Greetings from the Chair – Mark Hemphill-Haley (mark@humboldt.edu)

There have been big changes in the department since last year’s newsletter. I am in my second year as chair and have finally managed to figure out how things work, I think. I really appreciate the help and guidance provided by Lori Dengler last year as I learned the “ropes.” That brings about the first big change. Lori retired from the department at the end of the summer and now has “emeritus” at the end of her name. Fortunately, she is still an active part of the department and can now focus more on her work with the Redwood Coast Tsunami Work Group (https://www.facebook.com/RCTWG), traveling across the world in outreach and research associated with tsunami and hazard education and her recent publication of a book about Kamome the tsunami boat that washed ashore near Crescent City after the 2011 M9 Tohoku, Japan earthquake (see Lori’s section for more information). This also affords her more time to travel with her husband, Tom Lisle, who retired from the USFS-Redwood Sciences Lab a couple of years ago. Lori has been a member of the faculty at HSU since 1979. Congratulations Lori!

This spring marks the last regular semester of teaching for Andre Lehre as he completes his “FERP” (Faculty Early Retirement Program). Countless students have benefited from Andre’s knowledge regarding geomorphic processes, especially regarding hillslopes and streams. It has been a great pleasure for me to learn from and work with Andre for the past 30+ years, thank you Andre!

Last year I reported that we were advertising two tenure track positions (the first permanent faculty hires in 14 years!). As it turns out the searches were tremendously successful, in fact, we managed to get three permanent faculty as a result! We had an incredible pool of applicants for both searches, in petrology and geomorphology. As a result, we are pleased that Dr. Brandon Browne is now an Associate Professor in Petrology. As I mentioned in last year’s newsletter, Brandon came to the department as a single year sabbatical replacement. He immediately proved to be an excellent teacher, in the classroom and the field. He earned his PhD at University of Alaska, Fairbanks. His research includes field, geochemical and analytical investigations of volcanic eruptions. His current study areas include the Sierra Nevada, Cascades, and Alaska.

The geomorphology search included stellar candidates, so much so, that we invited two
finalists and are happy that both are now part of the faculty. The first is Dr. Melanie Michalak. Mel taught here the previous two years as a lecturer. She has taught a wealth of our courses including Structural Geology, Geomorphology, Earthquake Country, Field Methods, General Geology and Field Camp (both at California Springs and the Roberts Mountains). She and I have co-taught the Geologic Field Excursion of the Western U.S. course (we are headed to Utah this spring). She received her PhD from UC Santa Cruz. She is a tectonic geomorphologist, specializing in the exhumation, uplift and erosion of large orogenic belts. She is now setting up a sample preparation lab for low temperature thermochronology and geochemistry in Van Matre Hall.

Our second geomorphology position represents a new direction for us, Jasper Oshun, recently defended his dissertation work at UC Berkeley where he worked with William Dietrich. His research is within the "Critical Zone," that area between the tips of the treetops to the bottom of their roots. He uses field-based geology, arrays of real-time sensors and stable isotope analyses to understand the interaction between slopes, streams, geology, plants and water. We also look forward to working with Jasper in the development of international geologic study courses. He and his brother, Lucas, are the founders of the Global Student Embassy (GSE - http://globalstudentembassy.org) which promotes international study.

We also have two full-time lecturers this year, both alumni. Amanda Admire and Dr. Jay Patton. Amanda is a researcher working with Lori Dengler on describing water velocities in harbors related to better understanding tsunami currents. She is teaching Earthquake Country both in the classroom and as an online course. Jay is teaching this semester as a sabbatical replacement for Dr. William Miller. His courses include Sedimentary Geology and Quaternary Stratigraphy. He will also be teaching Whole Earth Geophysics and Field Methods in the spring. Jay earned his PhD from Oregon State University where he studied the sedimentary and geophysical evidence for earthquakes off the coast of Sumatra.
We are proud that Humboldt Geology has maintained a curriculum that is solid in field-based geologic learning. We still believe that hands-on learning is extremely important in producing good scientists. This last semester we scheduled over 50 field trips to local areas and to the northern Sierra Nevada. In addition, we are building labs on campus to support learning using new technologies, for example, we have a small GIS lab, in part supported by generous donor funds, that is dedicated to Geology and Geoscience students. They are able to use GIS software (ESRI ArcGIS) and photogrammetric analysis software (PhotoScan, aka, Structure-from-Motion). All three of the new faculty are building or reconfiguring labs to support undergraduate and graduate research. We are also upgrading our field instruments (RTK and Total Station, both generously donated) to help us teach valuable skills to our students.

As you would expect our students are still stellar. We have been well represented at national meetings this past year: Michelle Robinson, Sylvia Nicovich, Nathan Graham, Jessica Vermeer, and Brandon Crawford presented their research at the Fall international American Geophysical Union (AGU) meeting in San Francisco. It was great to see their presentations! Additionally, this past year Heath Sawyer, Ben Erickson and Tim Bailey presented at Geological Society national and regional meetings. Raul Becerra, Jessie Vermeer, Michelle Robinson, and Ben Erickson are presenting at AGU next month. Hector Flores, an undergraduate, was the recipient of a prestigious NSF Research Experiences for Undergraduates Award; he studied in Baja, Mexico during winter break and then attended a summer lab session at University of Missouri-Kansas City. The results of his research were presented at the National GSA meeting. We recently found out that Jesse Gates was just awarded a similar grant for this year. Congratulations Hector and Jesse!

