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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.

Salt and Cache Valleys faults (Class B) No. 2474

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 2474, Salt and Cache Valleys 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	Well dated but poorly understood zone of late Quaternary deformation along the margin of of the Salt Valley anticline, north of Moab. As with many other faults in the region, the Salt and Cache Valleys 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 18-1 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 Oviatt (1988 #5006). Fault traces from mapping of Williams (1964 #2789).
Geologic setting	Northwest-trending zone of folding, faulting, and warping related to dissolution and collapse of the Salt Valley anticline in eastern Utah.
Length (km)	58 km.
Average strike	N61°W
Sense of movement	Normal
Dip Direction	NE; SW
Paleoseismology studies	
Geomorphic expression	Collapse of the Salt Valley anticline appears to largely post-date late Pliocene(?) deposition of exotic fluvial gravels (likely derived from a since-eroded source in the Book Cliffs) on the rim and floor of Salt Valley and formation of an erosion surface on the flank of the anticline. Small depositional basins within Salt Valley that contain Bishop ash (~740 ka) and Lava Creek B ash (670 ka) were localized by salt dissolution and collapse and/or salt flow during early and middle Quaternary time and record syn- and post-depositional folding and faulting (Oviatt, 1988 #5006). Faults parallel and appear related to the major older structures of the anticline. At the lower end of the valley, slightly tilted and relatively undeformed middle to late Quaternary basin-fill deposits unconformably overlie older more-deformed units. Structural relations exposed at other localities in the valley suggest that Quaternary sediments have been deformed and localized by movement within salt diapirs of the Paradox Formation. In places, bedding dips away from the outcrop of the Paradox Formation and is fractured, thrust-faulted, and infolded into the caprock of the formation. Locally thick accumulations of sediments suggest that subsidence occurred adjacent to the diapirs. Playas and mudflats in upper Salt Valley indicate active deformation (due to salt flow or dissolution) and damming of

	surface runoff. A stream that crosses the south end of the Salt Valley anticline at a high angle is entrenched and bordered by probable late Holocene terraces north of the anticline and is braided and unentrenched in the short reach within Salt Valley, suggesting that the core of the anticline is presently subsiding and causing stream aggradation. In Cache Valley, a Quaternary(?) erosion surface that apparently post-dates collapse-related deformation is displaced by a major bedrock fault and may have been tilted. East of Cache Valley, Colorado River terraces are tilted upstream on the upstream side of the Cache Valley anticline, indicating that salt flowed into the collapsed structure during Quaternary time.
Age of faulted surficial deposits	Quaternary. As with many other faults in the region, the Salt and Cache Valleys faults are probably related to salt dissolution, but may have a tectonic component, thus we classify them as a Class B feature.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* As with many other faults in the region, the Salt and Cache Valleys faults are probably related to salt dissolution, but may have a tectonic component, thus we classify them as a Class B features.
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	#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. #5006 Oviatt, C.G., 1988, Evidence for Quaternary deformation in the Salt Valley anticline, southeastern Utah, *in* H., D.H., Oviatt, C.G., and Huntoon, P.W., eds., Salt deformation in the Paradox region: Utah Geological and Mineral Survey Bulletin 122, p. 61-

	76. #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.