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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.

Southeast Sheep Creek Range fault (Class A) No. 1150

Last Review Date: 2000-06-27

citation for this record: **Anderson, R.E., compiler, 2000, Fault number 1150, Southeast Sheep Creek Range 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 02:18 PM.**

Synopsis	The Sheep Creek Range is a south-pointing plateau-like prominence composed mainly of relatively flat-lying Tertiary volcanic rock. The main trace of the Sheep Creek Range southeast fault is a major, down-to-the southeast range-front structure that separates this prominence from the basin beneath Boulder Valley. Other subparallel faults juxtapose Quaternary alluvium against bedrock, but are not major range-margin structures. The main trace of the southeast Sheep Creek Range fault follows the base of a relatively continuous steep bedrock escarpment and places Quaternary alluvium against bedrock. In a few places, this trace is interrupted by short (1 km) southeast-facing scarps on Quaternary surficial deposits or erosion surfaces. There are no reports on the geomorphic expression of these scarps. Faulted surficial deposits or erosion surfaces are estimated to range from late Pleistocene (10–130 ka) to middle or early

	Pleistocene (0.13–1.6 Ma) age. Thus, the last surface faulting event may be late Quaternary (<130 ka).
Name comments	Name from dePolo (1998 #2845) who applied it to a fault along the southeast margin of the Sheep Creek Range. The fault extends from within 2 km of the north margin of the Winnemucca sheet (41° N.) southwest along the precipitous southeastern base of the Sheep Creek Range to about 5 km southwest of Whitehouse Spring. **Fault ID:** Referred to as fault WI15 by dePolo (1998 #2845).
County(s) and State(s)	EUREKA COUNTY, NEVADA LANDER COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Trace taken from Dohrenwend and Moring (1991 #282) who compiled it at scale 1:250,000 based on photogeologic study of 1:58,000-nominal-scale color-infrared photography transferred directly to 1:100,000-scale topographic quadrangle maps enlarged to scale of the photographs. Only part of the fault (about 12 km) is shown on a 1:125,000-scale map of young fault scarps by Wallace (1979 #203). Location of the southern end of the fault is from House and others (2001 #5674) and Ramelli and others (2001 #5676).
Geologic setting	The Sheep Creek Range is a south-pointing plateau-like prominence composed mainly of relatively flat-lying Tertiary volcanic rock. The main trace of the Sheep Creek Range southeast fault separates this prominence from the basin beneath Boulder Valley southeast of the range. Dohrenwend and Moring (1991 #282) mapped most of the fault as a major normal-slip, range-front structure characterized by juxtaposition of Quaternary alluvium against bedrock. Off the main trace, especially in an area of low hills north of Boulder Valley and in the southern Sheep Creek Range west of White House Spring, they also mapped faults that juxtapose Quaternary alluvium against bedrock, but which are not major range-margin structures. Also, they mapped a group of scarps and (or) lineaments on Tertiary volcanic or sedimentary rock within the southeastern margin of the Sheep

	Creek Range. These latter faults are considered to be Class C features and not included in the present compilation.
Length (km)	46 km.
Average strike	N°42E
Sense of movement	Normal *Comments:* The Sheep Creek Range southeast fault is one of many northeast-striking normal faults in north-central Nevada (Wallace, 1978 #2648, Stewart, 1978 #3413). The predominant strikes of Quaternary normal faults in the region from N. 12° E. to N. 28° E. (Dohrenwend and Moring, 1991 #282).
Dip Direction	E *Comments:* The fault probably dips steep based on the shallow dip of strata that form the Sheep Creek Range.
Paleoseismology studies	
Geomorphic expression	The southeastern margin of the Sheep Creek Range is a relatively continuous escarpment interrupted by sparse transverse drainages, the largest of which is Rock Creek that drains the southern part of the range. The main trace of the Sheep Creek Range southeast fault follows the base of the escarpment and, according to the photogeologic mapping of Dohrenwend and Moring (1991 #282), is marked in a few places by short (1 km) southeast-facing scarps on Quaternary surficial deposits or erosion surfaces. Wallace (1979 #203) mapped a relatively continuous scarp along 12 km of the fault, but there are no reports on the geomorphic expression of these scarps. dePolo (1998 #2845) reported a preferred maximum basal facet height of 213 m (201–226 m) for fault, but did not report the location of this facet.
Age of faulted surficial deposits	Based on reconnaissance photogeologic mapping by Dohrenwend and Moring (1991 #282), Quaternary surficial deposits or erosion surfaces on which short (about 1-km-long) scarps are formed are estimated to range in age from late Pleistocene (10–130 ka) to middle or early Pleistocene (0.13–1.6 Ma). More recent mapping by Ramelli and others (2001 #5676) shows that one Holocene alluvial fan is faulted. The rest of their mapping is in agreement with ages suggested by Dohrenwend and Moring (1991 #282).

	Thus, the age assigned here is based on the youngest multiple locations that suggest late Quaternary time for surface faulting.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Based on the estimate from reconnaissance photogeologic studies by Dohrenwend and Moring (1991 #282) the scarps are formed on late Pleistocene deposits or surfaces. Wallace (1979 #203) maps a short (about 12-km-long) part of the main range-margin fault as marked by a young scarp that may have formed in the past 500 k.y. However, there is some indication from geologic mapping of the southern part of the fault that shows one faulted Holocene fan (Ramelli and others, 2001 #5676).
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 0.403 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. However, 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 of a lesser magnitude. Most importantly, evidence of multiple latest Quaternary rupture is equivocal. 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. #5674 House, P.K., Ramelli, A.R., Wrucke, C.T., and John, D.A., 2001, Geologic map of the Argenta quadrangle, Lander County, Nevada: Nevada Bureau of Mines and Geology Open-File Report 2000-7, 1 sheet, scale 1:24,000. #5676 Ramelli, A.R., House, P.K., Wrucke, C.T., and John, D.A., 2001, Geologic map of the Stony Point quadrangle, Lander County, Nevada: Nevada Bureau of Mines and Geology Map 131, 1 sheet, scale 1:24,000. #3413 Stewart, J.H., and Carlson, J.E., 1978, Geologic map of Nevada: U.S. Geological Survey, Special Geologic Map, 1, scale 1:500,000. #2648 Wallace, R.E., 1978, Geometry and rates of change of fault-generated range fronts, north-central Nevada: Journal of Research of the U.S. Geological Survey, v. 6, no. 5, p. 637-649. #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.