

Down to Earth



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

Fall 2017



In This Issue:

Departmental Activities.....1
 Open House
 Our Award-Winning Home
 Countertop Geology
 Fossil Collage Donation Creates New Display in the Dean’s Office

Faculty Focus3
 Awards
 Research In the News
 Updates

Special Courses.....3
 Stable Isotope Ecology
 SPATIAL

Field Trips.....6
 Geology Field Camp, Summer 2017
 Karoo Basin Turbidites, South Africa Field Excursion
 Escape to Ecuador
 Passage to Peru

Student Achievements10

Alumni & Friends12
 Updates
 Spotlight
 Donor Recognition
 Giving to the Department

Message from the Chair

From 2016-2017 the Department of Geology and Geophysics (GG) experienced exciting changes and successes. This is my first year as chair, taking over from John Bartley who led the department for the past 3 years. We welcomed a new Dean of the College of Mines and Earth Sciences – Darryl



Butt (a material scientist from Boise State), as Frank Brown stepped down as Dean after more than 25 years of service. We had a special day to honor Frank – 5 lecturers each gave a perspective of Frank’s career decade by decade from 1965 to the present. This represents 50 years of fieldwork in the Omo-Turkana Basin in East Africa!

Margie Chan hosted a great alumni gathering at GSA in Denver last fall and I hope to see many of you at the 2018 GSA meeting in Seattle Washington this coming October. In the summer, we were able to get a number of new “kitchen countertop” slabs installed, including one outside at the back entrance. We hope it draws visitors on their way to the new parking structure situated where the old Mines building once stood.

Once again, we were fortunate this year to be able to give away a large number of scholarships to undergraduates. We appreciate all the donors to this effort – undergraduate scholarships are a great investment in our students. In January 2017, we welcomed Michelle Tuitupou to our department; she has an essential job as the undergraduate advisor.

We’re seeing new faces on the faculty – such as igneous petrologist Sarah Lambart, and seeing some established faculty looking at new directions (see stories of Barb Nash and Tony Ekdale in the Faculty Updates section).

We had our first Open House Night in April, described later in this edition of our newsletter.

The support of our alumni and friends and our sense of community is what makes our Department successful. Your gifts to our programs enable us to provide experiential learning, groundbreaking research, and innovative opportunities for our students and faculty. Your philanthropy plays an important role in the Department and we appreciate it!

Thure Cerling
 Dept. Chair 2017-2018



Solar suspenders. Thure Cerling sitting in the reflection of the solar eclipse.

The *Down to Earth* Newsletter is published by:
Department of Geology and Geophysics
University of Utah
 115 South 1460 East, Room 383
 Salt Lake City, Utah 84112
 Website: www.earth.utah.edu
 Dept. Phone: (801) 581-7162
 E-mail: gg@utah.edu

Copyright © 2017 University of Utah. All rights reserved.

Front Cover: *Geology & Geophysics undergraduate researcher Ben White (BS ‘16) deploys a seismometer on Corona Arch near Moab, Utah to measure ambient motion. Resonant frequencies of the arch detected from vibration data can be compared to later repeat measurements as a means of detecting internal damage.*

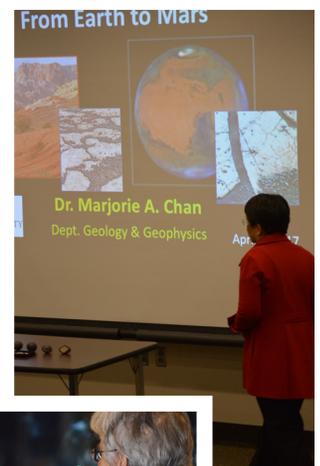
Down to Earth contributors: *Margie Chan, Thure Cerling, Travis McMullin, Michelle Tuitupou, Gabe Bowen, Dave Dinter, Alex Koch, Cari Johnson, Bill Johnson, Erich Petersen, Pete Lippert, and Jeff Moore. Layout: Anita Tromp*

Departmental Activities

GG Open House Stirs Interest in Geology for the Next Generation of Rock Stars

On April 7, 2017, the Department hosted its Spring Open House. The event included a lecture by Marjorie Chan titled "Red Rocks: From Earth to Mars," table displays with free rock samples, building tours, and refreshments. About 100 people were in attendance including former faculty and students, current faculty, staff, and students, as well as community members interested in learning more about the geosciences. The excitement of the open house extended into the next week when elementary-aged attendee, Addie, exclaimed to her aunt, "And we went to the UNIVERSITY, and went to a real CLASSROOM, and we heard a real PROFESSOR. And I learned about Mars, and the Curiosity Rover, and I am going to be a GEOLOGIST!"

As part of the mission statement for the College of Mines and Earth Science, the departments are charged with "educating the University community and the public about the composition and structure of Earth, processes that shape it, and its history and future." A current faculty member commented on the attendees and remarked how they were "not the same old people" attending the event. Thure Cerling, department chair, commented, "I hope this is the first open house of many. We had a good attendance from the local community and we plan on having these open houses in both fall and spring terms. I look forward to seeing everyone next time!"



The success of the event can be summed up by the youngest attendee, Emma (age 4), who declared, "I don't know what I learned, but I had FUN!" All are invited to our Fall Open House on September 29th 6-9pm. (7:00 Lecture by Jeffrey Moore -Dynamic Arches: the hidden movements of Utah's iconic landforms)





Alumni Social at GSA 2017

October 23rd (6:30 – 8:30pm)

Sheraton Seattle - 1400 6th Ave., Seattle, WA
(Jefferson Room)

Join Alumni, Faculty, Students and Friends of GG!



