated by the fact that Xcel energy had routed a major natural gas supply line for the mountains along the same road through the landslide hazard area! This was something a first year geology student could have advised against.

When not doing amateur geology, I run a software as a service provider that facilitates face-to-face meetings at conferences, trade shows and corporate events. Then in my free time, my wife and I just purchased an art enrichment franchise for the Denver area.

Annie Hanson '12

Since graduation Annie has not stopped living life on a slightly more prolonged version of the block plan... and may the adventures never cease! Fresh out of college she took a job as the kitchen manager at a small primitive skills wilderness education center in central NY where she stayed for 6 more months as an apprentice... mainly she tended to the chickens and Icelandic



sheep. During that time she also assisted the owner of a small, Waldorf inspired, home-based nursery school... and probably will never be able to get the seasonally appropriate children's songs out of her head... ever. That winter she made a bold decision to move into a small old apartment (we're talking that ancient wallpaper with intricate velvet-y designs all over) in a town of barely 500 people, next to a crotchety old she-hating ex-lover of the famous Robert Mapplethorpe. (Fun fact: Candy Darling, one of Andy Warhol's famous transvestite actresses, was buried in this town). She had a variety of small jobs, and helped open up an all vinyl record shop, XAVWAX, in the meantime. She went off to Colorado for a winter to get certified to teach yoga, and then back to NY to manage and cook for a small local food cafe and food truck, Origins Cafe, in Cooperstown, NY (that's right, baseball hall of fame! But more importantly..... Brewery Ommegang). After managing the kitchen for a Tibetan Buddhist retreat center, Rangjung Yeshe Gomde Cooperstown, she spent a month on the road with her teacher before most recently settling in to Atlanta, GA. She hopes to continue her studies of yoga and eastern philosophy and healing practices over the years to come, and in the mean time is hunting down every local urban garden she possibly can to see what good

veg the good city of Atlanta is feeding it's people! Annie really... REALLY... misses the mountains.... and hopes to set her feet on the biggest ones in the world someday soon!

Rowan Hill '09

I'm living in Durango these days, working with a wilderness therapy company called Open Sky Wilderness (there are a few of us CC geo majors who ended up here). I have been doing a lot of rock climbing and am actually heading out to the Utah and Nevada desert for a short climbing trip. I had a great visit at homecoming weekend and am feeling really grateful for all of my CC friends, both the ones I keep in touch with and the ones I saw for the first time in 5 years. Hope all is well in Palmer's basement.

Robert Jacobsen '10

Wow, another PCB and another year of graduate school! Still in Knoxville, still studying Mars, still loving it! See you next year :)

Bonita Lahey '69 is volunteering three or four days a week at the Denver Museum of Nature and Science. Two mornings a week in Prehistoric Journey and two days a week doing primary research for the Geology Department as a "citizen scientist." Under the direction of Dr. James Hagadorn, she is working on two Paleozoic extinctions as they occur in Colorado (end Devonian) and Colorado/Wyoming (Permian).

Peter McCarville '84

Another year continues for me acting as a geological guide and educator on adventure travel programs for various companies. While most of my "guiding" takes place with a company based in Ft Collins, called Mountains and Plains Institute, I continue to put together various educational tours for geologists and non-geologists as an independent contractor. Most of my activity centers

on the 4-corners states but I do trips in Death Valley , as well as abroad.

For Mountains and Plains Institute I provide the geology and natural history for adult educational vacations. Our (www.mpills.org) biggest client is the Road Scholar organization (formerly Elderhostel) out of Boston. For them, we create and execute hiking, biking, and skiing programs in the 4-corners states.

As I am always looking to broaden my contacts and build collaborative relationships with other providers of adventure travel, don't hesitate to email me if you are in the business. Likewise, if you are interested in a private adventure travel program with lots of outdoor activity and learning about the natural history of the Rocky Mountain west, please contact me. Cheers. Peter McCarville (petermccarville@gmail.com, class of 1984).

Personally I find a great joy in raising a 16 year old daughter together with my wife. Life is full of music lessons, AP homework help, family hiking and skiing, and prospective college visits! In addition, living rurally on the Western Slope of CO for over 20 years has been one of the most rewarding decisions of my life; in addition to going to CC!

