

**Stratigraphy of Lower Hinton Formation: A record of Transgressive-Regressive Episodes Preserved in the Ancient Coastal Plain and Estuaries of the Upper Mississippian Appalachian Basin, West Virginia, USA**

Smith, Tyson M.<sup>1</sup>; Bartek, Louis R.<sup>2</sup> (1) BHP Billiton Petroleum, Houston, TX. (2) Geological Sciences, University of North Carolina, Chapel Hill, NC.

In southern West Virginia, the Hinton Formation is a lithologic record of coastal plain (in outcrop) to estuarine marginal marine (in the subsurface) environments that were intermittently inundated by marine sedimentation during the late Chesterian. The ancient coastal plain on which these sediments were deposited existed along the northeastern shore of the Appalachian basin where an extensive record of Late Paleozoic sedimentation was preserved by foreland basin subsidence.

Cyclothems, a characteristic feature of Pennsylvanian Appalachian basin stratigraphy, are attributed to glacioeustatic fluctuation during the late Paleozoic, and have been the subject of much research. Despite geologic evidence that supports the presence of continental ice sheets during the late Mississippian, comparatively little work has been done until recent with regard to the identification of similar cycles in Chesterian stratigraphy. This study provides evidence for the presence of high frequency, transgressive-regressive cycles during the late Mississippian, in many ways similar to Pennsylvanian cyclothems. The eight transgressive-regressive episodes recorded in the coastal plain to marginal marine stratigraphy occurred over a roughly 2.5 million year span. These time constraints allow the eight transgressive-regressive episodes to be classified as 4th order. The character of these episodes appears to be modulated by a 3rd order lowstand and transgression. Sedimentation in these ancient environments was controlled by multiple allogenic forcing mechanisms, the interaction of which shaped the architectural motif of the geologic record that is present today. This study analyzes that record and documents how multiple controls on relative sea level, which operate on different timescales, influence sedimentation within coastal plain to marginal marine environments.