GEOLOGICAL SCIENCES
UNIVERSITY OF COLORADO BOULDER

Geology News

Geologic studies in Never Summer Mountains
Inside on page 9

Editors
G. Lang Farmer
Dan W. Mitchell

2011 - 2012

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Letter from the Chair

Lang Farmer

Greetings again from the Department of Geological Sciences. We recently finished another successful academic year, capped by one of our largest graduation ceremonies in recent memory. This Spring forty undergraduates completed their studies in Geological Sciences. Five Masters and six doctoral students also completed their graduate studies. Almost two hundred guests attended the departmental graduation ceremony, resulting in a raucous, if a bit crowded, reception in the Benson Building atrium. It looks like this will be the department norm for the near future, seeing that our undergraduate major numbers continue to increase, from 230 last year to over 250 in the upcoming year.

Our graduate program also continues to be healthy. We welcomed 20 new graduate students last year, in such areas as petroleum geology, tectonics, geophysics, paleontology, petrology and hydrogeology.

There were a few transitions among faculty this year. First and foremost we were saddened by the loss of Emeritus Professor Bruce Curtis, who passed away in Boulder earlier this year. Bruce had a huge impact on generations of CU petroleum geology students and he continued to be an inspirational figure during his retirement. Please take a look at his obituary printed on page 18 in the newsletter to get a flavor for the immense impact he had on the CU Geological Sciences community.

In other faculty news, Mary Kraus moved from her faculty position in the department to a new post as the Associate Dean for Natural Sciences in the College of Arts and Sciences here at CU. Assistant Professor Alexis Templeton was approved for tenure and promotion to Associate Professor in an exceptionally fine case.

Cover - Lake Agnes looking south towards Mt. Richthofen, at the northern end of the Never Summer Mountains.

Finally, after thirty years of service, Dr. John Drexler retired on February 1st, 2012 from his position on the faculty and as manager of the LEGS analytical facility. On behalf of the department and our alumni I'd like to formally thank John for his remarkable efforts in making routine wet chemical and electron microprobe analyses possible in the department. Very few have the energy and talent to pull off what John accomplished at CU and his devotion to improving the department will be much missed.

The good news is that we have been successful in hiring Dr. Julien Allaz, most recently of the University of Massachusetts, as the new director of the department's electron microprobe facility. Julien began his tenure in April, 2012 and is off to a terrific start in maintaining the lab as a premier regional instrumentation facility.

Another bit of good news is that Dr. Becky Flowers was successful in obtaining external funding for her primary thermogeochronology research instrument, a quadrapole mass spectrometer and noble gas extraction line for high precision helium isotopic measurements. The instrument is installed and running and is being overseen by recently hired lab manager Dr. Jim Metcalf, who arrived at CU after completing a postdoctoral appointment at Syracuse University.

The Geological Sciences alumni had a very busy year. As usual, the Geological Science Alumni Advisory Board met twice during the academic year, as described elsewhere in the newsletter by Advisory Board Chair Dean Miller. Board members helped organized a Career Night for our graduate and undergraduate students and participated in the Bradley New Graduate Student Field Trip last August. Board member Penny Patterson hosted her second annual alumni get together in Houston last October. After a short hiatus, the Denver area alumni again had the opportunity to reconnect with one another this time at a reception held last February at the Denver Country Club in honor of Bruce Curtis. Many thanks go to Bruce and Marcy Benson for sponsoring this exceptional event.

Alumni were also busy in directly helping with our graduate and undergraduate education. Gus Gustason volunteered to teach his petroleum geology related graduate course, and Rich Goldfarb added to our complement of "gratis" Advisory Board courses by organizing an "Introduction to Economic Geology" class for our graduate and undergraduate students. This course was a big hit and was the first pure economic geology course offered in the department since Prof. Bill Atkinson retired. I know I say this every year, but the department really is much the better for all of these volunteer activities and I know I speak for the entire department in expressing our sincere gratitude.

In lieu of offering a free course, I do hope that you will consider making a donation to the department this year. These gifts are becoming an increasingly important way to enrich both our graduate and undergraduate programs through, for example, our undergraduate mentorships and academic year graduate fellowships. These programs would not exist without your help, so we thank you for your past and, hopefully, future generosity in sustaining these programs.

We want to thank our Advisory Board members for donating their time and energy to the department

Notes from the Advisory Board

by Dean Miller

It was a busy year for the Geology Department Alumni Advisory Board. Last August, several members of the Advisory Board participated in the annual Bill Bradley Field Trip, where they helped Department faculty introduce incoming graduate students to the local geology and each other. The two-day field trip included a stay at the Mountain Research Station on Saturday night. Alumni always are welcome to come along on the Bradley Field Trip. If you are interested in participating in this year's trip, please contact Lang Farmer.

Last year, Sophie Newberry and Chandler Wilhelm joined the Advisory Board. Sophie works for Williams Energy in Denver; Chandler is with Shell in Houston. During the past year, the Board held one career night for undergraduates and another for graduate students. Both were well received and the feedback was positive. The students were appreciative of the Board Members' insights on networking strategies and job-hunting skills. Once again, Dawn Kaback was the driving force behind career night. Her efforts are greatly appreciated.

As Lang Farmer mentions in his column elsewhere in this newsletter, the Department held a successful alumni reception in honor of Bruce Curtis at the Denver Country Club, which was graciously sponsored by Bruce and Mary Benson. The reception was well attended and those present were glad to reconnect after the two-year hiatus since our last reception at the Brown Palace. Hopefully, this is the beginning of a new tradition.

Don't hesitate to visit the Department's website at http://www.cugeology.org which has current information about the Department research. The website also has a convenient Alumni Resources link where you can donate to the Department and update your contact information in the searchable online alumni database.

While the Department's endowed accounts held by the CU Foundation have recovered somewhat from the depths of the recession, state budget cuts have had a significant impact on the Department. Keep in mind that even the smallest donation has a real impact that directly benefits the students.

During our Board meetings, we met with graduate and undergraduate students to get their perspective on the Department. As with our student meetings the past couple of years, the feedback we received was overwhelmingly positive. Both undergraduate and graduate students reported that they are very satisfied with their experience at the Department.

The Department is doing remarkably well given the ongoing budgetary constraints it continues to face. I have served on the Board under the tenure of both Mary Kraus and Lang Farmer as Department chair, and it is difficult to overstate the quality of leadership and administrative skills they both have displayed. The Department has been very fortunate to have such high-quality leadership.

Helping Students Plan Their Careers

by Lon Abbott

On March 8, 2012, the Alumni Advisory Board hosted a career information night for both undergraduate and graduate students in the department. Alums Dawn Kaback, Alan Seeling, Rich Goldfarb, Penny Patterson, Greg Davis, Ben Lowry, and Gus Gustafson all gave the 35 participants brief snapshots of their career trajectories, provided job hunting tips, and fielded student questions about how to get their resumes noticed and how to secure a job. The alums emphasized the importance of networking, and they enthusiastically formed the first link in the participants' networks. The students who attended career night were extremely grateful for the tips and for the perspective that comes from having been in the workforce for some time; a perspective that the students themselves haven't yet had the opportunity to develop. Several of the attendees graduated two months later and they were still talking about how much help the alums had provided to them on Career Night and the sustained interest they had shown in the students' budding careers in many follow-up conversations.

