



NUHOU KANAKA PUKA

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Nuhou Kanaka Puka

Nuhou Kanaka Puka ("Alumni News" in Hawaiian) published by the Department of Geology and Geophysics of the School of Ocean and Earth Science and Technology (SOEST) for its alumni and friends.

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New Insights Into our Exploding Volcanoes From High Speed Movies

The biggest transformation in basaltic explosive volcanism in the 21st century has come with the use of high-speed cameras on volcanoes to capture the transient explosions that occur every day at the world's most active volcanoes. University of Hawai'i and our partners, including Tim Orr, Mathew Patrick and Jeff Sutton from the Hawaiian Volcano Observatory, are part of this wave thanks to a new Phantom Miro camera that is capable of capturing up to 1100 images per second.

Explosions at volcanoes like Kilauea and Stromboli occur on very short timescales (seconds or fractions of seconds), and instruments in the past have lacked the time resolution required to make direct measurements of events. Cameras such as the Miro, filming at 200 to 1100 frames per second, offer a window into such events.

University of Hawai'i is leading an NSF-funded study of activity at Kilauea, Stromboli and Etna, the three most intensely monitored, continually active basaltic volcanoes in the world. Our research partners are the Istituto Nazionale di Geofisica e Vulcanologia (INGV), in Rome and Pisa, University of Cambridge and the USGS Hawaiian Volcano Observatory (HVO). The study examines a spectrum of activity, from brief and widely spaced explosions (Stromboli) to fountains lasting hours to days (Hawai'i), via three synchronized cameras, which in 2015 we will pair to volcanic gas measurements with sub-second time resolution. The two images show this range: a single frame from filming of an 8-minute long fountain at Kilauea in December 2013 and a single Stromboli explosion in May 2014.

Until now, it has been almost impossible to reconstruct the speed of processes in the shallowest parts of volcanoes from direct field observations, owing to the short timescales on which they occur, yet these stages are the most critical for determining the style of eruptions. High-speed cameras (500 to 800 frames per second) capture the pulsatory nature of explosions which are not apparent to the naked eye. In 2013, University of Hawai'i purchased the state-of-the-art Phantom Miro camera, using funding from the Dean of SOEST. Linking and synchronizing our camera with an INGV Rome camera has permitted us to obtain, in June 2014, the first 3D-"picture" of a volcanic explosion. Using videos recorded simultaneously from 2 cameras we have designed software to reconstruct the movement of individual volcanic "bombs" in three dimensions as they exit the volcanic vent, a world first. Linking a third infrared camera permits us also to "see" the hot gas (water vapor, sulfur dioxide, carbon dioxide etc..) liberated in the explosions.

continued

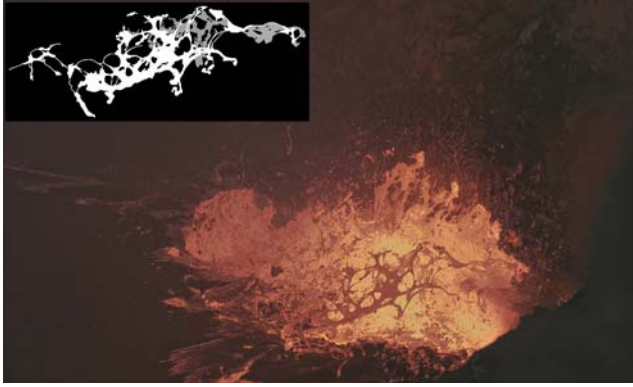


Fig. 1: Bursting of large (meters-wide) bubbles through the surface of the lava at the "Overlook" vent at Kīlauea on 5 December 2013. The bubbles are enclosed in a thick sheet of magma which lifts and stretches and finally tears. The sheet ruptures into a series of smaller fluid "plates" called pyroclasts. The black-and-white sketch outlines the form of the sheet.

The next phase of the study will explore the relationship between the hot gas, which drives each explosion and the magma (molten rock) that forms the bombs. At what depths is the gas released and in what quantities? We will couple the simultaneous high-speed photography with high-resolution measurements of the volcanic gas released in each explosion. This is again a world first and will permit us to "map" patterns of release of the gas and the bombs with sub-second resolution. A new configuration of existing hardware and newly developed sensors will be tested by our Cambridge and INGV Pisa colleagues at Stromboli.



Fig. 2: A single small explosion at Stromboli, on 18 May 2014. The high speed camera showed that the gases and pyroclasts are moving 2 to 3 times faster than previously estimated for explosions at Stromboli.

The project will test the notion that the form and duration of these eruptions is driven by the size and timing of pulses of meter-sized gas bubbles that escape from the magma (molten rock) at depths of hundreds of meters in the volcanoes plumbing system. These then rise, expand and interact with each other in a highly dynamic fashion as they stream up to the surface.

The study is specific to these three well-characterized volcanoes and yet will produce results that have broad application to all basaltic volcanoes. It has high relevance to societies such as Kīlauea and Stromboli are also locations of large and growing volcano-tourism operations. The Hawai'i Volcanoes National Park, for example, records over 5000 visitors per day to the summit of Kīlauea. These tourists anticipate an exciting yet safe experience on these active volcanoes. Their eruptions pose particular issues for management agencies because the sites are highly accessible and thus there is a need to balance the strong public interest in viewing the activity against the issue of public safety. The aim is to assist with satisfying public thirst for information and a need for improved forecasting of the likely course of all future eruptions.



Fig. 3: Deployment of the cameras and related sensors on the rim of Kīlauea crater. The data from the camera are linked to information from the permanent recording networks of the Hawaiian Volcano Observatory giving a uniquely detailed record of explosions. Tripods house infrared (A), monochrome (B), and color (C) high speed cameras which are synchronized.

The authors:
Bruce Houghton and Kristine Kosinski

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Message from the Outgoing and Incoming Chairs

Aloha everyone! The 2014-15 academic year will soon be upon us. We would like to welcome our new and returning undergraduate and graduate students.

I (Greg) want to say that it has been a pleasure to serve as your Chair for the past 4 years and to thank everyone for their great support. Please join me in welcoming Ken Rubin as our new Chairperson! Ken will make a wonderful chair because of his dedication to teaching, student learning and research. We can all look forward to continued departmental success in the coming years. And I (Ken) want to offer Greg Moore a HUGE MAHALO on behalf of the entire department for his hard work for and on the behalf of GG over the past 4 years. His excellent stewardship and efficient management have helped us weather an uneven fiscal climate. I'm sure he is more than ready return full time to research and teaching.

As is customary in this column, we want to inform readers from throughout the GG 'ohana of some high points of the past and upcoming academic years:

The Department of Geology and Geophysics moves into its 55th year as a strong and vibrant place of learning, and as a unified community of scholars. Our research enterprise is thriving, and our classes are full of learners from across campus. We have new undergraduate majors and graduate students in record numbers, to whom we extend our warmest welcome, and our MGEO professional Masters degree welcomes its inaugural class this year.

SOEST has been celebrating its 25th anniversary this year. The celebrations were launched at Open House last October, where GG made a great showing of interactive displays about the Earth. The other book end of this year of festivities is the all-SOEST picnic on August 30th at Kualoa Regional Park – it should be a great gathering of the SOEST 'Ohana for a day of food, music, relaxation and fun. All of GG including alums is welcome.

In Faculty news, we welcomed our two newest faculty members, Bridget Smith-Konter (seismology/geophysics) and Jasper Konter (Geochemistry/petrology) this past January. We celebrated John Sinton's career on the occasion of his retirement at of the end of 2013 with a wonderful springtime party at the Outrigger Club (Thanks Patty Lee and others!) and wished him all the best for a pleasant (and still working) retirement. We also congratulate Henrieta Dulaiova, who was awarded tenure and promotion to Associate Professor this

summer! Professor Mike Garcia was named as an AGU Fellow this year in recognition of his magnificent career contributions – way to go Mike! Congrats also to Ph.D. student Jonathan Sleeper, who was awarded the Denise B. Evans Graduate Fellowship. See the awards section for this year's Graduates and other student award recipients.

Undoubtedly the upcoming academic year will bring new opportunities and challenges. The department began a strategic planning process this past year and had a lively discussion about options for a possible department name change. It also discussed modifications to the undergraduate curriculum to broaden and modernize it, and to make it accessible to ever more incoming students. These discussions continue. Through continued growth and renewal, and because of our engaged and active faculty, students and staff, GG continues to be an exciting place to learn and conduct research.

At the same time, the university continues to experience budget restrictions and asks us to do more with less. The State Legislature continues to be somewhat "unkind" towards UH (particularly to the Mānoa campus), with on-going budget cuts that have forced us to direct all available funds into staffing. The result is that we have no State funds accessible for field trips that are so crucial to practice and learn Geology. In order to continue to offer this integral aspect of geological training, we have to rely on our UH Foundation Field Trip Fund to cover the costs of these trips, an increasingly difficult task with the cost of interisland airfares rising dramatically. We are very fortunate to have the support of our alums, including Janet Haggerty (our 2013 Alumna of the year) and her husband Mike Smith, Mike Jackson, Andy Goodliffe, Scott Rowland, and Steve Leslie. Please remember how much you enjoyed your visits to Kilauea, Haleakala, etc., and consider giving back by contributing to our field trip fund.

