Jump to Navigation

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.

East Canyon fault, southern East Canyon section (Class A) No. 2354b

Last Review Date: 2016-02-08

Compiled in cooperation with the Utah Geological Survey

citation for this record: **Black, B.D., Hecker, S., and Haller, K.M., compilers, 2016, Fault number 2354b, East Canyon fault, southern East Canyon section, 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 02:57 PM.**

Synopsis	**General:** Poorly understood Quaternary zone of faults extends from west of East Canyon Reservoir to Croyden. **Sections:** This fault has 2 sections. Segmentation was defined by Sullivan and others (1988 #4508). The boundary between the northern and southern sections is north of East Canyon Dam. For the purpose of seismic-hazard assessment, values for slip rate, recurrence interval, and single-event displacement are inferred to be similar to those calculated for the Morgan fault [2353], based on similarities in fault length and escarpment morphology. Piety

	and others (2010 #7332) divide the fault into seven sections (1.8–6 km long) to simplify discussion.
Name comments	**General:** **Fault ID:** Refers to fault number 12-16 of Hecker (1993 #642).
County(s) and State(s)	MORGAN COUNTY, UTAH
Physiographic province(s)	MIDDLE ROCKY MOUNTAINS
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Mapping from Sullivan and others (1988 #4508).
Geologic setting	Northeast-trending range-front fault generally bounding the northern side of the intermontane valley between East Canyon and Croyden in the Wasatch Range. The valley is one of several "back valleys of the Wasatch", a line of discontinuous valleys in the Wasatch hinterlands east of the Wasatch Range.
Length (km)	This section is 8 km of a total fault length of 26 km.
Average strike	N19°E (for section) versus N24°E (for whole fault)
Sense of movement	Normal
Dip Direction	SE
Paleoseismology studies	
Geomorphic expression	Range-front bedrock escarpment. The section branches north of East Canyon Dam into two en-echelon fault traces, which continue for a few kilometers to the southwest before again rejoining into a single trace.
Age of faulted surficial deposits	Tertiary
Historic earthquake	
Most recent prehistoric	undifferentiated Quaternary (<1.6 Ma)

deformation	*Comments:* Hecker (1993 #642) shows the southern part of the section (western branch fault and main trace to the south) may have moved in late Quaternary time based on Sullivan and others (1988) who concluded that the portion of the East Canyon fault south of East Canyon Reservoir may have been recently active. In contrast, Piety and others (2010 #7322) conclude that although geologic evidence suggests that displacement on the East Canyon fault was primarily responsible for the initial formation of the valley in the middle Cenozoic, displacement does not appear to have continued into the late Quaternary. While they acknowledge that studies to date have been limited, direct evidence for or against late Quaternary displacements has not been recognized in either investigation. The assigned age category is based on Piety and others (2010 #73223) assessment that early Quaternary activity on the East Canyon fault should be considered a possibility.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Poor geomorphic expression indicates a low slip rate.
Date and Compiler(s)	2016 Bill D. Black, Utah Geological Survey Suzanne Hecker, U.S. Geological Survey Kathleen M. Haller, 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. #7322 Piety, L.A., Anderson, L.W., and Ostenaa, D.A., 2010, Late Quaternary faulting in East Canyon Valley, northern Utah: Utah Geological Survey Miscellaneous Publication 10-5, 40 p., http://geology.utah.gov/online/mp/mp10-05/mp10-05.pdf and http://geology.utah.gov/online/mp/mp10-05/mp10-05appendices.pdf. #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.