Geological Sciences Advisory Board Members

Ted Ball
Los Alamos National Laboratory

Greg Davis
Brown Caldwell

Stephanie Gaswirth
U.S. Geological Survey

Richard Goldfarb
U.S. Geological Survey

Edmund (Gus) Gustason
El Paso Exploration and Production

Dawn S. Kaback
Geomatrix Consultants

Houston Kempton
Environmental Consultant

Eric Leonard
Colorado College

Dean Miller - Chair
Davis Graham & Stubbs, LLP

Sophie Newbury
Williams Energy

Penny Patterson
ExxonMobil Exploration Company

Alan Seeling
Petroleum Geologist

Chandler Wilhelm
Shell Exploration and Production Co.

Joe Zamudio
ITT Visual Information Solutions

Faculty Activities

Bob Anderson's research group have been all over the map this last year, with research projects that span a wide range of latitudes, elevations and processes.

• Kali Abel has been addressing the recent climate history of the Lyell and Maclure Glaciers at the top of Yosemite National Park. She has collected a fabulous tree ring record that reflects variations in snowfall over the last several hundred years, and is using these to model the terminus histories of these small glaciers.

• Katy Barnhart is addressing the evolution of the coastline of the Beaufort Sea coast on Alaska's North Slope. As the 4m tall bluffs consist entirely of frozen silts, they erode rapidly when exposed to the ocean during periods of sea ice-free conditions. She finds that the most rapid back-wearing of the bluffs coincides with set-up caused by storms over the ocean.

• Andy Wickert continues to explore the roles of the mantle in the evolution of Earth's surface. His recent work addresses the detailed evolution of the land bridge through which humans passed into North America, and the history of water and sediment discharge down the Mississippi since the last glacial maximum. Both projects require honoring the details of the deformation of the surface of the earth as it responds to the changing loads of ice sheets and oceans on these time scales.

• Leif Anderson (no relation) is working on the glacial history of the western US, as seen through the moraine record. In the course of this recently launched research, he is addressing the processes by which moraines are formed, how glacial erosion of valleys causes an inevitable decline in glacial length over the Quaternary, and whether winter snowfall or summer melt is responsible for the variation in glacial health at any particular site.

• Melissa Foster is embedded in the Boulder Creek Critical Zone Observatory effort here at CU. She has focused on documenting the erosion rates of bedrock underlying the soils in our subalpine catchment using 10Be isotopes, and is interested in both documenting the architecture of the soils in these catchments and modeling their evolution.

• Miriam Duhnforth, a postdoc here for 4 years who now has a faculty position in Munich, spent the last couple years of her postdoc documenting the deglaciation history of the Green Lakes Valley, and dating of the prominent terraces on the High Plains both north and south of Boulder. Again, she employed 10Be. While the deglaciation history showed no great surprises, matching in detail that derived by Dylan Ward in the 4th of July Valley to its south, the terraces were much younger than once thought.

Becky Flowers' group is looking forward to installation of a new quadrupole mass spectrometer for mineral degassing and measurement of He as part of a new (U-Th)/He thermochronology laboratory in the department. Apatite (U-Th)/He dating is widely applied to decipher thermal histories of rocks in the upper few kilometers of the Earth's crust and thereby gain insight into burial and unroofing, topographic development and elevation change, and the underlying controls on these processes. A variety of innovative applications of the method continue to be developed, including diverse hydrocarbon exploration studies to predict hydrocarbon maturation through reconstruction of basinal thermal histories, new work to decipher the origin and evolution of hydrothermal ore deposits, and sediment tracer investigations to quantify the spatial distribution of relief change and catchment erosion. Becky was awarded a grant from NSF Instrumentation and Facilities last fall to establish this lab, and hopes to be operational in summer 2012. Jim Metcalf, who obtained his PhD at Stanford and has extensive noble gas experience, will join the group as a new research associate and lab manager in June 2012. Jim will play a central role in getting their new lab up and running. In addition to using the facility for their own group's research, they already have both internal and external users who are interested in being trained in and obtaining analyses in the new facility as soon as this summer. They are enthusiastic to expand this user base.

PhD student Jessica Stanley hangs out with an elephant during a break from fieldwork in South Africa. Jess spent 5 weeks in South Africa during summer 2011 working on her thesis research with Professor Becky Flowers. Jess is using low temperature thermochronology to better understand the history and causes of uplift of the southern African Plateau.

Becky's group is continuing their work on tectonics projects in Canada, South Africa, and the western U.S. In March, Alexis Ault defended her PhD thesis entitled "Constraints on craton stability from thermochronology and geochronology studies of the Slave and Wyoming cratons". Alexis was awarded a NSF postdoctoral fellowship at the University of Arizona, and will be at CU for a few months as a postdoc before moving to Arizona this fall to start her new position. PhD student Jessica Stanley spent five weeks in South Africa during summer 2011 collecting samples of kimberlites and other rocks in a transect from Johannesburg to the coast as part of her thesis research using (U-Th)/He thermochronology to better understand the history and causes of uplift of the southern African Plateau. Rachel Landman is revising her MSc thesis research for publication on the evolution of the Gore Range in central Colorado, and is beginning PhD studies focused on deciphering the cooling and unroofing history of other portions of the southern Rockies. Alexis and Jess both gave presentations on their research at the 2011 Fall AGU meeting.

As soon as fall grades were turned in, **Assistant Professor Brian Hynek** headed to Hawaii for a week of fieldwork on the active volcanoes around Kilauea. He and a team from UW-Milwaukee have a grant to study the alteration process of basalt under acidic conditions as a Mars analog. They helicoptered in to the active volcanoes at Pu'u O'o and were working next to several spatter cones that were in constant eruption on the edge of a lava lake. Walking above the magma chamber on freshly solidified lava kept things exciting. Hynek sampled the mineralogy with a portable XRD/XRF that is the prototype for the CheMin instrument, currently on the way to Mars on the Curiosity Rover. The main goals of this

project are to characterize the earliest stages of acidic alteration of the Mars-like lavas and to collect data for comparison to that which will be returned from Curiosity in late 2012. Another focus of the study was to collect and analyze any microbes at these newly formed areas to see what communities may first colonize the steaming vents. Even with Mars' cold and dry climate covering most of its history, Hynek and his post-doc Stuart Robbins have shown that individual volcanoes were active on Mars for billions of years, providing a habitat for potential life. Finally, Hynek and the field team sampled some dry lava tubes and the secondary mineralization within them, in part to assess the astrobiological potential of these types of environments on ancient or perhaps contemporary Mars. Lava tubes are a good place to look for modern life on Mars since they have a near constant temperature and humidity and also provide shielding from radiation.

Assistant Professor Brian Hynek and his research group continued to study the history of Mars through Earth analogs, laboratory experiments, theoretical modeling, and remote sensing analysis. He conducted fieldwork on planetary analogs in Spain, Arizona, Hawaii, and Alaska this past year to better understand alteration of volcanic rocks and provide scientific input on future mission technologies and operational strategies. Hynek saw his first two PhD students complete their degrees; Stuart Robbins studying the impact crater history of Mars and Monica Hoke detailing the physical sedimentary processes in Martian fluvial systems. Additionally, Professor Hynek led a paper with Shijie Zhong (Dept. of Physics) and their students detailing the earliest history of the Tharsis complex on Mars, the largest volcanic center in the solar system. The team published their results in Earth and Planetary Science Letters, which showed evidence that the Tharsis superplume likely started near the current south pole of Mars and rotated to its current position on the equator early in the planet's history. The study has significant implications for Mars' mantle dynamics, early climate, and the possibility for true polar wander. Finally, Hynek has been providing scientific input to NASA on technologies designed for future human space missions. He spent 10 days at Mission Control at Johnson Space Center in Houston this fall evaluating crewed mission operational strategies for future landed missions on the Moon, asteroids, or Mars. While these types of missions are only in the early planning stages, assessing the technology to maximize scientific return from a future mission is already in progress.

