



NUHOU KANAKA PUKA

Department of
GEOLOGY & GEOPHYSICS
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Nuhou Kanaka Puka

Nuhou Kanaka Puka ("Alumni News" in Hawai'ian) 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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Water Flows Through Us...

Water is the most precious of resources of any island. As an island group isolated from other landmasses, we have to rely on local water sources, which mostly comprise groundwater. Long-term monitoring indicates that our aquifers are being stressed, and landward and upward movements of the salt water-freshwater transition zone have been clearly demonstrated over the last century. Sustainability of our groundwater resources hang in the balance, and as such remains a central theme in the modern science, politics, and society of Hawai'i today. The interaction of groundwater with the ocean is also of tremendous concern due to the severity of environmental problems that can be caused by contamination, on land and into the sea.

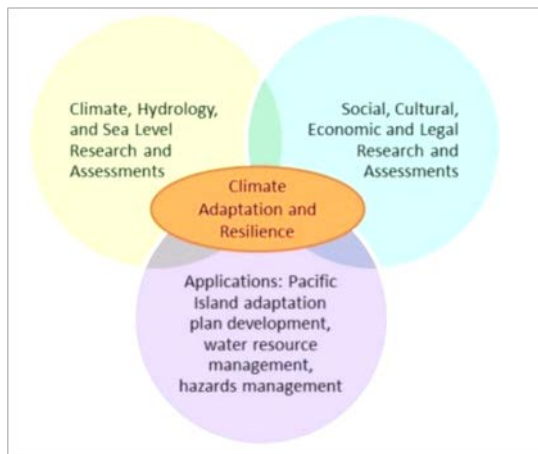
The **Hydrology and Coastal Groundwater Research Group** has been leading major research efforts to address a variety of interrelated and applied studies. The group includes faculty, researchers, and students from the Department of Geology and Geophysics and the Water Resources Research Center (WRRC), among others. Example studies include that by our hydrology team, who assessed potential risk caused by onsite disposal systems (OSDS) throughout Hawai'i, that include septic systems and cesspools. It is estimated that there are 112,000 units in Hawai'i with approximately 70 million gallons per day of minimally treated wastewater eventually discharged to the ocean. OSDS effluent has the potential to elevate groundwater nitrogen concentrations above drinking water limits. Majority of these systems are close to the ocean, which can cause serious water quality problems under sea-level rise.

Based on a study by Whittier et al. (2010), the State of Hawai'i's Department of Health (DOH) adopted a vulnerability model that combines groundwater modeling with a subjective index method for estimating drinking water source susceptibility of groundwater sources. Recently, our team completed an audit to evaluate the DOH approach and to develop and test an alternative risk assessment method (Mair and El-Kadi, 2013). The audit used recent well contaminant chemistry for target contaminants from major aquifer sectors.

The team is also involved in the hydrological phase of the Pacific Regional Integrated Sciences and Assessments (Pacific RISA) project aiming at assessing effects of climate change. Details can be found on the website:

(<http://www.pacificrisa.org/>).

We have also completed a major study that addressed climate change effects of the Jeju island of Korea, which has been documented by Hagedorn et al. (2011), Mair et al. (2013), and Tillery et al. (2013). We are currently involved in a USGS funded study aiming at addressing major issues affecting water sustainability on the island of Tutuila, American Samoa. The study will identify potential well contamination, assess wells under the direct influence of surface water, evaluate effects of climate change, and identify potential land-use impacts to wells, including inputs from soils, fertilizers, cesspools, septic tanks, and piggeries.



The three major components of Pacific RISA share the common nexus of increasing climate adaptation and stakeholder resilience in the Pacific Islands.

But, the significance of groundwater for the islands doesn't end there. Ancient Hawaiians recognized that groundwaters fed the coastal springs, which deliver nutrient rich waters to the coastline. Many Hawaiian fishponds, some created as early as 1,000-1,200 A.D., and some still present today, were built around the springs by erecting walls from basalt and coral to trap fish, and to manage water quality. The artesian springs fed freshwater into the ponds and changed them from saline to an estuarine environment preferred by and capable of sustaining many fish (Sato and Lee, 2007).

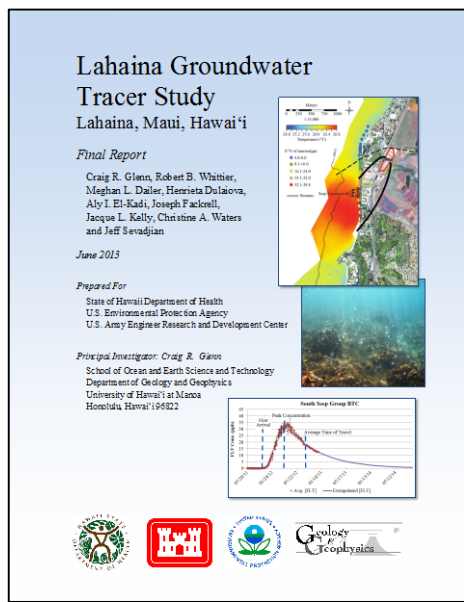


Indeed, hydrological budgets (e.g. Shade and Nichols, 1996) indicate that most of the groundwater which recharges in Hawaiian uplands is eventually discharged into the ocean. This flux manifests itself as coastal springs or diffuse seepage, for which we use the collective term submarine groundwater discharge (SGD). Some of this discharge is obvious and is relatively easy to quantify. Mostly, however, large quantities of the groundwater are inconspicuous, and discharge along the coastline with no direct way to quantify it.

Of significance is that, despite their much smaller lengths of coastline relative to continental land-masses, large islands such as the main Hawaiian Islands contribute as much as one half of total SGD to the entire Pacific Ocean (Zektser, 2000). This remarkable and disproportionately large contribution results from the climatic and physiographical characteristics of islands located in sub-tropical latitudes, such as high rainfall, sharp topographic relief, underdeveloped river systems and high permeability of fractured rock. These characteristics are all expressed in the Hawaiian Islands where the volume and rate of SGD per unit length of shoreline can greatly exceed those of continental systems and of surface runoff.

While some nutrients like silicate and phosphate occur in groundwater naturally, human presence in Hawai'i left its imprint on the chemical signature of groundwater. Of concern is the presence of elevated nutrients, pharmaceuticals, metals, chlorinated solvents, fumigants and pesticides. The sources of these contaminants are agricultural, military, and urban developments. While we worry about these pollutants because of our drinking water quality, there are entire nearshore and offshore coastal ecosystems that depend on SGD and are affected by its water composition as well. This is because submarine groundwater discharge is a pathway for both nutrients and pollutants from the terrestrial to the marine environment.

While the impact of episodic nutrient rich storm runoff on coastal biogeochemical processes is relatively well studied, non-point source pollution via groundwater discharge is a chronic impact to coastal ecosystems, the effect of which is more difficult to document. The impact of non-point source nutrient loading on coastal environments in Hawai'i is thought by many to be minor due to the rapid dilution by offshore mixing. However, more and more studies show that it is not the case everywhere, and especially vulnerable are nearshore coral reefs.



Groundwater that discharges with extreme nutrient loading, or discharges to regions with restricted circulation may have very significant impact on coastal ecosystems, leading to eutrophication, cascading shifts in coastal community compositions, persistence of invasive species, algal blooms and decreases in coral health.

In many coastal environments around Hawai'i macroalgae blooms and proliferation of several nonnative-invasive algae species have reached epidemic proportions (i.e. west Maui and east and southeast Oahu), smothering coral colonies, replacing endemic algae species, and severely fouling beaches (Smith et al., 2001). While biologic interactions such as the effects of grazing remain unclear, recent macroalgae growth rate experiments and extreme algal nitrogen isotopic signatures of the in situ algae clearly indicate a causative link to SGD (Dailer et al., 2012).

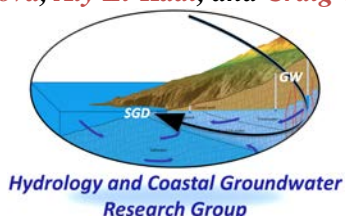
The Hydrology and Coastal Groundwater Research Group's projects address various aspects of these issues and extend from Mauka to Makai. These projects capture upstream processes that influence SGD from land, such as watershed approaches that examine natural and anthropogenic controls on groundwater recharge, transport and composition, including climate, hydrogeology and land use. On the Makai side, we study downstream coastal effects of SGD including its influence on coastal and marine biological processes, chemical budgets of elements, contaminant fates, and coastal zone management. Our 5-year NSF EPSCoR research project called ENDER (Environmental Dynamics and Ecosystem Responses) focuses on west Hawai'i, where groundwater discharge is the only source of freshwater, and the only source of nutrient flow to the ocean. A hydrological model

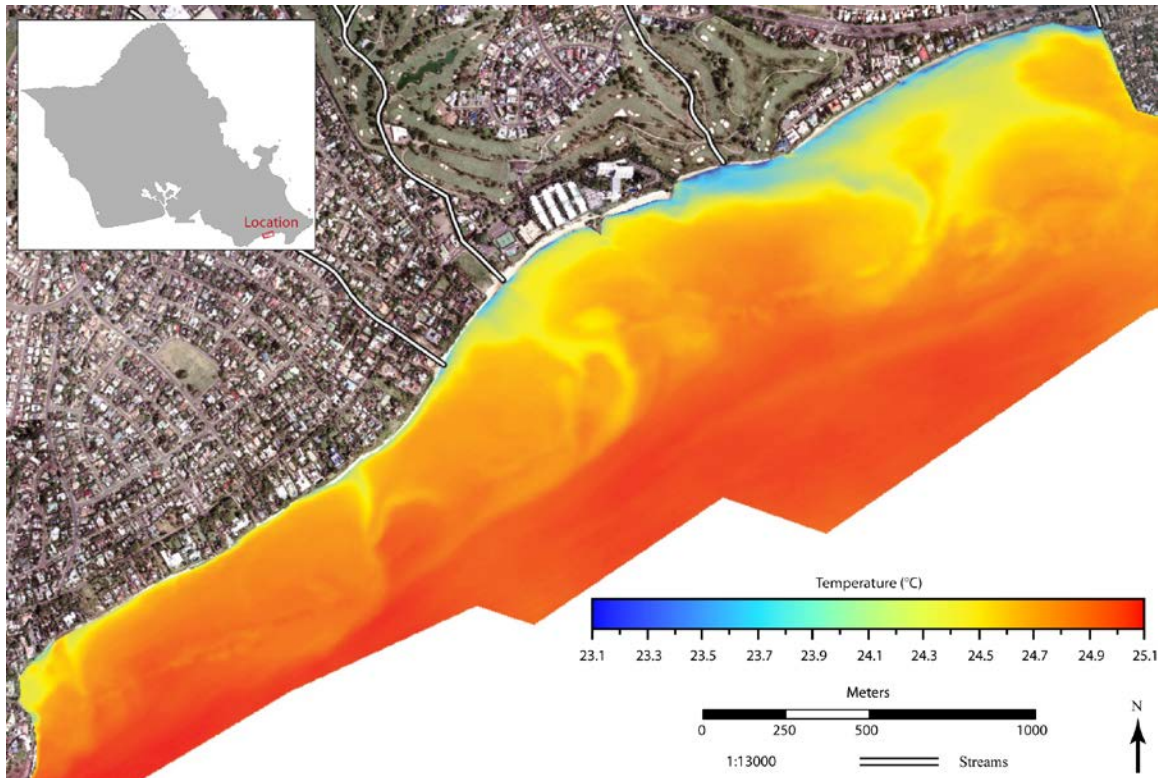
estimates large groundwater and nutrient fluxes along the watershed into the coastal zone. Our studies compare pristine and urbanized watersheds to contrast nutrient fluxes and investigate the primary drivers behind submarine groundwater discharge. On west Maui, we investigated the existence of a hydraulic connection between wells receiving injections of treated wastewater effluent and nearby coastal waters (Glenn et al., 2013). In a UH Sea Grant funded study we evaluate water resources and downstream effects of land-use changes in a contemporary He'eia Ahupua'a. Another UH Sea Grant funded study encompasses several locations around Maui and investigates groundwater-derived nutrient fluxes and algal communities with respect to land-use. Similar studies have been conducted and are ongoing on Oahu and many more are proposed. Throughout all the Hawaiian Islands and elsewhere in the Pacific we are attempting to precisely map and quantify the flow of groundwater to the ocean using geochemical tracers as well as by highly accurate thermal infrared remote sensing by air, and soon by satellite.



