Jump to Navigation

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.

Likely fault zone (Class A) No. 5

Last Review Date: 1995-10-01

Compiled in cooperation with the California Geological Survey

citation for this record: **Sawyer, T.L., and Bryant, W.A., compilers, 1995, Fault number 5, Likely fault zone, 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 03:09 PM.**

Synopsis	Detailed mapping of the southern and northern parts of the fault zone and small-scale, reconnaissance-level mapping of the entire fault zone are the sole sources of data for this fault zone. The activity of the Likely fault zone and its northern extent are controversial.
Name comments	Fault zone first mapped by Lawson (1908 #4969), who depicted a fault southwest of Alturas and extending southeast from the Pit River. Fault zone bounds the eastern side of Observation Peak, Madeline Plains, Schaffer Mountains, and Likely Mountains (its namesake). This fault zone was first named by Gay and Aune (1958 #4890).

	Fault ID: Refers to number 26 (Likely fault) of Jennings (1994 #2878) and number NE06 by Working Group on Northern California Earthquake Potential (1996 #1216).
County(s) and State(s)	MODOC COUNTY, CALIFORNIA LASSEN COUNTY, CALIFORNIA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:125,000 scale. *Comments:* Location based on digital revisions to Jennings (1994 #2878) based on original mapping by Gay and Aune (1958 #4890) at 1:250,000 scale, and California Department of Water Resources (1963 #5276) and Bryant (1990 #5102) at 1:62,500 scale.
Geologic setting	High-angle, oblique-slip fault zone that bounds the eastern side of Observation Peak, Madeline Plains, and Likely and Schaffer Mountains (Lydon and others, 1960 #5127; Bryant, 1990 #5102). The fault zone is probably not a through-going structure (Potter, 1988 #5103), and the fault may not exist north of Canby area (Bryant, 1990 #5102).
Length (km)	92 km.
Average strike	N35°W
Sense of movement	Right lateral, Normal *Comments:* Dextral with predominantly down-to-northeast normal component (Bryant, 1990 #5102).
Dip Direction	Unknown
Paleoseismology studies	
Geomorphic expression	The Likely fault zone is characterized by linear troughs and moderately to poorly defined scarps, shutter ridges and right-laterally offset drainages in resistant bedrock (Bryant, 1990 #5102). Although large closed depressions have been attributed to faulting, they may be more closely related to volcanic processes (Bryant, 1990 #5102).

Age of faulted surficial deposits	Although latest Pleistocene to middle Holocene deposits are reported as probably being offset (Woodward-Clyde Consultants, 1978 #5278; LaForge and Hawkins, 1986 #5277; Weick, 1990 #3020; Bryant, 1990 #5102) reports that the youngest faulted deposits apparently are late Quaternary alluvial deposits and only along the north-central part of the fault. Near the southern end, faulting of a Pliocene (~4 Ma) volcanic cone may be related to the Likely fault zone. Along northernmost part of the fault zone deposits older than the 5-6 Ma Devils Garden basalt are faulted and monoclinally tilted (Bryant, 1990 #5102).
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Timing based on late Quaternary(?) deposits within closed depressions along the north-central part of the fault (Bryant, 1990 #5102).
Recurrence interval	
Slip-rate category	Between 0.2 and 1.0 mm/yr *Comments:* A low slip rate is suggested by the absence of scarps on late Quaternary deposits and moderately to poorly defined scarps on resistant volcanic bedrock; slip rate may be less than 0.1 mm/yr
Date and Compiler(s)	1995 Thomas L. Sawyer, Piedmont Geosciences, Inc. William A. Bryant, California Geological Survey
References	#5102 Bryant, W.A., 1990, Likely fault zone, Lassen and Modoc Counties: California Division of Mines and Geology Fault Evaluation Report 218. #5276 California Department of Water Resources, 1963, Northeastern Counties ground-water investigation: California Department of Water Resources Bulletin 98, v. 1 and 2, 224 p., 32 pls., scale 1;125,000. #4890 Gay, T.E., and Aune, Q.A., 1958, Alturas Sheet: California Division of Mines and Geology Geologic Atlas of California, GAM001, scale 1:250,000.

#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.

#5277 LaForge, R.C., and Hawkins, F.F., 1986, Seismotectonic study of northernmost California for Shasta, Keswick, Spring Creek Debris, Trinity, Lewiston, and Whiskeytown dams: U.S. Bureau of Reclamation Seismotectonic Report No. 86-1, 132 p.

#4969 Lawson, A.C., chairman, 1908, The California earthquake of April 18, 1906—Report of the State Earthquake Investigation Commission: Washington, D.C., Carnegie Institution of Washington Publication 87.

#5127 Lydon, P.A., Gay, T.E., Jr., and Jennings, C.W., compilers, 1960, Geologic map of California, Westwood [Susanville] sheet, Olaf P. Jenkins edition: California Department of Conservation, Division of Mines and Geology, 2 sheets, scale 1:250,000.

#4860 Petersen, M.D., Bryant, W.A., Cramer, C.H., Cao, T., Reichle, M.S., Frankel, A.D., Lienkaemper, J.J., McCrory, P.A., and Schwartz, D.P., 1996, Probabilistic seismic hazard assessment for the State of California: California Department of Conservation, Division of Mines and Geology Open-File Report 96-08 (also U.S. Geological Open-File Report 96-706), 33 p.

#5103 Potter, S.L., 1988, Geology of the northern portion of the Likely fault lineament, Modoc County, northeastern California: Arcata, California, Humboldt State University, unpublished M.S. thesis, 55 p.

#3020 Weick, R.J., 1990, Structural, tectonic and Quaternary study of the eastern Madeline Plains, California and southwestern Smoke Creek Desert, Nevada: Reno, University of Nevada, unpublished M.S. thesis, 160 p.

#5278 Woodward-Clyde Consultants, 1978, Significant faults and seismicity in the northern Sierra Nevada region of major PG&E dams: Technical report to Pacific Gas and Electric Company, under Contract W.C.C project no. 13890A-1050, 34 p.

#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.