I have a few of my own students to brag about here; Sylvia Nicovich defended her master thesis work on the southern extension of the Little Salmon fault. At last year’s AGU meeting she was approached by a reporter from KQED, a SF Bay Area news station. He wrote a great story about a part of Sylvia’s research [http://ww2.kqed.org/science/2015/01/22/when-finding-faults-geologists-must-sometimes-become-ditch-diggers/](http://ww2.kqed.org/science/2015/01/22/when-finding-faults-geologists-must-sometimes-become-ditch-diggers/) The theme of the story was the determination of Sylvia and fellow students to get their field data, including hand digging an impressive trench across a splay of the Little Salmon fault. It also describes recent, similar trenching conducted by HSU’s Bob McPherson and USGS folks (see Bob’s discussion). To me the article epitomizes the HSU geology spirit. Sylvia is now working on her Ph.D. at Montana State University. Brandon Crawford, who defended his senior thesis on uplifted Holocene marine terraces at Singley Flat at Cape Mendocino, is now working on a master’s thesis at Idaho State University. Melanie Steven’s completed her masters thesis on the use of Interferometric Synthetic Aperture Radar (InSAR) to detect slope movement in forested terrane. She is now with the US Forest Service in Arizona. Michelle Robinson and Jessie Vermeer are writing up their masters theses and will defend in the spring. They both have done great research on the influence of the Mendocino Triple Junction on the geomorphology of the area, Michelle working on terraces in the headwaters of the Mattole River and Jessie re-evaluating the crustal response along the coast since the 1992 M7.1 Petrolia earthquake.

Two of our students, Nate Graham and Sylvia Nicovich, were selected to represent HSU in a California State University research competition. Twenty-three

Nate Graham, Sylvia Nicovich and Brandon Browne at the CSUResearch Competition at CSU San Bernardino.
campuses and 250 students competed. Nate won first place for his research with Dr. Brandon Schwab and Dr. Brandon Browne. We are very proud of their effort and excellent work!

At this point I need to mention Laurie Marx, our department’s Academic Support Coordinator (ASC). In truth I would have never survived the past year without her incredible help. She knows how things work in the department, college and university better than anyone I’ve ever met. We could not have had the success in these searches without her incredible organization. She also has a great attitude and sense of humor which makes chair life much better. Also, in her spare time Laurie is a great potter!

Recently, the Dean of our college asked if we had evidence for the success our Environmental Systems graduate program. I was happy to report that of the 37 degrees earned in the past 10 years 100% were either employed in earth science positions or working on advanced degrees!

We had a great visit recently from alumnus Steve Douglas ('68) who was on a tour of the west coast, including a visit to Dr. Frank Kilmer in Oregon. Steve was one of the first students in the geology program, back when it consisted of just John Young, Frank Kilmer and a young John Longshore. Steve did one of the very first senior theses in the department (#4) and worked on the geology/petrology of the New River area near its confluence with the Trinity River. Steve has been a donor supporter of our undergraduate students, especially to help them go to field camp. He said he believes Humboldt Geology is still carrying on the tradition of producing great geologists. We appreciate knowing that our alumni believe we are still on the right track!

Many of you remember our son Ethan who has been coming by field camp since he was 5 years old. He is now a first year student at the University of Oregon. How time flies!

Faculty/staff updates

Kenneth Aalto

Summer, 2014, I helped organize and participated in the INHIGEO (International Commission on the History of Geological Sciences) held at the Asilomar Conference Center in Monterey, CA. Former HSU undergrad Greg Stock, now Yosemite National Park Geologist, greatly aided us by running a post-meeting field trip that included a two day visit to Yosemite Valley. Geoscientists and historians of science from every continent attended. I was honored to introduce the ‘grand master’ of sedimentary tectonics, William Dickinson to the group. Indeed, Bill Dickinson organized a seminal plate tectonics conference at Asilomar nearly a half century ago and

Eldridge Moores, Ken Aalto and Bill Dickinson at Asilomar, August, 2015.
it was wonderful to hear at first hand his reflections on an outstanding career in geology. Sadly, he passed away earlier this year (2015).

I continue with research ties to the Franciscan Complex, having attended a Franciscan 'old timers' conference in Sonoma area this past June. I as well continue with studies in the history of geology, lately focusing on late 19th Century research in South America [2015, Hermann Karsten, pioneer of geologic mapping in northwestern South America: History of Geo- and Spaces Sciences, v. 6, p. 57-63, doi:10.5194/hgss-6-57-2015].

Amanda Admire

This past year has been quite enjoyable and eventful! I have continued my work as a Research Associate with Lori Dengler. Our focus has been on understanding the currents produced by tsunamis in Crescent City Harbor. Using an Acoustic Doppler Current Profiler (ADCP), we measured the small tsunami signal from the April 1, 2014 event produced by an M8.2 earthquake in Chile. Analyzing this event has led to the expansion of our understanding of the ambient conditions in the harbor as well as the response after a tsunami arrives. This summer we had a wonderful opportunity to travel to Prague, Czech Republic to present this research at the International Union of Geodesy and Geophysics (IUGG) Meeting held June 22 – July 2. At this meeting we had a chance to exchange ideas with other researchers also studying tsunami currents. It was a great experience!

We have continued our collaboration with the Humboldt Bay Harbor District, Chevron, and NOAA National Observing System (NOS) working on the nation-wide Physical Oceanographic Real-Time System (PORTS) project. This project also uses ADCPs installed on several structures and buoys in Humboldt Bay and focuses on measuring currents. At HSU, we work to maintain these instruments and keep them functioning as part of this national network.

In the past year, I have continued teaching the online version of GEOL 106 – Earthquake Country. The development of this online course began with Mark Hemphill-Haley and over the course of the past year we have worked together to refine and improve this learning environment. In September 2015, we received a CSU Quality Online Learning and Teaching (QOLT) Exemplary Award for our blended-online GEOL 106 course. Additionally, this fall I have been given the opportunity to teach a session of GEOL 106 face-to-face, and am excited to continue on in the spring semester.
Brandon Browne

Hello HSU geology friends! I am thrilled to now be a permanent faculty member in the HSU Geology Department. I am teaching Earth Materials, Optical Mineralogy, Summer Field Camp, and Instrumental Methods on the Scanning Electron Microscope. I also proposed a new Volcanology course, which will hopefully be offered in Fall 2016. I am excited to be working with some terrific undergraduate thesis students on volcano research projects. Raul Becerra is studying Tunnel Cone, a basaltic volcano in the Golden Trout Wilderness of the southern Sierra Nevada. He has already completed his geologic map and found evidence of Hawaiian-style fire fountaining from this ~175 ka eruption. Wow! Many more discoveries are sure to be right around the corner as he finishes polishing thin sections. Raul and I will be presenting this research via poster at AGU in San Francisco this December. Rob Cowdrey is conducting a petrographic and geochemical study of a parasitic cone on the SW flank of Mount Shasta called Spring Hill. And, Nick Richard is examining pre-eruption magmatic temperatures of a very mysterious Sierra Nevada rhyolite that erupted~185 ka called Long Canyon Dome. Not to worry – I’m sure Nick will crack the case!

