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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.

Tolay fault (Class A) No. 33

Last Review Date: 1998-09-10

Compiled in cooperation with the California Geological Survey

citation for this record: **Hart, E.W., and Bryant, W.A., compilers, 1998, Fault number 33, Tolay fault, 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 02:50 PM.**

Synopsis	High angle, dextral fault that extends about 36 km northwestward from Sears Poi partly concealed by alluvium and surface traces partly inferred. Mapping, based c geology and geomorphology, was done by Weaver (1949 #5262), Travis (1952 #5 Sims and others (1973), Fox and others (1973 #5253), Blake and others (1971 #4 1974 #5272), Huffman and Armstrong (1980 #4862) and Korbay (1982 #5295). Huffman and Armstrong (1980 #4862) interpreted Quaternary dextral activity bas geomorphology and proximity to the Rodgers Creek fault [32]. Fox (1983 #5252) inferred possible offset of Pliocene-Pleistocene deposits to the northwest, but late Quaternary alluvium in between lacks surface evidence. The Tolay fault may be a ancestral northwest extension of the Hayward fault [55] with large dextral slip. N interpreted as a recently active or Quaternary fault by Brown (1970 #1320), Helle Herd (1977 #509), or Herd and Helley (1976 #510) and probably not active in the

	Holocene (Hart, 1982 #5293). No detailed site investigations are known and the f lacks associated historic seismicity.
Name comments	Southeast part of fault initially mapped, named and described by Dickerson (192 #5271) southeast of Petaluma near Lakeville; also named and shown on a small-s map by Willis and Wood (1922 #5256). Later mapped in detail by Morse and Bai (1935 #5296), Weaver (1949 #5262), Travis (1952 #5290), and others. **Fault ID:** Refers to number 150 (Tolay fault) of Jennings (1994 #2878).
County(s) and State(s)	SONOMA COUNTY, CALIFORNIA
Physiographic province(s)	PACIFIC BORDER
Reliability of location	Good Compiled at 1:24,000 and 1:62,500 scale. *Comments:* Location of fault from Qt_flt_ver_3-0_Final_WGS84_polyline.shp (Bryant, W.A., written communication to K.Haller, August 15, 2017) attributed to 1:24,000-scale map by Clahan and others (2003 #8038) and 1:62,500-scale map b Huffman and Armstrong (1980 #4862).
Geologic setting	This dextral fault significantly truncates Miocene and older bedrock and the northwestern part may offset Pliocene-Pleistocene deposits (Huffman and Armstr 1980 #4862; Fox, 1983 #5252). Southeast end may connect with the Hayward fau [55] or may merge with Rodgers Creek fault [32]. Based on geomorphology, the southeast part may be Quaternary (Huffman and Armstrong, 1980 #4862), but see lack evidence for significant Holocene activity (Hart, 1982 #5293). Dextral offset along the Tolay-Hayward fault during past 6 m.y. is suggested to be 45±10 km (S Wojcicki, 1992 #5265) and 45±15 km in the past 8 m.y. (Fox, 1983 #5252). A rev slip component (up to the southwest) of at least 1,100 m has been interpreted in s places by Morse and Bailey (1935 #5296), Weaver (1949 #5262), Travis (1952 #5 and Wright and Smith (1992 #5258). The fault lacks evidence of historic seismici (Wong, 1991 #5257; Goter and others, 1994 #4855).
Length (km)	34 km.
Average strike	N50°W
Sense of movement	Right lateral *Comments:* Huffman and Armstrong (1980 #4862), Fox (1983 #5252), Sarna-Wo (1992 #5265).

Dip	90° *Comments:* Reported to be vertical to near vertical by Weaver (1949 #5262), Trav (1952 #5290), Wright and Smith (1992 #5258), Morse and Bailey (1935 #5296), Johnson (1943 #5294).
Paleoseismology studies	
Geomorphic expression	Huffman and Armstrong (1980 #4862) reported that the southeastern part of fault defined by dextral deflections in stream drainages, sags, benches, and a large play They considered that part of the fault to be Quaternary in age. Hart (1982 #5293) questioned the tectonic origin of some of the features that appear to be landslide related, and concluded that the geomorphic features failed to support significant Holocene displacement. He judged that the fault was not defined by fault-produce geomorphic features except southeast of Lakeville, where it is partly concealed by landslides and only moderately defined. The central and northwest parts of the fau not well defined, geomorphically.
Age of faulted surficial deposits	The youngest units clearly faulted are rocks of the Petaluma Formation and Sono Volcanics of Miocene age. Pliocene or Pliocene -Pleistocene units are inferred to faulted along the northwest extension of the fault (Huffman and Armstrong, 1980 #4862; Fox, 1983 #5252). Cardwell (1958) found no evidence that Quaternary alluvium was faulted where Weaver (1949) inferred the fault was by based on groundwater investigations. No excavations or exposures of the fault are known i Quaternary alluvium or soils.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Timing based on geomorphic features along the southeastern part of t fault (Huffman and Armstrong, 1980 #4862); (Hart, 1982 #5293). Also, classified Quaternary by Wesson and others (1975 #5261), Bortugno (1982 #5291), and Jen (1994 #2878), but not identified as Quaternary by Brown (1970 #1320), Helley an Herd (1977 #509), and Herd and Helley (1976 #510).
Recurrence interval	
Slip-rate category	Between 0.2 and 1.0 mm/yr *Comments:* Based on lack of Holocene evidence (Hart, 1982 #5293); however, lo term slip (late Tertiary) rate may be on order of 7.5±1.5 mm/yr (Sarna-Wojcicki, #5265).

Date and Compiler(s)	1998 Earl W. Hart, California Geological Survey William A. Bryant, California Geological Survey
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