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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.

Fisher Valley faults (Class B) No. 2478

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 2478, Fisher Valley 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	Late Quaternary faults, folds and warping in Fisher Valley from collapse. As with many other faults in the region, the Fisher Valley faults are probably related to salt dissolution, but may have a tectonic component, thus we classify them as a Class B feature.
Name comments	**Fault ID:** Refers to fault number 18-7 of Hecker (1993 #642).
County(s) and State(s)	GRAND COUNTY, UTAH
Physiographic province(s)	COLORADO PLATEAUS

Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Mapped by Williams (1964 #2789) and Colman and others (1986 #4976). Fault traces from geologic mapping of Williams (1964 #2789).
Geologic setting	Fisher Valley is on the crest of a long anticlinal structure that includes Salt and Cache Valleys in Utah and Sinbad and Rock Creek Valleys in Colorado. The valley formed from collapse of the anticline (Onion Creek diapir) due to salt dissolution.
Length (km)	17 km.
Average strike	N21°W
Sense of movement	Normal
Dip Direction	Unknown *Comments:* Varies, radial pattern related to salt dissolution and collapse.
Paleoseismology studies	
Geomorphic expression	The faults border and define Fisher Valley. Formation of the valley by collapse of the anticline beheaded streams whose broad shallow channels are preserved on the valley rim. Lower and upper basin-fill deposits (which contain the 610 ka Lava Creek ash bed) are tilted as much as 25? and 10? (respectively) in a radial pattern away from the diapir and indicate multiple upward movements. Angular unconformities within the deposits along the edges of the basin, notably at the base of the Lava Creek ash bed, contrast with conformable relationships toward the center of the basin and suggest intermittent subsidence, in addition to the uplift. Projection of dips in the upper Cenozoic deposits indicates at least 70 m of upward movement on the diapir and a similar amount of basin subsidence between 2-3 Ma and 250 ka (summarized from Colman and others, 1986 #4976).
Age of faulted surficial deposits	Upper Cenozoic deposits, by far the thickest sequence in the Paradox basin (>125 m thick), have ages between >2.5 Ma (based on paleomagnetic analysis) and about 250 ka (based on secondary

	carbonate accumulation rates; Colman and others, 1986 #4976) and record episodic deformation from movements of the Onion Creek salt diapir and basin subsidence (resulting from salt flowage into the diapir and/or salt dissolution and collapse). Lower basin-fill deposits, which contain the Bishop ash bed (about 730 ka), are locally infolded into the Paradox Formation caprock, although not as severely as older, Pliocene(?) gravels. The anomalous thickness of the basin-fill sediments and evidence that Fisher Creek flowed through the present diapir area indicate that drainage was first impeded and then diverted as diapir movement progressed.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Based on tephrochronology, soil development, and stream dissection rate (Colman and others, 1986 #4976). Young basin-fill deposits demonstrating recent movement are absent, but evidence for rapid incision (3 mm/yr based on radiocarbon dates), and steep, unstable slopes where Onion Creek cuts through the caprock, suggest that the diapir may be presently active.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr
Date and Compiler(s)	1999 Bill D. Black, Utah Geological Survey Suzanne Hecker, U.S. Geological Survey
References	#4976 Colman, S.M., Choquette, A.F., Rosholt, J.N., Miller, G.H., and Huntley, D.J., 1986, Dating the upper Cenozoic sediments in Fisher Valley, southeastern Utah: Geological Society of America Bulletin, v. 97, no. 12, p. 1422-1431. #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. #2789 Williams, P.L., 1964, Geology, structure, and uranium deposits of the Moab quadrangle, Colorado and Utah: U.S. Geological Survey Miscellaneous Geologic Investigations I-360.