



# DEPARTMENT OF GEOLOGY

UTAH STATE UNIVERSITY • NEWSLETTER 2005/2006

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## DEPARTMENT NEWS

### UPCOMING EVENTS

#### Alumni Advisory Board Meeting

Our department Alumni Advisory Board will be coming to Logan on March 3-4, 2006 to meet with students and faculty and to provide their input for directing the department. We are scheduled to meet with President Stan Albrecht for breakfast on March 4th. Our main goal will be to devise a set of development priorities for 2006-2010, to continue to grow our partnerships with donors who support our department.

#### Student Poster Session and Employment Round Table March 3, 2006

As part of our alumni advisory board meeting, we will host a student poster session highlighting the work of our students. We will also host a employer round table, in which students will hear from employers about opportunities in the geosciences and get advice regarding strategies for interviewing, etc.

#### Spring 2006 Graduation

Commencement ceremonies will take place Saturday, May 6, 2006 at 9:30 a.m. in the Dee Glen Smith Spectrum. There will be a college of science ceremony in the Taggart Student Center Ballroom at 12 p.m., followed by an informal reception in the Sunburst Lounge.

### NEWS HIGHLIGHTS

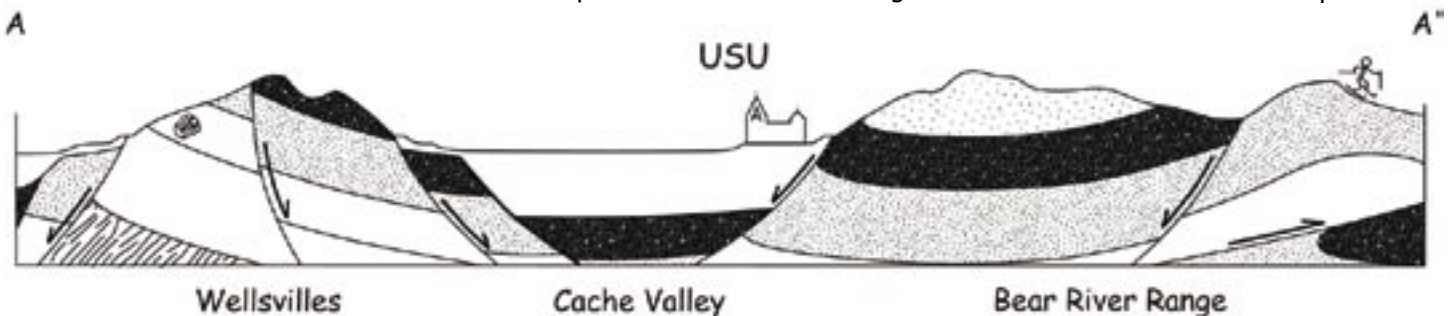
#### Drilling Into Earthquakes

-Written by Mary-Ann Muffoletto

Utah State University geologists are involved in a breakthrough drilling project that lays the groundwork for the first subterranean earthquake observatory established directly within a seismically active fault.

Geology professor Jim Evans, graduate student Sarah Draper, undergraduate Kelly Mitchell and Aggie alumnus John Solum, now with the U.S. Geological Survey, are among researchers working on-site with the San Andreas Fault Observatory at Depth (SAFOD) project. Launched in 2003, SAFOD is one of three major components of EarthScope, a National Science Foundation-funded initiative being carried out in collaboration with the USGS to investigate powerful geological forces that shape the North American continent.

Drilling personnel completed the project's 13,082 feet-long curved borehole, which penetrates an active area of the San Andreas Fault and reaches a vertical depth of about 2 miles, Aug. 9. Located on a private ranch near Parkfield, Calif., about halfway between Los Angeles and San Francisco, the borehole will be lined with steel and concrete in preparation for installation of a variety of instruments and sensors to provide



round-the-clock measurement of temperature, fluid pressure, strain accumulation and other processes.

"We've drilled into earthquakes," said Evans. "For one of the first times we can look at rocks in a zone where we know earthquakes occur."

Drilling into the precise location was easier said than done. Rather than an obvious gash in the ground apparent with up and down thrust faults, much of the 800-mile long strike-slip San Andreas is barely visible to the lay observer. It consists of two roughly parallel, underground plates that move back and forth like cross-country skis. While drilling into the carefully selected site, researchers discovered different rock types than their models suggested.

"We took samples at every 100 feet of drilling depth to anticipate when we'd cross the fault and hit the active zone," said Mitchell, the lone undergraduate in the multi-university 10-member student contingent of the research team.

Mitchell and Draper spent days in 100-plus degree heat scooping expelled drilling mud into buckets, washing and separating rock cuttings, and carefully analyzing the cuttings' composition.

Mitchell said it took longer than expected to hit the tell-tale heavy silicates indicative of the target zone. She recounted a false alarm in late July when she and fellow students were roused in the wee hours of the morning from their drilling rig-side double-wide trailer to witness breaking developments. "We all rushed to the drilling platform," she said. "The drilling break -- meaning the rate that you're penetrating the rock -- suddenly increased and we thought we'd crossed the fault."

The team's efforts were rewarded Aug. 2, when the drill sped up again, hit bursts of radon, carbon dioxide and hydrocarbon gases and breached the active zone.

William Ellsworth, chief of the Earthquake Hazards Team at the USGS in Menlo Park, Calif. and a principle investigator on the project, told national media the successful borehole marks a major milestone in understanding how quakes start, how they grow into deadly tremblors and whether scientists can learn to accurately predict them.

Until now, said Evans, geologists have been limited to study of exhumed faults -- that is, faults that were once at depth and have subsequently risen to the surface due to mountain building processes. "In those cases, we are never sure that the faults we look at were truly earthquake-producing," he said. "Now we're able to observe the actual earthquake machine in real-time."

Evans, Mitchell and Draper said they are grateful for the unprecedented opportunity to participate in a project that provides a literal window into previously unseen geophysical phenomena. "This is a very cool project," said Evans.

For more information about SAFOD, visit <http://www.icdp-online.de/sites/sanandreas/news/news.html>. For more information about Earthscope, visit [www.earthscope.org](http://www.earthscope.org).

## **New Browning Lab Boosts College of Science: Luminescence Geochronology Facility First With Capabilities in Interior West**

-Written by Jared Thayne

The Val A. Browning Foundation has recently awarded \$170,000 to create a Luminescence Geochronology Laboratory in the College of Science at Utah State University.

The bulk of the gift will be used to purchase cutting-edge technology in the form of a Risoe luminescence reader and associated equipment. This instrument, to be housed in the department of geology, is used to incite and measure luminescence from sand grains in sediment samples, and the amount measured can be used to calculate the age of a deposit. This has important applications in earthquake-hazard studies, understanding landscape change, and for determining the age of flood deposits, archaeological sites, sand dunes, etc.

An additional portion of the generous gift will be used to purchase an attachment for the reader that will enable USU scientists to analyze individual sand grains, an ability widely regarded as the most important recent advancement in luminescence dating.

"One of the primary challenges in Earth science has always been understanding the dimension of time—how old a canyon is, how long it takes to build a mountain range, how often earthquakes happen, etc.," said Joel Pederson, associate professor in geology.

"In the past several years, luminescence dating has undergone technical advances that make it perhaps the most powerful new tool to solve such problems. The generous Browning gift will make USU the first institution in the Interior West to have these capabilities."

## **USU Geologist Receives National Teaching Award**

-Utah State Today

Utah State University geologist Joel L. Pederson received the Geological Society of America's 2005 Biggs Award for Excellence in Earth Science Teaching. Pederson, associate professor in the geology department of USU's College of Science, was recognized at the GSA's annual meeting Oct. 16-19 in Salt Lake City.

