Jump to Navigation

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.

Sheeprock fault zone (Class A) No. 2405

Last Review Date: 1999-10-01

Compiled in cooperation with the Utah Geological Survey

citation for this record: **Black, B.D., and Hecker, S., compilers, 1999, Fault number 2405, Sheeprock fault zone, 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 02:55 PM.**

Synopsis	Poorly understood zone of late Quaternary range-front faults and scarps on the eastern sides of the Sheeprock Mountains and Red Pine Mountain. The southern half of the fault zone is a single, continuous, northwest-trending fault trace paralleling the range front, whereas the northern half trend is a north-northeast trending zone of en-echelon faults accompanied by antithetic faulting. Scarp morphology suggests multiple events and an average scarpage of about 53 ka . In contrast, scarp morphology also suggests a possible Holocene age for the latest faulting event. The embayed character of the range fronts suggest a long period of inactivity preceding the recent episode of faulting.

Name comments	**Fault ID:** Refers to fault number 7-1 of Hecker (1993 #642).
County(s) and State(s)	TOOELE COUNTY, UTAH
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Mapped or discussed by Everitt and Kaliser (1980 #4524), Hanks and others (1984 #337), and Barnhard and Dodge (1988 #429). Fault traces from 1:250,000-scale mapping of Barnhard and Dodge (1988 #429).
Geologic setting	Zone of Basin and Range normal faults on the northeastern side of the Sheeprock Mountains. The Sheeprock Mountains show a complex internal structure in mostly Precambrian crystalline and Paleozoic sedimentary rocks and some Tertiary volcanic rocks. Valley-fill deposits to east are mainly lake sediments and alluvium.
Length (km)	12 km.
Average strike	N24°W
Sense of movement	Normal
Dip Direction	E; NE
Paleoseismology studies	
Geomorphic expression	Range-front scarps along the eastern side of the Sheeprock Mountains and Red Pine Mountain. The southern half of the fault zone is a single, continuous, northwest-trending fault trace paralleling the range front. At East Government Creek, the fault zone and range front change trend to the north-northeast, and the fault zone changes from a single trace without antithetic faulting to an en-echelon fault zone accompanied by antithetic faulting.
Age of faulted surficial deposits	Late Pleistocene(?).

Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Diffusion-equation modeling of the scarps, which probably represent multiple events (cumulative displacement <11.5 m), yielded an age of about 53 ka (Hanks and others, 1984 #337). In contrast, Everitt and Kaliser (1980 #4524) concluded that scarp morphology suggests a possible Holocene age for the latest faulting event. The embayed character of the range front suggests a long period of inactivity preceding the recent episode of faulting (Everitt and Kaliser, 1980 #4524).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* The relatively low scarp height in deposits probably much older than the scarp age, as determined by diffusion modeling, indicate a slip rate much less than 0.2 mm/yr.
Date and Compiler(s)	1999 Bill D. Black, Utah Geological Survey Suzanne Hecker, U.S. Geological Survey
References	#429 Barnhard, T.P., and Dodge, R.L., 1988, Map of fault scarps formed on unconsolidated sediments, Tooele 1° x 2° quadrangle, northwestern Utah: U.S. Geological Survey Miscellaneous Field Studies Map MF-1990, 1 sheet, scale 1:250,000. #4524 Everitt, B.L., and B.N., K., 1980, Geology for assessment of seismic risk in the Tooele and Rush Valleys, Tooele County, Utah: Utah Geological and Mineral Survey Special Studies 51, 33 p. #337 Hanks, T.C., Bucknam, R.C., Lajoie, K.R., and Wallace, R.E., 1984, Modification of wave-cut and faulting-controlled landforms: Journal of Geophysical Research, v. 89, no. B7, p. 5771-5790. #642 Hecker, S., 1993, Quaternary tectonics of Utah with emphasis on earthquake-hazard characterization: Utah Geological Survey Bulletin 127, 157 p., 6 pls., scale 1:500,000.