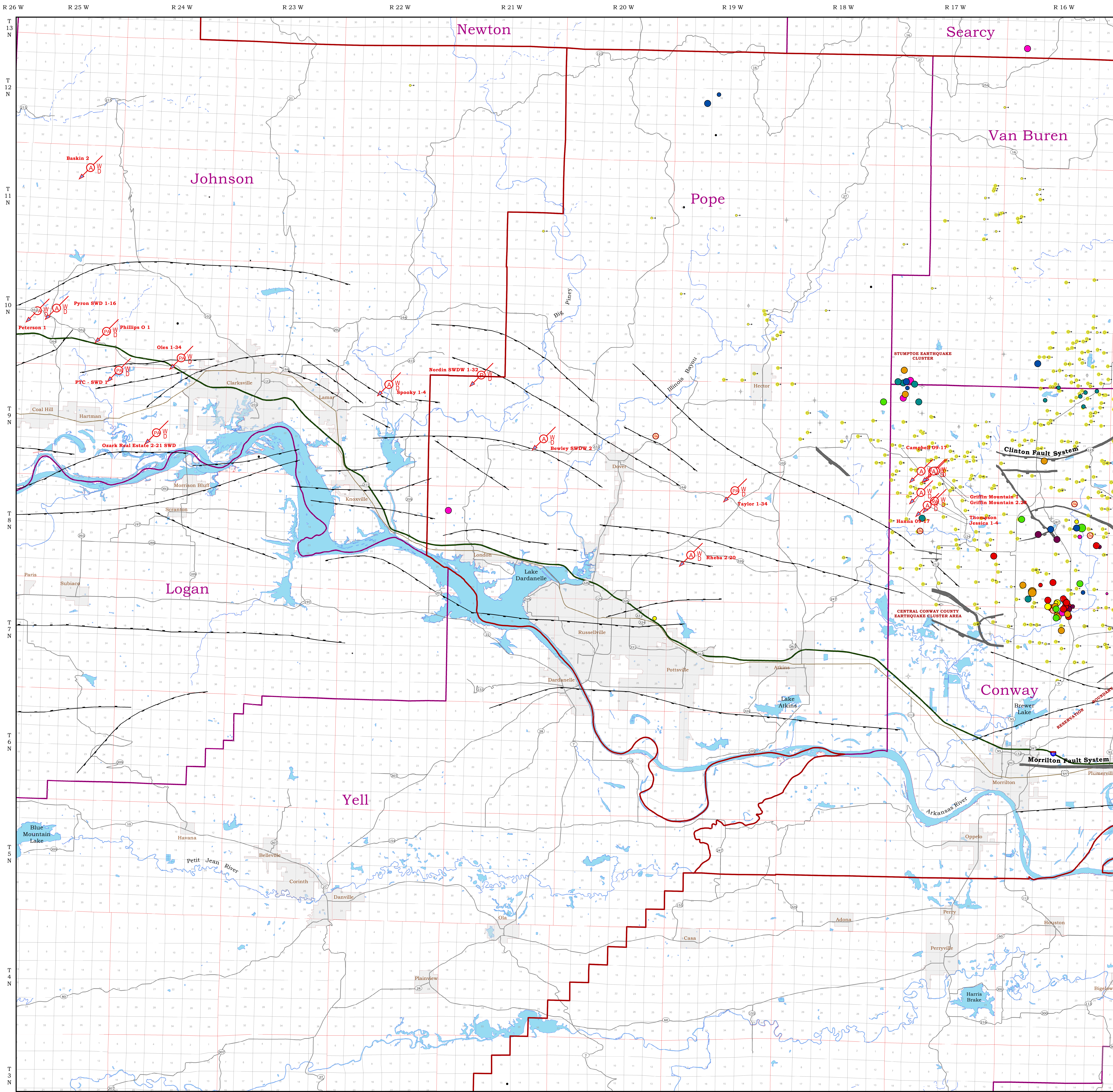


Compilation of Recent and Historic Earthquakes in the West Portion of the Fayetteville Shale Gas Play in North-Central Arkansas



About the Map

This map illustrates the location and magnitude of reported earthquakes that have occurred in the west portion of the Fayetteville Shale Play in north-central Arkansas. Earthquake epicenters in the area occur in scattered clusters (as delineated on the map). The earthquakes depicted on this map are derived from the Arkansas Geological Survey (AGS) earthquake catalog. This catalog has been compiled from various sources and publications (given below as references) and includes date, time, latitude, longitude, magnitude or intensity, and depth information. Some event records may contain incomplete data due to their date and/or source. The AGS earthquake catalog is dynamic and continually updated as event parameters are modified, new events are added and occasionally past events are deleted.

