

Contrasting styles of aeolian, fluvial and marine Interaction in the Cutler Group of the Paradox Basin, SE Utah, USA





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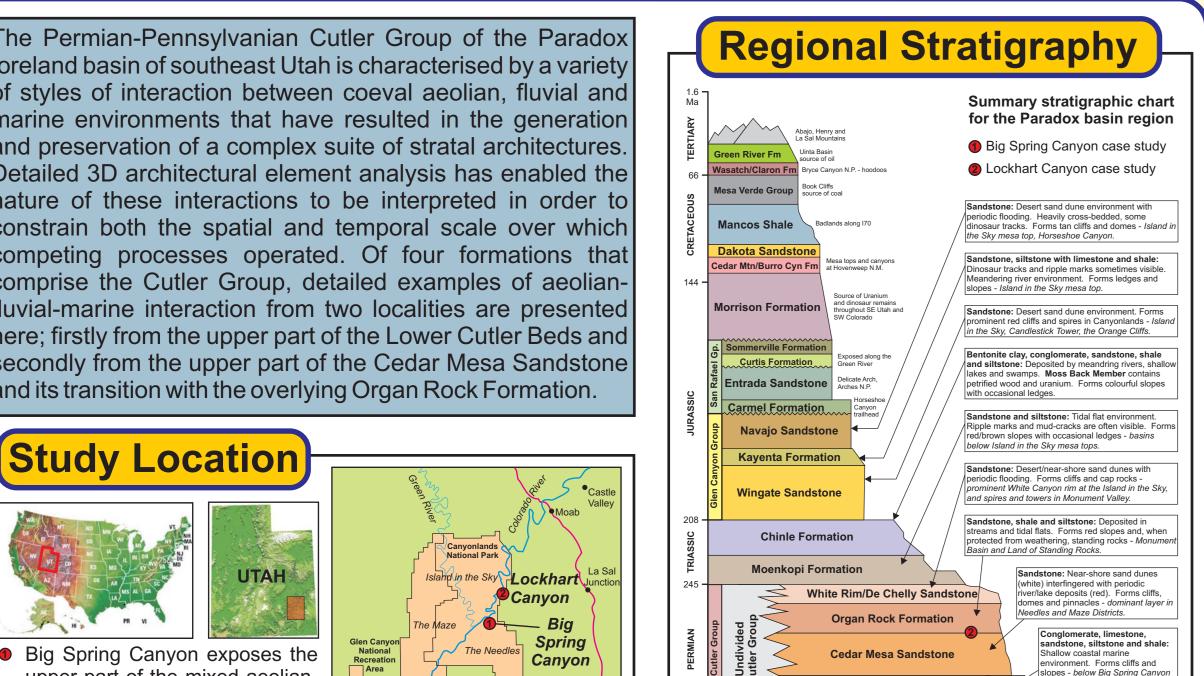
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Case Study 2: Lockhart Canyon

