

Mapping the Production Characteristics of the Haynesville Shale with a Well-Log Derived High-Density Stratigraphic Framework*

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Abstract

Detailed stratigraphic correlations were made in the Upper Jurassic interval of Western Louisiana and East Texas on approximately 1000 digital logs from wells that penetrate the section. The primary geophysical log used for identification of bounding surfaces was the Gamma-Ray. Other geophysical logs used to support the interpretations were the Deep-Induction and Spontaneous Potential. The surfaces associated with correlative well-log responses were both regionally and locally significant within the study area. Where possible, the regionally correlative surfaces were matched to second-order sequence boundaries that other workers have identified within the study area. Within the second-order system tracts, it was possible to identify bounding surfaces from the well logs that defined parasequences that are regionally significant within the study area.

Reported production volumes for wells producing from the correlated intervals within the study area were used to define the production characteristics of each regionally significant stratigraphic interval. Production from wells that penetrated multiple stratigraphic intervals was assigned equally to each interval in which the well was completed. The production volumes of the stratigraphic intervals were mapped to identify the relationship between production and stratigraphy.

References

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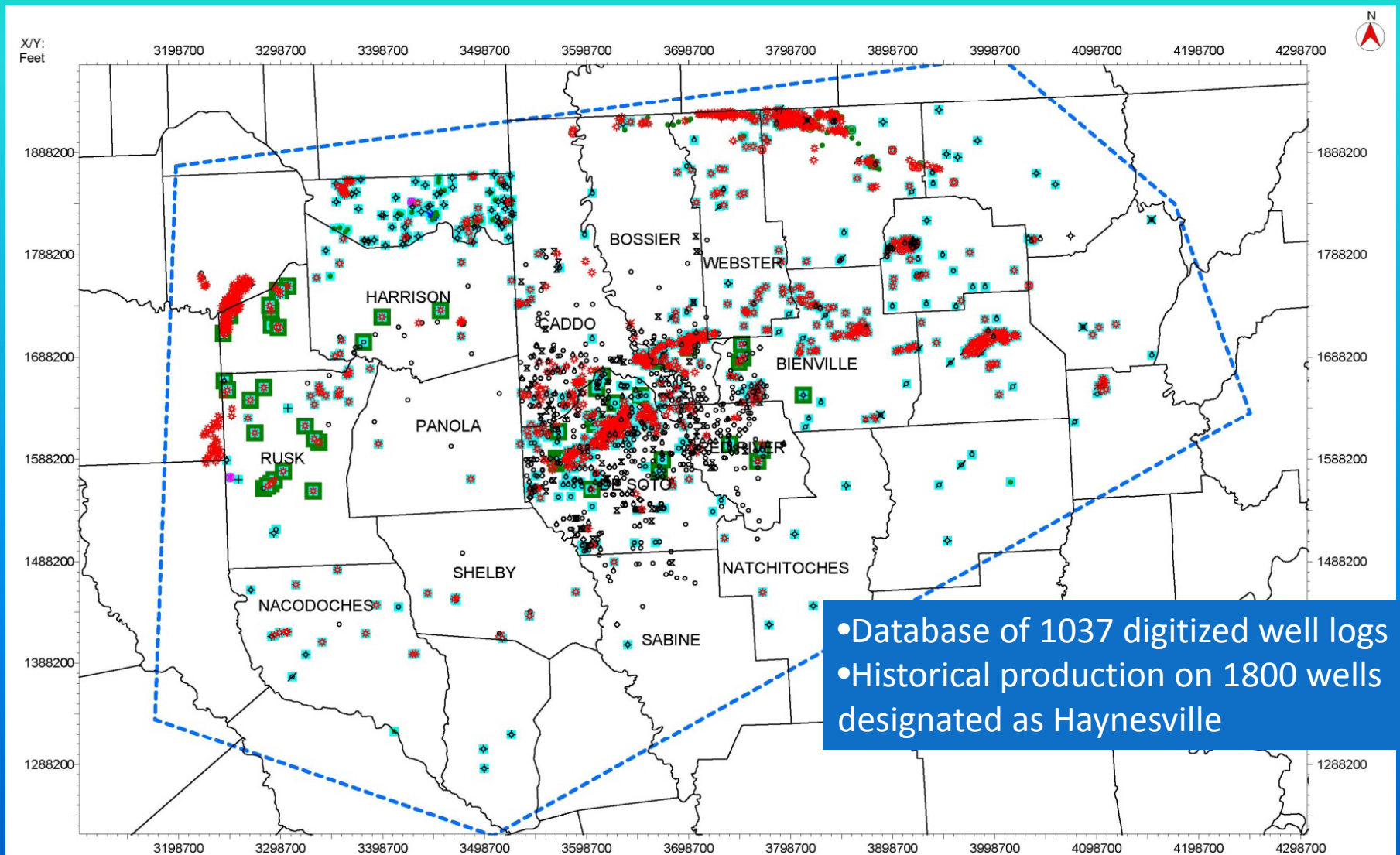
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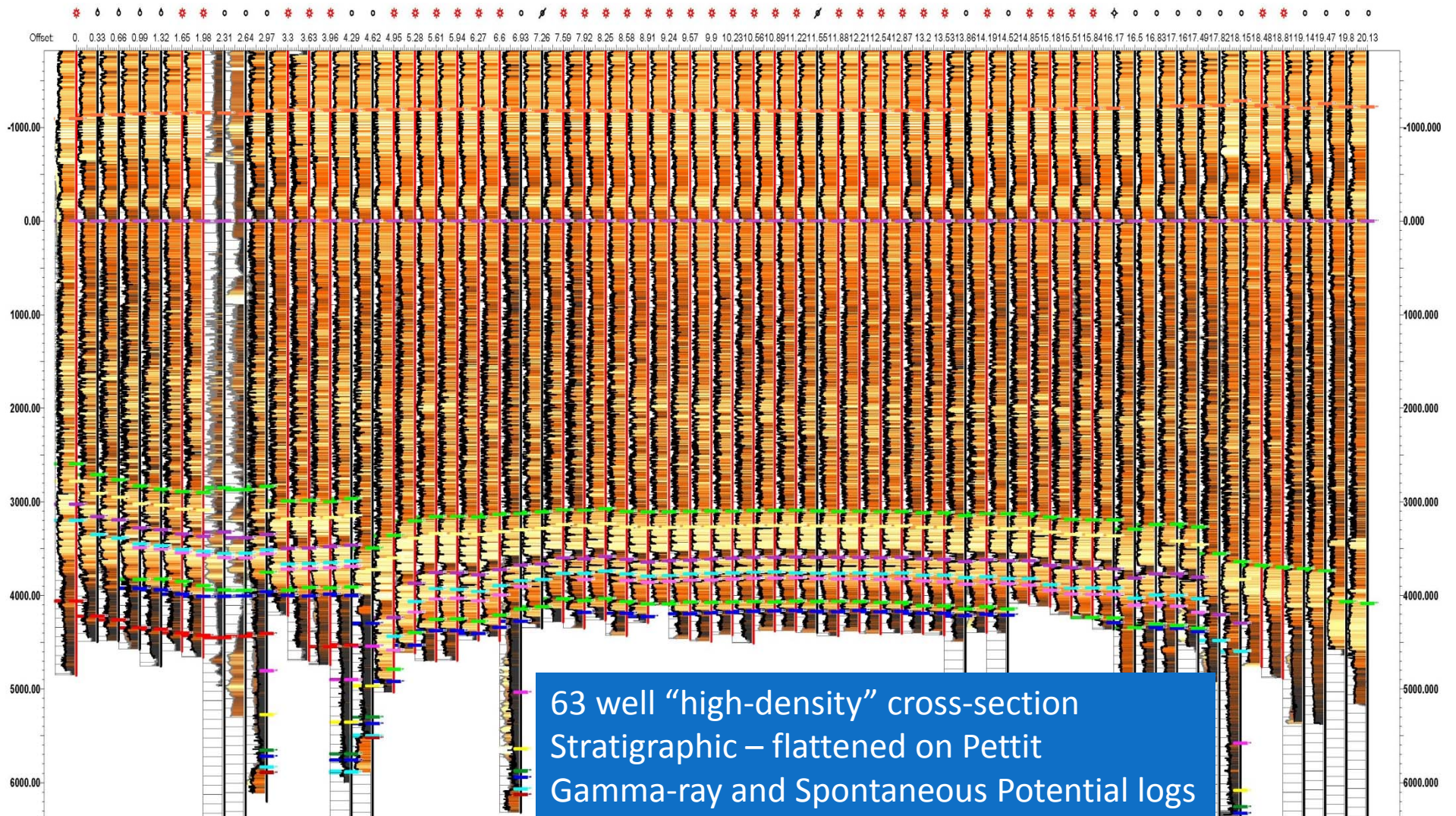
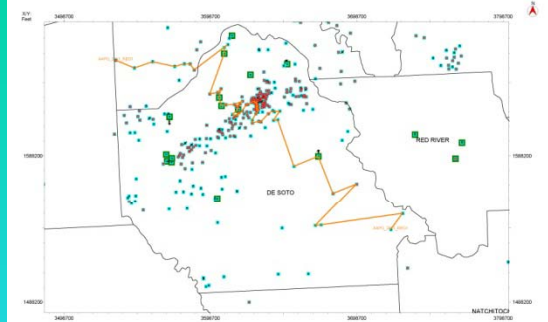
Ramona Hovey

