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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.

Curlew Valley faults (Class A) No. 3504

Last Review Date: 2010-10-27

Compiled in cooperation with the Idaho Geological Survey

citation for this record: **Machette, M.N., compiler, 2010, Fault number 3504, Curlew Valley faults, 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 02:51 PM.**

Synopsis	This northeast-trending group of en echelon faults form the range-bounding structure along the southwestern margin of the North Promontory Range (also known as the North Hansel Mountains in Utah). The faults form basinward-facing scarps on middle to late Pleistocene alluvial-fan deposits and lacustrine deposits of Lake Bonneville. Holocene movement is probable on most of the faults because they displace seemingly young (but undated) lacustrine deposits. No morphometric analyses or detailed investigations have been conducted, but these faults are inferred to have very low slip rates and long recurrence intervals.
Name	An unpublished name is applied here to a group of subparallel

comments	faults on the eastern margin of Curlew Valley in southernmost Idaho. These faults, which continue 60-65 km farther north with pre-Quaternary movement. Witkind (1975 #320) descriptively referred to the fault as "East side of Arbon Valley." The informal local name (Curlew Valley) is preferred due to a lack of evidence for Quaternary movement along the northern two-thirds of the fault on the east margin of Arbon Valley. The Quaternary faults, as mapped by Allmendinger (1983 #5153), extend from Ireland Canyon on the north, southward to the Idaho/Utah border (and possibly farther). The faults form a left-stepping echelon pattern and consist of four main strands and a fifth inferred basinward strand (on the south end). **Fault ID:** Coincident with the southern part of fault 59 of Witkind (1975 #320).
County(s) and State(s)	ONEIDA COUNTY, IDAHO
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* The faults are shown on the 1:24,000-scale geologic map of the North Hansel Mountains (North Promontory Range) of Allmendinger (1983 #5153). Fault traces were further constrained by satellite imagery and topography at scale of 1:100,000. Reference satellite imagery is ESRI_Imagery_World_2D with a minimum viewing distance of 1 km (1000 m).
Geologic setting	Curlew Valley contained a northern arm of Lake Bonneville, which intermittently occupied northern Utah and parts of northeastern Nevada and southern Idaho during pluvial climates in the Pleistocene. The lake?s most recent deep-water phase is the Bonneville cycle (marine-isotope stage II), which persisted from about 30-12 ka, and deposited a thick mantle of lake-bottom sediment (mainly silt, unit Qlb of Allmendinger, 1983 #5153). Shoreline deposits include spits, bars, and deltaic complexes at various levels. Allmendinger (1983 #5153) mapped these lacustrine deposits of Lake Bonneville (unspecified lake cycle) at three levels, but it is unclear if they are all related to the most recent (latest Pleistocene, marine-isotope stage II) deep-water

	cycle. All of the deposits lie at or below the highest shoreline (Bonneville, 5,100-5,300 ft in Utah), and thus are probably latest Pleistocene in age, although they could be related to a previous deep-water cycle, such as the Little Valley, which is generally considered to be marine-isotope stage VI (>130 ka). Cress (1983 #6541) considered the lacustrine deposits to be from the most recent cycle of Lake Bonneville, and thus restricted them to being younger than about 12 ka.
Length (km)	20 km.
Average strike	N31°E
Sense of movement	Normal *Comments:* All are shown as down-to-the-basin normal faults by Allmendinger (1983 #5153).
Dip Direction	NW *Comments:* Scarps are generally north to northeast trending, and concave to the west.
Paleoseismology studies	
Geomorphic expression	Scarps as much as 24-m high along the four main strands define the fault trace (Cress, 1983 #6541). Scarps of such large size are certainly the product of multiple (5-10 or more) faulting events, which brings into question that age of the faulted Lake Bonneville deposits. In addition, the faults tilt and deform shorelines of Lake Bonneville at altitudes between 1,500 m (4,600 ft) and 1,700 m (5,150 ft) in five areas (Cress, 1983 #6541).
Age of faulted surficial deposits	The faults cut alluvial-fan and lacustrine deposits that are perhaps middle Pleistocene but more likely late Pleistocene in age. Most of the fault scarps lie below 5,200-ft elevation, whereas the highest shorelines of Lake Bonneville (about 15 ka) range from 5,100-5,300 ft depending on the amount of hydrostatic rebound that has occurred at any given location. At many locations, the presence of faults in lacustrine deposits below 4,800-ft elevation suggests displacement of Provo (shoreline) level deposits, which are generally 11-14.5 ka.
Historic	

earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Repeated late Quaternary movement is certain, and latest Quaternary (<15 ka) movement is likely due to the altitude of faulted lacustrine deposits of Lake Bonneville. Cress (1983 #6541) reports movement that is less than 11 ka, and maybe as young as 2 ka. No morphometric analyses or detailed investigations have been conducted, thus the time of the most recent paleoevent is poorly constrained.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Low slip rate is suggested by rates of slip on similar faults in the region. However, the presence of large (24-m-high) scarps on deposits that are of reported latest Pleistocene age (Cress, 1983 #6541) suggests a much higher slip rates or the presence of older faulted deposits. No dating of the faulted deposits has been conducted, thus the low probable slip rates are considered more likely.
Date and Compiler(s)	2010 Michael N. Machette, U.S. Geological Survey, Retired
References	#5153 Allmendinger, R.W., 1983, Geologic map of the North Hansel Mountains, Idaho and Utah: U.S. Geological Survey Miscellaneous Field Studies Map MF-1643, 1 sheet, scale 1;24,000. #6541 Cress, L.D., 1983, Late Quaternary faulting and earthquake hazard in Curlew Valley, southern Oneida County, Idaho, and northern Box Elder County, Utah: Geological Society of America Abstracts with Programs, v. 15, no. 5, p. 376. #320 Witkind, I.J., 1975, Preliminary map showing known and suspected active faults in Idaho: U.S. Geological Survey Open-File Report 75-278, 71 p. pamphlet, 1 sheet, scale 1:500,000.