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EDUCATION

Ph.D. Geology & Geophysics, 1987, University of Hawai'i at Mānoa. Dissertation title: The flow character of Hawaiian basalt lavas. Dissertation advisor: George P.L. Walker.

BS in Geology, Oregon State University, 1982.

COURSES TAUGHT REGULARLY

[ERTH101L](#) (*Dynamic Earth Lab; 32 times, most recently Spring 2023*): Students learn, with hands-on and in-the-field exercises, about mineralogy, lithology, map-reading, earthquakes, structural geology, hydrology, landslides, and coastal processes. Lab sections are taught by TAs.

[ERTH103](#) (*Geology of the Hawaiian Islands; 11 times, most recently Spring 2023*): All key geologic processes are taught with Hawai'i examples during a geologic tour that starts at Lō'ihi and finishes in Papahānaumokuākea.

[ERTH104](#) (*Volcanoes in the Sea; 8 times, most recently Fall 2021*): This course looks at how the specific geological and geophysical aspects of Pacific islands and Pacific-rim regions affect the societies that lived there in the past and who live there (here) now.

[ERTH130](#) (*Geologic Hazards; 5 times, most recently Fall 2022*): This course looks in depth at those Earth processes (volcanic eruptions, earthquakes, tsunami, floods, etc.) that have direct and typically detrimental effects on people and societies.

[ERTH305](#) (*Geological Field Methods; 24 times; most recently Spring 2023*): In this class, Earth Sciences majors apply their classroom, lab, and book knowledge to real examples in the hot, muggy, dry, dusty, rainy, cold world, both in Hawai'i and in the Mojave desert.

[ERTH306](#) (*Work of Water; 9 times, most recently Spring 2023*): This is an introduction to water properties and processes, both on the surface and underground. E mālama i ka wai.

[ERTH333](#) (*Earth Materials and Structures; 3 times, most recently Fall 2022*): Students in the BA program who don't get full-semester courses on rock and mineral ID nor structural geology, get an introduction to these topics. It includes labs and field trips.

[ERTH460](#) (*Geological Remote Sensing; 18 times, most recently Spring 2022*): Students learn how energy interacts with terrestrial surfaces and how that energy can be collected from space or in the air, and how those data are processed, displayed, and interpreted. The course is co-taught with [Rob Wright](#).

[ERTH461](#) (*Geospatial Information; 12 times, most recently Fall 2022*): Students learn how to collect field data with a quantitative spatial component (i.e., with GPS), and then how to store and process these data (i.e., with GIS).

CURRENT RESEARCH PROJECTS

Understanding groundwater flow paths beneath the Red Hill Fuel Tanks, understanding lava flow morphology and emplacement, thick lava flows on Moloka'i, Co-Investigator with the Mars Science Laboratory "Curiosity" rover, improving Earth-science literacy among Hawai'i teachers.

ACTIVE EXTRAMURAL GRANTS

University of Hawai'i Participation in the Mars Science Laboratory Mission (Co-I; NASA) Geologic Controls on Groundwater Flow Paths Beneath the Red Hill Fuel Storage Tanks, O`ahu, Hawai'i (PI; State of Hawai'i Dept. of Health)

Project EPIK - Earth, Planets, 'Ike, and Kuleana - Preparing the Next Generation of Diverse Geoscientists in Hawai'i (Co-I, NSF)

STUDENTS ADVISED

Donielle Chittenden (Senior thesis, 2003), Elaine Lompitoc (MS, 2009), Darwina Griffin (MS, 2012), Brooke Winans (Senior thesis, 2014), Warren McKinzie (Senior thesis, 2016), Samantha Jacob (MS 2015), Colin Ferguson (MS 2020), Brian Shiro (PhD 2021)

EMPLOYMENT

- 11/04 to present: Associate Specialist, then Specialist in the Dept. of Earth Sciences (formerly Geology & Geophysics), University of Hawai'i at Mānoa, teaching courses, conducting volcanological research, and working with the Curiosity rover (on Mars).
- 9/89 to 10/04: Assistant, then Associate Researcher in the Hawai'i Institute of Geophysics and Planetology, University of Hawai'i at Mānoa. Most work was remote-sensing volcanology in support of various Earth-observing satellite missions (EOS, SIR-C, TOPSAR, etc.).
- 1/89 to 9/89: Geologist for Dames & Moore, Honolulu. Work involved field analysis of drill cores, sub-surface contaminant detection and mapping, and construction monitoring.
- 1/89 to 5/89: Instructor at Windward Community College, Kāne'ohe Hawai'i.
- 3/88 to 12/88: Laboratory technician, US Geological Survey, Menlo Park, CA. Work involved processing sulfide and sulfate minerals (using wet chemistry and gas distillation) to prepare them for running on a mass-spectrometer.
- 3/88 to 12/88: Geologist for Smith-Evernden Associates, Santa Cruz, CA. Work entailed evaluation of existing and proposed home sites with regard to their soil conditions, drainage, flooding potential, and fault proximity.
- 7/87 to 12/87: Instructor, Dept. of Geology & Geophysics, University of Hawai'i at Mānoa.

