

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](#).

Cattle Creek anticline (Class B) No. 2293

Last Review Date: 1998-01-23

Compiled in cooperation with the Colorado Geological Survey

citation for this record: Kirkham, R.M., and Widmann, B.L., compilers, 1998, Fault number 2293, Cattle Creek anticline, 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 03:02 PM.

Synopsis

The Cattle Creek anticline is the anticlinal flexure on the upper (eastern) limb of the Grand Hogback monocline. The anticline is a Laramide structure that has been locally enhanced by Neogene and Quaternary diapirism associated with Pennsylvanian evaporitic rocks. The axis of the Laramide anticline follows the Roaring Fork Valley from Glenwood Springs to near Carbondale and then turns up the Crystal River Valley. The axial crest of the Quaternary diapiric anticline generally follows the Laramide axis, but it apparently terminates near Carbondale (Kirkham and others, 1996 #3465; Kirkham 1997 #2705; Kirkham and Widmann, 1997 #2711). Outwash terraces as young as Pinedale are tilted away from the fold axis, and pre-Bull Lake debris-flow deposits at the

	<p>mouth of Fourmile Creek are uparched at least 30 m (Kirkham and others (1995 #2708; Kirkham 1997 #2780; Kirkham,1997 #2705). In as much as the faulting may be salt related, we consider this to be a Class B structure. There have not been any detailed studies conducted on this structure.</p>
Name comments	<p>The Cattle Creek anticline is on the eastern limb of the Grand Hogback monocline. The fold axis generally follows the Roaring Fork River Valley south from Glenwood Springs to Carbondale, then extends up the Crystal River south from Carbondale. The Cattle Creek anticline was recognized as a diapiric feature by Mallory (1966 #2720).</p> <p>Fault ID: Fold number Qf2 of Widmann and others (1998 #3441).</p>
County(s) and State(s)	GARFIELD COUNTY, COLORADO
Physiographic province(s)	SOUTHERN ROCKY MOUNTAINS
Reliability of location	<p>Good Compiled at 1:250,000 scale.</p> <p><i>Comments:</i> The Laramide axis of the Cattle Creek anticline was mapped at a scale of 1:24,000 by Kirkham and others (1995 #2708; 1996 #3465; 1997 #2709) and Kirkham and Widmann (1997 #2711). The axis of the Quaternary diapiric anticline, which is used herein as the fold trace, was mapped by Kirkham and Widmann (1997 #2711).</p>
Geologic setting	<p>The Laramide-age Cattle Creek anticline is the anticlinal flexure on the upper (eastern) limb of the Grand Hogback monocline. The fold was reactivated during the Neogene and Quaternary by diapiric uparching due to flowage of underlying Pennsylvanian evaporitic rocks (Kirkham, 1997 #2705; Kirkham and Widmann,1997 #2711). The region is underlain by at least 900 m of evaporite deposits (Mallory, 1966 #2720)</p>
Length (km)	9 km.
Average strike	N33°W
Sense of movement	Anticline

	<i>Comments:</i> This anticline trends northwest; its limbs dip northeast and southwest.
Dip Direction	Unknown
Paleoseismology studies	
Geomorphic expression	Quaternary diapirism on the Cattle Creek anticline has caused outwash terraces and locally overlying debris-flow deposits to tilt away from the anticline's axis (Kirkham and others, 1996 #3465; 1997 #2708; Kirkham, 1997 #2705; Kirkham and Widmann, 1997 #2711).
Age of faulted surficial deposits	Pennsylvanian bedrock, Miocene basalt flows, and various Quaternary deposits have been folded by the Cattle Creek anticline. Bull Lake deposits (late middle Pleistocene) locally dip as much as 12° away from the fold axis (Kirkham and others, 1996 #3465); pre-Bull Lake debris-flow deposits at the mouth of Fourmile Creek have been uparched a minimum of 30 m (Kirkham, 1997 #2705; Kirkham and others, 1997 #2708); and Pinedale outwash terraces are slightly tilted away from the fold axis (Kirkham and others, 1996 #3465; Kirkham and Widmann, 1997 #2711).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) <i>Comments:</i> Because late Pinedale outwash terraces are slightly folded by diapirism along the crest of the Cattle Creek anticline (Kirkham and others, 1996 #3465), the most recent movement on this structure is probably post glacial; however, definitive folding of Holocene deposits has not been substantiated.
Recurrence interval	
Slip-rate category	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.
Date and Compiler(s)	1998 Robert M. Kirkham, Colorado Geological Survey Beth L. Widmann, Colorado Geological Survey

References

#2705 Kirkham, B., 1997, Late Tertiary and Quaternary collapse related to dissolution and flowage of Pennsylvanian evaporitic rocks in the Glenwood Springs area, Colorado, *in* McCalpin, J.P., ed., Active geologic environment of central Colorado, Aspen-Glenwood Springs-Silt, Colorado: Friends of the Pleistocene, Rocky Mountain Cell, September 12-14, 1997, Field guidebook.

#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.

#2708 Kirkham, R.M., Streufert, R.K., and Cappa, J.A., 1995, Geologic map of the Glenwood Springs quadrangle, Garfield County, Colorado: Colorado Geological Survey Open-File Report 95-3.

#2709 Kirkham, R.M., Streufert, R.K., and Cappa, J.A., 1997, Geologic map of the Glenwood Springs quadrangle, Garfield County, Colorado: Colorado Geological Survey Map Series 31.

#3465 Kirkham, R.M., Streufert, R.K., Hemborg, T.H., and Stelling, P.L., 1996, Geologic map of the Cattle Creek quadrangle, Garfield County, Colorado: Colorado Geological Survey Open-File Report 96-1.

#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.

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