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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.

Beaver Basin faults, eastern margin faults (Class A) No. 2492a

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 2492a, Beaver Basin faults, eastern margin faults, 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 02:54 PM.**

Synopsis	**General:** Well mapped and moderately well understood late Pleistocene to early Holocene faults form a complex zone of generally north-trending faulting and deformation associated with the formation of a large antiform in the central part of the Beaver Basin. Faults along the eastern margin of Beaver Basin are considered tectonic and related to basin-range uplift. The central basin faults appear to be related to development of a north-south trending horst and antiform. **Sections:** This fault has 2 sections. Differences in fault ages

	generally reflect the distribution of different ages of faulted deposits and not necessarily recency of movement. Sterr (1980 #4652) divided scarps in Beaver Basin into age groups on the basis of the scarp morphology associated with different-age surfaces, and defined three "independent fault systems"associated with unique recurrence intervals. However, Machette (1985 #4594) revised surface-age estimates, which provided the basis for determining fault histories, and concluded that older scarps may not be suitable for morphologic age analysis due to the effects of stream erosion, calcic soil development (Anderson and Bucknam, 1979 #518), and episodes of movement.
Name comments	**General:** **Section:** This section is informally referred to as the eastern margin faults for their location along the eastern margin of the Beaver Basin. Includes the Beaver fault of Sterr (1985 #351).,This section is informally referred to as the eastern margin faults for their location along the eastern margin of the Beaver Basin. Includes the Beaver fault of Sterr (1985 #351). **Fault ID:** Refers to fault number 9-3 in Hecker (1993 #642).
County(s) and State(s)	BEAVER COUNTY, UTAH
Physiographic province(s)	BASIN AND RANGE COLORADO PLATEAUS
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Mapped by Anderson and Bucknam (1979 #518), Machette and others (1984 #4651), Machette (1985 #4594), and Anderson and others (1990 #4565). Fault traces from 1:50,000-scale mapping of Machette (1985 #4594) and Anderson and others (1990 #4565).
Geologic setting	Complex zone of generally north-trending faulting and deformation in the Beaver Basin. Faults along the eastern margin of Beaver Basin are considered tectonic. Central basin faults appear to be related to development of a north-south trending horst and antiform.
Length (km)	This section is 34 km of a total fault length of 39 km.

Average strike	N7°E
Sense of movement	Normal
Dip Direction	W
Paleoseismology studies	
Geomorphic expression	Individual scarps on Pinedale-age (12-15 ka) alluvium are 1-3 m high. Several faults cut the east end of the middle Pleistocene Last Chance Bench (north-northeast of Beaver) and early PleistoceneTable Grounds surface (east of Beaver) and appear to be buried by middle to late Pleistocene (10-130 ka) or Pinedale-age alluvium. Sterr (1980 #4652) determined average displacements of about 1.5 m per event. As a group, the basin-margin faults produced about 100 m of net, down-to-the-west displacement of the 500 ka Last Chance Bench surface. Seismic-reflection data suggest that the fault zone intersects a subhorizontal detachment at a depth of 10 km (Smith and Bruhn, 1984 #4561).
Age of faulted surficial deposits	Latest Pleistocene to early(?) Pleistocene alluvial deposits (mainly gravels).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Scarps are only slightly less degraded than Bonneville shoreline scarps and more degraded than the Drum Mountains [2432] fault scarps, which are estimated to be 9 ka old. However, morphometric scarp analyses by Sterr (1985 #351) yielded an age estimate of about 18 ka for one of the faults (the Beaver fault, which trends through the town of Beaver).
Recurrence interval	50 k.y. (<500 ka) *Comments:* Recurrence intervals are roughly 50 k.y. based on an assumed displacement of 2 m per event, and individual scarp heights of 11 m on 250 ka deposits and 25 m on 500 ka deposits (Machette, 1985 #4594).
Slip-rate	Less than 0.2 mm/yr

category	*Comments:* Assignment of slip-rate category based on 11 m scarps on 250 ka deposits, 25 m scarps on 500 ka deposits (Machette, 1985 #4594), and net displacement (100 m) across all the faults in the basin-margin zone that cut the 500-ka Last Chance Bench, which yield long-term geologic slip rates generally less than 0.2 mm/yr.
Date and Compiler(s)	1999 Bill D. Black, Utah Geological Survey Suzanne Hecker, U.S. Geological Survey
References	#4565 Anderson, J.J., Rowley, R.D., Machette, M.N., Decatur, S.H., and Mehnert, H.H., 1990, Geologic map of the Nevershine Hollow area, eastern Black Mountains, southern Tushar Mountains, and northern Markagunt Plateau, Beaver and Iron Counties, Utah: U.S. Geological Survey Miscellaneous Investigations Map I-1999, scale 1:50,000. #518 Anderson, R.E., and Bucknam, R.C., 1979, Map of fault scarps in unconsolidated sediments, Richfield 1° x 2° quadrangle, Utah: U.S. Geological Survey Open-File Report 79-1236, 15 p. pamphlet, 1 sheet, scale 1:250,000. #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. #4594 Machette, M.N., 1985, Late Cenozoic geology of the Beaver Basin, southwestern Utah: Brigham Young University Geology Studies, v. 32, pt.1, p. 19-37. #4651 Machette, M.N., Steven, T.A., Cunningham, C.G., and Anderson, J.J., 1984, Geologic map of the Beaver quadrangle, Beaver and Piute Counties, Utah: U.S. Geological Survey Miscellaneous Investigations Map I-1520, scale 1:50,000. #4561 Smith, R.B., and Bruhn, R.L., 1984, Intraplate extensional tectonics of the western U.S. Cordillera-Inferences on structural style from seismic-reflection data, regional tectonics and thermal-mechanical models of brittle-ductile deformation: Journal of Geophysical Research, v. 89, no. B7, p. 5733-5762. #351 Sterr, H., 1985, Rates of change and degradation of hillslopes formed in unconsolidated materials—A morphometric

	approach to date quaternary fault scarps in western Utah; USA: Zeitschrift fuer Geomorphologie N. Folge, v. 29, p. 315-333. #4652 Sterr, H.M., 1980, The seismotectonic history and morphological evolution of late Quaternary fault scarps in southwestern Utah: Boulder, University of Colorado, unpublished Ph.D. dissertation, 286 p.