PROFESSIONAL MEMBERSHIP

- AGU (American Geophysical Union), GSA (Geological Society of America; Fellow), IAVCEI (International Association for Volcanology and Chemistry of the Earth's Interior)

PUBLICATIONS

- Shiro, BR, Rowland, SK, Hurtado, JM, Caldwell, BJ, Bleacher, JE, Fagents, SA, Roma, PG, Bedwell-Torres, WL, Binsted, K (2022). Geological tasks during HI-SEAS planetary analog mission simulations, Mauna Loa, Hawai'i. *Planetary and Space Science*, **212**, 105409, <https://doi.org/10.1016/j.pss.2021.105409>
- Heydari E, Schroeder JF, Calef FJ, Van Beek J, Rowland SK, Parker TJ, Farién AG (2020) Deposits from tian floods in Gale crater and their implications for the climate of early Mars. *Nature Research* <https://doi.org/10.1038/s41598-020-75665-7>
- Edgett, KS (and 22 others; 2020) Extraformational sediment recycling on Mars. *Geosphere*, **16** no. 6:1508–1537. <https://doi.org/10.1130/GES02244.1>
- Minitti ME (and 20 others; 2019) Distribution of primary and secondary features in the Pahrump Hills outcrop (Gale crater, Mars) as seen in a Mars descent Imager (MARDI) "sidewalk" mosaic. *Icarus*, **328**:194-209.
- Malin MC (and 28 others; 2017) The Mars Science Laboratory (MSL) Mast cameras and Descent imager: I. Investigation and instrument descriptions. *Earth and Space Science*, doi: 10.1002/2016EA000252
- Harris AJL, Rowland SK, Villeneuve N, Thordarson T (2017) Pāhoehoe, 'a'ā, and block lava: an illustrated history of the nomenclature. *B Volcanol* **79.7**, doi: 10.1007/s00445-016-1075-7
- Harris AJL, Rowland SK (2015) Lava flows and rheology. *In* Sigurdsson H, Houghton B, McNutt SR, Rymer H, Styx J, eds. *Encyclopedia of Volcanoes*, 2nd Edition
- Mangold N, and 49 others (2015) Chemical variations in Yellowknife Bay formation sedimentary rocks analyzed by ChemCam o board the Curiosity rover on Mars. *J. Geophys. Res. Planets*, **120**:452–482, doi:10.1002/2014JE004681
- Harris AJL, Rowland SK (2015) FLOWGO 2012: An updated framework for thermorheological simulations of Channel-Contained lava. *In* Carey R, Cayol V, Poland M, and Weis D, eds., *Hawaiian Volcanoes: From Source to Surface*, Am Geophys Union Geophysical Monograph **208**
- Blaney DL and 31 others (2014) Chemistry and texture of the rocks at Rocknest, Gale Crater: Evidence for sedimentary origin and diagenetic alteration. *J Geophys Res Planets*, **119**:2109-2131, doi:10.1002/2013JE004590
- Kurz MD, Rowland SK, Curtice J, Saal AE, Naumann T (2014) Eruption rates for Fernandina Volcano: A new chronology at the Galápagos hotspot center. *In* Harpp KS, Mittlestaedt E, d'Ozouville N, Graham DW, eds. *The Galapagos: A Natural Laboratory for the Earth Sciences*, Am Geophys Union Geophysical Monograph **204**
- Grotzinger JP and 71 others (2013) A habitable fluvio-lacustrine environment at Yellowknife Bay, Gale Crater, Mars. *Science* **343**, 10.1126/science.1242777

