

# **Stratigraphic Architecture of the Kinderhookian to Meramecian Series**

**by Kurt Rottmann**

## **• Goals**

- To define the geometry of Meramecian/Osagean deposits in north central Oklahoma
- Build a stratigraphic column for north central Oklahoma
  - Define Kinderhookian and Woodford Strata
  - Define Osagean wedge deposits
  - Define possible Osagean Cowley Fm. in Oklahoma
  - Define Meramecian deposits
  - Define “Chat” deposits
- Use the correlation developed to help operators explore for oil and gas

## **ACKNOWLEDGEMENTS**

- |                                  |                              |
|----------------------------------|------------------------------|
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## **SPEAKERS**

KURT MARFURT – OU, CODY KNEPPER – NUTECH, GREG FLOURNOY – SCHLUMBERGER,  
CARL VANDERVOORT – ORION EXPLORATION, WALT MANGER – SOUTHWESTERN  
ENERGY CORPORATION

## **RECOGNITION**

SAL MAZZULLO – WSU, BRIAN WILHITE – WOOLSEY OPR CO., DARWIN BOARDMAN – OSU

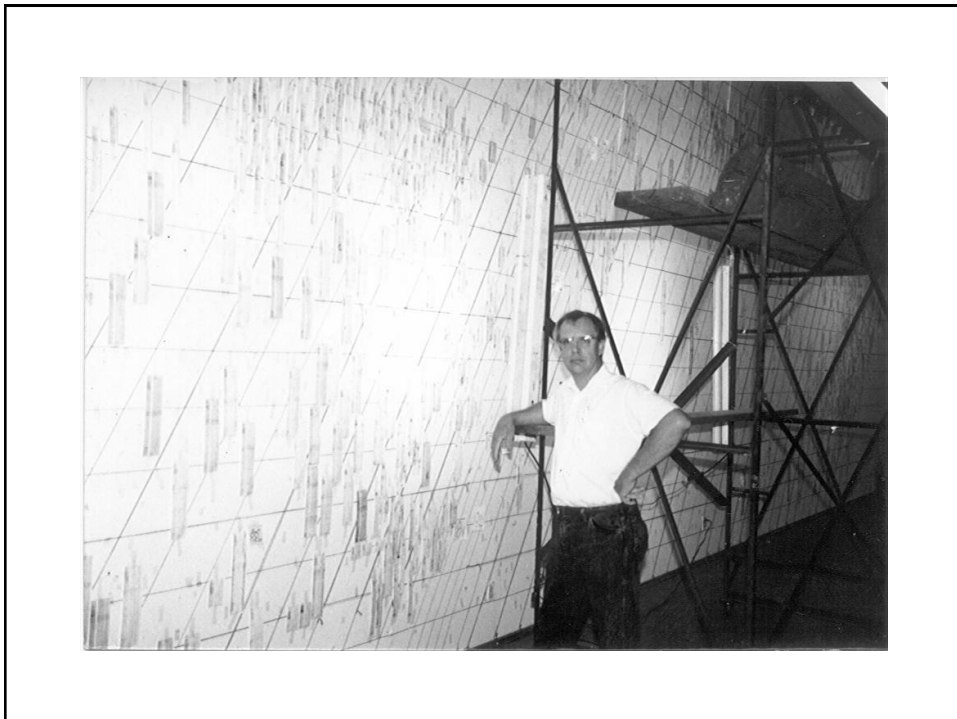
## List of Papers

- An introduction to chert reservoirs of North America, Rogers, J.P., Longman, M.W., 2001, American Association of Petroleum Geologists Bulletin, v. 85, no. 1 (January 2001) pp. 1-5
- Characterization of the Mississippian chat in south-central Kansas, Watney, L.W., Willard, J.G., and Byrnes, A.P., 2001, American Association of Petroleum Geologists Bulletin, v. 85, no. 1 (January 2001) pp. 85-113
- Deposition and diagenesis of Mississippian chat reservoirs, north-central Oklahoma, Rogers, S.M., 2001, American Association of Petroleum Geologists Bulletin, v. 85, no. 1 (January 2001) pp. 115-129
- Hydrocarbon Accumulation in "Meramec-Osage" (Mississippian) Rocks, Sooner Trend, Northwest-Central Oklahoma, Harris, S.A. 1975, American Association of Petroleum Geologists Bulletin, v. 59, no. 4 (April 1975) pp. 633-664
- Mississippian Continental Margins of the Conterminous United States, Gutschick, R.C., Sandberg, C.A., 1983, Society of Economic Paleontologists and Mineralogists Special Publication No 33, p 79-96 (June 1983)
- Lithostratigraphic Architecture Of the Mississippian Reeds Spring Formation (Middle Osagean) In Southwest Missouri, Northwest Arkansas, and Northeast Oklahoma Outcrop Analog of Subsurface Petroleum Reservoirs, Mazzullo, S.J., Wilhite, B., and Boardman, D.R., II, 2011, Shale Shaker, Volume 61 No. 5, March/April 2011, pp. 254-269
- The Origin and Age of the Mississippian "Chat" In North-Central Oklahoma, Mikkelsen, D.H., 1966, Shale Shaker Digest V, Volumes XV-XVII (1964-1967)
- Petroleum reservoirs within a spiculite-dominated depositional sequence: Cowley Formation (Mississippian: Lower Carboniferous), south-central Kansas, Mazzullo, S.J., Wilhite, B.W., and Woolsey, I.W., American Association of Petroleum Geologists Bulletin, v. 93, no. 12 (December 2009) pp. 1649-1689
- Pre-Chester Mississippian Rocks of Northwestern Oklahoma, Hoffman, E.A., Jr., Shale Shaker Digest IV, Volumes XII-XIV (1961-1964)

## Definition of Stratigraphy

- That branch of geology which treats of the formation (deposition), composition, sequence, and correlation of the stratified rocks as parts of the earth's crust.

Glossary of Geology,  
1966

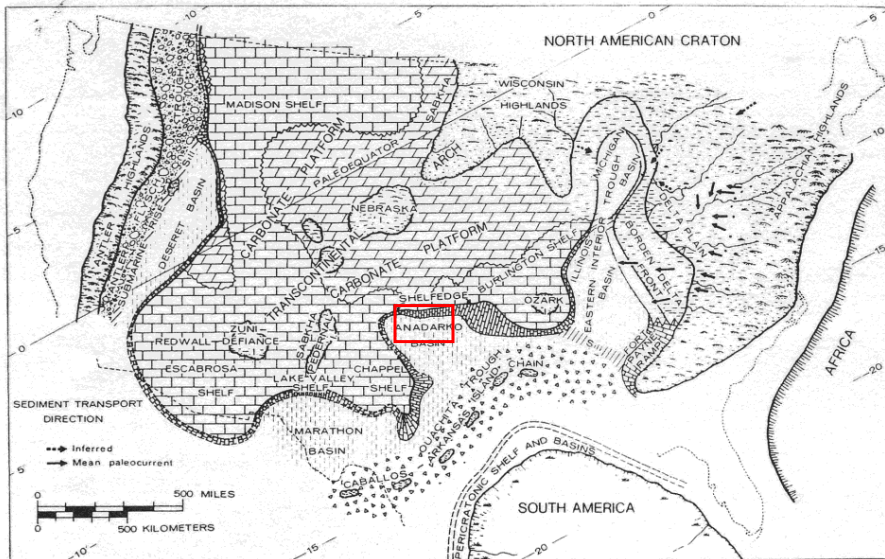


# Stratigraphic Architecture of the Kinderhookian to Meramecian Series

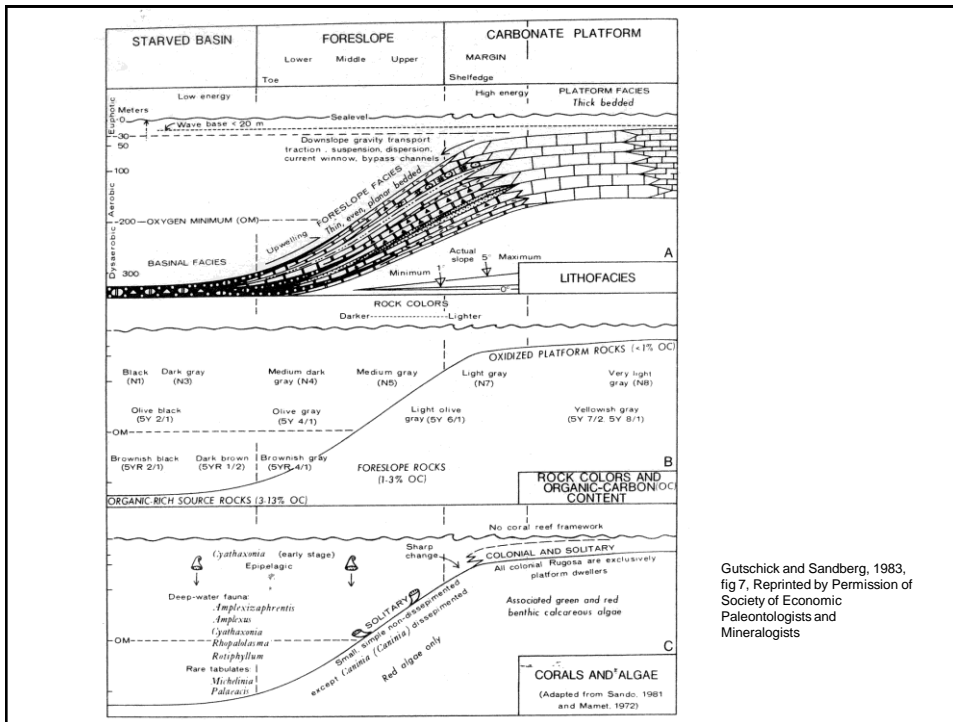
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## • Goals

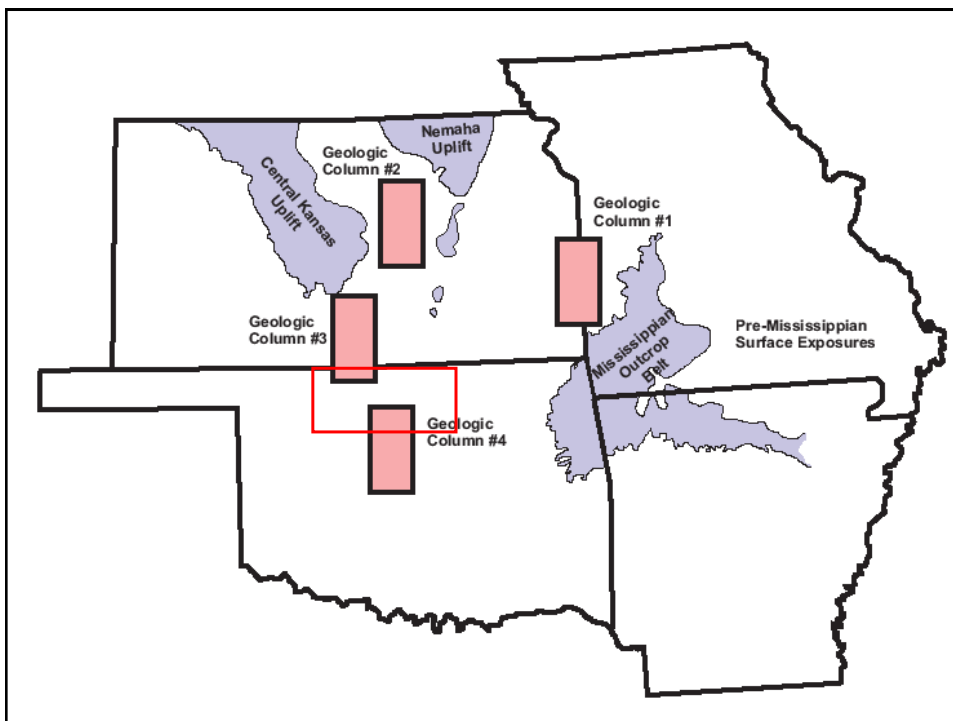
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Gutschick and Sandberg, 1983, fig 5, Reprinted by Permission of Society of Economic Paleontologists and Mineralogists



Gutschick and Sandberg, 1983, fig 7, Reprinted by Permission of Society of Economic Paleontologists and Mineralogists

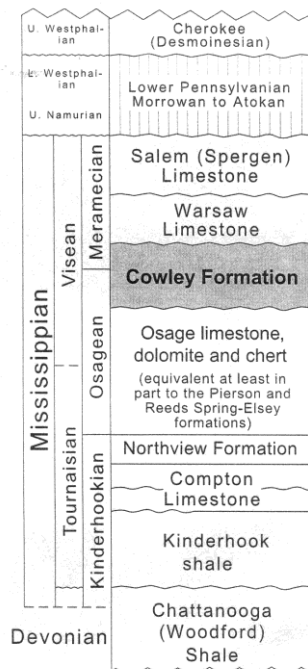


## Geologic Column #2

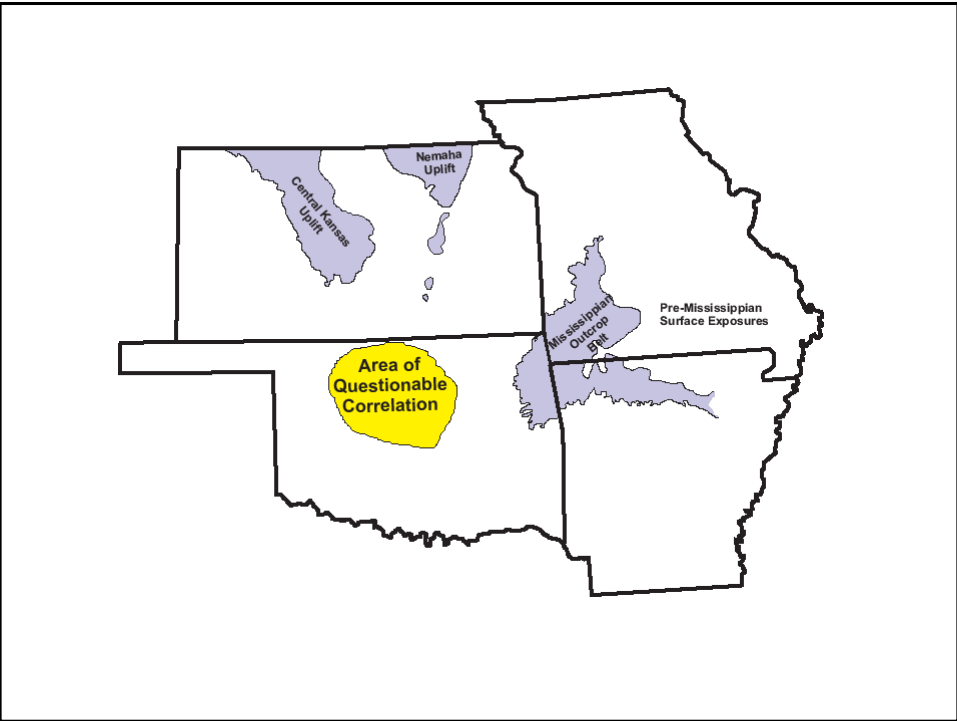
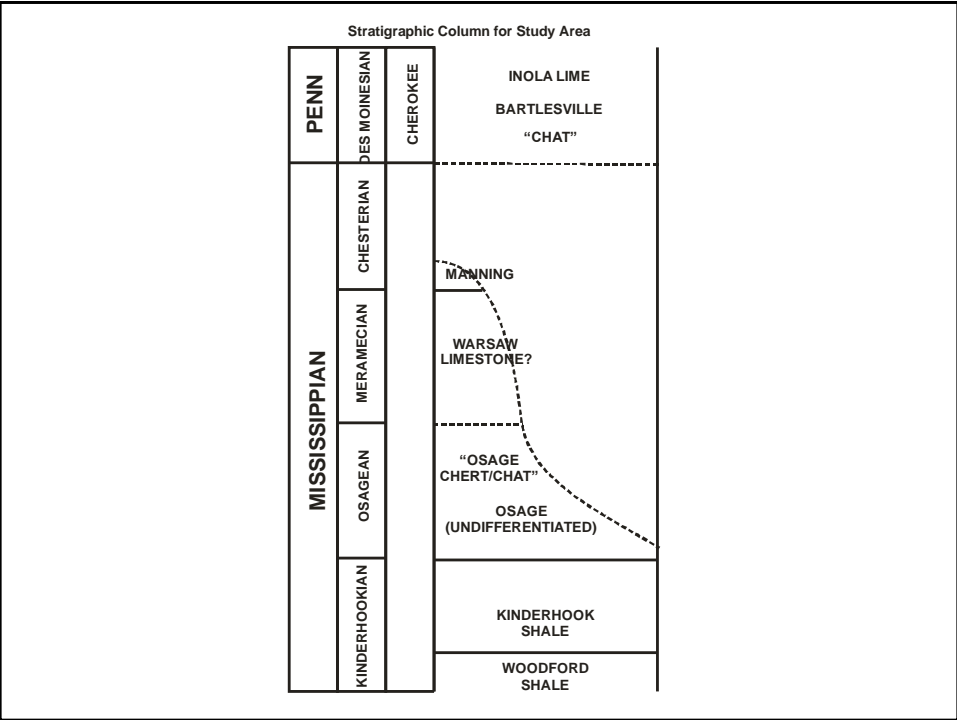
Period	Stage	Formations/Members (Goebel, 1968a, b)	Formations/Members (Maples, 1994)	Period	Stage
MISSISSIPPIAN	Chesterian	unnamed unit(s)	Shore Airport Formation	MISSISSIPPIAN	Chesterian
	Meramecian	Ste. Genevieve Limestone	Ste. Genevieve Limestone		Meramecian
		St. Louis Limestone	St. Louis Limestone		
		Salem Limestone	Salem Limestone		
		Warsaw Limestone	Warsaw Limestone		
	Osagean	Keokuk Limestone	Keokuk Limestone		Osagean
		Burlington-Keokuk Limestone	Burlington-Keokuk Limestone		
		Burlington Limestone	Burlington Limestone		
		Fern Glen Limestone	Reed Spring Ls. Mbr.		
	Kinderhookian	Gilmore City Limestone	Gilmore City Limestone		Kinderhookian
		Sedalia Dolomite (Northview Shale)	Sedalia Dolomite		
		Chouteau Limestone	Compton Limestone		
		Boice Shale	Hannibal Shale		
DEVONIAN		Chattanooga Shale	Chattanooga Shale	DEVONIAN	

