



KS/OK Mississippian Completions

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For

Mississippian and Arbuckle Workshop

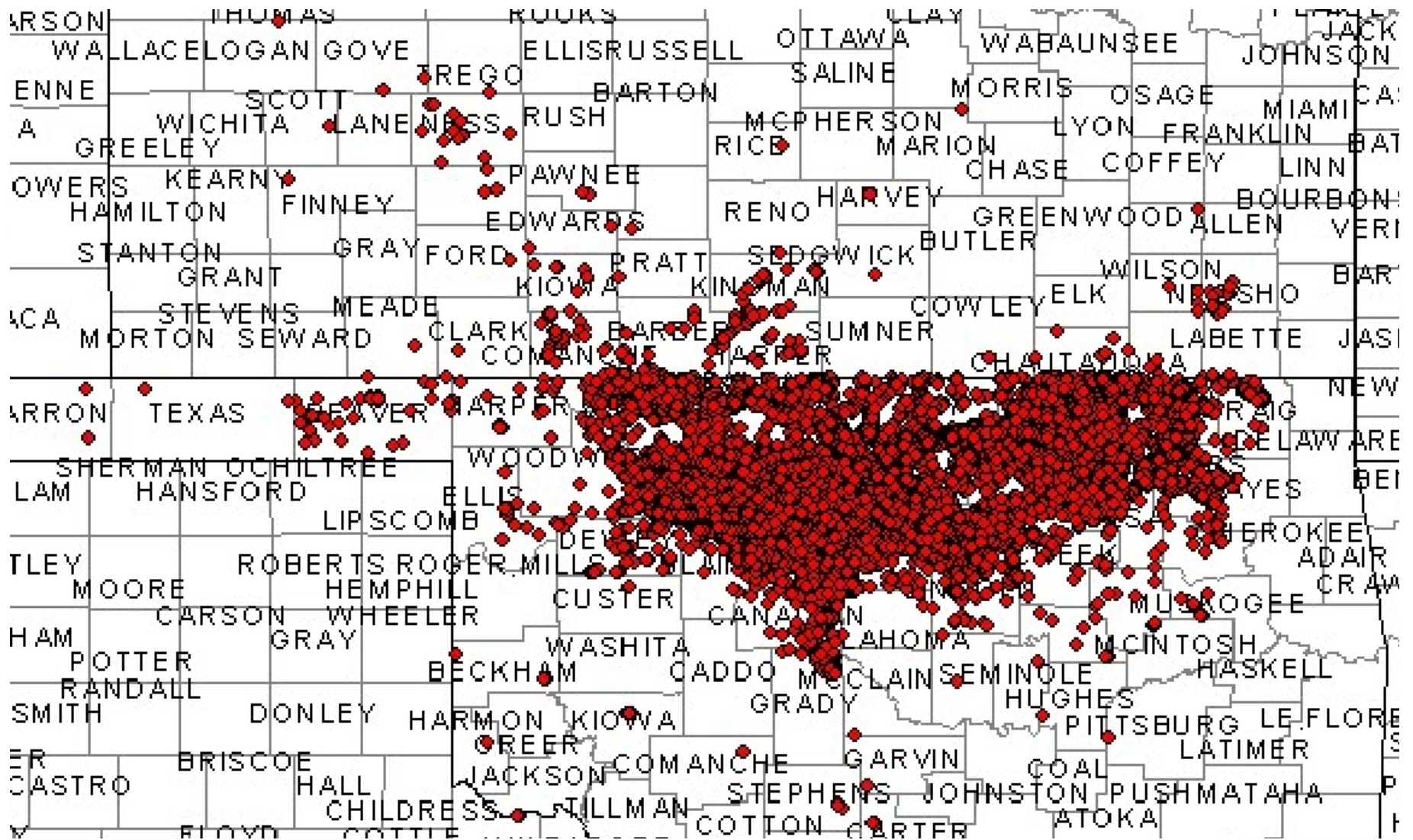
10/31/2012

HALLIBURTON

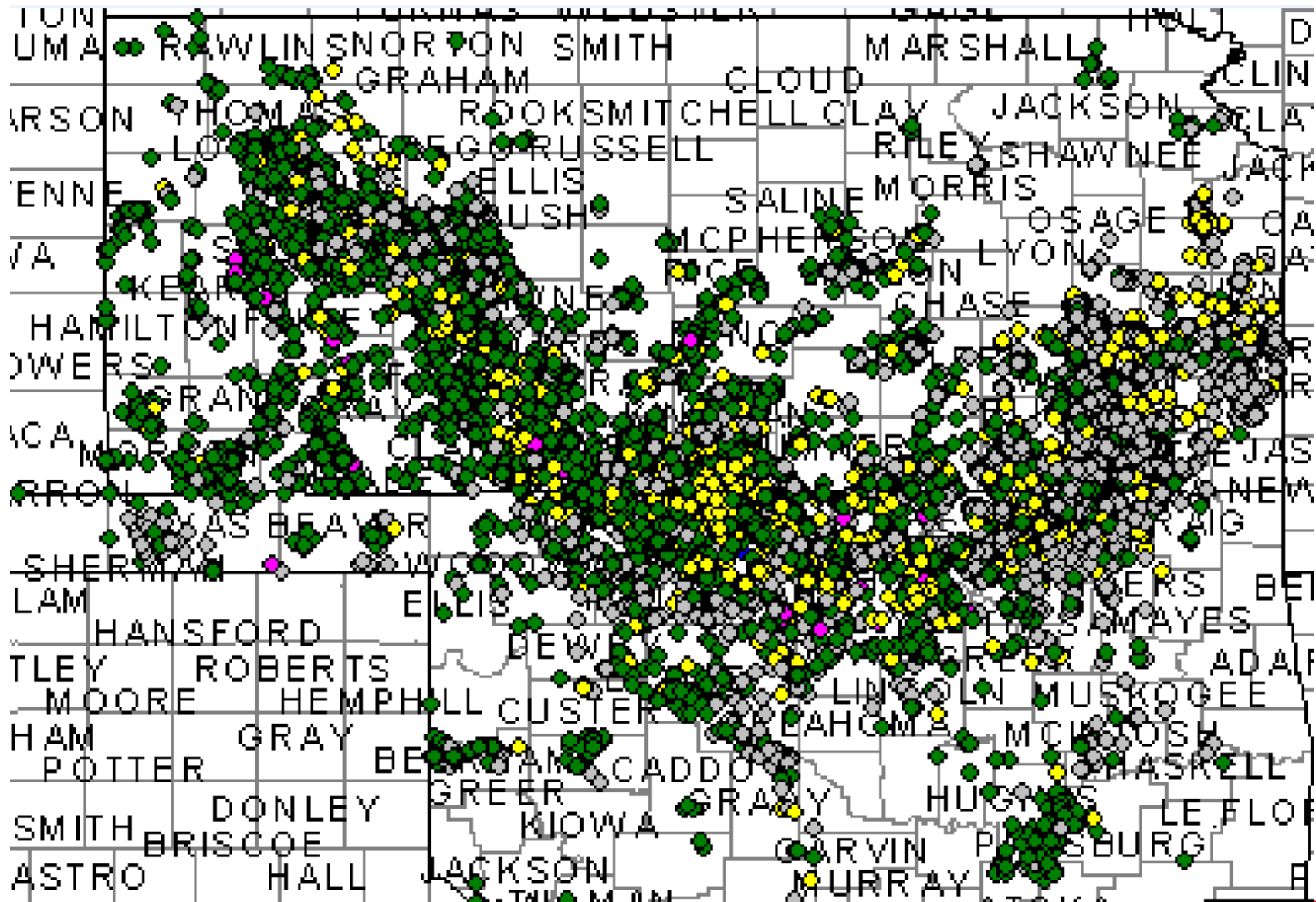
Outline

- Mississippian Completion & Permit Review
- Geological Review
- Historical Trends
- Completion and Stimulation Data
- Challenges & Solutions

