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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.

James Peak fault (Class A) No. 2378

Last Review Date: 1999-10-01

Compiled in cooperation with the Utah Geological Survey

citation for this record: **Black, B.D., McDonald, G.N., and Hecker, S., compilers, 1999, Fault number 2378, James Peak 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 02:58 PM.**

Synopsis	Late Pleistocene normal fault at the south end of the southern section of the East Cache fault zone [2352c]. Surface faulting on the James Peak fault and southern ECFZ section may have extended onto each other.
Name comments	**Fault ID:** Refers to fault number 11-12 of Hecker (1993 #642).
County(s) and State(s)	CACHE COUNTY, UTAH
Physiographic province(s)	MIDDLE ROCKY MOUNTAINS

Reliability of location	Good Compiled at 1:125,000 scale. *Comments:* Mapped or discussed by Sullivan and others (1988 #4508) and Nelson and Sullivan (1992 #617). Fault traces from Sullivan and others (1988 #4508).
Geologic setting	Northeast-trending range-front normal fault along the northern flank of James Peak at the south end of Cache Valley. Cache Valley is a north-trending intermontane graben (bounded by high-angle normal faults on the east and west) between the Bear River and Wasatch Ranges.
Length (km)	6 km.
Average strike	N°63E
Sense of movement	Normal
Dip Direction	N; NW
Paleoseismology studies	Site 2378-1. Sullivan and others (1988 #4508) excavated a trench about 2.5 km north-northwest of James Peak across a 7-m-high scarp on a glacial outwash fan. Stratigraphic relations and soil development provide ambiguous evidence for two surface-faulting events since about 110 ka.
Geomorphic expression	Faults are present in Bull Lake outwash deposits (~140 ka). The data are ambiguous, but lithofacies analysis of fault colluvium and the cumulative displacement (4.2 m) suggests two events rather than a single, large event. Assuming two events, displacement per event is 1.8 to 2.4 m. The short fault length (7 km) suggests that surface faulting may have extended northward, rupturing the southern ECFZ section. Faceted spurs at the base of James Peak suggest recurrent Quaternary displacements, though the spurs are smaller, less continuous, and less steep than those along the ECFZ and Wasatch fault zone.
Age of faulted surficial deposits	Bull Lake outwash deposits (~140 ka) are offset (Sullivan and others, 1988 #4508).
Historic earthquake	

Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Analyses of soil development in deposits which pre- and post-date faulting bracket the timing of movement between 30 ka and 110 ka (Sullivan and others, 1988 #4508). If faulting on the southern East Cache fault [2352c] extends onto the James Peak fault, then a time of 26-46 ka for most recent faulting applies as well to the James Peak fault.
Recurrence interval	>50 k.y. (?) *Comments:* The lack of a soil between the two colluvial wedges suggests that time between events was short and, therefore, that recurrence intervals may be nonuniform. The two colluvial wedges could also represent separate events on the ECFZ [2352c] and James Peak fault [2378] that propagated onto the adjacent fault.
Slip-rate category	Less than 0.2 mm/yr *Comments:* 0.03 mm/yr for the past 140 k.y. (Sullivan and others, 1988 #4508).
Date and Compiler(s)	1999 Bill D. Black, Utah Geological Survey Greg N. McDonald, Utah Geological Survey Suzanne Hecker, U.S. Geological Survey
References	#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. #617 Nelson, A.R., and Sullivan, J.T., 1992, Late Quaternary history of the James Peak fault, southernmost Cache Valley, north-central Utah, *in* Gori, P.L., and Hays, W.W., eds., Assessment of regional earthquake hazards and risk along the Wasatch front, Utah: U.S. Geological Survey Professional Paper 1500, p. J1-J13. #4508 Sullivan, J.T., Nelson, A.R., LaForge, R.C., Wood, C.K., and Hansen, R.A., 1988, Central Utah regional seismotectonic study for USBR dams in the Wasatch Mountains: Bureau of Reclamation Seismotectonic Report 88-5, 269 p.

Questions or comments?