

# the Pre. cam brian Basement

THE COLORADO COLLEGE GEOLOGY DEPARTMENT



2005

*Volume: VII (of the new series)*

*[www.ColoradoCollege.edu/Dept/GY/](http://www.ColoradoCollege.edu/Dept/GY/)*

Cover photo:

Left to right:

Michael Beckel, Paquito Lopez, Rob Backlund, Tom Collins, Andy Neuman, and Greg Maximov. Cairngorm Mountains. Aviemore, Scotland.

**The Precambrian Basement**

2005

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# Letter From the Chair

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Greeting from the Geology Department – still here (mainly) in the Palmer basement. You probably didn't expect to be getting another Chair's greeting from me, and I didn't really expect to be the one sending it out to you again so soon. But ... when Jeff moved over to the dark side (oops, I mean the administration), I signed on for another year as Chair. So here I am writing to you once again.

First let's catch up on the 2004-2005 academic year. We had another tremendous senior class – only 12 graduates but a great group (the incoming senior class is larger and we have oodles of sophomore and junior majors). Nearly all of the seniors did major research projects that took them to places as far away as Tibet, Mongolia, and Iceland. Our regional trip in fall 2004 took the entire class, along with Christine Siddoway and myself to Scotland. Why do Christine and I always lead trips to places where they drive on the wrong side of the road? You'll get the whole story of the trip in a full article inside, for now suffice it to say that we had wonderful Scottish weather (three days of brilliant sunshine, three weeks of rain), made pilgrimages to such venerable field sites as Siccar Point, the Moine Thrust, the Parallel Roads of Glen Roy, and the intrusive complexes of Skye, and undertook some pretty tough field projects. Other classes stayed a bit closer to home, but we had some great (and some snowy) field trips throughout the Rockies and the Southwest.

2004-2005 was one of those rare years when all five tenure-track faculty were on campus at the same time – no sabbaticals or other leaves. Still, we were able to keep Charly Bank here for a 3<sup>rd</sup> year as a visiting faculty member, enriching the geophysics end of the curriculum. Charly has since moved on to a tenure-track position at the University of Toronto, although he is still working with two CC geology majors. As usual, research work took faculty to several continents and throughout North America during the year. You'll hear more about that from individual faculty members. Two bits of important news on the department faculty front -- first, the new Dean of the College (Susan Ashley of the History Department) asked Jeff Noblett to take over as the Associate Dean of the Faculty. Jeff will be inhabiting Armstrong Hall for the next several years, so for the 2005-2006 year, Craig Scott will be taking over the petrology curriculum. Craig (PhD – University of Quebec, Chicoutimi) comes to us most recently from teaching positions in Southern California, but hails originally from Newfoundland, giving Paul a linguistic colleague. Second, the Department was awarded a new, *sixth*, tenure-track faculty position. We will be searching during the 2005-2006 academic year for a new faculty member. There are several fields in which we might hire, including geophysics, geochronology, and geobiology. We're really excited about the possibilities and about meeting candidates this coming February. We'll introduce our new faculty member to you in next year's Precambrian Basement. While we are waiting to fill the new position, we've hired Mike Petronis a (very) recent University of New Mexico PhD and a paleomagician, to teach geophysics, tectonics, and introductory level classes during 2005-2006.

The “new” Tutt Science Center is now 2 1/2 years old. We love our clean, spacious, modern spaces there. We also love our warm, cozy, and now almost-fully renovated, spaces in atmospheric Palmer Hall. Come on by and have a look at both buildings. Bring along a flash drive with a few slides and we'll set you up to give a talk, either in good old Palmer 16 or in the beautiful new lecture hall in Tutt. In the mean time, be sure to keep us up to date on what is going on in your life and career. We'll pass on the information to your classmates in the next Precambrian Basement and we love to brag about you guys, so keep the information flowing in.

- *Eric Leonard*

## *CC Seniors Experience Scotland's Geologic Bounty*

Professors Eric Leonard and Christine Siddoway first acquainted the 2005 geology seniors with the location of our Regional Studies course with these optimistic words from author Robert Louis Stevenson: “But Edinburgh pays cruelly for her high seat with one of the vilest climates under heaven. She is liable to be beaten upon by all the winds that blow, to be drenched by rain, to be buried in cold sea fogs ... For all who love shelter and the blessings of the sun ... there could scarcely be found a more unhomely and harassing place of residence.”

Scotland in September is no tropical getaway, but being renowned as the birthplace of geology for the Anglophone world makes it a hot tourist destination in our profession. The country owes its rugged beauty to hundreds of millions of years of tectonic activity, which accreted orogenic belt after orogenic belt and produced breathtaking examples of structural—and later, glacial—geology. So we eagerly traversed across the sea in homage to our Scottish forebearers.

The twisting, uneven roads of Edinburgh welcomed us, as did the local drinking establishments. And as fortune would have it, the sun taunted us with its rays during our first days, enticing the six of us males to purchase kilts and wager pints on who could last the longest performing field work in said traditional attire. (With more sensible outlooks, our six female compatriots

purchased flasks as their souvenir field instrument of choice.)

Soon after our arrival, we journeyed to Siccar Point, perhaps the most famous angular unconformity in the world, where we frolicked about on the Silurian greywackes and overlaying Devonian sandstone to appreciate, as James Hutton once famously did, this textbook example of the magnitude of geologic time and geologic processes.

Two days in the resort town of Aviemore introduced us to the glacial geomorphology of the Cairngorms. After mapping the extent of glacial ice during the LGM, we headed to our next base of operations, a secluded hostel near Assynt in the Grampian Highlands. Almost exclusively patronized by geologists thanks to its easy access to the Moine Thrust—the tectonic event that displaced these



*The 2005 senior class and Eric Leonard at the English border on our Regional Field Studies course.*



*Left: Student Mike Beckel consults with Christine Siddoway on the imbricate fault system in Assynt.*

*Right: Rob Backlund assists Andy Newman as he experiences a kilt malfunction.*

rocks more than a hundred kilometers when Baltica slammed into Laurentia during the Caledonian Orogeny—the hostel included a bunk house, dining room tables great for map work and competitive



*14 bodies and some rare sunshine allowed us to pay homage to our science in this unique way.*

cribbage, and a spacious recreational hall. For nearly a week, we surveyed the imbricate thrust belt (still in our kilts) trying to piece together the puzzle of disheveled geologic boundaries. In the crags of these isolated mountains, Royal Air Force fighters regularly flew by as we took scores of strike and dip measurements, shattering our remoteness from the outside world and the violence of the war in Iraq.

Our numbers increased on the Isle of Skye as we were joined by technological guru Steve Weaver. Armed with his camera and enthusiasm, he instructed us about the marvels of the island’s igneous petrology as we hiked with a rainbow seemingly around every corner. We also were afforded the opportunity to explore the quaint town of Portree, famous for its scenic harbor and the grassy point that hosts Skye’s annual Highland Games.

Eventually, our adventures led us to a day

deemed too wet for kilts. On our final field day in Scotland, we donned rainsuits to explore the Garvellach Islands, home to Neoproterozoic sandstones and conglomerates that discredit

the “snowball earth” theory of Harvard geologist Paul Hoffman. We trekked through the drenched ferns and trees, observing phenomenal eleven meter cross-beds, beautifully eroded varves and even spotted a rare basking shark in a cove.

In the end all six men endured the kilts, and the bet was ended with the ladies simply buying the guys a round of Guinness as we happily recalled the array of our adventures. From beholding the 800-million-year old sandstone of Torridon to hypothesizing about the origin of the alleged rock glacier of Beinn Alligin to visiting the Eilean Donan castle to swimming in Loch Ness and the North Atlantic, we endeavored to appreciate the significant cultural and geologic aspects of Scotland. As Eric reflected upon our return, “Geology gives you an excuse to travel the world. It’s sort of a shame to do one without the other.”

- Michael Beckel ('05)

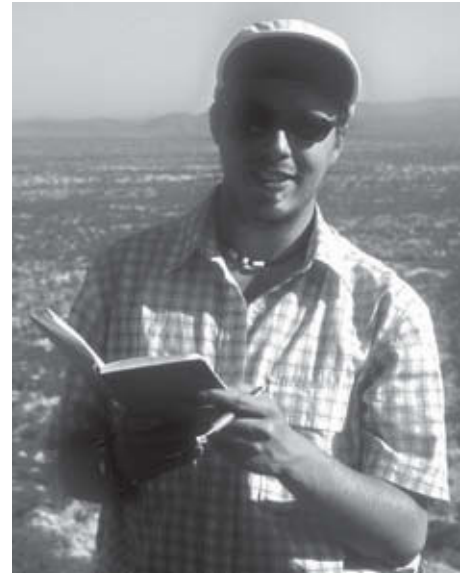
# *Alumni Spotlight*

## Woodward “Woody” Fischer (’00)

*The Alumni Spotlight is the section of the Precambrian Basement in which we have a chance hear about some of the absolutely amazing things our geo alums are doing, both in and outside the field of geology. This year we’re highlighting 2000 graduate and former paraprof Woody Fischer.*

Hi all, as I currently find myself nearing the end of my graduate student career I thought it might be nice to send in a brief update about my life, scientific and otherwise, since I left CC. For the past four and a half years I have been living on the BEast coast working with advisor Andy Knoll at Harvard University in the Department of Earth and Planetary Sciences in the subdiscipline of geobiology. During this time, my interest in the historical interactions between life and Earth surface environments grew from a harmless fascination to what now can only be described as aiepathy.

Earth is a living planet. The sedimentary rock record suggests that this has been true for at least the last 3.5 billion years. That being the case, the history of the Earth is inseparable from the history of life on Earth. I work to understand the congenial evolution of life and Earth surface environments on the young Earth. The major focus of my scientific attention has been on the Paleoproterozoic (~ 2.4 billion years ago) appearance and rise of atmospheric oxygen as told by an ancient carbonate platform preserved in South Africa. One of the most marked environmental changes in Earth history, the rise of atmospheric oxygen, stems from a major biological innovation. The evolution of oxygenic photosynthesis conferred the ability to use water as a photosynthetic substrate (earlier photosynthesis was anoxygenic and required reduced iron, sulfur, or hydrogen). Primary productivity was no longer limited by the source of electrons. Molecular oxygen became widely available for use in anabolic and catabolic metabolisms. This innovation profoundly altered biogeochemical cycles, led to the buildup of oxidants in the atmosphere and oceans, and ultimately paved the way for modern surface environments bathed in free oxygen, the internal combustion engine, and war in the Middle East. From field geology, petrography, geochemical measurements on returned field samples, and laboratory experiments concerning the metabolisms and molecular biology of selected extant organisms, we are now beginning to develop an appreciation for the ancient geobiological processes important in evolution of oxygenic photosynthesis and the rise of atmospheric oxygen.



On a somewhat different note, motorcycles are cool! I’ll bet that many of you think that the two-wheeled machines are just for people that can’t wait to be organ donors; until recently, so did I. Then one day a friend of mine picked up a late 70’s Suzuki Titan (yes, the one with the pink tank and baby blue pinstriping) at auction. I took it for a quick spin around the block and became hooked. I recommend everyone give motorcycling a try (wear a helmet!). For the apprehensive, you need to rent a copy of Bruce Brown’s “On Any Sunday”. If after that motorcycles still aren’t cool then I suggest that you might find some thrills at <http://www.hasbro.com/miltonbradley/>.

## Visiting Geophysicist Moves On

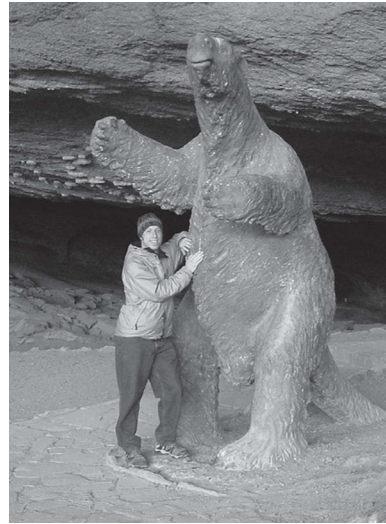
Colorado College has been lucky to have Charly Bank as a visiting professor of geology for the last three years. During his time at CC Charly taught a variety of courses including Introductory Geology, Geophysics, and Plate Tectonics. Charly also involved many students in geophysical research projects including a gravity survey of a landfill within the Garden of the Gods Park. In the summer of 2005 Charly moved on to a tenure-track position at the University of Toronto. Two geology seniors, Coleman Hoyt ('06) and Dave Mendel ('06), traveled to Toronto over half-block 2006 to continue collaboration with Charly on their senior theses.

Charly's incredible knowledge of the field of geophysics is only eclipsed by his willingness to impart that knowledge unto others. A great classroom teacher as well as field instructor, Charly truly cares about the education of his students. He gave many opportunities to students for projects in and outside of the classroom, and his enthusiasm made these opportunities into incredible learning experiences. Charly's friendly, gentle manner will be greatly missed by the geology department and the entire Colorado College community. We wish him the best at the University of Toronto.

- Coleman "Woody" Hoyt ('06)

## Geo Student Cruises to Chile and Maps Seafloor Structures

Last spring, thanks to the connections of Colorado College's esteemed Professor Christine Siddoway, I was presented with the chance to aid the joint research of Professor Joann Stock from CalTech and Steve Cande from Scripps Institute of Oceanography. Their research: mid-ocean ridges as relating to tectonic reconstructions; my part: cruise across the South Pacific ensuring that the data was collected properly. I was part of a five person science crew (one chief-scientist and four 'watch-standers') aboard the NSF Antarctic ice-breaking behemoth known as the Palmer. We embarked for our journey



*Dave at Milodon Cave, NZ.*

specific mission was to follow the trace of a fracture zone across the mid-ocean ridge, allowing the researchers to retrace the movements of the sea-floor on both sides.