In a statement recommending Pederson for the award, a GSA nominating committee wrote, "Although all of the nominations this year were of high quality, Dr. Pederson's nomination was truly outstanding. The committee was impressed by Dr. Pederson's teaching ability and inno-



vativeness, and by the strong letters of support from his colleagues, administrators, and current as well as former students. It is obvious that Dr. Pederson is an outstanding teacher who is truly deserving of this award."

Pederson joined Utah State in 1999. In addition to his teaching endeavors, he is a geomorphologist who conducts research with students on the erosion of the Colorado Plateau. He currently has National Science Foundation grants to investigate the timing of erosion and uplift of the Plateau, as well as the formation of the Grand Canyon. He recently received a \$335,000 grant from the U.S. Bureau of Reclamation to develop a plan to deal with the erosion of archeological sites along the Colorado River in the Grand Canyon.

Pederson earned a bachelor's degree in geology from Gustavus Adolphus College in St. Peter, Minn., and a master's in the same field from Northern Arizona University in Flagstaff. He completed a doctorate in earth and planetary sciences from the University of New Mexico in Albuquerque.

The Biggs award recognizes outstanding full-time undergraduate teaching by educators with less than 10 years of service.

### **Attention Alumni**

Remember Geol 490? 350? 250? 2500? Remember Grouse Creek and Etna? Hell's Half Acre? the House Range? Durango and Silverton? Campground above Provo? (If you do remember, you weren't there.) Well, guess what? We'll try to rekindle some of those memories - and/or make a whole bunch of new ones - on the Spring 2007, first (and possibly last) Fiesinger/Kolesar/alumni field trip. Keep the tentative date in mind, and please let either Don (don.fiesinger@usu.edu) or Pete (petes@cc.usu.edu) know if you are interested in joining us.

## **DEPARTMENT REVIEW**

### **New Assistant Professor, Carol Dehler**

Since our last newsletter, the department has grown and changed. The department is happy to announce the addition of Dr. Carol Dehler to the department as an assistant professor. Carol received her Ph.D. from the University of New Mexico in 2003, and she taught at Idaho State University for 2 years. Carol's expertise is in sedimentology, stratigraphy, Proterozoic tectonics, and geochemistry of sedimentary rocks. She has several new graduate students, and will be teaching classes in Earth History, Sedimentology, and Basin Analysis.

### **New Formal Instructor and Iditarod Sled Runner, Sue Morgan**

As a result of deft budgetary management on the part of the department chair, the department is also happy to announce the formal hiring on a permanent basis of Sue Morgan as an instructor. Sue's many years of service in teaching 1000 – 3000 level classes has been a key component to the department's success and the ability to hire her permanently.

In addition to teaching, Sue races sled dogs, and will be running the Iditarod this February. Follow her progress in the race at [www.iditarod.com](http://www.iditarod.com).

### **Departure of Professor Brad Ritts**

The department regrets to announce the departure of Dr. Brad Ritts to the University of Indiana. Brad is the Robert R. Shrock professor of sedimentary geology. Brad received an NSF Career grant in 2003, which recognizes outstanding young investigators. The department will miss Brad and his students, whose work in China has provided new insights into the sedimentology tectonics of China.

### **New Geophysicist Professor, Tony Lowry**

With the departure of Brad Ritts and the hiring of Carol Dehler, the department decided to hire a geophysicist. After reviewing nearly 100 well-qualified applicants, the department is pleased to announce that Dr. Tony Lowry will join us in Fall 2006. Tony received BS and MS degrees from University of Wyoming and a PhD from the University of Utah. Tony has had postdoctorates at Indiana University and University of Colorado, Boulder. He has wide-ranging research interests that include GPS analysis and crustal analysis of continental crustal structures. Tony and his wife, Jacqueline have a baby named Emma Miette. Tony will be bringing a series of grants and will be looking for new graduate students.

### **PhD Program Approved**

The Utah Board of Regents, in their October meeting, approved the PhD program for the Geology Department. This is the final step of a long process started 5 years ago, and interrupted by budget woes and changes in procedures at various levels. This program will be gradually developed to ensure that our undergraduate and MS programs are strengthened as well. The PhD program will allow our faculty to seek funding opportunities and students they had not a chance to go after in the past.



## LETTER FROM DEPARTMENT HEAD

The year 2005 was an active one in the Geology Department: our PhD program was approved by the Regents, and our new degree programs in Applied Environmental Geosciences (BS/MS) have been posted for comment – the last hurdle before moving onto the Regents agenda. We replaced one departed faculty member with a new hire in Geophysics – Tony Lowry, who is currently at the University of Colorado. This caps a successful effort the previous year to fund and fill a new faculty position – we were able to hire Carol Dehler, a sedimentologist who works on Neoproterozoic clastic successions, and Sue Morgan, who is now on hard money after years as a temporary lecturer.

Anadarko and ExxonMobil continue to recruit at Utah State, and have become great supporters of our program. Their support helps send students to professional meetings, on field trips, and also supports our Distinguished Lecture Series of visiting speakers. Our Advisory Board met for the second time last year and continue to provide ideas for moving the department forward. We are grateful for their continued support and look forward to meeting with them again this coming spring.

Our students continue to do well professionally, with undergraduate majors and graduate students placing in good jobs or continuing their education. Recent USU graduates are now working at Anadarko, ExxonMobil, Chesapeake Petroleum, Newmont Mining, and a range of consulting companies. We are heartened by their success, which reflects on their efforts and on the quality of education they received at Utah State.

Our faculty continue to do an outstanding job of teaching, as well. Two years ago our department won the first Department Teaching Excellence Award at Utah State. Last Spring, Jim Evans was selected by students of the Honors Program to deliver the Last Lecture – a major honor that asks the faculty member to speak on a topic that would represent the his thoughts as if it were his “last lecture” before retiring.

In October 2005 Joel Pederson was selected by the Geological Society of America for the Biggs Award for Excellence in Earth Science Teaching. This award recognizes outstanding Earth science faculty from all academic institutions engaged in undergraduate education, who have been teaching full-time for 10 years or less. This is most prestigious award for undergraduate education in the earth sciences.

The importance of Geology and the Earth sciences in human affairs has been underscored over the last year by a series tragic events, from the mega-earthquake and tsunami in Sumatra to the devastating earthquake in Kashmir, and the impact of hurricanes Katrina and Rita on the Gulf coast of the United States. Geology has also impacted our lives economically, with crude oil prices breaking \$65 per barrel. It is clear that the geosciences are going to continue their central role in understanding how the Earth works and providing the resources we need to live on it.

-John W. Shervais, Department Head

## LETTER FROM ADVISORY BOARD

Dear USU Geology Alumnus,

There are two new developments in the USU Geology Department that offer great opportunities to expand and enhance our programs. First, the department has submitted a request to the Board of Regents to establish BS and MS degrees in Applied Environmental Geosciences. Second, the Geology Department proposal to begin a PhD program in Geology has been approved by the State Board of Regents. Both of these programs capitalize on existing teaching strengths in our department and will offer graduate and undergraduate students expanded learning and research opportunities. The programs will also make USU a more attractive choice for both graduate and undergraduate students.

In order for these programs to start on a strong foundation, and for the Geology Department to realize its potential, we need your help. Geology alumni have a long tradition of giving to the department and the department has one of the highest percentages of alumni donors among all departments at USU. If you have not made a gift to USU Geology before, now is a great time to start. If you already support us, we thank you and ask you to continue!