Brian Hynek keeping an eye on the erupting volcano and making sure Pele does not send any lava in his direction

Assistant Professor Brian Hynek has been working with NASA since 2008 to maximize the science return from a future crewed mission to the Moon or beyond. Shown here is an astronaut testing the capabilities of the Space Exploration Vehicle designed by Johnson Space Center.

In January 2012, **Mary Kraus** was appointed associate dean for natural sciences in the College of A&S. In this position, she has responsibility for the 13 natural science departments in the college and reports to the Dean. The college will have a new Dean – Steven Leigh – as of July 2012 because Todd Gleeson is stepping down and returning to the faculty. During her four year appointment, Mary will not be teaching, but she will continue her research program. Mary and her students continue to work in Wyoming studying the Paleocene-Eocene Thermal Maximum to help understand the impacts of extreme climate change on the sedimentary record. The goal of this research is to reconstruct hydrological changes at the PETM event by using multiple geologic proxies to characterize changes in precipitation, seasonality, relative humidity and precipitation moisture source. In collaboration with paleontologists and paleobotantists, she works to understand how the changes in climate and paleoenvironment affected the nature of and rates of biotic change and the nature of fossil preservation. Last summer the Bighorn Basin Coring Project (BBCP), funded by NSF, collected 200 m long cores from 3 locations in the basin, and those cores form the database for current study. Rachael Acks is working on the cores for her MS thesis, and her research is partly funded by ExxonMobil.

Kevin Mahan's group continues to work on tectonics and deformation processes and properties of deep continental crust, with ongoing projects in western Canada and the northern Rockies of Montana and Wyoming. Shannon Leslie (MSc), who is working on deformation mechanisms in deep crustal mylonite from northern Saskatchewan, is slated to defend her thesis in May. Cailey Condit, a 1st year PhD student, will conduct her first full field season mapping basement rocks in southwestern Montana this summer. Her project is focused on understanding the structural and tectonic

Mary Kraus examining PETM paleosol together with Scott Wing, paleobotantist from the Smithsonian

setting for exhumation of an exposed deep crustal section in the Madison Range. Lesley Butcher, also a 1st year PhD student who is interested in combining geophysics and crustal/mantle xenolith petrology together to better understand the Laramide Orogeny, is working with Craig Jones and Kevin Mahan.

With the retirement of John Drexler, the department's electron microprobe facility will be undergoing new and exciting reorganization this spring. Kevin Mahan became the faculty director of the facility in February, and we will welcome Julien Allaz on April 1st as the new lab manager and research associate. Julien received his PhD in Earth Sciences in 2008 from the University of Bern, Switzerland (metamorphic petrology, Ar-Ar geochronology in Central Alps) and was a post-doc in the electron microprobe lab at the University of Massachusetts-Amherst from 2009 -2012. Look for a new webpage for our department's electron microprobe facility soon!

Between summer schools and workshops that he helped organize, **Peter Molnar** took a week in Panama to pursue one of geology's myths, did the closing of the Central American Seaway and the emergence of the Isthmus of Panama have anything to do with the onset of recurring ice ages since 3 Ma? He thinks that most of the evidence commonly recited as support for this relationship illustrates not geological reasoning, but geo-illogic.

Recently Colombian geologists working in Panama have found evidence that the seaway closed possibly as long ago as 20 Ma, long before ice sheets formed on Canada. Of course, it is virtually impossible to demonstrate that no gap allowed Pacific and Atlantic waters to mix, but if such gaps were present, they seem to have been narrow and shallow. It seems that most of the rock that forms the isthmus, including not only granitic intrusions, but also conglomerate derived from those intrusions, was in place in early Miocene time, when large vertebrates seem to have passed freely from the Canal Zone to Texas and Florida.

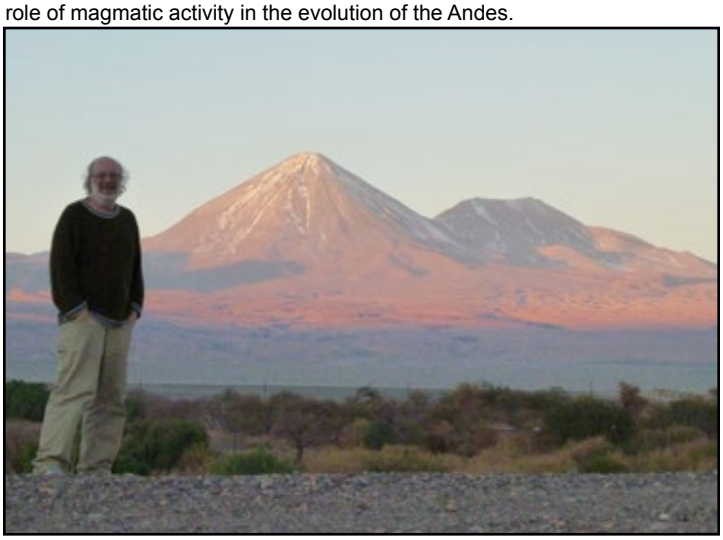
Peter was invited by the Smithsonian Tropical Research Institute to present his doubts about the Isthmus of Panama's role in the ice ages, and he was given the chance to see some of the evidence for a much earlier closure than most have believed. What a delightful place Panama proved to be.

Paul Weimer served as AAPG President in 2011-2012. He traveled extensively, giving 22 half-day short courses in 20 countries (Argentina, Brazil, Peru, Colombia, Australia, Thailand, Indonesia, Malaysia, South Korea, US, Nigeria, Bahrain, England, Russia, Ukraine, Romania, Hungary, Austria, Czech Republic and Poland). He gave talks in 5 additional countries, and attended one glorious field trip to the Dolomites. In July, they selected a new Executive Director for the Association, and in August, he sponsored the 2.5 day AAPG Leadership Days in the Benson Earth Sciences Building (150 attendees from 24 countries). He continues to serve on several AAPG Committees including 100th Anniversary, Resource Assessment, and Distinguished Lecture.

SEPM Special Publication 96 ("Mass-Transport Deposits in Deepwater Settings"), which Paul co-edited with Craig Shipp and Henry Posamentier, was finally published. He served on the technical program committee for the Dec. 2011 Bob F. Perkins Gulf Coast Section SEPM Research Conference on Seismic attributes, and is serving as the organizer for the Dec. 2012 Research Conference on "New Understanding of the Petroleum Systems of Continental Margins of the World."

For the spring semester, he taught a new graduate course "Unconventional Resources." In May, he received the Educator Award for the Denver Section of the Desk and Derrick Group. Five students finished their MS degrees under supervision this past year. Major efforts continue creating geologic animations of Colorado Geology for outreach. Sabbatical is beckoning….

Chuck Stern in front of the Licancabur volcano in northern Chile during the summer of 2011. Chuck continues his studies of Andean volcanism and the role of magmatic activity in the evolution of the Andes.



Emeritus Faculty Activities

Harmut Spetzler reports that since my retirement from CU we moved from our beloved mountain retreat to a nice home in Erie from where we have a beautiful view of the mountains. We have curtailed our traveling and I continue to replace body-parts to enable me to keep riding my bicycle up Flagstaff mountain. It now takes much longer, which means the pleasure of the climb is also longer. It also keeps me in sufficient shape for occasional longer rides, e.g. mountains in Colorado and Utah and the Alps and the Dolomites in Europe.

I am still seeking boredom, but do not appear to make any progress. Since I have taught at CU I have greatly expanded the age-range of my students, down to elementary school children. I am tutoring for the "I Have a Dream Foundation", which helps mostly underprivileged children attain high-school graduation and upon graduation guarantees them scholarships to trade-schools and/or universities. At the other end of the spectrum, I visit older and mostly frail people and enjoy their stories and wisdom.

