

Volcanology Class Field Trip to Hawaii – Spring 2013

Report and photos by Professor Cathy Busby (Berkeley '76, Princeton *83)

Twenty out of twenty-one students in Earth 185 (Physical Volcanology) elected to take an optional field trip to the Big Island of Hawaii, for five days of fieldwork over the Memorial Day weekend. The class consisted entirely of Geology majors (except for one Geology minor), many of them in their senior year, who had spent the quarter preparing for the trip by learning about volcanic processes and volcanoes. The trip was made affordable due to the generosity of Distinguished Alumnus Jason Saleeby (*76), my mentor and close friend, who made his non-profit Island Outpost Field Station in Volcano available to us for the modest price of a financial contribution to the care-taker's pay.



Earth 185 with Professor Busby (center lower right) at the gate to Island Outpost Field Station in Volcano, at the edge of Hawaii Volcanoes National Park.

On our first day at Hawaii Volcanoes National Park, we were very honored to be generously treated to a full update on the geologic history of Kilauea volcano by Dr. Donald A. Swanson, staff scientist and former Scientist-In-Charge of the Hawaii Volcano Observatory (1997-2004) and the Cascades Volcano Observatory (1986-1989). As the class learned first-hand by looking at the stratigraphy of Kilauea with him, Don has completely revised models for how Kilauea and shield volcanoes in general behave. Don's detailed stratigraphic mapping, dating and modeling have led to a paradigm shift, demonstrating that Kilauea has been dominated by explosive activity for 60% of the past 4,000 years, with ejecta that reached the stratosphere. I was also intrigued to

learn that Don spent two years in the UCSB Earth Science Department, when he followed Professor Aaron Waters out from Johns Hopkins University – so even though he got his degree from Hopkins, I am proud to consider him an honorary alumnus!



Dr. Donald Swanson teaching Earth 185 how to make stratigraphic interpretations of explosive volcanic deposits on Kilauea Volcano – thereby demonstrating how dangerous this supposedly calm shield volcano really is!

Throughout the trip, we made extensive use of pamphlets Dr. Swanson has prepared for taking self-guided walks around the major volcanic features (e.g. Kilauea Iki, Mauna Ulu, Halema'uma'u, etc). They are inexpensive (\$2 each) and beautiful full-color guides, provided right at the trailhead on the honor system (also available in the Park store, or free download on the web). The most amazing thing is the way Don explains things so that anyone can understand them - yet they are fascinating to the professional. The pamphlets also have wide appeal for including relevant Hawaiian traditions, and giving personal accounts with photos of the geologists involved in exciting events. Be sure to use them when you go!



Kilauea Iki provides a perfect opportunity to study a crater and lava lake whose formation was observed in real time – greatly enhancing understanding of physical processes and products.

Peléé was also extremely generous with us. Halema'uma'u pit crater (Hawaian for "House of Eternal Fire") had a lava lake inside it, which gave off a beautiful red glow at night. We saw it with a full moon above – while listening to "Dark Side of the Moon". Then we took a thrilling boat ride to see lava entering the sea – closeup! – with Captain Sean, who I have since seen doing the same on the TV show "Lava Chasers". A bucket lowered into the sea came up with water warm enough for a jacuzzi!



Then we marched a couple of miles across black basaltic glass (hot! take lots of water!) to watch pahoehoe lava flows form. This really brought home the concepts of lava crusts, lava toes, and inflation processes.



Bryan Norman poking at a pahoehoe toe (above) and Nathan Dickey holding a molten lava blob on his hammer (right).

Other highlights included a trip to the southernmost point in the United States, South Point, to study a thick ash fall deposit of unknown origin.....and a hike in to the spectacular Green Sand Beach, which is full of olivine eroded from a tuff ring.



The trip concluded with a swim, and a visit with giant sea turtles on a black sand beach. The students had one word for the experience: AWESOME!!!!