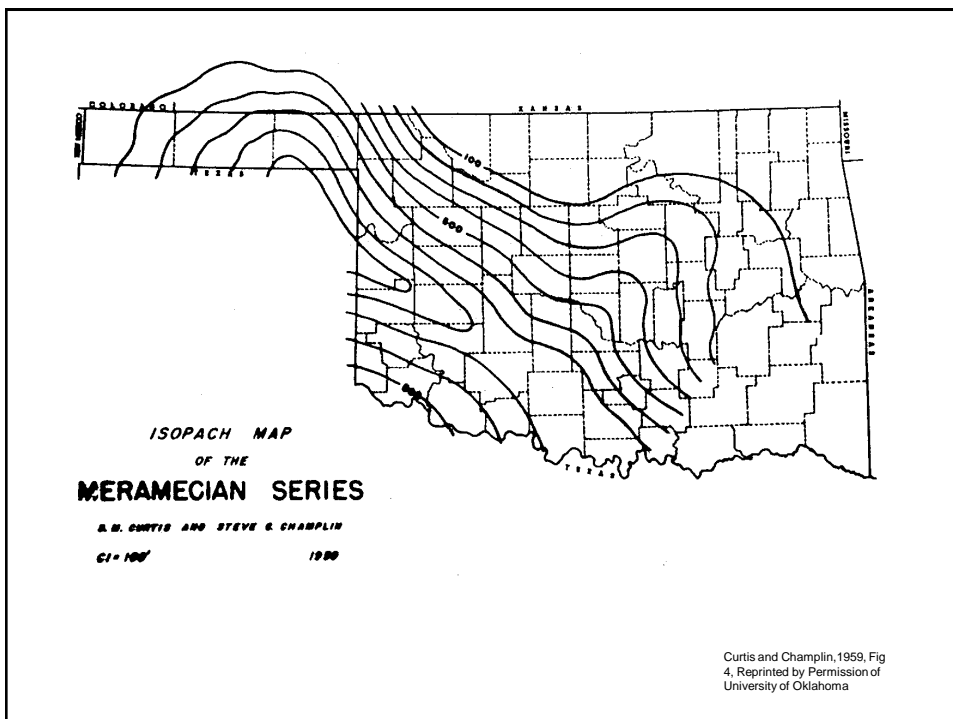
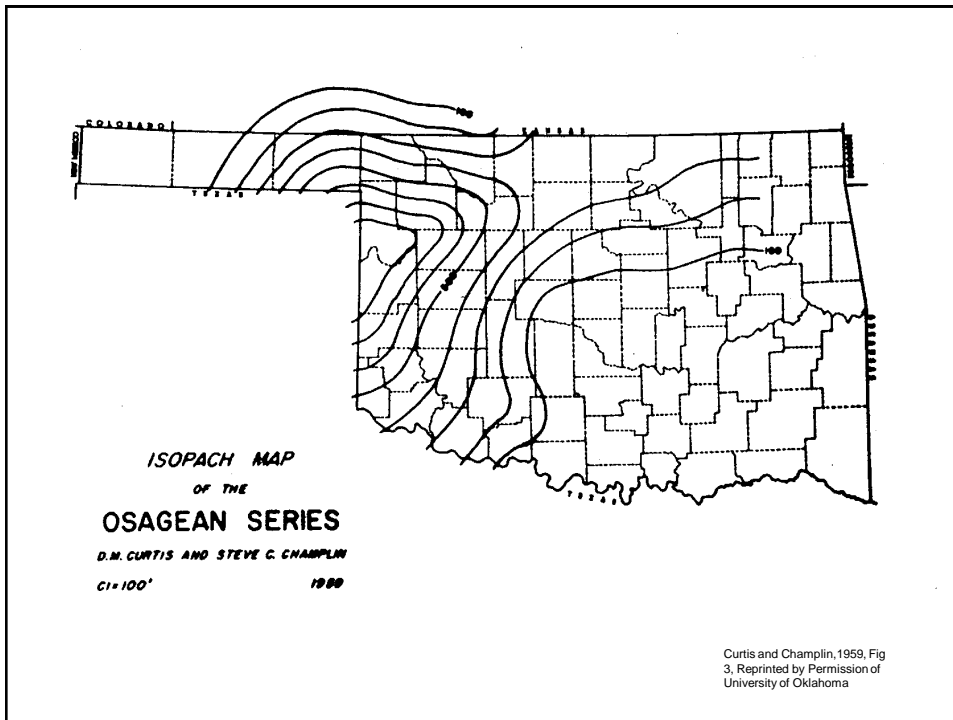
Maples, 1994, Reprinted by permission of Kansas Geological Survey

## Geologic Column #3

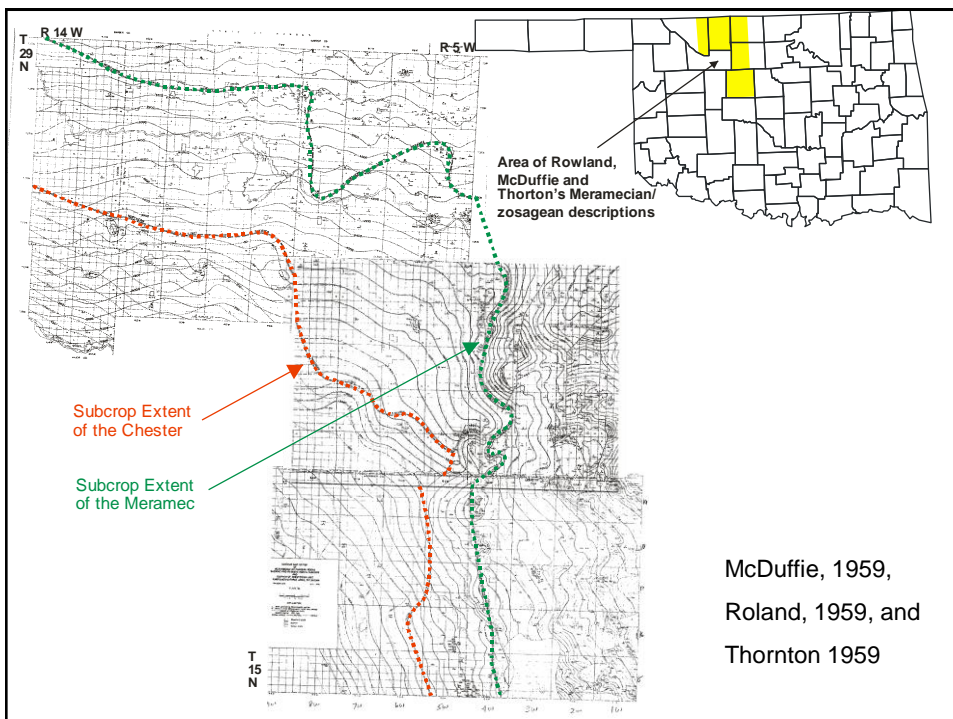
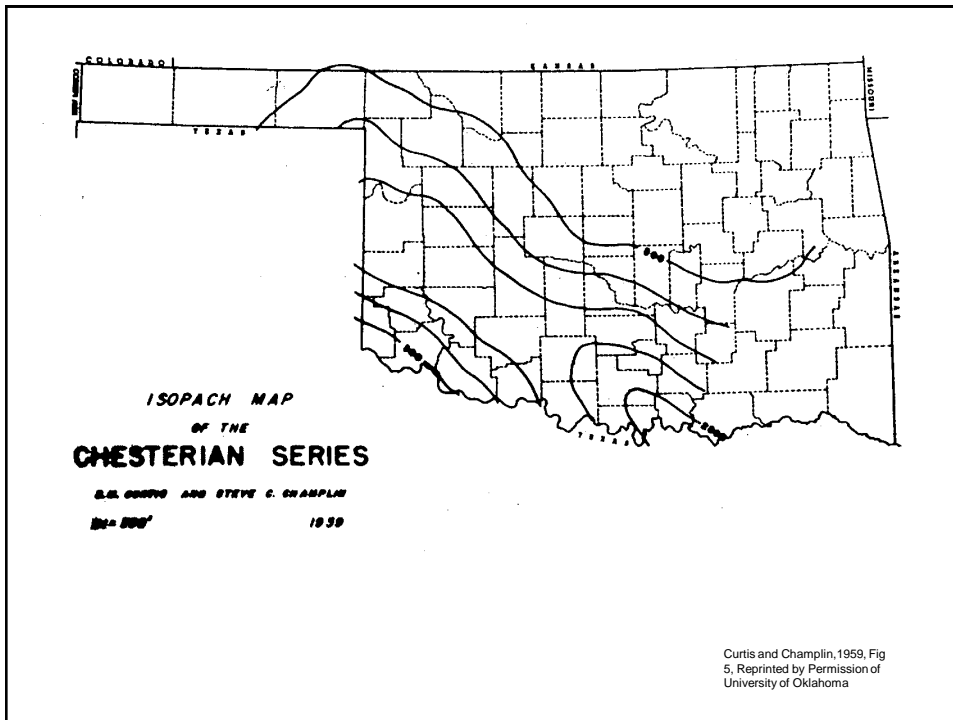


Mazzullo, Wilhite, and Woolsey, 2009, Fig 2, Reprinted by Permission of American Association of Petroleum Geologists

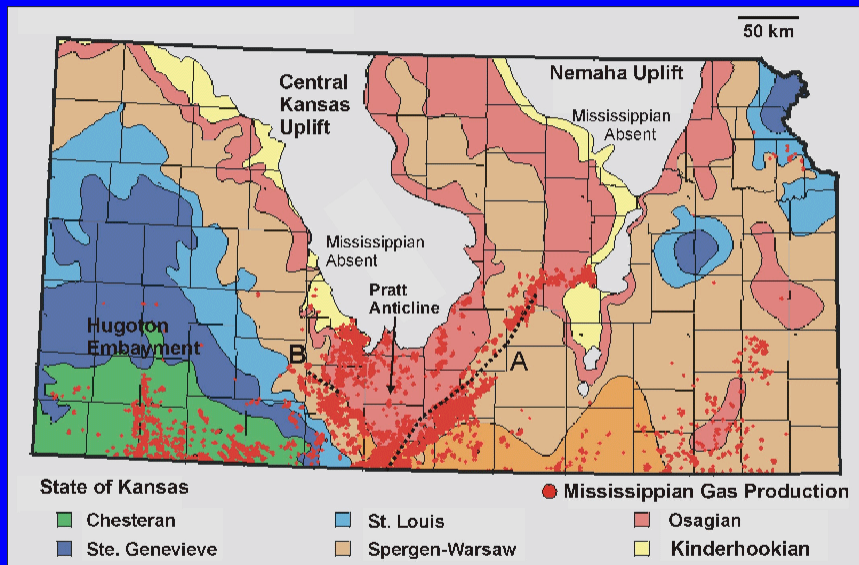




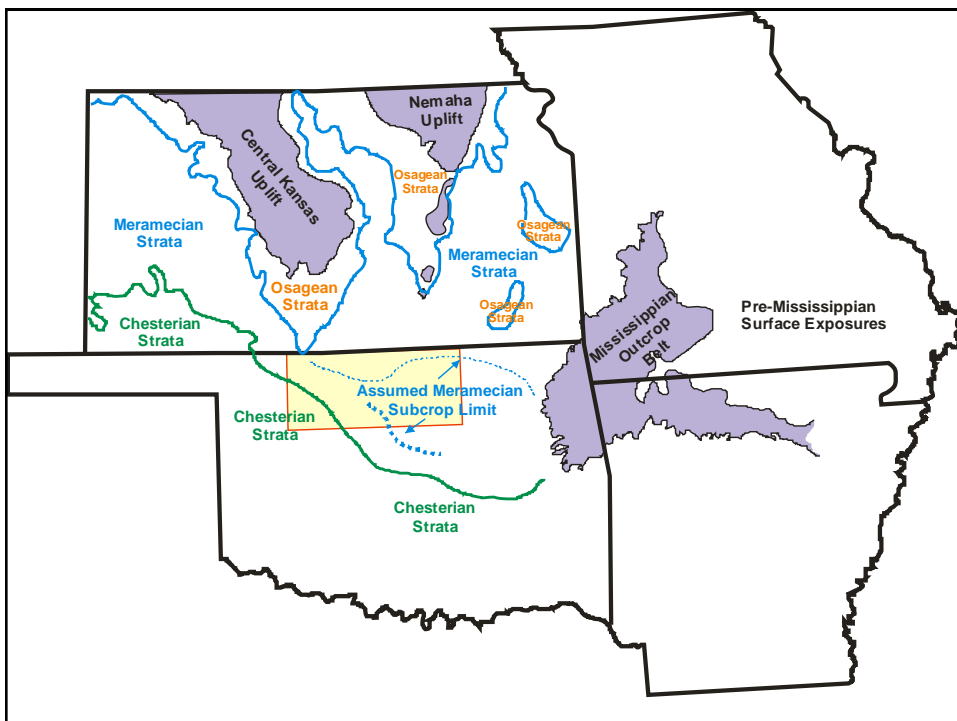




# Mississippian Subcrop



(Gerlach, 1998)

