GEOLOGY NEWS

Department of Geological Sciences • University of Colorado at Boulder • Spring 2003

The Department of Geological Sciences

1902 - 2002

100 Years of Geoscience

http://www.colorado.edu/geolsci

Emeritus faculty and staff at the 100th anniversary celebration of the department on October 25th, 2002. Left to right: Ed Larson, Don Runnells, Jim Munoz, Ted Walker, Bruce Curtis, Pauline Franz, Peter Birkeland, Edith Ellis, Bill Bradley, Erle Kauffman and Don Eicher.

Letter from the Interim Chair

Charles Stern

I'm back!! Last year the department selected Mary Kraus to be our next chair, but Mary deferred for one year and I have been acting as interim chair.

This year marked the 100th year of the creation of the Department of Geological Sciences. We celebrated this on Friday, October 25th with presentations by some of our new Assistant Professors, including a talk on petroleum exploration by Matthew Pranter, insect fossils by Dena Smith, and the early Earth and origin of life by Stephen Mojzsis. Following the talks was a reception attended by over 350 alumni and friends of the department, including 16 past professors and staff members among which were the 11 pictured above. It was a great event.

This 100th year has been another good year for us. We have added four new faculty members. Jaelyn Eberle, a joint hire with the Museum, is a vertebrate paleontologist. Eric Small is a vadose zone geohydrologist hired to expand our hydrology and environmental geosciences program. Tom Marchitto, a joint hire with INSTAAR, is a paleoclimatologist. Geoff Dorn, the director of the BP Center for Visualization, is a geophysicist with expertise in exploration for petroleum. You can find out more about these new faculty in the newsletter.

Two faculty left the department. Peter Robinson retired after 37 years at CU, and Kathryn Nagy, our aqueous geochemist, accepted an offer at the University of Illinois. Two of our faculty have also announced their plans to retire at the end of this year. They are John Andrews, who has been with us since 1968, and Hartmut Spetzler, who joined our faculty in 1974.

On a much sadder note, we lost Professor Emeritus Bill Braddock, who passed away in January of this year. Bill was a graduate of CU in 1951 and a faculty member in our department between 1956 and his retirement in 1994. We hosted a memorial service on February 15th for the family, friends, colleagues and students of Bill to celebrate his life. A group of Bill's students and friends are making an effort to raise funds for a permanent memorial in Bill's honor. Contact Neil S Fishman at nfishman@usgs.gov if you are interested in assisting in this effort.

We have been busy this year with three national searches for new faculty. We have already hired Jason Neff as a biogeochemist to join our department in September. Another search, being conducted jointly with INSTAAR, is for a Quaternary geologist to fill the position being vacated by John Andrews, and a third search, being conducted jointly with CIRES, is for a geomorphologist.

If all these searches are successful we will have grown to 30 faculty members, and we still have one vacant line to fill with the departure of our aqueous geochemist, a search that hopefully will take place next year. This will be the largest, with respect to faculty members, that the department has been in the last 100 years; and with a greater proportion of young Assistant Professors than we have had in some time, reflecting the very active period of growth and expansion we have undergone in the last 5 years since moving into the new building. We are currently building out the last 3,000 square feet of previously unfinished basement space in the building to house these new faculty, their research labs and graduate students.

We continue to try to raise funds to cover expenses associated with our field geology program, to create fellowship support for graduate students, and for special opportunities and growth in new directions. The Bruce Curtis Endowed Graduate Fellowship Fund has raised approximately $50,000 in the last year, and if we can reach a goal of $125,000 by June 30 of this year, we will receive an extra $75,000 from the Moore's Family Fund for graduate support. This is a special opportunity and this is our top fund-raising priority at the moment. You can find more about our fund raising activities and necessities on our web site at www.colorado.edu/geolsci. Those of you who have followed the story of Colorado's economy this year can understand our need to raise some of our own money from the private sector in order to make sure our program remains top notch. To those who have supported us in the past, I thank you again on behalf of the department.

We currently have 95 undergraduate geology majors. In 2002 we graduated 16 with B.A. degrees as well as 13 M.S. and 5 Ph.D. students. The department's graduate research and teaching program continues to be both broad and strong, with more than 80 graduate students engaged in numerous research projects — some described by our faculty inside the newsletter — supported by more than $6,000,000 of research grants. This level of activity suggests that the department's next hundred years will be at least as exciting and productive as the last hundred have been.

On a more personal note, I will have a sabbatical leave next year and no longer be either chair or interim chair! Alex and I will spend most of the year in Chile. I have a grant from the National Geographic Society to study the sources and distribution of obsidian artifacts in the archeological sites of Patagonia, another from FONDECYT (Chile) to develop the tephrochronology of the southern Andes as a tool for sorting out the chronology of archaeological excavations in Patagonia, and am also applying for a Fulbright Senior Scientist award. Alex has a grant to conduct research concerning the genesis of the world's largest copper deposit, El Teniente, located in the Andes just south of Santiago, a project we have been collaborating on for a number of years.

Our kids are all in college now. Are we beginning to get old? My father always said that getting old is not for wimps. David Kepesh, the aging professor in Phil Roth's novel "The Dying Animal" explained getting old very well in the last sentence of the first paragraph on the top of page 34 of the Vintage edition - you'll have to look it up yourself. Anyway, while we still can, we also hope to spend some time next year in Thailand and, if things work out, in Tibet. Wish us luck. I've always had plenty, but you can never have enough.

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New Faculty

Geoffrey Dorn

Geoffrey Dorn joined the Department of Geological Sciences as a Research Professor in the Fall of 2002. Geoff is a geophysicist with research interests in 3-D and 4-D seismic interpretation, attribute analysis, reservoir characterization and 3-D visualization. He serves in a dual position as the Director of the BP Center for Visualization at CU.

Geoff received his B.S. in astrophysics (1973) from the University of New Mexico in 1973, with a focus on modeling stellar interiors and stellar evolution. His interest in Geology, sparked while taking several courses as an undergraduate, lead to a change in his graduate plans and career path to Geophysics. He received his M.S. in Geology (1978) from the University of New Mexico with a Master's thesis on 3-D electrical resistivity modeling of a geothermal project in the Valles Caldera of north-central New Mexico.

After receiving his Masters degree, Geoff entered the Ph.D. program in Engineering Geoscience (Exploration Geophysics) at the University of California, Berkeley. Following two years of work on 3-D electromagnetic modeling, he began on a problem in theoretical seismology. Using a supercomputer at Lawrence Berkeley Laboratory, Geoff derived the mathematics and developed code to model seismic source-to-earth coupling problems in an anelastic earth model. The studies included both a characterization of the radiation pattern of the seismic source (a description of the strength of the seismic signal as a function of direction from the source) and the source's radiation impedance function (the load on the seismic source or 'antenna' as it radiates into the earth). Geoff received his Ph.D. in 1980. During the last two years of his Ph.D. work, he worked part-time as a Geophysicist for Chevron Resources in San Francisco, in their Geothermal Energy division.

Geoff joined ARCO's Exploration and Production Technology in the fall of 1980, spending his first two years in seismic acquisition research. From 1982 - 1987 he directed ARCO's interactive interpretation research group, with research focusing on 2-D and 3-D seismic interpretation, velocity interpretation and time-to-depth conversion. He left management in January of 1987 to pursue technical research interests in 3-D seismic horizon and volume attribute analysis, geophysical reservoir characterization and 3-D visualization. In 1993 Geoff was named an ARCO Research Advisor for his contributions in 3-D seismic interpretation and visualization research. During his career at ARCO, Geoff had the opportunity to work on over 40 3-D seismic surveys from ARCO's operations around the world.

Geoffrey Dorn

In 1997 ARCO formed a Visualization Technology Center at the Plano Exploration Research Lab. Geoff was brought out of his temporary management "retirement" to create and manage this new center. In May of 1997, ARCO opened its Visualization Center - the first in the industry. After the acquisition of ARCO by BP in April of 2000, he arranged BP's donation of ARCO's visualization technology center to the University of Colorado (CU). The donation occurred in October of 2001, and shortly thereafter Geoff became Executive Director of the BP Center for Visualization at CU. This multidisciplinary research center is sponsored by the Departments of Geological Sciences, Computer Sciences and Aerospace Engineering Sciences, and currently has industry-funded active research projects in immersive visualization applied to drilling planning, 3-D and 4-D seismic interpretation, automatic structural and stratigraphic interpretation of seismic data, and visualization of uncertainty. Other on-going research projects include applications of visualization to radiation therapy treatment planning, and the design and evaluation of aerospace systems.

In the Department of Geological Sciences, Geoff teaches a graduate level course in Advanced 3-D Seismic Interpretation. This course combines seminars with hand-on exercises in 3-D seismic interpretation, using donated 3-D seismic surveys from the oil and gas industry and industry standard 3-D interpretation systems. Although initially taught as a 1 semester graduate level course in the Fall of 2002, Geoff has plans to expand the material to a two semester course by the time it is next offered.

A member of the society of Exploration Geophysicists (SEG) Research Committee since 1990, Geoff has helped organize numerous post-convention SEG Research Committee workshops, was chairman of the 1993 SEG Summer Research Workshop on 3-D Seismology, and has twice been a District Representative to the SEG. He was the Spring 2002 SEG Distinguished Lecturer, speaking at 22 venues in North America and Europe on 3-D Visualization applied to resource exploration and development. He is also an active member of the SEG, EAGE, AAPG, and ACM SIGGRAPH.

Jaelyn Eberle inspecting dental records in the Denver Basin, CO

Jaelyn Eberle

Jaelyn, a Canadian vertebrate paleontologist specializing in fossil mammals, is among the new faculty members in Geological Sciences. Her research focuses on mammalian evolution across the Cretaceous-Tertiary boundary (that infamous boundary when dinosaurs went extinct), and Tertiary High Arctic vertebrate evolution, paleoclimate, and paleogeography. Jaelyn started her joint position as Assistant Professor in Geological Sciences and Curator of Vertebrate Paleontology in the University of Colorado Museum of Natural History in August, 2002.

Jaelyn's interest in paleontology began at a young age, when she and her grandmother discovered fossils of marine invertebrates on the family farm in Saskatchewan. In 1991, Jaelyn received a B.Sc. Honors in Paleobiology, as the first graduate of this program at the University of Saskatchewan. Jaelyn then began graduate studies at the University of Wyoming, where she worked with Jason Lillegraven in Cretaceous-Tertiary spanning strata of the Hanna Basin, south-central Wyoming. Her doctoral dissertation focused primarily upon mammals that lived in the Rocky Mountain region during the first geologic "minutes" following dinosaur extinction at the K-T boundary – the Puercan North American Land Mammal Age. This was an exciting time in mammalian evolution, when the roots of many modern orders were born. Among the most intriguing questions to Jaelyn were "How were the mammals affected by dinosaur extinction?" and "When did these effects occur?" Her Hanna Basin research suggests that the first great radiation of Tertiary mammals was not synchronous with dinosaur extinction, but rather, it occurred a few hundred thousand years afterwards. At this time, a marked increase in diversity, dental specialization, and body size amongst mammals occurred. If anything, mammals were positively affected by dinosaur extinction, but it took some time for early Tertiary mammals to "discover" the niches vacated by the dinosaurs.

Upon earning her Ph.D. in Geology from UW in 1996, Jaelyn began postdoctoral research at Rice University in Houston, Texas, studying fossil mammals from the Denver Basin. Receipt of an NSERC Postdoctoral Fellowship from the Canadian government in 1997 added a new direction to her paleontological career – she began working in the Canadian High Arctic, and moved up in the Geologic Timescale to the Eocene. Also in 1997, Jaelyn and colleague John Storer (Yukon Government) discovered the northernmost record of fossil mammals in the world. Jaelyn's ongoing Arctic research and that of her colleagues helps pin down the timing of land bridges between high-latitude North America and both Europe and Asia, as well as the height of Cenozoic global warming - some 55 million years ago, when alligators and rhinos inhabited a warm, forested Arctic.