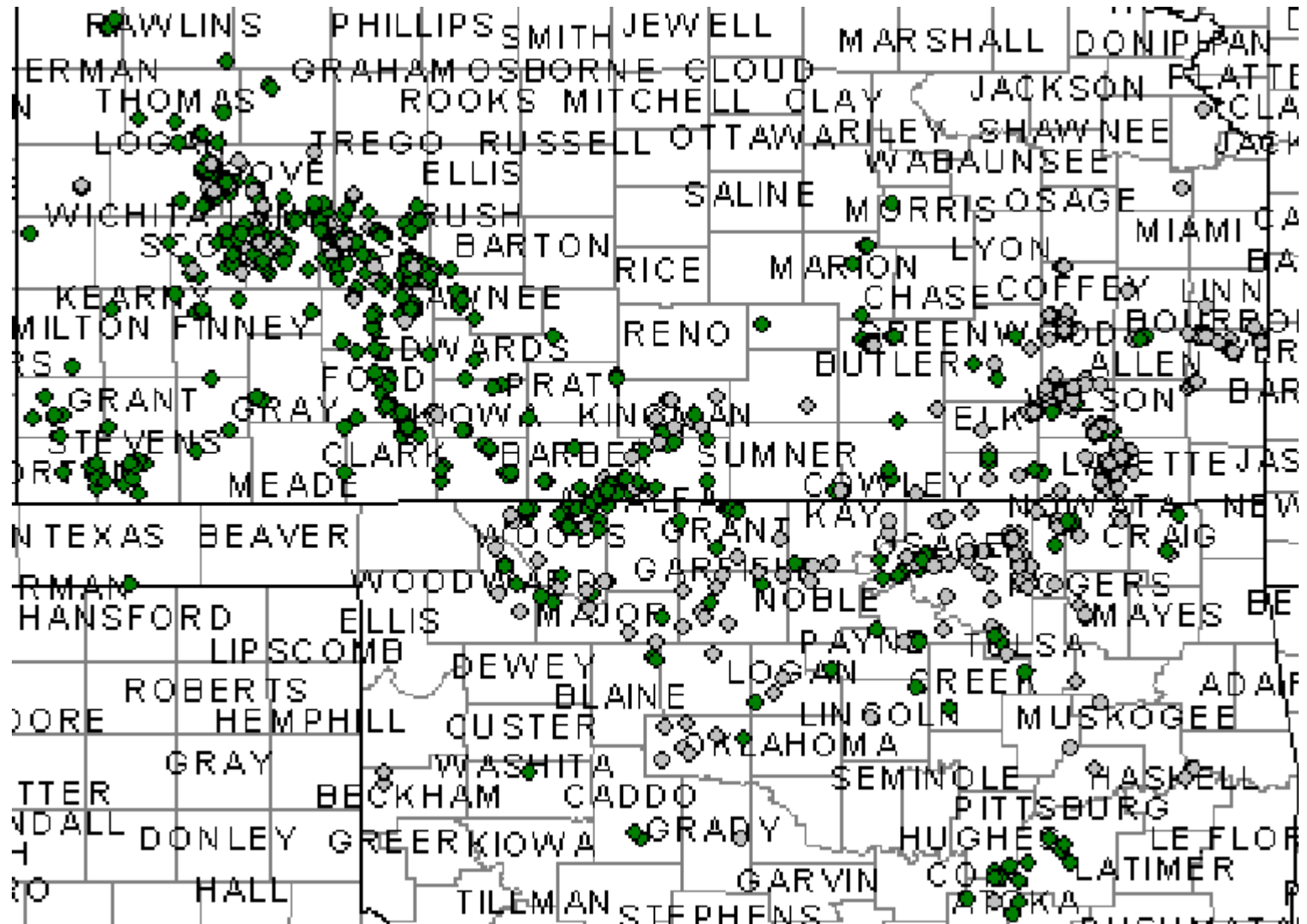
OK/KS Mississippian Production



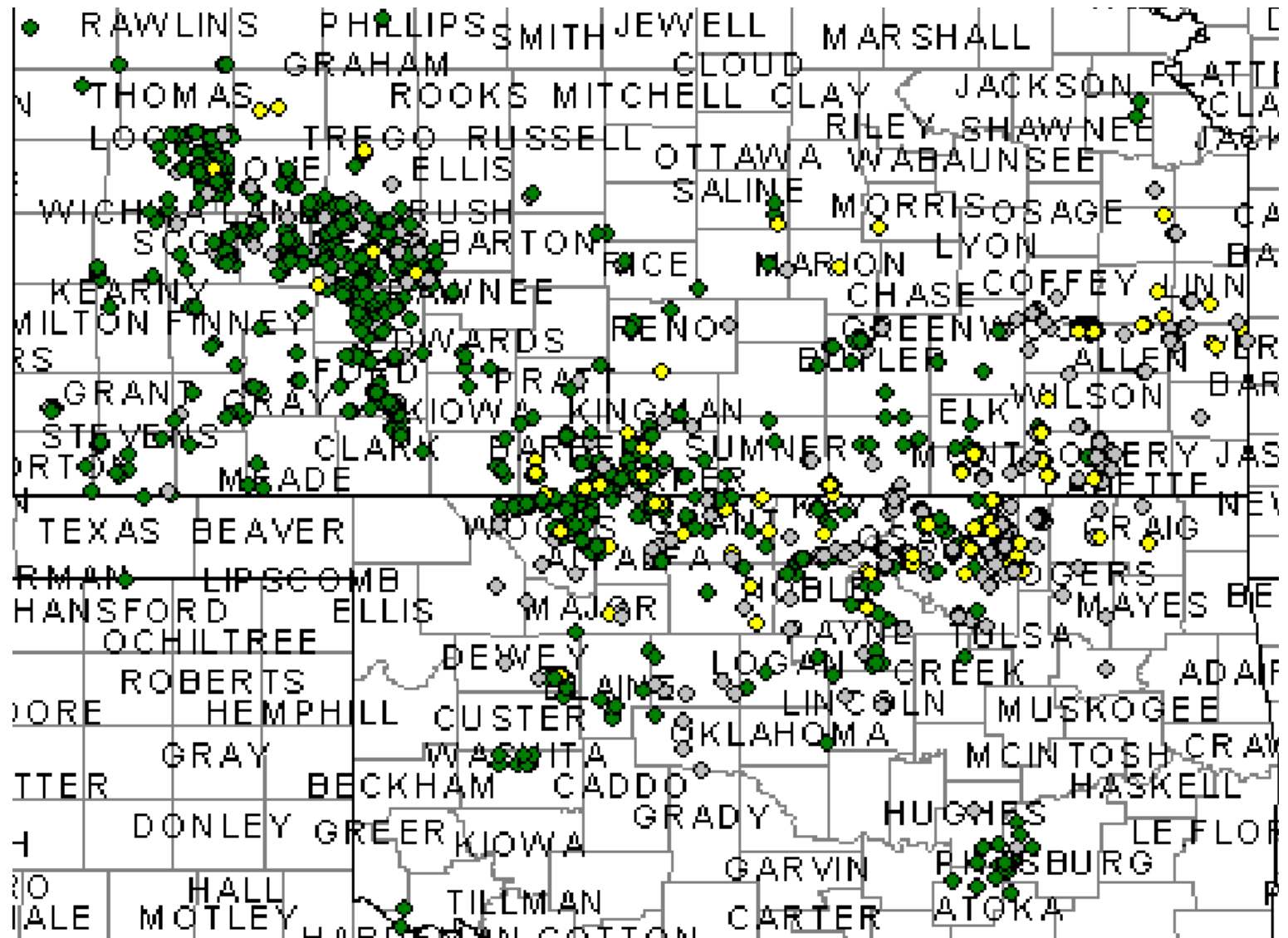
OK/KS Mississippian Permits



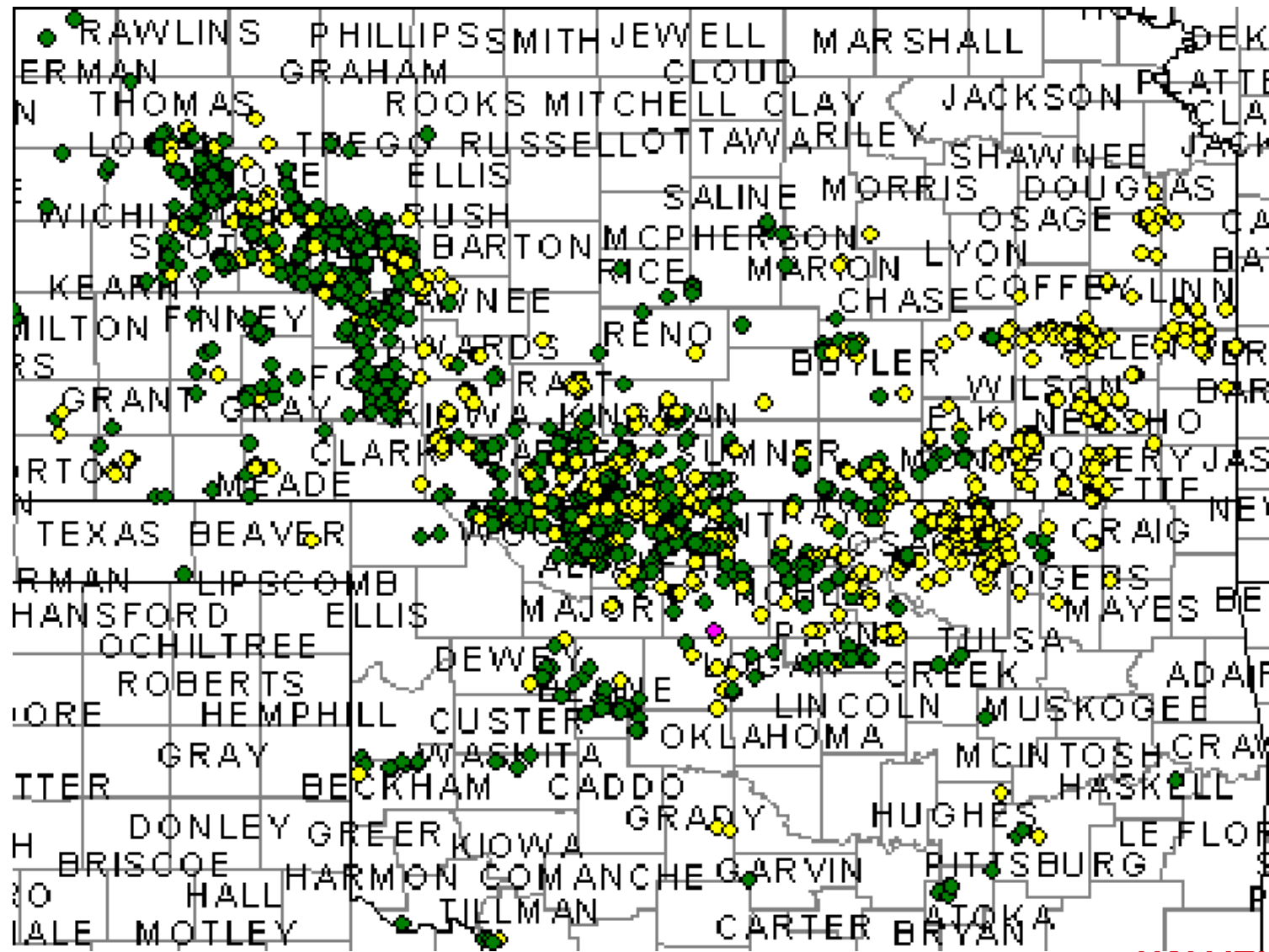
2009-2010



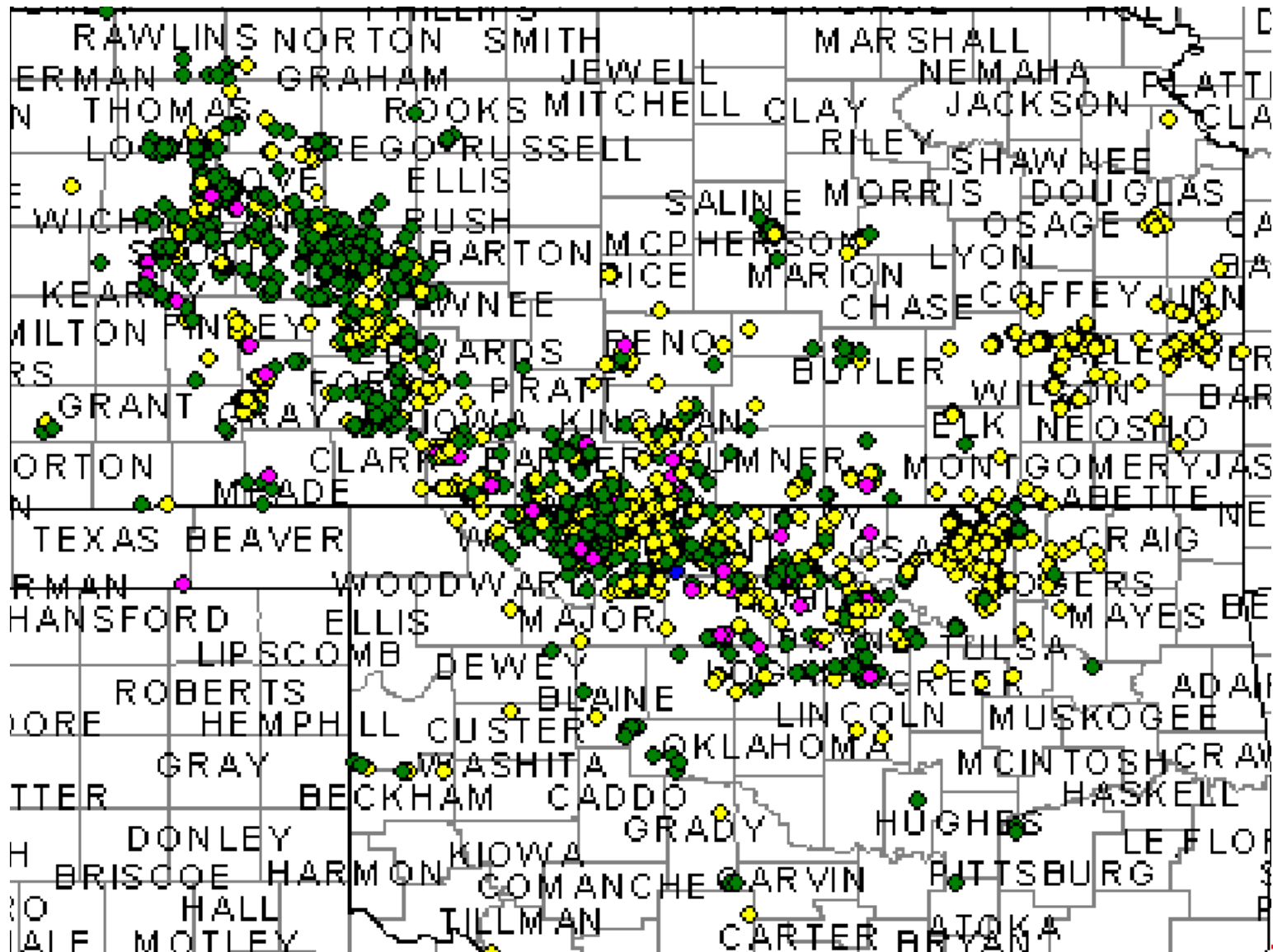
2010-2011



2011-2012



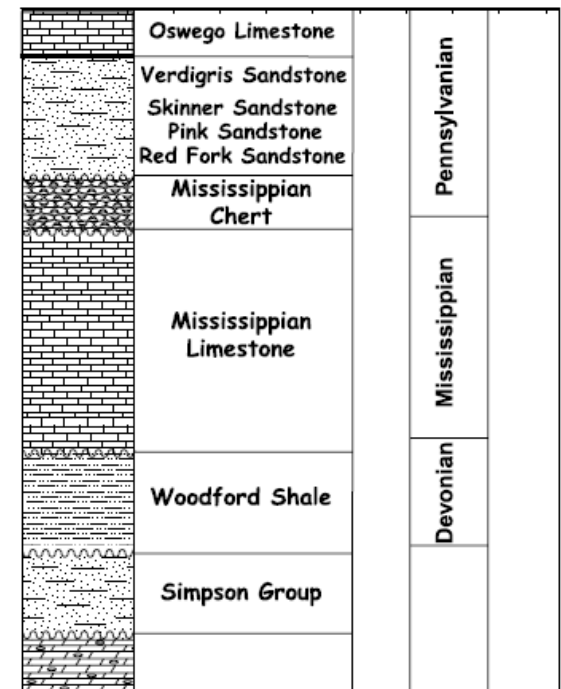
2012 - Present



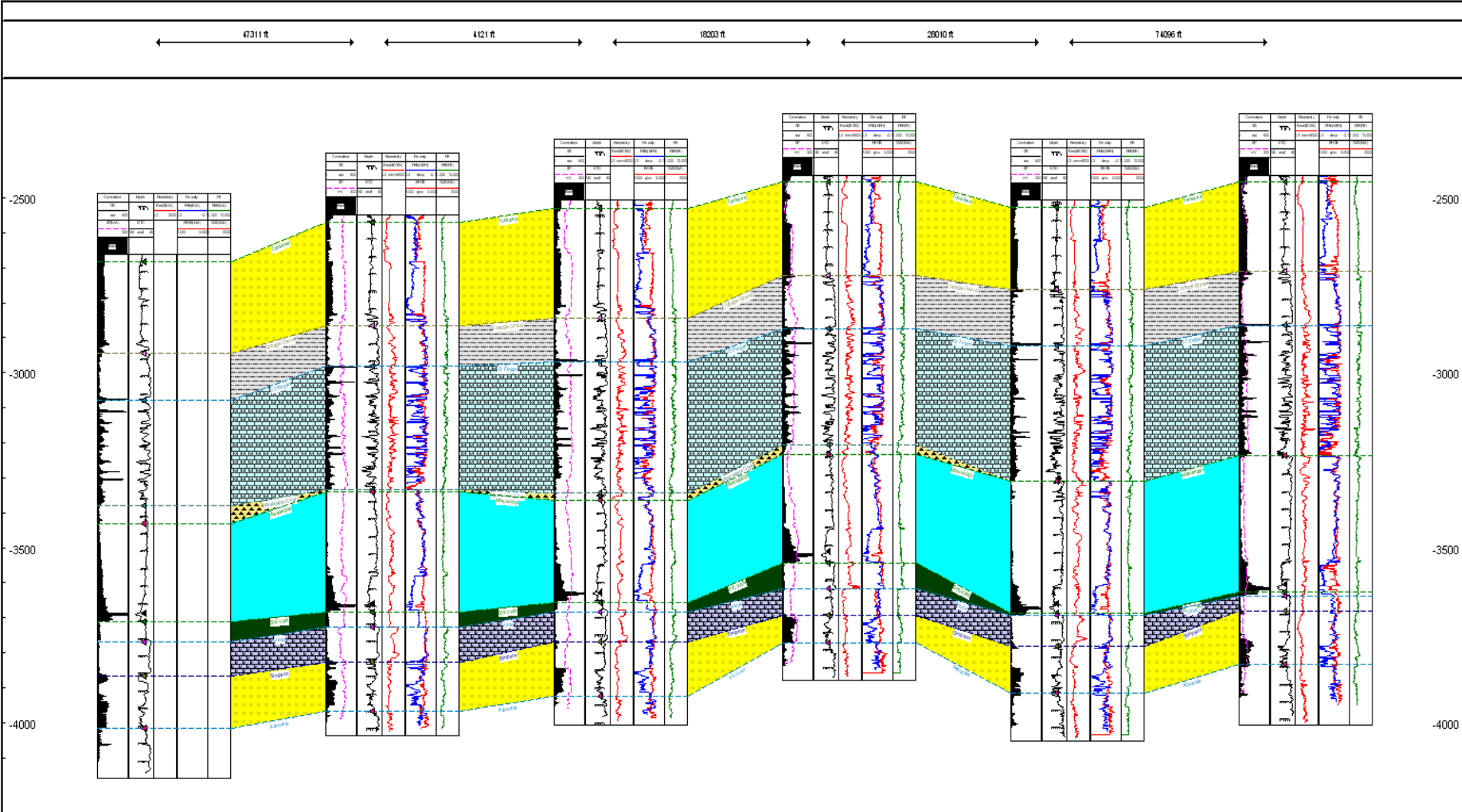
Mississippian Overview Summary