Once we arrived at the distant Chilean coast and began the trip through the Straits of Magellan, which guided us to our final destination of Punta Arenas, the radar informed us that we were once again near land, yet the fog hid the fact from our eyes. Eventually it cleared, and the rugged, barren land of Patagonia was revealed. We arrived in Punta Arenas and celebrated the safe arrival in town with the entire crew of the ship. The next day, the science crew pooled together and rented a truck that carried us north to the town of Puerto Natales and into Torres del Paine National Park. Once again, as we arrived the scene was covered in fog, but as we carried on the skies cleared and the full extent of the park was unveiled. The imposing peaks, so often photographed, were really something to behold. Alas, we could not linger due to flight schedules and so returned to Puerto Natales that evening. The following day, after seeing two of the crew off on a bus, we ventured to the nearby Milodon Cave and hiked around the prehistorically inhabited area. It was then time to return the vehicle and prepare for the trip home. A sunset visit to welcome back the Magallenas penguins from a long day of fishing was our last stop before arriving back in Punta Arenas. All told, it was quite an adventuresome sixth block and spring break (though I did miss the snow in Colorado a bit).

- David Mendel ('06)

in Christchurch, New Zealand and the receding lights of the city were our last glimpse of land for three weeks. While in transit side-scan sonar was employed to map the bathymetry of the ocean floor and magnetic anomalies were recorded to date the floor over which we were passing.

## Emeritus Professor Transcribes Early CC Geo Prof's Correspondence

About a year ago I became temporary custodian of a packet of letters written mostly by Professor Francis W. Cragin of the Colorado College geology department spanning the years 1872 - 1911. After reading all of the letters it became apparent that they provided a rare insight into the life of this professor and an even more fascinating picture of the college during the tenure of President Slocum. I spent three months transcribing the entire collection, recorded all of the information on a cd and convinced the owner that the entire collection should become part of the college's Tutt Library Special Collections where it has now been archived.

The letters record the meteoric rise of one of the nation's most promising paleontologists and the subsequent tragic inability of the man to cope with personal family and financial problems. Here, among miscellaneous bits of trivia, one can find the fascinating first person account of his wild chase

across western Kansas in 1890 to successfully acquire, and later sell, over 1,000 pounds of the "world's largest pallasite meteorite". Ironically this same area in western Kansas has just this week (November 12) produced a 1,400 pound specimen with an estimated value in excess of \$1,000,000.

We are indebted to Cragin for establishing the first real geology curriculum, for founding the Colorado College Palmer Hall Museum, and for devoting countless hours to the planning and construction of Palmer Hall. Cragin resigned his teaching position in 1903 and devoted the balance of his life to compiling a history of the "Old West" by interviewing the surviving trappers and traders of that era and all of his notebooks and writings were donated to the Colorado Springs Pioneer Museum. He died a ward of the state while living in the Myron Stratton Home.

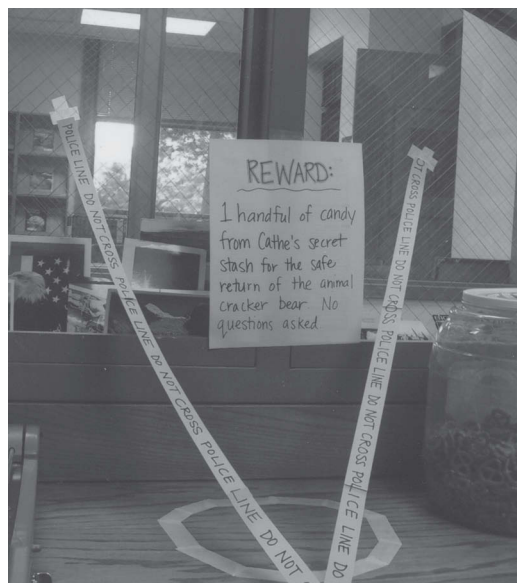
- Bill Fischer (emeritus)

## Animal Crackers Abducted! Thieves Caught Crumb-handed!

As many of you know, one critical locus of energy and good spirits in the geology department is the seemingly bottomless jar of animal crackers and pretzels that sits in Cathe's office. It is our watering hole - the place students, faculty and staff go to recharge during long hours of work and study. For many seniors working on theses, animal crackers and pretzels are their only source of nourishment in the demanding weeks before the thesis deadline. The role that this simple food plays in the functioning of our department cannot be overstated. Thus you

can image the consternation and general alarm that ensued in Block 3 when the jar disappeared! The crime scene was carefully cordoned off and photographed by Ross Baldwin '05 and Cathe Bailie. Despite their careful police-work, there were no immediate leads. The jar was recovered several days later by Karri Siccard '07. Who were the thieves? The students of GY 140, Introductory Geology! Their motive: hunger. Their method: con the paraprof into opening Cathe's office in the evening then distract her so that she leaves the door unlocked before heading home.

- Becky Zentmyer ('05)





## Portland Mill Site Investigated by Intro Classes

In the Spring of 2005 Bear Creek Park underwent a preliminary investigation by the students of Henry Fricke's Earth Systems Science class and Eric Leonard's Introductory Geology class. Bear Creek Park is underlain by what were once storage ponds of the fine-grained mining tailings of Portland Mill, a mill used for extracting gold from material brought down from the Cripple Creek gold mine in the early 1900's. The tailings have become exposed along the banks of Bear Creek, and have been in contact with the water, soils, flora and possibly fauna of the region.

The purpose of the class' investigation was to get preliminary data that might identify possible harmful contaminants that have leaked from the tailings into the surrounding environment. Students used the chemistry department's inductively coupled plasma spectrometer (ICP) and our own x-

ray fluorescence spectrometer (XRF) to obtain an elemental analysis of soils, water and plant matter in search of traces of contamination from the tailings. These results were compared to EPA water quality standards and expected elemental concentrations in soils and plants.

The most interesting finding of both classes was an anomalously high level of many heavy metals in plant material nearby the tailings ponds. These concentrations decreased radially away from the ponds, implying that their source is the tailings themselves. Further research in this region is a possibility for future geology classes, as more information is needed to determine the extent of contamination from these tailings, and what, if any, harmful effects these heavy metals are having on local plant life.

*-Emily Pope ('04)*



*Demonstrating C-S fabrics at the Moine Thrust near Assynt, Scotland.*

## GSA & AGU Presentations (Abstracts)

### Petrology of Mafic, Intermediate, and Silicic Lavas in an Abandoned Rift Zone, Laxárdalsfjöll, Iceland

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A sequence of Tertiary lavas on the Skagi Peninsula, Iceland was erupted along a rift abandoned at 7 Ma. Previous reconnaissance mapping of Laxárdalsfjöll, in the southern Skagi Peninsula, identified an acid volcanic unit within an otherwise basaltic sequence. New mapping has further constrained the extent, lithologic diversity and origin of this unit. The lower 200 meters of stratigraphy exposed in the study area consists of aphyric basalts and basaltic andesites. Overlying this unit is the acid volcanic unit, a ~20 meter thick coarsely plagioclase-phyric andesite. The andesite exhibits field and petrographic evidence for magma mixing. In much of the study area a rhyolite lava of variable thickness overlies the andesite. The upper 250 meters contains lavas of variable composition, including basalts, andesites, and one dacite lava. Minor tuffs exist in this unit. Twelve samples were analyzed by XRF and eight by ICP-MS. On classification diagrams (e.g. TAS) samples plot as basalts, basaltic andesites, andesites, dacite and rhyolite. All plot on the tholeiitic trend on an AFM diagram. The basalts are moderately to highly evolved (48.1-53.2 wt % SiO<sub>2</sub>, 3.5-7.0 wt % MgO). The upper basalts are more evolved on REE and incompatible element plots than the lower basalts. Silicic rocks range up to 75.3 wt % SiO<sub>2</sub>. The felsic samples are parallel to but more enriched than the basalts on REE and spider plots. Trace element data display generally parallel REE patterns with modest LREE enrichment. A negative Eu-anomaly develops progressively in the intermediate to silicic rocks (rhyolite Eu/Eu\* = 0.59). Spider plots show considerable LILE variation, including depletion

in Sr and variable Zr. Generally the trace element patterns of the basalts resemble P-MORB and OIB. The geochemical data suggest that the flows originated from an enriched mantle source, not a shallow asthenospheric N-MORB mantle. This is consistent with the plume interpretation of Iceland. Dacites and rhyolites may be crustal melts or fractionates from a basaltic parent. Trace element variations suggest that the andesites are the result of mixing basaltic and dacitic magmas.

1330h

### Geophysical Exploration of the Red Rocks Canyon Landfill in Colorado Springs, Colorado

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Our introductory geophysics class conducted a survey of the Red Rocks Canyon landfill to determine its boundaries, depth, type of fill, and groundwater runoff patterns. In the 1970s and 1980s the canyon was filled with domestic waste, and has recently been acquired by the city to extend an existing park. Our results in general portray a heterogeneous subsurface and reveal that the landfill likely contains many metallic objects. More specifically we found the following: A negative Bouguer anomaly across the landfill matches a model for a ~25 m thick fill. Resistivity is much lower on the landfill than off, but we could not confirm our hypothesis that the landfill drains water through the north end of the canyon. Our seismic data are inconclusive, we think that our assumption of a planar bottom and seismically homogenous fill is violated. The magnetic data show on average higher total values, large (>1,000 nT) variations and high magnetic gradients on the landfill; because this method is fast and very clearly maps the landfill boundaries we propose a magnetic survey

to detect possible unregistered dumps outside the mapped boundaries of the landfill. Measuring ground conductivity utilizing an electromagnetic survey produces significantly higher values on the landfill than off. Additionally, directional anisotropies match the direction of the strike of the geological formations adjacent to the landfill and are more randomly oriented on the landfill.

### **Shear zone roots in the middle crust: the transition from partitioned deformation to penetrative ductile flow in the northern Wet Mountains, CO**

**COLLINS, Thomas R. IV**<sup>1</sup>, SIDDOWAY, Christine S.<sup>1</sup>, JONES, James V. III<sup>2</sup>, and TELLIO, Candice<sup>3</sup>, (1) Geology Dept, Colorado College, Colorado Springs, CO 80903, [t\\_collins@coloradocollege.edu](mailto:t_collins@coloradocollege.edu), (2) Department of Geological Sciences, Univ of Texas at Austin, Austin, TX 78712, (3) Dept of Physical and Environmental Sciences, Mesa State College, Grand Junction, CO 81502

Proterozoic gneisses of the northern Wet Mountains, Colorado, contrast in metamorphic grade and structural style from those in adjacent ranges. The Wet Mountains form part of a ca. 1.4 Ga thermal culmination and mark a transition from deformation partitioned upon large discrete shear zones, characteristic in the Front Range (Shaw et al., 2001; in press), to distributed deformation in a partial melt / magma- rich horizon. In the northern Wet Mountains, non-migmatitic shear zones exposed in the Arkansas River Canyon contrast with high strain rocks in Copper Gulch, 6 km to the south, that are flooded with leucosome and heterogeneous granite intrusions. Fabric geometries, crosscutting relationships and small scale structures at these two sites were measured and documented in detail in order to understand the transition from localized deformation upon steep high strain zones to partial melt dominated flow.

In the Arkansas River canyon, NNW- to N-S-striking shear zones in Five Points Gulch and Sheep Basin exhibit steep to moderately steep high strain fabrics and share a NE- to NNE-plunging

mineral lineation, defined in the Five Points shear zone by prismatic sillimanite and symmetrical strain shadows upon garnet. The shear zones, developed in monotonous gray quartz gneisses, cut across WNW-ESE to NW-SE polyphase fabrics and map-scale, ESE- to SE-plunging folds outside the zones. Asymmetrical folds and rotated boudins record reverse oblique motion on the Sheep Basin shear zone. A late-tectonic pegmatite dike involved in the zone yields a U-Pb zircon age of  $1430 \pm 5$  Ma, constraining the time of shear zone activity. Work in progress in Copper Gulch to the south, at a deeper structural level, finds comparable rocks invaded by granite sheets and distinct leucosomes. Dominant fabrics remain steep but are variable in orientation, host gneisses and granites are closely interfolded, and fold trends seem variable; suggesting gradual onset of melt-dominated behavior as 'framework' gneisses weakened. Reverse movement on discrete zones, as at Sheep Basin, potentially drew incompetent, melt rich materials in to the shear zones, acting to progressively broaden the deformation zones and give way to distributed deformation.

Shaw, C.A. et al., 2004, in K.E. and Keller, G.R., eds., AGU Monograph, in press.

### **Insights on the kinematic evolution of the Ute Pass Fault Zone from investigation of mesoscopic brittle faults**

**FAY, Elizabeth J.** and SIDDOWAY, Christine S., Dept of Geology, Colorado College, Colorado Springs, CO 80903, [e\\_fay@coloradocollege.edu](mailto:e_fay@coloradocollege.edu)

The Ute Pass fault (UPF), Colorado Front Range, forms the eastern margin of the Pikes Peak massif, where Proterozoic crystalline rocks are upthrown with respect to Phanerozoic strata, consistent with west-side-up reverse faulting during the Laramide orogeny. Units as young as Late Cretaceous are vertical or overturned in the footwall of the fault. However evidence also exists for strike-slip and normal sense movement in Cenozoic time, suggesting a complex movement history for the UPF. To gain kinematic information about each deformation stage, a new study of mesoscopic brittle faults within

and bordering the UPF is underway in the area around Manitou Springs, CO.

In this area, the ~N-S-striking, moderately west-dipping UPF that bounds the southern Front Range changes in orientation to ~320°, subvertical, along a very linear trace suggestive of a strike-slip fault. The NW fault segment trends obliquely across the Front Range, and steep NW-striking brittle shears in the zone do exhibit shallow, NW-plunging striae indicative of sinistral (linked to west side up) oblique strike slip. Deformation is focused where the change in fault geometry occurs: the UPF divides in to three or more fault strands; there is a wide zone of brittle cataclasis and gouge; and footwall strata undergo an abrupt change in orientation. Abundant “sandstone dikes” in the UPF hanging wall are penetratively brittlely sheared. Work to date distinguishes three distinct fracture arrays associated with the Ute Pass Fault. These are 1) subvertical NW-striking shears with shallowly plunging fault striae; 2) steeply S-dipping ENE-WSW shears with shallowly plunging striae; and 3) a conjugate array oriented N65W, exhibiting down-dip, normal-sense striae. Preliminary results from kinematic analysis (P, T axis maxima; e.g. Marrett & Allmendinger 1990) indicate that the NW and ENE sets likely formed in response to generally E-W shortening during the Laramide Orogeny. The third array, identified with Pikes Peak granite bedrock, may be a record of NNE-directed stretching, and will be the focus of further study to determine whether the normal faults are a result of the Neogene extension that has been documented (Steven & others, 1997) to the northwest in the Woodland Park graben.

