University of California Santa Barbara
Earth Science Newsletter
FALL 2014

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Emeritus Profile

James Boles

Jim came to UCSB in 1975 from ARCO's research lab in Dallas,TX. Prior to that he was a post-doc at the University of Wyoming working in East Africa and the western US on diagnesis of volcanic glass in saline-alkaline lakes. His initial training was in his home state of Indiana, where he received a BS from Purdue University followed by traveling west for a Masters from the University of Wyoming, and then further west for a PhD from the University of Otago in New Zealand. While at UCSB, he was heavily involved in undergraduate teaching including Sedimentary Petrology, Geochemistry, Thermodynamics, Petroleum Geology and our 104 and 118 field courses. The Santa Cruz Island classes were memorable among these, including the taking of a pig one year (with permission of course). He is still involved in the Department, mainly advising students on industry jobs and giving research advice to grad students. He also leads a graduate student organized yearly trip to Santa Cruz Island where everyone gets to know each other and learn about local geology.

His research, resulting in more than 100 papers, involves understanding how sediments change into rocks using petrographic and geochemical techniques. Much of the work involves the study of cores and fluids from actively subsiding basins in California and the Gulf Coast. Most recent grants (DOE) focus on fluid flow and fluid-rock interaction along faults, of relevance to hydrocarbon exploration-production, including in unconventional resources. He has been involved in numerous consulting projects in the US and overseas during retirement.

Jim writes the following:
"Upon retirement I thought that research and consulting would fade away, but just the opposite. Active grants on fluid movement in the crust and fundamental oil-water rock interaction experiments with grants in Chemical Engineering/Materials still keep me busy. Recent discoveries include an unsuspected and exciting strong mantle helium signature in deep hydrocarbon well gases along the Newport-Inglewood fault. Nobody had previously bothered to look at helium in the deep basin; this new work highlights the need to re-evaluate basin models and seismicity. The work in Chemical Engineering with Jacob Israelchvili and his colleagues has led to a fundamental discovery that

...cont'd on page 2

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James Boles ...cont'd from page1

electrical potential is a driving force for "pressure solution". Pressure, as low as a few atmospheres, keeps the two surfaces close enough to generate potential. I am also still working on spontaneous combustion in shales from natural landslides. One such slide in Orange County reached 800˚C due to generation and combustion of oil! Lest you think it's all work and no play –I always have maintained a lot of hobbies. I am still active building useless items (Stacey calls it "themed debris"), the latest being a 1840s Hawkins .54 caliber black powder rifle, and a scratch built basswood model of Amelia Earhart's trans-Atlantic plane for daughter Grace. But my real effort has been in racing. Racing a 200 hp dwarf car (34' Ford Coupe, 3/5 scale) at the Ventura Speedway dirt track in the senior division for two seasons, I pretty much had a good view from the back of the field every race. So, my son Luke took the same car the following year and won the championship in the Pro Division as a rookie (people said you must have found the car set up—I said RIGHT!). Bouyed by our success, we foolishly bought a used 360 class sprint car that weighs 1300 lb with a 680 hp, alcohol fueled motor. I am the crew chief, mechanic, and fabricator for this, Luke drives, and Stacey does all the chassis, shock, and tire set up at the races. The car requires about 2-3 days a week of work and lots of money (it would be cheesy of me to solicit sponsor donations in this write up!)—so it's a big commitment. It's fun but somewhat frightening at the same time. Luke's off to college now, so we are rebuilding the car to be faster .... to be continued."

-Jim

Jim trailing behind his son at the Ventura Speedway.

Jim giving a lecture on the geology of Santa Cruz Island.

Letter from the Chair...

Andy's head shot

Geologists are supposed to understand the time thing. How is it, then that I'm writing this "Chair's" note after what feels like only a couple of years since arriving at UCSB? My fossilized countenance, and those ultimate timekeepers, children (mine having recently flown the coop to college), tell the true story however—I've been at our beautiful campus a while now. This only heightens my sense of privilege in addressing you, our cherished friends and alums of the department.

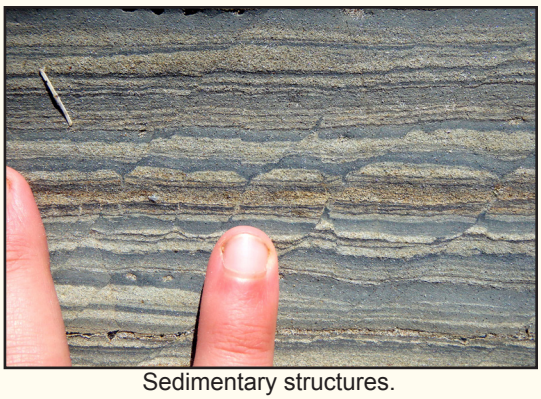
The words of my distinguished colleagues and our dedicated graduate students on the surrounding pages speak much more eloquently of the continued vigor, vitality, and intellectual energy of the Earth Science Department than mine ever could. Moreover, I don't want to spoil the surprises awaiting you as you reading the rest of this newsletter by distilling them here.

I do, however, wish to emphasize the critical importance of your past and —we hope— future donations to the department. Your generous contributions are indispensible to helping us fulfill our mission at all levels of student training.

I will indulge in one anecdote that beautifully reflects —by my standards— the wonderful work and strength of the faculty, staff, and students of this department. I recently gave a ten-minute presentation about our recent trip to Iceland (read Phil's wonderful piece about this on p. 4) to the Dean, Chairs, and Office Managers of UCSB's division of Math, Physical, and Life Sciences. Although speaking in front of audiences, especially imposing ones, is decidedly not one of my talents, I was gratified by the response. Uniformly, whether from other professors or the dean's staff, the reaction was, "Wow! I wish I were a student in your department." My response? "So do I!" Thanks for your outsized role in keeping our program the very special, constantly evolving, entity that it is.