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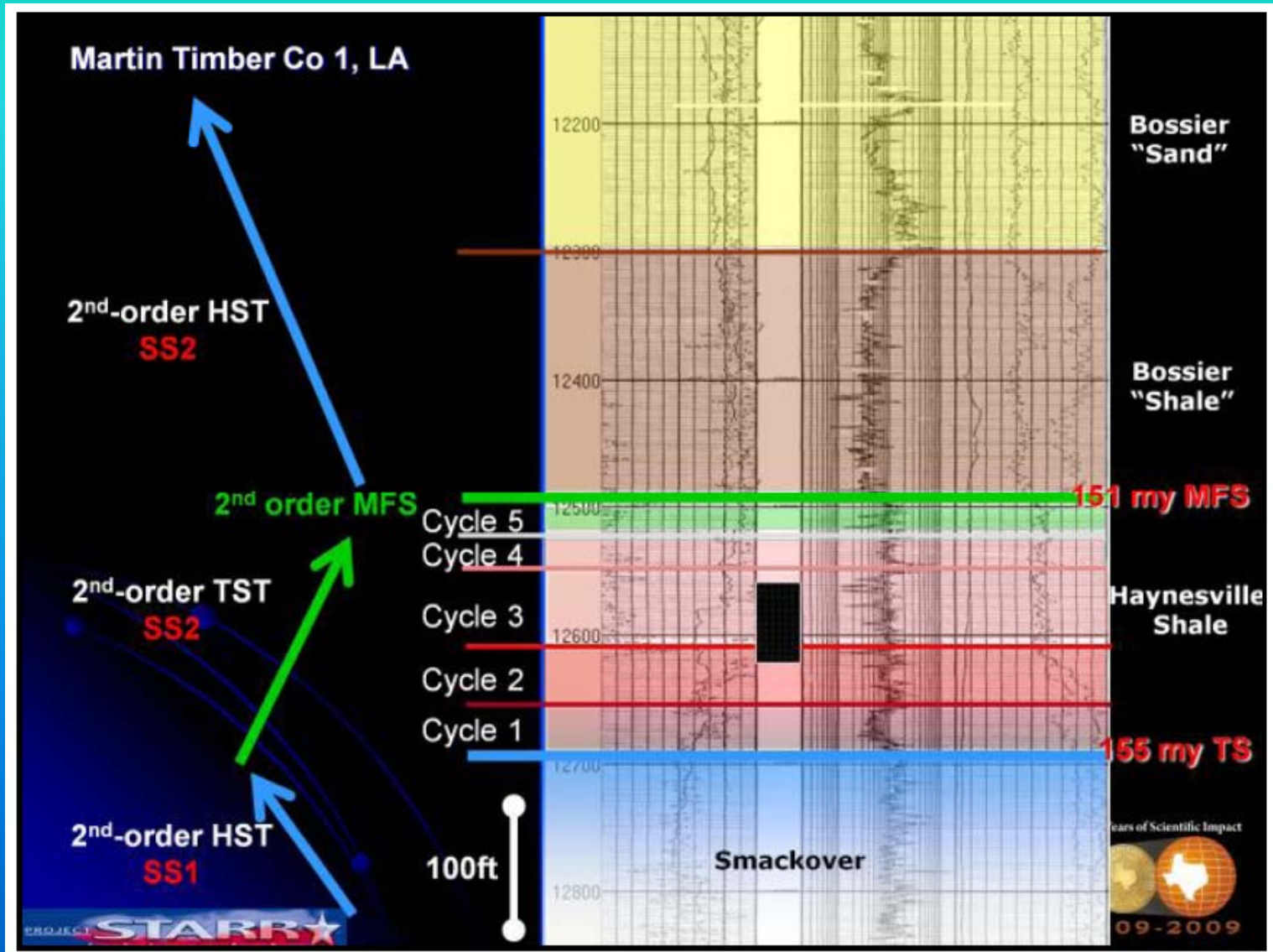
Project Area



