

# *Down to Earth*



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

**Fall 2011**



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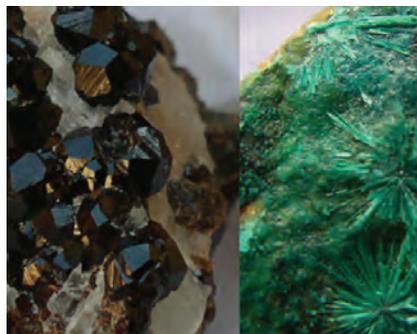
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*Our University of Utah students and faculty are world travelers.*

*The minerals to the left are examples from the field trip to the Carmen Bajo Mine in Chile. Left is garnet (brown) on calcite (white), and right is atacamite (green).*

**Message from the Chair**

Dear Alumni and Friends,

Big changes continue to happen in the Department. Two new faculty – Dr. Lisa Stright (petroleum geology) and Dr. Lauren Birgenheier (sedimentology) joined us this summer, and a visiting exploration geophysicist, Dr. Pier Bruno, joins us this fall. In addition, a new isotope geochemist (Dr. Gabriel Bowen) and clastic sedimentologist (Dr. Brenda B. Bowen) will be leaving Purdue University to join our faculty next summer. We also have open searches for a tectonophysicist and a geological engineer.

Faculty research continues to make national and international news. Michael Zhdanov’s and Bob Smith’s new images of the Yellowstone hot spot received international press coverage (everyone loves a “supervolcano”), as did Thure Cerling’s findings that the 2.3 to 1.2 million-year-old human relative nicknamed Nutcracker Man, did not actually eat nuts at all, but rather chewed grasses and sedges. Closer to home, Bill Johnson and students have been tracking mercury methylation in Great Salt Lake sediments, and Margie Chan and students



continue to unravel the complex history of fluid flow and iron transport in the Navajo Sandstone.

Our enrollments continue to grow with a record number of students in our core courses such as Earth Materials I. Amazingly, we have already outgrown the Sutton Building and find ourselves wondering where to squeeze in just a few more graduate student desks, and

where to put more workstations in our computer lab. These are great “problems” to have!

The Department of Geology and Geophysics is at a pivotal turning point. Bolstered by the success of an award-winning Sutton building, a series of new faculty hires, and record enrollments, we are positioned to rise to a new level. Our goal is to increase our visibility such that we are recognized as one of the top twenty-five departments nationwide. A new “Earth Frontiers” campaign planned for the next decade will help us advance our goal through targeted programs and agendas. Partnerships and participation of our alumni and friends will be vital to this effort. You will be hearing about this soon!

I hope you enjoy this edition of “Down to Earth”. It represents a huge amount of time, especially on the part of staff (Anita Austin), faculty (Margie Chan), and an alumna (Susan Fisher), but staying connected is very important to us. Our future is exciting and our national visibility is growing. You are all part of what the Department has become, and we need your help as we move into the very top tier of earth science programs.

— Kip Solomon

**On Our Cover:** *The “Chocolate Drops” from the Maze Overlook in Canyonlands National Park, Utah. Permian strata include the Cedar Mesa Sandstone, overlain by the dark Organ Rock Shale, and capped by remnants of White Rim Sandstone. Photo by M.S. student Marko Gorenc*

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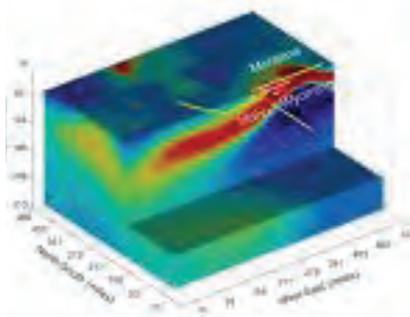
## Departmental Activities

Once again the many talents and interests of our faculty and students have resulted in remarkable advances in the geosciences all over the world.

### **Electrical Conductivity of Supervolcano Measured**

In April, University of Utah geophysicists Michael Zhdanov and Robert Smith announced the use of electrical conductivity to provide a new picture of the underground plume of hot and partly molten rock that feeds the Yellowstone supervolcano. Their study suggests the plume is even bigger than it appears in earlier images. This is a totally new method of looking at the volcanic roots of Yellowstone, say the authors.

In an earlier study, Smith used seismic wave speeds to make a 3-D picture showing the plume dips downward from Yellowstone at an angle of 60° and extends 150 miles west-northwest to a point >410 miles below the Montana-Idaho border.



3-D image of the Yellowstone plume.

Zhdanov's method measures electrical conductivity generated by molten silicate rocks and hot briny water mixed in partly molten rock. The results show the conductive part of the plume dipping more gently, at an angle of perhaps 40° to the west, and extending perhaps 400 miles from east to west.

Smith said the geoelectric and seismic images of the Yellowstone plume look somewhat different because "we are imaging slightly different things." However, he continued, "The body that conducts electricity is in about the same location with similar geometry as the seismically imaged plume." The lesser tilt of the geoelectric image raises the possibility that the seismically imaged plume, shaped somewhat like a tilted tornado, may be enveloped by a broader, underground sheath of partly molten rock and liquids.

The study was conducted by Zhdanov, Smith, two members of Zhdanov's lab – research geophysicist Alexander Gribenko and geophysics Ph.D. student Marie Green – and computer scientist Martin Cuma of the University of Utah's Center for High Performance Computing. Funding came from the National Science Foundation (NSF) and the Consortium for Electromagnetic Modeling and Inversion (CEMI), which Zhdanov heads. Their data were collected by EarthScope, a large-scale NSF-funded effort that collects seismic, magnetotelluric, and geodetic (ground deformation) data to study the structure and evolution of North America.

### **"Nutcracker Man" Misnamed for Decades**

For decades, a 2.3 million- to 1.2 million-year-old human relative named *Paranthropus boisei* has been nicknamed "Nutcracker Man" because of its big, flat molar teeth and thick, powerful jaw. But a definitive new study shows that it didn't eat

nuts at all, but instead chewed grasses and possibly sedges – a discovery that upsets conventional wisdom about early humanity's diet.

Geology and Geophysics Distinguished Prof. Thure Cerling and Ph.D. student Kevin Uno conducted the study with three scientists from the National Museums of Kenya – Emma Mbua, Francis Kirera, and Fredrick Manthi – and with Frederick Grine of Stony Brook University, Matt Sponheimer of the University of Colorado at Boulder, and famed anthropologist Meave Leakey, who is affiliated with the National Museums of Kenya, Stony Brook, and the Turkana Basin Institute in Nairobi.

The authors determined the extinct, upright-walking hominid's diet by analyzing carbon isotope ratios in the tooth enamel of 24 teeth from 22 individuals who were closely related to, and once thought part of, the genus of human ancestors named *Australopithecus*.

Carbon isotope ratios in tooth enamel can reveal whether ancient animals ate plants that use what is called C3 photosynthesis used by trees (and the leaves, nuts and fruits they produce), shrubs, cool-season grasses, herbs and forbs, versus plants such as warm-season or tropical grasses and sedges that use what is known as C4 photosynthesis. The study found that *P. boisei* dined more heavily on C4 plants like grasses than any other early human, human ancestor, or human relative studied to date. Only an extinct species of grass-eating baboon had a diet so dominated by C4 plants. Moreover, the species was eating this diet over a much longer time period (from 1.4 million to 1.9 million years ago) and bigger geographic area (a 500-mile-wide swath of East Africa) than was known before.

These new findings may provoke a major change in how we view the diets of other early humans and human relatives. "Much of the previous work has been on the size and shape of the teeth, along with microwear analysis," Cerling says. "Our results [on *P. boisei*] are completely different than the conclusions based on 50-plus years of research along those lines. It stands to reason that other conclusions about other species also will require revision."



Casts of two palates showing the large teeth of *Paranthropus boisei* (left) and the much smaller teeth from a *Homo sapiens* skull (right). Photo by Melissa Lutz Blouin, University of Arkansas. Cerling used a drill to pulverize some broken surface tooth enamel into powder, leaving the original surfaces intact for future study.



The skull of *Paranthropus boisei*, known for decades as Nutcracker Man, showing its large, flat teeth. Photo by David Brill, for the National Museums of Kenya.

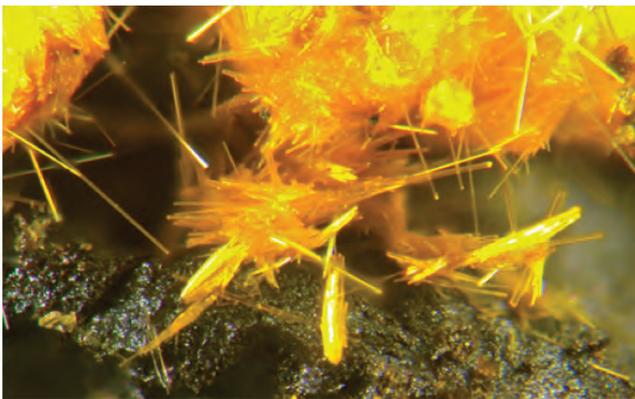
## New Center Integrates Disciplines

The new Global Change and Ecosystem Center (GCEC) promotes interdisciplinary research and teaching from multiple disciplines across campus. The GCEC focuses on how different global changes impact the dynamics and sustainability of natural ecosystems, human-built systems, and regional-to-global climate systems. Faculty research spans diverse areas, including natural and physical sciences, engineering, law, social sciences, and urban planning. The GCEC is currently a virtual center with affiliated faculty having appointments in different colleges across campus. They share a common interest in multidisciplinary research, training, and outreach. Find out more about the scope of the organization on their web page at <http://environment.utah.edu>. There is already a GCEC Fellowship program which is intended to attract new students.

Gabe Bowen and Brenda Beitler Bowen, who did Postdoc and Ph.D. work respectively in our Department, will leave their faculty positions at Purdue University to help get the GCEC going. Gabe is one of three new faculty hires and Brenda will be the Associate Director. (See their photo in the Alumni section.)

## Microprobe Lab Detects New Minerals

The Electron Microprobe Laboratory has been instrumental in the characterization of four new and rare vanadium minerals from the Utah-Colorado uranium district. These beautiful decavanadates – rakovanite, hughesite, postite and gunterite – were discovered by Joe Marty of Salt Lake City and, after thorough crystal structure determination and chemical analysis, were recently approved as new minerals by the International Mineralogical Association. The chemical analyses done by Prof. Barbara Nash posed a particular analytical challenge because the minerals, which form in the moist environment of abandoned uranium mines, tend to dehydrate in the high vacuum of the electron microprobe sample chamber, and they are easily damaged by the electron beam.



*This picture of the new mineral postite was taken by its discoverer, Joe Marty.*

## Solomon Investigates World Ground Water

Approximately 30% of the world's fresh water is estimated to be in aquifers, by far the largest usable reservoirs of fresh water on earth. While the groundwater storage volumes are large, the sustainable yield of many aquifers is potentially rather small as it is limited by rates of recharge. Groundwater recharge rates are extremely difficult to measure and as a

result, the sustainable yield of global groundwater resources is largely unknown. This is especially true in developing countries where monitoring wells are rare.

A new NSF-sponsored research project, held jointly between Dr. Kip Solomon and Dr. David Genereux of North Carolina State University, seeks to develop a method that utilizes the "age" of groundwater discharge into streams as a measure of the sustainable yield of contributing aquifers. If successful, the method will allow for global surveys of groundwater sustainability. Their NSF-funded project is currently evaluation collection schemes, work often best done in the winter. Simply staying warm can present problems!