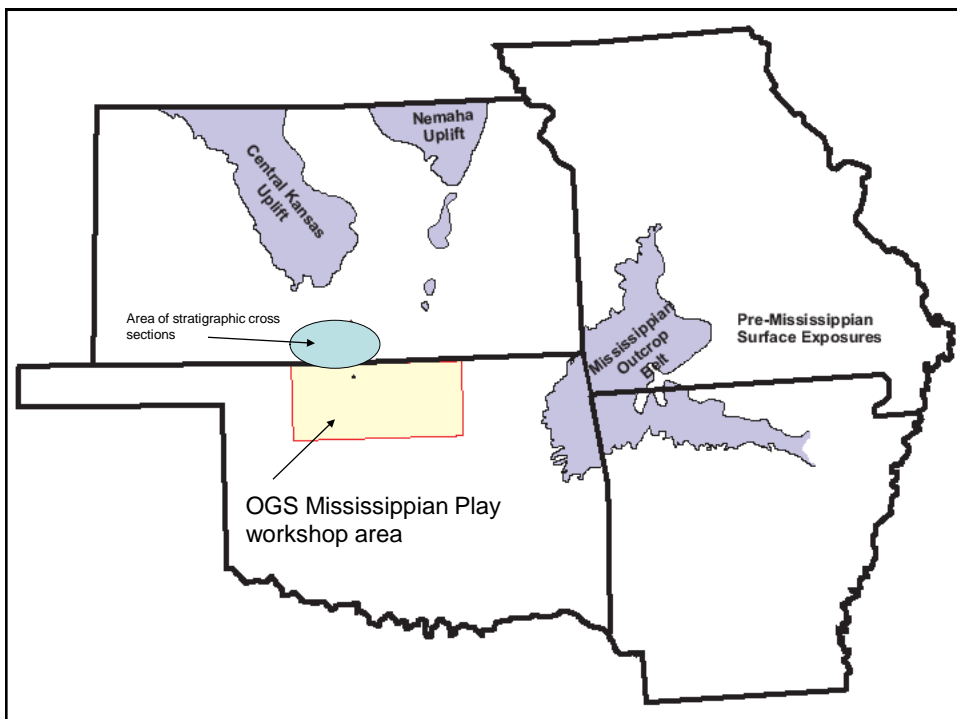


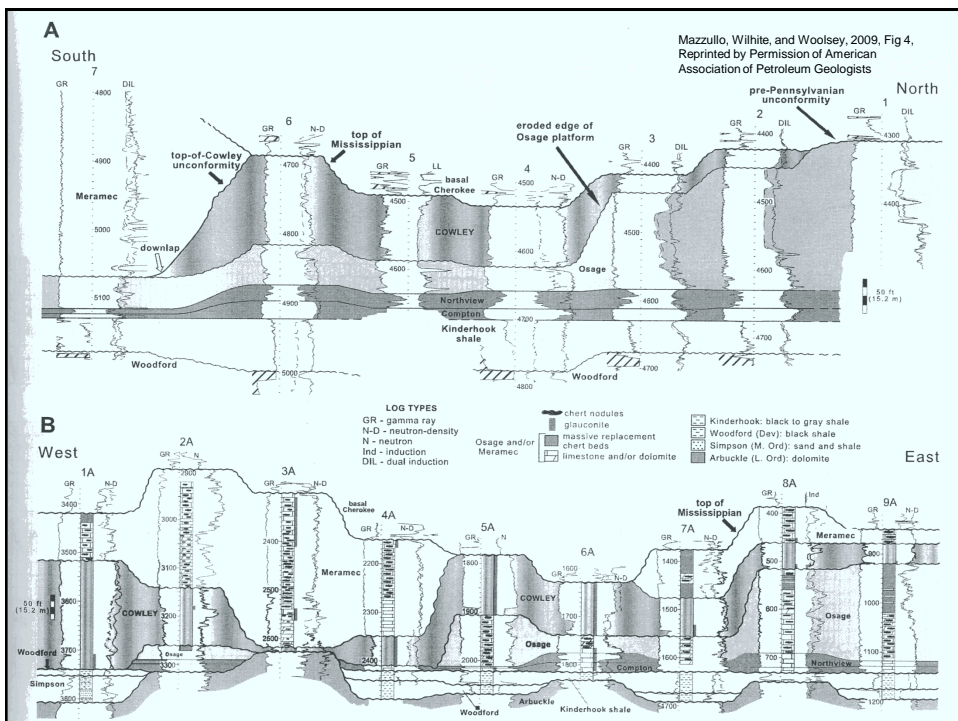
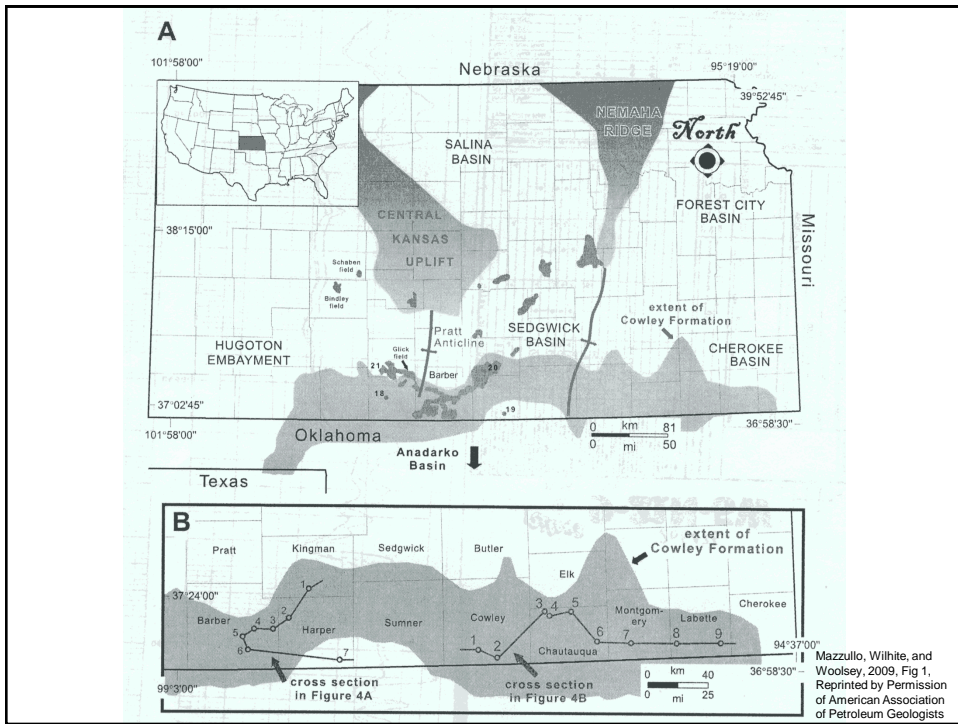
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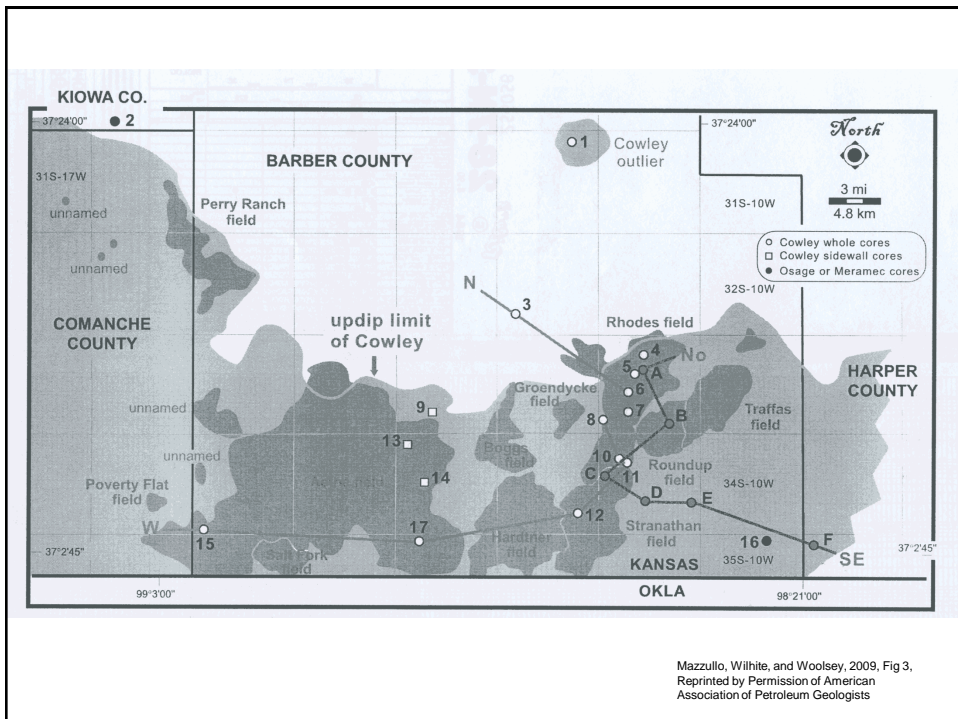
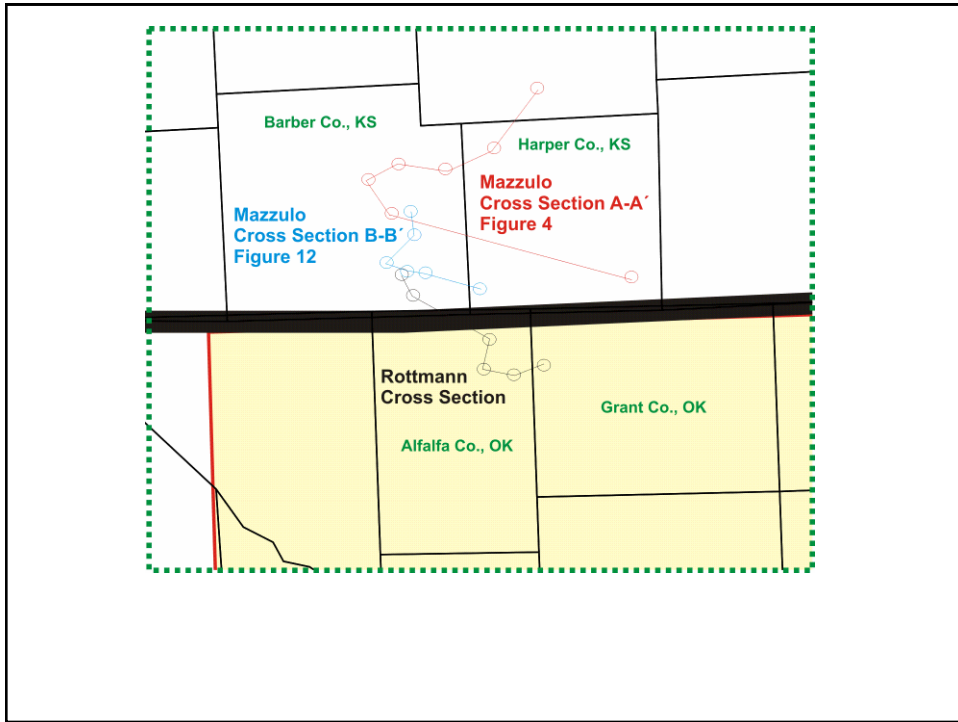
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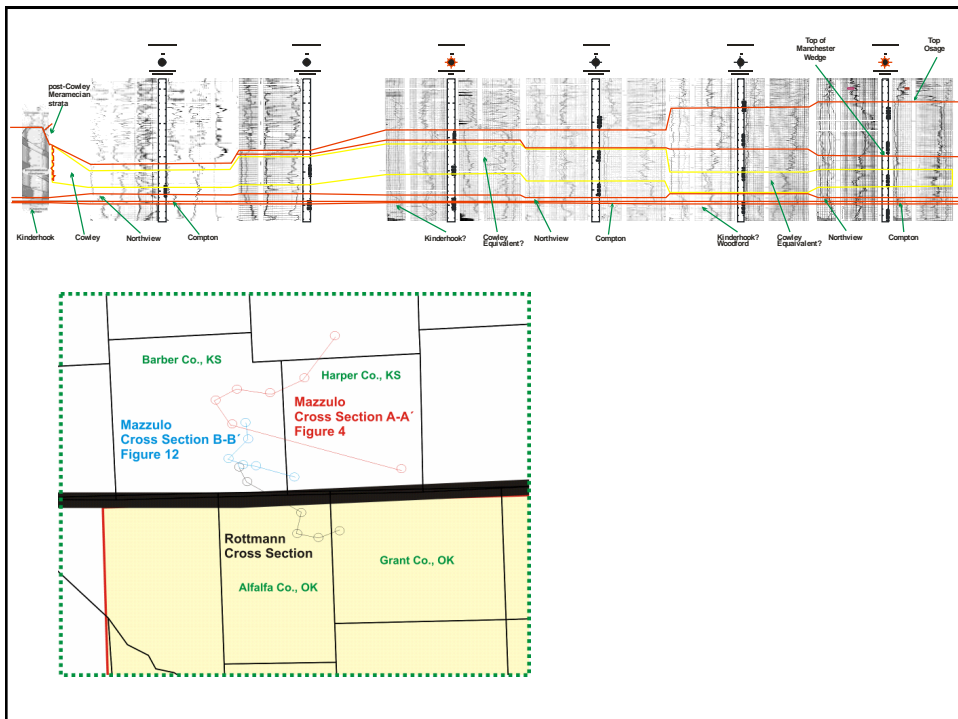
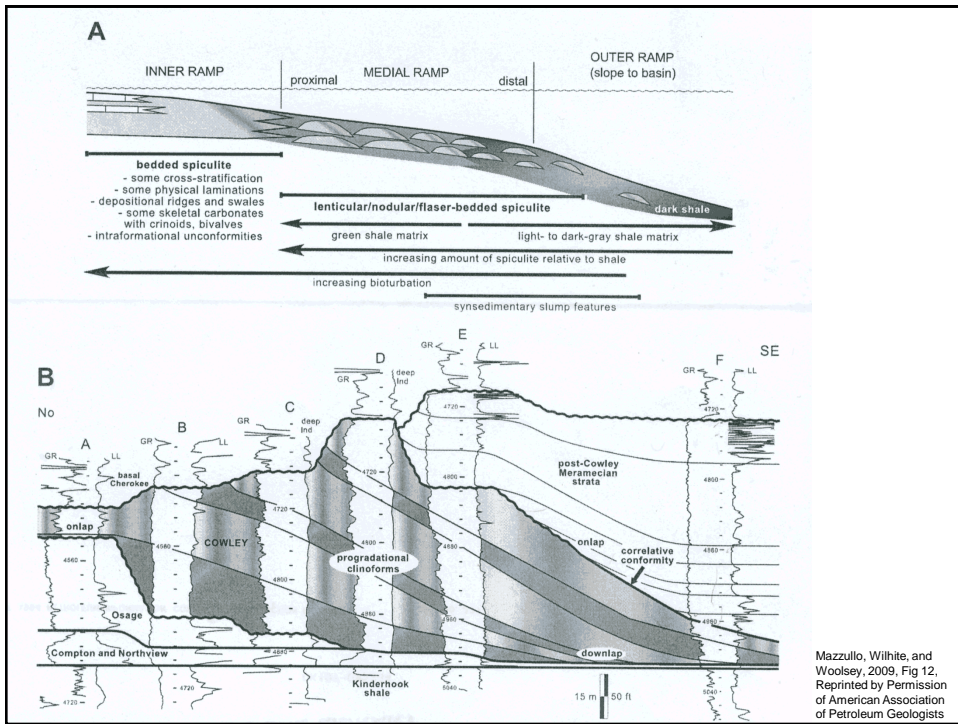
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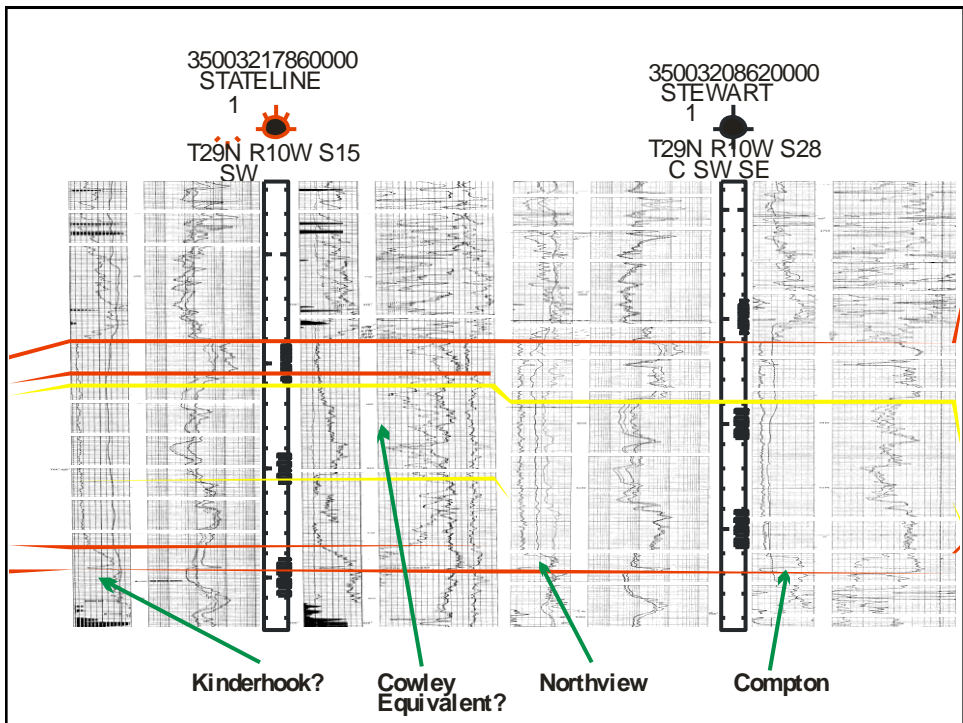
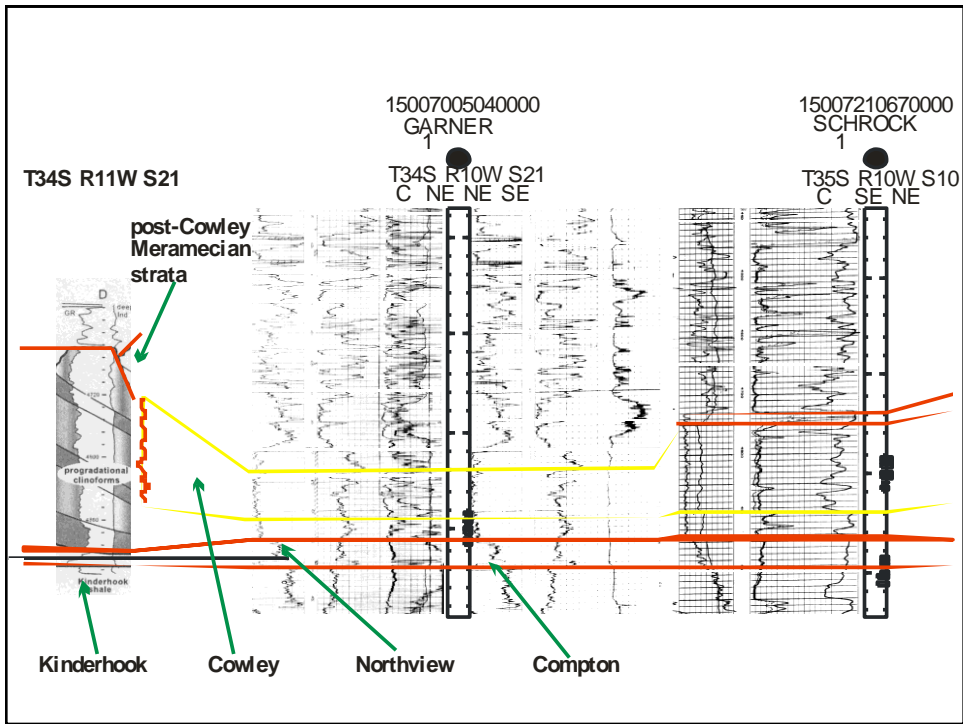


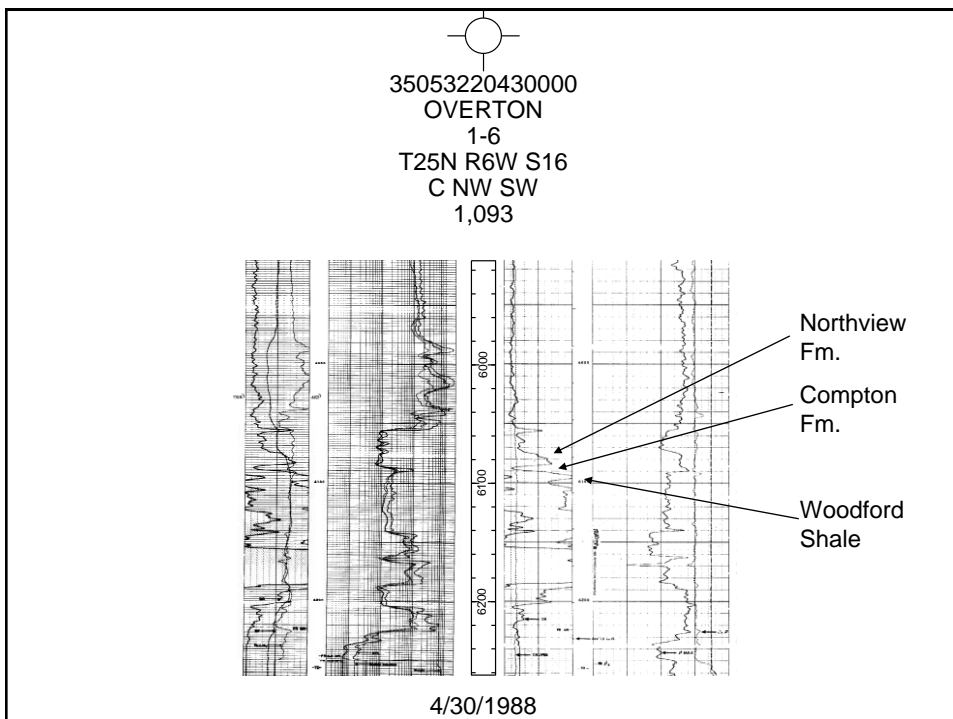
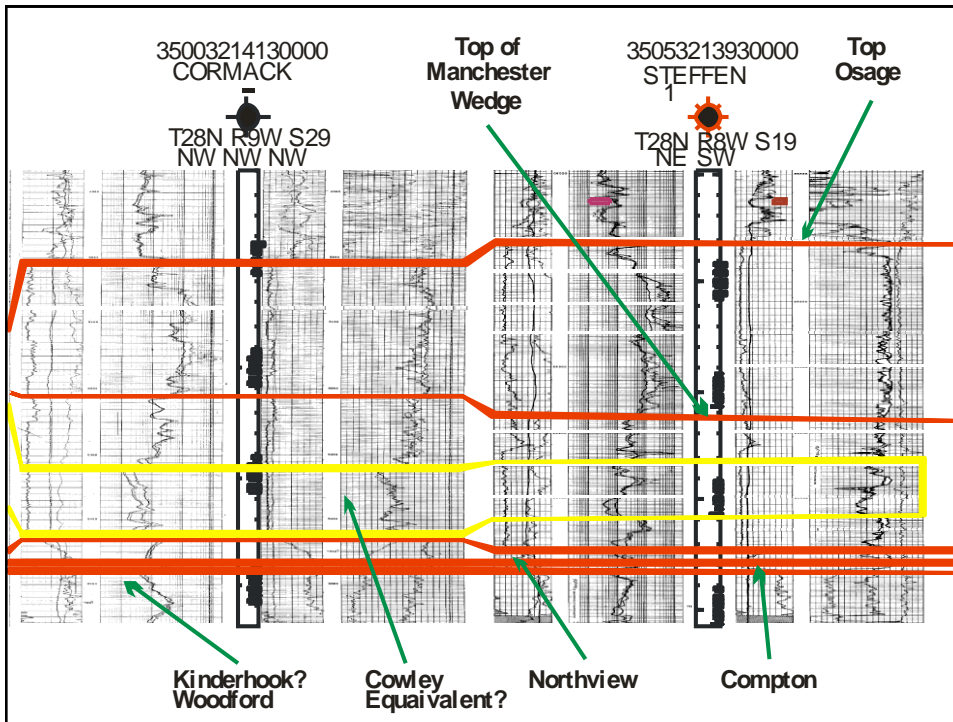




