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Reservoirs in Isolated Carbonate Platforms- Insight from Great Bahama Bank

Studies of Great Bahama Bank (GBB), the largest isolated carbonate platform in the Bahamas, continue to refine stratigraphic, depositional, and diagenetic models. These models are of particular importance in understanding the architecture and reservoir quality of reservoirs in isolated platforms.

Stratigraphic and depositional studies provide an understanding of the lateral growth potential and pulsed progradational nature of GBB. Ancestral isolated platforms coalesced to form GBB through progradation along their leeward margins by highstand shedding of bank-top derived sediment. The growth and diagenesis of platform strata are intimately linked to sea level. The role of antecedent topography on the platform top in initiating development of both marginal reefs and sand bodies is strongly coupled to a windward margin setting. Likewise, the sedimentary make-up (grain vs. mud dominated) of proximal slope facies is dependent upon the windward/leeward orientation of the margin. Details of the genesis of platform top shallowing upward cycles, coupled with the realization that unfilled accommodation space is common, add to our understanding of ancient platform equivalent strata. This nature of cycle variability suggests limitations inherent to cyclostratigraphic correlation and explains aspects of reservoir heterogeneity.

Syndepositional marine cementation clearly takes place to great depths down the flanks of GBB, suggesting that paradigms associated with slope stabilization and architecture need to be revisited. The presence of "meteoric-like" moldic porosity and cementation fabrics in the marine phreatic environment deep within the platform poses the dilemma of correctly interpreting the stratigraphic context of similar diagenetic features in reservoirs. Dolomite within this same deep marine phreatic environment corroborates a model for dolomite formation that is likely typical for isolated platforms.