*Here is Bert Stolp in the Fischa River in the Southern Vienna Basin, Austria, seeking guidance from a higher source; his advisor is nowhere to be found.*

## Lowry Links Quartz to Deep Structure



*Tony Lowry stands next to a GPS receiver in Wellsville Canyon. Photo by Donna Barry, Utah State University*

Utah State University Geophysics Professor Tony Lowry, who is both a Ph.D. graduate of our Department and one of our Adjunct Associate Professors, uses GPS data from the massive EarthScope project, spread across the western United States, to explain why and how mountains form and continents pull apart repeatedly in the same areas.

The Wasatch Front is a remarkable example, being a tectonic boundary now, but also a boundary 800 million years ago.

The study, co-authored with Marta Perez-Gussinye, was published March 17, 2011, in *Nature*. Studying the relative speeds of P and S waves emanating from the crust twenty miles below the surface indicated a great abundance of quartz under mountains. At great depth, and thus high temperature and pressure, quartz flows much more readily than other rocks.

The authors hypothesize that it may weaken the crust and allow buckling, and that once a zone of weakness has been established it may become permanently weak and thus cause repeated breaks and deformations over many plate tectonic cycles.

### **Wannamaker Leads Transantarctic Survey**

During winter 2011, an international team of eleven professionals, students and postdocs, lead by Adjunct Professor Phil Wannamaker of the University of Utah and the Energy and Geoscience Institute (EGI) carried out an unprecedented MT survey of the Antarctic interior. Working in a spectacular setting, the team accomplished a transect some 230 km in length across the central Transantarctic Mountains (TAM). The study was supported by the U.S. National Science Foundation, the New Zealand Geological and Nuclear Sciences (NZ GNS), the Tokyo Institute of Technology, and the University of Adelaide.

The west-to-east Antarctica geophysical transition is a major lithospheric extension system, compared sometimes with the Great Basin-to-Colorado Plateau transition, and the TAM itself is a rift shoulder uplifted during the Eocene. A prime tectonic uncertainty is its deep source of support. Also, extensional regimes host large earthquakes and contain many resources so they are studied generically; prospecting and development in Antarctica is forbidden by treaty.

The transect ranged from about 25 to 140 km from base camp, and deployment of the transceivers was mainly by helicopter, Crevasse hazards were a constant consideration in the project, so landing sites were probed immediately by mountaineers experienced in the Antarctic, and the group routinely used harnessed, roped, paired walking. From the good quality of the data, the team expects to recover new insight into the deep structure of the TAM.



*Final stages of deployment of the Phoenix MT system by John Jodt and Virginia Maris at the site near TAM-Ross Sea transition. Phoenix receiver in gray crate by Maris; tall cardboard box to left used to carry Ti heat electrodes. Double battery and double solar panel used here as insurance against common fog conditions in this area.*

### **Picard Documents World War II Remains**

Before dawn on June 6, 1944, more than 160,000 Allied troops, supported by more than 5,000 ships and 13,000 airplanes, began storming the shores of Normandy, France, in what would be the turning point of World War II. Not much evidence of the war remains beyond the staggeringly huge cemetery and

the war memorial, but the violence of that day is still written in its sands.

Prof. Emeritus M. Dane Picard of our Department and Professor Emeritus Earle F. McBride of the University of Texas at Austin visited Omaha Beach in 1988 and collected samples of the sand. Upon examination, they discovered the remnants of the war. There were angular, opaque, slightly worn, shards that were magnetic. These were associated with small spherical beads of iron and glass. Thin sections led Picard and McBride to conclude that these particles were generated from the explosions of munitions during the Normandy landings. Say the authors, "It is of course not surprising that shrapnel was added to the Omaha Beach sand at the time of the battle, but it is surprising that it is still there today. Exactly how long the shrapnel, glass and iron beads will remain mixed in the sand at Omaha Beach is uncertain, but the combination of chemical corrosion and abrasion will likely destroy the grains in a century or so, leaving only the memorials and people's memories to recall the extent of devastation."

*Duke has written an evocative as well as sedimentologically fascinating account of his visit in the June issue of the American Geological Institute's EARTH magazine, at <http://www.earthmagazine.org/digital/>.*

## **Faculty Focus**

Our faculty is constantly searching new realms of geoscientific inquiry, acquiring new interests and skills, and passing them to the wider world. We all benefit. This year we spotlight some faculty highlights in expanded feature stories. The following briefs feature special honors, awards, sabbaticals, and changes.

### **Bowman Receives GSA Fellow Award**



**John Bowman** was honored as a GSA Fellow at the GSA 2011 meeting in Minneapolis. His citation says: "John is one of the leading researchers in applying cutting edge methods in isotope geology, petrology, and geochemistry to problems in tectonics, mineral deposits, and geothermal systems, and interactions of crustal fluids with rocks in plutonic environments. He also has a distinguished career as an educator, training graduate students who go on to work in academia, industry, and government agencies."

Congratulations John!

### **Cari Johnson Receives ConocoPhillips Award**

ConocoPhillips, through its Faculty Sponsorship Program (FSP), awarded **Cari Johnson** a \$25,000 gift to continue her research. She is also Associate Chair of our Department, as well as coordinator of the oil company recruiters' visits.

## Chapman Speaks to Indian Geophysicists

**David Chapman** was invited to lecture at the Golden Jubilee Anniversary celebration of the National Geophysical Research Institute (NGRI) in Hyderabad, India, in October. Chapman has visited NGRI three times, and has an active collaboration with NGRI scientist Dr. Sukanta Roy who has made extended visits to Chapman's geothermal laboratory. NGRI, founded in 1961, is the premier geoscience research institute in India. This anniversary event drew geoscience professionals, geoscience policy makers, and graduate students from all of India for the two-day celebration. Five international scientists highlighted advances made in geoscience over the fifty years that NGRI has been in existence. Chapman lectured on geothermics and climate change. Other invited overseas lecturers included Claude Allegre and Vincent Courtillot of France, Mike Sandiford of Australia, and Minral Sen and Walter Mooney, also of the USA.

## Chan Uses Park Fellowship for Mars Study

**Marjorie Chan** enjoyed the Spring 2011 semester release as part of the John R. Park Fellowship award. She spent the entire month of February in Arizona visiting with colleagues at University of Arizona and Arizona State University, along with making preparations for her new Mars for Earthlings class to be offered in Spring 2012. She also enjoyed the famed Tucson Gem & Mineral Show. Through NASA funding, Chan is developing teaching modules that use Earth analogs to explore Mars processes. Modules will be available through the award-winning Science Education Resource Center (SERC) web page. (Read about the NASA field trips she led in our Field Trips section.)



Professor Chan and students Marko Gorenc and Ryan Hillier brave the 100 plus degree summer heat in Canyonlands.

## Cerling Observes Environmental Change

**Thure Cerling** is on sabbatical, spending September 2011 through January 2012 at three places in Kenya: Lamu Island, Turkwell Field Station, and the Save-The-Elephants Research Station in Samburu Reserve. On Lamu he is staying at the house of Richard and Meave Leakey – to go to town they must take a boat. He writes that the Takwa archaeological site on Manda Island provided a good lesson for impacts of society on

the environment. It was first inhabited about 1500, but within 150 years it was abandoned because of profligate use of the small reserve of “sweet” groundwater. In years since then, that little freshwater wedge has not been able to re-establish itself. He expects to incorporate this story into a Water Planet lecture when he returns. From January through May 2012 he will continue a “writing sabbatical” at Cal Tech.

## Smith Honored with USGS Powell Award

In the mid-1970s, **Bob Smith** noticed dead pine trees on the south shore of Yellowstone Lake. He realized the land was tilting, and it drove his research for the next forty years, research that has helped support 68 graduate students. He identified the vast magma plume of the Yellowstone supervolcano which causes the area to rise and fall. For this long-time effort, Dr. Smith has been awarded the U.S. Geological Survey (USGS) John Wesley Powell Award. The honor recognizes achievements that advance the agency's mission to provide scientific information about earthquake hazards, the health of the environment, and the management of natural resources. (A full account is on our web site.)

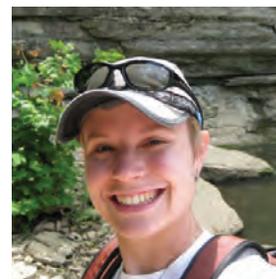
## Aurel Trandafir Joins Industry



In September 2011, **Aurel Trandafir** left the Geological Engineering Program in order to accept a new appointment with the offshore division of Fugro GeoConsulting in Houston, Texas. His work will focus on geotechnical investigations for the assessment and mitigation of seafloor instabilities associated with submarine slope failures, earthquake-induced liquefaction, and dissociation of gas

hydrates. Aurel enjoyed his time in Utah and plans to keep his connections with the Department.

## Julia Robinson Starts as New Postdoc



**Julia Robinson**, a postdoc fellow, who taught and worked for oil and gas companies in Texas, has returned to Utah, joining Marjorie Chan. Robinson will be working with Chan on a funded NASA EP/O grant to develop new curriculum integrating Earth analogs with Mars study and data. Her interests range from sequence stratigraphy of

carbonate systems to paleosols and paleoclimate. She hopes to further develop paleoclimate tools through geochemical characterization of paleosols and modern soils.

## Adjunct Faculty Add Depth to Our Department

We are very fortunate to have adjunct faculty who are willing to contribute their specialized knowledge to increase the breadth and depth of our programs. During the 2010 - 2011 year, this included the expertise of Bob Bereskin who taught the PICP Petroleum Geology class, Bill Keach who taught PICP Seismic Interpretation, and Mark Loewen who taught World of Dinosaurs.

## Field Trips

Students, faculty, and visitors alike profit from their field trip experiences involving our Department.

### Summer Field Camp Engages Students



*Field Camp 2011 headed by Professor David Dinter.*

Summer Field Camp is a celebration of field prowess and a perennial rite of passage for Geoscience and Geological Engineering majors. It is designed as a transitional experience from undergraduate study to either graduate school or entry-level employment in the Earth Sciences. This year students had the opportunity to take on real, challenging, mapping problems, the solutions of which require drawing upon and integrating knowledge from the various geologic sub-disciplines they have mastered earlier. This intellectually and physically demanding course employs Utah's Great Basin mountain ranges as natural laboratories. Students undertook two projects, during which they mapped a 3- to 4-square-mile area, described lithologies and textures, measured bedding, faults and folds, prepared cross sections and stratigraphic columns, interpreted the geologic history, and presented their results in professional-format technical reports.

The 2011 contingent, directed once again by David Dinter, included sixteen undergraduates. The effort called on the indispensable services of teaching assistant Danielle D'Alfonso and camp manager Kat Clayton. "Field camp angels" Elaine and Ron Jones, generously allowed them to camp on their land and use their cabin on the outskirts of Park Valley.

### SEG Again Sponsors Chilean Trip

In March of this year, Professor Erich Peterson and his colleague Dr. William Chavez, led their seventh Society of Economic Geologists (SEG)-sponsored student field trip to northern Chile, where they concentrated on iron oxide-copper-gold and copper-silver deposits. Sixteen students, ranging from undergraduate to Ph.D. candidates, and representing eight countries, were selected to participate. In addition, four professionals were invited to attend to serve as mentors to the students. Because of the course's popularity, it was repeated in May to accommodate another such group. The trip focused on varieties of mineralization including vertical zonation of

vein deposits, as well as east-west zonation which is limited to structural blocks but may be due to igneous intrusions. Key to the success of the trip were contributions from local professionals who provided access to such essential resources as mine tours and drill core reviews.