All our studies are interdisciplinary, and we are thus extremely fortunate to collaborate with an ever increasing number of many excellent colleagues from GG, East West Center, HIGP, Botany, Economics and HIMB, as well as with stakeholder agencies such as UH Sea Grant, the US Geological Survey, DNLR Aquatic Resources, U.S. Army Engineer Research and Development Center, U.S. Navy, the Clean Water and Safe Drinking Water Branches of the Hawai'i Department of Health, and the U.S. Environmental Protection Agency.

The authors:
Henrieta Dulaiova, Aly El-Kadi, and Craig Glenn





Thermal infrared image of Aina Haina, Oahu, illustrating large scale mixing of cool diffuse groundwater flow (blue through yellow) which is being mixed into the coastal zone and entrained by alongshore flow towards the southwest. No stream flow, Pacific seawater is red, spatial resolution = 3.2m. From Kelly et al., 2013.

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Message from the Chair



As we begin the 2014 academic year, I would like to welcome all of our new faculty, staff and students. Here is a quick summary of some high points of the 2013 academic year:

SOEST completed its latest 5-year external review and the Department received praise as "one of the leading earth science departments in the nation" with research called "truly excellent," faculty called "high quality" with "the best graduate students," etc. – many thanks to the hard-working students, staff, and faculty!

This year we were again able to replace some aging equipment (courtesy of a large fund match from the Dean) – we purchased new microscopes and computers for the student lab. The new A/V system was finally installed in our main lecture/seminar room (POST 723) – it makes a huge difference for our classes and seminars.

A GG graduate student, Alice Colman, was one of the awardees of the inaugural Denise B. Evans Graduate Fellowship. See the awards section for of this newsletter for additional accolades.

In news about the Faculty, we congratulate Julia Hammer on her promotion to Full Professor, and Steve Stanley on being awarded the most prestigious honor of the Geological Society of America, the Penrose Medal (p. 7). We were able to hire three new faculty members: Christian Miller as an Asst. Specialist for the Isotope Lab (see his short Introduction on p. 18) and Bridget and Jasper Konter as Assistant Professors. Jasper is an Isotope Geochemist and Bridget is a Geophysicist – they will start next January.

We were shocked and saddened last Fall when Professor Emeritus John Mahoney was diagnosed with Creutzfeldt-Jakob disease and passed away within a few weeks (see article by Ken Rubin and John Sinton on p. 19). John was actively working to finish some IODP work before moving to Montana to enjoy his retirement. John will be missed!

As most of you already know, the State Legislature has been somewhat "unkind" to UH and especially to the Mānoa campus. This year, Mānoa was hit with a \$7M cut and the Legislature refused to fund the negotiated faculty pay raises, which amounts to another ~2% cut. These cuts will take a bite out of the department budget and with the cost of interisland airfares rising dramatically, it is becoming increasingly difficult to fund our class field trips. **Thus, we need the support of our alumni!** Please remember how much you enjoyed your visits to Kilauea, Haleakala, etc., and see if you might be able to contribute to our field trip fund. If many of you contribute even a small amount, we will be able to sustain our field trip program for our current and future students – please help! We have made it easy for you to donate with this website which walks you through the process: <https://giving.uhfoundation.org/give/giving-gift.aspx?allocation=12077204>

Please visit our home page <http://www.soest.hawaii.edu/GG> on a regular basis. You will find posted there job opportunities, special announcements, curricular plans for the next 5 years, and profiles of all GG members.

Greg Moore, Chair

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Degrees, Awards & Honors

Undergraduates

Lindsey Spencer	<i>BA Summer 2012</i>
Kenneth Hay	<i>BS Summer 2012</i>
Jeffrey Skrotzki	<i>BS Summer 2012</i>
Nicole Okino	<i>BA Fall 2012</i>
Krista Salomone	<i>BA Fall 2012</i>
Laura Corley	<i>BS Spring 2013</i>
Zara Huntley	<i>BS Spring 2013</i>
Isaac Ishihara	<i>BS Spring 2013</i>



GG “Sweet Success” party - Spring 2013 - (L-R) Laura Corley, Isaac Ishihara, Garrett Apuzen-Ito (Associate Chair), Justin Wong, Kim Mayfield (GES), Shellie Habel.

Masters of Science

Regan Austin – *Early Seafloor Spreading and Variations in Crustal Accretion in the Lau Basin* (Advisor: F. Martinez, Fall 2012)

Darwina Griffin – *Geologic History of Mauna Loa’s Submarine southwest Rift Zone (SWRZ)* (Advisor: S. Rowland, Fall 2012)

Jessica Barnes – *Fluid Flow, Gas Accumulations, and Gas Hydrate Formation in Kumano Forearc Basin Determined by Seismic Reflection Interpretation and Well Data Correlation* (Advisor: G. Moore, Spring 2013)

Doctor of Philosophy

Deon van Niekerk – *Petrology of Enstatite Chondrites and Anomalous Enstatite: (Advisor: K. Keil, Fall 2012)*

Carolyn Parcheta – *Weak-Intensity, Basaltic, Explosive Volcanism: Dynamics of Hawaiian Fountains* (Advisor: B. Houghton, Spring 2013)

Bradley Romine – *Historical Shoreline Changes on Beaches of the Hawaiian Islands with Relation to Human Impacts, Sea Level, and Other Influences on Beach Dynamics* (Advisor: C. Fletcher, Spring 2013)

Student Awards

Agatin Abbott Memorial Award

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

Laura Corley and Shellie Habel (Tie this year)

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.

Alice Colman, Katharine Robinson, Jessica Zaiss-Bowman

J. Watumull Scholarship

Awarded annually to the department’s outstanding graduate student from an endowment from the Watumull Foundation. TBA

ARCS Award

Awarded by the Achievement Rewards for College Scientist foundation. Emily First

Other Fellowship, Scholarships & Awards

Alice Colman - *Denise B. Evans graduate fellowship in Oceanography*, Geological Society of America grant to support her research. **James Bishop** – Geological Society of America grant to support his research. **Malin Klawonn** – AGU Best Student Paper Award.

Faculty & Staff – Promotions, Awards & Honors

Julia Hammer – Professor, August 1, 2013. **Steve Stanley** – GSA *Penrose Medal*. **Bill Hagopian** – Honorable Mention for the RCUH Outstanding Employee of the Year 2012.

GSA Penrose Medal awarded to Steven M. Stanley

Boulder, Colorado, USA – Dr. Steven M. Stanley, University of Hawai'i at Mānoa, Department of Geology & Geophysics, is the recipient of the 2013 Geological Society of America (GSA) Penrose Medal, the Society's highest honor. This medal, which is awarded for eminent research in pure geology, will be presented at the GSA 125th Annual Meeting & Exposition in Denver, Colorado, at an awards ceremony on 28 October 2013.



Steve Stanley has been a research professor at the University of Hawai'i at Mānoa since 2005. Previously he was a professor at Johns Hopkins University in Maryland. He earned his bachelor's degree in Geology at Princeton University in 1963 and his Ph.D. in Geology at Yale University in 1968. He has said that he believed that Princeton chose him for his abilities in soccer and swimming, and that he chose Yale because Yale had graduated the three greatest paleontologists of recent decades – George Gaylord Simpson, Norman Newell, and John Imbrie.

“I have been privileged to take part in two revolutions in paleontology,” said Stanley. “The first, getting underway when I was a graduate student, was the injection of biology into paleontology on a large scale: paleontology expanded into paleobiology. In fact, my dissertation work dealt entirely with living animals, with the aim of bringing fossil creatures to life. No one questioned my motives, and my results were widely appreciated!” quipped Stanley.

Stanley is known for his work employing fossil data to make a case for the punctuational model of evolution. This model holds that most species are generally stable, changing little for millions of years—then, most evolution is concentrated in brief events, when new species arise from others.

“A second renaissance in paleontology is underway,” said Stanley, who continues to publish widely in his field. “It entails our efforts to interpret the history of life in the context of past environmental change. My efforts in this area have for the most part focused on major climate change and on changes in seawater chemistry over the course of hundreds of millions of years.”

“I owe a great deal to all those who have produced remarkable advances over the years in such fields as paleoclimatology and paleoceanography, opening up all kinds of new avenues for research,” he said.

Distinguished Alumna: Janet A. Haggerty (PhD 1982)

Vice Provost for Research and Dean of the Graduate School, Professor of Geosciences, University of Tulsa

It is an honor to accept the title of Distinguished Alumna for this year. I appreciate the opportunities provided to me as a doctoral student by the UH Department of Geology and Geophysics because these truly set me on course for my career. Field experiences and time at sea are critical to the development of marine geologists, and the Department provided plenty of both and does an excellent job today. In addition to that, I sought career development opportunities to prepare me for a faculty position at a university. I discussed this with Dr. Ralph Moberly, then Chair of the department, and proposed tasks for me to acquire a better understanding of a faculty member's job; these were acceptable to him. As a consequence of this opportunity, my preparation was better than many others applying for academic positions at the time.