GG Fall Open House Night

Fri., September 29th (6:00 - 9:00 pm)

Frederick Albert Sutton Bldg.
115 South 1460 East, Salt Lake City, UT

7:00 pm - Lecture by Jeffrey Moore

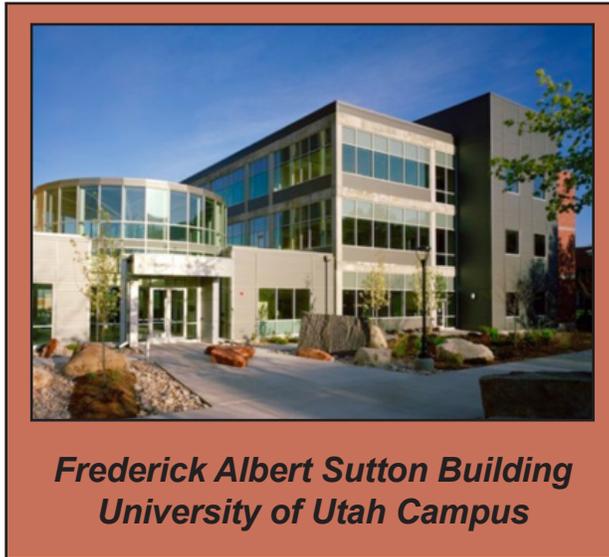
"Dynamic Arches: the hidden movements of Utah's iconic landforms"

All are Invited! (Free)

Our Award-Winning Home

In October 2017, the Sutton building will be recognized as a Beacon of Excellence for Undergraduate Education, one of the University's top educational awards. Although these awards are usually given to individuals, this is the first time it is being awarded to a campus building. Many individuals and company partners contributed to making the Sutton building so wildly successful. The design elements, particularly the hung slabs, are being adapted by geology departments around the country, including, for example, by CalTech, the University of Arizona, Arizona State University, and Fort Lewis College.

What nominators said about the Sutton building: *truly fosters*



**Frederick Albert Sutton Building
University of Utah Campus**

educational excellence; captures and nurtures interest in the Earth; has polished slabs that welcome and intrigue; most engaging and immersive building on our campus; surrounds everyone with beautiful physical evidence; one of the coolest places on campus; literally hands-on dynamic learning space; has science caked in its walls; spoiled me as an undergraduate; and helped me uncover my passion for geology.

If you haven't visited the Sutton building in the last year, do come back! We have added dozens of new rock slabs and specimens for teaching and outreach, including some on the outside of the building, courtesy of in-kind donations from several stone companies.

Countertop Geology

In Spring 2017, Margie Chan and Thure Cerling offered a new class called "Countertop Geology" focused on deciphering where some of our building's rock slabs (typically used for kitchen countertops) came from, and employing new department analytical facilities and petrography to elucidate their origins.

We especially thank Chuck Williamson (MS 1973) for sponsoring our analyses, and Matt Huarte - owner of Arizona Tile, for sharing his industry knowledge and continuing to support our program with donated rock slabs.

We found out there's still a lot we don't know about the origins of many slabs, but we plan to share some of our findings on our department webpage. Six other GG faculty also shared their perspectives of the slabs as part of the class. A memorable part of the class was dumpster diving for remnant scraps!



Fossil Collage Donation Creates New Display in the Dean's Office

Lonnie and Shannon Paulos recently donated a unique collage of 59 fossils, primarily from the Fossil Butte Member of the Eocene Green River Formation, southwestern Wyoming.

The vertical collage contains fossil leaf specimens, fossil fish (Cockerellites liops), and even a fossil bird feather. This nicely complements our fossil fish and plant walls in the FASB confluence.

We appreciate these kind gifts that enhance our space and add to our teaching mission.



Faculty Focus

Faculty Awards

President's Medal - Geological Society of America (GSA)



Thure Cerling received the President's Medal – Geological Society of America (GSA). He also received the American Geophysical Union's (AGU) Excellence in Earth and Space Science Education Award along with his colleague, Jim Ehleringer, Distinguished Professor in Biology. Lastly, Cerling was elected an AGU Fellow.

Visiting Scholar Award



Marjorie Chan received a visiting scholar award from the Center for Advanced Studies at Ludwig Maximilian University in Munich. She will spend part of her 2017-2018 sabbatical there in Germany. She also received a similar visiting researcher award in Japan hosted by the Earth-Life Science Institute at the Tokyo Institute of Technology.

Grover E. Murray Memorial Distinguished Award



Cari Johnson received the Grover E. Murray Memorial Distinguished Educator Award from the American Association of Petroleum Geologists.

AGU Early Career Award



Lowell Miyagi received a National Science Foundation CAREER Grant from the National Science Foundation for his project entitled, "CAREER: Deformation and Anisotropy Development in the Lower-most Mantle." In addition, he will be honored in December 2017 with an AGU Early Career Award from the Mineral and Rock Physics Section.

Congratulations to our faculty on these outstanding achievements!

2016-2017 GG Outstanding Teaching Award



Pete Lippert received the 2016-2017 GG Outstanding Faculty Teaching Award.

2016-2017 GG Outstanding Faculty Research Award



Jeffrey Moore received the 2016-2017 GG Outstanding Faculty Research Award.

Faculty Research in the News

Thure Cerling has been using radioactive carbon from nuclear bomb tests to fight elephant poaching. *National Geographic* described his work in the article, "How Mid Century Doomsday Tests May Help Save Elephants." [Click here to read more.](#)



Marie Jackson's work was featured in *The Washington Post* article, "Ancient Romans made world's 'most durable' concrete. We might use it to stop rising seas." [Click here to read more.](#)



Brenda Bowen's research on the shrinking Bonneville Salt Flats was recently publicized in *The Salt Lake Tribune* article, "Human activity — racing included — is shrinking the Bonneville Salt Flats, U. researcher says" [Click here to read more.](#)



Gabe Bowen was featured in the article, "The Strange Future Hurricane Harvey Portends" in *The Atlantic*. [Click here to read more.](#)