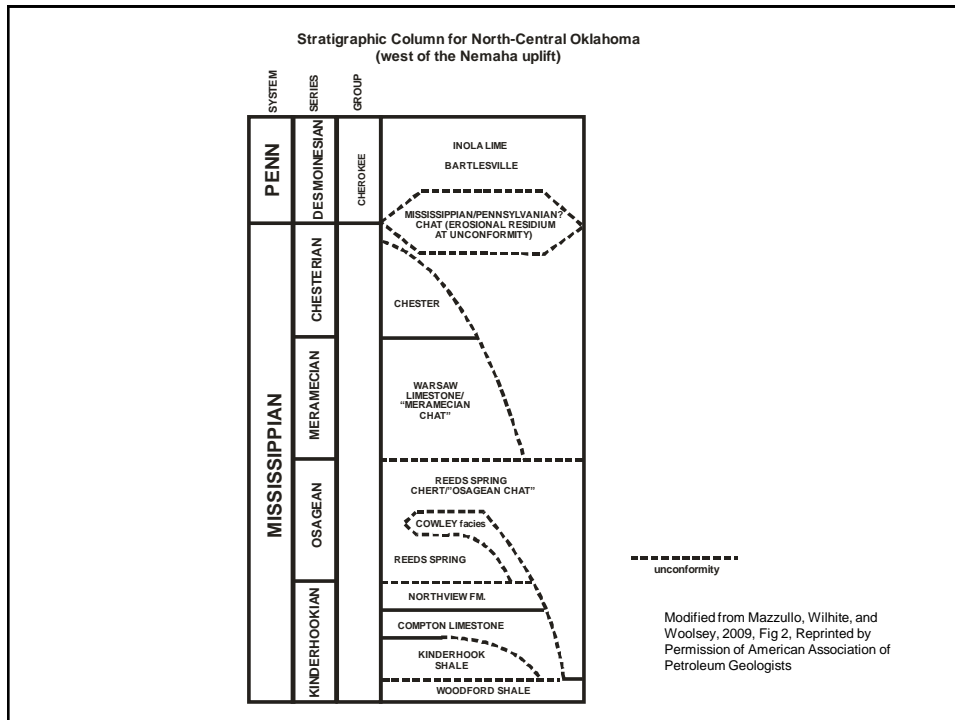












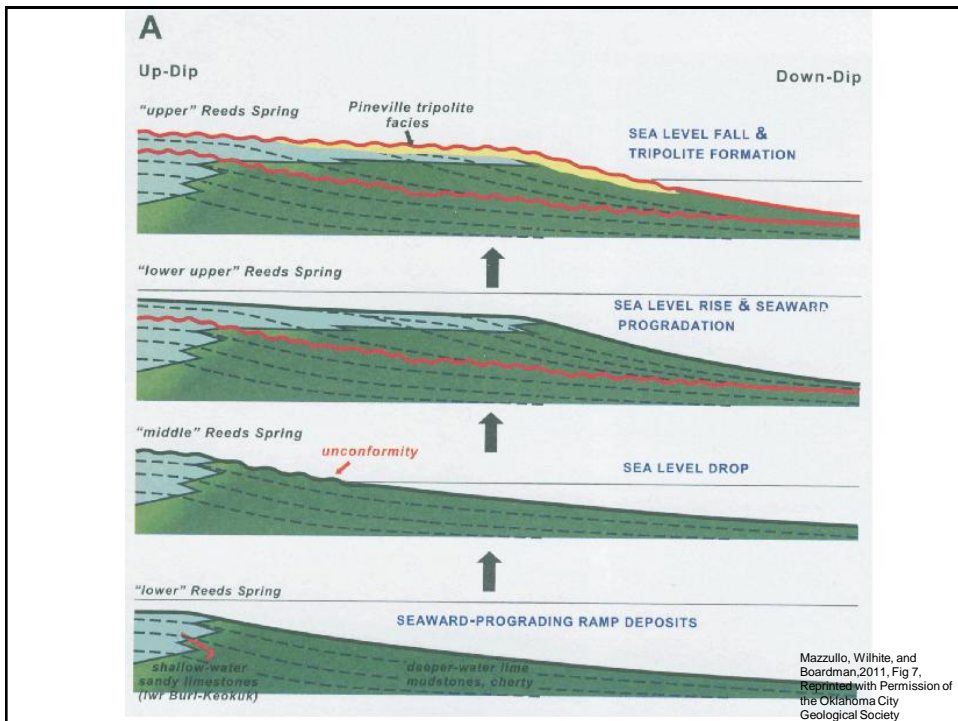
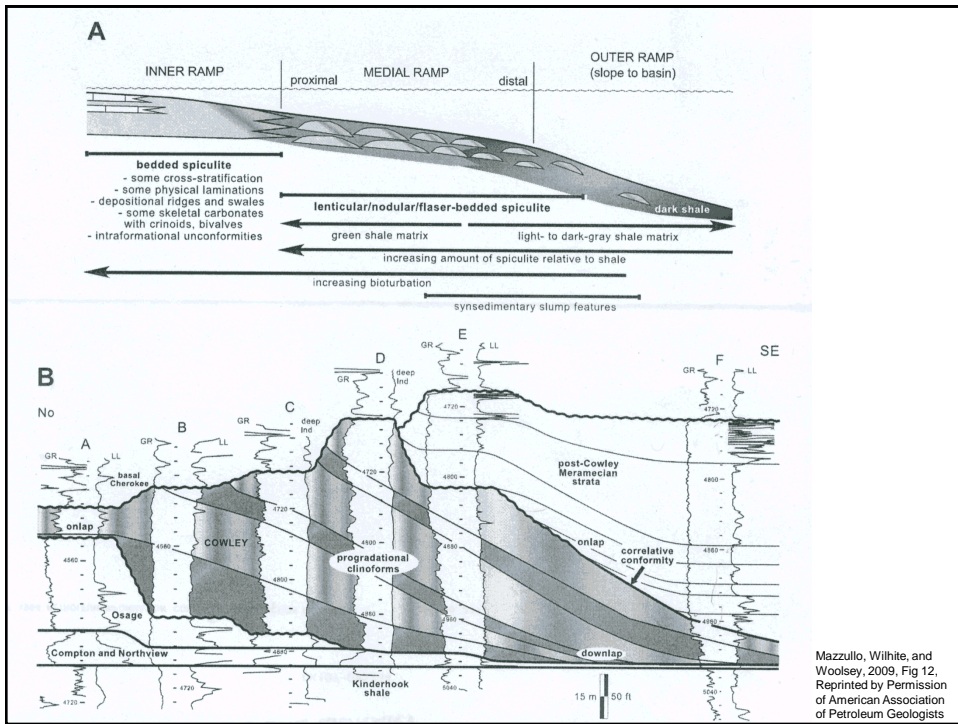
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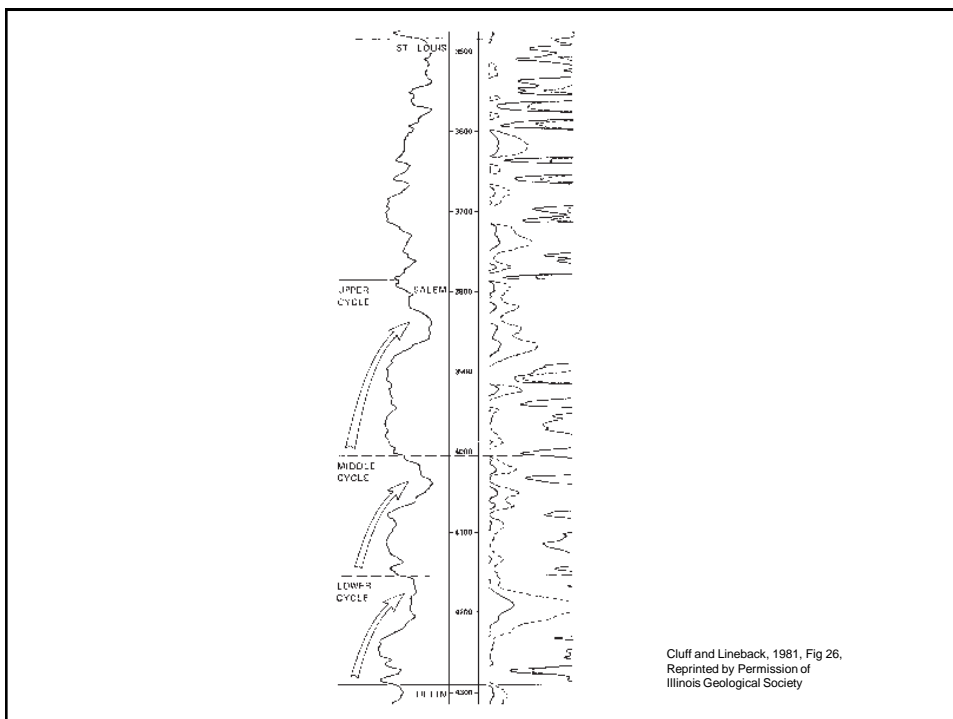
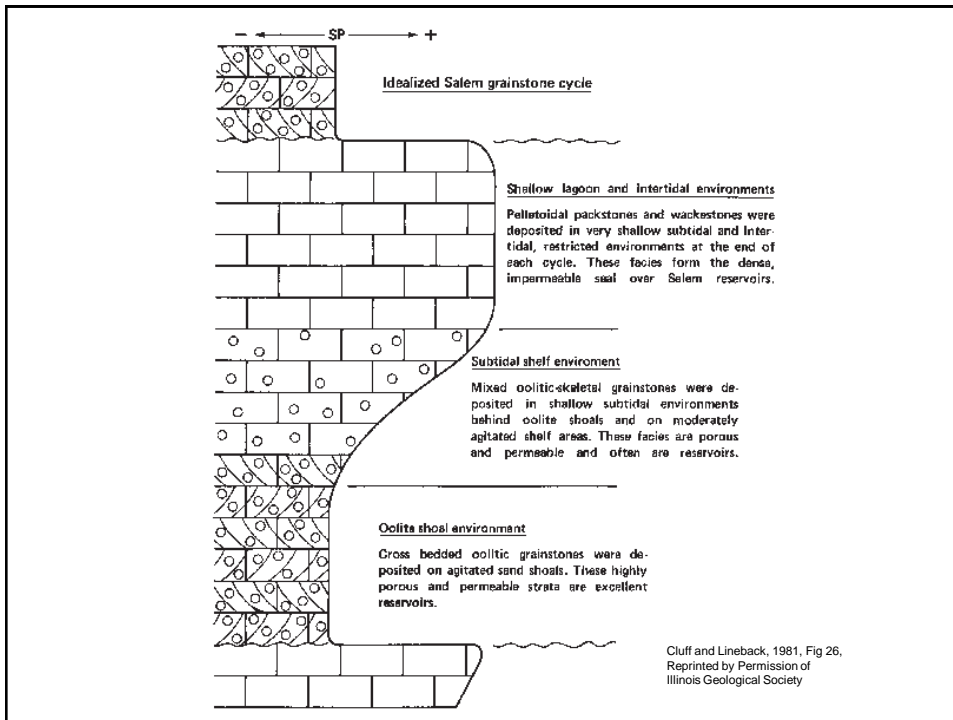
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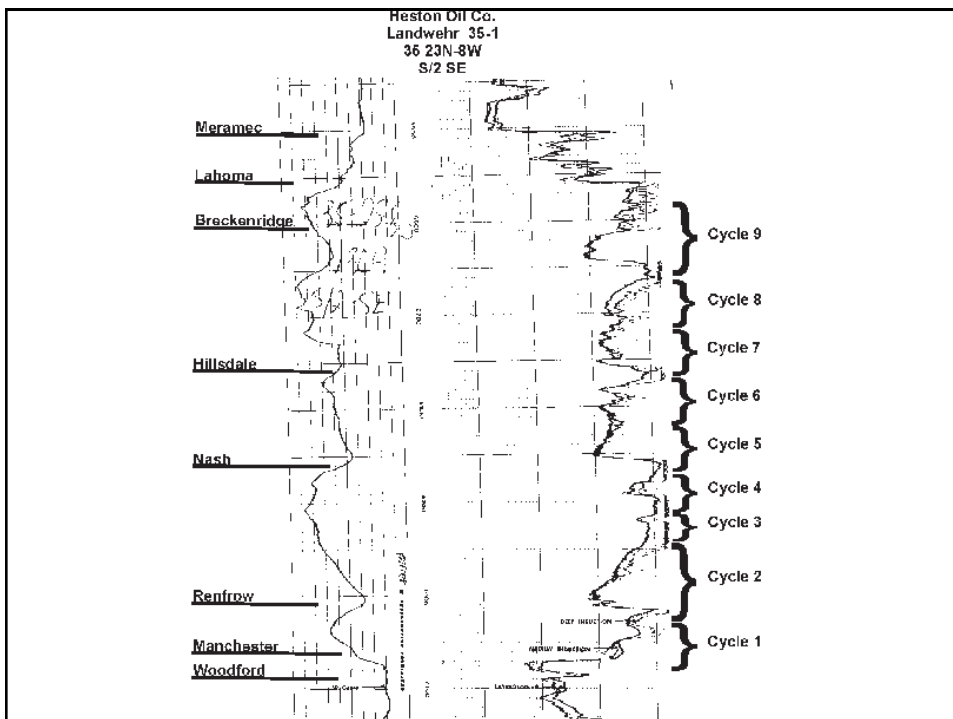
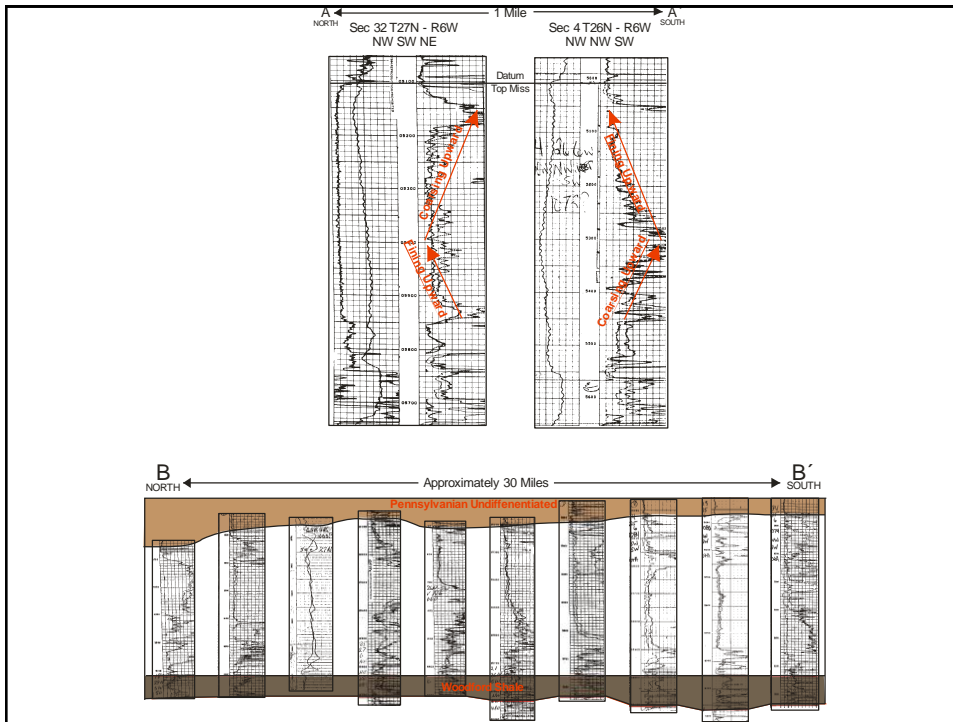
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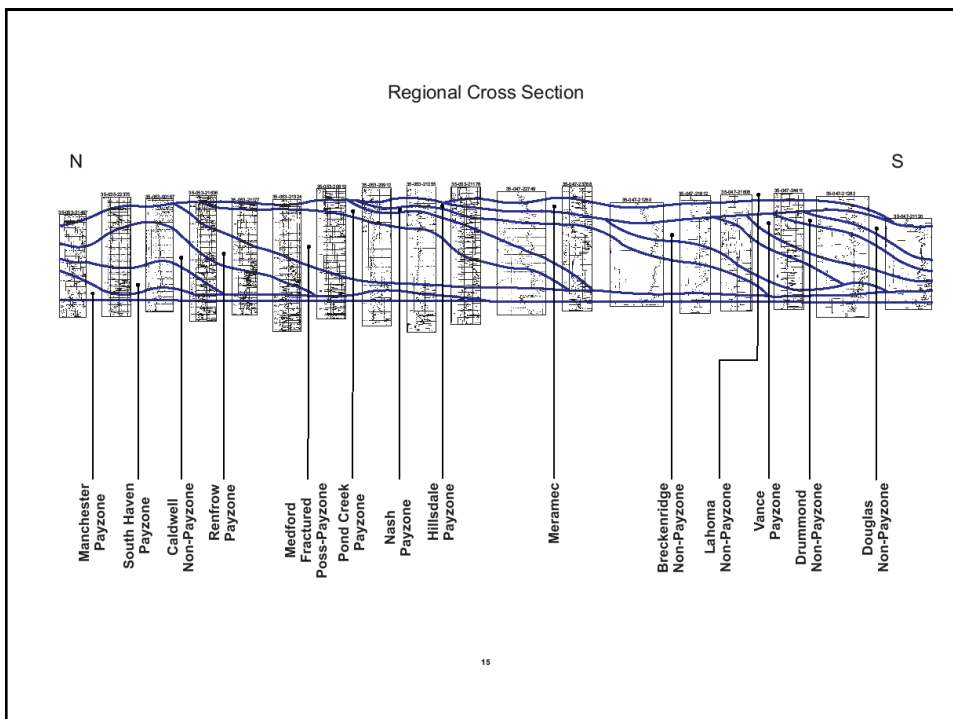
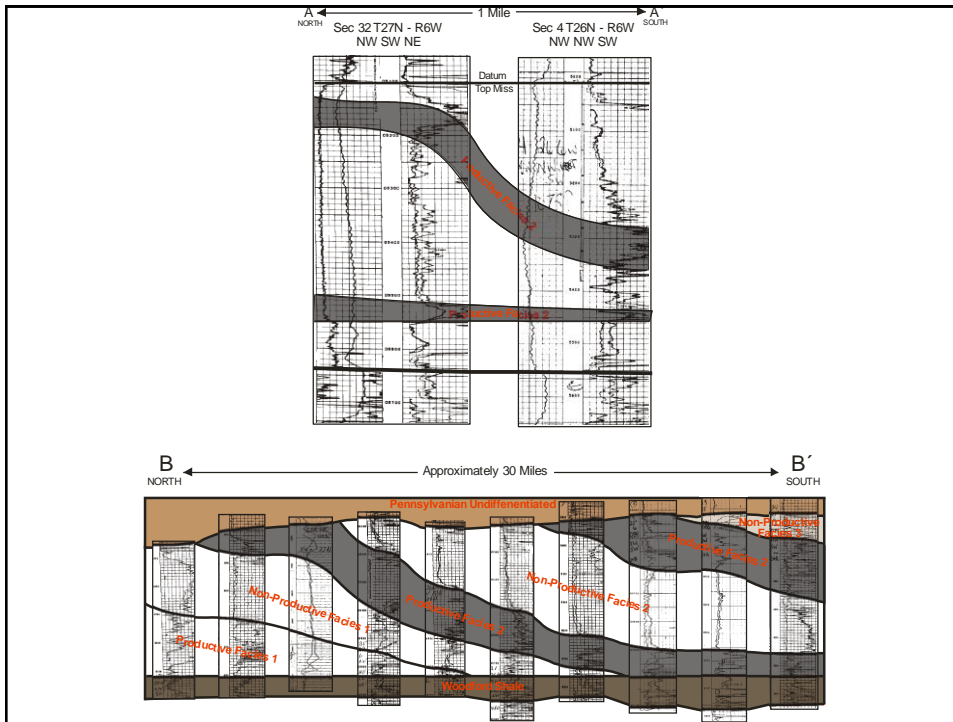
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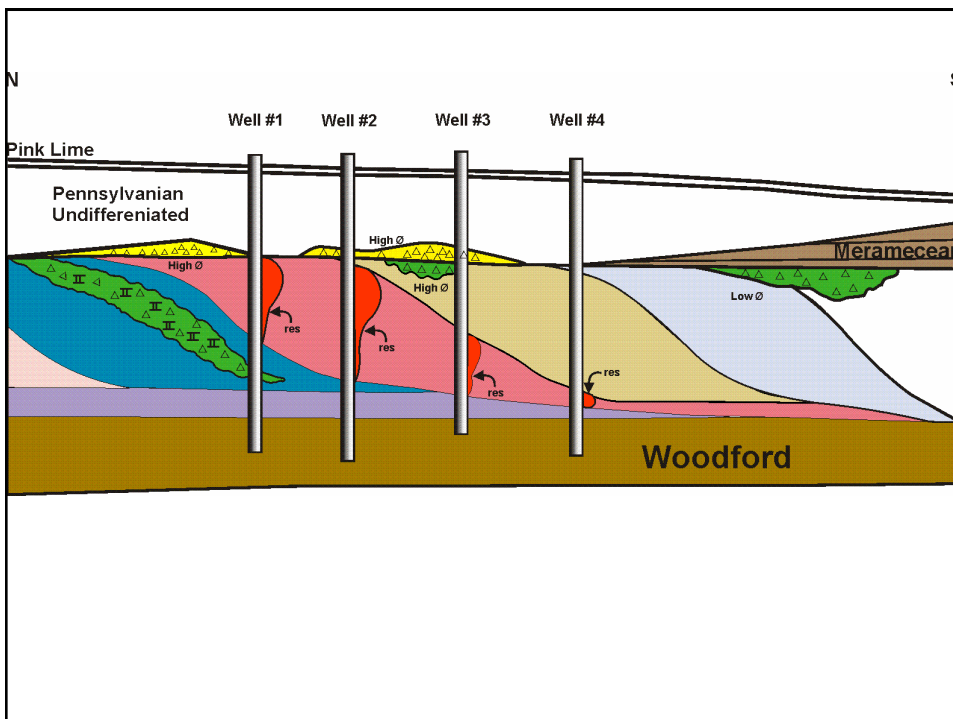
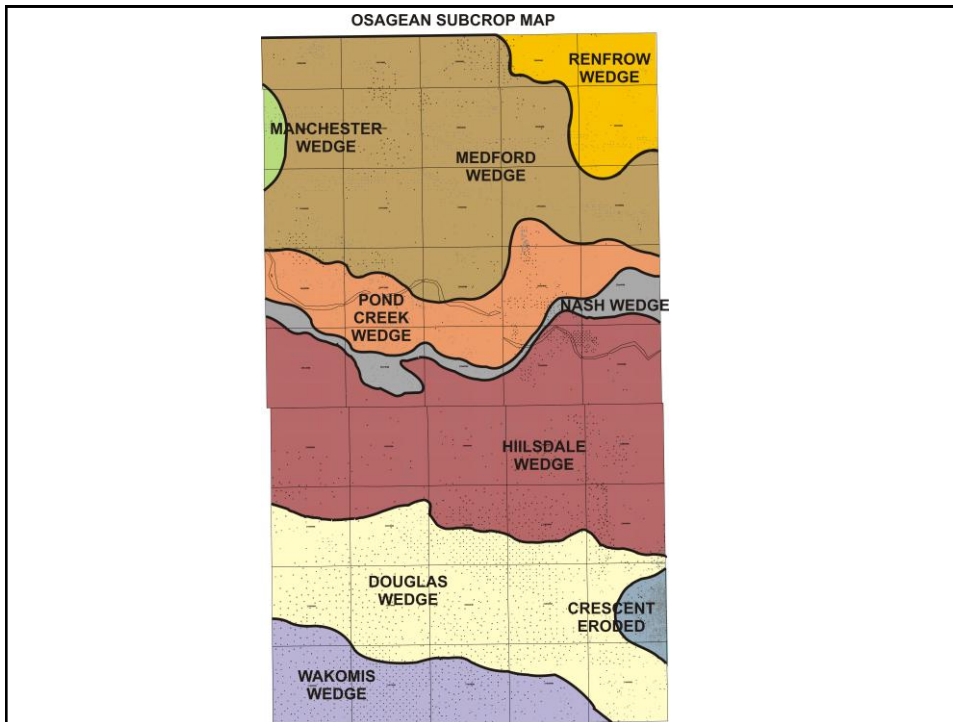