Following a short stint as Curator of Paleontology at the Houston Museum of Natural Science, Jaelyn returned to Canada in 2000, joining a team of paleontologists at the Canadian Museum of Nature. There, she continued her research in the High Arctic and Colorado, and helped to design the CMN's new fossil gallery (opening 2004-05).

Jaelyn, her husband David (a petroleum geologist), and three-year-old son Nicholas are thrilled to be back in the Rockies, and much closer to her field sites in the Denver Basin. Having been "bit" by the Arctic bug in 1997, Jaelyn will mark her 6th season in the High Arctic this summer by returning to Devon Island to conduct paleontological field work with CU colleague Karen Chin. Jaelyn also plans a season on Banks Island in Canada's western High Arctic this summer.

Having taught everything from plate tectonics to the bones of the human skull, Jaelyn sees herself and her discipline (paleontology) as occupying that important "grey area" between biology and geology. As a postdoctoral fellow at Rice University, Jaelyn lectured in the Departments of Ecology and Evolutionary Biology, Anthropology, and Geology. At CU, Jaelyn is currently teaching historical geology, and plans to teach vertebrate paleontology next spring. Like several other members of the geology faculty, Jaelyn has a joint appointment. Consequently, she has curatorial duties and works with graduate students in the Museum and Field Studies (MFS) program. Jaelyn's lab and primary office are in the Bruce Curtis Building (i.e., the old Geology Building), which houses the Museum's paleontological collections and research labs. Jaelyn also shares an office in Benson Earth Sciences with other joint faculty.

Jaelyn serves as Chair of the Membership Committee for the Society of Vertebrate Paleontology (SVP), the premier international organization established to advance the science of vertebrate paleontology, and is a member of numerous other professional societies.

Jaelyn was hired as the replacement for Peter Robinson, who, after 41 years as a Curator at the CU Museum (and a stint as Museum Director from 1971-1982), retired in fall of 2002.

Tom Marchitto

Tom Marchitto joined the department in January 2003 as an Assistant Professor in the area of paleoclimatology. He is also a member of the Institute of Arctic and Alpine Research (INSTAAR). Tom is mainly interested in rapid climate changes occurring during the latest Quaternary, up to and including the present day.

A native of New Haven, Connecticut, Tom earned his B.S. in Geology and Geophysics from Yale University in 1994. As a research assistant he was introduced to geochemistry (through Karl Turekian) and micropaleontology (through Kuo-Yen Wei), fields that he would later combine into his graduate work in the MIT/Woods Hole Oceanographic Institution Joint Program. Tom completed his Ph.D. thesis on trace metals in the shells of foraminifera (calcareous marine protozoa) in 1999, advised by Bill Curry and Delia Oppo.

Immediately after graduation Tom

Tom Marchitto playing with mud aboard the R/V Knorr

began a postdoctoral fellowship at Columbia University's Lamont-Doherty Earth Observatory. There he worked on high-resolution paleoceanographic records from off the coasts of Labrador, Mauritania, and Baja California, as well as in the deep eastern equatorial Pacific. Tom was promoted to Doherty Research Associate and Storke-Doherty Lecturer in 2002.

Tom's research at CU will continue to focus primarily on generating records of climate change from rapidly accumulating marine sediments. His lab, housed at INSTAAR, will consist of a clean room and an instrument room containing a high-resolution inductively-coupled plasma mass spectrometer (ICP-MS). This machine will have the capability to measure trace elements at very low concentrations (parts per quadrillion) in various materials, including carbonate fossils and natural waters. The lab is scheduled for completion in October 2003. The field aspect of Tom's research will involve occasional cruises to collect sediment and seawater samples. Past cruises have taken him to the South Atlantic off southern Brazil and to the Florida Straits.

This Spring, Tom is teaching a graduate-level seminar on Recent Developments in Rapid Climate Change Research. In the future he plans to teach the undergraduate-level course, The Geologic Record of Global Change and another course, possibly in the area of marine geochemistry.

Eric Small

Eric joined the Department of Geological Sciences in Fall 2002 as an assistant professor, filling a vadose zone hydrology position. His research is focused on the physical processes that control the coupled water, energy, and biogeochemical budgets of the Earth's land surface. For fun, Eric likes to operate heavy machinery in the desert during snowstorms (see picture), run, and bike.

Eric Small likes to operate heavy machinery in the desert during snowstorms

Eric's start in geosciences was somewhat accidental, as he initially wanted to major in music in college. His undergraduate advisor suggested taking an Earth history class for fun, which turned out to be fascinating. He thought he was really hooked after taking Sed/Strat, as coloring in fence diagrams during lab was really fun. Eric graduated from Williams College in Massachusetts in 1993, and then headed to UC Santa Cruz for graduate studies.

Eric spent his first 2 years as a graduate student studying geomorphology, focusing on the interactions between erosion, tectonics, and climate. The field work was awesome, including treks through the Sierra Nevada, Wind Rivers, and other beautiful mountains. For his dissertation, he studied how anthropogenic desiccation of the Aral Sea in central Asia modified the climate and hydrology of the surrounding region. This was primarily a modeling and data analysis project, so it was a BIG step down with regards to field work. However, Eric did get to visit Uzbekistan for several weeks, which he says was a real eye-opening experience. After earning his Ph.D. in 1998, Eric spent 6 months at MIT as a postdoc.

In 1999, Eric took an assistant professor position in the Hydrology Program at New Mexico Tech in Socorro, NM. NM Tech is a very small engineering school in an equally small town in the middle of the desert, which happens to have a very good hydrology program. This was a great opportunity for him, as he had the chance to study hydrology with some of the leaders in the field. After 3.5 years of dust, heat, and green chilis in New Mexico, Eric moved to Boulder to join the Geological Sciences department.

Currently, his research and teaching are focused on hydrologic processes at the Earth's surface, where soil, plants, and the atmosphere meet. The processes he studies act across a wide range of spatial and temporal scales, from the influence of plants on surface water redistribution during rainstorms to the effects of land-atmosphere interactions on decadal rainfall variability. A large portion of this work is interdisciplinary, and is enhanced by collaboration with experts in ecology, remote sensing, and atmospheric science. This research combines modeling, data analysis, and field work.

Retiring Faculty

John T. Andrews

Well, it seems like only yesterday that I was the youngest faculty member in the Department of Geological Sciences. Martha and I, plus Melissa turned up in Boulder in January 1968 thinking that we would stay for 2 or 3 years and then head off somewhere else—possibly Alaska. So it is now already AD 2003! Martha retired on January 31st from her position of Librarian at INSTAAR and I will come off the University payroll at the end of May this year. Its been a great ride, and I hope to continue with some level of research for a few more years but at my pace and desire.

On looking back over the years at CU I am grateful for the companionship of the faculty, especially in the first decade or so of Bill Bradley and Peter Birkeland. The three of us, plus the later addition of Giff Miller, and with people such as Nel Caine and Roger Barry from Geography, and the INSTAAR faculty, made a name for the University of Colorado in the general field of Quaternary studies. Later on Mark Meier added to the program with his knowledge of Glaciology. The influence of our program can easily be seen in the placement of tens of former graduates as faculty in colleges and universities in the USA, Canada, the UK, and elsewhere. Martha kindly listed all the M.Sc. and Ph.D. theses that I had supervised between 1968 and 2002. The total is close to 70, equally divided between the two levels. I confess that the companionship of this company of graduates is perhaps the most abiding pleasure of my association with the University, plus the memory of several field trips in the 1970's and early 1980's along with Bill, Peter, and even at times, "Red Bed" Ted.

Upon recollection I have now realized that I was the first faculty member tenured in the Department but initially at least a faculty member of the Graduate School not within the purview of the College of Arts and Sciences. However, a somewhat similar situation applied to faculty members rostered through the Museum. Ironically my position was moved to A&S in ca 1980 but now the department has about half its faculty rostered through INSTAAR, CIRES, LASP, and the Museum.

I must admit that one of the "joys" was not being Chair of the Department for more than one plus a bit stints. This is not so much a reflection on the faculty, who by-and-large were mainly civil(!), but is a statement about the burdens of trying to operate a relatively large unit with no managerial experience, or training, and a seemingly endless series of requests for nearly duplicate data from the Administration and other bodies. Edith, Pauline, and Kaye must be thanked for keeping me reasonably sane (I think), during this facet of my university experience.

From a research perspective I did undertake a major "sea change" in the late 1970's and early 1980's and switched from a land-based study of glacial processes and chronology, to a study of Quaternary offshore glacial marine sequences. This led to a series of research cruises into the Arctic by my self, colleagues (Anne Jennings), and graduate students. We also became involved in offshore Antarctica, the Ross Sea, to be more specific. Although I did not personally go on a cruise others from the group did, notably Kathy Licht and Nancy Weiner. Perhaps one of the most exciting problems that I have been involved with was the work that initially started with Kathy Tedesco, and continues with joint work with Lang Farmer (with a paper due out this year in EPSL), on the sedimentology, chronology, and provenance of the North Atlantic Heinrich-events. More lately I have derived great pleasure from working around Iceland with Anne Jennings, and colleagues from Iceland, such as Aslaug Geirsdottir, Jorunn Hardardottir, Greta Kristjansdottir and Gudrun Helgadottir.

Knowing that retirement was imminent two former graduate students, Giff Miller and Peter Clark, who now command enormous respect, spearheaded a one and a half-day session in my honor at the annual Geological Society of America meeting in Denver in October 2002. I was greatly honored by the thought of Giff and Peter, and delighted at the opportunity to see so many former graduates of mine and the department. The GSA meeting coincided with the 100th year celebration of the Department and it was rather disturbing to realize that I had been in the Department for 33% of its total existence!

In my stay at Colorado I have published a fair number of papers. Some of these are well cited, others are not. It is interesting to survey one's career and wonder, which say 10 papers, am I most proud of? Well, in case anyone is remotely interested in the answer to that question I append my selection (only joking).

I do intend to keep on with research but retirement also offers the chance to travel, visit children and grandchildren, and to have more time with a companion of 41 years. Some of the travel will no doubt take me back to Millom, Cumbria, the small iron mining town on the west coast of Cumbria where it all started. Martha and I have become interested in the small "Folk Museum" that the town has established.

John Andrews "Fit to be tied" on board the Icelandic Research Vessel "Bajrani Saedmundsson" in 1997. Micki Smith (PhD), Jorunn Hardardottir(PhD), Stephanie Cartee-Schoolfield (MSc)

Hartmut is looking forward to spending more time with family, friends and in outdoor activities

My family owned a small grocery and yeast shop which was started by my grandfather. Here is a description of the shop in AD 1917: "My favorite shop was Andrews' on the corner of Surrey Street and Argyle Street (a street without a house?). In the shop window was displayed the most attractive assortment of confectionery, ducks (shaped from red gums), potatoes and green peas occupied the center, Jap nougats, treasure chests made of pink icing, which perhaps had silver 3d, 6d and 1 sh pieces if you were lucky, but usually a trinket, like tiepins, rings and brooches, with some dolly mixtures, icing sugar, watches with a mock time disc on the front, pink mice, chocolate smoker's outfits, popcorns, fibrous sweet tobacco twists in yellow and red packets. Then gobstoppers, as big as golf balls, changing color as you sucked them to the size of marbles, flap jacks, long strips of multicolored toffee, Spanish strips, Barley sugar sticks, twisted rainbow walking sticks and many other kinds that have now disappeared.

