



Lower Cretaceous Sediment Preservation by Small Scale Halokinesis in the Haynesville Shale Play Area

Dale Short

Retired Geologist

EXTENDED ABSTRACT

Following the TST (transgressive systems tract) of the Haynesville Shale in the area north of the Toledo Bend Flexure (Anderson, 1979), and accompanied by an increase of clastic input into the basin, HST (highstand systems tract) siliciclastic delta systems prograded into the basin from the northern and western rims of the East Texas Basin far to the north and west of the study area. Initial sedimentation in the study area consisted of silty shale, followed by a minor marine transgression, forcing the deltaic deposition farther to the north and deposition, in the study area, of an organic rich, distal HST shale known as the Bossier organic shale. This period of the Berriasian and Valanginian stages were marked by several, higher order fluctuations of sea level. Unconformities associated with these third- or fourth-order sea level fluctuations appear to be parallel to the depositional surface in most of the study area. Those eroded facies are preserved in areas of minor halokinesis. One of these areas lies adjacent to the Sabine Island along the Angelina River that forms the boundary between Angelina and Nacogdoches Counties and was defined by 3D seismic data. A model that shows how minor halokinesis contributed to the preservation of Middle and Upper Bossier (or possibly Calvin?) (Loucks, 2017) facies (sands?) provides clues to both the deposition of section not usually represented in the study area, and erosion associated with the sea level fluctuations that removed most of the section. In the vicinity of the model, the postulated reason for the halokinesis being of a limited nature was because of a limited salt budget. Depletion of that salt budget prevented continued salt movement unlike areas to the north such as at Trawick Field.

...