The faults depicted on the map represent a series west-to-east, northwest-to-southeast and east-to-northeast-trending subsurface normal faults. The majority of the faults are downthrown to the south and the amount of displacement varies along the length of the fault (but can be up to 2000 feet locally). The named fault systems represent a zone of single and multiple low to high-angle faults that typically form an en-echelon map pattern. In the subsurface, the high-angle faults extend up from the Precambrian basement up to the Mississippian-Pennsylvanian unconformity while the lower angle faults extend from that unconformity through the Pennsylvanian strata and may or may not reach the surface. In the Fayetteville Shale Play, the majority of the earthquakes appear to originate from the deeper Precambrian basement and lower Paleozoic faults; however earthquakes have also occurred along the shallower upper Paleozoic faults.

Earthquake Symbols (2008 to Present)		Historic Earthquakes (Prior to 2008)	
Depth	Magnitude	Magnitude	
● <1.9 km	○ <0.0	● 0 - 1.9	
● 2.0-2.9 km	○ 0.0 - 0.9	● 2.0 - 2.9	
● 3.0-3.9 km	○ 1.0 - 1.9		
● 4.0-4.9 km	○ 2.0 - 2.9		
● 5.0-5.9 km	○ 3.0 - 3.9		
● 6.0-6.9 km			
● 7.0-7.9 km			
● >8.0 km			

Disposal Wells		Gas Wells	
⊗ Expired	⊙ Permitted Well	⊙ Producing	⊙ Recently Completed
⊗ Active	⊙ Dry and Abandoned	⊙ Plugged	⊙ Shut In
⊗ Permitted	⊙ Temporarily Abandoned	⊙ Proposed Injection	
⊗ Plugged, Abandoned			

Map Symbols

- Interstate
- US HWY
- State HWY
- ⊙ Incorporated Areas
- ⊙ Water
- Arbez Subsurface Faults (teeth denotes downthrown side)
- AOGC, AGS Subsurface Faults (Fault thickness depicts amount of displacement and teeth denotes downthrown side)

References

Advanced National Seismic System (ANSS) earthquake database web page: URL: <http://earthquake.usgs.gov/monitoring/anss/>

Arbez, J.K., 1984, Generalized Geologic-Structural Map of the Ouachita Mountains and Arkhoma Basin, Oklahoma and Arkansas, 1 sheet.

Arbez, J.K., 2008, Structural framework of the Ouachita Mountains, in Stratigraphic and structural evolution of the Ouachita Mountains and Arkhoma Basin, southeastern Oklahoma and west-central Arkansas: Applications to petroleum exploration: 2004 field symposium: The Arbez-Mitch/Oles Volume, Oklahoma Geological Survey Circular 112-A, 40 p., Plate 2.

Center for Earthquake Research and Information (CERI) - New Madrid Earthquake Catalog: URL: http://folk.worn.cerl.memphis.edu/catalog/html/ca_t_nm.html

National Center for Earthquake Engineering Research (NCEER) - earthquake catalog for the central and eastern United States, 1627-1985. URL: http://folk.worn.cerl.memphis.edu/catalog/html/cat_nceer.html

St. Louis University (SLU) Earthquake Center web page: URL: <http://www.ca.slu.edu/eq/>

Tennessee Earthquake Information Center (TEIC) - succeeded by University of Memphis Center for Earthquake Research and Information (CERI) - taken from CERI New Madrid Earthquake Catalog. URL: http://www.cerl.memphis.edu/seismic/catalog/cas_nm.html

United States Geological Survey (USGS) Earthquake Notification Service (ENS).

Faults provided by the AOGC were compiled from integration dockets prepared by various geologists of the companies operating in the Fayetteville Shale Gas Play. URL: <http://www.aogc.state.ar.us>

Feature Class Data used in the making of this map was acquired online at: URL: <http://www.geostor.arkansas.gov>

Arkansas

Disclaimer

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The depicted earthquakes, faults and delineated seismic areas are for illustrative purposes and may or may not represent all seismically active faults and areas. The exact origin of the earthquakes depicted on this map may or may not correspond with named faults at the surface or in the subsurface that originate from other published sources.