We are very grateful to all of our alumni for continued financial support. Your gifts make a real difference for our students and our program. If you have not already done so, please consider a (tax deductible) contribution to one of the Department's funds (see the last page of this Newsletter for a copy of the form, donate from the following website, <https://giving.uhfoundation.org/give/giving-gift.aspx?allocation=12077204> or click the "donate" button on the GG home page).

Please visit the GG website at:

<http://www.soest.hawaii.edu/GG/index.html>

regularly for updates, job opportunities, special announcements, course listings, curricular plans for the next 5 years, information about our degree programs and profiles of GG members. Also, stay tuned for the rollout of the new SOEST website coming sometime later this year. It will have more images, news and themed scientific content than the current site as well as a mobile version, all with the idea of better engaging the public, news organizations, foundations, donors and present and past faculty, students and staff.

Finally, please accept our very best wishes for a happy 2014-2015 Academic Year!



Greg Moore and Ken Rubin

* * *

GG is now offering the Master of Geoscience Degree for Professionals (MGeo)

The **new MGeo degree** provides basic training and practical experience for those seeking careers in applied geoscience. The MGeo is for individuals who have completed a bachelor's degree in natural science, math, or engineering, including working professionals. It can be finished in as little as one year if taken full-time, or 2 years if combined with full-time work. The MGeo is intended to prepare students to pursue a career in a variety of fields including geological and environmental consulting, geotechnical engineering, hydrology, natural hazard mitigation, climate change adaption, natural resource exploration, renewable energy development, and more. Mahalo nui loa to our alumni and other friends who have provided valuable input for this degree program and who have expressed interest in supporting internships for the program.

Visit the "**Academics**" page of the GG website for more details.



Degrees, Awards & Honors

Undergraduates

Justin Wong	<i>BS Summer 2013</i>
Bryson Aiu	<i>BA Fall 2013</i>
Heidi Reiter	<i>BA Spring 2014</i>
Katherine Dungan	<i>BS Spring 2014</i>
Lerma Gamiao	<i>BS Spring 2014</i>
Alex Oliver	<i>BS Spring 2014</i>
Brooke Winans	<i>BS Spring 2014</i>



GG “Sweet Success” party - Spring 2014 - (L-R) Greg Moore (GG Chair) Brooke Winans, Lerma Gamiao, Katie Dungan, Elise Rumpf, Sarah Maher.

Masters of Science

Samuel Howell – *The Origin of the Asymmetry in the Iceland Hotspot Along the Mid-Atlantic Ridge from Continental Breakup to Present-Day (Advisor: G. Ito, Summer 2013)*

Benjamin Czeck – *Our Food in a Changing Climate: Growth, Yield, and Nutrient Changes of Sweet Potato Grown Across the Spectrum of CO₂ Concentrations Projected in the Next 150 Years (Advisor: H. Jahren, Spring 2014)*

Haunani Kane – *Temporal and Spatial Patterns of Sea-level Rise Impacts to Coastal Wetlands and Other Ecosystems (Advisor: C. Fletcher, Spring 2014)*

Penny Larin – *Perception of Vulnerability Relating to Sea Level Rise and Climate Change in Island Communities: Insights from Hawai'i (Advisor: B. Houghton, Spring 2014)*

Sarah Maher – *The Case for a Chron 21 Change in Africa Absolute Plate Motion (Advisor: P. Wessel, Spring 2014)*

Doctor of Philosophy

Tiffany Anderson–*Shoreline Data Analysis (Advisor: L.N. Frazer, Fall 2013)*

Doctor of Philosophy (continued)

Arjun Aryal – *Landslide Deformation Character Inferred from Terrestrial Laser Scanner Data (Advisor: B. Brooks, Fall 2013)*

Malin Klawonn – *Studies of Pyroclastic Fall Transport and Deposition (Advisor: B. Houghton, Fall 2013)*

M. Elise Rumpf – *Lava-Substrate Heat Transfer: Implications for the Preservation of Volatiles in the Lunar Regolith (Advisor: S. Fagents, Spring 2014)*

Sarah Crites – *Interactions of Galactic Cosmic Rays with the Lunar Surface (Advisor: P. Lucey, Spring 2014)*

Student Awards

Agatin Abbott Memorial Award

Presented to the outstanding senior, annually, in memory of department faculty Agatin Abbott.

Katherine Dungan

Fred M. Bullard Fellowship

Endowed by Thais Freda Bullard in memory of her father, Fred M. Bullard, a pioneer in the studies of Volcanology and general Geology & Geophysics.

Caroline Caplan, Alice Colman, Sarah Crites, Katie Robinson

Harold T. Stearns Fellowship

Endowed by longtime department friend for the purpose of supporting student research on geological and geophysical problems in Hawai'i and the Pacific Basin. **Kendra Lynn**

GG Achievement Scholarships

Award based on merit service, achievement and outstanding grades of graduates. **Brian Shiro**

American Mineralogist Undergraduate Award 2014 - Tanis Leonhardi



Garcia becomes 2014 AGU Fellow

Michael O. Garcia has been elected Fellow of the American Geophysical Union. This honor is given to individual AGU members who have made exceptional scientific contributions and attained acknowledged eminence in the fields of Earth and space sciences. Primary criteria for evaluation in scientific eminence are a major breakthrough or discovery, paradigm shift, or sustained impact. Since the establishment of the AGU Fellows program in 1962, no more than 0.1 percent of the total membership of AGU is recognized annually. Mike is one of only 62 individuals who have been elected as 2014 Fellows. They will be recognized during a ceremony on Wednesday, 17 December, held during the 2014 AGU Fall Meeting in San Francisco.

Mike was nominated by Dr. Frederick Frey of the Earth Atmospheric and Planetary Sciences Department at MIT, "*for his leadership in understanding the origin and evolution of Hawaiian volcanoes.*" These are some of the words he used to describe Mike's excellence: "A significant portion of my scientific career has focused on the origin and evolution of Hawaiian volcanoes. Mike was absolutely essential for me to initiate this research. Over the past 15 years, I have witnessed Mike's growth and maturation as a researcher. An impressive aspect of his career is the expansion of his expertise from initial training as a field-oriented petrologist to now including laboratory-oriented geochemistry encompassing trace element and isotopic geochemistry. He now approaches problems in Hawaiian geology with a diverse array of field,

petrologic, and geochemical techniques. Other top-notch scientists have contributed significantly to understanding Hawaiian volcanism (initially prominent USGS scientists and more recently Stolper, DePaolo and Hofmann), but Garcia is the only field-oriented petrologist/geochemist dedicated to a long-term effort to understand Hawaiian volcanism."



Field-petrologist Mike Garcia. Halemaumau crater in the background with fume from the ongoing active Kilauea eruption.

Mike Garcia, 2014 AGU Fellow - Congratulations!

* * *

Distinguished Alumnus: Loren W. Kroenke

Retired GG and HIG Faculty Member



I received my B.S. degree in 1960 at the University of Wisconsin (Madison) with Dr. R. L. Batten as my advisor. Continuing my studies at the University of Wisconsin, I became a Project Assistant in Geophysics in 1961, under Dr. G. P. Woollard. In early 1962, I went to sea on board the USNS Eltanin, on

eight research cruises for almost a year and a half in the North and South Atlantic, including the Labrador, Billinghamen, Scotia (off Antarctica), and Weddell Seas. In late 1963, I followed Dr. Woollard to the Hawai'i Institute of Geophysics (HIG) at the University of Hawai'i (UH) in Honolulu, where I received my M.S. degree in 1968 and my Ph.D. degree in 1972 under the guidance of Dr. Woollard.

My research experience at sea has been extensive, participating in more than 68 research cruises in both the Atlantic and Pacific between 1960 and 2005. My early interest focused in two areas, the Scotia Sea in

the South Atlantic off Antarctica and the Ontong Java Plateau in the Central Pacific north of the Solomon Islands. These investigations provided the basis for my MS Thesis and my Ph.D. Dissertation. My research goals in the South Pacific were also advanced by the Deep Sea Drilling Project (DSDP). I participated in DSDP Legs 7 and 30 of the Glomar Challenger, which included drilling on the Ontong Java Plateau. On Leg 59 in the Phillipine Sea, I was Co-Chief Scientist.

My University of Hawai'i employment has also been extensive. Since becoming an HIG Assistant in Geophysics in 1963, I became a Jr. Geophysicist in 1966 and an HIG Assistant Geophysicist in 1972.

From late 1974 to mid 1976, on leave from the UH, I was Project Manager for the newly formed CCOP/SOPAC (Coordinating Committee for Offshore Prospecting, South Pacific). From 1975 to 1986, I was a UH/HIG Associate Geophysicist and from 1986 to my retirement in 2009, I was a Geophysicist at UH/SOEST (School of Ocean and Earth Science and Technology). During these times, my successful research efforts could not have been possible without the support of my research associates at the UH and the advice and assistance of numerous faculty members.



