Geology News

Department of Geological Sciences | University of Colorado at Boulder | 2006-2007

Spring Graduation 2007

Contents

Letter from the Chair

Mary Kraus

Amazingly, I have just completed the fourth year of my term as department chair. It simply does not seem that I have been chair so long. At the same time, I have been re-elected to a second, two-year term, so you will continue to hear from me. Over the past four years I have been helped considerably by Lang Farmer, associate chair for the undergraduate program, and Karl Mueller, associate chair for the graduate program. On behalf of the department, I want to thank both of them for their dedication and service. During the next two years, Shemin Ge will be the associate chair for the undergraduate program and Bob Anderson has agreed to be associate chair for the graduate program. I look forward to working with both of them.

Other faculty news is strongly positive. This spring Jason Neff and Tom Marchitto were successfully reappointed as Assistant Professors, and Steve Mojzsis and Greg Tucker were awarded tenure and promoted to Associate Professor. In addition, Shemin Ge was promoted to Full Professor. Joe Smyth was elected a Fellow of AGU. Alexis Templeton received a Packard Fellowship and the Clarke Medal from the Geochemical Society (see story on p. 6). Anne Sheehan and Craig Jones were coauthors on a new textbook titled Introduction to Applied Geophysics, which was published in August 2006. And, Paul Weimer co-authored a new book - Introduction to Petroleum Geology of Deepwater Settings - published in January 2007 as part of the AAPG Studies in Geology. James Syvitski is becoming executive director of a new NSF initiative (see story on p. 6). Although James will step down as Director of INSTAAR to take on this new role, he remains a faculty member in Geological Sciences. These are just a few of the exciting developments in the department this year.

There are both new faculty starting in our program and some faculty leaving. Henrietta Laustsen, who has been an instructor in the Department, moved with her husband to Oregon, where he is pursuing new career options. Alan Lester, who has been a mainstay of the undergraduate program through both his teaching and advising of our undergraduate students, has also left the Department to pursue other career goals. In Alan's case – he is becoming an airline pilot! Becky Flowers and Kevin Mahan join the faculty this fall, and Scott Lehman joined during spring semester 2007.

At the moment we have approximately 100 undergraduate majors and 70 graduate students. In addition to educating our majors, the department plays a large role in the science education of undergraduate students at CU with approximately 4,000 undergraduate students enrolled in geology classes last year. As you know from last year's newsletter, the Department is involved in the Science Education Initiative at CU. The goal of that program is to change the way science is taught to both the non-major undergraduate students and our undergraduate majors. As part of the SEI, two post-docs - Andrea Bair and Jennifer Stempien – joined the Department last fall. (see photo p. 13)

The 3rd Annual Bill Bradley Field Trip for all new graduate students was held in August, the weekend before classes started. The trip was sponsored by Shell Oil, and my former student, Tim Farnham (MS 2001), represented Shell on the trip. The first day of the trip had technical input from Alan Lester, Fred Barnard, Joe Smyth, and myself. We focused on the geology between Boulder and the Mountain Research Station, where we spent the night. Members of the Advisory Board were instrumental in trip logistics. Dave and Mary Peterson and Matt Silverman organized the dinner Saturday night and did the grilling. They were ably aided by graduate student Nick Sommer and my husband, Dave Uhlir. Advisory board members also provided funding for the liquid refreshments for the trip. The second day of the trip was led by faculty Bob Anderson and Alan Lester. We welcome any alumni who would like to participate this year. The dates are August 25 and 26.

The Advisory Board met twice this year as usual. The board has several new members, who are mentioned in an article later in this newsletter. Neil Fishman has continued as chair of the Board. The fall 2007 meeting of the Board will be just prior to the Geological Society of America Annual Meeting, which will be held in Denver, in October. Associated with that meeting, the Department will host a 10th Anniversary Celebration for the Benson Earth Sciences Building. The celebration is scheduled for Friday, October 26th. We hope that many of you are planning to attend the GSA meeting and can also attend this party. Please put the date into your calendars now.

The last page of this newsletter lists the names of those who have donated to our program over the last calendar year. To all these individuals and corporations I express my thanks on behalf of all the faculty, students, and staff of the department. Please consider making a gift to the department

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

Bradley Field Trip: New graduate students watch as Alan Lester explains the intricacies of Contact Corner.

so that our students can have the same quality educational experience today that you had when you were a student. This newsletter includes an envelope for sending a gift to the department and the last page has a form for identifying the fund to which you would like to donate. In addition to the Braddock and Curtis endowed funds, the Department is always in need of general gifts funding. General gifts support a number of important departmental programs including student travel to conferences, the undergraduate mentor program, and activities of the undergraduate Geology Club.

Notes From The Advisory Board

By Neil Fishman

This has been an exciting year for the Department of Geological Sciences, as measured by the number of ways that faculty members and students have been recognized by professional societies and CU. Recent publications (articles, books, and volumes) by members of the Department reflect the high quality of research being conducted at CU and its impact on earth sciences. In addition, members of the faculty have been elected by their peers to 1) serve professional societies in both executive positions and as advisory fellows and 2) receive faculty fellowships from CU. And several students were recipients of "Best Paper" awards for work presented at professional meetings, while other students were awarded fellowships to pursue their research. I refer you to the Department's website (http://www.colorado.edu/GeolSci/) for a listing of these awards and other recent accomplishments. Click on the "News and Current Events" link from the home page to get a better idea of some of the outstanding work being done by members of the Department. The website is updated frequently, so visit it often. I am honored to serve this truly exceptional department.

It has been heartening to see that alums and friends continue to generously contribute to one or more of the department's endowments and funds. This past financial support provides the foundation upon which a fundraising campaign is being built, as we work to further assist students in their struggle to afford an increasingly expensive education from CU in an environment of shrinking State funding. The Department and the Advisory Board will focus fundraising activities to expand the Bruce Curtis Endowment from its current level of about $750,000 to $1 million. The increased income from this expanded endowment will directly support additional students through graduate student fellowships. We obviously have our work cut out for us, and your further contributions would of course be most welcome, but helping to educate the next generation of scientists makes it a very worthwhile effort. Another endowment we have built over the last couple of years, the Braddock Geology in the Field Endowment, has grown to about $240,000, which is quite healthy and at its current level provides adequate funds to support departmental and class field trips. The Braddock Endowment is important because income from it ensures that field geology remains an essential component of the educational process.

Finally, the mission of the Advisory Board, "…to guide and assist the Department in improving the quality of education for undergraduates and graduate students in the geological sciences," can be realized only through the tireless efforts of its members. I would like to welcome new members and express a heartfelt thanks to those who have recently rotated off the Board. Patrick Williamson (M.S., 1987), Stephanie Gaswirth (Ph.D., 2004), Gus Gustason (Ph.D., 1989), and Rich Goldfarb (Ph.D., 1989) have all joined the board since the last newsletter was published. These new members bring a broad background of scientific disciplines and personal interests to the Advisory Board, and I look forward to working with them all and I'm certain the Department will benefit from their involvement. A most sincere thank you is extended to Fred Barnard for his many years as a very active member of the Board. Although the Spring 2007 Advisory Board meeting was Fred's last, he continues to play a key role in ongoing projects, including the effort to name a geographic feature in memory of Bill Braddock, former professor of field and structural geology.

New Faculty

Becky Flowers is joining the department in September 2007 as a new Assistant Professor in thermochronology, geochronology, and tectonics. Becky grew up in Virginia and obtained her undergraduate degree in Geology (1998) at the College of William & Mary. Her first experience with geologic research was through her senior thesis project involving geologic mapping and thermobarometric studies along the amphibolite-granulite facies transition exposed in the Ivrea Zone, a classic crustal cross-section in northern Italy. Becky then moved to the University of Utah to pursue a MSc degree (2000). Her MSc research used geologic mapping and high-precision U-Pb geochronology to understand the nature and evolution of the amphibolite-granulite facies transition exposed in the Vredefort impact structure of the central Kaapvaal Craton in South Africa. Becky subsequently moved to MIT for her PhD (2005), where her research focused on problems in continental tectonics and crustal evolution, primarily using U/Pb geo- and thermochronology, geologic mapping, and petrology. Her studies included work in the Canadian Shield, Fiordland New Zealand, and the southwestern United States. Most recently, Becky completed a postdoc at Caltech using lower temperature (U-Th)/He thermochronologic techniques to constrain the unroofing, incision, and uplift history of the Grand Canyon region of the Colorado Plateau.