These unique and irreplaceable examples gave rise to profitable discussions of the differences between mineralization systems of the northern Chilean coastal cordillera which could then be extrapolated to the geochemistry and paragenesis of mineralization. Petersen and Chavez acknowledged once again the first-rate cooperation they received from mining companies and the time taken by their hosts to make this experience valuable and exciting for the students. Both trip leaders and students lauded the SEG and all the professionals who provided such inspirational enrichment for this educational experience.

### NASA Mars Camera Teams Visit Utah

Marjorie Chan has led field trips for NASA's Mars Reconnaissance Orbiter High Resolution Imaging Science Experiment (HiRISE) camera team during the last two summers. The team is learning about terrestrial concepts to apply to Mars through examination of the sedimentary rocks of Snow Canyon and Quail Creek State Parks, Zion National Park, the Cockscomb (Grand Staircase Escalante National Monument), and the Lake Powell area near Page, Arizona.

### Paleoecologists Return to Gulf of California

During fall semester 2011, Tony Ekdale once again led his Paleocology class on a nine-day field trip to Puerto Peñasco, Sonora (Mexico), along the coast of the Gulf of California. This year sixteen students made the trip to the Center for the Study of Deserts and Oceans (CEDO), a research station whose antecedents go back to at least 1975, when Tony began taking his Utah students there to study marine invertebrates in intertidal and supratidal sedimentary environments.

The purpose of the expedition is to test the age-old tenet that "the present is the key to the past" by comparing organism communities living in the modern environments with the fossil assemblages preserved in Pleistocene rocks in the same area.



*Brown pelicans at Pelican Point, north of the town of Puerto Peñasco, keep watch over Tony and his students as they study the coastal habitats of marine organisms in the region.*

## ExxonMobil Presents Hands-On Short Course

In February 2011, ExxonMobil geoscientists presented a Short Course in Sequence Stratigraphy to teach graduate and upper level undergraduate students principles, concepts and methods. Using well logs and seismic data, the course provided a hands-on experience for learning criteria that identifies depositional sequences and their components.

## Serendipity on Chan's Sed/Strat Field Trips

Marjorie Chan's field trip for the Sedimentology/Stratigraphy class of 2010 included an all-day field trip to the Cretaceous units of the Price–Helper area, a local trip to the Precambrian of Big Cottonwood Canyon and the Triassic of Parley's Canyon, and the Cretaceous Ferron cores at the Utah Geological Survey Core Laboratory. Over the years the sed/strat field trippers have been "happened upon" by alumni Jeff Gentry (B.S. 1984) and Bryan Bracken (Ph.D. 1987), the latter leading a Chevron field trip, and other oil company and academic groups. One year, Walter Alvarez and his students from U.C. Berkeley coincidentally met the class on the outcrop and tagged along on all the stops.



Sedimentology/Stratigraphy students study Cretaceous Ferron core at the Utah Geological Survey Core Lab.

## Geological Engineering Studies Landslide



A house teeters on the edge of collapse into City Creek Canyon, on the north edge of Salt Lake City.

On a brilliant fall day in late October 2011, six students and their advisor, Paul Jewell, from the University of Utah Student Chapter of the Association of Environmental and Engineering Geologists (AEEG), examined the City Creek landslide in Salt

Lake City. Geologists Rich Giraud and Gregg Beukelman of the Utah Geological Survey led the tour. After years of relatively slow movement, in 2001 the landslide has moved approximately 11 feet and now threatens houses located at the head of the landslide scarp.

## PICP Class Visits Drilling Sites in Wyoming

In Fall 2011, eighteen members of the Petroleum Geology class, led by our new faculty, Lisa Stright, as part of the Petroleum Industry Career Path (PICP) program, visited a Questar petroleum drilling operation south of Rock Springs, Wyoming, in the Sand Wash Basin. The field trip was organized by one of our new Ph.D. students, Brent Greenhalgh, who is also currently a Questar employee, and his colleague Riley Brinkerhoff. On the way to the rig site, they stopped to examine the reservoir rocks outcropping along the road and to discuss the depositional environment and its impact on reservoir heterogeneity and subsequent production. The students then split up into two groups to visit two different rig sites. One of the groups was fortunate enough to see the well being "spudded" (the very start of drilling a new well). The participants wish to thank Questar supervisor Russell Griffin for arranging the trip and for providing box lunches for the students.



Brent Greenhalgh and Riley Brinkerhoff describe the outcropping reservoir rocks of the Almond and Ericson formations in Wyoming.

## Student News

We watch with delight as our students find new ways to expand their notions of the possible, in their science and at play.

### SAC Raises Its Bar

The Student Advisory Committee (SAC) had a very busy 2010-2011 school year, hosting informational sessions, gathering student opinions, acquiring votes for three new faculty positions, and passing on valuable feedback to the Department. SAC also amped up the food for attendees of the Distinguished Lecture Series each week, generating so much positive feedback that they're having a competition this year whereby attendees are voting to see who provided the best food. For fun, they sponsored a student Halloween Costume Contest and an overnight camping trip to Topaz Mountain, located just southwest of Nephi, UT. SAC has doubled its

membership for the coming year and hopes to increase their activities within the Department. Already they've participated in recruitment during the U's Welcome Week and Plaza Fest, hosted a department booth at the Avenues Street Fair, and many have signed up to be judges at upcoming science fairs. The group is planning field trips for the fall semester and will be hosting this year's fund raising efforts with Dean Brown and other student organizations.

### **SEG and AAPG Students Earn Matching Pledge**

In the fall of 2010, Frank Brown, the Dean of the College of Mines and Earth Sciences, pledged to match up to \$1,000 in funds raised for the Student Field Trip Endowment. The combined efforts of the student chapters of the Society of Economic Geology (SEG) and the American Association of Petroleum Geologists (AAPG) raised \$1,000, which guaranteed a total contribution of \$2,000 to the Student Field Trip Endowment. Without these funds they would not have been able to take their Basin and Range field trip over spring break.



At the SEG fund-raising event, John Zimmerman (left) and David Hedderly-Smith (right) enjoy food and conversation.

### **Student Geothermal Team Awarded Grant**

The G-Team, seven University of Utah geothermal students, entered a national competition sponsored by the National Renewable Energy Lab (NREL), part of the Department of Energy, to promote interest in geothermal energy. They were awarded \$10,000 to perform an assessment of the geothermal potential of the Rio Grande Rift. Ten university teams selected nationwide included Stanford University, the University of California at Davis, the Oregon Institute of Technology, the University of Idaho, Colorado School of Mines, the University of North Dakota, Texas A & M, Penn State, and Virginia Tech.

The interdisciplinary team was drawn from students who had taken a new course, Geothermal Systems for Geoscientists, organized last fall by Dr. David Chapman, and supported by Rick Allis, Director of the Utah Geological Survey, and Joe Moore, a geothermal scientist at EGI. **Danielle D'Alfonso, Christian Hardwick, Becky Hollingshaus, Stan Smith, and Ruthann Shurtleff** were from Geology and Geophysics. Kevin

Smith came from Mechanical Engineering, and Michal Kordy from Mathematics.

The G-Team did its analysis during spring semester and presented a 50-page report to NREL in Santa Fe in June. The team also showed its Rio Grande Rift Assessment in poster form at the Geothermal Resources Council Annual Meeting in San Diego in October.

### **Ph.D. Student Godsey Receives Journal Citation Award**



Ph.D. candidate **Holly Godsey** received recognition from the international journal *Quaternary Research* for the "Most Cited Article 2005 to 2010." The article "New Evidence For An Extended Occupation of the Provo Shoreline and Implications for Regional Climate Change, Pleistocene Lake Bonneville, Utah, USA" was in *Quaternary Research* (2005), v. 63 (2), pp. 212-223.

Co-authors included Don Currey (deceased) and Marjorie Chan.

### **Ph.D. Student Potter Attends NASA Courses**



**Sally Potter**, a Ph.D. candidate, received a scholarship to attend the NASA Astrobiology school in Hawaii in summer 2011. Sally has been fortunate to receive a number of NASA-supported courses to enhance her education in exciting places such as Spain and Sweden, and in 2012 she will attend a NASA course in Brazil.

### **Students Experience Summer Internships**

Many companies offer graduate students seasonal internships, where the latter learn more about their chosen fields, as well as what it's like to work in the industry, all valuable experience.

**Katherine Clayton** is working on hadrosaur dinosaur skin impressions, using incredibly well-preserved examples from the Grand Staircase Escalante National Monument.

**Megan Crocker** spent her summer working with the Midland Division of EOG Resources, using Petra, a software program that manages oil and gas data, to analyze a prospect area within the Permian Basin of Texas.

**Brendan Horton** worked for Exxon's Petroleum Geochemistry Division, in the Upstream Research Company. He worked on emerging technologies where one would listen to rocks being crushed and try to determine what useful information could be obtained from the data.

**Steve Pinta** worked with SM Energy Company of Billings, Montana where he did geological and petrophysical analyses of the Shannon Sandstone within the Powder River Basin, in terms of future exploration and possible quantities of overall oil recovery.

**Zhengwei Xu** held an internship with Shell Oil Company in Houston during the summer of 2011 and was invited to return next summer. He worked in the Electromagnetic (EM) Group,

concentrating on analysis of 4D deep marine data using control source electromagnetic method (CSEM).

**Hongzhu Cai** did an internship with Shell Oil this summer in Houston. He worked on potential field problems and basin depth analysis.

## Graduate Students Arrive from Around the World

Two Ph.D. candidates have joined us this year: **Brent Greenhalgh** - BYU focusing on Sediments/Stratigraphy and **Eliana Mananagon**, National Polytechnic School of Ecuador in Geological Engineering.

Our new M.S. candidates in Geophysics are: **Mason Edwards**, U. California – Santa Barbara; **Haiyan Fu**, Yangtze University (China); **Christine Gammans**, Georgia Institute of Technology; **Kevin Kwong**, California Polytechnic University – Pomona; **Carrie Welker**, San Diego State U.; and, **Yao Yao**, U. of Science and Technology.

Our new M.S. candidates in Geology are: **Dina Freedman**, U. of Utah; **Marko Gorenc**, Mesa State College; **Glynis Jehle**, U. of Arizona; **Patrick Loury**, Montana State University; **Andrew McCauley**, Dartmouth College; **Olivia Miller**, Wesleyan University; **Theresa Morrison-Zajac**, U. of Pennsylvania – Kutztown; **Joel Pierson**, Hope College; **Morgan Rosenberg**, U. of North Carolina – Chapel Hill; **John Solder**, Stanford U.; **Neil Swanson**, SUNY – Genesco; and, **Tyler Swarc**, Bucknell University; **Alexandre Turner**, U. of North Carolina – Chapel Hill.



New graduate students Morgan Rosenberg, Tyler Swarc, Kevin Kwong, and Alexandre Turner share lunch with new faculty member Lauren Birgenheier (center) at the graduate student orientation.

## Undergraduates Enjoy Research

Many of our undergraduates get invaluable experience by actively participating in research projects. Along the way, they learn a lot about what they like and don't like to do.