Please join us in investing in the future of the USU Geology Department. You can make a gift online via a secure connection at <https://secure.usu.edu/develop/>. Use the comment field to designate your gift to Geology, unrestricted. You may also call USU to make your gift over the phone at 1-888-OLD MAIN (888-653-6246) or mail it Utah State University Annual Fund, 1490 Old Main Hill, Logan, UT 84322. Again, designate your gift for Geology.

Thank you for your consideration of this request. Your support is essential to strengthening Geology at USU, and sustaining the high faculty-student interaction-based style of education we were fortunate to receive at USU.

Sincerely,

Allen Jones, '89 for the USU Geology Advisory Board

Allen Jones, Chair [BS, 1989; MS, 1996]  
Craig Nelson, Co-Chair [BS, 1982; MS 1986]  
Doug Hazlett  
Greg Jones  
Matt Novak [MS 1993]  
Richard Fuller [BS, 1970; MS, 1975]  
Karen Miller [MS, 1996]  
Grant Willis



# FACULTY NEWS



## LETTERS FROM FACULTY

### **Don Fiesinger**

There is never a dull moment in the dean's office, with a continual stream of papers to sign, reports to prepare, and meetings to attend. I've managed to teach a geology course each semester for the last 5 years, but with a number of major issues on the horizon, I will only teach mineralogy this year and no longer teach optical mineralogy. It was a tough decision, as I look forward to the contact with geology students, and I've taught those two courses here at USU for nearly 30 years.

On the "geology" side, I was contacted by a consultant who was working for a company interested in the Rozel Point oil field. This was discovered by Amoco in their off-shore drilling project in the Great Salt Lake during the mid 1970's. Beth Greenman (MS 82) did her thesis on the Tertiary basalts that outcrop in the area and compared them with some core samples provided by Amoco. This past April, I spent a day in the field with some consultants from New York and Denver looking at these rocks again. It was a kick being probed about research done more than 20 years ago!

I've managed to get to annual GSA meetings in the last few years, or at least those in Denver or points west, and have enjoyed visiting with our alums and catching up on their activities. In my travels as dean of the College of Science, I've also worked in visits with alums, most recently with Kim & Eric Teot (BS 83) in Colorado. Janet and I also enjoyed a visit this summer from Amanda Fullerton (MS 85). I hope to see more of you at various events this coming year.

### **Bob Oaks**

Bob Oaks is finishing up the major gravity survey of our local setting, and he presented a talk at GSA in Salt Lake City. He's got a new contract from Cache County to evaluate the drillers' logs of water wells in Cache Valley, Utah, thereby to define the lateral extents of the upper and lower confining layers [Bonneville and Little Valley lake cycles, respectively] for possible application to aquifer storage and recovery, and to draw isopachs of their thicknesses plus contours on the top of the major [lower] confined aquifer. This is an extension of the M.S. theses of Mike Robinson [1999], Kristine Smith [1996], and Piper Goessel [1999]. Already it appears that thicker muds deposited over paleochannels have compacted more, and thus concentrated some of the present surface drainage above the older paleochannels, which is useful to well drillers and in predicting likely subsurface flow paths.

### **Pete Kolesar**

Well, I've been in Logan for 31 years, Mary Veronica has retired from the Computer Science department, and I'm looking at 1 more year (spring, 2007) until I follow her into retirement. In the meantime I seem to keep busy as Undergrad Advisor (my last year; Joel Pederson will be the new Ugrad Advisor next year), Associate Dept. Head, teaching a couple of courses a semester, and being involved in research on the Bear River Range karst and hydrology with Jim Evans and Tom Lachmar, and Mike Gooseff at Colorado School of Mines.

We did a little traveling this summer - a trip to the east coast to visit family and attend a wedding (if I never see the New Jersey Turnpike again it'll be too soon) and one to Orcas Island in Puget Sound to visit some old friends. I got to visit with Bob Nutt on Orcas too; he's been there for about 17 years, has a great family, neat farm and orchard, and is an EMT for the fire department as well as keeping the Christian School in shape. I haven't been in the water in almost three years - I think it's time to plan a trip to the Yucatan again.

### **John Shervais**

This has been an extremely busy year for me, with four graduate students, an EdMap grant from the USGS, and two NSF grants all competing for my attention (that is, when I am not wearing my department head hat). Much of my effort over the last year was focused on the Snake River Plain volcanic province - site of two masters theses (Ruth Hobson and Meg Zarnetske), and an ongoing research topic for me - my colleagues and I started working there on our current project 10 years ago, and we are now beginning to understand many of the processes that control magma composition and eruptive history. This Fall I was funded by the International Continental Drilling Program to organize a workshop that will explore the feasibility of a large scientific drilling project in the Snake River Plain. The focus of this project will be the geochemical and tectonic impact of continental lithosphere on the Yellowstone mantle plume: how does continental lithosphere interact with a mantle plume, and how can we recognize intra-continental plumes in the geologic record?

Another major focus of my research this last year has been on early Earth processes. My graduate student Kyle Andreassen and I have been studying the Archean/Proterozoic Farmington Canyon Complex to understand how this incongruous assemblage of rocks (gneiss, amphibolite, komatiite, and quartzite/metachert) came to be. It resembles in many ways a subduction zone accretionary complex that has undergone collision and metamorphism. If so, tells us that Phanerozoic-style plate tectonics was active by the late Archean, and closely fixes the timing of the transition



from chaotic convection driven by heat from below to Phanerozoic-style tectonics driven by the cooling of plates from above. This research began with a trip to South Africa in July 2004 to visit the Barberton Mountain Land – the classic Archean greenstone belt and the type locality for komatiites (ultramafic lava flows).

I have just embarked on a new project to study the geochemical, magmatic, and fluid flux through the mantle wedge above subduction zones by looking at the mantle lithosphere that underlies suprasubduction zone ophiolites. These ophiolites are thought to represent fore-arc volcanism formed during subduction initiation. As a result, their underlying mantle rocks will tell us about the processes that affect the mantle wedge above modern subduction zones and control the geochemical budget of arc-trench systems. In order to learn the latest techniques and ideas for melt-rock interaction, my co-principal investigator and I attended the Peridotite Workshop Lanzo 2005 in northern Italy (September 2005). The workshop comprised two days of presentations followed by two days of field excursions in the Lanzo peridotite massif – one of the classic locales of Alpine tectonics, and my first visit to this site in 30 years!

But the main theme this last year was travel. In addition to South Africa (Summer '04) and Italy (Summer '05), I have had trips to Potsdam (ICDP), Austin (DOSEC), and California (GSA). My resolution for the coming year is to cut back.

### **Tom Lachmar**

I'm still teaching courses on ground water geology and techniques of ground water investigations in the fall and winter/spring semesters, respectively, as well as teaching physical geology once per year.

Six of my former graduate students are now gainfully employed as hydrogeologists. An e-mail message from Jeff Gadt, my very first grad student reports that he's currently working for HydroGeologic, Inc. in their Kansas City office. Gregg Hadlock has switched jobs at least twice that I know of since the last newsletter, and he's now doing ground water studies for the U.S. Department of Defense in Virginia. As far as I know, Alan (V.) Jones is still working for the Utah Department of Environmental Quality. Also, Barry Myers has left Bio-West and is now working for The Shipley Group in Woods Cross. Keri Murch is still employed by Environmental Resolutions, Inc. in their office in Novato, California. Neil Burk, who finished in 2004, left the Utah Geological Survey recently and is now working for Bill Loughlin and Associates in Park City. Jason Heath, who also finished in 2004, is now pursuing a Ph.D. degree (my first student to do so!) at New Mexico Tech in Socorro. Finally, Mike Robinson has settled down in Minnesota, where he's started his own bio-diesel company. However, the big news is that Mike and his wife Rachel have had their first child, a son they named Peter Thomas, but apparently not after Pete Kolesar.

