

Modified Mercalli Intensities

Enola Earthquake Swarm

Seismic Event: Magnitude 4.1

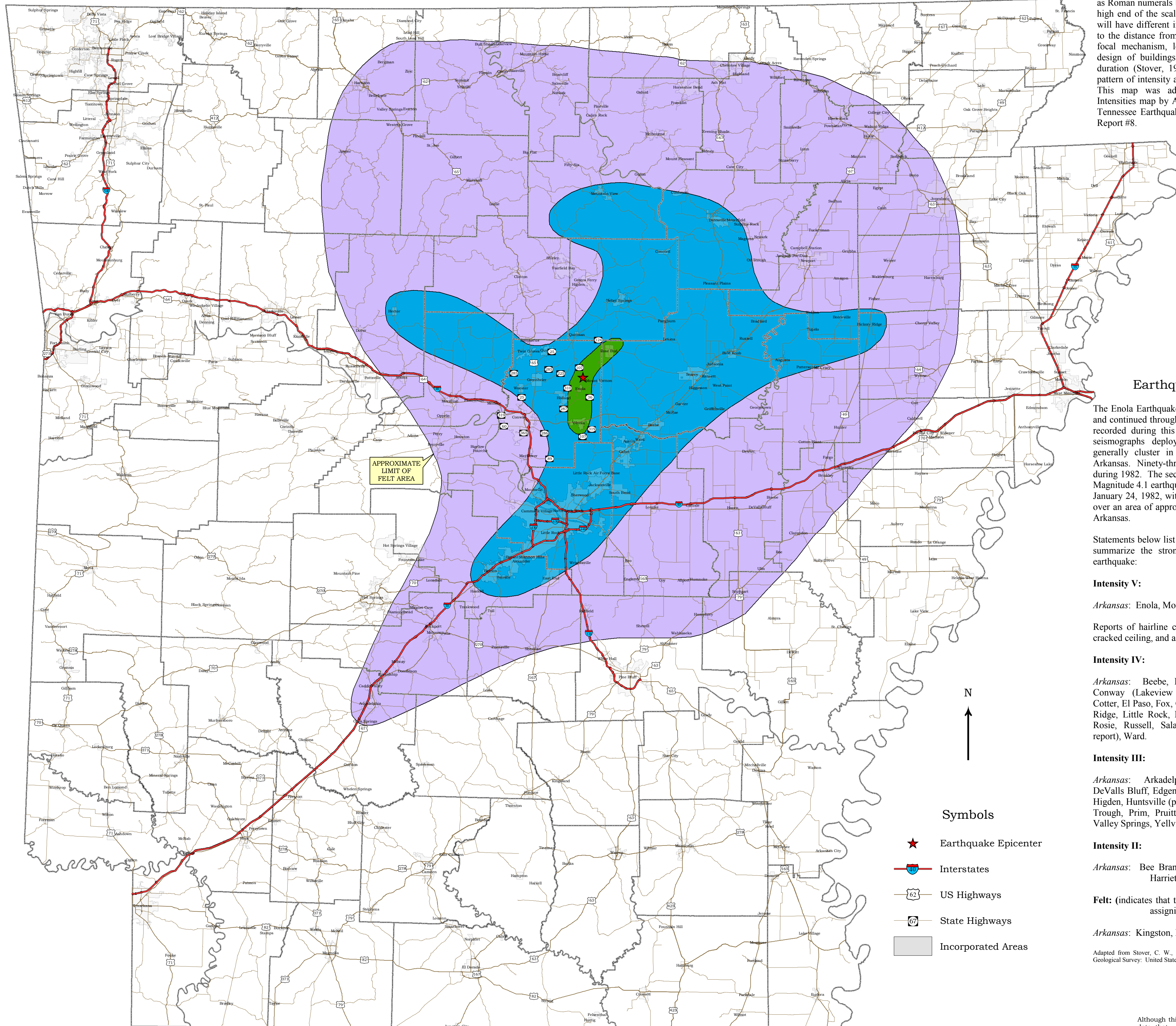
24 January 1982 @ 9:22 PM CST

About the Map

Intensity, as applied to earthquakes, represents a quantity determined from the effects on people, man-made objects, and the earth's surface. Intensities are assigned according to descriptions listed in the Modified Mercalli Intensity (MMI) Scale of 1931 (Wood and Newman, 1931). There were originally twelve discreet steps, but only ten are recognized by the United States Geological Survey (USGS) in the modern MMI scale. Intensity ratings are expressed as Roman numerals between I at the low end and X+ at the high end of the scale. An earthquake in a populated area will have different intensities at different localities, owing to the distance from the focus of the earthquake, type of focal mechanism, local geological conditions, structural design of buildings, and the earthquake magnitude and duration (Stover, 1985). MMI maps illustrate the areal pattern of intensity associated with individual earthquakes. This map was adapted from the Modified Mercalli Intensities map by Arch Johnson and Ann Metzger, in the Tennessee Earthquake Information Center (TEIC) Special Report #8.

