

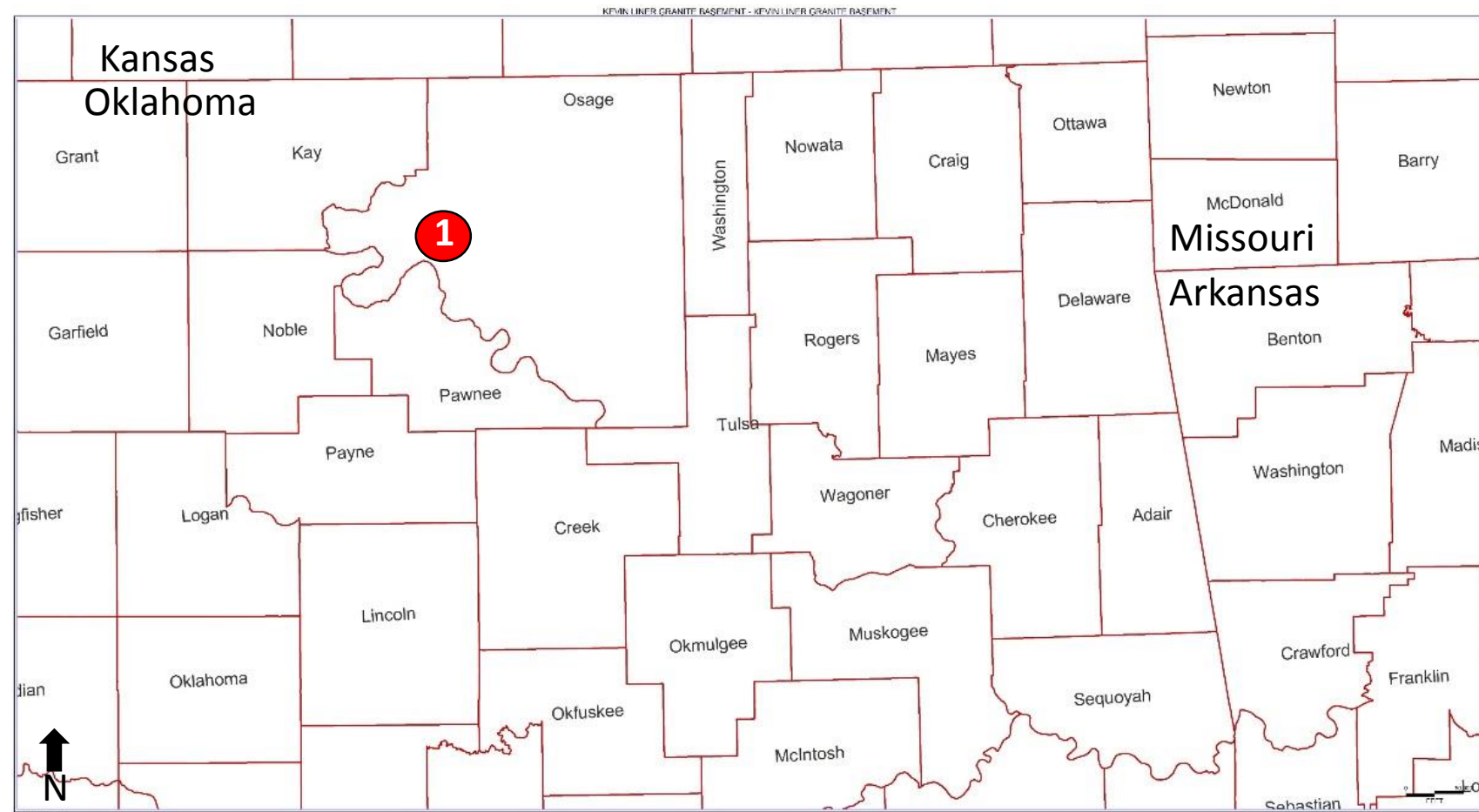
Study of Basement Rocks with Emphasis on Fractures with 3D Seismic and Well Logs in Osage County, Oklahoma

By

Kevin Liner

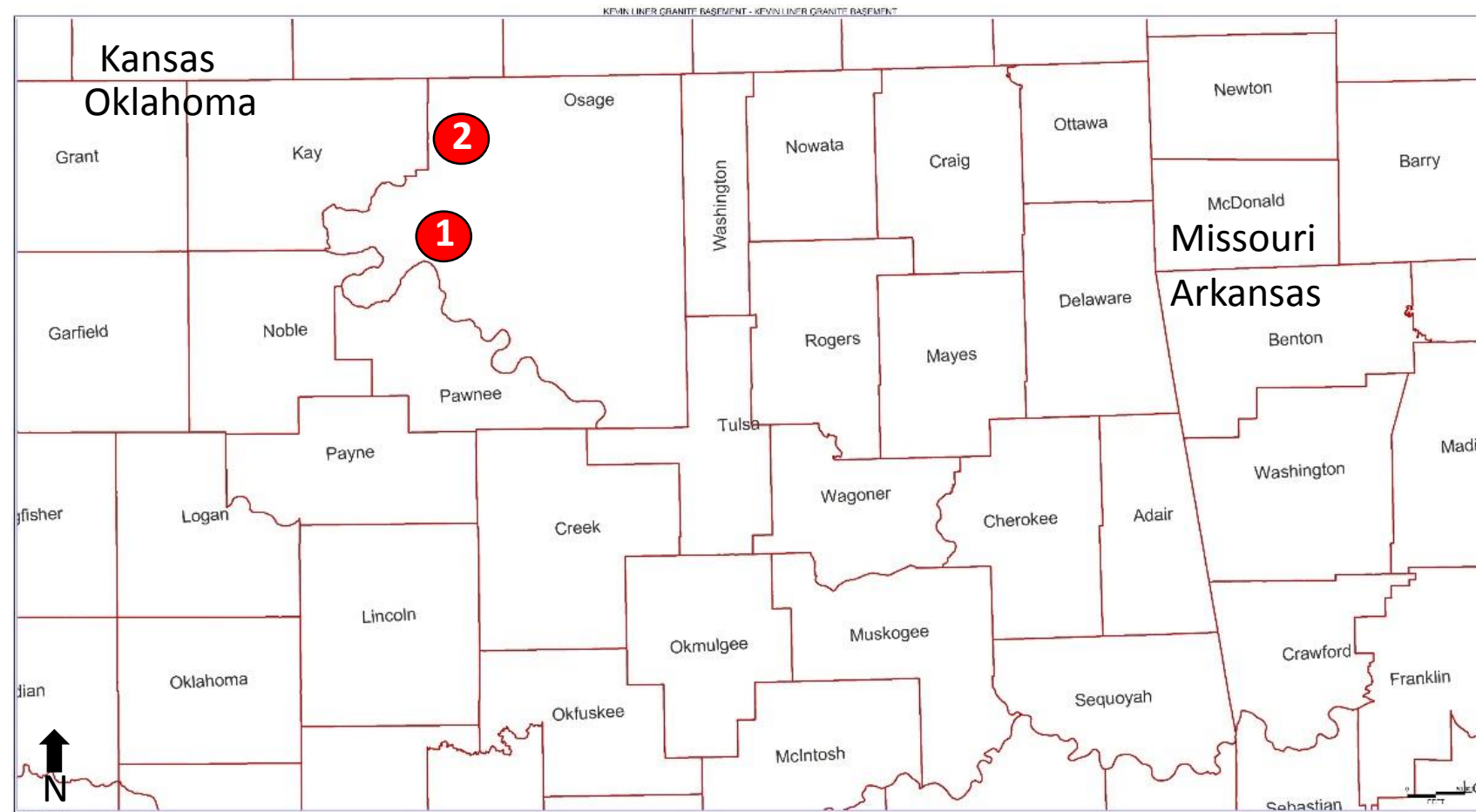
University of Arkansas

Study Area



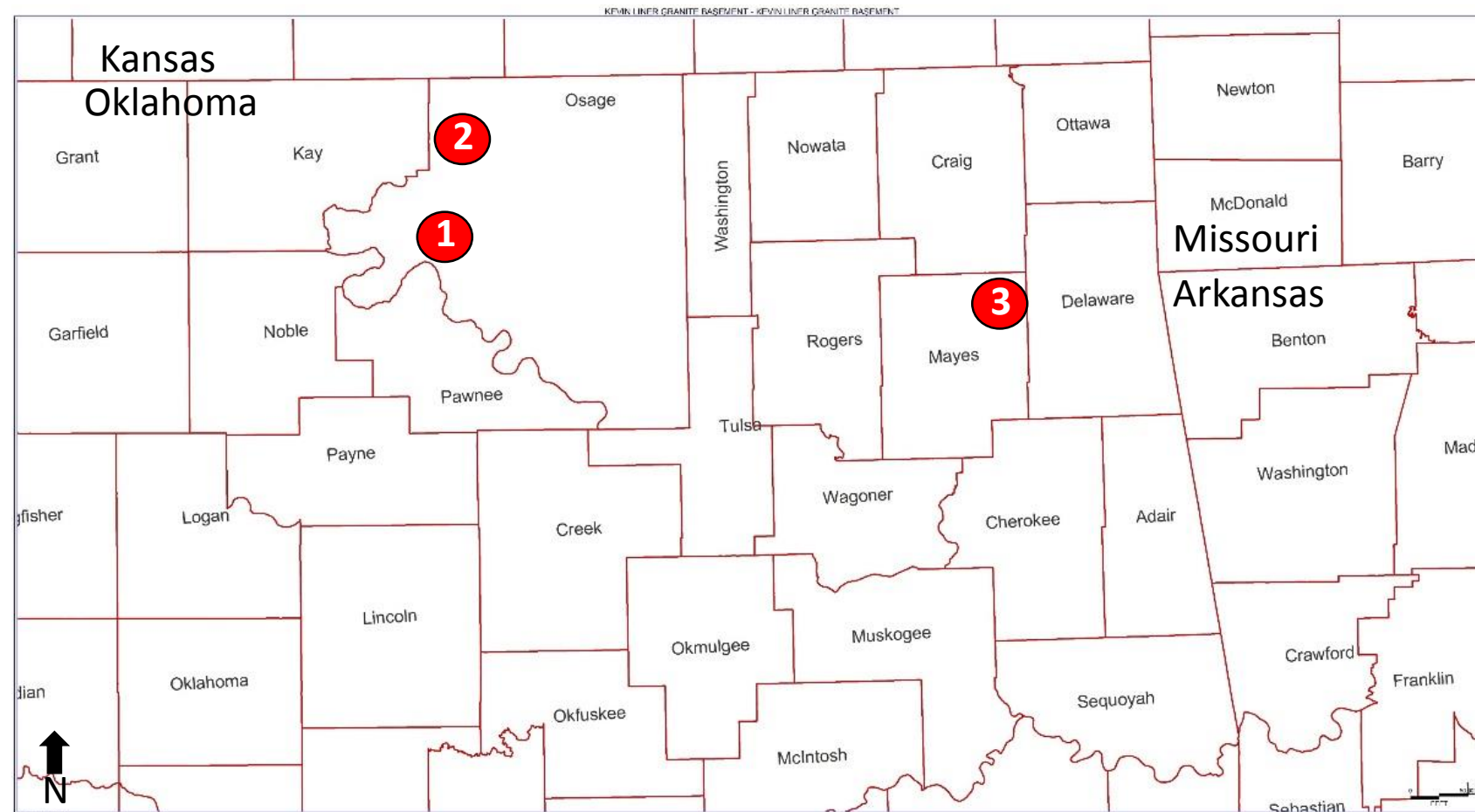
1. BIA- Wild Creek 3D
Chevron 1995
50 Square Miles