Tony Ekdale Retires



Front row (left to right): Lindsay Koehler, Keegan Melstrom, Patti Garcia, Sherie Harding (face partially hidden), Tony Ekdale, Deanna Brandau, Alison Harlick Oakley, Susan Lutz, Leif Tapanila, Bob Lamond, Mark Loewen. Back row (left to right): Kim Koeven, Benn Breeden, Zack Wistort, Bill Phelps (face partially hidden), Jim Magwood, Jim Lehane, Tommy Good (face partially hidden), Chris Bradbury, Luke Pettinga, Chad Fuller

Tony Ekdale retired on July 1 after 43 years on the faculty of our department. During those years, Tony taught countless undergraduate and graduate students in a variety of courses in paleontology, geology of national parks, and other geoscience subjects. During his research activities on four continents, he named several new taxa of trace fossils and contributed thousands of fossil specimens to our department's teaching and research collections. The department hosted a retirement party for Tony at the Fort Douglas Officers Club. In addition to many friends, colleagues and current and past students, it was great to see some of Tony's former graduate students who came from some distance especially for this event: Bill Phelps, Alison Harlick Oakley, Tommy (and Kelly) Good, Sherie Harding, Jim Magwood, Jim Lehane, Bob Lamond, Sue Lutz, and Leif (and Lori) Tapanila. An endowed scholarship fund has been established in Tony's honor!

Sarah Lambart to join the GG Faculty

Sarah Lambart will be joining the department in spring term 2018 as an Assistant Professor. Sarah studies the chemistry of planetary interiors (including Earth, of course!) and especially magma generation and magma evolution. She is an experimentalist and will be setting up a lab for experimental petrology with applications in many areas of petrology. She has worked in a variety of deep-earth processes, including magma focusing crack propagation under high pressure conditions, melting of mantle pyroxenites, and mantle heterogeneity. She immediately comes from Cardiff University where she is a post-doctoral fellow. Her PhD is from Blaise Pascal University in Clermont-Ferrand (France). We look forward to her joining our department.



Barbara Nash began a two-year term as Associate Dean of Research for the College of Mines and Earth Sciences on July 1, 2017. Her focus will be to foster inter-disciplinary research collaborations, improve research infrastructure, develop mentoring programs for junior faculty and to communicate research opportunities to faculty and students.

Frank Brown moves on but keeps on moving



Frank Brown speaking at his Dean's Farewell Luncheon in the Sutton Building in June 2017.

Frank Brown stepped down as dean after more than 25 years. A symposium and reception honoring his fifty years of contributions to the study of geology and human prehistory took place in October 2016. Special visitors to the symposium included alumni, friends, and Leaky Foundation board members. He continues to teach his classes and conduct research in Africa.

Special Short Courses

Stable Isotope Ecology



The Stable Isotope Ecology Short course which took place in June, 2017 taught by Thure Cerling and Jim Ehleringer (Adjunct Prof in GG; Distinguished Professor of Biology) along with a number of “IsoPopes” from other universities. This year we had 40 students, from Argentina, Brazil, Slovenia, Mexico, Columbia, South Korea, Israel, Lebanon, Italy, the Phillipines, and USA. Professors Cerling and Ehleringer were recognized by AGU for this course with the Excellence in Earth and Space Sciences Education Award for 2017. The long running (22 years!) course represents terrific outreach by the department to other universities and to the scientific world at large.

SPATIAL



The 2017 SPATIAL (Spatio-temporal isotope analytics lab) short course, led by Gabe Bowen, was held June, 2017 in the Sutton building. This class offers two intensive weeks of lectures and hands-on training to graduate students and postdocs from around the world. Students interact with a group of ~15 instructors and postdoc research mentors to explore techniques ranging from management of large datasets to

spatial statistics and geochemical modeling. They build on examples introduced in lecture to apply these skills to topics as diverse as urban water management, paleoclimate, and migratory habits of pre-modern humans.

The 21 students in this year’s class traveled from as far as South Africa, Australia and China. They came from backgrounds spanning the geosciences, ecology, anthropology and forensics. We had a stellar time getting to know and work with each other, aided by some fun excursions for hiking in the Wasatch Mountains, fieldwork in and around Salt Lake City, and an international students’ night at the ball park! Everyone spent a lot of time (including late nights) at the U, and came away very impressed with the campus culture and environment, particularly the outstanding facilities of the Sutton Building.

This year represents a period of transition, with the expiration of a 5-year NSF grant that has supported the Stable Isotope Ecology course and the development and launch of the SPATIAL course and provided scholarships to many students. However, based on the feedback we’ve received and the level of enthusiasm among alumni, we believe that the course has a strong future. We look forward to the 2018 offering and to its continued evolution in response to new advances and opportunities within the research community.



Spatial Short Course students from South Africa, the USA, England, Argentina, Switzerland, and Australia enjoy getting to know each other at a Salt Lake Bees game.

With the expiration of a 5-year NSF grant, these programs could use your support. If you are interested in making a contribution, please contact TJ McMullin at 801-581-4414 or email him at travis.mcmullin@utah.edu.

Field Trips

Geology Field Camp, Summer 2017



Summer Field Geology is the intellectually and physically demanding capstone course and perennial rite of passage for Geoscience and Geological Engineering majors at the University of Utah – a transitional experience from undergraduate study to either graduate school or entry-level employment in the Earth Sciences. It provides students the opportunity to independently take on complex mapping problems, challenging them to apply and integrate knowledge and skills from the geologic subdisciplines they have mastered earlier – structure and tectonics, stratigraphy, sedimentary environments, petrology, and geomorphology. The final prerequisite is a Spring Semester Geologic Field Methods course that entails a 4-hour field project every week for three months, so students are ready to hit the ground mapping at field camp. The goal is to turn geology students into geologists.

