

# 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](#).

## unnamed faults in the Burnt-Raven Creek area (Class A) No. 750

Last Review Date: 1998-03-30

*citation for this record:* Pierce, K.L., compiler, 1998, Fault number 750, unnamed faults in the Burnt-Raven Creek area, 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 01:59 PM.

<b>Synopsis</b>	The group of Burnt-Raven Creek faults are just outside of and parallel to the northeast margin of the Yellowstone caldera, which formed when the Lava Creek Tuff was erupted 0.63 Ma. The Burnt-Raven Creek faults are just inside (to the southwest) of the Mirror Plateau faults [749], many of which have post-glacial (<15 ka) activity. The Burnt-Raven Creek faults offset the 0.63 Ma Lava Creek Tuff and, because of its association with the Mirror Plateau faults [749], may have younger activity. Richmond maps three fault strands as offsetting deposits of last (Pinedale) glaciation; two are near the south-east end of this group and one extends through the Hot Spring Basin. No detailed study of fault activity has been made in this remote region.
<b>Name</b>	This group of faults are between Burnt Creek and Raven Creek in

<b>comments</b>	the remote back country of Yellowstone National Park, between the 0.63-Ma Yellowstone caldera and the Mirror Plateau faults [749].
<b>County(s) and State(s)</b>	PARK COUNTY, WYOMING
<b>Physiographic province(s)</b>	MIDDLE ROCKY MOUNTAINS
<b>Reliability of location</b>	Good Compiled at 1:125,000 scale.  <i>Comments:</i> Surficial geology mapped at 1:62,500 scale by Richmond and Waldrop (1972 #2261); bedrock geology mapped by Prostka and others (1975 #2259; 1975 #2260) and compiled at 1:125,000 scale by U.S. Geological Survey (1972 #639; 1972 #1057) and Christiansen (2001 #1784). No detailed study of fault activity has been made in this remote region.
<b>Geologic setting</b>	The Burnt-Raven Creek faults are parallel to and about 7 km outboard of the northeast margin the 0.63-Ma Yellowstone caldera (Christiansen, 2001 #1784), which is on the leading edge of the Yellowstone hotspot (Pierce and Morgan, 1992 #539). They form of an anastomosing band of faults on the western side of the Mirror Plateau (fig. 3 and Plate 1, Love, 1961 #3801), where the bedrock is Eocene volcanic rock partly covered with 0.63-Ma Lava Creek Tuff (U.S. Geological Survey, 1972 #639). P-wave and gravity studies suggest hydrothermal or partially molten material is at depth beneath this area (Smith and Braile, 1993 #2271).
<b>Length (km)</b>	44 km.
<b>Average strike</b>	N13°W
<b>Sense of movement</b>	Normal
<b>Dip Direction</b>	E; NE; W; SW
<b>Paleoseismology studies</b>	
<b>Geomorphic expression</b>	Fault offset expressed in geomorphology, but mapped through glacial deposits as short dashed lines (Richmond and Waldrop, 1972 #2261; Pierce, 1974 #2217; 1974 #2238) indicating that faults are older than glacial deposits. Detailed studies or

	descriptions are not available.
<b>Age of faulted surficial deposits</b>	Lava Creek Tuff (0.63 Ma) commonly offset along parts of fault length.
<b>Historic earthquake</b>	
<b>Most recent prehistoric deformation</b>	middle and late Quaternary (<750 ka)  <i>Comments:</i> The 0.63-Ma Lava Creek Tuff is commonly offset along fault length. Younger deposits may also be offset. G.M. Richmond mapped three fault sections as offsetting deposits of the last glaciation (Pinedale); two are near the south east end of this group and one through the Hot Spring Basin Group.
<b>Recurrence interval</b>	
<b>Slip-rate category</b>	Less than 0.2 mm/yr  <i>Comments:</i> Offset of 0.63-Ma Lava Creek Tuff is generally less than 30-50 m, suggesting these faults are in the low long-term slip-rate category of <0.2 mm/yr. However, this areas location between the 0.63-Ma caldera margin and the Mirror Plateau faults [749] may suggest that faulting here is of comparable activity to that of the Mirror Plateau, where post-glacial (<15 ka) faults [749a] are common.
<b>Date and Compiler(s)</b>	1998 Kenneth L. Pierce, U.S. Geological Survey, Emeritus
<b>References</b>	#1784 Christiansen, R.L., 2001, The Quaternary and Pliocene Yellowstone Plateau volcanic field of Wyoming, Idaho, and Montana: U.S. Geological Survey Professional Paper 729-G, 145 p., 3 pls., scale 1:125,000.  #3801 Love, J.D., 1961, Reconnaissance study of Quaternary faults in and south of Yellowstone National Park, Wyoming: Geological Society of America Bulletin, v. 72, p. 1749-1764.  #2217 Pierce, K.L., 1974, Surficial geologic map of the Abiather Peak and parts of adjacent quadrangles, Yellowstone National Park, Wyoming and Montana: U.S. Geological Survey Miscellaneous Geologic Investigations I-646, scale 1:62,500.

#2238 Pierce, K.L., 1974, Surficial geologic map of the Tower Junction quadrangle and part of the Mount Wallace quadrangle, Yellowstone National Park, Wyoming and Montana: U.S. Geological Survey Miscellaneous Geologic Investigations I-647, scale 1:62,500.

#539 Pierce, K.L., and Morgan, L.A., 1992, The track of the Yellowstone hot spot—Volcanism, faulting, and uplift, *in* Link, P.K., Kuntz, M.A., and Platt, L.B., eds., Regional geology of eastern Idaho and western Wyoming: Geological Society of America Memoir 179, p. 1-53, 1 pl.

#2260 Prostka, H.J., Blank, H.R., Jr., Christiansen, R.L., and Ruppel, E.T., 1975, Geologic map of the Tower Junction quadrangle, Yellowstone National Park, Wyoming and Montana: U.S. Geological Survey Geologic quadrangle Map GQ-1247, scale 1:62,500.

#2259 Prostka, H.J., Smedes, H.W., and Christiansen, R.L., 1975, Geologic map of the Pelican Cone quadrangle, Yellowstone National Park and vicinity, Wyoming: U.S. Geological Survey Geologic quadrangle Map GQ-1243.

#2261 Richmond, G.M., and Waldrop, H.A., 1972, Surficial geologic map of the Pelican Cone quadrangle, Yellowstone National Park and adjoining area, Wyoming: U.S. Geological Survey Miscellaneous Geologic Investigations I-638, scale 1:62,500.

#2271 Smith, R.B., and Braile, L.W., 1993, Topographic signature, space-time evolution, and physical properties of the Yellowstone-Snake River plain volcanic system—the Yellowstone hotspot, *in* Snoke, A.W., Steidtmann, J.R., and Roberts, S.M., eds., Geology of Wyoming: Geological Survey of Wyoming, Memoir No. 5, p. 694-754.

#1057 U.S. Geological Survey, 1972, Surficial geologic map of Yellowstone National Park: U.S. Geological Survey Miscellaneous Geologic Investigations I-710, 1 sheet, scale 1:125,000.

#639 U.S. Geological Survey, 1972, Geologic map of Yellowstone National Park: U.S. Geological Survey

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