

Fluvial response to base-level change in a low-relief shoreline setting

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The Pennsylvanian-Permian Lower Cutler Beds of Utah and Arizona record a series of repeated transgressive-regressive events that reflect a complex tripartite interplay between fluvial, shallow marine and aeolian sedimentary systems, which occupied a broad coastal plain. Fluvial response to base level change includes down-cutting and incised valley generation during periods of regression and complex stacking of fluvial channel elements in a retrogradational pattern in response to transgressive events. This project provides is examining the both link between fluvial systems behaviour and base-level change and fluvial system interaction within an arid coastal plain depositional setting.

Detailed analysis has involved the construction of over 80 1D sedimentary logs, the correlation of fluvial architectural elements with surrounding shallow marine and aeolian elements, the tracing of key stratal surfaces over distances of many tens of kilometres, the erection of a completely new and detailed sequence stratigraphic framework and the production of an initial static reservoir model using Petrel. Ongoing work is identifying criteria by which autocyclic fluvial activity may be discerned from allocyclic activity. Key to this approach has been the recognition of a parasequence architecture in which sets are arranged into progradational and retrogradational stacking patterns that record longer-term trends in shoreline position.

