



Down to Earth

Newsletter of the Geology and Geophysics Department
University of Utah, Salt Lake City, Utah

Fall 2003

Outreach: The Department of Geology and Geophysics Broadens Its Mission

Here in the department we have long recognized the vital role of the earth sciences in our modern world. We are committed to finding opportunities that will increase awareness of the importance of earth sciences both inside and outside the University, as well as society at large.

We can fulfill our commitment to this mission by increasing the number of departmental majors, expanding enrollments in departmental courses, and enhancing visibility of earth sciences in general and departmental programs in particular. To do so, we must reach out – to the university, to our colleagues, and to the community beyond. Building upon initiatives begun last year, outreach activities this fall have expanded into three areas:

- Programs beyond the university, especially for those who may have only a limited perspective about what we know and do – from museum displays to passing out information (and rocks) to the neighborhood
- Interdisciplinary programs for non-earth science departments and programs within the university – a substantial NSF grant and a new interdisciplinary major
- Activities among our geoscience colleagues outside the university – including participation in awareness programs and professional endeavors

Much of this issue of the Newsletter is devoted to our activities in all these areas (seven articles follow below). Please read on!

Utah Museum of Natural History Mounts Two New Geology Exhibits: Faculty, Staff and Volunteers Contribute to 'Dinosaur Tales'

In the Dumke Gallery of the Utah Museum of Natural History, there currently is a spectacular exhibit of dinosaur research by University of Utah paleontologists under the supervision of Dr. Scott Sampson. This temporary exhibit, entitled "Dinosaur Tales: The Science Behind the Stories", will be open only until the end of November, so time is of the essence if you want to see it.

The exhibit contains photos of professors and students in our department at various dinosaur collecting sites around the state, including some intriguing old photos of Dr. Golden York in the 1920s and Dr. William Lee Stokes in the 1960s. It also includes a professionally produced video of Dr. Sampson and current departmental students, including Bucky Gates and Eric Roberts, as well as numerous Museum staff and volunteers, showing the long, tedious process of finding, extracting, transporting, preparing and studying dinosaur fossils.

Three current graduate students in our department have portions of their own thesis work on display as part of this exhibit. Lindsay Zanno's M.S. research on Jurassic *Therizinosaurs* at the Crystal Geyser Quarry in east-central Utah is highlighted in a display of the evolutionary relationships of theropod dinosaurs. This is a very poorly



Utah's dinosaur legacy inspires awe in new display.

understood group of bizarre carnivores with huge bellies, long necks and extremely long claws on their hands. Bucky Gates' M.S. research on the taphonomy of the fossil assemblage preserved in the Cleveland-Lloyd Dinosaur Quarry in the northern San Rafael Swell is presented in a display, entitled "A Jurassic Murder Mystery". Bucky advances the argument that this world-class dinosaur

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**GSA University of Utah and Utah State
 University Alumni Reception**

Monday, November 3, 2003
 Washington State Convention and Trade
 Center Room 206, Seattle, Washington
 5:00-7:30 PM

Message from the Chair

Greetings! Thanks to the many of you who sent in feedback, letters, notes, and alumni news items following our May 2003 newsletter. Your positive and enthusiastic responses have encouraged us to continue with this second newsletter, and our plan is now to do one main annual newsletter every fall, summarizing the events of the previous academic year and summer.



Dr. Marjorie Chan

This fall we are doing a review study and assessment of our Department. This should help us see where we are, where we're going, how we can stay competitive, and chart the path that will help us get there. The new building is still at the top of our priority list. While we would welcome more majors, the quality of our degree programs is reflected in the students and we are proud of the careers of our alumni.

This summer, Cari Johnson, Jerry Schuster, and I visited seven oil companies in Houston, Texas. The purpose of this trip was to reconnect with industry folks outside of the campus recruiting visits and update them on the progress of our PICP program and general department status. We visited all the companies we could in a short two-day stay, and we hope to reach more in the future. In all, the trip was a success. Industry feedback has been very positive and supportive, and we plan to continue to build ties with industry through interdisciplinary programs.

One of my goals as chair has been to work on community within our Department – faculty, staff, students, and alumni. It is people and their experiences that really make a difference, and the small and close-knit geologic community is one where friendships last a lifetime. In this spirit, please do continue to keep us posted of your important events so we can share news with your friends and colleagues. This helps us build and strengthen your alumni organization.

We look forward to seeing many of you at the Seattle GSA meeting where our private Utah Alumni gathering will be held Monday November 3, 5:30-7:00 PM in the Seattle Convention Center, room 206. This leaves you time for dinner afterward or to visit other functions as well.

Thank you for your continued interest and support of our Department. We wish you the best in the upcoming year.

Marjorie A. Chan
 Professor and Dept. Chair

deposit is a drought-related death assemblage. Part of Mark Loewen's Ph.D. research on the growth stages of *Allosaurus* (Utah's state fossil!) is included in a display, entitled "Growing Up *Allosaurus*". Mark's anatomical studies demonstrate that the proportions of the skeleton of this well-known dinosaur changed with age, and that juveniles of this species had proportionately longer legs than adults. It is very unusual for graduate student thesis work to be included in a formal museum exhibit like this that is open to the general public.

Hank Goode's Bequest Celebrates the Henry Mountains

Hank Goode, a member of the faculty of this department from 1962 until his retirement in 1978, spent many years studying the hydrogeology of the Henry Mountains, sharing his knowledge as well as his love for the area in the many field trips he led there. When he died in 2000, he left a bequest to the Utah Museum of Natural History for a display to feature the Henrys. This September, that display was opened. Called "Island in the Desert", it is a broadly multidisciplinary study, rooted in the range's geology.



Dean Frank Brown gives introduction on Hank Goode.

The display recaptures the remarkable unfolding of the geological story of the Henry Mountains. This was the setting wherein a distinguished lineage of geologists observed and codified some of the basic tenets of modern geology.

In August of 1869, John Wesley Powell and his men climbed out of the Grand Canyon to see an unknown range of mountains, floating on the northwestern horizon. They proved to be the last range that would be discovered in the lower forty-eight states. Powell named them the Henry Mountains after Joseph Henry, physicist and first Secretary of the Smithsonian, and one of his most active supporters.

Powell sent Grove Karl Gilbert to the Henrys in 1875. In 72 days, Gilbert made seminal observations that became part of the basic tenets of geology. Based on what he saw in the Henry Mountains, he defined the morphology of laccoliths. Even more importantly, he used what he saw here to demonstrate clearly that igneous masses can deform the

rocks into which they intrude. He also defined many of the basic concepts of geomorphology, including pediment formation, fluvial erosion, stream stability and basin divides. Visitors to the exhibit can see facsimiles of pages from Gilbert's journals.

Charles Butler Hunt was inspired by Gilbert. Beginning in 1935, Hunt did the definitive mapping of the area, working out the stratigraphy and structure for an area the size of New York state, a full third of it without any roads at all. He maintained, probably with very little hyperbole, that all structural problems could be illustrated somewhere in the Henrys.

Other disciplines, too, recognize the rich and varied possibilities. Biologists, ecologists and anthropologists acknowledge that it is the geology that has controlled the plants, the animals and the people who lived here. The museum display provides two outstanding examples: With respect to human habitation, Charley Hunt and his wife, Anna, first realized that the evolution of the drainages controlled where the ancient culture (now called the Fremont) built dwellings and how they farmed. For biogeographers, the range provides a classic example of the effects of physical separation on plant and animal communities. Its elevation above a virtual sea of desert provides the isolation that fosters evolution. An outstanding example, shown in the display, is in the genus *Stanleya*, the showy yellow Prince's Plume, which has produced a new species, unique right down to the number of its chromosomes.

The thoughtful visitor can only wonder what else remains unknown in the Henry Mountains. Hank Goode's gift is at once a memorial and an inspiration.

Faculty and Students Promote Earth Science Awareness in the Local Avenues Community

We are already learning that the Salt Lake City schools and the community at large are among our most enthusiastic forums.

Our first-ever participation in the Avenues Street Fair, held in September in the Avenues neighborhood here in Salt Lake City, was a success by every measure, increasing awareness of earth science issues and educational opportunities, and expressing university concern for the community.



Kids and adults look for treasures in the free rock pile.

Outreach committee members Dr. David Dinter and Dr. Erich Petersen, joined by Dean Frank Brown, Chair Margie Chan, and graduate student Patrick Gathogo represented the department. They distributed information about the

earth sciences and geologic time scales, public lecture schedules, departmental class offerings, and brochures with earthquake maps and information. There was even a free rock pile (a captivating way to introduce minerals!) that was popular with children and adults alike. Over seven hundred people visited the display and many stopped to thank us for being there. Parents appreciated that the booth was aimed at children. One person said, "It's so refreshing to see something that's not just about ourselves". We plan to take part in this event on a regular basis.

A new outreach program for local high schools is in preparation. We also plan to provide Red Butte Garden with geology training for docents, who serve as nature guides to visiting elementary and secondary school classes. We are also preparing geological field exercises for local middle school students who visit the garden.



Dr. David Dinter, our department outreach coordinator (right), speaks with the community at the Avenues Street Fair.

Reaching Out in the Classroom

This last year two of our own graduate students, Brenda Beitler and Lori Chadwell, responded to requests from local schools for a presentation on what geology is. The response was very enthusiastic and a few lines of one of their thank you notes sum it all up: "We wanted to let you know how very much we appreciated the presentation at Herriman Elementary. It was wonderful and the students really loved it. Thanks for taking your time to encourage and instruct our students!"

Museum Exhibits for Earth Scientists

We want to remind you that the Utah Museum of Natural History located here on campus on Presidents' Circle waives admission charges for faculty, students and staff of the University. If you haven't had a chance to visit it lately, you'll find two new exhibits of particular interest to earth scientists: the Dino Tales exhibit, featuring new Utah finds by Dr. Scott Sampson and his co-workers, and a multi-disciplinary study of the Henry Mountains funded by a bequest from Dr. Hank Goode, longtime faculty member of this department. (See more about them in "Faculty Focus" in this Newsletter.)

NSF-Funded Multidisciplinary Education Program Grant Awarded

The National Science Foundation (NSF) has awarded the Department of Geology and Geophysics \$1,653,384 over the next three years for a multidisciplinary program that will link academic departments at the University, the Utah Museum of Natural History, and the Salt Lake City School District. This endeavor is known as WEST for its focus on water, the environment, science, and technology. Its purpose is to enhance science learning for elementary, middle, and high school students on the one hand, and the interdisciplinary training of university graduate and undergraduate geosciences students on the other.

Project WEST will facilitate integrative and inquiry-based learning among students in grades four, eight, and nine in a manner that fulfills core curriculum requirements and state standards. It will provide professional development tools to school teachers in the form of materials, observatories, workshops, and field trips that promote more effective science teaching. The multidisciplinary nature of WEST (geology, geophysics, meteorology, and ecology) will also provide intellectual stimulation and enhanced learning opportunities for graduate and undergraduate students selected as Fellows. Eleven graduate fellowships worth \$21,500 per year are provided by the grant.

The unifying theme of WEST – water and the environment – was chosen because of its significance not only within the earth sciences but also for human survival and livelihood in the arid West. Every school and university student and every resident in the State of Utah is impacted by the local hydrological cycle: our mountain ranges receive ten times the precipitation of valley floors, water runs off in streams or percolates into the ground supporting the many ecosystems found between 12,000 ft and 3,000 ft elevations, water provides for both agriculture and urban consumption, and some flows ultimately to the unique ecosystem of the Great Salt Lake. Water affects recreation, the economy, and settlement. By gaining an enhanced understanding of the role of water in the environment, particularly in this time of severe drought, students will contemplate their place in nature.