Inside the shop you were greeted with the fragrant aroma of coffee, yeast, bran; etc. Vinegar was on draught and maize was sold loose for poultry. On the left was a counter with numerous biscuit tins, McFarlane and Lang, Crawford and Carrs, the tops were open on some with display shelves and hanging from the wall shelves were cards of Parkinson's Pink Pills, Carter's little liver pills (three in, screwed paper 1d each), embrocation bottles, and Carnation corn cups. In the centre was the main counter with the brass weighing scales besides a large bottle of Indian brandy. But, like many other edibles and remedies, they have mostly vanished into the limbo of the past". (From Millom News, April 9th 1976 By Wm J. Wilson).

This description is not all that different from my recollections from the 1940's. In a similar sense though the Department has changed radically in the last 30 years. When I came we had little in the way of laboratory or analytical equipment, XRD and some crude sediment grain-size measurements were about it, whereas in the last 10 to 20 years we have mushroomed into a department with extensive and up-to-date laboratory facilities. Time does not stand still.

Hartmut Spetzler

"Why do I always have to ask why? Why don't I know anything myself?" That was the question I most often asked as a child; at least so I was told. Now, having taught at an institution of higher learning for 30 years, I am still wondering the same. During recent lectures on the judicial system in ancient Athens and another one in philosophy and while judging honors theses, that point was driven home again. While I have made a miniscule contribution to some answers to WHY questions, the list has just grown longer.

As I become an emeritus, I will pursue this life long quest of seeking answers to why, realizing fully that at best I can find only a few answers, but I am enjoying the process. With a small research group of post-docs and undergraduates I will continue lab and field experiments for remotely detecting the invasion of certain contaminants into groundwater. We are using a field site of the University of Arizona near Maricopa, 40 mi from Phoenix AZ, where fluids can be added to the groundwater under controlled conditions. We installed tilt meters and seismometers and are looking for water-induced local changes in signals from Earth tides and microseisms.

For some time I have been interested in helping with the teaching of science in Kindergarten through high-school. Together with Marc Dubin of the department of Molecular Cellular and Developmental Biology, Susan Buhr and Sandra Laursen of CIRES, we developed a two course sequence for students who wish to become teachers in the primary grades. These courses are inquiry based and give the students a chance to learn hands-on in a supportive environment in a small class. The first course is taught in Geological Sciences and the second semester in MCDB. I hope to apply what I have learned from this endeavor and my visits to many middle and high schools especially in rural areas, as I get more involved again in our outreach efforts.

The 30th annual trail-ridge ride is coming up in late June of this year. It is now an old tradition. Anyone who would like to participate is invited. We typically ride our bicycles to Estes Park on a Friday afternoon, continue on Saturday over trail-ridge road to Winter Park and on Sunday ride across Berthoud Pass to Idaho Springs. On my cross-USA trip I have traversed the mountains and deserts of the West and have arrived in Iowa. Retirement should afford the time to complete this undertaking. Seeing the country from a bicycle at rather low speed sharpens the senses and is for me a wonderful adventure. This autumn I hope to ride my titanium horse through the forests of New England while the colors are at their peak.

Maybe there will even be time to read non-science books to pursue more of the why questions. When I came to CU 30 years ago and interviewed with physics, electrical engineering and geology, I made a good choice that I have been, and am, happy with. In my new status I am looking forward to my continued association with CU, especially my home department and CIRES.

Faculty Activities

Bill Atkinson

Bill started the year with a radical prostatectomy to remove a prostate cancer. Blood tests since have been negative, so it looks like they got it all.

In April, Bill attended an international meeting of the Society of Economic Geologists, the second to be held by the society alone, held in Denver. In March, he presented a talk at the Cordilleran Section of the GSA at a session on "Arcs, magmatic gases, ores and geothermal systems," where he presented a talk on "comb quartz layers at Yerington, Nevada," a topic of his current research. In many porphyry molybdenum deposits, layers of quartz crystals have been found embedded in the igneous rock, apparently formed in a curious way. As the magma crystallized, an aqueous vapor phase separated near the top of the intrusion, with crystallized rock above, and magma below. Quartz crystals began to grow downward from the rock surface into the vapor-filled cavity. Suddenly, the vapor escaped, due to the formation of fractures. Magma then invaded the layer of crystals, and began to crystallize. Vapor separated again, and a new layer of quartz crystals formed. The process repeats again and again, forming alternating layers of quartz crystals and porphyry. This process has not been reported in porphyry copper deposits, only in molydenum deposits.

In May, perhaps a bit too soon, he went to Spain to give a lecture at the university in Barcelona and to attend the wedding of a former student, Sara Martinez. He visited the pyrite specimen mine at the tiny village of Navajun, in La Rioja, and collected a huge number of nice crystals. On the way to the airport the weight of the pyrite was too much, and he herniated the incision from the earlier operation. Not a serious problem, but the doctors said it would just get worse. So it was repaired in November, and he is still recuperating.

In July, Bill went to Chile with his student Worth Cotton, who is doing a study of alteration minerals using infrared spectroscopy on two copper deposits, Spence, near Chuquicamata, and Cerro Colorado, just east of Iquique. Both are in the Atacama desert, in spectacular barren scenery. At Spence, he found another example of the comb quartz, increasing the known number of occurrences by 25%. From Chile, he went to Bolivia, where one of his students, Peter Hanke, had done a thesis near Oruro a few years ago. He gave a two-day seminar on gold deposits, in Spanish, to members of their geological survey, and to faculty and students of the University of San Andres in La Paz. He also looked at a few mines, and got to know Bolivia a bit more. It was especially interesting, because the parliament chose the next president, and he watched the speeches on TV, in Spanish, as well as in Aymara and Quechua (not that he understood the last two!).

Bill was on sabbatical in the fall continuing with research on comb quartz and other topics. Dr. Meang Eon Park, of Korea, on sabbatical from his university in Pusan, arrived in August to join Bill in his research. He will be here for a year. In October, Bill enjoyed seeing many of his former students at our department centennial.

Another former student Dr. Abbas Sharaky, now a professor in Egypt, invited Bill to gave some lectures in Cairo in November. Abbas is doing well, a highly respected scholar. After Cairo, Bill visited the pyramids, temples and tombs from ancient times. It was a breathtaking trip! Cairo was pretty interesting, too, as one of the main centers of Islam. He arrived just at the beginning of Ramadan, the month of fasting and religious observance. Every night the city was lit up, and everyone had to get home to their families to break the fast each evening, with festivities. All the minarets were lit up with green and white fluorescent lights, a beautiful sight.

As soon as he returned, Bill had the hernia operation, and was a bit slowed down. Erin Marsh finished her thesis in December and graduated. Her topic was gold deposits associated with granites in the Yukon. This leaves Bill with just four students, all of whom expect to finish in 2003. Worth Cotton was mentioned above. Eric Anderson studied a mineralized breccia pipe in Arizona, doing field work, oxygen, hydrogen and sulfur isotopic analyses, radiometric age determinations and fluid inclusion studies, an unusually extensive master's thesis. Eric finished a first draft of his thesis by the end of the year. Lorna Jaramillo continues her study of the dispersion of metals around the Silver Bell copper mine, using remote sensing and groundwater studies, and will finish by next May. Lupe Espinoza studied a mining district in Sonora, Mexico. He had to return to Mexico before he was able to finish his thesis, and is currently teaching at the University of Sonora at Hermosillo. He promises to finish before Bill retires.

Speaking of retiring, Bill plans to teach

Alex Goetz and crew opening up a trench at Pierre Shale near Roxbourough Village East, southwest of Denver. Below is the resulting spectral image.

his Introduction to Ore Deposits one more time, in the fall of this year, and will retire in May, 2004, after 26 years at CU.

Alex Goetz

We are moving techniques for the remote mapping of mineralogy from space toward addressing an Earthly problem up close. NASA is supporting an extension of earlier work on the surface mapping of clay soils along the Front Range from 20 km altitude in a U-2 to observing clay soils up close in a trench.

The purpose of this project is to implement a cooperative effort with the geotechnical industry to develop a new method for rapidly testing soil samples using reflectance spectroscopy to determine their swell potential. This includes developing the soil testing protocols and opening a sizable trench to acquire samples. All along the Front Range the Cretaceous Pierre Shale contains many layers of volcanic ash that have weathered to smectites, bentonite in particular. Near the mountain front the beds are uplifted just like the Flatirons and the bentonite layers can wreak havoc with structures because of differential heaving. Bentonite expands by a factor of 4 in volume going from dry to wet.

Builders are required to drill and sample at one location per building lot. The samples are subjected to a swell consolidation test also known as the Denver swell test. This test takes about a week and costs approximately $200 per sample. One 30' drill hole into nearly vertically standing beds cannot properly sample the variety of beds that will intersect the foundation. Often the result is differential heaving when the moisture regime is disturbed, for instance, by watering a lawn. The aim of this project is to develop a rapid method of identifying swelling clays in the field so that many more samples can be tested to increase the probability of detecting problem soils.

The project is a joint effort among CU, Colorado School of Mines, Colorado Geological Survey and the USGS. At CU, Angel Gutierrrez, is involved in the project for his Masters thesis and Hye-Yun Kim is getting her feet wet for her Ph.D. proposal. At Mines, Hal Olsen, Research Professor and Jessica Humble a Masters student are working on the geotechnical properties of samples. Dennis Eberl of the USGS is working with the students in using XRD as a quantitative tool along with PVP, a new technique for determining smectite content in mixed smectite/illite samples David Noe of the Colorado Geological Survey is responsible for geologic mapping and helps us gain access to State lands for sampling. The Colorado Society of Geotechnical Engineers (CAGE) is our liaison with the geotechnical industry.

The highlight of the year was the opening of a trench, cross strike, in the Pierre Shale near Roxbourough Village East, southwest of Denver, shown in the picture on page 4.

The walls of the trench were measured spectroscopically at 5 cm intervals by setting up a 60 by 90 cm grid of wire mesh through which the measurements were made. We used a portable field spectrometer equipped with fiber optics and a built-in light source, manufactured by Analytical Spectral Devices in Boulder. The edges of the grid corresponded to the orange dots seen in the upper image on page 4. Each of these points was surveyed in. The result was a database of 29,000 spectra, collected in the heat of summer, each of which is georeferenced. From the spectra, we constructed a 29,000 pixel image,, each pixel of which had a value for each nanometer in wavelength range between 350 and 2500 nm, 2150 in all. The result is seen in the lower part of the picture on page 4. Image constructed from principal components 1,3,4 displayed as red, green, blue of the 29,000 spectra taken from the 3 trench walls. Bands of color angled up to the left are upturned beds in the Pierre Shale having different compositions. Smectite, illite, gypsum, calcite, and limonite are all readily identifiable from the reflectance spectra. Very powerful image analysis techniques developed for space-acquired data can be brought to bear on the trench spectra assembled as an image.

We collected 250 core samples from the trench walls and they are being tested commercially. Splits from the samples are being tested with XRD and PVP as well again spectrally. Initial results are promising with moderately good correlation between the spectra and smectite content. We are optimistic that a very rapid method (seconds) can be developed to augment the county-mandated techniques (days) to better characterize building ground.

Craig Jones

Craig Jones and his students have continued field projects in New Zealand and the Western U.S. through 2002. The New Zealand work, which has been underway since late 2000 with Anne Sheehan and Peter Molnar, has occupied much of the time of Ph.D. student Charlie Wilson. Charlie not only spent eight or nine months of 2001 in St. Arnaud, looking after seismometers, but returned in January 2002 to move a large number of them to new sites to help better image the structure of the Australian-Pacific plate boundary there. In May, Craig got to go back down under and remove the stations, a sad fraction of which had been mistaken for food by some local cattle. Our biggest press splash of the experiment was a report in the Nelson Mail of a stolen station we reported to the local police. Charlie is now deeply immersed in the hundreds of Gb of data, looking for the signals to clear up the mysteries of the region.

