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# 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.**

## Klamath graben fault system, South Klamath Lake section (Class A) No. 843c

**Last Review Date: 2016-04-05**

***citation for this record:*** **Personius, S.F., compiler, 2002, Fault number 843c, Klamath graben fault system, South Klamath Lake 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 03:15 PM.**

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| **Synopsis** | **General:** The Klamath graben fault system is a group of north and northwest-trer normal faults that form a complex graben system that confines the Klamath Lake at the intersection of the northwestern Basin and Range and Cascade Mountains i southern Oregon. These faults offset upper Miocene to Holocene volcanic rocks a Pleistocene and Holocene valley-fill sediments. The Klamath graben fault system divided into three sections—the West Klamath Lake section, the East Klamath La section, and the south Klamath Lake section. The West Klamath Lake and south Klamath Lake sections in part show evidence of latest Quaternary displacement; youngest displacement on the East Klamath Lake section occurred in the Quatern<br><br>**Sections:** This fault has 3 sections. The Klamath graben fault system is divided ir three sections herein, following the subdivisions of Geomatrix Consultants, Inc. ( #3593)—the West Klamath Lake section, the East Klamath Lake section, and the Klamath Lake section of the Klamath graben fault system. |

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| **Name comments** | **General:** The overall fault system is generally referred to as the Klamath graben maps of the region; individual fault names include the East Klamath Lake fault zo (Klinger and others, 1996 #3729; Bacon and others, 1997 #3516; 1999 #3499) an West Klamath Lake fault zone (Hawkins and others, 1989 #3548; Klinger and oth 1996 #3729). Geomatrix Consultants, Inc. (1995 #3593) informally include faults the southern part of the graben system in their South Klamath graben source zone Herein we retain the following names as sections of the Klamath graben fault sys the West Klamath Lake section, the East Klamath Lake section, and the south Kla Lake section.<br><br>**Section:** This part of the fault was informally named the South Klamath graben z by Geomatrix Consultants, Inc. (1995 #3593). Two faults mapped by Sherrod and Pickthorn (1992 #3567) south of Klamath Falls were named the Klamath Hills an Stuckel Mountain faults by Klinger and others (1996 #3729).<br><br>**Fault ID:** This group of structures is included in fault number 37 of Pezzopane (1 #3544) and fault number 52 of Geomatrix Consultants, Inc. (1995 #3593). This is number 52a of Geomatrix Consultants, Inc. (1995 #3593). |
| **County(s) and State(s)** | KLAMATH COUNTY, OREGON |
| **Physiographic province(s)** | CASCADE-SIERRA MOUNTAINS<br>BASIN AND RANGE |
| **Reliability of location** | Good<br>Compiled at 1:100,000 scale.<br><br>*Comments:* Location of fault from ORActiveFaults (http://www.oregongeology.org/arcgis/rest/services/Public/ORActiveFaults/MapS downloaded 06/02/2016) attributed to Jenks (2007 #7794). |
| **Geologic setting** | The Klamath graben fault system is a group of north-and northwest-trending norm faults that form a complex graben system at the intersection of the northwestern E and Range and Cascade Mountains in southern Oregon. Mount Mazama and Crat Lake may be localized at the intersection of the Klamath graben with the Cascade volcanic province (Bacon, 1983 #3787; Bacon and Nathenson, 1996 #3541; Bacc others, 1997 #3516). Parts of this fault system were originally mapped by Peterso McIntyre (1970 #3791), Smith and others (1982 #3493), Smith (1983 #3556; 198 #3555), Moring (1983 #3554), Hawkins and others (1989 #3548), Walker and MacLeod (1991 #3646), Sherrod and Pickthorn (1992 #3567), Bacon and others ( #3516), and Sherrod and Smith (2000 #5165). These faults offset upper Miocene Holocene volcanic rocks and Pleistocene and Holocene valley-fill sediments. |
| **Length (km)** | This section is 59 km of a total fault length of 148 km. |