WEST faculty and staff participants are drawn from three science departments in the University: Geology and Geophysics, and Meteorology, both in the College of Mines and Earth Science, and the Ecology and Evolution division of the Department of Biology in the College of Science. Departmental and Museum faculty and staff include principle investigator Dr. David S. Chapman, Dr. Thure E. Cerling, Dr. Marjorie A. Chan, Dr. Jamie Creola, Dr. Erich Petersen, Dr. Scott Sampson, and Dr. Kip D. Solomon.

New Composite Earth Science Teaching Major Inaugurated

Concerned about the large projected increase in the number of students in public education over the next decade and the current shortage of science teachers in Utah, especially in the earth sciences, our department has been deeply involved with the College of Education in creating a new composite earth science teaching major. The new program, to be administered by the Department of Geology and Geophysics, includes courses in geology, chemistry, physics, biology, and meteorology as well as education.

Graduates of the program will fulfill state requirements for three teaching endorsements in the areas of earth science, integrated science, and physical science. "This broad-based approach and the multiple endorsements mean that graduates will be versatile and able to teach a wide variety of science courses in addition to earth science", said Dr. Erich Petersen, one of the main designers of the new major. The program incorporates new standards in educational curricula and modern approaches to teaching science, and is designed to meet both Utah State Office of Education and National Science Education standards.

"We are very excited about this new teaching program," said department chair Dr. Marjorie Chan. "The major integrates knowledge from all fields of science and therefore is uniquely suited to address such socially relevant issues as water quality, global warming, earthquake hazards, and other environmental concerns. It is very important in this day and age that we have teachers trained to provide instruction in these areas," she added.

Additional information about the major, including model class schedules and scholarships can be obtained from our department or the teacher licensure program in the College of Education.

Involvement in Professional Organizations Enhances Department's Visibility

This fall, Dr. Erich Petersen gave an oral presentation at freshman orientation. We have made contacts with non-science departments promoting our general education courses and the new earth science composite teaching major (see related story). We had a departmental display at Plazafest on campus in August and we will present lectures and demonstrations at the University of Utah Science Day to be held November 15 in the student union and in participating departments.

Spring semester activities will continue on all three fronts, beginning with departmental participation in the University of Utah Science and Engineering Fair. The committee is also preparing an in-service introduction to departmental courses and degree programs for the University College advising staff.

The department participated in Earth Science Week activities in late October. This national event, sponsored

by the American Geological Institute, is hosted in Utah by the Utah Geological Survey (UGA). A second activity to encourage professional collegiality is a departmental display at the Geological Society of America (GSA) annual meeting in Seattle in November.

Department Activities

Third Earth Sciences Careers Seminars Held

The Earth Sciences Careers Seminars, held annually, are intended to make students aware of employment possibilities in the earth sciences, exposing them to specific career options early in their academic careers. This year's seminars were held in the Department on September 19 and 20.

Last year's format proved so successful that it was followed again this year. The undergraduate seminar was held on the first afternoon, and the graduate seminar was held the second day, followed by a buffet dinner for all attendees. Seventeen undergraduates and ten graduate students participated this year. The seminar instructor again was Dr. Matt Mikulich, Adjunct Professor in the department and retired Chief Earth Scientist of Chevron Corporation.

There were three sessions:

- The first presented employment statistics and salaries across the six primary Earth Science career paths.
- The second featured guest speakers, working professionals who described their day-to-day tasks.
- The third was dedicated to employment strategy including: the interview process, resumes, making yourself more valuable for your employer, how to think like the employer when seeking a job, and some words of wisdom about how to be successful in your job search and your professional career.

Feedback from the students remains very positive, and overall there is a strong indication that the seminars are very valuable to the students in evaluating their career paths.



Dr. Matthew Mikulich, Adjunct Professor, explains the skills needed to be a successful in the oil industry.

Petroleum Industry Career Path (PICP) Flourishes

Students and Industry Enthusiastic

In July Dr. Margie Chan, Dr. Cari Johnson and Dr. Jerry Schuster spent two busy days in Houston visiting some of the major oil companies – ExxonMobil, ChevronTexaco, British Petroleum, Conoco Phillips, Anadarko, Marathon, and Union. Part of the purpose of the trip was to evaluate the PICP program that started two years ago and to solicit feedback on what we could do to improve our programs. They also used this opportunity to reconnect with some of our alumni living in Houston.



Tonya Brami, ExxonMobil recruiter, speaks to students about petroleum career opportunities.

The PICP goal has been to develop a broad knowledge base that will complement specialized thesis-related research. The program features short coursework modules on petroleum geology, with additional emphasis on personal skills, career development, general geoscience knowledge, and complementary specialization factors. Student feedback has been enthusiastic. Students feel the modules are worthwhile, although they commented that the time commitment might warrant more academic credit.

Industry feedback has also been enthusiastic, with companies willing to support the program financially and logistically. During the Houston visit, the companies suggested more integration of geology and geophysics, more exposure to industry issues, more development of group and teamwork skills, as well as strengthening ties to petroleum engineering.

PICP Coursework Evolves

In light of two years of input and evaluation, we have slightly modified the PICP modules. We are working on coordinating teaching among PICP faculty, keeping class expectations appropriate with credit levels, and integrating modules using some common data sets. The new PICP curriculum for 2004-05 will be:

- PICP I. Petroleum Geology: An overview of petroleum systems (source, reservoir, seal, migration, and traps). It includes applied well-logging and formation evaluation, and exploration and production strategies.
- PICP II. Petroleum Basin Analysis. An introduction to basin analysis techniques applicable to the petroleum

industry. It focuses on sequential stratigraphic concepts and seismic stratigraphy. Teams analyze an industry data set (seismic profile, well logs, cores, bulk and organic geochemical assays, and outcrop data) that could provide exploration strategies in an 'unknown' basin.

- PICP III. Seismic interpretation. A computer workstation exercise, using a realistic data set and a three-dimensional program to generate a final report. Students will get an overview of seismic acquisition and processing, geologic interpretation of geophysical data (for example, work flow, 'pitfalls'), and both structural and stratigraphic mapping.
- PICP IV. Prospect Evaluation. The "capstone" project where students work in teams with an appropriate "real" data set to integrate what they've learned.
- PICP V. Petrophysics & Well Logging. An optional module, supporting the four core modules. It introduces the principles and use of downhole logging tools. This module can be taken concurrently with PICP III or it can be taken later. These techniques would be especially useful to reservoir engineers and we encourage participation of students in the Department of Chemical & Fuels Engineering.

Fall Recruiting Features Oil Companies

This fall's recruiting season brought representatives from four companies to the department. All these companies have been very supportive of our Department and programs, and talking with them provided a good follow-up to the Earth Sciences Careers Seminars. It was gratifying for students to see a graduate of our own department, Aksel Quintus-Bosz (M.S. 1992), return as a recruiter.

ExxonMobil was represented by Tonya Brami. ChevronTexaco sent Mike Kisucky and Aksel Quintus-Bosz. Dennis Yanchak and Mark Vandergon came from British Petroleum. ConocoPhillips sent Craig Murphy and Tiffany Hopkins.



Dept. Chair Margie Chan receives a contribution for student support from BP's Mark Vandergon as Elena Shoshitaishvili and Dennis Yanchak, both from BP, look on.



Tiffany Hopkins and Craig Murphy of ConocoPhillips explain their company's hiring needs.

Learn By Doing: the Professional Internship Program

Concerned that our students should be well prepared when they enter professional careers, the Geology and Geophysics department initiated an internship program in 2000. The focus of the program is to provide undergraduate students with experience in real geological problems in a career environment.

Representatives from local companies or institutions including the Utah Geological Survey (UGS), Petroleum Systems Inc., the Energy and Geoscience Institute (EGI), the Museum of Natural History, and the Bureau of Land Management (BLM) sponsor students, incorporating them into one of their ongoing projects. As well as the work experience, students earn up to three units of 5000-level (advanced undergraduate) credit per semester. Not only do internships provide valuable experience outside the classroom, but they contribute to the several electives required for graduation. Students have been highly enthusiastic about their intern experiences and have considered them high points in their undergraduate careers. For several students, the program has been a gateway to a long-term job.

One example is John Naranjo, a geophysics major working with the UGS in its Department of Oil, Gas and Mining, who is enthusiastic about his experience. The project in which he is involved includes decline analysis of a major coal bed and methane gas field at Drunkard's Wash near Price, Utah. Here are some of the things he has to say about the program.

"The most gratifying facet of the student internship program is actually being a part of real world geology. I love going to work knowing that my geologic background is both tested and relied on. The most impressive thing to me about entering into the internship program was just how

easy it was to find a placement. The agencies were excited to hear of my enthusiasm to work with them and many were in great need of students. Of the many successes I have experienced thus far, what stands out most to me is knowing that I haven't needed vast amounts of training. I had always had the premonition that upon leaving school and entering the work force, I'd go through some radical transformation, forgetting everything that I'd learned and having to be taught brand new concepts to maintain a career. I haven't felt like that at all here. I feel that my skills and education have both been greatly enhanced since working with the UGS."

Undergraduates wishing to enroll in the program should contact academic coordinators Dr. Susan Halgedahl, Dr. Richard Jarrard, Dr. Fulvio Tonon, or Ms. Kim Atwater.

Post-doctoral and Faculty Visitors Bring Varied Interests to Our Department

The department continues to attract post-doctoral students. They are welcome in many respects. First, we are pleased that they appreciate what we have to offer enough to make the considerable effort to come here for an extended time. Secondly, we appreciate the diverse interests and points of view they bring us. And finally, we know from long experience that they will enrich our own knowledge and skills. We hope many of our students and faculty will get to know and work with them.

Dr. Shoeleh Assemi is a post-doctoral fellow from Monash University in Melbourne and she is currently working with Dr. Bill Johnson. Her research will examine nano-structure of natural organic matter in the environment. With her expertise in waste-water analysis and absorption spectroscopy, she will conduct absorption experiments.

Dr. Haakon Fossen of the University of Bergen, Norway visited in the department during 2001-02 to work with Dr. Ron Bruhn. Dr. Fossen was studying the formation of deformation bands in Mesozoic rocks in southern Utah. These are of interest to petroleum geologists working with sandstone reservoirs throughout the world. Dr. Fossen participated in the structural geology research group's seminars and also exchanged ideas on the formation and role of deformation bands in petroleum reservoirs with our faculty and students.

Dr. Stephan Husen held a two-year post-doctoral position in Dr. Bob Smith's seismology group. He has taken a full time research position with the Swiss Seismological Service in Zurich in June 2003 but continues collaborative research with the University of Utah. Dr. Husen also serves as an adjunct assistant professor in our department and is a member of graduate student committees.

Dr. Michael Jordan is a new post-doctoral fellow in Dr. Bob Smith's seismology group. He arrived in September of this year. Dr. Jordan recently completed a Ph.D. in geophysics at the Institute of Geophysics, in Gottingen, Germany. His specialty is in joint inversion of seismic and gravity data. Dr. Jordan has been working on tomographic studies of the Eifel hotspot and in volcano seismology of the Vesuvius magmatic system. He will be working on seismic and dynamic models of the Yellowstone hotspot project and on seismological problems in the Yellowstone Volcano Observatory.

Dr. Seong Kon Lee is a visiting scholar from Korea. He received his Ph.D in applied geophysics from Seoul National University, Korea, in 1998, and works for the Korea Institute of Geoscience and Mineral Resources. Seong will work with Dr. Michael Zhdanov on magnetotelluric modeling and inversion with topography, approximate solutions of integral equations, and borehole fluid effects on direct current tomography.

Dr. Ann Mattson is completing a year of post-doctoral research working with Dr. Ron Bruhn and Dr. Jerry Schuster on an NSF funded project to determine the recurrence pattern of large earthquakes on faults in the Basin and Range Province. She is using a combination of high resolution seismic methods and drilling and dating of Quaternary deposits to investigate 100,000+ year histories of earthquakes along the Wasatch fault and faults on the western side of the Oquirrh Mountains. She is testing the idea that earthquake recurrence may be clustered in time rather than occur at more or less evenly spaced intervals of time. The research will be used to better constrain models of earthquake hazards and develop time-dependent mechanical models of faulting in general. Ann has been splitting her time between the University and her new home at Jackson Hole, Wyoming. Currently she is reviewing her options-she remains interested in teaching and research but wants to work and live in the Jackson Hole area.

