

787 EARTHQUAKES IN OKLAHOMA, 1990 THROUGH 1999

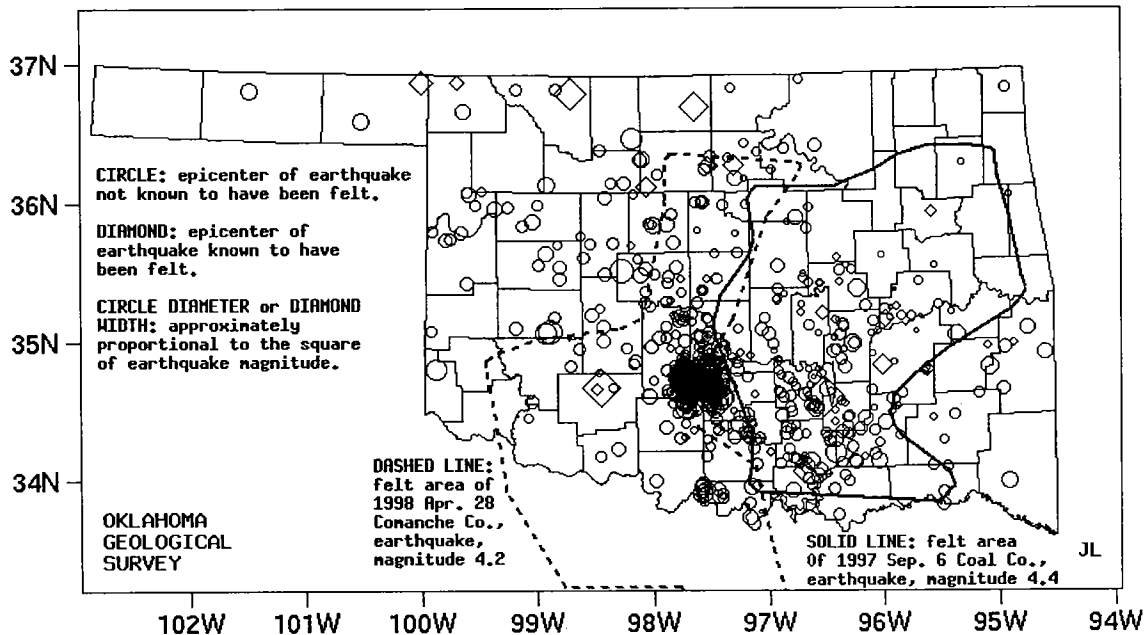


Figure 15 (question 46). Map showing 1990–1999 Oklahoma earthquake epicenters. Note the very large concentration of earthquakes near Pauls Valley. (Map by Jim Lawson, Oklahoma Geophysical Observatory.)

48. What causes Oklahoma's earthquakes?

Stress that gradually builds up within the North American plate.

Most earthquakes occur along the margins of the tectonic plates that make up the Earth's lithosphere (crust plus upper mantle). Oklahoma lies in the interior of the North American plate, which includes all of Canada and most of the U.S. and Mexico. The eastern edge of the North American plate is the mid-Atlantic ridge; the western edge is, in part, the San Andreas fault in California.

The North American plate is moving west-northwest about 1 to 2 inches per year. As it moves, stress builds up within the plate. This stress is relieved by small adjustments along pre-existing faults, most of which are very old. Because most of these faults are very deep and relative movement along them is small, most Oklahoma earthquakes are not felt by humans.

49. Is the occurrence of earthquakes influenced by the season? Time of day? Sunspots? Alignment of the planets? Earth tides?

No. These phenomena seem to have no effect on the stresses that build up over time in the Earth's crust and upper mantle.

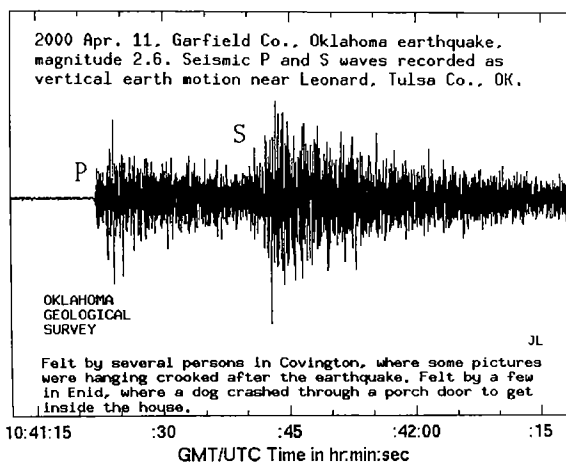


Figure 16 (question 47). Seismogram of April 11, 2000, earthquake centered in Garfield County, Oklahoma. GMT/UTC refers to Greenwich Mean Time/Coordinated Universal Time. GMT/UTC is six hours ahead of Central Standard Time (five hours ahead of Central Daylight Time). (Seismogram from Jim Lawson, Oklahoma Geophysical Observatory.)