The other main field effort has supported Ph.D. student Joya Tetreault in her thesis work. This involved paleomagnetic sampling of many monoclines on the Colorado Plateau to see if there are vertical axis rotations. Conventional wisdom holds there are no rotations in the folds, but more and more geologic work on the Plateau suggests some folds likely absorb this. We hope the Plateau work wraps up in 2003 and she gets to move to some other venues (California and the Rockies, perhaps).

In the office, other work is pushed along. Craig cannot leave the Sierra alone; he and Lang Farmer have a paper arguing that the removal of a large chunk of eclogite under the Sierra just before 3.5 Ma caused the range to rise by over a kilometer, Basin and Range extension to shift westward, the Coast Ranges of California to emerge, the Eastern California Shear Zone to accelerate, and the San Andreas Fault to slow down. The first version couldn't hold enough supporting evidence and pass Geology's page limits, so look to see this in GSA Bulletin sometime soon (we hope). Another paper with Peter Molnar exploits the unique aspects of this delamination event to show that a lot of approximations usually used in geodynamics are wrong: low temperature creep mechanisms in olivene rich rocks weaken cold upper mantle more than is often appreciated. This means that cold lithosphere might not be as strong as is often perceived. The final Sierra paper in the mill discusses the variations in seismic anisotropy under the range and how that is related to the tectonism of the area; this is an outgrowth of a 1997 experiment several CU undergraduates assisted with.

Some other work is coming to a professional journal near you. Charlie wrote up our results from the Coso Range, and we have found we can image the magma chamber under this young volcanic field. This is in press with JGR. He also discussed these results and their implications at an EarthScope planning meeting for volcano monitoring and met with considerable interest (particularly from the non-seismologists). This might yield a cheap and effective means of monitoring magma injections at depth that could be especially complementary to geodetic studies near volcanos.

Finally, teaching goes on, with the second running of the spring break field tectonics class out to Death Valley and back being a highlight. This was a big success, as students enjoyed the remote Toroweap rim of the Grand Canyon, plunging through the calderas west of Phoenix, and exploring Canyon deCelles among many other spots. Yet another trip heads out this spring break, this time all the way to the Sierra and back.

Paleosol section in Wyoming that formed during the Paleocene-Eocene Thermal Maximum, a transient episode of dramatic global warming. The paleosols are being studied by Mary Kraus and her students. Grad students from CU (Susan Riggins, right) and Johns Hopkins University (Jay Mussel, left) measure and describe the section

Mary Kraus

Mary continues to teach Introduction to Sedimentology and Stratigraphy (GEOL 3430) to undergraduate students. This past year she also taught Advanced Sedimentology to a group of graduate students. Mary is also still coeditor of the Journal of Sedimentary Research (with David Budd). She is happy to report that former CU student Brad Sageman, currently a faculty member at Northwestern University, coauthored the paper chosen as the Outstanding Research Paper of 2002 by the Journal. In addition, Mary is preparing to become the new department chair in July.

Mary is still collaborating with colleagues from Johns Hopkins, the Smithsonian, University of New Hampshire, and Santa Cruz. Using a combination of approaches—magnetostratigraphy, physical stratigraphy, and analysis of paleosols, stable isotopes, megafloras, pollen, and mammalian faunas—the group is constructing a highly resolved record of climatic and biotic changes to test the hypothesis that biotic change on land was influenced by episodes of climate change. The project is focusing on three episodes of faunal change that seem to be associated with climatic shifts of varying magnitude and direction: the Paleocene/Eocene boundary, and two intervals in the early Eocene. Graduate student Susan Riggins is actively involved in the project for her MS thesis.

This summer, Mary will start a new, NSF-funded project with former CU student, Steve Hasiotis, who is now a professor at the University of Kansas. This project will focus on different kinds of trace fossils found in alluvial paleosols. Because different paleosols represent different ancient environmental conditions, the project will determine which trace fossils are environmentally sensitive and can be used in other rocks to interpret ancient environmental conditions.

One new graduate student, Melissa Fallin, started in the fall semester.

GEOL4717 (Field Geology of Western U.S.) student Tiffany Yesavage contemplates the significance of the Shiprock volcanic center.

Giff Miller & Marilyn Fogel working on Giff's favorite jigsaw puzzle in southern Australia.

Melissa plans to work on isotope analysis of pedogenic carbonate nodules in the Lower Cretaceous Cloverly Formation. Several former students have moved on to new positions. Tim Farnham, with whom Mary published a paper on Denver Basin paleosols this past fall, is now a geologist with Shell International. Mason Dykstra left Houston for California, where he has begun PhD studies at the University of California at Santa Barbara. Mihaela Ryer, who returned to Boulder for the department's 100th birthday celebration in October, and Erich Heydweiller are both still in Houston with Marathon and BP, respectively.

Alan Lester

In addition to serving as the faculty supervisor for the graduate teaching assistants in our Introductory Geology Laboratory, Alan teaches Introductory Field Geology, Historical Geology (with an honors recitation), and Natural Catastrophes. In all of these courses, the approach is to consider science as a uniquely human endeavor, and much more than a mere logical progression along a prescribed flow chart (as the "scientific method" is so often depicted in textbooks). At the most basic level, this involves examining the history of science and learning to critically evaluate scientific information.

Alan taught a new course over the three-week Maymester session, "Field Geology of Colorado." This involved using geologic mapping and stratigraphic section measurement as a starting point to make interpretations about key phases in the geologic development of Colorado.

During the summer, Alan completed his training for a private pilot license, went on various climbing trips with wife Melissa (who works for the Journal of Sedimentary Research, here in the Geology Department), and utilized a laser ablation mass spectrometry lab at the USGS, Denver, to accumulate data for a project with Lang Farmer—investigating the nature and timing of crust formation in the northern portion of the Southern Rocky Mountains via geochemical and isotopic analyses of lower crustal xenoliths from kimberlites in Colorado and Wyoming.

Alan received two grants last year. A "Dean's Fund for Excellence" grant to document links between climbing and geology for presentation in introductory level courses; and a "CU Outreach Program" grant with Sandra Laursen of CIRES to develop a set of geology kits (including samples of the local stratigraphic section) for use in local Middle School science courses.

In his role as undergraduate academic advisor, Alan works with undergraduate students as they navigate through courses and towards graduation, see "Undergraduate Advising."

Gifford Miller

This past year has been a period of intensive fieldwork, reports Gifford Miller. With graduate students Jessica Black and Yarrow Axford and former Department PhD, Áslaug Geirsdóttir (Univ. of Iceland), he began a new field program on high-resolution records of Holocene climate change in the North Atlantic, using lake sediments recovered from Iceland as our primary archive. Using the lake ice as a coring platform in March, sediment cores were recovered from two lakes that span the last 12,000 years, and initial cores were recovered from a deep glacial-fed lake from which long cores are planned for 2003.

In May, Giff and PhD student Jason Briner teamed up with former PhD student Thom Davis (Bentley College), and Norwegian colleague Jon Landvik for over-snow sampling of rocks for cosmogenic exposure dating in the Clyde River region of Baffin Island, Arctic Canada. They collected samples from key regions that will allow assessment of competing hypotheses regarding both the extent of the northeastern Laurentide Ice Sheet at the last glacial maximum, and the conditions at its bed, which dictate the dynamics of ice-sheet flow. Enough rocks were collected to keep Jason and several undergraduate assistants busy in the lab for several years. Following the cosmogenic campaign, MSc student Roy Coulthard flew in with former post-doc Alex Wolfe (now Asst Prof at Edmonton) to core a series of lakes from sea level to 100 m asl to track the regression of the sea as the land recovered from ice load of the last glaciation. Giff left the group to core the lakes and he and Midra traveled to Placerville, CA to celebrate the wedding of their son Obadiah to their new daughter, Shelbey Reid.

For most of the summer it was time for the antipodes. Teaming up with Marilyn Fogel (Geophysical Laboratory) and Australian colleague John Magee, the group prospected for eggshells of the extinct giant bird, Genyornis, eventually locating the first nearly intact nests ever discovered. Later, Midra joined the group and they made a 1500 km traverse across the Great Victoria Desert. The end of the summer came too quickly.

Peter Molnar

Peter spent much of 2002 trying to understand how rivers erode, with the ultimate goal of understanding how climate change affects erosion. Unfortunately he still has little to show for lots of thought and manipulation of simple mathematics. Part of his effort included 6 weeks in India in the fall of 2002. Part of the time was devoted to lecturing on various topics in various institutions, but he also had the opportunity to look at effects of stream erosion in both the Himalaya and in the south of India, two very different terrains. He is currently trying to find a way to fund fieldwork there.

In an ongoing project to understand how mantle processes affect tectonic processes that shape mountain belts, Peter and Greg Houseman carried out numerical experiments on Rayleigh-Taylor instability, the instability that results from a dense layer (like mantle lithosphere) overlying a less dense layer (like asthenosphere). They examined the effect of a lighter layer on top of the others (like crust) when the entire system undergoes horizontal shortening. The density and thickness of the lighter (crustal) layer affects the pattern of flow. If crust is relatively thin or dense, mantle lithosphere beneath the thickened mantle lithosphere becomes unstable and sinks into the asthenosphere. Where crust is thick or with low density, and therefore buoyant, its buoyancy resists thickening of the underlying mantle lithosphere; hence, downwelling flow of mantle lithosphere occurs on the flanks of the thickening crust, not beneath it. Downwelling flow adjacent to mountain belts, and concurrent thinning of mantle lithosphere might account for aspects of regional Barrovian metamorphism, late stage igneous activity, and other processes that have occurred during orogenesis. Currently, they are pursuing implications of the numerical experiments for the earth. In addition, Peter and Craig Jones are examining the constraint that removal of mantle lithosphere from beneath the Sierra Nevada might put on its average viscosity.

In addition, Peter spent a month in France last summer working with Claude Jaupart at the Institut de Physique du Globe in Paris on laboratory experiments of convection in 2-layered fluids with different compositions and different intrinsic densities. The goal of this work is to gain insight into how the thick, chemically distinct mantle lithosphere beneath continents forms and evolves.

Peter's main ambition for the near future is to start a project in China to study how the growth of the Tibetan Plateau has affected climate over the past 20 million years. This remains a dream, however, at this stage.

Matthew Pranter

During the past year, Matt Pranter has been active starting a new research program and developing new graduate-level courses in reservoir geology and geophysics. Matt began a collaborative research project with David Budd that focuses on stratigraphic controls on heterogeneity within dolomites. Their research took them to the Big Horn Basin of Wyoming to do some reconnaissance work on carbonates of the Madison Formation. An initial locality at Sheep Mountain is being studied by graduate student Colette Hirstius. More work will begin in the summer 2003 at an additional locality within the Owl Creek Mountains of central Wyoming.

Matt is also involved with Paul Weimer on work in Ireland on deepwater deposits of the Ross Formation. This research will involve outcrop modeling of stratigraphic and petrophysical properties and forward-seismic modeling for comparison to subsurface reservoirs.

In spring 2002, Matt taught a new graduate-level course in reservoir modeling. Thirteen students from the University of Colorado and Colorado School of Mines were enrolled in the course that utilized the department's new PC workstation classroom. The course covers fundamentals of reservoir modeling and utilizes the latest software for analysis and 3-D modeling of subsurface reservoirs. In the Fall 2002, Matt taught two large sections of introductory physical geology to approximately 330 eager undergraduate students.