Becky is excited to join the department. She plans to continue using high and low-temperature geo and thermochonological methods to address problems in continental tectonics. She is particularly interested in the links between surficial and lithospheric histories, and is specifically examining this question in a new project focused on constraining erosional and depositional histories in cratonic continental interiors, exploring the question "how stable are continents?" She also is exploring a new potential collaboration in exhumed deep crustal rocks in the Bohemian massif of central Europe, speculated to have experienced crustal channel flow, as well as other potential research opportunities in the western United States and southern Africa. Becky is an avid marathoner/ultrarunner, and is looking forward to enjoying outdoor activities in the Colorado Front Range.

Researchers using sophisticated research vessels extract deep-sea sediment cores from oceans around the world to chart past climate change.

Scott Lehman joined the department in August 2006 as an Associate Professor. Scott is a paleoclimatologist interested in the cycling of heat, fresh water and carbon by the oceans, the role of the oceans in abrupt climate change, and the use of 14C as a tracer in the ancient and contemporary carbon cycles.

From Scott: Though new to the ranks of the regular faculty, I've had a long history with the department that began in January of 1982 when I enrolled as a graduate student under the guidance of Giff Miller and John Andrews. After completing Masters and Doctoral studies on the Late Quaternary glacial and marine climate history of the Arctic island of Spitsbergen in late 1987, I moved to the Woods Hole Oceanographic Institution as a postdoctoral scholar. Two things made this a pivotal time and place. The first was that Lamont's Wally Broecker had just published his theory that the large scale overturning circulation of the ocean might have more than one stable mode of operation. Maybe the ocean was not simply a capacitor in the climate system but a "switch." The other was the advent of 14C dating by atom counting in an accelerator. Counting 14C atoms directly rather than waiting for them to decay lowered the bar on the sample size needed for 14C measurement by nearly a factor of 10,000! We could now date directly the same foraminiferal shells that carried the ocean paleoclimate signal. We could begin to raid submarine sediment drifts and rapidly deposited sediments on the continental margins and still know where we were in time. Together with my senior colleagues at WHOI and MIT, Lloyd Keigwin, Glenn Jones and Ed Boyle, we quickly bumped up the resolution of the ocean paleoclimate record and were able to show that Wally's theorizing was largely correct. The down side was that all this nice work would eventually lead to the movie "The Day After Tomorrow."

After a 7-year stint on the WHOI faculty, I returned to CU in 1995 as an associate research professor in Geological Sciences and a Fellow of INSTAAR, where I maintain accelerator 14C preparation and trace organic geochemistry labs. Much of my recent work has focused on calibration of the radiocarbon time scale, reconstruction of past ocean temperature and circulation, and the use of 14C as an inverse tracer for fossil fuel derived CO2 in the contemporary atmosphere. One of my goals as a new member of the regular faculty is to help teach CU undergraduates about the timely and complex issues of climate and global change.

Kevin Mahan will join the Department in fall 2007 as a new research associate in metamorphic and structural geology. Kevin grew up in Alabama and obtained a bachelor's degree in Geological Engineering from Auburn University in 1996. While a senior undergraduate, he was introduced to

geoscience research through projects involving shallow subsurface geophysical surveys across earthquake-induced sand blow deposits in the New Madrid fault zone. From there, Kevin moved on to graduate school at the University of Utah, where he worked out age and kinematic relationships between ductile shear zones and the emplacement of granite plutons in the Sierra Nevada magmatic arc of California. After completing his Master's degree in Geology in 2000, he next moved to the University of Massachusetts-Amherst where he obtained a PhD in Geosciences in 2005.

Kevin's research interests span a broad area of continental tectonics and commonly focus on the relationships among deformation, metamorphic, magmatic, and hydrothermal processes. For his dissertation, Kevin did extensive field mapping and petrologic analysis on now exhumed lower crustal rocks in the Canadian Shield (northern Saskatchewan). This work involved studying the genetic links between microfabric development, metamorphic reactions, and radiogenic accessory minerals such as monazite and xenotime. As a Postdoctoral Fellow in Geology at the California Institute of Technology between 2005-2007, Kevin expanded his research to several new areas. One study involved kinematic and low-temperature thermochronological analysis of Neogene faulting in the Eastern California Shear Zone and Yucca Mountain region of Nevada. Another ongoing project builds on his earlier work with accessory minerals in metamorphic rocks, and is aimed at understanding the origin of authigenic xenotime and monazite in sedimentary environments. These initial studies are focused on Neoproterozoic rocks in South Australia, which are key sequences for reconstructing large-scale continental glaciation ("Snowball Earth") events and past supercontinent configurations (e.g., Rodinia), but for which absolute age constraints are extremely limited. The ultimate goal is to use in situ U-Th-Pb geochronological techniques to date these phases and thereby constrain depositional ages and hydrothermal fluid flow events, the latter being commonly related to the development of basin-hosted economic deposits. In addition, Kevin plans to begin a new avenue of research in the coming months that will involve collaboration with seismologists here at CU, Boulder. The goal is to study the deformation and metamorphic origins of seismic anisotropy in deep-crustal rocks. This phenomenon is generally thought to be induced by ductile deformation and is increasingly being utilized to image large-scale deformation fabrics in both ancient and modern orogens. Initial studies will focus on some key areas of Proterozoic deformation in the Rocky Mountain region.

Students on a field trip at the Rim of the Grand Canyon

Faculty Activities

Emeritus Professor **John Andrews** has been chosen to receive the Geological Society of America Quaternary Geology and Geomorphology Division Distinguished Career Award. The award will be presented at the QGG awards ceremony on Tuesday, October 30 at the GSA meeting in Denver.

A proposal by **Bruce Jakosky** (GEOL and LASP) to develop and fly a Mars orbiter mission was selected by NASA for Phase A study as part of the Mars Scout program. In Phase A, the mission, flight hardware, and science are defined in more detail, in preparation for full-scale development. The study is competitive, with another team also having been selected; one of the two will be confirmed for flight in January 2008. Jakosky's mission is called MAVEN -- Mars Atmosphere and Volatile EvolutioN mission. It is designed to study the upper atmosphere of Mars, its interactions with solar radiation and the solar wind, and the loss of gases to space. The goal is to determine how volatiles were lost from the planet over time, and thereby determine the history of the martian climate and liquid water and the history of martian habitability by microorganisms. NASA is supporting the Phase A study with a grant of $2M.

If selected for flight, the mission will have a cost cap of $475M for all aspects of the mission. Jakosky will be the mission Principal Investigator. CU will build several of the instruments to measure the martian environment, and also will lead the science activities, provide the Science Operations Center, and lead the education and public outreach activities. Other institutional partners include NASA's Goddard Space Flight Center, Lockheed Martin (to build the spacecraft), University of California at Berkeley, and University of Michigan.

Peter Molnar continues his work to address how Tibet has risen and how its rise has affected regional Asian climate. This has involved continued fieldwork in northeastern Tibet with geologists from the Institute of Geology of the China Earthquake Administration. Last summer he and post-doc Jean-Daniel Champagnac continued field studies of active faulting with the goal of constraining rates of slip on the major faults. In addition, Peter helped organize a small bi-lateral workshop for Chinese and US scientists on the "Evolution of Asian monsoon and desertification and growth of the Tibetan Plateau" in Sanya, Hainan Island in January, 2007. A major goal is to engage geologists interested in the tectonic and paleoclimatic history of the region with atmospheric scientists

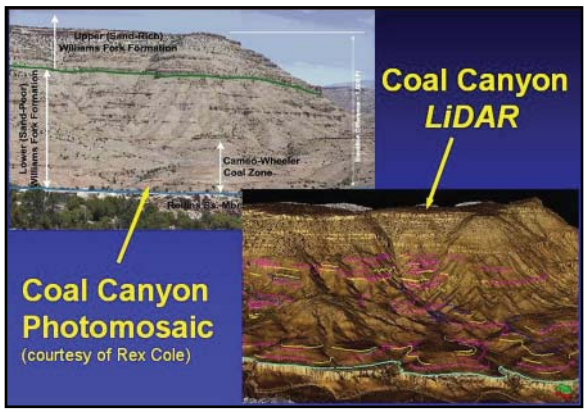
Peter "The Hammer" Molnar

eager to exploit paleoclimatic data to understand basic processes of atmospheric dynamics. (CU grad, Mark Pagani, now at Yale, was one participant.)

