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Quaternary Fault and Fold Database of the United States

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Great Salt Lake fault zone, Promontory section (Class A) No. 2369a

Last Review Date: 2004-04-01

Compiled in cooperation with the Utah Geological Survey

citation for this record: **Black, B.D., Christenson, G.E., DuRoss, C.B., and Hecker, S., compilers, 2004, Fault number 2369a, Great Salt Lake fault zone, Promontory 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:** This is a zone of Holocene faulting beneath Great Salt Lake that was identified from seismic-reflection profiling. Subsidiary faulting is common in the hanging wall west of the main fault in the southern Great Salt Lake. The faults may step to the west and connect with the Oquirrh fault zone [2398] to the south. The entire fault zone appears to have been active in the latest Pleistocene or Holocene (<15 ka). **Sections:** This fault has 3 sections. Dinter and Pechmann (1999 #4526; 1999 #4645; 2000 #4646) indicate the active East Great Salt Lake fault trace west of

	Antelope Island shows a 2-km-wide step to the west, suggesting the fault may form two north-northwest trending sections south of Promontory Point: a 35-km-long Antelope Island section and a 30-km-long Fremont Island section. A right step west of Promontory Point suggests that a northern Promontory section probably exists north of the Fremont Island section, although no high-resolution seismic profiles exist for the Promontory section. High-resolution seismic profiles show a sharp westward bend in the southern end of the fault indicating a step-over to the Oquirrh fault zone [2398].
Name comments	**General:** **Fault ID:** Refers to fault number 6-8 of Hecker (1993 #642).
County(s) and State(s)	BOX ELDER COUNTY, UTAH
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Poor Compiled at 1:95,000 scale. *Comments:* The location of the Promontory section in the northern Great Salt Lake basin is less accurate than sections to the south because it is based on less detailed reflection data (Pechmann and others, 1987 #4648). Mapping is from Mikulich and Smith (1974 #4492) and Viveiros (1986 #4649).
Geologic setting	Generally north-trending normal faults beneath Great Salt Lake identified from seismic reflection data. Subsidiary faulting is common in the hanging wall west of the main fault in the southern Great Salt Lake.
Length (km)	This section is 49 km of a total fault length of 103 km.
Average strike	N39°W (for section) versus N29°W (for whole fault)
Sense of movement	Normal *Comments:* A steeply west-dipping fault is evident on seismic reflection profiles but dips are not reported. Interpretation of reflection data suggests the fault may flatten with depth (Smith and Bruhn, 1984 #4561) and merge into a horizontal detachment at a depth of about 6 km (Viveiros, 1986 #4649). However, the evidence is equivocal.
Dip Direction	W
Paleoseismology studies	
Geomorphic	This section of the fault lies entirely beneath the eastern portion of Great Salt

expression	Lake.
Age of faulted surficial deposits	High-resolution seismic reflection profiles have not been obtained for the Promontory section, but Quaternary deposits are displaced and we presume the age of faulted deposits is similar to that on the two sections to the south [2369b, 2369c] .
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Because high-resolution seismic work has not been performed on the Promontory section, much less is known than about the two sections to the south [2369b, 2369c]. The timing of the most recent paleoevent is assumed to be similar to that on the other sections (middle to late Holocene). Restricted basins adjacent to the Promontory section existed prior to deposition of a 11.6 ka calcareous clay that overlies mirabilite salt deposits (Eardley, 1962 #4647); (Mikulich, 1974 #4492). Deformation is evident in deeper near-surface sediments which pre-date salt deposition (Mikulich, 1974 #4492).
Recurrence interval	
Slip-rate category	Between 0.2 and 1.0 mm/yr *Comments:* Similar to the two sections of the East Great Salt Lake fault zone to the south [2369b, 2369c].
Date and Compiler(s)	2004 Bill D. Black, Utah Geological Survey Gary E. Christenson, Utah Geological Survey Christopher B. DuRoss, Utah Geological Survey Suzanne Hecker, U.S. Geological Survey
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