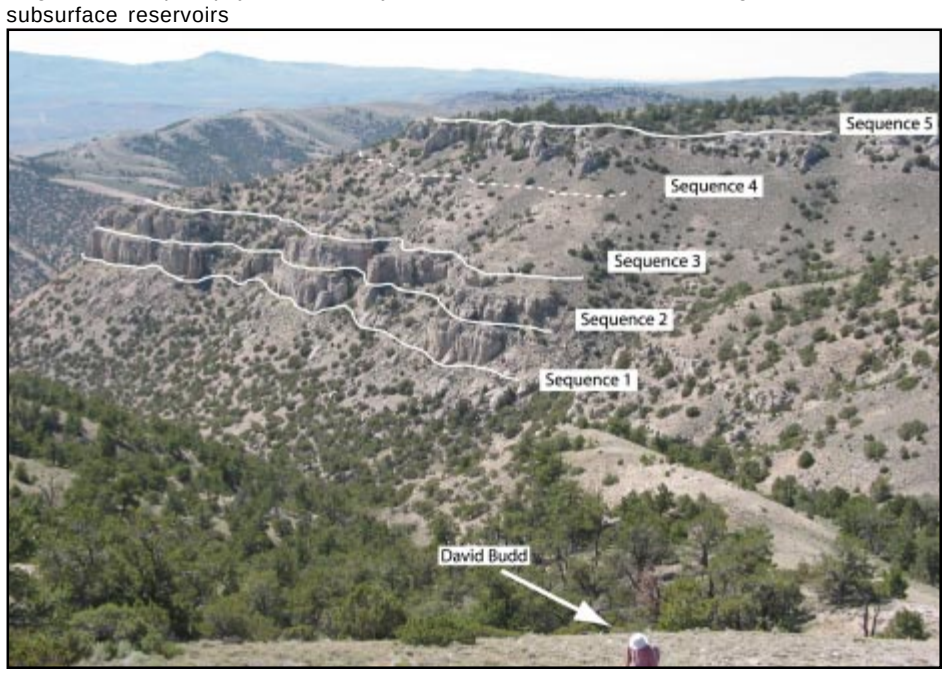
This Spring (2003), Matt is teaching a new graduate-level course in reservoir geology and geophysics (Reservoir Characterization) with Dr. Neil Hurley from Colorado School of Mines. Thirty graduate students from both CU and CSM are taking the course and represent disciplines of geology, geophysics, and petroleum engineering.

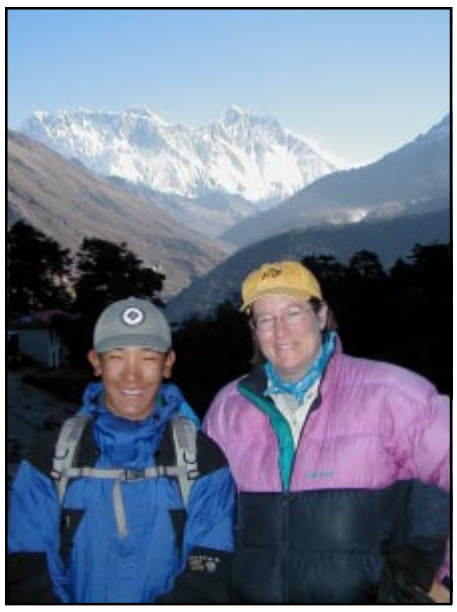
Matt was an invited colloquium speaker at the University of Wyoming, Department of Geology and Geophysics, Institute for Energy Research. His presentation was entitled: "Rocks to Models: Reservoir Characterization and 3-D Geologic Modeling, Examples and Direction." Matt also presented a paper at the AAPG Conference in Ruidoso, New Mexico on the use of 3-D seismic and horizontal wells for structural analysis.

Matt currently has four Masters students that are at different stages in their research. Colette Hirstius is investigating spatial variability of petrophysical properties in dolomites using outcrop data and plans to complete her research early next Fall. Matt and Colette spent several days in Wyoming last Fall conducting field work and obtaining samples for analysis of petrophysical properties. Colette has already accepted a position with Shell Oil Company in New Orleans which she will start following her graduate program.

Donna Beares joined the research group last Fall and is eager to begin her field work this summer in Wyoming on the Madison Formation at Lysite Mountain (see figure). Donna's research will extend the analysis of spatial variability in dolomites by

View of the Mississippian Madison Formation at Lysite Mountain, Wyoming. Dolomite facies within the carbonate depositional sequences are being studied for sedimentological, diagenetic, and petrophysical variability. These carbonate rocks are analogs for similar subsurface reservoirs





Guide Mingmar Sherpa and Professor Anne Sheehan in Mt. Everest region, Nepal

investigating additional dolomite rock fabrics. Donna will be working in the field with Suellen Melzer. Suellen is a graduate student of David Budd who will focus on the sedimentological and diagenetic variability within the dolomite lithofacies.

Marielis Vargas, a new graduate student from Venezuela, also joined the research group last Fall. Most recently, Amanda Ellison began her graduate work in January, 2003. Marielis and Amanda are both starting research projects in the Piceance Basin of western Colorado on fluvial deposits of the Cretaceous Mesa Verde Group. Their work is part of a joint research program between Matt and Tom Davis from the Department of Geophysics at Colorado School of Mines. This research involves the use of time-lapse (4-D), multicomponent seismic in dynamic reservoir characterization, geomechanical modeling, and flow simulation. Subsurface data from Rulison Field near Rifle, Colorado will be integrated with information from nearby prominent outcrops of the Williams Fork Formation near Cameo, Colorado to address stratigraphic controls on reservoir connectivity and petrophysical variability, and stress-induced changes in fracture-related permeability.

Matt continues to serve as an Associate Editor for the American Association of Petroleum Geologists (AAPG) Bulletin and as a member of the AAPG Distinguished Lecture Committee.

Anne Sheehan

Professor Anne Sheehan's research this year took her to Nepal for a National Science Foundation funded seismic field study. A team of CU researchers deployed 15 seismometers throughout eastern Nepal in order to study the earthquakes and faults associated with the mountain building of the Himalaya. Postdoctoral associates Frederick Blume, Rebecca Bendick, Vera Schulte-Pelkum, and Professor Sheehan visited Nepal to service the seismic stations, which remained in place for one year. Graduate students Gaspar Monsalve and Tom de la Torre, along with undergraduate mentor students Daniel Brothers and Max Knop, are working on the data analysis associated with the project. A Nepali scientist will visit CU in summer 2003 to receive training and participate in the earthquake studies, which will improve our understanding of earthquake hazards in Nepal.

Work closer to home includes Oliver Boyd's work on velocity and attenuation tomography of the Sierra Nevada and the Rocky Mountains, Frederick Blume's efforts with a GPS campaign in Colorado, and a project recently funded by the USGS NEHRP program for studies of Colorado seismicity and seismic hazards.

Three members of Sheehan's research group completed their studies at CU and have moved on to new positions: Hersh Gilbert is now a postdoctoral associate at the University of Arizona, Otina Fox works at the Geophysical Institute at the University of Alaska Fairbanks, and Victoria Rystrom is with the USGS in Denver. New additions this year include graduate student Gaspar Monsalve from Colombia and CIRES Visiting Fellow Dr. Vera Schulte-Pelkum from the Scripps Institution of Oceanography.

Joe Smyth

Joe Smyth's research group in mineral physics and crystal chemistry has been trying to address some of the questions regarding water in the Earth's interior by investigating the physical properties of hydrous high-pressure minerals. Water controls most of the geological and biological processes on the planet. Liquid water is necessary for life. In addition to the surface processes of climate, weathering, sediment transport, and sedimentation, water controls or dramatically impacts most of the internal processes as well. Flux melting by water contained in hydrous minerals is responsible for much of the igneous activity on the planet. Also, trace amounts of hydrogen dramatically reduce the strength of minerals and so water controls much of the tectonic activity in the crust and convection in the mantle.

Earth is unique among the planets in having liquid water on its surface. The oceans cover more than 70 % of the surface, but constitute only 0.025 % of the mass of the planet. Metamorphosed quartz pebble conglomerates of early Archean age indicate that there has been running water, hence both continents and oceans, on the surface nearly as far back in geologic time as we can see. Where did Earth get its water? Did it come from comets as some have suggested? Or is it an original, primordial constitutent of the Earth? Is all of Earth's water in the hydrosphere (oceans)? Or are there also reservoirs in the interior?

Because the mass of the oceans is such a tiny fraction of the mass of the planet, the solid silicate minerals of the mantle can incorporate many times this amount of water. In collaboration with the Bavarian Geological Institute in Bayreuth, Germany, Joe synthesizes the minerals using the large (5000 ton) multi-anvil press that can reach temperatures of 2000ºC at 24 GPa (equivalent to more than 700 km depth in the Earth's mantle). With Hartmut Spetzler and former student Steven Jacobsen, they are studying P and S-wave ultrasonic velocities in hydrous minerals, ringwoodite and wadsleyite. Back in Boulder, Joe has built an experimental facility to measure the compressibilities of these minerals by single crystal X-ray diffraction in the diamond anvil cell. Together with the ultrasonics, these compression data can be used to compute seismic velocities in the mantle. Preliminary indications are that hydration has a larger effect than temperature on seismic velocity, and the amount of water tied up as hydroxyl (OH) in solid silicates could be many time that of the oceans.

The internal solid reservoir is then likely exchanging slowly with the surface reservoir maintaining ocean volume over geologic time. Hydrogen contents of natural high-pressure minerals indicate that the entire ocean volume has exchanged at least once in 4.5 billion years.

James Syvitski

Professor Syvitski continues his efforts in national and international coordination of landscape evolution and stratigraphic modeling.

His Environmental Computation and Imaging Facility (ECI) staff affectionately known as the DeltaForce continues to evolve. Joining from the Netherlands are Dr. Irina Overeem and Albert Kettner, to work on U.S. Naval projects. Irina brings her expertise in the numerical modeling continental margins and Albert brings his GIS expertise. Joining from Australia is Dr. Chris Jenkins to develop perhaps the world's largest seabed database through support by NOAA and the U.S.G.S. Joining from Japan is Dr. Yusuke Kubo who is developing a suite of turbidity current models and applying this tool to laboratory experiments conducted at the Univ. of Minnesota.

Dr. Scott Stewart continues his work for ExxonMobil on developing a 3-D process-based stratigraphic model for reservoir characterization.

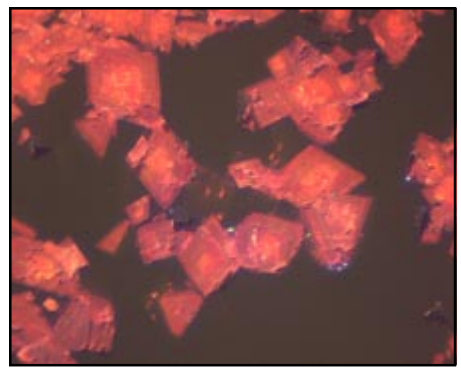
Dr. Scott Peckham has developed a new GUI-driven DEM-based hydrological model designed for wide applications. Ph.D. student Eric Hutton continues with modeling efforts related to the new ONR EuroSTRATAFORM project defining margin stratigraphy in the Adriatic. Ph.D. student Gita Dunhill continues her analysis of cores off of Denmark Strait relating the proxy signals to climate and ice dynamics of Greenland and Iceland.

Ph.D. student Dave Kinner applies new Pb-210 isotopes to terrestrial samples in an effort to understand sequestration of carbon in river basins.

David Mixon completed his M.Sc. degree on the significance of man-made reservoirs as terrestrial carbon sinks. He has joined the DeltaForce as a professional scientist and studies sedimentation along the U.S. East coast during Holocene rising sea level. Visiting scientists included Marina Rabineau (IFREMER, France), Bjarte Hannisdal (U. Chicago), Steve Goodbred (SUNY-Stony Brook), Inge Aarseth (U. Bergen, Norway), and Lothar Schrott (U. Bonn, Germany).

Dr. Damian O'Grady leaves his post-doctoral position with the DeltaForce, for full-time employment with the ExxonMobil Research Team. Professional Scientist Rachael Hilberman takes on new research at NOAA. Topics emphasized this year include earthquake induced sediment failure, Land-Sea interactions, and continental shelf dynamics.

