

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](#).

Devils Dream fault (Class B) No. 576

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Synopsis

The northwest-striking Devils Dream fault is shown on 1:62,500-, 1:100,000-, and 1:250,000-scale geologic maps by Fiske and others (1963 #5826), Schasse (1987 #5569), and Walsh and others (1987 #3579), respectively. As shown on these maps the fault cuts Miocene volcanic rocks, but terminates at Quaternary andesite flows of Mount Rainier. The fault is also shown on a map of known or suspected faults with Quaternary displacement in the Pacific Northwest (Rogers and others, 1996 #4191), and that map cites Crosson and Frank (1975 #5662) for information concerning known or suspected Quaternary offset along this fault. Crosson and Frank (1975 #5662) investigated the Mount Rainier area following the July 18, 1973, magnitude 3.9 earthquake, which was determined to have a hypocenter at a depth of 10.9 km in the vicinity of this fault. They analyzed aerial photographs and conducted reconnaissance field studies of the southern flank of Mount Rainier and reported the presence of several northwest-trending lineaments, one of which they identified in Quaternary andesite and glacial deposits. Based on their field reconnaissance

	<p>studies they reported no evidence for surface rupture or faulting along these lineaments. Because no definitive evidence for Quaternary activity along the Devils Dream fault has been reported and because a tectonic origin for the northwest-trending linear features identified by Crosson and Frank (1975 #5662) has not been demonstrated, this fault and these linear features are classified herein as a Class B structures.</p>
Name comments	<p>Refers to the northwest-striking Devils Dream fault and to other northwest-striking linear features identified along the southwest flank of Mount Rainier (Fiske and others, 1963 #5826; Walsh and others, 1987 #3579). The Devils Dream fault apparently was first mapped and named by Fiske and others (1963 #5826). The mapped trace of the Devils Dream fault roughly parallels Devils Dream Creek, for which it is named, and it extends for about 5 km between Pyramid Creek to the southeast and Tahoma Creek to the northwest. Following the July 18, 1973, magnitude 3.9 earthquake in this region, Crosson and Frank (1975 #5662) identified several northwest-trending linear features within about 5 km north and northeast of the Devils Dream fault.</p>
County(s) and State(s)	<p>PIERCE COUNTY, WASHINGTON</p>
Physiographic province(s)	<p>CASCADE-SIERRA MOUNTAINS</p>
Reliability of location	<p>Good Compiled at 1:250,000 scale.</p> <p><i>Comments:</i> Fault trace is from the 1:250,000-scale geologic map by Walsh and others (1987 #3579); fault trace was transferred directly onto a registered mylar overlay and digitized at 1:250,000 scale. This part of the 1:250,000-scale geologic map was compiled from the 1:100,000-scale geologic map by Schasse (1987 #5569).</p>
Geologic setting	<p>The Devils Dream fault is present along the southwest flank of Mount Rainier, which is a glaciated volcano in the Cascade Range of south-central Washington, that is composed mostly of andesite and built upon an earlier mountainous surface (Fiske and others, 1963 #5826). The oldest rocks of this area are volcanic debris of late Eocene age and the youngest are Pleistocene-Holocene, andesitic flows and pyroclastic deposits derived from the Mount Rainier volcano (Fiske and others, 1963 #5826). The older rocks</p>

	<p>were folded and faulted along northwest trends at least twice during the late Eocene to late Miocene. Later regional upwarping related to the Pliocene to Quaternary rise of the Cascade Range may have accentuated the earlier structures, but thick vegetation and a lack of post-Miocene bedded rocks probably obscures evidence for this younger deformation (Fiske and others, 1963 #5826). The northwest-striking Devils Dream fault is only known to cut Miocene volcanic rocks. Crosson and Frank (1975 #5662), however, identified nearby northwest-trending lineaments in Quaternary andesite and glacial deposits, and they interpret these lineaments as tectonic features that resulted from deformation controlled by the regional stress field and related seismic activity of this region.</p>
Length (km)	4 km.
Average strike	N58°W
Sense of movement	<p>Unspecified</p> <p><i>Comments:</i> The sense of movement along the Devils Dream fault is not definitively known. This northwest-trending fault is shown as a down-to-the-northeast fault on geologic maps of the Mount Rainier area (Fiske and others, 1963 #5826; Walsh and others, 1987 #3579; Schasse, 1987 #5569). Crosson and Frank (1975 #5662) reported and interpreted regional stress orientations and focal mechanism determinations; they concluded that late Cenozoic offsets along northwest-trending faults in this region, may be principally right lateral with a down-to-southwest, dip-slip component.</p>
Dip Direction	Unknown
Paleoseismology studies	
Geomorphic expression	<p>Little has been reported about the geomorphic expression of the Devils Dream fault. Fiske and others (1963 #5826) report that the Devils Dream fault roughly parallels Devils Dream Creek and displaces Oligocene-Miocene ash flows at least 1,200 feet vertically. They do not mention geomorphic expression of the fault, but they note that the general lack of marker beds in volcanic rocks and thick vegetation in this region may make recognition of faults difficult. Based on evaluation of aerial photographs, Crosson and Frank (1975 #5662) identified several northwest-trending lineaments within a few kilometers north and</p>

