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Quaternary Fault and Fold Database of the United States

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Concord fault, Ygnacio Valley section (Class A) No. 38c

Last Review Date: 1998-08-18

Compiled in cooperation with the California Geological Survey

citation for this record: **Bryant, W.A., and Cluett, S.E., compilers, 1998, Fault number 38c, Concord fault, Ygnacio Valley 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 03:11 PM.**

Synopsis	**General:** Holocene active dextral strike-slip fault. Fault is characterized by aseismic creep at a rate of 3.0–3.5 mm/yr (Galehouse, 1999 #5500). Several site-specific studies in compliance with the Alquist-Priolo Act have documented the location and approximate time of the most recent faulting (Wills and Hart, 1992 #5340; 1992 #5341). Detailed studies at Galindo Creek yielded a preliminary slip-rate of 3.7±2.0 mm/yr (Borchardt, 1998 #5334). **Sections:** This fault has 3 sections. Sharp (1973 #508) defined

	three segments based on differences in geomorphic expression and amount of fault creep. Due to reconnaissance nature of his report, Sharp's segments are herein considered as sections.
Name comments	**General:** Concord fault was first mapped and named by Poland (1935 #5337) based on groundwater data. Tolman (1931 #5322) previously referred to the Concord fault as the Sulpher Springs Mountain fault. The Concord fault extends from Suisun Bay south to the northwestern slope of Mt. Diablo. **Section:** Defined as the Ygnacio Valley segment by Sharp (1973 #508). Extends southeast from the westward flowing section of Pine Creek at the base of Lime Ridge. The southeastern extent is not known; Sharp (1973 #508) placed the southern end of the surface trace just north of the mouth of Walker Canyon. Wills and Hart (1992 #5341) mapped the southern end of the surface trace just north of Arroyo Del Cerro. Dibblee (1980 #5335) mapped a connection between the Ygnacio Valley section and thrust faults in the Mt. Diablo area **Fault ID:** Comments: Refers to number 160 (Concord fault) of Jennings (1994 #2878) and number C3 (Concord fault) of Working Group on Northern California Earthquake Potential (1996 #1216).
County(s) and State(s)	CONTRA COSTA COUNTY, CALIFORNIA
Physiographic province(s)	PACIFIC BORDER
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Location of fault traces based on digital revisions to Jennings (1994 #2878) using original mapping by Sharp (1973 #508) and Wills and Hart (1992 #5341) at 1:24,000 scale.
Geologic setting	This dextral strike-slip fault traverses the town of Concord and borders the western side of Lime Ridge. The northern end of the fault probably connects with the Green Valley fault [37] along an approximately 1-km-wide extensional jog north across Suisun Bay. The southern extent of the fault is conjectural. One possibility is that slip is transferred to the Greenville fault [53] across a complex compressional jog characterized by the Mt. Diablo uplift (Unruh and Sawyer, 1995 #5339). Alternatively, slip

	may be transferred to the northern part of the Calaveras fault [54] across a complex extensional jog (Oppenheimer and Lindh, 1992 #5336; Wills and Hart, 1992 #5340). Maximum dextral offset along the fault is unknown, but may be several kilometers based on geomorphic expression.
Length (km)	This section is 15 km of a total fault length of 20 km.
Average strike	(for section) versus N28°W (for whole fault)
Sense of movement	Right lateral *Comments:* Sense of displacement is inferred based on association with the northern sections of the Concord fault and the linearity of the southwestern side of Lime Ridge. The Ygnacio Valley section lacks evidence of fault creep (Sharp, 1973 #508; Wills and Hart, 1992 #5340; Galehouse, 1999 #5500).
Dip Direction	V *Comments:* Dip not reported, but assumed to be near vertical, based on linear strike and geomorphic expression indicating strike-slip displacement.
Paleoseismology studies	
Geomorphic expression	The Ygnacio Valley section is marked by a southwest-facing escarpment along the western side of Lime Ridge, a linear drainage, and a linear tonal contrast possibly due to ground-water barriers. Geomorphic evidence of latest Pleistocene and Holocene surface faulting is less distinct along the Ygnacio Valley section and may be characterized by a broad zone of distributive faults in late Quaternary alluvium.
Age of faulted surficial deposits	This section of the fault offsets late Pleistocene alluvium as determined from trench investigations done in compliance with the Alquist-Priolo Act (Wills and Hart, 1992 #5340). Radiocarbon dates from detrital charcoal and the unfaulted soil overlying the fault (7.6 ka) suggest a lack of middle to late Holocene displacement (Wills and Hart, 1992 #5341).
Historic earthquake	
Most recent	latest Quaternary (<15 ka)

prehistoric deformation	*Comments:* Time of most recent paleoevent not determined. Geomorphic expression of fault and offset alluvium suggests latest Pleistocene to Holocene displacement (Wills and Hart, 1992 #5340; 1992 #5341).
Recurrence interval	
Slip-rate category	Between 1.0 and 5.0 mm/yr *Comments:* Slip rate is assumed to be similar to Concord section [38b] on the basis of generally similar, but somewhat less well defined geomorphic expression.
Date and Compiler(s)	1998 William A. Bryant, California Geological Survey Sereyna E. Cluett, California Geological Survey
References	#5334 Borchardt, G., 1998, Holocene slip rate of the Concord fault at Galindo Creek in Concord, California: U.S. Geological Survey National Earthquake Hazards Reduction Program, Annual Summaries, v. 39, USGS Contract No. 1434-HQ-97-GR-03102, (electronic version on line at http://erp-web.er.usgs.gov/). #5335 Dibblee, T.W., Jr., 1980, Preliminary geologic map, Clayton quadrangle: U.S. Geological Survey Open-File Report 80-547. #5500 Galehouse, J.S., 1999, Theodolite measurement of creep rates on San Francisco Bay region faults: U.S. Geological Survey, Summaries of National Earthquake Hazards Reduction Program, v. 40, USGS Contract 99-HQ-GR-0084 (electronic version available on line at http://erp-web.er.usgs.gov). #2878 Jennings, C.W., 1994, Fault activity map of California and adjacent areas, with locations of recent volcanic eruptions: California Division of Mines and Geology Geologic Data Map 6, 92 p., 2 pls., scale 1:750,000. #5336 Oppenheimer, D.H., and Lindh, A.G., 1992, The potential for earthquake rupture of the northern Calaveras fault, *in* Borchardt, G., and others, eds., Proceedings of the second conference on earthquake hazards in the eastern San Francisco Bay area: California Division of Mines and Geology Special

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#5337 Poland, J.F., 1935, Ground-water conditions in Ygnacio Valley, California: Stanford University, M.A. thesis, 83 p.

#508 Sharp, R.V., 1973, Map showing recent tectonic movement on the Concord fault, Contra Costa and Solano Counties, California: U.S. Geological Survey Miscellaneous Field Studies Map MF-505 (U.S. Department of the Interior and U.S. Department of Housing and Urban Development Basic Data Contribution 55), 1 sheet, scale 1:24,000.

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#5341 Wills, C.J., and Hart, E.W., 1992, The Concord fault, Contra Costa County, California: California Division of Mines and Geology Fault Evaluation Report FER-231, 37 p., scale 1:24,000.

	#1216 Working Group on Northern California Earthquake Potential (WGNCEP), 1996, Database of potential sources for earthquakes larger than magnitude 6 in northern California: U.S. Geological Survey Open-File Report 96-705, 40 p.