

## **Paradigm Shift for Carbonate Platform Models - Broad Platforms, Intrashelf Seaways and Leeward Ramps**

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Basic characteristics of carbonate platforms are relatively well understood but existing facies and sequence stratigraphic models are too simplistic to fully address the variety and complexity of modern and ancient systems. Current models recognize attached versus detached platforms with rimmed shelf, ramp and flat-top profiles and they factor in controls on their development (antecedent topography, tectonics, sea-level, etc.). Nevertheless the highly distilled nature, or simplicity, of the models has hampered recognition of complex variations within some ancient platforms and has resulted in misinterpretations of their stratigraphic architecture. Reevaluation of Jurassic and Cretaceous platforms in the Middle East and the northern U.S. Gulf Coast indicates that these broad platforms contained previously undetected leeward ramps that passed into seaways, or shallow intrashelf basins. Jurassic Arab-D carbonates in Saudi Arabia prograded southward from a shoal-arch complex into an intrashelf basin, which later filled with lowstand-transgressive evaporites. In the U.A.E. Cretaceous Lekhwair and Kharai carbonates, previously interpreted to represent a featureless, broad platform and as a 'flat' ramp, show evidence of westward progradation into a platform seaway. In the northern Gulf Coast (U.S.A.), the Cretaceous James and Rodessa formations comprise a platform and intrashelf basin system flanked by a seaward-prograding ramp in the north and a landward-prograding leeward ramp along the platform margin in the south. Eventually this intrashelf basin became hydrologically isolated, which resulted in the deposition of the Ferry Lake Anhydrite.

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