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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.

Schell Creek Range fault (Class A) No. 1241

Last Review Date: 2011-10-27

citation for this record: Redsteer, M.H., and Haller, K.M., compilers, 2011, Fault number 1241, Schell 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 02:16 PM.

Synopsis	The fault system is primarily composed of a long, curving, linear series of down-to-the-east faults that offset surficial geologic units and juxtapose bedrock against Quaternary sediment along the eastern margin of the Schell Creek Range. South of Bald Mountain the fault curves to the southwest and forms a series of intrabasin fault splays [1265] that extend onto the floor of Spring Valley. Similarly, north of Munco Creek the fault curves to the northeast and splays out into a broad 5- to 6-km-wide zone of scarps that extends northward into the valley. Presence of younger faulted deposits along the south half of the fault, particularly the south end, suggest that the fault may have ruptured separately in the most recent earthquakes. Preliminary results of cosmogenic dating of faulted Quaternary deposits may give data on fault slip rates along the central part of the fault system.
Name	Refers to part of the Schell Creek Range fault system of dePolo

comments	(1998 #2845), also mapped by Dohrenwend and others (1992 #2480). This long fault extends along the eastern range front of the Schell Creek Range, from the base of Becky Peak south across the entire Ely quadrangle and along the base of Black Mountain to Cooper Canyon. Also includes a 2-km-long fault at the north end of the Schell Creek Range that trends northwest from the headwaters of Sampson Creek to the edge of the Ely 1:250,000-scale map. **Fault ID:** Refers to fault EY11 of dePolo (1998 #2845).
County(s) and State(s)	WHITE PINE COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Location based on 1:250,000-scale map of Dohrenwend and others (1992 #2480). Mapping based on photogeologic analysis of primarily 1:24,000-scale color aerial photography supplemented with 1:60,000-scale black-and-white aerial photography transferred to 1:62,500-scale topographic maps and photographically reduced and transferred to 1:250,000-scale topographic maps. Subsequent mapping by photogeologic analysis 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.
Geologic setting	The Schell Creek Range fault is typical of Basin and Range extensional faulting resulting in 1.3–1.6 km of topographic relief (Koehler and Wesnousky, 2011 #7175). The fault is a major down-to-the east range fault on the eastern margin of the Schell Creek Range and defines the western margin of the Spring Valley.
Length (km)	99 km.
Average strike	N3°E
Sense of movement	Normal *Comments:* Dohrenwend and others (1992 #2480).
Dip Direction	E

Paleoseismology studies	Site 1241-1 A culturally induced exposure along the south margin of a creek in the central part of the range shows evidence of several faulting events along the main range front fault, and a localized graben at Piermont Creek. Mapping of the exposure by Anke Friedrich (written commun., 2001) shows offset on the main fault and an adjacent graben; Koehler and Wesnousky (2011 #7571) published a log of the exposure. The exposure provides evidende for a minimum of two surface ruptures. Scarps up to 4–5 m high are on old Quaternary fans Site 1241-2 consists of two trenches across the Cleve Creek fault scarps, with combined vertical separation of 1.75 m (Koehler and Wesnousky, 2011 #7571). The exposures and proximal geologic relations suggest evidence of one coseismic surface rupture that occurred after the desiccation of pluvial Lake Spring.
Geomorphic expression	Fault scarps coincide with an abrupt change in elevation and juxtapose bedrock against Quaternary alluvium, forming a prominent range front fault and defining the eastern margin of the Schell Creek Range. dePolo (1998 #2845) did not report any values for maximum basal facet height along this seemingly active fault system. A series of intrabasin splays that extend onto the floor of Spring Valley at the south end of the fault system form valley and mountainward scarps that appear to be relatively fresh and may offset lacustrine shoreline features (M. Machette, oral commun., 2001), suggesting late Quaternary displacement. Koehler and Wesnousky (2011 #7175) provide a more detailed description of evidence for coseismic surface rupture. S\carps on old alluvial fans have scarps 12–14 m high
Age of faulted surficial deposits	Alluvium and alluvial-fan deposits of late Quaternary age at the south end of the fault and early to middle and (or) late Pleistocene age along the entire fault (Dohrenwend and others, 1992 #2480).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* The Cleave Creek study site suggests the most recent coseismic surface rupture occurred since 15 ka (Koehler and Wesnousky, 2011 #7175). Dohrenwend and others (1992 #2480) estimate the age of faulting as late Quaternary. Preliminary interpretations by Anke Friedrich (written commun., 2001) suggest similar timing.

Recurrence interval	*Comments:* Koehler and Wesnousky (2011 #7175) suggest the most recent Quaternary coseismic surface deformation include 2–3 late Pleistocene events: The most recent two events post pluvial (since 15 ka) and the estimated age based on diffusion modeling of the scarps at Piermont Creek suggests the youngest earthquake in that exposure occurred 30–35 ka.
Slip-rate category	Less than 0.2 mm/yr *Comments:* Koehler and Wesnousky (2011 #7175) estimate vertical-separation data for 20-k.y. and 60-k.y. timeframes that suggest low rates of vertical deformation. dePolo (1998 #2845) assigned a reconnaissance vertical displacement rate of 0.010 mm/yr for the fault based on the presence of scarps on alluvium and the absence of basal facets. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.
Date and Compiler(s)	2011 Margaret Hisa Redsteer, U.S. Geological Survey 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. #2480 Dohrenwend, J.C., Schell, B.A., and Moring, B.C., 1992, Reconnaissance photogeologic map of young faults in the Ely 1° by 2° quadrangle, Nevada and Utah: U.S. Geological Survey Miscellaneous Field Studies Map MF-2181, 1 sheet, scale 1:250,000. #7175 Koehler, R.D., and Wesnousky, S.G., 2011, Late Pleistocene regional extension rate derived from earthquake geology of late Quaternary faults across the Great Basin, Nevada, between 38.5 degrees N and 40 degrees N latitude: Geological Society of America Bulletin, v. 123, no. 3-4, p. 631–650, doi:10.1130/B30111.1. #7773 Koehler, R.D., III, 2009, Late Pleistocene regional extension rate derived from earthquake geology of late Quaternary faults across Great Basin, Nevada between 38.5° and 40° N. latitude: Reno, University of Nevada, unpublished Ph.D.

	dissertation, 119 p.