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### **Climate vs. Eustacy: Forces of Change in Delta System Evolution and Upper Slope Sedimentation**

Paleogeographic reconstructions of fluvial-deltaic systems in the Gulf of Mexico clearly illustrate differences between depositional systems spanning the last glacial cycle (130 kA to present). These differences underscore the complexity of the relationship between eustacy and climate and the stratal geometries that result from it. Studies indicate that climate can change the sediment load of a fluvial system 2 orders of magnitude regardless of eustacy and a system's sensitivity to climate varies through time. Previous investigations however, have not been able to satisfactorily separate climatic from eustatic influences, and therefore have been unable to address how these two forces interact and if the dominance of either force varies with time.

These questions are being addressed in the Colorado and Brazos River systems of Texas. A multitude of data sets (seismic, paleontologic, archeologic, isotopic and sedimentologic) have been compiled the collective coverage of which extends from the drainage basin to the upper slope. Using a chronostratigraphic framework each data set can be correlated to all other data sets, resulting in an integration of the source-to-sink network.

Results suggest that climate can vary the volume and type of sediment delivered to the basin, as well as the timing of maximum sediment flux, which in Texas is slightly out of phase with the eustatic cycle. It is clear that the efficacy to which climate and eustacy interact to affect the drainage basin and fluvial system characteristics changes throughout the glacial-eustatic cycle and that the relative importance of each driving force varies with time.