I also have two current graduate students. Aric Olsen should be finishing his thesis this semester, the title of which is "Discharge Monitoring and Chemical Characteriza-

tion of Springs along the East Side of Cache Valley, Utah." Kevin Randall, who earned his undergraduate degree at USU, hopes to finish his thesis by the end of fall semester. He's performing a geochemical investigation on the fate of salt water injected into the Navajo Sandstone in central Utah.

I've recently received additional funds from Cache County to continue the ground water investigations that started with Mike Robinson's thesis and continued with Barry Myers' and now Aric Olsen's. I've also submitted a proposal to the Utah Division of Water Rights to help collect field data for a new computer simulation model of the ground water system in Cache Valley that is to be prepared by the USGS, and I've received a seed grant through the USU Water Initiative to begin collecting these data. I've also received a grant to try and determine whether salt water produced with coalbed methane that is injected into deep wells is migrating to shallow depths along faults in the area between Price and Huntington. The results may be useful in assessing the suitability of the Navajo Sandstone for CO<sub>2</sub> sequestration in that area.

Lastly, I had two papers published in the recent UGA publication "Ground Water in Utah: Resource, Protection, and Remediation," one entitled "Updated Conceptual and MODFLOW Ground-Water Models of Cache Valley, Utah and Idaho" and another entitled "Isotopic Characterization of Ground Water in Salt Lake and Cache Valleys, Utah." Another paper, entitled "Groundwater Contribution of Metals from an Abandoned Mine to the North Fork of the American Fork River, Utah," has been accepted for publication in the journal "Water, Air, and Soil Pollution." Finally, Jason Heath and I are nearly finished preparing a paper entitled "Hydrogeochemical Characterization of Leaking Carbon-Dioxide Charged Fault Zones in East-Central Utah" for an upcoming AGU Monograph.

### **Susanne Janecke**

Greetings, friends of the Geology Department. This has been an exciting year for my research group. El Nino (sort of) in California forced me into the hard rocks and out of the muddy get-the-truck-stuck basin fill for a while. I found several new faults and lots of very nifty basement structures while mapping in the rain. The Colorado desert looked like an English moor in places. Stefan Kirby wrestled his huge data set into two major prepublication manuscripts about the Salton Trough in southern California, has finished with his MS degree, and now works at the Utah Geological Survey.

Alex Steely is finishing his work in the Salton Trough, where he is integrating a wide range of structural data to determine the age and geometry of detachment and strike slip faults in the area. Together with Stefan's work these data show extremely rapid and frequent reorganization of fault zones along the plate boundary.

Susanne worked closely with Stefan and Alex in California but has also been involved in dating the onset of extension in the Gulf of California. Magnetostratigraphic studies by Bernie Housen (Western Washington), Becky Dorsey



(Univ. of Oregon) and Amy Fluette (Western Washington) show that oblique rifting began a mere 8 Ma, and first produced a widespread fault-related subsidence event at about 6.5 to 6 Ma when the North American plate boundary stepped east into the Gulf of California. These data also show that the Colorado River was first deposited sediment on the marine part of its delta in southern California by 5.36 Ma, shortly after it first appeared in the Lake Mead area 400 km farther to the north. These data require a rapid integration of the lower Colorado River system and support models of lake overflow as starting the river into its present course.

The Cache Valley has yielded exciting results as well. Alex Steely mapped the Weston Canyon quadrangle in the NW corner of the valley. We led a one-day pre-meeting field trip at the National GSA meeting in Salt Lake City, in October. Bob Oaks and Vicki Langenheim (USGS Menlo Park) have new data about the subsurface geology of Cache Valley and can show that the East and West Cache faults have more throw across them than the adjacent parts of the Wasatch fault.

During the summer Jim and I had the chance to attend Anadarko's Technology conference in the Woodlands of Texas. Anadarko treats our students very well and they have exciting projects around the world. It was great to see how well everyone is doing and to learn more of the ins and outs of the oil business. Tony Williams was our on-site host, but we also saw Matt Pachell, Joe Jacobs, Andy Taylor, Jill Pachell, Adrian Berry, and many other geologists at Anadarko. A stretch limousine picked us up at the airport! A recruiting visit from Exxon-Mobil in the fall brought Holly [Langrock] Novak to town and we enjoyed having her back in Logan for a few days.

Ben Belgrade, a University of Iowa graduate, joined our group this fall and will do field studies to verify the existence of the Clark fault at the surface. This fault is slipping at 10mm/yr yet has such a confused surface expression that all prior efforts to map its SE end failed to confirm its existence!

Our girls are doing well and had an adventure-filled summer. Erica backpacked across the Bear River Range and went river rafting on the Snake and Colorado rivers.

## **Joel Pederson**

A lot has happened here in the Geomorphology lab in the past 2+ years since the last alumni newsletter. Good things have happened! Where to start?

First of all, Carol Dehler, my wife and sedimentologist extraordinaire, has become a regular faculty member here in the Geology Department. Soon after that--last year--I gained tenure. Hmm... looks like we will be here awhile!

The geomorph students keep finishing up and moving on (funny how that happens). In the past two years, Ron Counts finished his thesis in the northeastern Uintas while working full-time at the Kentucky Geological Survey. Rob Mackley finished his thesis measuring rock strength on the Colorado Plateau and relating that to the geomorphology of the Colorado River, also finishing up while working

full-time at the Pacific National Laboratory in Richland, WA. New MS students include Scott Cragun who is finding surprisingly high incision rates at Lees Ferry, Ben DeJong who is working in eastern Grand Canyon on how tributary sedimentary systems are responding to climate changes, Kevin Hadder who is continuing mapping and geochronology in the northeastern Uintas, and Jonathan Felis who is using cosmogenic methods to track sediment yield through Quaternary time in Grand Canyon. In addition, Buck Ehler, Kelly Mitchell, and Alan Hidy completed geomorph undergraduate research and have moved on to geology jobs or grad school.

In addition to students, Tammy Rittenour is here as a postdoc working with me and my students on applications of luminescence dating (more on this below), and Gary O'Brien is a Research Associate taking charge of a geoarcheology project we have going in Grand Canyon.

On the topic of students and student research, I was honored this past semester to receive the Biggs Geoscience Teaching Award from the Geoscience Education Division of GSA. I need to thank some of you reading this who may have been involved in writing support letters, and I wouldn't have gotten it if it wasn't for John Shervais nominating me. It is really humbling to receive this award because of all those who deserve one, here in our department and elsewhere. Writing this makes me realize that I need a break! In fact, I plan to take a sabbatical next academic year. I will spend much of that time here in Logan, building a new luminescence geochronology lab in the basement of the Geology building! The lab is being made possible by an incredibly generous gift from the Browning Foundation. It will be exciting to have this increasingly important and in-demand tool right here at USU, but I am also worried about what I am getting myself in to.

Lastly, speaking of changes and new equipment arriving... Carol and I have just had a baby, and his name is Zane. Never a dull moment—and I hope the same is true for all of you. Please drop me a note sometime.