The mountains of Utah's Great Basin are our natural laboratories. Students undertake two projects, each of two weeks' duration, during which they map a 3- to 4-square-mile area, describe lithologies and rock textures, measure bedding, faults and folds, prepare cross sections and stratigraphic columns, interpret the geologic history, and present results in professional-format technical reports. Project One in 2017 focused on Parowan Gap, an antecedent stream canyon northwest of Cedar City, which exposes Cretaceous Sevier thrusts and foreland deposits that were first covered by Oligocene pyroclastics, then displaced by Cenozoic Basin-and-Range normal faults. For Project Two, the class moved into the Sevier hinterland, to the Raft River Mountains in Utah's northwest corner. The metamorphic core of this range, exhumed in Miocene time from mid-crustal depths by low-angle normal faulting, exposes the oldest rocks in Utah beneath a world-class mylonitic shear zone enclosing a range-scale recumbent anticline. The project culminated with a field trip through the syndetachment basin along the abandoned 1869 Southern Pacific Railroad grade north of the Great Salt Lake, a bit of rock-scrambling in the City of Rocks in southern Idaho, and refreshments at the Almo Rock City Cafe.

Graduate instructors of the Field Methods/Field Camp sequence have received the departmental Outstanding Teaching Assistant of the Year award for the last six years.

This year's outstanding instructional crew included field camp veterans and award winners Casey Duncan and David Wheatley, first-rate newcomer Grant Rea-Downing (already drafted for Field Camp 2018), and long-time field camp director, David Dinter. Camp managers extraordinaire, Nicole Cholewinski and Gabby St. Pierre, organized and provisioned the camp and fed 32 students, five staff members, and occasional visitors a gourmet dinner every evening, with vegetarian, vegan, and gluten-free alternatives! Entertainment and affection were provided by camp border collie, Oliver.

Karoo Basin Turbidites, South Africa Excursion



Students enjoying the expansive South African landscape at the start of the trip.

As the well-known adage goes, the best geologist is the one who has seen the most rocks. In continuing tradition for our AAPG chapter, we pulled together a world-class international field trip. The hard efforts of our AAPG members, and generous contribution from industry sponsors, our department and college, and from our friends and family made this field trip possible.

Our journey involved 12 students, our chapter advisor Cari Johnson, local field consultant De Ville Wickens, and long-time collaborator with our chapter Bill Morris. Bill and De Ville have both spent multiple decades researching the turbidites of the



Dr. Cari Johnson and students, Ellen Reat, Gabriela St. Pierre, and Alex Koch debate bedforms. Note ripple marks on bedding plane upper right.

Karoo Basin (continued)



Tabular beds of this turbidite fan unit make wonderful resting places.

Karoo, and their expertise proved invaluable. Our students were one third undergraduates, and the rest graduates, marking one of our most successful mergers in undergrad and grad involvement and collaboration.

The Karoo is famous for its broad and continuous outcrop exposure in every direction of the depositional system. Our focus was on the turbidite fans, with some time spent on the up-dip deltaic deposits of the basin. We began at the most proximal part of the fans and worked our way distal throughout the field trip. For the first two days, we observed complexes of channelized turbidite deposits. We spent our time discussing both larger-scale architecture, and facies associations within. The Ta/Tb/Tc turbidite/Bouma facies nomenclature quickly became second nature to us as we discussed them in the field, with our noses on the outcrop.



Group photo in front of a world-famous turbidite channel outcrop (steers' head feature at top of the outcrop behind us.)

Next, we looked at a more medial position on the fan, which was composed still of channelized deposits. We went off-axis of the fan, and observed channels that had avulsed off of the beaten path and created an isolated sand body out on the abyssal plain. We ended the turbidite portion of our trip by looking extensively at lobe deposits at the distal portion of the fan. We spent our last field day looking at the marginal marine rocks that were deposited atop the turbidite succession. To stand in one place and view the deposits of the basin floor and the shoreline in a single vista is what makes the Karoo world-class, and aided us in understanding the entire depositional system as a whole.

Escape to Ecuador



20,500 ft. Chiborazo from Ozochoche lakes, Ecuador

Eleven GG undergraduate students and a collaborating Peruvian graduate student from Virginia Tech joined three UU professors and two graduate TAs from Geology, Geography and Anthropology to undertake the 4th Learning Abroad hands-on research boot camp (initiated in 2012). In August, 2017 they worked with five collaborating professors from Ecuadorian universities (Escuela Politécnica Nacional, Universidad de Cuenca, Universidad Técnica Particular de Loja, Universidad Andina Simón Bolívar and Universidad del Azuay) to investigate environmental concerns across Ecuador and across physical and social science perspectives, with emphasis on sampling and post-trip analyses in four physical science contexts:

- 1) High Andes lake sediment core retrieval and paleoenvironmental reconstruction (led by Andrea Brunelle and Patricio Crespo)
- 2) Upper Amazon investigation of viability of lateral channel construction for bank biofiltration remediation of mining-impacted rivers (led by Bill Johnson and E. Pazmiño)
- 3) Central highland water resource management, protection and treatment in the Spanish colonial city of Cuenca (led by X. Diaz, G. Chacón)
- 4) Pacific-ocean trawl sampling between mainland and Isla La Plata for dreaded plastic microbeads (led by Bill Johnson and E. Pazmiño)

Social science activities examined community structure impacts on socio-economic concerns including indigenous perspectives (led by Shane Macfarlan, Juan Manuel Garcia, Maria Beatriz Riofrio, and Malki Saenz). Graduate TAs (Logan Frederick and Blanca Yague) assisted in all physical and social science activities.

During the week preceding the trip, UU faculty and TAs oriented students to Ecuadorian history, culture and socio-economic setting, mining processing and waste issues (guest lecture by Michael Nelson of UU Mining Engineering), lacustrine sedimentary climate and environmental records, and a smattering of primary principles and practical concerns in physical and social environmental science. During the trip, students trained in teams to perform sample preparation, sampling and preservation, with rotation through teams for each activity. Following

Ecuador (continued)



2014 participants Jessica Ellis and Nora Nelson with locals during well sampling

the trip, students focused on physico-chemical analyses of choice ranging from pollen and charcoal analyses of core sediment, inductively-coupled plasma mass spectrometry of water samples, and laser diffraction and optical analyses of nano- to micro-sized particles with possible HPLC analyses of solvent extractions. They related these analyses to local and broader environmental concerns and social science findings.