**Kim Koeven** received a University Research Opportunity Program (UROP) grant to support her research project on iron oxide concretions associated with vertebrate bones in the Triassic Chinle Formation near Ghost Ranch, New Mexico.

**Ryan Hillier** is examining sedimentologic aspects of the Jurassic Wanakah Formation of western Colorado.

**Tracy Thomson** has been conducting research on Early Triassic subaqueous tracks that indicate pre-dinosaurian reptiles swam upstream much like modern-day dogs.



Tracy Thomson finds underwater, early reptilian, swim tracks in Utah's Moenkopi at Capitol Reef.

**Abby Smith** is studying carbonate nodules out of the Triassic Chinle formation in Grand Staircase Escalante National Monument, Utah.

**Daniela Anguita** is mapping the Salt Lake segment of the Wasatch fault near Olympus Cove in the Salt Lake City area.

**Katie Bradbury** is looking at the geometry, abundance, and oxygen isotope composition of dolomite vein sets and their role in formation of talc in the Alta contact metamorphic aureole, Utah.

The team of **Ian Feltt**, **Casey Root**, and **Chris Carlson** are examining textures and chemical composition of ludwigite, the rare iron-magnesium borate mineral in the Alta contact metamorphic aureole, Utah.

## GG Team Wins Dodgeball Championship

In the fall of 2010, a team of Geology and Geophysics graduate students was crowned champions of Intramural Dodgeball. After a grueling battle, with tired arms and everything on the line, our own Nodding Donkeys eliminated the enemy and brought the Department of Geology and Geophysics their first intramural Dodgeball championship. In the spring they hoped to stage a repeat, but after another hard-fought contest, they fell just short. Nevertheless, they are poised to recover their laurels this fall.

## Moving Forward

"The times, they are a-changin'," sang Bob Dylan. We, too, are acutely aware of constant change in our science as well as in the education of our students – and beyond that, of our impact on the community. We reach out wherever we can to make what we do important and interesting to an ever-wider audience. We want to encourage our friends and alumni who can see more opportunities in this arena to contact their favorite faculty or our Department at the e-mail address in the masthead inside the front cover. Here's what's happened this year.

## Outreach Efforts Spur Recruitment

Fall Semester is outreach and recruiting season for the Geology and Geophysics Department, both on and off campus. The parade of events commences with **Plazafest**, a campus “fair” which provides students with information on clubs, majors, service organizations, and support groups. Student Advisory Committee (SAC) members spoke to more than 40 individuals interested in our Department, or at least in the eye-catching fossils and minerals on display.



Many groups visit the Sutton building to learn about geology and see our inviting displays.

Next up was the **Avenues Street Fair**, a Salt Lake City community event that draws hundreds of visitors year after year to our exhibits on Wasatch Front earthquake hazards and Utah geology. The **Majors Expo** and **Science Day** (at which our faculty and students present research workshops to visiting high school seniors), the **Future Students Open House**, **Transfers Day**, and several freshman orientation events including a **geologic tour** of Red Butte Garden present other opportunities. Prof. David Dinter coordinates these activities, but we depend on our cadre of indispensable, world-class undergrad and graduate student volunteers. Thank you!

Our outreach efforts are paying off, as enrollments in our courses are way up and continuing to rise, and numbers of declared Geoscience majors have increased dramatically. Registration in core geology courses languished for much of the last decade, but for fall semester 2011, we can show a 200% increase from just a few years ago! Our general education courses, which fulfill the undergraduate Science Foundation requirement and introduce students from all over campus to geoscience, are also strong and growing. The Natural Disasters class nearly fills to capacity every semester, and demand for the World of Dinosaurs has grown so strong that a fall semester section has been added. A recent addition, Living With Earthquakes and Volcanoes, an online offering that satisfies the international requirement (the only hard science course to do so!) debuted last year with an enrollment of 160 and has 191 enrolled this fall. Plans are underway to offer a classroom section of this course, possibly as early as next year, and we are also looking forward to the first offering next spring of Mars for Earthlings.

## WEST and Its Spinoffs Inspire Teachers

The Water, the Environment, Science and Teaching (WEST) program, which has been active in the Salt Lake City School District, continues the mission of a former NSF grant to Dr. David Chapman in 2004.

WEST began as an effort to pair graduate students in the scientific disciplines with K-12 teachers to implement hands-on, inquiry-based, and authentic science experiences. The goal was to improve the teaching and communication skills of the university students while at the same time increasing the science knowledge and enthusiasm of teachers and their students. The university students are able to draw on resources from the Utah Museum of Natural History as well as the departments of Geology and Geophysics, Biology, Atmospheric Sciences, Mining Engineering, Metallurgy, and Chemistry. Over the life of the program, WEST has impacted 70 graduate students, 60 teachers, and over 8,000 young students.

So successful was WEST that three allied programs with similar goals were developed and implemented. The Embedded Alliance for Science Teaching (EAST) program, which began in 2007 with an NSF Math and Science Partnership grant to the Salt Lake City School District, pairs undergraduate students in the sciences with K-12 teachers and their students. This program has impacted 33 undergraduates, 30 teachers, and over 800 students. The Think Globally, Learn Locally (TGLL) program grew with a grant to Dr. Don Feener in the Department of Biology. This program has engaged 27 graduate students, 18 teachers, and over 500 K-12 students. The Connections with Ecology, Science, and Teaching (CWEST) program provides professional development for teachers, using the scientific expertise of WEST, TGLL, and other University of Utah scientists. Through hands-on workshops, they learn to set up an outdoor classroom to engage in authentic science experiments wherever their school may be located.



At the First Annual Salt Lake Center for Science Education Climate Change Forum in May 2011, twenty-five 7th graders gave presentations on topics related to the Earth's climate. They also presented posters, displayed artwork, invented games, and recited poems about the global change and the carbon cycle. The event was well attended by our faculty who enjoyed being in the role of student as the 7th graders taught them about the carbon cycle.

To date, funding from the NSF and from various arms of the University, the George S. and Dolores Doré Eccles Foundation, the Salt Lake Education Foundation, and Lakeview Charter School has provided \$2,523,000. Graduate student Holly Godsey coordinates these student teaching programs.

## Sutton Building Creates Ripple Effect

We are repeatedly reminded that our now famous Department home, the LEED Gold Certified Frederick A. Sutton Building, is a ground-breaker and a rule-changer. It continues to serve us well on so many levels – as a teaching tool, research center, hub of student activity, and outreach venue. The Sutton building received the “Environmental Designs” Award in the Design Arts Utah 2011 competition, recognizing the creative designs and integrated educational experience employed by Diamond Phillips.

Groups from all over Utah hold receptions in the Confluence entry hall (the Governor delivered a speech there this year), with its fossil fish and plant walls from Wyoming’s Green River Formation, or gather for meetings in our state-of-the-art conference room looking towards the Wasatch Mountains. Students from across campus come to study, talk, or sip drinks from our own Two Creeks Café, or in the many open, comfortable, informal, gathering places indoors and out, where they are surrounded by museum-grade fossil and mineral displays from around the world.



Governor Herbert unveiled his 10-year energy plan in the Sutton Building Confluence, in front of the fish wall.

Our faculty and students have guided many tour groups, including those from Lausanne University, the Student Services Counseling Center, the Engineering and Science Orientation, and the Latinas Adelante program from the University, Salt Lake Arts Academy, Mountain View Elementary School, Boy Scout troops, Hess Oil Company, Utah Museum of Natural History summer camps, and more.

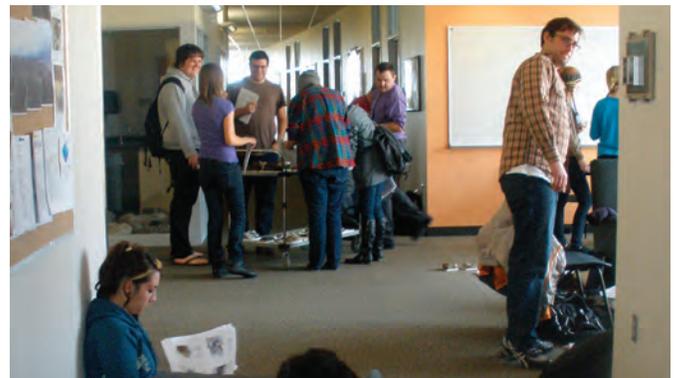


Kristie McLin and Kimberly Koeven give a hands-on demonstration of sand art while teaching about depositional processes to a group of possible future geologists!

As this wider range of people becomes aware of the innovative and beautiful displays, ideas to further enhance them pour in. Dr. Marjorie Chan recently received an Undergraduate Student Experts on Teaching (USET) grant to involve an undergraduate student in another innovative effort that extends the building’s teaching and outreach capabilities. The plan

uses quick response (QR) codes installed near displays. Visitors and students can scan the codes with smart phones to get immediate links to video clips telling about the displays and design features. With this new technology, visitors can take their own tours and explorations of our building.

Chan also presented aspects of an “experiential environment,” using the Sutton building as a model, at the 2011 National Society for Campus and University Planners (SCUP) meeting in Washington, D.C. The presentation demonstrated how a building that showcases academic disciplines can create an inviting and engaging learning environment. The ideas were received enthusiastically, and the team was invited for an encore at the SCUP spring 2012 meeting to be held at Stanford, California. It is clear that the Sutton building’s integration of educational displays is a new trend that other university campuses will want to emulate.



Sometimes the hallways are literally overflowing with our enthusiastic undergraduates (record enrollments).

## Oil Company Recruiters Meet Our Students

This year, we had a record number of oil companies sending recruiters to interview our students. It’s particularly a pleasure when some of our alumni are among them (*alumni in italics*). They come with a lot of information about what working in the industry is all about, and we learn as much from them as they do about us. We would like to thank the following representatives:

**ConocoPhillips** - Carlotta B. Chernoff and Jason Stein

**ExxonMobil** - Eric Wildermuth and Shane Long

**Hess Oil** - *John Byrd* (Ph.D. 1995), *Will Gallin* (M.S. 2010), Hannah Lagrone, and Laurel Gandler

**BP** - *John Naranjo* (B.S. 2005) and Doug Stoner

**EOG Resources** - John Chapman and Kim Cadena

**Chevron** - *Jacob Umbriaco* (M.S. 2004), *Aksel Quintus-Bosz* (M.S. 1992), Tyson Perkes, and *Keith Christianson* (M.S. 2009)

**Apache Oil** - Michael Abrams

## Annual Awards Salute Exceptional Achievements

Hard work and dedication mark the efforts of our faculty and students. The April 2011 celebration lauded another outstanding group.

