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Quaternary Fault and Fold Database of the United States

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Kohala Volcano, Kohala headwall section (Class B) No. 2600d

Last Review Date: 2006-09-16

citation for this record: **Cannon, E.C., and Burgmann, R., compilers, 2006, Fault number 2600d, Kohala Volcano, Kohala headwall section, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, https://earthquakes.usgs.gov/hazards/qfaults, accessed 12/14/2020 02:53 PM.**

Synopsis	**General:** Kohala is the oldest volcano on the Island of Hawai'i. It has two poorly defined volcanic lineaments inferred along broad topographic ridges: the northwest [2600a] and southeast [2600b] volcanic lineaments. These volcanic lineaments may follow the general trend of earlier shield-stage rift zones. At the summit region in the Kohala Mountains, the volcanic lineaments are co-located with the northwest-trending Kohala graben [2600c] (Wolfe and Morris, 1996 #6977). Along the northeast coast of the Kohala Peninsula, a coastal "headwall" [2600d] trends approximately northwest from Kukuihaele to Akokoa Point. The Kohala graben most likely is a pull-apart graben at the head of the 3,500 square kilometer Pololu submarine debris avalanche (Moore and others, 1989 #6961). **Sections:** This fault has 4 sections. The sections are the northwest

	[2600a] and southeast [2600b] volcanic lineaments, the Kohala graben [2600c], and the Kohala headwall [2600d].
Name comments	**General:** Kohala Volcano is located on sheet 1 of 3 of the 1:100,000-scale geologic map compiled by Wolfe and Morris (1996 #6977), which is available in digital format from Trusdell and others (2006 #6976). **Section:** Informal section name based on Moore and others (1989 #6961).
County(s) and State(s)	HAWAII COUNTY, HAWAII
Physiographic province(s)	HAWAIIAN-EMPEROR ISLAND-SEAMOUNT CHAIN
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Inferred from the reentrant coastline, an embayment shown on the 1:100,000-scale geologic map compiled by Wolfe and Morris (1996 #6977), based on information from Moore and others (1989 #6961).
Geologic setting	Kohala is a postshield-stage volcano and is the northernmost and oldest volcano on Hawai'i with an approximate age of 120-700 ka (Wolfe and Morris, 1996 #6977).
Length (km)	This section is 20 km of a total fault length of 22 km.
Average strike	N. 63° W. (for section) versus N. 53° W. (for whole fault)
Sense of movement	Normal *Comments:* Moore and others (1989 #6961).
Dip Direction	NE *Comments:* Moore and others (1989 #6961).
Paleoseismology studies	
Geomorphic expression	The sea cliffs that form the Kohala headwall have as much as 400 m of topographic relief and form a 20-km-long reentrant in the coastline that extends the shoreline inland about 2 km (Moore and

	others, 1989 #6961). Access to the sea cliffs is extremely difficult due to heavy vegetation and steep slopes. At Waipi'o Bay, 4 km west of Kukuihaele Landing, there is no visible surface trace of an active fault. Moore and others (1989 #6961) interpret the reentrant coastline along the coast from Kukuihaele to Akoakoa Point as the headwall of the submarine Pololu debris avalanche that has been modified by erosion.
Age of faulted surficial deposits	The sea cliffs are composed of middle Pleistocene Pololu lava flows (Wolfe and Morris, 1996 #6977). Dalrymple (1971 #6938) calculates 700 ka for the weighted mean age of five tholeiitic shield-stage Pololu lava flows located in Waipi'o Valley. Wolfe and Morris (1996 #6977) redefine the Pololu Volcanics as shield-stage to transitional.
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* Moore and others (1989 #6961) estimate the age of the Pololu debris avalanche to be "slightly older" than 370 ka. Their estimate is based on bathymetry that suggests the debris avalanche material shows a slope change attributed to the transition from shield-stage to postshield-stage volcanism dated at 370 ka from subsidence rates and modeled coral-reef ages.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Herein considered to be <0.2 mm/yr and likely inactive. The Pololu debris avalanche may represent a one-time, catastrophic event, perhaps triggered by an earthquake. If so, then the Kohala headwall may be inactive at present. Additionally, postshield-stage eruptive activity at Kohala has ceased (Wolfe and Morris, 1996 #6977).
Date and Compiler(s)	2006 Eric C. Cannon, none Roland Burgmann, University of California at Berkeley
References	#6938 Dalrymple, G.B., 1971, Potassium-argon dates of from the Pololu volcanic series, Kohala Volcano, Hawaii: Geological Society of America Bulletin, v. 82, no. 7, p. 1997-2000.

	#6961 Moore, J.G., Clague, D.A., Holcomb, R.T., Lipman, P.W., Normark, W.R., Torresan, M.E., 1989, Prodigious submarine landslides on the Hawaiian Ridge: Journal of Geophysical Research, v. 94, no. B12, p. 17,465-17,484. #6976 Trusdell, F.A., Wolfe, E.W., and Morris, J., 2006, Digital database of the geologic map of the island of Hawai'i: U.S. Geological Survey Data Series 144 supplement to Miscellaneous Investigations Series Map I-2524-A, 18 p, 1 sheet, scale 1:100,000. #6977 Wolfe, E.W., and Morris, J., 1996, Geologic map of the island of Hawaii: U.S. Geological Survey Miscellaneous Investigations Series Map I-2524-A, 18 p., 3 sheets, scale 1:100,000.