Upon completion of my doctoral degree, I had an NSF proposal pending, was accepted to serve as a sedimentologist on DSDP Leg 89, Central Old Pacific Cruise, and was hired in a tenure-track position at the University of Tulsa. Teaching the first semester was tough but exciting because I was gone at sea for 7 weeks on Leg 89 and NSF notified me that my proposal was funded. From there, teaching and mentoring students intertwined with research and expeditions: DSDP Leg 93, Atlantic Passive Margin Transect; a U.S. Geological Survey expedition to the Marshall Islands; ODP Leg 103, Galicia Bank in the Atlantic; Mariana Forearc Seamount dives using the Alvin submersible; ODP Leg 125, Mariana-Bonin Forearc; and co-chief scientist on ODP Leg 144, Atolls and Guyots of the Western Pacific. In our role as co-chiefs, Isabella Premoli Silva and I were the first pair of female co-chiefs for the drilling program, and this astounded Miss Yokohama who came to welcome the ship in port. My students enjoyed the discoveries from the expeditions being brought into the classroom. Coming from a landlocked university, I frequently received questions about my research at sea and the pressure compressed and shrunken Styrofoam cups in my office from Alvin dives. While moving through the ranks as a faculty member, I also served the marine community on national committees such as JOI-U.S. Science Advisory Committee, and was also asked to serve as a lecturer for the USSAC Distinguished Lecturer Series.



Janet Haggerty with her dissertation advisor Sy Schlanger in 1982 onboard the D/V Glomar Challenger.

As I advanced within the marine geology field, I also looked for ways to give back to the education community. I taught in numerous workshops for teachers, was involved in Bob Ballard's efforts with the JASON program for teachers and 4-9th grade students, and served on the Advisory Board of two grade schools. Schools requested me as a guest speaker about geology and the oceans. One rural school stands out in my memory: a 4th grade boy asked to talk with me after class. His science teacher waited patiently to hear his question and was as surprised as I was. He wanted to know if he could be from Oklahoma and be a scientist. He was surrounded by farms and oil wells and thought those were the only job options. These small efforts can touch young lives and inspire them.

With respect to higher ed, I also found ways to give back. I have served for 17 years as a peer reviewer for the Higher Learning Commission (HLC), North Central Association of Colleges and Schools, which is one of the six regional institutional accreditors in the U.S. The experience acquired during site visits to universities, as well as service on various committees within HLC has provided some of the best career development and kept me abreast of developments in the world of higher ed. Also as a way of giving back to my home institution, I took on administrative duties in the Graduate School and the Office of Research and Sponsored Programs. By serving in that capacity, I have the opportunity to interact with more students and faculty to address issues faced by them and the

university. During this time, a graduate student requested my assistance with developing a Student Research Colloquium, which has become an annual event and is a student-led function. Our students take on leadership roles in the organization and production of the event, in addition to presenting their scholarship and research. The colloquium has grown and evolved over the years, and then in 2003, and every three years thereafter, the regional meeting of the American Association for the Advancement of Science is held jointly with our colloquium because our students are very engaged. Today I serve my home institution as Vice Provost for Research and Dean of the Graduate School. My career since leaving UH has been exciting, rewarding, and very fulfilling.

While finishing my studies at UH, I married Michael Smith, a doctoral student who became a UH

alumnus from the Department of Geology & Geophysics. Michael is the president of his own company, Advanced Hydrocarbon Stratigraphy. We have two children: Christopher who is in a doctoral program in analytical chemistry at University of Arizona and married to a Venezuelan doctoral student in Petroleum Engineering at the University of Tulsa; and Timothy who is an undergraduate in Geosciences at the University of Tulsa. Our family enjoys scuba diving and the barrier island beaches of the Outer Banks in North Carolina, and my sons and husband are very active in Boy Scouts and Explorer Scouts. Again, thank you for the honor of Distinguished Alumna for the year.

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2012-2013 GG Research and Teaching Highlights

Garrett Apuzen-Ito continues to work on convection and composition of the Hawaiian mantle plume with post-doc **Maxim Ballmer**. Garrett, **Alejandro Gallego** and **Rob Dunn** just published a paper on computer models of the convection and seismic structure of the Iceland plume. We bid farewell to Alejandro who just left UH to take a job with First Hawaiian Bank. Congratulations to **Samuel Howell** for successfully defending his M.S. on the evolution of the Iceland hotspot from continental break-up to present-day. Sam is now starting a Ph.D. with Garrett to study faulting at mid-ocean ridges.

Garrett, his wife Kahlil, and 7-year-old daughter Sekai, also welcomed Nia Rae Apuzen-Ito into their family this past November!



Janet Becker has been analyzing the dynamics of low frequency motions on fringing reefs and their contribution to wave driven inundation (NSF, Army Corp). Undergraduate **Hyang Yoon** (GES, OCN) has assisted with this research which is detailed in her senior thesis "*Low frequency modes on two fringing*

reefs: Observations and Dynamics". Janet also welcomes new postdoc, **Yao Yu** (Nanyang Technological University, Singapore), who is carrying out numerical modeling studies of wave transformation across reefs. With Murray Ford (Univ. of Auckland) and Mark Merrifield (OCN), a second observational study of the effects of excavation pits on wave transformation in Majuro has been carried out.

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. Postdoc **Maxim Ballmer** (now working with Garrett Ito) published a paper in *Geology* looking at how internal circulation within "pockets" of low-viscosity mantle may induce "shear-driven upwelling" and intraplate volcanism. Maxim showed that pressure gradients beneath the lithosphere can propel these pockets laterally (see figure), producing chains of small volcanoes such as the Pukapuka, Hotu-Matua, and Sojourn ridges in the South Pacific. This mechanism may also be important for explaining progressive volcanism in the western United States. Former graduate student **Svetlana Natarov** published a paper demonstrating that these sub-lithospheric pressure gradients cause depth-variations of rock fabrics in the 100-300 km depth range; seismic observation of these fabrics may help constrain pressure gradients in the mantle. Current postdoc **Joost van Summeren** has been looking at how these pressure gradients may induce variations in mineral grain-sizes that can in turn affect rheology. In separate

work with **Eric Gaidos** that will soon be published, Joost also has computed cooling histories and geodynamo lifetimes for planets currently being discovered in other solar systems. Also on the horizon for Conrad's research group in 2013-2014 are a review paper that discusses the interaction between sea level and the solid earth on all timescales, and the discovery that two upwelling regions of the mantle that have remained remarkable stable over geology time. In addition, current graduate student **Harrison Togia** is developing an interesting study of Hawaiian swell topography and its interaction with sea level, and incoming graduate student **Alex Rice** will be joining the research group this year.

Henrieta Dulaiova has been working with students **Christine Waters, Gabrielle Weiss, Taz Beyene, Kariem Gazal and Kim Mayfield** (GES, 2012) studying coastal groundwater and geochemistry across the Hawai'i Islands. The team started a new project studying water budgets in the Heeia watershed, which is undergoing significant land-use changes (collaboration with **Aly El-Kadi**). Dulaiova continues the monitoring of radioactive releases from the severed Fukushima nuclear power plant and extended research objectives to estimate radioactive fallout on the islands. With postdoc **Jan Kamenik** they developed new instrumentation for coastal ocean observing for radon, a natural groundwater tracer.



A newly constructed coastal gamma-spectrometer was constructed in collaboration with the SOEST Engineering Support Facility, shown here during its testing at UH. Dulaiova and Kamenik deployed the buoy in Heeia, Oahu in June 2013.

Robert Dunn's lab continues research on the tectonic and magmatic evolution of mid-ocean ridges and back arc spreading centers. In early 2013, Robert, postdoctoral scholar **Ryuta Arai**, and UH undergraduate **Eva Kakone** spent 40 days at sea along the Mid-Atlantic Ridge collecting seismic and other

geophysical data as part of a study with collaborators at WHOI to understand the evolution of a transtensional section of mid-ocean ridge with a harzburgite-hosted hydrothermal system. This cruise hosted several international students and post docs. **Ryuta Arai** is finishing a paper on a little recognized "hydrous" form of oceanic crust found in back arc environments, and postdoctoral scholar **Alejandro Gallego** submitted a paper on a joint geodynamic/seismic project (with **G. Ito**) concerning the Reykjanes Ridge. Using data from ocean bottom seismometers, graduate research assistant, and Bullard Fellow, **Dana Brodie** spent the past year documenting the acoustic calls of several baleen whale species recorded over a period of one-year in the Lau basin. Such data is a bonanza for marine mammal researchers. With **Cecily Wolfe**'s departure from UH, graduate student **Silke Ballmer** has moved to Robert's lab to finish her dissertation.

Aly El-Kadi is involved in a number of projects, including the Lahina Tracer test to assess the likely contaminant contribution of partially treated wastewater to the ocean (with **Glenn** and **Dulaiova**). Other projects are related to groundwater, which is the primary source of municipal water on most developed islands in the Pacific, and yet the reliability of water supplies will be challenged by reductions in rainfall and changes in its distribution owing to climate change. Among these is a project supported by NOAA that uses projections of climatic conditions together with hydrologic models to assess the sustainability of groundwater resources on the Island of Maui. With advance planning, the consequences of climate change on water systems can be mitigated. Because of the underlying seawater, groundwater pumping must be carefully managed to prevent saltwater intrusion. Of particular concern with regard to climate-change is the possibility that decreases in precipitation or increases in evapotranspiration may reduce the amount of fresh water recharge and thus affect the sustainability of fresh groundwater resources. More details can be found at the link:

http://www.wrrc.hawaii.edu/research/project_elkadi/climate.shtml. In addition, a new project has started recently in American Samoa concerning assessing groundwater sustainability of the Island of Tutuila where anthropogenic and natural sources of contaminants represent a serious threat to groundwater, surface-water, coastal waters, and coral reefs. Major sources include streamside development, flow modification, loss of riparian vegetation, land-use changes, and human and pig waste disposal systems. Threats to groundwater are especially of major concern considering that subsurface sources provide about 99%

of drinking water. The specific objectives of this research include identifying potential contamination sources in well capture zones, assessing conditions of wells under the direct influence of surface water, assessing water resources' sustainability under drought and future water uses, and identifying potential land-use impacts to wells. This effort will include compilation and analysis of available historical and new water quantity and quality data and modeling. New data to be collected includes aquifer information, water levels, and water-quality parameters.

Chip Fletcher's Coastal Geology Group has published maps on sea level vulnerability through the NOAA digital coast website:

<http://csc.noaa.gov/digitalcoast/tools/slrviewer>.

These maps have already been involved in stimulating public discussions on the subject of "what are the appropriate steps to be taken by government authorities in managing problems related to future sea level rise". Similar types of vulnerability modeling has led to publication of 2 papers by **Hannah Cooper** in 2013, and **Haunani Kane** is researching sea level rise impacts on coastal wetlands funded by a grant from the Department of Interior. **Tiffany Anderson** and **Brad Romine** both successfully defended their dissertations in the Spring. Tiffany will remain with the coastal group as a soft-money researcher focused on modeling future shoreline change due to sea level rise; Brad took a position with Sea Grant on the extension faculty. Lastly, we have been joined by **Shellie Habel**, a new MS student, who will work on groundwater inundation as a consequence of sea level rise. Shellie's work follows our publication of "*Assessment of groundwater inundation as a consequence of sea-level rise*" in Nature Climate Change.