Regional Cross-section

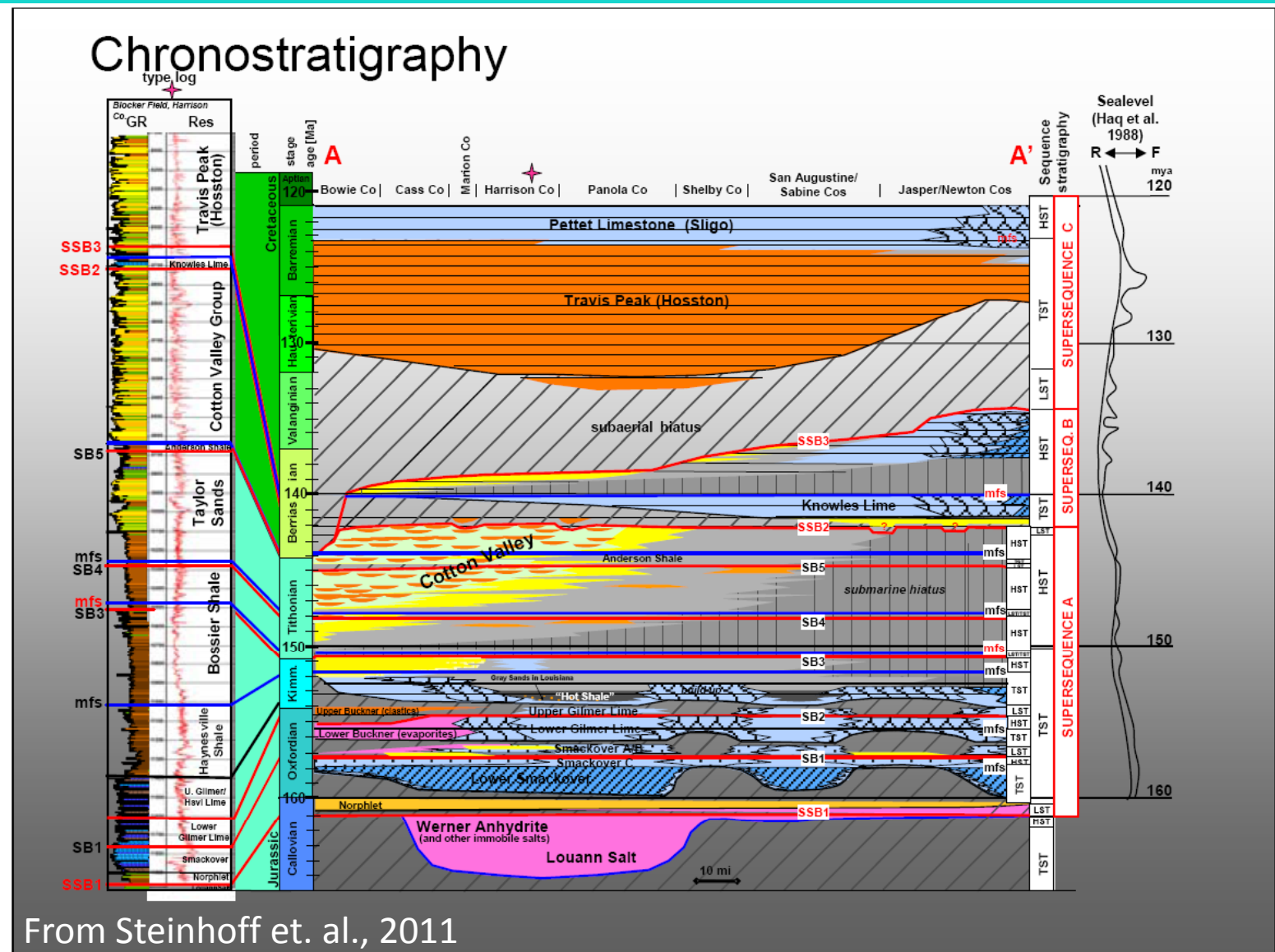


Haynesville Sequence Stratigraphy

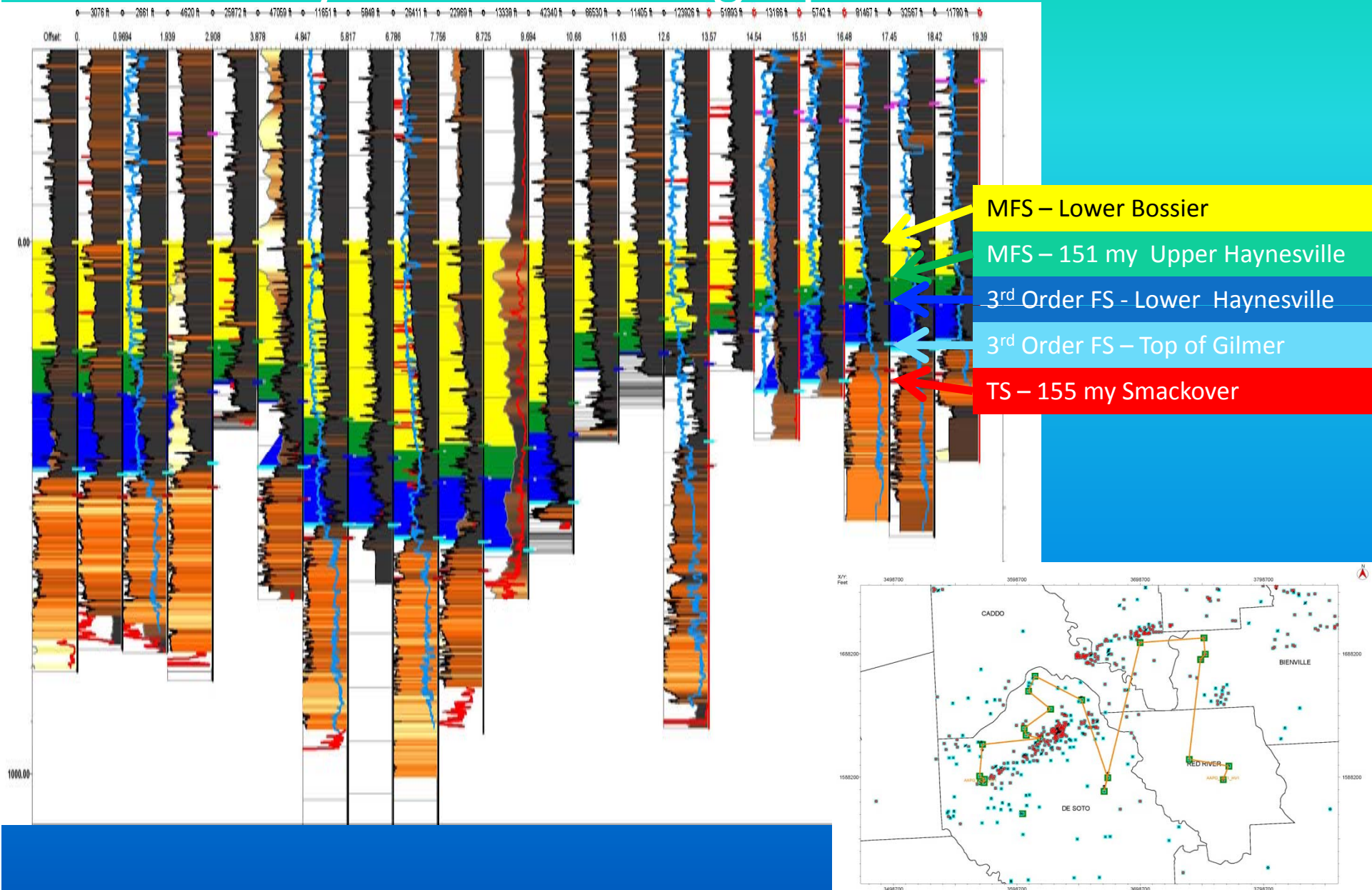


From Hammes and Carr, 2009

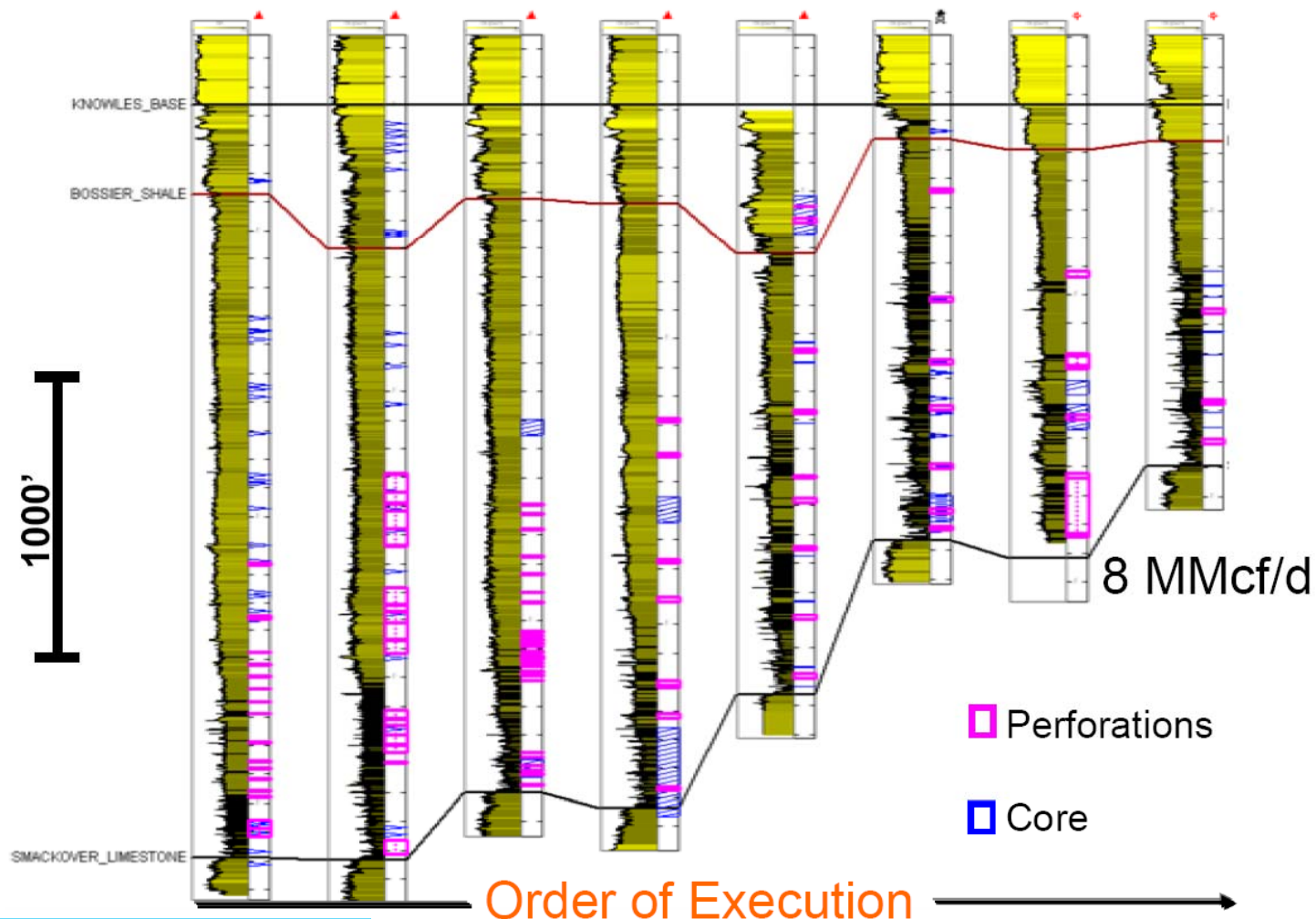
Haynesville System Tracts



Haynesville Stratigraphic Section



Haynesville / Bossier Shale Pilot Phase Vertical Wells