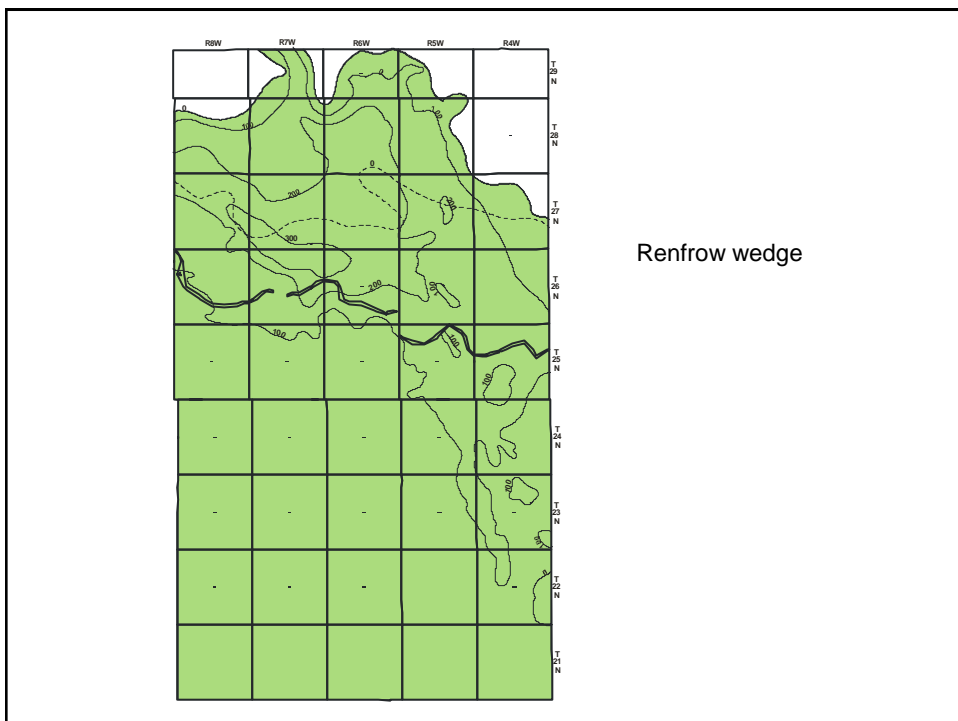
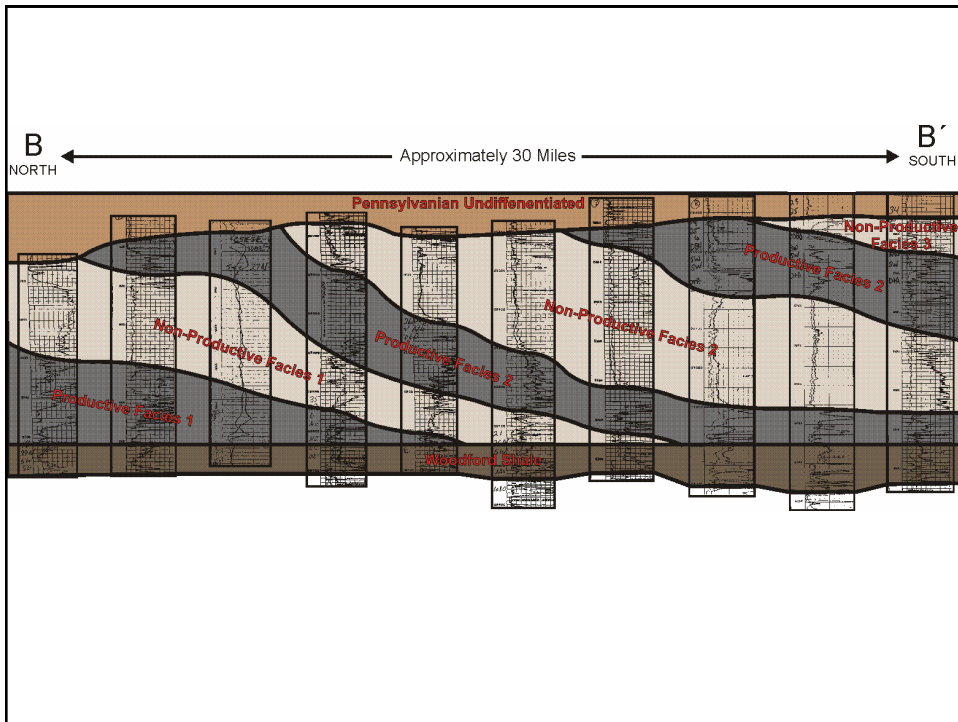




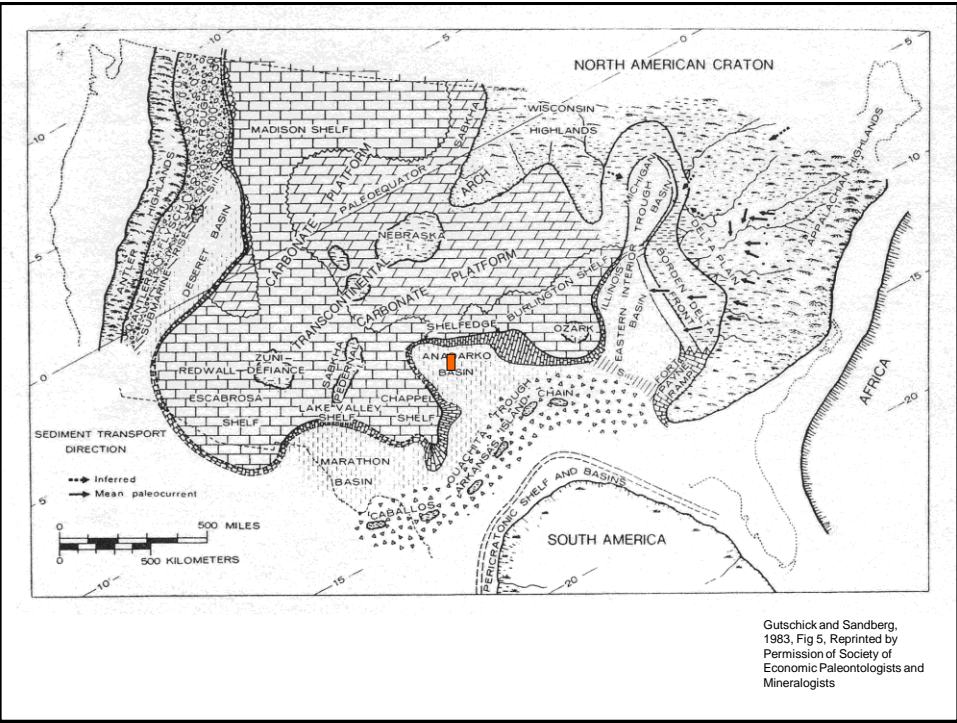
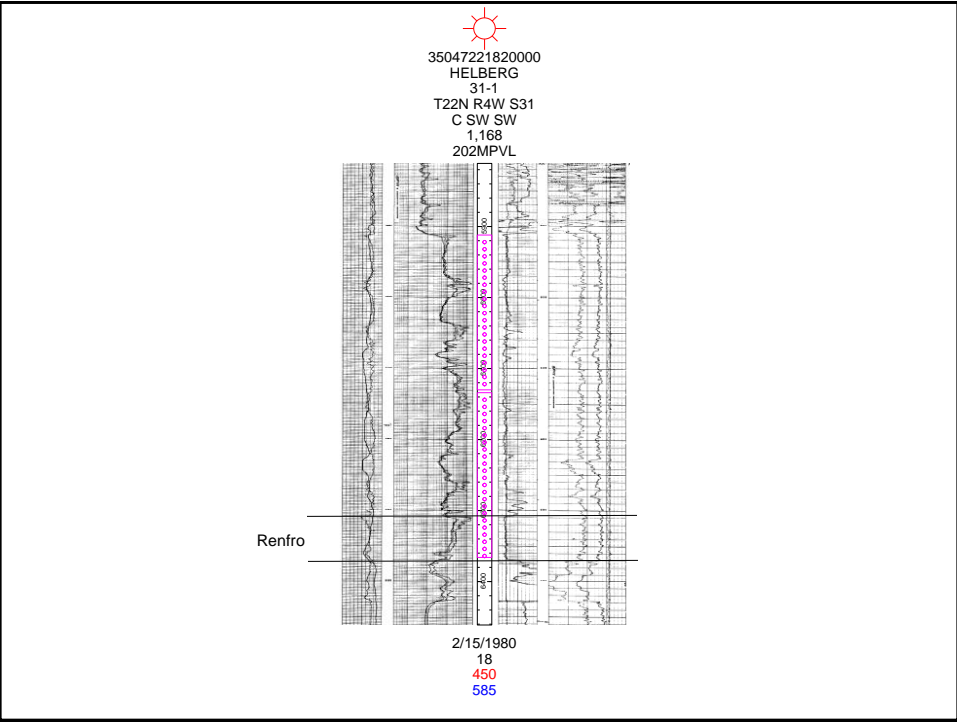