Students hauled gear, sampled sediment and water, and assisted surveying people, in contexts ranging from the high Andes to the upper Amazon to the Pacific, using eyes, ears, mouths, legs, arms, nets, wells, rafts, tour boats, and (we hope) tractors.

The course will culminate by Thanksgiving 2017 in a report and presentation by the student participants. Support for the experience comes from Learning Abroad, the Center for Latin American Studies, the National Science Foundation Hydrologic Sciences Program, the Global Change and Sustainability Center, and the Department of Geology & Geophysics.



2014 Participants moving gear for lake sediment coring effort on the Cajas at 13,000 ft. Dan Prady and Evan Melquist on the parallel bars.



2014 participants (left to right, front to back) Mermory Ware, Jessica Ellis, Logan Frederick, Matt Morrison, Evan Melquist fresh from a futbol and football match during sampling in the playa.



2014 participants setting up to core at Tres Lagunas



2014 participant Marcel Gaztambide reckoning the source of mining effluent

Passage to Peru

The Education and Training Committee of the Society of Economic Geologists offered a four-day field course in May, 2017 in the Yanacocha District of northern Perú. Participants observed core from the Yanacocha Sur deposit, spent several days in the field noting the alteration mineralogy and structural styles of key outcrops, and observed structural alteration from several open pit mines that characterize the district. Erich Petersen along with students from the GG department participated in the course that was offered in both English and Spanish. The course was suggested by Dale Finn, Newmont Regional Group Executive (South America Exploration), who supported the idea of a mapping-oriented course directed at professionals who would benefit from knowing “what to map, and why.”



Top photo: Jakson Vilchez, chief geologist, reviews core with course participants. Center Photo: In the field discussing high-sulfidation alteration of volcanic rocks. From right to left, William X. Chavez, Jr. and Erich Petersen. Bottom photo: Group picture in Yanacocha open pit.

**Thank you to all our contributors
to the Geology and Geophysics
Unrestricted Fund, which helps
make many of these trips possible!**

[Click here to support field trips.](#)

Climate and Biotic Events of the Paleogene (CBEP) Conference 2017

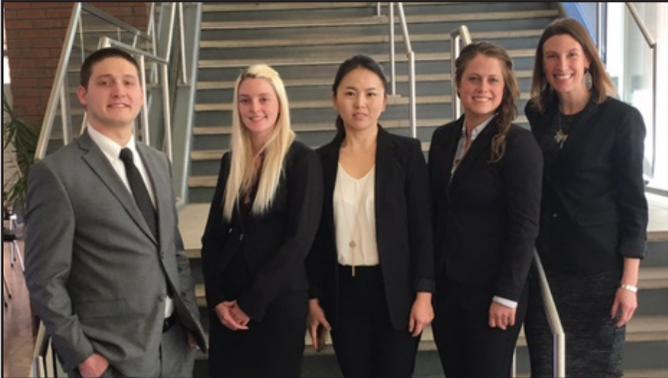
Since 1989, the Climate and Biotic Events of the Paleogene (CBEP) conference series has been a venue for a self-organized community of researchers to share and discuss the latest and most innovative ideas about Earth systems during the Paleogene period of Earth history (23 to 66 million years ago). This unique conference is held once every three years, and CBEP 2017 marks the meetings' first return to the USA since 2001. The four-day meeting in early September 2017, organized by GG professors Gabe Bowen and Pete Lippert, brought together over 110 students and scientists from around the world to Snowbird Resort in Little Cottonwood Canyon to discuss their research and insights on climate dynamics, tectonics and surface processes, ecosystems, and biogeochemical cycles during this 43-million-year period of Earth's history. The conference concluded with field trips throughout eastern Utah and SW Wyoming led by GG faculty to showcase exceptional geological records of Paleogene climate, life, and surface processes and catalyze additional research collaborations and ideas.

The CBEP conference series was organized because the Paleogene was a time of extremes and transitions relevant to our modern changing planet. Bounded by the catastrophic extinction of the dinosaurs and the rise of the modern grasslands, the world of the Paleogene was characterized by climatic conditions largely unfamiliar with us today but saw the rise of essentially modern continental configurations, biotic communities, and biogeochemical regimes.

It was during the Paleogene that mammals diversified rapidly, global climate was punctuated by exceptionally warm periods in pace with abrupt changes to the global carbon cycle, permanent ice sheets first appeared and stabilized on Antarctica, and ocean circulation and heat transport changed to a pattern more similar today, as old oceans closed and new oceans opened. The Paleogene provides several examples of carbon cycle perturbations and their downstream effects— including ocean and atmospheric warming, ocean acidification, and habitat restructuring— similar to the especially rapid changes human civilization is causing today. Understanding the function of these systems under global greenhouse conditions that may approximate Earth's climate future is intriguing both for what it can tell us about our past and for the hints that it may provide about our future.

Student Achievements

2017 Imperial Barrel Award Regionals - 2nd Place



(Pictured left to right): Alex Koch, Shawn Moore, Tsolmon Adiya, Jennifer Morris, and Faculty Advisor Lauren Birgenheier. Special thanks to Aksel Quintus Bosz and alumnus Matt Heumann for helping advise the team

University of Utah GG Department Team Kodachrome took 2nd in the annual Rocky Mountain Region Imperial Barrel Award contest, a petroleum exploration contest organized by the American Association of Petroleum Geologists.

MS Geology Student Published in Nature - Jory Lerback

Jory Lerback, MS Geology Student, along with Brooks Hanson, Director of Publications at the American Geophysical Union were published in Nature (January, 2017). They presented an analysis of gender bias in peer review for scholarly publications.