Over the past year, **Neil Frazer** has continued to work on shoreline change, with colleague **Chip Fletcher** and Coastal Geology Group graduate students **Tiffany Anderson** and **Haunani Kane**, and on the inversion of volcanic deposit data for plume load, with colleague **Bruce Houghton** and graduate student **Malin Klawonn**. This spring he began work with **Eva Nosal** and her graduate student **Kai Gemba** (ORE dept) on the development of algorithms for detecting human divers from their breathing noises. When not occupied with these projects, he works on mathematical models to estimate the loss of wild fish due to disease from sea-cage farmed fish, an issue of great interest in marine conservation.

Eric Gaidos has spent the past year studying the properties of planets around distant stars discovered by the NASA Kepler mission, as well as searching for new examples around the closest stars. His student **Andrew Mann** (Institute for Astronomy) recently defended his doctoral dissertation on red "M" dwarf stars and their planets, work for which he was awarded the 2013 University Student Research Excellence Award. His postdoctoral researcher **Knicole Colon** recently completed a study of the atmosphere of "*GJ 1214b*" which may be composed of half water ice. With former postdoc **Joost van Summeren** and department colleague **Clint Conrad**, Eric published predictions of the magnetic fields that may be present in rocky planets around other stars and are indicators of the interior state of these bodies.

Michael Garcia's research continues to be focused on Hawaiian projects including two NSF supported studies: 1. the ongoing eruptions of Kīlauea and 2. the Northwest Hawaiian Ridge (from north of Kauaʻi to the Bend in the Hawaiian-Emperor Chain). Two new students have joined in these studies: **Kendra Lynn** and **Jonathan Tree** (see photo below).



During the last year papers were accepted for publication on: Age and geochemistry of lavas from the Northwest Hawaiian Ridge (with student Jonathan Tree), the Puʻu ʻŌʻō eruption of Kīlauea (with former UH students **Aaron Pietruszka** and **Jared Marske**), looking at what happened to the source of Hawaiian basalts before it was melted (with former UH students Aaron Pietruszka and Jared Marske), the discovery of a new type of Hawaiian shield volcano to the south of Kauaʻi (with **Garrett Ito** and our former students **Lisa Swinnard** and **Ashton Flinders**, and SOEST Dean **B. Taylor**), using gravity to infer the small % of intrusives in Hawaiian shield volcanoes (with **Ito**, **Flinders** and **Taylor** and professor **John Sinton**), and dating lavas from Mauna Loa volcano. His teaching

activities including GG302 (igneous part with Dr. **Sarah Sherman** teaching the metamorphic part as she has done for the last 10 years) and special topics course for graduate students on the origin and evolution of the Hawaiian Ridge.

GG signed a MOU with Yamagata University in Japan. Garcia was invited to visit their campus to give lectures on his research and the GG Dept. (see photo below), and to visit Zao Volcano with Prof. Ban and the devastation area from the Tohoku tsunami. Garcia continues to serve as a part-time Technical Judge for the U.S. Nuclear Regulatory Commission and was involved in a trial last summer relating to a new uranium enrichment plant.



Michael Garcia presents Hawaiian geology to students at Yamagata University, Japan.

Craig Glenn and his students remain happily busy studying origins and fates of groundwater and submarine groundwater discharge, particularly in bridging gaps between natural and anthropogenic impacts that happen on land, and the effects of those impacts have when they reach the ocean. Many members of MEG participate in these research projects (**Henrieta Dulaiova, Aly El-Kadi, Brian Popp**), as do PIs from HIGP (Paul Lucey), Botany (Celia Smith) and Economics (Kimberly Burnett). Craig remains Team Leader of a 5-year NSF EPSCoR research project called **ENDER** (*Environmental Dynamics and Ecosystem Responses*) which mainly concentrates on studies in West Hawai'i, and Craig has been directing a **two year study for the EPA**, State Department of Health and the U.S. Army that is investigating travel times and fates of groundwater and nutrients that load the ocean as a result of wastewater well injection on West Maui.

Henrieta, Aly and Craig also have a new project started in 2013 in American Samoa, and similar biogeochemical projects are currently underway throughout Maui with Craig's students **James Bishop**

(GG) and Dan Amato (Botany), where the impact of nutrient loading on the growth of invasive algae and the demise of coral reefs is the major concern. Craig's Ph.D. student **Joe Fackrell** is tackling groundwater evolution with stable isotope geochemistry on the slopes and coasts of Kona, and **Jacque Kelly** finished her Ph.D. (2012) studying groundwater discharge at all scales by sampling on the beach or in a kayak, riding first-class aboard U.S. Navy dive boats in Pearl Harbor, and by flying all over the islands **mapping groundwater discharge** by infrared remote sensing from a small plane. Jacque continues to do the same, only nowadays way down south, as Assistant Professor at **Georgia Southern University!**

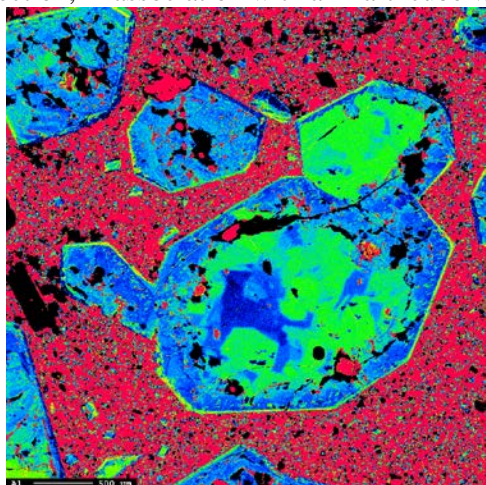


Jacque Kelly (PhD 2012) and Kim Mayfield (GES BS 2013) studying groundwater discharge in Pearl Harbor with the energetic help of the U.S. Navy.

Members of **Julia Hammer**'s group brought to fruition several ongoing projects. **Samantha Jacob** completed an undergraduate thesis on petrographically stunning pyroxene-rich lavas from East Maui Volcano. Mentored by postdoc **Benoît Welsch**, Sammie considered the possibility that the textures of individual crystals preserve a record of early, anomalously rapid growth, rather than resorption and overgrowth. She is now pursuing a M.S. degree with **Scott Rowland**.

Julia's PhD student **Emily First** continued her experimental studies of olivine and pyroxene in Y-98, a synthetic version of a Mars meteorite. She demonstrated that the natural textures develop at cooling rates that are much lower than previously suggested. She presented her work to the ARCS (*Achievement Rewards for College Scientists*) Foundation members as a 2013 Honolulu Scholar, and also at the *Lunar and Planetary Science Conference* in Houston. Benoît returned to the lab group after a hiatus at University of La Réunion, with funding from NSF to study the formation and chemical implications of

crystalline dendrites. **Tom Shea** keeps the furnaces humming and computer models running simultaneously. He succeeded in raising support for his diverse interests in magmatic volatiles, phase transformation theory, and physical volcanology in two sequential rounds at NSF-EAR. Julia recharged with a conference on crystallization in silicate glasses in Goslar, Germany, and a visit to the National Meteorite Collection, in association with an Earthcube workshop.

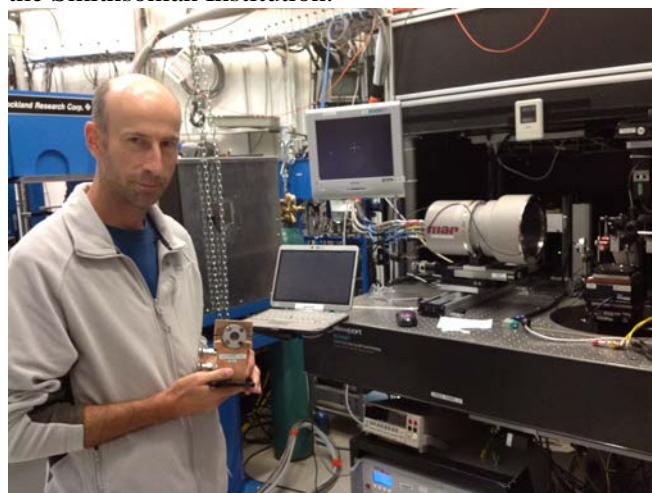


Al x-ray intensity map of ankaramite lava from East Maui Volcano. Variations in the Al content within clinopyroxene crystals may arise from sector zoning, exacerbated by rapid crystal growth.



*Julia holds pieces of three important Martian meteorites, Shergotty, Nakhla, and Chassigny, at the National Meteorite Collection, Smithsonian Institution, where she attended an EarthCube workshop with **Eric Hellebrand** and **Ken Rubin**.*

Eric Hellebrand continues to look after the temperamental Electron Microprobe and XRF labs and their occasionally equally temperamental users. Highlights of last year include the high-resolution zircon trace element maps, which were on the cover page of a *Nature Geoscience* issue that accompanied an article by **Rioux et al.**; the stunning images of wadsleyite (high-pressure polymorph of olivine) exsolution lamellae in olivine, which were part of an experimental petrology study published in *PEPI* by Smyth et al.; fantastically complex Maui pyroxenes in collaboration with **Julia Hammer**'s group (submitted for publication); and a multi-faceted study on incipient melt segregation in Loihi pyroclasts (Schipper et al., *Geology* 2012). He also visited Argonne National Lab in Chicago to conduct high-pressure experiments (see picture) with **Pavel Zinin** (HIPG) and **Tayro Acosta** (PhD student working with **Shiv Sharma**) and attended an NSF Earthcube meeting in Washington DC, followed by an amazing behind-the-scenes visit of the Smithsonian Institution.



Eric holds a diamond anvil cell containing boron-carbides at a pressure of 55 GPa, which is about to be loaded into the beamline at the Argonne National Lab.

Brue Houghton's volcanology team has chilled out by working on the aftermath of the Grimsvötn 2011 and the Eyjafjallajökull 2010 eruptions, with Iceland colleagues, in parallel with a more ambitious and larger scale study of historical eruptions of their even more active neighbor Hekla. Two PhD candidates, **Carolyn Parcheta** and **Malin Klawonn** have finished and three more have joined. **Maria Janebo** and **Samantha Weaver** took time out from their UH 'careers' to complete Masters at University of Bristol before returning to our group. The third, **Tim Orr** is dovetailing his PhD with his career at Hawaiian Volcano Observatory.



Field transport on Grimsvötn.

The new high speed camera, the second of its kind in the world, has been trialed at Kīlauea in May and plans are underway to deploy it at Stromboli in partnership with Istituto Nazionale di Geofisica e Vulcanologia, Roma early in 2014.

We are also continuing work within the National Disaster Preparedness Training Center delivering their Volcanic Crisis Awareness course in Alaska, Washington, Oregon, California, South Carolina, Korea, and many times in Hawai'i. **Kristine Kosinski**, **Samantha Weaver**, and Bruce Houghton just developed a day of classes for the new executive-level 'Science of Disasters' and delivered it to an audience of senior FEMA and regional managers in Emmitsburg, Maryland.