Loren as a graduate student on board the Eltanin.

* * *

Professor John M. Sinton Retires

After 36+ years of service in the Department of Geology and Geophysics, John Sinton retired on January 1, 2014. On April 21, 2014 dozens of John's former and current students, colleagues, and friends gathered at the Outrigger Canoe Club to honor him and celebrate his career and friendship. With good food and ample drinks guests shared tales of adventure and camaraderie with John over the years, in keeping

with the spirit of his time at UH. John is continuing his involvement with the University of Hawai'i as an emeritus professor in the Department of Geology and Geophysics. Old friends Mike Smith and Janet Haggerty commemorated the occasion with a generous gift to the department in support of undergraduate field trips.



John with his safety shoes and a 1-ton lead dredging weight on the fantail of the R/V Kana Keoki in 1982 off Futuna Island. (Photo: Kevin Johnson)



Fred Duennebie, Phil Milholland (PhD 1984), John, Dick Hey and Marty Kleinrock enjoying a refreshment after a day on Isla Santa Cruz, prior to one of the first Moana Wave cruises, led by Fred Duennebie using SeaMARC II to survey the 95.5W propagating rift on the Galapagos Spreading Center.



The sign says it all!



At Haleakala crater during GG103 in Fall 2013 (Photo: Kat Szatkowski.)



A selection of John's students from left to right: Rob Yonover, Elizabeth Zbinden, Kevin Johnson, Buffy Cushman-Patz, Patty Fryer, John, Lori Liu Ford, Alice Colman, Janet Haggerty, Cheney Milholland.



At John's retirement party at the Outrigger Canoe Club (Photo: Ken Rubin)

* * *

Bridget Smith-Konter: New Geophysics Professor

Bridget Smith-Konter joined the Department's Geophysics and Tectonics division as an Assistant Professor in January 2014. Bridget's research interests are primarily focused on terrestrial and planetary crustal deformation, geodetic data integration, and geophysical visualization techniques. Her research addresses questions related to stress evolution and the spatial/temporal occurrence of seismicity: Why do faults rupture when and where they do? What can past earthquakes tell us about the state of stress that is presently accumulating along tectonic plate boundaries? To investigate these questions, Bridget utilizes sophisticated computational models of crustal deformation constrained by geologic, geodetic, and seismic data. She uses similar modeling tools to also study the tectonic evolution of icy faults on Saturn's moon Enceladus and Jupiter's moons Europa and Ganymede. Bridget is also involved with education and outreach activities related to NSF's EarthScope program, a vast initiative to explore the structure and evolution of the North American continent and the processes controlling volcanoes and earthquakes. She has installed several interactive Earth Science kiosks within under-represented communities and continues to develop visualization products that help broaden public awareness and appreciation of the Earth Sciences.

Originally from Phoenix, Bridget received her B.S. in Physics and Astronomy from Northern Arizona University (1999) and Ph.D. from Scripps Institution of Oceanography (SIO) at the University of California San Diego (2005). She did postdoctoral work at SIO (2006) and Caltech/JPL (2007) within the Planetary Ices Division. Bridget was an Assistant and Associate Professor at the University of Texas at El Paso (2008-2013) before relocating to UH Manoa. Within G&G, Bridget has begun to build a crustal deformation research group with postdoctoral scholar Arjun Aryal and new Ph.D. student Marissa Cameron. See Bridget's faculty webpage <http://www.soest.hawaii.edu/GG/FACULTY/smithkonter/> for more information.



Jasper Konter: New Geochemistry Professor

Jasper Konter joined the Department of Geology and Geophysics in January 2014 as an assistant professor. His background includes a BSc. and MSc. equivalent degree from the Vrije Universiteit Amsterdam, a Ph.D. from Scripps Institution of Oceanography (UCSD; 2007), and a postdoc position at San Diego State University (2007). From January 2008 – December 2013, Jasper was an assistant and associate professor at the University of Texas at El Paso. His main interest is in igneous geochemistry, and he has brought his research program, and one of his Ph.D. students, Valerie Finlayson, to Hawai'i, joining the Isotope Lab and MC-ICP-MS Lab. His work is based

on samples from islands and seamounts in the Marshall Islands, Tuvalu, Samoa, Kiribati, Tokelau, and volcanoes off the coast of Baja California, as well as several continental volcanoes. It includes a variety of topics, including:

- Mantle evolution at hotspots: compositional evolution of hotspot volcanoes (Pb-Sr-Nd-Hf isotope compositions). Compositional variations within individual volcanoes reflect processes and source materials that build these volcanoes, while along-chain variations reflect larger scale mantle structure and composition.

- Absolute plate motion: the combination of isotopic compositions and radiometric ages can be used to unravel intersecting volcanic chains in order to further constrain models of absolute plate motion.
- Extensional volcanism and the lithosphere of the SW USA: isotopic compositions of various volcanic fields and their relationship to mantle xenolith compositions can provide insight into both crustal assimilation by magma, and processes in the lithospheric mantle.
- New techniques: development of improved measurements of Fe isotopes, Sr isotopes on MC-IC-MS, portable field-based/shipboard chemical analysis by LIBS.

Jasper will build on his 6 years of experience teaching introductory to Ph.D. level classes, planning to teach Geochemistry, Trace elements and Isotopes, and Introductory Geology in the department.

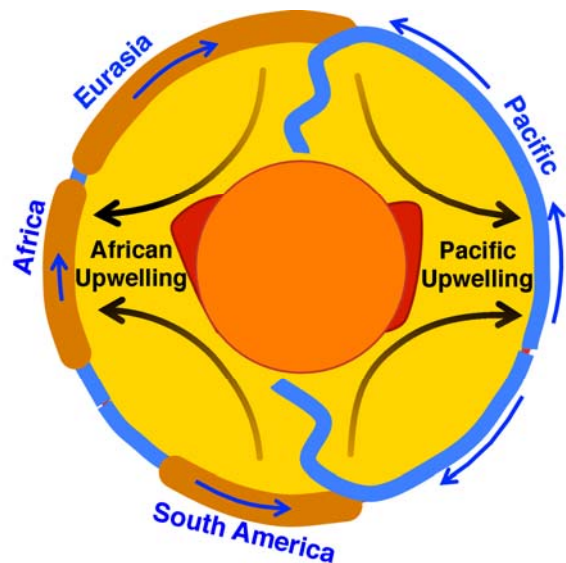
More information is available through:
<http://www.soest.hawaii.edu/GG/FACULTY/konter/>



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2013-2014 GG Research and Teaching Highlights

Clint Conrad and his research group have been developing a number of different research topics this year that relate to intraplate volcanism, planetary convection, sea level change, and patterns of mantle flow. This year Clint published a major review of the interaction between sea level and the solid earth on timescales ranging from decades to billions of years. Different solid-earth processes exert important influences on sea level across all of these timescales! In another major discovery published in the journal *Nature*, Clint used the reconstructed history of plate motions to deduce patterns of mantle flow for past times in Earth history. This analysis revealed two regions of net divergence of plate motions, located in Africa and the Central Pacific, that have remained stable since the beginning of the Mesozoic. Two anomalous regions at the base of the mantle beneath these regions appear to be generating mantle upwelling that drives the plate divergence that we see at the surface. These deep mantle anomalies may act as “anchors” that have stabilized patterns of mantle flow throughout Earth’s recent history (see figure).



Conrad discovered that two major upwellings in the Earth’s mantle, beneath Africa and the Pacific, have remained stable and stationary for at least a quarter billion years [Conrad et al., Nature, 2013].

Postdoc **Joost van Summeren** left the research group for a job in the Netherlands this year, but not before publishing a paper about the cooling histories and geodynamo lifetimes for planets currently being discovered in other solar systems. Former postdoc **Maxim Ballmer** is currently continuing his work on shear-driven upwelling as he prepares a study of mantle mechanisms for driving intraplate volcanism around the Colorado Plateau. Graduate student **Harrison Togia** is currently putting the finishing touches on an interesting study of the evolution of Hawaiian swell topography. Finally, incoming graduate student **C. Evan Watkins** will be welcomed into the research group this year.

Henrieta Dulaiova has been working with students **Christine Waters**, **Alana Kleven**, **Chris Schuler**, **Joseph Kennedy**, **Kariem Gazal** and **Raymond Moore**, as well as postdoc **Olkeba Leta** studying coastal groundwater and geochemistry across the Hawai'i Islands and elsewhere. The team developed and deployed a new instrument to monitor submarine groundwater discharge that will help understand the hydrological connection between terrestrial and coastal environments. The group also continued their collaboration with **Aly El-Kadi** and **Craig Glenn** on water budgets in Heeia, HI and in Tutuila, American Samoa. In collaboration with HIMB scientists Megan Donahue and Florence Thomas the group started a project looking into the influence of groundwater discharge on coastal water quality and coral accretion-erosion balance. We are happy to welcome two new graduate students joining the group in Fall 2014: NSF Fellow **Christina Richardson** and NSF Fellow **Samuel Wall**.