Department Highlights

Santa Cruz Island Trip, Fall 2014



Sedimentary structures.

This year's department trip to Santa Cruz Island was one of fun-filled adventure, enthralling educational breadth, and memorable bonding moments. The trip got off to a great start on the boat trip over, during which we chatted with old friends and introduced ourselves to new ones, particularly those in the new cohort. We had the unexpected but very welcome surprise of viewing a pod of dolphins. We capitalized on this opportunity to take wonderful photos of these splendid creatures.

After disembarking, our adventure continued with a jarring jeep ride along the magnificent crest of the island to Christy Ranch, our base of operations. En route, our trip leader, Emeritus Professor Jim Boles, pointed out the left-lateral Santa Cruz Island fault, a dominant fault of the northern Channel Islands. Earlier stops included various sedimentary units, the Blanco volcaniclastics, the Monterey Formation, and San Onofre Breccia. Seeing rhyodacitic clasts similar in composition to those of the Poway Conglomerate was impressive. Our first day ended with a stimulating debate about faulting versus a buttress unconformity between units we had seen. The group then dispersed; some went to hike and explore the island, while others mingled and enjoyed an early evening swim in the ocean.

On our second day we saw wonderful blueschist clasts, some of which contained exquisite grains of lawsonite. We proceeded down-section to examine a diversity of units, including the Rincon Shale, Willows Diorite, Santa Cruz Island Schist, and the Vacqueros Sandstone. We gained many snap-shot worthy views of sedimentary structures (see photo above) such as rip-up clasts, cross-beds, ripple marks, and graded beds. Our paradise-like walk along the beach back to Christy Ranch early that evening was happily interrupted by a friendly visit from a sea lion—a pinniped to you cognoscenti.

Evening activities included a gluttonous BBQ buffet on the first day, followed by a bountiful taco bar on the second. Of course we basked in the warmth of a roaring campfire, laughter and entertaining stories being exchanged. Apres fire the camaderie continued with board and card games, desserts, and a battery operated boom-box from the 90's. To say the least, we were thankful for the mix CDs that came along the trip.

Following the arduous and dusty drive back to Prisoners' Harbor, many of us indulged in a swim in the enticing Pacific (some jumping exuberantly from the pier) before enjoying a relaxing and reminiscence-filled boat ride back to the mainland. Overall, Santa Cruz Island, was truly an amazing and unforgettable experience. Overflowing with wonderful memories of our experience on the island, we unanimously agreed upon one sentiment: it was all over too soon.

- Stephanie Tsang
  4th year, PhD Student

Grad students pose with Professors Jordan Clark, Phil Gans and Professor Emeritus Jim Boles, for a group picture.

The favored mode of transportation on the island.

Summer Field 2014: From the high desert of eastern Nevada to the (very) active volcanic systems of Iceland

This year's installment of our capstone Summer Field Geology course followed an unusual and decidedly ambitious itinerary. Taking advantage of a newly established exchange agreement with the University of Iceland, we split the course between four weeks devoted to classical geologic mapping projects in the mountain ranges and diverse geology of east-central Nevada followed by a two-week field volcanology course organized by our Icelandic collaborators. Needless to say, our 23 students were thrilled with the broad range of geologic experiences and opportunity to travel to such an exotic destination.

To economize for the Iceland trip, we "roughed" it for the Nevada portion of summer field, including making do with a fairly primitive camp setup, buying and preparing our own food, and moving camps to the map areas. This would not have been possible without the remarkable team spirit of the students and the very hard work and leadership of our four graduate student TAs (Sophie Briggs, Mary Kate Fidler, Josh Garber, Rob Holder) - they were simply fantastic. We used creative solutions for office days, relying on the generosity of the local community college and hotels in Ely to provide us with workrooms, tables, and power outlets for the students to complete their interim reports.

Our first two weeks were spent in the beautiful White Pine Range of western White Pine County. The students mapped and analyzed a thick Miocene volcaniclastic succession known as the Horse Camp Formation and learned firsthand the difficulties of defining and mapping "formations" in non-marine sedimentary successions with dramatic lateral facies variations. From Horse Camp we moved to the Indian Garden Springs area where we mapped folded and faulted Devonian to Mississippian formations of the well-known Paleozoic marine shelf sequence. This was mainly a structural project, focused on mapping, describing, and interpreting map-scale folds and faults to assess the Mesozoic to Cenozoic history of crustal shortening and extension.

Our next two weeks were devoted to the spectacular geology of the northern Snake Range along the Nevada/Utah border. This range offers a little bit of everything, from high-grade metamorphic and plutonic rocks, to polyphase tectonite fabrics and mylonites, to some of the best exposured high- and low-angle extensional fault systems anywhere. The Snake Range is an archetypical "metamorphic core complex". Students mapped portions of the Snake Range Decollement or detachment fault and were forced to evaluate various mechanisms that have been proposed for the formation and evolution of this remarkable fault system. This portion of field camp took on much more of a research flavor, as students were divided into small groups, each responsible for mapping a previously poorly studied area.

Iceland was an experience unto itself. We returned from Nevada to UCSB in mid July, and after a day or so to collect our wits, flew to Reykjavik. The summer field students, many of whom had never been out of the country before, were joined by eight graduate students and three additional professors (Burbank, Jackson, and Wyss) for an adventure of a lifetime. Iceland is dramatic and geologically fascinating in many ways. As one of the few active mid-ocean ridges is exposed on land, Iceland boasts the most active volcanic systems on the planet, with frequent eruptions that are surprisingly diverse in both character and composition. Spectacular glaciers, waterfalls, and rivers, a rich cultural history, and a starkly beautiful landscape all add to the experience. Our two-week field volcanology course (devised by Gans and Icelandic colleagues Drs. Armann Hoskuldson and Thor Thordarson) involved an in-depth examination of active and ancient volcanic (and plutonic) features, with an emphasis on understanding the wide range of eruptive processes.