Hope Jahren and her lab have been as busy as ever during the last year. Early 2013 saw the publication of their new take on what changing carbon dioxide levels have done to the fossil record in *Nature* (Communications), first-authored by UH postdoc **Brian Schubert**. This work also won them the "Best University Research" Award for 2012 given by the Department of Energy, as presented in the annual meeting in Gaithersburg, Maryland. Graduate student **Ben Czeck** has finished his experimental work, growing sweet potatoes up in the Magoon Greenhouse Facility, under the carbon dioxide levels we fear will come to pass in the year 2300 (1800 ppm!) -- look for his graduation announcement in next year's newsletter! **Bill Hagopian** was awarded Honorable Mention for the RCUH Outstanding Employee of the Year 2012 for his work managing the Jahren Lab. During May, 2013, the lab swarmed with middle-school students who learned about the carbon cycle by building take-home terrariums. Check back here for a description of fieldwork in Siberia, to be completed in 2014!

Kevin Johnson — My current research is on studies of chemical reactions between basaltic and ultramafic rocks and CO₂ (\pm H₂O). I am working with researchers at the Pacific Northwest National Lab and Yale University conducting laboratory experiments on these carbonation and hydration reactions in olivine, pyroxene, and plagioclase. The work is funded by the U.S. Dept. of Energy. We are planning a field study of these reactions in basalt cores and deep boreholes from the geothermal wells in Puna, Hawai'i Island. Research is also being planned to study these types of reactions on the seafloor in certain hydrothermal systems.

I am also coordinating the effort to inventory and curate the vast SOEST marine rock dredge collection stored at the UH Marine Facility at Snug Harbor. SOEST and HIG scientists have been active in seagoing marine expeditions for more than half a century, and the seafloor samples collected on those research cruises are stored in the Snug Harbor warehouse. Over 5,500 5-gallon storage containers are stored in the warehouse, but there is no catalog of the samples. Not only that, but the plastic buckets degrade over time from the combined effects of heat, UV rays, and salt air and they become too brittle to move. With the impending relocation of the UH Marine Center to a different site, an inventory and repackaging endeavor were necessary. The samples are also invaluable scientific resources. With daily rates for oceanographic ship time running at upwards of \$30,000 per day, and rising, deep-sea samples are very expensive to collect. If samples from an area already exist, it often doesn't make sense to go back again to collect the same material from far-flung locations. The SOEST collection covers many remote areas from the oceans and cataloging and curating these samples for the benefit of the international scientific community is a high priority. The sample information will be uploaded to the National Geophysical Data Center database so that the international scientific community can know what we have and request samples for their research. So this inventory-cataloging-curation effort is an operational necessity for SOEST for the Marine Center relocation as well as being responsible scientific citizenship.

Steve Martel continues his research on sheeting joints ("exfoliation joints"), concentrating on their mechanics, local implications for slope stability, and regional implications for stresses in the shallow crust. He and Dave Pollard also continue to progress in their writing of a textbook and a lab manual at the undergraduate level for structural geology.

Greg Moore and his students continued their study of subduction zone processes around Japan and in the NE Indian Ocean. **Jess Barnes** completed her M.S. thesis on methane hydrates and bottom simulating reflections (BSRs) in the Nankai Trough forearc basin. **Brian Boston** mapped the normal faults in the Pacific plate where it is subducted beneath Japan at the site of the 2011 Tohoku earthquake. He presented his findings at the AGU meeting in San Francisco in December, 2012 and was invited to present a talk at the Japan Geoscience Union meeting in May, 2013. Greg joined IODP Expedition 338 in the Nankai Trough as co-chief scientist in the fall and started a new field project to study the relationships between mud volcanoes and tectonic mélanges along the west coast of Myanmar in the spring.

Brian N. Popp — There have been a few changes in the Stable Isotope Biogeochemistry Laboratory. Sadly, **Karen Arthur** finished her postdoctoral fellowship and moved back to Canberra Australia where she is faculty at Australia National University. However, **Hilary Close** joined us as a SOEST young investigator after graduating from Harvard and **Cecelia Hannides** continues her postdoctoral fellowship. **Cristina Bradley** defended her PhD and will leave at the end of the summer. **Leilei Shih**, **Natalie Wallsgrove** and **Cassie Lyons** also keep work in the lab moving forward. We had a productive year publishing 5 papers in 2012, and 4 so far in 2013 with another 9 manuscripts currently being revised or reviewed.

Greg Ravizza — In the past year we have kept up our Osmium isotope work going. Jess Zaiss an MS student has completed the first detailed Os study of a terrestrial K-Pg boundary section. Other efforts include expanded work on gas-prone organic-rich sediments supported by donations from Shell Exploration and Production and NSF supported research coupling Os and He isotopes as dual tracers of particulate extraterrestrial material. The former project is exploring the potential of Os isotope chemostratigraphy in gas-prone shales, and the latter will better constrain temporal variations in the background flux of extraterrestrial material to the Earth over the 12 million years.

Scott Rowland — My big deal of the year was spending most of the fall 2012 semester on Mars (Pasadena, CA), working on the Mars Science Laboratory “*Curiosity*” rover mission. It was tough to be away from home, but it was an incredible experience to work with very talented and dedicated scientists and engineers. Plus, we were on Mars – how can you beat that?

The rover work continues, but now we conduct all our science and tactical meetings via phone, chat, and web-sharing. Once the spring semester started, it was Mars + teaching (too much, sometimes).



This is the testbed rover, an almost identical copy of Curiosity, which is used to practice potentially tricky maneuvers and to troubleshoot problems.

In April, I had the pleasure of introducing 3 ex-GG students to some of our GG undergraduates. They took time out from their busy schedules to come and give current students an idea of what they can expect once they graduate. Mahalo, you three – it is good to see you doing so well.

In May, Pete Mougini-Mark, Sarah Fagents, Bruce Houghton, and I taught our 11th NASA Volcanology Field workshop. Hopefully our 16 participants will enter their planetary volcanology careers with a good background of field experience. Finally, in June, I taught my portion of the CSAV International course. The participants come from volcanic countries all around the world, and they are volcanology sponges – soaking up knowledge at an incredible rate.

Throughout the year I continued lava-flow modeling work with ex-GG-er Andy Harris (+ Harold Garbeil and Rob Wright of HIGP), and Galápagos mapping with Mark Kurz (WHOI). This year I also worked on the Kahua A’o project (with GG graduate Lindsey Spencer). We are using Earth-science information

gleaned from translated Hawaiian language newspapers to produce teacher-training materials.



Maria Janebo (2008; in graduate school at GG), Tracy Ibarra (2008; AECOM), and Chad Shishido (2006; teaching at Pearl City High School)

Ken Rubin continued his research at sea over the past academic year with another ROV expedition to study and sample young submarine volcanoes of the Niuu Arc (Tonga) and the NE Lau basin and studies of the ever expanding collection of unusual lava compositions from this region with graduate student **Sarah Glancy**, **Eric Hellebrand** and a group of national/international collaborators at NOAA and various universities. Ken also continues his work on deglacial sea level change in Hawai'i with Chip Fletcher and others, and has become involved in the EarthCube effort to promote and create the next generation of cyberinfrastructure for earth and ocean sciences through his membership on the Integrated Earth Data Applications (IEDA) User committee. The SOEST Isotope group will soon be coming back up to full speed, with the recent hire of a new Specialist lab manager (**Christian Miller**) and the arrival in early 2014 of **Jasper Konter**, currently at UTEP.

John Sinton spent most of the last year working on the geology, petrology and geochemistry of Ka'ena Ridge with **Doug Pyle**, **Deborah Eason** and others. This work concludes that there is a previously unrecognized, precursor volcano to the island of O'ahu lying to the northwest of Wai'anae. PhD candidate **Alice Colman** continues to work on samples from the GRUVEE Expedition to the Galápagos Spreading Center. Alice was recognized this year as one of two initial recipients of the prestigious Denise B. Evans Fellowship in Oceanographic Research, administered by HIGP and the UH Foundation.

Steve Stanley states: "I have been dealing with proofs of my two large chapters for the second edition of the bivalve portion of the Treatise on Invertebrate Paleontology. One is on the functional skeletal morphology of bivalves, and the other is on the group's evolutionary ecology (how bivalves' adaptations and modes of life have expanded over time). This has been something of a labor of love for me, because it takes me back to the where I started. My dissertation was a general analysis of bivalve functional morphology based on study of 95 species at three marine labs. It was published as a GSA memoir, but the problem was that the first edition of the bivalve Treatise came out the previous year, while my memoir was in press, and the chapter on functional morphology was full of errors. I have had to wait more than four decades to produce a proper chapter!

I have also been finishing a paper that presents a new methodology for estimating percentages of genera lost in mass extinctions. Previous approaches have been erroneous, generally overestimating these losses. This new approach will also appear in paper on mass extinctions solicited by editors of the *GSA Bulletin* as one of a group of review papers to be published this year in celebration of the society's 125th anniversary.

Francois Paquay, now my postdoc, has joined me in the resumption of my laboratory experiments on the effects of the magnesium/calcium ratio of seawater on calcification. We are focusing on taxa not previously included in this kind of work.

Finally, I am heavily occupied in producing the new edition of my Earth System History textbook. This job entails reviewing a huge number of recent articles. This time, however, the burden is lightened by the inclusion of a second author (John Luczaj) of the University of Wisconsin at Green Bay."

Paul Wessel has spent (and continues to spend) a sabbatical year as a Green Scholar at the Scripps Institution of Oceanography near San Diego, working with David Sandwell and others. His graduate student **Sarah Maher** is holding down the fort and is working with Paul on a new model for the absolute plate motion of Africa. The sabbatical has given him time to complete numerous projects and allowed for future collaborations with Scripps scientists. He also hopes to release version 5 of the Generic Mapping Tools (GMT) before returning. Wessel is back in Hawai'i, just in time for teaching Matlab programming to 20 unsuspecting undergraduate majors.

* * *

GG Picnic and Softball Challenge 2013

by Brian Boston

Eats and hits were plenty during the 2013 G&G Picnic and Softball Game at Lanikai Park held on April 20th. In one of the most exciting games of the series, the Grads narrowly defeated the Faculty, reclaiming the Johnny Geeangee Memorial Trophy and taking lead of the series 5-4. The Grads' early big hits put them well ahead in the beginning, but the Faculty's enthusiastic spirit slowly chipped away the score. The determination of both teams forced the game into extra innings. With no end in sight, the Grads hit a made-for-TV-movie home run, clinching the game. Some highlights include: While dancing the Charleston, John Sinton made a miraculous catch between his knees, but his dancing moves were of no help when he was temporarily evicted from the game. The Grad powerhouse included Joe "in the parking lot" Fackrell and Ben "MVP" Czeck. It was the pure power of the Grads that lead to the ultimate defeat of the young and emotionally charged Faculty team.

