Earth and Planetary Sciences at UC Santa Cruz

Fall 2012

The Summer Field Class of 1979 (188A) at White Mountain Research Station (White Mtn. in background). Instructor Casey Moore is front and center; TA Jeff Mount (now of UC Davis) is standing on far right, with student Judy Fierstein (now of the USGS) on his shoulders; TA Stephen Janes (now of MIAMO Archaeology) is sitting on the far left. The other participants pictured included (in no particular order-1979 was a long time ago!): George Branlund ,Tim Colen, Kevin Crawford, Adam Druckman ,Will Elder, Geoff Elliot, Bill Emerson, Judy Junkman, Akwia Knipe, Keith Long, Harold Magistrale, Martha Pernokas, Terri Plake, Leslie Sartor, Carl Schwab, Mike Veseth, Scott Walker, Sara Monteith, Sandy Peters and Kurt Toelken.

http://eps.ucsc.edu

Earth and Planetary Sciences at UC Santa Cruz

Fall 2012

Table of Contents

Chair's Welcome

Dear Alumni and Friends,

It's been a typically eventful year: from a budgetary perspective, we're relieved that, though the state portion of UC's budget is historically small, at least Proposition 30 passed. Its passage assures, for a little while, at least a status quo state budget for the University of California. Thus, the campus (and the department) did not have to make an instantaneous large post-election budget cut.

On happier topics, emeritus faculty Casey Moore continues to rake in much-deserved awards, with this year's highlight being the Shepard Medal of the Society for Sedimentary Geology for outstanding contributions to marine geology. Thorne Lay gave the prestigious Gutenberg lecture (named after the discoverer of the eponymous seismic discontinuity) at last Fall's AGU meeting. Our alumni continue to make us proud, with our graduates cleaning up on young scientist awards. Gabe Bowen (Ph.D., 2003), who currently hangs his hat at the University of Utah, won AGU's Macelwane Medal; and Samantha Hansen (Ph.D., 2007), at the University of Alabama, won an NSF CAREER Award.

We've had a few transitions in the last year as well: Rob Coe retired after 45 years (!!) from teaching and service at UCSC. While this is definitely a major loss for students, our research profile won't suffer anytime soon--his research seems to be accelerating, with new projects launching and improved paleomagnetic apparatuses being designed and built. And, right now, we're searching for a new faculty member in one of two areas: Inorganic Geochemistry or Crustal Dynamics. So, we're looking forward to announcing in next year's newsletter the hiring of a new faculty member in one of these areas. Congratulations to Paul Koch on his being named the Dean of Physical and Biological Sciences, thus losing the 'interim' from his title; he has now moved on a full-time basis over to the Dean's warren in the Natural Sciences Annex (the former Science Library, for older alumni). On the staff side, UCSC alumna Jenna Scarpelli has joined us as our new front office manager, replacing Jennifer Fish who moved over to our Graduate Advisor position last year—if you're in the Department, stop by, introduce yourself, and say hello!

Now, I've alluded to the markedly reduced state budget that goes to the University of California—the negative consequences of this reduction/privatization of the institution include higher tuition for students, and fewer institutional funds available to seed research, or support deserving students. So, the Department would certainly appreciate any support you can give: in this newsletter, you'll find descriptions of some of our most active donor opportunities within our Department. These include the Weber-Holt Fund, which provides scholarships for students attending field camp; the Casey Moore Fund, for which the first awards were just made to seed graduate student research opportunities in our department; and the much-coveted Aaron Waters Award Fund, given to the top Ph.D. proposal of the year within the Department. Other opportunities can be found at http://eps.ucsc.edu/support-us/ . Also, for more updates on our Department, do consider friending our Department's Facebook page—it's just a few months old, at https://www.facebook.com/UcscEPS , and our number of friends has been mushrooming.

Finally, we'd love to see you at our annual alumni/friends/current folks' get-together at the Thirsty Bear ("San Francisco's first and only organic brewery") during AGU. It's a fantastic opportunity to see old friends and make new ones (and, needless to say, have some really good beer and snacks, too). It's Tuesday, December 4th, 6 – 8.30 p.m., 661 Howard Street, San Francisco!!

Quentin Williams, Chair

Paul Koch

Casey Moore

Jim Zachos

Slug Web Corner

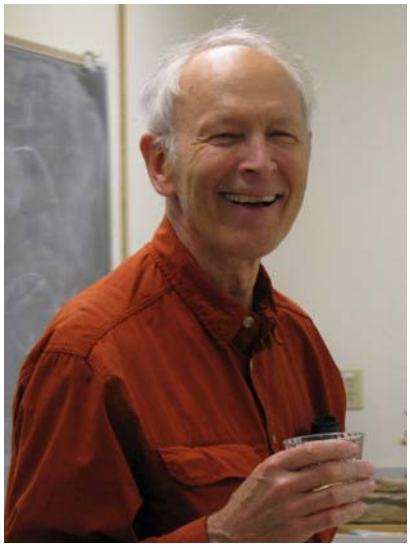
We are now on Facebook! Like us at **www.facebook.com/UcscEPS**

Department News

Paul Koch was appointed Dean of the Division of Physical and Biological Sciences at UCSC, having served as Interim Dean for a year.
Casey Moore was awarded the Shepard Medal of the Society for Sedimentary Geology for outstanding contributions in marine geology.
Jim Zachos and **Paul Koch** were featured in a *National Geographic* article on global warming.
Thorne Lay gave the Gutenberg lecture of the Americal Geophysical Union (AGU).
Andy Fisher received a UCSC Excellence in Teaching Award
Gabe Bowen (PhD 2003) was awarded a Macelwane medal by the AGU.
Sam Hansen (PhD 2007) obtained a CAREER award from the National Science Foundation.

Arrivals/Departures

Rob Coe became an Emeritus Professor.
Cathy Smith retired after **15** Years of service as undergraduate and then graduate advisor.
Jenna Scarpelli joined the front office staff.
Jennifer Fish became the new graduate advisor.



Rob

Cathy and Laura

Jenna

Abbey and Jennifer

Fundraising With a Twist

On 4th October 2012 a very large fraction of the Department assembled at the Santa Cruz Mountain Brewing Company to raise money for the **Gerald Weber and Suzanne Holt fellowship fund**. Each pint consumed raised $1 for the fund—and people seemed to need little encouragement to contribute.

The guest of honor and Casey

Ian & Patrick, off duty

Jenna & Abbey

We hope to see you at the Thirsty Bear Brewing Company for our *12th Annual UCSC Earth & Planetary Sciences Alumni Event at Fall AGU!*

When? **Tuesday, December 4th, 2012**
from 6:00pm - 8:30pm

Where? **Thirsty Bear Brewing Company**
661 Howard Street, San Francisco, CA 94105
http://www.thirstybear.com/

Support Your Slugs!!

Editors: Eli Silver & Francis Nimmo

Dept. Earth & Planet. Sci.

Phone: 831-459-2266
Fax: 831-459-3074
E-mails:
esilver@ucsc.edu
fnimmo@ucsc.edu

Graduate Degrees, 2011-12

Nicholas Van der Elst, May 2012
"The effect of seismic waves on earthquake nucleation and fault strength"

Dione Rossiter, May 2012
"Observational Studies of Drizzle in Marine Stratocumulus"

E. Lynne Harden, June 2012
"Shoreface morphodynamics, back beach variability and implications of future sea-level rise for California's sandy shorelines"

Kelsey Dyez, June 2012
"Pacific Ocean Pleistocene and Holocene Surface Temperature Variability and Implications for Climate Change"

Tess Russo, July 2012
"Hydrologic System Response to Environmental Change: Three Case Studies in California"

Jake Walter, July 2012
"The Influence of Small Stresses on the Dynamics of Glaciers and Subduction Zones"

Cheryl Harrison, Sept 2012
"Coherent Structures and Larval Transport in the California Current System"

Graduate Awards

CAMPUS-WIDE OUTSTANDING TA (FACULTY NOMINATED):
Kerri Johnson

DEPARTMENTAL OUTSTANDING TA (STUDENT NOMINATED):
Priya Ganguli (Winner)