Elsewhere on the research front, a colleague and I contributed the chapter on Rates of Magma Ascent and Storage to the 2nd edition of Encyclopedia of Volcanoes, which is exciting to be part of such a wonderful reference book. And, I am slowly beginning to make some changes to the HSU Experimental Petrology Laboratory. I will be adding (1) a new welding instrument for safer and more efficient welding of precious metal tubing, (2) two horizontal furnaces that will be able to replicate temps (up to 850° C) and pressures of magmatic processes common in intermediate and felsic magmas in the shallow crust (0-10km depth), and (3) a Titanium-Zirconium-Molybdenum (TZM) pressure vessel that will allow us to experimentally replicate mafic magmatic processes in the shallow crust.
Finally, my family continues to be amazed and inspired by our surroundings, whether we are exploring the beaches or drifting through the upper canopy of redwoods. Carrie and I feel so lucky to be raising our wild-hearted boys in Humboldt. (Levi and Clark like it too!)

Bud Burke

Hi all, I wish to make this newsletter reflection more about you than about me. A heartfelt thank you! I am retired from formal teaching, but enjoying a bit more travel, and continue with research interests in Soil Geomorphology and Quaternary Geology. These research interests are accommodated primarily through involvement with students and colleagues in Northern California, resulting in attendance at a number of field conferences, poster presentations at GSA and AGU meetings, and many discussions with new and old friends – I've renewed many friendships. In July of 2015, it had been 10 years since the viral attack “ate” the myelin of my central nervous system and allowed me to see the geology from a wheelchair! This past year has been a year of improved field time and travel, but that is only possible because of help from many of you – for each trip I require an entourage to accommodate the needs of a “paraplegic field geologist”. A day trip might involve hooking up and pulling a trailer with the 4X4 wheelchair, a couple of transfers to and from that chair, an endless list of “please get me’s”, and maybe an extraction of a stuck power chair! An overnight trip involves tent and cot set up/take down, transfers to and from the cot, an additional list of aide that is required for the normal morning activities, etc., etc., etc. I cannot express my appreciation enough for those folks directly involved in allowing me to be in the field. In addition, many of you have given to me in so many ways – I’ll try to summarize using recent travels and a little HSU Geology history. There have been many highlights to my year, maybe none more rewarding than the recent Pacific Cell of the Friends of the Pleistocene [FOP] led by Joanna Redwine. We gathered to look at the Quaternary Geology of Mohawk Valley near Quincy, CA. The trip leader has been long recognized as a true leader. For example, 2003 was the inaugural year of the Patricia O. McConkey Award given then for the
Outstanding Graduate Thesis at HSU. Joanna Redwine was the recipient of that first award. She went on to receive her PhD at the University of Nevada Reno, where her dissertation advisor was Ken Adams, who had years previously received his undergraduate degree from HSU. Now employed by the Bureau of Reclamation in Denver, Joanna and her co-conspirators led a trip of awesome proportions. Joanna and FOP have attracted a fair number of HSU geology Friends. However when we gathered for the “associated with HSU Geology” group photo, I was overwhelmed with the shear number, let alone the multiple decades of association! I am so proud to be a part of the HSU geology family – thank you!

Furthermore, the Van [named Dusty] you folks purchased for me is seen here as I load up surrounded by some of an entourage ... I can not reach deeply enough into my heart to tell you what pleasures Dusty has provided for the past 70,000 miles!!!!

Active research revolves around local and near local soil stratigraphy and weathering/erosion rates. The research near Clear Lake working with Bomac, students, and a host of colleagues is on-going and will take a turn towards the effects of fire on stone weathering and soil erosion – see the page by Bob McPherson for further thoughts about the Cache Creek evolution, and the devastating fire that occurred there. Eolian input to the soils of Belize is an ongoing research effort of grad student Heath Sawyer. Locally we’ve been trying to delineate the development of the soil, and the timing of the emplacement of the eolian materials in which that soil is formed. The photos below show an exposure and a very happy Bud looking at the exposure!

Lastly, I’d be remiss if I didn’t point out a few thoughts on the Bud Burke Scholarship for research in Quaternary Geology and/or Geomorphology. Although the scholarship carries my name, it was originated by, and completely funded for the first 4 years, through the generosity of Don and Ellen Easterbrook. Their mentoring and friendship through the years is priceless, and their insistence that the scholarship be in my name, not theirs, is to say the least, unique! While I am honored and humbled, it is not ME that created the scholarship – it is YOU. The Easterbrooks
have always been impressed with the quality of Quaternary-minded students that graduate from Humboldt, as undergraduates and/or with a Masters. They have frequently conveyed to me how pleased and proud they are to have been a major aspect of my early geologic training. They likewise share in my pride of Humboldt Geology, and in you. I’m sure they would appreciate your donations to the scholarship fund, allowing a continuation of the scholarship beyond the original 5 year expectations. It is the showing of FOPers that demonstrates to so many Quaternary scientists in the western states that helps to promote who we are – Go HSU Geology!

**Sue Cashman and Harvey Kelsey**

We continued our “year off” as visiting scholars at the University of Washington (Sue) and at University of Washington and the U.S. Geological Survey (Harvey), and returned to Arcata in August. It was great to arrive back at a newly-repopulated (by faculty members, anyway) Geology Department!

Harvey is continuing to split his time between Seattle and Arcata this academic year. He is continuing studies of recent faulting and folding in central Washington state with colleagues at the USGS.