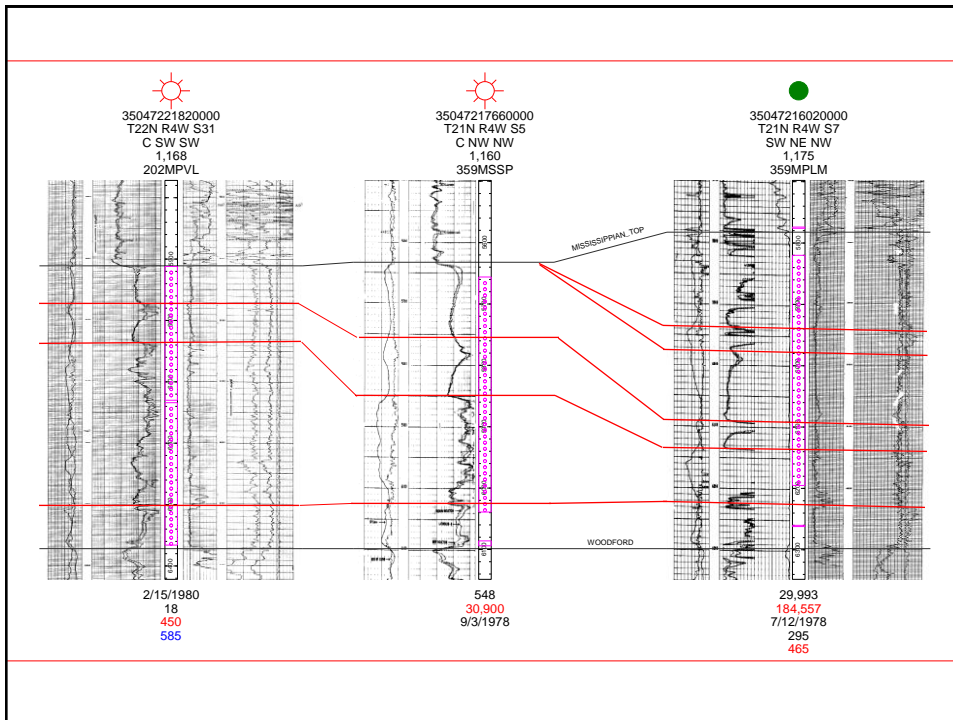










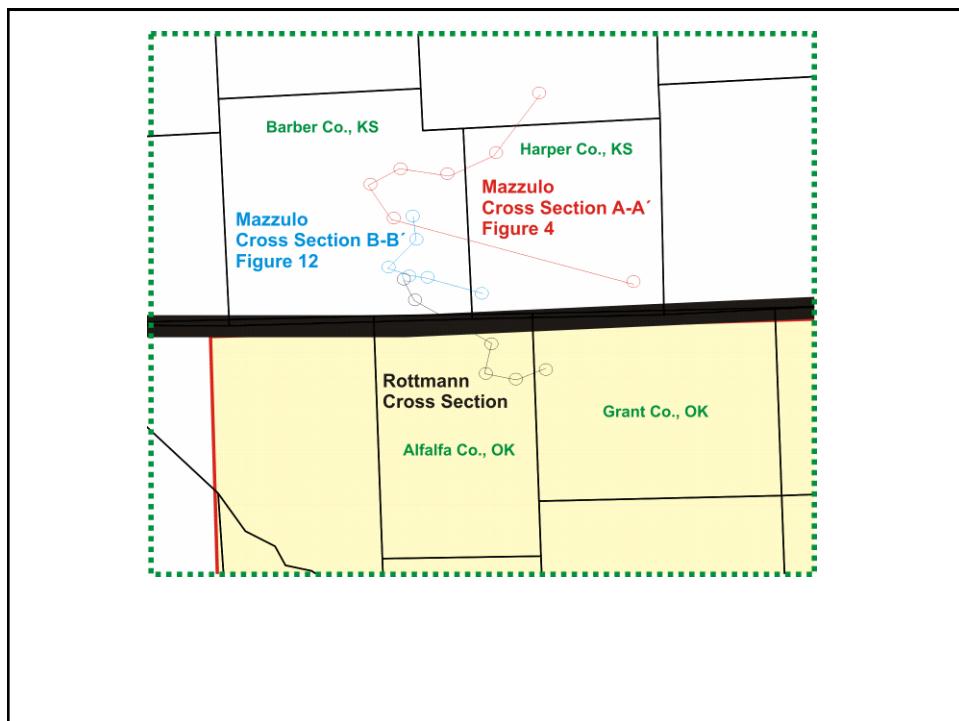
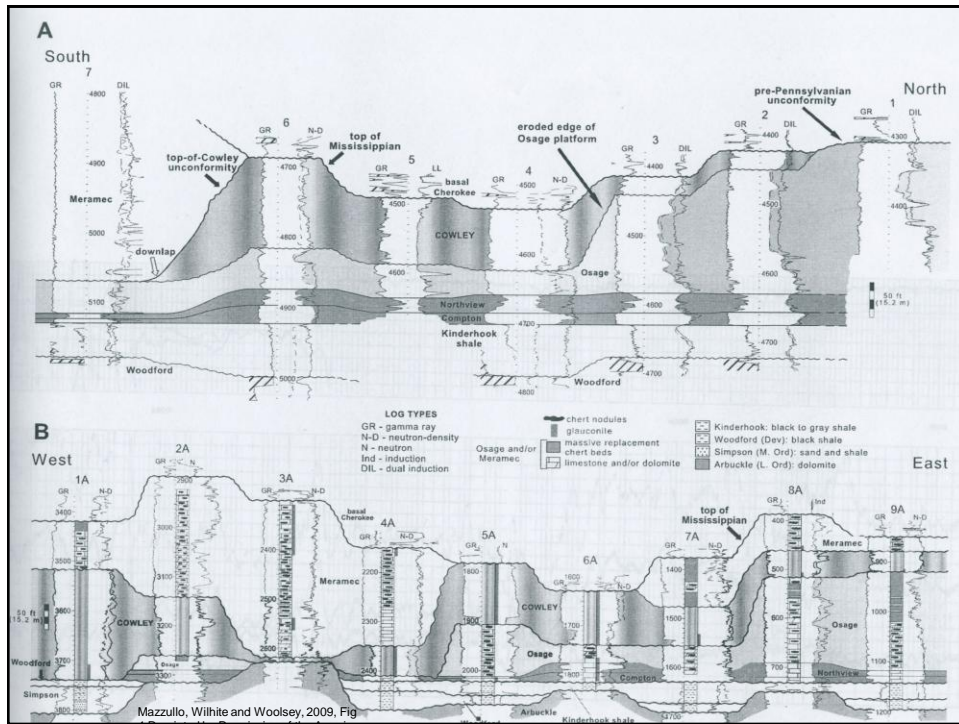


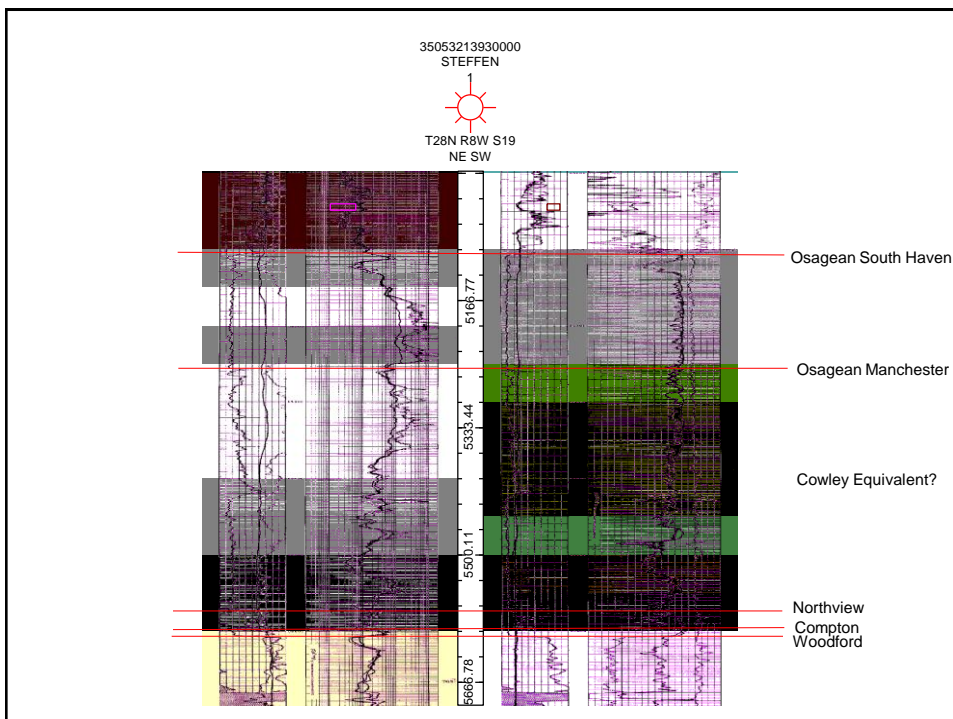
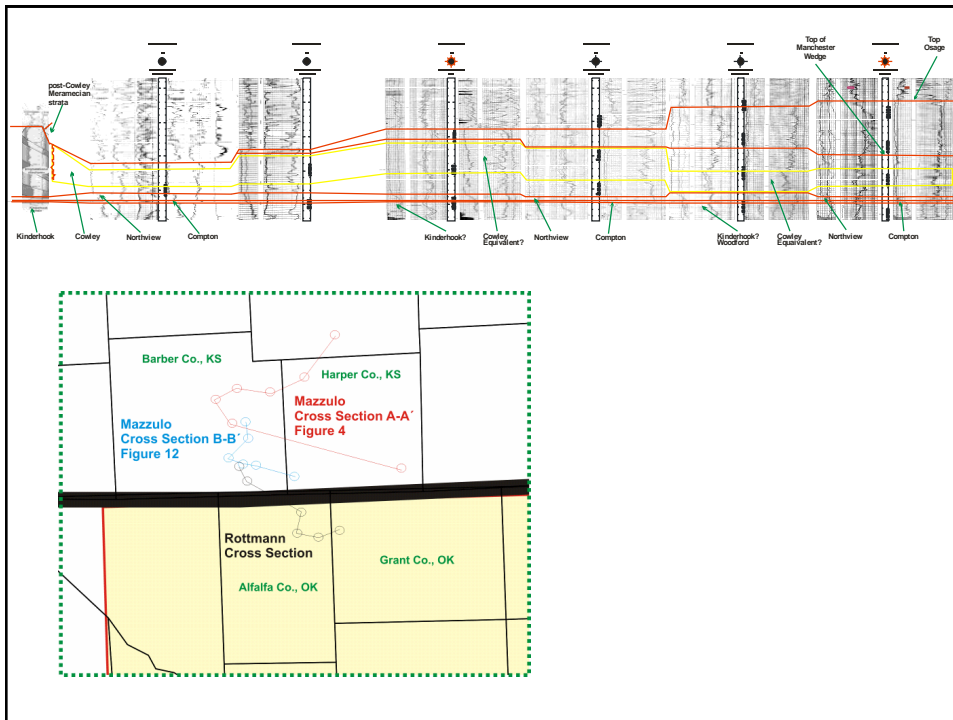
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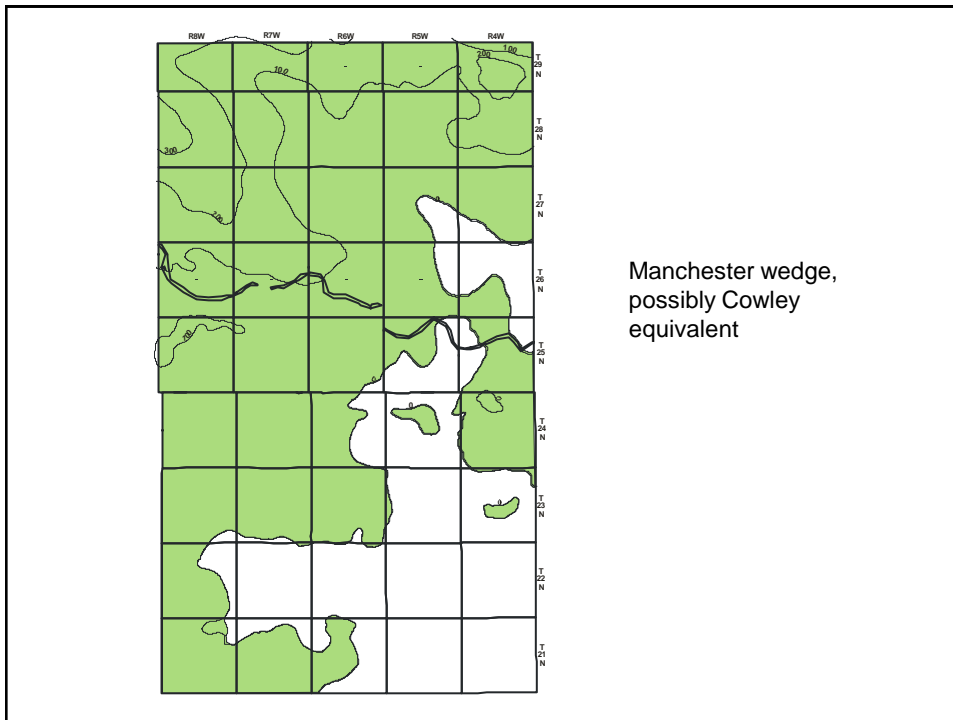
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### • Goals

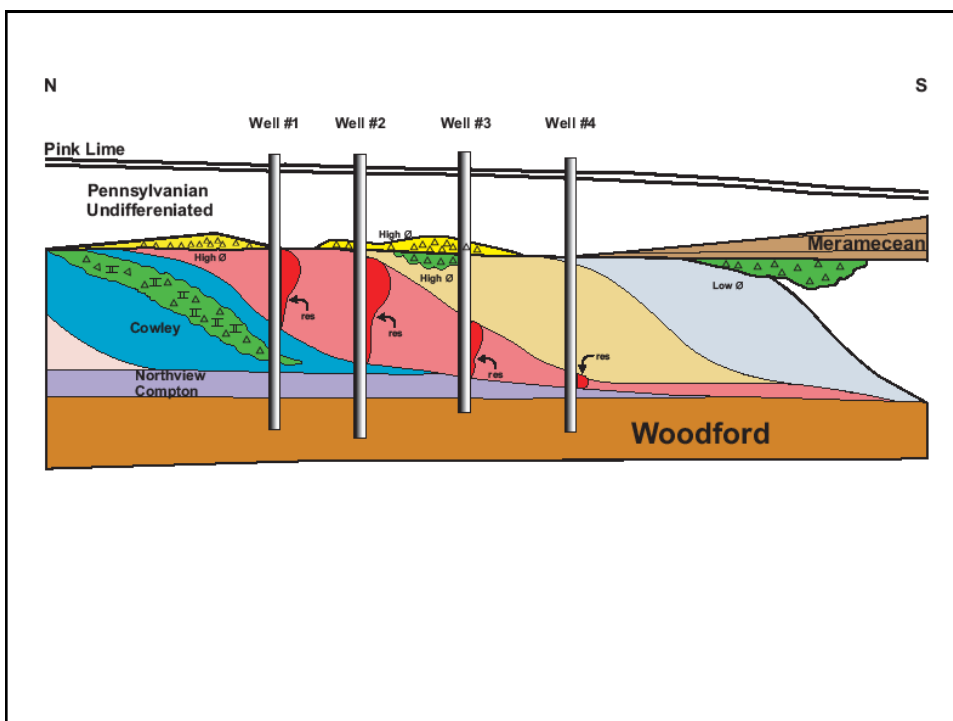
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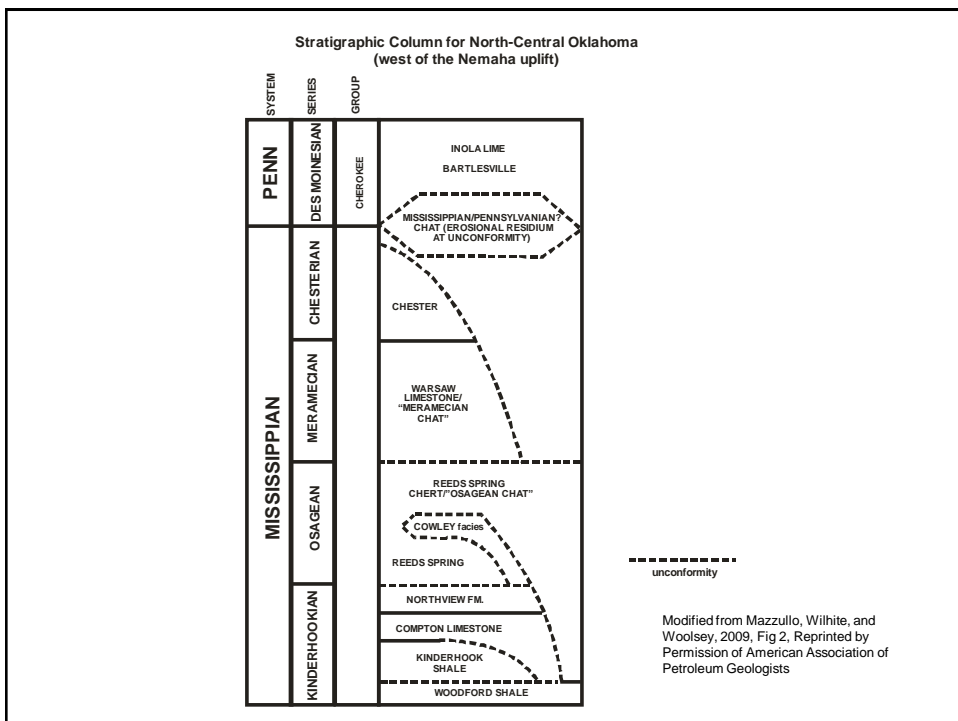
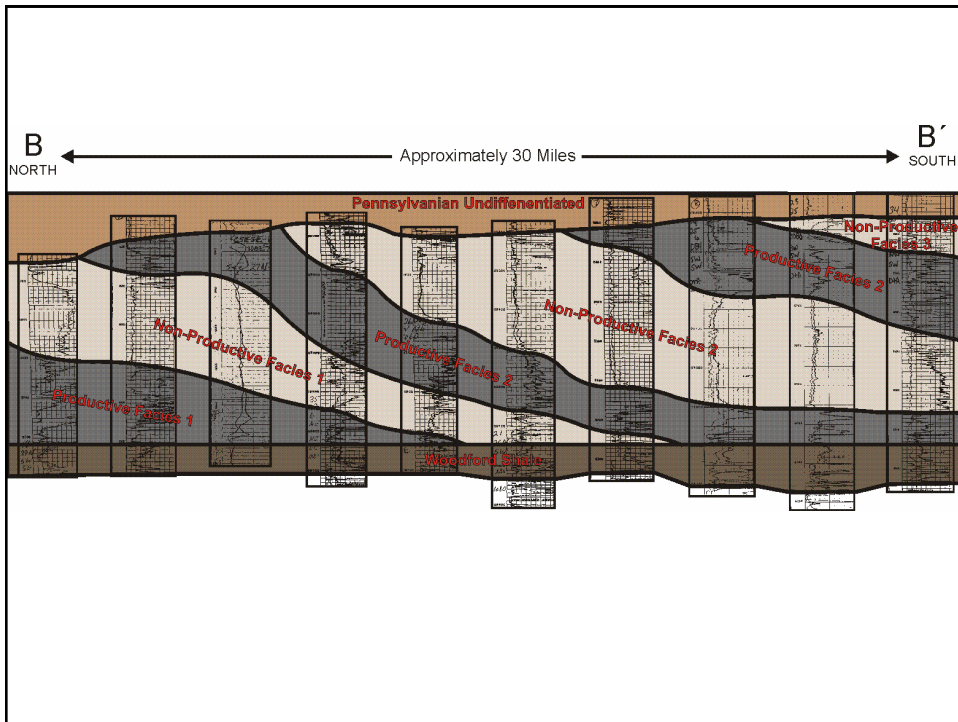