From Brittenham, 2010

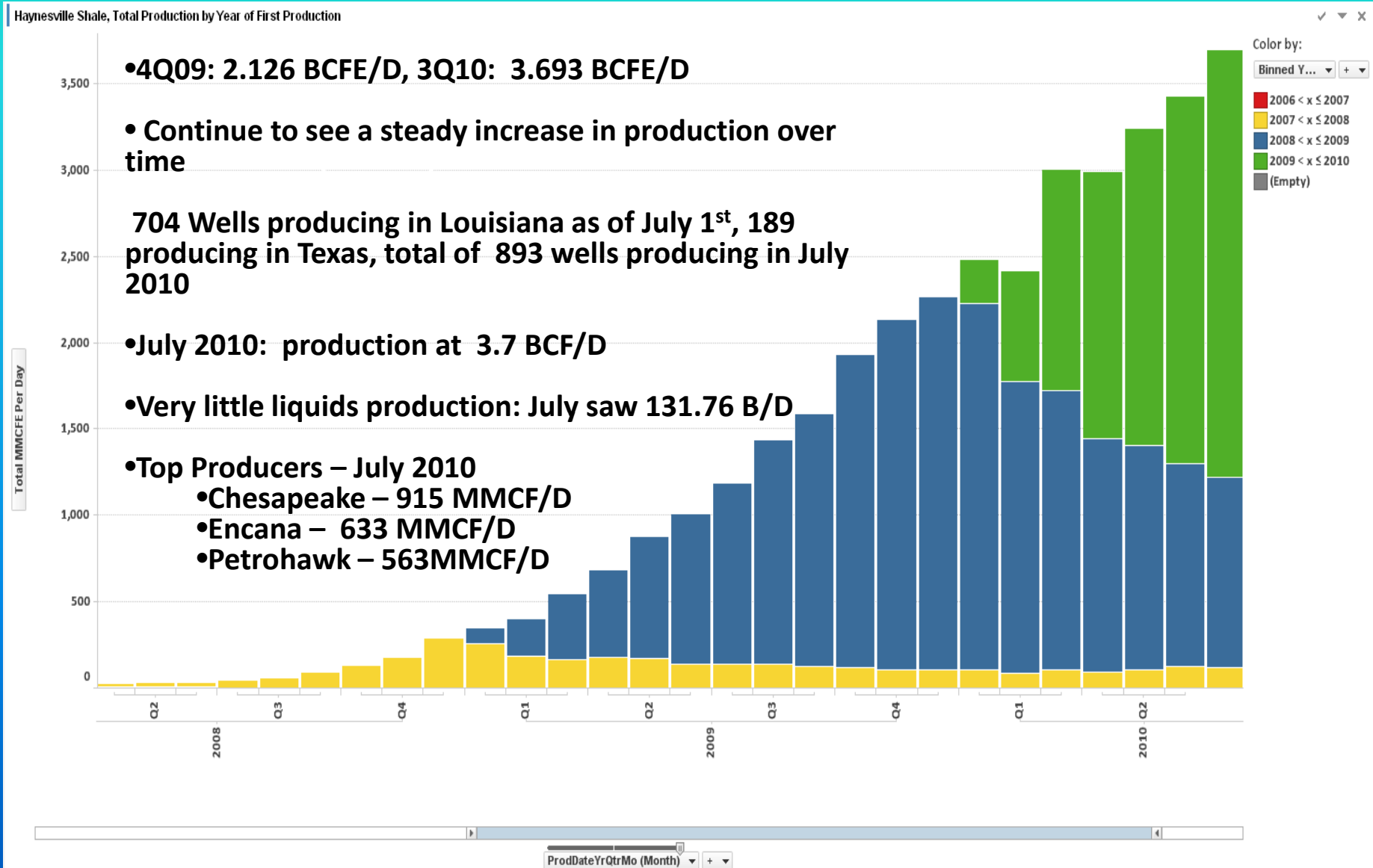
Reference J. Beer 2009

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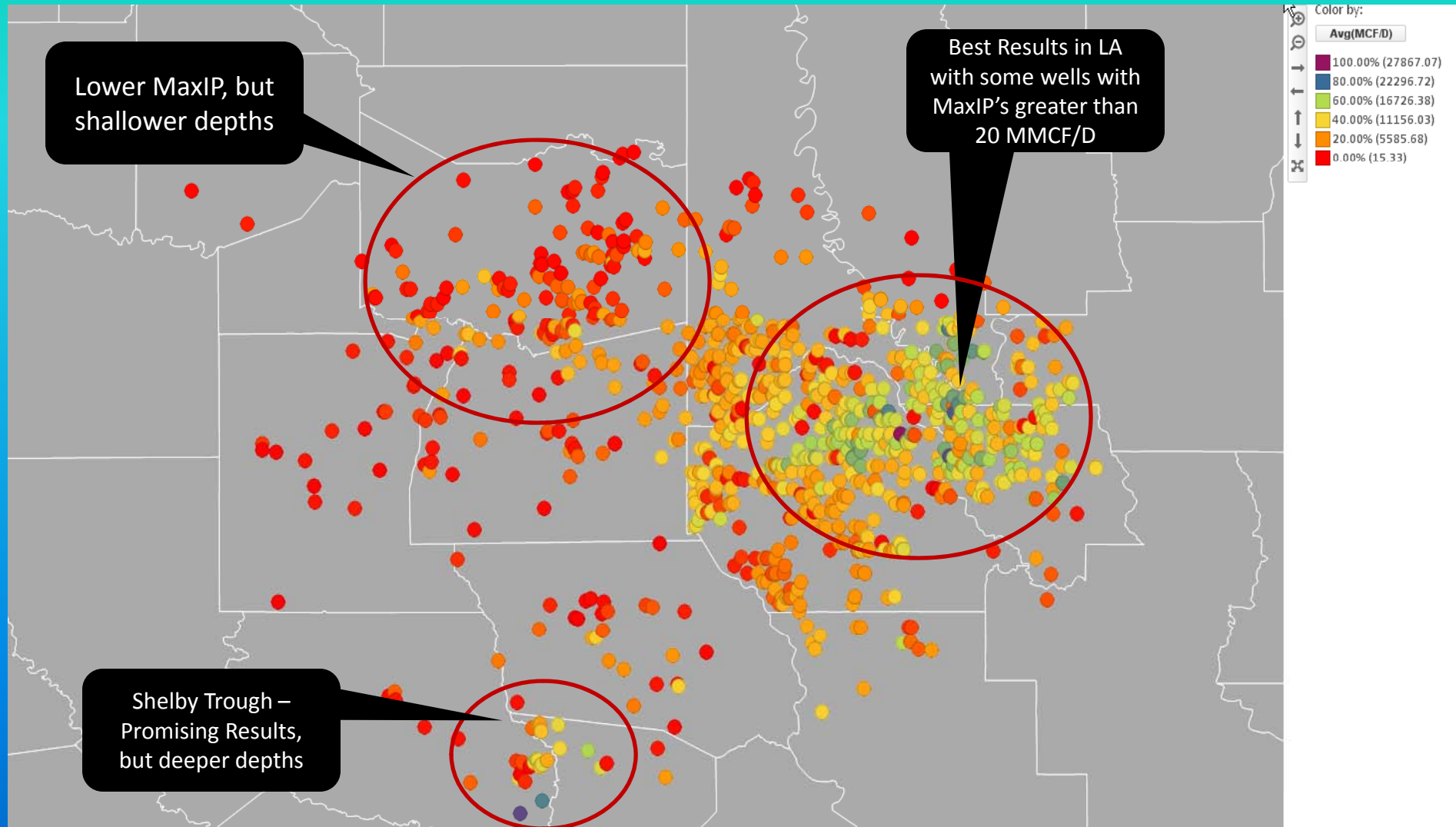
Haynesville Production

- Haynesville is now rivaling the Barnett Shale with almost 4 BCF/D.
- Approximately 90% of the production in 2010 is from Louisiana wells.
- While most of the permitting and production have been centered in Louisiana, operators have shifted their focus back to Texas and the Shelby Trough.
- Operators have recently begun large-scale restricted rate programs to improve long-term well performance and to help maintain the integrity of the reservoir.