I was able to finish two long-term projects during my year at UW, both were done in collaboration with geology friends and colleagues. On the research side, I co-wrote a paper investigating relationships between the La Grange fault and regional Tertiary uplift in the Klamath Mountains (Piotraschke at al., 2015, in “Lithosphere”). Our study links evidence from fault rocks at the La Grange fault, a site well known to HSU structural geology students, to the uplift history of the Klamath Mountains recorded by apatite fission track and apatite (U-Th)/He thermochronometry data.

On the pedagogy side, the “Bringing MARGINS Research into the Classroom” teaching materials that I’ve been working on are completed and ready to use at the Science Education Resource Center website (you can access them at http://serc.carleton.edu/margins/index.html). The materials are the product of a 3-year project sponsored by the GeoPRISMS program. Teams of researchers combined forces with science teaching experts at the Science Education Resource Center in Carleton, MN, to develop suites of classroom activities for upper division geology students. The activities use data, research methods, and research findings from the four MARGINS subject areas: “Rupturing Continental Lithosphere”, Seismogenic Zone Experiment”, “Source to Sink”, and “Subduction Factory”. I learned a tremendous amount by working on one of these teams. The spring 2014 structural geology class at HSU participated in this project by field-testing one of the lessons. I’ve been very busy teaching classes at HSU this fall. A few new coastal mapping projects with the field methods classes have been a highlight.

Harvey mapping late Q sediments, Sue and UW mascot
Lori Dengler

I finally took the plunge, officially retiring from teaching this summer and gaining emeritus status. I am still on campus on a fairly regular basis. I have two contracts that run for another couple of years – one continuing to manage maintenance for the Humboldt PORTS project http://tidesandcurrents.noaa.gov/ports/index.html?port=hb and the other, continuing the tsunami support efforts with the California Geological Survey. I am currently negotiating three new contracts to continue various aspects of earthquake and tsunami outreach and hazard assessment. Looks like I will still be kicking around the department for another couple of years.

I continue to keep involved with other earthquake and tsunami efforts. This is my second year as chair of the Advisory Committee for the California Integrated Seismic Network (CISN). CISN is the platform that integrates USGS, CGS, Berkeley, and CalTech seismic data into a seamless interface for users and the public and is now taking shape as the organization coordinating California’s Earthquake Early Warning efforts. This summer, Amanda Admire and I had a great time in Prague attending the 26th International Union of Geodesy and Geophysics. We both presented papers at the IOC UNESCO tsunami session. In October, I got to work with a great crew of folks from the Cascadia Earthscope Earthquake Tsunami Education Project while running a 4-day workshop for 27 North Coast teachers, interpreters and emergency managers in Arcata.

On November 5, my first book was released. I never intended to write a book but this project is not an academic tome and sometimes a story so extraordinary drops in one’s lap that you can’t turn away. “The Extraordinary Voyage of Kamome: A Tsunami Boat Comes Home” is a bilingual children’s book that tells the story of a boat that beached in Crescent City about two years after the tsunami tore it away from Japan. I have been so fortunate to work with co-author Amya Miller, Special Assistant to the City of Rikuzentakata and with amazing Arcata artist Amy Uyeki to tell the sweet story of how a small boat linked two tsunami-vulnerable communities on opposite sides of the Pacific. The book is not only a first for me, it is the inaugural publication of Humboldt State University Press. More about the book and where to find it at http://now.humboldt.edu/news/tsunami-boats-journey-captured-in-new-childrens-book/, http://humboldt.edu/kamome/ and on Facebook at www.facebook.com/kamomeboat
**Don Garlick**

Now 80 years old, I have transitioned from teacher to student. Although I did present one colloquium this year, “Evolution of our Atmosphere”, I now chiefly consume, rather than provide, education. I attended every colloquium during the past year, all of them extremely informative. I also read two superb books: Sean Carroll’s “The Particle at the End of the Universe” and Frank Wilczek’s “A Beautiful Question”. From the latter I learned that “the mass we successfully calculate for a nucleon depends very little on quark masses, which are relatively tiny. Almost all of a nucleon’s mass, and therefore almost all the mass of ordinary matter in the Universe, arises from pure energy according to Einstein’s $m = E/c^2$. That energy arises from the kinetic energy of confined quarks and from the field energy of gluons that confine them”. When you step on a scale, you are really measuring your energy!

I hear that our brains consume 20% of our energy. I fear that most of mine is dissipated as heat, as revealed by the attached photograph recorded via thermal infrared light reflected from a heat-reflecting window in Corning’s Museum of Glass. Amazingly, a single strand of Corning’s optical fiber can, in principal, carry the world’s entire internet traffic of $10^{12}$ bits per second. A couple of Corning engineers expressed interest in my research (with B. Kamb, past Provost of Caltech) into the strange optical-fiber properties of anisotropic ulexite. I gave them a copy of our paper. It was Ken’s son, Emil, who first pointed out to me the mysterious cones of light seen in a slab of ulexite. I continue to be fascinated by Martian geology, and have a collection of interesting images that I could share with the Department if given another chance at a colloquium. I look forward to reading about the achievements and adventures of our entire outstanding faculty.

**Eileen Hemphill-Haley**

This past year I’ve been wrapping up three research projects focusing on different aspects of earthquake and tsunami hazards for the U.S. West Coast. The first project –and current record holder for the longest running – was supported by the USGS SAFRR (Science Application For Risk Reduction) project, and involved investigating numerous locations along the California coast for possible evidence of tsunami inundation. The project also included some additional support to collect new observations on tsunamis and earthquakes at Crescent City, which our team from HSU (including Harvey Kelsey and some really great students) was quite happy to pursue. Amongst a number of new findings was that: (1) coseismic subsidence accompanied the AD 1700 Cascadia subduction zone (CSZ) earthquake; and (2) the stratigraphic record of the 1964 tsunami is sparse and non-distinct, although the tsunami was quite destructive to the area. The first point supports the current deformation model, and definitely makes Bob McPherson happy. The second point demonstrates that unless ideal conditions exist to preserve tsunami deposits from
events even as large as the 1964 tsunami, there probably will not be stratigraphic evidence to record the event. This is significant for understanding tsunami hazards for the central and southern California coasts because, although many locations are probably susceptible to inundation from farfield tsunamis great enough to cause damage, there appears to be no definitive supporting stratigraphic evidence for any such events at least over the past several hundred years.

