Jump to Navigation

# 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.**

## Carp Road fault (Class A) No. 1063

**Last Review Date: 1998-03-31**

***citation for this record:*** **Anderson, R.E., compiler, 1998, Fault number 1063, Carp Road fault, 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 02:19 PM.**

| | |
|---|---|
| **Synopsis** | The Carp Road fault is a northerly striking range-bounding structure at the western base of the East Mormon Mountains, an east-tilted structural block in a part of the Basin and Range interpreted to have undergone large-magnitude Tertiary extension. No detailed study is available; photogeologic study of its Quaternary history does not provide a basis for estimating the timing of the last displacement event more closely than Quaternary. |
| **Name comments** | Name applied by Axen and others (1990 #4688) to an approximately 13-km-long northeast to north-northeast striking fault at the western base of the East Mormon Mountains. Carp Road, the main access road into the fault, extends north along the valley, west of the East Mormon Mountains.<br><br>**Fault ID:** Equivalent to fault LV22 of dePolo (1998 #2845). |

| | |
|---|---|
| **County(s) and State(s)** | LINCOLN COUNTY, NEVADA |
| **Physiographic province(s)** | BASIN AND RANGE |
| **Reliability of location** | Good<br>Compiled at 1:250,000 scale.<br><br>*Comments:* Traces were compiled at 1:100,000 scale from 1:58,000-scale photographs and recompiled for publication at 1:250, 000 scale (Dohrenwend and others, 1991 #288). |
| **Geologic setting** | The Carp Road fault is located in a part of the Basin and Range interpreted to have undergone as much as 200 percent of late Tertiary extension (Axen and others, 1990 #4688). It bounds the east-tilted East Mormon Mountains structural block on the west and, as such, appears similar to many northerly striking block-bounding faults in the southern Great Basin. Throw is down to the west; bedrock is exposed in the hanging wall in a few places constraining the amount of throw, which increases southward to about 1.8 km at the south end (Anderson and Barnhard, 1993 #4700). At its north end, the fault is coextensive with the Sams Camp fault of Axen (1991 #4705), a fault that bounds the Tule Springs Hills on the west. If the two faults connect as one structure, the total length is about 22 km. Quaternary displacement is not documented on the Sams Camp fault. On the basis of 1:12,000-scale geologic mapping, Axen (plate 2 in 1991 #4705) shows a solid-line fault contact between Pliocene/Quaternary sediments and bedrock, but also shows the fault to be overlain by unfaulted, undifferentiated Quaternary deposits (plate 4 and cross section C-C' in Axen and others, 1990 #4688). |
| **Length (km)** | 14 km. |
| **Average strike** | N18°E |
| **Sense of movement** | Normal<br><br>*Comments:* Striated surfaces on bedrock suggest sinistral-normal slip and on subparallel small faults suggest that the youngest slip is mainly left lateral (Anderson and Barnhard, 1993 #4700). |
| **Dip** | 30°-77° |

| | |
|---|---|
| | *Comments:* Dip is highly variable. Where the East Mormon Mountains are crossed by South Toquop Wash, the Carp Road fault is shown in cross section with a gentle (about 30?) west dip (fig. 18 in Axen and others, 1990 #4688). About 5.2 km to the south of South Toquop Wash, the fault dips 77? west (plate 5 in Anderson and Barnhard, 1993 #4700). |
| **Paleoseismology studies** | |
| **Geomorphic expression** | On the basis of photogeologic study, the main fault is mapped as discontinuous traces along which Quaternary alluvium is downfaulted against bedrock (Dohrenwend and others, 1991 #288). Subsidiary traces directly west of the range base are mapped as scarps on Quaternary surficial deposits or on Quaternary erosional surfaces (Dohrenwend and others, 1991 #288). Anderson and Barnhard (1993 #4700). published a photograph showing a 2-3 m scarp <0.5 km long formed on bedrock and pre-Holocene alluvium along the northern part of the fault. |
| **Age of faulted surficial deposits** | On basis of photogeologic study, displaced materials and/or surfaces are estimated to be Pleistocene (10 ka-1.6 Ma) or questionable late Pleistocene (10-130 ka) (Dohrenwend and others, 1991 #288). |
| **Historic earthquake** | |
| **Most recent prehistoric deformation** | undifferentiated Quaternary (<1.6 Ma)<br><br>*Comments:* There are no stratigraphic studies or geologic maps with subdivided Quaternary units that allow for a more constrained estimate than Quaternary. |
| **Recurrence interval** | |
| **Slip-rate category** | Less than 0.2 mm/yr<br><br>*Comments:* No detailed data exists to determine slip rates for this fault. dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.01 mm/yr for the fault based on the presence of scarps on alluvium and the absence of basal facets. The late Quaternary characteristics of this fault (overall geomorphic expression, |

| | |
|---|---|
| | continuity of scarps, age of faulted deposits, etc.) support a low slip rate. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault. |
| **Date and Compiler(s)** | 1998<br>R. Ernest Anderson, U.S. Geological Survey, Emeritus |
| **References** | #4700 Anderson, R.E., and Barnhard, T.P., 1993, Heterogeneous Neogene strain and its bearing on horizontal extension and horizontal and vertical contraction at the margin of the extensional orogen, Mormon Mountains area, Nevada and Utah: U.S. Geological Survey Bulletin 2011, 43 p., 5.<br><br>#4705 Axen, G.J., 1991, Tertiary extension, magmatism, and thrust reactivation in the Southern Great Basin, and a mechanical model for detachment faulting: Cambridge, Harvard University, unpublished Ph.D. dissertation, 235 p.<br><br>#4688 Axen, G.J., Wernicke, B.P., Skelly, M.F., and Taylor, W.J., 1990, Mesozoic and Cenozoic tectonics of the Sevier thrust belt in the Virgin River Valley area, southern Nevada, *in* Wernicke, B.P., ed., Basin and range extensional tectonics near the latitude of Las Vegas, Nevada: Geological Society of America Memoir176, p. 123-154.<br><br>#2845 dePolo, C.M., 1998, A reconnaissance technique for estimating the slip rate of normal-slip faults in the Great Basin, and application to faults in Nevada, U.S.A.: Reno, University of Nevada, unpublished Ph.D. dissertation, 199 p.<br><br>#288 Dohrenwend, J.C., Menges, C.M., Schell, B.A., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Las Vegas 1° by 2° quadrangle, Nevada, California, and Arizona: U.S. Geological Survey Miscellaneous Field Studies Map MF-2182, 1 sheet, scale 1:250,000. |