During the past year, **Matt Pranter** was busy completing one phase of the EMARC Williams Fork Research Consortium and prepared to begin another phase (Phase IV) that addresses the stratigraphic architecture and reservoir connectivity of fluvial deposits. The Phase III research was sponsored by 10 industry associates that represent independent and major petroleum companies and through the Petroleum Research Fund of the American Chemical Society. The Williams Fork Phase III consortium meeting was held in Boulder in January 2006 with representatives from industry. Graduate students, a post-doctoral researcher, and faculty made research presentations and discussed the project objectives and results. This research has involved field work and the use of high-resolution aerial LiDAR (laser scans of the outcrops) and orthophoto data to "map" the distribution and dimensions of fluvial deposits of the Williams Fork Formation as exposed in various canyons along the western margin of the Piceance Basin (see figure). The fluvial deposits are analogous to the reservoir sandstones that produce natural gas in the central portion of the basin – one of the most active natural gas plays in the United States.

In April 2006, Matt and David Budd held a research consortium meeting for Phase I of the EMARC AVID Consortium (Analysis of Variability in Dolomites). This research investigates the origin, characteristics, and significance of petrophysical and geochemical variability within dolomite petroleum reservoirs. Phase II of this research begins in 2007. During 2006, Matt's former student, Quentin German, successfully completed his Masters program in the summer and is a petroleum geologist with ExxonMobil Exploration Company in Houston. Masters student Nick Sommer also made significant progress on his research evaluating reservoir-scale sandstone-body connectivity in the Lower Williams Fork Formation of the Piceance Basin. Quentin and Nick, along with Matt and Dr. Rex Cole (Mesa State College), presented a poster on the Williams Fork research at the AAPG Rocky Mountain Section meeting in June, 2006 and received the Steve Champlin Award for best poster presentation. Three graduate students joined the Reservoir Characterization and Modeling Laboratory in 2006: MS student, Brandon Binford, and PhD students Adel Aboktef and Jill Haynie.

Matt continues to be active in AAPG, serves as a reviewer for the AAPG Bulletin, and is a member of the AAPG Reservoir Development Committee. Most recently, he co-chaired a session on reservoir characterization and modeling at the AAPG Annual Convention in Long Beach.



Alexis Templeton was named one of twenty promising young scientific researchers by the David and Lucile Packard Foundation. Each scientist selected for the fellowships receives an unrestricted research grant of $625,000 over five years.

Alexis plans to use the Packard funding to build an interdisciplinary group of graduate students and post-doctoral researchers who will conduct cutting-edge research at the interface of geology and microbiology. Her research focuses on little-understood microorganisms in subsurface environments that get their energy from water reacting with rocks rather than sunlight or organic carbon. Alexis said she wants to understand how these tiny life forms survive and shape larger, more complex environments around them. During expeditions in search of microbial life in unexpected places, Alexis has explored undersea volcanoes in submersibles near Hawaii and has plumbed the depths of an active molybdenum mine in Colorado.

The Packard Fellowship Program was developed in 1988 out of David Packard's commitment to strengthen university-based science and engineering programs. By supporting unusually creative U.S. researchers early in their careers, the foundation hopes to develop scientific leaders, further the work of promising young scholars and support efforts to attract talented graduate students into university research. Alexis was one of only two CU-Boulder faculty nominated for this year's Packard fellowship, and among 100 researchers nationwide. Other researchers selected for this year's fellowships include faculty at the University of Washington, the University of California, Cornell, Harvard, Johns Hopkins, Princeton and the Massachusetts Institute of Technology.

In addition to being awarded a Packard Fellowship, Alexis was also awarded the 2006 F.W. Clarke Award from the Geochemical Society. This award is conferred on a young scientist for a single outstanding contribution to geochemistry or cosmochemistry, published as a single paper or a series of papers on a single topic. The Clarke award "recognizes her outstanding contribution to understanding how microbial biofilm coatings on mineral surfaces affect the interaction of trace elements with these surfaces."

Professor **James Syvitski** has been awarded a multimillion-dollar cooperative agreement from the National Science Foundation (NSF) to coordinate the national effort and develop a Community Surface Dynamic Modeling System (CSDMS). The NSF award of $4.2 million over 5 years will be augmented with financial and in-kind support by other federal agencies, including NASA, NOAA, the Office of Naval Research, the Army Research Office, the Army Corps of Engineers, and the USGS. The CSDMS effort will develop and coordinate a suite of numerical tools (models) that simulate the behavior, for example, of how rivers and glaciers erode mountains, where and when rivers flood, the damaging nature of hurricanes and tsunamis, how sediment deposits record the nature of past

climate, and how sea level change could impact our coastal systems. Professor Syvitski is stepping down, after 12 years, as INSTAAR Director, to take on the position as Executive Director of CSDMS (pronounced "systems").

CSDMS is part of NSF's effort to organize the academic research community to model planet Earth, from its deep interior to its climate system. The creation of focal points of excellence is designed to organize the national community and support the five national imperatives in Earth-science research: 1) discovery, use, and conservation of natural resources; 2) characterization and mitigation of natural hazards; 3) geotechnical support of commercial and infrastructure development; 4) stewardship of the environment; and 5) terrestrial surveillance for global security and national defense. CSDMS will cover the near-surface environment where people live, in which complex interactions involving rock, soil, water, air, ice and living organisms regulate the natural habitat and determine the availability of life-sustaining resources.

Modeling the surface of the Earth is a problem of comparable complexity to modeling oceanic and atmospheric dynamics. The community approach allows efficient development of models that are more powerful than any single group could develop. The CSDMS infrastructure will provide a modeling environment to catalyze Earth-surface research over the coming decades by: empowering a broad community of scientists and students with computing tools and interdisciplinary knowledge; streamlining the process of idea generation and hypothesis testing through linked surface dynamics models; and enabling rapid creation and application of models tailored to specific settings, scientific problems, and time scales. CSDMS will provide: 1) professional training in use of the CSDMS computational system, 2) technology to enhance undergraduate earth-science education, (3) tools for enhancing secondary-school teaching in earth-surface science, and (4) informal educational packages to public institutions such as science museums.

Paul Weimer taught two new courses in 2006-07: *Geology of Colorado* (1040), and *Earth Resources and the Environment* (3500). He also taught *Sequence Stratigraphy* and *Basin Analysis* (6330) for the 13th time. His book, "*Petroleum Geology of Deepwater Settings*," written with Roger Slatt (OU), was published by the AAPG as Studies in Geology 57. In 2006, Paul served as the Trustees Chairman for the GCSSEPM Foundation, and will to continue to serve as a trustee until 2010. He is serving on the program committee for their 2008 Research Conference on deepwater reservoirs. For his work with the Gulf Coast SEPM since 1990, Paul received honorary membership in 2007. As a follow-up to co-organizing the 2006 SEPM Research Symposium at the Annual AAPG/SEPM National Convention, Paul (with Craig Shipp and Henry Posamentier) are co-editing SEPM Special Publication Number 91, *Mass-Transport Deposits in Deepwater Settings*. Expected date of publication is 2008. As part of his responsibilities with the AAPG 100th anniversary committee, he is filming and conducting interviews (along with Ed Dolly and Jessica Betz) this summer with select "historic" Rocky Mountain and Houston geologists. Results will eventually be made available through the RMAG and AAPG. And now that he has time, Paul can finish writing the 15 papers sitting on his laptop for the past three years. Oh yes, he has finally developed his second career--a roadie for such bands as *Prizm, Bad Mutha' Goose,* and *Third Street Connection.*

From Alan Lester:

It's not easy to give up a great job. CU geology students are a special bunch— smart, motivated and fun. Additionally, our faculty has always been very receptive and respectful to instructors. Looking back, I've had a wonderful association with this department for well over 20 years, from graduate student to research associate, lecturer, instructor, and advisor. I hope to maintain some thread of connection by teaching an occasional class, field outing, or working on outreach projects.

It was just too hard to resist the unique opportunity afforded by my recreational aviation background (acquiring just about every rating available) peaking at the same time that the airline industry became greatly in need of pilots. So, after a couple months of intense training, I'm an airline pilot—flying 50-90 seat regional jets all over the US, Canada, and Mexico—for SkyWest Airlines, who operate United Express and Delta Connection.

Recently, while descending out of 30,000 feet, we got to chat about our map-like view of the breached anticline at Dinosaur National Park. A few minutes later, we were examining the gentle sweep of monocline at Colorado National Monument while on final approach at Grand Junction. Nope, nobody in the back heard any of this. Commercial airliners aren't tour boats. Hmmm…that does give me an idea though. Perhaps my next career will involve aerial geology tours?