Manchester wedge,  
possibly Cowley  
equivalent





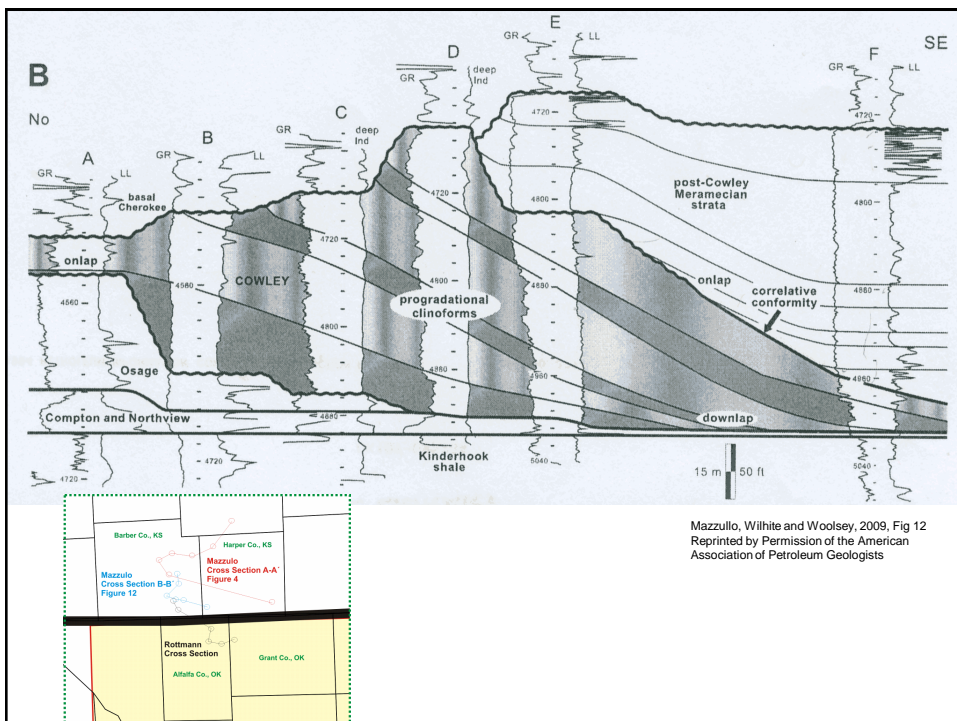


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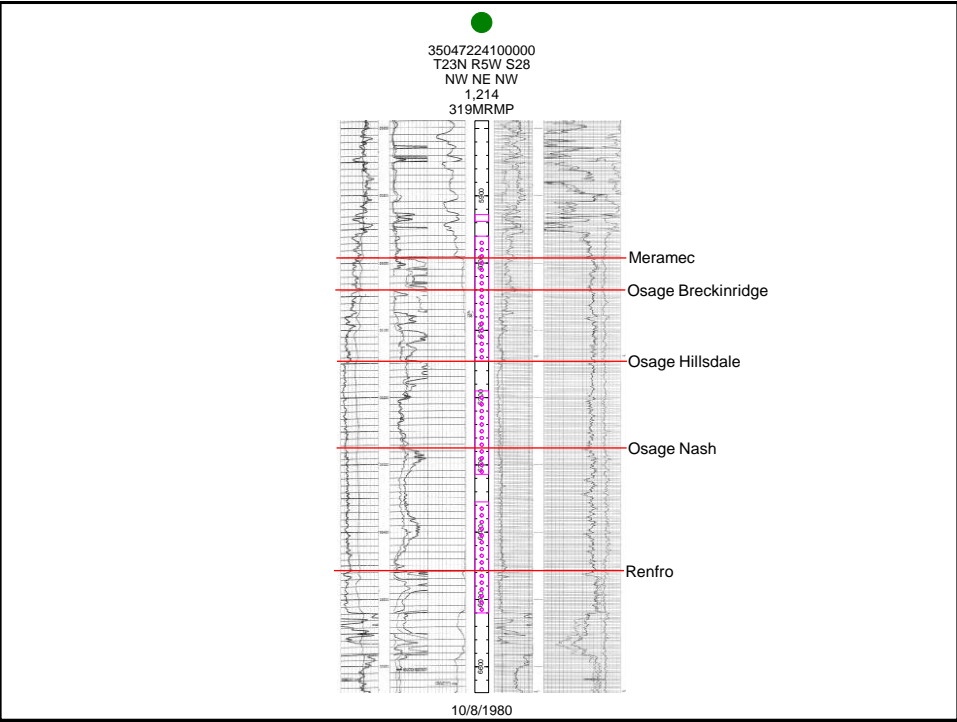
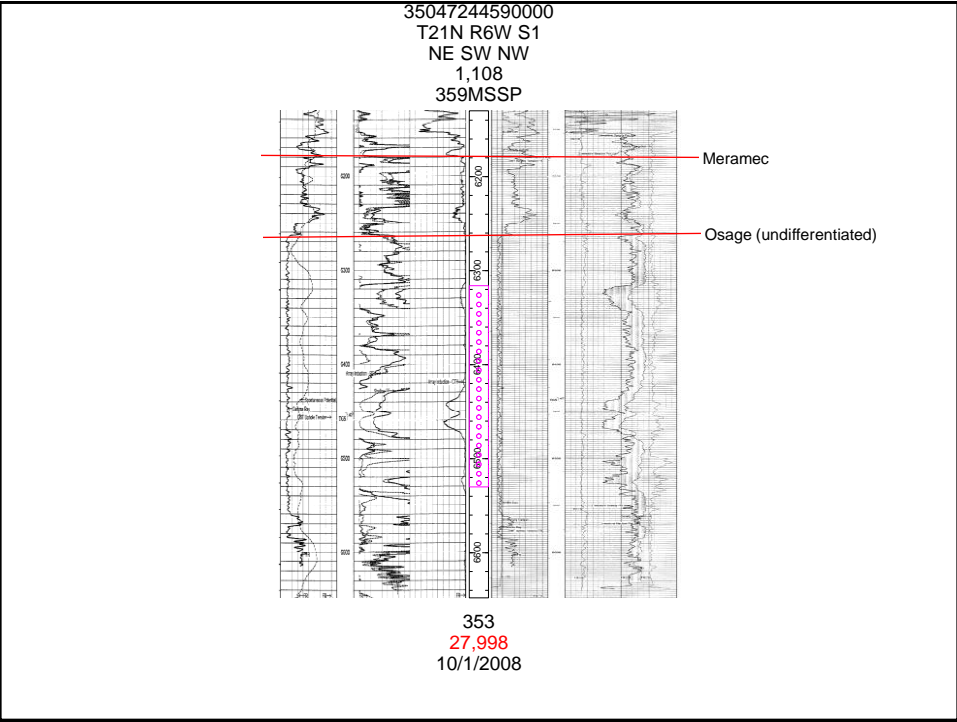
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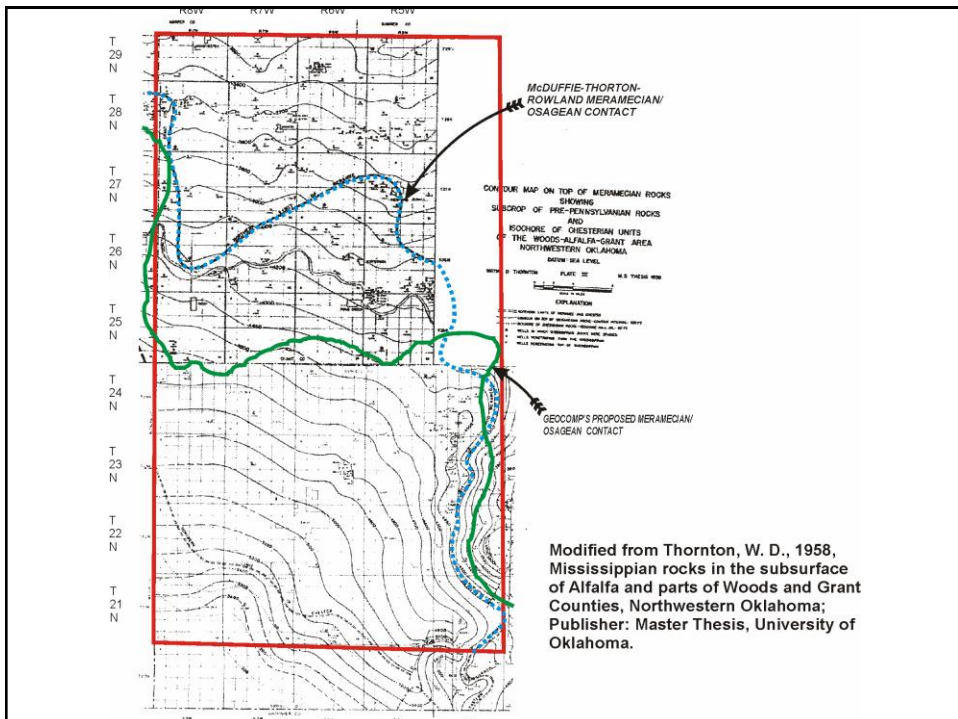
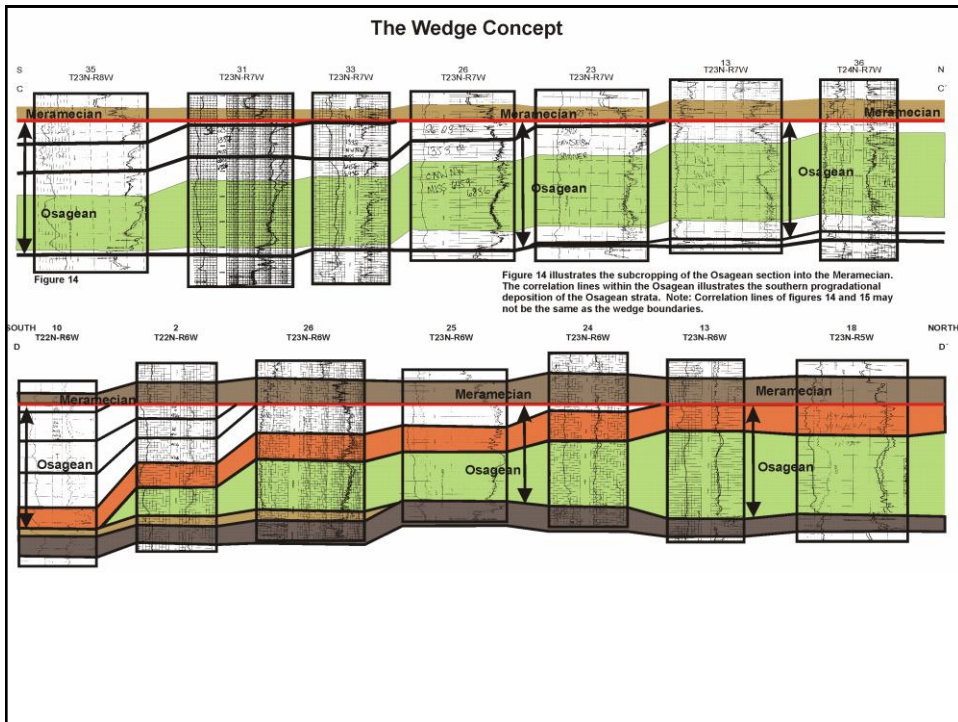
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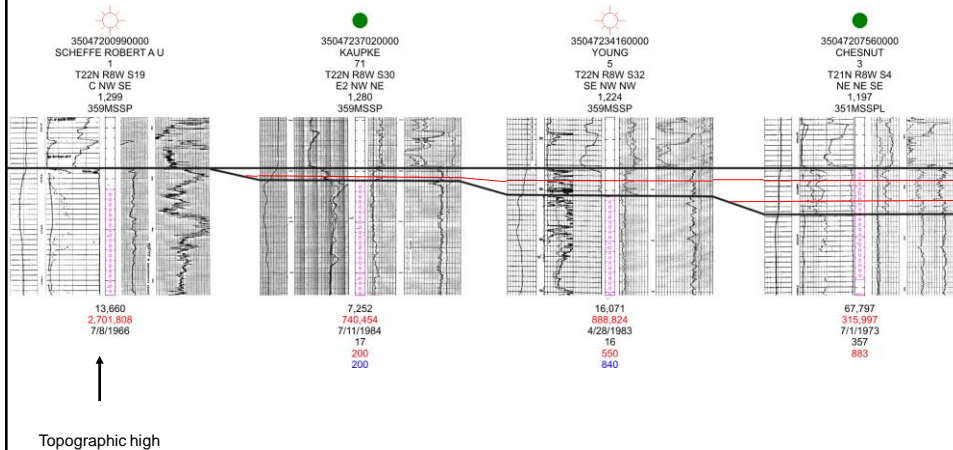
Mazzullo, Wilhite and Woolsey, 2009, Fig 12  
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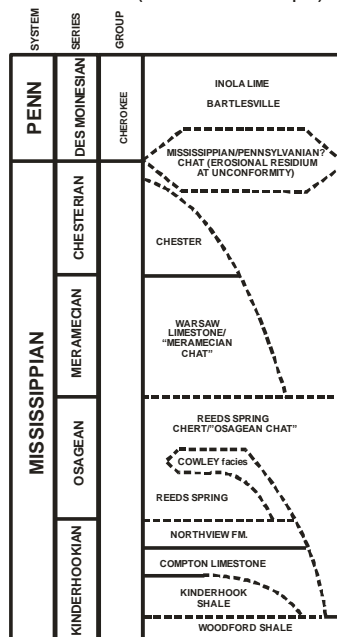




## Meramec thin over structure



## Stratigraphic Column for North-Central Oklahoma (west of the Nemaha uplift)



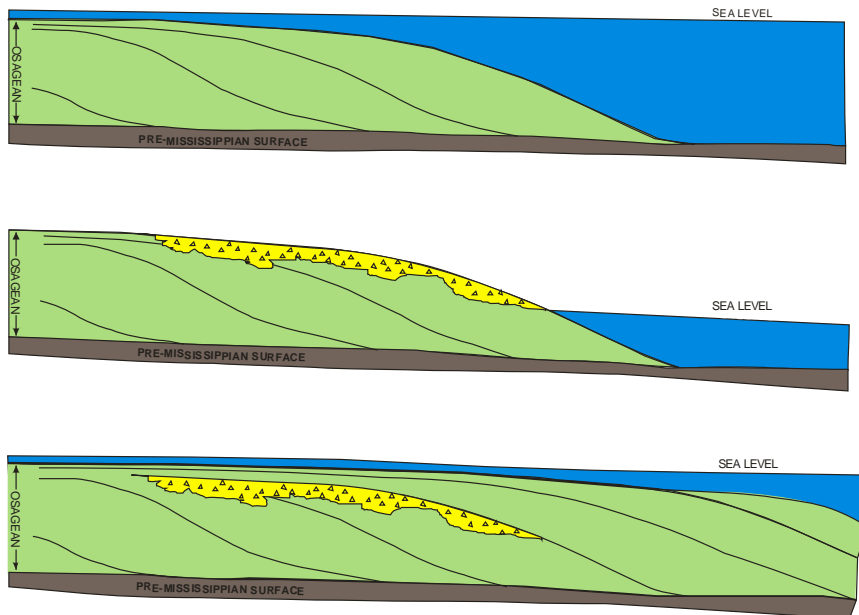
Modified from Mazzullo, Wilhite, and Woolsey, 2009, Fig 2. Reprinted by Permission of American Association of Petroleum Geologists