Dr. Salah Mehane is a postdoctoral research associate with Dr. Michael Zhdanov's Electromagnetic Modeling and Inversion Consortium. His research interests include electromagnetic modeling and inversion and its application for oil exploration, mineral exploration, and environmental and engineering problems.

Dr. Glenn Wilson held a short-term postdoctoral research fellowship at Griffith University working with BHP Billiton Minerals, before accepting his current postdoctoral research associate position under Dr. Michael Zhdanov in the Consortium for Electromagnetic Modeling and Inversion.

Dr. Jianhua Yu is a research scientist in the Utah Tomography and Modeling/Migration group. He is currently working on advanced imaging methods, and is an invited speaker at the 2003 SEG workshop on 3D VSP imaging.

Annual Awards Luncheon

This past April, our department's annual awards luncheon was held as an informal picnic on the lawn outside the Alumni House at the University. Burgers, hotdogs and chocolate brownies (a typical geologist's lunch!) were the fare of the day, and many attendees received miscellaneous field items as door prizes.

As usual, a large number of students, faculty and staff were honored in various ways. **Dr. Jerry Schuster** received the Outstanding Faculty Teaching Award, and **Dr. Michael Zhdanov** received the Distinguished Faculty Research Award. The department's Outstanding Teaching Assistant Award went to **Eli Ludwig**, who has now left us for a job with CH2MHill in the San Francisco area. The Outstanding Masters Student Award went to **Bucky Gates**, who is continuing his dinosaur research in our department as a Ph.D. candidate. The Outstanding Ph.D. Student Award went to **Ann Mattson**, who is doing post-doctoral research on a project with Dr. Ron Bruhn and Dr. Jerry Schuster while living in Jackson, Wyoming. The Outstanding Undergraduate Geology Major was **Bradley Diderickson**, who has now begun graduate study at the University of Kansas. The Outstanding Undergraduate Geophysics Major was **Melissa Masbruch**, who has now begun graduate study at the University of Wisconsin. The Outstanding Undergraduate Geological Engineering Major was **Andrew Burr**, who is now working in the Salt Lake City area.



AAPG Student Chapter fund-raising silent auction.

Guy F. Atkinson Distinguished Lecture Series

This long-standing and popular lecture series continues to present engaging and challenging topics. Once again, we are fortunate to be able to present a diverse array of speakers who this year will address problems from hydrology, to structural and sedimentary geology, to seismology, and to petroleum and mining engineering. Other speakers will ask us to synthesize our knowledge and think on the global scale.

We encourage students, faculty and others in the earth-science related community to attend. The lectures are usually held at four o'clock on Thursday afternoons. An informal gathering, held half an hour before the talks, gives attendees a chance to meet the speaker. However, because of various conflicts some talks may be held at other times and places. If you would like a schedule and location, you can either call the department or send an e-mail query to jbollis@mines.utah.edu.

The agenda for Fall 2003 includes:

- Jean Bahr**, University of Wisconsin-Madison, Birdsall-Dreiss Distinguished Lecturer, "Groundwater as an Ecosystem Resource"
- Ronald Bruhn**, University of Utah, Geology and Geophysics, "Neotectonics of Southern Alaska: Consequences of Global Plate Motion, Terrane Collision and Climate"
- Steven Schamel**, University of Utah, Chemical and Fuels Engineering, "Strategies for Optimal Enhanced Recovery of Heavy Oil by Thermal Methods, Midway-Sunset Field, Southern San Joaquin Basin, California"
- Ann Mattson**, University of Utah, Geology and Geophysics, "Beneath the Trench: High-Resolution Seismic Tomograms and Sediment Cores Applied to Paleoseismology, Mercur, Utah"
- Greg Schlenker**, Kleinfelder, Salt Lake City, Utah, "Issues and Responses in Engineering Geology and Geotechnical Engineering for Natural Gas Pipeline Construction in the Middle Rock Mountains"
- Michael Dorais**, Brigham Young University, "The Petrogenesis and Emplacement of the New Hampshire Plutonic Suite"
- Jack Schmidt**, Utah State University, "Physical and Ecological Changes of the Colorado River Caused by Water Development: A Mandate for Restoration?"
- J. Janine Helmich**, AAPG Visiting Geologist, Marathon, (Title not yet supplied)
- Linda Bonnell**, Geocosm LLC, Austin, Texas, AAPG Distinguished Lecturer, "Sealed, Bridged or Open - A New Theory of Quartz Cementation in Fractures"
- Paul Hoffman**, Harvard University, "Oases on Snowball Earth: Confluence of Geophysical Models and Geological Observations"

Frontiers of Science Lectures Expanded

The College of Mines and Earth Sciences and the College of Science have combined their resources to expand the Frontiers of Science (FOS) Lectures, a series of presentations from distinguished scientists, that cover a wide range of topics. Of the five lectures offered this year, earth scientists should find those by Paul F. Hoffman and Peter B. deMenocal particularly interesting.

The lectures are held in the Skaggs Biology auditorium at 7:30 PM and are offered without charge to the general public. The complete schedule is as follows:

Wednesday, October 8, 2003

Gary Horowitz, U.C. Santa Barbara

"Strange Views of Space and Time: From Einstein to String Theory"

Wednesday, December 3, 2003

Paul F. Hoffman, Harvard University

"Snowball Earth: Testing the Limits of Global Climate Change"

Wednesday, January 28, 2004

Bruce N. Ames, U.C. Berkeley

"The Metabolic Tune-up: Delaying Aging and Optimizing Health"

Wednesday, February 18, 2004

Peter B. de Menocal, Columbia University

"Climate Shifts and the Collapse of Ancient Urban Cultures"

Wednesday, March 10, 2004

Christopher R. Johnson, University of Utah

"Computing the Future of Biomedicine"

Dr. Kip Solomon represents the College of Mines on the FOS committee, and he welcomes suggestions for future speakers.



Dr. Jerry Schuster (second from left) and students examine signal and image processing.

Faculty Focus

Scott Sampson – Treading Where Dinosaurs Trod

Dr. Scott Sampson wonders a lot about what made the dinosaurs the way they were. For example: What were the ecological factors – the living conditions – during the Mesozoic that allowed them to become so big and to diversify so broadly? And why had so many of their species begun to die off near the end of the Cretaceous, just a few million years before that meteor delivered its coup de grace? Scott, a native of Vancouver, Canada with a Ph.D. from the University of Toronto, was already fully

focused on dinosaurs in 1999, when the Utah Museum of Natural History approached him about a joint appointment divided between the Museum and the Department of Geology and Geophysics. It was an exciting offer and the timing was right, too. Establishment of Grand Staircase – Escalante National Monument had focused attention on Southern Utah's vast, unexplored fossil potential. Due to the rugged nature of the terrane, this was the last area in the lower forty-eight states to be formally mapped. It is proving to be one of the last regions in the country for the discovery of new dinosaurs and other vertebrates from the Late Cretaceous. In the past four years, University of Utah crews have recovered the remains of perhaps five new kinds of dinosaurs alone, all of which are currently under study. One of these is a huge horned relative of *Triceratops*, with eye horns that project to the side, as in bison, instead of forward, as in other horned dinosaurs.

In the past four years Scott has built a program that will help define what the world was like in North America during the Late Cretaceous. He currently has four enthusiastic graduate students – Mark Loewen, Terry “Bucky” Gates, Lindsay Zanno, and Josh Smith – all of whom are working on Utah-based projects. He has received considerable financial support from the Bureau of Land Management, the National Science Foundation, the National Geographic Society, and the Discovery Channel. His point of view is part evolutionist and part paleoecologist, a perspective that requires a multi-disciplinary approach, involving sedimentologists, taphonomists, paleobotanists and geochemists. With the aid of Mike Getty, Scott's coordinator for field activities, he has reached out to the local community for volunteers; over fifty are now contributing to



Graduate student Lindsay Zanno (front left) shows paleontological volunteers how to dig up a dinosaur.

various aspects of the program, from digging up specimens out in the field, to laboring in the laboratory cleaning and stabilizing fossils, to working in the collections, curating and storing the prepared specimens. Altogether, they are helping to build a coherent story of life in the Mesozoic of Utah. A new exhibit at the Museum of Natural History, "Dino Tales", showcases the enormous amount of work they have done. (See related story).

But Scott's interests extend well beyond Utah. This summer he was supposed to go back for a fifth season in Madagascar, also in search of Late Cretaceous dinosaurs. This project has been very successful, yielding a diverse fauna that has played a pivotal role in our understanding of Gondwanan fragmentation and its biotic impact, but he sent others instead. There was simply too much to do here, advising students, teaching vertebrate paleontology and preparing a new book, tentatively titled "Fossil Threads: Dinosaurs in the Web of Life." He observes that dinosaurs are a wonderful tool for involving nonprofessional people in the problems of extinction, global warming and genetic change, with all their serious implications for contemporary life on earth.

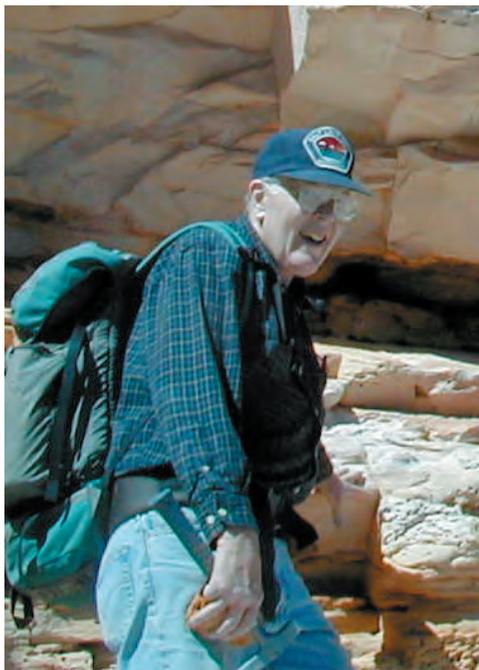
Two years ago, with support from the National Geographic Society, Scott began a multi-disciplinary project in the Chihuahuan Desert near Saltillo, Mexico, involving researchers from Mexico and Canada, as well as the U.S. The geographic area, like southern Utah, represents a "knowledge gap" with respect to the Late Cretaceous. At that time it was the southernmost part of North America, comparable to what South Africa's Cape of Good Hope is today. Violent storms raged around it, and the team has found abundant dinosaur remains chaotically intermixed with shelly marine fauna, suggestive of hurricane-induced mass death events. For the paleontologist, it presents an irresistible challenge. Without doubt, Scott's diverse projects, addressing large scale patterns of ecology and evolution, will keep him busy for many years, maybe a lifetime.

Bill Parry Retires – Sort Of

Bill Parry may have to shove aside a sack of rocks and dust off a chair for you. It doesn't look like the office of someone in retirement. He will assure you, though, that some things have indeed changed. A new interest, fly fishing in the cold, serenely beautiful streams of the Mountain West, challenges and engrosses him. It's fun to talk with him about memorable moments in a long and productive career as a clay mineralogist and geochemist. His ability to entertain both colleagues and students is legendary, but he says modestly, "Stories? Oh, I don't think so. I've never been one for anecdotes." Yet you will be quickly engrossed by perceptive and germane vignettes from this rich and varied career.

Raised in the small rural community of Manti, Utah, Bill had no prospects for a university career, though he grew up a voracious reader who by the end of high school already loved chemistry and physics. A perceptive high school principal urged him to go up to the University of Utah in the spring of

1953 to take an examination for a scholarship offered by U.S. Smelting, Mining, and Refining Company. Later that summer, he remembers looking down from a high roof where he was working construction to see his mother crossing the lawn toward him, nearly running. A staid English teacher, this was quite out of her character.