## Distinguished Alumnus Recognized

Matthew J. Mikulich and Robert B. Smith

## Scholarships, Fellowships, and Awards Given

We thank the College, the Department and our many Friends who made substantial and important support possible for the following students:

**James and Ann Anderson Award:** Jordan Culp  
**Thomas Parry Billings Scholarships:** Rachel Anderson, Matthew Fenoglio, Deborah Grant  
**Francis H. Brown Scholarships:** Luke Dow, Jonathan Root  
**Ken and Nedra Bullock-Keller Scholarships:** Kyle Blasé, Gordon Chapdelaine, Ian Feltt, Scott Greenhalgh, Allyson Harward, Ryan Hillier, Kristine Honsvick, Joshua Johnston, James Taylor, Richard Patterson, Lars Petersen, Ruthann Shurtleff, Kimberly Koeven  
**Chevron Scholarship:** Christopher Volk  
**Chevron Graduate Fellowship:** Tyler Szwarc  
**Orlo Childs Field Camp Scholarships:** Kimberly Koeven, KayeLinda Heiner, Robert Armstrong  
**James A. Comstock Scholarship:** Kyle Blasé  
**ConocoPhillips Graduate Fellowships:** Luke Pettinga, Alexandre Turner  
**Ken Cook Geophysics Award:** Christopher Tingey  
**Cooper-Hansen Undergraduate Scholarships:** Brooks Black, Kristine Honsvick  
**Dean's Alumni Scholarship:** KayeLinda Heiner  
**Dee Foundation Assistantship:** Daniela Anguita  
**Eardley Graduate Fellowship:** Glynis Jehle  
**Earl Family Scholarships:** Kelsey Jolley  
**Etta Keith Eskridge Scholarships:** Rebecca Gage, Derek Herndon  
**Frischknecht Scholarship:** Jacqueline Farnsworth, Ruthann Shurtleff  
**Geology and Geophysics Scholarships and Fellowships:** William Hugie, Robert Armstrong, Ryan Jamison, Scott Stosich, Deborah Grant, Rachel Anderson, Abbey Smith, Ryan Thomas, David Jamison, Amy Steimke  
**Department of Geology and Geophysics:** Derek Herndon, Jonathan Root, Tracy Thomson, Kimberly Koeven  
**Geophysics Scholarships:** Gavin Thomas, Friedeike Wischmann  
**Global Change and Ecosystem Center (GCEC) Graduate Fellowship:** Olivia Miller  
**Dorothy Rice Goode Scholarships:** Robyn Lyons, Leah Moelling  
**John Keith Hayes Award:** Adriana Garcia  
**Gerald W. Hohman Memorial Fund:** Casey Duncan  
**H. Honda Sedimentary Scholarship:** Thomas Etzel  
**Honors at Entrance Award:** Amy Steimke  
**Charles B. Hunt Award:** Taylor Wessman  
**Earl Johnson Scholarships:** Robert Armstrong, Thomas Etzel, Ian Feltt, Ryan Hillier, David Jamison, Britni Lowe, Richard Patterson, Scott Greenhalgh, Allyson Harward, Scott Stosich, Brittney Thaxton, Ryan Thomas, Taylor Wessman  
**G. Frank and Pamela M. Joklik Scholarship:** Casey Duncan  
**Kennecott Meritorious Awards:** Gordon Chapdelaine, Kelsey Jolley, Robyn Lyons, James Taylor, Roxanne Winegar  
**Kennecott Scholarships:** Mallory Millington, Ali Shearman

**Matt Mikulich Scholarship:** Brett Judy  
**Mineralogical Society Scholarships:** Brooks Black, Jordan Culp, Luke Dow, Casey Duncan, Matthew Fenoglio, Rebecca Gage, KayeLinda Heiner, Land Huegel, Kimberley Koeven, Britni Lowe, Brittney Thaxton, Roxanne Winegar  
**Questar Scholarships:** Hannah Durkee, Ian Feltt, Kelsey Jolley, Scott Stosich  
**Ricardo Presnell Scholarships:** Daniela Anguita, Mequette Gallegos, Adriana Garcia, Kevin Jimenez, Eric Thomas  
**Stokes Graduate Fellowship:** James Lehane  
**Think Globally, Learn Locally (TGLL) Graduate Fellowships:** Thomas Good, John Solder, Carrie Welker  
**University of Utah Continuing Scholarship:** Hannah Durkee, John Fullmer, Jennifer McCullough  
**Marta S. Weeks Legacy Scholarship:** Daniela Anguita, Paris Morgan  
**AWG – Salt Lake Chapter: Susan Ekdale Field Camp Scholarship** – shared by Lundyn Milne from Southern Utah University and Daniela Anguita of the University of Utah; **Outstanding Student Award** – Kim Koeven; **Research Scholarship** – Carolyn Levitt



AWG Award recipients (front row left to right) Daniela Anguita, Kim Koeven, and Carolyn Levitt

## Honors Awarded

### Outstanding Faculty and Staff Awards

**Research:** William P. Johnson, Randall B. Irmis  
**Teaching:** John R. Bowman  
**Team of Excellence:** Christina B. Carver

### Outstanding Graduate Students

**Ph.D. Candidate:** Gregory Carling  
**M.S. Candidate:** Michelle Cotton  
**Outstanding Teaching Assistant:** John Boswell

### Outstanding Undergraduate Students

**Geology:** Rex Bigelow  
**Geoscience and Environment:** Nora Nieminski  
**Geological Engineering:** Jesse Moyles  
**Earth Science Teaching:** Rebecca Gage  
**Ronald Terrill Award:** Rachel Anderson

**Petroleum Industry Career Paths (PICP) Awards:** Patrick Dooling, Lei Fu, Thomas Good, Muran Han, Brendan Horton, Luke Pettinga, James Schloss, Ruthann Shurtleff, Zhengwei Xu

**AAPG Geosciences in the Media Award:** Ronald C. Blakey

### GSA Awards

**Fellows:** Phil Wannamaker, John Bowman  
**Subaru Outstanding Woman in Science:** Naomi Levin  
**Fellow:** Richard P. Langford  
**Cole Award:** Dave Marchetti

**Student Honorable Mention:** Jesse Morris



Graduate students enjoy the Spring Banquet (left to right) - Patrick Dooling, Brendan Horton, Kelly Sullivan, Tommy Good, Luke Pettinga, Joshua Lively, Jim Lehane, and Angela Seligman.

## Alumni and Friends

Every year we look forward to learning what our alumni and friends have been doing. We send 'em out into the world and, Wow!

### Ken Larsen Endowment and Historic Tales

**Ken Larsen** (B.S. 1953) fondly remembers his Utah days and is enthusiastic about giving back. The Department is proud to announce that Ken has initiated an endowed fund that will help support the coming generations of students. These kind gifts truly build and sustain our programs.



Ken Larsen with Marjorie Chan at his 81st birthday party in Taos, NM.

Clearly, over the years Ken understood the value of his education. But it was also a lot of fun. As we promised last year when we printed one of Ken's stories, here is another. It, too, took place in 1950.

Then as now, there were student jobs around the Department. Ken worked for geochemistry professor, Dr. Edwin Roeder who had a grant to do pure research for the Office of Naval Research. The pay was a dollar an hour, and Ken's first duties were to pulverize samples of Si, Al, Ca and Fe oxides that had been produced by melting in platinum crucibles at controlled temperatures in a homemade ceramic-core furnace made by coiling platinum wires around the ceramic core inside an old five-gallon metal bucket with holes punched in the top and bottom. On the floor, under a well-ventilated hood, was a container of pure mercury that bubbled when the white-hot crucible was lowered into it.

As Thanksgiving approached, Dr. Roeder invited Ken and several other students to Thanksgiving dinner. Ken and his three roommates shared a one-room attic apartment where

they ate mostly potato bread because they found it kept the longest without going moldy. They ate sandwiches made from the contents of dented or unlabelled cans which they bought at a cut-rate grocery store for ten cents a can, making a pact that no matter what was in the can they would eat it on the potato bread. Ken recalls they had some peach sandwiches or even just hot chilis on bread. Once in a while they would splurge and go to University Drug Store for a meat loaf sandwich. So that Thanksgiving invitation was really exciting, especially for someone 3,000 miles from home. They had a wonderful meal with wine, a big brown turkey and bowls of potatoes, gravy, and squash, accompanied by great conversation. About a month later, Dr. Roeder extended another invitation, this time for a Christmas dinner. This time the turkey in the center of the table looked smaller. Ed said, "You might recognize the turkey, because after you left we froze the whole bird and saved it for Christmas!" It tasted even better the second time around as Ken realized that professors at Utah were forced to economize, wherever possible, just like the students.

### Blast from the Past: Susan Beck

In our "Blast from the Past" series, we take pleasure in giving our geology and geophysics community a look at another alumna, this time one who pursued the academic path with noteworthy success.

### Susan Beck Pursues Teaching, Administration and Research



Susan Beck in Argentina doing fieldwork.

**Susan Beck** (B.S. 79, M.S. 82) has recently stepped down from seven years as head of the Department of Geosciences at the University of Arizona. She looks with satisfaction on those years, and the preparation that began with her years at Utah. Her solid foundation in structural geology with Dr. Ron Bruhn led to summer mapping and exploration jobs that strengthened her field skills, thus giving her a vital background for the geophysical studies she pursued at the University of Michigan,

culminating in a Ph.D. in 1987. From there, she continued with a post-doctoral fellowship in seismology at the Lawrence Livermore National Laboratory. When asked about the highlights of the past couple of decades, she spoke enthusiastically about her ambitions for her department and its students, and then of her own evolving research interests.

As the department head at Arizona, she was determined, first, that the faculty they hired should be the very best and brightest they could find. Part of that excellence had to be their ability to communicate well both scientifically and in their teaching. She also looked for flexibility, choosing people with breadth rather than niche players for, as she said, "We all do other things than we did in graduate school." Then, she strove to create the environment that smart, motivated people need to do their best. She believes strongly in the need for collegiality within the department, something that is no surprise to those who knew her during her Utah days, when we saw the respect and appreciation she showed for everyone.

Her educational mission began simply: to build the best undergraduate program, first by actively recruiting bright students, then by increasing scholarships and endowments to support them, and by giving them a head start in the profession through field and lab experience, and interaction with the faculty. She is proud that 60 per cent of the undergraduates have field and laboratory research experience. But during her tenure as head, the focus of teaching grew dramatically broader; ideas about effective academic education moved into general public awareness. On the one hand is the realization that all students, regardless of their discipline, need to learn to think critically. In addition there is a need to incorporate earth science awareness into the education of non-majors, and beyond that is a new mandate to educate the public about the integral part the geosciences play in the success of our civilization.

She should have a little more time now to pursue her research interests in seismology and active tectonics. Since 1992 she has studied lithospheric-scale deformation in the subduction zone in the Andes where there are thousands of earthquakes daily. For the past eight years she has also been working on the North Anatolian Fault region, a strike-slip situation vital in the formation of the Anatolian Plateau, very different processes from her ongoing work in Chile, Argentina, Bolivia, and more recently Peru. Each year she sends four or five graduate students to remote field sites for about a month at a time. After all these years, she still revels in the “fantastic travels and great people.



The colorful Triassic Chinle Formation is host to a number of geologic studies in our Department.

### ***Distinguished Alumnus Award Initiated***

The Department is repeatedly and constantly reminded, on every side, of how much our graduates contribute to Earth science, to industry, and to their communities. To honor their outstanding accomplishments, we have initiated the Distinguished Alumni Award. This award will recognize those graduates of our Department who have earned acclaim in academia, government, and industry, as well as those who have exceptional records of service to professional organizations, our Department, or the greater community. They will receive a memento of the Department and have their names added to a plaque in the Sutton Building. At the Awards meeting in April 2011, the first recipients were announced.



**Robert B. Smith** (Ph.D. 1967) was recognized for his seminal geophysics research on the tectonophysics of the western United States, for his development of graduate students, and his service to our Department through his associations with professional groups, government agencies, and the public. (See the article about his latest recognition in “Faculty Focus” in this issue of the Newsletter.)