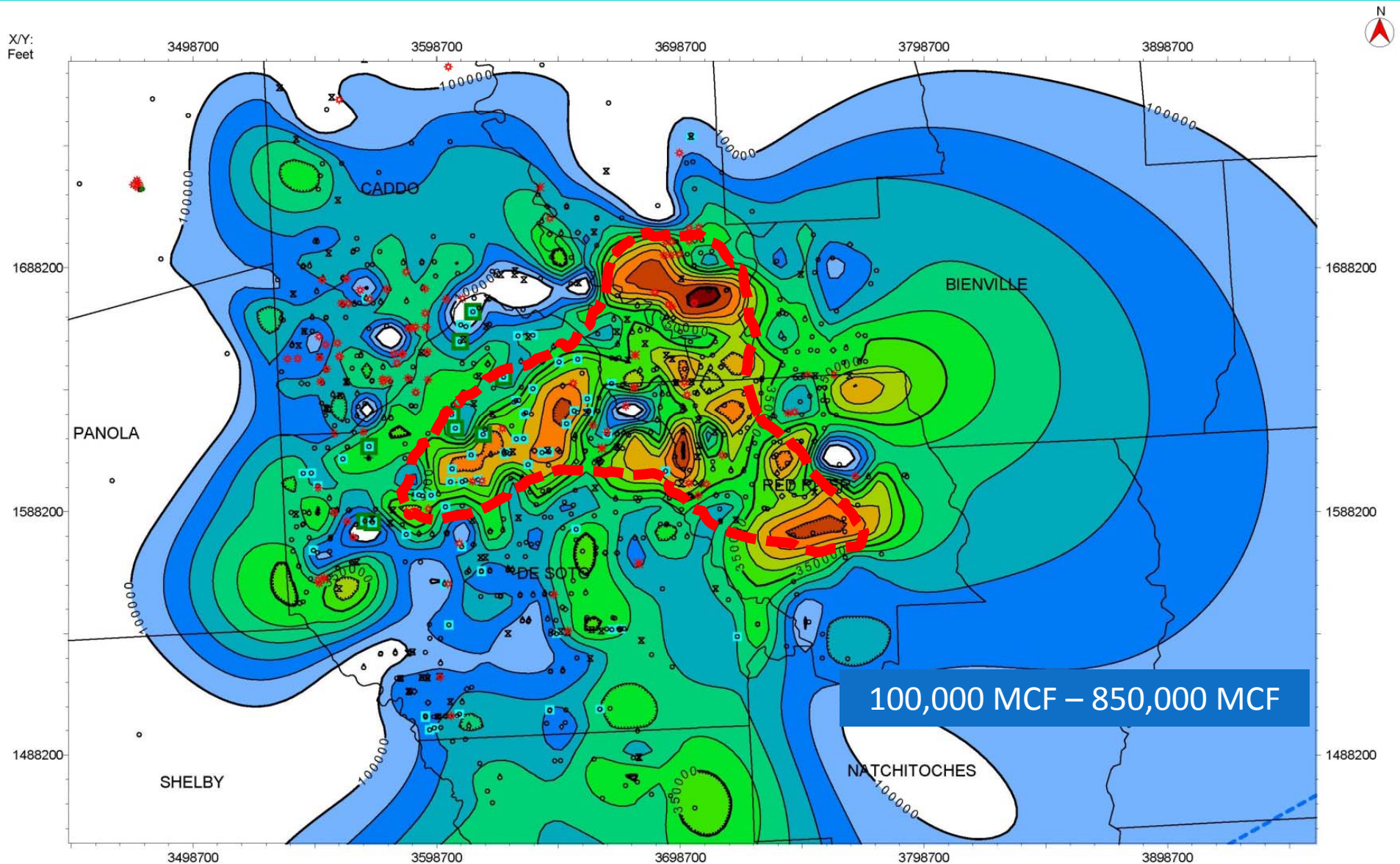
Production reached new heights in 3Q10



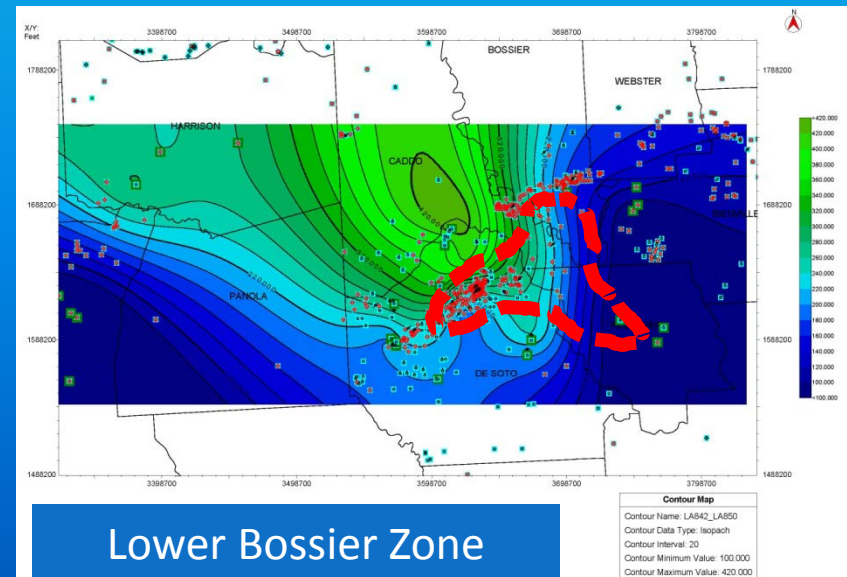
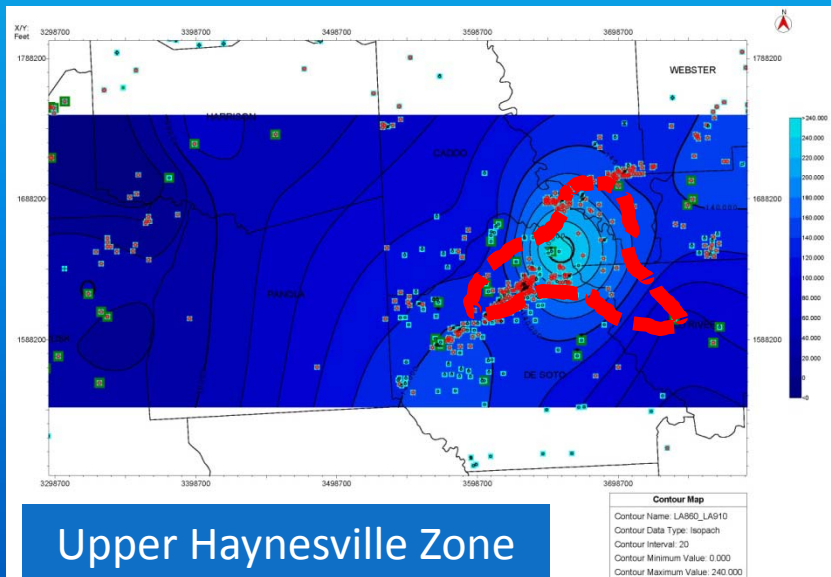
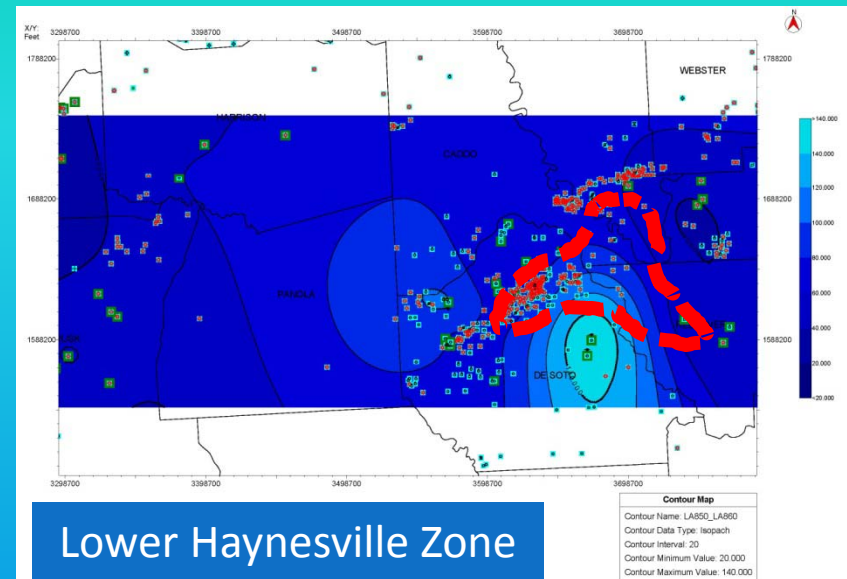
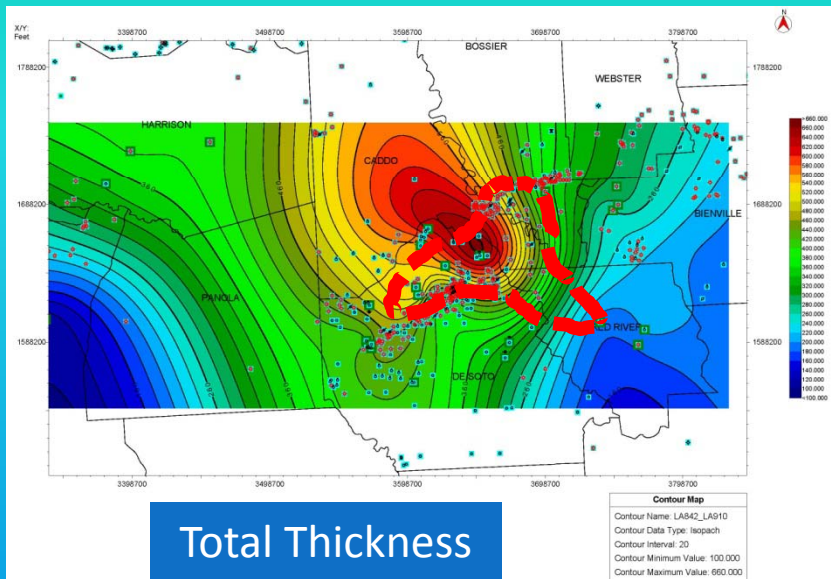
MaxIP Points to “Sweet Spots”