	<p>northeast of the Devils Dream fault. They reported that one of these lineaments is expressed in Quaternary andesite and glacial deposits, whereas the other northwest-trending lineaments are only expressed in Oligocene or Miocene rocks (Crosson and Frank, 1975 #5662). Based on reconnaissance field studies, Crosson and Frank (1975 #5662) reported that the lineaments are mostly expressed as erosional troughs, aligned depressions, and rocks faces; they also noted that they found no evidence of surface rupture or displacement along these lineaments.</p>
<p>Age of faulted surficial deposits</p>	<p>As shown on geologic maps of this region, the Devils Dream fault cuts Oligocene or Miocene rocks and appears to be buried by Quaternary surficial deposits (Fiske and others, 1963 #5826; Walsh and others, 1987 #3579; Schasse, 1987 #5569). Based on evaluation of aerial photographs, Crosson and Frank (1975 #5662) identified a northwest-trending lineament about 3 km north of the Devils Dream fault that is expressed in Quaternary andesite and glacial deposits. Based on field examination of this linear feature, however, they described it as an erosional trough and reported that there was no evidence for surface rupture or offset along this feature and along the other linear features they identified (Crosson and Frank, 1975 #5662).</p>
<p>Historic earthquake</p>	
<p>Most recent prehistoric deformation</p>	<p>undifferentiated Quaternary (<1.6 Ma)</p> <p><i>Comments:</i> No definitive evidence for Quaternary activity along the Devils Dream fault has been reported. Crosson and Frank (1975 #5662) reported expression of a northwest-trending lineament in Quaternary rocks and deposits north of the Devils Dream fault, but they were unable to demonstrate a tectonic origin for this lineament and the other nearby, northwest-trending linear features. Consequently, the Devils Dream fault and the nearby, northwest-trending lineaments identified by Crosson and Frank (1975 #5662) are classified herein as Class B structures until further studies are conducted.</p>
<p>Recurrence interval</p>	<p><i>Comments:</i> At this time, there is no information on prehistoric earthquakes or recurrence interval for the Devils Mountain fault. No or definitive evidence for Quaternary activity along the Devils Dream fault has been reported and a tectonic origin has not been</p>

	demonstrated for the nearby, northwest-trending linear features identified by Crosson and Frank (1975 #5662).
Slip-rate category	<p>Less than 0.2 mm/yr</p> <p><i>Comments:</i> No definitive evidence for Quaternary activity along the Devils Dream fault has been reported and a tectonic origin has not been demonstrated for the nearby, northwest-trending linear features identified by Crosson and Frank (1975 #5662). If these features have been active during the Quaternary, the lack of scarps expressed in Quaternary rocks and deposits may indicate a relatively low rate for possible Quaternary slip.</p>
Date and Compiler(s)	<p>2003</p> <p>David J. Lidke, U.S. Geological Survey</p>
References	<p>#5662 Crosson, R.S., and Frank, D., 1975, The Mt. Rainier earthquake of July 18, 1973, and its tectonic significance: Bulletin of the Seismological Society of America, v. 65, p. 393-401.</p> <p>#5826 Fiske, R.S., Hopson, C.A., and Waters, A.C., 1963, Geology of Mount Rainier National Park, Washington: U.S. Geological Survey Professional Paper 444, 93 p.</p> <p>#4191 Rogers, A.M., Walsh, T.J., Kockelman, W.J., and Priest, G.R., 1996, Assessing earthquake hazards and reducing risk in the Pacific Northwest— Volume 1:U.S. Geological Survey Professional Paper 1560, 306 p.</p> <p>#5569 Schasse, H.W., 1987, Geologic map of the Mount Rainer quadrangle, Washington: Washington Division of Geology and Earth Resources Open File Report 87-16, 43 p. pamphlet, 1 sheet, scale 1:100,000.</p> <p>#3579 Walsh, T.J., Korosec, M.A., Phillips, W.M., Logan, R.L., and Schasse, H.W., 1987, Geologic map of Washington-southwest quadrant: Washington Division of Geology and Earth Resources Geologic Map GM-34, 28 p. pamphlet, 2 sheets, scale 1:250,000.</p>

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