EMARC News

Several new research projects are being started. These include (a) outcrop and subsurface studies of the Upper Cretaceous Lance Formation, the main producing reservoir at the Jonah and Pinedale Anticline fields in western Wyoming; (b) 3D interpretation of the Red Wing Creek Field, a meteorite impact field. This research is done in conjunction with Roger Barton (CU Geology '64); (c) shallow analog studies of deepwater depositional systems from offshore Nigeria and northern Gulf of Mexico (with Sverre Henricksen of Statoil); (d) a subsalt study in the northern deep GOM; and (e) two research projects studying various aspects of the geologic evolution of the Piceance Basin from the Precambrian to present (with Dag Nummedal and Rick Sarg at CSM). Dr. Shu Jiang (from CNOC) is working with us as a post-doc researcher on several of these projects. More post-docs will be hired this coming year, and incoming students will be working in the projects. Ongoing Sisyphean efforts to attract recruiters to campus continue. Visit EMARC @ http:\\emarc.colorado.edu.

What's new in the Jerry Crail Johnson Earth Sciences and Map Library?

We had our photograph taken as part of the University Libraries Department of the Month campaign last year. In the photo are, clockwise from the lower left, Laura Wright (Map Library staff), Ilene Raynes (Map Library staff), Suzanne Larsen (Earth Sciences Librarian), Naomi Heiser (Map Library staff) and Katie Lage (Map Librarian). Missing are the Earth Sciences staff members, Brittany Reed, who took Terrie O'Neal's place in May 2006 and Becki Perna, who joined us in August 2006.

The Library continues to thrive as "place" and at the same time provides more and more material and databases online. That is a question we always get: "If everything is online, why do we still need physical libraries?" There are several answers. First of all, not everything is online and it never will be. In addition, using libraries is not intuitive, either searching online or searching the stacks. Most everyone needs help finding information on a topic or using a database or even finding a book in the stacks at some point. They need to learn that Google, even Google Scholar, is not always the best or most efficient academic database. We spend a lot of time teaching, in classrooms and one-on-one. We don't just teach "how to use a library" anymore but strategies on how to find and evaluate information resources. We also "create" the collection that supports the teaching, learning and research of the Department of Geological Sciences and the broader needs of the campus. We do this by determining what books to buy and what journals to subscribe to. And finally on an academic campus students always need a place to study. And yes, they do study, especially around midterms and finals.

In April, I gave a presentation to the Department's Advisory Board. I illustrated how we have access to full text online journals through our databases and through the library online catalog record for the journal. A new addition to our battery of online journal access is GeoScience World. This is the product of several geoscience societies working together to create a database of their online journals driven by GeoRef. Because of this type of access we have stopped taking most of our journals in paper, relying on online access only. Many of the Advisory Board members, remembering the drudgery of tracking down references, expressed envy at the ease at which students can now do their research. Having the University Libraries open 24/7 to electronic access is another positive aspect of our "library of the future."

The Map Library continues to be a major resource for interdisciplinary research on campus. We have been aggressively building our collection in both paper and digital formats. Several years ago, with the help of a grant, we began digitizing aerial photographs of Colorado and hosting the searchable collection. We have a new grant funded project digitizing our collection of Sanborn Fire Insurance maps from the late 1800s to the early 1920s. We are creating a database with a searchable interface for these as well. These are especially of interest to historians and folks interested in local history. Katie Lage, the Map Librarian, is the PI on this latest project, which also involves an outreach component to public and school librarians. The Map Library Webpage is found at http://ucblibraries.colorado.edu/map/index.htm. The aerial photograph and Sanborn map databases are under "new."

Please contact me if you have any questions!
Suzanne.Larsen@colorado.edu

Suzanne T. Larsen, Jerry Crail Johnson Earth Sciences and Map Library

Outreach

Last June, public middle school teachers from Longmont's St. Vrain Valley school district were able to participate in a 2-day, hands-on workshop to explore Front Range landscapes and geologic processes. The workshop was hosted by the Department of Geological Sciences and the Cooperative Institute for Research in Environmental Sciences (CIRES). The workshop was developed by Karl Mueller, Alan Lester, and graduate student Rebecca Anderson from Geological Sciences in collaboration with Sandra Laursen of CIRES and with advice from St. Vrain teachers. The program was supported by an award from the CU-Boulder Outreach Committee.

The workshop allowed the teachers to bring back to their classrooms current geological information to enhance the Earth science curriculum in the schools, emphasizing local and regional examples of key geologic concepts. The teachers spent a day in the classroom learning how erosion and movement of sediments shape landforms. Karl Mueller dem-

Rebecca Anderson (left) helping a middle school teacher with a DEM

onstrated the use of computer-generated, two-dimensional maps that appear three-dimensional with the use of special glasses that give unusual insight into the nature of geologic landforms. The participating teachers were able to take home a set of the maps for classroom use with their students. The second day of the workshop was spent out in the field exploring Front Range landscapes at Rocky Mountain National Park.

The **Interactive Geology Project** http://igp.colorado.edu (Paul Weimer, Jay Austin, Ben Haugen, Chris Grey, Rick Couture) continues to develop geologically accurate animations and interactive displays that illustrate the geological evolution of local areas. These animated movies and displays are displayed in auditoriums or kiosks in both museums and National Parks. The purpose is to use these interactive displays to bridge the gap in the general public's lack of understanding of geologic processes in the third and fourth dimensions. More than 90% of our financial support has been derived from private funds.

This year's products include: (1) a two-minute animation for the University of Colorado Museum (origin of Florissant National Monument); (2) a ten-minute animation for the Colorado School of Mines Geology Museum titled "A View From the Window," and (3) a thirty-second animation for a show on Moab, Utah for *The Weather Channel*. The animation shows the evolution of the Pennsylvanian salt in the Paradox Basin.

Two ongoing projects will be completed this summer: (1) an interactive web-based geologic display for Arches National Park, and (2) an interactive kiosk displaying the Geology of Colorado for the University of Colorado Museum.

One long-term project is being started--a 40-minute movie on Colorado Geology, designed for free distribution to all primary and secondary schools in the state. Expected date of completion and distribution is 2009.

Finally, we continue to work with Ron Blakey (Northern Arizona University, http://jan.ucc.nau.edu/~rcb7/) by animating the 100 paleogeographic maps he has compiled showing the Phanerozoic evolution of North America. Final content has many different applications for future venues.

Funding Updates

Bruce Curtis Graduate Fellowship

The Bruce Curtis Graduate Fellowship has now provided funding for three students. Quentin German and Greg Robertson were funded in 2005-06 and Nick Sommer was funded in 2006-07. Both Greg and Quentin are currently employed by ExxonMobil. Nick is finishing his MS degree this summer and will go to work for EnCana in the fall.

In February, at the CU at the Brown reception, the Bruce Curtis Graduate Fellows for 2007-08 were announced. They are Lyndsay Ball and Brandon Binford. Lyndsay is a PhD student working with Shemin Ge on a research project tentatively titled "Measurement of fault zone permeability, Elkhorn Fault, South Park, Colorado." Brandon is a MS student studying with Matt Pranter. His research project is titled "Estimation of fluvial sandstone-body dimensions based on outcrop and borehole image data, Lower Williams Fork Formation, Piceance Basin, Colorado."

Due to several very generous gifts over the past year, this fellowship has grown to $750,000. As noted in Notes from the Advisory Board, the Department and Advisory Board hope to increase this fund to $1 million. Contributions to this fund are very welcome.

Lyndsay Ball

Brandon Binford

Bill Braddock Geology in the Field

This fund was established in 2003 with $90,000 in funds. Since then, it has grown steadily to $240,000. This endowment allows the Department to fund field trip expenses that are not covered by student fees and by the university. These trips range from short, three hour excursions around the Boulder area for both majors and non-majors in our introductory geology courses, to one day and weekend trips in the Colorado Rocky Mountain region for our undergraduate majors and graduate students, as well as special week to ten day trips to areas of unique geologic interest and importance including Mexico, the Basin and Range, and Yellowstone Park.

Geology students on a field trip

Alumni Receptions and Society Meetings

The Department hosted an alumni reception associated with the GSA Annual Meeting, which was held in Philadelphia in October of 2006. The Department normally hosts a GSA reception during the meeting itself, however, this year, the Department will celebrate the 10th Anniversary of the Benson Earth Sciences Building just prior to the meeting. The celebration is scheduled for Friday October 26th. We hope that many of you are planning to attend the GSA meeting and can also attend this party.