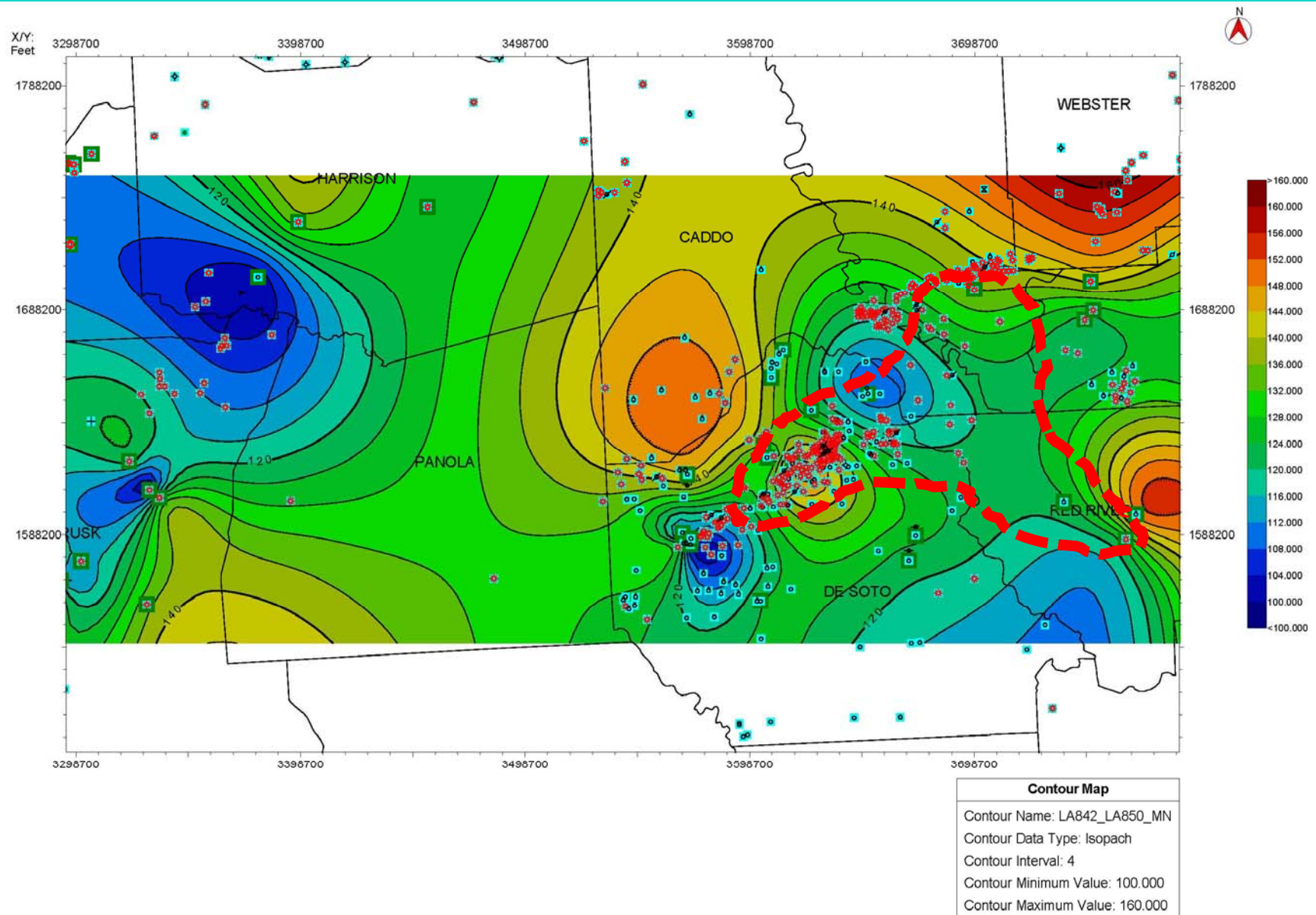
Peak Gas Production (30 day)