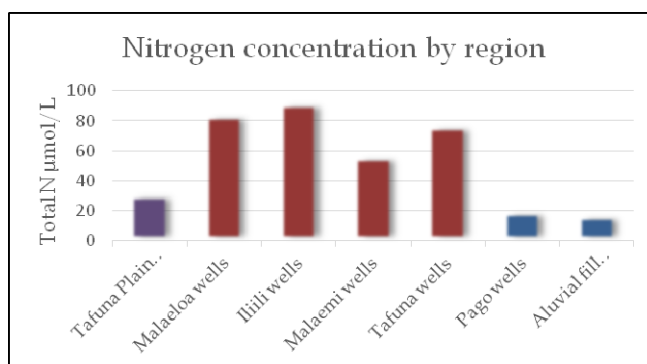


Christine and Henrieta attending to the SGD Sniffer in Kiholo Bay, HI. Photo credit: Joseph Kennedy

Robert Dunn's geophysical group continues research on the tectonic and magmatic evolution of mid-ocean

ridges, arc and back-arc systems, and hotspots. Last year he carried out a 40 day geophysical survey along the Mid-Atlantic Ridge to study oceanic crust formation and evolution; this year he led a short geophysical cruise aboard the R/V Falkor to study Maui Nui structure. Recently, Robert joined forces with **Deborah Eason** to explore the petrogenesis of back arc crust and is excited about the possible future directions of this research. Deborah presented her initial results at the EGU meeting in Vienna. Post doctoral scholar **Ryuta Arai** took a position at JAMSTEC after finishing his work on back arc crust, and graduate research assistant **Silke Ballmer** is finishing her work on Big Island seismic structure. Graduate research assistant, and Bullard Fellow, **Dana Brodie** is finishing her work on the acoustic calls of baleen whales recorded by ocean bottom seismographs in the Lau basin. Robert has also formed an outside alliance to study Minke whale acoustics in the Lau basin. This summer, Robert completed his term as a Manoa Faculty Senator (and as FS committee chair).

The Hydrology group, headed by **Aly El-Kadi**, has published the last papers concerning a project dealing with assessing groundwater sustainability on Jeju Island, South Korea. The project has resulted in five publications, dealing with climate projections (two papers), groundwater recharge estimation (two papers), and groundwater sustainability assessment (one paper). The research team included Benjamin Hagedorn, Alan Mair, Suzanne Tillery, and Robert B. Whittier. A current project, Assessing Ground Water Sustainability of the Island of Tutuila, American Samoa, is on-going (El-Kadi, PI).



Tafuna well waters (brown shade), a major water use area, have a distinctive excess of nitrate and total nitrogen compared to the small valley fill aquifers that are distributed around the coast.

In addition to assessing water sustainability under current and future water uses, including a number of scenarios of drought and land use changes, the project

is aimed at identifying potential land-use impacts to groundwater, including inputs from soils, fertilizers, cesspools, septic tanks, and piggeries. Both field data collection and modeling will be used in achieving this project's objectives. The project team includes **Craig Glenn**, **Henrieta Dulaiova**, and **Chris Shuler**. Help has been also provided by **Joe Fackrell**.

Over the past year, **Neil Frazer** has continued to work on empirical models for shoreline change with colleague **Chip Fletcher** and Coastal Geology Group graduate students **Tiffany Anderson** (PhD 2013), **Haunani Kane** (MS 2014) and **Shellie Habel**, and on the inversion of volcanic deposit data for plume load with **Bruce Houghton** and graduate student **Malin Klawonn** (PhD 2013). More recently he has been working with Don Thomas, Nicole Lautze, **Garrett Ito** and others to evaluate geothermal resources across the state of Hawai'i; with **Bridget Smith-Konter** and graduate student **Sam Howell** on the use of (often-neglected) vertical-component GPS data to estimate crustal motion; and with **Rob Dunn** and graduate student **Dana Brodie** on the detection and classification of whale calls recorded on ocean bottom seismometers. When not occupied with these projects, he works on mathematical models to estimate the loss of wild fish due to disease transfer from sea-cage farmed fish, an issue of great interest in marine conservation.

Michael Garcia's research focuses on Hawaiian projects. He has two NSF supported studies: 1. the ongoing eruptions of Kīlauea; and 2. the Northwest Hawaiian Ridge (north of Kaua'i to the Bend in the Hawaiian-Emperor Chain). Two PhD students are working on these projects: **Kendra Lynn** and **Jonathan Tree**. Since the last newsletter, several of his papers were accepted for publication or published: "Age and geochemistry of lavas from the Northwest Hawaiian Ridge" (with student Jonathan Tree); "Cycles of explosive and effusive eruptions at Kīlauea Volcano, Hawai'i" (with **Adonara Mucek**, BS 2012); an invited paper for an AGU monograph celebrating the 100th anniversary of HVO "How and why Hawaiian volcanism has become pivotal to our understanding of volcanoes"; and "The composition and distribution of the rejuvenated component across the Hawaiian plume: Hf-Nd-Sr-Pb isotope systematics of Kaula lavas and pyroxenite xenoliths".

Mike's teaching activities included GG302 (*hard rock petrology*), a grad class on *how to write scientific journal papers* (new class GG616), and a special seminar on *Geology and Geophysics of the Hawaiian Ridge* to prepare 7 students for a 36-day expedition on

the RV Falkor along the Ridge, an amazing adventure. The seminar was taught with other GG faculty including **Garrett Ito**, **Paul Wessel** and **Clint Conrad**. Service activities for Garcia include hosting a MS student from Yamagata University (Japan) for research on a Japanese volcano using SOEST research equipment. Garcia led a field trip for Yamagata students on O'ahu. He also led trips for students from Tokyo Institute of Technology, Univ. of Alaska and for local high schools students with the Sierra Club. Invited lectures were given by Garcia in Japan, Honolulu and Kona related to Hawaiian volcanism. He continues to serve as a part-time Technical Judge for the U.S. Nuclear Regulatory Commission.



Adonara Mucek (BS 2012) doing field work on Kīlauea. Halemaumau crater in background with fume from ongoing active Kīlauea eruption.

Craig Glenn — is winding up his 5th year as Team Lead for the UHM ridge to reef Terrestrial and Marine projects of the UH Hawai'i EPSCoR Project. During the past year my students and I have been continuing quests linking terrestrial sources to marine sinks of groundwater, and the transformations and impacts of the nutrients they contain. **James Bishop** is finishing his work in GG with fellow Botany Department student **Daniel Amato** in a combined hydrology and biogeochemical stable isotope project on Maui, and both have now been joined by **Joseph Kennedy**, who is mapping the distribution of submarine groundwater discharge by high resolution thermal infrared imaging around the entire island of Maui. **Joe Fackrell** has been helping **Chris Shuler** in American Samoa, and is wrapping up studies tracing the flow of deep injected wastewater into the shallow nearshore waters of West

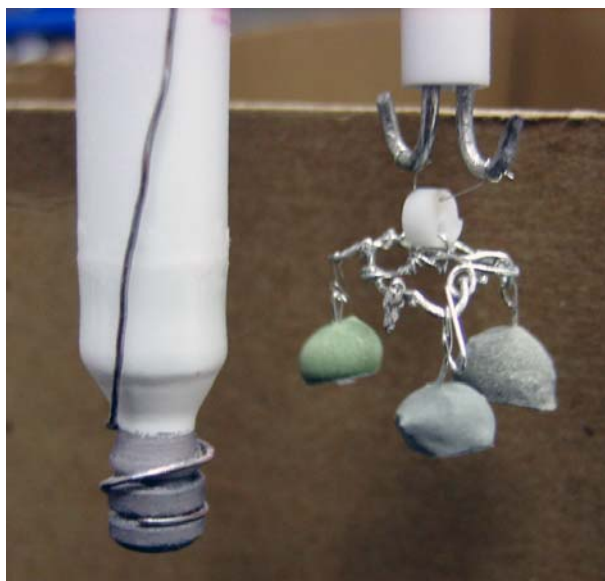
Maui coast at Lahaina, as well as continuing our work on source water and other geochemical partitioning studies along the Kona Coast. As in the past, all my students and I greatly profit and enjoy the combined expertise and excitement of collaboration with co-PIs **Henrieta Dulaiova**, **Aly El-Kadi**, **Paul Lucey**, **Brian Popp** and **Celia Smith**.



Aly El-Kadi explains effects of pollution and drinking water salinization at the Annual Bishop Museum Science Alive! Expo. Over 5,000 local residents attended.