Study Area



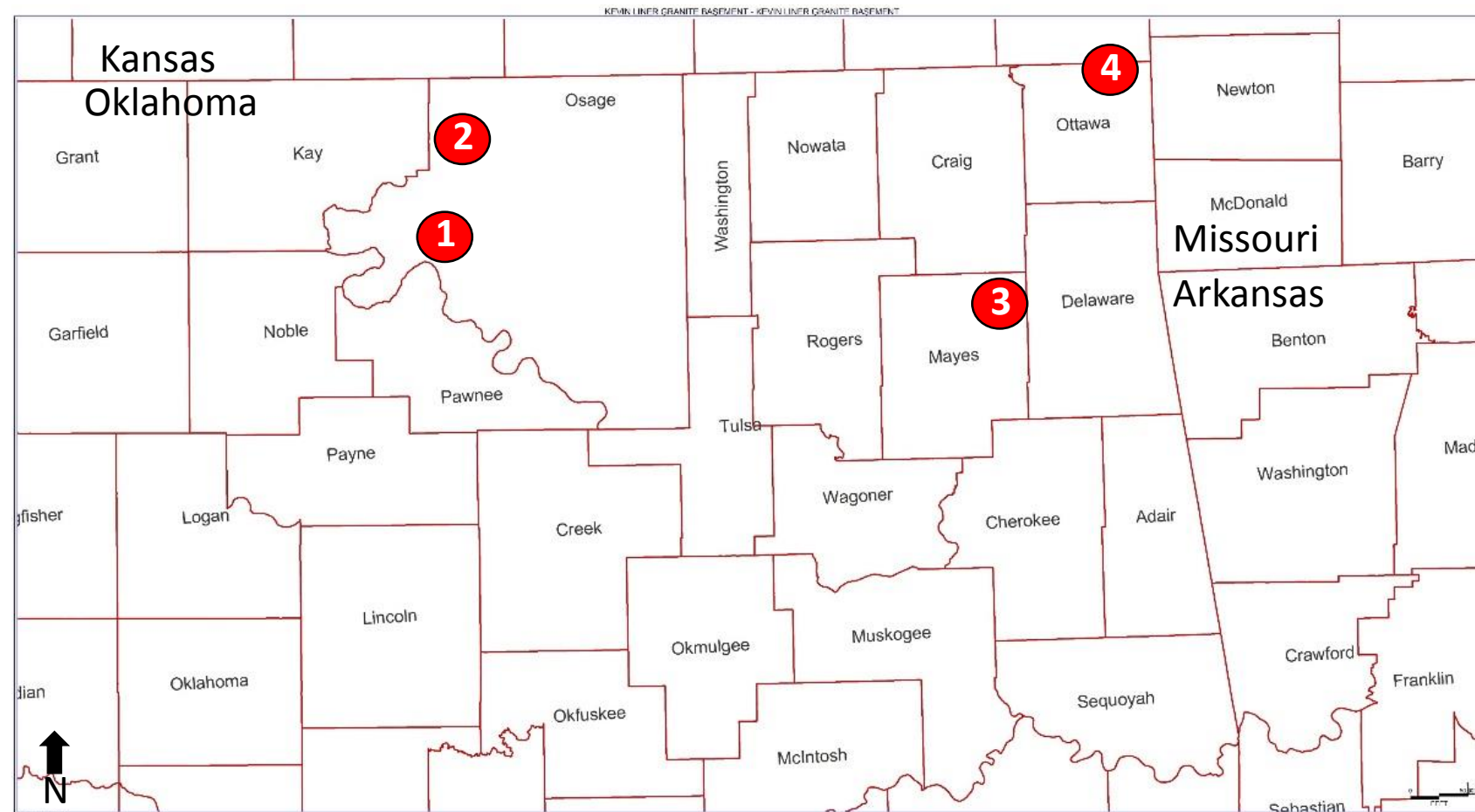
1. BIA- Wild Creek 3D
Chevron 1995
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Spy Glass Energy LLC 2012
TVD 8093 ft
4000 ft of granite

Study Area



1. BIA- Wild Creek 3D
Chevron 1995
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TVD 8093 ft
4000 ft of granite
3. Spavinaw Granite Outcrop
1.285 g.a. (Denison 1981)

Study Area

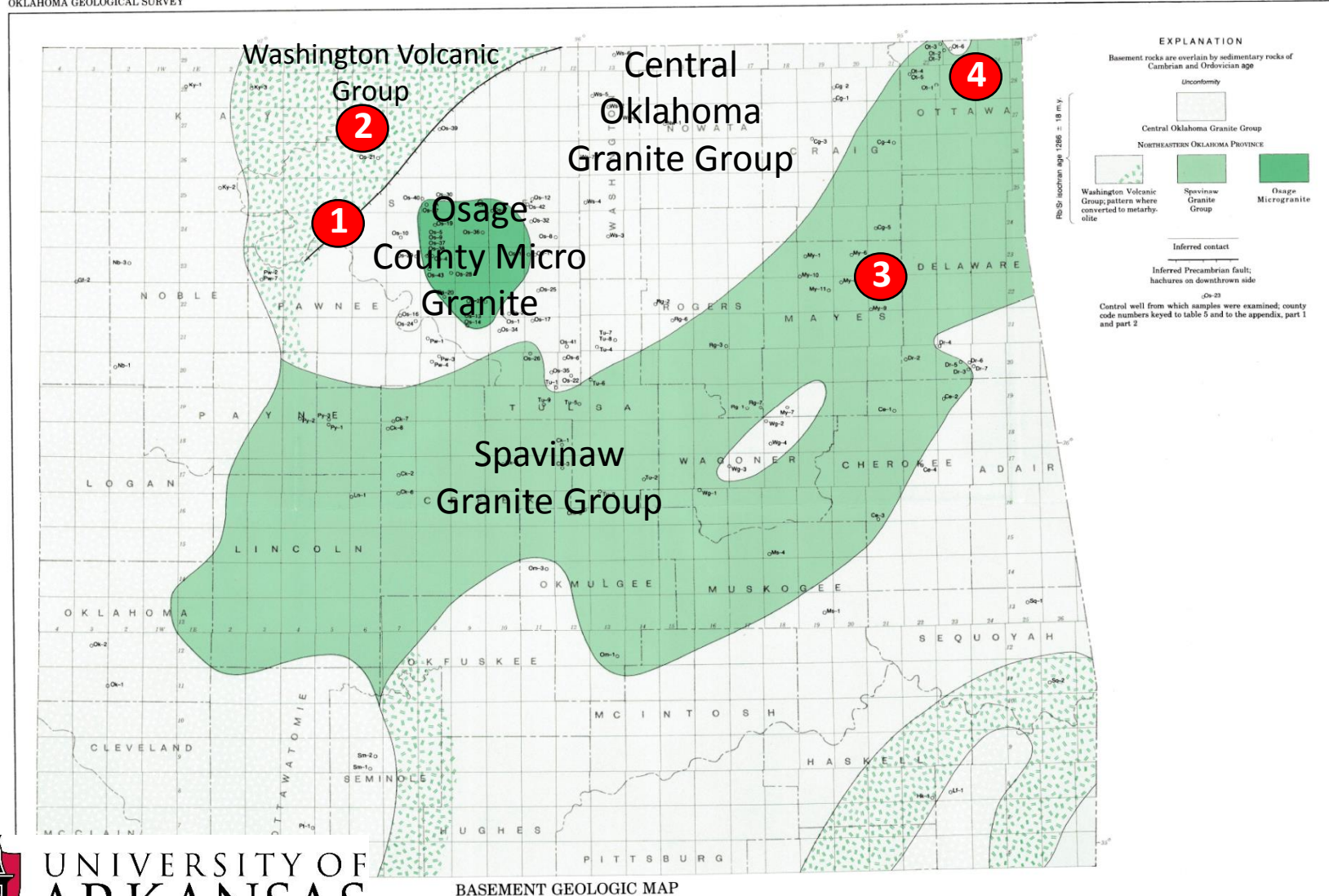


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Chevron 1995
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TVD 8093 ft
4000 ft of granite
3. Spavinaw Granite Outcrop
1.285 g.a. (Denison 1981)
4. Tri State Mining District
Lead zinc mining 1891-1967

Basement Rocks of NE Oklahoma

OKLAHOMA GEOLOGICAL SURVEY

CIRCULAR 84 BASEMENT ROCKS IN NORTHEASTERN OKLAHOMA PLATE 1



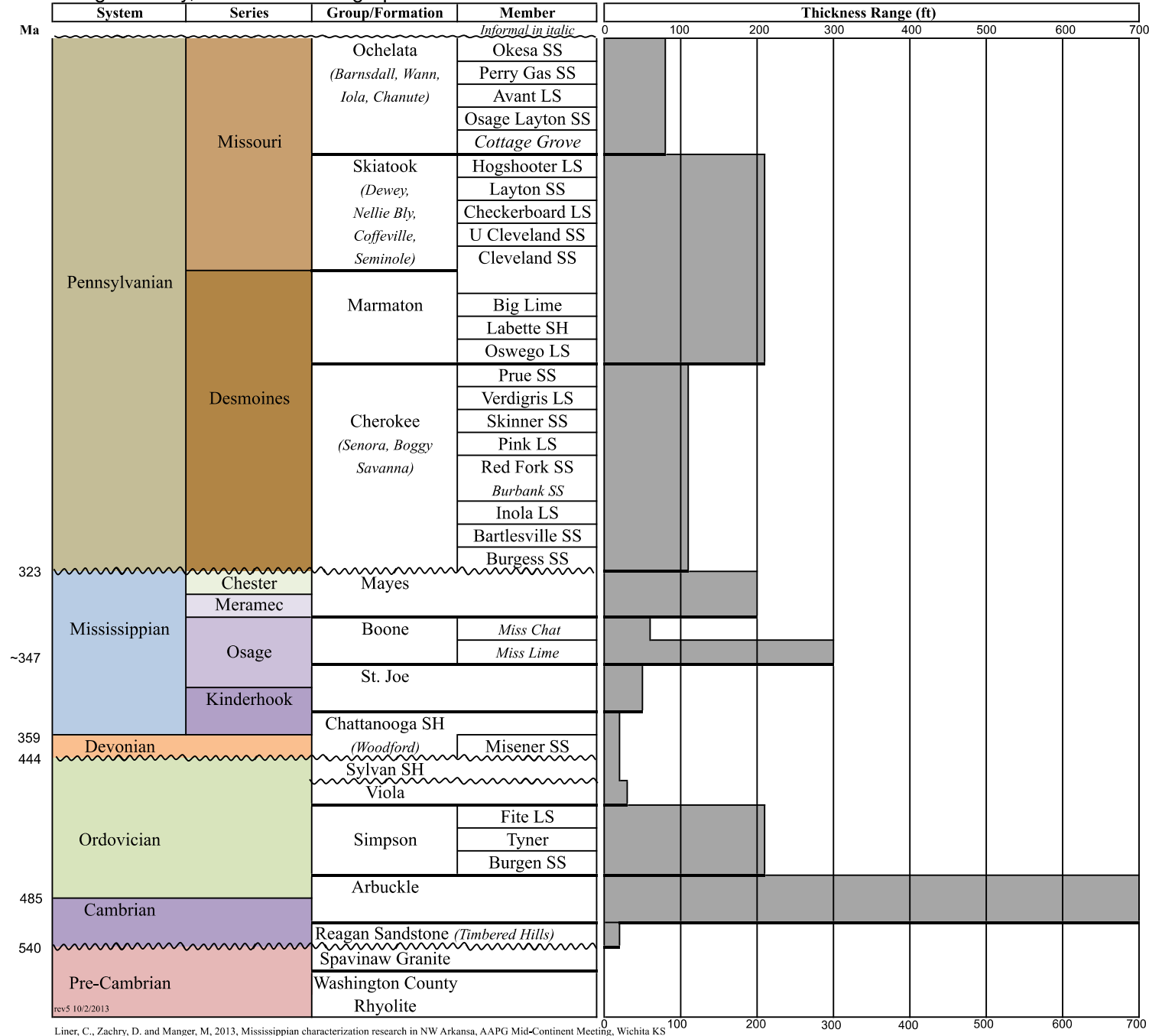
1. BIA- Wild Creek 3D
Shot by Chevron 1995
50 Square Miles
2. Wah Zah Zhi #1
Drilled by Spy Glass Energy LLC
TVD 8093 ft
4000 ft of granite
3. Spavinaw Granite Outcrop
1.285 g.a.
4. Tri State Mining District
Lead zinc mining 1891-1967