During a couple of days getting acclimated, we examined the active rift systems in and around Reykjavik. We boarded our charter bus and proceeded on a 10-day excursion around the perimeter of the country, which included multi-day stops and field exercises in the north (Lake Myvatn and Askja Volcano) and along the east coast. Lodging and culinary experiences were inventive, but always excellent. We owe an enormous debt of gratitude to our Icelandic hosts for their logistical and financial support, as they organized and covered the lion's share of our group's travel and living expenses. Armann, our fearless guide for most of the trip, demonstrated an encyclopedic knowledge of all matters geological and historical. A memorable part of the trip was a near brush with disaster at Askja Volcano. After an initial visit to the volcano and standing on the shores of the caldera lake late on the evening of July 21st, we returned the next day to discover that where we stood (photo above) was overrun by a tsunami (200 foot vertical run-up), just three hours after we had left. This catastrophe, caused by the collapse of the eastern wall of the caldera as a mile-long landslide, provided a fantastic learning opportunity for the students, who were immediately put to work mapping the tsunami deposits. For more about this event see http://www.news.ucsb.edu/2014/014353/close-brush-disaster. The Iceland experiment for summer field was deemed so successful, that we anticipate repeating it in the future and making an Iceland field volcanology course a semi-regular part of future summer field camps.

Staff News

Joe Cisneros

Retired, July 2014

Hey, can you believe I get to be in the Earth Science Newsletter! Sure do miss the people in the Dept. Don't miss getting up and going in every day. Can't beat this retirement! But that's why I am enjoying today is because of all the good days I had working for the Dept. I know the Students are getting a good opportunity to experience all the different avenues available for sparking their specific interest of the Earth. I was fortune enough to enter the Dept. with, what I call the "Ole Lions" of Geology. George Tilton, RV Fisher, Jim Valentine, Bob Norris, Cliff Hopson, Ken Macdonald (he was pretty young too to be an Ole Lion) and Preston Cloud (he was an emeritus at the time). Art Sylvester and Jim Mattinson were reaching that status as well. Anyway these guys were Great. The Young Lions were there, and I watched the sparks fly as they busted their behinds gathering rocks, fossils, solidified lava, debris from flows, and sediment and compiling the data. The labs were bustling. I was enthused to help them with their Labs' analytical equipment. I knew very little about their exact science, but I was sure willing to listen. Everyone was also willing to explain and teach me what I needed to know to get my job done and more. My Supervisor Bill Bushnell, was probably the most enthusiastic of them all. It's hard to believe that I only worked with that man for 3 years before he died. It felt much longer based on all the fun we had and places we went especially the new ideas that we were able to provide for the dept. when we combined our experiences. Mike Fuller was Chair, Priscilla Mori was MSO, my fellow staff members Steve Sutter, Pearl Ligon, Dave Crouch, Ellie Dzuro, Cindy Smith, Evelyn Gordon, Patti Kelly, Craig Welsh, Mark Stein and Rose. They use to have to keep Bill and Mark separated or these guys might start something that I snickered at. Dave Robbins and Howard Berg started right after I did. Jim Kennett and the present department chair, Andy Wyss had just started as well. Bruce Tiffney came in the year before I did. Brian Patrick and Phil Gans came in shortly after I did.

...cont'd on page 6

Chris Livsey

Began, September 2014

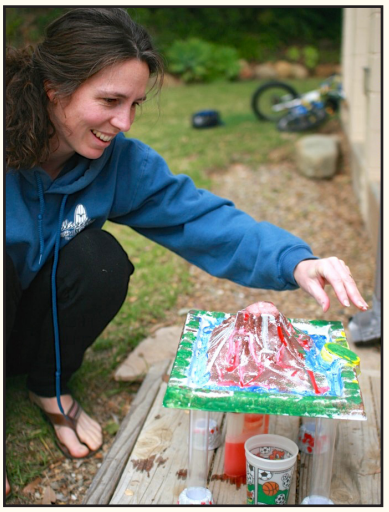
I began my new job as Mechanical Shop Supervisor early this fall and it has been a great privilege and pleasure to be here. I really love working with people of all ages to build and repair things that need to be restored. It's a great thing to see people enjoy accomplishing their projects and to be with them as they grow and succeed. I grew up in Oklahoma in a large family and come from a long line of craftsmen. My father is a carpenter and taught me from a young age to be able to work together to build many things. I graduated Architecture school at OSU and quickly realized that working with people to build and restore things is what I loved doing. So I set out to work with five young apprentices over the last four years teaching them carpentry and fine woodworking. I had my own residential design build company and we completed many interesting projects. My apprentices grew in skill and started moving on to pursue higher education and other building trades. When UCSB interviewed me for the job, I was so excited that I could continue on a new chapter doing creative projects with students and faculty. Since being here, I have had the chance to go with two of our great professors to the mountains with a large group of students on Earth 18, to help with trip logistics, and redesign a laboratory. I enjoy working with the wonderful team of staff to help make life easier for all the students and professors. I am thankful to be a part of Earth Science and am very excited for the future of our excellent department.

Congratulations Joe on your retirement!

Welcome to our department Chris!!!

Faculty News

Susannah Porter receives UCSB Distinguished Teaching Award



Susannah Porter who began her teaching career in 2003, recently was presented the UCSB Distinguished Teaching Award. This highly selective award recognizes a UCSB professor's exemplary teaching. In recognition of her leadership and service to the department, Susannah was appointed as the department's Vice-Chair and Graduate Advisor this fall.

Susannah was exposed to geology at an early age. Her father studies Quaternary climate change, and as a teenager she accompanied him as a field assistant to the Big Island of Hawaii and to the Qinghai Plateau and Inner Mongolia regions of China. Susannah received her bachelor's degree in mathematics from Yale University and her Ph.D. at Harvard University, where she studied paleontology. After Harvard, Susannah completed a one-year NASA Astrobiology Post-Doctoral Fellowship at UCLA, and joined UCSB in 2003.