Outstanding TA - David Wheatley

In the past three years, David has been the teaching assistant for three courses, and their respective labs (Sedimentology and Stratigraphy, Field Methods, and Field Camp). Comments from David's nomination forms consistently spoke to David's friendliness, care, and devotion in his TA responsibilities. Students consider him to be very knowledgeable and great at what he does, but also willing to find out the information if he didn't have an answer immediately. Students note that he is able to clearly explain the subjects that he teaches. David was also praised for his efforts in designing a final project that was 'awesome' and with real-world application in sedimentology/stratigraphy interpretation and industry work. One student noted that David 'would make a great professor one day.' A common theme in his nominations was his patience and willingness to take the time necessary to ensure that students understood.



2017 Outstanding Undergraduate Researcher Award

Nicholas Thiros

Nicholas Thiros received the 2017 Outstanding Undergraduate Researcher Award from the University of Utah. Nick developed a new methodology to purify the lead contained in environmental samples such as soil, sediment or tissue, and determine its isotopic composition using plasma mass spectrometry. By measuring the isotopic composition for the lead contained in Great Salt Lake sediments, Wasatch tree rings and Wasatch front dust, he was able to reconstruct the history of lead contamination in our region for the past three centuries. This data will be important to investigate in which ways human and animal life has been exposed to this toxic metal. Nick works with Diego Fernandez and he wrote the proposal "Lead Isotope Analysis of Great Salt Lake, Utah, Microbialites in Response to Anthropogenic Lead Pollution."



Scholarships, Fellowships, and Awards

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

UGA Field Camp Scholarship: Aini Mokhdhari, Cole Richards

University of Utah T53 Scholarship: Emily Kam, Clay Woods, Jenna Taylor

Earls Family Endowment for Field Studies: Griffin Siebert, Hannah McIlwain, Jacklyn Hallett, Jake Reitman

Orlo Childs Field Camp Scholarship: Jason Wisniewski, Jessica Page, Sam Callis, Sean Hatch

Mineralogical Society of Utah Memorial Scholarship: Alysha Armstrong, Jonathan Voyles, Patrick Cunningham, Lucas Johnson

Kenneth W. Larsen Scholarship: Jens Ammon, Roselyn Hurlow, Sam Callis

GG Scholarship Fund: Baylee Olds, Emily Kam, (Max) Jin Hansheng, William Haddick, Garrett Weaver

Kenneth and Nedra Bullock Keller Scholarship: Lily Bosworth, Lyric Anderson, Sean Hatch, Elena Mitchell

Frischknecht Scholarship: Michaela Lemen, Courtney Pratt

Dorothy Goode Scholarship: Jacob Peterson, Amanda Jayo, Lily Wetterlin

Marta S. Weeks Legacy Scholarship: Katherine Worms, Arvind Parapuzha, Nathan Ong

Hellmut H. and Gerda A. Doelling Scholarship: Kyle Christenson, James Kowalski

Presnell Scholarship: Diana Maxwell, Quinton Rico, Luis Vidal

Dean's Office Awards: Jens Ammon, Alysha Armstrong, Lily Bosworth, Adam Graham, Emily Kam, Aini Mohd Mokhdhari, Baylee Olds, Andrew Stireman, Landon Tueller, Jonathan Voyles, Michaela Lemen, Jacob Peterson, Hansheng Jin, Sarah Johnson, Harrison Lamb, James Nickel, Elena Mitchell, Nathan Ong

Honors at Entrance: Jens Ammon, Lily Bosworth

Rio Tinto Kennecott: Jenna Taylor

Outstanding Undergraduate Students

Outstanding Geoscience Student - Geology Emphasis:
Nicole Cholewinski

Outstanding Geoscience Student – Geophysics Emphasis:
Cole Richards

Outstanding Geoscience Student – Environmental Geoscience Emphasis: Sam Callis

Outstanding Geological Engineering Student: Jenna Taylor

Outstanding Earth Science Composite Teaching Student:
Katherine Moser

SAC Service Awards: Casey Duncan, Julia Howe, Gabriela St. Pierre, Courtney Wagner, Madi McIntyre, Lily Wetterlin, Hannah Stinson

SAC Outstanding Volunteer Award: Bradley Munk

Outstanding MS and PhD Students:

Outstanding M.S. Student: Julia Howe

Outstanding Ph.D. Student: David Wheatley

Outstanding Teaching Assistant Award: David Wheatley

Graduate Fellowships:

Jeremiah Bernau - Departmental Fellowship

Kevin Mendoza - Departmental Fellowship

Kendal FitzGerald – Copper-Hansen Fellowship

Anna Stanczyk – Cooper-Hansen Fellowship

Tyler Huth - Graduate Research Fellowship

Logan Frederick - Center for Latin American Studies Fellowship

Andrea Chica - Center for Latin American Studies Fellowship

Grant Rae-Downing - UTA Fellowship

Gabriela St. Pierre – NSF Graduate Research Fellowship

Anna Rasmussen – EPA Science to Achieve Results (STAR) Fellowship

2017 Research Grant Recipients from University of Utah:
Benjamin Breeden, Seana Hood, Keegan Melstrom, Ellen Reat

Spring Awards Banquet April 26, 2017



Alumni and Friends

Alumni Updates



GG Alumni & Friends Reception at 2016 GSA Meeting in Denver, CO

Alison Alcott (MS 2002) is a consultant at RockWare, Inc. in Denver, CO.

Lee Allison, former Utah State Geologist and former member of the GG Advisory Board sadly passed away in a tragic accident in August, 2016.

Grant Anderson (BS 1982) recently retired after 35 combined years with Unocal and Chevron. He enjoyed a fantastic career which included project work on 6 continents and approximately 280 wells planned and drilled on 3 continents. He feels fortunate to have worked in clastic, carbonate (both pre-salt and post-salt) and weathered basalt reservoir environments.

Susan Beck (BS 1979, MS 1982) received the George P. Woollard Award from the GSA Geophysics Division.

