

The Upper Tuscarora Sandstone as an Example of a Tectonically Forced Transgressive Systems Tract Composed of a Single Retrogradational Parasequence

DORSCH, JOACHIM, Department of Earth & Atmospheric Sciences, Saint Louis University, Saint Louis, MO 63103, USA.

The white quartzarenite of the Upper Tuscarora Sandstone (Lower Silurian) constitutes a part of the Taconic peripheral foredeep fill of the central Appalachians. It onlaps onto a regional unconformity that developed during a period of isostatic rebound of the Taconic orogen and adjacent foredeep related to a lull in compressional tectonism. Based on stratification types and trace fossils the Upper Tuscarora Sandstone is interpreted to represent lag deposits and offshore-directed bottom-current deposits (surf zone); deposits of laterally migrating storm-enhanced rip currents (upper/middle shoreface); finer grained organic-rich fairweather deposits (upper/middle shoreface); deposits of ebb-dominated tidal channels (estuary); and amalgamated sandy storm deposits with interbedded fairweather deposits (lower shoreface to offshore transition zone). The storm-dominated deposits are stacked as a fining- and deepening-upward, complete, transgressive facies succession. The facies succession is framed by a sequence boundary and transgressive surface (merged with a wave-ravinement surface) at its base and a prominent marine flooding surface at its top. In addition, at proximal localities closer to the basin margin a tidal-ravinement surface occurs. The Upper Tuscarora Sandstone is interpreted as a transgressive systems tract composed of a single retrogradational parasequence. The special circumstances leading to development and preservation of the complete transgressive facies succession encompass steady creation of accommodation space and the availability of sediment. Creation of accommodation space can be linked to renewed thrust-load induced flexural subsidence within the Taconic foredeep.