On the scientific front I am taking advantage of the excellent computer support from within the department, Dan Mitchell, at CIRES and the bug-busters, to dabble in seismology. I have several years of seismic records near an irrigation-site in Arizona over which I had control. I am looking to see if spatial changes of signals from microseisms, noise generated by ocean waves, can be used to detect local changes in irrigation. - Cheers, Hartmut

John T Andrews wrote in to say that although I have been retired—in the sense that CU is no longer paying my salary---I continue my research on the paleoceanography of the northern marginal seas. This includes continuing, and NSF funded, studies of marine sediments around Iceland, along the East Greenland margin, and in Baffin Bay and the Labrador Sea. Much of this research is in collaboration with Anne Jennings. The focus is on the last glacial cycle and the last 12,000 years in particular, with an emphasis on changes in ice-rafting of sediment as an indicator of climate change. I have been working closely with Dennis Eberl of the USGS on applying quantitative X-ray diffraction to down-core sediments. We recently published a paper in "Marine Geology" which was reported to be the most downloaded paper from that journal over the 1st 4 months of 2012. The paper represents the application of a non-linear unmixing model to deriving sediment sources from XRD data. I was also honored to be elected a Fellow of the AAAS. I am an external advisor to a large EU project studying Arctic climate change and that has led to trips to Europe.

On a more personal note, Martha and I have spent time travelling to Ames, Iowa, to visit Melissa and three grandsons. Our son Thomas is now an Associate Professor of History here at CU Boulder with a wife, son and daughter (they live in Denver). Travel has involved a 55th school reunion back in Cumbria, England, a 50th University (Nottingham) reunion, and our annual sojourn to Maine for 3 weeks each September.

Alumni Events

Participants in the Denver area alumni reception held at the Denver Country Club in February, 2012

Lisa Campbell, Fleming Mengel, Scott Laurent and Elwin Peacock at the Houston area alumni reception in October, 2011

Janet Slate, Pat Poole and Karen Houck enjoying the Denver area alumni reception held at the Denver Country Club in February, 2012

Jerry Crail Johnson Earth Sciences & Map Library

In February of 2011, a pipe burst in the southwest corner of the main floor of the Library. Although the water was turned off quickly, water ran over the floor and through the ceiling, damaging collections and facilities. The University Libraries' emergency coordinator said that this was the worst emergency he'd seen in the Libraries in 20 years! The Library collections fared better than the facility. Only about 50 books and 5 maps were damaged irreparably. An additional 1700 books and maps required preservation to make them usable again.

The Library was closed for two months and access to the book stacks was limited even after we reopened. Library patrons were very patient as staff took requests and paged books in the stacks for their use. Most of the damage to the facilities was fixed very quickly, but it was only in January 2012 that the movable book stacks were replaced and ready for public use. One benefit from this disaster was that, with additional funding from the Libraries, we were able to recarpet the entire library and remove some un-used shelving. The new carpet gives the Library a bright and updated look and we have grand plans for installations for the newly available wall space.

Last year we significantly increased our collections in the area of atmospheric sciences and geophysics, as those collections were transferred from the old Math/Physics Library. We continue to add to our digital collections, with notable additions being access to electronic versions of the Geological Society of America Special Publications and historical aerial photographs of Boulder County from 1953, 1964, and 1972. We are in the midst of a long-term project to process an archival collection of historical mining maps of Colorado and finding many interesting maps of great local historical importance.

http://ucblibraries.colorado.edu/earthsciences/index.htm

Front Office News

by Marcia Kelly

The Geological Sciences department has survived another academic year with no major personnel changes.

Joanne Brunetti continues in her position as the Accounting Tech with humor and efficiency – both strong job requirements! Joanne works hard to ensure the tracking of finances, travel and procurement. She is very much the center of Department and faculty financial activity.

Top - Tiernen McConaughy & Marcia Kelly.
Bottom - Barbara Easter & Joanne Brunetti

Barbara Easter continues to enjoy her position as the front office receptionist and does a fine job of greeting students and visitors and handling phone calls with the utmost kindness and a smile on her face. She has many other responsibilities that she works on with an upbeat attitude.

Marcia Kelly is in her fourth year in the department as the Office Manager and supervisor. She feels fortunate and privileged to work in a department with such dedicated faculty, students and other staff. Marcia really enjoys working as the Chair's assistant with Lang Farmer.

Tiernen McConaughy is finishing her second year in the department and handles her position as Graduate Program Assistant with dedication to serving the needs of students in the program. She does a great job managing the myriad of responsibilities for new students entering into our graduate program and for advising current students and their advisors in the policies of the Graduate School.

The staff works hard to facilitate the daily accomplishments of keeping the department running smoothly. We look forward to assisting students, alums, faculty, and emeritus while helping to accomplish the mission of the department in educating the next generation of leading Earth and planetary scientists.

Please stop by and see us sometime! The Departmental office can be contacted at:

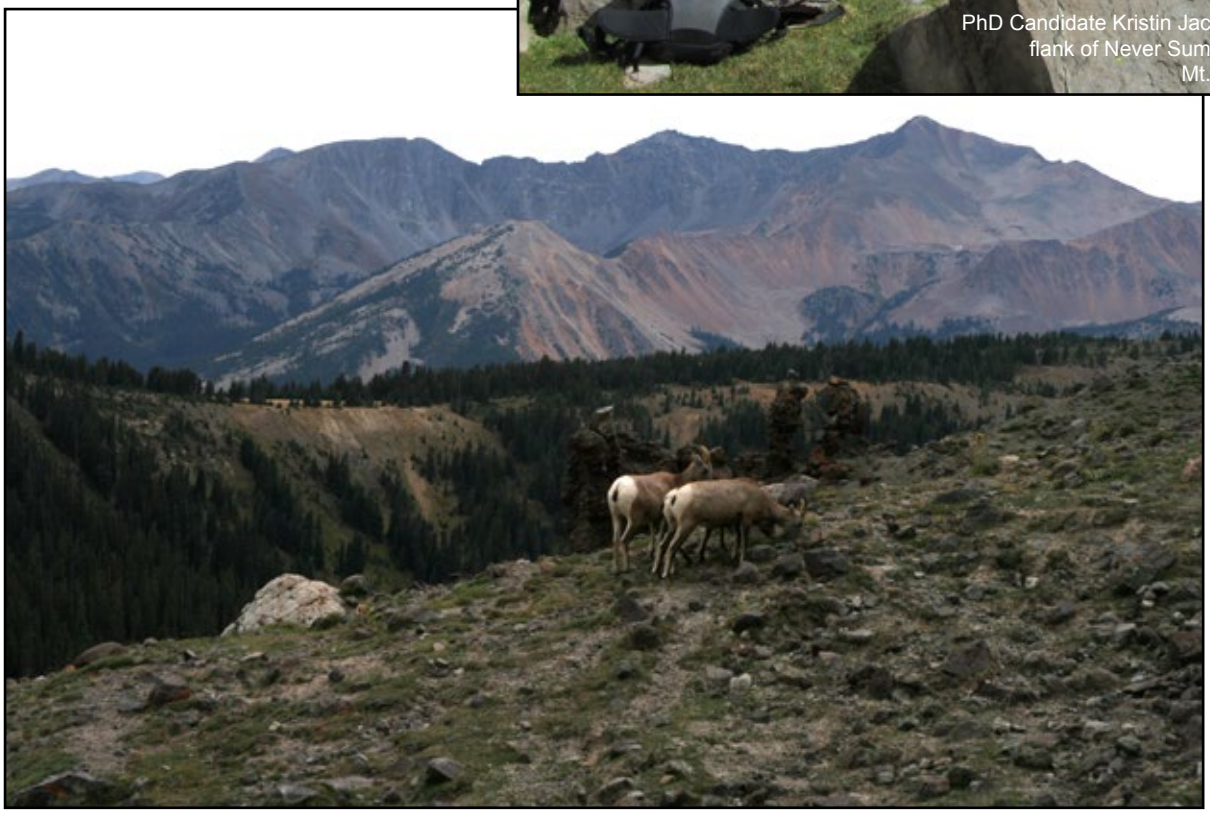
Phone: 303.492.8141
Fax: 303.492.2606,
Email: geolinfo@colorado.edu

On The Cover.....