Professor Syvitski was fortunate to spend valuable research time in Europe while on his sabbatical visiting Delft, Amsterdam, Bologna, Venice, Florence, and Barcelona. His claim, if it is to be believed, is that he gained no weight while consuming many five-course dinners. The DeltaForce hosted a very successful NSF Community Sediment Model Workshop and plans to take on a leadership role in this national effort.



Cathodoluminescent image of euhedral dolomite cement crystals from the Late Eocene Ocala Formation, West-Central Florida. Zonation of the dolomite crystals reflect changing water chemistry during precipitation of the pore-filling dolomite cement. Scale across the image is 1.5 mm. Image provided by Stephanie Gaswirth.

Paul Weimer

Paul began a two-year stint as AAPG Treasurer in July 2002. His responsibilities include overseeing the $13 million budget, and liaison with 6 committees to Executive Committee (Insurance, Investment, Distinguished Lecture, Membership, DEG, Training Centers). He serves as a Trustee to the SEPM Gulf Coast Section Foundation. He also serves on the AGI ad hoc committee on Outreach of Geology of the National Parks. In May 2003 at the AAPG Annual Convention in Salt Lake City, he will receive the Distinguished Service Award from the AAPG.

He is organizing a session at the AAPG International meeting in Barcelona (September 2003) with Steve Flint (University of Liverpool) and Richard Vaughn (Cairo) on "Visualization of Depositional systems."

In 2004, Paul has been invited to give the SEG Distinguished Instructor Short Course. This speaking tour will occur throughout all of 2004. He will teach a one-day short course on the petroleum systems of deep-water margins in 25-30 cities in six continents. This is the third DL program that he has participated in during the past six years: 1998-99 (AAPG) and 2001 (Esso Australia). In 2003, he will have to write a book for the short course to be distributed to all attendees (immediately after he finishes writing a book for AAPG!!).

He served as Associate Graduate Chair of the Graduate Studies during fall 2002. He also served on the College of Arts and Sciences Personnel Committee in 2002-2003.

In the fall, Paul taught the graduate course (6330) Applied Sequence Stratigraphy and Basin Analysis I (10 students). The class took a field trip to Roswell, as well as the Guadalupe Mountains . He met up with CU-Alum Scott Tinker (Professor at The University of Texas-Austin), and co-lead a field trip (picture on page 9). Paul supervises 14 graduate students.

Baby bear treed by students of the field volcanology class in Bandelier National Monument, New Mexico. Photo by senior geology major Adam Armour.

Students Sara Jo Dickens and Larina Herbert download GPS data to a laptop

GPS Class Is On The Move.....

by Henrietta Laustsen

Instructor Henrietta Laustsen teaches critical thinking and scientific writing, as well as two classes in Geographic Information Systems (GIS). In one of the GIS classes, the focus is on collecting Global Positioning System (GPS) data and integrating these data with ArcView GIS. Each student is given a GPS receiver for use throughout the semester. A department laptop allows the data to be downloaded from receivers to the computer while in the field. Each student then takes his or her data file back to the computer lab, where the files are manipulated using Microsoft Excel, until the format is correct for ArcView. After the data are imported to ArcView, the students add basemap data found on the Internet, and create maps of the fieldwork. An essential aspect of working with these kinds of data is to understand the many potential sources of error.

One of the students' favorite projects uses "mystery data" collected by the instructor. The GPS data are time-coordinated with digital photographs. The students use these data to discover where the instructor went, as well as the activities in which she participated. The final GPS "Mystery Project" includes "hot links." Thus, GPS points displayed on the GIS map are linked to digital photographs, so the user can click on a GPS point, and the computer then displays the photograph taken at that point.

Several of our recent graduates have obtained GIS-related jobs as a result of taking the two GIS courses we now offer.

Undergraduate Advising

by Alan Lester

The Department of Geological Sciences is presently home to over 80 undergraduate majors and a partial home to over 40 students pursuing minors. The minor program is popular with students in allied fields, such as Geography, Environmental Studies, and Anthropology; it requires only 18 credit hours of coursework as opposed to the 64 credits of combined geology, calculus, chemistry, and physics courses necessary for the major. Although the major program is challenging, our students have a combined grade point average of 2.9. Last year, nearly 20 students graduated. Most students obtained their degrees via the standard "Geology" track, with approximately 20% using the "Environmental Geosciences" track, and a few via the (math/physics demanding) "Geophysics" track.

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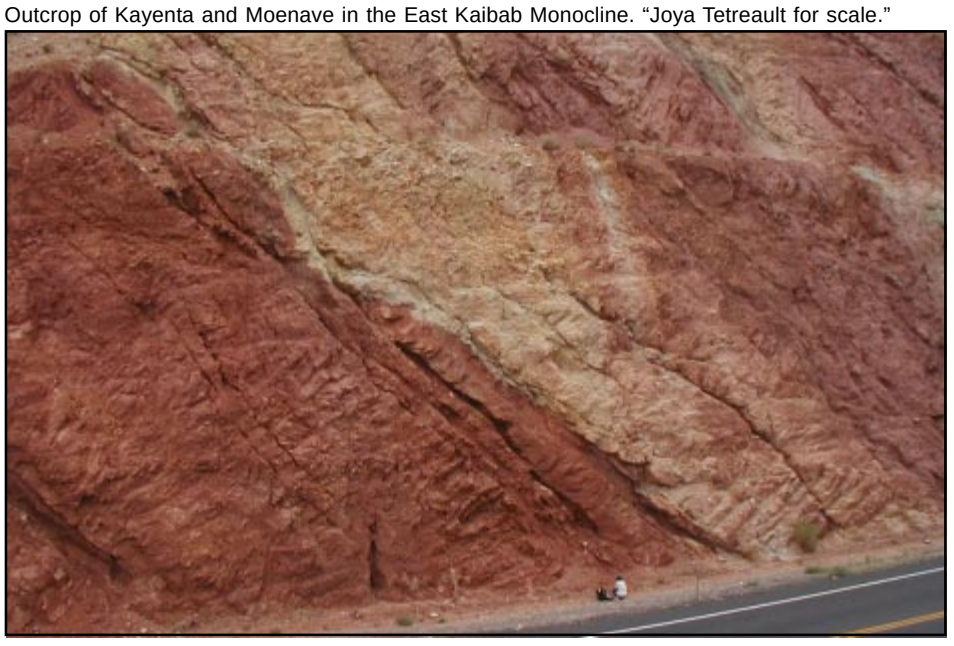
Graduate Student News

David Pyles, PhD student, received the A. I. Levorsen Award for the best oral presentation at the AAPG-Rocky Mountain Section Meeting in Laramie. His talk was titled "Stratigraphic Response to Tectonic Forcing in the Cretaceous Western Interior Seaway, Lewis Shale and Fox Hills Sandstone, Wyoming." It reflected a portion of his MS thesis from CSM. Dave also co-led a field trip with Ron Steel (University of Wyoming) to visit these outcrops in southern Wyoming. Kudos to David!

David Pyles, receiver of the A. I. Levorsen Award, poses in County Clare, western Ireland.

In July and August 2002, **Joya Tetreault** continued her fieldwork on the Colorado Plateau. She collected rock cores, 3 inches long, with a paleomagnetic rock drill, with the help of graduate students Terry Crater and Oliver Boyd, and her advisor, Craig Jones. The drill is a modified chainsaw with a drill bit attached instead of a saw blade, which can be quite heavy when trying to drill straight cores! They drilled samples from the Moenave, Kayenta, and Chinle formations at the East Kaibab and San Rafael monoclines in Utah; and from the Morrison Formation at the Defiance Monocline in Arizona.

Outcrop of Kayenta and Moenave in the East Kaibab Monocline. "Joya Tetreault for scale."



Despite the usual hot weather, Craig and Joya were almost washed out of one of the sampling sites at the San Rafael Monocline, when a thunderstorm moved through. Joya then headed for sunny California to analyze the sample cores at the paleomagnetic laboratory in the California Institute of Technology in January. She also used the laboratory at the University of Wyoming during the winter, which unfortunately cannot compete with the nice weather of Pasadena.

Last summer's fieldwork added to the number of monoclines on the Plateau that she has studied. Joya will continue fieldwork on the Grand Hogback Monocline of Colorado as well as reconnaissance sampling of the East Kaibab, San Rafael, and Hogback monoclines in Spring 2003. The aim of this project is to determine if paleomagnetic vertical-axis rotations, produced by lateral shear, can be found on folds that have formed oblique to the maximum compression. In the Colorado Plateau, lateral shear in fault-propagation folds will be used to resolve the regional deformation mechanism during the Laramide Orogeny.

The first meeting of the AAPG Student Chapter

AAPG Student Chapter

The first meeting of the AAPG Student Chapter for 2003 was held on February 12, with approximately fifteen undergraduate and graduate students in attendance. The first order of business was electing new officers. They include President Amanda Ellison, Vice President Colette Hirstius, Treasurer Aaron van den Berg, Secretary Quentin German, and Social Coordinator (the most important officer) Stephanie Gaswirth; the faculty advisor is Dr. Matthew Pranter. Planned activities for the upcoming semester include industry speakers, workshops on resume building and interviewing skills, field trips, and social events. The club also plans on attending the 2003 Annual AAPG Convention on May 11-14 in Salt Lake City, Utah. The chapter invites geology students of any discipline to join and attend meetings and activities. Alumni or others that are interested in contributing time to make presentations, lead field trips, or for other activities, please contact the chapter president at Amanda.Ellison@colorado.edu.

EMARC

On April 4, 2002, EMARC cosponsored a special reception for Bruce Curtis, prior to the dedication of the Bruce Curtis Museum Studies Building. About 120 of Bruce's friends attended this special event honoring Bruce.

The current Gulf of Mexico research consortium will be finishing this year. On May 28-29, 2003, the final results will be presented at a consortium meeting in Boulder. Three new cos. have joined now making sponsorship at 30 cos. The results of the consortium will be published in a special digital publication with SEPM in late 2004/early 2005.

By the completion of this consortium, 10 MS and one PhD degrees will have been awarded through the research. Renaud Bouroullec and Veit Matt continue do yeoman's work as research scientists in the consortium. As system administrator, John Roesink keeps the hackers off our backs and out of our networks. Ryan Crow and Jay Austin continue as the digital masters. All told, these are "the real nerds."

As part of the consortium, David Pyles has been conducting research on the Ross Formation (Lower Pennsylvanian) in County Clare, western Ireland. The Ross is a deepwater sand deposit, considered to be an analog for many deep-water reservoirs in the world. Dave will lead one or two field trips for the consortium sponsors (each five days in length) in September 2003.

During the past year, all of the sponsoring companies have been visited during the past year by Renaud, Veit and Paul, where a 2-3 hour presentation updating research results.

To celebrate the 100th Anniversary of the Department, a private alumni reception will be held on May 11 at the AAPG Salt Lake. All are alumni invited.