HONORABLE MENTION DEPT OUTSTANDING TA:
David Finn
Lia Lajoie
David Santaniello

WATERS AWARD:
Karla Knudson
Don Penman

ARCS AWARD:
Elizabeth Crook

DWORNIK AWARD, GSA:
Doug Hemingway (Planetary)

AGU OUTSTANDING PAPERS:
Andrew Racz (Hydrology)
Dustin Winslow (Ocean Sciences)
Han Yue (Seismology)
Don Penman (Paleoclimatology)

LAWSON HYDROLOGY AWARD:
Chia-Te Chien
Lian Xue

EXXONMOBIL GEOSCIENCE GRANT:
Nadine Quintana-Krupinski

SCHLANGER OCEAN DRILLING FELLOWSHIP:
Karla Knudson

SWITZER FOUNDATION ENVIRONMENTAL FELLOWSHIP:
Priya Ganguli

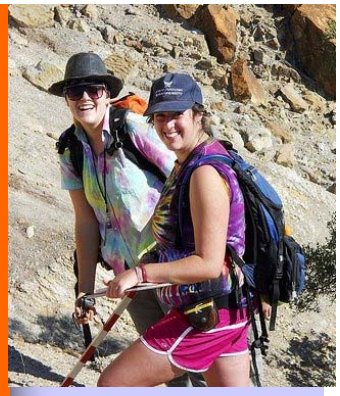
MYERS TRUST AWARD:
Alanna Lecher

PRESIDENT'S DISSERTATION-YEAR FELLOWSHIP AWARD:
Kathleen Uzilov

CHANCELLOR'S DISSERTATION-YEAR FELLOWSHIP AWARD:
Erinna Chen

UCSC DOCTORAL STUDENT SABBATICAL FELLOWSHIP:
Priya Ganguli

EPS SPRING FELLOWSHIP AWARD:
Kelsey Dyez
Priya Ganguli
Lingling Ye



Degrees (BS/BA)

Acosta, Paul
Aguilar, Alejandro
Anderson, Nathan Joel
Austin, Valerie Ann
Bachicha, Kyle
Bigler, Anthony Rex
Bodiford, Sadie
Broderson, Karl Christian**
Chakravarty, Arjun
Cohen, Daniel
Cummins, Michael Thomas
Donzanti, Robert
Edlund, Katarzyna*
Genetti, Jennifer
Gibson, James*
Gollner, Elaine Marie
Hayes, Kristina Ann
Hohn, Rachel
Jacobsen-Guy, Leandra
Juel, Erik*
Leitner, Astrid**
Lo, Vanessa*
Londergan, Tara
Matjnerova, Zuzana
Matson, Gabriel**
Maurel, Sean**
McCall, Samantha L.*
Moe, Annelisa Ehret***
Nale, Stephanie *, ***
Norling, Brooke*
Norris, Benjamin K*, ***
Nye, Jonathan
O'Connell, Patrick**
Ooms, Jonathan G.
Ortiz, Cruz***
Sadeghi, Sina
Seelos, Mark Loren
Sherman, Reid
Shisler, Andrea
Slovacek, Amalia**
Staudigel, Philip
Stern, Aviel***
Stonehouse, Alison
Taylor, Barbara E.
Teimoorian, David A.
Teter, Ashley*
Thompson, Tyler
Townsend, Liam*
Tuthill, Wills
Whitman, Mackenzie
Williams, Chrissy
Zelcer, Nina

L to R: Matt Beck and Sina Sadeghi

Undergraduate Awards

HOLLY DAY BARNETT MEMORIAL GRANT
Ruby Williams

ASSOCIATION OF WOMEN GEOLOGISTS OUTSTANDING WOMAN GEOSCIENTIST
Astrid Leitner

CHANCELLOR'S THESIS AWARD
Stephanie Nale

DEAN'S AWARD
Amalia Slowacek

WEBER-HOLT GRANTS
Paul Acosta
Valerie Austin
Daniel Cohen
Leandra Jacobsen-Guy
Vanessa Lo
Tara Londergan
Gabriel Matson
Brooke Norling
Andrea Shisler
Frederic Trang

* Honors

** Highest Honors

Vanessa Lo, 2012 Graduate

Turning The Xbox Into A Research Tool, by Ken Mankoff

I never thought that my interest in hacking consumer electronic devices for unintended uses would lead to my most recent adventure: Thanks to a video game controller, last month I stepped out of a helicopter as it hovered with its skids touching the snow, unable to land on the steep slope of a Norwegian mountain north of the Arctic Circle. I walked through a door in the side of the mountain into a mineshaft, and spent the next four days 2 km inside the mountain, at the base of a glacier, underneath 200 m of ice.

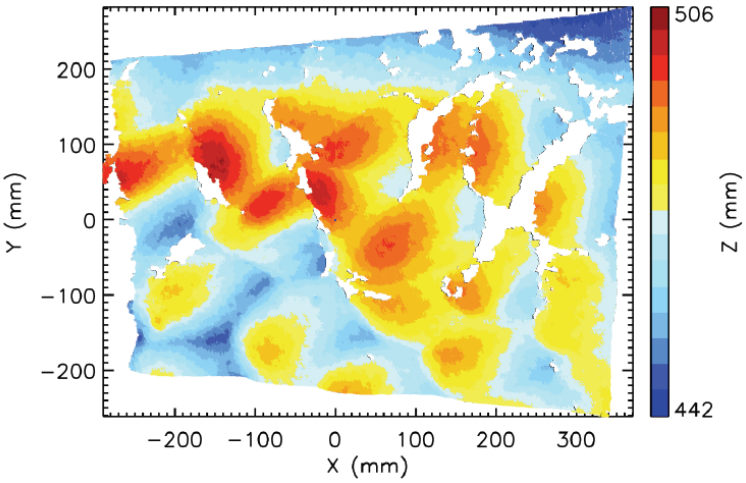
The author underneath the Rieperbreen Glacier, Svalbard, Norway, with the field kit: A 12 V battery, a netbook running Ubuntu Linux and the "libfreenect" software from http://openkinect.org, and the Kinect. Visible in the picture is the rocky floor and the scalloped ice roof.

In the past I've modified many home-electronic devices for alternate purposes. I've re-wired old analog alarm-clocks for home-automation, hacked Palm Pilots in the days before iPhones, made my parents solar panels Tweet if something was amiss, etc. My newest repurposed tool is the Microsoft® Kinect™, which I am using for my Ph.D. research.

The hovering helicopter near the entrance to the Svartisen Subglacial Laboratory, Engabreen Glacier, Norway. Colleagues unload our equipment from the helicopter as the pilot holds it steady.

The Kinect is an input device designed for the Microsoft Xbox 360® video-game system. Unlike all previous video game controllers, you do not hold the Kinect and press buttons, instead, the Kinect rests on top of the TV and looks at you, detecting your body position and motion. You move yourself (your arms, legs, body, head, and hands) to control the characters on the TV screen. The Kinect was released in November 2010 and within 48 hours several individuals reverse-engineered the device and accessed the output with a personal computer. In the first sixty days on the market, an average of 133,000 units were sold per day, for a total of ~8 million units, placing the Kinect in the Guinness Book of World Records as the fastest selling consumer electronic device. The Kinect contains an infrared (IR) structured light emitter, an IR camera, a visual wavelength camera, a three-axis accelerometer, and four microphones. The

combination of the IR projector and camera allows the Kinect to detect ripples on the surface if the water is opaque. Geomorphologists can use it to characterize small-scale changes (erosion, deposition, deformation, etc.) of their field sites. It can measure objects flying through the air or another fluid in three dimension at up to 30 Hz. Geologists can use it to scan rocks, measure their volume, and calculate the angle between its faces. There are a huge number of other applications for the Kinect already being applied in a wide variety of fields, and each week several publications are released demonstrating new uses.



Data collected with the Kinect of the scalloped ice roof of the subglacial cave. The Z eropoint is arbitrary (distance from the Kinect) but the size of the scallops can be determined from these measurements.