The Experimental Petrology lab was lively with place-based research in 2013-14. **Julia Hammer**'s graduate student **Emily First** kept the controlled-atmosphere furnace humming with experiments examining the crystallization response of martian basalt to various thermal histories. With the help of lab visitor and UH NASA Astrobiology Postdoctoral Fellow, **Patricia Doyle** (now a research fellow at the University of Cape Town, South Africa), Emily perfected the elegant chandelier technique for producing beads suitable for joint petrologic-magnetic characterization, and shared her expertise with undergraduate **Tanis Leonhardi**. Having tackled the challenges of electroplating platinum with iron as a work-study student, Tanis is undertaking a senior thesis study of the rock beneath our feet. Emily and Tanis are melting and cooling the Sugar Loaf lava, an example of rejuvenation-stage volcanism on which the UH campus is situated, to study the kinetics of nepheline nucleation. Julia embarked on mineral synthesis with HIGP graduate student, **David Trang**, with the aim of improving the calibration set of optical properties for lunar and planetary remote sensing applications. The Hammer lab group attended the Goldschmidt Conference in Sacramento, and presented six abstracts spanning the topics of 3D diffusion modeling, the microtextural fingerprints of rapid crystal growth in olivine and pyroxene, theoretical modeling of crystal

nucleation, and discriminating secondary water from primary magmatic volatiles in volcanic materials.



Art and science: Emily's experimental setup for suspending several samples from a chandelier of platinum wires.



Julia Hammer, Emily First, Tom Shea, and Benoît Welsch in the Sacramento Convention Center, attending the 2014 Goldschmidt Conference.

Eric Hellebrand was awarded 2014-2015 *Ocean Leadership Distinguished Lecturer* and is looking forward to touring the mainland in the fall and spring semesters. He continues to look after the Electron

Microprobe and XRF labs. The high-resolution imaging and element-mapping capability of probe has again revealed spectacular zoning in natural and experimentally produced materials, shown to the public during the SOEST Open House and several school visits in the spring. Three of the research highlights that involved such probe discoveries were the chlorine zoning in Vesuvius pumice (**Shea** et al. in *Journal of Petrology*), the unexpectedly heterogeneous water distribution in oceanic zircon (De Hoog et al., in *Geochimica et Cosmochimica Acta*), and the mindboggling phosphorus zoning in olivine that will revolutionize igneous petrology (**Welsch** et al, *Geology*). One particularly challenging project was the analysis of the carbon content and distribution in CR meteorites, using unpolished, Al-coated fragments mounted in indium (PhD project of **Patrick Gasda**, who did the actual hard preparation work). Eric also still works on mantle rocks; two collaborative studies on the Arctic Lena Trough peridotites (with UT-Austin and U-Houston researchers) and pyroxenites (with former postdoc **Anette von der Handt**) were published this year. After almost a decade of landlubberdom, Eric participated in a short research expedition on *R/V Kilo Moana* to Kaena Ridge with **John Sinton** and **Deborah Eason**. Last but not least, Eric thanks HIGP researcher **Pavel Zinin**, who returned to Russia this summer, for an inspiring and productive collaboration in the field of materials science and mineral physics over the past few years.

Christian Miller—Since my arrival last summer I have spent most of my time settling-in: learning the operation and management of the facilities that make up the SOEST Isotope Laboratory. In addition, I have been setting up new analytical capabilities, specifically the analysis of Re and Mo isotope composition in natural materials, and in the near-future, Li. Finally, with the help of colleagues, I have been dipping my toes in the analysis of volcanics rocks, something I never anticipated before arriving here at SOEST.

Greg Moore's group continued with studies of the Japan Trench and Nankai Trough subduction zones around Japan. Graduate student **Brian Boston** is working on normal faults on the subducting Pacific Plate that develop outboard of the Japan Trench. He submitted a paper on the fault orientations, their complicated patterns in the trench axis and how they interact with the overriding Japan forearc. Brian also joined IODP Expedition 348 in the Nankai Trough as a Logging Scientist. Graduate student **Katie Taladay** presented a poster at a Gordon Research Conference on Gas Hydrates in the Kumano forearc basin (Nankai

Trough). Greg re-visited mud volcanoes on Ramree Island, western Myanmar and studied the interactions of mud volcanoes and associated tectonic melanges.

Steve Martel is continuing his research on sheeting joints (“exfoliation joints”) and topographic stresses. The research has expanded out of the Sierra Nevada into Scotland and Colorado and includes collaborators in Europe, Massachusetts, and Colorado, as well as California. Steve and Dave Pollard are continuing to make progress on their undergraduate structural geology book.



Field research during “good” weather in Scotland on sheeting joints and tors.

Brian N. Popp—I wish to congratulate **Christina J. Bradley** and **C. Anela Choy** for graduating with their Ph.D. in 2013. Both were regulars in the Stable Isotope Biogeochemistry Laboratory. CJ is now a postdoctoral fellow at the University of California at Merced and Anela is working with NOAA until she begins her postdoctoral fellowship at the Monterey Bay Aquarium Research Institute in Fall 2014. Congratulations also go to **Cecelia Hannides** who was recently promoted to an Assistant Researcher. **Hilary Close** is completing her second year with us as a NOAA Climate and Global Change Research Postdoctoral Fellow and SOEST young investigator. **Lelei Shih**, **Natalie Wallsgrove** and **Cassie Lyons** also keep work in the lab moving forward. We hosted several visitors over the last year including 2 ITCE **Research in Residence** scholars in 2013 and another 2 RiR scholars in 2014. I am really happy to report that our work with Joel Blum at the University of Michigan on mercury methylation in the ocean was published in *Nature Geoscience* and included my old friend Marcus Johnson as a co-author. In total, we published 7 papers in 2013 and another 8 have been published so far in 2014.

Greg Ravizza—Our work on the marine Os isotope record continues. On-going efforts include work on the Cretaceous-Paleogene boundary, a Miocene comet shower and hunting for previously undetected impact events. **Jess Zaiss** finished up her M. S. work this summer and then headed off to Texas A&M to pursue a doctorate. New projects we are spinning up include using Re concentrations in ancient deep sea sediments to recognize episodes of low dissolved oxygen in the deep ocean and developing a novel geochronology method for gas-prone shales in collaboration with colleagues at Shell Oil and the University of Missouri, Columbia.

Scott Rowland—The past year was pretty similar to last year except without the 3 months in Pasadena. In the fall I taught GG104 and GG461, and in the spring GG305 and GG460 (with Rob Wright; see field trip photos later in this newsletter). Fortunately, Sarah Sherman has taken over the GG101L duties for the time being. I'm still working with the Curiosity rover, but from Hawai'i rather than Pasadena, and I went to AGU for the first time in 11 years, which was great. A few Mars, Galápagos, and Hawai'i papers are slowly trickling out, with the emphasis on slowly. If I can get my act together I might even go on a sabbatical next year – what a concept!

This year's presentation to our undergraduates about life after G&G was given by Brandee Pang Brookman, who received her BS in 1999. Since then Brandee has been an Archaeologist, Park Ranger, GIS Specialist, GeoSAR Analyst, and GEOINT Analyst. She talked to our current undergraduates about differences between working in the private sector vs. government, the importance of getting some work experience during school, not being afraid to "sell" themselves when applying for jobs, and about how good the G&G undergrad degree is because of the broad set of skills and knowledge that it involves. Mahalo Brandee!



Ken Rubin split his research time between deglacial sea level research with **Chip Fletcher**, mid-ocean ridge volcanism with **John Sinton**, Dave Clague and others, and submarine boninite volcanism in Tonga with graduate student **Sarah Glancy**, **Eric Hellebrand** and a group of international collaborators. His sea level research included 2 Pisces V submersible dives at a new site just offshore of Hanauma Bay, joined by GG grad students **Haunani Kane** (MS 2014) and **Shellie Habel**, and 2 of the first 4 science dives with the brand new SOEST ROV, Lu'ukai, at Penguin Banks in January. Ken and **Sarah** also participated in an ROV study of 2011 lava flows at Axial Volcano (NE Pacific) with an MBARI team and their ROV Doc Ricketts. Ken participated in three end user domain workshops for the EarthCube cyberinfrastructure initiative (geochronology, petrology and geochemistry, and deep sea science) and took on the roles of associate dept. chair and curriculum assessment coordinator this past academic year. He is looking forward to an interesting first year as GG dept. chair, which started July 1, 2014.



In the control van of SOEST's new ROV Lu'ukai, with the pilot and navigator team in the front row and Ken Rubin and Shellie Habel on the back bench. An array of cameras and instrument readouts are displayed on the monitors, but at this moment, all eyes were on the prize (top center monitor), which was a colony of roughly 17000 year old coral they intended to sample. Photo by Sarah Glancy.

Assistant Researcher **Tom Shea** brought closure to several projects with publications in *Journal of Petrology*, *Journal of Volcanology and Geothermal Research*, and *Nature Geoscience*. Tom also increased functionality of the Experimental Petrology Lab with a custom-built permeameter and densitometry station, and is using these apparatus to study eruptive vesiculation processes in the Pu'u Wa'aWa'a cone, on Hawai'i.



Tom and his wife Clara also welcomed Enzo into their family this past December.

John Sinton—Highlights of the last year include the successful completion of PhD studies by Alice Colman, the publication of a paper on the the Ka'ena Volcano (precursor to the island of O'ahu) in Bull GSA, and the beginning of retirement on January 1, 2014.