- Stolper EM, Baker MB, Newcombe ME, Schmidt ME, Treiman AH, Cousin A, Dyar MD, Fisk MR, Gellert R, King PL, Seshin L, Maurice S, McLennan SM, Minitti ME, Perrett G, Rowland S, Sautter V, Wiens RC, MSL Science Team (2013) The petrochemistry of Jake_M: A Martian mugearite. *Science* **341**: DOI: 10.1126/science.1239463
- Edgett KS, Yingst RA, Ravine MA, Caplinger MA, Maki JN, Ghaemi FT, Schaffner JA, Bell JF, Edwards LJ, Herkenhoff KE, Heydari E, Kah LC, Lemmon MT, Minitti ME, Olson TS, Parker TJ, Rowland SK, Schieber J, Sullivan RJ, Sumer DY, Thomas PC, Jensen EH, Simmonds JJ, Sengstaken AJ, Willson RG, Goetz W (2012) Curiosity's Mars Hand Lens Imager (MAHLI) Investigation. *Space Science Reviews* DOI 10.1007/s11214-012-9910-4.
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- Mougini-Mark PJ, Fagents SA, Rowland SK, (2011) NASA volcanology field workshops on Hawai'i: Part 2. Understanding lava flow morphology and flow field emplacement. *In* Garry WB, Bleacher JE, eds., Analogs for Planetary Exploration: Geological Society of America Special Paper **483**: 435–448, doi:10.1130/2011.2483
- Rowland SK, Sparks RSJ (2009) A pictorial summary of the life and work of George Patrick Leonard Walker. *In*: Hoskuldsson A, Thordarson T, Larsen G, Self S, Rowland S, eds. The Legacy of George P.L. Walker, Special Publications of IAVCEI, **2**: 371–400, Geological Society, London.
- Rowland SK, Jurado-Chichay Z, Ernst GJ (2009) Pyroclastic deposits and lava flows from the 1759–1774 eruption of El Jorullo, México: Aspects of “violent strombolian” activity and comparison with Parícutin. *In*: Hoskuldsson A, Thordarson T, Larsen G, Self S, Rowland S, eds. The Legacy of George P.L. Walker, Special Publications of IAVCEI, **2**: 105-128, Geological Society, London.
- Harris AJL, Rowland SK (2009) Effusion Rate Controls on Lava Flow Length and the Role of Heat Loss: A Review. *In*: Hoskuldsson A, Thordarson T, Larsen G, Self S, Rowland S, eds. The Legacy of George P.L. Walker, Special Publications of IAVCEI, **2**: 33-51, Geological Society, London.
- Mougini-Mark PJ, Rowland SK (2008) Lava flows at Arsia Mons, Mars: Insights from a graben imaged by HiRISE. *ICARUS* **198**:27-36.
- Kervyn M, Kervyn F, Goossens R, Rowland SK, Ernst GGJ (2007) Mapping volcanic terrain using high-resolution and 3D satellite remote sensing. *In*: Teeuw RM (ed) Mapping Hazardous Terrain using Remote Sensing. Geol. Soc. Lond. Spec Publ **283**:5-30
- Mougini-Mark PJ, Harris AJL, Rowland SK (2007) Terrestrial analogs to the calderas of the Tharsis volcanoes on Mars, *in*: Chapman M (ed) The Geology of Mars: Evidence from Earth-Based Analogs. Cambridge Univ. Press: 71-94
- Bailey JE, Harris AJL, Dehn J, Calvari S, Rowland SK (2006) The changing morphology of an open lava channel on Mt. Etna. *Bull Volc* **68**:497-515
- Rowland SK, Garbeil H, Harris AJL (2005) Lava channel lengths and hazards on Mauna Loa determined from thermal and downslope modeling with FLOWGO. *Bull Volcanol* **67**:634-647.
- Rowland SK, Lockwood JP, Trusdell FA, Moore RB, Sako MK, Koyanagi RY, Kojima G (2005) Anatahan, Northern Mariana Islands: reconnaissance geological observations during and after the volcanic crisis of spring 1990, and monitoring prior to the May 2003 eruption. *J Volcanol Geotherm Res* **146**:26-59.
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- Garcés M, Harris A, Hetzer C, Johnson J, Rowland S, Marchetti E, Okubo P (2003) Infrasonic tremor observed at Kīlauea Volcano, Hawai'i. *Geophys Res Lett* **30**:2023-2026, doi:10.1029/2003GL018038.
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- satellite data: the 1995 Fernandina and 1998 Cerro Azul eruptions in the western Galápagos. *Bull Volcanol* **65**:311-330.
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- Jurado-Chichay Z, Urrutia Fucugauchi J, Rowland SK (1996). A paleomagnetic study of the Pohue Bay flow and its associated coastal cones, Mauna Loa Volcano, Hawaii: constraints on their origin and temporal relationships. *Physics of Earth and Planetary Interiors. Phys. Earth Planet. Int.* **97**:269-277.
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- Jurado-Chichay Z, Rowland SK (1995). Channel overflows of the Pōhue Bay flow, Mauna Loa, Hawai'i: examples of the contrast between surface and interior lava. *Bull. Volcanol.* **57**:117-126.
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- Rowland SK, Munro DC (1993). The 1919-1920 eruption of Mauna Iki, Kilauea: chronology, geologic mapping, and magma transport mechanisms. *Bull. Volcanol.* **55**:190-203.
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Galapagos islands using remotely-sensed data. Program, 8th Thematic Conf. on Remote Sensing.

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Rowland SK, Walker GPL (1988). Mafic-crystal distributions, viscosities, and lava structures of some Hawaiian lava flows. *J. Volcanol. and Geotherm. Res.*, **35**:55-66.

Rowland SK, Walker GPL (1987). Toothpaste lava: characteristics and origin of a lava structural type transitional between pahoehoe and a'a. *Bull. Volc.*, **49**:631-641.