Dr. William Parry

It was the best of news. She'd just received a phone call telling her that her son had won the competition. He had two choices for a major: either geological engineering or metallurgical engineering. He says, "What did I know about anything? What was geology? What was metallurgy?" Mostly because he liked the mountains and being outdoors, he chose the geology side. He received his B.S. in 1957, stayed to earn an M.S. in 1959, and was awarded a Ph.D. in geological engineering in 1961. Not the time frame we see these days, we both observed.

He then spent two years with Shell Oil Company, participating in the development of known oil fields in west Texas where the towns bear evocative names like Levelland, Plainview and No Trees. Soon realizing this wasn't how he wanted to spend his professional life, he took a faculty position teaching geology, clay mineralogy, and geochemistry at Texas Tech in Lubbock. Here was born his love of teaching and enjoyment of students. All his life, he said, he's liked students for their fresh intellects, energy and enthusiasm – and the fact that they were often smarter than he was. "As a matter of fact," he grinned, "I've liked my colleagues the same way."

In 1967 Bill was invited to return to the University of Utah, this time as a member of the faculty. When he first arrived, he didn't feel warmly welcomed, to say the least. He had to cajole even an office, then go out and buy his own desk. He had to fight for lab space. His long term observation is

that a university is not the collegial enterprise one expects but rather a collection of independent entrepreneurs, each jostling to further his or her own interests. Yet finally, his own greatest professional satisfaction has come from the many collaborations he has enjoyed with his colleagues. What he likes the most is formulating a question and then figuring out how to find the solution. He thinks of himself as a lab man, chuckling, "I really don't know anything about field work. I pick up rocks, but I keep forgetting to take strikes and dips and photographs." The moments of personal recognition he has found the most memorable seem to have been unexpected, low-key accolades such as that from a distinguished and extremely picky geochemist, "This is the best data set I've ever seen." And after Bill had finished giving a particular seminar, the Dean who had approved his appointment twenty years before approached him to say, "I wondered whether I'd done the right thing hiring you. I am sure now that I did." We can all agree.

Long-time "Hard Rock" Faculty Member Dies

Dr. James A. Whelan, who deeply influenced students of this department for nearly forty years, died this past April 2003. He came to the University of Utah in 1959 with a brand-new Ph.D. from the University of Minnesota to teach economic and mining geology. He had served in the Navy in World War II and, as for many of his generation, the GI Bill was his passage out of an Iowa farming community and into the burgeoning technological world. That unprecedented opportunity changed his life and always remained large in his memory.

Jim was the quintessential "hard rocker". His office was piled with rocks, mostly colorful ones, all over and under desk and tables, spilling off shelves, in dusty little heaps you had to step over, and a haze of smoke from his omnipresent pipe hung above it all. A long line of yellow oilcloth-covered field notebooks stood neatly on one shelf, meticulously recording a lifetime spent in the field, much of it in mining engineering. He loved everything about minerals, from their sheer mass to the tug of war between their atoms, and especially where they were found. Show him a hole in the ground and he could hardly keep out of it. Above all, he appreciated students, providing patient encouragement even to those who were not spectacularly gifted because he believed that everyone should be able to spend their lives at a job that they truly enjoyed, especially if it was geology.

The Navy remained an important part of his life; he belonged to the Naval Reserve for thirty years, commanding a Seabee unit whose reputation as seat-of-the-pants engineers he cherished. Over the years he took occasional leaves from the department to serve the Navy, importantly at China Lake, California, where his expertise in both engineering and brine chemistry contributed to the Navy's effort to harness the geothermal reserves there, and enabled him to bring back leading-edge technology to our department.

Departmental Field Trips

Students Affirm Uniformitarianism in Mexico

On perhaps the very first day of their first class in geology, geology majors are instructed that “the present is the key to the past”. Though the Principle of Uniformitarianism is scarcely controversial any more, geology students today should be encouraged to test the validity of this axiom of Earth science firsthand. In September of this year, Dr. Tony Ekdale’s paleoecology class set out on a field trip to Mexico to do just that.

The students visited the northern Gulf of California in the vicinity of Puerto Penasco, Sonora, where they spent a week working in association with the Intercultural Center for the Study of Deserts and Oceans (CEDO), a multi-national research station. For nearly thirty years Dr. Ekdale has been leading students here on the only regularly scheduled field trip to a modern marine depositional environment offered by this department.

One could not ask for a more ideal field laboratory to see the present reflected in the past. The coastline here is a macrotidal realm with a tidal range that exceeds eight meters, thus exposing an extensive tract of the intertidal zone during daily tidal cycles. The area introduces students to high-energy and low-energy beaches, sandy and muddy tidal flats, open and restricted salt marshes, rocky intertidal pools in limestone, granite and basalt, and coastal dune fields with varying degrees of vegetative cover. Each of these settings serves as a distinct habitat for diverse communities dominated by gastropods, pelecypods, crustaceans and echinoderms. Late Pleistocene outcrops



Brian Baziak, Gracie Reitz and Chris Busch stand on billions of snails at Cholla Bay, with Cerro Prieto volcano in the background.

in the same area contain abundant fossils of the same species that inhabit the area today, so direct inferences can be drawn between the modern organism communities and fossil assemblages, and between the modern sediments and ancient strata. While in principle it should be very simple and straightforward to interpret ancient environments in this setting, the students learn quickly that

such interpretations are not so easy as they expected. They find that the taphonomic overprint affecting the fossil assemblages is significant, and that sedimentary sequences look quite different in vertical section in an outcrop than they do when you walk across the unconsolidated sediment surface in your tennis shoes!



Chris Busch compares modern sand dunes to Pleistocene eolian paleoenvironments.

This year, strong winds created spectacular situations where students could observe what happens to shells in high-energy erosional and depositional settings. Upon being tossed around by five to six foot waves and being pulled along the sea floor by strong longshore currents, Gracie Reitz remarked, “No sedimentary geologist can properly appreciate the depositional process until experiencing the feeling of being a helpless sedimentary particle firsthand!” While noting the bewildering variety of sedimentary structures, animal traces and bed forms that occur juxtaposed on a tidal flat, Chris Busch declared, “Everything you hear in a sedimentology lecture or read in a textbook does not come close to preparing you for the amazing complexity you encounter when visiting a modern beach and tidal flat in person!”

Class members collected dozens of species of mollusks and other marine organisms for their own collections, and a few exceptional specimens made it back to campus to be accessioned into the department’s paleoecology research collection. Some species are especially well-represented because of their superabundance on the Puerto Penasco tidal flats. While standing in the middle of Cholla Bay at low tide, surrounded by billions of the small mud snail *Cerithium stercusmuscarum* (whose name literally means “snail covered with the excrement of flies”), Brian Baziak screamed, “I’ve seen enough - I hope I never have to look upon another *Cerithium stercusmuscarum* as long as I live!” At the conclusion of the week’s endeavors, Leif Tapanila gazed pensively out toward the azure Sea of Cortez and sagely concluded, “Indeed, the present *is* the key to the past!”

Geology Field Camp, Summer, 2003

“Any weather is mapping weather,” proclaimed student Heidi Ellefson, knee-deep in a snowdrift, Brunton compass in hand. The Summer field geology class got off to a wintry start last May in the Hurricane Cliffs of southern Utah, where the class awoke several mornings to freshly fallen snow. Fortified by huge bowls of steaming oatmeal, senior geology and geological engineering majors, joined by



Dr. David Dinter (center) introduces the 2003 field camp class to field geology in the Raft River Range.

two intrepid geophysicists, mapped strata and structures exposed in Parowan Gap, an antecedent stream valley bisecting the Red Hills at the eastern margin of the Sevier fold-and-thrust belt. Late-stage thrusts, as young as Eocene in this area, deform a foreland basin including oncologic marine sandstone, fluvial deposits containing dinosaur tracks and bones, and impressively thick sheets of boulder conglomerate.

“That’s the most fantastic thing I’ve ever seen,” asserted James Pearce, sitting on a quartzite outcrop at 8000 feet and staring across Quaking Aspen Creek at an Alpine-scale recumbent fold exposed for 20 kilometers along strike on the south flank of the Raft River Range in Utah’s northwest corner. For their second project, students mapped brittle hanging-wall structures and ductile footwall fabrics associated with the Miocene extensional exhumation of the Raft River metamorphic core complex. In footwall mylonites, they observed stretching lineations, mica and hornblende fish, shear bands, asymmetric porphyroclast tails, and S-C fabrics to determine the sense of shear on the Raft River detachment system.

Summer Field Camp provides earth science majors the opportunity to hone their field and technical writing skills to a professional level. They integrate expertise in structural geology, petrology, stratigraphy, geochemistry, and engineering geology to address challenging mapping problems, and present their data and conclusions in journal-format reports. Instructor Dr. David Dinter was assisted this year by co-instructors Dr. David Applegate

(American Geological Institute and Johns Hopkins University) and Meg Coleman (University of Southern Maine). The course is intellectually and physically demanding, but the mountains are beautiful, the food is great (“Better than I eat at home!” exclaimed Dustin Christianson), and the work is stimulating and fun. “I wish I could have mapped all summer,” said Andrew Haynes—a sentiment echoed by many.

Epithermal Gold Deposits in Nevada

Dr. Erich Petersen, together with Dr. William X. Chavez from New Mexico Tech and Dr. Jeff Hedenquist of the Colorado School of Mines organized a Society of Economic Geologists (SEG)-sponsored short course on the field characteristics of epithermal gold deposits in the Goldfield and Bullfrog Districts, Nevada. Jenny Szabo and Junyoung Sung, graduate students in economic geology, participated as student assistants.

A field trip to classic high-sulfidation and low-sulfidation epithermal gold deposits in Nevada was an integral part of the course. University of Utah SEG student chapter members Jenny Szabo, Xiwen Sun, Jason Babcock, Hector Suarez, Anthony Lowe, Cassidy Macallister were joined at Tonopah, Nevada by nine members of the New Mexico Tech SEG student chapter. In all, twenty-two participants from industry, academia and government representing the United States, Canada, Ivory Coast, Peru, Australia, and El Salvador attended.

Goldfield is an example of a high-sulfidation epithermal system. At the Cuprite Hills, participants compared (AVRIS) Airborne Visible/Infrared Imaging Spectrometer satellite data with their own visual observations and measurements made with an ASD spectrometer. The



Course participants examine samples of epithermal deposits worldwide in the U of U collection in the Rhyolite (ghost town) jail.

Cuprite Hills have been the focus of U.S. Geological Survey efforts in remote sensing of rock alteration characteristics and a testing ground for new remote sensing devices. Geologist Bob Bennett gave an excellent tour of the “ledges”, as silicified and sometimes mineralized outcrops are called. Outstanding examples of advanced argillic (diaspore, pyrophyllite, alunite), argillic (dickite, kaolinite) and phyllic (sericitic) alteration are exposed in the district.

By contrast, Bullfrog is a low-sulfidation epithermal deposit. At the original Bullfrog mine the group collected abundant visible gold from pay streaks where chalcocite and pyrite had oxidized to iron oxides and chrysocolla.

At Round Mountain, Craig Pickins showed participants outstanding examples of “nugget” gold in an otherwise low-grade gold system.

Sedimentology and Stratigraphy Class Visits Eastern Utah

The sedimentology and stratigraphy class with Dr. Margie Chan and teaching assistant Siang Lim, took advantage of the warm fall weather to head to Price, Utah on September 21, 2003. Armed with field gear, notebooks, measuring staffs, and the all-important lunch, students examined Cretaceous clastic facies and relaxed by the beach – the Blackhawk beach, that is – underlying the coal.

