

Maximum Flooding Surface Sequence Stratigraphic Analysis, High Resolution Biostratigraphy and TOC/%CO₃ in Correlation of Eagle Ford South Texas, Eaglebine East Texas and Tuscaloosa Louisiana-Mississippi

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Abstract

Twenty-five wells were analyzed and used to correlate the Eagle Ford South Texas Eaglebine East Texas to the Tuscaloosa in Louisiana-Mississippi using High Resolution Biostratigraphy and Sequence Stratigraphic Analysis. Seven third order Gallo- way type sequences and eight bounding maximum flooding surfaces (MFS) were identified and correlated in 25 wells from Webb County in South Texas to Wilkinson Counties in Mississippi. This correlation demonstrates the time correlation of rocks of Eagle Ford age that are of different facies. It is especially important to correlate to the Tuscaloosa TMS because it is an emerging play and a new oil reservoir in Mississippi and Louisiana.

In order to understand the complex relationship vertically and laterally of the Eagle Ford, Eaglebine and Tuscaloosa, Calcareous Nannofossils and Foraminiferal high resolution biostratigraphic analysis, Maximum Flooding Surface Sequence Stratigraphic Analysis and TOC/%CO₃ values were completed on 25 wells. The depth of the high value intervals of TOC per well in the Lower Eagle Ford is proposed as a minimum depth for placement of the landing point for lateral wells.

Genetic Sequences range from Cenomanian Ce3 (95.69Ma) MFS to Turonian 4 (Tu4) 88.77Ma MFS. The Maness Shale, South Texas to Mississippi is characterized by Ce3 (95.69Ma) MFS. The Cenomanian Eagle Ford, Woodbine Group (Lower Eaglebine) and lower Tuscaloosa are characterized by Ce4 (94.75Ma), Ce5 (93.10Ma) MFS. The Turonian Eagle Ford, Eagle Ford Group (Upper Eaglebine) and upper Tuscaloosa are characterized by the Tu1 (91.41Ma), Tu3 to Tu4 (88.77Ma) MFS.

Unconformities are recognized from South to East Texas to Louisiana-Mississippi at the top of Buda/Washita, Maness, Cenomanian Eagle Ford, Cenomanian Woodbine Group in Eaglebine, Cenomanian Lower Tuscaloosa, Turonian Eagle Ford, Turonian Eagle Ford Group Eaglebine and Turonian in Tuscaloosa. The Cenomanian-Turonian, Tu1 Sequence Boundary and unconformity is especially important because it has eroded part of the richness zone in Cenomanian-Turonian Eagle Ford, Woodbine Group and TMS in Tuscaloosa affecting the exploration in these unconventional plays.

In the Maverick unconformities of 0.2 up to 6.4 Ma (My) are demonstrated in the Eagle Ford with Upper Austin unc Upper Turonian, Lower Austin unc Lower Turonian, Lower Austin unc Upper Cenomanian, Upper Turonian unc Upper Cenomanian, Upper Turonian unc Lower Cenomanian, and Lower Turonian unc Lower Cenomanian Eagle Ford. Because unconformities represent missing time and sediments, they have a direct effect on the thickness of Galloway sequences, richness zones, landing points and correlations within the Eagle Ford, Eaglebine and Tuscaloosa.