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Quaternary Fault and Fold Database of the United States

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Dry Hills faults (Class A) No. 1153

Last Review Date: 2006-06-01

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Synopsis	The Dry Hills faults extends northeast from Hot Springs Point at the southwestern Dry Hills where it is a single trace. About 5 km north, it bifurcates into a trace that follows the northwest margin of the Dry Hills and other traces that project into the piedmont and extend northeast to within 2 km of the Humboldt River. The faults bound a block of Tertiary and older bedrock that is uplifted and tilted southeast in the center of the northern part of Crescent Valley. On the basis of reconnaissance photogeologic studies, some of the NE-trending scarps appear to be formed of surficial deposits and (or) erosion surfaces of middle to early Pleistocene (0.13–1.6 Ma) and (or) Pleistocene (0.10–1.6 Ma) age.
Name comments	Name adapted from dePolo (1998 #2845), who applied it to a NE-striking fault that bounds the Dry Hills on the northwest. Wallace (1979 #203) referred to the feature as the Dry Hills scarps. The fault extends northeast from Hot Springs Point at the

	southwestern Dry Hills where it is a single trace. About 5 km north, it bifurcates into a trace that follows the northwest margin of the Dry Hills and other traces that project into the piedmont and extend northeast to within 2 km of the Humboldt River. **Fault ID:** Referred to as fault WI20 by dePolo (1998 #2845).
County(s) and State(s)	EUREKA COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* The fault locations are taken from the 1:125,000-scale map of young fault scarps by Wallace (1979 #203). That map was compiled mostly from field and photogeologic study of 1:60,000-scale aerial photos.
Geologic setting	The Dry Hills faults bound a block of Tertiary and older bedrock that is uplifted and tilted southeast in the central part of northern Crescent Valley. Mapping by Wallace (1979 #203) show four traces arranged in a crudely left-stepping en-echelon pattern. The south trace is convex to the NW and is mapped by Dohrenwend and Moring (1991 #282) as a discontinuous major, range-front fault that bounds a tectonically active block. Wallace (1979 #203) mapped discontinuous young scarps along this same trace. The three northern traces do not follow major bedrock escarpments, but their footwalls have bedrock surrounded by Quaternary and Tertiary basin-fill deposits.
Length (km)	22 km.
Average strike	N51°E
Sense of movement	Normal
Dip Direction	NW
Paleoseismology studies	Site 1153-1 Dry Hills trench north (Wesnousky and others, 2006 #7559) extends across a 0.2- to 0.3-m-high scarp on young alluvium; on the basis of radiocarbon dating, coseismic surface rupture occurred about 5280±87 cal yr BP.

	Site 1153-2 Dry Hills trench south (Wesnousky and others, 2006 #7559) extends across a 2-m-high fault scarp on older alluvium. Evidence for two coseismic ruptures, the youngest surface rupture occurred about 5.8±1.2 ka to 9.9±1.1 ka resulting in about 0.3 m of vertical offset. The penultimate event occurred about 14.0±1.5 ka to 18.1±1.8 ka resulting in about 1.2 m of vertical offset. An earlier event may have occurred around 28 ka.
Geomorphic expression	Dohrenwend and Moring (1991 #282) mapped the southern trace as a major range front fault characterized by an abrupt piedmont-hillslope transition, steep bedrock slopes, faceted spurs, and fault juxtaposition of Quaternary alluvium against bedrock. dePolo (1998 #2845) reported a maximum preferred basal fault facet height of 73 m (61–85 m). Wallace (1979 #203) mapped discontinuous scarps along that same trace, but did not distinguish whether they are formed on bedrock or alluvium. At 1:24 ,000 scale, the line formed by the abrupt piedmont/hillslope transition has an irregular trace, suggesting either an irregular fault shape or steep bedrock slopes that are erosionally receded to differing distances from the fault. Dohrenwend and Morning (1991 #282) mapped the remaining traces as discontinuous northeast-facing scarps on Quaternary surficial deposits or erosion surfaces.
Age of faulted surficial deposits	On the basis of reconnaissance photogeologic study, Dohrenwend and Moring (1991 #282) map some of the NE-trending scarps as formed of surficial deposits and (or) erosion surfaces of Pleistocene (0.01–1.5 ma) age.
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Wesnousky and others (2006 #7559) document evidence for one Holocene event that has a similar age as the most recent event on the Cortez fault [1157] and at least one additional late Quaternary coseismic surface rupture. Wallace (1979 #203), on the basis of photogeologic and field study, estimated that the most recent surface faulting event is >12 ka and <500 ka. Dohrenwend and Moring (1991 #282) suggest the most recent event could be as old as early Pleistocene.
Recurrence interval	

	Comments: A period of about 10 k.y. separates the two earthquakes recognized in Dry Hills trench south (Wesnousky and others, 2006 #7559).
Slip-rate category	Less than 0.2 mm/yr *Comments:* dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.171 mm/yr based on an empirical relationship between his preferred maximum basal facet height and vertical slip rate. The size of the facets (tens to hundreds of meters, as measured from topographic maps) indicates they are the result of many seismic cycles, and thus the derived slip rate reflects a long-term average. The late Quaternary characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) suggest the slip rate during this period is low. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.
Date and Compiler(s)	2006 R. Ernest Anderson, U.S. Geological Survey, Emeritus Kathleen M. Haller, U.S. Geological Survey
References	#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. #282 Dohrenwend, J.C., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Winnemucca 1° by 2° quadrangle, Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-2175, 1 sheet, scale 1:250,000. #203 Wallace, R.E., 1979, Map of young fault scarps related to earthquakes in north-central Nevada: U.S. Geological Survey Open-File Report 79-1554, 2 sheet, scale 1:125,000. #7559 Wesnousky, S.G., Barron, A.D., Briggs, R.W., Caskey, S.J., Kumar, Senthil, and Owen, L., 2005, Paleoseismic transect across the northern Great Basin: Journal of Geophysical Research, v. 110, B05408, 25 p.

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