Over the years his research interests helped support 68 graduate students, and produced over 160 papers. He is a University Distinguished Professor and a Fellow of both the American Geophysical Union and Geological Society of America, and he has been repeatedly recognized by the USGS and the National Park Service.

He was actively involved in development of the University of Utah Seismograph Station over many years, and developed large instrumental arrays of seismometers and GPS instruments in the Yellowstone – Teton Parks and along Utah’s Wasatch Front. Bob has been one of the best possible ambassadors for our Department.



**Matthew J. Mikulich** (Ph.D. 1971) spent a remarkable career with Chevron, rising to be Chief of Exploration while playing an important role in the Summer of Applied Geophysical Experience (SAGE). He has always taken a personal interest in our geophysics students as well as the interests of university colleagues. As chairman of our Advisory Committee, he urged the Department to aspire to new heights, contributing to new initiatives

such as the Department’s Career Day and the Petroleum Industry Career Path program (PICP). As an Adjunct Professor, he initiated and taught seminars in “Careers in Earth Science.” Matt’s enthusiasm for science – and life – is an example to us all.

### ***Old Friends of the Department Meet at GSA***

The 2011 GSA U. of Utah Alumni function held in Minneapolis this October was attended by faculty members Kip Solomon, Ron Bruhn, Marjorie Chan, and Paul Jewell.

Alumni who dropped by were Rip Langford, Brenda Beitler Bowen, Jessica Moore, Dave Marchetti, Leif Tapanilla, Phil Armstrong, Michael Manship, Steve Vanderhoven, Devin Castendyk, Andy Manning, Roy Van Arsdale, Troy Thompson, Roger Congdon, Payton Gardner, Devin Castendyk, Anke Friedrich, and Vic Heilweil.

Students who made the trip included Katie Bradbury, Daniela Anguita, Kim Koeven, Becky Hollingshaus, Josh Lively, Stan and Amanda Smith, and Ryan Hillier.

We enjoyed seeing you all, and look forward to seeing even more of you next year.

### **Dean Greets Alumni in Houston and Denver**

On occasion Dean Frank Brown visits the energy cities of Houston and Denver to meet with Utah alumni. At a fall 2010 visit in Houston the following alumni were able to join for a lively luncheon, hosted by Roice Nelson (B.S. 1974), where John Dorrier (B.S. 1975) spoke about the future of offshore drilling. Those present included Jessica Moore (M.S. 2005), David Bartel (M.S. 1984), Grant Crandall (B.S. 1978), Marc Croes (M.S. 1979), Ben Davis (B.S. 2004), Andrew Haynes (B.S. 2004), Alan Leeds (Friend of the U) Stirling Pack (M.S. 1976), Bill Powell (Ph.D. 1997), Yonghe Sun (Ph.D. 1990), Jake Umbriaco (M.S. 2001), Ross McNeil (M.S. 1991), and Eric Olafsen (B.S. 1978).

When he visited Denver in spring 2011, he saw David Aldous (B.S. 1980), Elwood (Woodie) Hardman (B.S. 1963), Richard (Dick) Hepworth (M.S. 1963), Jerry Knaus (B.S. 1980), Andrew Ross (M.S. 1977), and Bob Garvin (M.S. 1967).

Dean Brown also had the opportunity to have dinner with Jim Hollis (M.S. 1988) and Craig Beasley (Ph.D. 1989).

### **Alumni Send News from All Over the World**

Every year the activities and interests our alumni tell us about are more exciting. We look forward to hearing from all of you.

#### **1950s Graduates**

**Ken Larsen** (B.S. 1953) celebrated his 81st birthday with family and friends in Taos, New Mexico. He still enjoys going on geological field trips, and his three-day birthday party included an excursion to the Rio Grande Gorge. Read more about him in "Ken Larsen Initiates Endowment" in this issue. We've included another of his stories, as we promised last year.

#### **1960s Graduates**

**Doug Hollett** (M.S. 1969) has been named as the new Geothermal Technologies Program Manager at the Department of Energy. His thesis with Ron Bruhn prepared him for work as an exploration geologist at Union Oil. Later he participated in the formation and growth of Canada's first integrated oil and gas research agency. Since 1981 he has held leadership positions in research, exploration, and business development at Marathon Oil.

**Charles Mardiros** (M.S. 1964), from whom we've not heard in a long time, sent a great update on his career as a mining geologist. We'll just recount the highlights here. (For those of you who knew him "when", he's cut off the last three letters, "-ian", of his name.) Over the years, he's worked both surface and underground properties in metallic and non-metallic deposits, from the U.S. to Honduras. Of the latter, he says that living and working in the Third World, particularly the jungle, was quite an experience. He's been both employee and

consultant with several oil and mineral companies, and even taught at a junior college. He asks, "Is the old Mines Building still there?" We can tell him a lot about that, can't we?.

**Wallie Rasmussen** (B.S. 1969 Mines & Earth Sciences, J.D. 1972 Law) retired from Exxon-Mobil and moved back to his old stompin' grounds. He is happy to be back in Salt Lake City.

**Peter Stifel** (Ph.D. 1964) had a busy and fun summer. It included a fabulous trip to Squaw Valley and Pebble Beach. A highlight was flying home right over the middle of the Hogup Mountains – his old stomping grounds. He's taken several friends on excursions out there with Google Earth. It's great technology!



*Pleistocene Lake Bonneville shorelines in the Hogups are impressive as ever.*

#### **1970s Graduates**

**Edith Allison** (M.S. 1979) retired from the Department of Energy office in Washington D.C. and now enjoys travel and catching up on some of the things she was too busy to do before.

**Ron Blakey** (M.S. 1970) retired from his long-held position at Northern Arizona University and is now Professor Emeritus. He is still active, constantly refining the time-slide paleogeographic maps that so many of us use. Ron was recognized at the April 2011 American Association of Petroleum Geologists awards ceremony where he received the "Geosciences in the Media Award". Congratulations, Ron!



*The new Natural History Museum of Utah displays Ron Blakey's time slices of Utah paleogeography for each geologic era in the "landscape" trail that leads to the rotating world globe.*

**John Dorrier** (B.S. 1975) has been busy with his many ventures, but for fun he has also enjoyed investigating some rare fossils from China, such as specimens of *Anchiornis*, a small, feathered, deinonychosaurian dinosaur, and a sabre tooth cat.

**W. Dan Hausel** (B.S. 1972, M.S. 1974) recently finished a new book with his son Eric, who graduated in geology, physics and astrophysics at the University of Wyoming. They've written a new book together, called *Gold: A Field Guide for Prospectors and Geologists (Wyoming and Nearby Regions)* Vol. 1.

**Rich Leveille** (B.S. 1977) is president of Freeport-McMoRan Exploration Corp. but he still loves the fieldwork and gets out as much as he can. He fondly remembers the tutelage of Prof. Lee Stokes and the grounding fundamentals he received in mineralogy, petrology, and careful field observations.

**Matt Mikulich** (Ph.D. 1971) is still an Adjunct Professor in our Department. He likes to give woodworking demonstrations at various fairs and events. Last year he completed a large, complex altar with beautiful hand-carved relief, and now is thinking about another project – a lectern. He enjoyed the yearly reunion of Chevron retirees out west this past year.

**Craig Morgan** (B.S. 1975) continues to be busy working in the Petroleum Group of the Utah Geological Survey. In his free time he enjoys golfing with a group of other geo-buddies.

**Roy Van Arsdale** (Ph.D. 1974) is still at University of Memphis, Tennessee. He is interested in extending the New Madrid seismic zone to the north through Missouri and Kentucky. He also studies the Pliocene history of the Mississippi river system.

**Chuck Williamson** (M.S. 1973) has been instrumental in helping establish a new Jackson Student Center at the University of Texas, his Ph.D. alma mater. This year his travel included trips to the Andes and Bogota, Columbia, along with visits to see the jungle operations, as part of work for the company boards he serves on.



*Chuck Williamson cooks a great artisan pizza in his wood-fired oven!*

## 1980s Graduates

**Brad Boschetto** (M.S. 1988) stopped in to visit mentor Dean Frank Brown recently. Brad and his wife **Nancy Butterworth** (M.S. 1988) and teen-age daughter have enjoyed life in Alaska,

but are soon moving to Shell's headquarters office in The Hague.



*Brad Boshetto and Dean Frank Brown pose against our wall of Green River fish fossils during a recent visit.*

**Gary Colgan** (B.S. 1984) recently got married and has been working as a senior technologist for CH2M Hill, overseeing one of the western regions.

**Roger Congdon** (M.S. 1987) is still with the USDA Forest Service, technically for the Washington office, but he is able to be based out of New Mexico.

**Diane Doser** (Ph.D. 1984) stepped down from the Chair of the Department of Geological Sciences at University of Texas-El Paso and is now back to her seismotectonical studies of southeastern Alaska, Death Valley, the Caribbean, Pacific Northwest, and New Zealand.

**Jody Geisman** (B.S.) retired from the Army Reserve after 20 years of service — Wow! She still works for CH2M Hill and in some of her free time likes to fish and camp.

**Jeff Gentry** (B.S. 1984) has been busy on the international mining scene. His company, Emerald Peak Minerals (EPM) has been developing a potash prospect near Sevier Lake. Recently Valley Holdings, a subsidiary of Tata Chemicals, acquired a large chunk of EPM. Jeff visited us several times this past year with some exciting ideas for student and faculty involvement in EPM.

**Richard (Rip) Langford** (Ph.D. 1989) has more than a full plate as Professor of Geological Sciences at University of Texas at El Paso, and for several years was Chair of the Environmental Science and Engineering graduate program, sometimes supervising as many as 10 graduate students. But he still makes time for service, as he is the 2011 Chair of GSA's Division of Sedimentary Geology. The GSA recognized his contributions with a 2011 Fellow award. Rip's research still focuses on understanding how arid landscapes respond to environmental change. He also studies the evolution of river systems and the interactions between different desert environments.

**Brad Larsen** (M.S. 1989) is still consulting and looks at XRD/XRF questions regarding nano-thermite particles in dust samples.

**Steve Newman** (M.S. 1985), teaching Earth science at Kent Middle School in Denver, made news in August 2011 when the seismograph his class built five years ago recorded the largest earthquake to hit Colorado in almost 40 years. It made a nice homework exercise for his students to tackle on their first day back to school.

**Steffan Ochs** (M.S. 1988) and wife, Barb, are still in Perth, in a home close to the beach, and making good use of their lap pool. They still enjoy hiking world-wide. Steffan is once again engaged in regional geology, stratigraphy, and play generation. They hope to be making a trip to the U.S. this next summer.

**Troy Thompson** (M.S. 1988) is a regional hydrogeologist for the eastern region of the U.S. Forest Service in Milwaukee.

**Dave Tomten** (M.S. 1985) is living in Boise and enjoying his work with the EPA, where he has been for more than two decades. He does permitting and mine issues, and in his free time he still likes to go trail running.

**Phil Wannamaker** (Ph.D. 1983) attended the 2011 GSA in Minneapolis, Minnesota, where he both gave a paper and received a GSA Fellow Award. (We featured his Antarctica research story in the Feature Stores section of this newsletter.)