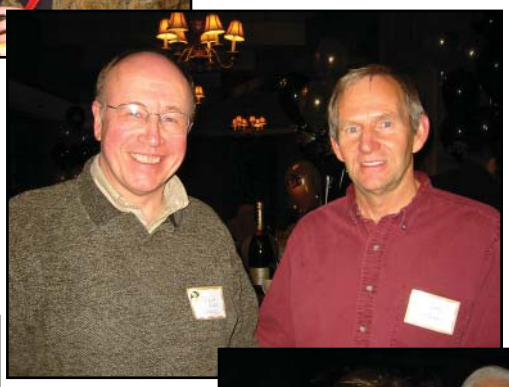
At the end of January, the 3rd Annual CU in Houston was held at the end of January in association with the NAPE (formerly North American Prospect Expo). This event was organized and hosted by Advisory Board members Anna Wells and Tim Garfield.

The 3rd Annual CU at the Brown Alumni Reception for the Department of Geological Sciences was held on February 22, 2007 at the Brown Palace Hotel. Anna M.R. Wells and Michael Zakroff of St Anselm Exploration Company generously sponsored this elegant reception. The Department thanks Todd Gleeson, Dean of the College of Arts and Sciences; Phil Distefano, Provost of CU Boulder; and Susan Avery, Dean of the Graduate School and Associate Vice Chancellor for Research, for attending and showing their support.

The pictures on these pages show the festivities at CU at the Brown and CU in Houston.

@ Benson Earth Sciences Building - 5:30 pm

Thank You Donors!
Your Generosity is Greatly Appreciated




Science Education Initiative

Front Office News

The front office has survived the year without any drastic changes, in other words no personnel changes.

Carrie Simon is enjoying her position as Graduate Program Assistant with graduate students who are incoming, continuing and graduating. **Barbara Amaral** has settled into the Administrative Assistant front desk position of fielding phone calls, helping folks who come into the office and handling the academic scheduling, plus a myriad of other duties. **Joanne Brunetti** continues as our accounting tech working with purchases, travel and account handling for the department. **Beth Hanson** continues as Office Manager and Assistant to the Chair. All four manage their positions with aplomb and great attitudes while doing an excellent job.

We have a staff dedicated to meeting the administrative needs of Geological Sciences Faculty and Students in an efficient, friendly and timely manner.

The front office staff looks forward to, and welcomes assisting alumni and friends of Geological Sciences in finding answers to appropriate questions they have regarding the Department, faculty, former faculty, students, and staff.

The front office still maintains the position of being the meeting and greeting place, or the "nerve center," in the Department.

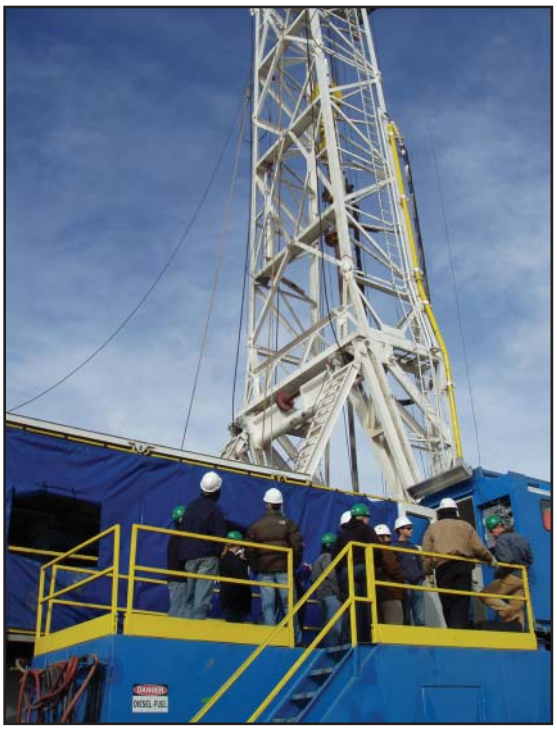
The Departmental Office can be contacted by:
Phone: 303-492-8141
FAX: 303-492-2606
EMAIL: geolinfo@Colorado.Edu

Thank You to the front office for proof reading the newsletter

Our office staff: front row - Beth Hanson, Barbara Amaral
back row - Joanne Brunetti, Carrie Simon

AAPG Chapter News

The CU, Boulder AAPG/SEG Student Chapter has enjoyed a great year of activities, including a field trip to a drilling rig, a very successful petroleum-company recruiting season, and numerous presentations from petroleum-industry geologists. We recently teamed up with the Colorado School of Mines AAPG Student Chapter to foster collaboration between the two chapters and increase the number of activities and opportunities available for our members. EnCana Oil and Gas (USA) sponsored a trip to a drilling rig operating 20 miles east of Boulder in the Denver-Julesburg Basin in the fall of 2006. Students were able to tour the rig and learn about the different components of the rig directly from the toolpusher. Afterwards we were treated to lunch by Terri Olson, the geosciences recruiting coordinator from EnCana. The fall 2006 job-recruiting season was a fruitful one for many members of the AAPG Student Chapter, with internships and full-time positions being offered and accepted. One focus of the chapter before recruiters arrived was to encourage students to participate in the information sessions and interview process, while offering advice on how to make both of these experiences beneficial to our members. The fall 2006 and spring 2007 semesters saw many excellent presentations come to the CU and CSM geology departments. Geoscientists from ExxonMobil, ChevronTexaco, Shell, and EnCana all made visits to present interesting case-studies and applied-research topics. Many of these were held in conjunction with Dr. Paul Weimer's Sequence Stratigraphy and Basin Analysis class. Chapter members learned how what we are learning in school can be applied towards petroleum exploration, and gained invaluable information through these talks. The climate surrounding the petroleum industry could not be better for up-and-coming petroleum geoscientists. Virtually all companies are looking to hire many young geoscientists in anticipation of the upcoming retirement boom. Experienced petroleum geoscientists are trying to pass down the deep knowledge-base they hold to the next generation, and we are currently reaping the benefits of this trend through talks and classes.



We thank Shell Oil for its financial support of our chapter.

Student News

Randy Caber, who received his BA degree at the Spring graduation, was the recipient of the 2006-07 Austin Weeks Undergraduate Memorial Grant from AAPG.

Jason Adams was awarded the Rocky Mountain Association of Geologists Bolyard Award to support his thesis research. This award is funded through the generosity of alumnus Dudley Bolyard and his wife, Marion. He also received a Graduate Student Research Grant from GSA. Jason is working with Mary Kraus on paleoclimate change at the Paleocene-Eocene Thermal Maximum.

Tim Bartholomaus, **Chris Harig**, and **Will Levandowski** are the recipients of Best Student Paper awards from the Cryosphere (Bartholomaus), Tectonophysics (Harig), and Seismology (Levandowski) sections of AGU. Bartholomaus' award was for "Melt Season Surface Velocities at the Kennicott Glacier, Alaska, Including Response to the 2006 Hidden Creek Lake Outburst Flood." Tim's co-authors were Bob Anderson and Suzanne Anderson. Harig's presentation was entitled "Pressure difference across continental keel and their implications on upper mantle viscosity," and his co-author was Shijie Zhong from Physics. Levandowski's award was for his presentation "Receiver functions from medium aperture broadband beams and the Moho of the Sierra Nevada, California" coauthored with Prof. Craig Jones. Levandowski was an IRIS undergraduate intern at CU during the summer of 2006 and will begin his graduate studies at CU in 2008.

Mary Ellen Benson has been awarded the Gould Award from the Paleontological Society as well as awards from the CU Museum's Walker Van Riper Fund and the Evolving Earth Foundation. Mary Ellen, who is studying with Dena Smith, is studying the taxonomy, ecology and taphonomy of freshwater diatoms from the Florissant Fossil Beds, Colorado (Late Eocene).

Quentin German, who graduated with his MS in August 2006, was awarded the 2006 Steve Champlin Award for best poster presentation at the AAPG Rocky Mountain Section Meeting in 2006. Quentin's coauthors were Nick Sommer, Matt Pranter, and Rex Cole. This award is presented by the Wyoming Geological Association in memory of oil independent, Steve Champlin, for the best poster presentation of the yearly section meeting. The title was "Analysis of Fluvial Sand-Body Characteristics and Dimensions in a High Net-to-Gross System, Upper Williams Fork Formation, Main and Plateau Creek Canyons, Piceance Basin, Colorado."