- The Mississippian formation is actually an age of rock consisting of
 - Chester Lime (Manning)
 - Mississippi Chat
 - Meramac Lime (St. Louis)
 - Mississippi Lime (Solid)
 - Osage (Sycamore Lime)

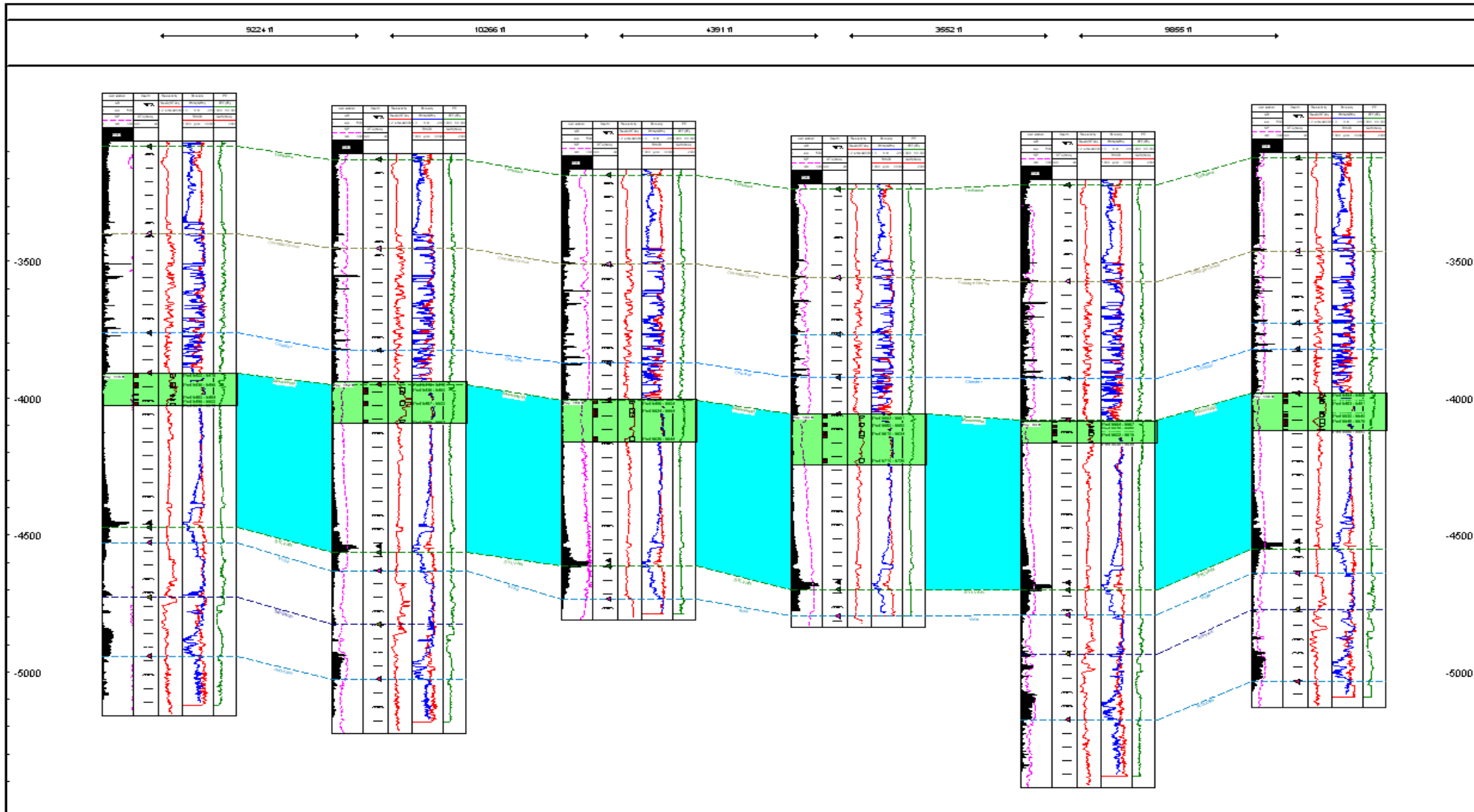
Figure 2. Stratigraphic column for Osage County. Extracted from Zeller (1968), Thorman and Hibpshman (1979), and Franseen et al., 2004.