Susannah's research focuses on the early fossil record of animals and their protistan relatives, and is motivated by her love for these beautiful and strange creatures that lived so long ago. She has worked on problems relating to the early evolution of skeletal biomineralization, the influence of "snowball Earth" glaciations on the diversity of life, and the early evolution of eukaryotes. Her fieldwork areas have included central Australia, Tasmania, West Africa, southern and central China, and the Grand Canyon. At UCSB, Susannah teaches courses on The Age of Dinosaurs, Invertebrate Paleobiology, and Early Life and its Environmental Context. Susannah lives at a boarding school in Carpinteria where her husband, Jamie, teaches chemistry, physics, and computer science. Jamie, Susannah, and their two boys, Samuel (5 years) and William (10 years) love to road trip in the summers visiting the nation's amazing National Parks and Monuments.

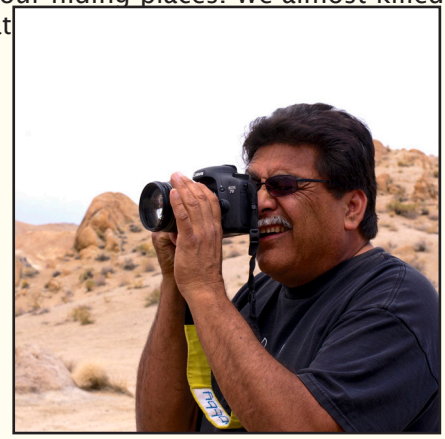
Matt Jackson receives two prestigious awards

Every year the American Geophysical Union (AGU) honors a member with the Hisashi Kuno Award for outstanding contributions made to the fields of volcanology, geochemistry or petrology. This year the award was given to one of our own, Matt Jackson. He was also named 2014 F.W. Clarke Medalist by the The Geochemical Society in December 2013. The Clarke Award is given to an early-career scientist for a single outstanding contribution to geochemistry or cosmochemistry.

Matt joined our department last fall after 3-1/2 years of teaching at Boston University. His current research explores early early-Earth formation and the bulk composition of the modern Earth. Jackson and his students examine the compositions of hotspots lavas to better understand the composition and evolution of the Earth's deep interior.

Joe Cisneros ...cont'd from page 5

Ralph Archuleta was running full court press with seismic arrays about this time. All this mixed together was such an explosion of New Blood and Old Blood. The mix fired the Dept to the point that we were all hustling to keep up with these guys. And I was the "Kid". I was 34 years old. I had a black mustache, 80 pounds lighter. Damn I was Good! Oh, Nevermind. Anyway we had a good time just like how the Dept. is Today. Christmas Parties were a Hoot. This is back when Pearl would spike the punch. Oh the stories after the party and the Xerox copies that got copied, that's another story. Bill use to Love to scare everybody and play jokes on Pearl. He'd put a dead mouse on her desk and hide around the corner and wait for her to start screaming before we shot from our hiding places. We almost killed Mic DeNiro with a "Pop Goes the Weasel" Mad Ferret cage. We'd rattle people that weren't used to the basement by making sure they were fully warned about the trolls living up in the dirt pan area of the basement. It was always fun to uncrate a new instrument and get the lab up and running. It was also very unnerving because EVERY faculty member was like an expectant father making sure we knew how to handle the Baby. Setting up the different camps was hard, hot, bug filled, work. I loved it! What everyone experienced that built the camp, was this pride that Geology was going to be discovered and documented in such a desolate remote location, with as many amenities that would allow the time and work to be completed as comfortable as possible. Well I sure enjoyed my Job and loved doing what I did. I miss you guys and wish all the Alums a good life like I had at UCSB. Together we were awesome weren't we? Everyone there keep being Awesome for the Science and the Students. I Miss those Grads and Undergrads. Adios - Via con RV



Graduate Student Spotlight

In the Spotlight

Carlye Peterson, 5th year PhD candidate

It's hard to keep a broad prospective on life when you're engulfed in a pile of manuscripts, thinking, staring at a blank wall, the image of your computer screen burned into your retinas. But the reality is I'm doing what I love in one of the most beautiful places in California. I'm a native Californian – I grew up just 2 hours north in Atascadero, and moved to Long Beach for college where I earned my bachelor's and master's degrees in Geology. During my master's I participated on a research cruise to the Santa Barbara basin on the R/V Melville. There I met and started collaborating with Lorraine Lisiecki, joining her lab group in 2010 when I started my Ph.D. at UCSB.

I study past ocean circulation and ocean carbon storage using as many $\delta^{13}C$ records I can find – I'm a data glutton. Using published $\delta^{13}C$ records and online data repositories, I assemble isotopic data from the benthic foraminifera *Cibicidoides wuellerstorfi* because it's an excellent proxy for past ocean $\delta^{13}C$. Benthic $\delta^{13}C$, helps us track changes in carbon storage, water mass boundaries, ocean circulation, and atmospheric CO_2 over glacial-to-interglacial cycles. I'm taking my large compilations and re-evaluating some foundational questions in paleoceanography: does the 3D distribution of water masses CO_2 over glacial-to-interglacial cycles. I'm taking my large data compilations change on glacial-interglacial timescales? What was the mean change in ocean $\delta^{13}C$ from the Last Glacial Maximum to today? How does the timing of changes in $\delta^{13}C$ relate to the timing of climate and ocean circulation shifts? Do changes in carbonate chemistry influence the $\delta^{13}C$ signature in *C. wuellerstorfi* shells?

My studies have taken me around the world, presenting at conferences in San Francisco, Italy, Spain, and most recently, Scotland and Switzerland. I finished my second year as Queen of the Graduate Student Earth Science Association (aka, The Royal Geological Society of Goleta). Under my rein, we traveled to Figueroa Mountain, Big Sur, Santa Cruz Island, and Mammoth, to study geology, have fun, and build working relationships with our peers. I founded the Science Communication Club in which grad students meet weekly to practice giving talks and peer-review manuscripts or proposals.