Environmental Geochemistry in the Field - in Spain and Portugal

In May the Society of Economic Geologists sponsored a field course in Environmental Geochemistry lead by Drs. Erich Petersen, William X. Chavez (New Mexico Tech) and João Matos (Instituto Geológico e Minero). Participants from six countries examined historic mining districts in the Iberian Pyrite Belt of Portugal and Spain for ten days. In the well-known Rio Tinto District participants appreciated the parallels between long-term supergene enrichment and very short-term ARD production and consequent metals transport. In the Sao Domingos district, industry and government are working together to simultaneously identify historically impacted sites, restore known mining sites with innovative approaches, and promote mining of resources in an environmentally responsible manner. Part of the effort involves a service component where interactive and research museums are being planned that will provide the public with an understanding of the historical importance of this region. Throughout the pyrite belt, pyrite-rich tailings are being evaluated for their gold potential. Underground visits at Aljustrel provided a unique three-dimensional view of the hydrologic system where melanterite, römerite, and chalcantite are being actively precipitated in open spaces. Acid waters bubble to the surface along faults. At Aguas Teñidas the group visited a small water plant that efficiently converted metal-laden, low-pH mine waters into clear, near neutral-pH water suitable for discharge and local irrigation projects.



Back, left to right: Jim Saunders, Ralph A. Gonzalez, David Burney, João X. Matos, Erich U. Petersen; Front, left to right: Jason Odette, Veronica Garcia, William X. Chavez, Petr Rambousek

Student News

Graduation Exercises 2003

The University of Utah Commencement Ceremony and College of Mines and Earth Sciences convocation for the Class of 2003 were held on May 2, 2003. At the University Commencement, the address was delivered by Terry Tempest Williams, nationally acclaimed author of books and essays on environmental issues in the West, and our own Dr. Craig Forster was singled out by the University to be honored as the Lowell Bennion Public Service Professor. At the College convocation, Dr. Scott Sampson was presented with the Outstanding Faculty Teaching Award for the College. It was a bright, sunny day for the joyful occasion, and the orchestra “Kairo by Night” provided festive music. Following the Convocation, participants in the ceremonies and their guests were invited to socialize and enjoy a picnic lunch on the plaza outside the Fine Arts Auditorium.

Members of the Class of 2003 who received graduate degrees in our department include the following:

- Julie Bernier**, M.S., Geology, “Stratigraphy and Sedimentology of the Tidwell Member, Upper Jurassic Morrison Formation, East-Central, Utah”
- Alexey Chernyavskiy**, M.S., Geophysics, “Application of the Spectral Lanczos Decomposition Method for Three-Dimensional Inversion of Helicopter-Borne Electromagnetic Data”
- Patrick Gathogo**, M.S., Geology, “Stratigraphy and Paleoenvironments of the Koobi Fora Formation of the Ileret Area, Northern Kenya”

David Handwerger, Ph.D., Geophysics, "Core- and Log-based Geophysical Methods for Investigating Neogene Deposition on Continental Margins of the Southern Ocean"

Scott Hynek, M.S., Geology, "Middle Eocene Depositional Systems of Western Wyoming"

Ann Mattson, Ph.D., Geology, "Temporal and Spatial Patterns of Normal Faults: Determined by geomorphic, geological, and Geophysical Techniques, Eastern Great Basin, Utah"

Salah Mehanee, Ph.D., Geophysics, "Multidimensional Finite Difference Electromagnetic Modeling and Inversion Based on the Balance Method"

Anne Parry, M.S., Environmental Engineering, "Passive Venting at Utah Test and Training Range- North, Utah"

Scott Putnam, Ph.D., Geophysics, "Analysis of Air and Ground Temperatures for Detecting Climate Change"

Imam Raharjo, M.S., Geophysics, "Magnetotelluric Interpretation of the Karaha Telaga Bodas Geothermal System, Indonesia"

Jenny Reinman, M.E., Environmental Engineering, "Systems Thinking Approach to Environmental Remediation Modeling"

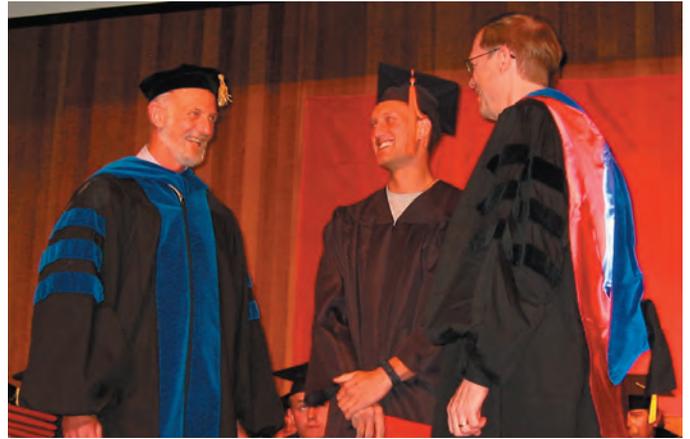
Andrew Rupke, M.S., Geology, "Analysis of Wall-Rock Structures Adjacent to the Silver Zone Pass, Pluto, Nevada"

Timothy Sodergren, Jr., M.S., Geophysics, "Deep Fluid State and Thermal Regime of the Central Great Basin, Nevada, Inferred from Electrical Resistivity"

James Weigel, M.S., Geological Engineering, "Fault and Fracture Control on Fluid Flow: Implications for Intrabasinal Flow"

Members of the Class of 2003 who received baccalaureate degrees in our department include the following:

Trent Bay (B.S., Geological Engineering)
Elizabeth Berg (B.S., Geophysics)
Andrew Burr (B.S., Geological Engineering)
Chelsea Christiansen (B.S., Geophysics)
Dustin Christianson (B.S., Geology)
Christopher DeKorver (B.S., Geological Engineering)
Bradley Didericksen (B.S., Geology)
Stephanie Earls (B.S., Geology)
Heidi Ellefson (B.S., Environmental Earth Science)
Andrew Johnston (B.S., Geological Engineering)
Robyn Kurz (B.S., Geology)
Melissa Masbruch (B.S., Geology, B.S., Geophysics)
Bradley Murray (B.S., Geological Engineering)
Douglas Schmitt (B.S., Geology)
Jennifer Swift (B.S., Geology)



Dean Frank Brown, Andrew Burr, and Paul Brinkman (Associate V.P. for Academic Affairs) at Convocation.

Students Present Papers at National Meetings

Marshall Bartlett, David Chapman, and Robert Harris, "Mapping uncertainty in the borehole method of climate reconstruction", AGU Annual Meeting, 2002.

Marshall Bartlett, David Chapman, and Robert Harris, "Toward reconciling climate change reconstructions from borehole temperatures and proxy data: the role of snow", IUGG Meeting, Sapporo Japan, 2003.

Marshall Bartlett, Scott Putnam, David Chapman, and Robert Harris, "Emigrant Pass Observatory - Insights on air and ground temperature tracking", AGU Annual Meeting, 2003.

Brenda Beitler, Marjorie Chan, and William Parry, "Field mapping and multispectral analysis of Jurassic Navajo Sandstone color and iron mineralization, Grand Staircase- Escalante National Monument, Utah", GSA Annual Meeting, 2002.

Brenda Beitler, Marjorie Chan, and William Parry, "Paleo-reservoir characteristics and diagenetic bleaching in the Jurassic Navajo Sandstone, Southern Utah", AAPG Annual Meeting, 2003.

Brian Bollin and Susan Halgedahl, "Bitter Patterns on Glass-Ceramic Magnetite: Links Among LEM States, Saturation Remanence, and Demagnetization Processes", AGU Annual Meeting, 2003.

Maike Buddensiek, Gerard Schuster, and Ronald Bruhn, "Colluvial Wedge Study at the Provo Segment of the Wasatch Fault Zone", AGU Annual Meeting, 2003.

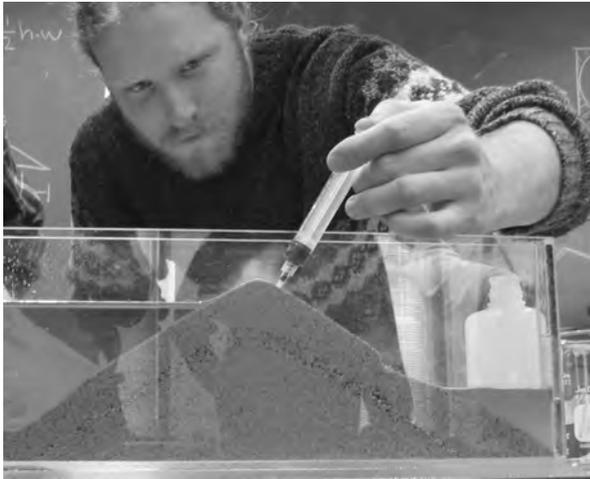
Lorraine Chadwell and John Bowman, "Textural aspects of forsterite in the Alta Aureole, Utah", GSA Annual Meeting, 2003.

Wu-Lung Chang and Robert Smith, "Rheology of an extending lithosphere from postseismic deformation of large Basin-Range normal-faulting earthquakes", AGU Annual Meeting, 2003.

Wu-Lung Chang, Robert Smith, and Charles Meertens, "Rheologic properties of an extending lithosphere from inversion of postseismic deformation (EDM and GPS) from the 1959 M 7.5 Hebgen Lake, Yellowstone earthquake", AGU Annual Meeting, 2002.

Chernyavskiy, Alexey, "Three-dimensional inversion of helicopter-borne electromagnetic data using the spectral Lanczos decomposition method", 72nd SEG Annual International Meeting, 2002.

Wesley Christensen, Gregory Roselle, and John Bowman, "High temperature (>600 oC) development of fracture permeability in the Alta stock, Utah: Constraints from thermal and isotopic evidence preserved in the Alta aureole", GSA Annual Meeting, 2002.



Graduate student Ben Passey demonstrates hydrologic properties of a dam model (see abstract "Dam Fun", GSA Seattle annual meeting, 2003).

Eric Cline and John Bartley, "Southern termination of the Wasatch fault localized by evaporite-cored Cretaceous anticline, Sevier Valley", GSA Annual Meeting, 2002.

Travis Crosby, Min Zhou, Scott Sampson, and Gerard Schuster, Workshop W-9: Near surface problems and solutions, "Imaging dinosaur fossils by seismic tomography and GPR", SEG Annual Meeting, 2002.

Bradley Didericksen and John Bartley, "Did kilometer-scale flow of interstitial melt erase evidence of incremental emplacement of the Alta stock?", GSA Annual Meeting, 2003.

Rose Difley, "Biostratigraphy of the Cretaceous North Horn Formation, Price Canyon, Carbon County, Utah", GSA Annual Meeting, 2002.

Rose Difley, "Biostratigraphy of the Late Cretaceous (Maastrichtian) North Horn Formation at Trail Mountain, Emery County, Utah", GSA Annual Meeting, 2003.

Jamie Farrell, Robert Smith, Harley Benz, Kristine Pankow, and Stephan Husen, "Amplified ground response across the Western U.S. Interior from the M7.9 Denali Earthquake", AGU Annual Meeting, 2002.

Jamie Farrell, Gregory Waite, Robert Smith, Christine Puskas, H. Heasler, B. Bartel, and C. Dietel, "Seismic and GPS monitoring of the 2003 Norris Geyser Basin hydrothermal disturbance", AGU Annual Meeting, 2003.

Alisa Felton, Paul Jewell, Donald Currey, and Marjorie Chan, "Depositional models for tufa development in Pleistocene Lake Bonneville, Utah", GSA Annual Meeting, 2002.

Terry Gates, Eric Roberts, and R. Rogers, "Drought in the vertebrate fossil record: A review of fossil and modern drought-related assemblages", Society of Vertebrate

Paleontology Annual Meeting, 2003.

Paul Gettings, Robert Harris, Richard Allis, and David Chapman, "Repeated high-precision gravity and GPS measurement techniques", IUGG Meeting, Sapporo Japan, 2003.

Paul Gettings, Robert Harris, Richard Allis, and David Chapman, "Repeated high-precision gravity and GPS measurement techniques", AGU Annual Meeting, 2003.