In the figure to the left, from a site just northeast of downtown Crescent City, check out the 1964 tsunami deposit (A-C) and compare it with the AD 1700 CSZ tsunami deposit (C-E). Not only is the stratigraphic record of the destructive 1964 tsunami barely distinct, but the comparison between the two tsunami deposits makes the 1964 event all the more jarring.

The second project – another collaboration with Harvey Kelsey – is supported by the USGS National Earthquake Hazards Reduction Program. Our assignment is to use microfossils and C14 to reevaluate the timing of earthquakes in the past 2,000 years for northern Humboldt Bay, and amounts of land-level change associated with those earthquakes. The findings are quite interesting, and again will provide baseline data needed to model the seismic and interseismic behavior of the subduction zone. In addition to the paleoseismic part of things, I am getting to study the diatoms in Humboldt Bay in greater detail than I ever have in the past. I have wanted for some time to produce a solid reference on diatoms in Humboldt Bay, which with online publishing resources now available might make this kind of thing more feasible.

Finally, I’ve been collaborating with a team from the USGS to reevaluate earthquake and tsunami hazards at Seal Beach National Wildlife Area in SoCal. Super complicated and interesting project, and highly significant as it is the site of a large U.S. Navy weapons depot. If you are going to be attending AGU this year, look up one or more of these studies and come by our posters!
Bob McPherson

During 2015, although I have officially retired from teaching, I continue to do research on the Cascadia Subduction Zone by presenting posters at the last two AGU meetings with several of my colleagues at HSU and other contributing authors from University of Washington, Cal Tech, as well as local consulting companies. Also, Bud and I continue to work with Heath Sawyer and Jody Mielke on their research in Cache Creek Wilderness Area, which this year burned in the fast-moving and terrifying Rocky Fire. Jody and I, along with Jim Lienkemper and Steve de Long both from the USGS, presented a poster on the newly discovered Kui Kui Fault using newly obtained LiDAR. Mark Hemphill- Haley and Mitch Craig brought students from HSU and Cal State University East Bay respectively for a field exercise in hand trenching and geophysics (ground penetrating radar). We plan another such trip this school year to bring students in the field for hands-on experience in fault investigation, mapping, geochemistry and Holocene reconstructions.

For the last 10 years I have been a commissioner on Humboldt County’s Local Area Formation Commission, or LAFCO, the county’s most powerful commission that nobody knows about. I was humbled to be sent to the state’s CALAFCO conference the last two years as our county’s representative with this year’s conference taking place in Sacramento. As you may or may not know, Governor Brown signed the Sustainable Groundwater Management Act of 2014 which forces the state to begin aggressively collecting groundwater data in an effort to understand our water accumulation and distribution systems statewide, and to work towards a sustainable future for California’s water needs. All local LAFCOs are tasked with creating Groundwater Sustainability Commissions (GSA) in order to understand and manage our water resources. The next decade should be interesting as this law is enacted, and the task of understanding all of the watersheds and the people and industry that depend and use these ephemeral resources undoubtedly will require the help of hundreds of geologists and hydrologists in the near future. At the conference I was left with the thought of what a huge and daunting effort this will be for the state, and I foresee new water wars. As Mark Twain said, “Whisky is for drinking, water is for fighting”!

Susan and I are hosting a French high-school student for the year, and brought her on the FOP field trip led by Joanna Redwine. We also continue to explore for oil on the Oxnard plain, and
we are just making final preparations for a 10,000 foot well in early October on Susan’s family’s ranch.

**Melanie Michalak**

I am thrilled to start the 2015-2016 academic year as new tenure-track faculty. So far, this year has been the best one yet. I continue to be impressed by the abilities, excitement and dedication of our Geoscience and Geology majors to their classes, field trips, Geology club, student research and their extracurricular activities. The passion of the students is infectious, and our recent growth in faculty has energized everyone.

This year I am teaching Earth Resources, General Geomorphology, Earthquake Country, and co-leading the Geology of the Western US spring break field trip. In these courses, I continue to emphasize field trips and simple ways of data collection, in conjunction with “fancier” tools of technology. I’m also leading a small reading group with eight students reading past and current literature, called Tectonics, Climate and Landscape Evolution. The seminar is led at a graduate-level and students are stepping up to this level of analysis and interpretation. I expect to see many of them accepted into graduate school soon. My work in the Peruvian Andes looking at rock exhumation, uplift and relief generation is ongoing; our recent paper was accepted in the journal Lithosphere, published by late 2015/early 2016. I am taking my work in newer, and more local directions. First, my senior thesis student, Mallory Garcia, and I are investigating provenance of the Scotia Bluffs and Rio Dell formations near Scotia, using high precision U-Pb detrital zircon ages. Secondly, Sue Cashman and I plan to collaborate with future masters students working in the Klamaths.

As our Masters program slowly rebuilds, we have one newly enrolled student this year, Mindi Curran. She was chosen by McBain and Associates to work on a gravel augmentation project in the Clackamas River, OR. She is working closely with myself, and HSU alum Geoff Hales, and is going to do her thesis on predicting downstream movement of the augmentation sediment using a sediment transport model, and then tracking and quantifying downstream movement using high-resolution photogrammetry.

Finally, on a personal note, my partner and I got married last summer, and will be heading to New Zealand in January for our honeymoon. Lots of geology, and no poisonous snakes.

**Jasper Oshun**

I am very pleased to join the Faculty of the Geology Department at Humboldt State. I pursued my PhD at UC Berkeley, using stable isotopes to measure the movement of water through the critical zone (the zone that spans from the tops of the trees to fresh bedrock that has not
been altered by the near surface environment). My study site is within old growth forest on the South Fork of the Eel River, a location that is closer to my new home in Arcata than to my old home in Oakland. I am thankful to the department (students, staff, and faculty) for making my transition very smooth. This semester I am teaching introductory geology (GEOL-109), and have been impressed with the engagement of my diverse group of students. Next semester I will teach Natural Disasters, and I am looking forward to teaching the second half of Field Camp at California Springs, Nevada.