Modified Mercalli Intensity Scale

- I** Not felt.
- II** Felt by persons at rest, on upper floors, or favorably placed.
- III** Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
- IV** Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing automobiles rock. Windows, dishes, doors rattle. Glasses clink. Crockery clashes. In the upper range of IV, wooden walls and frame creak.
- V** Felt outdoors; direction estimated. Sleepers awakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.
- VI** Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware break. Knickknacks, books and other items fall off shelves. Pictures fall off walls. Furniture moved or overturned. Weak plaster and *Masonry D* cracked. Small bells ring (church, school). Trees, bushes shaken (visibly, or heard to rustle).
- VII** Difficult to stand. Noticed by drivers of automobiles. Hanging objects quiver. Furniture broken. Damage to *Masonry D*, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices (also unbraced parapets and architectural ornaments). Some cracks in *Masonry C*. Waves on ponds; water turbid with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.
- VIII** Steering of automobiles affected. Damage to *Masonry C*; partial collapse. Some damage to *Masonry B*; none to *Masonry A*. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
- IX** General panic. *Masonry D* destroyed; *Masonry C* heavily damaged, sometimes with complete collapse; *Masonry B* seriously damaged, and damage to *Masonry A*. (General damage to foundations.) Frame structures, if not bolted, shifted off foundations. Frames racked. Serious damage to reservoirs and underground pipes broken. Conspicuous cracks in ground. In alluvial areas sand and mud ejected, earthquake fountains, sand craters.
- X+** Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly. **XI**. Rails bent greatly. Underground pipelines completely out of service. **XII**. Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.



Earthquake Description

The Enola Earthquake Swarm began on January 12, 1982, and continued throughout the year with over 19,000 events recorded during this period by a temporary network of seismographs deployed in the area. The epicenters generally cluster in an area near the town of Enola, Arkansas. Ninety-three events were felt by local residents during 1982. The second largest event of the swarm was a Magnitude 4.1 earthquake that occurred at 9:22 PM CST on January 24, 1982, with a maximum intensity of V and felt over an area of approximately 45,000 km² in north-central Arkansas.

Statements below list the reported intensities, locations and summarize the strongest effects of the Magnitude 4.1 earthquake:

Intensity V:

Arkansas: Enola, Mount Vernon, Rosebud, Vilonia.

Reports of hairline cracks in plaster walls, one report of cracked ceiling, and a few cracked (broken) windows.

Intensity IV:

Arkansas: Beebe, Black Rock, Bryant, Center Ridge, Conway (Lakeview Acres Subdivision-Press Report), Cotter, El Paso, Fox, Greenbrier, Hanover, Hector, Hickory Ridge, Little Rock, Marcella, Pangburn, Pleasant Grove, Rosie, Russell, Salado, Steprock, Sweet Home (press report), Ward.

Intensity III:

Arkansas: Arkadelphia, Austin, Cave City, Choctaw, DeValls Bluff, Edgemont, Fisher, Guion, Harrison, Hazen, Higden, Huntsville (press report), Mayflower, Menifee, Oil Trough, Prim, Pruitt, Romance, Shirley, Sulphur Rock, Valley Springs, Yellville.

Intensity II:

Arkansas: Bee Branch, Cotton Plant, Damascus, Desha, Harriet, Humphrey, Pleasant Plains.

Felt: (indicates that the available data is not sufficient for assigning an intensity value)

Arkansas: Kingston, Malvern, Wesley (press report).

Adapted from Stover, C. W., 1985, United States Earthquakes, 1982, United States Geological Survey: United States Geological Survey Bulletin 1655, 141 p.

Disclaimer

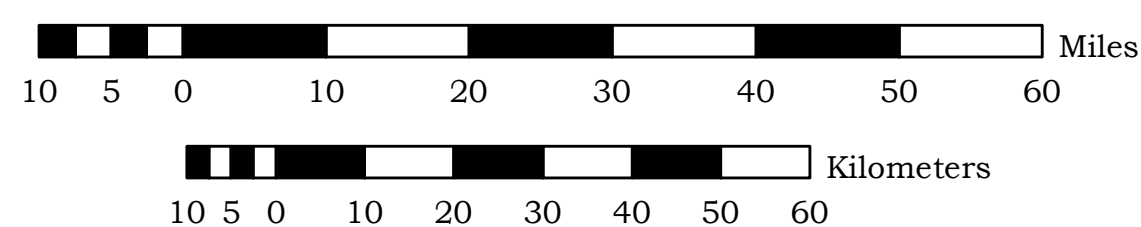
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The Feature Class Data used in the making of this map was acquired at the GeoStore online.

Symbols

- Earthquake Epicenter
- Interstates
- US Highways
- State Highways
- Incorporated Areas



INTENSITY	I	II	III	IV	V	VI	VII	VIII	IX	X+		
SHAKING	None	Weak	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme		
DAMAGE	None	None	None	None	Very Light	Light	Moderate	Moderate Heavy	Heavy	Very Heavy		
MAGNITUDE	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7+

References

- Association of Bay Area Governments (ABAG), On Shaky Ground, 2003, Retrieved January 28, 2008 from <http://www.abag.ca.gov/bayarea/eqmaps/doc/mmi.html>.
- Johnson, A., and Metzger, A., 1982, The Central Arkansas earthquake swarm—Part 1, 12th January to 12th July 1982: Tennessee Earthquake Information Center (TEIC), Special Report, no. 8, 84 p.
- Stover, C. W., 1985, United States Earthquakes, 1982, United States Geological Survey: United States Geological Survey Bulletin 1655, 141 p.
- Wood, H. O., and Neumann, Frank, 1931, Modified Mercalli Intensity Scale of 1931: Seismological Society of America Bulletin, v. 21, no.4, p. 277-283.

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