Holly Godsey, Marjorie Chan, and Donald Currey, "Refining the record of Pleistocene lake level change, Lake Bonneville, Utah; Evidence of climate-driven oscillations from the Provo shorezone?", GSA Annual Meeting, 2002.

Alexander Gribenko, "Sensitivity analysis of tensor induction well logging in anisotropic media", 72nd SEG Annual International Meeting, 2002.

Alexander Gribenko, "Three-dimensional imaging about a single borehole", 72nd SEG Annual International Meeting, 2002.

Derrick Hasterok, David Chapman, and Robert Harris, "Contributions to the elevation of North America", AGU Annual Meeting, 2003.

Ruiqing He, "Least-squares migration of both primaries and multiples", SEG Annual Meeting, 2003.

Stephan Husen, Robert Smith, and Gregory Waite, "Shallow structure of the Yellowstone volcanic system from tomographic imaging: evidence for gas and magmatic sources", AGU Annual Meeting, 2002.

Zhiyong Jiang, and Gerard Schuster, "Target-oriented least squares migration," SEG Annual Meeting, 2003.

Xiqing Li, Pengfei Zhang, C. L. Lin, and William Johnson, "Role of hydrodynamic shear in colloid attachment and detachment during transport in porous media", American Chemical Society National Meeting, 2003.

Yike Liu, and Hongchuan Sun, "Least-squares wavepath migration", SEG Annual Meeting, 2002.

Mark Loewen, M. T. Carrano, and Scott Sampson, "Ontogenetic changes in hindlimb musculature and function of the Late Jurassic theropod *Allosaurus*", Society of Vertebrate Paleontology Annual Meeting, 2002.

Mark Loewen, Scott Sampson, M. Tarrant, and D. J. Chure, "Evolution of the Late Jurassic theropod *Allosaurus*", Society of Vertebrate Paleontology Annual Meeting, 2003.

Salah Mehaneh, "3-D finite difference iterative migration of the electromagnetic field", 72nd SEG Annual International Meeting, 2002.

Souvik Mukherjee, "Regularized inversion of 3-D gravity tensor data", 72nd SEG Annual International Meeting, 2002.

Benjamin Passey, Thure Cerling, and Marjorie Chan, "Dam Fun: Interactive teaching of sedimentological and hydrological principles using a see-through dam-reservoir model", GSA Annual Meeting, 2003.

Ertan Peksen, "Apparent resistivity correction for tensor induction well logging in a deviated well in an anisotropic medium", 72nd SEG Annual International Meeting, 2002.

- Ertan Peksen**, "Sharp Boundary Inversion of Tensor Induction Logging Data", SPWLA meeting, 2003.
- Christine Puskas, Robert Smith, and Charles Meertens**, "GPS-derived models of intraplate deformation of the Yellowstone Hotspot, AGU Annual Meeting, 2002.
- Eric Roberts**, Raymond Rogers, and Brady Foreman, "An experimental approach to identifying and interpreting Dermestid (Insecta, Coleoptera) bone modification", Society of Vertebrate Paleontology Annual Meeting, 2003.
- Eric Roberts, Marjorie Chan, and Scott Sampson**, "Taphonomic Analysis of the Late Cretaceous Kaiparowits Formation in the Grand Staircase-Escalante National Monument, Southern Utah", GSA Annual Meeting, 2003.
- Jianming Sheng, Kristine Pankow, Gerard Schuster**, and R. Nowack, "Coherence-weighted wavepath migration of teleseismic data", AGU Annual Meeting, 2003.
- Joshua Smith, Scott Sampson, and Mark Loewen**, "Trackway evidence of possible gregarious behavior from the Early Jurassic Moenave Formation, Zion National Park, Utah", Society of Vertebrate Paleontology Annual Meeting, 2002.
- Joshua Smith, Eric Roberts, Terry Gates**, M. Getty, and **Lindsay Zanno**, "Fossil vertebrates from the Kaiparowits Formation, Grand Staircase-Escalante National Monument: An important window into the Late Cretaceous of Utah", Society of Vertebrate Paleontology Annual Meeting, 2003.
- Jennifer Szabo, and Erich Petersen**, "Textural clues to the genesis of tourmaline in magmatic-hydrothermal systems. University of Utah, Department of Geology & Geophysics", GSA Annual Meeting, 2003.
- Leif Tapanila and Robert Lamond**, "Fossil record of embedding organisms in biogenic substrates: examples from Quebec and Wyoming," GSA Annual Meeting, 2002.
- Leif Tapanila, Eric Roberts**, and Maureen O'Leary, "Phosphate-mediated taphonomy: A concentrated bone and bioeroded coprolite bed from the Maastrichtian of Mali": Society of Vertebrate Paleontology Annual Meeting, 2003.
- Gregory Waite**, Shutt, D, and **Robert Smith**, 2002, "Shear-wave anisotropy at the Yellowstone Hotspot", AGU Annual Meeting.
- Waite, Gregory, Robert Smith, Christine Puskas**, D.L. Shutt, and Richard Allen, "Kinematics of the Yellowstone hotspot derived from seismic anisotropy, tomography and GPS", European Geophysical Society, 2003.
- Ken Yoshioka**, "3-D inversion of the bipole-bipole array induced polarization data", 72nd SEG Annual International Meeting, 2002.
- Ken Yoshioka**, "Three-dimensional cross-well electromagnetic imaging based on the LQL approximations", ASEG Annual International Meeting, 2003.
- Jianhua Yu, and Hu, Jianxing**, 2003, "Prestack MD+AVO inversion", SEG Annual Meeting.

- Jianhua Yu, Hu, Jianxing, Gerard Schuster, and Robert Estill**, "3-D prestack migration deconvolution," SEG Annual Meeting, 2003.
- Jianhua Yu, Jiang, Zhiyong, and Gerard Schuster**, "Migration of VSP Multiples to Increase the Area of Subsurface Illumination," SEG Annual Meeting, 2003.
- Lindsay Zanno, and Scott Sampson**, "A new caenagnathid from the Upper Cretaceous Kaiparowits Formation, Grand Staircase-Escalante National Monument, Utah", Society of Vertebrate Paleontology Annual Meeting, 2003.
- Min Zhou, and Gerard Schuster**, "Wave-equation wavefront migration", SEG Annual Meeting, 2002.
- Min Zhou, Hongchuan Sun, and Gerard Schuster**, "The application of primary-only imaging condition to SMAART data", SEG Annual Meeting, 2003.

Marta Sutton Weeks Honors Father with Gift to Mines and Earth Sciences

Some of you have asked about the person who donated so generously for our new building. Why did she do it, and what is she like? Here are some thoughts she shared with the College at the time she proposed this gift.

Reverend Marta Sutton Weeks quotes her mother and grandmother when she says that "dollars are round, and they're meant to roll." She continues, "One can roll money in all kinds of directions. I guess because education has always been important in my family, we've tended to roll some of ours that direction." Her generous gift for a new teaching and research building for the University's College of Mines and Earth Sciences carries on that family tradition.



Dean Frank Brown, Rev. Marta Weeks, Dr. Marjorie Chan

She has made this gift in the name of her father, Frederick A. Sutton, who died suddenly when she was only 19 years old. "I do this to honor his memory," she says. "He would be pleased with this gift to his school. I never had a chance to say goodbye to him, or to thank him for all the happy times we had." His daughter remembers him as a warm man, full of humor, who cared about his family, his friends, and the company for whom he worked.

Frederick Sutton, a native of Salt Lake City, received his engineering degree from the University of Utah in 1917 and was representative of the field geologists of the 1920s, '30s, and '40s. Following World War I, he began a career in oil exploration. When the Great Depression made it difficult to find work in the United States, he spent many years in South America, China, and Tibet, seeing his family only once very two to three years. In those days, field geologists did their work on foot and under very difficult conditions. Says Reverend Weeks, "He often had to slog and hack his way through the jungles to get where he was going." Her father became an authority in the 1940s on oil production in Venezuela's extensive Maracaibo basin.

Her personal interest in geology extends even deeper since her husband, Austin, was a research geologist, also in the oil business. He worked for General Petroleum (Mobil), serving on research ships in the Antarctic and the Caribbean, and was chief scientist for expeditions to the Andaman Islands for the International Indian Ocean Expedition.

Reverend Weeks also acknowledges the role of her father-in-law, Lewis George Weeks. "It is because of his generosity to me that I am able to make this gift to the University of Utah," she says.

Reverend Weeks resides principally in Florida where she is an Episcopal priest-at-large in the Diocese of Southeast Florida. A graduate of Stanford University, she actively supports a variety of educational pursuits. One role is that of a trustee of the University of Miami, where she chairs the Student Affairs Committee.

But her ties to Utah remain strong, as shown by her gift. A graduate of St. Mary-of-the-Wasatch Academy in Salt Lake City, Reverend Weeks visits the Salt Lake area often, maintaining a home here and growing a summer garden when possible. It comes as no surprise then that she rolls her vegetables – of all shapes – even as she rolls her dollars: she donates them to a local welfare kitchen.

Study and Research Struggle On in the Old Mines Building

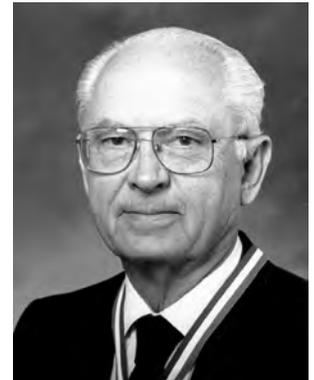
While we are waiting for a new building to take us through the next century, we are still making do in the old Mines Building. Curator Quintin Sahratian went on a major spring cleaning binge and with his team of hard workers got some large spaces on the second floor cleared out and rewired so we could have an expanded laboratory space for sedimentary classes. It is hard to believe what a big improvement this is, even though it still has its limitations. We thought you'd like a sampling from our pictures of the amazing conditions under which we are trying to work.



The fresh look of a classroom in the old Mines Building.

Lehi Hintze Honored with Award

In October, the Utah Geological Survey (UGS) and the Utah Geological Association (UGA) inaugurated a new award, to be called the Lehi Hintze Award for Outstanding Contributions to the Geology of Utah. The initial recipient will be Lehi Hintze himself.



Dr. Lehi Hintze

Lehi Hintze has spent a lifetime committed to studying, mapping, writing and teaching about the geology of Utah.

He is professor emeritus of geology at Brigham Young University, holding an undergraduate degree from the University of Utah (B.A. 1941) and a doctorate from Columbia University. After spending 37 years as a faculty member of Brigham Young University, he spent close to ten years working for the Utah Geological Survey (UGS), and in retirement has continued to work on Utah's geology.

In subsequent years, the award will be made annually to one person. The awardee can be from academia, government, the private sector or the general public. The award process will be facilitated by the UGS and the UGA; additional information about the nomination and selection process for this award will be posted on their websites.

Alumni News

Old Friends Greet Each Other at AAPG Meeting

At the Utah alumni party held during the May AAPG meeting in Salt Lake City, quite a number of our graduates and old friends dropped by to say hello. They were:

Grant Anderson, Unocal (Thailand Division) in Sugarland, Texas
Bryan Bracken, ChevronTexaco in San Ramon, California
Marc Croes, Kingwood, Texas
Brad Diderickson, West Valley City, Utah
David Fowler, Bakersfield, California
David R. Friz, Stantec Consulting Inc. in Salt Lake City, Utah
Robert Garvin, Englewood, Colorado
David Handwerker, Salt Lake City, Utah
Jim Hollis, LMK Graphics in Houston, Texas
Greg Lord, Geosystems in Kingwood Texas
Paul Matheny, Questar Exploration in Denver, Colorado
Lynn Peyton, Coal Creek Resources in Lakewood, Colorado
Bonnie Pruitt, Salt Lake City, Utah
H. Roice Nelson, Jr., in Houston, Texas
Bob Krantz, Conoco Phillips in Cypress, Texas
Bill Tafuri, Park City, Utah
Art Trevena, Unocal in Sugarland, Texas
Tammy Wambeam, Salt Lake City, Utah
Randy White, Sinclair Oil in Salt Lake City, Utah
Patrick Winkler, Equity Oil in Denver, Colorado



Dr. Duke Picard (center) with former students Art Trevena (left) and Greg Lord (right) at AAPG, May 2003.