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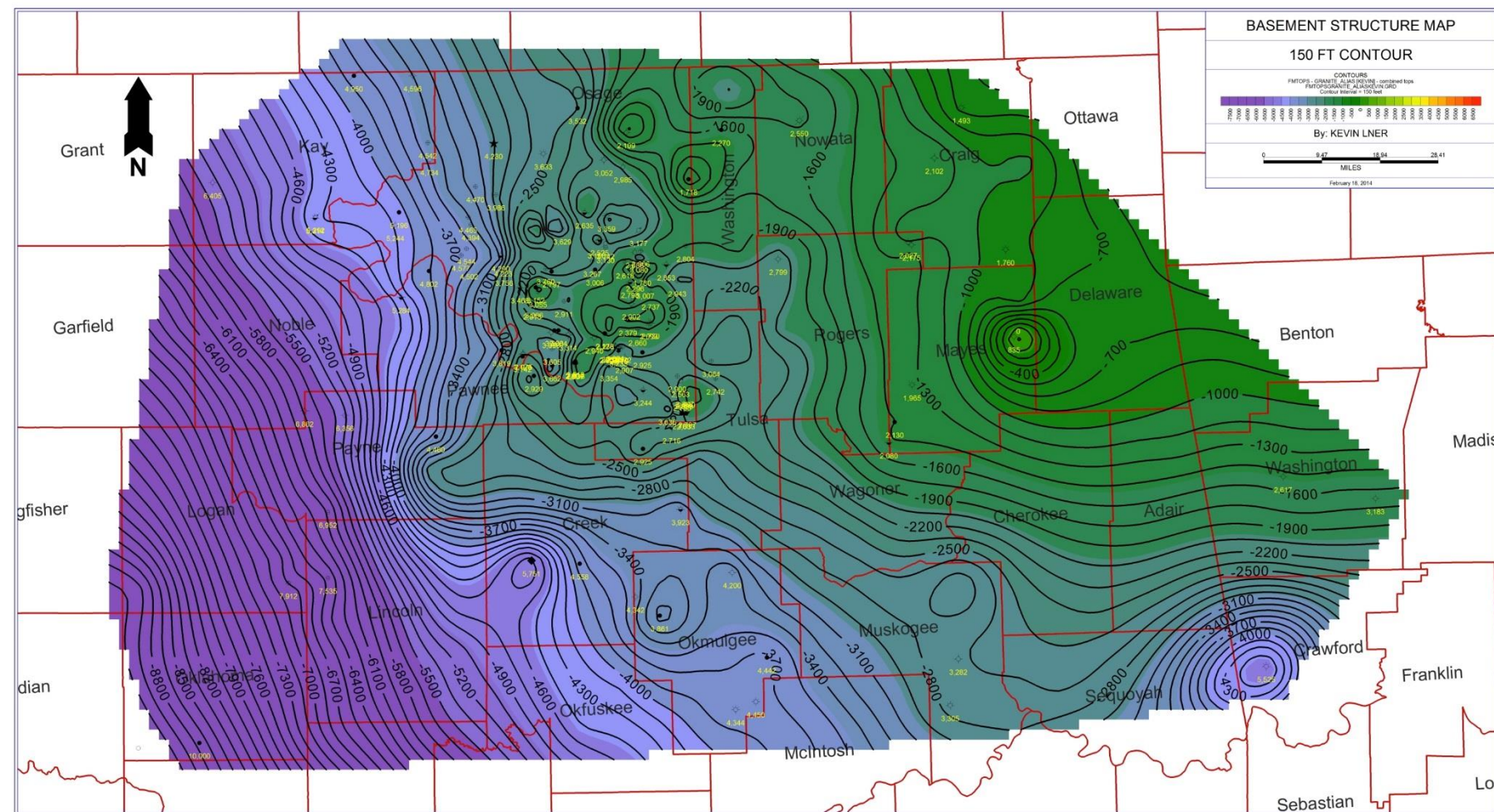
(OK Geol. Survey, 1981)

Osage County, Oklahoma Stratigraphic Chart



Liner, C., Zachry, D. and Manger, M, 2013, Mississippian characterization research in NW Arkansas, AAPG Mid-Continent Meeting, Wichita KS

Basement Depth Structure

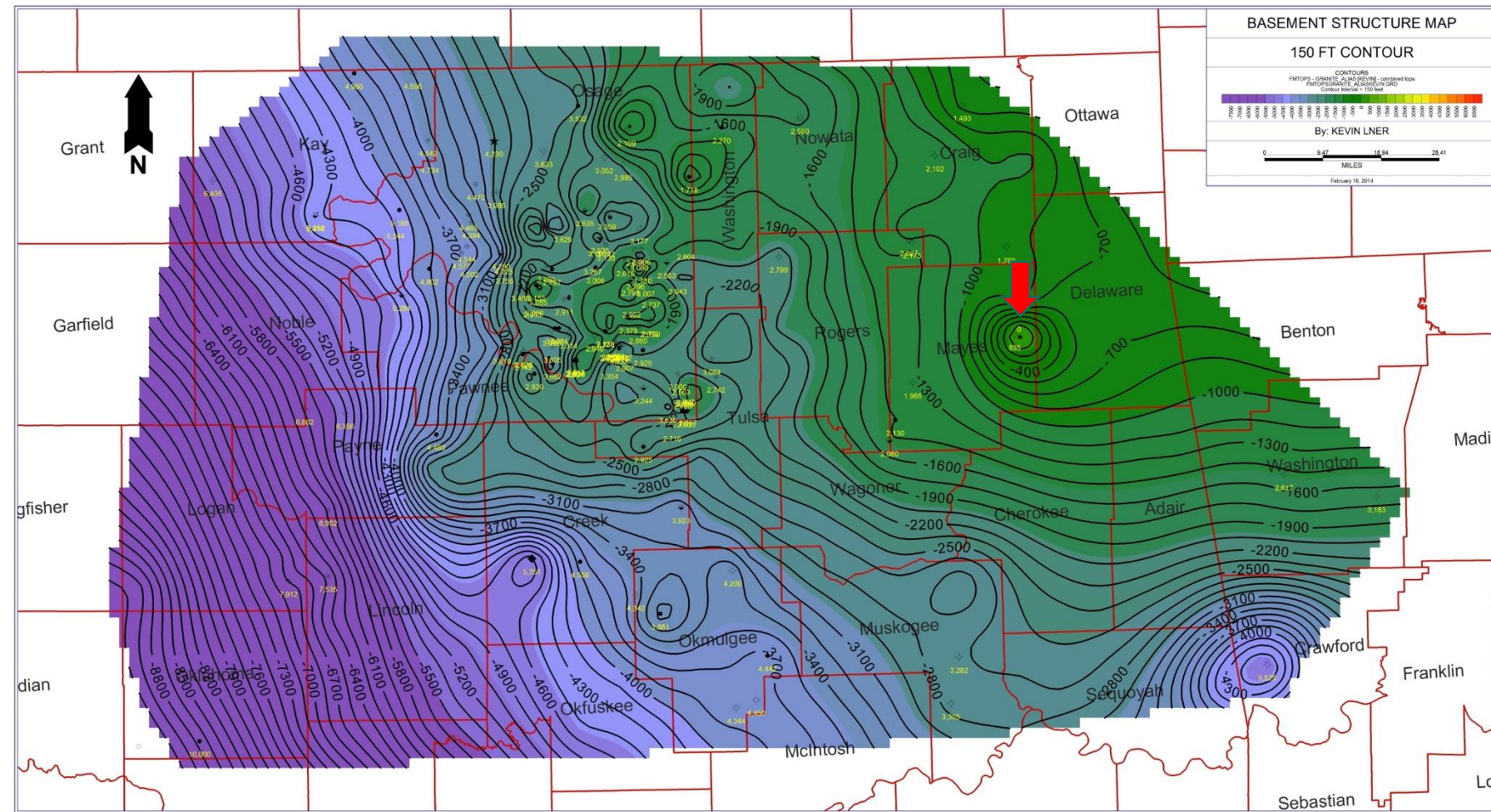


Contour interval = 150 ft

176 Wells



Spavinaw Granite



Contour interval = 150 ft

176 Wells

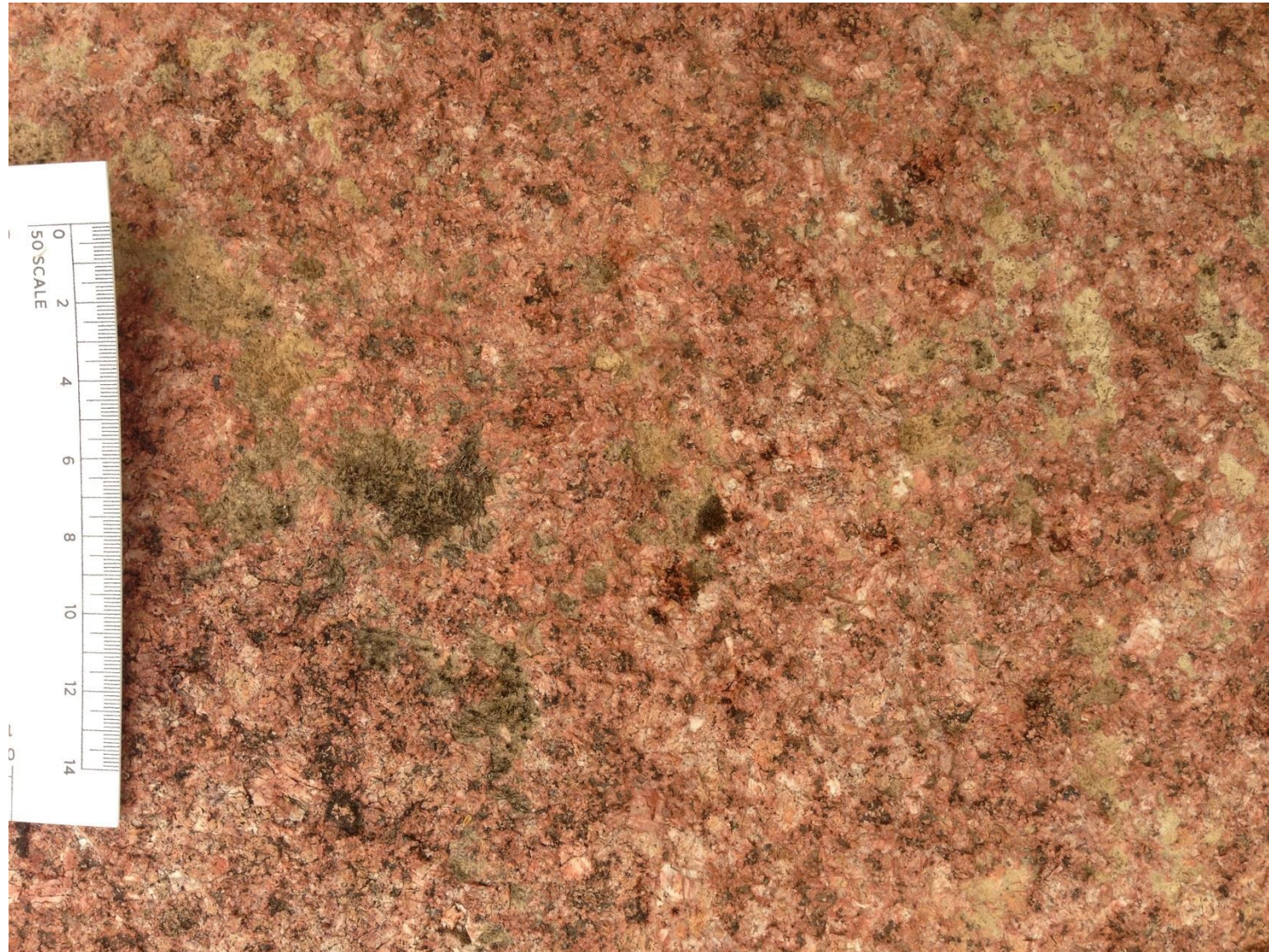
Spavinaw granite outcrop
marked with red arrow



