

# 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 syncline southwest of Carbondale (Class B) No. 2332

Last Review Date: 1998-03-05

## Compiled in cooperation with the Colorado Geological Survey

*citation for this record:* Kirkham, R.M., and Widmann, B.L., compilers, 1998, Fault number 2332, unnamed syncline southwest of Carbondale, 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 03:00 PM.

### Synopsis

This unnamed, east-west-trending synclinal sag lies within the Carbondale collapse center east of the Grand Hogback monocline. It is on the north side of the Roaring Fork River near the mouth of Crystal Spring Creek, southwest of Carbondale. The sag is interpreted to result from flowage and dissolution of evaporite from beneath the area. Middle and early (?) Pleistocene outwash gravel and overlying 620 ka Lava Creek B ash and undivided Pleistocene "older" alluvium and colluvium are deformed by this structure (Kirkham and others, 1997 #2710). There have not been any detailed studies conducted on this structure. In as much as the

	faulting may be aseismic (salt related), we considered this to be Class B structure.
<b>Name comments</b>	Named unnamed synclinal fold southwest of Carbondale by Widmann and others (1998 #3441), herein shorted to "unnamed syncline southwest of Carbondale." This unnamed structure is a northwest-southeast-trending synclinal sag southwest of Carbondale and the Crystal River. The sag lies within the Carbondale collapse center and is related to flowage and dissolution of evaporite from beneath the area (Kirkham and others, 1997 #2710).  <b>Fault ID:</b> Fold # Qf3 of Widmann and others (1998 #3441).
<b>County(s) and State(s)</b>	GARFIELD COUNTY, COLORADO
<b>Physiographic province(s)</b>	SOUTHERN ROCKY MOUNTAINS
<b>Reliability of location</b>	Good Compiled at 1:250,000 scale.  <i>Comments:</i> This synclinal sag was mapped at a scale of 1:24,000 by Kirkham and Widmann (1997 #2711).
<b>Geologic setting</b>	This unnamed, east-west-trending synclinal sag lies within the Carbondale collapse center, which is reported to have experienced significant Neogene collapse due to flowage and dissolution of evaporite deposits from beneath the area (Kirkham and Widmann, 1997 #2711). The area is underlain by at least 900 m of evaporite deposits (Mallory 1966 #2720). The sag created a prominent, elongate depression on a middle and early (?) Pleistocene outwash terrace; the 620 ka Lava Creek B ash and overlying "older" alluvium and colluvium were deposited within the depression and subsequently deformed by later movement on the synclinal sag (Kirkham and Widmann, 1997 #2711). Several sink holes in the depression are associated with the sag.
<b>Length (km)</b>	3 km.
<b>Average strike</b>	N25°W
<b>Sense of movement</b>	Syncline  <i>Comments:</i> Syncline trends northwest; limbs dip to the southwest

	and northeast.
<b>Dip Direction</b>	SW; NE
<b>Paleoseismology studies</b>	
<b>Geomorphic expression</b>	An elongate, subdued, partially sediment-filled depression marks this unnamed synclinal sag (Kirkham and Widmann, 1997). Several sink holes occur in the depression associated with the sag.
<b>Age of faulted surficial deposits</b>	Middle and early (?) Pleistocene outwash gravels and overlying 620 ka Lava Creek B ash and Pleistocene "older" alluvium and colluvium are deformed by this synclinal sag (Kirkham and Widmann, 1997 #2711).
<b>Historic earthquake</b>	
<b>Most recent prehistoric deformation</b>	middle and late Quaternary (<750 ka) <i>Comments:</i> Deformation of middle and early (?) outwash gravels, Lava Creek B ash, and overlying Pleistocene alluvium and colluvium suggests movement on this synclinal sag during the past 620 ka (Kirkham and Widmann, 1997 #2711).
<b>Recurrence interval</b>	
<b>Slip-rate category</b>	Less than 0.2 mm/yr <i>Comments:</i> Widmann and others (1998 #3441) placed this anticline within the <0.2 mm/yr uplift-rate category.
<b>Date and Compiler(s)</b>	1998 Robert M. Kirkham, Colorado Geological Survey Beth L. Widmann, Colorado Geological Survey
<b>References</b>	#2711 Kirkham, R.M., and Widmann, B.L., 1997, Geologic map of the Carbondale quadrangle, Garfield County, Colorado: Colorado Geological Survey Open-File Report 97-3.  #2710 Kirkham, R.M., Streufert, R.K., Scott, R.B., Lidke, D.J., Bryant, B., Perry, W.J., Kunk, M.J., Driver, N.E., and Bauch, N.J., 1997, Active salt dissolution and resulting geologic collapse in the Glenwood Springs region of west-central Colorado: Active Salt Dissolution and Resulting Geologic Collapse in the

Glenwood Springs Region of West-central Colorado, v. 29, no. 6, p. A-416.

#2720 Mallory, W.W., 1966, Cattle Creek anticline, a salt diapir near Glenwood Springs, Colorado: U.S. Geological Survey Professional Paper 550-B, 12-15 p.

#3441 Widmann, B.L., Kirkham, R.M., and Rogers, W.P., 1998, Preliminary Quaternary fault and fold map and database of Colorado: Colorado Geological Survey Open-File Report 98-8, 331 p., 1 pl., scale 1:500,000.

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