I've been awarded the Wendell Phillips Woodring Memorial Graduate Fellowship as I start my fifth and final year as a Ph.D. student at UCSB. I'm working on manuscripts of the final chapters of my dissertation, writing postdoctoral fellowship proposals for an international postdoc, and applying for local tenure-track jobs. I'm also pursuing the Certificate in College and University Teaching program, which includes teaching Introduction to Oceanography and Geological Catastrophes in the coming quarters. After graduating I plan to continue studying ocean circulation in 4D. "...there will be sleeping enough in the grave...." Benjamin Franklin

Johnathan Rice, 2nd year MS candidate

I am amazed by what I've been a part of during a year and a half of graduate school. Within a few miles of UCSB I have helped collect cores in marshes and offshore within the Santa Barbara Channel. I surveyed and collected ground penetrating radar data for an archaeological dig on Santa Cruz Island.

I received BS degrees in Geology and Environmental Sciences from Northern Arizona University, in Flagstaff, AZ. Through this combination of majors I gained an appreciation of the interaction of humanity and Earth. While at NAU, I reconstructed a paleo-fire record from a pond near Lompoc, piquing my interest in paleo-environmental analysis in general. This project made me want to study modern processes and how they contribute to reconstructing Earth's history.

Working with Alex Simms has broadened my knowledge of modern sedimentological processes. My research focuses on the Holocene evolution of the Nueces Bay-head delta near Corpus Christi, TX. Currently, I am investigating how the delta responded to a period of aridity roughly 2,500 years ago. Prior work suggests that the delta backstepped landward approximately 12 km in response to this climate event.

To get at this question we have collected twenty-eight vibracores, eight geoprobe cores, and twenty-five kilometers of seismic profiles. Six sand lobes have been identified in the sub-surface using a combination of the sediment cores and seismic profiles. The relative position of these sand lobes through time will help us better understand the rates of coastline transgression during climate change.

While at UCSB I have also been introduced to the professional side of geology. Last summer I interned for DCOR LLC, an energy company in Ventura. This opportunity allowed me to apply my geologic knowledge to real-world problems. I've benefited greatly from this diversity of experiences, and I look forward to my future career in geology.

Alumni Page

What are the Alumni Doing?

Graham Lederer (PhD, Summer '14) is now a postdoctoral researcher at MIT working on high-precision U-Pb dating of large igneous provinces associated with mass extinction events.

Adam Arce (BS, expected Spring '15) will be enrolled in a masters program at Colorado University- Boulder.

Alice Koerner (MS, Fall '10) is a Development Geologist at Chevron in Bakersfield, CA.

Bryan Norman (BS, Summer '10 & MS, Fall '13) works for the State of California, Department of Conservation, Division of Oil, Gas & Geothermal Resources as an Engineering Geologist.

Eva von Thury (BS, Summer '05 & MS, Spring '13) is a Project Geologist/ GIS Analyst at Padre Associates, Inc.

Jesse Mosolf (PhD, Fall '13) is a Field Geologist for the Montana Bureau of Mines and Geology.

Monica Erdman (BS, Summer '09 & MS, Winter '11) is a 4th year PhD student at Rice University.

Eryn (Burkhart) Torres (BS, Fall '12 & MS, Fall '14) worked as a development geologist for Venoco, Inc. for a year and recently began as a development geologist for LINN Energy in Bakersfield. She and her husband are expecting their first child in May!

Tess Mayall (BS, Winter '09 & MS, Spring '12) is employed as a Community Manager for Science Exchange in Palo Alto.

Sarah Medley (PhD, Summer '11) works as a Research Associate at the University of Virginia, Center for Diversity in Engineering.

Trevor Smith (BS, Spring '14) began his graduate career as a MS student working with Prof. Chen Ji.

Jennifer Bradham (MS, Winter '11) is a PhD student at Vanderbilt University.

Floyd Jaggy (BS, Spring '15 expected & MS, Spring '15 expected) was accepted into the 5yr BS/MS program in Earth Science at UCSB.

Timothy Becker (MS, Fall '13) is a Staff Hydrogeologist at Kear Groundwater, based in downtown Santa Barbara, CA. His supervisor, Jordan Kear, graduated from UCSB with a BS in Geology in Spring '94.

Noah Garrison (MS, Winter '04) just got hired as a Professor of Environmental Law at UCLA.

Christopher Stubbs (MS, Fall '10) is a freelance Marine Geophysicist and Survey Engineer, specializing in ultra-high res seismic, magnetic and sonar surveys all over the world.

Maura Quady (MS, Winter '13) recently welcomed a baby.

Lauren Simkins (PhD, Summer '14) began a postdoctoral research fellowship at Rice University working with John Anderson on constraining the timing and nature of retreat of the Antarctic Ice Sheet.

Eric White (MS, Winter '14) is working at Numeric Solutions in Ventura as a Geoscientist.

Scott Herman (MS, Winter '13) recently started his own consulting company (Vulcan Geoscience) for the geothermal and mineral exploration industries.

Amanda Willingham (MS, Spring '12) is working as a Geologist for Gold Canyon Partners in Alaska.

Jessica Thompson (PhD, Summer '13) is a Senior Geologist at Conoco Phillips.

Stephani Shusta (MS, Fall '13) is currently working full-time for the engineering and scientific consulting firm Exponent as an Environmental Scientist.

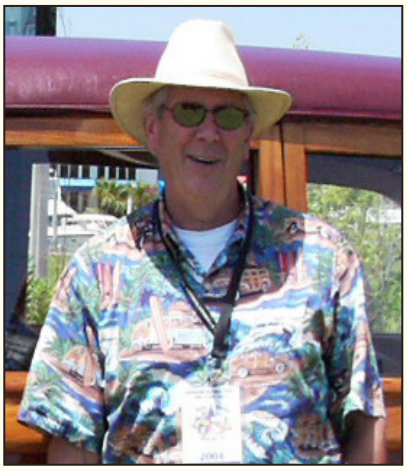
Elizabeth Lovelock (MS, Fall '10), is working in agriculture as co-owner of Apricot Apiaries, a honey bee business in Kimberly, Oregon.