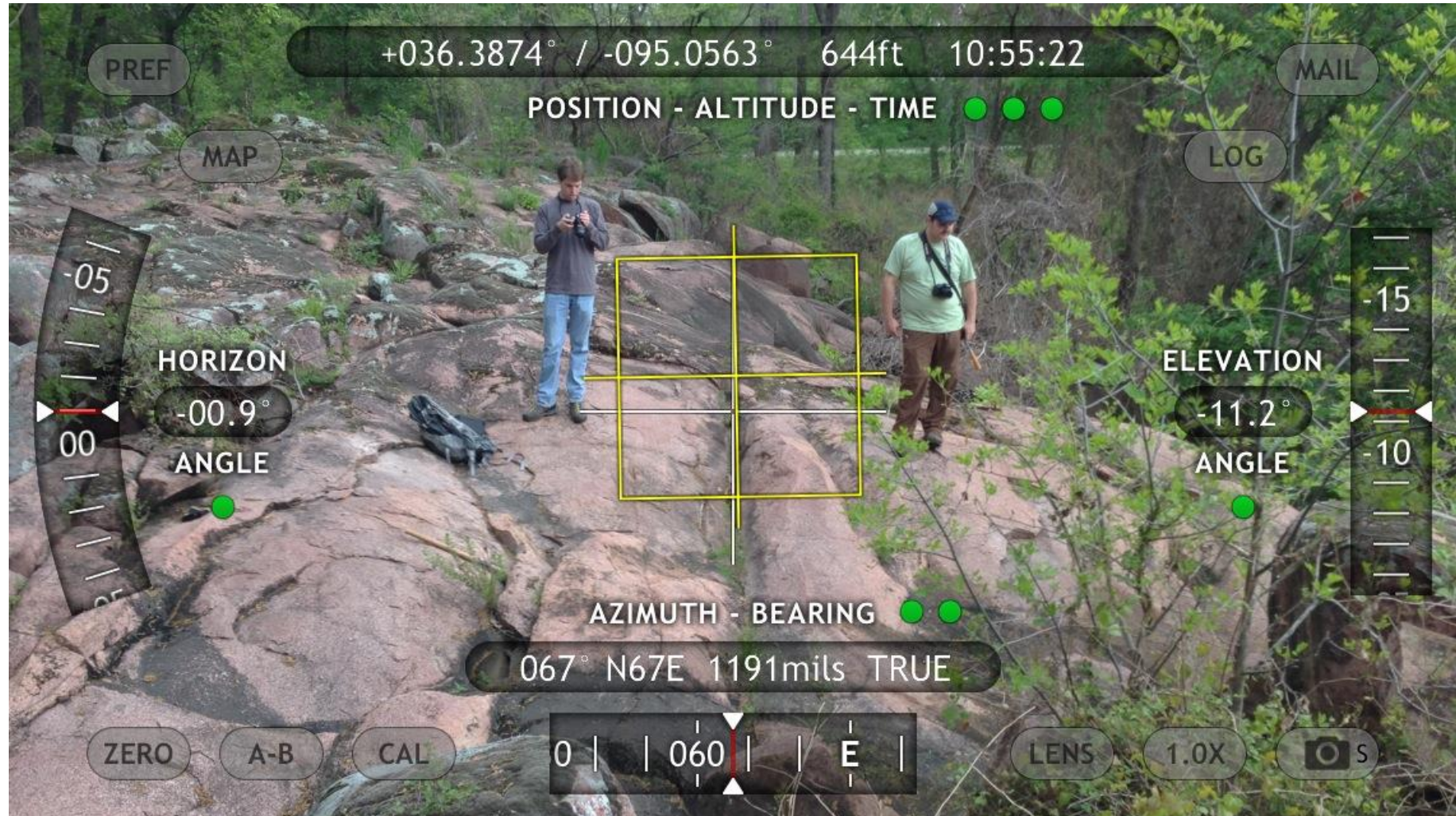
Spavinaw Granite



Spavinaw Granite



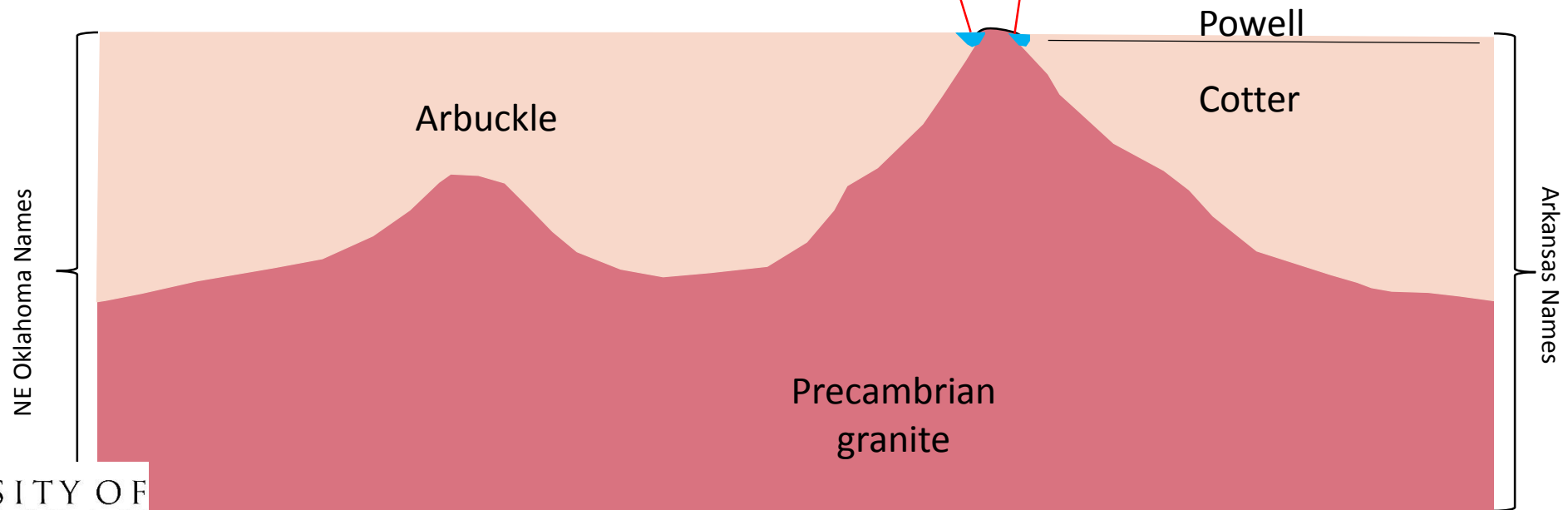
Spavinaw Granite



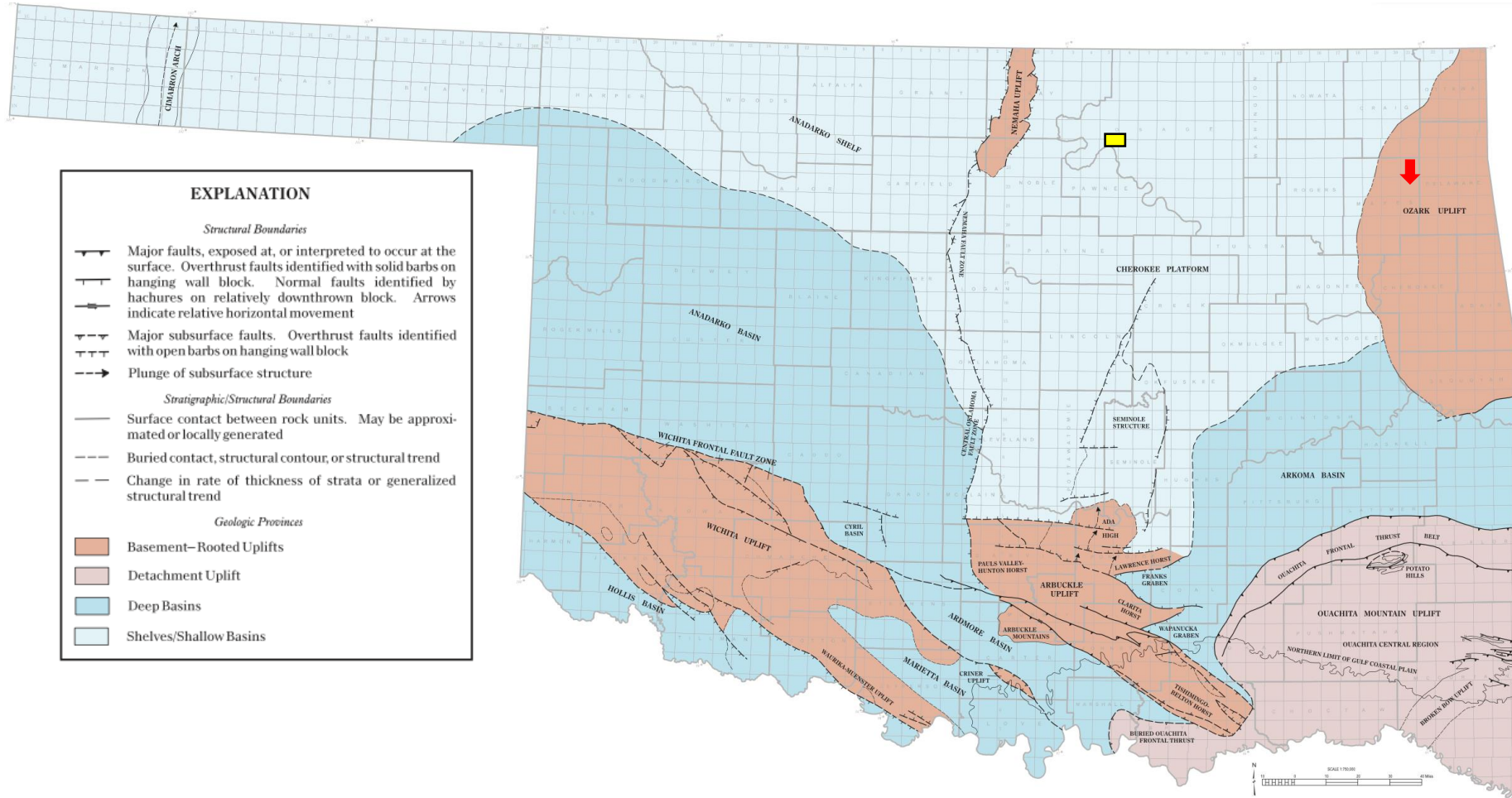
Spavinaw Granite Contact



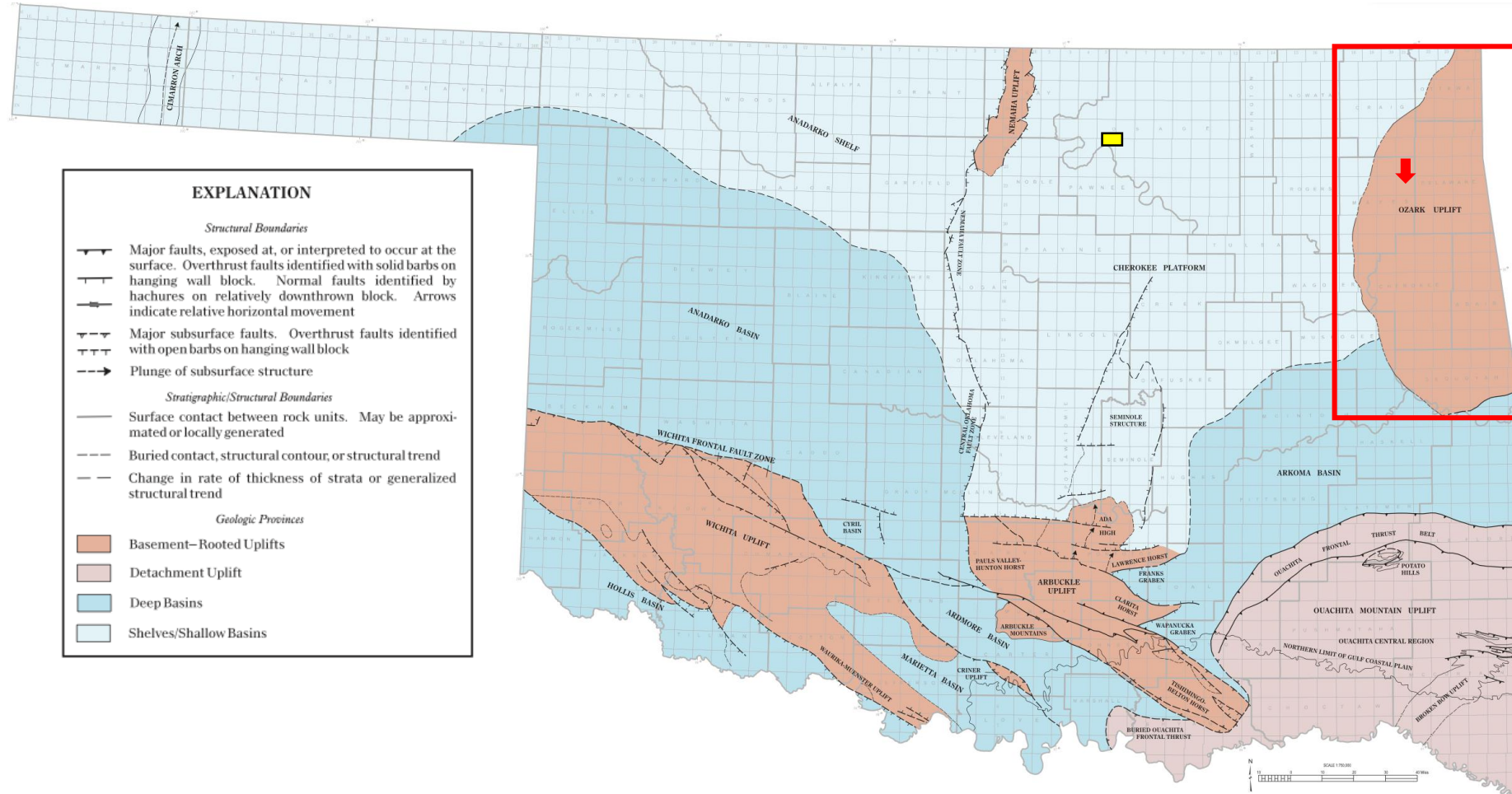
Spavinaw Granite Contact

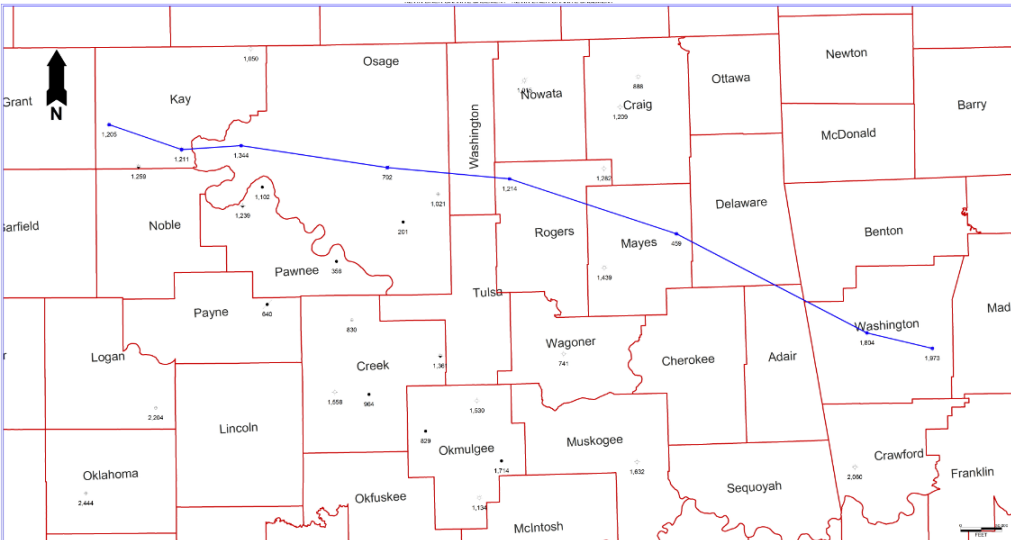


Geologic Provinces in Oklahoma

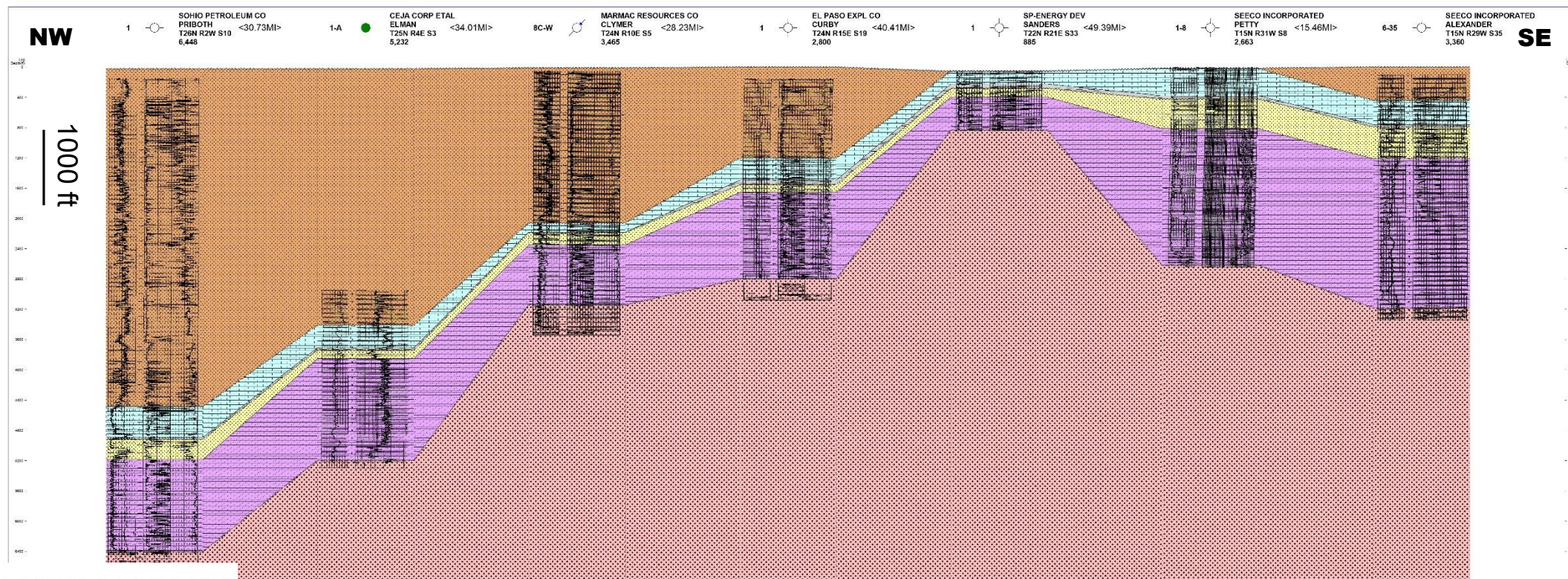


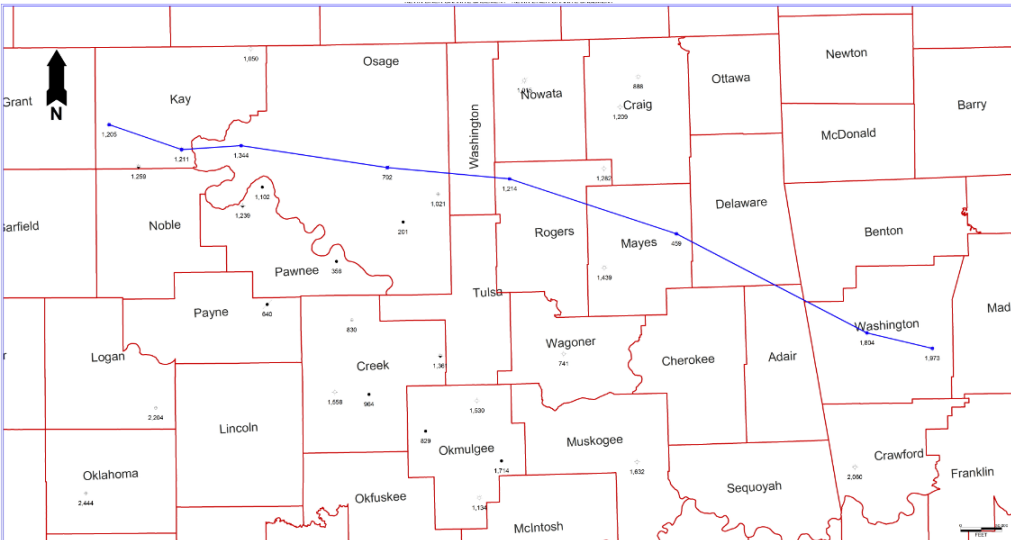