Assistant researcher **Benoît Welsch** shepherded his paradigm-shifting interpretation of Hualalai olivine textures into a *Geology* publication, co-authored by **Julia Hammer** and **Eric Hellebrand**, and is

completing a detailed study of Maui ankaramite lavas with Eric, graduate student **Samantha Jacob**, and **John Sinton**. Ben is also the institutional lead on a collaboration to advance the numerical treatment of crystal growth with researchers from the Earth Observatory of Singapore.

Paul Wessel has continued his research into the kinematics of Africa, and his student **Sarah Maher** graduated this spring by successfully defending her thesis on Africa absolute plate motion. The fall saw the long-awaited release of GMT 5, which is being adopted around the planet. More work on GMT is likely as a UH collaboration with Scripps and the University of Michigan has been funded by NSF/Geoinformatics to strengthen GMT's role in seismology, radar interferometry, geodesy, and high-performance computing. Wessel spent the summer writing proposal, hoping the third time is the charm for a mapping expedition to the remote Ellice Basin between the Ontong Java and Manihiki Plateaus.

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GG Picnic and Softball Challenge 2014

by Brian Boston

A wet and wild time was held on April 26th for the 2014 G&G Picnic and Softball Game at Lanikai Park. In a solid game in between rain showers, the Grads held out long enough defeat the Faculty, 15-12. After a close call at second base in the first inning, both teams realized the stakes were too high not to have an official umpire. Steve “exMVP” Martel rushed in to settle later disputes with his iron bat. The Grads maintained a small lead of the Faculty throughout the game with the Faculty knocking at the door multiple times including a seven run streak. Jonathan “Most Improved” Sleeper progressed from a huge 1-foot hit to a daring diving catch within 6 innings. Eric “Over the Catcher” Hellebrand's daring dance moves on the field, including jumping over the catcher to reach home plate, led him to be nominated as Faculty MVP. The graduates are slowly pulling ahead of the series 6-4. And they're not looking back.

Many thanks for those who attended and for the periods of sunshine that made the game more enjoyable. A great way to send off the year.



Grads for the win! Standing (left to right): David “Out of the Park” Trang, Jonathan Sleeper, Jonathan Tree, Sam Howell, Patrick Gasda, Dana Brodie, Jonathan Weiss, Christie Jilly, Sarah Maher. Trophy row (left to right): Brian Boston and Sarah Crites. Photo by Caroline Caplan.

Alumni News

Floyd W. McCoy [BS, 1962; MS, 1965] continues teaching at WCC in geology and oceanography funneling undergraduate majors across the Ko'olau to G&G, in addition to developing curriculum in the earth and oceanographic sciences adapted to Hawai'i and its language, culture, and legends (in conjunction with Scott Rowland) via the College of Education. Research continues to focus on geoarchaeology at sites on Crete impacted by the Late Bronze Age eruption of Santorini (Thera), and in Hawai'i on those irresistible tsunami deposits.

Lisa Gaddis [PhD 1987] who works for USGS-Flagstaff writes: I don't really have much news. All I can think of is that I was appointed to the NASA planetary sciences subcommittee (PSS) this past year. That's an advisory group to the NASA advisory council.

Michael D. Knight [PhD 1989]: I am the owner of Knight Enterprises, Inc., which has been in business for over 8 years, and I conduct geological, geophysical, hydrological, geo-engineering, remote sensing, and volcanological studies throughout Hawai'i, the Pacific and Circum-Pacific. This year is starting out very well with several moderate sized geotechnical soil engineering and drainage projects already completed and several volcanic/groundwater, landslide, and stream geo-engineering studies that are under contract or will begin later this year. My most recent work is involved with drinking water resources on Tutuila, American Samoa. The Samoan volcanoes are related to complex shear coupling of the Pacific Plate due lateral plate bending toward the transform portion of the Tonga Trench, and these plate interactions appear to have imposed quite a complex volcanic history.

David O'Brien [PhD 1990]: I was the first person in Alaska to become a Geographic Information System Professional (GISP), and have been the Data Analyst at the Alaska Cancer Program for the last 15 years. I work with cancer-patient data that are sent from hospitals, physicians, and pathology labs around Alaska, compile them into a database, and generate annual statistics on cancer incidence and mortality. I also conduct cancer studies for communities that are concerned about the cancer rates in their area. I have been married to Irene for 26 years and we have two sons, Thomas (22) and Daniel (19), who are both attending the University of Alaska Anchorage. Both

sons are Eagle Scouts, and even though they are not in scouting anymore, Irene and I are still involved as adult leaders.



David in front of Mount McKinley

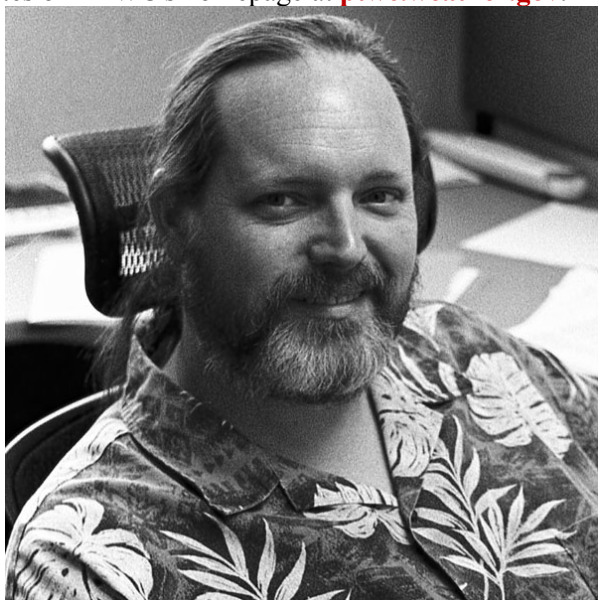
Paraluman Stice-Durkin [BS 1991] has been a science teacher at Punahou for 21 years.



Mauna Kea summit after a hike with fellow geologist and science teacher Dan Gaudiano. Great place to pause and be grateful for how wonderful life is.

Nathan Becker [MS 1997; PhD 2005]: I am an oceanographer at the Pacific Tsunami Warning Center (PTWC), part of the National Weather Service and NOAA, where along with my colleagues we monitor the world's oceans 24/7 for tsunami hazards, improve our operation through scientific research towards developing new tsunami hazard detection and analysis techniques, and inform emergency managers and the public about our Center's operations and tsunami science. My own scientific

contributions include developing geospatial analysis methods to predict tsunami warning response times from the distribution of available sensors in seismic and sea-level networks. My outreach and education efforts are far more visible to the public, however, since I produce content for PTWC's social media sites, mostly computer animations of earthquakes and their tsunamis. These animations have also appeared in local, national, and international media, and one of these animations, "*Perspective*" garnered considerable praise in an AGU video production workshop. You can find links to our social media sites on PTWC's homepage at ptwc.weather.gov.



Andy Goodliffe [PhD 1998] and **Denise Hils** write: Andy has settled into his dual role at the University of Alabama, continuing to teach classes and advise students in the Department of Geological Sciences while shaking things up as Assistant Dean of the Graduate School. Research projects have included work on geological carbon sequestration and development of innovative teaching methods. Within the graduate school, Andy has been instrumental in the establishment and success of the Graduate School Parent Support Program (recently featured by the Association of American Colleges and Universities) as well as the WiSE (Women in STEM Experience) conference. WiSE has grown from an evening workshop targeting UA students to a full-day+ event pulling attendees from throughout the southeast.

Denise has been kept busy with her role as Director of the Energy Investigations Program at the Geological Survey of Alabama. She's continued work on geological carbon sequestration, traditional hydrocarbon resource assessment, and alternative

energy assessment. A recent project, Alabama's participation in the National Geothermal Database System, has led to her work on data preservation issues, particularly the issues around legacy physical objects (e.g., drill core) in an increasingly digital world. Much of her recent work has surrounded issues with oil sands resources in Alabama - technologies for extraction, issues about regulation, and thorough assessment of the potential for development.

Both Denise and Andy are involved with professional organizations - for example, Andy is on the national board for NAGT, while Denise is serving on the national board of AWG. Outside involvement doesn't end there, though - Denise and Andy have co-taught a once-a-week geology class for elementary students through the Tuscaloosa City School system for the past five years. Denise also serves on the board of the Alabama State PTA, and she ran (unsuccessfully, but it was a close race) for the Chair of the Tuscaloosa City School Board of Education in August of 2013. Kieran (now 11) and Genevive (who goes by Ginny, and is now 7) are both doing well. It's hard to believe that they are starting 6th and 2nd grades, respectively! Both show strong aptitude for science and math, and keep Denise and Andy busy with their respective activities.

Brandee Pang [BS 1999] came to give the Life-after-G&G presentation to our current undergrads (see picture in Scott Rowland's Research & Teaching blurb). She works for the National Geospatial-Intelligence Agency.

Kirsten Zellmer [MS 2000]: I'm in Costa Rica at the moment -- it's spectacular!!! As for work, well, I still use some of the mapping skills I picked up at UH -- but now I help run a GIS system to monitor transmission pipelines for PG&E! Aloha & Pura Vida, Kirsten.