The Never Summer Mountains are located along the western margin of Rocky Mountain National Park and are the site of an ongoing igneous petrogenetic study by PhD candidate Kristin Jacob and Lang Farmer. Besides being home to black bear, moose, and bighorn sheep, the mountain range has some geologic interest as well. Much of the range is cored by mid-Tertiary granitic rocks and flanked by contemporaneous volcanic rocks, such as those pictured from the “Crater” area near Specimen Mountain in Rocky Mountain National Park. The result is a chance to investigate the relationship between shallowly intruded granitic rocks and their volcanic cover. Kristin’s work has involved mapping, petrography, geochronology, and geochemical and isotopic studies of both the volcanic and intrusive rocks and is resulting in a sophisticated picture of how this shallow crustal magma system evolved. For example, the main granodiorite pluton (Mt. Richthofen stock) has no eruptive equivalent and apparently represents a reworked “crystal mush” repeatedly underplated by more mafic magmas. The younger Mt. Cumulus granite stock, in contrast, is likely the unerupted remnants of the same magma from which the large volume high silica rhyolite that erupted at the end of the volcanic activity in this area was derived. Kristin has spent much time mapping and sampling throughout the Never Summers, but has still managed a few climbs up the flanks of Braddock Peak at the northern end of the mountain range, the Colorado peak named in recognition of our late Professor Bill Braddock.

PhD Candidate Kristin Jacob along the east flank of Never Summer Mountains in Mt. Richthofen stock

Top Photo -The “Crater” area in Rocky Mountain National Parks. This area has volcanic rocks, but no crater



View from Specimen Mountain east towards Red Mountain and the rest of the Never Summer Mountains

Field Trips

2011 Bill Bradley New Student Field Trip

2011 Planetary Geology Field Course - Brian Hynek

Professors Steve Mojzsis and Brian Hynek led 18 students to study planetary analog processes in Death Valley and the Mojave Desert as part of a one credit graduate geology course in Fall 2011. Eight days were spent in the desert southwest looking at recent volcanism and tectonics, examples of arid geomorphology, and sedimentation and stratigraphy relevant to other planets. The students paired up to present to the class a summary of the local geology and planetary relevance at places like Ubehebe Crater, Racetrack Playa, The Devil's Golf Course, and Shoreline Butte. They debated the fundamental principles of geology from Steno to Hutton to Lyell, and the applications of their theories to other planets. A great time was had by all. The students learned a lot from each other, and really enjoyed a good meal in Vegas on the final night.

Geology students at Briggs John Mine, Panamint Valley, CA

Ubehebe Crater. Our first and coldest stop on the 2011 Planetary Geology Field Course.

Students in Field Geology descending the central core of a pierced salt diapir, Canyonlands National Park

GEOL 4719 field trip to the Department of Energy uranium bioremediation test site in Rifle, Colorado.

Structural Geology students new and old pondering faults and strata in the Cache Valley, Utah. Undergrads at CU now use Google Earth to interactively map complex structures in both traditional field and modern digital settings. When combined with simple smart phone apps that emulate a Brunton compass and GPS unit, this technology creates opportunities for critical thinking field geologists could not have envisioned only a few years ago

Jessica King (MS 2012, hydrogeology) leading a field trip to the Niwot Ridge and demonstrating conducting aquifer tests to determine rock's hydraulic permeability. From left to right: Liz Jones (Papadopulos Associates and Inc), Alana Wilson (Geography), Morgan Zeliff (Geography), Jessica King, Jonathon Galeano (1st-yr hydrogeology graduate student), Matthew Weingarten (2nd-yr hydrogeology graduate student), Nadine Reitman (1st-yr hydrogeology graduate student), Jacob Coate (Geography), and Nathan Rock (Geography)

2011-2012 Undergraduate Mentoring Program

Mike Berger worked with **Charles Stern** on a project concerning the petrology of the rare-earth-element-rich Mountain Pass carbonatite in California. Mike analyzed different generations of monazites to constrain compositional variations during the different stages of formation of this deposit. He wrote his work up as a honors thesis, graduated summa cum laude, and will continue his research on this topic as a graduate student next fall at the Colorado School of Mines.

Anthony Cronin is inaugurating the U-Th/He thermochronometry lab at CU with mentor **Becky Flowers**.

Sam Ecenia was instrumental in helping **Francis Rengers** conduct field work and analyze data. They focused on gathering field data such as rain gage measurements, discharge and soil moisture data. Sam also helped a great deal in processing soil samples, and with digital terrain analysis of the field sites. Sam is now competent in using and obtaining data from hydrologic field instruments, and analyzing data in a laboratory setting.

Eric Ellison worked with PhD student **Lisa Mayhew** in Dr. Alexis Templeton's Geomicrobiology Laboratory investigating geological hydrogen production and microbial hydrogen consumption. Eric's hard work enabled a thorough investigation of hydrogen gas generation from eight different rocks and minerals at 55°C and 100°C, he was integral to the experimental set-up and data collection. In Dr. Tom McCollom's lab in the Laboratory for Atmospheric and Space Physics, he perfected the use of a gas chromatograph for measuring hydrogen, methane, and carbon dioxide. Eric is an excellent and independent scientist who designed and conducted an experiment to test the ability of a microorganism, *Methanothermobacter thermoflexus*, to couple hydrogen consumption with the reduction of iron present in iron oxide minerals. He presented numerous lines of evidence to unequivocally demonstrate iron oxide reduction by *M. thermoflexus*, which had not been done previous to Eric's work. In 2012, Eric will apply his knowledge and extensive laboratory experience to his own independent research as a Master's student at Lehigh University in Pennsylvania.

Brian Spitzmiller worked with **Melissa Foster** in the Cosmogenic Radionuclide (CRN) Laboratory as part of the undergraduate mentee program. Brian was an eager student, and Melissa's experience as a mentoree was great. Brian initially developed an interest in CRN dating after he heard a colloquium talk by Greg Tucker. The mentoree program provided him with the opportunity to get hands-on experience in CRN dating.

With Brian's help, they have almost finished processing 25+ samples from the Boulder Creek Critical Zone Observatory. These samples were very time-consuming and difficult to clean. Brian's help was invaluable! Brian followed several samples through from the beginning lab stages to the end sample-packing for analysis at the PRIME lab accelerator mass-spectrometer. Throughout this process, Brian also did outside research to better understand interpretation of CRN data. They will present the results at the 2012 American Geophysical Union conference, with Brian Spitzmiller as a co-author.

James Stewart-Moore looked at the Paleoseismology of southern California coastal regions with mentor **Karl Mueller**.

Lauren Terry is testing quantitative X-ray diffraction mineral abundance determinations with mentor **John Andrews**.

AAPG-SEG Student Section talks

This year we continued our series of outstanding talks from industry to introduce the state-of-the-art in concepts and technology.

