

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](#).

Gallina fault (Class A) No. 2001

Last Review Date: 2015-12-11

Compiled in cooperation with the New Mexico Bureau of Geology & Mineral Resources

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Synopsis	The Gallina fault, which forms the western margin of the Gallina-Archuleta arch, is a high-angle to nearly vertical normal fault (Baltz, 1967 #1167; Woodward, 1987 #1130; Woodward and others, 1992 #7628). There is no documented geologic evidence for Quaternary activity along the Gallina fault, although the spatial coincidence of diffuse contemporary microseismicity within the Gallina-Archuleta arch suggests that the Gallina fault may be active (Wong and others, 1995 #1155; House and Hartse, 1995 #1160).
Name comments	The Gallina fault is along the northern extension of the Nacimiento fault [2002] (Manley and others, 1987 #1119;

	Woodward, 1987 #1130) and extends from the northern end of the Sierra Nacimiento, 7 km northeast of Regina, to about 5 km south of El Vado Reservoir. Woodward and others (1992 #7628) used the name “Tierra Montañosa fault” for the northern 10 km, but the name “Gallina fault” has subsequently been applied to its entire trace (House and Hartse, 1995 #1160).
County(s) and State(s)	RIO ARRIBA COUNTY, NEW MEXICO
Physiographic province(s)	COLORADO PLATEAUS
Reliability of location	Good Compiled at 1:24,000 scale. <i>Comments:</i> Original fault location based on map compilation at a scale of 1:250,000 by Manley and others (1987 #1119); location improved by more detailed (1:24,000) geologic maps addressing some of the fault (Woodward and others, 1976 #7290; Crouse and others, 1992 #7289) combined with accurate placement using photogrammetric methods.
Geologic setting	The Gallina-Archuleta arch separates the Chama Basin and the San Juan Basin (Baltz, 1967 #1167; Woodward, 1987 #1130). The arch formed during Laramide deformation and likely was reactivated during Miocene formation of the Rio Grande rift (Woodward, 1987 #1130). Wong and others (1995 #1155) and House and Hartse (1995 #1160) noted that the Gallina-Archuleta arch is spatially coincident with contemporary seismicity, which may represent late Quaternary reactivation of the Laramide structure.
Length (km)	39 km.
Average strike	N17°E
Sense of movement	Normal <i>Comments:</i> Manley and others (1987 #1119) and Woodward (1987 #1130) show the fault as a high-angle normal fault. Crouse and others (1992 #7628) mapped right-lateral slip in the French Mesa quadrangle apparently based on the juxtaposition of Triassic and Jurassic strata.
Dip Direction	E; W

	<p><i>Comments:</i> There are no deep structural data published for the Gallina fault. Manley and others (1987 #1119) map a linear fault trace across rugged topography, suggesting high-angle fault strands. The southern 20 km of the fault dips to the west (Woodward and others, 1992 #7628).</p>
Paleoseismology studies	
Geomorphic expression	<p>The southern part of the fault lies along the west-facing western margin of Capulin Mesa. If there is an absence of Quaternary activity, the escarpment along the mesa margin likely is related to differential erosion of less resistant rocks on the western side of the fault.</p>
Age of faulted surficial deposits	<p>Youngest faulted bedrock is Cretaceous in age, but there are no Tertiary units mapped across the fault (Manley and others, 1987 #1119). There are little or no data on the presence or absence of displaced late Quaternary deposits. At the southern end of the fault, Manley and others (1987 #1119) mapped undisplaced gravel across the fault trace at Rio Capulin, but the gravel is considered to be of undifferentiated Quaternary age.</p>
Historic earthquake	
Most recent prehistoric deformation	<p>undifferentiated Quaternary (<1.6 Ma)</p> <p><i>Comments:</i> Timing of the most-recent event is unknown. Possible association with contemporary microseismicity suggests late Quaternary activity (Wong and others, 1995 #1155; House and Hartse, 1995 #1160).</p>
Recurrence interval	
Slip-rate category	<p>Less than 0.2 mm/yr</p> <p><i>Comments:</i> Low slip-rate category assigned based on lack of documented late Quaternary displacement.</p>
Date and Compiler(s)	<p>2015 Keith I. Kelson, William Lettis & Associates, Inc. Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources</p>

References

- #1167 Baltz, E.H., 1967, Stratigraphy and regional tectonic implications of part of Upper Cretaceous and Tertiary rocks east-central San Juan Basin New Mexico: U.S. Geological Survey Professional Paper 552, 99 p., 1 pl., scale 1:377,000.
- #7289 Crouse, D.L., Hultgren, M.C., and Woodward, L.A., 1992, Geology of French Mesa quadrangle, Rio Arriba County, New Mexico: New Mexico Bureau of Mines and Mineral Resources Geologic Map 67, 1 sheet, scale 1:24,000.
- #1160 House, L., and Hartse, H., 1995, Seismicity and faults in northern New Mexico, *in* Bauer, P.W., Kues, B.S., Dunbar, N.W., Karlstrom, K.E., and Harrison, B., eds., Geology of the Santa Fe region, New Mexico: New Mexico Geological Society, 46th Field Conference, September 27-30, 1995, Guidebook, p. 135–137.
- #1119 Manley, K., Scott, G.R., and Wobus, R.A., 1987, Geologic map of the Aztec 1° by 2° quadrangle, northwestern New Mexico and southern Colorado: U.S. Geological Survey Miscellaneous Investigations Map I-1730, 1 sheet, scale 1:250,000.
- #1155 Wong, I., Kelson, K., Olig, S., Kolbe, T., Hemphill-Haley, M., Bott, J., Green, R., Kanakari, H., Sawyer, J., Silva, W., Stark, C., Haraden, C., Fenton, C., Unruh, J., Gardner, J., Reneau, S., and House, L., 1995, Seismic hazards evaluation of the Los Alamos National Laboratory: Technical report to Los Alamos National Laboratory, Los Alamos, New Mexico, February 24, 1995, 3 volumes, 12 pls., 16 appen.
- #1130 Woodward, L.A., 1987, Geology and mineral resources of Sierra Nacimiento and vicinity, New Mexico: New Mexico Bureau of Mines and Mineral Resources Memoir 42, 84 p., 1 pl., scale 1:100,000.
- #7290 Woodward, L.A., Gibson, G.G., and McLelland, D., 1976, Geology of Gallina quadrangle, New Mexico: New Mexico Bureau of Mines and Mineral Resources Geologic Map 39, 1 sheet, scale 1:24,000.
- #7628 Woodward, L.A., Hultgren, M.C., Crouse, D.L., and Merrick, M.A., 1992, Geometry of Nacimiento-Gallina fault system, northern New Mexico, *in* Lucas, S.G., Kues, B.S., Williamson, T.E., and Hunt, A.P., eds., San Juan Basin IV: New Mexico Geological Society, 43rd Field Conference, Guidebook,

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