Geologic Provinces in Oklahoma





-  Pennsylvanian
 -  Mississippian
 -  Devonian
 -  Ordovician
 -  Ordovician/Cambrian
 -  Pre-Cambrian
- 200 mile Horizontal length

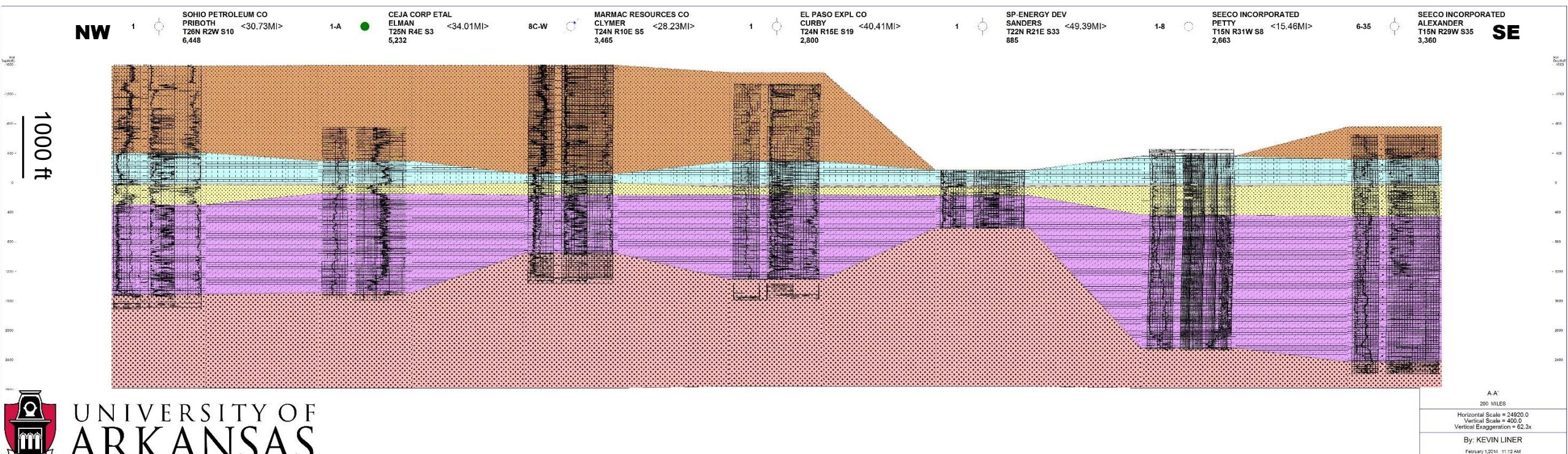




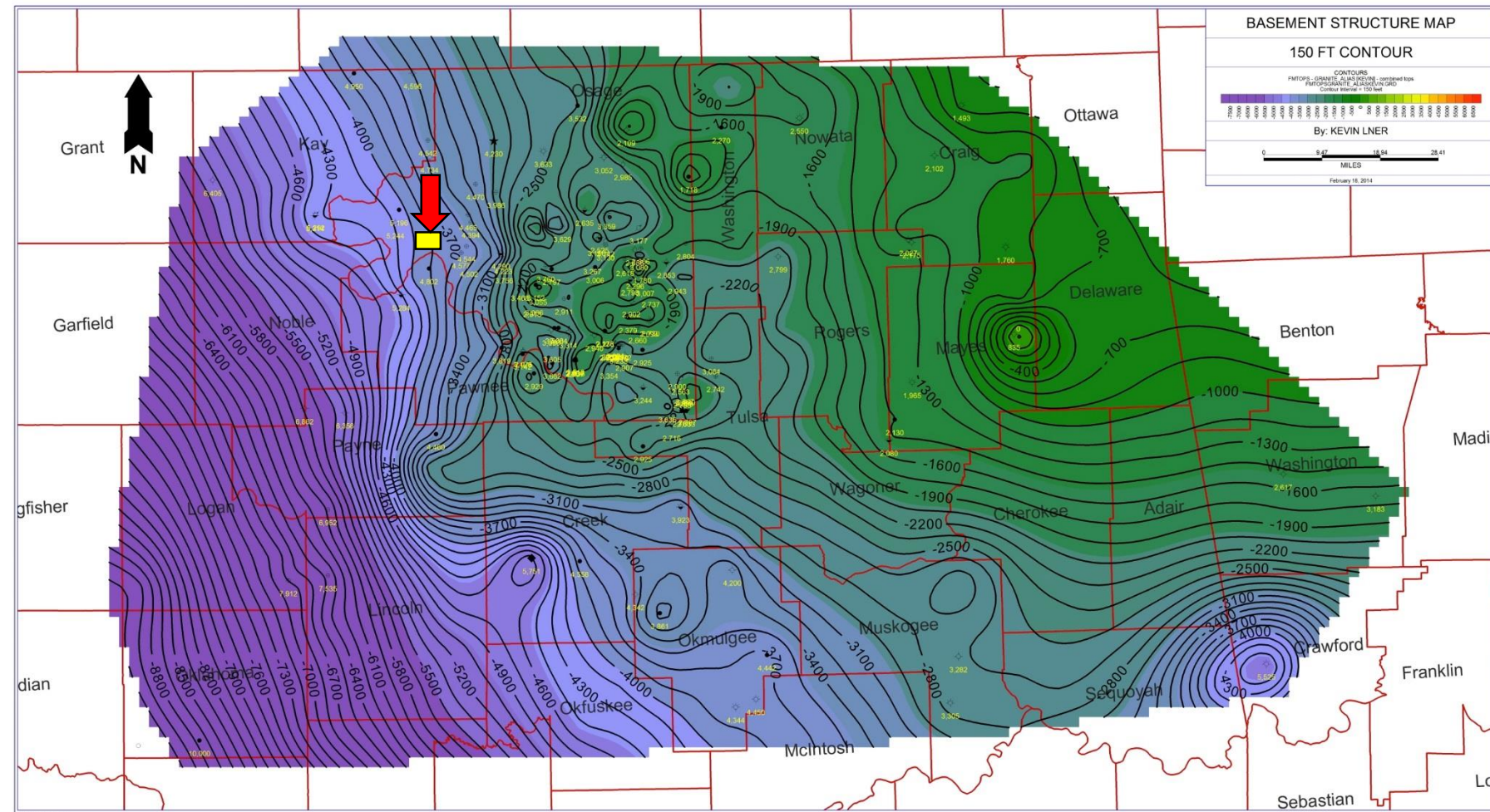
-  Pennsylvanian
-  Mississippian
-  Devonian
-  Ordovician
-  Ordovician/Cambrian
-  Pre-Cambrian

200 mile Horizontal length

Stratigraphic cross section hung on
Devonian period shale know as the
Woodford.