Marrett, R. & Allmendinger, R., 1990, *J. Structural Geology*, v. 12, p. 973-996.

Steven et al., 1997, in Bolyard & Sonnenberg, eds., *RMAG*, p. 114-124.

## Neogene development of the Pleasant Valley Graben (Howard, CO) based on the study of mesoscopic faults

[HENDERSON, Rebecca](#) and SIDDOWAY, Christine S., Geology Dept, Colorado College, Colorado Springs, CO 80903, [r\\_henderson@coloradocollege.edu](mailto:r_henderson@coloradocollege.edu)

The Pleasant Valley graben in central Colorado formed in Miocene time as an isolated depocenter immediately east of the northern Rio Grande rift and Sangre de Cristo Mountains. It is a rhomb-shaped, asymmetrical basin that lies along the trend of the Poncha Pass transfer zone (Chapin & Cather, 1994), and is bounded by NW-trending, NE-side down faults flanking the northern Sangre de Cristo range. Mesoscopic faults cut the Oligocene and younger basin deposits, including 27.8 and 27.3 Ma ignimbrites correlated to Fish Creek and Carpenter Ridge Tuffs by MacIntosh & Chapin (in press). This study uses kinematic information from the brittle structures to assess the Neogene history of the Pleasant Valley graben.

Faults cutting the Tertiary volcanic rocks exhibit highly polished, red-brown, grooved slickensides, or appear as rough surfaces with patchy preservation of striae. They range in trace length from 0.5 to 13 m. Reliable offset markers are generally absent; therefore, such textural features as reidel fractures, positive steps, grooves, and mineral streaking are used for interpretation of kinematic sense. Preliminary data show two dominant sets of brittle structures: 1) prevalent steeply dipping faults with a mean strike of N24W exhibiting low-raking striae, and 2) moderately dipping faults oriented ~N60E, with down-dip striae. The faults are considered to be contemporaneous, since all cut mid-Tertiary volcanic rocks, and to record Neogene tectonism associated with northern Rio Grande rift development. The prevalence of subvertical, NW-striking, dextral faults together with the rhombohedral basin geometry suggest that the Pleasant Valley graben developed in a releasing bend and that the basin-bounding faults accommodated dextral oblique strike slip movement. The results are consistent with results from the upper Arkansas valley, interpreted as a pull-apart basin by Hubbard & Wawrzyniec (2000). Thus, the Pleasant Valley graben may be one in a series of an echelon, strike slip basins.

Chapin, C. & Cather S., 1994, in *GSA Special Paper 291*, p. 5–25. McIntosh, W. & Chapin, C., in press, in *NM Bureau of Mines & Mineral Resources Bulletin 160*. Hubbard & Wawrzyniec, 2000, *GSA Abstracts with programme*, v.32, p.

## Origin and significance of travertine terraces from south-central Tibet

[ZENTMYER, Rebecca Anne](#), Geology, The Colorado College, 14 E. Cache La Poudre, Colorado Springs, CO 80903, [r\\_zentmyer@coloradocollege.edu](mailto:r_zentmyer@coloradocollege.edu) and MYROW, Paul M., Geology Department, Colorado College, 14 E. Cache La Poudre St, Colorado Springs, CO 80903

A newly discovered travertine platform measuring roughly 1 km by 0.5 km exists along a river valley approximately 30 km north of Nyalam in southern Tibet. This platform did not have an active discharge at the time of study, but there are indications of fairly recent flow in the form of rhizoliths at river level and the entrapment of alluvial fan clasts in travertine at the top of the platform. A complex geomorphological landscape records interaction between growing alluvial fan systems on both sides of the river, the travertine terrace on one side, and a rapidly down-cutting river with associated fluvial terraces. River incision was contemporaneous with travertine deposition, as indicated by a perched gravel deposit that is overlain and underlain by travertine and located roughly 18 m above river level. The perched gravel terrace is overlain by ~1 m of travertine, the top of which defines a terrace surface. Large blocks

of travertine rest on this surface and contain a thin layer of gravel as well as well-developed rhizoliths. These blocks were created by upstream erosion of the underlying travertine and the uppermost part of the gravel bed. The rhizoliths in the block are identical to those present along the edge of the modern river where marsh plants with rigid stems of similar shape and size are growing on vegetated bars. This suggests replication of a river-edge ecosystem in time and space during river incision and progradation of the travertine platform. A wide variety of travertine depositional textures are recorded in the platform. These include shrub-like, globular, sponge-like, crystalline-fibrous, and massive forms. On a larger scale, the travertine forms wide, very gently sloping terraces that exhibit pool-and-ridge topography. Many of the terraces terminate in meter-scale “rollovers” that consist of cascading asymmetric folds with long sub-vertical limbs. The widest point of the platform terminates at the modern river with a 10-m-tall cliff of travertine with spectacular rollover folds. This cliff of travertine prograded over the face of the youngest river terrace. The terrace is of similar height and extends along the river beyond the platform to the northwest. The rollovers are therefore interpreted as travertine draped over the edge of fluvial gravel terraces that developed during different stages of river

## Department Initiates Weekly Pub Event



*Experiencing “pub culture” in Kinlochleven, Scotland.*

Rigorous courses, productive faculty, and engaged students – these are all recognizable trademarks of the CC geology department. But if you have spent any time in the hallowed halls of Palmer Basement, you know that the geo department also knows how to have fun. In an effort to sustain this tradition, students and faculty have begun meeting at Phantom Canyon Brewery on Tuesday afternoons for happy hour. The food and beer is cheap, the company is good. If you’re in town on a Tuesday, come by the pub and regale current students with stories of the good ol’ days!

*- Becky Zentmyer ('05)*

# CC Hosts the Keck Symposium

Last April, CC hosted the Keck Geology Symposium for the second time in nearly twenty years of the consortium's existence. Thanks to great work by Cathe, planning began a year ahead and most everything went smoothly (well- J's Motel changed hands and "lost" our reservations but we recovered in time (and the college since bought J's and has turned it into some nice dorm suites)). Folks flew in on Thursday and we left at 8AM Friday on a department-led field trip that left people wishing they had gone here! Paul made sleepy students wake up and answer questions in the field while getting them to unravel the mysteries of the Cambrian. Eric presented work from a recent class that analyzed the heavy metals in the dirt along S. 8<sup>th</sup> street (old mine tailings) that is being turned into a housing development (with no one allowed to grow vegetables!) and the wind blew said dirt onto all of us. Chris recreated the Garden of the Gods and most of the Laramide orogeny for these (largely) easterners.

The Saturday symposium ran without a hitch, thanks in large part to Steve's technical expertise as we made great use of the new Lecture hall in Tutt Science Center (ok – one student panicked when she realized she had left her poster in a long pipe-bomb- like tube outside the airport upon her arrival, but it was picked up in time for her session without too much trouble). We had great presentations

covering soil properties in development of fine wine in upstate New York (hmm), abandoned rift evolution in Iceland, geophysics in Canyonlands that discovered evidence for salt diapir movement, and a range of geology in Mongolia- with the Mongolian students and faculty joining us. Our two students, Laura McCarthy (Mongolia) and Ross Baldwin (Iceland) were completely on top of their research (and also good hosts

providing a party center for one of the nights, hmm!).

President Celeste kicked off the Saturday evening banquet with a welcome, especially to the Mongolians, reminding us all of a recent geology student's unusual preparation of goat in his backyard at CC (attempting to share a cultural moment with unappreciative neighbors). After dinner, Henry regaled the audience with tales of dinosaur eating habits and habitats. How he managed to get these sleepy students to stay attentive and interactive is a miracle. Then

the Symposium culminated with the re-appearance after many years absence of Paul Myrow and his blues magic (and new band for backup).

As people left, there were many comments about the amazing geology here and the high-energy, rocking department we have. We showcased Geology at CC well!

- Jeff Noblett



Christine Siddoway discusses the structure of the Garden of the Gods.



Paul Myrow and band enliven the banquet.

## Faculty Updates:

**ERIC LEONARD** (Geomorphology/Glacial geology)



My 2004-2005 year began with a great class trip to Scotland. A field trip around Scotland is a real pilgrimage for any geologist, but particularly one with an undergraduate history degree. Ah, the land of Hutton, Lyell, Forbes, Peach and Horn, and all the others! We bored the students with all the

history, but not with the Highlands geology. The rest of my teaching year held somewhat fewer adventures but was fun and included Geomorphology, Glacial Geology, and the good old 2-block Intro class.

Research work this past summer took me back to the Canadian Rockies to work on two projects ... one old, one new. I returned to the glacial environment of northern Banff National Park to finish up a project on glacial, periglacial, and rockfall processes. Then I continued on north to Jasper National Park to begin a thermochronologic (fission track and (U/Th)/He) project aimed at documenting the late and post orogenic topographic evolution of the range. Working with Pete Sak, Christine's 2002-2003 sabbatical replacement, now at Dickinson College, I collected a couple of hundred kilograms of samples to see if we could find a few suitable grains of apatite! This work was funded through my Thomas M. McKee Professorship. Pete and I also continued our work in the upper Arkansas River drainage, doing provenance studies on terrace gravels, sampling travertine for U-series dating, and drinking coffee at Bongo Billy's --- all with the goal of working out the drainage history of the river. My indoor research has involved lots of GIS work on glacial geology and paleoclimate. I think that I'm beginning to get some interesting results in terms of patterns of late Pleistocene climate change across the Western Cordillera. We'll see if they impress the reviewers.

I think I reported last year that I've become addicted to road biking – it is easier on aging joints than basketball. Well, this year I can report that my bike was stolen last spring, just as the snow melted off the mountain roads. Miraculously, it returned in

the fall, just as the first snow fell. So ... I'm anxiously awaiting the 2006 spring melt! I can't go back to basketball to get back in shape this winter because even the short guys out rebound me and the slow guys out run me now. Julia is now a sophomore in high school and has passed Lisa up in height. Susan is in her last year of elementary school and still hasn't run out of energy. She and I did the traditional Dad and 10-year-old daughter trip to Washington, D.C., in the summer. Lisa won't admit that she is now in the shorter half of the family, but otherwise is fine, although up to her old trick of taking on new things to do (including a new job developing senior housing) faster than she sheds old things.

**PAUL MYROW** (Sedimentology/Stratigraphy)



Hello to all. I have heard from a number of alumni this year and it is great to hear from you. Much has happened in the last year. I am now living just south of campus in the old stone mansion on Cascade Avenue. Easy walking distance, although I never walk!!

My biggest accomplishment of the year was rebuilding the engine on my late father's 1969 MGB. I had no idea what I was doing, but did it anyway: new pistons, rings, bearings, etc. When it came time to start the engine I crossed my fingers, and sure enough it ran great!

I had a fairly standard year teaching, although I did teach Oceanography again, which was a lot of fun. The students finished construction of a wave tank, which several of us have been using for demonstrations in our classes. I didn't do a Himalayan trip this year, but wound up traveling quite a lot anyway. I went to the Crimean Peninsula in the Ukraine in June with Russian Professor Alexei Pavlenko to scout out a possible summer class. We are going to offer a class this coming June. I cannot say I learned that much about the geology of Crimea, but I am now an expert on pickling one's liver in the great tradition of eastern European countries. It is November now, and I am almost over my hangover.

I also traveled to Kunming, China in August for an international meeting on Cambrian rocks. I went on a

long post-meeting field trip to Nanjing and environs, and got to sample for Cambrian soft-bodied fossils! That was quite exciting and we now have a modest collection in Room 19.

I hope to continue work on my Himalayan project with my colleague Nigel Hughes (UC-Riverside), but we have to get more funding from National Science Foundation – we will hear from them in another month or so. Meanwhile, our paraprofessional Becky Zentmyer has continued to do analytical work on our study of travertine deposits from Tibet from a year ago, and we hope to write a paper on this topic this year. I am excited to have two papers on our Himalayan study in press. One is on outcrops from the Ladakh area of northern India, which is co-authored with Katie Snell ('03). Another paper is based on Cambrian rocks from the Spiti Valley of northern India, this one co-authored with student Karl Thompson ('02). I traveled to Australia last fall to work on the SHRIMP (mass spectrometer) in Canberra to analyze detrital zircons from samples from Bhutan. This was my second time to Canberra, and it was great to go again.

Last fall I led two field trips for the Geological Society of America in association with their annual meeting. I will never do that again! They were great, but it was a bit hectic. One trip was to look at Cambrian and Ordovician rocks in the El Paso, Texas area, and the other focused on rocks of the Pennsylvanian Minturn Formation in west-central Colorado. I am wrapping up work on the latter with a graduate student from Berkeley, our paraprofessional from last year Claire Lukens ('04), and a student Justin Strauss (among others). We have written two companion papers for the *Journal of Sedimentary Research*, and hope to submit them this fall. These manuscripts analyze sandstone beds deposited by a combination of turbidity currents and wave oscillations.

I spent a lot of time working on Devonian rocks in central Utah this summer with students Jessica Creveling (J.C.) and Justin Strauss. In case you missed it, the region was hit with an intense heat wave this summer. We hiked uphill every day about 2,000' in the blistering sun, and this went on for several weeks. The last day it was 106° and at that point we felt that it was

not worth boiling our brains, even in the interest of science.

Finally, I ran for about two months with the cross-country team. One of the runners, who I was regularly beating in runs last year, said to me “either you are getting slower or I am getting faster.” Smart-ass. I am still playing music, and was able to play a number of events on campus last year with my band. That's about all the news that's fit to print...keep in touch.

**JEFF NOBLETT** (petrology/environmental geology)



Well, the big news is my move from 25 years of teaching in the classroom to accept the position of Associate Dean of the Faculty for the next few years. In a nutshell, I just spent the first summer of my life with my butt in a chair in an office! That was crazy, but the work is interesting. It wasn't until new student orientation that I first really missed teaching- all those bright-eyed, raring-to-go faces and I had no advisees, no brilliant minds to turn into geologists! Oh well. As Susan Ashley (the first woman dean of the college and dean of the faculty) puts it- this is a parenthesis in my career! Hopefully, it will be an opportunity for significant service to the college.

