

GG 104 Volcanoes in the Sea

(Fall 2007 Tuesday, Thursday, 10:30-11:45 am)

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Office Hours: **W (10:00-12:00)** or by appointment

text: none - see Reading materials instead

Revised lecture schedule, as of 09/11/07:

#	Date	Topics	Readings
1a	8/21	Intro to Geology, Earth Structure	Macdonald <i>et al.</i> (1983: 1-5), Hazlett & Hyndman (1996: pp 1-7), Kāne (1997: 10-18)
1b	8/23	Papa, Wākea, Hawaiian Science (<i>Sam Gon</i>)	Lili'uokalani (1897), Beckwith (1951; 1970: 293-306), Kamakau (1991), King (1997), Gon (2001a; 2001b), Malo/Chun (2006; 3-4)
2a	8/28	Hotspots, Magma, Volcano Evolution	Macdonald <i>et al.</i> (1983: 6-12), Hazlett & Hyndman (1996; pp 7-23)
2b	8/30	Giant Avalanches, Rejuvenated Volcanism, and Pele's Travels	Macdonald <i>et al.</i> (1983: 12-35), Westervelt (1916: 1-13)
3a	9/4	Eruption Styles, Pele, Hi'iaka, Keoūa, and Keanakāko'i	Emerson (1915), Westervelt (1916: 126-145), Beckwith (1970: 173-179), HVO (2000), Swanson (2006)
3b	9/6	Climate Change - Causes and Effects (<i>Jenny Engels</i>)	IPCC (2007)
4a	9/11	Eruption Styles, Pele, Hi'iaka, Keoūa, and Keanakāko'i	Emerson (1915), Westervelt (1916: 126-145), Beckwith (1970: 173-179), HVO (2000), Swanson (2006)
4b	9/13	'A'ā and Pāhoehoe Lava Flows, Dikes	Macdonald <i>et al.</i> (1983), Hazlett & Hyndman (1996; 24-31)
5a	9/18	The Healing Stones of Waikīkī (<i>Babette Galang</i>)	Thrum (1923), Boyd (1999), HawaiianStyle (2007)
5b	9/20	Geological Aspects of Stones for Implements	Hiroa (1957: 27-462), McBride (1998), Gon (2001b)
	9/22	FIELD TRIP TO GATHER PŌHAKU	
6a	9/25	Stone use in modern Hawai'i	Leidmann (1996), Cheever & Cheever (2005), Simon (2005),
6b	9/27	MIDTERM EXAM	

7a	10/2	Human/Pele Interactions in Pre-, Syn-, and Post-Contact Times (<i>Keali'i Pang</i>)	Westervelt (1916: 63-71)
7b	10/4	Volcano dieties elsewhere	
10/6 FIELD TRIP TO SOUTHEAST O'AHU			
8a	10/9	Earthquakes, Causes, Effects	Press & Siever (1998: 460-469)
8b	10/11	Making Stone Implements, Pele (<i>Eric Enos, Vince Mahoney</i>)	Hiroa (1957: 27-462), Kāne (1997: 50-109), Gon (2002)
10/16-10/18 FIELD TRIP TO MAUNA KEA			
9a	10/16	Glaciation on Mauna Kea	Macdonald <i>et al.</i> (1983: 252-259)
9b	10/18	Mauna Kea Adzes, Volcano-Ice Legends	Westervelt (1916: 55-62)
10/20 FIELD TRIP TO NORTH SHORE			
10a	10/23	Other Types of Volcanoes	Rowland (2004)
10b	10/25	Tracing Stone Around the Pacific (<i>John Sinton</i>)	Collerson & Weisler (2007)
10/30-11/1 FIELD TRIP TO MAUI ISLAND			
11a	10/30	The Geology of Pacific Islands and the Diversity (or lack) of Raw Geologic Materials	Menard (1986: 109-145), Kirch (1994), Diamond (1999: 53-66)
11b	11/1	Effects of Island Type and Raw Materials on Cultures	Diamond (1999: 53-66)
11/2-11/4 GIANT GG101 FIELD TRIP TO HAWAI'I ISLAND			
12a	11/6	Volcano Beliefs in the Marianas islands and(?) other parts of the Pacific (<i>Frank Trusdell</i>)	Rogers (1986)
12b	11/8	Tsunami, Causes, Effects (<i>Laura Kong or Brian Yanagi</i>)	Reynolds <i>et al.</i> (2008: 330-331, 348-349)
11/13-11/15 FIELD TRIP TO HAWAI'I ISLAND			
13a	11/13	Tsunami in Pacific Culture and Legends	
13b	11/15	Hydrology, Streams, and Groundwater (stone implement display card drafts due)	Gingerich & Oki (2000), Oki (2003)
11/16-11/18 GG104 FIELD TRIP TO HAWAI'I ISLAND			
14a	11/20	Hydrological Effects on Pacific Cultures	Kirch (1994: 1-24)
14b	11/22	THANKSGIVING	