Erin Leckey has been awarded the Ellis Yochelson Award from the Paleontological Society as well as a Walker Van Riper Research Grant from the CU Museum. Erin works with Dena Smith and is studying the evolutionary ecology of oak-insect interactions in ecosystems that span the Miocene to the Recent in western North America.

Scott McCoy was recently awarded an NSF Graduate Fellowship. Scott was also awarded a CIRES Graduate Research Fellowship for summer and fall 2007. These competitive fellowships provide support for outstanding current or prospective graduate students affiliated with CIRES. This year, Scott was one of only seven students to receive this award. Scott is working with Prof Greg Tucker on studies of the physical processes controlling mass transport and valley incision and how these processes interact with landscape change due to climate, tectonics, and human impact.

Elizabeth Swanner will participate in the NSF East Asia and Pacific Summer Institutes in Japan this summer. Betsy, who is a student of Alexis Templeton, will work with Dr. Ken Takai to investigate syntrophic associations in microbial ecosystems that are driven by geochemically derived hydrogen.

Walter Szeliga, a PhD student in the Department, was named recipient of the 2007 WAGS/UMI Distinguished Master's Thesis Award from the Western Association of Graduate Schools (WAGS) and University Microfilms International (UMI). This award recognizes his MS thesis, completed at Central Washington University in geological sciences last June. The thesis is titled "Transient Detection and Modeling of Continuous Geodetic Data."

Arwen Vidal, a PhD student working with Karl Mueller, was chosen as an Outstanding Graduate Teaching Assistant by the National Association of Geoscience Teachers.

Arwen Vidal

Jennifer Stempien and Andrea Bair take a break from their Science Education Initiative duties.

News and Awards

Undergraduate Awards for Spring 2007

AWARD	RECIPIENTS
AWG Outstanding Seniors	Catherine Bohling
Bruce Curtis Outstanding Junior	Ben Haugen
Johnston Memorial Scholarship	Greg Diefenbach
RMAG Outstanding Senior Award	Greg Diefenbach
T. Keith Marks Scholarship	Farrin Wilson

Shell Petroleum Graduate Research Awards

Shell provided funding that is helping 4 graduate students complete research projects for their degrees. The students and their projects are listed below. Also listed in parentheses are the faculty advisors for each student.

Jason Adams (Mary Kraus) – "Paleoclimate change at the Paleocene-Eocene Thermal Maximum (PETM) determined from alluvial paleosols, Bighorn Basin, Wyoming"

Brandon Binford (Matt Pranter) – "Estimation of fluvial sandstone-body dimensions based on outcrop and borehole image data, Lower Williams Fork Formation, Piceance Basin, Colorado"

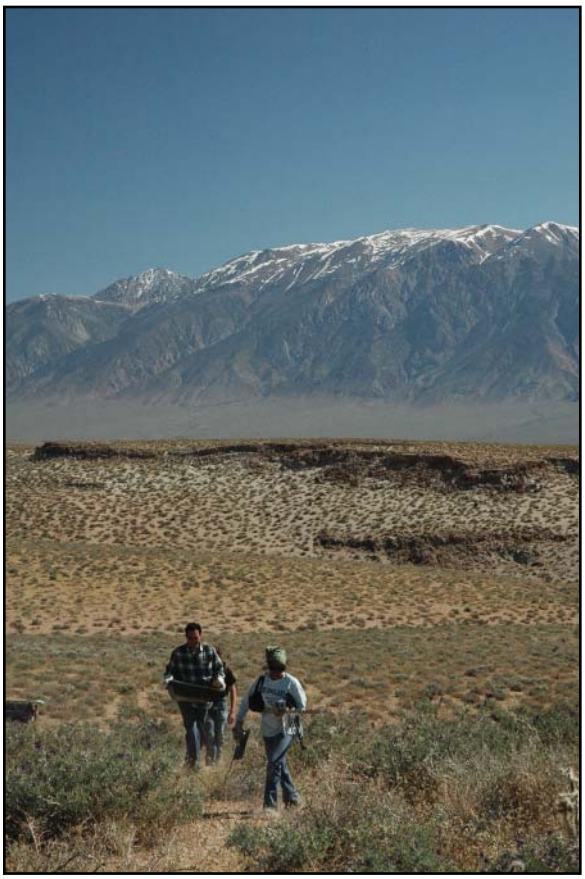
Benjamin Burger (Jaelyn Eberle) – "The vertebrate faunal transition across the Paleocene-Eocene boundary in the southern Piceance Creek Basin, Western Colorado"

Nicholas Sommer (Matt Pranter) – "Reservoir characterization of the Williams Fork Sandstone"

Kenneth Babcock explains the finer points of groundwater exploration

Graduate Awards for Spring 2007

AWARD	RECIPIENTS
Association of Women Geoscientists (AWG)	Rebecca Anderson Atkinson Arwen Vidal
Bruce Curtis Fellowship	Brandon Binford Lyndsay Ball
Bruce Curtis Scholarship	Jill Haynie
Jeffrey Deen Memorial Scholarship	Ben Burger Gaspar Monsalve
Jack Edwards Scholarship	Brian Yanites
Longley, Wahlstrom, Warner	Walter Szeliga
Spetzler Award for Research	Lisa Mayhew
RMAG Bolyard Award	Jason Adams
RMAG Norman Foster Award	Brandon Binford
W. O. Thompson Award	Laura Wilson Scott McCoy
Waldrop Memorial Scholarship	Corey Lawrence



Degrees Awarded
(Spring 2006 - Spring 2007)

B.A. Geology Majors

Jacob P. Bauer
Catherine Bohling
Randy Caber
Quinn Collins
Greg Diefenbach
Trevor Gates
John Patrick Gartland
Angus Andrew Leger
Daniel Lopez
John Paul Minier
Timothy Patrick O'Neil
Stephanie Reininger
Christopher Struck
Isaac Joseph Vimont
Elizabeth Wolfe

Spring graduation, 2007

M.S. Candidates Graduating with Degrees

	Advisor	Thesis Title
Kenneth Babcock	Ge	Shallow alluvial aquifer system and the interaction with Boulder Creek, Boulder, Colorado
Jonathan Funk	Stern	Anhydrite-Bearing Igneous Breccias in the El Teniente Cu Deposit, Chile
Ursula Quillmann	Andrews/ Jennings	Holocene environmental variability in Isafjardardjup and its tributary fjords, NW Iceland
Alexandra Sinclair	Syvitski	Review of a NOAA hydroacoustic survey region and the possible use of fisheries echo sounder for rapid sediment classification
Ian Sweeney	Chin	Fossil wood from the Moreno Hill Formation: Unique expressions of wood mineralization and implications for the proceses of wood preservation

Ph.D. Candidates Graduating with Degrees

Yarrow Axford	Miller	Interglacial temperature variability in the High-Latitude North Atlantic Region inferred from subfossil midges, Baffin Island (Arctic Canada) and Iceland
Jessica Black	Miller	Holocene climate change in south-central Iceland: a multi-proxy lacustrine record from glacial lake Hvitarvatn
Thomas de la Torre	Sheehan	Upper lithospheric seismic characteristics beneath the Himalaya and the Southern Tibetan Plateau
Eric Hutton	Syvitski	Modeling the processes that form and erode marine strata
Shad O'neel	Pfeffer	Understanding the mechanics of tidewater glacier retreats: Observations and analysis at Columbina Glacier, AK
Nathaniel Putzig	Jakosky	Thermal inertia and surface heterogenicity of Mars
Annalisa Schilla	White	The stable isotopes and deuterium excess from the Siple Dome ice core: Implications for the Late Quaternary climate and elevation history of the Ross Sea Region, West Antarctica
Joya Tetreault	Jones	Paleomagnetic, structural, and seismological evidence for oblique-slip deformation in fault-related folds in the Rocky Mountain Foreland, Colorado Plateau, and central coast ranges
Arwen Vidal	Mueller	Thrust faulting on Mars: Implications for early Martian crustal rheology and heat flow
Kali Wallace	Bilham	Geodetic constraints on earthquake source parameters and continental deformation in India and Tibet.
Kimberly Wickland	Neff	Controls of decomposition in boreal black spruce forests, interior Alaska
Daniel Woody	Kraus	Depositional and pedogenic responses to the Paleocene-Eocene Thermal Maximum climatic event in an alluvial floodplain setting, Polecat Bench, Bighorn Basin, Wyoming