Because my Ph.D. research is in glaciology, I have spent the most time thinking about how the Kinect could be useful to glaciologists, which led to multiple subglacial explorations. Usually we glaciologists look at the surface of the glacier, as that is the part we can walk on, photograph, drag radar across, place GPS on, and observe with sensors mounted on airplanes and satellites. In addition to looking, plenty of thinking is directed toward the surface of the glaciers because a lot of interesting science happens there (ablation, debris cover, melt ponds, etc.). However, in my subset of the glaciology community, we spend a lot of time thinking about what happens at the bed or base of the glacier, even though it is not easy to get there or place sensors there. The glacier bed is interesting because this is the where the motion of the glacier is determined: The fast-flowing glaciers that move tens of meters per day do so because there is hardly any friction at their base, and ice around the planet is accelerating because the friction at the base is decreasing. Side-wall drag and internal stress and strain play an important role too, as evidenced by ice shelves having zero basal drag yet maintaining their structure, but the primary area of interest when studying the motion of ice is the base.

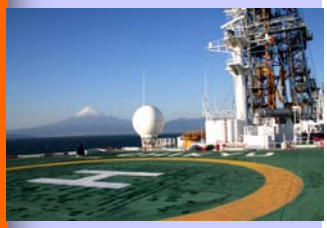
Rough beds have high friction, slowing the glaciers that slide over them. Smooth beds have low friction, and sometimes the bed is made of soft deformable sediments. In addition to the properties of the bed itself, meltwater from the surface, or meltwater generated at the bed due to frictional or geothermal heating, flows along the bed. Water flows through the soft sediment pore-space, between the low-pressure hollows on the down-stream side of bumps and rocks, in thin braided streams, or in large channels carved into the base of the ice. All of these processes happen among

the varying conditions at the base of glaciers and ice sheets. Exactly where and when they happen, and what the effects are, is of great interest to the glaciological community. The base of many glaciers and ice sheets have been accessed through borehole drilling, allowing sensors to be placed there, but only at one point at the base of the hole. Scientists have also used the natural drainage channels that the surface water takes to the base (moulins) to learn more about sub-glacial hydrology, for example by tracking tracer dye and rubber duckies dropped into the moulins that then travel through glaciers and the Greenland Ice Sheet.

Surprisingly, it is possible to easily and directly access the bed of some glaciers yourself, and I did so for the first time in September 2010 in Svalbard, Norway. A colleague and I crawled under a glacier through a mostly dry subglacial streambed. Eventually the conduit under the glacier grew large enough that we could sit up, and here we used the Kinect to scan the ice roof and rocky floor. The data provides us with direct measurements of surface roughness under the glacier, which can be used as boundary conditions in a computational fluid dynamics model that will allow us to study how water flows through these cave systems. My second trip under a glacier, including the helicopter delivery mentioned at the beginning of this story, was to the Svartisen Subglacial Laboratory, underneath Engabreen Glacier, Norway. The Svartisen Subglacial Laboratory entrance is a door into a mountainside. Once inside, a several-km-long tunnel contains a living area able to house eight scientists, a research laboratory, and several places with direct access to the bed of the glacier underneath 200 m of ice. There is no sunlight in this mine shaft, and one instantly feels disconnected from the world after entering and closing the outside door. The retro-fitted shipping container living units are similar to those in Antarctica (when not in a tent). There is a kitchen, rooms with bunk beds, and a bathroom and shower. After a 15 minute walk up the tunnel to the office there are experiment benches and work space, and surprisingly, a WiFi signal with slow internet access to the above-ground world. Another 5 minute walk to the end of the tunnel, and there are holes in the bedrock leading to the bed of the glacier, and a door big enough to walk through. Several times a year, scientists open the door and with a hot-water hose melt a cave, several cubic meters in size, into the bed of the glacier. This cave creeps closed quickly due to the pressure on the ice around it, shrinking to about 1/2 its size every 24 hours and closing entirely within a few days. Again, the Kinect was used to scan the bedrock surface that the ice would soon re-cover and slide over, collecting data necessary to understand the friction between the ice and rock, a primary control on how the ice slides.

If you think the Kinect might be useful for your research, I invite you to read some posts I have created about it on my blog http://kenmankoff.com/tag/kinect including the AGU poster available there, or keep your eye out for a paper, currently in review:

K. D. Mankoff and T. A. Russo. The Kinect: A low-cost, high-resolution, short-range, 3D camera. Earth Surface Processes and Landforms. In Press.



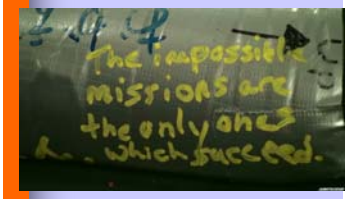
Helideck, Derrick and Fuji in background

Drilling Into A Record-Breaking Fault, by Prof. Emily Brodsky

The author onboard the Chikyu

Why do earthquakes start, keep going and stop? What are the forces and processes initiating, propagating and arresting earthquakes? The quest to answer these questions requires probing faults with the full arsenal of Earth science techniques including seismology, structural geology, hydrogeology, laboratory rheology, statistical analysis and borehole measurements. The goal is to develop a mechanistic understanding of earthquakes from beginning to end.

A physical understanding of how earthquakes propagate hinges in large part on understanding the resistance to motion (fault friction). Although the driving forces of earthquakes are in large part understood, no first-principle understanding can be developed without direct observations of the resisting force. Over the past decade, I have become increasingly convinced that the key data was only going to be available after a major earthquake. During slip, the friction dissipates heat and therefore taking the temperature of the fault shortly after an earthquake provides a measure of the friction.



So in November 2008 my colleagues and I convened a workshop in Tokyo to discuss the need for rapid response drilling following the next major earthquake. Rapid response drilling projects followed several major recent earthquakes including the 1995 M6.8 Kobe, Japan earthquake, 1999 M7.6 Chi-Chi, Taiwan earthquake and 2008 M7.9 Wenchuan, China earthquake. However, the limits on depth and response-time combined with the relatively moderate slip of each of these earthquakes make the results ambiguous.

The March 2011 Tohoku Earthquake in Japan surpassed all previous predictions for earthquake magnitudes in this area; it is the site of the largest slip ever recorded during an earthquake. In the wake of this disaster, the scientific community has an obligation to learn as much as possible about the mechanisms that generate such catastrophic events.

Santa Cruzians led the charge to capture this fleeting data in the Japan Trench Fast Drilling project (JFAST). I helped assemble the team and write the proposal that resulted in the International Ocean Drilling Program setting sail less than 13 months after the earthquake. UCSC alum **Demian Saffer** and **Harold Tobin** helped plan the expedition. Slugs **Casey Moore**, **Jamie Kirkpatrick** and **Patrick Fulton** as well as Slug alum **Christie Rowe** and **Jim Sample** sailed for two months on the largest research drill ship in the world, the *Chikyu*, to collect core, borehole geophysical data and begin the temperature sensor installation. I sailed on a follow-up cruise in July that managed to complete the installation.

Jim Sample on Helideck

The JFAST site sits in the area of highest slip where the fault approaches the ocean bottom. Therefore the drilling was in nearly 7 km of water, which was an entirely unprecedented technical feat. No one had ever completed a substantive (>15 m) deep hole in such deep water before. The multiple 800+ meter holes including a complete temperature observatory open the way to full geophysical monitoring of subduction zones.

The world's largest research drilling ship—the Chikyu

The preliminary data is thrilling. The core is allowing us to directly access the fault zone of the giant earthquake and assess the processes that make such extreme motion possible. The breakouts suggest that the earthquake may have released all of the compressional stress in the system resulting in a local change in tectonic regime.

To me the most exciting piece is still to come. Weather permitting, in February the temperature sensors will be retrieved. In a deployment fashioned after **Andy Fisher's** work in Juan de Fuca, 55 instruments are currently tied to a climbing rope dangling beneath the seafloor. The Japanese remotely operated vehicle *Kaiko* will attempt to reel up the string and bring the data to the surface, in one last unprecedented maneouver. Enormous earthquakes pose enormous challenges. Please wish us luck.

Mission accomplished! The deployment of the temperature sensors into the bore hole, captured by a camera operating in 7 km of water.