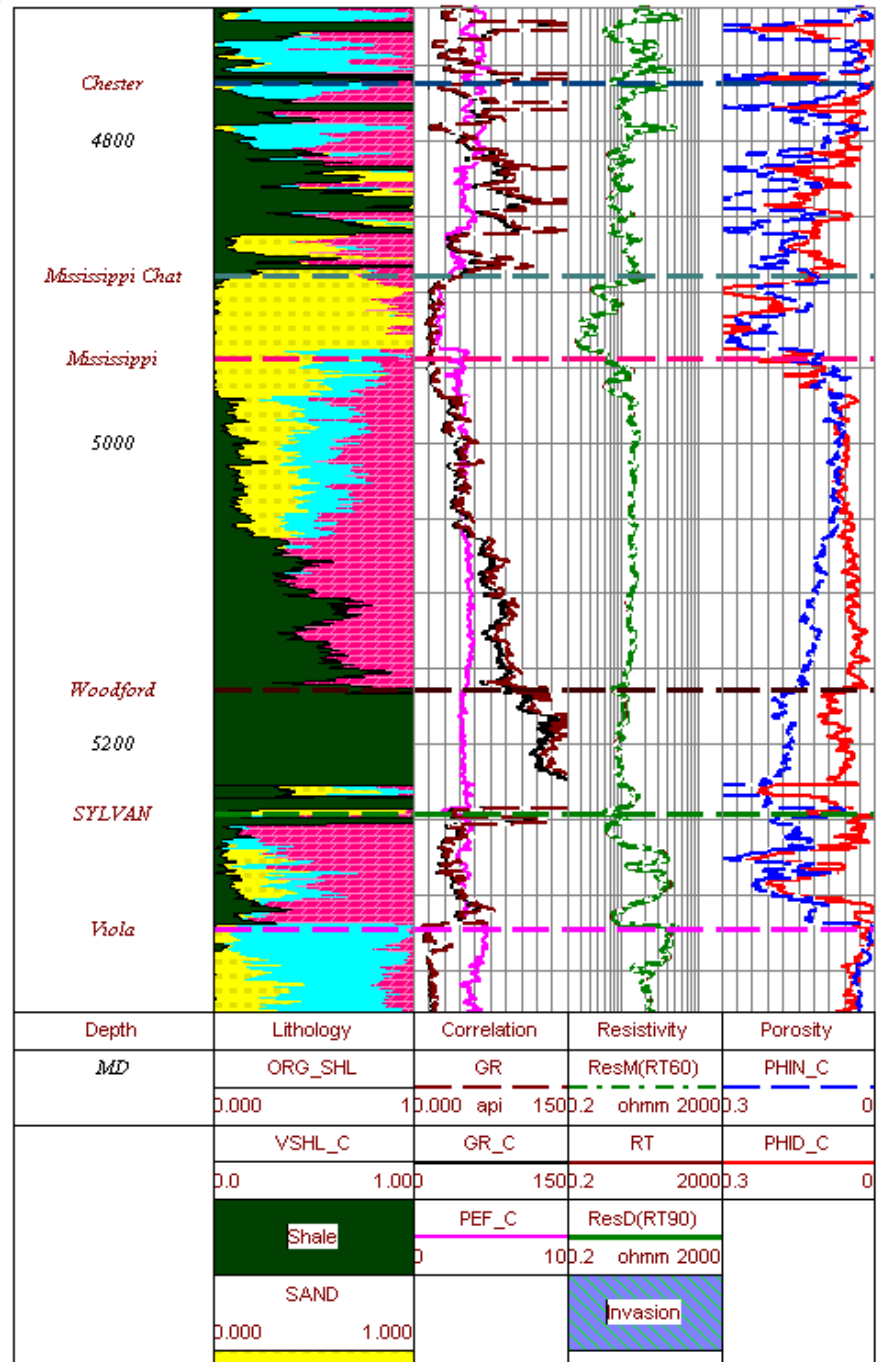
South Kansas Sample Cross-Section



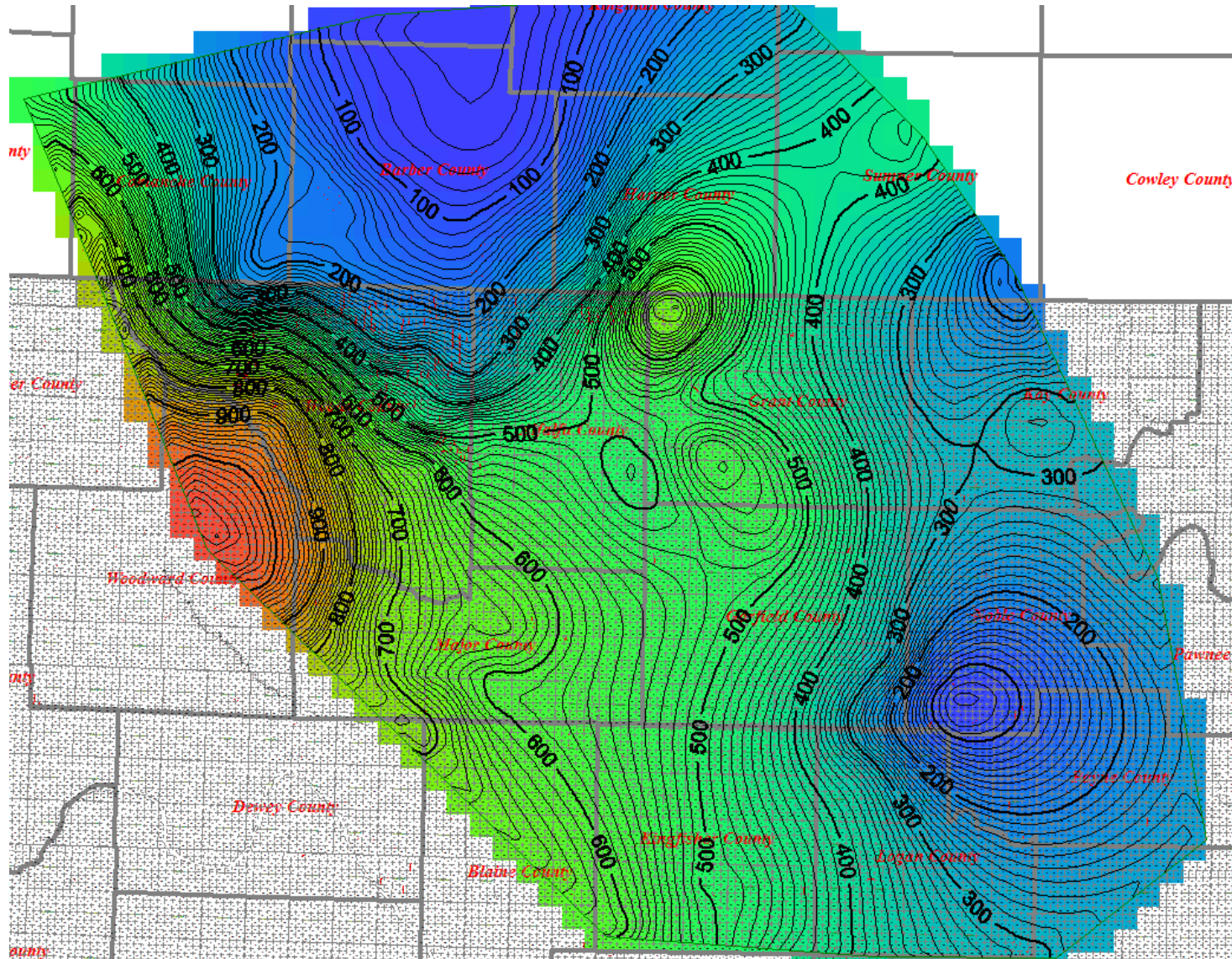
Woods County Sample Cross-Section w/ Typical Vertical Well Completions



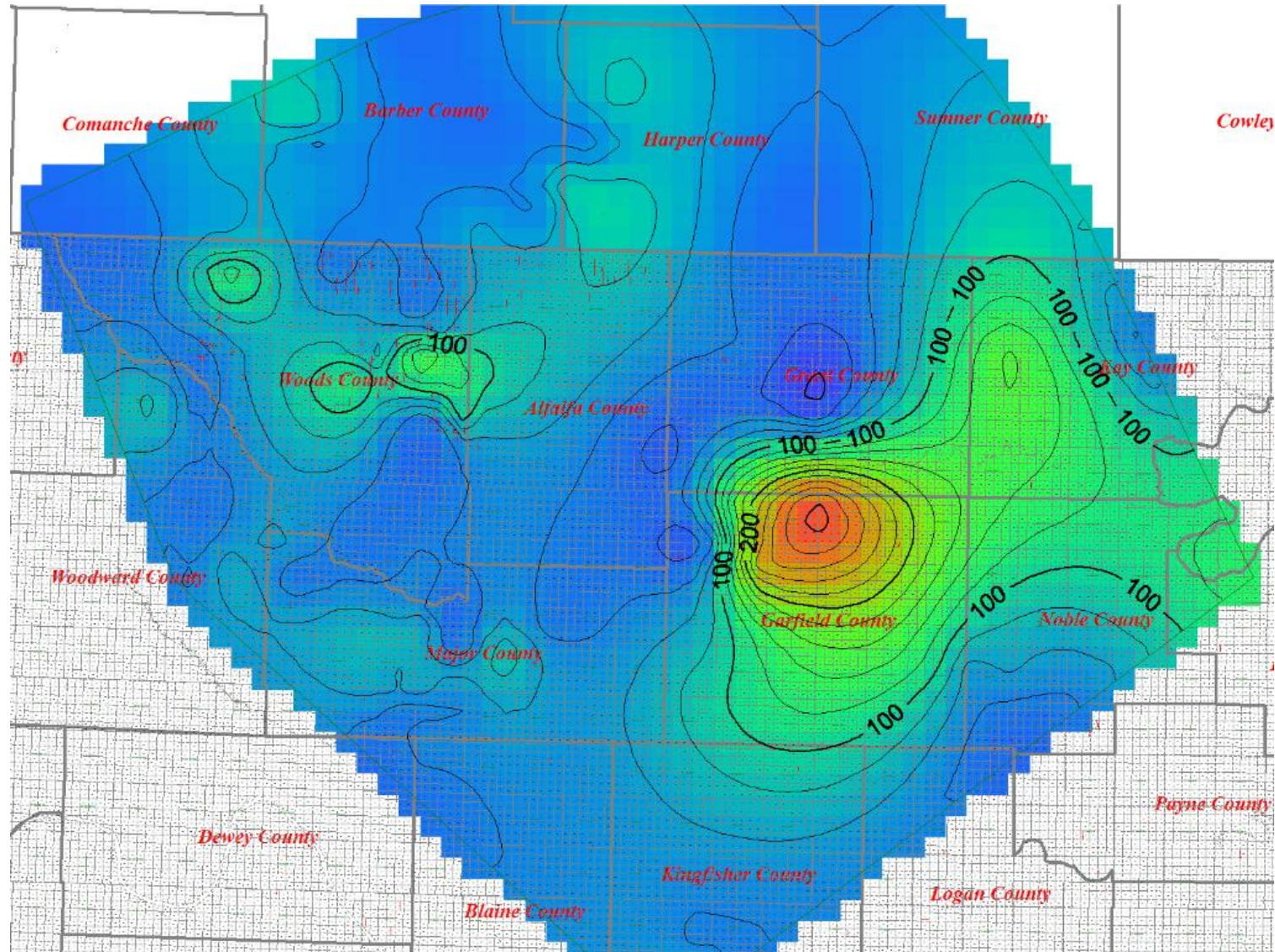
Example Woods County Stratigraphic Column



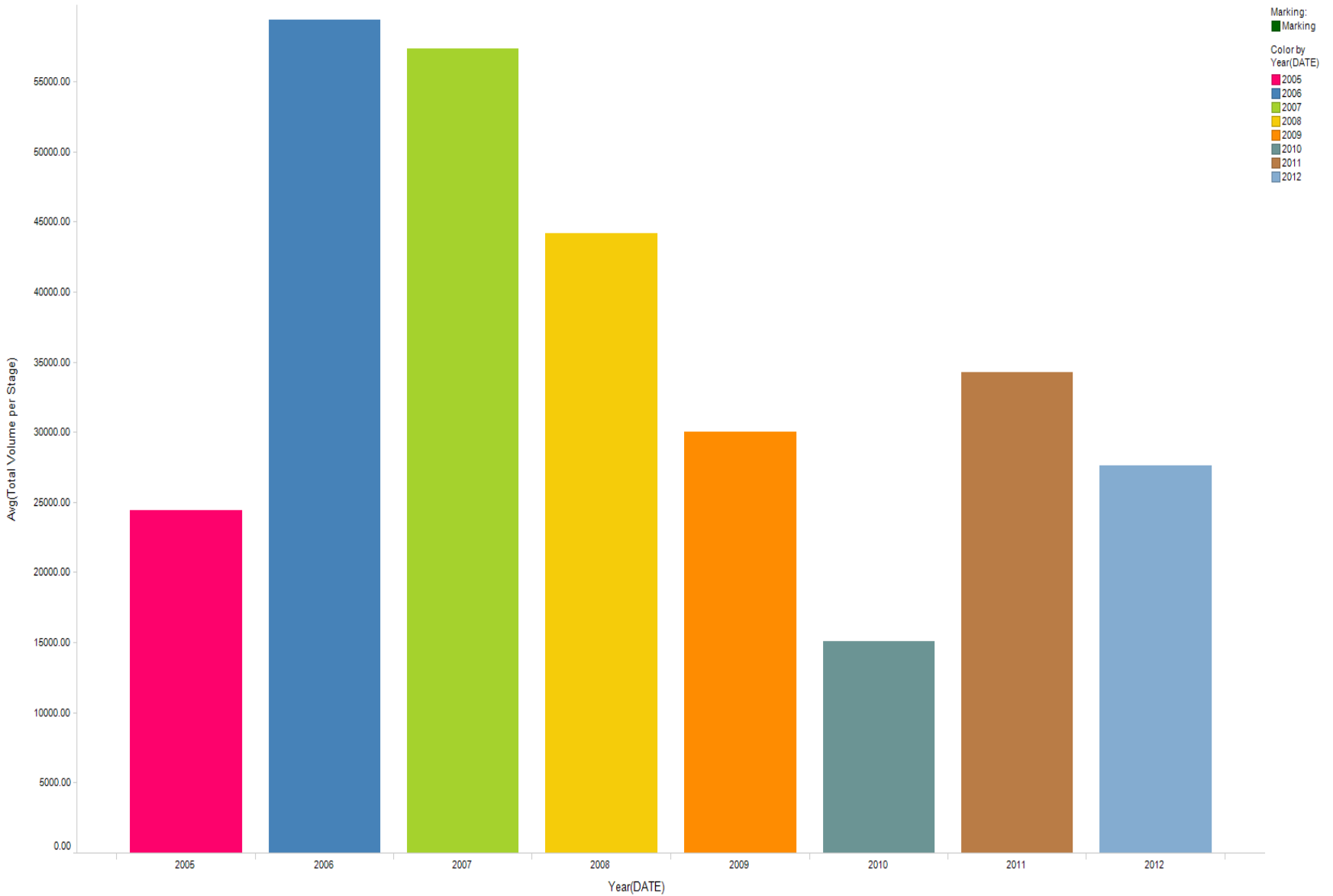
Mississippi Play Extrapolated Vertical Thickness-GeoAtlas