11 October, Gus Gustaston (EnerPlus): "Marcellus Shale"

29 November, Roy Kligfield (Wireless seismic): "Wireless progresses."

18 January, Scott Tinker (BEG-Austin): "Recent advances in nanotechnology and reservoir applications"

27 January, Mark Sonnenfeld (Whiting Oil and Gas): "Recent developments in the Bakken Formation and related units, Williston basin."

January 30, Steve Cumella (Endeavour Petroleum): "Basin-centered gas and tight gas sandstones, Piceance and other basins "

Feb 6: Marv Brittenham, Tom Smagala, David Schmude (Encana): "Emerging unconventional shale-gas and shale-oil plays. "

Feb 10: Paul Rady, (Antero Resources): "Barnett, Marcellus, Woodford plays"

Feb. 13: Murray Roth, Transform Geophysical: "Seismic in unconventional plays"

Feb 17: Ira Pasternack, Comet Ridges: "Tight-gas sandstone reservoirs in the Jonah and Pinedale fields"

April 18: John Kaldi, University of Adelaide: "Carbon Capture and Storage"

The Department of Geological Sciences undergraduate mentor program is funded solely from gifts like yours!

News and Awards

Undergraduate Awards for Spring 2012

AWARD	RECIPIENTS
Bruce Curtis Outstanding Junior	Tyler Kane
Johnston Memorial Scholarship	Christina Johnson
Kolber Award	Jim Stewart-Moore Devon Theune
RMAG Outstanding Senior Award	Mike Berger
T. Keith Marks Scholarship	Connor Burt Tim O'Toole Emily Longano Matthew Reed

Shell Exploration & Production Graduate Research Awards

Shell provided funding that is helping graduate students complete research projects for their degrees.

Matthew Weingarten
Julian Michaels
Amanda Howard

Advisory Board member Houston Kempton reviewing posters at the 2012 Graduate Student Poster Session

Graduate Awards for Spring 2012

AWARD	RECIPIENTS
Longley, Wahlstrom, Warner Award	Emma Marcucci Katy Barnhart
Johnston Award	Derek Willer Melissa Foster
Spetzler Award for Research	Danny Feucht Ben Hudson
W. O. Thompson Award	Darren Larsen Ulyana Horodyskyj
Waldrop Memorial Scholarship	Cailey Condit

We wish to congratulate all of our graduates and award winners.

Spring 2012 Graduation Reception

WHY I DONATE

TO THE BRUCE CURTIS FELLOWSHIP

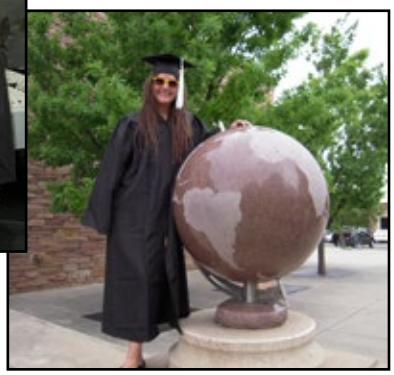
Penny Patterson

As a member of the Department of Geological Sciences Advisory Board, I have the opportunity to meet with the graduate students and hear about their challenges in achieving their educational and research goals while balancing their resources for academic expenses. I also recognize the challenges that the geology department has in maintaining and growing the endowment funds. So, as an alumna of the department, I regard my contributions to the Bruce Curtis Endowment as an opportunity to help graduate students and the department achieve excellence in their geoscience pursuits as well as an occasion for me to return the gracious assistance that I received as a student in the department.

Degrees Awarded (Fall 2011 - Spring 2012)

B.A. Geology Majors

Mahdi Almahasnah
Mohammed Hussain Al-mubarak
Brandon Amos
Snir Attia
Michael Berger
Alexander Brown
Eric Brown
Connor Burt
Brandy M. Butler-Beuth
Zachary P. Catto
Chase Cazedessus
Kevin Cianfichi
Lyle Cobb
Malcolm Arthur Conolly
Sage Elizabeth Davis
Theodore William Deere
Graham Ellsworth
Kara Epple
Thomas H. Felts
Kendra Lea French
Mario Ansony Guzman
Stephen G. Hilfiker
Pike Holman
Todd Jesse
Christina Johnson
John Kinney
Robert Hunter Lee
Sterling Loetz
Emily Arwen Longano
Andrew Martens
Ryan McDaniel
Brian A. Meyer
Alexander Addison Miller
Trevor Mills
Stephen Bryant Morioka
Connor Patrick Newman
Michael Daniel Oetken
Timothy O'Toole
Reed Pellicore
Sarah Michelle Palladino
Patrick Michael Patton
Philip Max Persson
Matthew A. Petersen
LongXiang Quek
Clayton Charles Roehner
Nolan William Seles
Sam Shiverick
Kevin Smerud
Megan Allison Statler
James A. Stewart-Moore
Wesley Temple
Benjamin Patrick Thompson
Derek William Timmermann
Elizabeth van Diepen
Seth Thomas Vuletich
Sydney Michelle Weitkunat
Michael Dane Whitney
Christopher Willatt



M.S. Candidates Graduating with Degrees

	Advisor	Thesis Title
Kali Abel	Robert Anderson	Listening to the Trees: Tree Rings, the Little Ice Age and the Response of Yosemite's Lyell and Maclure Glaciers to Climate Change
David Brown	Joseph Smyth	On the Hydration of Majoritic Garnet
Cody Flagg	Jason Neff	Spatial and Temporal Patterns of Wind Erosion in Semi-Arid Southeastern Utah
Pamela Grothe	Karl Mueller	3D Growth of the Osaka-Wan Thrust and Fault-Related Fold - A Detailed 1250 ka Record of Rapid Outward Lateral Propagation Followed by Higher Rates of Central Uplift
Jessica J. King	Shemin Ge	Characterization of the Shallow Hydrogeology with Estimates of Recharge at a High-Altitude Mountainous Site, Niwot Ridge, Front Range, Colorado
Shannon Leslie	Kevin Mahan	Contrasts In Sillimanite Deformation In Felsic Tectonites From Anhydrous Granulite- and Hydrous Amphibolite-Facies Shear Zones, Western Canadian Shield
Analisa Maier	Stephen Mojzsis	Geology and Geochemistry of Hadean Zircon Bearing Supracrustals from Quad Creek, Eastern Beartooth Mountains (Montana, USA)
Whitney Mathias	David Budd	Characteristics and Origin of Lateral Cyclic Patterns in Petrophysical, Geochemical, and Petrographic Properties of Dolomite: Miocene Seroe Domi Formation, Bonaire, Netherland Antilles
Kristopher Schwendeman	Paul Weimer	Sequence Stratigraphy of the Upper Cretaceous Castlegate Condensed Section Through Iles Formation, Piceance Basin, Northwestern Colorado
Christina Sheldon	James Syvitski	The Deglacial History and Paleoceanography of the Umanak System, West Greenland

Ph.D. Candidates Graduating with Degrees

	Advisor	Thesis Title
Alexis Ault	Becky Flowers	Constraints on Craton Stability From Thermochronologic and Geochronologic Studies of the Slave and Wyoming Cratons
Lyndsay Ball	Shemin Ge	Groundwater Flow in an Intermountain Basin: Hydrological, Geophysical, and Geological Exploration of South Park, Colorado
Lisa Mayhew	Alexis Templeton	Geological Production and Microbial Consumption of Hydrogen During Low Temperature Water-Rock Reactions
Scott McCoy	Greg Tucker	Controls on Erosion and Transport of Mass by Debris Flows
Kurt Refsnider	Giff Miller	Reconstructing Quaternary Ice Sheet Erosion and Dynamics Across Baffin Island, Artic Canada
Tarka Wilcox	Karl Mueller	Foreland Architecture, Erosion and Active Shortening of the Puli Topographic Embayment, Taiwan
Laura Wilson	Karen Chin	Paleobiology of Hesperornithiforms (Aves) from the Campanian Western Interior Seaway of North American, with Analyses of Extant Penguin Bone Histology

Fall 2011 Graduate Kurt Refsnider

Spring 2012 Graduates

Fall 2011 Graduates

Spring 2012 PhD and MS Graduates

Alumni News

CITATION
for SEPM's Twenhofel Medal,
awarded in 2012 at Long Beach CA, to John C. Harms

For his leadership during the research-intensive 1960s-1980s, in greatly clarifying geologists' understanding of sedimentary structures in sandstones, over the range of environments from fluviatile to deep sea -- always emphasizing the processes in sandstone deposition.