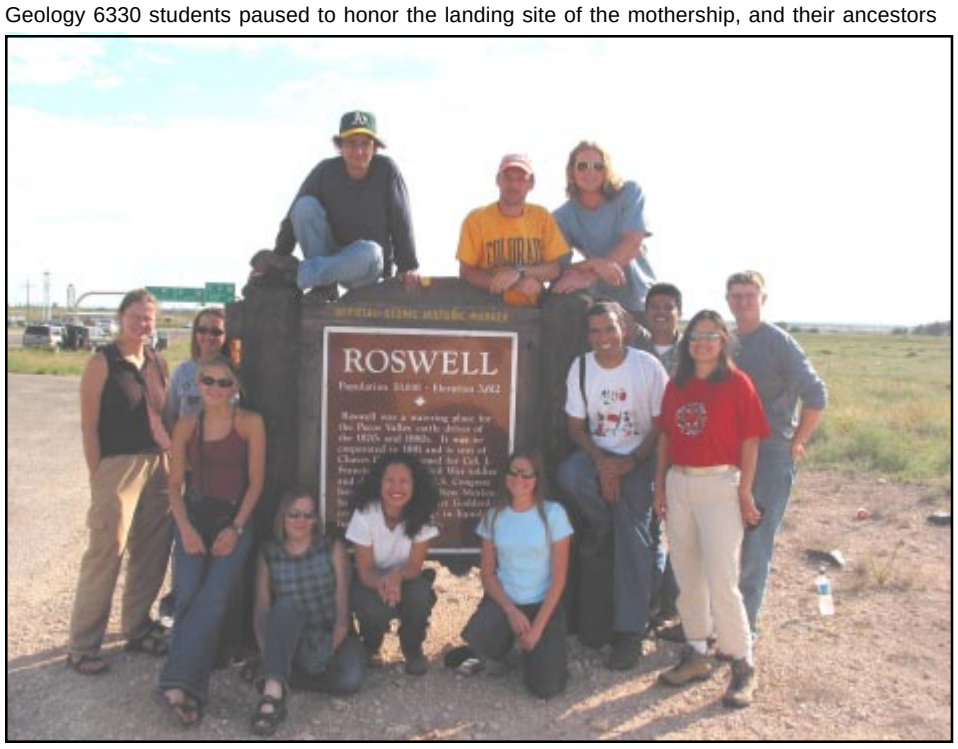
EMARC sponsored 8 AAPG DL and other special speakers this year.

Eight companies recruited this past year, in spite of the paralysis and uneasiness in industry.

Matt Pranter is establishing a research consortium with Tom Davis at CSM on reservoir characterization and monitoring. Matt's research and teaching lab will be finished this summer 2003. Now students will be able to describe cores, interpret 3-D seismic and build reservoir models.

Website: emarc.colorado.edu

Geology 6330 students paused to honor the landing site of the mothership, and their ancestors



Colloquium Speakers, 2002

John Alroy, National Center for Ecological Analysis and Synthesis
The evolution of major ecological guilds in North American mammals.

Ariel Anbar, University of Rochester
In Pursuit of Proterozoic Paleoredox: Insight from Molybdenum Isotopes.

Bob Anderson, University of California, Santa Cruz
High surfaces, glacial troughs and strath terraces: Late Cenozoic evolution of the Laramide ranges and adjacent basins.

David M. Anderson, NOAA Paleoclimatology Program
Abrupt Changes in the Asian Monsoon and Their Links to the North Atlantic.

John Behrendt, INSTAAR
Magnetic and topographic expression of volcanic rocks, West Antarctic Ice Sheet.

Barbara Bekins, USGS
The subduction squeegee: Fluid pressure and flow in accretionary prisms.

Rebecca Bendick, University of Colorado
A thin viscous sheet approach to Himalayan curvature.

Peter Birkeland, University of Colorado
Integrating soils and geomorphology in mountains---examples from the Colorado front range and New Zealand.

David DiCarlo, ARS/USDA National Sedimentation Laboratory
Fast and Slow Flow in the Vadose Zone.

Gareth Dyke, American Museum of Natural History
Teriary fossils and phylogeny: The evolutionary radiation of modern birds.

Jaelyn Eberle, Canadian Museum of Nature
Dawn of the Age of Mammals in the Rocky Mountain Region.

Emmanuel Gabet, University of California, Santa Barbara
Sediment Loading in Steep Mediterranean Landscapes.

Susan Hough, USGS, Pasadena
Triggered Earthquakes: Something old, something new, something borrowed.

Munir Humayun, The University of Chicago
Life in an Antarctic Meteorite?

Hope Jahren, Johns Hopkins University
New Insights into Arctic Paleoclimate during the Eocene from Stable Isotope Analyses of Plant Fossils.

A. Jay Kaufman, University of Maryland
Proterozoic Snowball Earths.

Randolph Langenbach, FEMA
Earthquake Survivors in Turkey and India: Forms of traditional construction that refuse to be reduced to rubble during violent earthquakes.

Malcolm McKenna, American Museum of Natural History
Two projects at the interface between Paleontology, Structual Geology, and Paleocene-Eocene Climate.

Jay Melosh, University of Arizona
Meteorites from Mars: Interplanetary exchange of rocks and microbes.

Jason Neff, USGS
From the arid Southwest to arctic Siberia: Biogeochemical controls on environmental change.

Robert Pappalardo, Astrophysical and Planetary Sciences Department & Laboratory for Atmospheric and Space Physics,University of Colorado at Boulder
The Geology of Europa: Where Are We Now?

David Polly, Queen Mary, University of London
Paleophylogeography and the need for fossils: historical reconstruction of mammalian evolution at inter- and intraspecific levels.

Bob Raynolds, Denver Museum of Nature and Science
Reconstructing the Front Range uplift during the Laramide Orogeny from the synorogenic rock record.

Eric Small, New Mexico Tech
Water Cycling in Semiarid Environments.

Roel Snieder, Colorado School of Mines
Coda Wave Interferometry and applications to geotechnical, hazard, and hydrocarbon reservoir monitoring.

Michelle Walvoord, New Mexico Tech
Advances towards Understanding the Hydraulic Response of Deep Arid Vadose Zones to Paleoclimate Change.

Dorthe Wildenschild, Technical University of Denmark
Quantifying Pore Scale Flow Processes with Synchrotron-based X-ray Microtomography.

Plastic resin cast of Stegosaurus Stenops. One of the most complete skeletons ever found. Located in the Jerry Crail Johnson Earth Sciences and Map Library

Degrees awarded

B.A. Geology Majors

Spring 2002

Sarah Jackel
Jessica Jennings
Krystyna Kowalska
Kevin Lausten
Julianne Macie
Kevin Reitz
Rachel Shannon
Ryan Thomas
Tiffany Yesavage

Fall 2002

Sean Cavanaugh
Seth Fetters
Eric Permut
Andrew Pruett
Aimee Scheffer
Erik Stern
Gail Vento

William L. Hiss Creativity Awards for 2002

Oliver Boyd
Eric Cannon
Paula Cutillo
Thomas de la Torre
Stephen DeVogel
Chris Holl
Shirley Kurc
Robin Martin
Trevor J. Popp (2)
Lauren Powell
David Pyles (2)
Annalisa Schilla (2)
Rachel Shannon
Sean Sunderman
Ryan Vachon
Charlie Wilson (2)

M.S. Candidates Graduating with Degrees

	Advisor	Thesis Title
Spring 2002		
Emily Bray	Robinson	Parataxonomic Classification of the Eggs and Eggshell of the North Horn Formation, Emery County, Utah
Ethan Gutmann	Goetz	Mapping the Potential for Eolian Surface Activity in Grasslands of the High Plains using Landsat Images
Albert Thomas Harris III	Asner	Effects of Managed Grazing on Vegetation Structure and Range Condition in Grand Staircase-Escalante National Monument, UT: Combining Imaging Spectroscopy and Field Studies
Erich Heydweiller	Kraus	Variability of Avulsion Deposits in the Willwood Formation, Bighorn Basin, Wyoming
Melissa Lester	Robinson	Stratigraphic Investigations in the Wasatch Formation, Washakie Basin, Southern Wyoming: Implications for the Temporal Distribution of Vertebrate Fossil Localities, with an Emphasis on the Genus Microsyops
Daniel Miggins	Stern	Chronologic, Geochemical, and Isotopic Framework of Igneous Rocks Within the Raton Basin and Adjacent Rio Grande Rift, South-Central Colorado and Northern New Mexico
Summer 2002		
Stacy Farrar	Jakosky	Biological potential of martian hydrothermal systems.
David Mixon	Syvitski	Automatic watershed location and characterization with GIS for an analysis of reservoir sedimentation patterns
Seth Mueller	Farmer	A Geochemical Characterization of Groundwater Near Fairbanks, Alaska, with Emphasis on Arsenic Hydrogeochemistry
Fall 2002		
Terry Crater	Stern	Iron release from biotite in aqueous solutions as a function of high ph and high nitrate concentrations
Grant Kier	Mueller	"What I did on my summer vacation (The Origin of Regional uplift in Southern California and Northern Baja California: A Flexural Response to Kinematic Rifting of a Continuous Elastic Plate
Erin Marsh	Atkinson	Geology and geochemistry of the Clear Creek intrusion-related gold occurrences, tintina Gold Belt, Yukon, Canada
John Martin	Weimer	Sequence Stratigraphy of Upper Miocene to Upper Pliocene Sediments of West-Central Mississippi Canyon and Northern Atwater Valley, Northern Gulf of Mexico

Ph.D. Candidates Graduating with Degrees

Spring 2002		
Will Brunner	Spetzler	Surface contamination and changes of mechanical damping in Berea sandstone
Jennifer Mangan	Goetz	An integrative study using Landsat TM data, CENTURY model output, and a digital elevation model to quantify climatic effects on High Plains vegetation related to sand dune stability
Bruce Rueger	Markgraf	Holocene Environments of Bermuda
Fall 2002		
Diane Fritz	Farmer	Water-rock interaction at small scales: studies with lattice Boltzmann modelling and Sr isotopes in a K-metasomatized tuff.
Ralph Klinger	Birkeland	Quaternary Alluvial Stratigraphy, Soil Geomorphology, and Tectonic Activity along the Furnace Creek Fault

Undergraduate Awards for Spring 2002

AWARD	RECIPIENTS
AWG	Ursula Quillman
Estwing	Erica Johnson
Elaine Bass-Parkinson	Krystyna Kowalska
Johnston Memorial Scholarship	Justin Kan, Robert J Austin, Dan Krasnow
RMAG pick	Tiffany Yesavage
T. Keith Marks Scholarship	Ryan Tolene, Jesse Richter-Foley

Graduate Awards for Spring 2002

AWARD	RECIPIENTS
Geoscientists (AWG)	Gita Dunhill, Joya Tetreault
Bruce Curtis Fund	Todd Lapinski , Aaron van den Berg Paula Cutillo
Longley, Wahlstrom, Warner	Lorna Jaramillo-Nieves, Oliver Boyd Charlie Wilson
RMAG Graduate Award	Susan Riggins
W. O. Thompson Award	Greta Kristjansdottir, Stephanie Gaswirth Amanda Cook
Waldrop Memorial Scholarship	Eric Cannon, Jason Briner, Sarah Principato

2002-2003 undergraduate mentoring program

MENTOR	MENTOREE	PROPOSAL TITLE
Briana Agar	Charles Stern	Petrology/geoarchaeology of obsidian from Patagonia
Adam Armour	Bruce Bohor/Paul Murphey	Chronostratigraphy of the Eocene Bridger Formation in SW Wyoming
Brian Bencivengo	Gita Dunhill	Project to elucidate the sedimentary processes that dominate on glaciated margins and how these processes are affected by glacial/interglacial cycles.
Daniel Brothers	Craig Jones - fall	Seismic tomography of the Coso Geothermal area, Ridgecrest, CA
Daniel Brothers	Anne Sheehan - spring	Himalayan Nepal Tibet Seismic experiment.
Tara Chesley	John Andrews	Sedimentological data from Iceland core
Brian Clarke	Jason Briner	How thick was the Laurentide ice sheet over northeastern Baffin Island?
Doug Dickens	Jason Briner	How thick was the Laurentide ice sheet over northeastern Baffin Island?
Quentin German	Matt Pranter	Reservoir Geology of the Dakota Sandstone, Watenberg Field, Colorado
Jennifer Hurley	Bruce Bohor/Paul Murphey	Chronostratigraphy of the Eocene Bridger Formation in SW Wyoming
Adam Huttenlocker	Jaelyn Eberle	Phylogenetic Analysis of early therapsids (mammal-like reptiles)
Ali Jaffri	Paul Murphey	Sedimentology and stratigraphic paleontology of Dhok Gangaal
Max Knop	Anne Sheehan	Analysis of local earthquake data from Nepal and Tibet
Dan Krasnow	Suzanne Larsen	Researching and cataloging rock art in the Benson Earth Sciences Building
Lauren Roemer	Shemin Ge/Paula Cutillo	Study of the hydrodynamic response of Devils Hole to seismic activity
Ryan Tolene	Karl Mueller	Digital topographic models of the frontal fold and thrust belt of Taiwan.
Hannah Wanebo	Mary Kraus	Alluvial paleosols formed during the latest Paleocene thermal maximum in northern Wyoming.
Tiffany Yesavage	Charles Stern	Sources of volcanic aggregate in Roman harbor concrete.