Wild Creek Survey

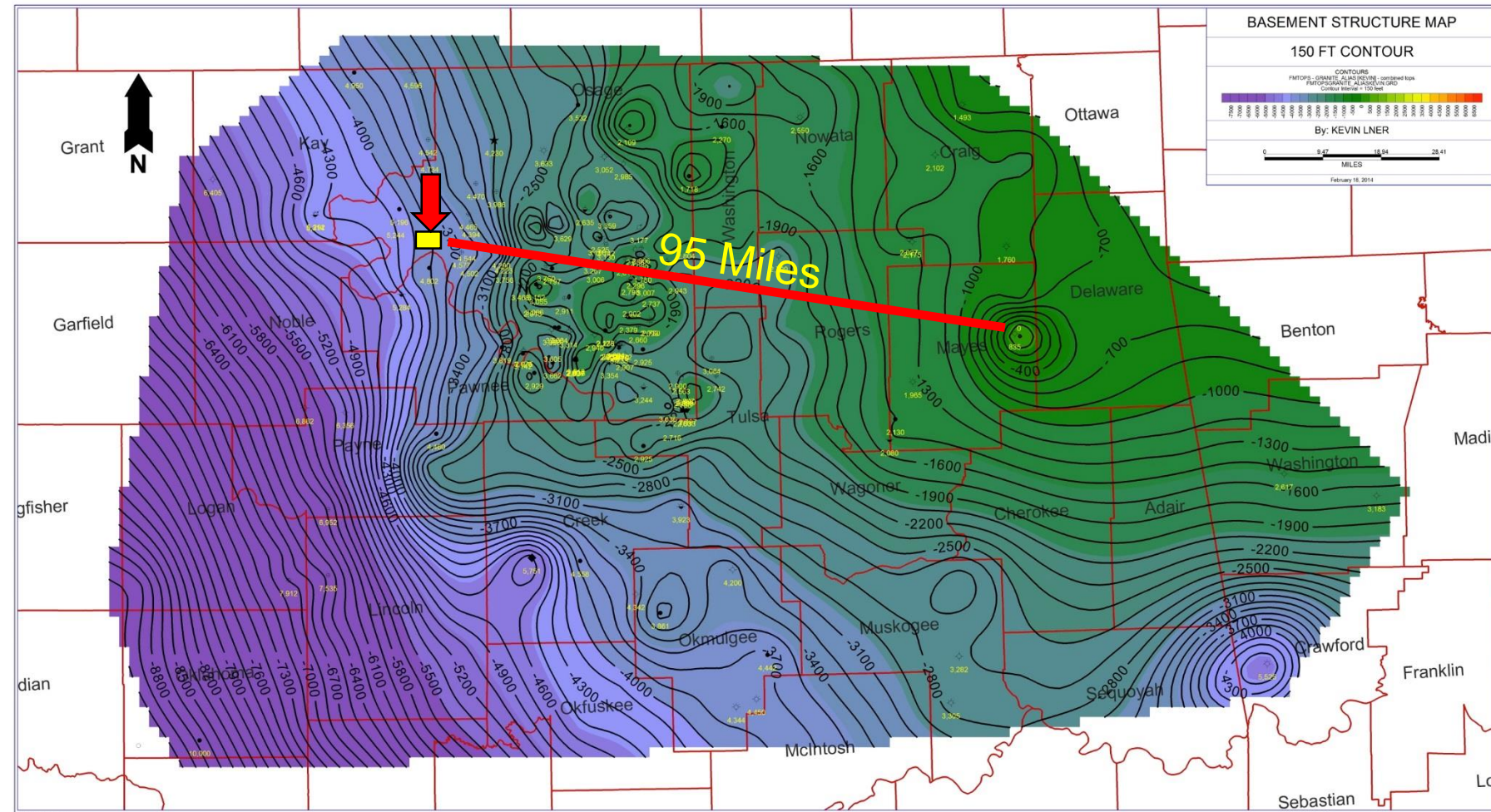


95 miles north west of the Spavinaw granite outcrop.

Basement is SSTVD 5250 ft



Wild Creek Survey

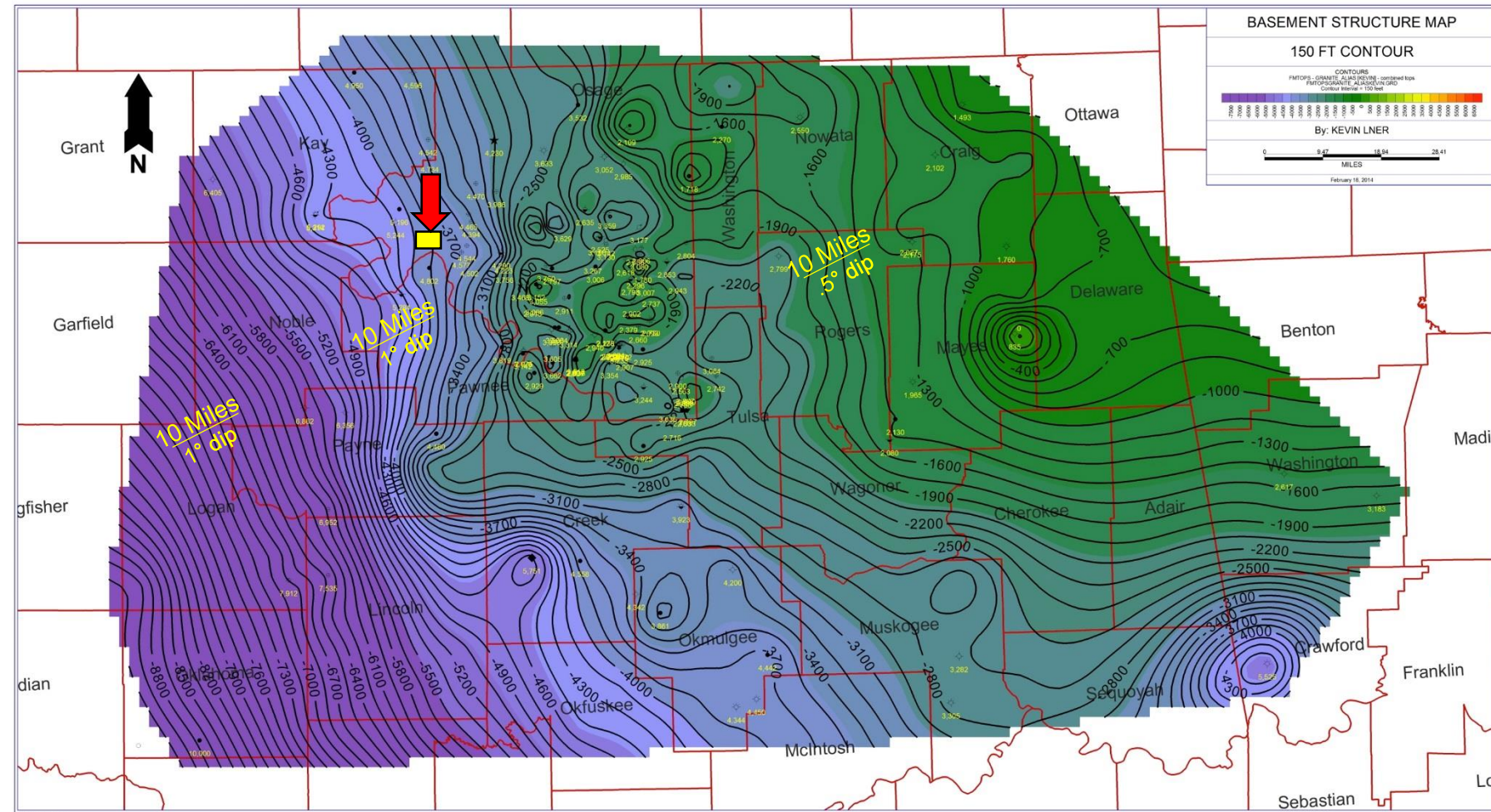


95 miles north west of the Spavinaw granite outcrop.

Basement is SSTVD 5250 ft



Basement Structural Dip

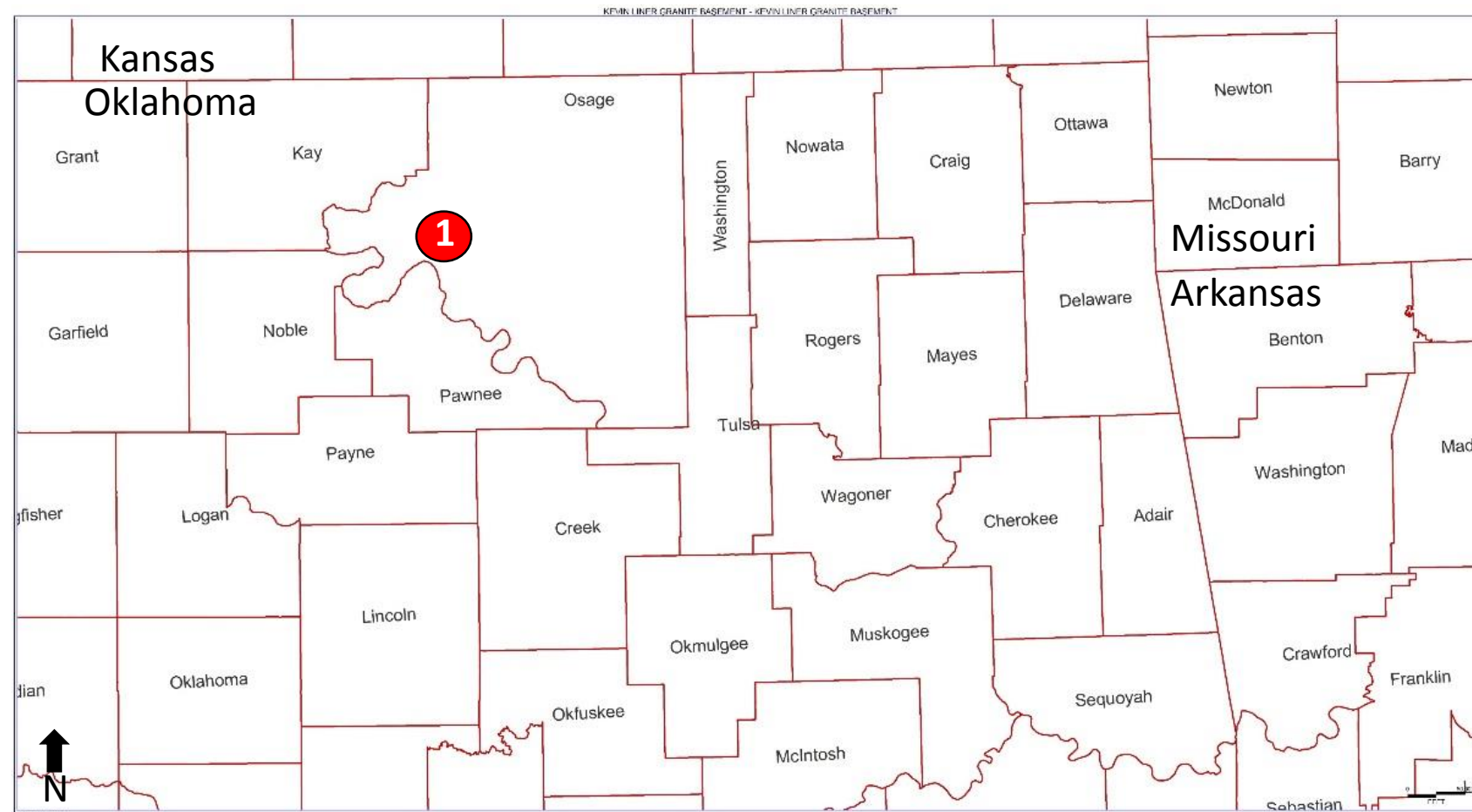


95 miles north west of the Spavinaw granite outcrop.