Slugs Still Out Standing in the (Summer) Field
By Hilde Schwartz

Summer 2012 marked the Earth and Planetary Sciences Department's 38th consecutive offering of the 188A and 188B series courses, known collectively as summer field geology, summer field internship, summer field or simply field camp. These classes remain a popular capstone choice for Earth Sciences majors despite the existence of less perilous options (e.g. senior theses, internships, graduate-level coursework) and the tales of hardship and deprivation thoughtfully circulated by summer field veterans (keep them coming alums!). This year 26 hardy souls participated in our summertime geological rite of passage. It has been my privilege to instruct 188A for the last 11 years so I can say with some old-timer authority that this year's class worked exceptionally hard, acquitted themselves honorably and were good fun to map with. They also kept field trips to the Inyo County Hospital to a minimum, so kudos to the Class of 2012 (Figure 1)! UCSC's summer field program is rigorous, elaborately staged and ever evolving. On the cusp of its 40th anniversary it seems like a good time look back at its history, and acknowledge contributors past and present.

Figure 1: ***The 188A Class of 2012 at the Poleta Overlook***. *From left to right: Lea Jacobsen-Guy (hammer aloft), Val Austin, Patrick O'Connell, TA Rachel Brown, Tara Londergan (kneeling), Spencer Haran (hands up), Kyle Bachicha, Andrea Shisler, Alison Stonehouse (seated), Jacob Gallegos (black hat), Daniel Cohen, instructor Hilde Schwartz (kneeling), Michael Cummins, Jennifer Gennetti (kneeling), Fred Trang, Sina Sadeghi (screaming), Francesca Spinardi (kneeling, white hat), Rob Donzanti, Aviel Stern, Samantha McCall (kneeling), Brooke Norling (black hat), Vanessa Lo (kneeling), Gabriel Matson, Jonathan Nye, Mark Seelos (aghast), Ben Norris (pointing), TA David Finn, Jonathan Ooms*

In the beginning

…the young 'Earth Sciences Board' (founded in 1967) offered its first term-length field geology course in Spring Quarter of 1975. That first class worked in the Marin Headlands, with professors Léo Laporte and Othmar Tobisch presiding. An empty Army barracks in what is now the Golden Gate Recreation Area served as the base camp. James Gill and Casey Moore took over 'spring field' teaching duties the following year; they fatefully selected field areas in the Sierras and White-Inyo Mountains (including the Poleta Fold Belt) and hired a dedicated field camp cook[1], initiating two enduring traditions. With rare exceptions (including an exercise in The Indians, Santa Lucia Range, in 1982) well-fed field camp classes have been based in the Sierras and points east ever since.

In the late 1970's spring field had become a summer exercise (See cover photo), with separate base camps for the 'A' and 'B' portions of the class. The 1982 field camp was taught exclusively by Earth Sciences faculty members: professors Robert Garrison and Ken Cameron were part of the teaching rotation, in addition to Laporte, Tobisch, Gill and Moore. However in 1983, just as the US government began its 'Just Say No' anti-drug campaign, Earth Sciences said 'yes' to Gerald (Jerry) Weber, hiring him as a lecturer to teach summer field (and other field courses). At the time Jerry was an Earth Sciences Ph.D. candidate, professional consulting geologist and business owner, with no idea that he would be spending his next *20* summers wrangling geology students.

Jerry was (and still is) a famously compelling, exacting, fair and stylish instructor (Figure 2) with uncanny field savvy. His students respected him and he tried to make the class better for them. For example, Jerry and long-time department technician (now retired) Bruce Tanner (Figure 33) built a sophisticated infrastructure for the 188B campsite; it included a full, propane-powered kitchen, plumbed shower and kitchen sink, fancy study tents and, in the late 1990's, hydroelectricity courtesy of a Pelton wheel. In 1991 Jerry and economics professor (and Jerry's better half) Sue Holt (Figure 4) endowed an Earth Sciences 'special needs' fund that became a field camp scholarship.

The Weber/Holt Awards came on line in 1995 and 110 undergraduates have since received scholarships that substantially reduced, or completely paid for, their summer field course fees (now ~$2200).

Figure 2: *Jerry Weber and friend*

As other old-timers may recall, colorful traditions were also a hallmark of the Jerry years. These included grease bombs, participation in the Demolition Derby at the County Fair (really!- see Figure 5), naked softball and creative 'wrap' parties (Figure 6). Most of the above did not survive the 20th century, but good, pretty clean fun is still customary (read on). Predictably, Jerry has an impressive reserve of field trip anecdotes. They involve lightening, fires, vehicle disasters, flaming boulders, bear invasions, square dancing, creative pranks and more. Since he is a gifted raconteur, I suggest that those who wish to hear Jerry's remembrances in full invite him out for a beverage or two, and enjoy.

The 21st century

… brought changes in Summer Field personnel, curriculum and base camps. Jerry relinquished 188A in the late1999's and retired completely in 2002 after teaching his last round of 188B. Various lecturers and faculty have taught field camp since then: Al Bole (188A, through 2001), myself (188A, 2002-present), Bobby Lopez (188B, through 2005), Casey Moore (stepping back in the ring, 188B, 2006-2009), Peter Lippert (188B, 2009-2010) and most recently Noah Finnegan (Figure 7) (188B, 2010-present).

[1] The 1976 summer field cook was a UCSC student with a master's degree in biology and a burgeoning interest in geology. By 1979 she had completed master's and doctoral degrees in Earth Sciences and she has subsequently had an illustrious professional/academic career. The moral: Never refuse an offer to cook for summer field!

Figure 3: *Bruce Tanner (right) and TA Cliff Gill relaxing around the campfire in 1992.*

Figure 4: *Jerry Weber and Sue Holt on the banks of the Tsavo River above Lugard Falls, Kenya.*

Figure 5: *Louise Hauke and Chris Hickey at the Demolition Derby, 1986.*

Figure 6: *Greg Easton, deep undercover, celebrating the end of Summer Field in 2002.*

Figure 7: *Professor Noah Finnegan (current 188B instructor) disseminating geological wisdom near Mono Lake.*

188A remains primarily a three to four week-long Poleta Fold Belt mapping/stratigraphy exercise (Figure 8), but in 2004 we moved from our long-time base camp at the Bernasconi Center in Big Pine to a campground at the top of Westgard Pass, and there we remain. We use Bruce and Jerry's lavish camp set up, now enhanced - thanks to the heroic efforts of department technical staff members Bruce Tanner, Dan Sampson and Brandon Cheney - with solar power (allowing computer and printer use, most of the time), a 350 gallon water tank, better showers and hot water in the kitchen sinks. Brandon also recently procured a 20-foot trailer that simplifies storage and loading/unloading of our camp equipment and is a far cry from the Forest Service 'Hanta Hut' of olden days.

Figure 8: *188A students measuring the lower Poleta Formation in Rattlesnake Canyon, 2008.*

188B changed substantially in 2006, when Casey Moore (with assistance from Pete Lippert) redesigned the course to incorporate GIS and GPS technologies into the field exercises. These days the class has two parts. Part 1 is a Spring Quarter lecture and lab in which students study GIS theory and software, and the geology of their future field areas. Part 2 consists of 10 days in the field analyzing target sites with the aid of high-resolution images and handheld Trimble computers with integrated GPS units. During Part 2 188B stays at the Sierra Nevada Aquatic Research Laboratory (SNARL) in the eastern Sierras, which offers internet access and ample power (to say nothing of indoor showers). Because of space constraints at SNARL 188A and B are now limited to approximately 25 participants, and students must *apply* for admittance to the courses.

2012 was a great field season all round. 188A shared the Poleta field area with field camps from several other universities, so geological networking and friendly competition abounded. We began on the right foot as 27 Slugs took on and methodically destroyed 38 UC Davis Aggies in a 4th of July 'kickball' game at White Mountain Research Station (our 2nd year of dominance). Later in the month we got to show off our 'Dress Up Day' costumes[1] to a surprised University of Arizona mapping class. 188A participants also visited the Eureka Dunes, collected exotic minerals and made a few trips to the Owens River. Students found some museum-quality specimens (Figure 9) and unexpectedly discovered buried treasure at the now-infamous outcrop in Payson Canyon known as 'the Druid' (ask Mark Seelos). The Poleta Fold Belt bade us farewell on our last mapping day with a classic, out-of-nowhere Great Basin thunderstorm complete with harrowing lightning strikes in the 'Meatgrinder' and southern 'Sea of Harkless'.