15a	11/27	Shorelines and Sea Level Change	IPCC (2007)
15b	11/29	The Effects of Sea Level Rise in Tuvalu (<i>Jane Taafaki-Sam</i>)	Menard (1986: 71-85), Chipperfield & Harrison (2000), Michaels (2001), Baliunas & Soon (2002), Allen (2004), WorldView (2005)
16a	12/4	Soil and Dryland Farming on Kohala	Hazlett & Hyndman (1996: 36-49), Vitousek <i>et al.</i> (2004)
16b	12/6	Soil-type Effects on Cultures, turn in pōhaku	Kirch (1994: 251-268), Vitousek <i>et al.</i> (2004)

12/13 Final Exam, (Thursday of finals' week), 10:30 am - 12:30 pm

Original versions of some of the readings are available in digital format (good for color figures). These have been placed on the web at: <http://www.higp.hawaii.edu/~scott/GG104/Readings/>
Powerpoint presentations from lectures and guest lectures are available at: http://www.higp.hawaii.edu/~scott/GG104/Powerpoint_presentations/
Midterm and Final review questions are available at: <http://www.higp.hawaii.edu/~scott/GG104/>

Course work will include:

- reading assignments
- class lectures and activities
- field trips (you must go on 2 of the 3)
- 1 mid-term (Sept. 27) and a final (Dec. 13)
- a stone implement

Grades will be based on:

- 1 mid-term (25%)
- 1 non-cumulative final (25%)
- 2 field trips (12.5% each)
- your stone implement (25%)

There will be a web site for this class where powerpoint presentations, exam reviews, color copies of some reading materials, and field trip photos will be displayed: <http://www.higp.hawaii.edu/~scott/GG104/>

Please do the reading before coming to class. There is no textbook for this topic, so I've cobbled together a bunch of stuff from geology and culture books. It looks like a lot, but there many photos.

There is one term project, a stone implement that you will make yourself using traditional Hawaiian methods (no power tools!). We will learn about the uses of stone and their significance in Hawaiian culture by an expert in this topic, Mr. Eric Enos. Then, on Sept. 22 we will travel to Wai‘anae to gather our own stones, and each of you will start making a stone implement of your choice. You need to finish by the end of the semester. You also need to produce a 1-page display card that will go with your stone implement while it is on display in the POST building. This card needs to say what your stone implement is used for, and how the geological qualities of the particular rock relate to it. For example, what qualities made the implement easy (or difficult) to produce? What qualities made the implement good for its intended purpose? A draft of what you plan to write for your card is due on Nov. 15 - I'll give you more information about this later. There are photos of the stone-gathering trip from Fall 2005 on the web at:

http://www.higp.hawaii.edu/~scott/GG103/Waianae/Fall_2005/

You are required to go on two of the two other field trips (Oct. 6 to SE O‘ahu or Oct. 20 to the North Shore). Note that these field trips last pretty much all day, so you'll need to bring lunch, water, sun protection, rain protection, and something to write with. There are photos of previous field trips on the web at:

http://www.higp.hawaii.edu/~scott/GG103/NorthShore/Fall_2006/

http://www.higp.hawaii.edu/~scott/GG103/SE_Oahu/Fall_2005/

http://www.higp.hawaii.edu/~scott/GG103/SE_Oahu/Fall_2006/

There will be two Big Island field trips (Nov. 2-4 and 16-18). They are optional, and will give you a chance to see young Hawai‘i geology, and hopefully even some flowing lava! The cost typically comes out to \$200-250, and you will be responsible for making your own flight arrangements to and from Hilo. More details about the trips will be available soon. For photos from previous years' trips, see:

http://www.higp.hawaii.edu/~scott/GG103/Big_Island/Fall_2005/

http://www.higp.hawaii.edu/~scott/GG103/Big_Island/Fall_2006/

<http://www.soest.hawaii.edu/GG/STUDENTS/engels/BIFT06.html>

There is no lab for this class, however, you are encouraged to sign up for the Dynamic Earth laboratory (GG 101L). It is a separate class and will give you lots of good hands-on experience. You are also encouraged also to attend department seminars, read and bring in news articles related to Earth science and Pacific culture, and look around at your natural surroundings wherever you go. **BECOME A GEO-NERD!** By the way, we are always looking for more Geology & Geophysics undergraduate majors...