I have oversight for all the interdisciplinary (e.g. Southwest Studies, Environmental, Cultural, Women's Studies programs) and the International programs (Asian, Latin-American, African, Russian-Eurasian and South-Asian) as well as First-Year Experience program. Seems I may have been the only faculty member who was both a scientist and had taught in the majority of these programs- thus getting support from throughout the campus to hold this position. Days seem to be full of meetings, faculty requests, organizing programs for all sorts of folks, random “official function” appearances and researching all sorts of questions for Susan. All-in-all, I have learned more about this college in four months than I had (or had wanted to know) in 25 years. So far it goes well, but as I warned the department, as soon as I either get tired or screw something major up, I'll be back in the classroom!



I did manage to keep one research project alive. We will be running a Keck project in Shiprock, New Mexico this summer. Charly Bank and I, along with Steve Semken, will take 6 Keck students and 3 Dine students to run a large survey of gravity and magnetics over Shiprock (completing the preliminary surveys we ran 3 years ago) and neighboring diatremes. The students will not only learn to run and analyze geophysical data, they will also have opportunities to learn something about the Navajo culture. We seem to have a number of folks who want to visit the project (and carry equipment). We hope that the modeling will allow us to distinguish the mechanism(s) by which these bodies form. The preliminary data strongly suggested that these are not volcanic necks; questions about their development as buds off rising sheets (dikes) or through other mechanisms may be resolvable with these data.

I still maintain the connections with Japan. I will be assisting the Japanese geology class in the Grand Canyon next spring and hope to join them later in Yellowstone. In general, life is good, my girlfriend is happy (math professor in town), my daughter is paying her own bills; the energy-healing/shamanic studies remain a pleasure. Always glad to see old faces (and geologists get priority appointments in my new office!).

#### CHRISTINE SIDDOWAY (Structural geology)



My primary research focus this year is a new project in West Antarctica, investigating the Fosdick Mountains gneiss domes. A *gneiss dome* is a culmination of metamorphic rocks that has undergone partial melting at depth within Earth's crust, under elevated temperature conditions.

The Fosdicks dome is made up of "migmatite" gneisses, or "mixed rocks" that exhibit swirly, flowy, folded textures within strongly light- and dark-layered discrete bands; some of the layers contain extraordinarily wonderful metamorphic assemblages such as Cordierite-Garnet-Sillimanite. Three CC students are involved in the project: Rose Vail '08 and Zion Klos '09 have worked on the GIS database for



Warren Dickinson, Edith Day, Christine Siddoway, and Jenny Haywood in Scott Base Bar, McMurdo Station, Antarctica. western Marie Byrd Land, and Jenny Haywood '06 is involved in the field study. Jenny showed herself "worthy" by focusing her Introductory Petrology (GY202) research paper on *gneiss domes* last year; little did she imagine that one year later she'd be spending 2 months doing field research on one, out in the distant reaches of Antarctica! The NSF-funded project is collaborative with 3 members of the Structure-Tectonics-Metamorphic Petrology (STAMP) group at University of Minnesota. To know more about the work on gneiss domes in Antarctica, go to [www.stamp-antarctica.org](http://www.stamp-antarctica.org). There you will see that the geologists in this group **love** gneiss domes and are *enthralled* with migmatites!

The teaching mode of CC life is equally exciting. Henry and I co-taught a "first year experience," or FYE, course for 16 motivated and enthused new CC students, several of whom are considering geology as a major. My other courses this year are examples of population extremes: the Block 2 course, "Great Orogens of the World" had only two students enrolled, which allowed a collaboration-style effort, whereas the Block 7 Structural Geology course will have a record 22 students. That course will begin with one week of structural analysis and mapping in northern Arizona, followed by theory and quantitative studies back at CC.

On the home front, Winona the Labrador



*Antarctic penguins photographed by Jenny Haywood.*

will be 10 this year and likes to spend the winter napping and the summer swimming. Walking is not a favored activity any longer. Hockey is getting seriously neglected this winter (summer) due to field work, and is relegated to weekly updates via email from my husband Mike, on how CC Men's Hockey is doing.

Snow-shovelling and

trudging over glaciers will now be the primary means of recreation and exercise. A fairly novel occurrence, Mike and I have written an article for publication together this year that addresses a major tectonic correlation problem for Antarctica researchers: stay tuned next year for publication details!

#### **HENRY FRICKE** (Geochemistry)



Hello All! I think I said this last year, but didn't I just write an update for the PCB? Hmm. Well, let me start with The Science. Basically, I think I have a problem saying no to new research. The result is a bunch of papers waiting to be written (but hey, isn't that what sabbaticals are for?) along with

many projects in progress. If you have been reading the PCB with any regularity, you are aware that I've been studying dinosaur paleoecology for some time using stable isotope geochemistry of tooth enamel. This work has been expanding to the south, and now includes sites in Utah and New Mexico as well as in Montana, and should soon include analyses of samples from Madagascar. I have also found myself doing a lot more carbon isotope chemostratigraphy that I would have anticipated a year ago. Back then I was focusing on K/T time, but now I find myself construct-

ing curves for Morrison Formation rocks of Jurassic age with the goal of constraining ages of dinosaur fossil localities, and for early Cenozoic time with the goal of locating the Paleocene-Eocene boundary in different Laramide basins. As for new stuff, there is a project aimed at using stable isotope gradients obtained from mammal teeth to infer the elevation of the Front Range during latest Eocene time, and I have begun to revisit earlier attempts at estimating the partial pressure of CO<sub>2</sub> in the atmosphere during the Eocene Climatic Optimum using data from paleosol carbonates. Even further a field, I am really getting into rare earth element geochemistry of fossil remains, and its use as an indicator of depositional environments.

Needless to say, some liberty is being taken when I say "I" in the preceding paragraph. Most of this work is being done in collaboration with students who only seem to get better every year - if that is possible! - and it has been great working with all of them. Let me end by saying I didn't have another kid this year. No, the two I have already are more than enough to keep my wife and I busy, thank you very much. Eli is almost four, and when we go for a walk in Palmer Park he picks up a rock, scowls at it, throws it on the ground, picks up another, scowls, throws, etc. Annaliese, who just turned two, puts rocks in her mouth and won't take them out. Don't know where they get it. But our big news is that we recently bought a place down in the mountains by Cucharas. I am blown away by the beauty every visit, and feel that I might slowly be turning into a real Coloradonian. Make that Coloradan.

#### **CRAIG SCOTT** (visiting Petrology professor)



Hi to all the CC alumni. As I am new to these parts I will give a brief rundown of who I am and where I hail from. I am originally from Newfoundland (the ROCK; can you think of a better place to be raised as an aspiring geologist?), where I received my BSc from Memorial University of Newfoundland. I then promptly moved to the mainland where I received my MSc from the University of Ottawa working on evidence of magma

mixing in pumice from the Canary Islands. Then being of sound mind I decided to head to a French-speaking school in Quebec (I did not speak French at the time!) to pursue a PhD working on the paleogeographic reconstruction of an Archean subaqueous volcanic arc. Then after all my fieldwork was done I headed to Southern California, where I was an adjunct professor for 3.5 years teaching introductory courses within the Cal State system and at Santa Barbara City College. All the while I was writing and defending my PhD, getting married, and playing beach volleyball year round. Over the past month I have begun teaching my first block at CC, as well as celebrating the (late) arrival of my first child, Aidan Benjamin Scott. On the research side of things, I have studied numerous aspects of subaqueous volcanism, as well as textural work of igneous rocks related to magma genesis. Presently I am busily writing up a few papers related to deep water explosive to effusive eruptions of andesitic to dacitic lavas (and learning to be a father!).

**MICHAEL PETRONIS** (visiting professor)



Greetings CC alumni. As I am the youngest, most energetic, and freshly christened PhD (Dec 2005) in the CC geology department, I feel I should tell you a little bit about myself. I am currently a one year visiting assistant professor in the department. I hail originally from Cleveland, Ohio.

Yes, I know, that's a strange place to breed a geologist. But I am a strange geologist indeed, as I am a cross between a basic field geologist and a geophysicist. I unknowingly began my geology career while I was in the Marine Corps. During my 4 year service, I recall always asking too many questions about where we were going and why the rocks looked different here to there. I then began to point out the difference between rocks and continually peppered the usually unwilling ears of my fellow marines with my geologic observations and interpretations. As I know now, my interpretations back then were at time a bit "out-there"!! After leaving the marines in 1991, I returned to northeastern Ohio and received a BSc from Kent State University where I did a senior theses investigating the open-

ing of the Death Valley pull apart system in southern California. It was during this time that discovered the power of paleomagnetism in tectonic studies. After graduating from Kent State in 1995, I packed up my blue 1981 Chevy C-10 pickup truck (which I still drive) and smartly moved very far away from the gray skies of northeastern Ohio to sunny New Mexico! I received a MSc in 1998 from the University of New Mexico investigating strain accommodation and deformation in a part of the Walker Lane belt in west-central Nevada. I then once again packed up my old blue Chevy and moved to Houston, TX and worked for three years at Exxon Exploration as a geologist/geophysicist. Realizing that I was living in a swamp, wearing a tie to work everyday, and had no hope of ever being a happy petroleum geologist, I once again packed up old blue and returned to Albuquerque, NM to pursue a PhD. My dissertation entailed a combination of paleomagnetic investigations, geologic mapping of regional ignimbrite deposits, geochronology, and kinematic studies in western Nevada. After diving deeply into this project, I figured it would be fun if I started another project in New Mexico investigating rift-margin kinematics combining structural mapping and paleomagnetic studies and once deeply into this project I started another study in western Utah evaluating shallow level magma emplacement mechanism and magma flow patterns. During all this, I did find the time to be married to Laura Hagan, after she chased me around for 7 years, and be a play toy for my Siamese cat, Chaco Zuni; who by all measures is far smarter than many people I know. Since I began teaching at Colorado College, I have taught GY140 intro geology and GY250 geologic and geophysical field instrumentation. In the spring, I will teach GY100 environmental impacts of economic geology and GY250 tectonics of the Rio Grande Rift. On the research side of things, I'm interested in all aspects of paleomagnetism and rock magnetism, volcanology, and geophysics (gravity and magnetics). I currently have research projects in southern Poland investigating tectonic fabric development related to exhumation of ultra high pressure - temperature rocks, projects in NW Scotland, Utah, and the Canary Islands investigating magma flow at different vertical levels within the volcano-magma-system, and ongoing research projects

in western Nevada involving paleomagnetic studies, volcanic stratigraphy, geochronology, geologic mapping, and high resolution gravity and magnetic studies. I currently have several papers in review related to these studies and am writing up several others related to these and other projects and am desperately seeking a permanent faculty position. Take care Alumni, it has been a pleasure and an honor to teaching geology at CC!

**STEVE WEAVER** (Technical Director)



I have been busy keeping the Department technology moving forward. The new Panalytical Epsilon 5 Energy Dispersive XRF has been getting a lot of use with classes and producing research grade trace element data for rocks and soils. I have also been contributing to the GIS initiative on

campus with support for a new GIS lab in the old basement Palmer computer lab. I recently installed a new data server with 2.7 terabytes of storage available for the large data sets used in GIS.

My photography business also has been growing and I continue to win awards in local and regional art shows and in other news I am enjoying playing with my two grandsons.

**JOHN LEWIS** (professor emeritus)

John Lewis writes that he periodically blows his wad and goes out aerobatic flying, just for kicks. John is now in Bellingham, WA, and is doing his best to get Sarah Andrews '71 to let him at the throttle of her Beech Baron. John says, "It's great to feel 4 g-s on one's seat!"

**BILL FISCHER** (professor emeritus)

After teaching 33 years full time and another 17 years part-time I was ready to do something different so we moved to Boulder, Colorado and are living in a retirement complex located in the north end of town and just a few blocks from the GSA Headquarters Building. A few weeks from now will mark the completion of our third year of life in a retirement center and we have become adjusted to all the changes that came with that move.

As we both get closer to 90 we realize our limitations and are thankful for every day that we can still be together. On the 6<sup>th</sup> of November all of our immediate family joined us here at Alterra along with about 30 of our fellow residents to celebrate our 60<sup>th</sup> wedding anniversary (actually Nov.10<sup>th</sup>). For the occasion the family reserved one of the large meeting areas in the building, hired a professional piano player to provide music, and served wedding cake, coffee and treats. For decoration we had original wedding photos with Bill in Navy uniform during World War II. To make the event more authentic, Bill took the old uniform out of storage, discovered the 28" waist wasn't about to stretch to the current configuration but the jacket and hat would still fit and so he dressed and accompanied the bride to the party. Family members all contributed with reminisces, bits of poetry, and a gay time was had by all. Residents still compliment us on the event.

Bill suddenly discovered in August that he had cancer of the bladder and he is now a urostomate and has learned to cope with the arcane world of the bagman. The cancer is currently in remission and being monitored.

**BRUCE LOEFFLER** (professor emeritus)

I moved with my partner Dan O'Brien last year to San Luis Obispo. I have been teaching Classical and Medieval Art (Art 211), Renaissance and Baroque Art (Art 212) and American Art (Art 310) at Cal Poly, the best of the California state universities. I have also been asked to teach Physical Geology, although I haven't yet, since I have needed the time to make the digital transition in teaching art history. In the past year, I have assembled a digital library on my laptop that now has over 15,000 images, which I use in teaching. I also continue to travel, giving lectures for the American Museum of Natural History. Recently this has taken me on a circum-navigation of Sicily (including a trek up Mt. Etna); across southwestern France, northern Spain and Portugal looking at early man sites and Romanesque pilgrimage churches; and down the Dalmatian Coast of Croatia looking at Roman sites and at Medieval and Renaissance architecture. I am scheduled to take a trip across the Caucasus Mountains from the Caspian Sea to the Black Sea, including Azerbaijan, Georgia and

Armenia, in May. We love living on the Central California coast and feel as though we have moved to paradise. San Luis Obispo is a small town with only 45,000 residents; nothing is more than ten minutes away, including the beach and great hiking trails.