David Mendel '06

I recently moved back to Denver following a 4 year stay in Seattle, with my wife and 1.5 year old daughter alongside. I was able to stay with the same employer for the move; an environmental consulting firm called SoundEarth Strategies. I don't get to play in the dirt as much after the move, but otherwise all's well. Cheers!

Brook Nunn '98

Graduated in 1998 Geology and Chemistry double major.- Name Brook L. Holcombe. Now Brook L. Nunn
Married 2003 to Chris Nunn (anesthesiologist) graduated with Ph D in Chemical Oceanography 2004
Moved to Dunedin New Zealand to com-

plete postdoctoral NSF fellowship award at University of Otago with Philip Boyd.

1 child- Tasman A. Nunn, born in New Zealand.

Moved back to Seattle to work at the University of Washington.

August 2014 hired by the University of Washington Department of Genome Sciences as a Research Professor to study Environmental proteomics. We use state-of-the-art tandem mass spectrometry technology and bioinformatic tools in order to analyze and decipher protein expression from a variety of samples from the environment. Our specialty is in the marine world. Be it particles floating in the ocean, sediments on the ocean floor, phytoplankton adapting to climate change, or bacteria surviving on hydrothermal vent plumes or in Arctic ice channels, we are interested and excited to tackle the project.

My unique position as a research professor allows me to be a dedicated researcher and a highly-involved dedicated mother. I am an avid bike racer, specializing in criteriums on the road or distance in the mountain races. My daughter is in 2nd grade and a bad-ass on skis!

website: environmentalproteomics.org

Terri Olson '80

Terri Olson has been working as a petrophysicist, first at Amoco, then BPAmoco (in Norway), then at Tom Brown, which was bought by Encana. She gave a talk at the CC Geology forum series about 10 years ago, on White River Dome Field in the Piceance Basin. She went to EOG Resources as a petrophysical advisor 6-1/2 years ago. This fall she changed tracks, and in October started working for Lithicon/FEI, developing applications of SEM and CT imaging technologies for unconventional hydrocarbon reservoirs. Her husband Christof Stork is a research geophysicist for Ion Geophysical, and her son Devon Stork will graduate from Harvey Mudd College in the spring with a dual biology/chemistry degree.

Matt Rosales '08

I'm still working with Teck Resources, based in Vancouver, Canada. So far this year I've worked on epithermal and porphyry gold/copper systems in Turkey, the Red Dog lead-zinc mine with Besty Friedlander and Jenny Haywood, and am currently working on a Carlin-type gold project in northern Nevada. GSA Vancouver was great this year; really enjoyed seeing where our diverse department has ended up!

Jon Rotzien '07 is enjoying reading *The Precambrian Basement* right now and would be delighted to talk geology over Peet's Coffee in Houston or College Station any day (email: jrotzien@alumni.stanford.edu).

Rob Sanders '99 and Amber McIntosh '98

Some of you have heard rumors and for others this is news...today we purchased a lavender farm business not far from where we currently live in west-central New Mexico. A market downturn in economic geology and life-style changing events (aka. our awesome 3 yr old son Riley) had left us brainstorming for a feasible way to financially exist on our beautiful 52 acres.



We've been focused on how to use our low-temperature geothermal well for aquaculture and agricultural concepts including the cultivation of Ajwain and Kala Jeera,

two Indian curry spices currently being researched for anti-oxidant and anti-cancer properties which grow in similar environmental conditions and elevation we have here at the farm. We established the small company Rain Mesa Botanicals.



Paths of fate crossed two months ago when neighbors, whom until now we'd only met in passing, approached us to sell their established lavender farm and lavender-based product business. After contemplation we decided this was an ideal mesh between our desire to operate a home-based business with an agricultural angle, expand our elaborate gardens (which by the way are in full bloom and beautiful right now), and continue our scientific background with research, formulation, and experimentation.

