

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](#).

Eagle Bay fault, northern section (Class A) No. 757a

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Synopsis

General: The Eagle Bay fault strikes north across the margin of the 0.63-Ma Yellowstone caldera. Although the fault in Yellowstone Lake has been imaged by seismic-reflection profiles collected concurrently with multibeam bathymetric data, it is only nominally mentioned in recent publications (Finn and Morgan, 2002 #7054; Johnson and others, 2003 #7050; Morgan and others, 2003 #7053, 2007 #7051; Pierce and others, 2007 #7052).

Sections: This fault has 3 sections. The middle section of the Eagle Bay fault [757b] offsets Holocene lake sediment adjacent to and in the Eagle Bay-Flat Mountain Arm area of Yellowstone Lake. Studies concluded that there was only one post-glacial event that offsets lake sediments on this section of the fault. The main fault scarp is as much as 9 m high, but when adjusted for the vertical offset from multiple antithetic scarps, the resulting net

	<p>stratigraphic offset is less than one-half this amount. Near the northern section of the fault, seismic profiles show that post-glacial lake sediment is vertically offset, although the location and trace of the fault are not yet well controlled. The northern section of this fault probably connects to the Lake Hotel fault [755]. Vertical displacement on the southern section of the fault has formed a bedrock scarp on the 0.63-Ma Lava Creek Tuff.</p>
Name comments	<p>General: Named the Eagle Bay fault by Locke and others (1992 #308). It was previously known as the Yellowstone Lake fault of Witkind (1975 #819).</p> <p>Section: This informally named section is aligned with a postulated northward extension of the middle segment (central section) of the Eagle Bay fault [757b] beneath Yellowstone Lake. Christiansen (2001 #1784) extends the Eagle Bay fault northward beneath Yellowstone Lake to connect with Holocene age Lake Hotel fault [755].</p> <p>Fault ID: Refers to fault 238 of Witkind (1975 #819).</p>
County(s) and State(s)	TETON COUNTY, WYOMING
Physiographic province(s)	MIDDLE ROCKY MOUNTAINS
Reliability of location	<p>Poor Compiled at 1:24,000 scale.</p> <p><i>Comments:</i> Location in underwater sections across Eagle Bay and Flat Mountain arm are constrained by 450 km of high-resolution seismic reflection profiles collected concurrently with multibeam bathymetric data seismic reflection profiles (Pierce and others, 2007 #7052, fig. 2).</p>
Geologic setting	<p>This is one of several north-trending, range-front faults in the area between the 0.63-Ma Yellowstone caldera and the Teton fault to the south [768]. However, it is the only fault that cuts across the caldera's structural boundary. This fault is near a swarm of small earthquakes that occurred in 1989 (fig. 1, Peyton and Smith, 1990 #2270).</p>
Length (km)	This section is 13 km of a total fault length of 31 km.
Average strike	N5°E (for section) versus N3°E,N5°E (for whole fault)

Sense of movement	Normal <i>Comments:</i> Northward extension of Eagle Bay normal fault.
Dip Direction	E
Paleoseismology studies	
Geomorphic expression	Not observed in geophysical reflection traverses of Otis and others (1977 #2273) and Kaplinski (1991 #2272). Northward extension from middle section shown on Richmond (1974 #2276) based on alignment of cold-water springs as noted by Smedes (1968 #2262). More recent seismic profiles show offset of lake sediment near the trace of the northern section.
Age of faulted surficial deposits	Post-glacial lake sediment (<15 ka).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) <i>Comments:</i> Seismic profiles show post-glacial faulting, but available location data do not permit a good location for the fault trace.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr <i>Comments:</i> Wong and others (2000 #4484) suggested fault slip rates of 0.4 mm/yr (60% weight) and 1.4 mm/yr (40% weight) for the entire fault based data from Locke and others (1992 #308) from a site along the central section [757b]. However, no data are available on the amount of offset of post-glacial lake sediment along this section of the fault. The moderate slip-rate category is inferred recency of movement, and similar slip rates determined for section [757b] to the south.
Date and Compiler(s)	2011 Kenneth L. Pierce, U.S. Geological Survey, Emeritus Kathleen M. Haller, U.S. Geological Survey

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