Bruce's new address is:

Bruce Loeffler  
670 Woodbridge St.  
San Luis Obispo, CA 93401  
805 544 1621  
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*Geomorphology students survey  
Horseshoe Cirque near Fairplay, CO.*

## *Theses and Projects*

*Presented at Geology Day - April 9, 2005*

**Rob Backlund ('05)** - Stable isotope analysis of vertebrate fossils and sediments from the Upper Cretaceous of Montana: a study of dinosaur paleoecology and behavior

**Ross Baldwin ('05)** - Petrology of mafic, intermediate, and silicic lavas in an abandoned rift zone, Laxárdalsfjöll, Iceland

**Nancy Calhoun ('07)** - Geophysical exploration of the Red Rocks Canyon landfill in Colorado Springs, Colorado

**Tom Collins ('05)** - Shear zone roots in the middle crust: transition from partitioned deformation to penetrative ductile flow in the northern Wet Mountains, Colorado

**J.C. Creveling ('06)** - Scaling biogenic trace gas emissions from plot to regional level: Effects of *Morella faya* stand size on soil N<sub>2</sub>O and NO<sub>x</sub> fluxes in Hawai'i Volcanoes National Park

**Lizzy Fay ('05)** - Insights on the kinematic evolution of the Ute Pass fault zone from investigation of mesoscopic brittle faults

**Becky Henderson ('05)** - Brittle kinematic analysis of Neogene mesoscopic fault development in the Howard Basin in central Colorado

**Greg Maximov ('05)** - Precision U-Pb geochronology provides new age information at Garden Park fossil site within the Morrison Formation, Colorado

**Laura McCarthy ('05)** - Tectonic geomorphology of the Jid Fault, Mongolian Altai: River gradient as evidence for tectonic uplift

**Dave Mendel ('06)** - Marine survey of the Menard fracture zone and tectonic implications

**Andy Neuman ('05)** - Late Neoproterozoic varves of the Port Askaig

**Becky Zentmyer ('05)** - Origin and significance of travertine terraces from south-central Tibet

## Seminar Series 2004-2005

September 28, 2004

**Charly Bank's GY 100 Natural Disasters Class**  
with panelists

**John Himmelreich**, *geotechnical consultant*

**Robin Kidder**, *Project Manger, City of Colorado Springs*

**Bill Knapp**, *vice president and area office manager, CH2M Hill, Consulting Engineering*

**Vince Matthews**, *State Geologist, Colorado Geological Survey*

**Greg Miranda**, *ANPAC insurance agent*

**Brian Newsome**, *journalist for Gazette newspaper*  
"Mitigating Natural Hazards in Colorado Springs"

November 5, 2004

**Mark Clementz**, *Smithsonian Marine Station, Fort Pierce, Florida*

"Sea Cows of the Caribbean: a 50-million year record of aquatic herbivory in seagrass ecosystems"

December 10, 2004

**Geology Class of 2005**

"Midges, thrusts, and kilts, oh my! The Seniors' Scotland Culmination"

December 13, 2004

**Nigel Hughes**,  
*Department of Earth Sciences, University of California Riverside*

"Body building for the dead: a paleontologist looks at how trilobites grew up"

February 10, 2005

**William D. Nesse**,  
*Department of Earth Sciences at the University of Northern Colorado*

"Tectonic model for the Laramide Front Range, Colorado"

March 1, 2005

**Brian McAdoo**, *Department of Geology and Geography, Vassar College and Visiting Professor, Institute of Zurich*

"Surveying the Damage: The Sumatra Earthquake and Tsunami in Sri Lanka, the Maldives and Aceh"

March 3, 2005

**Beth Pratt-Sitaula**, *Geologic Sciences, University of California, Santa Barbara*

"Impacts of climate change on surface processes, Nepal Himalaya" and

"From raindrops to mountain building: interactions between climate and tectonics"

March 7, 2005

**Pete Reiners**, *Department of Geology and Geophysics, Yale University*

"Radioisotopic decay, growth, and dating: just enough to be dangerous" and

"Thermochronometry in tectonic geomorphology"



*Cathedral Valley, Capital Reef National Monument captured on film by our own Steve Weaver.*

March 9, 2005

**Amy Gaffney**, *Institute of Meteoritics, University of New Mexico*

“A geologic tour of the moon” and

“A new look at old lavas from the moon: U-Pb, Rb-Sr, and Sm-Nd isotope systematics of mare basalts”

March 14-15, 2005

**Anna Cruse**, *United States Geologic Survey*

“Trace metal records of regional paleoenvironmental variability in Pennsylvanian black shales” and  
“The biogeochemistry of mid-ocean ridges”

March 19, 2005

**Arlo Weil**, *Department of Geology, Bryn Mawr College*

“The Orocline Concept in Geotectonics”

April 18-19, 2005

**Matt Brueseke**, *Department of Geology, Miami University (Ohio)*

“Diverse mid-Miocene volcanism associated with the Yellowstone-Newberry thermal anomaly” and  
“Is it a lava flow or is it an ash flow: Factors and features that characterize silicic volcanism”

May 2, 2005

**Bruce P. Luyendyk**, *Geological Sciences, University of California, Santa Barbara*

“Geophysical exploration of the Ross Sea rift, Antarctica”

May 12-13, 2005

**Mike Petronis**, *Earth and Planetary Sciences, University of New Mexico*

“From sills to mountains: How do laccoliths grow? A case study from the Colorado Plateau Transition Zone, SW Utah” and

“Applications of paleomagnetism in structural geology and tectonics”

June 3, 2005

**Craig Scott**, *Earth and Planetary Sciences, Santa Barbara City College*

“Paleogeographic Reconstruction of an Archean subaqueous volcanic arc, Val d’Or, Quebec”

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## Awards Presented at May 2005 Honors Convocation

### *Estwing Outstanding Senior Geologist Award:*

Robert Backlund

### *Association for Women Geoscientists Award:*

Emily Baldwin

Rebecca Zentmyer

### *Rocky Mountain Association of Geoscientists Award:*

Rebecca Zentmyer

### *Brian J. Hannigan Scholarship for fieldwork:*

Emily Baldwin

Gregory Maximov

### *Patricia J. Buster Scholarships for student research:*

Elizabeth Fay

Emily Baldwin

Robert Backlund

Justin Strauss

Rebecca Henderson

Thomas Collins

Gregory Maximov

Rebecca Zentmyer

Andrew Neuman

### *Donald B. Gould Scholarship Award:*

Caitlyn Florentine

Emily Parker

Karri Sicard

### *Darrell M. Putman Scholarship Award:*

Timothy Barker

Caitlyn Florentine

Emily Parker

Karri Sicard

### *12th Annual Smooth Move Award:*

Rebecca Henderson

Tex, as she is fondly known around the Palmer base-ment, lost her thesis field notebook during 3rd block break and completed her thesis with advisor Christine Siddoway none the wiser. The notebook was discovered the next fall; it had been “recycled” for use during another class. Moral of the story...photocopies of field notebooks are your best friends.

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## 2004/2005 Course Highlights:

### Invertebrate Paleontology Explores the History of Life

Last winter's Block 4 Invertebrate Paleontology class, taught by Professor Paul Myrow, was a broad overview of the evolution of invertebrate marine life over the course of earth history. This class attracted a bevy of biology majors who enlivened discussions with their ardent passion for living critters. The geology majors gained a greater appreciation for the role of paleontology in the interpretation of the sedimentary record.

The highlight of the course was a weeklong field trip to El Paso, Texas and surrounding areas. (December is a *perfect* time for a field trip!) The class explored the Permian reef complex in the Guadalupe Mountains, hunted for trilobites in Bat Cave Gulch outside of El Paso, and gawked at gigantic ammonites in middle Ordovician rocks above the University of Texas, El Paso. The trip home proved unusually eventful. It involved a "shortcut" over the Jemez Mountains, six students pulling a trailer through the snow, a broken van window, and emergency camping at the Days Inn. Never a dull moment in the world of paleontology!

- *Becky Zentmyer ('05)*

### Volcanology Class Blows Students Away!

Eighth block at CC is somewhat of a phenomenon; with summer just on the horizon, the days long and the weather fine, academic preoccupations tend to become lower on priority lists as activities involving enjoying clear spring Colorado May days gain precedence. However some dedicated geo students at CC chose to take Volcanology, an elective usually offered by the Geology department every other year. This class, which included a ten-day field trip to New Mexico, was taught by Steve Quane, a visiting professor and recent PhD. (Amy Gaffney '96 was intended to teach however had last minute knee surgery that prevented her from instructing). The class was an ap-

pealing introduction to one of geology's most glamorous topics, Volcanology.

New Mexico, as its state motto attests, is home to enchanting ancient volcanologic features including expansive basalt fields, crater-like marr explosion features, and car size bomb clasts expelled with unimaginable force by ancient "Super Volcanoes." Students returned with backpacks full of sparkling green olivine crystals and smooth small Agape's tears (small, tear shaped fragments of volcanic glass) collected in the field, minds full of newly implanted knowledge on the petrology and physical attributes of various volcanologic features, and hearts warmed by the camaraderie shared and the good times had.

The class was full of fascinating facts on volcanoes learned pleasantly in the shadow of text book example physical features gifted to the modern world by ancient volcanologic activity. Much to the dismay of tragedy-seeking professor Jeff Noblett, all observations were made on ancient sites and no modern eruptions were observed. However, besides the disappointment of not witnessing modern volcanic activity in New Mexico, participants of the class had a great time nonetheless in the field. The thirst for more violent volcanic activity was quenched by the final project- a presentation required of every student on a historic volcanic eruption. On the whole, the Volcanology class offered eighth block last year turned out to be the perfect option for the final month of a long and laborious school year.

- *Caitlyn Florentine ('07)*

### Field Methods Class Analyzes Structures Near and Far

Professor Christine Siddoway's 6th Block class, Field Analysis of Geological Structures, was a great success. She lead six brave students to do a field intensive block. They traveled to the El Paso area to carry out field mapping projects at Bishop Cap and Anthony Gap. Cactus, poor weather, and dangerous outcrops did not hold the group back from completing their analysis of the brittle kinematic structures in the area. Later the class proceeded to do an extensive



project in our very own backyard. They spent two weeks crawling around Garden of the Gods and Glen Eyrie mapping numerous faults of different ages potentially relating to the Rampart Range Fault. The group spent nearly the entire class in the field and learned a great deal about field methods and mapping of geological structures.

- Lizzy Fay ('05)

## Alumni Updates:

This section is news from alumni who sent in information on themselves in response to last year's newsletter. We encourage you to do the same! Let us know what's going on with you (humorous, entertaining, gossipy, blatantly self promoting), and the news will appear in the next year's letter! If at all possible, please send the information by email to [csiddoway@coloradocollege.edu](mailto:csiddoway@coloradocollege.edu), or mail in the accompanying form (on the inside of the back cover). Feel free to send photos as well! To those who responded to our request for alumni news, THANK YOU!! We're particularly happy to receive news from those who graduated before the arrival of the current CC Geology Faculty! We hope that you all find the news of your classmates and other alums as interesting and inspiring as we have.

With regards and good wishes,  
*Christine Siddoway*

*Ann Clarke '72*

Ann Clarke was recently promoted to the position of Executive Officer in the Office of the Chief Scientist, NASA. Her 2002 honeymoon trip took her on a 12 day rafting trip on the Tatshenshini and Alsek Rivers in Alaska.

*Sarah Andrews '73*

(Sarah Andrews) is a geology-murder-mystery writer and analyst of issues and opportunities for women in geology. She has been awarded an Artists and Writers fellowship for work in Antarctica by the National Science Foundation and will travel to the Ice at the end of this year! Since both are preparing for field work this year, Sarah and Chris Siddoway have enjoyed some good conversations about the ways and means of the US Antarctic program – and the two may have an opportunity to meet on the southern continent this year!

*Bill Chadwick '81*

I'm still studying submarine volcanoes, both on mid-ocean ridges (primarily the Juan de Fuca ridge) and in volcanic arcs (Marianas and Kermadecs). My fieldwork involves sonar mapping, dives with submersibles, and deploying seafloor instruments. (All methods of trying to "see" what's going on on the



*Ann Clark ('72) at the confluence of the Alsek and Tatshenshini Rivers, Alaska.*

seafloor without all that water in the way.)

*John Spengler '91*

John Spengler teaches at Pine Creek High School here in Colorado Springs, and awakens an appreciation in his students for such current topics as the landscape evolution of Pikes Peak!

*Jon Fauver '95*

Jon Fauver is a guide for Outdoor Interlaken AG in Switzerland.

