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Quaternary Fault and Fold Database of the United States

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Crescent Valley faults (Class A) No. 1156

Last Review Date: 2000-06-01

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Synopsis	The Crescent Valley faults are mid-basin structures consisting of a singular north-northwest-trending scarp and a group of northeast-trending scarps in Crescent Valley, south of the Dry Hills and northwest of the Cortez Mountains. Their tectonic relationship to nearby range-bounding faults is not known. The Crescent Valley faults are inferred to have normal slip, and the northeast -striking faults appear to terminate against the north-northwest -striking fault, which may accommodate for extensional displacement on the northeast faults. They have a mean offset of 1.65 m as determined from 13 topographic profiles across the scarps: the offset is close to the average height of the scarps. A mean apparent age of 7.6 ka was estimated for the scarp-forming event based on 11 topographic profiles of scarps 1 m or more high. Neither the recurrence interval nor the slip rate is reported. These mid-valley scarps are not associated with deflections of topographic contours at 1:24,000 scale, and thus have subdued

	geomorphic expression and are either new faults, are entirely within young material, or have a low long-term slip rate.
Name comments	Name modified from Wallace (1979 #203) who gave the name Crescent Valley scarps to a singular north-northwest-trending scarp and a group of northeast-trending scarps in Crescent Valley, south of the Dry Hills and northwest of the Cortez Mountains. **Fault ID:** Referred to as fault WI21 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 Crescent Valley faults are located in the basin of Crescent Valley between the Dry Hills on the north and the generally southeast-tilted Cortez Mountains block on the southeast. The tectonic relationship between these mid-basin faults and nearby range-bounding faults is not known. The NE-striking, NW-facing scarps are approximately parallel to the nearby Cortez Mountains fault [1157] and the NNW -striking W-facing scarp is approximately parallel to the northern section of the Simpson Park Mountains fault zone [1178a]. Three structural alternatives are considered herein. First, the plan-view angle formed by these scarps may reflect a buried structural intersection similar to that formed by the Simpson Park Mountains and Cortez Mountains faults. Second, the NE-striking faults terminate against the NNW-striking fault, which accommodates extensional displacement on them. Third, a fault marked by the NNW-striking scarp continues NNW to intersect with the Dry Hills fault [1153], forming a subsurface structural intersection similar to that formed by the Cortez Mountains [1157] and Simpson Park Mountains [1178] faults. Arguing against such an intersection is the mapping of Wallace (1979 #203), which suggests that the Crescent Valley faults have been active in the past 12 k.y. but the Dry Hills faults

	[1153] have not.
Length (km)	15 km.
Average strike	N22°E
Sense of movement	Normal *Comments:* No specific data available; sense inferred from location and orientation in extensional tectonic province. It is perhaps unlikely that the NE- and NNW-striking faults both have perfectly normal movement (unless they are vertical or nearly so).
Dip Direction	W; NW *Comments:* If both the NNW- and NE-striking faults are normal, the dip would probably be vertical or nearly so.
Paleoseismology studies	
Geomorphic expression	The NNW-trending scarp faces west and the NE-trending scarps face northwest. These mid-valley scarps are not associated with deflections of topographic contours at 1:24,000 scale, and thus have subdued geomorphic expression. On the basis of 13 topographic profiles across the scarps, Pearthree (1989 #238) reported a mean offset of 1.65 m, which may be close to the average height of the scarps. dePolo (1998 #2845) indicates that there are scarps on alluvium but no basal fault facets.
Age of faulted surficial deposits	Dohrenwend and Moring (1991 #282) suggested, on the basis of reconnaissance photogeologic mapping of young faults at 1:250,000 scale, that Holocene deposits or erosion surfaces are offset by both the NNW- and NE-striking faults. This is consistent with Pearthree's (1989 #238) preferred estimate of about 7.6 ka for the last surface-faulting event on the Crescent Valley faults.
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Dohrenwend and Moring (1991 #282) estimated that Holocene (0-10 ka) deposits or erosion surfaces are offset at the scarps. Wallace (1979 #203) suggested that the most recent paleoevent is <12 k.y. Pearthree (1989 #238), on the basis of 11

	topographic profiles of scarps 1 m or more high, estimated a mean apparent age of 7.6 ka for the last scarp-forming event (after applying a correction factor based on abundant shoreline data).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* No detailed data exists to determine slip rates for this fault. dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.01 mm/yr for the fault based on the presence of scarps on alluvium and the absence of basal facets. If the inferred normal sense is valid, the long-term slip rate must be low because the faults have little topographic expression and or they are only expressed as single event features on young (latest Pleistocene and Holocene) landscape. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.
Date and Compiler(s)	2000 R. Ernest Anderson, U.S. Geological Survey, Emeritus
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. #238 Pearthree, P.A., Demsey, K.A., Bull, W.B., and Slaff, S., 1989, Detailed geomorphic studies of late Quaternary faulting in central Nevada: Technical report to U.S. Geological Survey, Earthquake Hazards Reduction Program, under Contract 14-0001-08-G1360, December 1989, 17 p. #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.