I plan to accept Master’s students for Fall 2016, and will be building my laboratory and research program to pursue questions of landscape evolution, ecohydrology, and the balance of water between forests and the water in our streams. I also plan to cultivate education and research opportunities for HSU students through ongoing international ecological restoration projects led by Global Student Embassy (www.globalstudentembassy.org).

**Jason “Jay” R. Patton**

After teaching at community colleges for three years, I am proud to return as an education facilitator at HSU to teach two classes: Sedimentary Geology and Quaternary Stratigraphy.

Conjoining my field experiences with the lessons that I learned when I took these classes has been an exciting part of my return to the Arcata campus. Ken Aalto and Bud Burke led me through these two classes and I hope that I am living up to their standards. I am also excited to return in the spring semester to teach Field Methods II and Solid Earth Geophysics. I continue to prepare and present my educational earthquake reports on earthjay.com.

I have been working on two science projects related to the earthquake and tsunami hazards in this region of northern California. With my colleagues from over 30 federal, state, and local organizations, I am working on a project initiated by Todd Williams (HSU, M.S., 2002) called the Humboldt Bay Vertical Reference System Working Group (hbv.cascadiageo.org). This project was established to evaluate the tectonic contribution to sea level rise in northern California. In the Humboldt Bay region secular tectonic subsidence modifies local sea level to result in the highest rate of sea level
rise along the west coast of the US. We are collaborating with faculty from different universities (Ray Weldon, Univ. OR; Reed Burgette, UNM), along with Mark Hemphill-Haley from HSU. We are currently writing a paper summarizing our findings.

I have been continuing to organize the “Tsunami Science” program for northern California (tsu.cascadiageo.org). I presented this idea at a Redwood Coast Tsunami Work Group meeting and I have been collaborating with RCTWG members to develop a co- and post-tsunami documentation team of subject matter experts. We have developed a response protocol and have been training subject matter experts during annual field exercises. We have been coordinating our plans with the California Geological Survey, the California Emergency Management Agency, and the Humboldt County Office of Emergency Management. Our team has been participating in statewide and local exercises and we are preparing to join a Federal Emergency Management Agency exercise in June 2016 called “Cascadia Rising.”

Recently, my colleagues at our 501(c)3 non-profit Cascadia GeoSciences started a lecture series called “Cascadia GeoSciences Presents” (CGP; cgp.cascadiageo.org). Tom Leroy (HSU M.S., 1999), Jay Stallman (HSU M.S., 2004), Diane Sutherland (HSU M.S., 1999), Todd Williams (HSU M.S., 2002), and I are working to bring our non-profits’ mission to fruition by announcing our student scholarship program at the inaugural CGP event. We are offering three $500 scholarships: 1 for HSU geology field camp, 1 for undergraduate research, and 1 for graduate research. The five of us each graduated with an M.S. from HSU Dept. of Geology and were 5 of the 7 who organized the 2006 Pacific Cell Friends of the Pleistocene field conference (along with Mark Hemphill-Haley and Bob McPherson). I find it quite pleasurable to continue to work with these good friends, especially that we have a shared experience at the HSU Department of Geology!

Dallas Rhodes

Last November, out of the clear blue, I received an email from the National Commission for Academic Accreditation and Assessment” (the NC-Triple A) inviting me to participate in the upcoming accreditation review for the geology program at the King Fahd University of Petroleum and Minerals (KFUPM) in Dhaoran, Kingdom of Saudi Arabia. I immediately thought that this must be some kind of internet scam, or that one of the jokers I had known in graduate school was pulling my leg. I was wrong. The offer was legitimate and, after talking to a number of colleagues who have visited the Kingdom, I accepted. I left SFO on February 11, flying to Frankfurt and then on to Dammam. The geophysics program and the geology program were both undergoing review. The two panels each had three members. I worked with Geoffrey Boulton (University of Edinburgh) and Chris Baldwin (another Brit who ended his career as a dean at Sam Houston University). We spent our time meeting with university administrators, the geology program’s faculty, current students, and alumni, visiting classes, touring facilities, and working on the final report that would address the 11 standards and 46 subdivisions. Part of the bargain was that each team would deliver a complete draft of the report before we departed. We spent
virtually all of our time on the KFUPM campus (which shares a common border with Saudi Aramco’s headquarters) or at the Crowne Plaza Hotel where we were housed. There were armed guards at the campus gates and a metal detector at the hotel entrance. The daily experience was an odd mixture of the familiar and the exotic. The familiar included big hotels, freeways, gas guzzling cars (but gasoline is only about 15 cents per gallon in the Kingdom), every chain restaurant you can imagine (Col. Sanders, Chili’s, Baskin-Robbins, etc.), and huge shopping centers. The exotic included the native dress of both men and women, the calls to prayer, a language that I couldn’t read or understand, some different food, Arabian coffee, and a total separation of men and women. I could go on at great length about the experience… all anyone need do is express an interest.

My work with the Building Strong Geosciences Program also continued this year. I facilitated workshops this year at Central Connecticut University (March) and Willamette University (November). Research on the Carrizo Plain continued with colleagues Ramon Arrowsmith (Arizona State) and Rob Negrini (CSU-Bakersfield). The big step was the acquisition of a large set of digital images that will be used for Structure from Motion models of the detailed topography.

Steve Tillinghast

It’s an exciting time in the Humboldt Geology Department! With three new tenure track faculty, that means lots of new energy and new ways of doing things. I have been working with Jasper, Brandon and Mel on evaluating lab space and planning for the future to accommodate their research needs. Jasper has been introducing new projects in the intro geology lab classes. I’ve assisted Mel and Brandon in exploring new field trip locations to maintain our strong field-centered program. We all are working together to identify and evaluate new field camp locations. Together, we continue to update field camp mapping projects, and learning objectives to ensure camp provides our students with the best capstone field experience they can get. Our new GIS lab is up and running and I am familiarizing myself with new software that will expose students to cutting edge remote sensing and mapping methods. My
future plans are to continue to work with the new faculty on their projects and field trip planning, including field camp. We are also hoping to secure funds to purchase a new vehicle next year to replace Lily. The future is bright!