*Dick Heermance '95*

Dick Heermance is working with Doug Burbank on my PhD here at Santa Barbara. My project is looking at the basin evolution of the Tian Shan Foreland, and how the facies respond to structural deformation in the Tian Shan. I'm starting year 4, and hope to be finishing up in the next year or two. His address is:

Richard Heermance

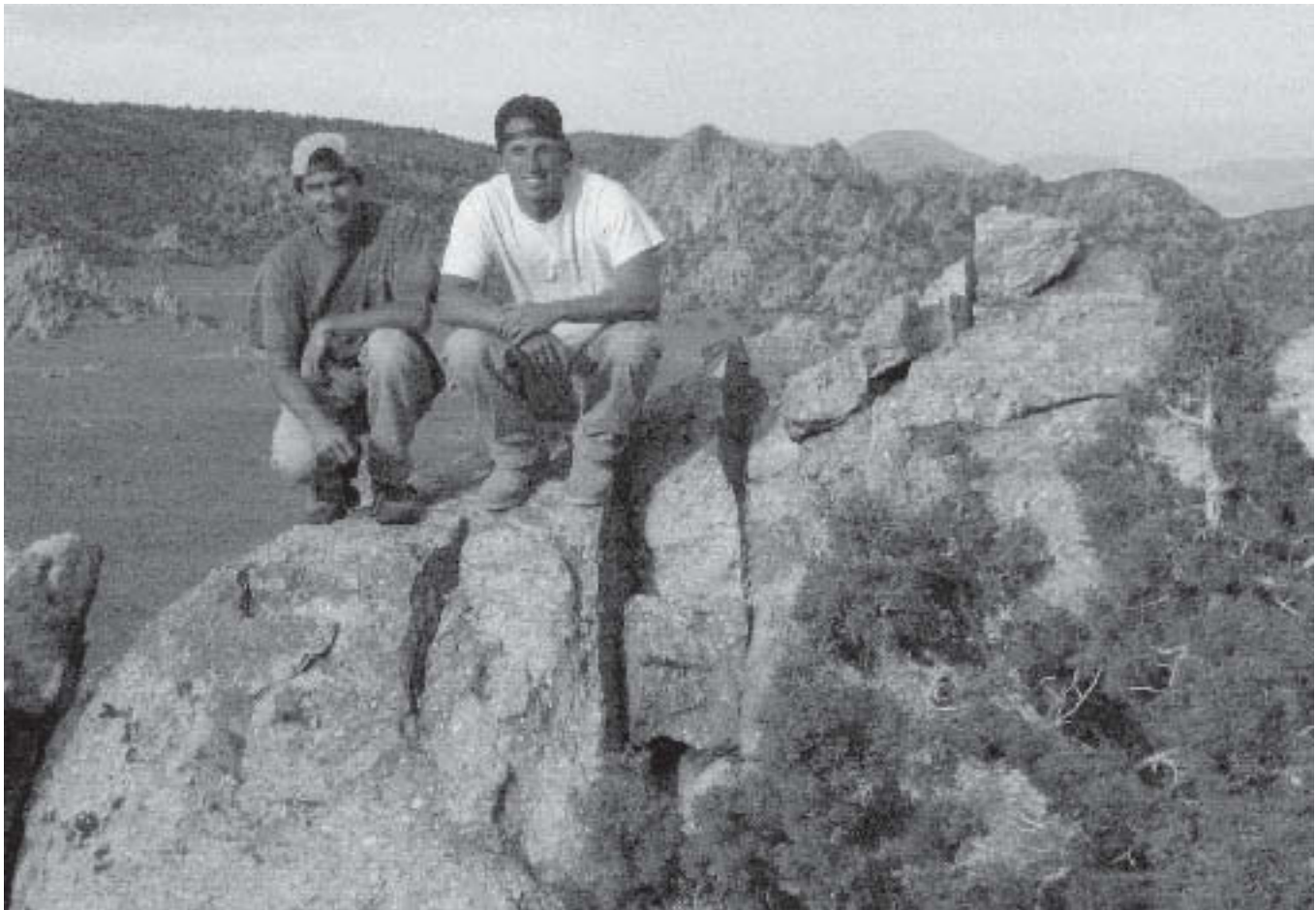
Dept. of Geological Sciences  
1006 Webb Hall, UCSB  
Santa Barbara, CA 93117-9636  
(805) 893-7242  
fax: (805) 893-2314

*Amy Gaffney '96*

Amy Gaffney is on a postdoc at the Institute for Meteoritics at the University of New Mexico. She graced the CC department with a visit and seminar last spring, infusing us with her enthusiasm for newfound applications of isotope geochemistry for questions of planetary evolution.

*Greg Schorr '96*

Greg Schorr has undertaken work for NOAA (National Oceanic and Atmospheric Administration) over the past few years, and worked for a time as marine debris



*CC alumni Dick Heermance ('95) and Peter Anderson ('04)  
on the granite of the Papoose Flat Pluton, Inyo Range, CA. Oct. 2005*

coordinator for cleanup of Pacific islands and atolls until 2003 or so. Recently his name was discovered among the 2005 list of “State of Hawaii permitted whale researchers.” Greg has provided dive support for investigators of the diving behavior of beaked whales in coastal waters of Hawaii.

*Kalsoum Abbasi '97*

Kalsoum Abbasi now lives back in Colorado Springs, together with Matt Reuer, former Geo paraprof... and Kalsoum took up the noble paraprof position herself, this spring! She worked with the Historical Geology class and Paul during Block 8 this year, including the legendary trip to the Grand Canyon. Matt Reuer has worked in the EV Dept at CC for one year now, as the technical director for that program. <kalsoumabbasi@hotmail.com>

*Lindsey Quackenbush Flagstad '98*

Lindsey Quackenbush Flagstad is working on a masters at the U of Alaska – Anchorage. She writes, “Things are rolling along here. My first field season went well (got to ride around in a helicopter and look at plants!) and the research questions are taking form. I am planning on comparing the succession of different trophic levels (specifically vascular plants and soil protist communities) along glacial recessional chronosequences in Kenai Fjords NP – what a mouthful. Anyways I enjoy thinking about it and am really happy with my committee.”

*Amber McIntosh '98*

Amber McIntosh worked as the editorial assistant to the GSA Bulletin editor for about a year, but left that job in order to undertake “home improvements” on some new property that she and Rob Sanders bought in western New Mexico.

*Edith Day '99*

Edith Day is off an adventure following the completion of her MSc in carbonate sedimentology... she'll be working in McMurdo Station, Antarctica, as a cook in the galley this summer (October 2005 to February 2006; that's “summer!”).

*Laura Dickerson '99*

Laura Dickerson writes: We'll be moving the Vida Verde office there, too, and will be moving Vida Verde's programs to a new site starting next fall.

As many of you know, this has been a difficult but exhilarating time for us, and we're so thankful to all of you who helped us make this happen.

We're excited about our move and our new home! So, our new address is as follows, starting today!:

1043 Tunitas Creek Road  
Half Moon Bay, CA 94019

Our phone number will be moving with us: 650-726-9210

For those people who haven't heard from us in a while (sorry about that),

you can learn about Vida Verde at [www.Vveducation.org](http://www.Vveducation.org), and if any of you

have struck it rich, we're always looking for donations! Har har

*Blair Schoene '99*

Blair Schoene [schoene@MIT.EDU](mailto:schoene@MIT.EDU) is involved in “momentum writing” on his diverse PhD investigations at MIT.

*Bryn Clark '00*

*Louis Sass '00*

Bryn Clark and Louis Sass spent the winter in Alaska (first time, for Louis, right?). Louis continues to guide on Denali and Bryn is working for an oil company. Look for her paper on turbidites in a future Journal of Sedimentary Research.

*Grant Kaye '00*

Grant Kaye has started a PhD at the University of Canterbury in Christchurch, New Zealand; where he is working with Jim Cole, at the Natural Hazards Research Center, on volcanic hazards mitigation GIS. Neat-o. More recently, Grant was working in Truckee, California (during the biggest Sierra Nevada snow year since the demise of the Donner party) doing GIS and driveway inspections (? Independent or related jobs, we don't know!).

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# Alumni Grouped By Location 26

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## Foreign Countries

Debra Adams 74, London N5 1JB  
England  
John Dolson 71, Moscow, Russia 119090  
Jonathan Fauver 95, CH-3800 Interlaken-  
Matten  
Switzerland  
Prentice Forsyth 81, #07-03 International  
0923  
Singapore  
Jack Garrett 92, 1015 XT Amsterdam  
The Netherlands  
Geoffrey Gushee 85, Francistown,  
Botswana  
Robert Harrington 77, San Isidro, Lima  
Peru  
Ronald Hartwell 52, Grand  
Caymon  
British West Indies  
Meadow Koslen 2000, Arrowtown  
Ronald Laughlin 58, Drumheller  
AB T0J 0Y4  
Jesse Porter-Henry 2003, Costa  
Rica  
Deborah Scott 81, O'connor Act  
2602  
Australia  
Robert Vincent 88, Montreal  
Quebec  
Kelly West 87, Bujumbura  
Burundi

## Alabama

Jordan Olshan 83, Birmingham  
Marion Berg 84, Fairhope

## Alaska

Bryn Clark 2000, Anchorage  
Kimball Forrest 77, Anchorage  
John Freeman 79, Anchorage  
Sami Goldman 93, Anchorage  
Christopher Krajicek 2001, Anchorage  
William MacFarlane 96, Anchorage  
Louis Sass 2000, Anchorage  
Anne Whitehead 2000, Denali National  
Park  
James Wadell 68, Eagle River  
Samuel Dashevsky 77, Fairbanks  
Daniel Dryden 2002, Palmer

## Arkansas

Grover Carpenter 48, Bella Vista  
Eddy Bailey 80, Flippin  
Margaret McMillan 91, Little Rock

## Arizona

Pamela Cady 94, Flagstaff  
Susan Fischer 77, Flagstaff  
Charles Reno 51, Green Valley  
Gordon Best 58, Mesa  
Donald Teason 51, Mesa  
Jeffrey Seaton 72, Phoenix  
Nathanael Brooks-English 96, Tucson  
Ross Bryant 80, Tucson  
David Johnson 88, Tucson  
Kathryn Mauz 93, Tucson  
Abigail Moore 97, Tucson  
Nancy Petersen 82, Tucson  
Christa Placzek 97, Tucson  
Walter Sweet 50, Tucson



*Alum Sarah Andrews ('73) at Cape Royds, Antarctica.*

## California

Seth Bacon 93, Alameda  
Gary Cook 58, Alamo  
Michael Florance 80, Apple Valley  
James Huyck 82, Aptos  
John Coash 44, Bakersfield  
Donald Miller 76, Bakersfield  
Samuel Scott 2001, Bakersfield  
Kenneth Boyer 85, Belmont  
Jesse Quay 98, Berkeley  
Steven Spear 69, Carlsbad  
Kurt Anderson 93, Carmichael  
Daniel Tenebaum 99, Chatsworth  
Thomas Mason 56, Cool  
Joel Bauman 99, Davis  
Sandra Hilton 73, El Granada  
Kenton Gee 85, Emeryville  
John Howell 98, Emeryville

Fredrick Conwell 56, Fremont  
Laura Dickerson 99, Half Moon Bay  
Jamie Webb 68, Irvine  
John Ginsburg 2000, Kings Beach  
Thomas Ross, 52, La Jolla  
Peter Anderson 2004, Laguna Beach  
Ronald Jackson 67, Laguna Beach  
Roger Neiley 74, Laguna Beach  
Nikolai Bailey 93, Laytonville  
Robert Schock 61, Livermore  
John Tinsley 70, Menlo Park  
Pamela Polite-Fisco 77, Mill Valley  
Marcia McNutt, Moss Landing  
Pamela Miller 84, Oakland  
Barbara Owens 51, Orinda  
Norman Neofotist 67, Pacific Palisades  
Anthony Barnosky 74, Palo Alto  
Richard Heermance 95, Palo Alto  
John Wandke 99, Pebble Beach  
Paul Osmundson 83, Petaluma  
Scott Emerson-Price 84, Pleasant Hill  
Lynne Westerfield 2000, Rancho Palos  
Verdes  
Warren Coonrad 49, Redding  
Brian Wirtz 88, Redwood City  
William Cooke 49, Sacramento  
Margaret Gehl 50, Sacramento  
Thomas Stewart 90, Sacramento  
David Cronin 81, Saint Helena  
Christopher Gale 2001, San Diego  
Kate Henrioulle 99, San Diego  
Jennifer Kleck 91, San Diego  
Tania Plascencia 96, San Diego  
John Bearden 81, San Francisco  
Andrew Bradford 94, San Francisco  
Gregory Shopoff 2001, San Francisco  
Lucius Taylor 96, San Francisco  
Andrew Wyckoff 95, San Francisco  
William Fowler 80, San Jose  
Joseph Hitch 54, San Jose  
Thomas Rowe 54, San Jose  
Bonny Archuleta 2001, San Ramon  
Bryan Bracken 79, San Ramon  
Kweku-Mensah Sagoe 69, San Ramon  
Stuart Magee 80, Santa Barbara  
Kathryn Snell 2002, Santa Cruz  
Sarah Andrews 73, Sebastopol  
James Gilkinson 52, Sebastopol  
Shawn Benner 87, Sierraville  
Valerie Esser 2000, Simi Valley  
Bettina Baylis 83, Soquel  
Brenton Bergh 43, South Pasadena  
John McComish 60, Tiburon  
Virginia Waters 69, Ukiah  
Carl Wheat 72, Ventura

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# *Alumni Grouped By Location 27*

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Roy Herndon 82, Villa Park  
John Cassell 47, Walnut Creek  
Sorrel Dye 97, Yorkville  
Barbara Parsons 76, Yucca Valley

## **Colorado**

Worth Freeman 47, Arvada  
William McFarland 47, Arvada  
Frederick Peel 61, Arvada  
Betty Severy 74, Aspen  
Theodore Billings 40, Aurora

Robert Zech 72, Boulder  
Frederic Wehrle 77, Breckenridge  
Ronald Antweiler 76, Broomfield  
Judith Flook 73, Broomfield  
Joseph Huggins 77, Broomfield  
Carl Lipp 51, Broomfield  
Harley Hamilton 61, Buena Vista  
Ronald Green 48, Canon City  
James Githens 75, Carbondale  
D. Stickney 62, Carbondale  
Michael Baltzer 53, Cascade

Tyler Moskal 83, Colorado Springs  
Lawrence Norris 42, Colorado Springs  
Emily Pope 2004, Colorado Springs  
Veronica Poteat 2004, Colorado Springs  
Katherine Poulter 2002, Colorado Springs  
Donald Singmaster 56, Colorado Springs  
John Spengler 91, Colorado Springs  
Charles Sulfrian 73, Colorado Springs  
Herbert Sweat 66, Colorado Springs  
Douglas Wheat 70, Colorado Springs  
Alexandra Woods 86, Colorado Springs



*The Gore Range in winter, photographed by Steve Weaver*

Edward Gubrud 83, Aurora  
Linda Schorr 85, Avon  
Richard Moore 69, Bailey  
Samuel Allen 79, Boulder  
Karin Budding 77, Boulder  
Alexander Durst 93, Boulder  
James Gigone 56, Boulder  
Douglas Haller 88, Boulder  
Joseph Hansen 2001, Boulder  
Constance Hayden 87, Boulder  
Jill Hollingsworth 81, Boulder  
Michael Kerwin 92, Boulder  
James McCrea 57, Boulder  
Peter Mortimer 97, Boulder  
Jennifer Schwarz 86, Boulder  
Lisa Seaman 87, Boulder  
John Shallow 84, Boulder  
Steven Thompson 99, Boulder  
Patrick Williamson 82, Boulder

David Hicks 82, Castle Rock  
Andrew Tankersley 2001, Castle Rock  
Philip McKenna 51, Centennial  
Robert Thompson 56, Centennial  
William Boddington 72, Colorado Springs  
Benjamin Gross 2002, Colorado Springs  
Harry Hamill 84, Colorado Springs  
Michael Hannigan 75, Colorado Springs  
Debra Hannigan 79, Colorado Springs  
Patrick Hollenbeck 2000, Colorado Springs  
Ronald Jagger 85, Colorado Springs  
Marshall Johnson 49, Colorado Springs  
Kevin Kinney 76, Colorado Springs  
Robert Klipping 53, Colorado Springs  
Claire Lukens 2004, Colorado Springs  
Alan Manley 86, Colorado Springs  
Charles Matteson 69, Colorado Springs  
Georgia Matteson 69, Colorado Springs