## **Jim Evans**

The past year has gone by fast! Three students – Joe Jacobs, Jason Kneedy, and Tony Williams, defended in rapid succession in the end of 2004. Joe worked on faults in southern California, Jason examined the structural and sedimentological controls on fracture in coal, and Tony worked on the Little Grand Wash fault. Joe and Tony are with Anadarko in Houston, and Jason works for Chesapeake in Oklahoma City. By the time you read this, Angela Isaacs will have finished her MS on work in Taiwan and Japan, and Kevin Thomas defended his MS on borehole geophysics in the Navajo Sandstone. We get to see our former students in Houston a fair bit – this year at the Anadarko Technology Conference. Watch for announcements for a USU Alumni dinner to be held during AAPG in April.

Our big new research effort is the San Andreas Fault Observatory at Depth, [SAFOD] where NSF has funded a 13000' long inclined borehole that went through the San Andreas this summer. Graduate student Sarah Draper



worked at the drill site and is deciphering the geology of a part of the hole for her MS, and undergrads Kelly Mitchell and Corey Barton have worked on some of the data. The project is a great opportunity for students to work with borehole data, geologic data, and to work with many other scientists. We hope to be involved in the analysis of core to be acquired in 2007.

Adam Majeski is a new student who is going to take on a study of the delta of the Colorado River in Lake Powell, where the drought provided exposures and created deformation of the sediments in the delta. Dustin Keele is examining deformation and sedimentology for the Nugget Sandstone, using subsurface data from the dying East Anshultz Field, Wyoming.

I of course have had numerous travels to meetings and field work – this year, to Vietnam, southern and central California, Houston, southeastern Utah, and Washington D. C. The Vietnam trip was very interesting both geologically and culturally. Oil production from fractured granite was the main reason for the trip, but there may be some research opportunities in the future. We did field work along the coast, and had great seafood everyday. The people were extremely kind, and I was impressed with how hard everyone worked.

On the home front, as Susanne mentions, Erica [12] and Karen [8] are getting bigger. Karen rips through math problems, and Erica is taking on debate in middle school – perhaps a dangerous thing for a teen-to-be.

## **W. David Liddell**

My research interests continue to include both Recent and Cambrian marine communities and environments. MS student Thad Nicholls and I conducted field work on the Yucatan Peninsula in March of last year. We examined anthropogenic (human induced) effects on reefs along a heavily utilized tourist area known as Akumal (Place of the Turtle). Our project consisted of resurveying sites that Matt Novak (MS 1992) studied in the late 1980s. The take-home-message is that the reefs are in a state of serious decline.

My work with Cambrian sequence stratigraphy continues. Brad Ritts and I co-advised Ben Kessel (now at Anadarko in Houston, MS pending) on a Cambro-Ordovician sequence stratigraphy project in the Ordos Basin of China. Isaac Westfield, a Geology undergraduate, received an Eccles Undergraduate Fellowship and has been working with me on microbial bioherms in the Wheeler Formation in the Drum Mountains and their value as sequence boundary indicators. His work was presented at the 2005 GSA Annual Meeting in Salt Lake City and was, more recently, showcased at Capitol Hill in SLC. Doug Smith, a new graduate student, will begin working with me on the Marjum Formation in the House Range in the spring.

In a very different research direction, Bronson Barton, is doing an undergraduate research project with me on *Vancleavea campi*, a very unusual Triassic reptile from the Petrified Forest National Park. Bronson has presented the

preliminary results of his research at Capitol Hill in SLC.

My courses continue to include Geology of the World's Oceans, Sedimentation and Stratigraphy, Paleontology, Paleoecology and Quantitative Methods. As usual, being Geology Graduate Program Director seems to consume any "free" time I might have. As mentioned elsewhere, the department was recently approved to offer a PhD program. This will require considerable effort from all of the faculty in order to get ready for the first PhD candidates in the Fall of 2006. On the home front, Jessica (19) is majoring in psychology at Reed College in Portland. Christine (16) will graduate from Logan HS this spring and plans to begin her college work in Germany this summer.

## **Carol Dehler**

I am in my second year as a half-time tenure-track faculty member in the geology department. This is a challenging position, because I am trying to learn how to not work full-time. My teaching load is about 1.5 classes per year and, so far, has included a large-enrollment section of USU 1360 (aka: "Planet Earth"), a "Geology 2500 trip" to the Uinta Mountains, and a graduate seminar on Precambrian stratigraphy. This semester I will teach the second half of Earth Through Time (aka: "Historical Geology"); however, the first half of the semester I am on maternity leave!

My husband (and department geomorphologist), Joel Pederson, and I are proud to announce the arrival of our son, Zane Nicholas Pederson. He was born on January 3rd, 2006 and weighed in at a robust 8 pounds 2 ounces. We are all now getting used to each other and trying to develop a schedule that works for two academicians and a growing baby boy. My graduate students and colleagues are making regular visits out to our house in Richmond to make sure I do not forget about geology.

My recent research focus has been on the Precambrian geology of the Uinta Mountains. There is so much unstudied Precambrian rock out there that I could work nowhere else for the rest of my career! The work in the Uintas entails mostly field mapping and stratigraphy, integrated with a lot of sampling for analyses such as carbon-isotope and shale geochemistry, and petrography. I am anxiously awaiting to hear from NSF about a proposal written with my co-PIs Paul Link and Adolph Yonkee whereby we are proposing to attack Precambrian strata in the Wasatch and Bannock ranges.

I have two graduate students at the moment and will likely bring in one more in the fall. Andy Brehm is working on a USU and EDMAP-funded field map and stratigraphy project in the eastern Uinta Mountains. He will be finished in the fall of this year and has already signed on as a permanent full-time employee at Anadarko. Caroline Myer is my new graduate student. She has chosen a project in the western Uinta Mountains and her focus will be the facies analysis and carbon-isotope stratigraphy of the Red Pine Shale, a potential source rock in the area. Hopefully I will get some undergraduates interested in my research in the near future.



## 2005 PRESENTATIONS

Carol M. Dehler presented a talk titled "Neoproterozoic Records From Grand Canyon and the Uinta Mountains: An Evolving View of Climate Change and Tectonic Setting at ~800-750 Ma" at the Utah Geological Association Luncheon, Salt Lake City, Utah, 14 March 2005.

Carol M. Dehler presented a talk titled "Neoproterozoic Records From Grand Canyon and the Uinta Mountains: An Evolving View of Climate Change and Tectonic Setting at ~800-750 Ma" at the University of Oregon Department of Geology, Eugene, Oregon, 31 March 2005.

Cragun, W.S. and Pederson, J.L., 2005, Patterns of fluvial incision and deposition related to climate change along the Colorado River at Lees Ferry, Arizona.

The following presentations were made at the American Geophysical Union Meeting, San Francisco, California, 5-9 December 2005:

Sarah D. Draper, Naomi Boness, and James P. Evans. Talk. "Source and Significance of the Sedimentary Rocks in the SAFOD Borehole: Preliminary Analysis."

David L. Kirschner, James P. Evans, Judith Chester, Fred Chester, John Solum, and Diane Moore. Poster. "Elemental and Stable Isotope Chemistry of Cuttings and Core Samples From SAFOD Drill Hole."

D. Corey Barton, Kelly K. Bradbury, John Solum, and James P. Evans. Poster. "Structural and Lithologic Characterization of the SAFOD Pilot Hole and Phase One Main Hole."

James P. Evans, Diane Moore, David L. Kirschner, and John Solum. Poster. "Lithologic Characterization of the Deep Portion of the SAFOD Drillhole."