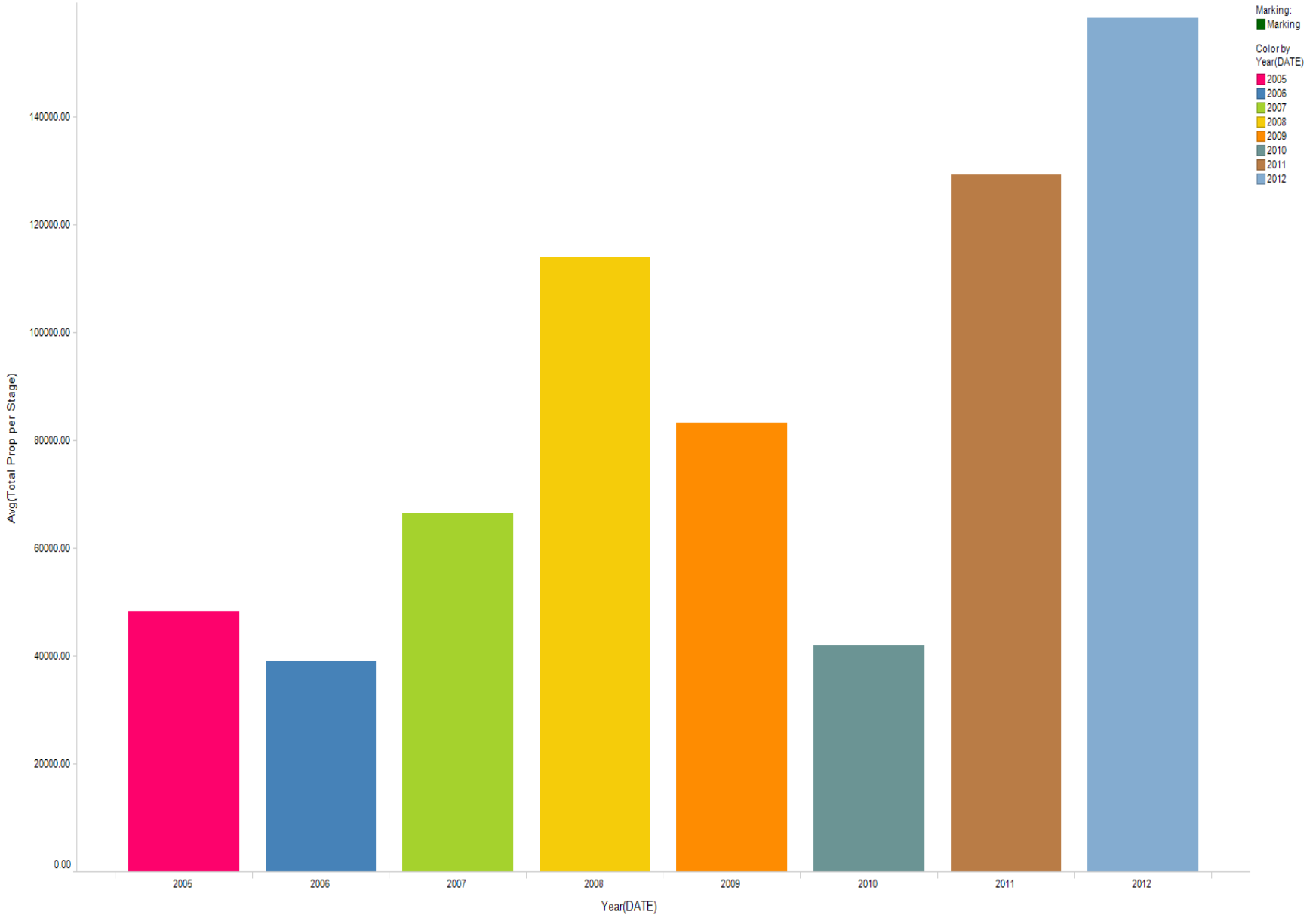
Mississippi Chat Vertical Thickness



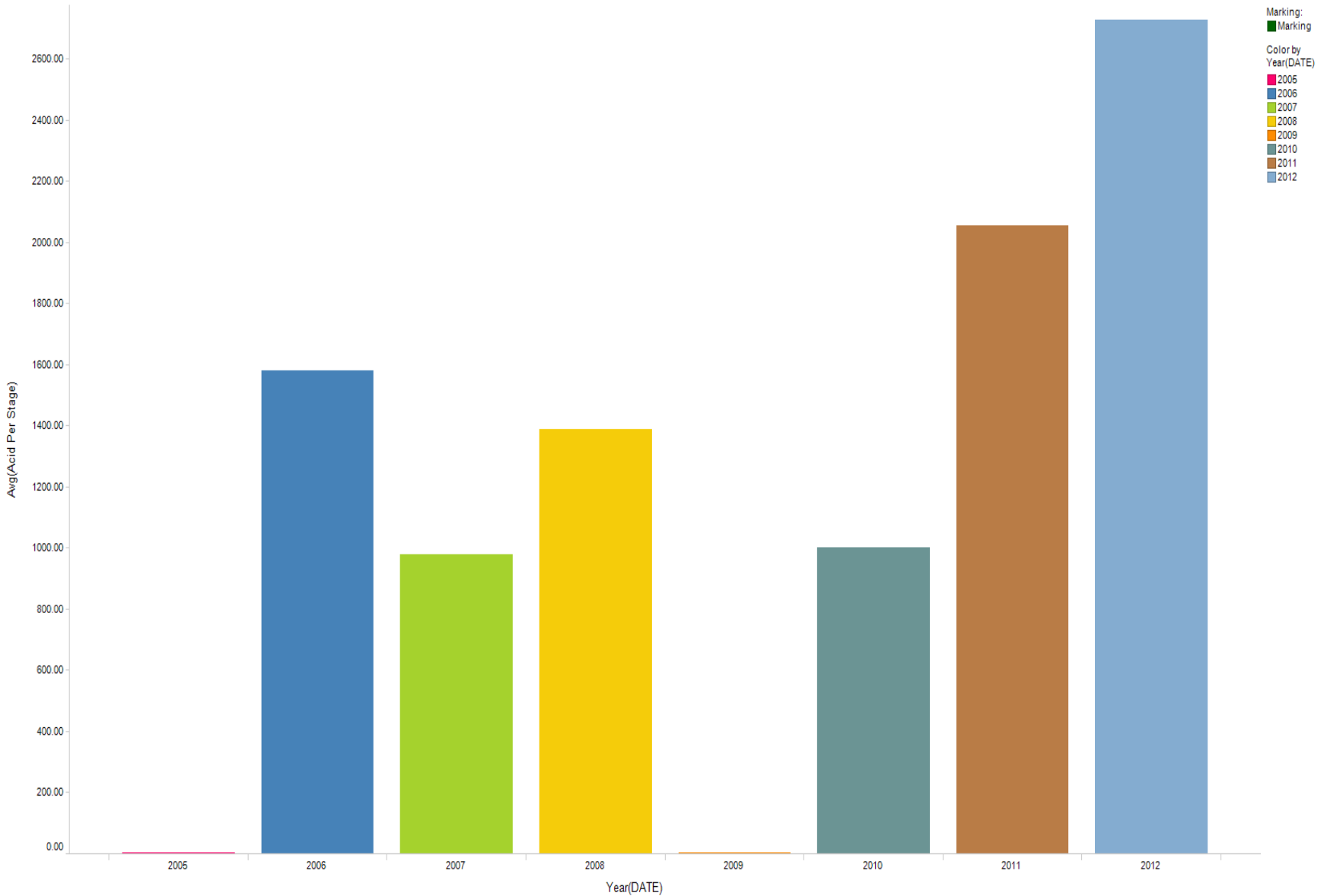
Avg Total Gal per Stage



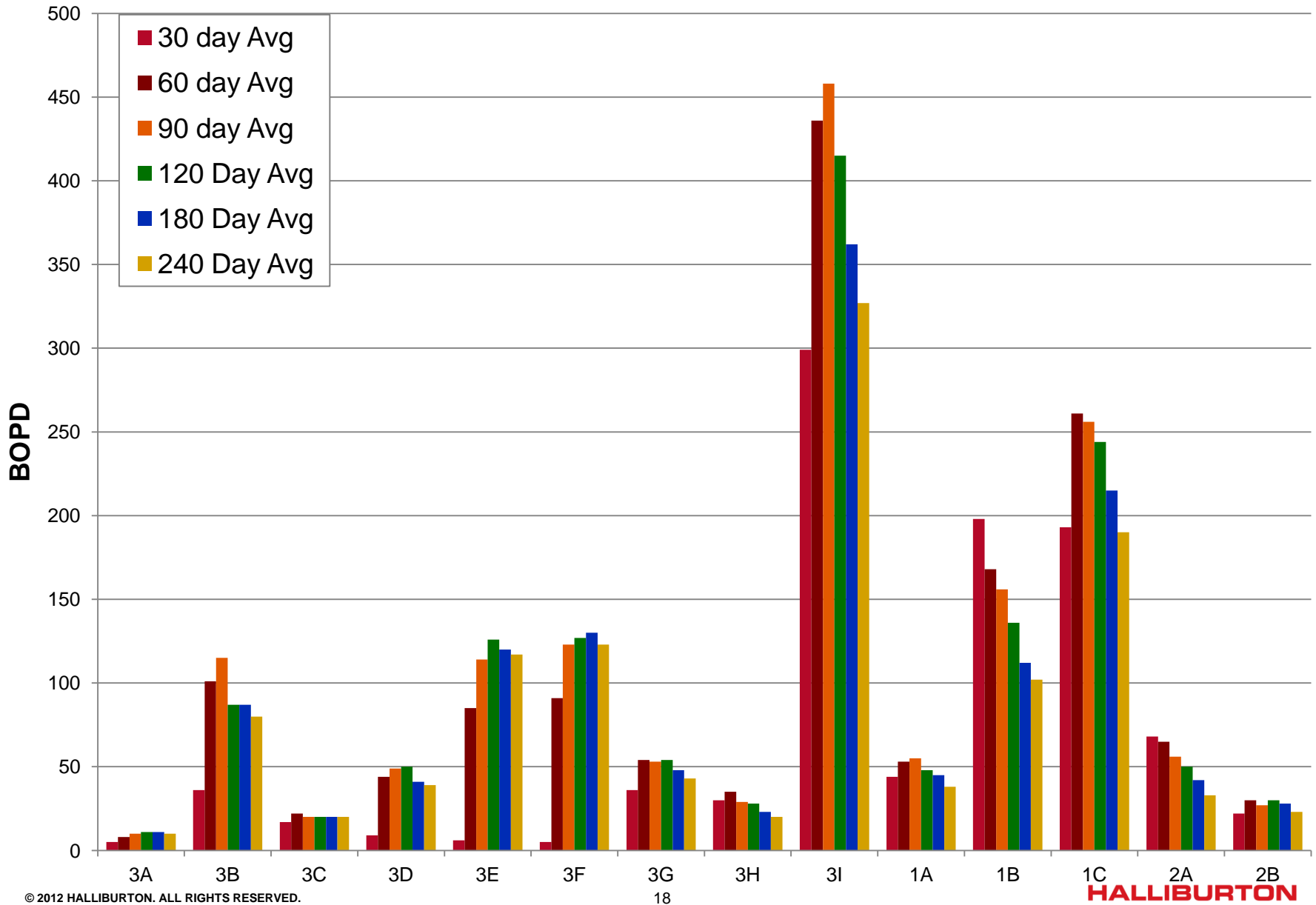
Avg Total Proppant per Stage