Georgiana Young Kramer [BS 2000]: I received my BS from UH in 2000. I spent a few months preparing for and getting married before moving to South Bend, IN to begin my graduate work at the University of Notre Dame, where I received a PhD in 2007 for my dissertation on the geochemistry and petrology of the Moon using sample and remote sensing data. My first job after grad school was at the Bear Fight Institute in Winthrop, WA, where I was afforded the opportunity to be on the Moon Mineralogy Mapper Science Team. In 2010 I began my current position at the Lunar and Planetary Institute.



Georgiana with husband Jim at Meteor crater

Ebitari Isoun Larsen [MS 2001]: My company, Delta Data Services, has now been in business five years. I provide services in management consulting in particular: Zoho Systems Integration, Web design, Training Development and Project Management - www.dds-llc.com. I live in Long Beach, CA with my husband and son. In my free time I work with my family on our vegetable garden.



Ebitari and her family

Zoe Norcross-Nu'u [MS 2001]: Aloha from Vancouver Island! Been a challenging year for my girls (6 & 8) and I as my husband passed away last year. Was so amazed and touched by the awesome support from my Hawaiian 'ohana, and from all over

the world... amazing. On a lighter note, I had the excellent fortune of hooking up with Jackie Caplan-Auerbach and Eric Grossman in Bellingham for the Ski to Sea Race in May. Jackie had completed a thorough 6-month analysis of all the stats on all the team's competition and previous years' results, and had developed a model that calculated everyone's required speed in order for the team to make the podium. Her obsessive data crunching, along with her athletic prowess, paid off, as the team placed 3rd in the highly competitive mixed open division! Eric ripped up the surf ski leg with his not-yet-walking mini-me strapped to his back. (Well, almost, I think Sarah rescued Asher at the last second.) The guy is still a total machine even under sleep-deprived, no-training conditions. Love having UHG&G alum nearby - that means you too Geoff Garrison! Steve Quane how come I never see u? A hui hou!



Left: team #calmerthanyouare. Right: Kaena, Zoe and Tiare

Stephen Leslie [MS 2001]: Recently passed the 10 year mark in the Oil and Gas Industry and actually had a hand in an oil discovery in Colombia this year. Enjoy spending time with my son Ethan, who just finished the 1st grade.

Margaret Milman-Barris [MS 2002]: Brian and I moved to upstate NY almost 2 years ago and are now living in Oneida, NY, in the middle of farm country. Rose and Irene are growing up smart and fun, and we had another baby girl, Grace, who is now 18 months old. I'm working at an environmental consulting company called FPM Remediations on projects at Fort Knox, KY and Charleston Air Force Base, South Carolina. It's a fun office and I'm happy to have interesting work to do.

Junaid Dawud, [BS 2002]: While I haven't done anything for a few years in the geology field, a friend and I walked between and summited Colorado's 14,000ft peaks. The trip was the first thru hike of the 58 named 14ers, and it was named one of the top 10 FKTs (fastest known times) of 2013. The website has details, pictures, and a google earth file of the hike: www.14ersthruhike.com. It turns out my greatest talent is as an adventurer.



Jeremy Kimura [BS 2003]: I continue to work as a hydrologist for the State of Hawai'i Commission on Water Resource Management. The job has allowed me many opportunities to work with friends at the University and abroad.



Elaine Smid [MS 2004]: Kia ora and aloha! I am coming up on 6 amazing years of living in Auckland, New Zealand (almost citizen-eligible!). Happily, I have found a place on the research staff at the University of Auckland's Geology Dept., serving on the project management, outreach, and research teams for two large projects studying the hazards and risk posed by monogenetic volcanic fields in Auckland and Saudi Arabia. I also just started a part-time PhD in volcanology in May 2014, so life is quite busy!



Elaine in a lava tube in the Auckland Volcanic Field

Angela Peltier [Angela Miller; BS 2004]: I currently live in Reno, Nevada and continue to work remotely as a geologist for Element Environmental, LLC, a Hawai'i based company. My job consists of writing environmental reports for a wide range of clients throughout the State of Hawai'i and Pacific Rim.



Ken Natividad [BS 2004]: I live in Highlands Ranch, Colorado with my wife and 3 girls (5 yrs, 2 yrs, and 10 months old). I am a Geophysicist for a company in Colorado called Sigma3 Integrated Reservoir Solutions, Inc. that integrates geoscience and engineer principles. My work involves processing and monitoring microseismic and 2D/3D VSP (Vertical Seismic Profile) data from many parts of the world. One of the interesting things I experienced at work was real-time microseismic monitoring. It is fascinating to see where fractures or events are generated and in some locations, these events can map out a fault or some kind of geologic

feature. In my free time I enjoy spending it with my girls riding bike, hiking, camping, snowboarding and cooking Hawaiian, Filipino food, which they love to eat.



Chris Gandy [MS 2006]: We've actually got some rather large news as of late. My wife gave birth to our second child, Emerson Mae Gandy on May 28th, she's a healthy, beautiful baby girl. Still residing in Savannah.



Kyle McHargue [BS 2006]: This past year I moved from New York to Temecula, CA to take a staff geologist position with a great company called LGC Geo Environmental, Inc. I've had the privilege of being involved in every aspect of a three month slope stability study which included: mapping 200 acres of

mountainside, logging 70+ trenches and borings, fault zone studies, and completing all of the autoCAD and slope stability analysis for the final report. Every day I feel so thankful to be doing what I love. Who else gets to be half scientist and half kid playing in the dirt?



Mapping alluvial deposits during a fault investigation

David Gremminger [BS 2006]: I was able to find a job in the geotechnical engineering field within 6 months after graduating. Finding a job as a geologist was extremely rewarding for two reasons; One, I could use the knowledge I gained at UH and apply it to the job I was doing. Second, getting a job in Hawai'i allowed me to stay in Hawai'i and not live on the budget of a college student! I have been with the same company since and I love it. I have gotten the opportunity not only to apply the skills I learned at UH but the chance to travel to all of the main Hawaiian Islands and been have been lucky enough to have surfed on every one!



Mike Theune [BS 2007] recently moved to north-central Minnesota where he is the Public Affairs Officer for Chippewa National Forest. He is also the Forest Service coordinator for the 2014 U.S. Capitol Christmas Tree, which will be lit in early December in Washington, D.C. after a 21-day tour across the

mid-west and eastern regions of the country. His wife Ashley Occhipinti (Meteorology '08) also works on the same forest.



Mike on frozen Lake Bemidji.

Tracy Saguibo [BS 2008]: I have been a geologist with AECOM for 5.5 years now. Currently, I am working on a subsurface fuel investigation on the British Indian Ocean Territory of Diego Garcia. We are in the planning stages of the project and are tentatively planned to arrive on DG in January 2015.



Noah Kippen [BS 2009]: Currently I work for ESN Pacific. Actually since about a month after my graduation from GG in 2009. ESN is an environmental company. We do soil and wet lab analysis and I specialize in drilling mostly. We have one dual rig and two dpt rigs. I totally miss GG classes and the whole GG department.

Meryl McDowell [PhD 2009], and Loyc Vanderkluisen [PhD 2008]: Meryl recently started working in remote sensing at the Naval Postgraduate School in Monterey, and we both relocated to California last Spring. Another big move is on the horizon, however: starting in the Fall, I'll become a

tenure-track professor at Drexel University, so we'll soon be Philadelphia-bound.

Aaron Deloach [BS 2010]: In 2011 I did a Geotechnical investigation in American Samoa with Yogi Kwong Engineers, LLC. We were developing a geotech plan to repair roadways following the earthquake. Mark Higley, Dave Gandy and I worked on the Kaneohe-Kailua Gravity Conveyance Tunnel (Sewer Tunnel) in 2012, also with Yogi Kwong. In 2013, I went to Crete with Floyd McCoy for a Geo-Archeology project. Using geological methods to identify and help describe important Minoan archeological sites. I have since gone back to moving furniture.



Doing a line survey at the exposed dikes along Mokapu Saddle Road cut in Kailua.

Brian Kastl [MS 2010]: I am an international consultant on water resources management, designing conservation projects for organizations including *The Nature Conservancy* and the *Asian Development Bank*.



Brian (dark blue shirt) with a team for the International Union for Conservation of Nature (IUCN) in coastal Cambodia, working on securing freshwater resources and building coastal resilience.

Christopher Hamilton [PhD 2010]: After receiving my Ph.D., I moved to Washington, D.C. to undertake a three-year NASA Postdoctoral Program Fellowship at the Goddard Space Flight Center. During that time my research focused of lava flows on Earth and Mars, impact cratering, and tidal heating processes within Jupiter's moon Io. Following this, I moved to Tucson to become an Assistant Professor in the Department of Planetary Sciences / Lunar and Planetary Laboratory at the University of Arizona. I was also selected for a NASA Early Career Fellowship and elected as the Secretary of the IAVCEI Working Group on Volcano-Ice Interactions. I am currently leading several NASA-funded projects related to volcanism on Earth, Mars, and Io and am in Hawai'i this summer to investigate lava flow emplacement processes on the Big Island and work with colleagues in HIGP.