Hanna Alexander (BS, Summer '08 & MS, Winter '13) and Steven Arauza (MS, Spring '11) tied the knot which was officiated by current grad, Rev. Daniel Luna of the United Church of Bacon.

Distinguished Alumni 2014

Every year, the department honors alumni whose accomplishments provide our current students with exemplary role models.

Steven Comstock



Steve Comstock came to UCSB in the Fall of 1965 on a football scholarship, as an undeclared major. He very quickly fell into Professor Robert Webb's "web" of mystery & discovery in the earth sciences. Sports, fraternities & geologic field trips consumed his freshman year… to the point he skipped too many classes… and lost his student military draft deferment. Steve entered the US Army in the fall of 1967 and served three years on active duty, rising to the rank of Captain.

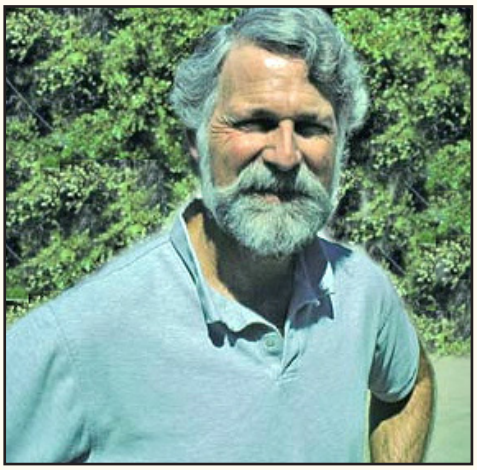
On his return, Steve re-started his education at American River College, earning an AA in Math & Physics. Meantime, he married his high school sweetheart, and they began their family. He returned to UCSB where he completed a BA in Geology in 1972 and then an MS in 1974. Under the masterful guidance of Norris, Hopson, Tilton, Clark, Wise, Sylvester, Crowell & Weaver, Steve backpacked into an area of the San Rafael Wilderness that hadn't been mapped on the ground since 1923. There he quantified right-lateral displacement along the Big Pine Fault and defined some unique paleoenvironmental elements of the Paleocene.

After graduating Steve joined Mobil Oil in Denver, where his early work as an exploration geologist led to some of Mobil's first computer-generated maps. Upon transfer to Mobil's Alaskan Exploration group in Dallas, Steve led summer field expeditions to Alaska from 1976-1979. It was especially in this role that the strong field program at UCSB helped Steve in his early career. In 1979 Steve became Mobil's Geologic Supervisor in the Gulf of Mexico, managing hundreds of wells, including many of the first deep-water platforms. These were the years of burgeoning computer capabilities revolutionizing exploration capabilities. Steve helped Mobil capture hydrocarbon assets using these new methods.

In 1989 Steve became President & Managing Director of Mobil Exploration Norway, where he managed exploration, acquisition, and development of Stratfjord, the world's largest offhore oil field. In 1991, he returned to Dallas as Mobil's International Exploration Manager. From 1993-1997 Steve was Mobil's Vice-President of Upstream Planning and Technology before he became Vice-President of Drilling, a unique position for a geologist, directing all drilling operations around the globe. Upon the Exxon-Mobil merger in 1999, Steve became Deputy GM of Mobil Upstream Research Lab in Dallas and subsequently became the VP of Upstream Technical Computing for XOM. In 2005, he became the CIO for XOM's Global Upstream, incorporating productivity, business, commercial and technical computing.

Steve & Sharen retired in 2007 ("Believe me," she says," being a geologist's wife for 48 years is hard work"). He is active in United Way and the Boy Scouts. They reside half the year in Austin, Texas on Lake Travis… because all 4 of their children and 9 grandchildren live in Texas… and the other half in Santa Barbara, with a view of the UCSB campus. Full circle.

James Mattinson



Professor Emeritus James Mattinson took his B.A. and Ph.D. (1970) in geology at UCSB where, among many other awards and honors, he was a Woodhouse Scholar. He joined the UCSB faculty as an assistant professor in 1977. His research focuses on two major areas of isotope geology: application of geochronology and radiogenic isotope tracer studies to problems in tectonics and igneous and metamorphic petrology; and advancement of understanding of the commonly complex behavior of the U-Pb system in zircon, one of the premier geochronology minerals. Mattinson has provided technological breakthroughs in zircon dating that are now being employed by the best labs around the world. Using clever combinations of annealing zircon grains and chemical dissolution, Mattinson discovered ways to reduce the sources of error in zircon ages. His techniques result in radiometric ages that have much, much smaller uncertainties than previously possible. Mattinson taught the gamut of courses over the years, including introductory geology, mineralogy, igneous petrology, geochemistry, summer field geology, and graduate courses in geochronology. He retired in 2009.

Kaj Hoernle

Kaj Hoernle completed his MS and PhD degrees, plus his postdoctoral study, at UCSB between 1982 and 1991. After a second postdoc at UCSC, he became a research scientist and lecturer. His research has focused on applying volcanology, igneous petrology, geochemistry, and geochronology as tools to solve geodynamic problems related to convergent and divergent margins and intraplate volcanic systems, including related hazards and climatic impact of volcanic emissions. About half of his research has been conducted on land, and the other half in the oceans. In 1994, Kaj received an Associate Professorship at the Christian-Albrechts Unversity of Kiel and the GEOMAR Research Center for Marine Geosciences affiliated with the university. In 2004, GEOMAR merged with the Institute of Oceanography (IFM) in Kiel to become the IFM-GEOMAR Leibniz Institute of Marine Sciences. As Deputy Director from 1999 through 2007, Kaj played a key role in the merger of the two research institutes. In 2012 this institute became the GEOMAR Helmholtz Center for Ocean Research.