Many thanks for those who came and for the great weather at Lanikai, a fantastic way to end the semester.



All smiles for the Grads after a triumphant win. Standing (left to right): Samantha Jacob, Carolyn Parcheta, Kendra Lynn, David Trang, Brian Boston, Jonathan Weiss, James Bishop, Jonathan Tree, Dana Brodie, Patrick Gasda. Trophy row (left to right): Sarah Crites, Jonathan Sleeper, Johnny Geeangee Memorial Trophy, Ben Czeck, Harrison Togia, Christie Jilly. Front row (left to right): Sarah Maher and Jess Zaiss.

* * *

SOEST trivia corner (with compliments from the editor)

Did you know that the Dutch Royal Family used to live in the village of Soest? Queen Juliana (1909-2004) was the last queen to reside in **Soestdijk** Palace. Don't confuse Soest in the Netherlands with its twin city **Soest** in Germany, which is famous for its **Zwiebelbier** (onion beer). Image how that beverage would revitalize the next TGIF...



Soestdijk Palace (Netherlands)

Christian Miller, new manager of the Isotope Lab

I am the new Isotope Specialist Faculty, and am responsible for the clean-lab, TIMS, and MC-ICP-MS facilities here in the GG Department. Analytically, my interests involve developing techniques for evaluating non-traditional isotope systems. To date, I have set up methods for Mg, Ni, and Re (ICP-MS) and Cr (TIMS), and am interested in adding Mo and U analyses in the next calendar year. Scientifically, my main interest is Earth's paleoredox history, though I anticipate acquiring interests in young volcanics due to the availability of a broad range of scientific and analytical expertise in-house.

The modern atmospheric content of ~20% O₂ is principally the result of the sequestration of huge amounts of sedimentary organic matter. This huge C reservoir over geologic time should be tractable via the application of isotope analyses of redox-sensitive elements; Mo, Re, and U are among the most common examples. These elements show a broad geochemical coherence in their reductive-enrichment in black shales (for example), but also exhibit subtle differences in seawater residence time and redox

chemistry, providing more information than any one proxy alone.



Should anyone wish to discuss introducing new isotope or elemental systems within the ICP-MS and or TIMS facilities, or to use the established systems in novel ways, I would be happy to talk with you.

* * *

Obituaries

Bruce R. Rosendahl died of multiple illnesses on 26 July 2013 in Annapolis, Maryland. Bruce received a BS in Geology in 1970 and MS in Geology and Geophysics in 1971 from the University of Hawai'i. His PhD was from Scripps Institution of Oceanography. He taught at Duke University and at the University of Miami. From 1989 to 1995 he was dean of the Rosenstiel School of Marine and Atmospheric Science. He is best known for his seismic work that detailed the structure and evolution of the rift valleys of Africa, the basis for much of our current understanding of the architecture of continental rifting and its application to early stages of

the opening of the Atlantic African margin.

SOEST lost one of its original employees on June 8, 2013, when **Ted Jordan** passed on. Ted worked for George Woollard and Chuck Helsley as a mechanical engineer/machinist/can-do technician through the 60's and 70's. Before joining HIG, Ted was in the US Navy in Japan after WWII, and worked at Los Alamos, building the 2nd hydrogen bomb. At HIG, Ted worked with John Rose building an absolute gravity meter, with Chuck Helsley deploying seismometers in Mexico, and with Ed Laws growing algae at Snug Harbor. It's also rumored that he brewed beer in the HIG core locker. Ted originated the Order of the Broken Screw at HIG,

eventually becoming a member of this august order.

Since retiring, Ted grew cherries in Oregon, raised bees, and has lived mainly on the Big Island, where he built a house in Puna and taught seniors how to use computers.

Chuck Helsley, former Director of HIG, says :

"At the time of his retirement, he was a one-man staff that looked after all maintenance of the HIG building. He is the reason we have our own facilities management group to this day, for we learned we could not do without men and women with this skill set. "

A remembrance for Ted will be planned for this Fall.

Remembering Professor Emeritus John Mahoney

by Ken Rubin and John Sinton

After earning his B.A. in his native Colorado, John moved with his family to Montana, where he worked as a building contractor. During his recovery from a work-related injury, he became interested in geology while reading textbooks brought to him by his sister. Consequently he contacted Prof. Al Engel of Scripps, who had a home in Montana just down the street from the Mahoneys. Al encouraged John to apply to Scripps Institution of Oceanography for graduate study, which he did, starting in 1978.



John used high precision radiogenic isotope data coupled to major and trace element analyses of volcanic rocks to probe the origins of one of the world's major flood basalt provinces in India, the Deccan Traps, along with the smaller Rajmahal Traps. This would be the start of an area of research (on large igneous provinces) that John would continue for his entire career.

John earned his Ph.D. in 1984, under the supervision of J. D. (Doug) Macdougall. He subsequently spent a year at Univ. Minnesota as a postdoc, where he helped renovate an isotope lab. Shortly thereafter he moved to the University of Hawai'i as an assistant professor in 1985. He established a radiogenic isotope program and associated clean lab facility. He immediately began a collaborative research project with Prof. John Sinton on Southern East Pacific Rise MORB (the so called

“S and M” cruise), which gave rise to the first of several research cruises on ridges, including the Galápagos Spreading Center and Southeast Indian Ridge. This work extended John's major contribution on the Central Indian Ridge, which explained why the Indian Ocean mantle differs from that of the Atlantic and Pacific. While the UH lab was being built, John made many trips back to Scripps to make measurements in the Lugmair-Macdougall lab and to visit Nancy. Upon completion of this lab, John returned to Hawai'i, accompanied by Nancy.

At UH, John established what would later be known as the SOEST Isotope Laboratory, which was centered on a clean room lab complex and a VG Sector thermal ionization mass spectrometer. Lab renovations occurred in 1985-1987 and the mass spectrometer arrived in 1987. He was helped in these endeavors by Khal Spencer, the isotope lab's first lab manager.



Field work in India

John, his colleagues and his students, subsequently used the isotope lab to pursue a wide

array of research topics, including the causes and consequences of flood basalt volcanism, the formation of linear island chains and oceanic plateaus, with major projects in India, Madagascar, the Ontong-Java and Manihiki plateaus, Shatsky Rise, and the Louisville Ridge.



John sailed as a shipboard scientist on four international ocean drilling expeditions.

He continued work on magma formation at mid-ocean-ridges and Hawaiian volcanoes and, through a highly influential collaboration with Prof. Garrett Ito, on the dynamics of mantle melting. He also contributed to the study of geoneutrinos to understand Earth's internal radioactivity. John's lab became known for the meticulous precision and reliability of data that emerged from it. This reputation attracted many US and international visitors and students in the lab, particularly from

China, India, the Philippines, Switzerland, France and Italy. John recognized the importance of ocean drilling in addressing key questions in mid-plate volcanism, and was widely sought after on drilling-related advisory bodies and as a participant on multiple expeditions. He had the respect of his peers, made friends easily and established long-lasting collaborations with researchers in the US, Canada, Asia, and Europe.

John and new faculty member Ken Rubin funded two additional mass spectrometers (a TIMS in 1994 and an MC-ICP-MS in 2006) expanding research applications in Quaternary Geology, Volcanology and Environmental Chemistry. The facility moved into new, larger clean room space in 2005 and to this day continues the work John started nearly 3 decades prior. In 2012 the lab was dedicated to his memory.

John was awarded a research excellence medal by UH in 1995, and with Mike Coffin (now at Univ. Tasmania), established the Large Igneous Provinces commission of IAVCEI in 1993, staying at its helm until 1998. John co-edited an influential AGU monograph on flood basalt volcanism in the 1990s and was an editor of JGR Solid Earth during the 2000s. John was a consummate editor, and a dedicated educator and mentor to graduate students and postdocs. He was also an outdoorsman and concerned about the environment. During the 1996 presidential race, he was contacted by Al Gore's team about a possible science advisory position, for which he was exceptionally well suited.



* * *

Alumni News

Floyd W. McCoy (BS 1962; MS 1965). Focus for the past year in the geology program at Windward Community College has been embellishing course offerings beyond GG 103 (Geology of the Hawaiian Islands) and a selection of field courses, to add GG 101 (which had not been taught for a decade), GG 106 (Humans and the Environment) and GG 130 (Geologic Hazards). All provide badly needed focus for freshman and sophomores on environmental issues as well as natural hazards. And perhaps with this we can generate more majors for passage over the Ko'olau's to the department – these classes at WCC are usually full.

Research programs in Greece continue with combining geology/geophysics with archaeology – geoarchaeology - primarily at Bronze Age sites on Crete, especially those affected by the Late Bronze Age eruption of Santorini. This summer saw fieldwork at seven prehistoric sites on eastern Crete, where evidence for ash fall, seismic damage, climate change, neotectonism, and tsunami can be documented (not all of these at any one site, however). This work is in conjunction with undergraduate and graduate students from other US and Greek universities, with laboratory facilities provided by the American School of Classical Studies in Athens, and the Study Center for East Crete; permits are from the University of Athens and the Greek Institute for Geology and Mineral Exploration (other permits come via the Greek Ministry of Culture, which can be quite an experience).

Patty Fryer (PhD, 1981)

How I spent Spring Break 2012:

After 4 decades of studying plate margin processes, it finally paid off. I spent Spring Break 2012 at sea on James Cameron's expedition in which he did his solo dive in his remarkable submersible to the deepest place in the world's oceans, the Challenger Deep in the southern Mariana Trench. I contributed the bathymetry data I'd collected over the years and got to pick the spot for him to make the dive. Fun! Details about the adventure are on the National Geographic web site at <http://deepseachallenge.com/the-expedition/>

Rob N. Yonover (PhD, 1989) is the founder and CEO of SEE/RESCUE Corporation of Honolulu. SEE/RESCUE® develops, patents, and fields life support technologies for military, commercial, and consumer sectors worldwide. Technologies invented include the SeeRescue® Streamer, Inflatable Paddleboards, LIFE/FLOAT™ Rescue Boards, Pocket Floation Device, Pocket DeSalinator, and the co-invented Video Search and Rescue technology (vSAR). The SeeRescue® Streamer technology is now in use by all branches of the U.S. military, including all U.S. Navy Submarines. The Self-Deploying Lighted Streamer technology (SDIRS) has been adopted by the U.S. Air Force, U.S. Air Guard, and the Singapore Air Force for all their fighter jets. SeeRescue® Streamers are credited with saving 4 lives to date. Rob is an avid outreach educator, including his volunteer work as a Virtual Professional In Residence (VPIR) for the Pacific Asian Center for Entrepreneurship (PACE) at UH, and has written "Hardcore Inventing" and the children's book, "Brainstorm Islands". He has

appeared on CNN, PBS, Discovery Channel, and is still appearing on big North Shore waves.