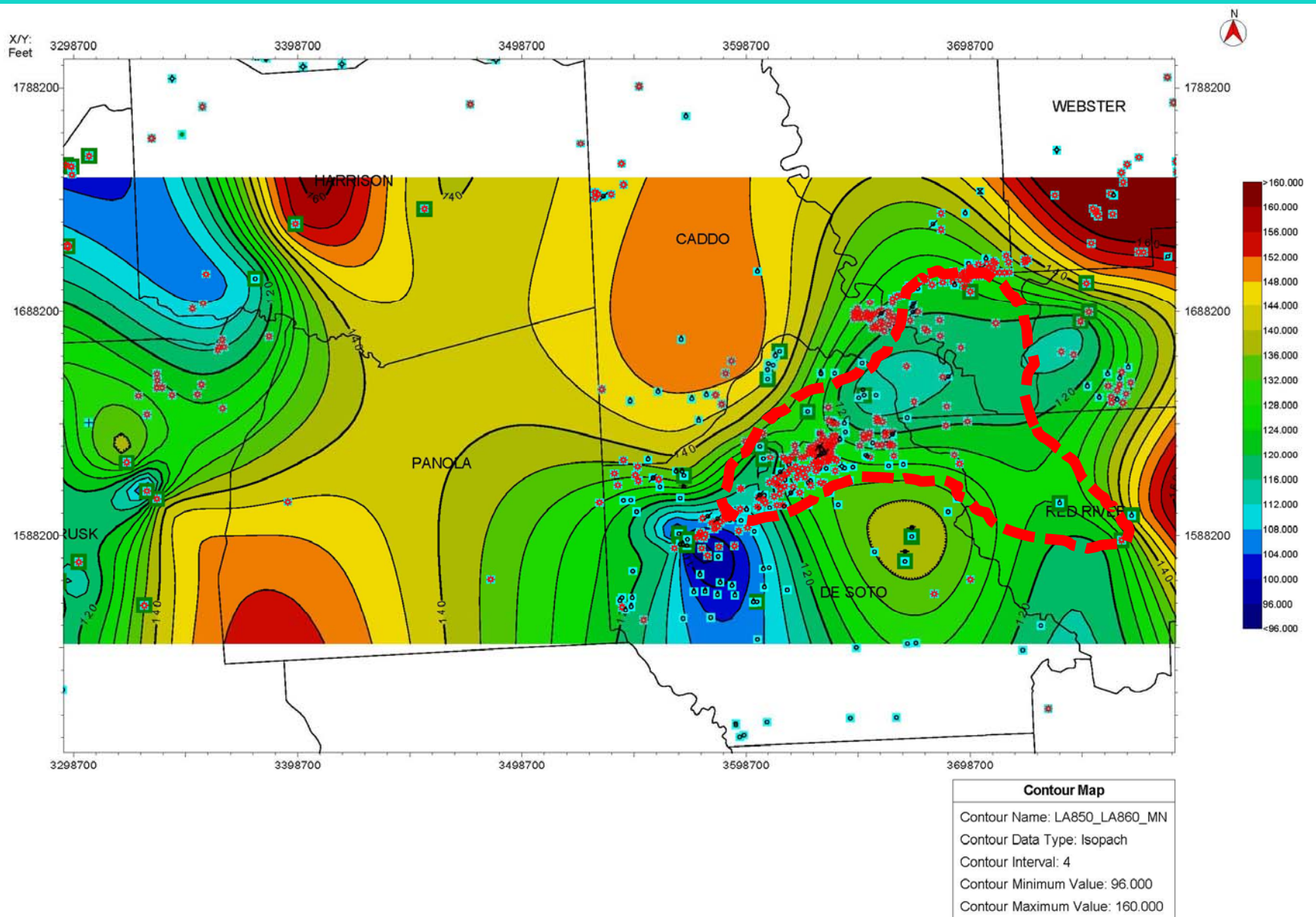
Lower Bossier-Haynesville Gross Isopachs



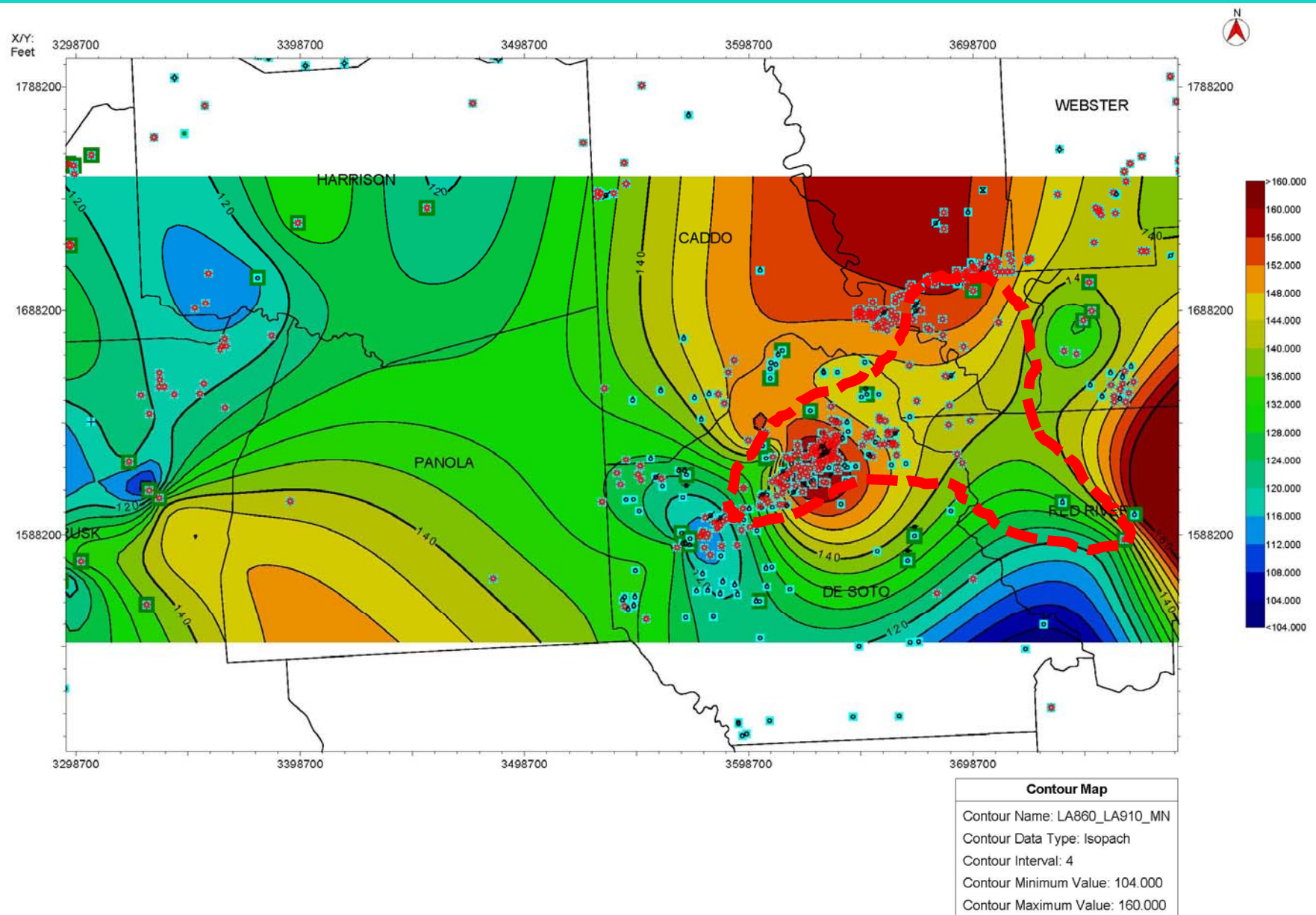
Lower Bossier – Mean Gamma-ray



Upper Haynesville— Mean Gamma-ray



Lower Haynesville – Mean Gamma-ray



Summary

- Detailed correlation of well logs provides insight into the sequence stratigraphic framework of the Lower Bossier/Haynesville section.
- Petrophysical analysis of digital well logs may provide a means to identify areas of greater potential production.
- Geological understanding matched with historical production records may provide a means for understanding the extent of the Haynesville Shale Trend.

References

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