Current faculty and students who attended were:

Dean Frank Brown
 Department Chair **Margie Chan**
Dr. Tony Ekdale
Dr. Cari Johnson

Dr. M. Dane (Duke) Picard (emeritus)
Dr. Bob Smith
Jessica and Riyad Ali-Adeeb
Brad Diderickson
Patrick Gathogo
Greg Lord, Houston, Texas
Sue Lutz
Mary Milner



Bonnie Pruitt Weiss, David Fowler, Mary Milner, and Dr. Tony Ekdale

Others weren't able to make it to the party but we were able to talk with them at the meetings. These included:

Dr. Bob Bereskin, an adjunct member of our department
Brenda Beitler, student in our department
Jeff Dunn, Graduate student in our department
Carl Ege, Utah Geological Survey, Salt Lake City
Samuel Hudson, Graduate Student, UNLV
Jenny Joyce, ExxonMobil in Houston, Texas
Rip Langford, University of Texas in El Paso, Texas
Mark Milligan, Utah Geological Survey, Salt Lake City
Jeanne Richter, Undergraduate student in our department
Alan Tripp, research faculty in our department



Dr. Robert Smith and Lynn Peyton

Alumni response to our last newsletter was heart-warming, to say the least. We know we're on the right track when we hear the kind of thoughts Gail Artrip (B.S. 1985), wrote, "I think it's really important to give students a feel for real-world career opportunities (besides academia) that await them after they finish their education. This initiative ... has the potential to provide such a network for current students, encourage more donations from alumni, and keep people in touch! I enjoy reading the newsletters very much." We hope this issue will bring more feedback from you to keep us on track.

We wish we could print alumni addresses in this column so that you could send off a quick letter or e-mail to old friends, but we just don't have the space. However, you can get the latest addresses we have from Jennifer Brown (e-mail: jbollis@mines.utah.edu).

Pre-1970s Grads

Grant C. Parsons (B.S. 1942) is living in Arcadia, California, and encourages us to keep promoting the University of Utah because there's a lot of competition out there! In sending in some of his memories of professors and classmates, he closed with a classic line- "my walk may be a little shaky, but I ain't dead yet". More power to Grant and many others of our alumni!

Kent Condie (B.S. 1959, M.S. 1961) He writes, "I remember working with Bronson Stringham on the Mineral Mountains pluton. I granitized the whole thing and don't believe a word of it now." He continued on to get a Ph.D. at the University of California at San Diego in 1965. Presently a Professor of Geochemistry at New Mexico Institute of Mining and Technology (New Mexico Tech) in Socorro, his major research interests are the study of the earth's oldest rocks, the composition and evolution of the lower continental crust and mantle lithosphere, and the role that mantle plumes may have played in the evolution of our planet.

W. W. (Bill) White III (B.S. 1967, M.S. 1973), currently works for the U.S. Bureau of Land Management- Salt Lake Field Office and has been doing a small project in the Simpson Springs area with geophysics faculty Jerry Schuster.

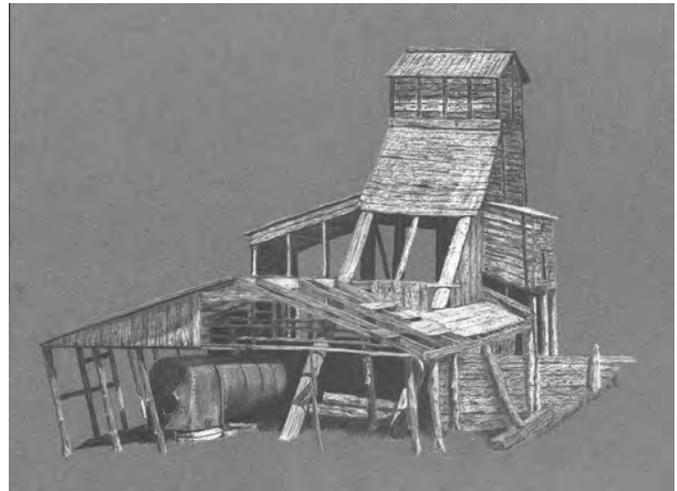
Wallie Rasmussen (B.S. 1969) went on to earn a law degree from the University of Utah in 1972. He is able to practice both disciplines as senior counsel with ExxonMobil in Houston, Texas. He would enjoy sharing his experiences with students when he is in Salt Lake City, as he is several times a year.

1970s Grads

Robert L. Randolph (M.S. 1973) is currently living and working in Salt Lake City.

W. Dan Hausel (B.S. 1972, M.S. 1974) will be included in the 2003 Who's Who in Science and Engineering and Who's Who in America. When a co-worker at the Wyoming State Geological Survey noticed the detail he put into his maps and suggested that he might want to take up sketching, he gave it a try. Now, his sketches

have been used to illustrate geology-oriented publications. His interest in the martial arts has led to teaching classes in that field at the University of Wyoming. Dan claims that his geology background has been partly responsible for his success in martial arts as it helps him to identify the better rocks for breaking.



Sketch by W. Dan Hausel for the cover of a Wyoming State Geological Survey publication. The sketch is of the Red Mask gold mine located along the Snowy Range scenic byway west of Laramie.

Deborah J. Wechsler (M.S. 1974) is a senior staff geophysicist with ChevronTexaco Exploration & Production Technology in San Ramon. She's been there since 1997, after a variety of assignments with the company in La Habra, California, Denver, Oklahoma City, Houston and Bakersfield. Over the years she has worked on projects in Angola, Brazil, China and, for the past four years, in Thailand. In August she and her husband Bruce Bilodeau (a geologist) will transfer with their two children to Indonesia, where they will both work for the next four years for CalTex Pacific Indonesia in Sumatran oil fields.

James L. Mason (M.S. 1975) is a hydrologist working for the U.S. Geological Survey in Salt Lake City.

Craig Morgan (B.S. 1975) started off as a mud logger right after graduation, then worked in petroleum exploration for eleven years with UV Industries and Celsius Energy. He has been a geologist with the Utah Geological Survey in Salt Lake City since 1990.

Riley Skeen (B.S. 1975) is working for Mountain Eagle Exploration in Cody, Wyoming.

Bob (Robert) Estill (M.S. 1976) got a Ph.D. from the University of Hawaii, and then went on to work for Unocal. He is currently doing a lot of work in SE Asia.

Frank Hamtak (M.S. 1976) lives in Houston, Texas and is just finishing up a geophysical consultanting contract with Shell International Exploration and Production Incorporated.

Richard J. Heaney (MS 1978) is currently a senior geophysical advisor with ConocoPhillips in Houston working the deepwater Gulf of Mexico. Along the way he worked in oil exploration for Amoco, Sohio, BP

and Mohave Oil and Gas Corp. in areas ranging from the Overthrust Belt to Portugal to Qatar in the Middle East. He has conducted independent research on the theory of salt-sediment interaction and should shortly be presenting papers on the subject to the exploration geological and geophysical society annual meetings.

Mike Schilly (M.S. 1979) moved to Aberdeen, Scotland last year, with British Petroleum.

1980s Grads

Melinda Griscom (M.S. 1980) is a geophysicist for ChevronTexaco in San Ramon, California.

Paul Matheny (M.S. 1981) is general manager of Questar's Rocky Mountain Division of Exploration and Production in Denver, Colorado, where he has lived since 1985. Prior to that, he worked in Midland Texas and Farmington, New Mexico for Gulf Oil and Celsius Energy. He had a "very fun" job with Ampolex, an Australian company. He says he "has published a few papers, traveled a bit, and drilled a lot of oil and gas wells." Paul is still happily married to Debbie, and their two children are now in college.



Geologists enjoy AAPG Eolian field trip led by Margie Chan, and Utah Alum Rip Langford (Ph.D. '88). This trip was held in conjunction with the May 2003 Annual American Association of Petroleum Geologists meeting in Salt Lake City.

Edward LaFehr (B.S. 1981) went on to earn an M.S. in geophysics at Stanford University in 1983 and a second M.S. in mineral economics at Colorado School of Mines in 1993. He worked for 17 years with Amoco before the merger with British Petroleum. He has gone on with the company and is now asset manager for BP in Anchorage, Alaska, with responsibility for operations, reservoir management, and development

drilling.

David Bartel (M.S. 1984) is a geophysicist with ChevronTexaco in Houston, Texas.

Gary Colgan (B.S. 1984) is currently working for CH2M HILL, an engineering/geotechnical firm in Salt Lake City. Gary has participated as an enthusiastic guest speaker in our Career Day seminars, and enjoys watching the growth of the next generation of students.

Steven A. Young (B.S. 1984) is the Business Development Manager for Pipeline Systems Incorporated in Walnut Creek, California. His pride and joy are his kids!

Gail Artrip (B.S. 1985) is a principal/senior engineer for URS Corporation in Rolling Meadows, Illinois.

Pam Gibler (M.S. 1985) is living in Richmond, California where she works as a project engineer/geologist for AGRA Foundations, a subsidiary of AMEC Engineering. Her company is currently the deep foundation contractor on the seismic retrofit of the Richmond-San Rafael Bridge and she is engineer of record for a program which is installing 463 micropiles through existing bell foundations. She supervises the field engineers and geologists who work on the AMEC work platforms. She says, "I have a super job that is an interesting combination of technical and contractual issues. And I get to take a boat out to work every day!"

Mark Brokaw (M.S. 1985) has been working for ChevronTexaco as a geophysicist, first in Texas, then in Alaska and is moving to Perth, Australia this autumn.

David Turner (M.S. 1985; Ph.D. 1990) and his wife Kristy live in San Antonio, TX where David works for the Southwest Research Institute. He was promoted to Assistant Director of Systems Engineering and Integration (although he's still really a geochemist at heart). He has also been teaching intro geology and environmental science courses at local universities. David and Kristy have two children Michelle Stanton Turner (four mos) and her big brother Austin (five).

Wendy Houghton (M.S. 1986) is currently working for Newfield Exploration Company in Houston, Texas, and thoroughly enjoying it. After 17 years with Conoco she thought she'd had enough of big oil and wanted to try some time with an independent.

Andrew Ross (M.S. 1987) is working for the state of Colorado, doing regulatory work involving water quality, and really enjoying it. He has been involved with many of the legacy mining issues in the state for the past few years, but has recently been reassigned to work on water issues in the Denver/Front Range area. He is on the Rocky Flats Citizen's Advisory Board which is a federally appointed site scientific advisory board that reviews actions at the Rocky Flats nuclear weapons site and makes recommendations to the Department of Energy on the cleanup.

Michelle Weis (M.S. 1988) is working for the State of Utah, Environmental Quality- Solid and Hazardous Waste. In her free time she does welding and sculptural art.

Peter E. Riemersma (M.S. 1989) is Assistant Professor of Geology at Grand Valley State University in Allendale, Michigan. He now gets to make it west (close to his old stomping grounds) to teach field camp.

1990s Grads

Lynn Peyton (M.S. 1991) is currently a Geophysicist with Coal Creek Resources, Inc.

Thom Rahn (B.S. 1992) earned a Ph.D. from Scripps Institution of Oceanography in 1998, was a post-doctoral scholar at California Institute of Technology for the next three years, and is currently the Frederick Reines post-doctoral fellow at Los Alamos National Lab in New Mexico. His research has focused on the use of light stable isotopes as a tracer of atmospheric photochemical processes and trace gas exchange between the atmosphere and the terrestrial biosphere.