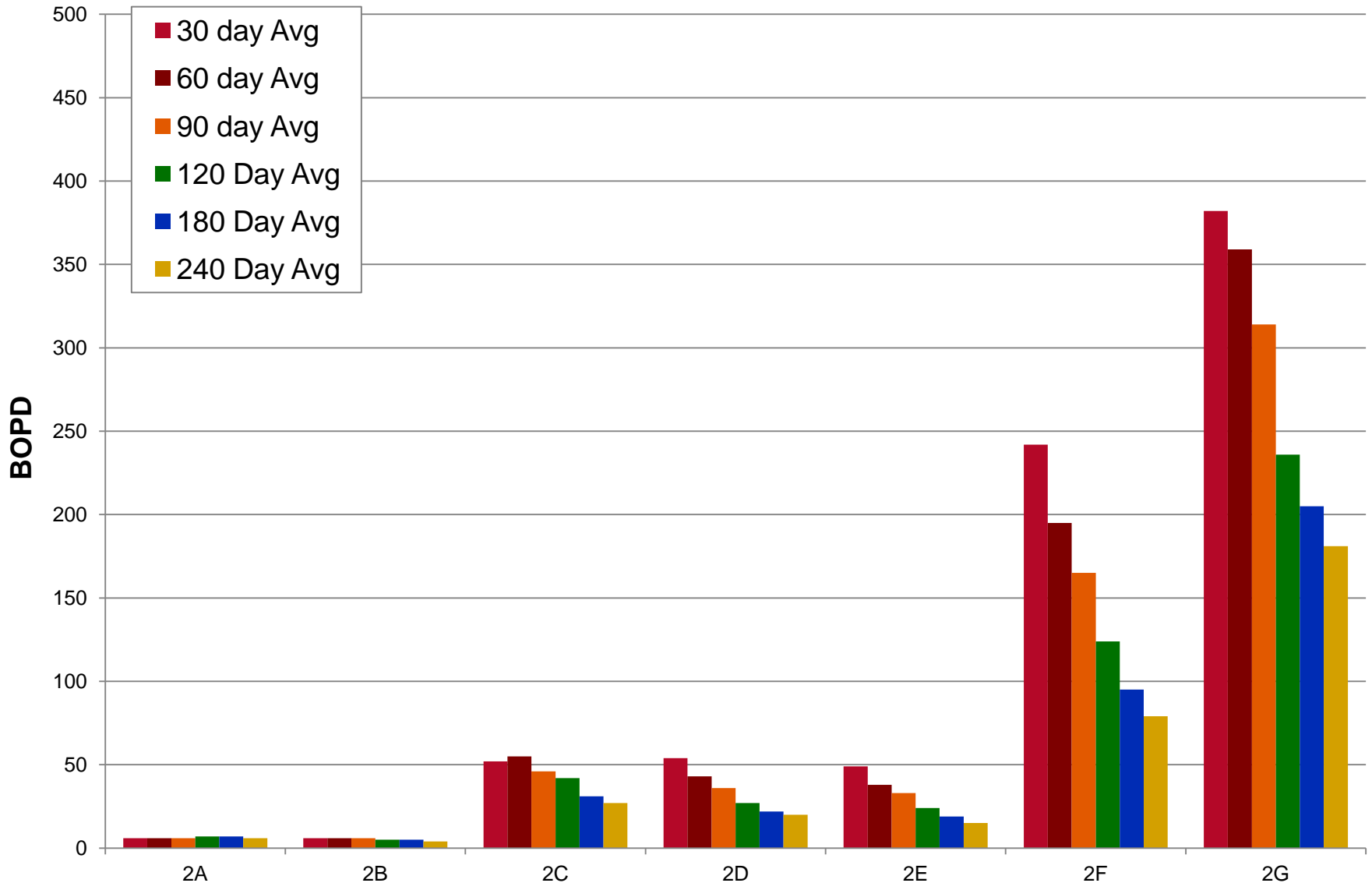
Avg Total Acid Gal per Stage



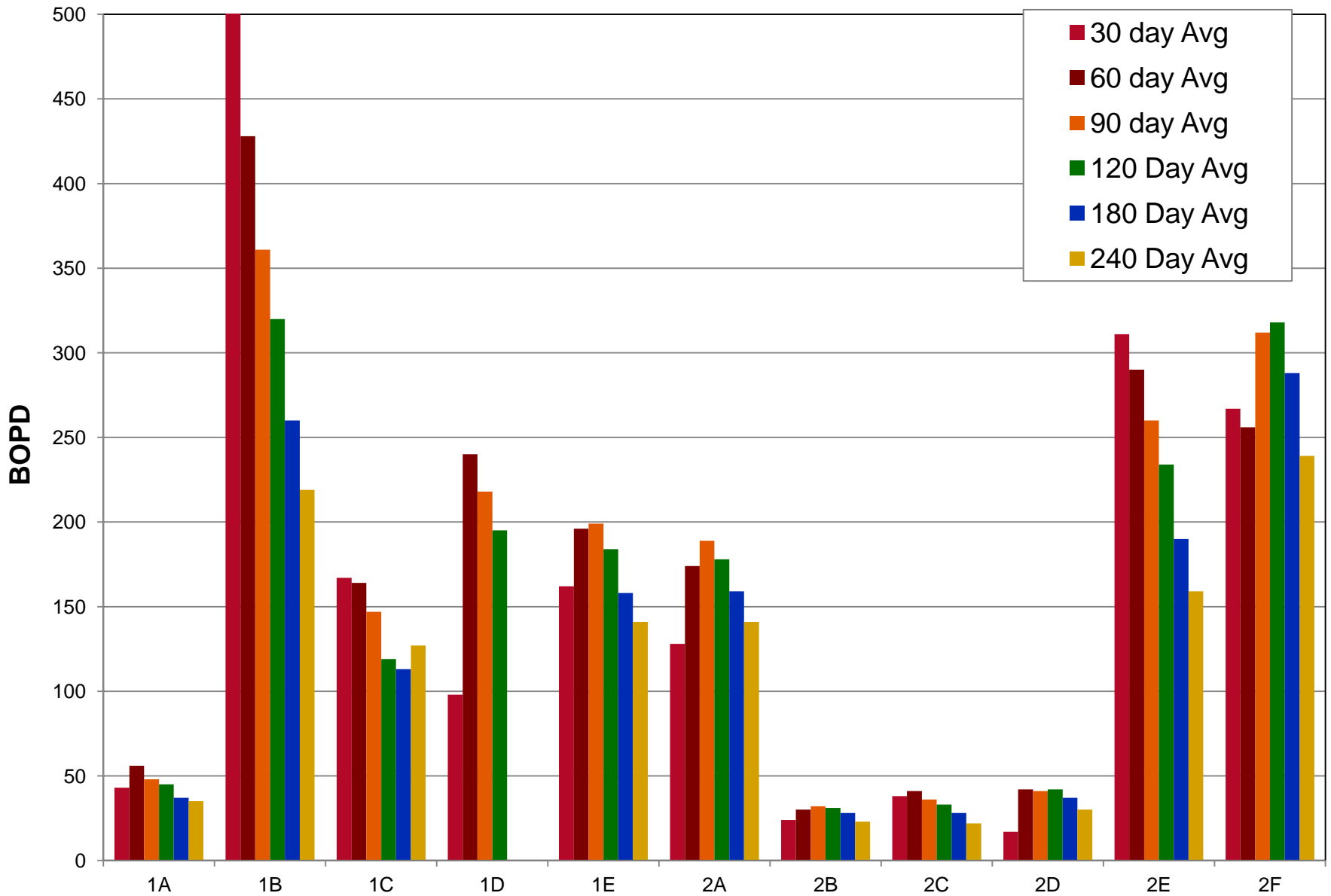
Woods County - Mississippi Lime Production



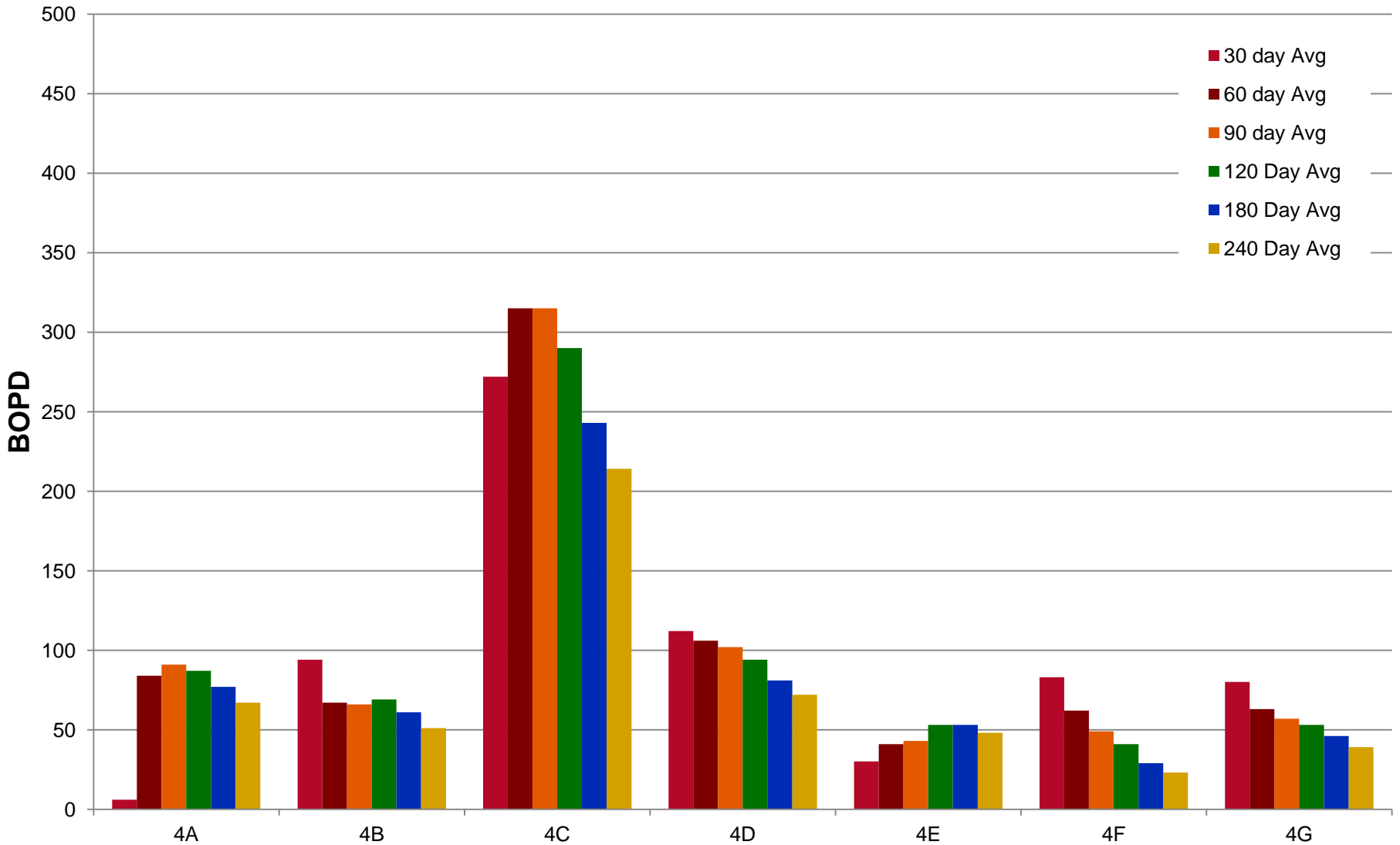
Grant County - Mississippi Lime Production