Basement is SSTVD 5250 ft



Wild Creek Survey



1. BIA- Wild Creek 3D
Chevron 1995
50 Square Miles

Survey Parameters

Bin Size= 66x66 ft

Dominant Frequency= 48 Hz

Time Sample Rate= 2ms

Granite Velocity= 19700 ft/s

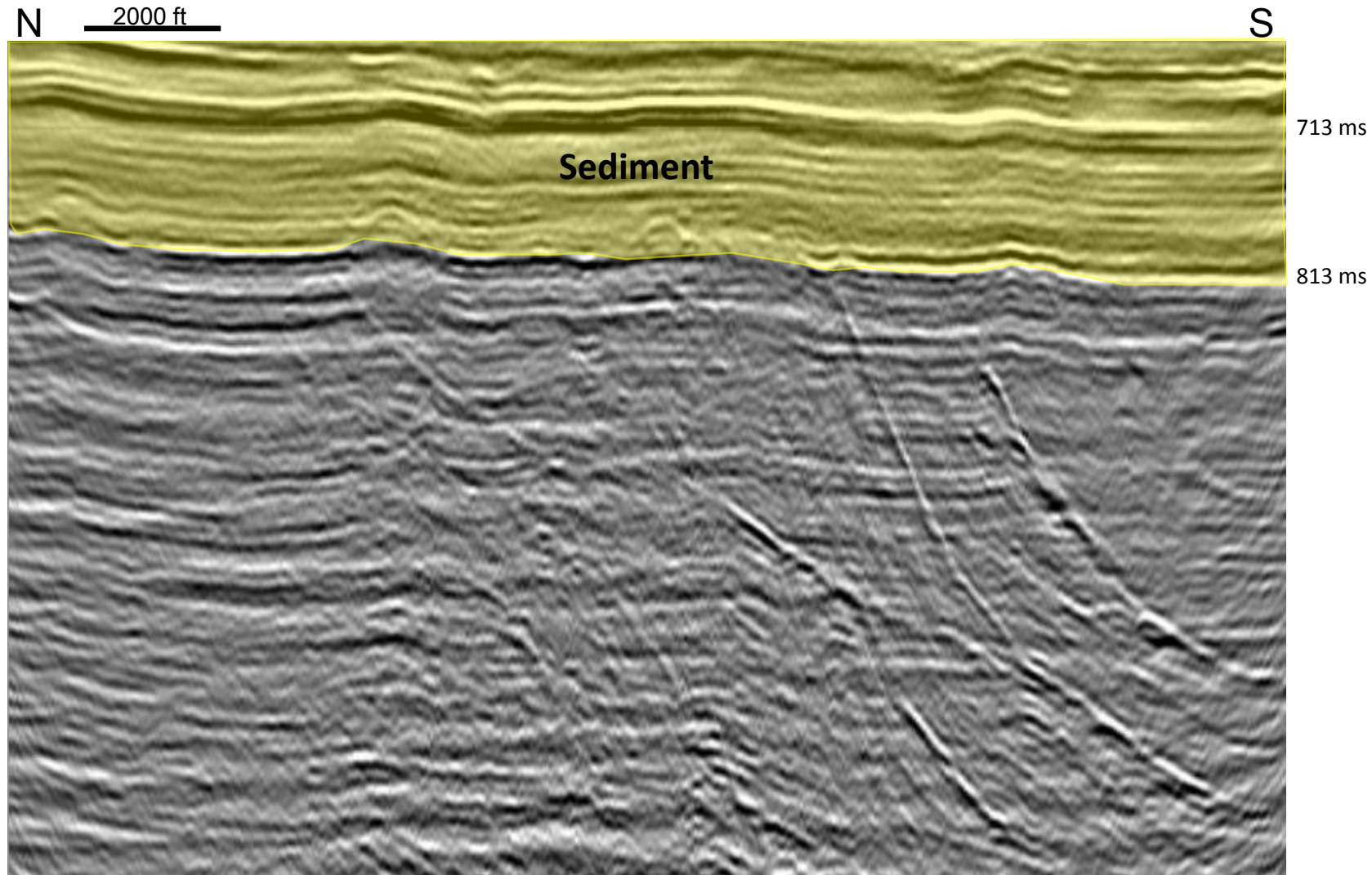
Wavelength= 410ft

Vertical Resolution= 103 ft

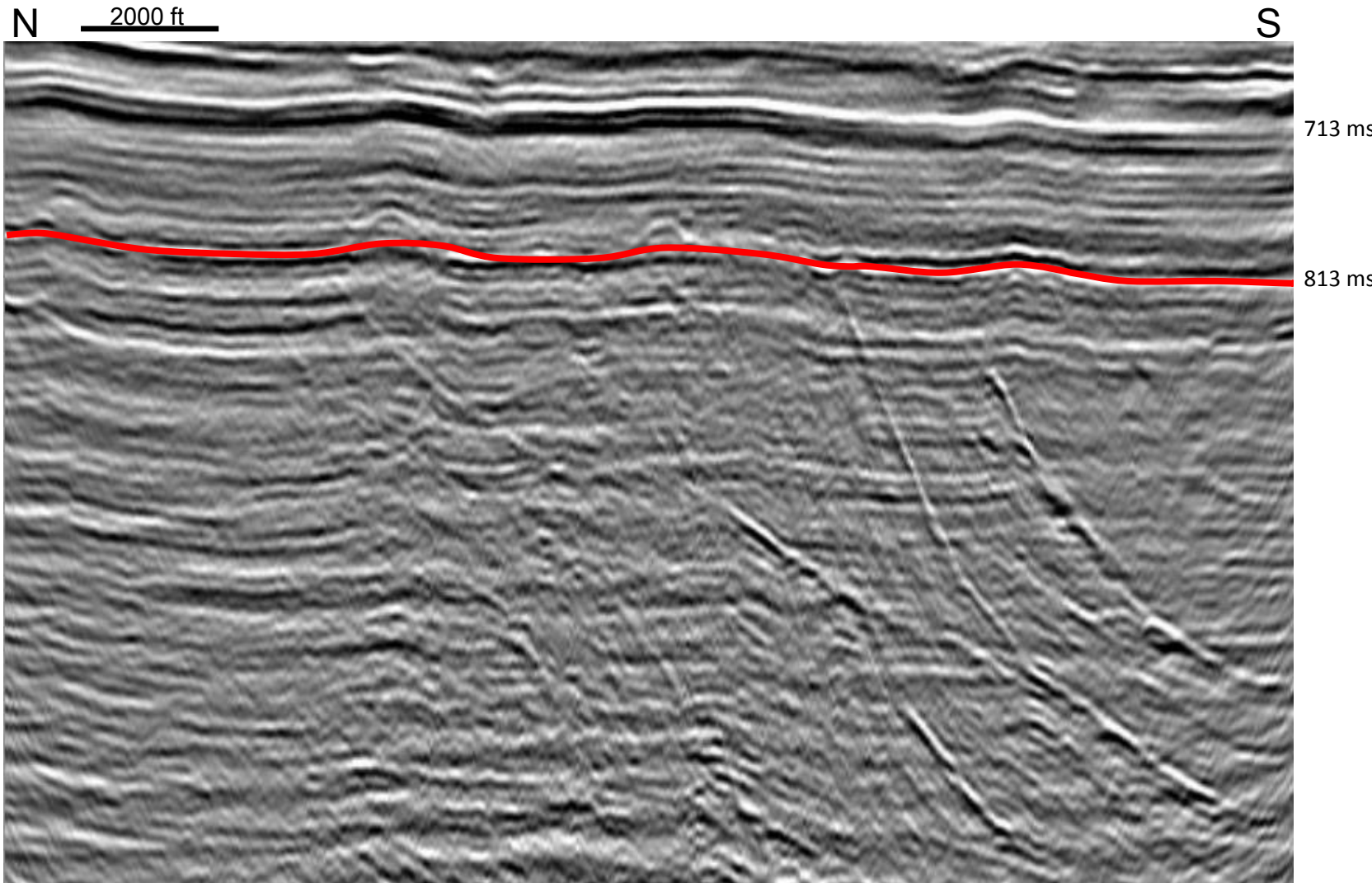
Lateral Resolution= 205 ft

Record Time= 2.0 s

Sediment to Granite Interface



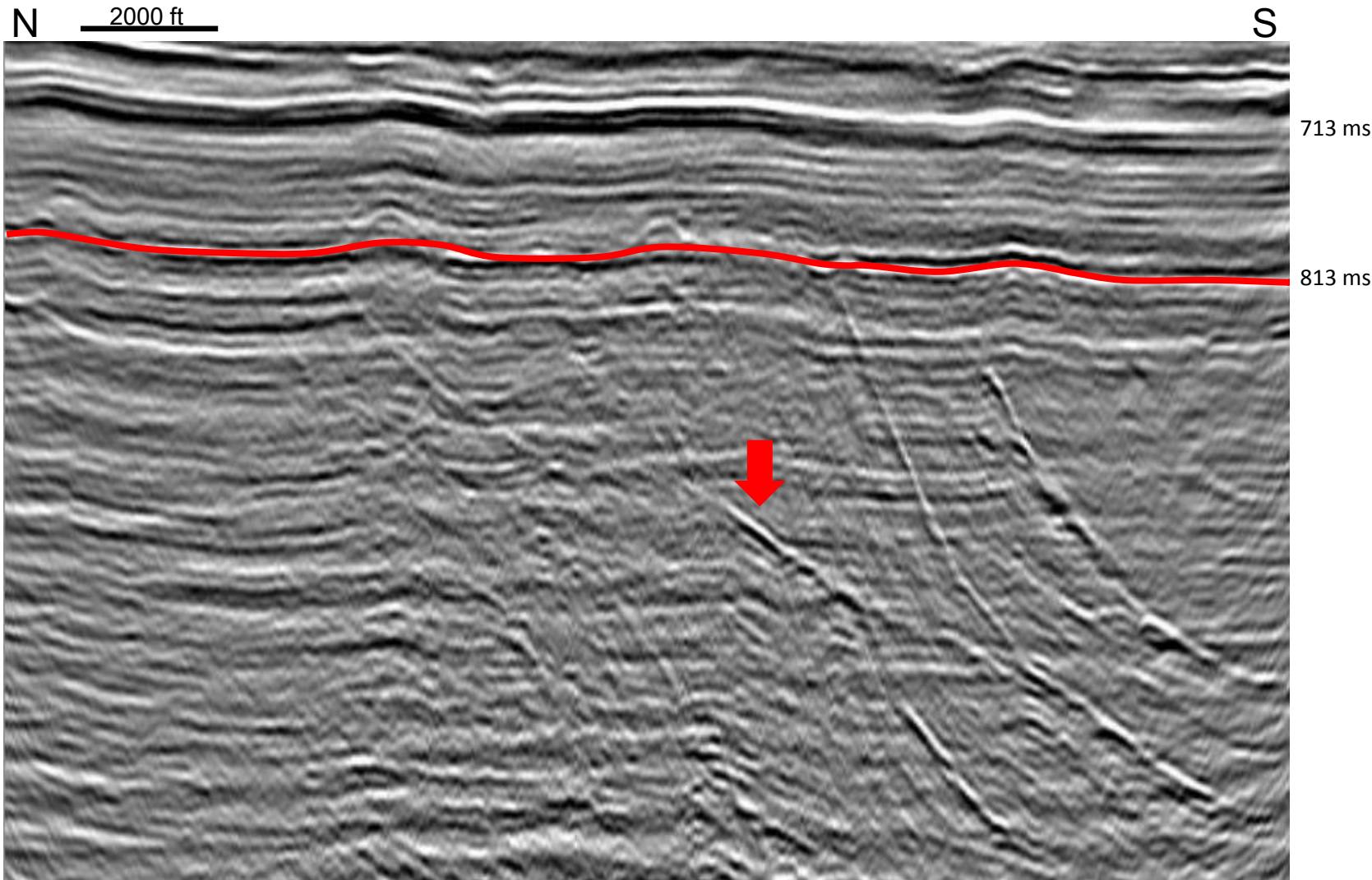
Basement Events



Reagan sandstone marked in red represents the top of the basement.

The Reagan sandstone formed in the late Paleozoic consisting of weather fragments of granite.