Several Utah faculty and alum gather for July dinner in Houston

Front Row: Margie Chan, Cari Johnson, Craig Barker
Middle Row: Yonghe Sun, David Lemons, Sam Johnson, Rich Heaney, Marc Croes
Back Row: Roice Nelson, Jerry Schuster, Dave Sheley, Michael T. Reblin

May L. Harris (B.S. 1995) went on to receive her law degree from the University of San Diego in 2000, but still pursues geology as a hobby. For the past two years she has had the luxury of staying home with their two children while her husband, Eric, was at the Naval Submarine Medical Research Lab. Now that he is doing his orthopedic surgery residency in San Diego, she plans on getting back into law practice.

Kristi Watabe (B.S. 1995) is currently in Cleveland, Ohio where her husband is completing a post-doctoral fellowship in forensic psychiatry. While he was pursuing his studies in Topeka, Kristi finished an M.S. in paleontology at the University of Kansas. Still following her husband, this time to Rochester, Minnesota, she found her "dream job" teaching environmental geology and earth systems science. Just now, she's taking a break to have their first child. She says their newfound interest in rock climbing will have to wait a bit.

Peter Shabestari (B.S. 1996) is GIS Manager for Draper City, Utah. He comments that he has been "mostly

working in the gold exploration/mining industry."

David P. Braxton (M.S. 1997) is back in Australia after finishing a couple of months of fieldwork in the Philippines, the field location for his Ph.D. project. He will be presenting a paper at the 17th Australian Geological Convention in February 2004 on his work in Orcopampa, Peru.

Berthold Kriegshaeuser (Ph.D. 1997) works for Baker Atlas in Rio de Janeiro, Brazil, where he and his family moved in 2000. His wife, Patricia, has joined Landmark Graphics. Besides work, they are busy caring for their four children – Berthold says their dog helps, too.

David Hedderly-Smith (Ph.D. 1997) has his own consulting company, in Park City, UT. He tells us he's done "a fair bit" of mineral exploration work in Alaska, but currently he is working with Summit County, Utah, to help them implement their water concurrency program, which is tied closely to the growth of the area.

2000s Grads

Rebecca Kessler Cardoso (M.S. 2002) is enjoying her new job as an environmental management specialist with San Diego County, California.

Noel Carreon (M.S. 2002) is living in Arequipa, Peru with his family and doing base and precious metal exploration with Industrias Peñoles, S.A. de C.V. In October he will be presenting the results of his M.S. work on the structural geology of the Milpillas District at the XXV International Mining Convention in Acapulco, Mexico.

Sam Hudson (B.S. 2002) is finishing up his M.S. at University of Nevada- Las Vegas and is currently looking for employment in the petroleum industry. His thesis topic was on "Characterizing the interaction between migrating hydrocarbons and salt weld structures as seen in surface exposure of the La Popa salt weld, Northeastern Mexico".

Andy Manning (Ph.D. 2002) is pursuing post-doctoral studies with the U.S. Geological Survey in Golden, Colorado.

Suzanne Nguyen (B.S. 2002) has been working for the Department of Energy in Washington D.C., and was accepted into the graduate program at City College of New York. She intends to pursue graduate studies in economics.

Josh Walker (B.S. 2002) is working for North American Exploration, doing contract work for Kennecott Utah Copper Corporation at the Bingham Canyon mine.

Alisa Felton (M.S. 2003) has a new job as a teacher in Park City, Utah.

Patrick Gathogo (M.S. 2003) spent his summer in Kenya looking for more early human fossils. This fall he is pursuing a PhD with Professor Frank Brown.

David Handwerker (Ph.D. 2003) was off to Ireland, England, and Scotland this year as his reward for finishing up his degree.

Victor Heilweil (Ph.D. 2003) is working as a hydrologist with the U.S. Geological Survey in Salt Lake City, Utah, pursuing his research interest in desert ground water recharge. As a consequence of his graduate studies, he was recently selected as the Utah District Ground-Water Specialist.



Dean Frank Brown, Alisa Felton, and Dr. Paul Jewell at the 2003 College Convocation.

Jennifer Reinmann (M.E., 2003) is employed as an Environmental Engineer with MWH, a world-wide environmental engineering firm. She is working on industrial waste treatment, pollution prevention, and remediation.

New Feature, "Blast From the Past", Jogs Old Memories

Several folks wrote to share more memories from many years ago, prompted by the last newsletter's "Blast From the Past" article featuring memories of Margaret Best (B. A. 1939). (One of them pointed out that the University enrollment in those days was closer to 4000 instead of 8000 as we had reported).

In particular, Grant C. Parsons (B. A. 1941) wrote us about several of his memories, including those of Professor Fredrick J. Pack. Grant took general geology classes from Prof. Pack as a freshman in 1937-38 when the class met in a corner room on the second floor of what is now the James E. Talmage building on Presidents' Circle. Grant remembers having a seat by the window and being distracted by the girls' gym class doing their exercises. We don't have those views these days; we're more likely to see the ROTC gang exercising around our buildings.

Dr. Lehi Hintze (see related article, page 18) was also a classmate of Grant Parsons. Lehi, the son of Professor Ferdinand F. Hintze of our department, will be sharing some of his memories in an upcoming newsletter, so stayed tuned for more blasts from the past!

H. Roice Nelson, Jr. Celebrated as 'Futurist, Visionary and Dreamer'

H. Roice Nelson, Jr. (B.S. 1974) grew up amid the spectacular geology of southern Utah, loving to explore and make things. It was a propensity that was to follow him through life. In July of 2003, *Leading Edge*, the magazine of the Society of Exploration Geophysicists, published an extensive interview celebrating his achievements in revolutionizing the processing of seismic data. It was a fitting tribute for someone who has remained true to his vision.



H. Roice Nelson, Jr.

As an undergraduate, he produced what he now believes was the first three-dimensional map using seismic data. When he could not interest the oil company for which he worked to further develop this new tool, he founded his own company, Landmark Graphics. It became the leading company in three-dimensional interactive interpretation. He is quick to acknowledge all those who contributed to his ideas, from the University of Utah to computer companies to the big oil companies. As he says modestly, "The timing was right."

He is still dreaming ahead with enthusiasm, focus, and energy. He has founded Walden3D, a company whose goal is to design the ideal city of the future, no less!



Studies of Dr. Margie Chan, Dr. Don Currey (Geography), and graduate students examine the changing face of the Salt Lake valley with increased urbanization and sand and gravel extraction at Point of the Mountain and the Traverse Range (south end of the Salt Lake valley). Aerial picture taken by hang glider pilot Mark Bennett.

Gifts to the Department

Department Receives Air Photos

The Department recently received a large collection of aerial photos covering much of Utah and the Rocky Mountains from the estate of Paul T. Walton (B.A. 1935, M.S. 1940), who died in 1998. We appreciate the generosity of Betty Walton, his wife, in donating these air photos. Please see our Curator, Quintin Sahratian, if you need access to the maps for research purposes.

March 2003-October 2003

The Ken Cook Endowment, the Earls Family Endowment for Field Studies, the W. Lee Stokes Endowment, the Sedimentary Geology and Geophysics Endowment, the Geology and Geophysics Students Endowments, and the Thermal History Basins received gifts from:

BP Amoco Foundation	Edward Lafehr
David Chapman	Mobil Foundation
ExxonMobil Foundation	Barbara Nash
Renee Gardner	William Powell
Merrill S. Ginsburg	William Wood
Sidney Groff	Anonymous donors
Uk Han	

The Atkinson Distinguished Lecture Series, the Chevron USA Graduate Fellowship, the Orlo Childs Field Studies Fund, the Norma Eardley Program for Women in Geology, the Frischknecht Scholarship in Geophysics, the Mikulich Scholarship in Geophysics, the Geologic Research Scholarship, and the Geology and Geophysics Scholarship received gifts from:

Grant Anderson	John Isby
Walter Arabasz	Susanne Janecek
Myrtle L. Atkinson Foundation	Calvin & Mona Lowe
Ruth E. & John E. Bamberger Foundation	Matthew Mikulich
David Bartel	Dale Miller
John Bartley	William Powell
BP Amoco Foundation	Robert Rogers
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ExxonMobil	Kristina Leavitt Watabe
David Fowler	Marta Weeks
Charles Gorman	Sally Williamson
Paul Green	Gordon Wise
Ernest Hardin	Wayne Woolston
	Anonymous donors

The Consortium Research fund received gifts from:

BHP Billiton	Kennecott Exploration
BHP World Exploration	Shell International
Exxon Production Research	Sumitomo Metal Mining

A number of faculty and friends also donated to the College of Mines and Earth Sciences. We appreciate these gifts that help us build our programs.

See Us on the Web!

If you haven't discovered our web page at: www.mines.utah.edu/geo, we hope you will soon. It provides links to our people, programs, resources and activities as well as to the university at large. Check out the pictures of some of our exciting field sites. As always, it remains a work in progress. If you have any suggestions or contributions, please let us know by choosing "Contact Us" from our home page. You can also e-mail the department Chair directly at: gg_chair@mines.utah.edu, and faculty e-mail addresses are available by choosing the Faculty option on our home page.



Lake Powell (picture of Glen Canyon Dam) is low and still dropping, currently at nearly 100' below its full pool level with the drought expected to continue.

Putting this newsletter together is a very big job! We couldn't do it without the help of Susan Fisher (one of our alumni), Jennie Brown (staff), and Tony Ekdale (faculty), as well as a number of faculty, staff, and alumni that also supplied the article contents. Thanks all who contributed!

Your fellow alumni and colleagues in the Department of Geology and Geophysics would like to hear about your professional accomplishments, job promotions or changes, address changes, or any other news you would like to share. You can also update your information on our website at: <http://www.mines.utah.edu/geo/alumni/index.html>.

Include my news in the next "Down to Earth."

Name _____ Class Year _____ Degree _____
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 Geology and Geophysics
 University of Utah
 135 South 1460 East Room 717
 Salt Lake City, UT 84112-0111
 Fax: (801) 581-7065, Email: gg_chair@mines.utah.edu



Grosvenor Arch, Grand Staircase- Escalante National Monument

New opportunities to expand our facilities and services come to our attention constantly. Needless to say, there is seldom room in the budget to accommodate them. Gifts from our friends and alumni provide many extras that enhance our students' educations. We appreciate your support.

YES! I'd like to provide support.

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 Salt Lake City, UT 84112-0111



The enclosed check is for:

- _____ General Geology Fund
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- _____ Orlo Child's Field Trip Fund
- _____ Atkinson Distinguished Lecture Fund
- _____ Larger donation. Please have Department Chair contact me.



Graduate Student Travis Crosby giving a geophysical demonstration.

AAPG Student Chapter T-Shirt Order Form

Sizes (please circle one): S M L XL

Color: White or Grey

I would like to order _____ T-shirt(s) @ \$20.00 each (includes U.S. postage and handling)

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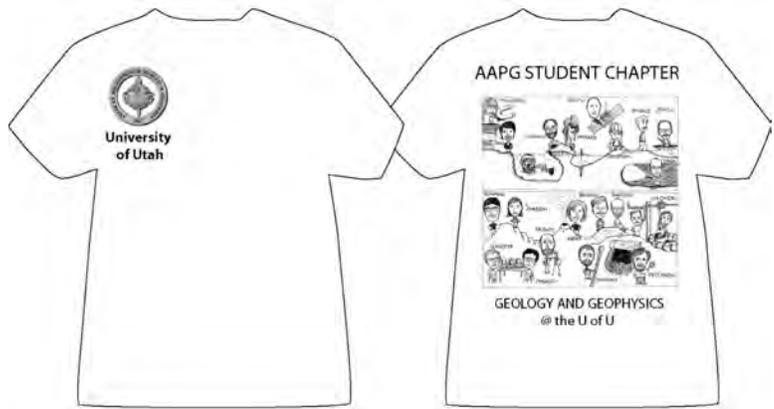
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University of Utah
Geology and Geophysics
135 South 1460 East Room 717
Salt Lake City, UT 84112



Graduate student Jessica Moore with department booth at AAPG.

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