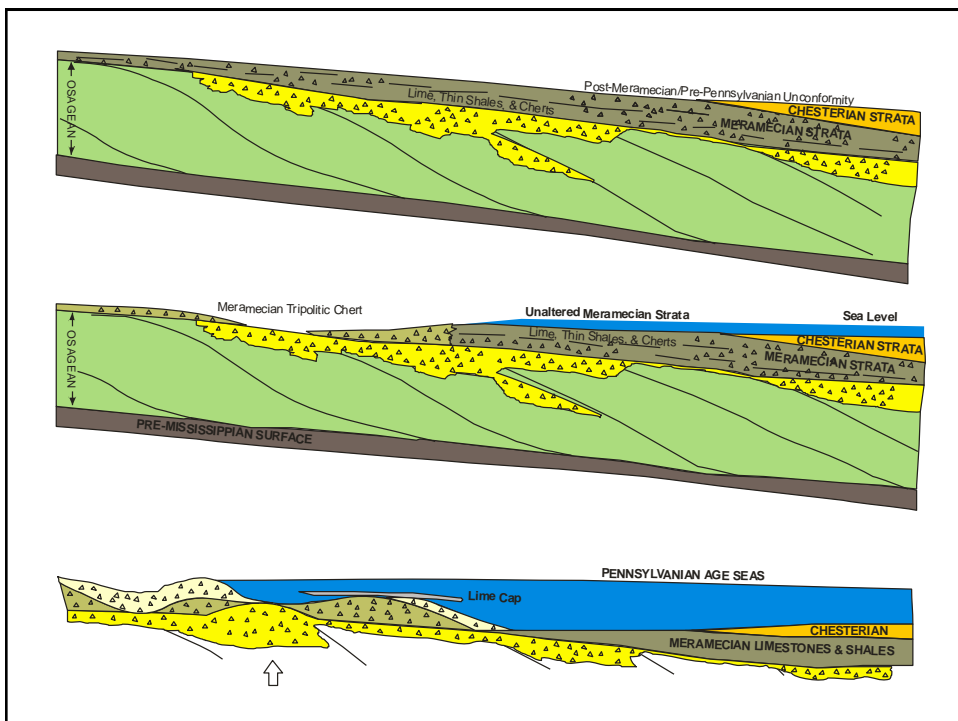
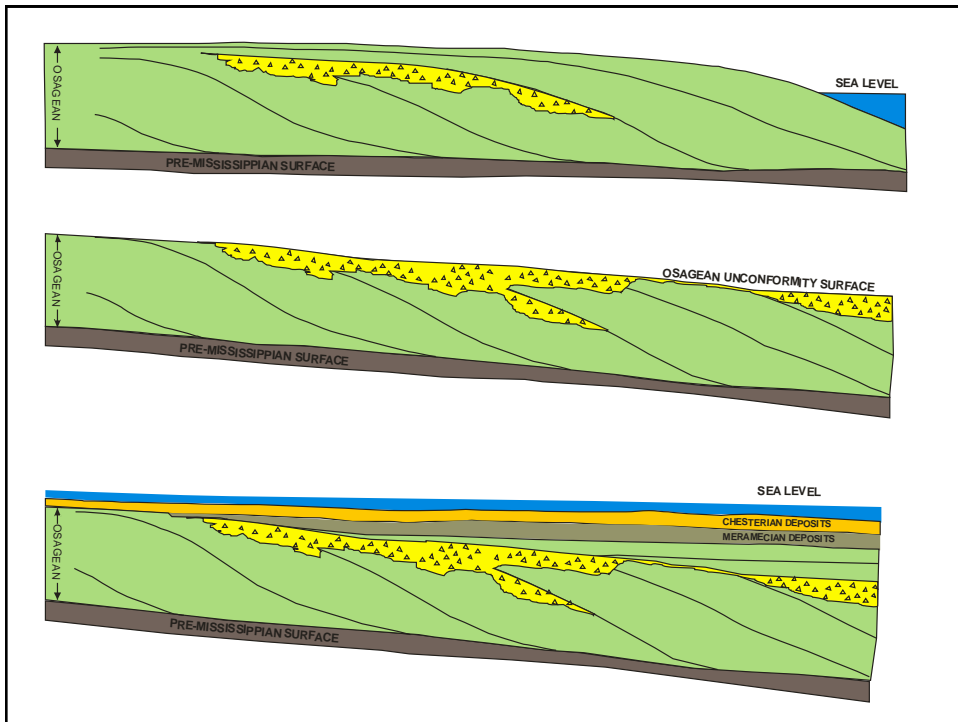
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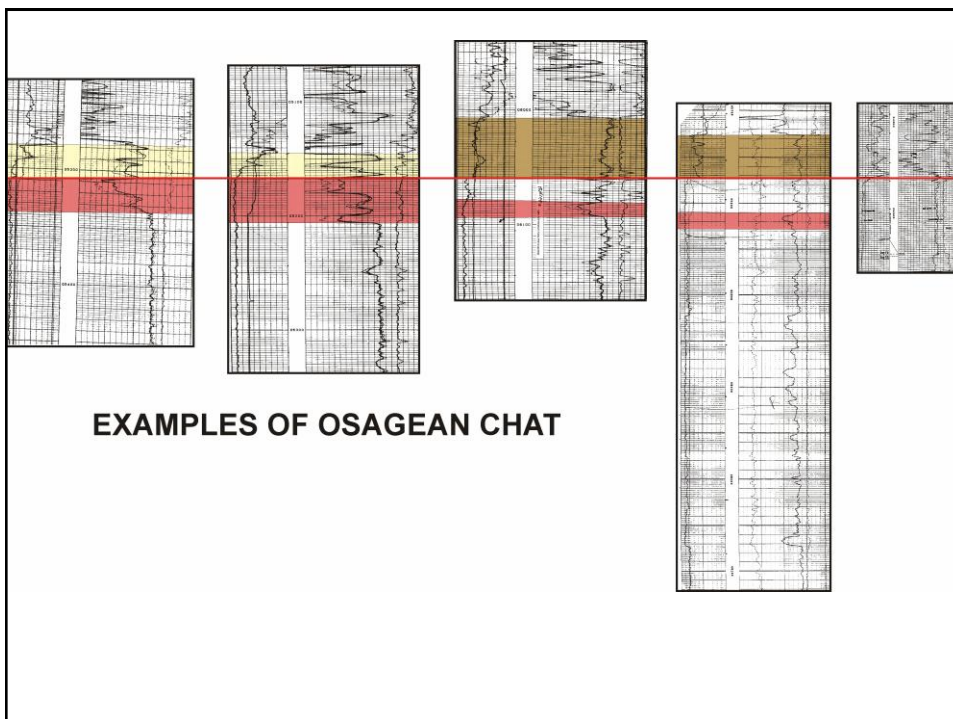
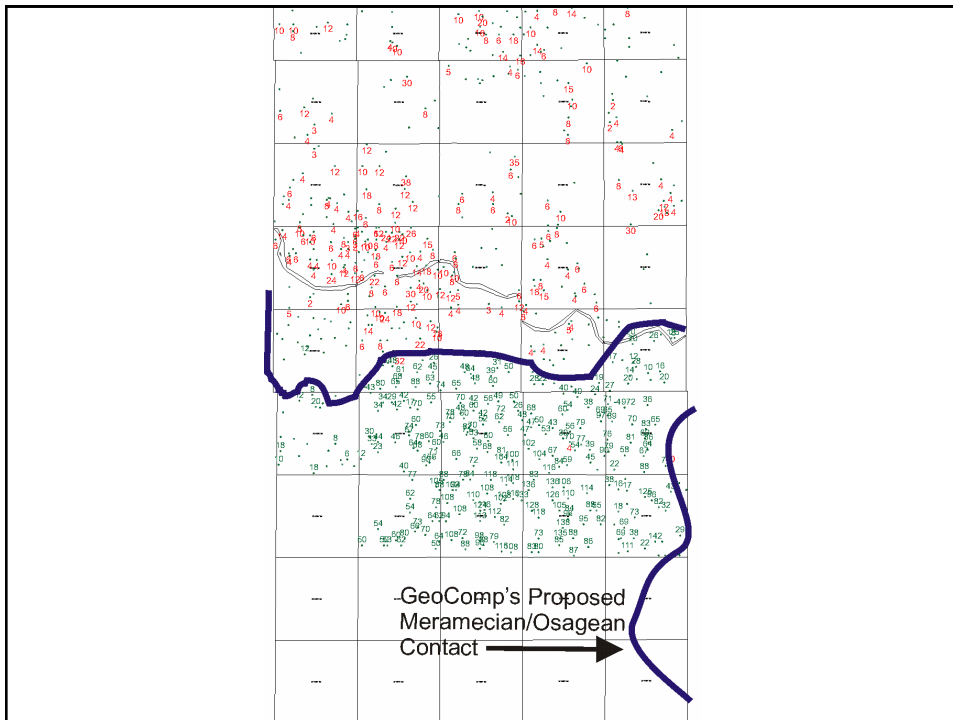
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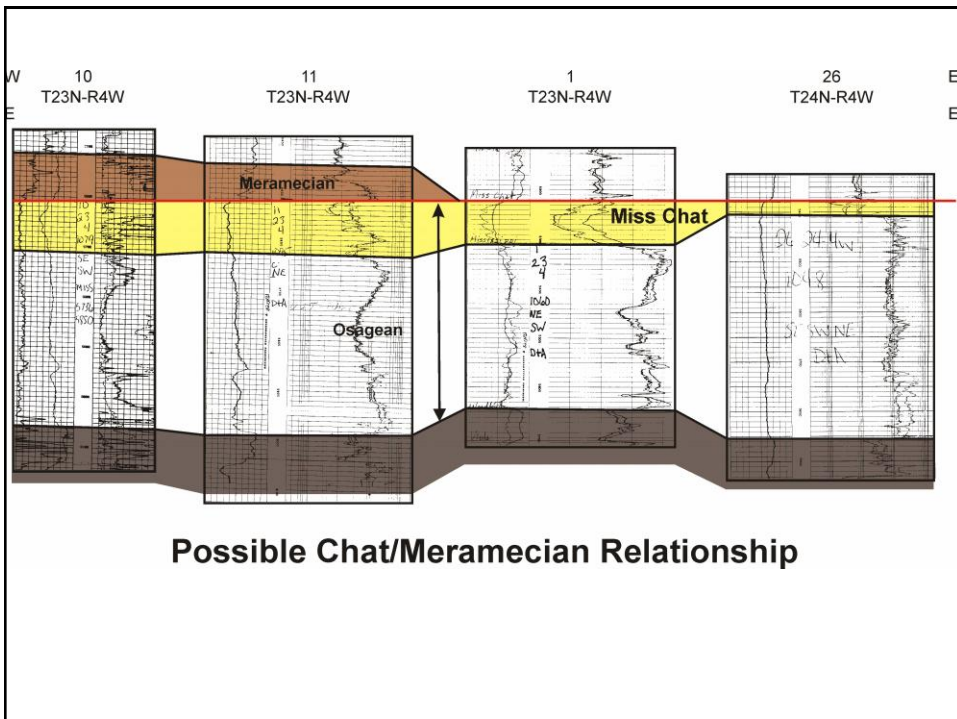
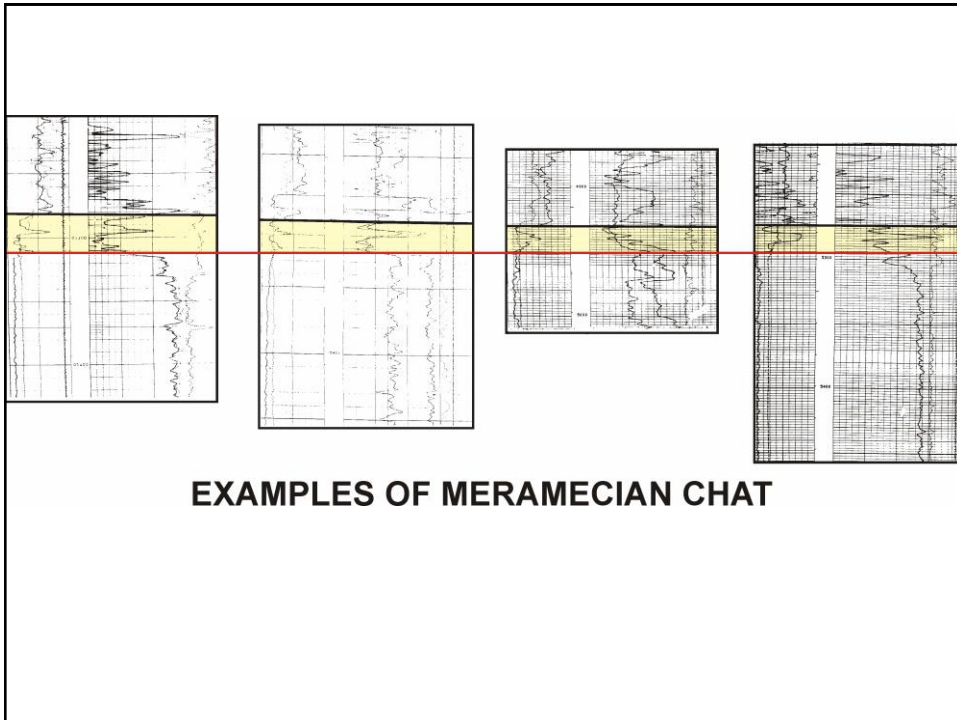
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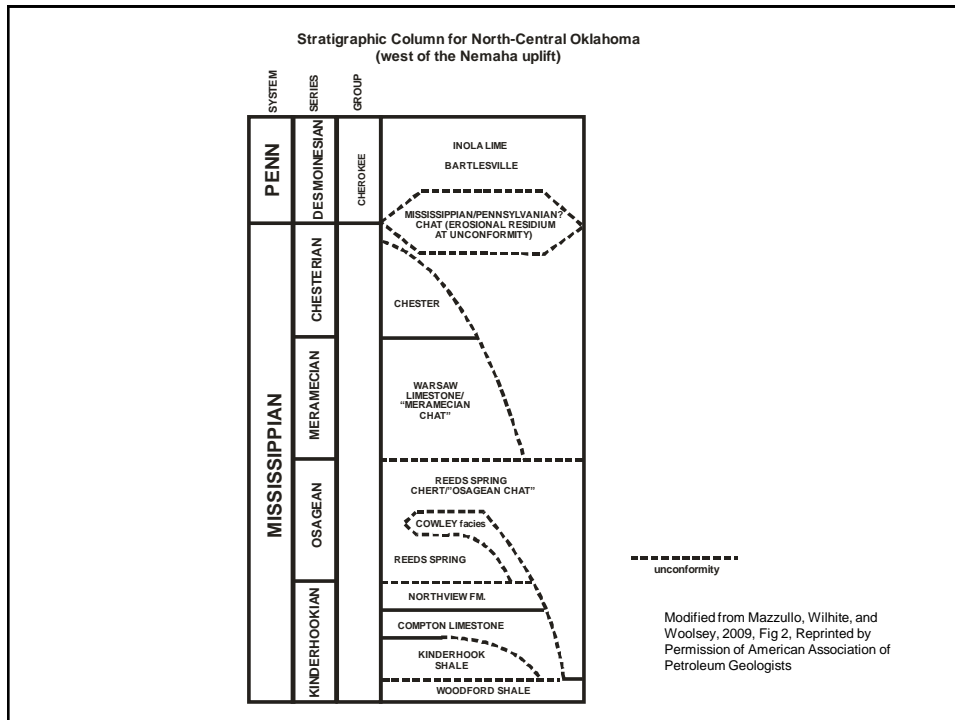










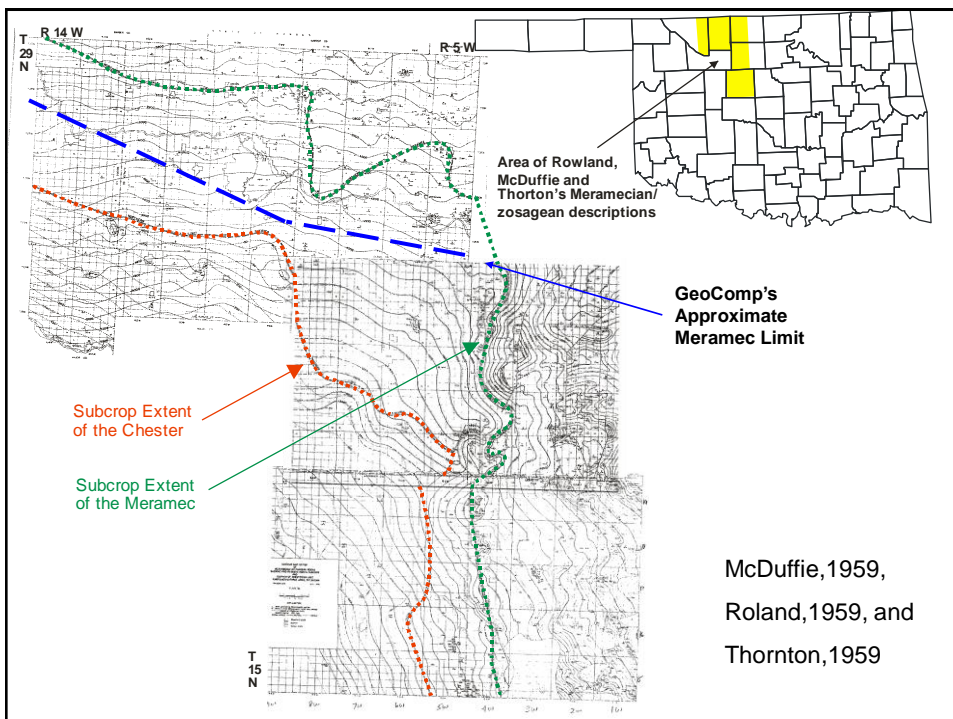
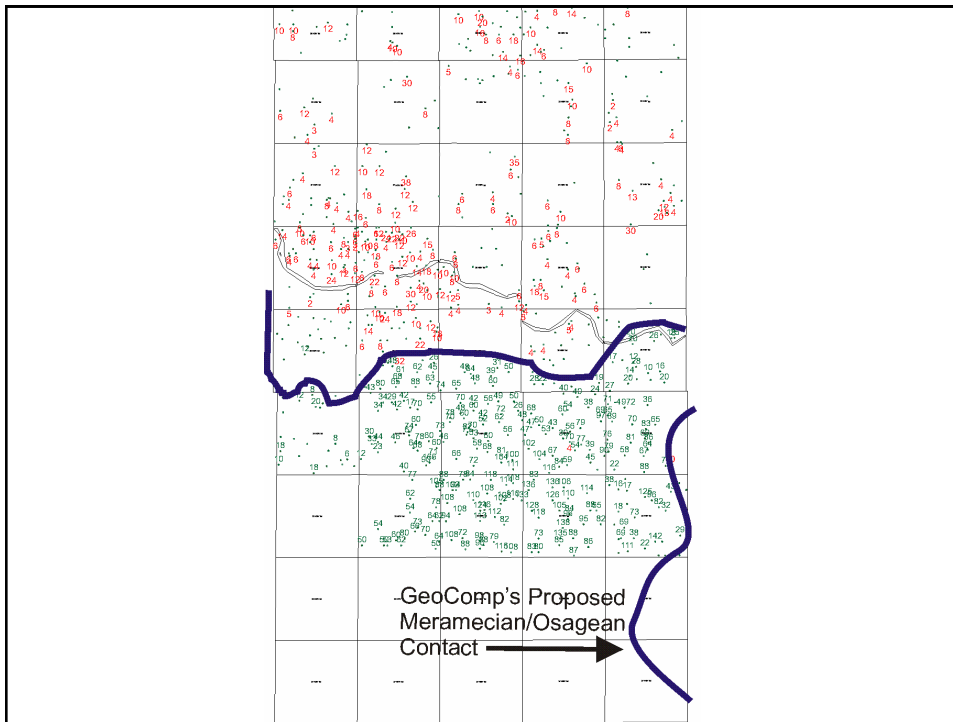


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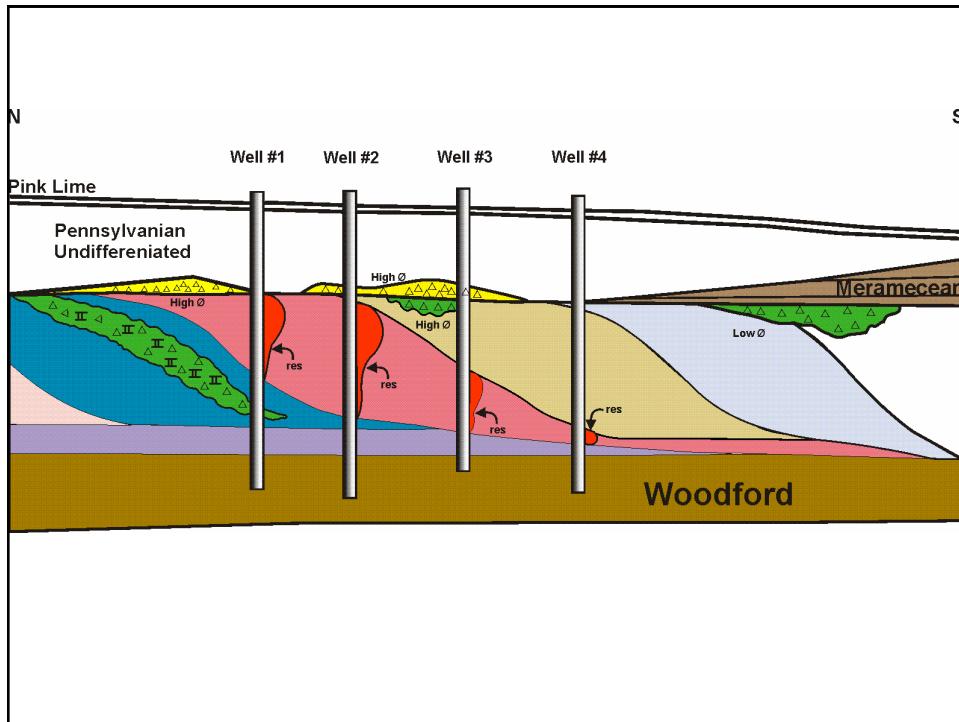
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