Figure 9: *The best trilobite of 2012 – Nevadella (?) sp. - found below Darwin Peak (southwest Poleta) by 188A student Jonathan Nye.*

This year 188B students completed exercises at Panum Crater, Hilton Creek and the Poverty Hills, with emphasis on geomorphology and neotectonics. By day they calculated fault slip and volcanic flow paleovelocity, analyzed transpressional deformation and intrepidly discovered significant new outcrops. By night they worked on reports, consumed large quantities of bacon and investigated Wild Willy's hot spring. On bad nights they learned how to get a van stuck, then unstuck, on the Sherwin Plateau. In the dark.

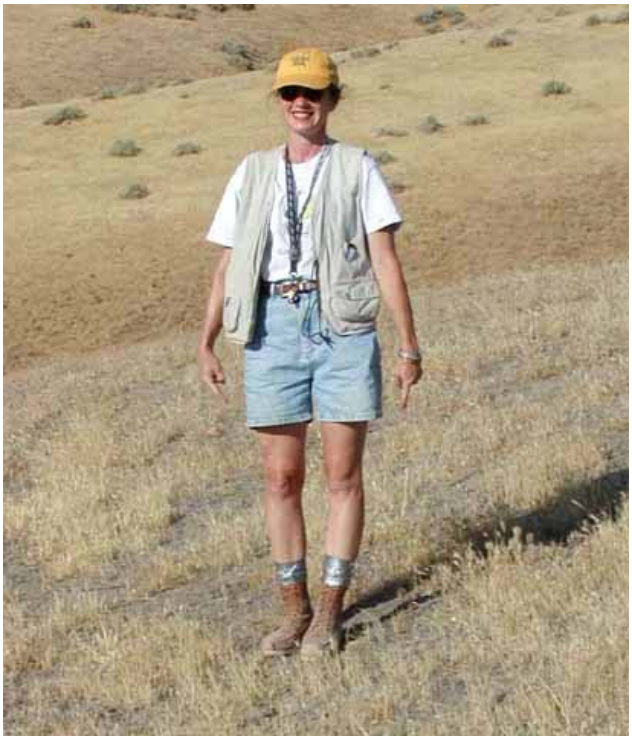
188A and B were both delicious this year, thanks to the genius of two sets of cooks.

[1]Dress Up Day is an emerging 188A tradition begun in 2002 (Figure 10). It takes place on one of the last mapping days in the Poleta Fold Belt.

40 years from now

… I like to think that 188A and B (and maybe C and D?) will still be going strong. But this will require some determination. Summer field is a big class fraught with logistical and financial challenges felt across the department and division. In future it will need to be reinvisioned periodically to keep pace with changing technologies in the discipline, and keep Earth Sciences majors competitive in the 'outside world'. I hope basic observational reasoning will always be part of the curriculum. If instructors and funding are available, and a critical mass of majors continues to see value in supplementing the 'abstraction of the classroom' with the frustration and hard-earned victories that come from practicing geological research in the *real* outside world, summer field will carry on.

If any field camp veterans out there are interested in attending a (possible) 40th, all-years anniversary reunion somewhere east of the Sierras, please let me know (hschwartz@pmc.ucsc.edu). I will be in touch if the possibility becomes a reality. In the meantime - Nullum lapidem patere immotum (leave no stone unturned)!



Hilde Schwartz

Figure 10: *The first 188A 'Dress-up Day' (2002). Kevin McCoy and Avery Sullivan take on the Poleta Fold Belt in neoclassical field garb. Note Avery's terrifying bihawk.*

New Idria Vets—2012

Alumni Notes

1977

Lisa Wright (BS): Greetings! After 26 years, my husband I have sold our sailboat and left Anchorage, as I'm now doing an ex-pat posting for ConocoPhillips in Aberdeen. Still working development geology, but I'm now working on a high pressure / high temperature (15,000psi / 300 F) gas condensate field in fluvial sandstones in the J-block area of the North Sea, instead of on my familiar Alaskan deep marine/light oil developments. A new challenge all the time! We love life in Scotland. We spent a recent day visiting Bronze Age, Roman, medieval, and Reformation-era monuments, and finishing in a Victorian tea room with little china cups and pastries--glimpsing the complete span of human culture all within 30 miles in a single day. Looking forward to some geologically focused trips in the spring, too.

Rick LeVeque (BS): I worked for the USGS after graduation, then on to U of Arizona for a MSc. I spent 25 years with Unocal, half in California, half overseas (Thailand, Indonesia, Bangladesh), working a combination of exploration, development and planning. I did not go on with the offer from Chevron when they purchased Unocal and returned to California. We have been in the Long Beach area and I now work for the Occidental asset that manages the oil islands in the Long Beach harbor. It has been a while since I have done true geology (recovering geologist), but have great memories of the time at UCSC. Best wishes to all.

Alan Howard (BS): I breezed in and out of UCSC doing my BS in geology (1977) in < 2 years as a transfer and haven't maintained too many connections in the many years since then. Occasional fun re-connections along the way. Just moved to the Bay Area again in 2010 to build the new Caldecott Tunnel and open my company's CA offices doing underground engineering and engineering geology.

Larry Smith (BS): I am busy teaching undergraduates and M.S. graduates in Geological Engineering at Montana Tech in Butte, Montana. One of my main duties in the school is to convince budding petroleum engineers that geology is important. I keep busy with ongoing research on the stratigraphy and sedimentology of Glacial Lake Missoula and its outburst floods in Montana, along with other glacial geology. I have students working on subsurface-to-surface correlations of Lower Cretaceous marine clastics and Devonian carbonates in western and eastern Montana. In my spare time, I get out with my hiking boots or mountain bike with my wife and our dogs in our scenic neighborhood. With winter comes playing and refereeing ice hockey, and cross country and telemark skiing.

1978

Steve Rowland (PhD): Greetings from the edge of the craton. I'm now the senior faculty member in a very dynamic geology department at the University of Nevada, Las Vegas. My UNLV colleague Michael Wells is also a UCSC alum (B.S.). I'm working with students on isotope geochemistry of Pleistocene mammals and also on Miocene and Jurassic trackways (including the first dinosaur tracks reported from Nevada). I just published a translation of an eighteenth-century Russian book titled "On the Strata of the Earth" by MIkhail Lomonosov. Slugs Rock!

Ken Johnson (BS): I have completed my role as geotechnical discipline lead for the Final Design of Phase 2 of the Central Subway and now it is actually getting built! Apologies to all for the traffic mess it will create in SF for the next 4 to 5 years, but it will be really great when it is up and running in 2019. In other work I have been involved in some great projects in Istanbul, Los Angeles, Seattle, Dearborn, and others in the Bay Area. Most of the projects involve tunnels for light rail, highways, or conveyance of water. All involve interesting geology and in all cases getting the geology right is essential to getting the project right! Looking forward to seeing you at the Thirsty Bear this December!

Jim Barry (BS): A two-year technician stint at the USGS yielded some life-long friendships and a good look at the profession. A move south to San Diego followed, and then two years on the aft deck of a seismic boat off California and in the Bering Sea. I learned how to process multi-channel data and spent another two years churning out reflection imagery. The company rode into a bad business cycle and suddenly it was all over. I was back on the beach for a while, and then into a series of fun and not so fun jobs, until one day I found myself in the SIO library trying to decipher some wave papers by M. Longuet-Higgins and realized I really wanted to be an ocean engineer. So it was off to school in Hawaii, where I received a degree after many years and many wonderful distractions. Since 1995 I've been a coastal engineer with Sea Engineering in Hawaii, and it has been great. I still have trouble with the works of M. Longuet-Higgins

1980

Richard Slack (BA, 1980) – after graduating from UCSC, I travelled the world and settled in Australia working in seismic processing for the oil and gas industry (and marrying a local girl). I later learned that I enjoyed creating the software rather than using it, so ended up in Houston, TX working for a number of oil and gas software technology companies. While in Houston, I studied geophysics at University of Houston and received my Masters of Science degree. Not long after, I eventually migrated into management, and am now CEO/ President for a Saas company, in Denver, CO, that develops software targeting the oil and gas industry. My wife, Cathy, and I are beginning to think about retirement – but only after getting our two girls through college!