**Sean Willett** (B.S. 1982; Ph.D. 1988) is Professor and Chair at the Swiss Federal Institute of Technology – Zurich. Sean conducts research on physical processes at, and near, Earth's surface. His research is particularly focused on how climatic and erosional processes affect the structure, evolution, and sediment transport in mountain belts. Most of his research involves application of numerical models, but also includes field experiments and applications of low-temperature, isotopic dating.

**Mark Williams** (B.S. 1982) is Vice President of Exploration for Whiting Petroleum Corporation. He enjoys living in Golden, Colorado.



*A toadstool in the Jurassic Entrada Formation is a fascinating site in Grand Staircase Escalante National Monument.*

### 1990s Graduates

**Phil Armstrong** (Ph.D. 1996) is Professor of Geology at California State University at Fullerton (CSUF), working with graduate and undergraduate students on projects in southern

Alaska, Joshua Tree National Park, and the southern Sierra Nevada Mountains. His wife, **Tisha Butcher** (M.S. 1993), teaches geology part time at CSUF and spends a ton of time helping with their 15-year-old daughter Ema's sport teams. They also run in the local mountains trying to recreate the terrific times they had in the Wasatch.

**Devin Castendyk** (M.Sc. 1999), is an Associate Professor at State University of New York (SUNY) College at Oneonta, and is working on the physical limnology of lakes in the Dry Valleys of Antarctica, and is well known for his work on mine pit lakes. Devin recently received tenure and was the recipient of a 2011 SUNY Chancellor's Award for Excellence in Teaching. Congratulations, Devin!

**Anke Friedrich** (B.S. 1990, M.S. 1993), Professor and Department Chair at Ludwig-Maximilians-University in Munich, Germany, and adjunct faculty in our Department has played a pivotal role in developing an exchange program between the University of Utah and Ludwig-Maximilians-University. As part of the exchange, German students will be checking out Utah geology in September 2012, and Utah students will go on a field trip to the Alps in August 2013. Anke organized and hosted a fall 2011 International Fragile Earth Conference in Munich. All who participated rated it a big success.

**Jordi Maria de Gibert** (Post-Doc. 1997-1999) who did paleontological research and taught a few courses as an instructor here, is now a tenured Professor at the University of Barcelona in Spain. He teaches undergraduate courses, supervises graduate students, avidly roots for the European champion Barça soccer team, and is actively engaged in research on Miocene paleoecology of the western Mediterranean region. Jordi collaborates with Prof. Tony Ekdale, and they have written papers together on Miocene trace fossils. This past summer, Jordi organized and led a coast-to-coast geological field trip across northern Spain for a small international group of geoscientists to coincide with the visit of Tony and his U. of Utah students.

**Suzanne Janecke** (Ph.D. 1991) enjoyed a sabbatical break from Utah State University which she and husband Jim Evans were able to spend at the University of Wisconsin. Suzanne and colleague Bob Oakes led a sectional GSA field trip to Lake Bonneville sites in Cache Valley in May 2011.



*Suzanne and colleague Bob Oakes led a sectional GSA field trip to Lake Bonneville sites in Cache Valley in May 2011.*

**Jenny Joyce** (M.S. 1996) is keeping busy as a geologist for ExxonMobil in Houston.

**David R. Lemons** (Ph.D. 1997) is an oil and gas consultant and recently moved to Pennsylvania.

**Anthony Lowry** (Ph.D. 1994), is an Assistant Professor in the Department of Geology at Utah State University and an Adjunct Associate Professor in our Department. He received the NSF Early Career Award in April, 2010. (See his story about linking quartz deposits earlier in this issue.)

**Brian J. McPherson** (Ph.D. 1996) left New Mexico Institute of Mining and Technology to come here as a Utah Science and Technology Research (USTAR) professor. His research program on carbon capture and sequestration (CCS) collaborates with some of our Department programs and supports students doing characterization studies. Brian is busy getting his new lab settled into the newly completed USTAR building on campus.

**Mark Milligan** (M.S. 1995) continues to handle public inquiries for the Utah Geological Survey. In his free time he is often out trail running or racing. He has developed a knack for renovating and fixing up historic properties.

**Adolph Yonkee** (Ph.D. 1990) is in his second decade as Chair of the Geology Department at Weber State University. His is a full plate, with administrative responsibilities on top of several NSF-funded research projects.

## 2000s Graduates

**Jess Allen** (Ph.D. 2009) recently left the Energy Geoscience Institute (EGI) and moved to Houston to work with Chevron.

**Kimberly Beisner** (M.S. 2008) is now a USGS hydrologist in Tucson, Arizona.

**Julie Bernier** (M.S. 2003) is now on the permanent staff of the USGS in St. Petersburg, Florida. She has been studying astounding changes (e.g., land loss and variations in accommodation space) on human scales in coastal areas of the southeast. She still enjoys playing soccer.

**Brenda Beitler Bowen** (Ph.D. 2005), Assistant Professor at Purdue University, received the 2010 Purdue College of Science Undergraduate Advising Award. Brenda is anticipating new adventures as she and her husband, **Gabe Bowen** (Post-Doc. 2005) make their way back to our campus. (Read about their role in the GCEC earlier in this issue.)



*Brenda and Gabe Bowen doing field work in Alaska.*

**Sean Conner** (B.S. 2009) has been a Geomechanics Engineer at TerraTek (a Schlumberger Company) almost since graduation. He loves it.

**LeAnne Diamond** (B.G.E. 2001) left Kleinfelder and has been keeping active with other contract work in Salt Lake City.

**Ximena Diaz** (Ph.D. 2008) is now a Professor of Chemical Engineering at Escuela Polytechnic Nacional Ecuador. She has been a terrific host and facilitator for some of Bill Johnson's research stints in Ecuador.

**Stephanie Earls** (B.S. 2003) completed a Master's degree in library science and is now working as the librarian in the geologic information and outreach program of the Utah Geological Survey. She is happy to be back in Utah!

**Todd Ehlers** (Ph.D. 2001) is Professor and Chair of Geodynamics at the University of Tübingen in Germany. Todd's research interests are in the interactions between climate, tectonics, surface processes, and biota as applied to the evolution of active mountain ranges and adjacent sedimentary basins.

**Doug Ekart** (Ph.D. 2008) has been working at TerraTek (a Schlumberger company) as a well log analyst for the past three years and loves it. He also got married and says, "Life is good!"

**Chad Fuller** (B.S. 2000, M.S. 2005) sends word that he is now a TerraTek (a Schlumberger company) employee.

**David Handwerker** (Ph.D. 2003) travels all over the world giving talks for TerraTek, a Salt Lake City subsidiary of Schlumberger.

**Sonja Heuscher** (M.S. 2007) does GIS for the Energy and Minerals division of the Utah Geological Survey. She and **Abraham Emond** (M.S. 2007) like exercise and enjoy the great outdoors. Abraham has been keeping busy with geophysical consulting work.

**Sam Hudson** (Ph.D. 2008) continues working at Conoco Phillips in Houston and occasionally makes it back to visit in Utah with his family.

**Grant Hurst** (M.S. 2009) has been working for Montgomery Watson in Salt Lake City as a groundwater hydrologist. He recently left the company with the goal of working on water issues in developing countries.

**Hugh Klein** (M.S. 2009) has been working in western Australia for Golder Associates for the past several years. He is in the process of becoming a Registered Professional Geologist with a speciality in hydrogeology.

**Naomi Levin** (Ph.D. 2007) is now an Assistant Professor at Johns Hopkins University. She and **Ben Passey** (M.S. 2004, Ph.D. 2007) pulled their faculty start-up packages together to get a new mass spectrometer to outfit their lab. Naomi received the 2011 GSA Outstanding Woman Scientist award at the Minneapolis meeting, and gave a presentation speech at the awards ceremony. We are proud of Naomi and all her accomplishments.

**Andy Manning** (Ph.D. 2002) is still with the USGS in Denver. He and **Cheryl Brown** (1994) attended the Fragile Earth Conference in Germany (organized by **Anke Friedrich**) and got to spend some extra days hiking the Alps. They loved it.

**David Marchetti** (M.S. 2002, Ph.D. 2006) continues to use geochemistry and geochronology to study past climates and landscape at Western State College of Colorado. He received the 2011 GSA Gladys W. Cole Memorial Research Award for investigations of the geomorphology of semiarid and arid terrains in the United States.

**Mary Milner** (M.S. 2004) recently left TerraTek and has entered law school at the University of Utah.

**Jessica Moore** (M.S. 2005) is now in Chevron's Bakersfield, California, office and enjoys being back in the Development Division.

**John Naranjo** (B.S. 2005) completed an M.S. at the University of Wisconsin several years ago and for five years has been a Geophysicist with BP Subsurface Technology in Houston, Texas, focusing on deepwater exploration. For a year he was assigned to Perth, Australia. He's currently supporting seismic acquisition operations in Brazil and asks, "Are there any Utes in Rio?" He enjoyed visiting the department as one of the BP recruiters.

**Wade Oliver** (M.S. 2009) is now a hydrologist with a Texas Water Authority.

**Ben Passey** (B.S. 2001, M.S. 2004, Ph. D. 2007) who is now an Assistant Professor in the Department of Earth and Planetary Sciences at Johns Hopkins University, gave our opening fall 2011 Atkinson Distinguished Lecture. His talk on clumped isotopes and carbonate diagenesis drew an audience from several departments.

**Anthony Pollington** (B.S. 2006) is enjoying graduate school at University of Wisconsin, and is using isotopic evidence to interpret quartz cementation in the Illinois Basin.

**Eric Roberts** (Ph.D. 2005) enjoys his position as Lecturer in the School of Earth and Environmental Sciences at James Cook University, Australia. He has active projects in South Africa, Tanzania, Mali, Zimbabwe, Democratic Republic of Congo, and of course Utah.

**Ian Schofield** (M.S. 2002) and **Alisa Felton** (M.S. 2003) are busy with their two young children. Ian works for CH2M Hill, and Alisa loves teaching in Heber City.

**Winston Seiler** (M.S. 2008) enjoys his work with Chevron in Bakersfield, CA. This year he heads off on a big trip to Patagonia and Antarctica which will include some snowboarding. It should be a hoot!

**Meiping Tong** (Ph.D. 2007) is now a professor of environmental engineering in the College of Engineering at Beijing University.

**Steve Van Der Hoven** (Ph.D. 2000) left Illinois and currently works in environmental consulting at Genesis Engineering in Lodi, California. His family enjoys living in Livermore with its close access to mountain biking.

**Mike Vandenberg** (M.S. 2003) continues to work as a geologist – energy database specialist with the Utah Geological Survey. He enjoys getting outdoors to do photography. You may have seen some of his photos in the famous Utah Geological Survey calendar.

**Greg Waite** (Ph.D. 2004), Assistant Professor in the Department of Geology and Mining Engineering and Science at

Michigan Technical University, received an NSF Early Career award in April 2111. Congratulations, Greg!

**Jim Wiegel** (M.S. 2003) has been rebuilding his house after it caught fire. He is busy with both his geologic work and his young child.

**Adam Williams** (B.S., 2006) is a geological engineer for Kleinfelder in Southern California.

**Xiqing Li** (B.S. 2006) is now a Professor of Environmental Science in the College of Environmental and Urban Sciences at Beijing University.

**Lindsay Zanno** (Ph.D. 2008) is now an Assistant Professor of Vertebrate Paleontology at University of Wisconsin – Parkside. While a researcher for Chicago's Field Museum, she discovered a new, feathered raptor in southern Utah. With its huge talons, "I think it's fair to say *Talos sampsoni* was a fierce predator," she says. She named it in honor of Scott Sampson, an Adjunct Professor in our Department and a Research Curator at the Utah Museum of Natural History, as well as director of PBS's "Dinosaur Train" program.

