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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.

Utah Lake faults (Class A) No. 2409

Last Review Date: 2014-08-25

Compiled in cooperation with the Utah Geological Survey

citation for this record: **Black, B.D., and Hecker, S., compilers, 2014, Fault number 2409, Utah Lake 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 02:55 PM.**

Synopsis	Poorly understood latest Pleistocene to Holocene faults and folds beneath Utah Lake identified from seismic-reflection data.
Name comments	**Fault ID:** Refers to fault number 12-19 of Hecker (1993 #642).
County(s) and State(s)	UTAH COUNTY, UTAH
Physiographic province(s)	BASIN AND RANGE
Reliability of	Poor

location	Compiled at 1:250,000 scale. *Comments:* Fault traces from mapping of Brimhall and Merritt (1981 #4528). Faults and folds shown on 1:50,000-scale map by Machette (1992 #4529). The features are entirely subaqueous.
Geologic setting	Northeast- to northwest-trending faults and folds beneath Utah Lake in Utah Valley. Utah Valley is bounded on the east by the Provo section of the Wasatch fault zone [2351g] and on the north by the east-west trending Traverse Mountains. Surficial geology of the valley is dominated by deposits of late Pleistocene Lake Bonneville (Machette, 1992 #4529).
Length (km)	31 km.
Average strike	N8°E
Sense of movement	Normal
Dip Direction	E; W
Paleoseismology studies	
Geomorphic expression	Fault and fold locations, based on widely spaced seismic-reflection transects and pre-GPS navigational control, are uncertain at best. Acoustical profiles show from <2 to 5 m of displacement across individual faults and folds beneath the lake in a persistent 8- to15-m-deep layer identified as the sediment of the Provo Formation (youngest phase of Lake Bonneville). Machette (1992 #4529) interpreted the layer as lake-bottom sediments probably deposited during the regressive phase of Lake Bonneville. The reflection profiles suggest that displacements decrease upward in strata above the marker horizon and occur within several meters of the lake bottom.
Age of faulted surficial deposits	Latest Pleistocene to Holocene lacustrine sediment (Machette, 1992 #4529).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Latest Pleistocene to Holocene lacustrine sediment is

	displaced from <2 m to about 5 m as indicated by acoustical profiles (Brimhall and Merritt, 1981 #4528).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Net displacements of less than 2 to 5 m in the past 14-16 k.y. (period since the Bonneville regression) indicate probable low slip rates. This data suggests that the fault can be characterized by a geologic slip rate within this or the lowest slip-rate category.
Date and Compiler(s)	2014 Bill D. Black, Utah Geological Survey Suzanne Hecker, U.S. Geological Survey
References	#4528 Brimhall, W.H., and Merritt, L.B., 1981, The geology of Utah Lake-Implications for resource management: Great Basin Naturalist Memoirs Number 5, p. 24-42, scale 1:250,000. #8527 Dinter, D.A., and Pechmann, J.C., 2005, Segmentation and Holocene displacement history of the Great Salt Lake fault, Utah, *in* Lund, W.L. (ed.), Proceedings, Basin and Range Province Seismic Hazard Summit II: Utah Geological Survey Miscellaneous Publication MP05-2 5 pp. (extended abs.). #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. #4529 Machette, M.N., 1992, Surficial geologic map of the Wasatch fault zone, eastern Utah Valley, Utah County and parts of Salt Lake and Juab Counties, Utah: U.S. Geological Survey Miscellaneous Investigations Map I-2095, scale 1:50,000.