The following papers were presented at the Geological Society of America Meeting, Salt Lake City, Utah, 16-19 October 2005:

Peter T. Kolesar, James P. Evans, Michael Gooseff, Thomas E. Lachmar, and Rob Payn. "A Tale of Two (Or More) Karsts, Bear River Range, Cache National Forest, Utah."

Sean P. Long, Paul K. Link, Susanne U. Janecke, Michael E. Perkins, and C. Mark Fanning. "Multiple Phases of Tertiary Extension and Synextensional Deposition in an Evolving Superdetachment Basin, Malad Range, Southeast Idaho."

Rebecca J. Dorsey, Amy Fluette, Kristin McDougall, Bernard Housen, and Susanne U. Janecke. "Terminal Miocene Arrival of Colorado River Sand in the Salton Through Southern California: Implications for Initiation of the Lower Colorado River Drainage."

Robert Q. Oaks, Jr., Susanne U. Janecke, Victoria Landenheim, and Joseph M. Kruger. "Insights into Geometry and Evolutions of Extensional Basins Along the Wasatch Fault and East and West Cache Fault Zones, Utah and Idaho, U.S.A."

Kelly J. Mitchell, Rob D. Mackley, and Joel L. Pederson. "Quantifying Bedrock Strength with Respect to Fluvial Erodibility Along the Colorado River: Comparing in Situ and Laboratory Methods."

Alexander N. Steely, Susanne U. Janecke, Gary Axen, and Rebecca J. Dorsey. "Pleistocene (~1 MA) Transition from West Salton Detachment Faulting to Cross-Cutting Dextral Strike-Slip Faults in the SW Salton Through."

Susanne U. Janecke, Alexander N. Steely, Stephanie M. Carney, and Sean Long. "The Evolution of Fold-Prone Supradetachment Basins: Examples of Translation and Breakup from Montana and SE Idaho."

Susanne U. Janecke, Stefan Kirby, Victoria Landenheim, Alexander N. Steely, Rebecca J. Dorsey, Bernard Housen, and Andrew Lutz. "High Geologic Slip Rates on the San Jacinto Fault Zone in the SW Salton Through and Possible Near-Surface Slip Deficit in Sedimentary Basins."

John W. Shervais, Scott Vetter, and Barry B. Hanan. "Basaltic Volcanism of the Snake River Plain and its Relation to the Yellowstone Hotspot: An Overview."

John W. Shervais, Dennis Geist, Scott Hughes, M.J. Branney, Barry

Hanan, Scott Vetter, Douglas Williams, and Alexander Prokopenko. "The Snake River Plain Scientific Drilling Project (SRP-SDP): Tracking the Yellowstone Hotspot Through Space and Time."

Scott Vetter, John W. Shervais, and Meghan Zarnetske. "Basaltic Volcanism in the Western Snake River Plain and Boise River Valley: Ferrobasalts, Flotation Cumulates, and the Change to K-Rich Ocean Island Basalts 750,000 Years Ago."

W. David Liddell. "Spatial Competition in Marine Hard Substrate Communities: An Overview."

Carlton Brett, Michael K. Desantis, Peter Allison, and W. David Liddell. "Sequence Stratigraphy and Lagerstätten in the Middle Cambrian, Great Basin, Utah."

Isaac T. Westfield, W. David Liddell and Carlton Brett. "Middle Cambrian Microbial Communities Along a Bathymetric Gradient."

Carol M. Dehler, Paul K. Link, C. Mark Fanning, and Laura Degrey. "Mid-Neoproterozoic Strata of Northern Utah and Southern Idaho: Dating and Correlation of Uinta Mountain Group and Pocatello Formation."

Andy Brehm, and Carol M. Dehler. "Reevaluation of the Neoproterozoic Jesse Ewing Canyon Formation, Eastern Uinta Mountain Group, Northeastern Utah."

C. Mark Fanning, and Carol M. Dehler. "Constraining Depositional Ages for Neoproterozoic Siliciclastic Sequences Through Detrital Zircon Ages: A CA. 770 MA Maximum Age for the Lower Uinta Mountain Group."

Caroline Myer, Chris Merriman, Bonnie Pitblado, and Carol M. Dehler. "Petrographic and Geochemical Sourcing of Culturally Modified Quartzite in the Gunnison Basin, Colorado."

Marilyn B. Vogel, J. Michael Moldowan, Linda L. Jahnke, David J. Marais, and Carol M. Dehler. "Biomarkers from the Neoproterozoic Red Pine Shale, Uinta Mountain Group, Utah."

Joel L. Pederson. "The Last-Standing Hypothesis About the Path and Integration of the Late Miocene Colorado River Off the Colorado Plateau."

Alan J. Hidy, Joel L. Pederson, W. Scott Cragun, and John Gosse. "Cosmogenic <sup>10</sup>Be Exposure Dating of Colorado River Terraces at Lees Ferry, Arizona."

Kevin Hadder and Joel L. Pederson. "Quaternary Stratigraphy and Geochronology Associated with the Green River in the Uinta Mountains: Incision in the Headwaters of the Colorado River."

Ben D. Dejong, Joel L. Pederson, and Tammy M. Rittenour. "Esting the Signature of Climate Change on Sedimentation and Geomorphology in Eastern Grand Canyons Tributaries."

Richard J. Phillips, Warren D. Sharp, Joel L. Pederson, and Janice L. Boettinger. "Uranium-Series Dating of Pedogenic Carbonate From the Provo Shoreline, Lake Bonneville, Utah, USA."

Tammy M. Rittenour, Warren D. Sharp, Joel L. Pederson and Karl Karlstrom. "Luminescence Geochronology and Correlations of Terrace Deposits of Colorado River Tributaries within the Grand Canyon and Grand Wash Through, Northwestern Arizona."

James P. Evans. "Faults and Fluid Flow in the Crust: Advances Yet to be Made."

## RECENT PUBLICATIONS

Anders, M.D., Pederson, J.L., Rittenhour, T.M., Sharp, W.D., Gosse, J.C., Karlstrom, K.E., Crossey, L.C., Finkel, R.C., Goble, R.J., Stockli, L., and Yang, G., 2005, Pleistocene geomorphology and geochronology of eastern Grand Canyon: linkages of landscape components during climate changes: *Quaternary Science Reviews*, v. 24, p. 2428-2448.

Carney, Stephanie M., Janecke, Susanne U., 2005, Excision and the original low dip of the Miocene-Pliocene Bannock detachment system, SE Idaho: Northern cousin of the Sevier Desert detachment?, *Geological*