Panel 4



Halgaito Shale/Lower Cutler Beds

Fossiliferous limestone facies

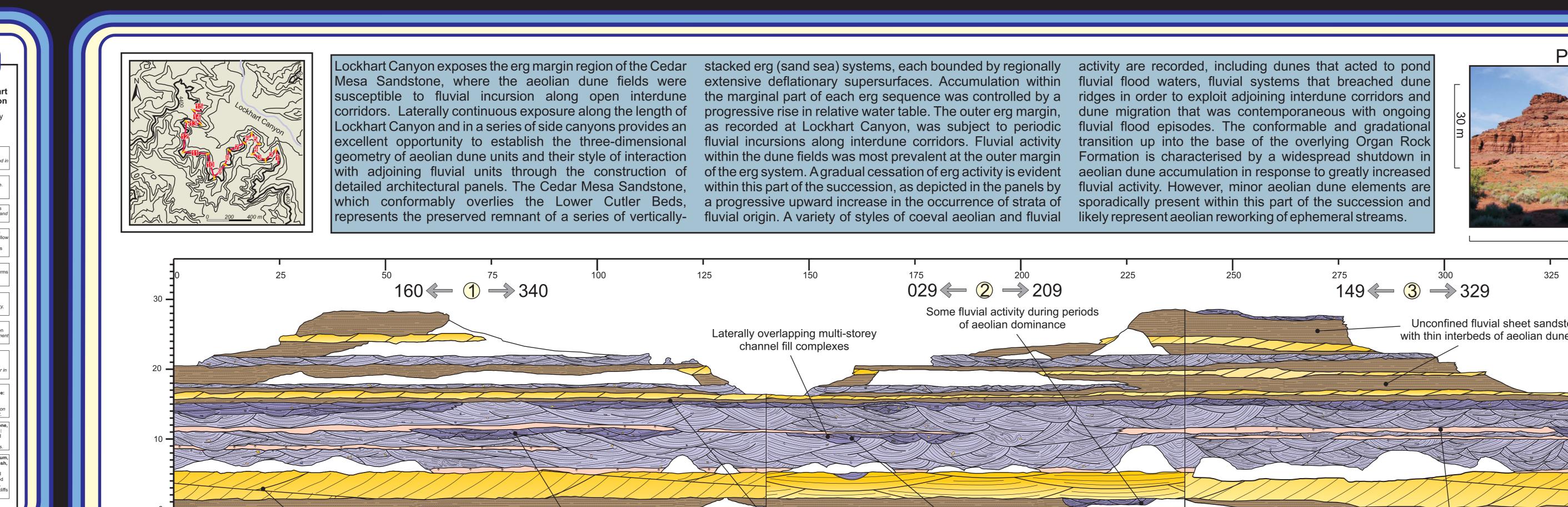
Introduction and Geologic Setting

Case Study 1: Lower Cutler Beds

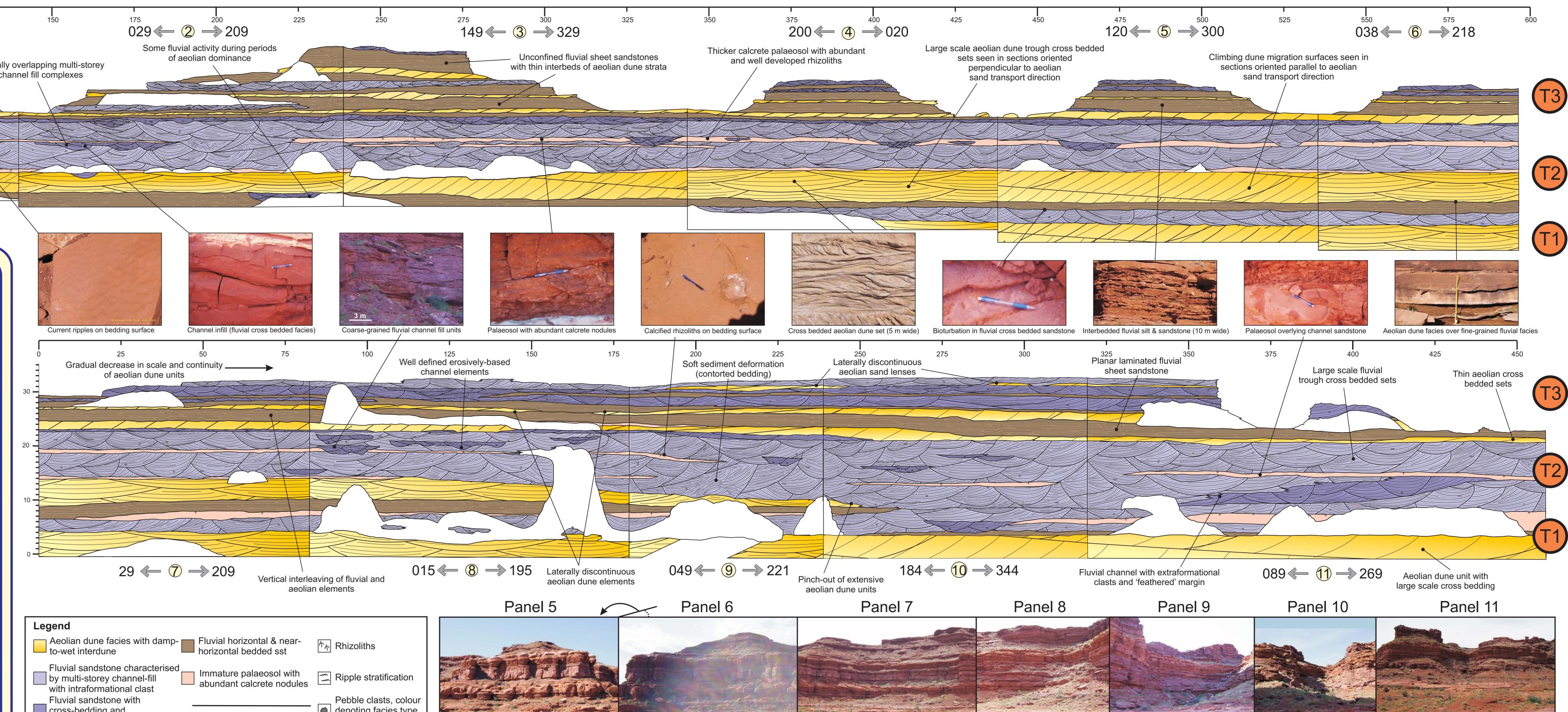
(laminated) sandstone

☴ Flat bedding |ੰ'