At GEOMAR, Kaj set up and maintained the first radiogenic isotope group with facilities for analyzing Sr-Nd-Pb-Hf and U-series isotope ratios in magmatic, metamorphic, and sedimentary rocks, with an emphasis on volcanic rocks. Kaj served as a coordinator for >50 scientists in a collaborative research center focused on subduction zones and natural disasters. Kaj has held many leadership positions (Deputy Director, Head of Volcanology, Speaker) within GEOMAR where he coordinates diverse disciplines, including physical oceanography, maritime meteorology, marine biogeochemistry, marine ecology and biology, and the geology of the seafloor and margins of the ocean basins. Kaj has been principal advisor to 14 MS students, 10 PhD students, and 13 postdocs. Clearly, Kaj is both blazing new trails and leaving a legacy for the next generation.

Kaj married Teresa Aydelotte who graduated from the UCSB Geology Department in 1988. After a year of mud-logging, she went to San Francisco State law school and is a member of the California bar. In Kiel, she runs a foreign exchange program, teaches Anglo-American law and translates everything from courses on "Cloud Physics" to books on "Natural Hazards." They have three sons, ranging in age from 13 to 19.

Roy Patterson

Roy Patterson graduated with a bachelor's degree in Geology in 1975 and a master's degree specializing in tectonic geomorphology in 1979. Although he submitted his thesis in 1977, Roy began working for the international consulting firm Dames & Moore which caused a delay in getting his MS degree awarded.

Roy has been fortunate to spend his 37-year career as a consulting geologist with one company, Dames & Moore, where he became a Partner in 1990. Following the acquisition of Dames & Moore by URS Corporation in 1999, Roy continued his career with URS. The first nine years of his career focused on geologic and seismic hazards evaluation for critical structures. Roy's career evolved to environmental assessment of soil and groundwater impacts and remediation of many large-scale former industrial and petroleum-related sites in the late 1980s. He continues to practice in that area today.

The Dames & Moore acquisition by URS allowed him to relinquish his operational and office management responsibilities and turn his attention to working with clients and mentoring staff. He focuses on helping his clients understand their environmental liabilities, assessing soil and groundwater impacts, and developing remediation strategies to address those impacts. Whereas most of his work is in the Southern California area, Roy has worked on very large redevelopment projects in Hong Kong and Shanghai for a major entertainment company. For the last eight years, he has been lead investigator for former petroleum refining-related facilities in the Los Angeles Basin for a major oil company.

Outside of work, Roy devotes his time to his family, is an avid saltwater fisherman, and is a home chef. Roy is happy to provide advice regarding careers in consulting geology. He can be reached at roy.patterson@urs.com.

2013/14 Earth Science Fund Drive

We had a great response to our funding appeals last year. It is gratifying to see our alumni taking a lasting and consistent interest in their department. When I explain to potential donors that we have substantial commitment of support from our alumni, it makes us believable about our needs and we are taken seriously. The department has benefited in particular from employer matching gift programs. Be sure to check with your company when you make your gifts this year!

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Graduate Alumni Career Panel

Spearheaded by graduate students Elizabeth Steel, Laura Reynolds, and Eric Schoettle, our Third Graduate Alumni Career Panel was held on Friday morning, April 25, prior to the Graduate Research Review that afternoon. With financial support from the Graduate Division and the department, these grad students invited a suite of alumni representing a spectrum of Earth Science careers. Lurena Hoffman is a crime scene investigator for the Norfolk, Virginia, police department. Determined to apply her geologic expertise to solving crimes, Lurena "made" a position for herself as the first forensic geologist in the Norfolk police force. Melissa Morse has spent two decades as a development and exploration geologist in the oil and gas industry. Over a decade ago, she moved from ExxonMobil to Occidental Petroleum, where she now leads their reservoir characterization and modeling team. At the time of the panel, Noah Garrison was an attorney with the Natural Resources Defense Council's water program, where he focused on issues including urban runoff, green infrastructure, and the bearing of Low Impact Development (LID) on water supply, energy use, and climate change. Noah has now become the Environmental Science Practicum Director in UCLA's Institute of the Environment and Sustainability where he coordinates their interdisciplinary BS program. Rounding out the panel was Steve Comstock who brought a seasoned perspective following a very successful and diverse career with Mobil and then ExxonMobil.

In front of a Webb Hall audience of undergraduates, graduates, and faculty members, this panel spent two very engaging hours describing and answering questions about their career paths and choices, what gave them satisfaction in their work, what hurdles they faced, and their view of both opportunities and challenges in the years ahead. One might summarize their advice to students as, "Be broad, master the fundamentals, learn to think critically and communicate well, take advantage of the talented teachers and researchers at UCSB, follow your passions, and be creative, adaptive, and opportunistic." The striking diversity of their career paths highlighted the value of that advice!

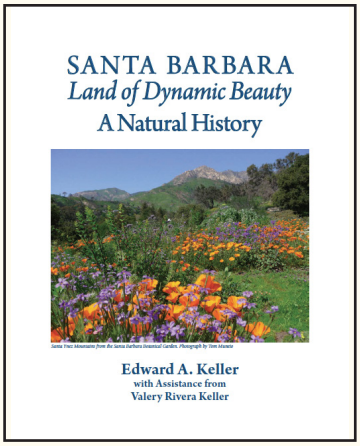
- Professor Doug Burbank

Hot off the Press...

Hi Everyone-- I published with my wife Valery a book in 2011 about the natural history and geology of Santa Barbara with an introduction about the big tectonic picture, followed by natural hazards and then a discussion in several chapters about the geology of Goleta, Santa Barbara, Carpinteria and other areas. The book sold out and I do not plan another printing. Below is a link to my book that you may download for free. Hope you enjoy it!