His studies were detailed and carefully documented, and were done in the subsurface, in field work on the range of ancient sandstones and on modern sands in two American rivers – and a landmark study of sand transported under controlled conditions in a large flume at CSU.

His work was reported promptly and with great clarity, both written and spoken, not only in the literature, but in two widely respected SEPM workshops which he initiated, and in which he was the principal.

In all these studies, and many proprietary studies later (1982 to present) for clients in this country and overseas, John Harms has approached problems as a premier earth scientist with a generalist's perspective. His distinguished career spans more than 50 years.

Dudley Bolyard receiving his Honorary membership from the AAPG

Michael Leibovitz and daughter at the Houston Reception

Lyndsay Ball (Ph.D. 2012, hydrogeology) conducting groundwater level survey at Mr. Guy Del Hierro's house in South Park.

Ben Herber received the best poster award at the Rocky Mtn Section AAPG meeting.

Jennifer Hinds (MS, 1997, right) and Shemin Ge (left). Jennifer is a researcher in the Department of Geological Sciences at the University of Idaho specializing hydrogeology, geothermal systems, geospatial analyses, and visualization, and web development, working with a dynamic group of faculty and students on a wide range of geological and environmental projects.

Michael Leibovitz has been at ExxonMobil for two years now and after being transferred to the Middle East Exploration, is now working on the Kurdistan Exploration Team. Michael and his wife Erica and are expecting their second daughter, sometime in June.

Submit your alumni news @
www.cugeology.org
click on "Alumni / Donations"
"Alumni Database"
"Submit News..."

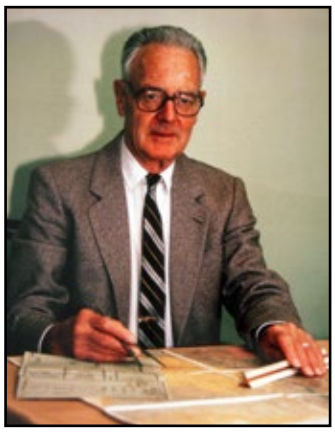
Eldorado Canyon Late Day Mosaic - Photo by Karl Mueller

Would you like to receive the "Geology News" electronically? Please let us know by sending an email to geolinfo@colorado.edu and place "E-News" in the subject line. Also, keep us updated on your current contact information.

We would like to thank
ALL of our faithful and generous donors.
Words can hardly express our gratitude for your continued support and encouragement to the Department of Geological Sciences.
We would not be the first class program that we are without your support.

Our Sincerest Thanks
From the Faculty, Staff and Students

Obituaries



Bruce F. Curtis

By Paul Weimer and Matthew Silverman

Bruce F. Curtis, emeritus professor at the University of Colorado, Boulder, died on February 5 in Boulder after a short illness. He was 93. Bruce was preceded in death by his wife Ruth Bachrach Curtis, a prominent geologist. He is survived by his niece Carol Wuhuke of Davis, California.

A native of Denver, Bruce was born on December 16, 1918, and graduated from South High School. He received his BA from Oberlin College (1941) and his MA from CU-Boulder (1942), both degrees in geology. After serving in the Army Air Corps during World War II, he received his Ph.D. from Harvard in 1949. Bruce worked as the Rockies Regional Exploration Manager for Continental Oil Co. until 1957, when he began three decades of teaching and research at CU.

He met his wife Ruth while they both worked for Continental. They carried out a consulting geology practice for the 27 years while he was a professor, and six years afterward. After her death Bruce often said, "She was my partner in everything."

Curtis profoundly affected the careers and lives of generations of geologists. Through decades of service at CU and in the petroleum industry, he educated, mentored and led hundreds of students and professionals. During that time, he taught subsurface methods, geology of organic fuels and related subjects. Bruce's lectures were known for their thoroughness and comedic appeal.

He was widely recognized for his contributions in editing important scientific volumes on Rocky Mountain geology and natural gas. Bruce was editor of the 1958 RMAG Symposium on Pennsylvanian rocks of Colorado and adjacent areas, the landmark 1968 AAPG publication Natural Gases of North America, and GSA's 1975 Cenozoic history of the Southern Rocky Mountains.

He served as the President of the RMAG in 1956 and was recognized as honorary member. He served as the Chairman of the CU-Geology Department from 1961 to 1968.

Bruce retired in 1983 after 26 years of dedicated service to the department and the University. In April 2002, the Bruce F. Curtis Museum Studies Building was dedicated at CU-Boulder. Formerly home to the Geology Department, this building was refurbished through the generous gift of Bruce Benson, University of Colorado President, who honored Curtis as his most influential professor. Bruce's passing represents the loss of an inspiring scholar and an extraordinary individual. At Bruce's request, no funeral was held. A private memorial service was held in Boulder, and the University recognized his contributions at a reception in Denver. His legacy endures through the Bruce Curtis Graduate Student Fellowship at the University of Colorado which supports graduate students in the fields that Curtis taught.

John Alan Masters passed away on Tuesday, September 21, 2011. He was 84. John was born September 20, 1927 in Shenandoah, Iowa. He graduated from Yale University in 1948 and achieved a M.Sc. in Geology from the University of Colorado in 1951. He worked two years with the U.S. Atomic Energy Commission, twenty years with Kerr-McGee Corporation, and twenty-one years as President of Canadian Hunter Exploration, Ltd. John was one of the last great oilmen; he never retired.

He dedicated his life to the pursuit of the hidden treasures of the earth. In 1955, John discovered Ambrosia Lake which was, at the time, the largest uranium deposit in the world. He also was responsible for the discovery of important oil fields in Arizona and the Gulf of Mexico. In 1976, he led Canadian Hunter to the discovery of Elmworth, the largest gas field in Canada. For his contributions to science, John was awarded the Distinguished Service Medal of the American Association of Petroleum Geologists, the first ever Stanley E. Slipper Award of the Canadian Society of Petroleum Geologists for outstanding petroleum exploration, and the Outstanding Explorer Award in 2009 from the Rocky Mountain Association of Geologists.

While John achieved much, he loved more. He is survived by his devoted wife, Lenora, and his children Chuck, Barbara, Robbie, and Jimmy; and predeceased by his beloved son, Alan. He was an avid outdoorsman, most alive skiing in the mountains or captaining a sailboat.

Published in Denver Post on September 27, 2011

Jane Thoms Morgan French - "Janie" September 28, 1922 - September 3, 2010

Born in Milwaukee, Wisconsin, on September 28, 1922 to Clinton W. Morgan and Helene Reed Morgan. Janie moved to Lombard, Illinois in 1925 where she attended elementary school. Janie grew-up in Lombard during the Depression years and graduated with honors from high school in Glen Ellyn, Illinois 1940. She attended and graduated from the University of Colorado in Boulder, Colorado with a Bachelors of Arts degree in oil shale geology 1944.