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- DeGrey, L.D., and Dehler, C.M., 2005. Stratigraphy and facies analysis of the eastern Uinta Mountain Group, Utah-Colorado border region. In, Dehler, C.M., Pederson, J.L., Sprinkel, D.A., and Kowallis, B.J., editors, Uinta Mountain Geology: Utah Geological Association Publication 33, p. 31-47.
- Dehler, C.M., Elrick, M., Bloch, J.D., Crossey, L.J., Karlstrom, K.E., Des Marais, D.J., 2005, High-resolution <sup>13</sup>C stratigraphy of the Chuar Group (ca. 770–742 Ma), Grand Canyon: Implications for mid-Neoproterozoic climate change, Geological Society of America Bulletin, v. 117: 32-45.
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- Dehler, C., Pederson, J.L., and Wagner S., 2005. Geology of the Seven Rivers 7.5' quadrangle, Eddy County, New Mexico: New Mexico Bureau of Geology and Mineral Resources, Open-file Geologic Map OF-GM 98, scale 1:24,000.
- Dehler, C.M., and Sprinkel, D.A., 2005. Revised stratigraphy and correlation of the Uinta Mountain Group, north eastern Utah. In, Dehler, C.M., Pederson, J.L., Sprinkel, D.A., and Kowallis, B.J., editors, Uinta Mountain Geology: Utah Geological Association Publication 33, 17-30.
- Dehler, C.M., Sprinkel, D.A., and Porter, S., 2005. Neoproterozoic Uinta Mountain Group of northeastern Utah: Pre-Sturtian Geographic, Tectonic, and Biologic Evolution. In Pederson, J., and Dehler, C.M., eds., Interior Western U.S.: GSA Field Guide 6, p. 1-25.
- Dennis, A.J., Shervais, J.W., Mauldin, J., Maher, H.D. Jr., and Wright, J.E., 2004, Petrology and Geochemistry of Neoproterozoic Volcanic Arc Terranes Beneath the Atlantic Coastal Plain, Savannah River Site, South Carolina, Geological Society of America Bulletin, v 116, 572–593.
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- Shervais, J.W., Kauffman, J.D., Gillerman, V.S., Othberg, K.L., Vetter, S.K., Hobson, V.R., Meghan Zarnetske, M., Cooke, M.F., Matthews, S.H., and Hanan, B.B., 2005, Basaltic Volcanism of the Central and Western Snake River Plain: A Guide to Field Relations Between Twin Falls and Mountain Home, Idaho; in J. Pederson and C.M. Dehler, Guide to Field trips in the western United States, Field Guide volume 6, Geological Society of America, Boulder Colorado, 27-52.
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# STUDENT NEWS



## RECENT DEGREES

### BS Degrees 2005:

Rod Buttars  
John Campbell  
Paul Cobb  
Sharalyn Jensen-Lewis  
Dustin Keele  
Kelly Mitchell  
Hiroyuki Nakayama  
Matt Pluta  
Kevin Randall  
Isaac Westfield

### MS Degrees 2005:

Ron Counts  
Scott Friedman  
Angela Isaacs  
Ben Kessel  
Stephen Kirby  
Jason Kneedy  
Joe Jacobs  
Rob Mackley  
Tony Williams

Congratulations graduates!

## STUDENT AWARDS

Andy Brehm, geology graduate student, received a student research grant from the Geological Society of America for \$1700 for his grant proposal entitled, "Re-evaluation of the Jesse Ewing Canyon Formation: Implications for Neoproterozoic paleogeography and tectonic setting of northeastern Utah".

Sarah Draper received \$4500 from DOSECC [Direct Observation and Sampling of Earth's Continental Crust] for her research on samples from the San Andreas Fault Observatory at Depth project.

Kelly Mitchell and Isaac Westfield have received the Eccles undergraduate research fellowships from the USU College of Science. These \$7,500 awards will be used to pay for a stipend and research expenses. Kelly's research advisor is Joel Pederson, and Isaac is working with Dave Liddell.

Kelly Mitchell, Joel Rackham and Isaac Westfield received undergraduate research and creative opportunity grants for their research projects.

## 2005 J.S. WILLIAMS AWARD RECIPIANTS

### Sarah Draper

Sarah Draper grew up as an army child, which led her to live in many places throughout the U.S. as well as Japan. Her family finally settled in Tacoma, WA, where she graduated from Clover Park High School with honors. She later earned a Bachelors of Science in Geology with an Environmental and Engineering emphasis from Western Washington University.

Sarah is currently working towards a Masters degree through the study of how geology affects and is affected by a creeping fault segment of the San Andreas fault in California. She's utilizing core samples from initial phases of drilling on the Parkfield segment of the fault and is tying it in with geologic mapping north of the drill site.

Sarah's love of geology stemmed from her long-time fascination with the outdoors and the sciences. Geology integrates all of the sciences and offers differing avenues post-graduation. Though she doesn't have any set plans, she's excited to have a Masters degree, which will provide her with more options from which to choose her future.

In her free time, Sarah also loves to ski, and has been swimming since she was a small child, which led to her being certified as a lifeguard and a lifeguard instructor.

### W. Scott Cragun

Scott Cragun was raised in Davis, CA—home of the other Aggies. He attended Davis High School where he enjoyed playing soccer, but quickly realized that hiking and camping were much better ways to spend his time. These hobbies later led to his decision to study geology.

After attending one year at Utah State University, Scott left for Guatemala where he served a 2-year mission for his church. Upon returning, Scott worked in Arizona at a wilderness survival camp for troubled youth—a program that had greatly influenced his own life. He later moved back to California where he met his wife, and then together, they came to back to USU where he could study his love of the earth. He and his wife, Yvette, have four beautiful boys, two of which are newborn twins.

Scott has found that solitude governs most of his thinking to this day. He's discovered that his chosen profession as a geologist grants him the peace and alone-time he searches for. He's currently at USU earning a Masters degree with a specialization in geomorphology. His research involves the Quaternary evolution of the Colorado River at Lees Ferry, Arizona. More specifically, he is working through detailed geochronology of the river terraces in order to calculate incision rates and explore the control on terrace formation at the Ferry. Scott hopes to have his degree by May 2006, and then plans to earn a doctorate degree.





## ALUMNI NOTES

Melissa [BS 2001] and Torrey Copfer [BS 1998, MS 2003] happily announced the birth of their baby, Jessie Gerrit Copfer, on May 4, 2005. She arrived at 8 lbs 4 oz., and parents are doing well. Torrey works for NRCE in Ft. Collins, where he works on hydrogeology and water resource projects in the west. Melissa is finishing her M. S. degree in geology at Colorado State University.

Jill [MS 2001] and Matt Pachell [MS 2002] announced the arrival of Emily Pachell on March 23, 2005. Emily and parents are doing well, based on a recent visit by Jim Evans and Susanne Janecke to their home in the Woodlands, TX. Matt is working for Anadarko Petroleum [currently on projects in west Texas] and Jill is on leave from Exxon Mobil. She plans to return to work in the fall, where she was working on Mobile Bay gas production.

Tony Williams [BS 2001, MS 2005] completed his MS degree at USU, and is now working for Anadarko Petroleum in Houston. He was an intern at Anadarko in 2004, and hosted Susanne Janecke and Jim Evans at the 2005 Anadarko Technology Conference.

Joe Jacobs [MS 2005] did an internship with Anadarko in the spring of 2005, and recently accepted a permanent position with them, starting in October.

Jason Heath [BS 2001, MS 2004] completed his MS on the hydrochemistry of natural CO<sub>2</sub> springs in central Utah. He is now a PhD student at New Mexico Tech, working on hydrogeochemical modeling and carbon sequestration research.

Karen [MS 1996] and Mark Miller have a two-year-old boy.

Jason Kneedy [MS 2005] moved to Oklahoma City to work for Chesapeake Energy. Jason's family is now 3, and reports are that life in Oklahoma City is good – the new neighbors that are quite friendly, and his family is happy.

Amy Hochberg [MS 1997] continues to live in Logan, with her husband Paul Vaslet. Amy had a baby girl 2 years ago, and she continues with a variety of activities, including a very popular fresh lemonade stand at the Cache Valley Gardeners Market on Saturdays, and she works part time for UF3 Consulting group in Logan.

Holly [BS 1993] and Matt Novak [MS 1993] continue to thrive in Houston, Tx. Their family includes two children, and Matt is now working in the VP Planning office at Exxon Mobil, and Holly plans to return to work at ExxonMobil in the fall. Matt is a valuable member of the Geology Advisory Board.