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| **Average strike** | N31°W (for section) versus N17°W (for whole fault) |
| **Sense of movement** | Normal<br><br>*Comments:* Faults in this section are mapped as normal or high-angle faults by Peterson and McIntyre (1970 #3791), Walker and MacLeod (1991 #3646), Sherro Pickthorn (1992 #3567), Pezzopane (1993 #3544), Colman and others (2000 #41 and Sherrod and Smith (2000 #5165). |
| **Dip** | 51°–58°<br><br>*Comments:* Sherrod and Pickthorn (1992 #3567) show dips of 51°, 52°, and 58° c fault strands in the South Klamath Lake section. Geomatrix Consultants, Inc. (19 #3593) used an estimated dip of 70° in their modeling of earthquake potential of t South Klamath Lake section. |
| **Paleoseismology studies** | |
| **Geomorphic expression** | Faults in the South Klamath Lake section form composite grabens in the vicinity Klamath Falls. To the north, large escarpments on Miocene and Pliocene bedrock define a graben that confines Upper Klamath Lake; fault scarps are formed on Holocene and Pleistocene talus deposits along these escarpments; apparent 6- to 1 deep troughs thought to be fault scarps are also present on the floor of Upper Klar Lake (Sherrod and Pickthorn, 1992 #3567; Colman and others, 2000 #4131). The of extensive alluvial fans at the mouths of canyons that empty into Upper Klamat Lake may indicate late Quaternary subsidence (downfaulting) along the margins o upper Klamath basin (Smith, 1983 #3556; Sherrod and Pickthorn, 1992 #3567). S of Klamath Falls, the graben system widens into a series of fault blocks and grabe fault scarps are present on Holocene and Pleistocene talus deposits and Pleistocer landslides, mostly on down-to-the-west faults in this part of the South Klamath L section (Sherrod and Pickthorn, 1992 #3567). |
| **Age of faulted surficial deposits** | No radiometric ages have been obtained on faulted surficial deposits, but Sherrod Pickthorn (1992 #3567) inferred Holocene movement on faults in Holocene and Pleistocene talus deposits along several fault strands in the South Klamath Lake section. Probable 6- to 12-m-high fault scarps that form bathymetric troughs on th floor of Upper Klamath Lake are thought to at least in part offset post-Mazama (<6,845±50 radiocarbon years B.P., Bacon, 1983 #3787) sediments, because the l shallow and such features should have been filled by pyroclastic debris from the Mazama eruption (Sherrod and Pickthorn, 1992 #3567). Such a relationship has b recently confirmed by coring and shallow seismic reflection data (Colman and oth 2000 #4131). |
| **Historic** | |

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| **earthquake** | |
| **Most recent prehistoric deformation** | latest Quaternary (<15 ka)<br><br>*Comments:* Sherrod and Pickthorn (1992 #3567) inferred Holocene movement or some faults in Holocene and Pleistocene talus deposits along several fault strands the South Klamath Lake section, and inferred post-Mazama (<6,845±50 radiocarl years B.P., Bacon, 1983 #3787) displacements along fault scarps that form bathyr troughs on the floor of Upper Klamath Lake. Colman and others (2000 #4131) us coring and shallow seismic reflection data to demonstrate offset of the Mazama a across numerous faults on the floor of Upper Klamath Lake. Sherrod (1993 #351( assigned an age of <35 ka for activity on faults in the South Klamath Lake sectio did not discuss the basis for these age assignments. Klinger and others (1996 #37 discuss evidence for possible Holocene displacement exposed in a gravel pit near north end of the Stuckel Mountain fault south of Klamath Falls, but conclude that Cenozoic displacement on this structure appears to be small. |
| **Recurrence interval** | 3 events in 7 ka<br><br>*Comments:* Colman and others (2000 #4131) observed evidence of at least three faulting events that postdate the 7 ka age of the Mazama ash on faults on the floo Upper Klamath Lake. |
| **Slip-rate category** | Between 0.2 and 1.0 mm/yr<br><br>*Comments:* Pezzopane (1993 #3544) inferred an average slip rate of about 0.5–1 mm/yr across the Klamath graben. Geomatrix Consultants, Inc. (1995 #3593) use from Sherrod and Pickthorn (1992 #3567) to calculate a post-Pliocene slip rate of 0.14–0.2 mm/yr and a post-Mazama maximum rate of 0.9–1.8 mm/yr; they used preferred slip rates of 0.15–0.5 mm/yr in their analysis of earthquake hazards associated with various sections of the Klamath graben fault system. Colman and others (2000 #4131) calculated a vertical displacement rate of 0.43 mm/yr based m of offset of the 7 ka Mazama ash across faults on the floor of Upper Klamath L |
| **Date and Compiler(s)** | 2002<br>Stephen F. Personius, U.S. Geological Survey |
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