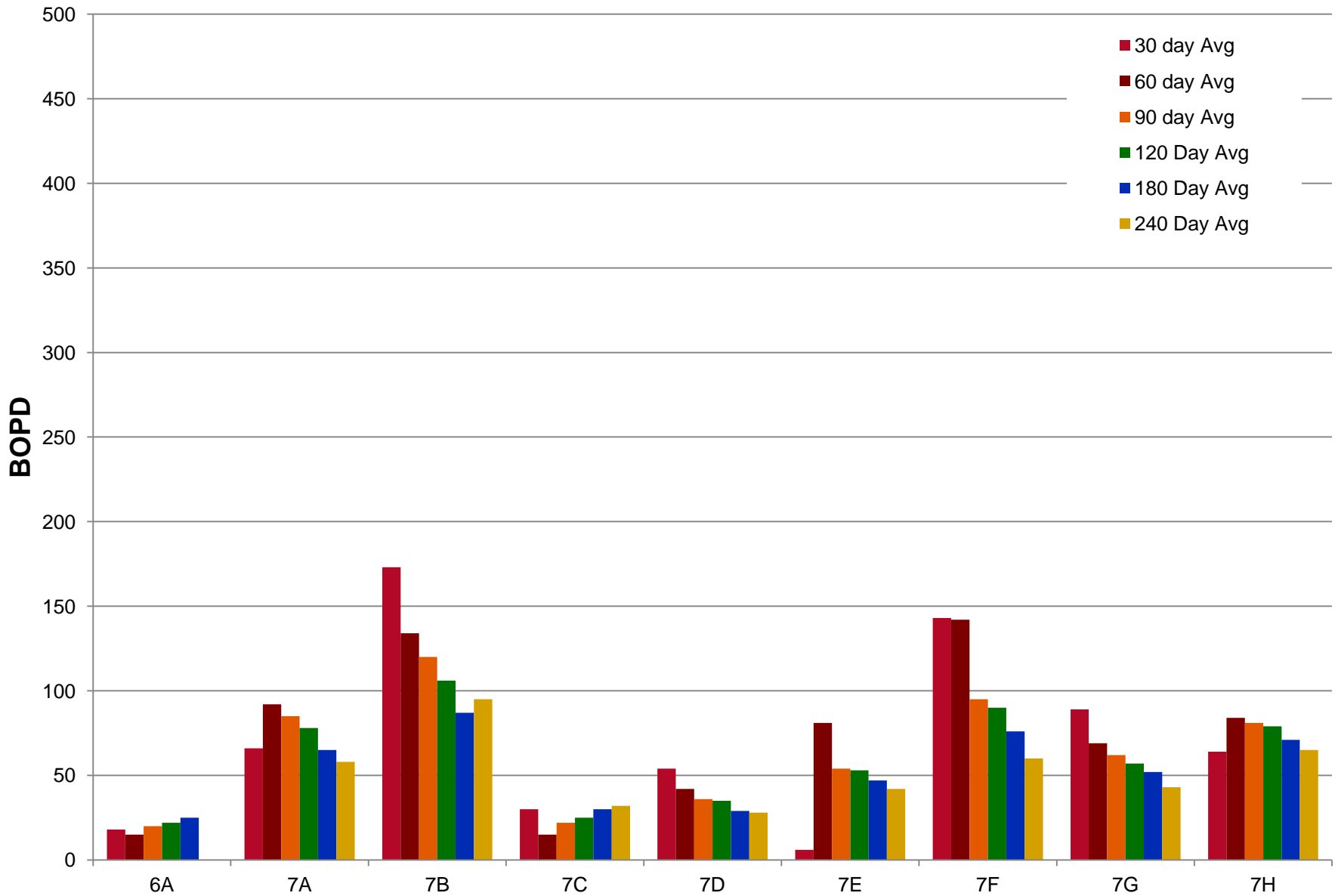
Alfalfa County - Mississippi Lime Production



Kay County - Mississippi Production



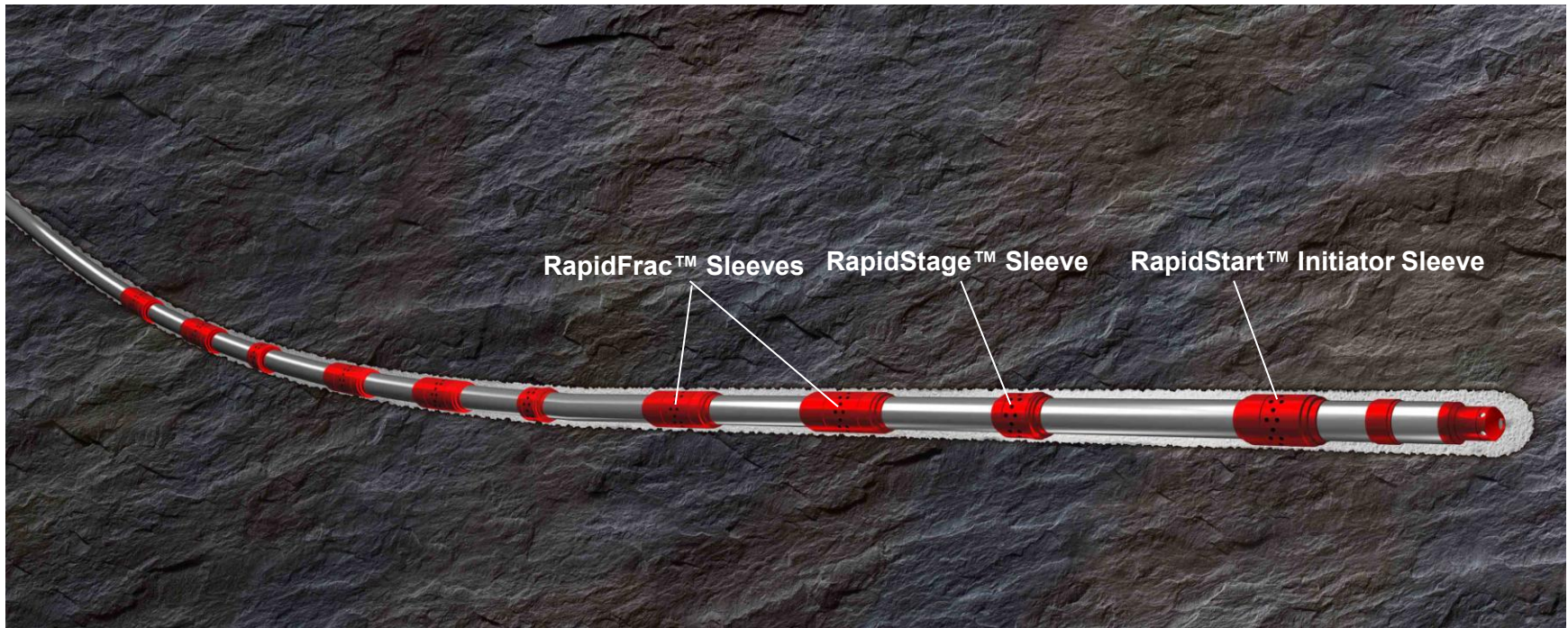
Payne County - Mississippian Production



Challenges & Solutions

Sleeve Systems

- Reduce Completion Time & Cost
- Cemented & Open Hole Systems Available
- Production Analysis Needed

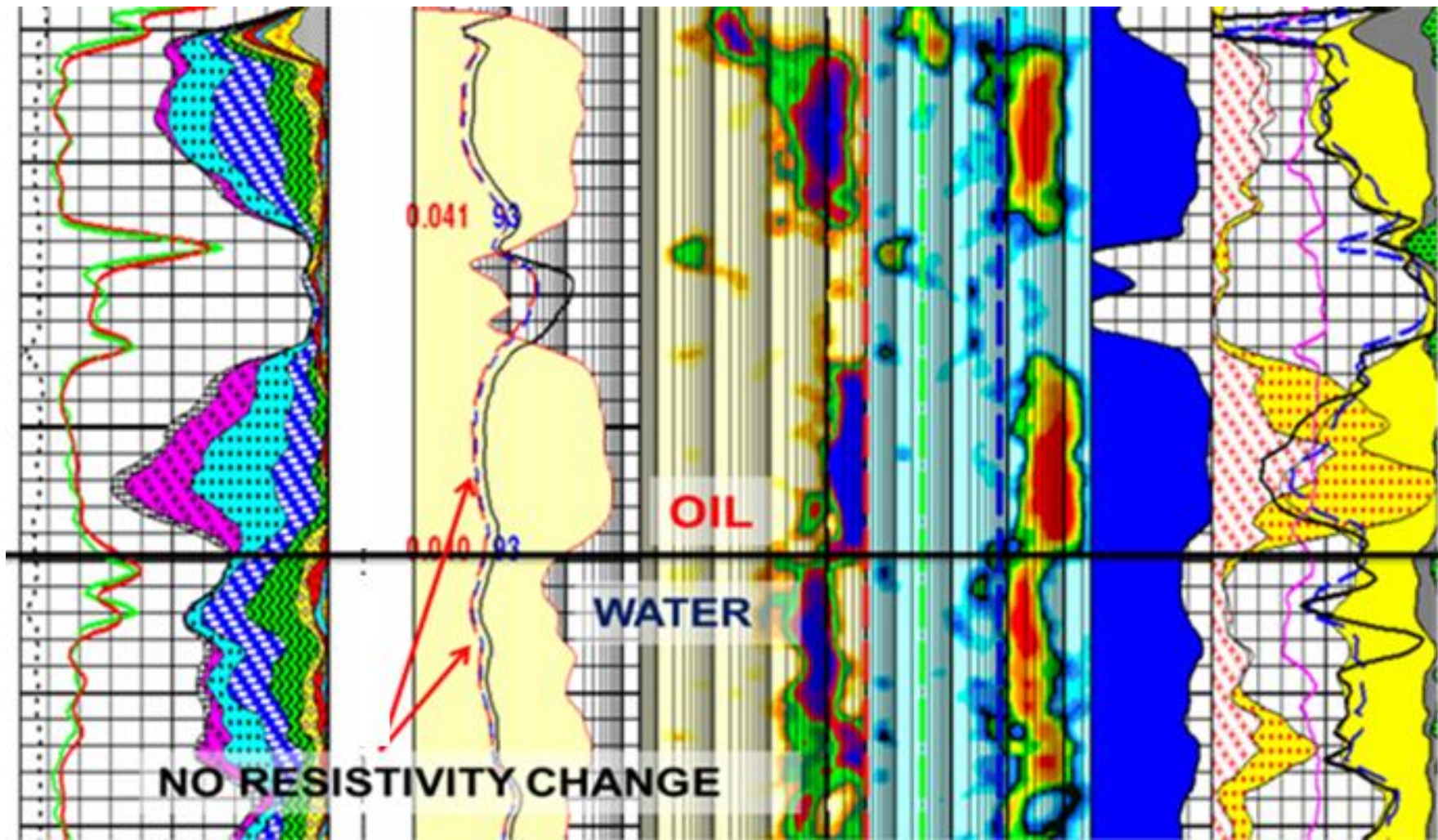


Challenges & Solutions

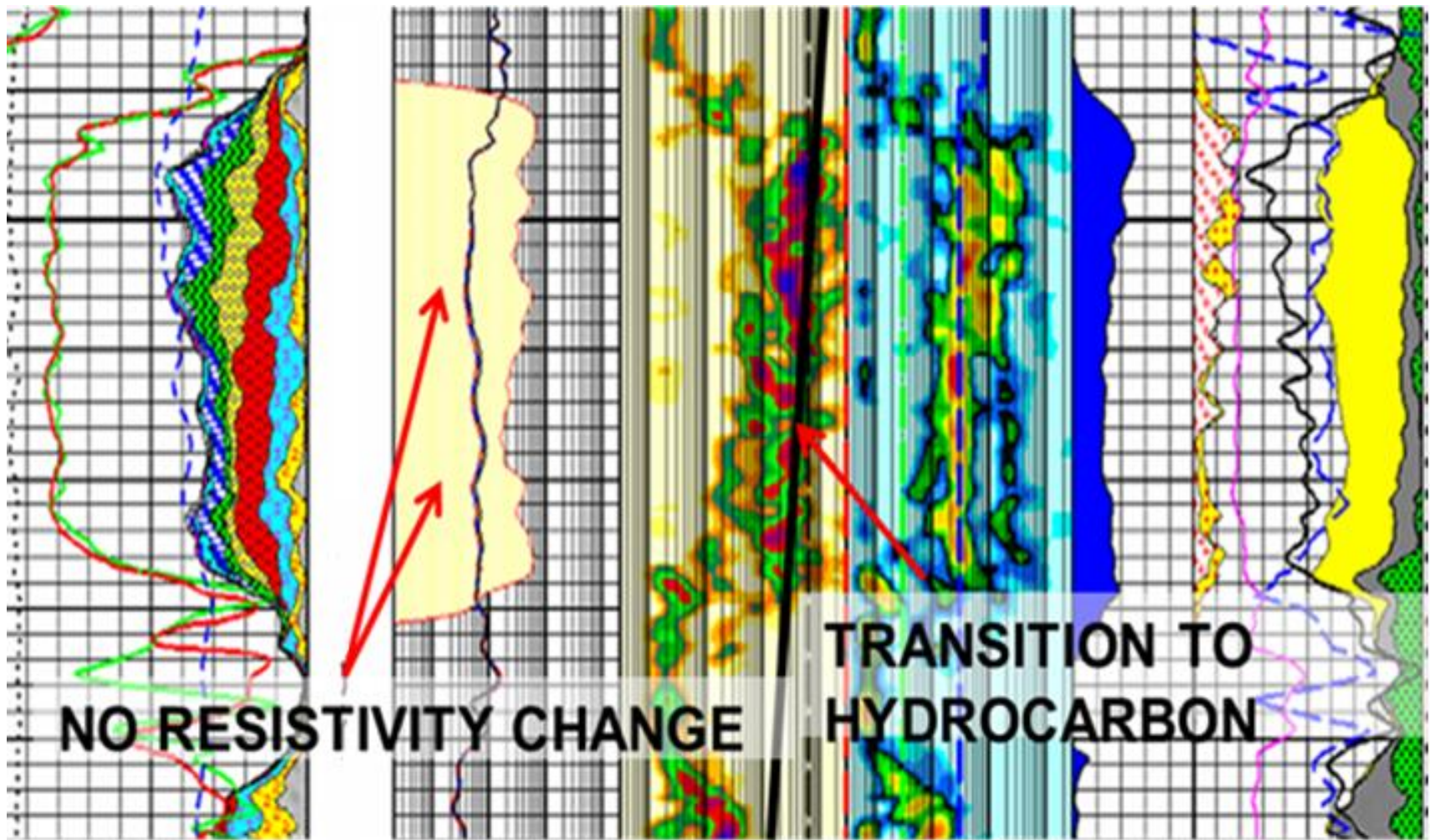
MRIL[®] and WSST[®] in the Mississippian

