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**Mixed Siliciclastic-Carbonate Systems -- Revisiting the Reciprocal Model**

In many carbonate platforms, siliciclastics intervals take on a special meaning for interpreting sequence stratigraphic frameworks. Using the reciprocal sedimentation hypothesis introduced in the 50’s and applying it forward, most models assume a clastic basin fill -- lowstand versus platform-top carbonate deposition -- highstand relationship. This concept was put forward to explain the Permian of the Permian Basin in Texas but has taken on much broader significance. Minor modifications have been made to this hypothesis that suggest that preserved clastics on the shelf are evidence of transgressive preservation following the main bypassing event.

Examples from the Permo-Pennsylvanian of New Mexico and Texas and the Cretaceous of the Middle East have illustrated that an on-off clastic/carbonate system in not the rule. Early Permian strongly glacioeustatically forced platforms contain large slope-to-basin-floor siliciclastics complexes that formed during highstand carbonate progradation, presumably associated with very high-frequency cycle lowstands. This is in agreement with the ‘born-to-bypass’ model proposed by Borer and Harris for the Capitan margin.

No simple rule has been found to apply regarding the reciprocal nature of large shelf clastic sheets on carbonate platforms. Some, such as the Aptian Nahr Umr shale that separates the Kharib carbonate platform (below) from Shuaiba appears to be largely transgressive preservation rather than lowstand deposition as commonly assumed. The sequence boundary here is placed at the base rather than the top of the clastics. Siliciclastic-dominated cycle-sets within the Seven Rivers and Yates platforms have shown that sequence-bounding surfaces commonly split lithostratigraphy, calling into question many of our simplistic log-correlation methodologies.