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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.

Round Valley fault (Class A) No. 45

Last Review Date: 1995-10-01

citation for this record: **Sawyer, T.L., compiler, 1995, Fault number 45, Round Valley 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 03:10 PM.**

Synopsis	The Round Valley fault, a high-angle, down-to-east normal fault along the prominent eastern front of central Sierra Nevada, is in one of the most seismically active region along the eastern front of the Sierra Nevadas. No detailed studies involving trenching have been conducted along the Round Valley fault; reconnaissance studies provide much of available data on fault activity.
Name comments	Round Valley was first mapped in part by Chelikowsky (1940 #5590). Rinehart and Ross (1957 #5591) mapped and named the high east-facing escarpment the Wheeler Crest scarp. Later, Clark and others (1984 #2876) proposed the name Round Valley fault and Bryant (1984 #5588) suggested using the name Round Valley fault for the recently active normal faults along the base of the escarpment in order to distinguish this zone from a north-trending, down-to-the-west bedrock fault (Wheeler Crest scarp) east of the Wheeler Crest summit.

	Fault ID: Refers to number 207 (Round Valley fault) of Jennings (1994 #2878) and fault number MA8 (Round Valley fault) of dePolo (1998 #2845).
County(s) and State(s)	INYO COUNTY, CALIFORNIA MONO COUNTY, CALIFORNIA
Physiographic province(s)	CASCADE-SIERRA MOUNTAINS
Reliability of location	Good Compiled at 1:62,500 scale. *Comments:* Location based on digital revisions to Jennings (1994 #2878) using original mapping by Bateman (1965 #5587) and Bryant (1984 #5588; 1984 #5589) at 1:62,500 scale.
Geologic setting	This high-angle, down-to-east normal fault is along the prominent eastern front of central Sierra Nevada, which represents one of the most seismically active regions along the Sierra Nevada front. Displacement along the fault diminishes to the south in the vicinity of the Coyote Warp (Bateman, 1965 #5587).
Length (km)	36 km.
Average strike	N19°W
Sense of movement	Normal *Comments:* Constructional micro-fan topography (for example, debris-flow levees) can be matched across the fault and clearly show normal offset (Bryant, 1984 #5588; 1984 #5589).
Dip	45°-89°E *Comments:* Slickensides on bedrock fault planes have near-vertical groves and dip 85?-89?E; joints in granitic bedrock inferred to be oriented parallel to fault dip 45?-70?E (Bateman, 1965 #5587; Bryant, 1984 #5588; 1984 #5589).
Paleoseismology studies	
Geomorphic expression	The Round Valley fault forms "one of the most precipitous escarpments along the east face of the Sierra Nevada" (Bryant,

	1984 #5588;, 1984 #5589). It is roughly 1,750-2,100 m high (Bateman, 1965 #5587). Well defined scarps, vertically offset or beheaded drainages, ponded alluvium, and linear troughs are abundant along most of the faults trace (Bryant, 1984 #5588; 1984 #5589).
Age of faulted surficial deposits	Holocene alluvium and talus, late Pleistocene (late Tioga-stage, Tahoe-stage) moraine deposits (Bateman, 1965 #5587). Bryant (1984 #5588; 1984 #5589) concluded that alluvial-fan deposits as young as a few thousand years old are faulted from the faults well defined surface morphology.
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Bryant (1984 #5588; 1984 #5589) concluded that the most recent paleoevent occurred on about a few thousand years ago, based on offset alluvial deposits that have well defined constructional surfaces that lack dissection.
Recurrence interval	
Slip-rate category	Between 1.0 and 5.0 mm/yr *Comments:* 5 mm/yr Comments: Clark and others (1984 #2876) calculated a preferred vertical slip rate of 1 mm/yr (0.7-1.4 mm/yr) based on Tioga moraines (13-20 ka) that are offset 13-18 m near Pine Creek. Bateman (1965 #5587) estimated that the Bishop tuff (0.76 Ma) is down-warped as much as 300 m across the fault, suggesting a long-term vertical slip rate of 0.4 mm/yr across the fault zone.
Date and Compiler(s)	1995 Thomas L. Sawyer, Piedmont Geosciences, Inc.
References	#5587 Bateman, P.C., 1965, Geology and tungsten mineralization of the Bishop district, California: U.S. Geological Survey Professional Paper 470, 208 p., scale 1:62,500. #5588 Bryant, W.A., 1984, Round Valley fault, Inyo and Mono Counties, California: California Division of Mines and Geology Fault Evaluation Report FER-158, microfiche copy in Division of Mines and Geology Open-File Report 90-14, 8 p., scale 1:62,500.

#5589 Bryant, W.A., 1984, Evidence of recent faulting along the Owens Valley, Round Valley, and White Mountains fault zones, Inyo and Mono Counties, California: California Division of Mines and Geology Open-File Report 84-54SAC, 4 p.

#5590 Chelikowsky, J.R., 1940, Tectonics of the rhyolite in the Mammoth embayment, California: Journal of Geology, v. 48, no. 4, p. 421-435.

#2876 Clark, M.M., Harms, K.H., Lienkaemper, J.J., Harwood, D.S., Lajoie, K.R., Matti, J.C., Perkins, J.A., Rymer, M.J., Sarna-Wojcicki, A.M., Sharp, R.V., Sims, J.D., Tinsley, J.C., III, and Ziony, J.I., 1984, Preliminary slip rate table and map of late Quaternary faults of California: U.S. Geological Survey Open-File Report 84-106, 12 p., 5 plates, scale 1:1,000,000.

#2845 dePolo, C.M., 1998, A reconnaissance technique for estimating the slip rate of normal-slip faults in the Great Basin, and application to faults in Nevada, U.S.A.: Reno, University of Nevada, unpublished Ph.D. dissertation, 199 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.

#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.

#5591 Rinehart, C.D., and Ross, D.C., 1957, Geologic map of the Casa Diablo Mountain quadrangle, California: U.S. Geological Survey Geologic quadrangle Map GQ-99, scale 1:62,500.

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