- Major issues for log interpretation in the Miss are:
 - is there sufficient permeability for production
 - Identification of fluid type to minimize water production
 - Identify ability to initiate fracture treatment and the ability to maintain treatment geometry
- MRIL[®] identifies permeability and fluid type.
- WSST[®] identifies brittleness and rigidity of the formation

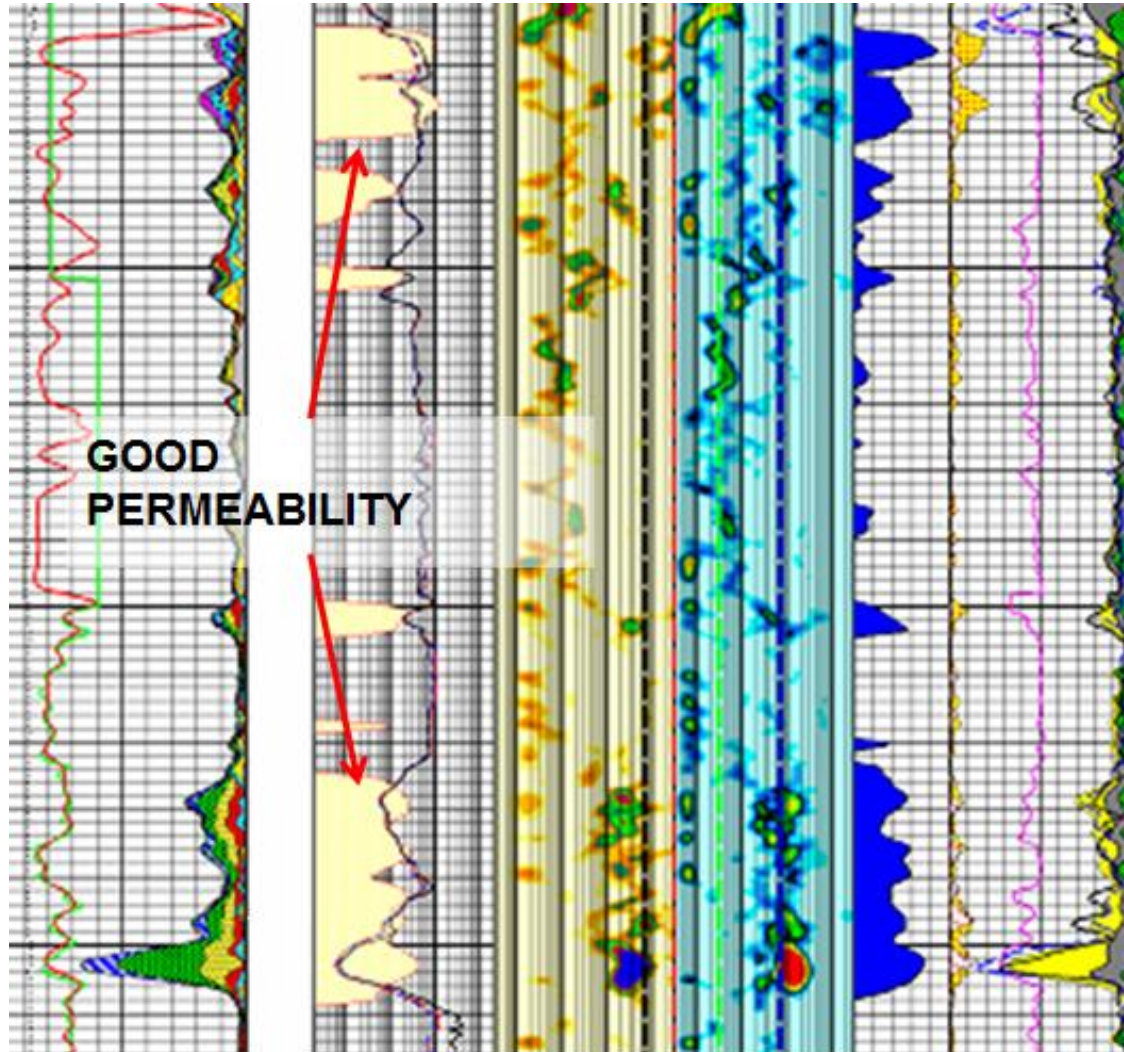
Miss Section with Oil Water Contact



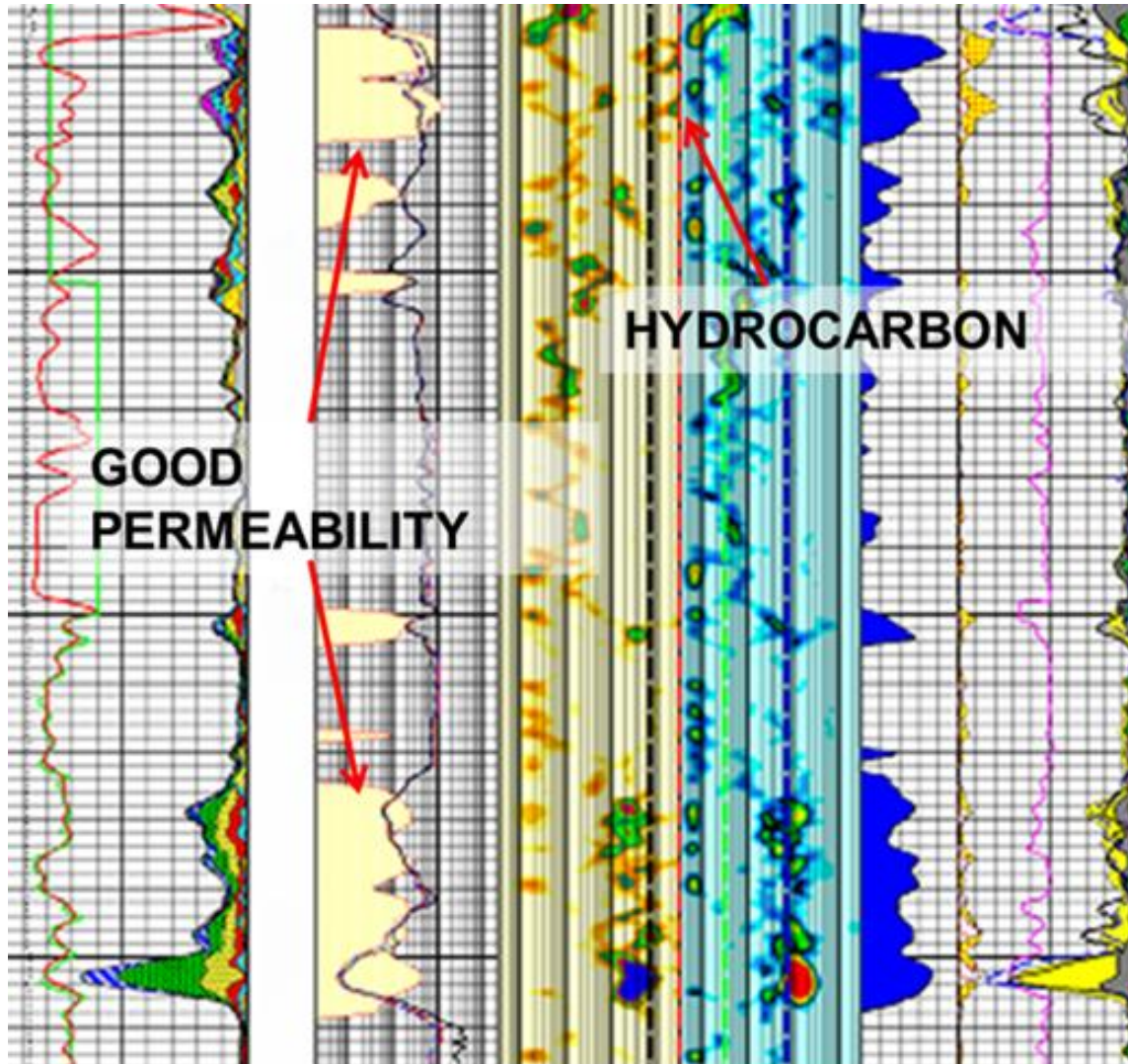
Miss Section with Transition from Oil to Water



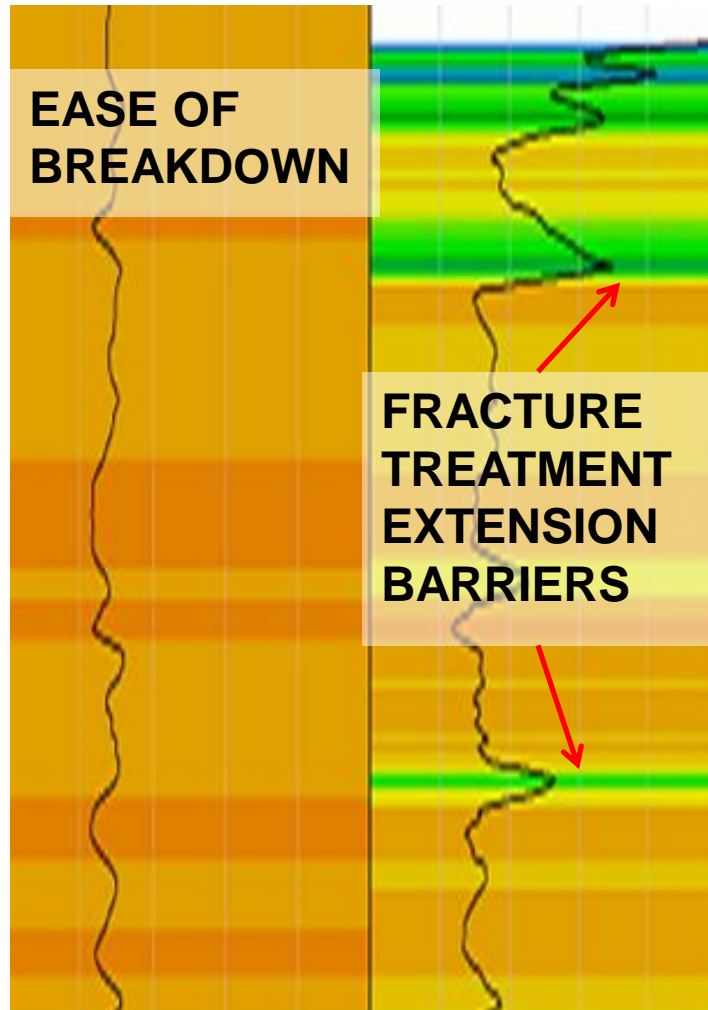
Miss Low Porosity Permeability Where is Best Landing Horizon?



Miss Low Porosity Permeability T1 Hydrocarbon Definition



Rock Mechanical Property Solutions



- Fracture Treatment Barriers must be defined and planned for
- Vertical properties define ease of breakdown
- Three Dimensional properties define the quality of placement
- Considered together, these maximize the efficiency of fracture treatment

DISCUSSION?