James Wright 70, Colorado Springs  
Merida Zerbi 2001, Colorado Springs  
Lawrence Wyman 74, Conifer  
Jane Dillard 53, Cortez  
Peter McCarville 84, Crawford  
Robert Warren 83, Crested Butte  
Richard Forrest 69, Del Norte  
Andrew Allan 80, Denver  
Edward Calvin 84, Denver  
Jocelyn Childs 80, Denver  
Jerald Cohen 60, Denver  
Randall Czech 95, Denver  
John Denman 96, Denver  
Margaret Keiser 33, Denver  
Marie Knotwell 98, Denver  
Bonita Lahey 69, Denver  
Mark Levine 82, Denver  
Charles Lippitt 84, Denver  
David McCreedy 83, Denver

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# Alumni Grouped By Location 28

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Daniel Niemela 2000, Denver  
Jane Ohl 50, Denver  
Michael Ohl 51, Denver  
Terrilyn Olson 80, Denver  
Hugh Pitcher 72, Denver  
Christopher Sanchez 94, Denver  
David Sawyer 79, Denver  
Matthew Seitz 97, Denver  
Paul Sorensen 87, Denver  
Charles Stanzione 84, Denver  
Stanford Stockdale 83, Denver  
Nathan Williams 2000, Denver  
John Wold 75, Denver  
Jonathan Wombwell 85, Denver  
Amy Wright 73, Denver  
Seth Berman 2000, Dillon  
Lowe Billingsley 88, Divide  
Harvey Carter 56, Divide  
Jeffery Gaul 90, Divide  
Victor deWolfe 71, Dumont  
Tom Casey 72, Durango  
Gary Gianniny 83, Durango  
Billy Latch 47, Durango  
Erika Roberts 98, Durango  
Frederick Vanden Bergh 94, Durango  
Bruce Petterson 78, Eagle  
Hazel Severin 48, Eaton  
Albert Schoenfeld 52, El Jebel  
Todd Burke 91, Englewood  
Cheryl Christopher 77, Englewood  
Timothy Crawford 2000, Englewood  
Martha Sippel 76, Englewood  
Walter Truettner 78, Englewood  
Robert Dern 51, Estes Park  
Michael Seybold 94, Estes Park  
Alison Koch 2002, Evergreen  
Margaret Staub 89, Evergreen  
Ellen Thompson 82, Evergreen  
Daniel Ferguson 86, Falcon  
Vaughn Surface 58, Florence  
Charles Beardslee 59, Florissant  
Russell Cowart 78, Fort Collins  
Daniel Gregory 74, Fort Collins  
Edie Stout 76, Fort Collins  
Ana Vargo 84, Fort Collins  
Christian Baxter 98, Golden  
Lynne Chastain-Carpenter 93, Golden  
Steven Gray 81, Golden  
Roland LaForge 72, Golden  
Charles Mace 80, Golden  
Nancy McNab 76, Golden  
Stewart McNab 76, Golden  
Barbara Nevins 74, Golden  
Blanche Vine 46, Golden  
Charles Betton 51, Grand Junction

Frances Ellinwood 49, Grand Junction  
Joan George 74, Grand Junction  
Charles Neill 52, Grand Junction  
William Wilson 81, Grand Junction  
Hugh Graham 52, Greeley  
John Haggin 46, Greeley  
Michael Taber 86, Greeley  
David Gottenborg 77, Greenwood Village  
Daraya Haddock 83, Greenwood Village  
Robert Kenyon 51, Greenwood Village  
Robert O'Hayre 82, Gunnison  
George Allen 81, Highlands Ranch  
Roger Felch 76, Idledale  
Rolfe Spiegel 87, Ignacio  
Albert Hofstra 78, Lakewood  
Anne Leibold 81, Lakewood  
Wendy Naugle 85, Lakewood  
Cecilia Travis 61, Lakewood  
Laura Roberts 73, Larkspur  
Susan Echt 2004, Littleton  
John Forster 75, Littleton  
Rodney Haenni 73, Littleton  
John Lien 95, Littleton  
Carl Martinez 81, Littleton  
James Robinson 76, Littleton  
Roland Rogers 52, Littleton  
Leslie Winn 75, Littleton  
Frederick Witsell 80, Littleton  
Christina Cooley 98, Longmont  
Susan Presti 76, Manitou Springs  
John Slovek 70, Mead  
Robert Moore 57, Montrose  
James Bowman 81, Monument  
Clarion Taylor 48, Morrison  
Gregory Twombly 75, Morrison  
Christine Jensen 84, Nederland  
Peter Jensen 84, Nederland  
Paula Bennedsen 71, Ordway  
Helen Olivier 67, Ouray  
Stephen Kuhlman 70, Pagosa Springs  
Laura Mason 90, Parker  
Patrick Pearson 86, Parker  
Gary Reinking 80, Silverthorne  
Ronald Timroth 54, Snowmass  
Jason Albrecht 2000, Steamboat Springs  
Elizabeth Schnackenberg 88, Steamboat Springs  
Courtney Thunstrom 95, Steamboat Springs  
Herbert Vandemoer 44, Sterling  
Robert Shoff 96, Telluride  
Christian Dockum 98, Vail  
Stacey Jonker 95, Vail  
Michael Martinez 78, Woodland Park  
Cyril Whiteside 59, Woodland Park

## **Connecticut**

Otto Schmidt 56, Auon  
Elizabeth MacKenzie 82, New Canaan  
David Neuhaus 80, New Canaan  
Ryan Bennett 97, New Haven  
Ian Miller 99, New Haven  
Daniel Rawson 75, Newtown  
Jeffrey Miller 81, Norwalk  
Josh Lowell 94, Stamford  
Derek Sexton 98, Westport

## **Florida**

Thomas Twitmyer 86, Dade City  
Richard Rooney 56, Fort Lauderdale  
Suzanne Moore 2002, Jacksonville  
Lauren Wade 81, Longwood  
Sandra Parks 77, Melbourne  
John Ferrill 84, Tampa  
David Tarbox 66, Tampa  
David Schultz 51, Vero Beach

## **Georgia**

Timothy Winfrey 83, Duluth

## **Hawaii**

Carrie Brugger 99, Honolulu  
Bradley Evans 90, Honolulu  
Duncan MacNaughton 66, Honolulu

## **Iowa**

Susan Crane 94, Iowa City  
Ryan Larson 2001, West Des Moines

## **Idaho**

David Llewellyn 47, Boise  
Christopher Thomas 76, Boise  
Paula Wiens 84, Caldwell  
Leon Pankau 53, Idaho Falls  
Alfred Conroy 54, McCammon

## **Illinois**

Jesse Harvey 79, Barrington  
Donald Clark 77, Chicago  
Cathryn Hartman 80, Chicago  
Kiel Smith 2004, Chicago  
Alden Sulger 83, Chicago  
Catherine Vaughan 2000, Chicago  
Beverly Llewellyn 83, Glenview  
Marc Gamble 87, Hinsdale  
Jeanne Remaley 50, Lake Forest  
Kent Glatthaar 59, Mount Vernon  
Susan Siegel 82, Northbrook  
William Gappert 59, Rolling Meadows  
Lauren Tice 2002, Western Springs  
Franklin Judson 54, Winnetka

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# Alumni Grouped By Location 29

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## **Indiana**

John Hay 51, Goshen  
Sonya Hernandez 2001, Indianapolis  
Mark Lesh 98, Lafayette

## **Kansas**

Julienne Ruth 99, Lawrence  
Eric Cattell 77, Manhattan  
Kirsten Nicolaysen 92, Manhattan  
Byron McDaniel 73, Topeka  
Camille Nohe 66, Topeka

## **Kentucky**

Shea Hogan 2003, Frankfort  
Karl Thompson 2001, Frankfort  
James Ellerbe 79, Lexington

## **Louisiana**

Steven Humphreys 73, Baton Rouge  
Susan Humphreys 73, Baton Rouge  
Robert Kennedy 2000, Baton Rouge  
Claire Blazek 84, Gretna

## **Massachusetts**

Judith Richmond 53, Andover  
Caroline Seaman 97, Boston  
Jaime Kopke 2001, Brookline  
Chris Nielsen 83, Cambridge  
Robert Schoene 99, Cambridge  
Nicholas Maynard 94, E Somerville  
Kenneth Sims 86, East Falmouth  
Timothy Bruno 72, Gloucester  
Daniel Lohr 2002, Harwich  
Mark Johnston 86, Jamaica Plain  
Edward Simmons 79, Marblehead  
Matthew Bastress 93, Marlboro  
Lindsey Quackenbush 98, Monson  
James Bradbury 95, Northampton  
David Gengler 69, Northampton  
Timothy Donohue 91, Somerville  
Woodward Fischer 2000, Somerville  
Michael Toomey 2000, Stoughton  
Elizabeth Darley 84, Sudbury  
Katharine Powell 95, West Tisbury  
Tona Winterbottom 92, Winchester

## **Maryland**

Nicole Klimt 98, Baltimore  
Douglas Cattell 88, Bethesda  
Ann Clarke 72, Bethesda  
Sarah DeWitt 2000, Chevy Chase  
Stanley Buck 69, Columbia  
Lisa Williams 2000, Columbia  
Mary Curtis 72, Kensington  
Geoffrey Mason 85, Severna Park

James Mott 84, Severna Park

## **Maine**

Petra Hall 76, Belfast  
Elsa Gruen 2004, Cape Elizabeth  
Victor Sunshine 87, Cape Neddick  
Mathieu Duvall 91, Lewiston  
Kenneth Shaw 76, Rockland  
Karl Brunner 97, Walpole

## **Michigan**

Robert Nelson 82, Birmingham  
Drew Beckwith 2001, East Lansing  
Allison Baker 88, Grosse Pointe Park

## **Minnesota**

William Dumler 84, Burnsville  
Kirsten Rojina 83, Chanhassen  
Kristian Benson 98, Edina  
Thomas Love 60, Lake Elmo  
Robert Nystrom 77, Lakeville  
Deborah Jones 76, Minneapolis  
Kristin Van Loon 93, Minneapolis  
John Tuttle 88, Saint Paul  
Dennis Fischer 73, Wayzata  
Gregory Dehn 98, Woodbury

## **Mississippi**

Carter Gehman 97, Lakeshore

## **Missouri**

Paul Davis 71, Boonville  
Kathryn Riesenberger 93, Columbia  
Timothy Daughton 90, Elkland  
Alvin Schisler 50, Kansas City  
Jennifer Collins 71, Saint Louis

## **Montana**

George Long 47, Billings  
Elizabeth Wahl 83, Clancy  
Thane Riordon 94, Dillon  
Anthony Dalpiaz 82, Missoula  
Ward McCartney 71, Whitefish

## **North Carolina**

Jay Wimer 59, Charlotte  
Brian Fireman 92, Mars Hill

## **North Dakota**

George Perkins 2002, Grand Forks

## **Nebraska**

George Wheat 50, Grand Island  
Nancy Lindsley-Griffin 64, Lincoln  
Lauren Tice 2002, Omaha

## **New Hampshire**

Paul Dishong 58, Amherst  
J. Maloney 99, Hanover  
Joseph Gartner 2000, Hollis

## **New Jersey**

Jessica Jackson-Keeley 92, Hightstown  
Kalsoum Abbasi 97, Princeton  
Michelle Segal, Somerville  
Deborah Roth 2001, Warren

## **New Mexico**

Laura Crossey 77, Albuquerque  
Amy Gaffney 96, Albuquerque  
David Mueller 94, Albuquerque  
Ezra Bayles 93, El Prado  
David Clark 79, Farmington  
Elisa Arviso 94, Gallup  
Peter Gram 85, Los Alamos  
Jason Hall 98, Pecos  
Amanda Bissell 2004, Penasco  
Anne Schaub 99, Questa  
Kay Havenor 57, Roswell  
Susan Clark Neary 82, Santa Fe  
Charles Hagerman 51, Santa Fe  
Kirt Kempter 81, Santa Fe  
Daniel Levitt 84, Santa Fe  
Donna Middleton 80, Santa Fe  
Elizabeth Mitchell 88, Santa Fe  
Sarah Pierpont 97, Santa Fe  
Jodi White 96, Santa Fe  
Reyna Abeyta 98, Socorro  
Amber McIntosh 98, Socorro  
Robert Sanders 99, Socorro  
Christophe Olson 87, Tesuque

## **Nevada**

Duane Packer 69, Gardnerville  
Polly Draper 95, Las Vegas  
Rhonda Paxton 84, Pahrumpp  
Tom Bullard, Reno  
Saxon Sharp, Reno  
Walter Stapleton 99, Reno  
Steven Weiss 78, Reno

## **New York**

Louis Derry 81, Brooktondale  
Sally Odland 76, Croton-on-Hudson  
Ruth Mitchell 51, Holbrook  
Michael Baron 83, New York  
Craig Hart 90, New York  
Patrick Picard 2004, New York  
Marc Silverman 78, New York  
Max Minnerop 2000, Sparkill

# Alumni Grouped By Location 30

## Oklahoma

Robert Blaik 77, Edmond  
Helen Peterson 51, Edmond  
Chester Long 49, Grove  
Sara Loosen 99, Okarche  
Kenneth Baird 55, Oklahoma City  
Julia Atherton 81, Tulsa  
Charles Harding 77, Tulsa  
Jean Lemmon 77, Tulsa  
Patricia Peters 46, Tulsa  
Lewis Peters 50, Tulsa

## Oregon

Michelle Bassett 99, Beaverton  
Kurt Black 84, Corvallis  
Grant Kaye 2000, Corvallis  
Nicholas Watterson 96, Corvallis  
Laurence Kittleman 53, Eugene  
Erica Langbecker 97, Eugene  
Julie Miller 82, Eugene  
Martin Miller 82, Eugene  
Craig Isenberg 97, Lake Oswego  
Cathy Whitlock 75, Monroe  
William Chadwick 81, Newport