Fortunately the farm is coming to us. By that I mean we have moved the production facilities onto our spread, and are in the process of establishing new acreage of lavender fields with currently over 200 new plants waiting for spring. We are an off-grid establishment operating on solar power and satellite internet and devoted to wise water use. It might be utopian thinking, but to take a successful, operating business and simply transition power and communication requirements to a renewable energy source makes us proud on a different level.

We invite you to visit our website www.rainmesabotanicals.com.

frollickingdeer.com to view our product line. As this transition proceeds please check back for updates and changes. Our goal is to continue to produce this very high quality selection of lavender-based products and ultimately diversify as research, biochemistry, trial and error, witch doctor, and medicine man aspects coalesce.



Ted Starns '07

I'm working in Anchorage for ConocoPhillips as a Development Geologist in a drilling program for a mature oil field on the North Slope of Alaska. I'm living in Anchorage and settling in to life here, trying to fish as much as possible. I've been enjoying my opportunities to catch up with my miner colleagues Betsy Friedlander and Jenny Hayward as they pass through to their work in the remote regions. I'm always grateful that they take the time to cavort with a city slicker office jockey like me. Best wishes to everyone, don't be a stranger if you're in Anchorage.

Walter Sweet '50

M. Sc., PhD at University of Iowa. Faculty at Ohio State University 1954 to present, Professor Emeritus 1988-Present. Married Lou Franken in Oslo, Norway, 1957 while there as Fulbright Research Scholar. Mentored 30 M.S. and PhD students, authored (or co-authored) some 200 scientific reports, 5 books. Field work in Bolivia, north Italy, China, all over U.S. SEPM Moore Medal, Paleo. Soc. President and Medalist, Chief Panderer Pander Society, & Pander Medal.

Lynne Westerfield '00

I'm guiding Grand Canyon River Trips, where I get to hang out with lots of rocks! I'm also adventuring in the big wild whenever possible and running an environmental non-profit, Cloud City Conservation Center, in Leadville, which I founded last year.

Paul Whittaker '95

For the past four years I have been living in Tromsø, Norway - a small island 350 kilometers north of the Arctic Circle. While most people who visit come to play in the nearby Lyngen Alps or to see the midnight sun and the northern lights, the geologic community should know it as a global headquarters for earth observation. I am employed as the Director of Sales at Kongsberg Satellite Services (KSAT). We own and operate the world's largest commercial ground station, connected by subsea fiber optic cables to the island of Svalbard - another 1,000 kilometers north



Paul Whittaker's ground station satellite

at 78° (we also have antennas in Antarctica, although I have yet to find a way to justify a trip to our facilities there). From Svalbard our antennas can see every pass of the polar-orbiting satellites used for earth observation. This includes, for instance, sensors equipped for high-resolution optical imagery such as you find in Google Earth, Synthetic Aperture Radar (SAR) capable of operating in darkness and through clouds, and Automatic Identification Systems (AIS) for tracking vessels at sea.

dreams) it is a unique company and the best job I've ever had.

David Williams '87 has another book coming out. *Too High and Too Steep* will explore Seattle history through the lens of its topography. UW Press will publish it in Autumn 2015. More info at geologywriter.com

Emily Parker Wright '04 has a new job that brings her back to Colorado! Now a Geology Instructor at Front Range Community College, in Westminster, CO.



The most interesting services we provide are derived from SAR data, which we are using to monitor the oceans around the world for early detection of oil spills, to track ice conditions throughout the arctic, and observe the movements of vessels engaged in illegal, unreported and unregulated fishing activity. We have a team of analysts interpreting fresh satellite data twenty-four hours a day and are able to deliver information anywhere in the world in near real time.

I first took a remote sensing course while enrolled in a Hydrology program at the University of Arizona – graduate school naturally following my time in the geology basement at CC. While it would be dishonest to draw too straight a line between these points (I didn't move to the arctic to chase satellite

Eric Daniels '09 is back in the Denver area and just started a new job at Neos GeoSolutions (www.neosgeo.com).



Students in Ventura, CA for GY445 Regional Studies



Photo by Stephen G. Weaver

Dear Colorado College Geology Alum:

We hope you have enjoyed the 2014-15 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

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