## 2010s and Later Graduates

**Will Gallin** (M.S. 2010) is keeping busy at Hess in Houston.

**Payton Gardner** (Ph.D. 2010) completed a postdoc at CSIRO in Adelaide, South Australia. He sampled crocodile-infested rivers for evidence of deep groundwater inflows, survived the 40° C. heat of the outback, looked for some of the oldest groundwater on Earth, and received the Best Student Presentation Award at a recent meeting in Caines. He recently accepted a research position with Sandia National Laboratory. He is happy to be close to the skiing.

**Jared Gooley** (M.S. 2011) recently started his new job with Chevron, joining the growing gang of recent U. of U. graduates in Houston.

**Matt Heumann** (Ph.D. 2010) is in Houston working in ConocoPhillips' Unconventional Exploration group. His group there is pleased to have him and report that Matt stepped up to make an immediate difference. Matt loves his job! He and **Jared Gooley** organize a Houston University alumni Monday gathering called "sad hour" (the flipside of Friday's "happy hour") and welcome other alumni in the area.

**Jesse Moyles** (B.S. 2011) was with his fellow lieutenants at the Basic School in Quantico, Virginia, when the 5.8 magnitude earthquake of Aug. 23, 2011 shook the old building they were in. Jesse killed the down time by giving his fellow lieutenants a "hip-pocket" class on plate tectonics and earthquakes.

**Abby Rudd** (M.S. 2011) is now employed in an analytical laboratory in the Salt Lake City area.

**Krysia Skorko** (M.S. 2010) is a Ph.D. candidate at the University of New Hampshire.



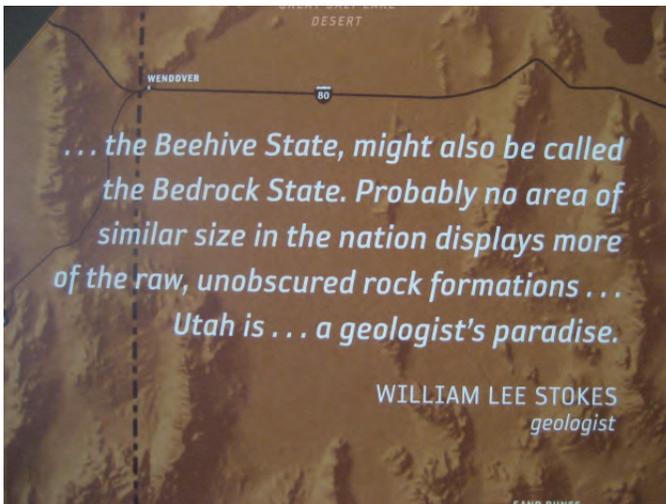
*A picturesque view of a summer's eve at Lake Powell, Utah.*

## In Memoriam

**Betty Walton**, wife of the late **Paul T. Walton** (B.S. 1935, M.S. 1940) and good friend of this Department, passed away in April 2010. Paul was an oil man, and she followed him around the world. They finally settled on their Wyoming ranch which they left as a legacy to the Jackson Hole Land Trust.

**Delmar Bott**, friend of our Department, passed on in May 2010. In retirement, he loved fishing and fly tying.

**Martha Smith** (M.S. 1977) died in March 2011. She had worked for the Utah Geological Survey, and of late years divided her time between geology, her large family, and art.



A wonderful quote in the new Natural History Museum of Utah reminds us of Professor Stokes enthusiasm and knowledge of Utah's landscape.

## Friends of Our Department

**Loren Rauscher** (at Utah in the 1960s) retired from Utah's Dept. of Transportation nearly fourteen years ago and has since been enjoying the retired life, traveling in the motor home and getting together with family. On a recent visit to the Sutton building, it brought back many memories for him of the old Mines building, and the fun times he had working with Prof. Bob Smith. He still collects rocks!

**Lonnie Paulos** (U. of U. M.D. 1973) is medical director of the research and education division of the Andrews-Paulos Research & Education Institute In Florida. Although his Utah undergraduate degree was in zoology and he received his medical degree here, he still has a soft spot for geology and fossils, and fondly remembers his class from Prof. Lee Stokes. Some of his beautiful fossils grace the walls of the Sutton building.

**Scott Starratt** and **Elmira Wan** (at Utah in the 1980s) are both busy at the USGS office in Menlo Park, California. They are able to combine vacation and geology almost wherever they go, and it often seems like it's somewhere fun – such as Hawaii. They are still fixing up their home in Berkeley and Scott enjoys teaching some classes at San Francisco State University. Scott was also deeply involved in the 25th Pacific Climate Workshop (PACLIM) held in spring 2011 at Asilomar, California.

## Guy F. Atkinson Distinguished Lecture Series



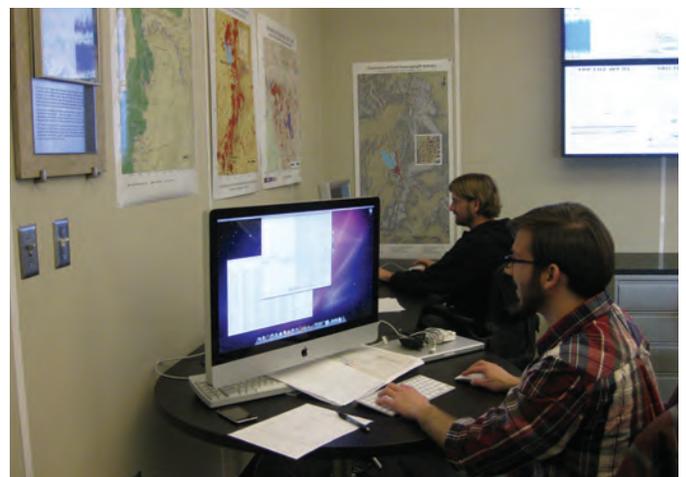
For the 2010-2011 school year, we had 25 guest speakers from industry as well as academia make presentations on a variety of fascinating topics. Two of the lecture slots last year were used to showcase our new graduate students. In these sessions, called GeoSlam after the tradition of

Poetry Slam events, each student presents her or his thesis question, approach to the problem, preliminary work if any, and anticipated results. All in 10 minutes. The annual GeoSlam introduces each new graduate student to the department, informs others of their research interests, and helps students hone their communication skills. The GeoSlam was introduced last year by Professor David Chapman as the culminating exercise in the fall course, Reviews of Earth Science. To keep informed about each week's lectures, please go to: [www.earth.utah.edu](http://www.earth.utah.edu) > Lecture Series

### From field to laboratory -- we like to do it all!



*It must be a field trip.*



*Undergraduate geophysics majors Hobie Willis and Christian Gray process seismic data in the University of Utah Seismograph Stations Earthquake Information Center.*

Dear Alumni: 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 hear. You can also update your information on our website at: [www.earth.utah.edu](http://www.earth.utah.edu) > Alumni > Update Information.

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

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*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. If your company has matching grants, please send us one of their forms.*

**Yes, I would like to provide support!**

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**We are starting a new Earth Frontiers Campaign consisting of:**

- 1. Student Excellence**
- 2. Utah Petroleum Partnership (UP<sup>2</sup>)**
- 3. Special opportunities.**

**Look for details in the near future.**

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*The above listings are for donations received from September 1, 2010 until August 31, 2011. If we have left someone out, we sincerely apologize. Please inform us of any corrections for our records.*

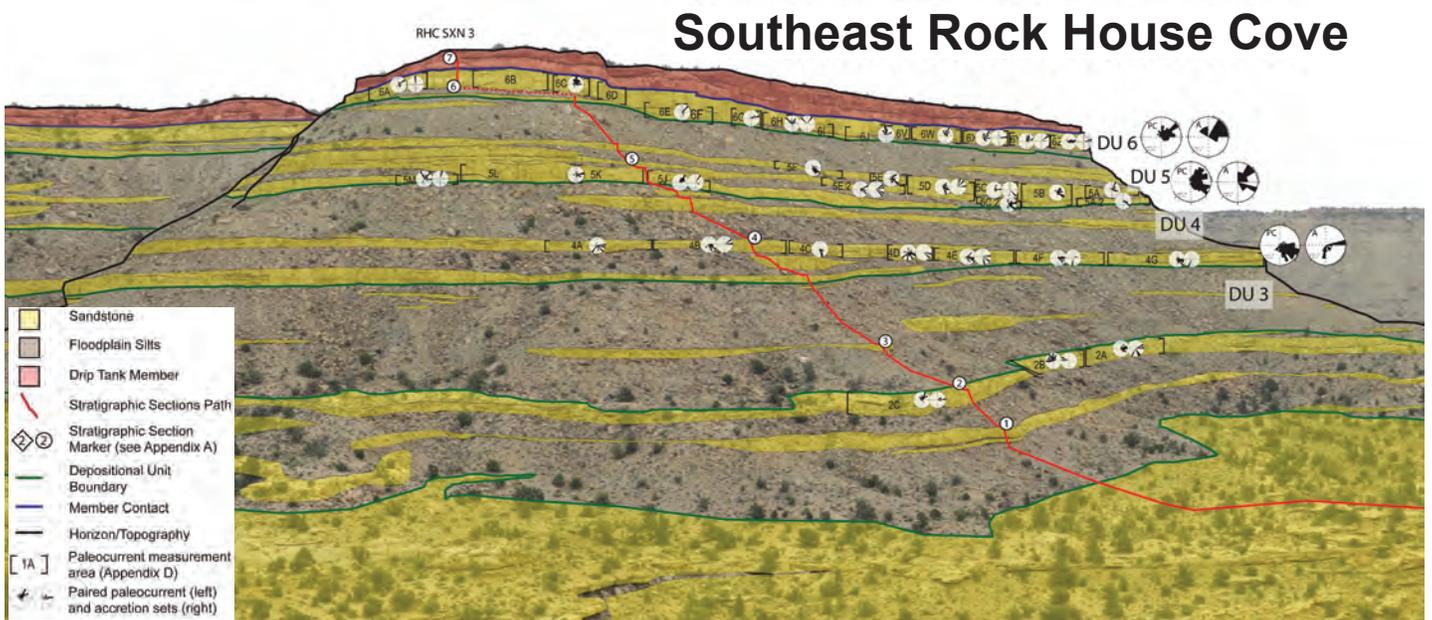


### **Browning Receives Calcite Donation**

A large stunning stand of honeycomb calcite from the Uinta Mountains was installed in the remodeled lobby of the Browning Building (WBB). On top of this natural vein display of honeycomb calcite, there is a cut and lit piece. This donation, from Floyd Anderson, owner of Shamrock Mining Association in Hanna, UT will be enjoyed by many who pass through the lobby area of WBB and those who visit the Two Creeks Coffee Shop.

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Various interpreted lithologies labeled in this photopanorama highlight fluvial rocks and paleocurrents in the Cretaceous Straight Cliffs Formation. Depositional unit boundaries aid in sequence stratigraphic interpretations of fluvial systems. This image is part of a data collection technique that utilizes gigapan technology and generates ultra high resolution images by stitching together hundreds of digital photographs. This project was part of Jared Gooley's (M.S. 2010) masters thesis, and exemplifies the type of research done by our students.