-Professor Ed Keller

Santa Barbara *Land of Dynamic Beauty* A Natural History
http://128.111.108.210:8181/2/SantaBarbara_LandofDynamicBeauty.pdf



Annual Department Awards Ceremony

2013-2014 Academic Year

Graduate Awards

G.K. Gilbert Award
Joseph Stern

Harry Glicken Memorial Award
Ryan Neilson, Jason Schmidt

Richard and Eleanor Migues Graduate Field Research Award
Beau Gentry

George Tunell Endowed Fellowship
Sophie Briggs

Wendell Woodring Memorial Award
Carlye Peterson

Preston Cloud Memorial Award
Mary Kate Fidler, Daniel Livsey, Tyson McKinney, Allison Price, Lauren Simkins, Elisabeth Steel

Lloyd and Mary Edwards Field Studies Fellowship
Al Neely, Jake Poletti, Eric Schoettle

RV Fisher Award
Allison Price

Geophysics Award
Stephanie Tsang

Alumni Graduate Award for Research Excellence
Jorge Crempien, Robert Holder, Laura Reynolds, Lauren Simkins, Michael Stearns

Coast Geological Society Award
Elisabeth Steel

Global Field Travel Fund
Mary Kate Fidler, Beau Gentry, Demian Nelson, Brenna Quigley

Graduate Student Opportunity Award
Sophie Briggs, Joshua Garber, Demian Nelson

Olivia Nicholson was awarded the Norris Prize.

Recipients of the Graduate Student Opportunity Award.

Undergraduate recipients of the Global Travel Field Award.

Al, Jake & Eric received the Edwards Field Studies Fellowship.

Undergraduate Awards

William Bushnell Memorial Scholarship
Alexa Everson

Robert M. Norris Prize in Field Geology
Olivia Nicholson

Outstanding Graduating Senior
Allison Kimbrough, Mark Edwards, Daniel Lliteras, Katherine Wentz

Outstanding Academic Achievement
Olivia Anderson, Colin Eckert, Mark Edwards, Theresa Fagnan, Paige Granneman, Christopher Harron, Ashley Kammet, Mark Korte-Nahabedian, Daniel Lliteras, Israel Magana-Cardenas, Christopher Older, Trevor Smith, Katherine Wentz, Jason Womer

Distinction in the Major Award
Olivia Anderson, Nolan Blackford, Colin Eckert, Paige Granneman, Mark Korte-Nahabedian, Christopher Older, Angela Roman, Jason Womer

Charles Douglas Woodhouse Award
Olivia Anderson

Venoco Field Scholarship
Christopher Older, Angela Roman

Department Field Award
Olivia Anderson, Adam Arce, David Betran, Nathan Dickey, Colin Eckert, Joshua Franck, Erin Heimburge, Alexis Iwasiw, Jenni Jenkins, Mark Korte-Nahabedian, James McNeil, Angel Monarrez, Olivia Nicholson, Addison Sani, Michael Stein, Justin Steinmann, Jason Womer

Fugro West Award
Adam Arce, Alexa Everson, Joshua Franck, Jenni Jenkins, Olivia Nicholson, Justin Walker

Webster Field Award
Nolan Blackford, Paige Granneman

Global Field Travel Fund
Marius Vilkas, Jason Womer

Leadership Award
Nathan Dickey

Coast Geological Society
Olivia Anderson

List of Theses/Dissertations

Fall 2013 - Fall 2014

Timothy Becker, MS, Fall 2013
"Heat and B-10 Enriched Boric Acid as Recycled Groundwater Tracers for Managed Aquifer Recharge"

Burch Fisher, PhD, Fall 2013
"Deciphering Landscape Drivers and Signatures in Tectonically Active Landscapes using Google Earth Imagery, Remote Sensing, and Cosmogenic Radionuclides"

Qiming Liu, PhD, Fall 2013
"Broadband Simulation With Physics-based Seismic Source Models"

John Moore, PhD, Fall 2013
"Studies on Cambrian Small Shelly Fossils"

Jesse Mosolf, PhD, Fall 2013
"Stratigraphy, structure, and geochronology of the Abanico Formation in the Principal Cordillera, central Chile: Evidence of protracted volcanism and implications for Andean tectonics"

Bryan Norman, MS, Fall 2013
"Structural Evolution of the Central Schell Creek Range, White Pine County, Nevada"

Stephanie Shusta, MS, Fall 2013
"Sulfur Isotope Fractionation Accompanies Dimethylsulfide Disproportionation by Methanosarcina sp. Strain MTP4"

David Wampler, MS, Fall 2013
"Tectonic Geomorphology of the Gaviota Coast"

Joseph Stern, PhD, Winter 2014
"Regional Benthic Foraminiferal Oxygen Isotope Stacks for the Last Glacial Cycle"

Eric White, MS, Winter 2014
"Changes in the Indian summer monsoon during the last interglacial: insights from two hydrological proxies"

Robert Holder, MS, Spring 2014
"Monazite Trace-Element and Isotopic Signatures of Ultrahigh- Pressure Metamorphism: Examples from the Western Gneiss Region, Norway"

Bryan Murray, PhD, Spring 2014
"Crustal extension and magmatism during the mid-Cenozoic ignimbrite flare-up in the Guazapares Mining District and Cerocahui basin regions, northern Sierra Madre Occidental, western Chihuahua, Mexico"

Samuel Tyson McKinney, MS, Spring 2014
"Evaluating Mechanisms for Rare Earth Element (REE) Mineralizationin Proterozoic Gneiss, Music Valley, California"

Graham Lederer, PhD, Summer 2014
"Time-scales of Crustal Anatexis: Monazite Petrochronology of Himalayan Granites"

Lauren Miller Simkins, PhD, Summer 2014
"Antarctic Raised Beaches: Insight on Geochronology, Relative Sea Level, and Coastal Processes"

Michael Stearns, PhD, Summer 2014
"Genesis and Evolution of the Pamir Plateau: a Petrochronologic View"

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