Peter Bromirski (PhD, 1993) conducts research at Scripps. His research includes sea level variability, waves, storm surge, microseismicity, seismic hum and, more recently, tsunamis and glaciology. This October-November, he will be traveling to Antarctica as lead-PI to deploy a broadband seismic array on the Ross Ice Shelf to study the dynamic response of the Ross Ice Shelf to gravity wave forcing.

Tim McCoy (PhD, 1994) has been working as a meteorite expert at the Smithsonian Museum for Natural History in Washington, DC. In addition, one of his pursuits is helping to revive the words of the Miami tribe (click [here](#) for more information).

Rajan Sivaramakrishnan (PhD, 1995) is presently the Director of the Goa-based National Centre for Antarctic and Ocean Research, the R&D Wing of India's Ministry of Earth Sciences. He has been actively involved in India's Antarctic, Arctic and Southern Ocean research programs since 2000. In addition, he is India's elected representative to the United Nations Commission on the Limits of the Continental Shelf and the Member-Secretary of the National Committee to advice on India's initiatives in IODP. In 2010 Rajan was conferred with the National Geosciences Award for his contributions in the field of ocean development.

Rob Mullane (MS, 1996). After 4 years with Hawai'i Sea Grant as a coastal processes extension agent, Rob moved to California and has worked in several different capacities in municipal planning and environmental consulting. He currently is the Community Development Director for the City of Ojai in Ventura County and

resides in Carpinteria, a classic Southern California beach town just outside of Santa Barbara. He misses Hawai'i and gets back to the islands at least once a year.

Sirit Coeppicus (MS, 1999) writes: After finishing my MS, I participated in a coral bleaching study at the Australian Institute of Marine Science (AIMS) in Townsville, Australia. After that I was employed by the Université de la Reunion in the Indian Ocean. Back in Germany I went for a degree in Journalism and did diverse Media Work for Global Nature Fund (GNF), the Eifel National Park and (until now) an Indo German Cooperation focusing on Water Management issues - at the RWTH Aachen University. My son Levin is almost 5 years old.

Karl Hibbitts (PhD, 2001) now works at the JHU/APL as a senior research scientist. He runs an optical spectroscopy lab, is deputy PI of the NASA BRRISON stratospheric balloon mission, and is the father of twin 9 year old boys.

Jackie Caplan-Auerbach (PhD, 2001) writes: after my PhD, I spent 5 years as a seismologist working for the Alaska Volcano Observatory. At present I am an associate professor of geophysics at Western Washington University in Bellingham, Washington (just south of the Canadian border). My research is mostly focused on volcano seismology, and in recent years I've returned to first love, Lo'ihi submarine volcano. In 2010-2011 we deployed a network of ocean-bottom seismometers on and around Lo'ihi so I had the great treat of returning to Hawai'i and sailing aboard the Kilo Moana. My husband Pete is also on the faculty at WWU and we're the mostly proud but sometimes horrified parents of 8 year old twins Naomi and Tucker.

Gary Kiyabu (BA, 2002) writes: I am a substitute teacher with the Department of Education on the Windward side and teach mostly grades K-6. Our son Kai is going into 8th grade at Castle High School next year and our daughter Mahina will be in 2nd grade at Kaneohe Elementary. My wife Bonnie still works customer service at United Airlines. I'm old, fat, and grey and I miss my classmates and teachers.

Tara Hicks Johnson (MS, 2002) and **Paul Johnson** moved to Durham, New Hampshire in 2011 and both work at the University of New Hampshire in the Center for Coastal and Ocean Mapping, about an hour north of Boston (and the Boston Red Sox). They have two kids Keira (7), and Ian (4).



Geoff Garrison (PhD, 2002) writes: In 2010 and 2011, I worked as a geochemist with Calera Corporation in Los Gatos, CA, managing research developing new building materials which sequester carbon dioxide. My work included determining the suitability of various natural and industrial materials as viable feedstocks, and I assayed those materials for their reactivity and availability at pilot, demo, and commercial scales. Since early 2012 I've returned to Seattle to work with AltaRock Energy developing geothermal energy resources and Enhanced Geothermal Systems (EGS). My work here has included studying the geology and groundwater geochemistry at the Newberry EGS

Demonstration project on the flanks of the Newberry Volcano in central Oregon. The project is demonstrating AltaRock's innovative technologies for developing EGS reservoirs and producing geothermal energy in non-hydrothermal areas.

Eric Haskins (MS, 2002) writes: After graduating from UH I moved to the Big Island to work on the Hawai'i Scientific Drilling Project with faculty member Donald Thomas until 2008, then taught high school and middle school science courses at St Joseph School until Spring of 2011. I'm currently working on another Mauna Kea drilling project with Don Thomas at the Pohakuloa Training Area, continuously coring two 6000'+ water observation wells and studying the rock samples down the hill at UH Hilo. Anyone interested in the progress of the project can check out my blog for updates, photos, and other information at <http://hgrp.blogspot.com>.

Dolan Eversole (MS, 2003) is a Coastal Geologist by training and graduate of the University of Hawai'i. He currently works with the University of Hawai'i Sea Grant College Program where he serves as the NOAA Coastal Storms Program, Pacific Islands Regional Coordinator. Dolan served from 2003 to 2010 as a technical and policy advisor to the Office of Conservation and Coastal Lands (OCCL), of the Hawai'i Department of Land and Natural Resources on coastal management policy. Since 2010 as the NOAA CSP regional coordinator, Dolan's role includes regional (U.S.-affiliated Pacific Islands) coastal hazard mitigation, disaster management and recovery planning with a focus on community resilience planning and education.

Buffy Cushman-Patz (MS, 2003) is the founder and school leader for a new 6th-12th grade public charter

school in Honolulu. Buffy taught in public, private, and independent schools in Hawai'i after graduating with her M.S.; she then spent a year as an Einstein Fellow at the National Science Foundation, and a year at the Harvard Graduate School of Education where she earned an EdM in School Leadership. SEEQS: the School for Examining Essential Questions of Sustainability is opening in Kaimuki on August 5, 2013 with its inaugural classes of 6th and 7th grade students.

Marc McGowan (MS, 2004) has been living in Perth, Australia for the past 6 years. He is currently a Senior Hydrogeologist with BHP Billiton in the Iron Ore division. He works on a variety of mining projects focusing on groundwater supply, mine dewatering, and managed aquifer recharge. On a personal note Marc was married in February 2012, still likes to get out for an occasional surf, and is about to embark on building a house.

Patrick Shamberger (MS, 2004) married Kathryn Fagan (M.S. in Chemical Oceanography from UH, 2005) in 2008 and received a PhD in Materials Science & Engineering from University of Washington in 2010 under the guidance of Prof. Fumio Ohuchi on the topic of "*Engineering Phase Transitions in Heusler Alloys: Towards better magnetic refrigerants*". He writes: During this PhD, I applied the thermodynamics and mineralogy that I learned from Julia Hammer at UH to understand thermodynamic irreversibilities associated with magnetic field-induced martensitic phase transformations. I am currently a materials researcher at the Air Force Research Lab (AFRL), where I am a member of the nanoelectronics branch. Current research includes a consulting role in the VIPR-III C-17 jet turbine ash ingestion test,

together with researchers from USGS, NASA, FAA, and engine manufacturing companies.

Chris Conger (BS 2002, MS 2005 - Coastal Geology) writes:

I have been working at Sea Engineering, Inc. since the fall of 2011. I work on a wide range of topics, including coastal design and permits, environmental documents, oceanographic studies, coastal assessments, coral relocation, and acoustic monitoring, to name some of the more interesting ones. Before Sea Engineering, I was with Hawai'i Sea Grant and worked with the Office of Conservation and Coastal Lands at the Department of Land and Natural Resources. My wife, Katie, and I have two young boys, Coltin and Kades. We have been lucky enough to stay in Hawai'i since we each earned our degrees from UH.

Christian Gandy (MS, 2006) writes: I currently live in Savannah, Georgia with my wife Katie and our son Grayson. I took a job as a Senior Geologist at the US Army Corps of Engineers here in Savannah in September 2008. As part of my duties for the Corps I manage large-scale environmental cleanups at active and former military installations; I write work statements, estimates, reports, and technical analyses of contractor proposals; provide technical guidance on civil works and geotechnical projects; and I am the resident 'hard-rock' specialist at our Savannah District office. I am currently in charge of two, large, high-profile clean-up projects in Fort Drum, NY and Former Fort Gillem, GA. When not at work I enjoy playing hockey and boating the many waterways in the Savannah area with my family and friends.

Julia Sable (PhD, 2006) After finishing her Ph.D. in Geology and Geophysics, Julia Sable enrolled in the Master of Fine Arts program in

Science and Natural History Filmmaking at Montana State University - Bozeman. Partway through the program she got a fellowship doing media production at the Museum of Science, Boston. Then she got a full-time position as an educator in the museum's Current Science and Technology Center. She finally completed her MFA in April 2013 while working in Boston. Her thesis film about the 1959-60 eruption of Kilauea covers research by several GG faculty and alums (click: kilaueaiki1959.info). Julia plans to continue at the Museum of Science for the near future.

Sean Vitousek (MS, 2007) writes: I am still at Stanford and about to finish my PhD in Civil & Environmental Engineering. My defense is coming up this August. I am working on developing a new ocean model that is well-suited for modeling internal waves. I will most likely be starting a postdoc at Stanford in the fall and then looking for academic jobs shortly after that.

Melody and Ben Studer (MS, 2007) I am currently working part time at TerraGraphics Environmental Engineering, Inc as an environmental scientist. I just got certified in OSHA's 40 hour HAZWOPER training, which trains individuals in handling hazardous waste and being on a hazardous site. I am currently studying to take the ASBOG exam in October of this year to hopefully become a licensed professional geologist in the state of Idaho. (I am only taking the first half of the exam, which will make me a "geologist in training or GIT." In two years, when I meet the experience requirements, I may take the other half.) Since UH I have lived in Idaho. We first lived in Coeur d'Alene, ID where I had my daughter, Malia in 9/2007. My husband, Ben Studer (who also was

a MS graduate student in 2004-2007) and I then moved to Boise, ID where he is employed at the Idaho State Dept of Fish and Game as a GIS Analyst Senior. I stayed home for several years to raise our children. Logan, our second child, was born in 10/2009. I have been working at TerraGraphics coming up on a year in June. I have taken a liking to road biking, and have joined a local group here in Boise called Spinderella. I ride weekly about 15-20 miles and have met Kristin Armstrong who lives here. My cousin is also on her team.

Melissa Rotella (MS, 2008) writes: I completed my PhD at Victoria University of Wellington, New Zealand, in April 2013 studying explosive underwater silicic volcanism in the Kermadec Arc with Prof Colin Wilson. I am now a Postdoctoral Research Fellow at Victoria University of Wellington. I am still involved in outrigger canoe paddling in New Zealand but more so in the summer months.

