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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.

Almanor fault zone (Class A) No. 21

Last Review Date: 2000-12-19

Compiled in cooperation with the California Geological Survey

citation for this record: **Bryant, W.A., compiler, 2000, Fault number 21, Almanor 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 02:21 PM.**

Synopsis	Latest Pleistocene to probably Holocene (active) normal to sinistral-normal fault zone located in the northeastern Sierra Nevada. Kelson and others 1995 (#5125; 1996 #5126) reported late Pleistocene net slip rates of 1.1 to 3.3 mm/yr for the northern part of the Almanor fault zone. The timing of the most recent event is poorly constrained.
Name comments	Almanor fault first mapped by Diller (1895 #5124). **Fault ID:** Refers to number 56 (Almanor fault zone) of Jennings (1994 #2878).

County(s) and State(s)	LASSEN COUNTY, CALIFORNIA PLUMAS COUNTY, CALIFORNIA
Physiographic province(s)	CASCADE-SIERRA MOUNTAINS
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Locations based on digital revisions to Jennings (1994 #2878) using original mapping by Wills (1990 #5128) at 1:62,500 scale and unpublished mapping by T. Sawyer (written communication, 1995) at 1:250,000 scale
Geologic setting	Almanor fault zone is located in the eastern part of the northern Sierra Nevada and extends from the southern shore of Lake Almanor north-northwest to near the southern end of the Hat Creek [9] fault zone. Total vertical displacement is not well documented, but the cumulative height of scarps on 2.2 to 2.4 Ma basalts is greater than 360 m (Kelson and others, 1995 #5125). Cumulative sinistral displacement is not known.
Length (km)	40 km.
Average strike	N14°W
Sense of movement	Normal *Comments:* Fault is delineated by prominent west-facing scarps on basalt that forms Almanor Peninsula. In the Dead Tree Swale area, Kelson and others (1995 #5125; 1996 #5126) observed possible evidence of normal-sinistral displacement based on offset lateral moraines.
Dip Direction	W *Comments:* Dip unknown, presumed to be steeply west-dipping to near vertical.
Paleoseismology studies	
Geomorphic expression	The Almanor fault is delineated by geomorphic features indicative of late Pleistocene normal displacement. In the Almanor Lake area, these features include prominent, but degraded, west-facing scarps on Pliocene basalt (Wills, 1990

	#5128). In this same area, the fault lacks ephemeral geomorphic features indicative of Holocene normal offset, such as sharp scarplets and vertically offset stream channels. In the Dead Tree Swale area north of Lake Almanor, the fault is delineated by well-defined scarps and troughs indicative of late Pleistocene and possible Holocene offset (Kelson and others, 1995 #5125).
Age of faulted surficial deposits	The Almanor fault offsets Pliocene basalt and late Quaternary alluvial and glacial deposits (Lydon and others, 1960 #5127). Kelson and others (1995 #5125) identified three age groups of offset glacial deposits. The Last Chance Springs deposits are thought to be 130-190 ka based on relative age dating and are offset 110?10 m vertically and 90?90 m sinistrally. The Black Cinder Rock glacial deposits are estimated to be Tahoe-age equivalent (58-75 ka) based on soil profile development and surface morphology; they are offset 71?10m vertically and greater than 45?10m sinistrally. The youngest glacial deposits, the East Benner Creek, offset 23?5 m vertically and 34?7 m sinistrally, are estimated to be Tioga-age equivalent (15-28 ka).
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Kelson and others (1995 #5125; 1996 #5126) reported that Tioga-age equivalent lateral moraines (15-28 ka) are offset sinistrally and vertically along traces of the Almanor fault.
Recurrence interval	
Slip-rate category	Between 1.0 and 5.0 mm/yr *Comments:* Kelson and others (1995 #5125; 1996 #5126) calculated a post latest Pleistocene to early Holocene minimum net slip rate (sinistral-normal) of 1.1-3.3 mm/yr on the basis of 41?9m net offset of the 15-28 ka East Benner Creek lateral moraines. A late Pleistocene net (minimum) slip rate of as much as 1.4 mm/yr was estimated based on offset of a pre-Tahoe age lateral moraine.
Date and Compiler(s)	2000 William A. Bryant, California Geological Survey
References	#5124 Diller, J.S., 1895, Description of the Lassen Peak sheet,

	California: U.S. Geological Survey Geologic Atlas Folio GF-15, 4 p. #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. #5125 Kelson, K.I., Hitchcock, C.S., Zeeb, R.B., and Lettis, W.R., 1995, Appendix 2-6—Displacement of late Pleistocene glacial moraines by the Almanor fault, Plumas County, California, *in* Page, W., ed., Quaternary geology along the boundary between the Modoc Plateau, southern Cascade Mountains, and northern Sierra Nevada: Friends of the Pleistocene, 1995 Pacific Cell Field Trip. #5126 Kelson, K.I., Page, W.D., Unruh, J.R., and Lettis, W.R., 1996, Displacement of late Pleistocene glacial deposits by the Almanor fault near Lassen Peak, Northeastern California: Geological Society of America Abstracts with Programs, v. 28, no. 5, p. 80. #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. #5128 Wills, C.W., 1990, Faults in the Lake Almanor area, Plumas and Lassen Counties, California: California Division of Mines and Geology Fault Evaluation Report FER-212.