Karen Barrett 74, Portland  
Chase Brand 83, Portland  
Lisa Brodeur 83, Portland  
Susan Huffman 79, Portland  
Steven Kenitz 85, Portland  
Peter Lund 80, Portland  
Alex Macpherson 2004, Portland  
Daniel Rohlf 84, Portland

## Pennsylvania

Robert Pickard 61, Ambler  
Andrew Steiner 2003, Ambler  
James Ward 51, Mountville  
Lisa Greer 93, State College  
Jonathan Zook 95, Warrington

## Rhode Island

Elizabeth Mantelli 73, Johnston  
Bryan Shuman 94, Providence

## South Carolina

Charles Haslett 57, Charleston  
Adair Stevenson 2002, Columbia  
Karen DeMattio 2000, Myrtle Beach

## South Dakota

Lee Vierling 92, Rapid City

## Tennessee

Frank Kruzich 56, Dresden  
Peter Caswell 85, Harriman  
Rachel Sobrero 98, Morfreesboro

## Texas

Glen Brosier 59, Amarillo  
Stephen Boese 95, Austin  
Ryan Ewing 98, Austin  
Emily Francis 99, Austin  
Thomas McCann 44, Austin  
Richard

Ornelas 50, Austin  
Carl Phelan , Austin  
Ryan Wooley 99, Austin  
John Sanders 45, Beaumont  
John Howland 43, Carthage  
William Clark 44, Cedar Park  
Leo McCune 57, Dallas  
Daniel Northcut 85, Dallas  
Richard Langford 79, El Paso  
Robert Burford 59, Fort Worth  
Stephen Tally 73, Fort Worth  
John McDavid 52, Frisco  
Thomas Berkman 82, Houston  
Arthur Elder 56, Houston  
Arthur Gelber 81, Houston  
Helen Gilbert 42, Houston  
Norman Hammond 55, Houston  
Robert McGinnis 50, Houston  
Jeffrey Mitchell 81, Houston  
James Orofino 2000, Houston  
William Reade 81, Houston  
Richard Spaw 74, Houston  
Laura Wilhelm 78, Houston  
Albert Shultz 76, Katy  
Robert Roark 33, Memphis  
Mary Anne Dingus 83, Midland  
Donald Posey 51, Midland  
Jim Starrak 51, Midland  
Howard Viger 57, Richmond  
Thomas Ewing 75, San Antonio  
Greg Harpel 77, San Antonio  
Wayne Maxwell 62, Spring  
Lynn Six 56, Spring  
Olian Shockley 52, Tyler  
Robert Southwood 59, Waco  
James Scott 74, Weatherford  
John Stephenson 51, Wichita Falls  
Donald Milton 48, Woodlands

## Utah

Stephen Dinkowitz 81, Draper  
David Gaeuman 82, Logan  
Penny Rieke 96, Logan  
John Keogh 53, Moab  
Clifton Koontz 2000, Moab  
Eric Lonn 81, Park City  
Joseph Arnold 81, Salt Lake City  
Geoffrey Christensen 2004, Salt Lake City  
Kathryn Clark 81, Salt Lake

City  
Dale Goddard 86, Salt Lake City  
George Hamilton 51, Salt Lake City  
Van King 85, Salt Lake City

## Virginia

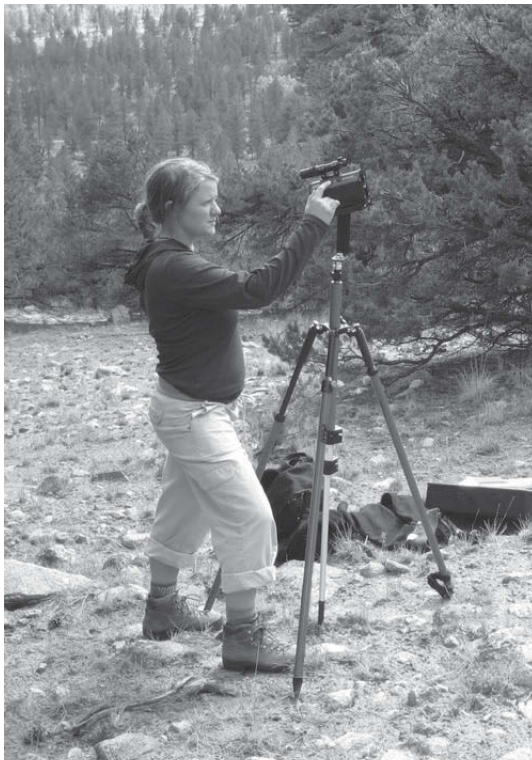
Jeannine Leadbeater 90, Bowers Hill  
James Doan 58, Centreville  
Therese Phillips 81, Glen Allen  
Kenneth Reeves 64, Lynchburg  
Christie Smith 73, Manakin

## Vermont

Amy McVay 96, Jeffersonville  
Laurie Lamb 91, Montpelier  
Andrew Lamb 92, Montpelier  
Janet Hardy 84, Norwich  
Sarah Millsbaugh 84, Shelburne

## Washington

Molly Magee 71, Aberdeen  
Gregory Schorr 96, Bainbridge Island  
Emery Bayley 62, Bellevue  
Samuel Atwater 80, Duvall  
Aaron Clark 99, Enumclaw  
Matthew Dalton 74, Ferndale  
Edward Smith 83, Gig Harbor  
Joe Creager 51, Kenmore  
Blake Larsen 98, Mazama  
David Trench 2004, Medina  
William Carroll 89, North Bend  
David Catterson 86, Olympia  
Charles Lathe 76, Olympia  
Glenn Scarcia 52, Port Angeles  
Henry Brooks 57, Port Ludlow  
Tamara Pokorny 85, Port Townsend  
William Rudolph 79, Poulsbo  
David Rodland 96, Richland  
Walter Charm 54, Seattle  
Seth Cowdery 2001, Seattle  
Carolyn Edmond 76, Seattle  
Ross Freeman 90, Seattle  
John Holmberg 73, Seattle  
Matthew Huston 85, Seattle  
Michaeleen McNerney 2001, Seattle  
Emily Munson 95, Seattle  
Gregory Wallace 82, Seattle



Betsy Friedlander ('07) surveying with a laser rangefinder.



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# Alumni Contact Information 31

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If you would like your address or website information to be listed or changed, please send it to us. If you don't want your contact information included, or would like us to have it for department records only, please send a note to that effect.

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William Schacht 58, Tumwater

## Wisconsin

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Philip Owen 71, Eau Claire  
Jerry Denniss 55, Middleton  
Michael Heublein 98, Spring Green

## Wyoming

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Anne Powell 94, Centennial  
John Gallagher 84, Cody  
Evan Howe 94, Jackson  
Bradley Jaeckel 94, Jackson  
John Chase 86, Sheridan

## District of Columbia

Sonya Berger 97, Washington DC

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Gordon Best '58  
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Mesa, AZ 85213

Charles Betton '51  
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Eric Bilderback '99  
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Theodore Billings '40  
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Lowe Billingsley '88  
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Divide, CO 80814-8402

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Claire Renault Blazek '84  
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Gretna, LA 70053-4850

William Boddington '72  
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Colorado Springs, CO 80907-7350



*Shiprock, NM. Photographed by Steve Weaver.*

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Kenneth Boyer '85  
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Belmont, CA 94002-3714

Bryan Bracken '79  
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James Bradbury '95  
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Andrew Bradford '94  
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Chase Brand '83  
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Lisa Brodeur '83  
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Portland, OR 97219-6213

Henry Brooks '57



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Port Ludlow, WA 98365

Nathanael Brooks-English '96  
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Glen Brosier '59  
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Amarillo, TX 79109

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Timothy Bruno '72  
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Gloucester, MA 01930-1570

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Columbia, MD 21045-5118

Karin Budding Budding '77  
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2215 Raggio Parkway  
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Fort Worth, TX 76109-2259

Fort Worth, TX 76109-2259

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Edward Calvin '84  
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Denver, CO 80207-3261

Grover Carpenter '48  
42 Abingdon Lane  
Bella Vista, AR 72714-6223

William Carroll '89

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# Alumni Contact Information 33

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Harvey Carter '56 PO Box 395 Divide, CO 80814-0395	Cheryl Holmes Christopher '77 10738 East Crestridge Circle Englewood, CO 80111-3810	Alfred Conroy '54 3470 South Marsh Creek Road McCammon, ID 83250-1541	Laura Jones Crossey '77 1609 Stanford NE Albuquerque, NM 87106-3729
Tom Casey Casey '72 2050 E Second Ave Durango, CO 81301-4630	Bryn Clark '00 800 Delaney St. Anchorage, AK 99501	Fredrick Conwell '56 4780 Stratford Avenue Fremont, CA 94538-3337	Mary Curtis '72 11014 Kensington Blvd Kensington, MD 20895-1639
John Cassell '47 2398 Benham Court Walnut Creek, CA 94596-6456	Aaron Clark '99 25435 SE 391st St Enumclaw, WA 98022	Gary Cook '58 31 Mott Dr Alamo, CA 94507-1713	Randall Czech '95 2059 Eudora St Denver, CO 80207-3810
Peter Caswell '85 208 Blair Rd Harriman, TN 37748	Kathryn Volz Clark '81 1352 E Logan Ave Salt Lake City, UT 84105-2628	William Cooke '49 3405 Tembrook Drive Sacramento, CA 95864-5007	Anthony Dalpiaz '82 203 Takima Dr Missoula, MT 59803-1603
Douglas Cattell '88 c/o Dr. Hereward Cattell 8008 Greentree Road Bethesda, MD 20817-1304	David Clark '79 4104 N Buena Vista Ave Farmington, NM 87401-2374	Christina Brachle Cooley '98 321 Judson St Longmont, CO 80501	Matthew Dalton '74 6034 N Star Rd Ferndale, WA 98248-8702
Eric Cattell '77 3446 Treemill Dr Manhattan, KS 66503	Donald Clark '77 5706 North Talman Chicago, IL 60659	Warren Coonrad '49 PO Box 493978 Redding, CA 96049	Elizabeth Jones Darley '84 106 Thunder Road Sudbury, MA 01776-1326
David Catterson '86 1121 5th Ave SE Olympia, WA 98501-1601	William Clark '54 214 Roxboro Rd SW Calgary, AB T2S 0R1 Canada	Harold Cowan '55 123 East Chestermere Drive Chestermere, AB T1X 1A1 Canada	Samuel Dashevsky '77 1636 Wolverine Lane Fairbanks, AK 99709-6627
William Chadwick '81 872 SE Crescent PL Newport, OR 97365-4205	William Clark '44 1313 Roadrunner Dr Cedar Park, TX 78613-5105	Russell Cowart '78 717 Peterson St Fort Collins, CO 80525-1812	Timothy Daughton '90 R.R. 2, Box 70 Elkland, MO 65644-9213
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John Chase '86 128 Canvasback Rd Sheridan, WY 82801-9040	Ann Hooker Clarke '72 4536 S Chelsea Ln Bethesda, MD 20814-4759	Susan Crane Crane '94 930 Talwrn Ct Iowa City, IA 52246	Edith Day '99 1-72 Princess St Kingston, ON K7L 1A5 Canada
Lynne Chastain Chastain-Carpenter '93 645 Kilmer Street Golden, CO 80401-4076	John Coash '44 600 Elsey St Bakersfield, CA 93309-1418	Timothy Crawford '00 3962 S Bannock St Englewood, CO 80110-4602	Gregory Dehn '98 2581 Eagle Trace Ln Woodbury, MN 55129
Jocelyn Gamble Childs '80 2012 East 4th Avenue Denver, CO 80206-4104	Jerald Cohen '60 5395 East Custer Place Denver, CO 80246-1444	Joe Creager '51 7711 NE 175th St #A301 Kenmore, WA 98028	Karen DeMattio '00 141 North Gate Road

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# Alumni Contact Information 34

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Jerry Denniss '55 3319 Conservancy Lane Middleton, WI 53562	Timothy Donohue '91 44 Paulina St #2 Somerville, MA 02144-1813	Scott Price Emerson-Price '84 224 Evelyn Dr Pleasant Hill, CA 94523-2225	Brian Fireman '92 952 Forks of Ivy Rd Mars Hill, NC 28754
Robert Dern '51 PO Box 3638 Estes Park, CO 80517-3638	Polly Draper '95 10494 Perfect Peace Ln Las Vegas, NV 89135	Valerie Esser '00 1063 Balsamo Avenue Simi Valley, CA 93065-4326	Woodward Fischer '00 289 Highland Ave #407 Somerville, MA 02144
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Sarah DeWitt '00 6713 E Ave Chevy Chase, MD 20815	William Dumler '84 15400 Oriole Court Burnsville, MN 55306-5200	Ryan Ewing '98 5207 Avenue H #A Austin, TX 78751-2027	Dennis Fischer '73 2322 Huntington Pt. Road West Wayzata, MN 55391-9626
Victor deWolfe '71 PO Box 176 Dumont, CO 80436-0176	Alexander Durst '93 765 Hartford Dr Boulder, CO 80303-5718	Thomas Ewing '75 13011 Hunters Ledge San Antonio, TX 78230-2025	Judith Flook Flook '73 1760 Peregrine Court Broomfield, CO 80020-1264
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Jane Wallace Dillard '53 #6 Indian Camp Ranch 21720 Road K Cortez, CO 81321-8400	Sorrel Dye '97 PO Box 156 Yorkville, CA 95494	Jonathan Fauver '95 Outdoor Interlaken AG Hauptstrasse 15 P.O. Box 451 CH-3800 Interlaken-Matten Switzerland,	Kimball Forrest '77 1534 Kinnikinnick Anchorage, AK 99508-3017
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# Alumni Contact Information 35

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*Don't miss next year's Precambrian Basement as  
CC Geology sails away to the Caribbean!*

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Dear Colorado College Geology Alum:

We hope you have enjoyed the 2004 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

Last Name \_\_\_\_\_ First Name \_\_\_\_\_

Maiden Name or Nickname \_\_\_\_\_ Year of Graduation \_\_\_\_\_

Current Address (street) \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zipcode \_\_\_\_\_

Home Phone \_\_\_\_\_ Business Phone \_\_\_\_\_

email \_\_\_\_\_ website \_\_\_\_\_

Current Employment or Graduate School Info:

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Recent Events, Exciting Adventures, and other Comments:

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