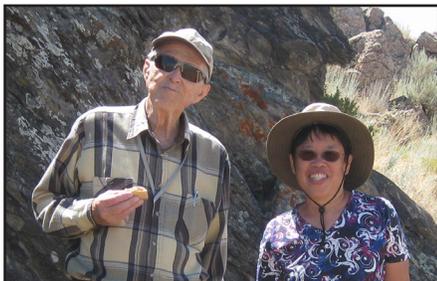
Lawrence W. Braile (PhD 1973) is in partial/phased retirement, doing online classes and still involved in SAGE camp.

Jonathan S. Caine (PhD 1999) is working with USGS on the Yukon Tanna & Denali Fault systems in Alaska, and fighting off bears.

Devin Castendyk (MS 1999) is in a new position as an INSTAAR Affiliate at the University of Colorado, Boulder.

Roger Congdon (MS 1987) is continuing his work as a hydrologist for the U.S. Forest Service in Albuquerque, NM

Hellmut Doelling (BS 1956, PhD 1964) still loves to get out in the field! Here, he and Marjorie Chan discuss Precambrian geology of Antelope Island.



Thomas M. Etzel (BS 2012, MS 2016) is working with Elizabeth Catlos at UT Austin where he studies the tectonic evolution of western Turkey, specifically the Menderes Massif.

Susan Eyzaguirre (BS 1988) has been doing hydrogeology contract work on Navajo nation land, and other work related to uranium mining. Over the years she has enjoyed many outdoor activities including running rivers.

Cassandra R. Fenton (MS 1998, PhD 2002) is an Instructor of Geology at Colorado Mesa University.



Victor Heilweil (MEN 1989, PhD 2003) is enjoying a new position as Western Hemisphere Science Advisor at the U.S. Geological Survey. He represents USGS scientists and programs in coordinating and facilitating earth science activities in Canada, Latin America, and the Caribbean. He works with the international branches of other federal agencies, earth science agencies of foreign countries, and 3rd party funding institutes (World Bank, IDP, USAID, etc.) to better understand environmental and geology-related issues and help develop projects to provide for science-based decision making.

JoAnn M. Holloway (BS 1990) is a biochemist for USGS. She is currently working on mercury and arsenic cycling from rock to water in Yellowstone National Park and legacy mining impacts on trace metal transport in the South Fork Salmon River in Central Idaho.

Rip Langford (PhD 1988) is a professor at the University of Texas- El Paso. He was the faculty adviser for the winning AAPG IBA (Imperial Barrel Award) team from UTEP last year, announced at the 2016 AAPG convention in Calgary Canada.

Ken Larsen (BS 1953) sadly passed away in fall 2016. He enjoyed traveling and thinking about geology up to the very end. He is fondly remembered through the Kenneth W. Larsen Endowed Scholarship.

Otgonbayar "Oodoo" Ochirbat (BS 2016) is working as a geotechnical engineer at Rio Tinto's Au & Cu project in the Gobi Desert in Mongolia for a 2-year assignment. This prospect is similar to Bingham Canyon mine in Utah although less sedimentary rocks he reports!



Clay Parr (BA 1960, MS 1965, JD 1968) has been enjoying many travels and wanderings along back roads of the West in his retirement. He also recently taught an OSHER Lifelong Learning class on laws governing public lands.

Michael Peffer (BS 1973) is Chief Geologist at Aspect Energy and travels extensively, especially to Hungary.

Jay Quade (PhD 1990) is a professor at the University of Arizona. He recently spent his sabbatical in Israel.

Jack Shroder (PhD 1967) gave one of our Department Distinguished lectures in 2016. He still keeps busy with many projects and consulting.

Ralph F. Stearley (MS 1988) is a professor at Calvin College. Over the years, he has taught courses in ichthyology, geology, and land resources for the Au Sable Institute for Environmental studies. He also recently worked on Miocene deposits of southeast Oregon doing field stratigraphy to get the context for a large collection of permineralized wood.



Peter Stifel (PhD 1964) continues to travel (e.g., Florida and the Caribbean) but still keeps busy with his homestead on the

Chesapeake with his gardens, chickens, sheep, some wood-working and antique cars.

Pei-Fen Tamashiro (MS 1989) visited campus with one of her twin sons last spring and he has decided to follow in her tradition of attending the U. Although he will be in computer science, he reports that he was intrigued by geology!

Wanda Taylor (PhD 1989) is a Professor of Geology at UNLV. She currently has 5 graduate students working on Ed Map and other projects. She recently got funding with the Nevada Bureau of Mines to map active faults, funded by Clark County Building Division.



Do you have a new job, title, recent retirement, award, etc.? We'd love to include you in our next issue! Please send your updates to travis.mcmullin@utah.edu.

Alumni Spotlight

*In Loving Memory
Matthew J. Mikulich
March 27, 1942 -
October 19, 2016*



The College of Mines and Earth Sciences and the Department of Geology and Geophysics recently lost a great alumnus and dear friend. Matthew J. Mikulich (1971 PhD – Geology & Geophysics) passed away last Fall at the age of 74. Matt spent a remarkable career with Chevron, rising to be Chief of Exploration and Chief Geophysicist while playing an important role in the national Summer of Applied Geophysical Experience (SAGE). While at Chevron he hired several University of Utah graduates and helped acquire substantial funding for graduate fellowships. In 1998 Matt established a scholarship endowment to provide financial assistance on an annual basis for an upper division undergraduate or a graduate student within the GG.

He always took a personal interest in our geophysics students as well as the interests of university colleagues. As chairman of the GG Advisory Committee, he urged the Department to aspire to new heights, contributing to new initiatives such as the Integrated Tectonics and Seismology (ITS) research program and the Department's Career Day and the Petroleum Industry Career Path program (PICP). Most recently, Mikulich raised funds from former graduate students for building a new computational lab on the third floor of the Sutton Building. As an Adjunct Professor, Matt initiated and taught departmental seminars in "Careers in Earth Science." Matt received the 2011 GG Distinguished Alumnus Award. Matt's enthusiasm for science – and life – is an example to us all.