1982

Janis Minor Stokes (BA): Living in the Granite State and loving hiking all seasons in the Presidentials of the White Mountains. Winter hiking is my passion. Currently building my own cairn in my yard,- it was time for the rocks to move outside of the house. Part owner of a company called Career Dimensions, Inc. We produce online career planning software including FOCUS 2 Online Career and Education Planning System which is used by UCSC Career Services☺ Worked for 15 years as an earth sciences teacher in New York. I have two daughters, aged 12 and 15, a husband, a dog and 2 birds.

1985

Joe Hayes (MS), is living in New Paltz, NY, the Hudson RIver Valley, where he is dividing his time and energy between rebuilding, fixing, sailing old wooden boats, raising his 3rd kid with Robin (the other 2 are launched), and work on local and foreign groundwater contamination issues. He is working as consultant for

Chazen Group doing Environmental SIte Assessments in NY, and for Blacksmith Institute of NYC as Technical Director of a cleanup at a former Lead Acid Battery Recycling Plant in Jakarta, Indonesia. His new love is Freyja, a 50-year old yawl, and her home port is Kingston, NY on Hudson River.

Kent Screechfield (BS**):** After graduating from UCSC, I have worked for three geotechnical consulting firms and now presently work for TRC in Concord, California. I am the Geotechnical Practice Lead for the Bay Area and it is hard to believe I have been in the same type of business for over 27 years. I live in Danville with my wife Elaine (24 year anniversary in April) and have a daughter who is a junior at San Ramon Valley High School and a son who is a freshman studying Mechanical Engineering at the University of Portland. I stay active with hiking, backpacking and cycling.

1987

Larry O'Hanlon (BA): Geoscience writer Larry O'Hanlon has returned to the fold. After an almost two-year sojourn into astrophysics at Keck Observatory in Hawaii, he is back in New Mexico and now manages AGU's blogosphere and social media. Follow him @TheAGU and @Earth2larryo.

1988

Erik Schmitz (BA): I graduated UCSC in '88 in Environmental Studies, with a minor in Earth Science. I'm in my 21st year teaching high school science at Marin Catholic High School in Marin County. I currently teach Biology and AP Environmental Science. I'm married with three kids, living in Novato, and still have my old personalized SLUGCAR license plate from my old lime yellow Mercury Comet from my days in Santa Cruz hanging in my workshop, to remind me of my Molluscan roots…

Jim Robinson (MS): As I have for the past 19 years, I am still working for the Montana Department of Natural Resources as a water resource planner. My area of the state is the Yellowstone River Basin. Current projects include the Yellowstone component of the Montana Water Supply Initiative (techno speak for a new state water plan), and a cumulative effects assessment of channel and floodplain modifications on the Yellowstone River riparian ecosystem. Had I known that I would be spending so much of my career dealing with water issues, I would of spent more time studying ground and surface water hydrology! I had fun this past July visiting the UCSC campus with my daughter who is a senior in high school considering colleges. It felt good to feel the soft marine air and feel the energy of the big trees. I haven't been to the campus in over 20 years so it was a little disconcerting to see the old Earth Sciences building turned into an expanded engineering building. But that's progress and I was gratified to see the justly deserved new Earth and Marine Sciences building. It was a Sunday, so I didn't get a chance to go inside, but it looks to be a great facility. I am forever indebted to the faculty and students that made my time at UCSC such a huge growth experience.

1990

Alan Bol (PhD): Alan and **Nan Rosenbloom** (MS, 1992) are married and living in Boulder, CO, along with a posse of other UCSC geologists. We have two kids: Nathan (14) and Eva (12). Nathan attends high school with Liam McDonald (son of Rich McDonald and Lisa Dierauf) and Karsten Mengel (son of Lisa Campbell). We see a lot of Rich and Lisa D. Our kids have played soccer and nordic skied on the same teams. Lisa C's daughter, Christine attends Middle School with our daughter, Eva. Lisa C. recently moved back to Boulder after a lifetime in Houston and bought a house a few blocks away. Lon Abbot and Terry Cook also live in the neighborhood and their children currently attend the same elementary school that our kids did. This summer, our family went on a 6-day backpacking trip near Aspen with Tim Best and his family. We managed to choose the one week that the summer monsoon made an appearance - rain every day.

Lisa White (PhD): After twenty-two years on the Geosciences Department faculty at San Francisco State University including the last four as Associate Dean of the College of Science and Engineering, Lisa White accepted a new appointment in July 2012 as Director of Education and Outreach at the UC Museum of Paleontology. Lisa states "the position allows me to be closer to my research roots in paleontology and be at the forefront of innovative ways to increase public understanding of the nature and process of science, the importance of evolution and the fossil record, and the impact of global change." In this role Lisa is working to enhance research programs at the UCMP by providing avenues through which to share research on the history of life and the fossil record with the public and K-16 education community. She is developing new collaborations to expand UCMP's award-winning websites, *Understanding Evolution* and *Understanding Science*, with a new web resource on *Understanding Global Change*. Lisa remains affiliated with SF State as an Adjunct Professor and PI of the SF-ROCKS geoscience education NSF grant with Bay Area high school students.

1991

Fred Hochstaedter (PhD): Fred chairs the Earth Science Department at Monterey Peninsula College, a California community college in Monterey. He recently published a paper for the first time in many years about creating animations of ocean currents, winds, atmospheric pressure, and sea surface temperatures in Google Earth for use in introductory oceanography classes. He has also been busy taking gigapans—high resolution, zoomable, panoramic photographs—of local field trip stops.

1992

Rich Koehler (BA): became the senior earthquake research geologist for the State of Alaska, Division of Geological and Geophysical Surveys in 2009. In 2010, he was appointed to a three year term to the Alaska Seismic Hazards Safety Commission by governor Sean Parnell.

1993

Todd Wirths (BS): I graduated back in 1992-93. Since Santa Cruz, I attained an MS in geology from San Diego State in 1995, and entered into the environmental consulting arena in San Diego. But I am very proud to announce the recent publication my book, published by the San Diego Association of Geologists, of which I am currently president. "Picacho and the Cargo Muchachos: Gold, Guns, and Geology of Eastern Imperial County, California" is a full-sized, 230 page-plus collection of geology, mining, and history of this near-forgotten corner of California. It can be purchased through amazon.com. I authored 2 articles, co-authored another, as well as the dedication (to Dr. Gary Girty) and of course the intro.

Tracy Hancock (MS): I was a graduate student with Shirley Dreiss. After 19 years with the USGS as a Hydrologist, I recently started a position with the U.S. Forest Service in Washington, DC. I am the National Monitoring and Evaluation Coordinator. I still live in Richmond, VA and my daughter Meghan is now 14 years old.

Lon Abbott (PhD) **and Terri Cook** (MS 1994): published the popular geology book 'Geology Underfoot Along Colorado's Front Range' and together they authored eight articles for Earth magazine. Lon produced a web-based textbook for the University of Colorado's physical geology lab course and Terri published two more Earth articles. Lon is the Field Trip Co-Chair for the 2013 GSA meeting in Denver.

1995

Saskia Goes (PhD): It has been too long since I was in Santa Cruz. Fun to see everyone's updates on the newsletter. I am now a senior lecturer at Imperial College in London, where I live with my husband Mark, 10-year old son Jasper and 8-year old daughter Imke. I continue studying lithosphere and mantle processes. Over the past years, we have been especially breaking our heads over the complex dynamics of subduction zones. Not too much time for studying earthquakes anymore, although I do keep up a bit by teaching geohazards (using some of Steve's tsunami and landslide movies!).

1996

Jorine Campopiano (Lawyer) (BS): has moved from the Wetlands program to the Children's Health program where she is now working as a schools environmental health coordinator at the U.S. Environmental Protection Agency. She also welcomed her third son, Joseph Maverick who joins older brothers Jackson and Bradyn.