**Colin Wingfield**

Greetings from the Science Shop at HSU. I have recently moved offices in the engineering building and am now a work roommate of my hero, Marty Reed. My career in the sciences is ever evolving and seems to always relate back to Geology. Recently, I fabricated a model of a vortex weir fish-way, a fancy fish ladder. Students used the scale model in the sediment transport flume to measure flow conditions for Lamprey passage in a real world application. This semester I have switched gears and am working on electronics and instrumentation. I have been helping with the maintenance of the Quanta 250 Scanning Electron Microscope that Brandon Browne and Geology 482 students are using. In addition, I am in the process of rebuilding a broken 3D printer. Using open source electronics and software the printer will be used by students to repurpose plastic materials to make 3D printed parts. Of course, my intention is to print scale models of geologic features. Always in Geology, Colin.

**Other staff news**

- William Miller is on sabbatical leave this Fall and exploring trace fossils in the southern Appalachia
- Kerry Sherrin (formerly Pinto), our Department Coordinator in 2011-12, continues to work
  
  Lori on earthquake and tsunami outreach activities – thanks Kerry!

**News from the Geoclub**

Watch out, the 2015/2016 Humboldt State Geology Club is together again for another ‘Rockin’ year!

**The Rock Auction returns for the 41st consecutive year on Friday December 4, starting at 6:00 PM in Founders 118. We welcome all of you to this event of rock revelry!**

Over the past semester our club has traveled long distances to attend this year’s Friends of the Pleistocene gathering, rockhounded with the local Gem and Mineral Society at their Annual Rock Show, and promoted the Worldwide ShakeOut event in the UC Quad. The Gem and Mineral Show had a large helping of student members to help with set-up and take-down of their show and we thank them for bringing worldwide geology to Eureka this November. The HSU Geology Club gives thanks to all of its support from friends, alumni and the community for these activities would not be possible without them.
Field Classes – yes we still spend a LOT of our time in the field

GEOL 475 - Field Camp 2015 – from Melanie

The month of May for the Geology Department is a busy one: students scramble to study for finals, complete final projects, present their theses; professors scramble to grade these finals and read the theses; parents and families come from all over for graduation; the Geology Club puts on the end of year picnic and elects its next officers. Despite all of this, we somehow managed to leave the Van Matre loading dock, with 23 students and seven staff members, having loaded up several tons of gear, at approximately 8:22AM, only 22 minutes “late.” Which isn’t really even late if you correct for Humboldt Time. This is only possible because of an excellent and hard working group of staff and students. Students in the advance party worked hard setting up, under direction of camp manager Colin Wingfield, and TAs Steve Tillinghast, Jessica Vermeer, Michelle Robinson and Sylvia Nicovich. Brandon Browne taught the first half of the course, and I taught the second half.

2015 was the rainiest and stormiest field camp in HSU history. (Note: I do not have actual data to support this claim, but after seeing the number of ragged tents and soaked clothing, it is a reasonable assumption). Students dealt with hail, rain, lightning, unreadable topo lines, mud, flooded tents and high winds. They survived brilliantly, lending a hand to each other and making the best of the situation. By the end of field camp, the rain subsided and the dry heat was on.
In the Roberts Mountains, students become intimately acquainted with the Roberts Mtns Thrust, its subsequent alteration of surrounding rocks, and learned to battle with mapping enigmatic carbonates. They had three projects over the four week course: thus, three maps, three reports and multiple cross sections and a final group presentation. Lots of work! It was a highlight to see our students step up to the challenge and persevere. Their dedication, long days and late nights were ultimately rewarded (by fantastic field camp instruction of course! But also) by a field trip to Lamoille Canyon near Elko.

2015 also marks a changing of the guard moment for HSU’s field camp. Colin will be taking a break from camp manger duties, and Steve will be taking over for 2016. TA’s Jessie and Sylvia have gone on to more, and distal, graduate work. Finally, the Roberts Mountains are now a mining prospect, which may limit our access in the future. However, despite these changes, we know the drill. You can always depend on HSU’s field camp to roll out of the Van Matre loading dock on a foggy morning in late May, at ~8AM, Humboldt Time.

**GEOL 554 Advanced Field Geology – from Mark**

In August, GEOL 554, Advanced Field Methods, took us to Mohawk Valley in the Northernmost Sierra Nevada where the Basin and Range, Modoc and Sierra Nevada geomorphic provinces converge along the Walker Lane. Our trip this year was to provide field support for alumnus Joanna Redwine (M.S., 2003) who, a month later, would present a portion of her PhD work on the geomorphology and glacial and lake
history of Mohawk Valley. We got an opportunity to dig soil pits, measure lake shorelines and search for faults in glacial outwash deposits. The geology was fantastic. We were camped on the edge of Gold Lake during the Perseid meteor shower. It was a great show. The students were excellent; they worked hard in hot conditions, were inquisitive and enthusiastic and never complained about the bear that raided our camp two nights in a row.

Friends of the Pleistocene Field Trip – From Mark
At the end of September more than 200 geologists from around the west met to hear Joanna Redwine’s dissertation research story. It was a great trip highlighted by the many, many HSU geology alums. We were able to corral most of the HSU’ers for a group photo. As you can see, about 80 HSU folks were present. It is always impressive to see such an great turnout of people who have been to Humboldt and are still active in geology!
GEOL 110 Death Valley Trip – from Mark

Each spring we run a course called GEOL 110, Field Geology of the Western U.S. We often travel to Death Valley and surrounding environs to escape the Humboldt winter. Steve Tillinghast has spent extensive time in the area so we challenge him to get us to different parts of the national park for each visit. This year we went to Mosaic, Monarch and Titus Canyons, the

Racetrack and Eureka Dunes. While at Furnace Creek we were camped next to a group of middle school students and chaperones on an extended science trip through the area. A sudden, crazy Death Valley storm blew their camp all over the place. The HSU students ran to the rescue finding

lost items, rebuilding their amazing kitchen and chatting with the scared students about geology and nature. We were rewarded with meals for the next two days by their incredible chef! It reminded me of the time that the HSU Field Camp helped dig Keeler, CA out from a large debris
flow. Annie’s Keeler Market became the official home of HSU Geology (see photo). We passed through Keeler on this trip. Annie is long gone, the store is closed but the sign is still there!