Kilauea's December 1974 flow provides an ideal terrestrial analog for platy-lava formation on Mars.

Regan Austin [MS, 2012] recently started work as a map and publications editor for the U.S. Geological Survey in Menlo Park, California. She's really enjoying the new job and being back in the Bay Area after 15 years away.

Jennifer Beyer [BS 2012]: I'm currently in my second year of my Master's degree at the University of Texas, Arlington. My research involves characterizing the geometry and orientations of sandstone injectites near Sheep Mountain Anticline in Wyoming, also investigating the mechanics of downward intrusion and deformation of these injectites. I'm hoping to complete my thesis by Spring 2015 and then go on to pursue a PhD.



Jennifer Beyer in the field

Adonara Mucek [BS 2012]: I just completed my second year as Ph.D. student at Oregon State University. Thanks to a GSA Research Award, I'll be returning to the field this summer, studying the resurgence process at Toba Caldera, Indonesia. I will be presenting my preliminary results at the Cities on Volcanoes 8 conference in Yogyakarta, Indonesia this September, as well as the Commission on Collapse Calderas in New Zealand this December.



Ken Hay [BA 2012]: After graduating from UH, my wife and I moved to Buffalo, NY where I recently received my Master's in geology from the State University of New York at Buffalo. My area of study was on hydrogeology with my Master's project focused on further analyzing the sensitivity of groundwater/surface water discharge estimates as calculated from temperature time series data. Currently I am looking to begin a long a fulfilling career in the field of hydrogeology.



Yellowstone during summer field camp in '12.

GG Alumni Meeting at AGU Fall Meeting



L-r: Aisha Morris (PhD 2008), Ole Kaven (MS 2004), Eric Mittelstaedt (PhD 2008), Elaine Smid (MS 2004), Yohei Shinozuka (Ocean, PhD 2008).

Both photos were taken at AGU Fall Meeting 2013 by Elaine Smid, who was regretfully left out of last year's Alumni News.



L-r: Deborah Eason (PhD 2009), Kolja Rotzoll (PhD 2007), Eric Mittelstaedt (PhD 2008), Mary Engels (MS 2003), Ole Kaven (MS 2004), Seung-Sep Kim (PhD 2010), Elaine Smid (MS 2004).

Take your group pictures at AGU or any other place where GG alumni meet and please send them to us.

Disclaimer:

If you find any errors in the names and graduation years, we're very sorry. Please contact us we will fix them.

Field Trips

Chip Fletcher's Big Island field trip with GG101



Photos: Chip Fletcher



Photos: Pavel Zinin



GG104 went on field trips to Ka'ena to gather pōhaku, Lē'ahi (w/ GG101L) to learn geologic mapping, Kīlauea (w/ GG101 and 101L) to visit Pele, and Waipao (above) to learn about hydrology and lo'i. See also: http://www.soest.hawaii.edu/GG/FACULTY/ROWLAND/GG104/GG104_webpage01.htm



GG104 students and stone implements at Open House.



Gathering pōhaku at Keawa'ula.



Mapping sandstone among the beachgoers.



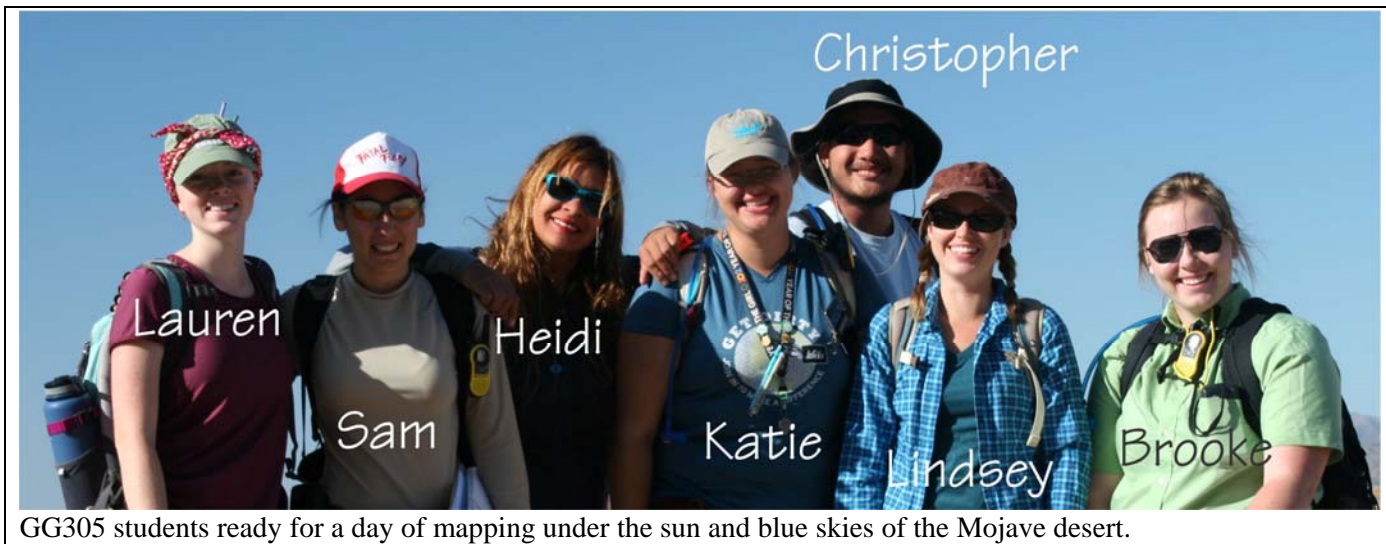
Measuring streamflow at Waipao.



GG104 + 101 + 101L in the Ka'ū Desert.



'A'ā and pāhoehoe at Hilina Pali.



GG305 students ready for a day of mapping under the sun and blue skies of the Mojave desert.

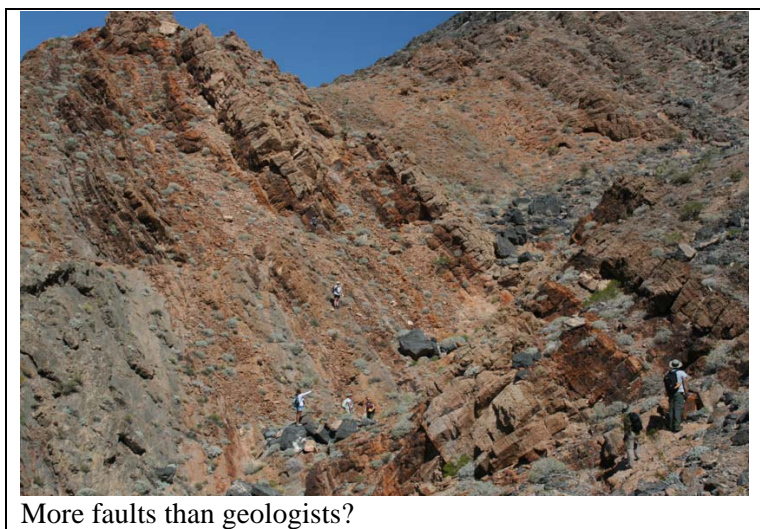
This year's bunch in GG305 enjoyed some very rainy days at Makapu'u and some very sunny days in the Mojave. They're moving on to jobs, graduate school, and the fall semester. See also: http://www.soest.hawaii.edu/GG/FACULTY/ROWLAND/GG305/GG305_webpage01.htm



Measuring and describing the filled lava tube at Makapu'u.



This year Hanauma Bay made us all wear orange vests.



More faults than geologists?



The traditional post-mapping jump at Badwater.

Maui field trip led by John Sinton (GG402)



Photos: John Sinton and Heidi Needham



There were 19(!) students in **GG460** this year so Rob Wright and Scott Rowland had their hands full. Above they are about to set off and ground-truth the geologic maps that they'd spent weeks (theoretically) working on. See also: http://www.soest.hawaii.edu/GG/FACULTY/ROWLAND/GG460/GG460_webpage01.htm



P-type and S-type pāhoehoe. Are they on my map?



Rob explaining how not-tired they should be at the end of the day.



Using SAR to navigate around 'a'ā



A brief stop at the sulfur banks to discuss SO₂, vog, alteration, and Kamapua'a's gift to Pele.

Remember When...

*you held your first rock specimen in a GG class or took your first GG field trip?
you made your first map, learned about a useful isotope, or looked at a seismogram?
GG department became your academic home, a place of learning, with friends and colleagues?*

Help others have that experience with a gift to the GG department. Your donation would provide funds to maintain and replace aging teaching infrastructure, support field excursions, and provide modern computing and audiovisual equipment for our classrooms and computer lab.

Please contribute today to the GG department fund at the University of Hawai'i Foundation and help make those *geo-dreams* come true for a new group of emerging geoscientists. Consider making a gift today, using this form or through the UH Foundation website (see below). *Thank You!*

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