Sometimes Geology Stinks; Eric Cannon inspects a petroliferous rock in the Horse Springs Formation near the Las Vegas Shear Zone in Nevada. Photo by Joya Tetreault

DEPARTMENT NEWS
ADMINISTRATIVE OFFICE NEWS

By Beth Hanson

The front office remains the "meeting/greeting" place, and operations center in the Department. Our staff of four are dedicated to meeting the administrative needs of Geological Sciences Faculty and Students in an efficient, friendly, and timely manner. We also look forward to assisting alumni and friends of Geological Sciences to find answers to any questions they have regarding the Department, faculty, former faculty, students, and staff.

We are fortunate to have had minimal turnover in our office personnel during the last year, losing only our part-time student assistant. Lisa Massengill continues as front office first contact. She handles the answering of phones, greeting and assisting students, and visitors to the department, departmental academic scheduling, plus a myriad of other duties necessary for the smooth operation of the Department with a cheerful, "How can I help you more?" attitude. Joanne Brunetti continues as our departmental accounting tech, assisting with ordering equipment, teaching and technical supplies, grant account management and many other duties associated with the position. Joanne infuses her work with a contagious sense of humor. Marge Atkinson continues to assist the Graduate Students with information and paper work necessary to move them from application to graduation, which she approaches with persistence, quiet patience and congeniality. Beth Hanson continues as lead administrative officer, office supervisor, and assistant to the Chair with the goal of maintaining a smooth and efficient front office operation to facilitate the daily accomplishment of a multitude of large and small tasks.

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EMAIL: geolinfo@Colorado.Edu

Beth Hanson, Marge Atkinson, Joanne Brunetti, and Lisa Massengill

Dedication of the Bruce Curtis Building and Reception for Bruce

A dedication ceremony for the CU Museum of Natural History's $6.1 million renovation of the collections building, formerly the Geology Building, was held at 4 p.m. on Friday, 3/29/02. Bruce and Marcy Benson donated toward the CU Museum renovation project and in honor of this gift the old Geology building has been renamed the Bruce Curtis Building in recognition of geology Professor Emeritus Bruce Curtis, who was Benson's mentor at CU.

Benson and Curtis spoke at the ceremony and were joined by state Senator Terry Phillips, D- Louisville; J.D. Beatty of the CU president's office; Provost Phil DiStefano; Carol Lynch, Vice Chancellor for Research and Dean of the Graduate School; and CU Museum of Natural History Director Linda Cordell.

The 44,000-square-foot building opened for classes in January 2002 and houses the Museum and Field Studies graduate program and more than 3 million specimens from the Museum of Natural History's extensive collection.

Prior to this ceremony the Geology department held a reception in honor of Bruce, which was well attended by numerous former faculty colleagues and students of Bruce's.

Emeritus Professor Bruce Curtis and Bruce Benson at the reception for Bruce Curtis

Alumni News

Marcia Rottman Shapiro, Ph.D. graduate of CU in 1977 has now retired in Corvallis, Oregon. She was a Geophysical Advisor, ExxonMobil Exploration Co. Since March of 2000 she was in charge of the cartographic data part of a major project to merge the EXXON and Mobil computing systems and data. This job has taken her to London, New Orleans, Calgary, Celle, Germany, Bordeaux, and Jakarta. She enjoyed the task immensely.

John R. Coash Currently retired Dean Emeritus – Cal State Univ – Bakersfield, CA. John reports that he is very pleased to hear about the honors bestowed on Bruce Curtis as he served as Bruce's field assistant during the summer of 1947, on the north flank of the Uintas. He reports that he gave Bruce a hard time – like when he managed to stick the field vehicle in a bog – Bruce got them pulled out with a farmer's old steam tractor – he is a great person!

Dederick Ward, Masters, CU 1958 reports that he is currently self-employed and maintains a studio in Anacortes and paints full time. Many of his canvases contain aspects of the Northwest geology. He also paints outside in the company of local painters. His work is exhibited in Seattle by the Friesch Gallery. In January and February of 2003, his works will be exhibited in Augusta, GA.

Barry Eakins , B.A., Dec 1994, CU Boulder; Ph.D. April 2002, UCSD
Jennifer Brown Eakins, B.A. December 1993, CU Boulder; M.A., 1996 Wash Univ. at St Louis. Jennifer is currently a Staff Research Associate at the Inst. for Geophysics and Plan Physics, Scripps Institution of Oceanography; Barry has worked as Research Geologist with the Volcano Hazards Team, U.S. Geological Survey. Upon completion of his Ph.D. in Earth Sciences at SID/UCSD he moved and is now a post-doc at USGS, Menlo Park, CA investigating the submarine flanks of Hawaiian Volcanoes.

Both report they enjoyed their time with the CU Geology Department and are glad to see the Geology Club is still going strong.

S. Dave Hixon, B.A. CU Boulder, 1952; MA, U. of TX 1959; Ph.D., 1964, U. of Michigan. Dave reports that he is semiretired, and does some consulting which included 8 weeks at Guadalupe Mt. National Park; 3 years for USGS in the Houston office doing water well work & surface runoff; visiting "Montana pre-Cambrian" gas and managed a field trip in 1998 to look at the Bakken, a Mississippian source bed. While at CU he spent 5 years in Regent Hall (now the Women's Studies Building) in the dish-washing department. Time flies.

Scott Burns, Ph.D., 1980 CU Boulder. Scott reports that he is currently a Professor of Geology at Portland State University and that he will be the national president of the Association of Engineering Geologists in the Fall (2002-2003); he has been doing lots of landslide work, hazard mapping, soils work, and quaternary geology; he was president of the faculty senate this past year at PSU.

Emeritus Professor Peter Birkeland and Edith Ellis at the Bruce Curtis Reception

In Passing...

George Newmarch

George received his B.S. in Geology from CU Boulder and his M.Sc. from Sacramento State, CA. George worked as a geologist for 47 years, most of those for the state of California. George went to be with the Lord on 11-21-02. George loved his wife and family and is deeply missed by them.

Curt Dale (1946 - 2003)

Chief Architect of the Benson Earth Sciences Building, and Principle in the architectural firm Anderson, Mason, Dale was tragically killed by an avalanche while back-country skiing on the south side of Elkhead Pass in Febuary of this year.

Curt worked closely with the Department Building Committee throughout the design phase, and made an extraordinary effort to provide us with the building we wanted, not some preconceived form devoid of departmental input.

As a department, we are indebted to his integrity and the commitment to excellence that characterized his work. We extend our deep sympathy to his family, friends and colleagues in the profession.

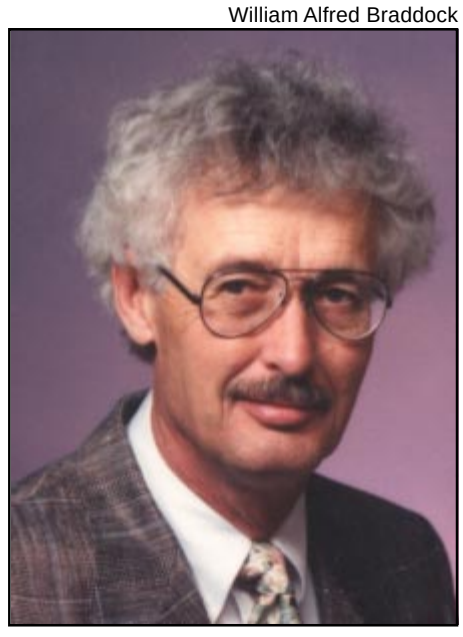
William Alfred Braddock (1929 - 2003)

Emeritus Professor William Alfred Braddock died of cancer of the pleura on Wednesday, Jan. 1, 2003, in Boulder. He was 73. Born Feb. 3, 1929, in Rifle, Bill was the son of Alfred Braddock and Doris Luebbert Braddock. He married Virginia Oberg on Dec. 17, 1949. They divorced. He married Carol Gerlitz on June 2, 1978, in Boulder.

Bill earned a Ph.D. from Princeton University in 1959. He was a professor of geology at the University of Colorado, where he began teaching in 1956, retiring in 1994. Bill also had a career-long appointment with the U.S. Geological Survey to conduct research in the Front Range. His research included papers on landslide complexes, the Front Range, the Pierre Shale and numerous detailed geologic maps, including the Geologic Map of Rocky Mountain National Park. He was a volunteer with Rocky Mountain National Park, the City of Boulder Parks and Recreation divisions, and other groups, where he trained naturalists, led field trips, provided geologic counsel, and compiled geologic maps of open-space areas to educate visitors.

Family, friends and students of Professor Emeritus Bill Braddock are working to establish a permanent memorial in Bill's memory. If you desire to contribute or assist in this effort, or for more information, contact Neil S. Fishman of the USGS at nfishman@usgs.gov

William Alfred Braddock



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James A. Pendleton (MS 1973 and PhD 1978) Memorial Fund

Jim Pendleton was both an alumni and a member of the department's advisory board. He passed away December 13, 2001. We published an obituary in last year's newsletter.

Jim's family and friends have created a memorial fund to provide research support to deserving students and are requesting donation to build this fund in Jim's memory. One or two deserving students will benefit each year from the fund.

To donate to this fund, send a check payable to the CU Foundation to the Department of Geological Sciences, with a note indicating it be dedicated to the James A. Pendleton Fund in the Department of Geological Sciences.

For more information you may contact Jim's professional colleague and friend David Berry at 303-424-3057 or david.berry@state.co.us

Gift & Deposit Information: (Select only one type per transmittal)

Check (or cash) in the amount of: _____

Credit Card Type & Number: _____

Exp: _____ Day phone: _____

Cardholder signature: _____

Securities (stock): _____
(NOTE: attach security valuation packet)

Other: _____

Please deposit this gift to:

Fund Name:	Geology In The Field	**Amt:**	**$**
Fund Name:	Geology Endowed Funds	**Amt:**	**$**
Fund Name:	Geological Sciences General Gifts	**Amt:**	**$**
Fund Name:	Geological Sciences Mentoring Program	**Amt:**	**$**

Please write fund name on check for tax purposes **Total:** **$**
should equal gift total

Additional Gift Information:
This gift is in memory of: _____
This gift is in honor of: _____

This gift will be matched by: _____
(Name of Employer)
Matching gift form Attached: ☐
This is a corporate matching gift for: _____

***Checks should be made payable to:** **University of Colorado Foundation**
***Please mail all donations to:** Department of Geological Sciences
University of Colorado at Boulder
399 UCB
Boulder, CO 80309

All Gifts are Tax Deductible

Attention Alumni

By completing and mailing in this form, you can help us do a better job of keeping up with you, your whereabouts, and your career or family news. We all enjoy reading about classmates and not-so-close-mates who survived Boulder in whatever era! So send us some news or some recollections—we promise to use them.

Name _____ Date _____

Address _____

Degree(s) (years and institutions) _____

Current Position/Employer _____

News About Yourself/Family/Friends _____

_____

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Comments _____

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Mail to: Geology News, Department of Geological Sciences, 399 UCB, University of Colorado, Boulder, CO 80309-0399.

We need more alumni news!!

Let us hear from you!

Please use this page to send us your information

and visit us online at

http://www.colorado.edu/geolsci