We are headed across the Great Basin this spring, traveling through Pyramid Lake, Fairview Peak, Berlin-Ichthyosaur State Park, Lunar Crater, Lehman Caves and Crystal Peak, Utah. It will be a great trip!

History of the Geology Department – from Laurie, Harvey, and Frank Kilmer

This year marks the 50th anniversary of the department. This was brought the attention of the faculty by faculty emeritus Frank Kilmer who sent a letter recently (March 24, 2015) to Harvey Kelsey. Frank’s letter sheds insight to how our department was formally established.

Although individual people taught geology at what was then called Humboldt State
College (including Harry Macginitie, who taught in the Physical Sciences Division for more than three decades until 1960), the seeds of a real department started with the hiring, in 1961, of John Young, a recent PhD from Princeton University. He subsequently hired Frank Kilmer (PhD, UC Berkeley) to assist with geology courses and shortly thereafter (1965) John Longshore, a recently minted PhD from Rice University, was hired as well. At that time, John Young said that he did not want to stay unless geology became a formal department, and Frank Kilmer approached the then Chairman of the Division of Physical Sciences, Roscoe (Rocky) Peithman, about formally establishing a Geology Department. Dr. Peithman dutifully brought the proposal before the Chancellor of the California State University in Long Beach for consideration, and a geology department at Humboldt State was formally approved in 1965.

So..., the prime players are the proactive administrator who proposed a geology department to the CSU administration, Rocky Peithman, and the three stalwart original individuals who were on hand to be that department, John Young, Frank Kilmer and John Longshore. Roscoe (Rocky) Peithman passed away in February of this year, one week before his 102nd birthday. John Longshore recently passed in 2012. Frank and John Young are still with us - John Young lives in the Salt Lake City area and Frank lives in Florence, Oregon.

In the near future, the Geology Department plans to create a plaque, to be placed in the main office that encapsulates the narrative above. Happy semi centennial, HSU Geology!!

A Plea from Lily...

Hi everyone, Lily here. It’s been almost 16 years since I was adopted by the Geology Department at HSU, and what a ride it’s been! Having been born in 2001 at a General Motors assembly facility (either Wisconsin or Texas... I can't remember which), I could have ended up anywhere in the USA; working a ranch in Wyoming, shuttling kids in suburban Chicago, or hauling delivery items in NYC. I feel fortunate to have been a part of the Geology field-tripping team! The places I’ve been, the things I’ve seen (the things I’ve heard on these long trips!) I could not have experienced with any other family.

When I was first adopted by the department the students got to name me as is tradition. I started out being called Gangrene, yuk, then Yoda and Kermit, meh, then I got the name Lily. I thought that was a beautiful name, but I do have the feeling that it was a bit derogatory because of my very comfortable interior. Still, my frame is a sturdy pick-up truck design, and with a V8 engine and four-wheel drive, I could go anywhere, and it was my pleasure to do so.

These past few years have been a bit rough as it is more difficult for me to get to the places we need to go, and places I would like to see again. I feel that with only 118,000 miles on me, I should be able to do the things I used to, but I always have to remember that those miles were heavy with students; gear; and....anyway; I’m getting on in years. I have spent much time in the
shop for replacement parts and have let my family down in some inhospitable places. Although continuing on would be my choice, I just can’t do the things I used to; it’s time to retire.

If you can find it in your heart, pockets, seat cushions, to help out my family with a donation to find my replacement, I can retire in peace with the knowledge that my staff, faculty, and future generations of students will be well taken of. Please contact the department at geology@humboldt.edu to learn how to make a donation. It has been a privilege transporting your curious and eager minds to some of the most beautifully fascinating geologic sites in the western US! I will miss my job and all of you!

Oh by the way, on the next page are some of the past and present Geology fleet, you might recognize one or two.

Butch

Vanna White

Polly

Whitey Ford

Betty Ford
Final Note

We are always reluctant to come to you all with our hands out. Unfortunately, it is a part of running our great department. I remember John Longshore said it was the hardest thing for him to do. State budgets are always in decline and we are always dealing with less. Still, we think we provide one of the most rigorous and complete geologic educations available in the country. Our field vehicles are purchased largely as a result of donor contributions to our geologic trust fund. Without those generous contributions we would have to use two-wheel drive rental vans and buses for our trips.

We have a mobile computer lab (currently 12 laptops contained in a wheeled charging cart) that moves between labs in Van Matre Hall. We use these computers for most of our labs. Those computers are now 8 years old and are no longer suitable for teaching. This mobile lab was originally purchased from a generous donation. A new, 24 laptop lab would cost almost $20,000. We would love if you could help us get our lab back up to date.

As costs have increased, and support decreased, it has become harder for our students to go to our capstone course, field camp. Fortunately, the proceeds from the annual Geology Club Gem and Mineral auction, some generous corporate, and especially, individual donations have been able to aid students with camp costs through scholarships and grants. This year, for the first time, we will be able to use the John Longshore Endowment as a source for field camp scholarships. Please consider a donation in John’s name; his concern was always making sure that the field experience was available to all undergraduates.

Thank you again for any help you can provide. It is always a pleasure saying that I am a part of the Humboldt Geology family. - MHH

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HSU Advancement - Online Gifts (https://alumni.humboldt.edu/hsu-giving)

- Choose the amount of your gift, or insert the amount in the blank box;
- In the “designation” field, choose OTHER
- Type in your choice from the Dept. of Geology funds:
  1. Geology Trust (A6699) for vehicle and equipment funds
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- If you prefer to send a check, please mail to:
  Humboldt State University
  Department of Geology
  1 Harpst Street
  Arcata, CA 95521

The check payee line should read “HSU Advancement Foundation”, and in the memo field please indicate one of the following: Geology Trust; Longshore Field Geology Endowment, or; Bud Burke Scholarship.