While attending the University of Colorado, Janie met her future husband Albert Lloyd French, Jr. Janie worked for Phillips Oil Company looking for domestic oil sources while Albert was serving in the US Army Medical Corps in the European Theater WWII. They were married in 1945. Janie then pursued an honorary PHT (put hubby through school) degree and Albert finished his medical degree at the University of Colorado, School of Medicine, Denver, Colorado 1946.

Janie was blessed with three children; Albert Lloyd III born in 1952, Susan Jane born 1954, Rebecca Morgan born in 1957. They were the joy of Janie's life and she treasured their adult friendships and their time together.

In 1966 Janie and her family moved to Estes Park, Colorado where she spent four years working as a nurse and secretary to her husband and for his medical practice. More PHT degree put to use. In 1970 Janie and her family relocated to Lebanon, Oregon. Janie was employed with Linn-Benton Community College for 18 years as an executive assistant to the Special Programs Department while putting her children through college. Yet more PHT degree put to use.

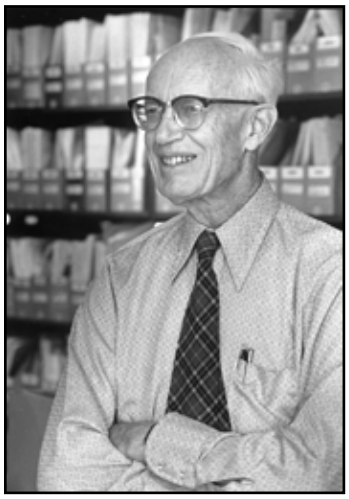
In 2003, Janie moved to Sisters, Oregon where she spent 7 great years. She got to know her grand daughters Kristy Knoke, Lindsay (and Ben) Holloway, and her son-in-law, Jason Knoke. Janie loved living in Sisters and being surrounded by all of her family. Janie loved all things great and small and rescued many a lost soul.

Janie enjoyed creative past times; arranging beautiful flowers, playing the piano, listening to jazz, and all kinds of art work. Janie drew the initial pen and ink drawings of the Mammals of Colorado for the University of Colorado Museum publication and Museum of National History in 1947. Janie was an incredible pianist and

shared her many, many art talents.

Janie is survived by her children: Al, Jason, and Rebecca. She is also survived by a younger sister, Sue and younger brother Charlie. Janie was preceded in death by her parents, husband, two older brothers, and beautiful daughter Susan Jane.

Janie passed September 3, 2010, a beautiful sunny day. She went to sleep on her front deck wrapped in the warmth of the afternoon rays. There was a rainbow and a thunderhead waiting to show her the way. She will be greatly missed by all that know her - especially her family. There was music in the park . . . . June 2011: At Janie's request, no services were held. Janie's ashes were scattered under an ancient forest of yellowed-bellied pine in the Metolius region near Camp Sherman and Sisters, Oregon. The volcanic and geological formations and landscapes created much inspiration for Janie's creativity, her spirit and her soul. Some of her fondest memories were studying at CU during WWII and she was very proud to be one of the few women in the department. R. M. French-Janie's daughter/Sisters, Oregon.



Glenn R. Scott died Monday, June 4, 2012 at the Collier Hospice Center in Wheatrldge. He was 93. He was born in New Philadelphia, Ohio, on July 23, 1918. After graduating from high school, he attended college part time at Western Reserve University while working at the Cleveland Library. He was inducted into the Army in 1942: he served in the 14th Photo Reconnaissance Squadron at Peterson Field near Colorado Springs and then in an Army intelligence unit at Pueblo. While in Colorado, he became interested in rock and fossil hunting.

Glenn married Juanita Mary Weiker June 20, 1943, while in the Army in Pueblo.

Following the war, Glenn attended the University of Colorado and received a bachelor's degree in geology and mineralogy in 1948. He worked for the U.S. Department of Interior's U.S. Geological Survey from 1948 to 1989, and continued as a geologist emeritus until shortly before his death. During his career, he published 194 scientific papers and geologic maps, mostly of the Colorado area.

Glenn had an intense interest in history and in 1964 began making historic trail maps showing early wagon trails, stage stations, abandoned railroads and ghost towns for areas of eastern Colorado and northeastern New Mexico. The USGS published 12 of his trail maps. Glenn received many awards, including the Hall of Fame Award from the Jefferson County Historical Commission for the historical work, and the Meritorious Service Award from the USGS for his work in geology.

He lived in Lakewood from 1949 on. He played cello for the Golden Symphony Orchestra for 12 years. He and his family collected fossils (five ammonites, snails and clams are named after him), old bottles, rocks, minerals and arrowheads. He volunteered for the Denver Public Library for about 40 years and received the Eleanor Gehres award. In 1929 he and his mother became interested in family history and eventually finished more than 50 genealogies for his own and extended families. He researched more than 130 direct-line family names. Glenn and family enjoyed travel, visiting most of America and every continent except Australia and Antarctica.

Glenn is survived by his three children. Jeannie C. (Roger) Pestorious. Kathleen (Don) Fagerstone and James Scott, of Lakewood: grandchildren Jennifer (Mark) Holt, Jessica Pestorious Bell and Kelly Fagerstone; and great-grandchildren Katelyn and Sawyer Holt.

He was preceded in death by his wife, Juanita Mary (Weiker) Scott, and a brother and sister.

Glenn's ashes will join his wife's in his beloved Colorado mountains.

Don Freeman Tobin, 95, passed away June 28 surrounded by children and grandchildren at his ranch in Bandera County.

The son of an Irish immigrant and pioneer ranching family, he was born in 1915 in Casper, Wyoming near his family's Wyoming ranch. As a youth, he spent his summers working at the family ranch and for a year after college lived in an old sheepherder's covered wagon working the ranch from horseback. He graduated from the University of Colorado, earning a degree in geology and entered the oil business.

He met his wife, Peggy Portwood, the daughter of the Superintendent of San Antonio public schools and they were married at St. Mark's Episcopal Church in San Antonio shortly after the beginning of World War II. Tobin served in the U.S. Army Air Corps, training pilots in meteorology and navigation.

After the war, he graduated from St. Mary's Law School, attending classes on nights and weekends in the building that is now the La Mansion Hotel in downtown San Antonio. Tobin was a leader among the independent oil men of Texas, making numerous discoveries in Texas, Louisiana and Oklahoma. He was elected President of the internationally prestigious American Association of Petroleum Geologists and traveled around the world promoting scientific research and the advancement of the science of geology.

Tobin served as President of the San Antonio Charro Association, and was instrumental in establishing the present day Charro Ranch near Mission San Jose. He was a long-time Board member of the Southwest Research Institute and served as the President of the former San Antonio Children's Home, which later developed into the Clarity Child Guidance Center. Tobin was a faithful and life long member of the Rotary Club of San Antonio, living out its motto of Service Above Self and serving as one of three generations of Presidents, including his father-in-law Tom Portwood before him, and his son Patrick after him.

His heart was always at his Bandera ranch where since the 1940's the Tobin family has raised cattle, sheep, horses and grown blue ribbon quality hay. His happiest days were spent at the ranch in the company of his big and loving family.

He is survived by his wife Peggy, their eight children, Don, Tim, Martha Bersch, Phillip, Mark, Patrick, Kathleen Krueger, and Ann Hevenor, and nineteen grandchildren, eight great grandchildren.

Published in San Antonio Express-News on July 1, 2011

The Department of Geological Sciences offers our sincere condolences to the family and friends of those who have passed in this last year.

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