1997

Glen Wallace (BS 1997; MS 1999): After finishing up at UC Santa Cruz I moved to Seattle and the University of Washington for a PhD looking at the record of magma mixing in zoned minerals. The Pacific Northwest sank its roots into me and after graduating in 2004, I took a position as a consulting geologist at Pacific Groundwater Group, where I have been for the last 7 years.

1998

Josh Caulkins (BS): is at the University of Rhode Island working as the research coordinator for a National Science Foundation Math and Science Partnership grant seeking to improve science education in the state of Rhode Island. He remains active in the earth sciences as a geomorphologist and geoscience education specialist and will be presenting at GSA in Charlotte, NC, in Nov. 2012

Brenda Bowen (Beitler) (BS '98 and MS '00) and **Gabe Bowen** (PhD '04) have had a busy year! This summer they and their two boys (Isaac [age 5] and Benjamin [age 2]) made a move westward from Indiana, (where they were both faculty at Purdue University), to pursue new adventures at the University of Utah. Gabe now serves as an Associate Professor of Geology and Geophysics and Brenda is Associate Director of the Global Change and Sustainability Center and Associate Research Professor of Geology and Geophysics at the University of Utah. They are excited to be back in the western US and to explore the spectacular mountains and canyons of Utah with their children. Hope all is well in Santa Cruz - hope to be back to visit before too long!

1999

Phil Stauffer (PhD): I am continuing to lead work on a range of exciting projects at Los Alamos, including nuclear waste in salt repositories, CO2 sequestration cooperation with China, and local waste dump modeling. I got remarried in 2008 and Betsy and I have 3 wild boys, Denali 9, Carson 3, and Happy (Jasper) will be 2 in Dec 2012. Lots of fun building play-land next to the house. The tree house now has 3 floors, a trap door and a 4x pulley system. The zip-line is fast, and the adult sized swing keeps guests happy. Aspen are just changing and at 8200' the nights are getting cold, with the first freeze on Sept 14th.

Gregory Easton (BS): After working for local engineering geologist Rogers Johnson for 10 years, I started an engineering geology firm this past August. Easton Geology is based in Santa Cruz and currently working on projects in the San Francisco and Monterey Bay regions. What little free time I have is spent outdoors; surfing, gold prospecting, mountain biking and backpacking. I also enjoy restoring and riding classic motorcycles.

2000

Stefano Mazzoni (BS, 2000; MS, 2002) continues to work for Occidental Oil & Gas, currently developing a mature oilfield in the Ventura Basin, while living in Bakersfield. He continues to enjoy traveling with his geologist wife Heidi and in the past year they've been to Costa Rica, Italy, New York, Vermont, and Seattle. In the spring of 2012 he was heavily involved in the annual American Association of Petroleum Geologists annual convention in Long Beach where he served as a Technical Committee Chair, organizing 19 successful field trips.

2002

John Cook (MS): Things are status quo with me teaching/career wise since last time I wrote. I am still staying busy teaching part-time at West Valley and DeAnza. My wife Kathy and I have gotten back into rock climbing and we go to Pinnacles nearly every weekend. We've been in the Sierra a few times on Sonora Pass with Pinnacles guidebook author and mentor Brad Young. We got to meet Royal Robbins at an AAC climb-in in Pinecrest a couple months ago – great people and tons of fun! We hiked to the summit of Clouds Rest and climbed in the Alabama Hills over the summer. Most recently we visited Red Rocks - saw some spectacular geology and did some amazing climbs. Every climb is an exciting new adventure!!

2004

Carrie Evje (MS): This year I am working at the same middle school in southern Norway. I teach three subjects: math, German, and English. I am also studying English online at NTNU in Trondheim so that I can get formal qualifications to teach English.

2005

Erica Howat (Erica Schneider, M.S. 2005): I married fellow Geoslug **Ian Howat** (PhD 2006) in the Fall of 2007. We welcomed our daughter, Anna Jayne, on July 23, 2011. We live in Columbus, Ohio with our dog, Shelby. I am currently working half-time at Battelle Memorial Institute in the Carbon Management group as a petrophysicist and spending the other half of my time at home with Anna. Ian was recently promoted to Associate Professor in the Earth Science Department at the Ohio State University and continues his glaciology research with field campaigns in Greenland and Iceland.

2006

Alissia Austell (BS): I am so glad to hear that the newsletter is going to be up and running again! I loved my time in the program and would love to keep up with what's going on. That being said, I don't remember seeing last year's copy of the newsletter. Can I please have another? I've also wanted to come to the meet-ups in the city but just haven't been able to work it out yet. As far as what I've been up to these last few years, after graduating I worked odd jobs in Santa Cruz as a taxi dispatcher and at an advertising company until my boyfriend graduated in 2006 and we got married the following month. I worked for a short time doing asbestos analysis, but, since then, my life mostly consists of being a stay-at-home mom to my two children, a girl and boy (with another on the way), in Mountain View. I am still playing with the idea of starting a series of geology books for younger children and am hoping I'll have time to really work on it soon. In the meantime, it's been lots of fun homeschooling my daughter for kindergarten and fulfilling my role as the family's resident geology "expert." So, that's me! Nothing really exciting career-wise, but my personal life sure seems to be taking off! :) I really look forward to being involved geology again someday, but in the meantime it's lots of fun raising the next generation of geoscientists :)

2007

Samantha Hansen (Ph.D): I've started my 3rd year as an assistant professor at The University of Alabama, and things are going very well. I was recently awarded an NSF CAREER grant and as part of this, I will be deploying to Antarctica in a few weeks to install a new seismic network in the northern Transantarctic Mountains. Santa Cruz still holds a special place in my heart, and I try to get back to visit as often as I can.

2008

Brina Mocsny (BS): I'm coming up on my 3rd year in Yosemite National Park! For most of the year I am a teaching environmental education for NatureBridge, formerly Yosemite Institute. I combine my love of earth science with my love of teaching students in one of the most dynamic classrooms in CA! During the summer season, I am a Physical Science Technician with the park service working on projects in hydrology, glaciology, air quality, and landscape ecology. A recent highlight this year was participating in a glacier survey and exploring an ice cave with alumnus Greg Stock (park geologist) and faculty alumni Robert (Bob) Anderson. If you're in Yosemite drop by Foresta, I live in the only house (green) on Big Meadow and there's room for slugs!

Sarah Hall (PhD): I guess I should update that I've moved from McGill University to College of the Atlantic in Bar Harbor, ME. I love it here (so far!) Field geology paradise!

2009

Shayna Kram (BS): Hello geoslugs! I am currently completing the last year of my Master of Public Health at UCLA, with a focus in Environmental Health and Industrial Hygiene. Environmental health is all about how to prevent and mitigate the health effects of environmental pollutants. This summer I worked at the Chevron Refinery in El Segundo as a Safety and Industrial Hygiene intern, creating a benzene monitoring plan, sampling for multiple environmental constituents, and learning about the refining process. Earth Science was a great foundation for what I am doing now, and I have lots of fond memories from my classes at Santa Cruz!

2010

Tina To (BA): I have recently been accepted to a PhD program studying the effects of pollution on dolphins in the Great Barrier Reef. I am seeking funding in hopes of being able to take on this opportunity.

2011

Ben Melosh (BS): I am currently in my 2nd year of the PhD program at McGill University working under Christie Rowe (also a slug) studying the geometry of a continental shear zone and the evolution of deformation mechanisms through the brittle plastic transition in southwest Africa.

Lauren Schurmeier (BS): After graduating I continued working as an intern at NASA Ames Research Center for a year. I worked in laboratory where we simulated the chemistry happening in the atmospheric haze layers and lakes of Saturn's moon Titan. I also worked on a project finding landing sites for a potential future Mars lander. This year I started graduate school at the University of Illinois at Chicago Earth and Environmental Science Department.

We hope to see you at the Thirsty Bear Brewing Company for our
12th Annual UCSC Earth & Planetary Sciences Alumni Event at Fall AGU!

When? **Tuesday, December 4, 2012**
from 6:00pm - 8:30pm

Where? **Thirsty Bear Brewing Company**
661 Howard Street, San Francisco, CA 94105
http://www.thirstybear.com/

UC Santa Cruz

EARTH & PLANETARY SCIENCES WAYS OF GIVING

We welcome all expressions of support. Please know that gifts at all levels support the excellence of our students, faculty, research, and programs, and that your support is much appreciated!