2006-2007 Undergraduate Mentoring Program

MENTOREE	MENTOR	PROPOSAL TITLE
Henry Berglund	Anne Sheehan	Field work and data analysis of Rio Grande Rift GPS experiment
Willis Blakeslee	Jason S. Adams	Study of paleosols in the Bighorn Basin, Wyoming. Paleosols will be used as proxies for paleoclimate interpretation of the Paleocene-Eocene Thermal Maximum
Randy Caber	David Budd	Work on aspects of the AVID (Analysis of Variability in Dolomites) project
Greg Diefenbach	John Andrews	Analyzing iceberg-controlled sediment transfers from Greenland to Newfoundland
Devin Girtin	Kurt Refsnifer	Study of paleosols of the Clyde Foreland Formation using sedimentary fabric analyses of diamictons and radiocarbon and cosmogenic 10Be and 26Al dating of the diamictons
Gus Leger	Shemin Ge	Analyis of the permeability of the Elkhorn thrust fault in South Park Basin, Colorado to understand how the fault influences hydrogeologic communication or ground water flow across the fault
Analisa Maier	Matt Pranter	Processing, manipulating, and analyzing data sets from the Madison Formation in the Bighorn Basin and the Williams Fork Formation in the Piceance Basin
Laura Pommer	Karl Mueller	Study of the propagation history of the Osaka Bay blind thrust, Honshu, Japan to understand the effects of basin infilling and rock strength
David Thul	Maureen Berlin	Analysis of the processes and timing of knickpoint migration and landscape evolution on the Roan Plateau to understand bedrock channel incision and history of the upper Colorado River
Tristan Wolffe	Ken Babcock	Investigation of groundwater/surface water interactions along a riparian reach of Boulder Creek

Department Spotlight

Dan Mitchell has been the Department System Administrator since Dec 1999. Dan routinely performs a number of vital tasks for the department including designing and publishing this newsletter every year. Dan supports our faculty and students in many of their computing and networking needs, including providing help with graphics for publications and printing posters for meetings. Dan also helps the Department by managing the departmental website, designing and printing graduation programs twice a year and posters for departmental fundraising, and supervising our undergraduate computer lab.

Dan Mitchell prepares the Department printer for work

Obituaries

Raymundo S. Punongbayan – 1937-2005
PhD Geological Sciences, University of Colorado, Boulder, 1972

CU Geology, and the scientific community in general, lost a friend and colleague when Raymundo Punongbayan was killed in a helicopter crash in the Philippines, on April 28, 2005. Four other Philippine Institute of Volcanology scientists and staff members and three Air Force personnel also died in the crash. The crash occurred as they flew to inspect the devastation from landslides and floods on the flank of a recently active volcano on the island of Luzon.

Ray graduated from the University of the Philippines in 1960 with a BS in Geology. He later obtained his PhD in Geology from the University of Colorado in 1972. Upon his return to the Philippines, Ray became involved in volcanology, a subject of urgent human and economic importance in the Philippines. He rose to become Director of the Philippine Institute of Volcanology and Seismology (PHIVOLCS) in 1983, retiring at the end of 2002.

Nearly twenty volcanoes in the Philippines have erupted since 1850, including such well-known ones as Taal and Mayon, and many more are considered active. Under Ray's leadership, PHIVOLCS sounded the first warnings about volatile conditions around Mt. Pinatubo, two months before the volcano erupted in 1991. Pinatubo had formerly been considered extinct, and the warnings averted huge losses of life. As it was, the Pinatubo eruption killed hundreds of people, and created a stratospheric disturbance ten times larger than Mt. St. Helens in 1980, and the greatest since Krakatau in 1883.

As a result of the catastrophic Pinatubo eruption, and the role of PHIVOLCS in alerting the populace to subsequent eruptions, ash falls, lahars, earthquake aftershocks and tsunamis, Ray was frequently interviewed by newspapers and on television. "Mr. Ray" became a household name in the Philippines, his face recognizable to farmers on volcanic slopes as well as to city dwellers.

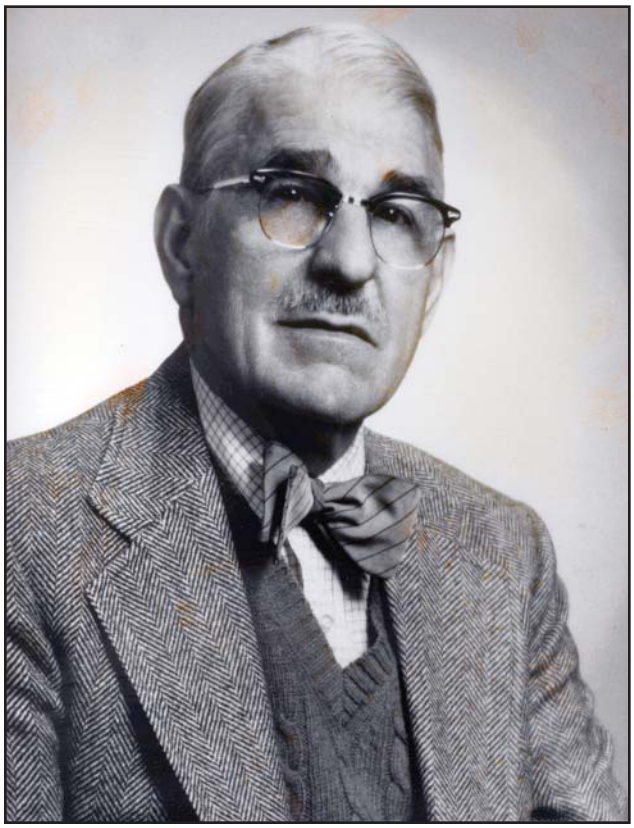
Ray was the recipient of numerous national and international prizes, including the Sergey Soloviev Medal from the European Geophysical Society. After his retirement, he was a governor of the Philippine Red Cross, in which capacity he made the fateful trip in 2005. Upon hearing of Ray's death, the President of the Philippines issued a laudatory statement of sympathy. He is survived by four children. His legacy is an energetic PHIVOLCS, which continues its role as a guardian of the nation's safety and economic well-being.

by Fred Barnard, April 2007,
based on press reports

The 2005-06 newsletter noted the death of former Professor Ernest Wahlstrom and asked alumni to share their memories of Prof. Wahlstrom. In response to that request Bill Siapno wrote:

Dr. Ernie Wahlstrom was my professor for crystallography, optical mineralogy, and the summer field course. He also reviewed my MS thesis in 1953. I was pleased to be his student and came to know him well as a camp cook for the 1952 summer field course in the Never Summer Range. It was held at Cameron Pass near M-M Ranch. Prof. Wahlstrom survived my efforts as camp cook. In turn, I was able to take the course tuition free, which I greatly appreciated. Life was busy and demanding. We lived in rambling shacks, remains of a logging camp, with the exception of Wahlstrom who lived in a tent. "Judge" Litsey, a bright PhD student, was Wahlstrom's assistant. We labored days mapping geology and, after sun down, compiled survey data. Reports were written on return to campus in the fall.

I came to know the professor quite well as he was with us each day in the field and we had meals together in camp. I came to appreciate his wisdom, insight, and friendship. After a hard day tramping high mountains, he gave brilliant lectures around open campfires in the evening. These fireside chats related to the course but applied well beyond to life itself. My career has taken me through airborne surveys exploring for uranium with the Atomic Energy Commission, Lunar research for landing sites in the Apollo program, deep ocean exploration for manganese nodules, and international programs with German, Italian, Russian, Belgian, and Japanese scientists and politicians. The lesson learned was – intense study is ever needed and never ending. I am eternally grateful for Prof Ernest Wahlstrom, as the guiding light throughout my life time.



Alumni News

In 2006, **Bruce Geller** conducted mineralogic research in Denver on specimens from Argentina, Australia, Brazil, Canada, England, Haiti, Indonesia, Madagascar, Namibia, Nevada, New Mexico, New Zealand, Peru, Somalia, and Wales. He was the first to confirm the existence of emeralds in New Mexico, making that state only the third in the U.S. to possess emerald. Unfortunately, these stones are not gemmy, but of true scientific interest. Additionally, Bruce helped create a permanent fluorescent mineral exhibit for the Colorado School of Mines Museum.

Ralph Langenbein (MS Geology, 1947) was reelected November 2006 to a third term on the Champaign, IL County Board as part of the first ever democratic board. He uses his geology serving on the environment and land use and the history committee. He is probably the oldest ever board member.