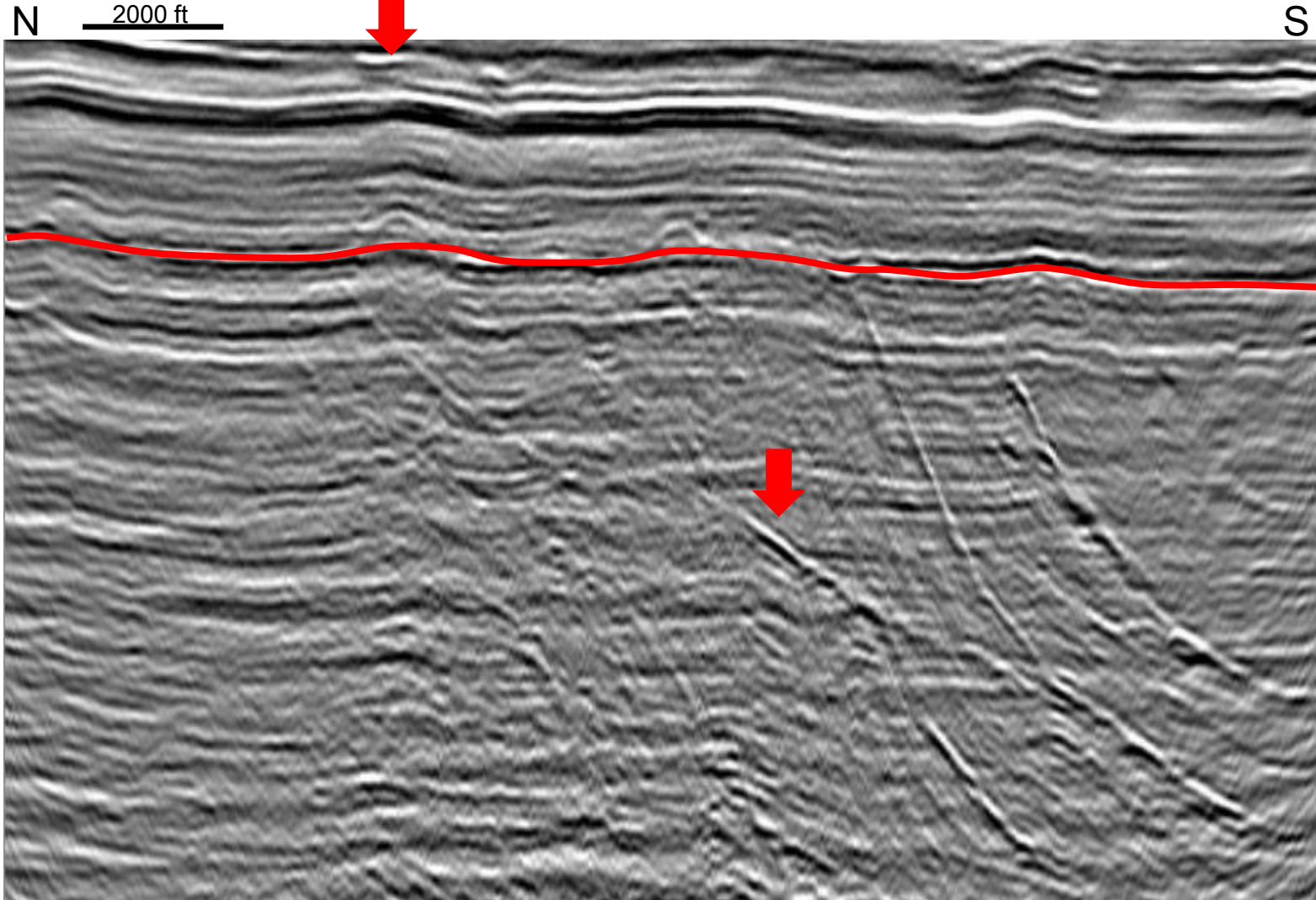
Basement Events



Large negative amplitudes
similar to Mississippian Chat

Basement Events

Mississippian Chat



Large negative amplitudes
similar to Mississippian Chat

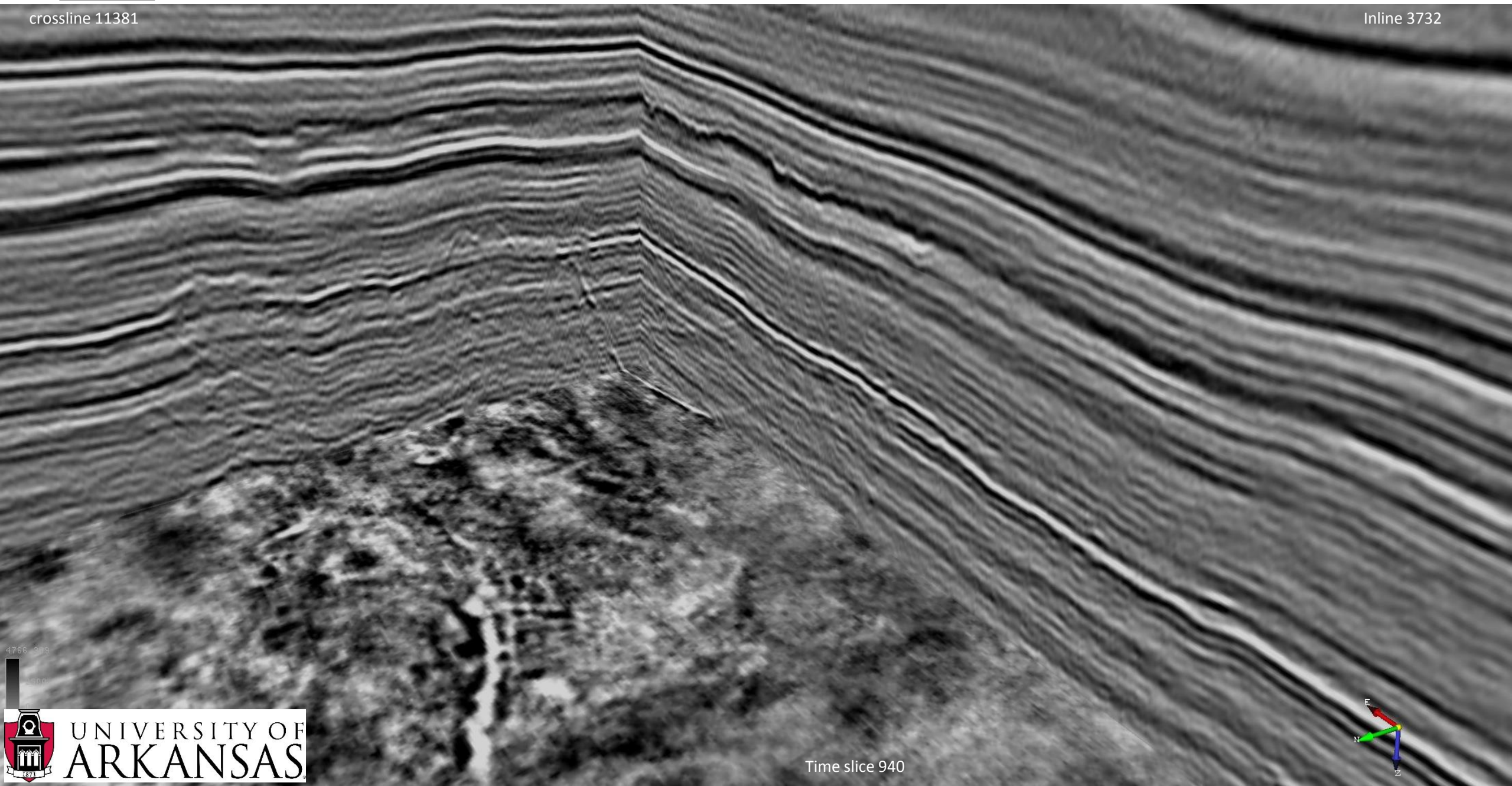


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2000 ft

crossline 11381

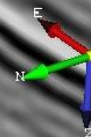
Inline 3732



4766 309



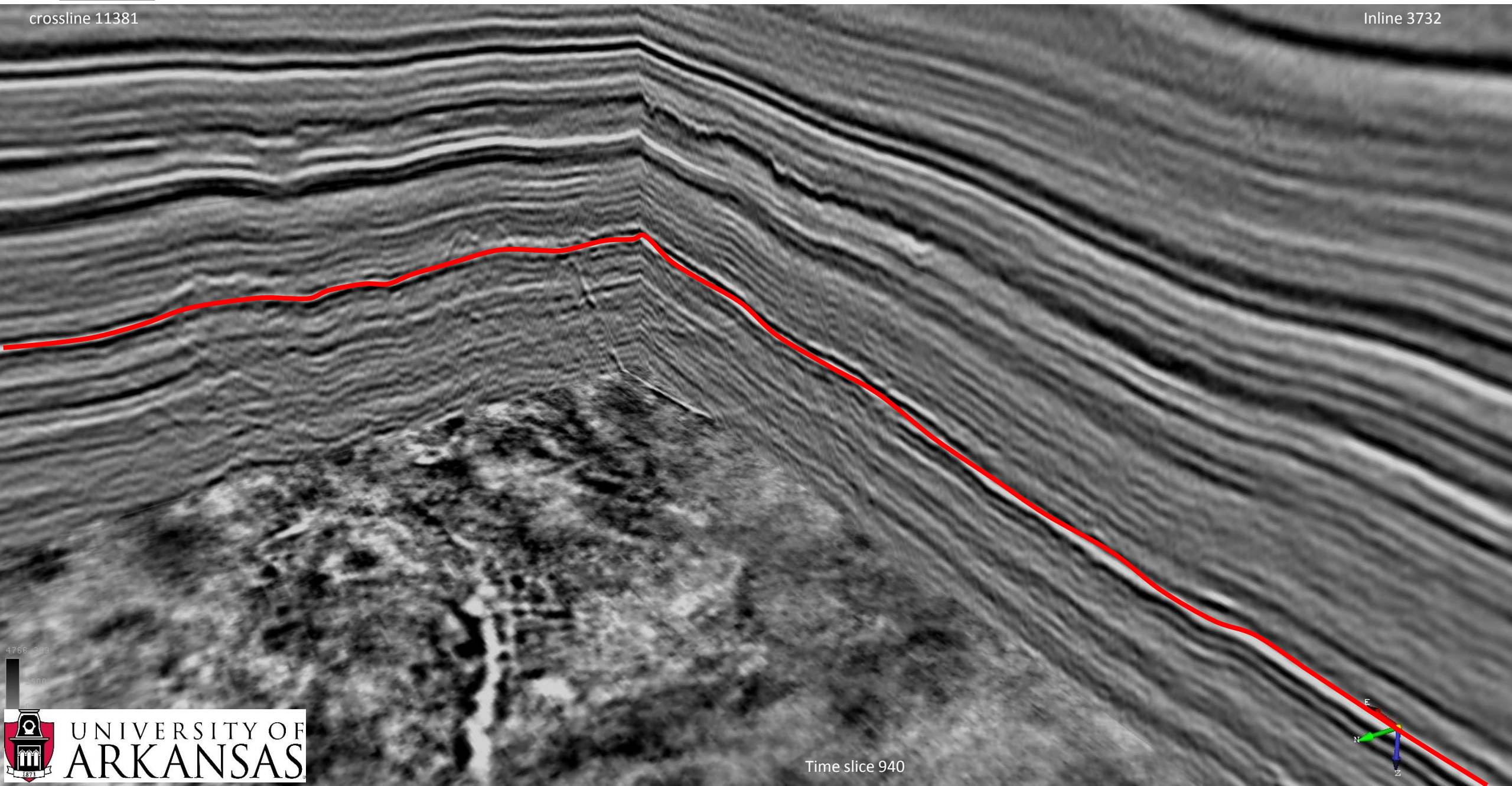
Time slice 940



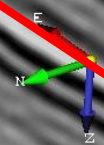
2000 ft

crossline 11381

Inline 3732



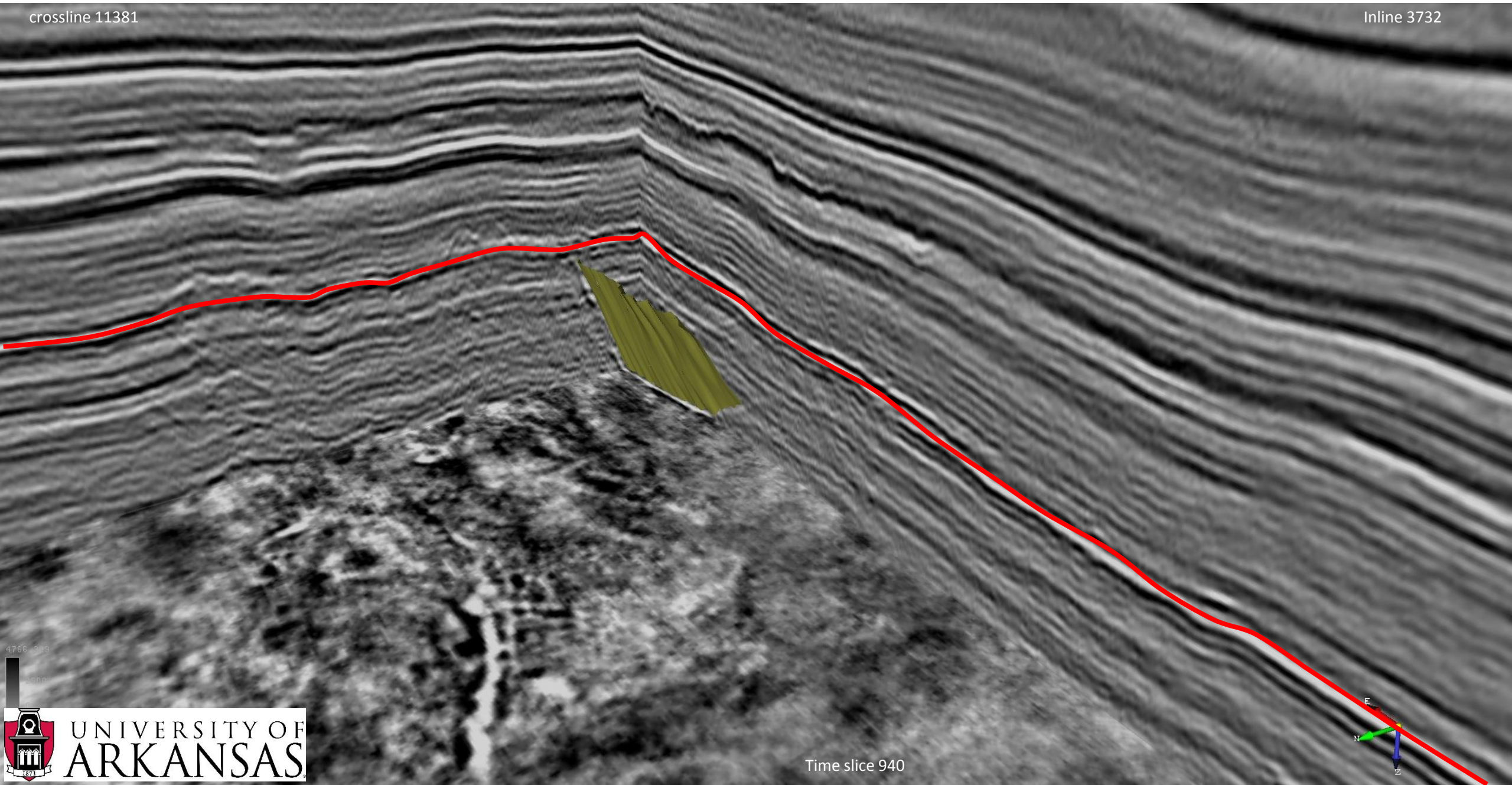
4766 309
1800



2000 ft

crossline 11381

Inline 3732



Thank You

References

Campbell, J.A, Weber, J.L, 1995, Geologic Provinces of Oklahoma: Oklahoma Geological Survey

Johnson, K.S., 1989, Geologic Evolution of the Anadarko Basin: Oklahoma Geological Survey Circular 90, part 1, pp. 2-12.

Ireland, H.A., 1930, The age of the Spavinaw granite: Proceedings of the Oklahoma Academy of Science, v. 10, pp. 72-77.

Denison, R. E., 1981, Basement rocks in northeastern Oklahoma: Oklahoma Geological Survey Circular, **84**, 1-84.