Sequence Stratigraphy and Lithofacies Palaeogeography of the Tremadocian (the Latest Cambrian to Early Ordovician) in the Hunan and Hubei Region, China

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Four third-order sequences have been recognized in the latest Cambrian to Early Ordovician Tremadocian successions in the Hunan and Hubei part of the Yangtze platform. These four sequences could be well correlated with each other in different depositional settings of the Yangtze platform, indicating four third-order transgression - regression cycles. The integration of sequence stratigraphy and facies analysis has improved our understanding of the evolution of lithofacies and palaeogeography in the region. This can help predict locations of better-quality carbonate reservoirs such as the lowstands karst-developed limestone reservoirs.

At the beginning of the early Tremadocian, the depositional facies from northwestern Hubei to central Hunan change successively from tidal flat, tidal lagoon dolomite facies through restricted carbonate platform, open carbonate platform, platform margin shoal complex, to platform marginal slope and the black carbonaceous shale basin. During the early stage of the Tremadocian, relative sea level fall caused gradual regression from north to south, resulting in depositional environments varying from tidal flat, tidal lagoon dolomite facies, restricted carbonate platform, to platform margin shoal and outer shelf. During the middle Tremadocian, a new transgression resulted in onlapping of the bioclastic limestone and shale towards the Qingfeng-Xiangguang fault zone to the north. During the late Tremadocian, another relative sea level fall caused a further slow regression, and the open carbonate platform in Hubei and northwestern Hunan was developed with the bioclastic shoal of inner shelf and platform margin shoal complex.