Eric Leonard (PhD – '81) has just completed another stint as Chair of the Geology Department at Colorado College. He is also beginning his third year as the Thomas M. McKee Professor of Natural Sciences at the College. He continues to focus much of his research effort on glacial geology and paleoclimate in the Rocky Mountains of Colorado and Canada. More recently his interests have also turned to the longer-term evolution of the Rocky Mountain landscape, using geomorphic, stratigraphy, and low-temperature thermochronological methods. Following a fall 2006 glacial geology workshop/field trip in China and Tibet (in the company of CU geologists Bob Anderson and Kurt Refsnider and CU Geology alums Jason Briner, Darrell Kaufman, and Mike Kaplan), Eric will be leading a 3 1/2 week field course in early 2007 on North and South Islands in New Zealand. Daughters Julia and Susan are a high school junior and a sixth grader respectively, and although generally embarrassed to do anything with their father, will go skiing with him. Spouse Lisa is attempting to bring liberal politics and the pleasures of yoga to Colorado Springs.

Cindi Preller After 17 years stomping around alaska (full of abandoned mine explorations and teaching geology for the University of Alaska.), I look back on my time with the geology department at CU as some of the finest; recalling each and every professor and friend with heartfelt thanks. This year has been so rich and fantastic geologically that I just have to share it. While working with my mentor, Don Richter, at the USGS, we published 'geologic map of Wrangell-St. Elias National Park and Preserve, Alaska'. 13 million sq acres of unbelievable geology! I had a fossil named after me, Odontomaria cindiprellerae n. sp., a rare open-coiled gastropod. (my 10-yr old daughter, isn't very impressed. She thinks my snail must have lived in some really thick mud and thus, led a boring life.) I also scored a fantastic position with NOAA at the west coast and Alaska tsunami warning center. Marie Tharp's (via Bill Hay) huge map hangs appropriately, finally. It is wild being on the tsunami front line. And lastly, I owe my geologic career to Mary Kraus who saw something in me that I was oblivious to. I doubt you know that Mary, so thank you.

From **Jill Pursley** (BA 2006)
"I am still living in Avon, Colorado and am working at the Vail Hospital as a Unit Coordinator. I am back in school and am taking my prereq's for nursing school. I am going to apply in the fall to Regis, University of Colorado Health Sciences, and Metro State College. All three programs are accelerated and I will be done in a year after the program starts. I have to admit that I have never felt this kind of pressure in school before. I am getting all As in my classes, which I have to get in order to get into nursing school. After graduation I knew that I really liked science and loved geology, but I could never see myself sitting behind a computer or not taking a job that helped people. I still love the outdoors and learning about geology, but I really like helping people and seeing results sooner rather than later."

Steve Santoro writes:
"The majority of my past year has been spent in South America. The allure of the culture and geography was too much to resist. During these travels we stumbled across an active basaltic volcano, Volcan Villarica, outside of the town Pucon, Chile. Being a geologist, it was simply too tempting not to hire a local guide and drag my girlfriend 10,000 feet up to look into the mouth of an active volcano. With sulfur in our lungs, we took in the crater and the surrounding countryside. For a moment there, I felt like I was once again on a geology field excursion. Since that afternoon, I have returned to the US, packed up my things and my brother, and moved to Seattle. Exploring the geology of Seattle has proved no less interesting than climbing in Chile. As unnerving as it is, the Seattle Fault is a mere mile away from our apartment. Recently, however, I have spent the bulk of my time searching for work and contemplating graduate school."

Scott Tangenberg received his MS from the University of Utah and works for the Forest Service in watershed management . Scott writes: "Our unit covers about 1.2 million acres in Northeast California, surrounding Lassen Volcanic National Park. Most of what I do is survey existing conditions of soil and water and analyze the effects that timber harvest and roads have or would have on those conditions. I work on individual projects (100-acre to 35,000-acre areas). But, I'm also responsible for forest-wide activities and assessments. For example, we are in the process of determining where all of our roads are (including ones made by members of the general public that we didn't authorize), and estimating the effects of those roads over the entire forest. Then, we use that information to decide which roads we want to keep, which ones we want to improve, and which ones we want to eliminate. I have a roughly half-million dollar budget to program and prioritize (not much but great by Forest Service standards). We decommission roads, improve drainage and erosion from roads, stabilize stream channels, plant riparian vegetation, restore meadow habitat, reduce conifer competition in aspen clones, eliminate fish migration barriers, and so on. It's a great job. During the summer and fall, I spend 3 out of 5 days on trips to the woods. I don't get to use too much of my classic geology education, but it gives me a great background to learn about and talk about all of this other stuff.
On the personal side, I have a wife (we met at CU, Boulder; she has a minor in Geology) and 2 little girls, one is 3 and the other was just born on Oct 17th. We have a house and a mortgage."

Harvey Thorleifson, a 1989 PhD grad from Geology & INSTAAR, was appointed Director of the Minnesota Geological Survey, State Geologist of Minnesota, and Professor in the Department of Geology and Geophysics at the University of Minnesota in 2003. He is pleased to have joined the highly accomplished Minnesota Geological Survey team. His PhD work in Boulder under the supervision of John Andrews and Giff Miller dealt with Hudson Bay Lowland Quaternary stratigraphy. At the Geological Survey of Canada in Ottawa from 1986 until 2003, Harvey's work related to gold exploration, diamond exploration, and water-related topics from Alberta to Hudson Bay. He was the 2003-2004 President of the Geological Association of Canada (GSA-equivalent), and then was the 2004-2006 President of the Canadian Geoscience Council (AGI- equivalent). He remains active in the field of indicator mineral methods in mineral exploration, as well as development of protocols for web-accessible 3D geological mapping.

Submit your alumni news @ www.cugeology.org click on the "alumni web" link

Donor Honor Roll, 2006-07

Jeffrey Abbott
Anadarko Petroleum Corporation
Robert and Suzanne Anderson
John & Martha Andrews
Lynne Ashton
Terry Bailey
Janice & Roland Baldwin
Frederick & Nancy Barnard
Patrick Barosh
William Barrett
Roger Barton
Simon Bate
Scott Bennett
Bruce & Marcy Benson
Verne & Beverly Berry
Big Sky Royalty Corporation
Gilbert Billings
Robert Blair Sr.
Robert Blair Jr.
William & Louise Bradley
Whitney Bradley
Paul & Joan Brenckle
David Bright
Phillip Brubaugh
Katherine K Brunton Trust
David Budd
Lorraine Burgin
Scott Burns
Doug Callier
Chevron Corporation
Douglas Childs
Robert & Anita Cody
James Cole
John Craig
Frederic & Elizabeth Creamer
Anthony & Pamela Crone
Kenneth Cummings
Bruce Curtis
Claire Davidson
Lynn & Nicholas Davis
Sue & Donald Deininger
Stanley & Judith Dempsey
William Downs
Robert Dumville
John & Anne Dyni
John & Donna Edwards
Betsey & David Eggler
Exxon Mobil Foundation
Benjamin Felzer
William Fisher
Patricia Freysinger
in honor of Jacob Gelfand
Daniel Gallen
Samuel Gary Jr. & Associates
Stephanie Gaswirth
Shemin Ge & Ning Lu
Bruce & Judith Geller
Carol Gerlitz
John & Lori Gibson
Lou & Kathleen Gilliam
Alexander Goetz
August Goldstein
Stanley Grazis
Clare Gregg
Greenback Exploration
Rebecca Griffin
Timothy Grove
Philip Grubaugh
Margaret Guccione
Donald Gustafson
Deborah Harden
Paul Henderson
Richard Hepworth
Vernon Hill
Warren Hill
S. B. Hixon
Diane Holliday
Mary Hubbard & Jobie Carlisle
William Hupp
Herbert Inouye
Bruce Jakosky
Claudia Johnson
Arch Johnston
Jill Johnston
Kinsley Geotechnical Inc
Sandi & Fred Kinsley
Harold & Ramona Knudsen
Dennis & Paula LaPoint
Collis & Gloria Lee
Harold & Caroline Malde
Marathon Oil Company Foundation
Patricia Marks
Stephen K. Marks
Beverly Mcmahon
Paul & Ruth Merifield
Forrest & Sue Molsberry
John Muenzinger
Christopher Morton
Robert Munger
D. Murray
Frederick & Judith Murray
Brian Naess
Jason Neff
Darrell & Karen Nordstrom
Thomas Oesleby
Elwin & Jane Peacock
Dayne & Frank Penney
David & Mary Alison Peterson
Daniel Ponti
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