Thank you to Our Generous Donors!

Your Support is Vital to Our Mission

We received generous gifts from the following from July 1st 2016 – June 30th 2017:

*If your gift was received after June 30th it will be recognized in our next issue.

American Association of Petroleum Geologists Foundation
Anonymous
Grant L. Anderson
Leona P. Anderson
Robert George and Patricia T. Anderson
Apache Corporation
Walter J. Arabasz and LaRetta B. Burnett
Arizona Tile
Dean Lee and Stacey Jo Armstrong
Judith Mary Ballantyne
Craig A. and Susan M. Barker
Richard D. M. Barnes
Daniel E. and Sheila M. Barnett
John M. and Kristy Kenyon Bartley
Bedrosians Tile & Stone
Gabriel J. and Brenda Beitler Bowen
Jacob Steven Benner
Bereskin and Associates
Lauren Birgenheier
Ronald C. Blakey
John M. and Virginia Colleen Bodell
Dennis G. Bones
David J. Bottjer
John R. and Mary Beth M. Bowman
Brinson Foundation
Paul D. Brooks
Francis Harold Brown
Robert L. Bucher II
Lorie Burningham
Andrew Lynn and Laurel Ann Burr
Darryl P. and Ann L. Butt
D. Robert and Candace C. Cady
Jonathan S. Caine
Gregory T. Carling

Thure E. Cerling and Mahala Kephart
John W. Middleton and Marjorie Chan
Chevron
Chevron Matching Employee Funds
Timothy J. Chisholm
Roger Duane Congdon
ConocoPhillips
Contempo Slab Gallery
Harrison R. and Anne D. Crecraft
Megan Lynn Crocker
Al and Jane Curran
Daltille
Richard E. Dedolph
Michael Depangher
Diamond Phillips
John D. Diamond and Lee Phillips-Diamond
Hellmut H. and Gerda Doelling
Patrick Ryan Dooling
Paul Alan Downhour and Diane Miller Downhour
Mason Cole Edwards
Allan A. Ekdale
Gregory Ekdale
Lea E. Erickson
Exxon Mobil Corporation
Craig Stratton Feibel
Fidelity Charitable Gift Fund
Susan Richards Fisher
Freeport-McMoRan Copper & Gold
Joseph S. and Constance C. Gates
Janet J. Genter
Global Granite and Marble
Goldman Sachs Philanthropy Fund
Alexander Brian Gonzalez
Thomas Roger Good
David A. Handwerger and Tamara J. Wambeam
Sherie Cerise Harding
Richard C. Hepworth
Hess Corporation
Glenn O. and Leila R. Hewitt
James R. Hindman
JoAnn M. Holloway
Clell R. Hooton
Lynn R. Partington and Debbie L. Hopkins
Robert L. Horine
Randall B. Irmis
John S. Isby and Peggie R. Gallagher
David C. Jacobs
Glynis Jehle
Paul W. Jewell
Cari L. Johnson
Eric H. Johnson
Samuel R. Johnson
Dale R. and Kelsey A. Julander
Kathryn Wang Enterprise LLC
Briant A. and Kristine N. Kimball
Michael G. and Margaret A. King
Jerry R. Knaus
Robyn Elaine Kurz
Kim Holtan Lang
Afe Uoleva Langi
Jeremy LeFevre
Carolyn Gale Levitt
Fan-Chi Lin
Terry W. Massoth and M. Lyle Wilson
B. Ross and Ingrid McNeil
David S. Moelling and Natalie B. Vasa
Mold Works USA
Diego P. Fernandez and Valeria Molinero
William L. and Jane Ehardt Moore
Thomas A. Morgan
C. Gil Mull
Barbara P. Nash
Bert W. and Shirley B. Nixon
Brent C. Osiek
Kristine L. Pankow
William T. and Gayle W. Parry
Leon E. and Shannon Paulos
James W. C. and Judith B. Pechmann
Michael Lee Pepper and Karen Marie Brown
Erich U. Petersen
Petroleo Brasileiro S.A. - Petrobras
Sara Lynn Peyton
PGS Geophysical AS
Oleg N. Portniaguine
Questar- Wexpro Development Company
RMS-AAPG Foundation

Matthew Andrew Sabisky
 Annalisa R. Sapp
 Amy L. Sheldon
 Shell International Exploration/Production
 Larry A. and Tiffany G. Skelton
 Gary E. and Suzanne N. Smith
 Robert B. and Janet D. Smith
 State Stone Corp. Inc
 Mustafa Abdullah and Josephine A. Syammach
 Pei-Fen Tsai Tamashiro
 Sherrie Taylor
 Technolmaging, LLC
 Marcus G. and Constance Rodman Theodore
 Robert G. Thinnies
 Michael Thorne
 Arthur S. Trevena
 David R. and Kristy K. Turner
 Jacob T. Umbriaco and Erin L. Umbriaco
 Gregory T. Van
 Tsili Wang and Saijin Huang
 Mark R. and Sue Williams
 Charles R. and Cathy J. Williamson
 Hobart Watson Willis
 Daning Wu and Rongjuan Wang
 Michael S. Zhdanov
 Min Zhou

**We sincerely apologize if we have inadvertently
 left anyone off this list.*

Please call 801-581-4414 or email travis.mcmullin@utah.edu
 to update your recognition preferences.

Giving to the Department

Please consider making a gift to the Department of Geology and Geophysics by clicking the link below or contacting TJ McMullin, Development Director at 801-581-4414.

- [Give online here](#)
- Checks can be mailed to:
 College of Mines and Earth Sciences
 115 South 1460 East, Room 205
 Salt Lake City, UT 84112



Geology & Geophysics graduate student Paul Geimer deploys a seismometer near the base of Landscape Arch, Arches National Park, Utah.

*Department of Geology & Geophysics
 University of Utah
 115 South 1460 East, Room 383 FASB
 Salt Lake City, Utah 84112-0102
 (801) 581-7062*



www.earth.utah.edu