Stephanie Carney [MS 2002] recently saw part of her MS thesis get published in GSA Bulletin with her advisor,

Susanne Janecke. Stephanie works as a geologist for UF3 Consulting group, and she has added pesto and salsa production and sales to her repertoire, selling at the Gardner's Market on Saturdays. Stephanie's projects include work in the Canadian foothills, S. California, and Algeria.

Kelly Keighly Bradbury [MS 2000] works as a geologist for UF3 Consulting group, and has been doing field work in coastal California, SW Colorado, and Wyoming. She also works with the Center for Nuclear Waste Regulatory Analysis group at the Southwest Research Institute on issues of fractured and faulted non welded tuffs, and their flow properties. With her extra time, she runs ultramarathons and 50 or 75 mountain races, and organizes the Bear River 100 race in Logan. Daughter Ember is now in second grade.

Jason Briner [MS 1999] completed his PhD at the University of Colorado, Boulder, and is now an Assistant Professor at SUNY Buffalo. He is busy setting of his lab, and has his first group of graduate students starting this fall. Jason's research focuses on the geomorphology and climate records in the Canadian and Alaskan Arctic.

Yarrow Axford [MS 2001] is completing her PhD at the University of Colorado, Boulder.

Steven Schulz [MS 1997] recently left Marathon Oil for Occidental Oil, in Houston. He is now a senior geologist and working on new exploration projects in Libya.

Jim Goddard [MS 1993] continues to work for Utah Division of Water Rights. Rapid population growth keeps him busy.

Caleb Pollock [BS 1996] and his wife Shelly [BS 1996, Env. Studies] recently left Exxon Mobil, and he joined Pioneer Energy in Dallas, TX.

Dan Kendrick [MS 1994] works for 3D Geo in Melbourne, Australia.

Colby Vandenburg [MS 1998] works for Red Willow Production, but has moved from Ignacio to Denver, Colorado. Colby married in 2004, and met his wife while, guess what, rock climbing in Colorado.

Andy Taylor [MS 2002] visits the department along with the Anadarko recruiting trip to Logan, and he is exploring for oil in Texas and California.

Ben Kessel [MS 2006] completed his MS degree in June, 2005, and is going to work for Anadarko Petroleum in Woodlands, Texas.

Scott Friedman [MS 2006] finished his MS degree and is working for Chesapeake Energy in Oklahoma City.

Adrian Berry [MS 2003] now works for Anadarko in Houston.



Rob Mackley [BS 2002, MS 2005] completed his MS degree and is working at the Pacific National Lab in Richland, WA.

Blair Larsen [BS 1997] teaches at Mt. Logan Middle School, where she leads a great end of year field trip on geology and ecology for her honors students. She also hosts a 1 hour folk and bluegrass radio show on KUSU in Logan, and is active in getting the Cache Valley animal shelter off the ground.

Scott Wright [MS 2000] teaches science at Mt. Logan Middle School in Logan, and he and his wife Liz had a baby boy in 2004.

Dick Heermance [MS 2002] is getting his PhD at UC Santa Barbara, and is working on tectonic, geomorphic, and sedimentological problems in China. He received the USGS Mendenhall post-doctoral fellowship.

Angela Issacs [BS 2002, MS 2005] did her field work in Taiwan in 2004, and will have finished her MS on fault structures. She did an internship with the US Forest Service in Juneau, Alaska in the summer 2005. Her husband Kyle was stationed in Afghanistan for 15 months in 2004- and 2005, and he returned safely and happily in April 2005. Angela and graduate student Sarah Draper [MS exp., 2006] organized a gift drive in the department for Kyle's unit for the Christmas 2004 holiday. Angela starts with Anadarko in Feb. 2006.

L. C. Allan (Al) Jones [BS 1989, MS 1996] lives in Logan, Utah, where he is refurbishing his historic home. He works with Jim McCalpin on hazards assessment and mitigation for the development on Traverse mountain, south of Salt Lake City. Al is also the co-chair of the Geology Advisory board.

Jim McCalpin [former faculty 1981-1995] is president, VP, CFO, COO, and treasurer of Geo-Haz, Inc., a geologic consulting firm with its world headquarters in Crestone, CO. His work on Traverse Mountain brings him to Utah often, and he visited the department in the spring of 2005 to give a talk on the geologic hazards associated with development on Traverse Mountain, Utah.

John Solum [BS 1980] finished his PhD on fault-related mineralogy and geochemistry at the University of Michigan in the fall of 2004, and he is now a Mendenhall postdoctoral fellow at the USGS in Menlo Park. He is working on the SAFOD project, and he and Jim Evans, and students Sarah Draper and Corey Barton, collaborate on analysis of samples from the drill hole across the San Andreas fault. John helped lead a field trip in Utah for deaf high school students from around the country, organized by Prof. Michele Cooke, University of Massachusetts.

Zoe Shipton [Post-doctorate 1999-2001] is now a lecturer [associate professor] at the University of Glasgow, Scotland. She is doing field work in Europe, Utah, Jordan, and the Canary Islands, working on fault structures, and CO<sub>2</sub>.

Stefan Kirby [MS 2005] finished his degree on sedimentary rocks and stratigraphy of deposits in the Anza-Borrego

State Park [west of Salton Sea, CA] with Susanne Janecke. Stephen now works for the Utah Geological Survey in Salt Lake City.

Russ Griffin [BS 1991] works for Questar Gas in Vernal, Utah. Russ recently gave a keynote [and brilliant] talk on their efforts in increasing gas production in the Red Wash field.

Jordan Bright [BS 1997] completed his MS degree at Northern Arizona University with former USU faculty Darrell Kaufman. Jordan now operates the Amino Acid lab at NAU, and was a 2004 DOSECC graduate fellow.

Cam Snow [MS 2002] is completing his PhD at Stanford University, working with Gary Ernst on the petrology and tectonics of the Sierra foothills.

## DEVELOPMENT NEWS AND ALUMNI GIFTS

The continued financial support from geology alumni, friends, and corporations provide an ever increasing base of long-term support for the department's mission in teaching and research. The following roster includes the names of the donors for 2004 and 2005. The donations we receive are primarily directed to programs that directly benefit students—either as scholarships for undergraduate or graduate students, as support for our department lecture series or to support student travel to professional meetings like GSA, AAPG, and AGU. Everyone in the department is grateful for these donations.

In late 2004, faculty member Jim Evans organized the development of the Peter McKillop memorial scholarship fund. Along with former students of Jim Evans and Susanne Janecke and friends of Peter, a new graduate fellowship has been established as a permanent memorial to Peter, who died in the Sierra Nevada mountains in 1999. The fellowship will go to a graduate student in geology, who like Peter, exhibits talents not only in geology, but interests in other fields, such as art, music, or the social sciences. As of this writing, the fellowship endowment has reached about \$30,000, and we hope to see that grow. We will award the first fellowship in the spring, 2006.

Other developments in student support include the J.S. Williams graduate fellowships. Due to the continued generosity of Dr. and Mrs. Williams, we now are able to award two summer stipends to help students fund their summer research work. Unrestricted gifts and corporate donations form an important source of support, and the growth of gifts to endorsed scholarships increases our ability to support students at all levels.

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## ALUMNI: PLEASE GIVE US AN UPDATE!

We would love to hear from all of you and publish a note from you in our next newsletter. Please send a note letting us know your contact information, what you are are researching, where you are working, how your kids are doing, or whatever you like. Plus, if you have any photos from old field trips, please send us copies for the new alumni web page.

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UTAH STATE UNIVERSITY GEOLOGY DEPARTMENT  
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Photo taken from the Spring 2004 Geology 2500 Trip in the San Rafael Swell.

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