☐ Please accept my Donation

Gift Amount: $_____

Please direct my gift to the following area:

_____
(SEE NEXT PAGE FOR FUND DESCRIPPTIONS)

Additional comments or information for this gift:

_____

Payment Information

_____ Check (Please make checks payable to: UC Foundation)

_____ Credit Card

Address for donations:
UC Santa Cruz
MS: PBSci Development
1156 High St
Santa Cruz CA 95064

By phone:
831-459-2192

Online:
http://giving.ucsc.edu

Choose "Earth & Planetary sciences general fund" in the PBSci giving menu, or fill in a specific fund in the "Other designation or pledge number" text box.

Credit Card Number: _____ Credit Card Type: ____Visa ____ MC

Name on Credit Card: _____ Expiration Date: _____ (Mo/Yr)

It is the policy of the University of California, Santa Cruz, that a portion of gift funds received may be used to defray costs of raising and administering funds.

Yes! I want to increase my support with this matching gift.

My company (please print company name) _____will match my gift.

Thank you for helping us maintain our educational integrity!

For more information please contact:
Department Manager Judy Van Leuven at 831-459-4478, or e-mail her at judy@ucsc.edu; or
Department Chair Quentin Williams at 831-459-3132, or e-mail him at qwilliams@pmc.ucsc.edu.
Assistant Director of Development Anne Hayes at 831-459-5238, or email her at: adhayes@ucsc.edu
Or visit our department web site at: http://eps.ucsc.edu

UC Santa Cruz

EARTH & PLANETARY SCIENCES
WAYS OF GIVING

EARTH SCIENCES GENERAL FUND
This fund is used to support research and educational activities of graduate and undergraduate students.

EARTH SCIENCES SPECIAL NEEDS FUND
This fund supports special projects and initiatives, or areas that require urgent one-time support.

THE AARON & ELIZABETH WATERS FUND
This fund honors the founder of our department and his wife. The Waters Fund is a scholarship fund for grad students and is given as an annual award for the most meritorious Ph.D. thesis proposal (or two) of the year.

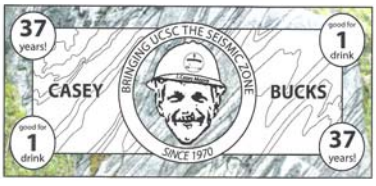
THE GERALD WEBER & SUZANNE HOLT FUND
The Gerald Weber and Suzanne Holt Fund interest is currently used to provide summer field camp scholarships for meritorious students, support undergraduate students giving talks or poster sessions at national conferences, the Outstanding TA Award as nominated by students, and the annual Outstanding Undergraduate Award. It may also be used to support other kinds of special student projects.

THE KATHRYN D. SULLIVAN SCHOLARSHIP FUND
This fund honors astronaut Kathryn Sullivan, one of UCSC's most distinguished alumnae. Its aim is to enable upper-division undergraduates to take advantage of professional development opportunities (e.g. field research, attending conferences) and improve their understanding of environmental and policy issues.

THE HOLLY DAY BARNETT FUND
This fund is a tribute to undergraduate alumna Holly Day Barnett. Awardees (advanced undergraduates) have traits in common with Holly's: outdoor hobbies, leadership skills, and interests in environmental Earth Sciences.

THE J. CASEY MOORE FUND
This new fund (established in 2007) honors Emeritus Prof. Casey Moore. It supports targeted grants for independent research by graduate and undergraduate students.

THE SHEN AND REN WU MEMORIAL AWARD FUND IN GEOPHYSICS
In memory of the parents of Ru-Shan Wu, this fund establishes support for an annual graduate award for students in Geophysics or other aspects of Earth and Planetary Sciences. Funding can be used for educational expenses, field or laboratory research, and/or attendance at conferences or other professional development opportunities.



UC SANTA CRUZ

EARTH & PLANETARY SCIENCES

1156 High Street
Santa Cruz, CA 95064
http://eps.ucsc.edu

☐ Please Update My Contact Information

Name _____ **Telephone** _____ **E-Mail** _____

Year _____ **Degree** _____ **Is This A New Address?** ☐

Address _____
Address City State Zip

News about myself and other classmates

Please use space below and continue on facing page. Let us know where you are and what you are up to!

May we publish your comments on the Earth and Planetary Sciences website under Alumni? ☐Yes ☐No
☐ I would prefer my comments to appear only in the Earth and Planetary Sciences newsletter.

We hope to see you at the Thirsty Bear Brewing Company for our *12th Annual UCSC Earth & Planetary Sciences Alumni Event at Fall AGU!*

When? **Tuesday, December 4, 2012**
from 6:00pm - 8:30pm

Where? **Thirsty Bear Brewing Company**
661 Howard Street, San Francisco, CA 94105
http://www.thirstybear.com/

Alex Nereson **Tracey Conrad**

The Department is pleased to announce the first recipients of a J. Casey Moore Award. These two awards of $2500 apiece are intended to support graduate students in the early stages of their research with an emphasis on helping bootstrap new projects. The 2012-13 Awardees are **Alex Nereson** for his project entitled "Aspect-dependent Earthflows in Franciscan mélange, Alameda County, CA" and **Tracey Conrad** for her project "Os isotope age dating of Fe-Mn crusts along the California continental margin"

Congratulations to Alex and Tracey!

The Earth and Planetary Sciences Department proudly acknowledges its many advocates and supporters. The following people and organizations have made gifts to the department since November 2011. Thank you one and all!

David Al-Lami
Alan Allwardt and Jane Reid
Aurora Belarmino and Eric Selvin
James F. Berkey
Betsy Jo Beyer
Douglas C. Bleakly
Suzanne Michelle Bourret
Ethan and Lara Brown
Jerry and Toni Buffa
Christopher and Kathryn Castelli
Guy R. Cochrane
Charlie Crocker and Charity Kahn
Robert Daniel
Noah Suresh Diffenbaugh
Gregory F. Easton
Karen Farley and Jeff Bold
Genevieve and Chris Halvorsen
Andrew Fisher and Carrie Pomeroy
Fugro GeoServices, Inc.
Fraser E Goff
Laurie and Jerry Green
Bradley and Maureen Harrington
James R. Hein
Philip Heller
Christopher R. Hiller
Thomas and Kathleen Hinz
Fred G. Hochstaedter
Nicholas M. Johnson
Robert Johnstone
Isaac Samuel Jones
Maryann Jones
Judy Junkman and Allen Stork
Alexander and Mette Kaufman
Shane Donovan Keefauver
Miriam and James Klier
Paul L. Koch
Christopher Frederick Kopf
Barry R. Kyle
Charles and Jennifer Lawson
Edmond Ken Lee
Schon Levy and Michael Fehler
Joe and Sue Liddicoat

EPS Advocates and Supporters, Continued

Pilar Llanes Estrada
Robert and Rebecca MacKnight
Teresa A. Malm
Grant Marshall
Patricia Alison McCrory
Chad C. McNeal
Kevin E. Meaney
James Moore and Hilde Schwartz
Gordon and Betty Moore Foundation
Klaus Neumann
David Pais and Deena Bemnet Pais
PG&E Corporate Foundation, Princeton
Lois and Fred Phillips
Mark K. Reagan
Richard and Margaret Rhodes
Christen Danielle Rowe
Jeanne M. Ruefer
Margaret Rusmore and Scott Bogue
James Sample and Mary Reid
Kent and Elaine Screechfield
Thomas James Smart
Kathryn Elaine Snell
R. Stanley and H. Gibbons
Statoil Petroleum AS
Laura K. Stupi and Javier D. Santillan
Paul Brett Talmage
Philip A. Teas
Scott Teter
Jessica Anne Tibor
Michael and Gail Underwood
James E. Usack
Peter Vrolijk
Joan B. Wactor
Thomas and Chantal Walsh
Gerald Weber and Suzanne Holt
Jesse L. Williams
Lisa H. Wright and Greg Jurkowski
Tianrun Zhang and Shen Luo