Adam Johnson (MS, 2008) writes: I still live in Honolulu and work at the USGS Pacific Islands Water Science Center.

Eric Mittelstaedt (PhD, 2008) writes: In January 2013, I began my first faculty position as an assistant professor in the Department of Geological Sciences at the University of Idaho. Since leaving UH in 2008, I had a post-doctoral stint in Paris followed by a second post-doctoral appointment at Woods Hole Oceanographic Institution. I am excited to begin this next chapter in my career and to explore my new community of Moscow, ID.

Lisa Swinnard (MS, 2008) returned home to Vancouver, BC in late 2012 after 6 months of working in the Australian Outback for Atlas Iron. For a Canadian girl used to working in the Arctic, 6 months of

relentless heat and poisonous creatures was enough. She now works for Leapfrog, a 3-D geological modeling software company.

Loyc Vanderkluisen (PhD, 2008) and **Meryl McDowell (PhD, 2009)** write: Meryl and I moved to the Phoenix area early in 2011, and we have since been enjoying the desert heat, the sandstorms, and spectacular geology of the American Southwest. As soon as we arrived in Arizona, we got a dog, an adorable fluff-ball called Marzipan. Meryl and I both work at Arizona State University. Most recently, Meryl has been working on Mars THEMIS data in Phil Christensen's group, and I have been carrying out interdisciplinary research on a large ongoing mud volcano eruption on the island of Java (Indonesia). In collaboration with ASU engineers, I have also been involved in designing new instruments and sensors to monitor volcanic eruptions. My most recent accomplishment has been to get almost all of my sixty Historical Geology students (mostly non-majors) to understand that mammoths went extinct several million years after dinosaurs. If that doesn't sound like much of an accomplishment, it probably means you haven't taught college geology recently! Shout out to Steve Stanley, whose textbook I used for the class.

Seung-Sep Kim (PhD, 2010) writes: I am an Assistant Professor of Geology and Earth Environmental Sciences at Chungnam National University in Daejeon, Korea. At work, I am carrying out a geophysical study on the Australian-Antarctic Ridge and supervising two graduate students on environmental problems caused by various mining activities. At home, I am playing with my daughter, Ye-yun, who was born in 2012.

Jared Marske (PhD, 2010). In 2012, Jared Marske accepted a two year postdoctoral fellowship at Carnegie Institution of Washington in DC. At Carnegie he continues his awesome research on Hawaiian Volcanoes looking at the link between magmatic volatiles and source lithology in the Hawaiian Plume. This summer he is heading back to Mauna Loa for some field work by helicopter! He misses Hawai'i like the deserts miss the rain.

Lisa Tatsumi Petrochilos (MS, 2010) writes: I started to work as a Geologist at Yogi Kwong Engineers LLC in Hawai'i mainly logging for boring, and shortly after joined Schlumberger as Petro-physicist/software support engineer in Houston, Texas. I do software support of one of our software products, training, and occasionally write scripts for my clients. I have gone through 2-3-yr-long training programs in the current company to learn the business and the field, and plan to continue my career in this business. Our daughter Camille Momoka Sophie was born in 2011 (now 2 yrs old), it has been a lot of joy to spend time as a family. My husband Nicolas also joined Schlumberger. We started to find Houston as home (for the moment)...

Brian Kastl (MS, 2010) writes: As an independent consultant on environmental management and education, I lead water resource management and geomorphology projects in Micronesia and Cambodia for the Nature Conservancy and the International Union for Conservation of Nature (IUCN). I am also a Community-based Disaster Risk Management Specialist for the Asian Development Bank in Vietnam and Lao PDR and an environmental leadership educator for the East-West Center in Honolulu under a US State Department grant.

Michael Chandler (PhD, 2011) writes: I've been working as an Assistant Researcher at HIGP since January 2012 on topics including modeling the break-up of the greater Ontong Java super-plateau, compiling marine geophysical maps of the West Philippine Basin and South China Sea, publishing correction tables for NGDC's ~5,230 marine geophysical track line datasets, and implementing a new system for processing, sharing, and archiving SOEST's shipboard geophysics data. My term here ends this summer and I accepted a Postdoctoral Research Associate position at Michigan State University, starting in July.

Ásdís Benediktsdóttir (MS, 2011) writes: I moved to Iceland after graduation and started a Ph.D. at the University of Iceland in the fall of 2011. I am trying to figure out

the anatomy of Eyjafjallajökull through ambient seismic noise tomography. In August 2012 we had our first child, Aníta, so we are now a family of three.

Jennifer Beyer (BS, 2012) writes: I recently spent four months working as a graduate researcher at the University of Otago in New Zealand. I was characterizing the internal structure of zircons to determine a method of separating the magmatic cores from the metamorphic rims. New Zealand is a wonderful country, and I definitely recommend visiting to everyone! Currently, I am back in the states bidding my time until August when I will start a Master's program at the University of Texas at Arlington. My research will be looking into sandstone dikes in Wyoming to better understand the mechanics of the intrusions. If all

goes as planned, I'll find a job I enjoy after I graduate!

Adonara Mucek (BS, 2012) is now pursuing her Ph.D. at Oregon State University under her advisor Dr. Shan de Silva. Her thesis focuses on the resurgence at Toba Caldera, a super volcano in Indonesia. She is fortunate enough to have just received an NSF Graduate Fellowship for the next three years and GSA funding for her field work this summer.

Jacque Kelly (PhD, 2012) is presently an Assistant Professor of Geology at Georgia Southern University in Statesboro, Georgia. She primarily teaches but has also been actively establishing a research program. She and her husband are expecting their second child summer 2013.

* * *

Postdocs

Julie Bowles writes: After leaving UH, I spent 4 1/2 years at the Institute for Rock Magnetism, University of Minnesota, before taking an Assistant Professor position at the University of Wisconsin - Milwaukee last year. I'm loving Milwaukee, and several people have pointed out that compared to Minneapolis, it's almost like Hawai'i -- farther south and on the water.

Helge Gonnermann took a position as assistant professor at Rice University.

Brian Schubert writes: My wife and I moved to Louisiana this

winter where I began as an Assistant Professor in the School of Geosciences at the University of Louisiana at Lafayette. Our first child, Noah, was born in December.

After leaving UH in 2010, **Anette von der Handt** took an Assistant Professor position at the University of Freiburg (Germany). In the Fall of 2012, she moved to the University of Minnesota, where she's been managing the electron microprobe lab.

Alain Volentik writes: Leaving UH and Hawai'i at the end of 2010 was definitely tough for Jasmine

and I. We have been in Houston ever since and I am currently serving as a senior petroleum geologist with ExxonMobil. My first two years were spent developing an oil field in Angola toward oil production and I recently transferred to the research section to help develop and apply a subsurface visualization application. Although Texas is definitely lacking some aloha spirit, Houston turned out to be a much nicer city to live in than we originally thought. Hope to see y'all very soon.

* * *

Field Trips

GG101L had 136 students combined in F2012 and S2013, and thanks to TAs Kendra Lynn, Olivia Schubert, Jonathan Tree, Malin Klawonn, Elise Rumpf, and Jonathan Sleeper (and to Hope Jahren, who took over organizing in fall 2012), all the students got a great dose of hands-on geological and geophysical experience, both in the lab and outdoors. A class website (still under construction) is at: http://www.soest.hawaii.edu/GG/FACULTY/ROWLAND/GG101L/GG101L_webpage01.htm



GG101L students used chalk to illustrate the geologic history of living organisms (and to make the boring UHM sidewalks much prettier).



Students learned GPS navigation on Wa'ahila ridge.



GG103 and GG101L students learned the geology of Wai'anae during a field trip led by John Sinton.



Students practiced the finer points of streamflow measurement along an 'auwai next to Mānoa stream.



Here are the effects of 7 days of mapping mostly Cambrian sedimentary and meta-sedimentary rocks out in the Mojave Desert. Bryson Aiu (1), Nakoia Ching (2), Laura Corley (3), Lerma Gamiao (4), Shellie Habel (5), Zara Huntley (6), Isaac Ishihara (7), Alex Oliver (8).

GG305: Eight newly minted field geologists emerged from a semester's worth of applying class and lab knowledge to the windy, dusty, hot, dry, cold, wet field.



Shellie, Laura, and Lerma level their way up Makapu'u



Bryson, Isaac, Nakoia, and Alex discuss tuff-layer relationships at Hanauma Bay.



Isaac, Alex, Shellie, Nakoia, and Zara jump for joy upon discovering Gypsum near Tecopa.,



Zara, Nakoia, Lerma, Isaac, Bryson, and Koa measure Makapu'u dike orientations.



GG460 students plus Rob Wright get set to start ground-truthing the geologic maps they've spent a month constructing from raw satellite and airborne data.



We hiked through the rain near Kalapana...



...to practice thermal imaging of a (very) hot target.



The second day of ground-truthing was very wet.



Rebekah examines "that strange linear feature".

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!*

Mailing address: University of Hawai'i Foundation, P.O. Box 11270, Honolulu HI 96828-0270.

Name(s): _____ UH Alumni Year (if applicable): _____

Address: _____ City: _____ State: _____ Zip: _____

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Area of Support: Please designate my gift to support the **Department of Geology & Geophysics:**

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| <input type="checkbox"/> \$1,500 President's Club | <input type="checkbox"/> \$500 | <input type="checkbox"/> \$100 |
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- I will make my gift online at **<http://www.uhf.hawaii.edu/GeologyGeophysics>** instead of using this form.

If you are associated with a company that will match your tax-deductible gift to the University of Hawai'i, please obtain the matching gift form and mail it to the University of Hawai'i Foundation PO BOX 11270 Honolulu, Hawai'i 96828, or mail it with your gift.

Signature: _____ Date: _____

Rev. 5/2011

**The 2013 SOEST Open House will be
Friday, October 25th (8:30 am to 2 pm) and Saturday, October 26th (10 am to 2 pm)!**

The **SOEST Open House** presents a diverse array of entertaining and educational “hands-on” activities, which highlight the research conducted by our faculty, students, and staff. Stay tuned to this website for more information about exhibits that will be offered!

Your students and families will learn about volcanoes, tsunamis, El Niño, planetary exploration, hurricanes, coastal erosion, and marine ecosystems, to mention just a few topics, through a variety of videos, posters, and interactive demonstrations. They will visit state-of-the-art laboratories and hear about cutting-edge research from the scientists who are making the new discoveries!



If you are a teacher planning on bringing a class, please fill out the Group Reservation Form (PDF). SOEST is home to the academic departments of Oceanography, **Geology and Geophysics**, Meteorology, and Ocean and Resources Engineering, as well as eight research institutes, centers, laboratories, and programs. SOEST's graduate programs in these sciences are highly ranked nationally, and the School brings in over \$140 million dollars in funding per year.

The SOEST Open House is only offered every two years. We hope that you will be able to join us for this great event!

For more information, please call 808-956-3151 or email openhouse@soest.hawaii.edu

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