

Quaternary Fault and Fold Database of the United States

As of January 12, 2017, the USGS maintains a limited number of metadata fields that characterize the Quaternary faults and folds of the United States. For the most up-to-date information, please refer to the [interactive fault map](#).

Kohala Volcano, northwest volcanic lineament (Class B) No. 2600a

Last Review Date: 2006-09-16

citation for this record: Cannon, E.C., and Burgmann, R., compilers, 2006, Fault number 2600a, Kohala Volcano, northwest volcanic lineament, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, <https://earthquakes.usgs.gov/hazards/qfaults>, accessed 01/04/2021 10:24 AM.

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 Akokoia 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	<p>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).</p> <p>Section: Informal section name based on Peterson and Moore (1987 #6970).</p>
County(s) and State(s)	HAWAII COUNTY, HAWAII
Physiographic province(s)	HAWAIIAN-EMPEROR ISLAND-SEAMOUNT CHAIN
Reliability of location	<p>Poor Compiled at 1:100,000 scale.</p> <p><i>Comments:</i> The northwest volcanic lineament may follow a preexisting, shield-stage rift zone structure (Wolfe and Morris, 1996 #6977). Peterson and Moore (fig. 7.2, 1987 #6970) use the term "rift zone" rather than "volcanic lineament" and show the general trend of a northwest rift zone on a regional-scale map of Hawai'i. Holcomb and others (2000 #6945) offer alternative rift zone models. Fault location generalized from Trusdell and others (2006 #6976).</p>
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)	km.
Average strike	N. 39° W. (for section) versus N. 53° W. (for whole fault)
Sense of movement	<p>Normal</p> <p><i>Comments:</i> Unknown, presumably extension that produces normal faulting.</p>
Dip Direction	<p>NE; SW</p> <p><i>Comments:</i> Unknown, presumably near vertical to vertical.</p>

Paleoseismology studies	
Geomorphic expression	A broad topographic ridge trends northwest from the summit region of the Kohala Mountains and continues northward offshore as a broad submarine ridge. The locations of Pleistocene shield-stage to transitional Pololu and postshield-stage Hawi scoria cones and lava domes are generally located along this broad topographic ridge. Note that Wolfe and Morris (1996 #6977) only associate rift zones with the shield-stage phase of volcanism, which ended on Kohala about 400 ka.
Age of faulted surficial deposits	Wolfe and Morris (1996 #6977) summarize the K-Ar ages from several researchers for the postshield-stage Hawi Volcanics as being between 230 ka and 120 ka. 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) <i>Comments:</i> An active rift zone located along the general trend of the northwest volcanic lineament probably occurred during shield-stage volcanism about 700 ka to 400 ka. Once the volcano reached postshield stage, volcanic activity along the rift zone probably declined greatly (Wolfe and Morris, 1996 #6977), and postshield stage of volcanism buried the inactive, shield-stage rift zone. Postshield-stage Hawi scoria cones and lava domes crop out along the northwest volcanic lineament indicating that some magma transport may have followed rift zone pathways during postshield-stage volcanism.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr <i>Comments:</i> Herein considered to be <0.2 mm/yr and likely inactive. Postshield-stage eruptive activity at Kohala has ceased (Wolfe and Morris, 1996 #6977).
Date and	2006

Compiler(s)	Eric C. Cannon, none Roland Burgmann, University of California at Berkeley
References	<p>#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.</p> <p>#6945 Holcomb, R.T., Nelson, B.K., Reiners, P.W., and Sawyer, N.-L., 2000, Overlapping volcanoes: The origin of Hilo Ridge, Hawaii: Geology, v. 28, no. 6, p. 547-550.</p> <p>#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.</p> <p>#6970 Peterson, D.W., and Moore, R.B., 1987, Geologic history and evolution of geologic concepts, Island of Hawaii, <i>in</i> Decker, R.W., Wright, T.L., and Stauffer, P.H., eds., Volcanism in Hawaii: U.S. Geological Survey Professional Paper 1350, v. 1, p. 149-189.</p> <p>#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.</p> <p>#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.</p>

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