Bulletin of seismic activity in Oklahoma for the month of September 2023

This bulletin details earthquake activity as analyzed by the Oklahoma Geological Survey for September 2023. During September, a total of 227 earthquakes including 28 quarry blasts (Figure 1), were detected and reviewed. That represents a decrease of 9 earthquakes as compared with the previous month, August 2023, during which 236 earthquakes were detected and reviewed. The cumulative number of earthquakes from January through September 2023 is 2312.

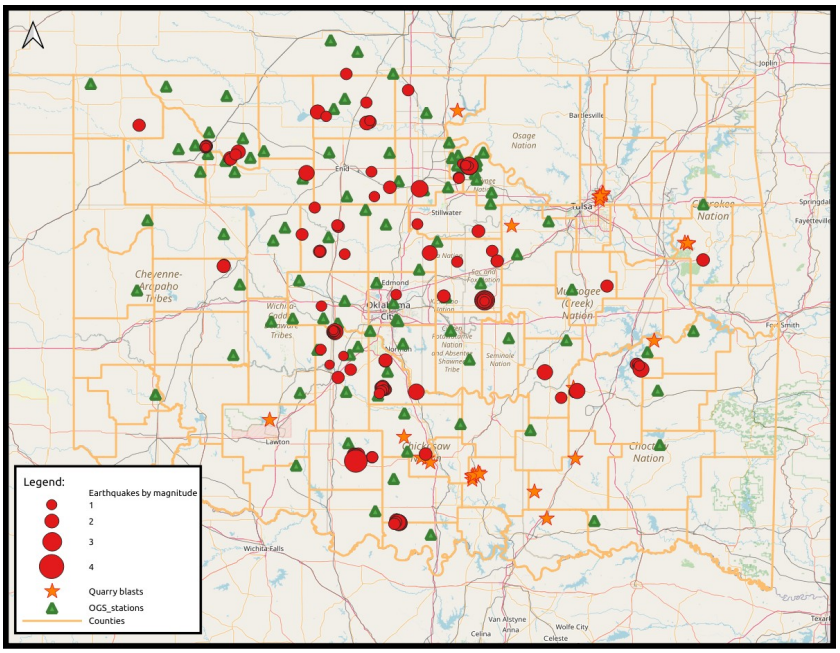

Figure 1. Epicenter Map of Earthquakes in Oklahoma during September 2023.

During September 2023, Stephens county recorded the most seismic activity with 36 earthquakes, followed by Grady county with 31 earthquakes. 38 out of 77 counties within the state have experienced at least 1 earthquake in September 2023 (Table 1).

The earthquake depths range from 0 to 21 km while the magnitudes fluctuate from 0.4 M_L to 3.7 M_L (Table 2). Excluding the quarry blasts that have a depth of 0, the average depth during this month is 7.34 km.

Earthquakes per Counties							
County	Earthquakes	County	Earthquakes	County	Earthquakes	County	Earthquakes
Alfalfa	5	Custer	2	Lincoln	17	Osage	1
Atoka	2	Garfield	1	Logan	3	Pawnee	14
Blaine	1	Garvin	22	Major	4	Payne	1
Bryan	1	Grady	31	McClain	2	Pittsburg	10
Canadian	2	Grant	6	Macintosh	1	Stephens	36
Carter	17	Harper	1	Murray	9	Tulsa	6
Cherokee	1	Hughes	2	Muskogee	3	Woods	2
Cleveland	1	Johnston	1	Noble	3	Woodward	6
Comanche	1	Kay	1	Oklahoma	3		
Creek	1	Kingfisher	6	Okmulgee	1		

Table 1. Table of earthquakes per county in Oklahoma during September 2023.

Number of Earthquakes per Magnitude range		
Magnitude range	Number of Earthquakes	Earthquake Effects
0 – 0.9	22	Usually not felt.
1 – 1.9	164	Usually not felt.
2 – 2.9	38	Often felt.
3 – 3.9	3	More likely to be felt

The largest earthquake that was recorded during August 2023 was in Stephens county and had a magnitude of 3.7 M_L.

Table 2. Number of earthquakes per magnitude in Oklahoma during September 2023.

For the most current information on earthquakes and other OGS-related news, visit: https://www.ou.edu/ogs.