Fluvial cross-bedded sandston

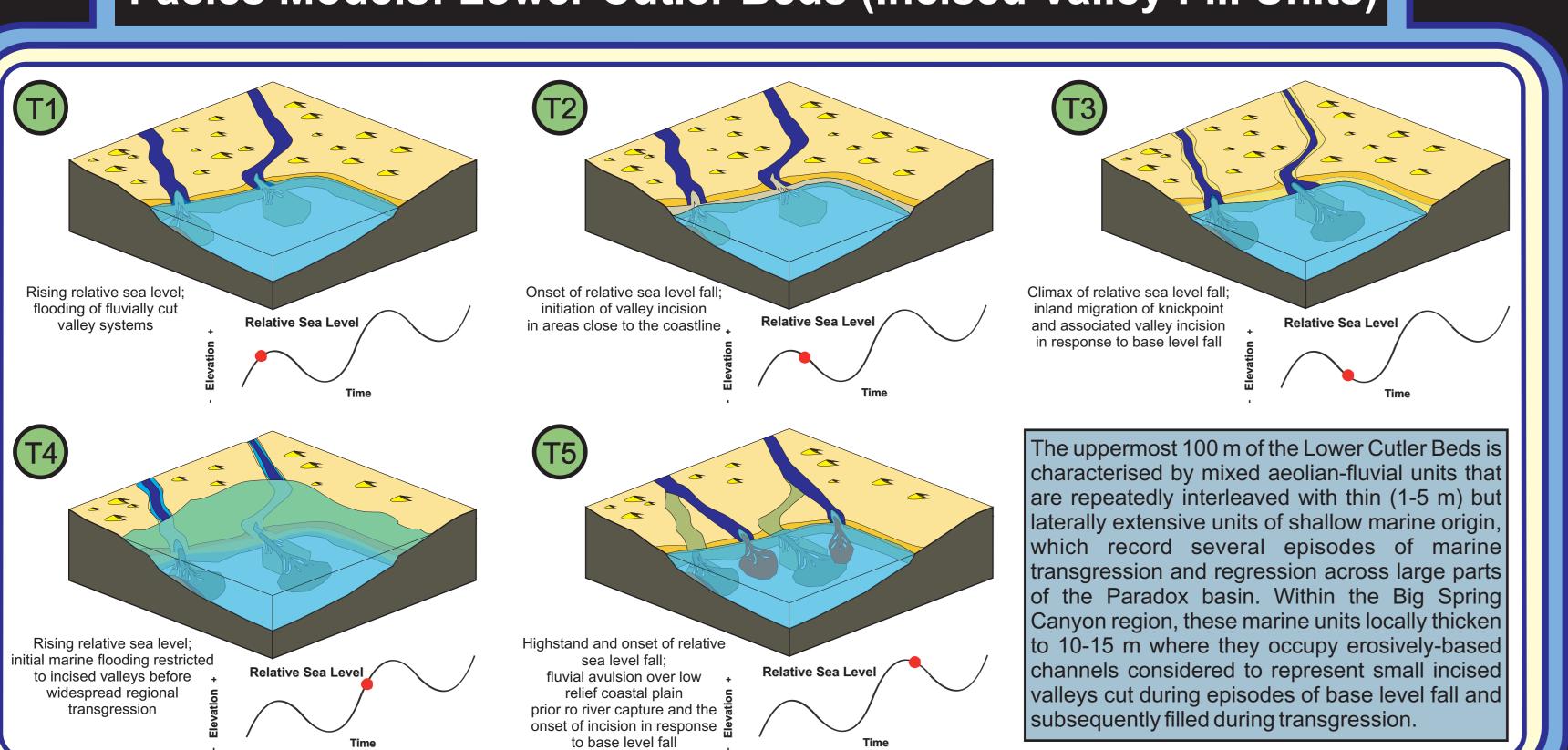


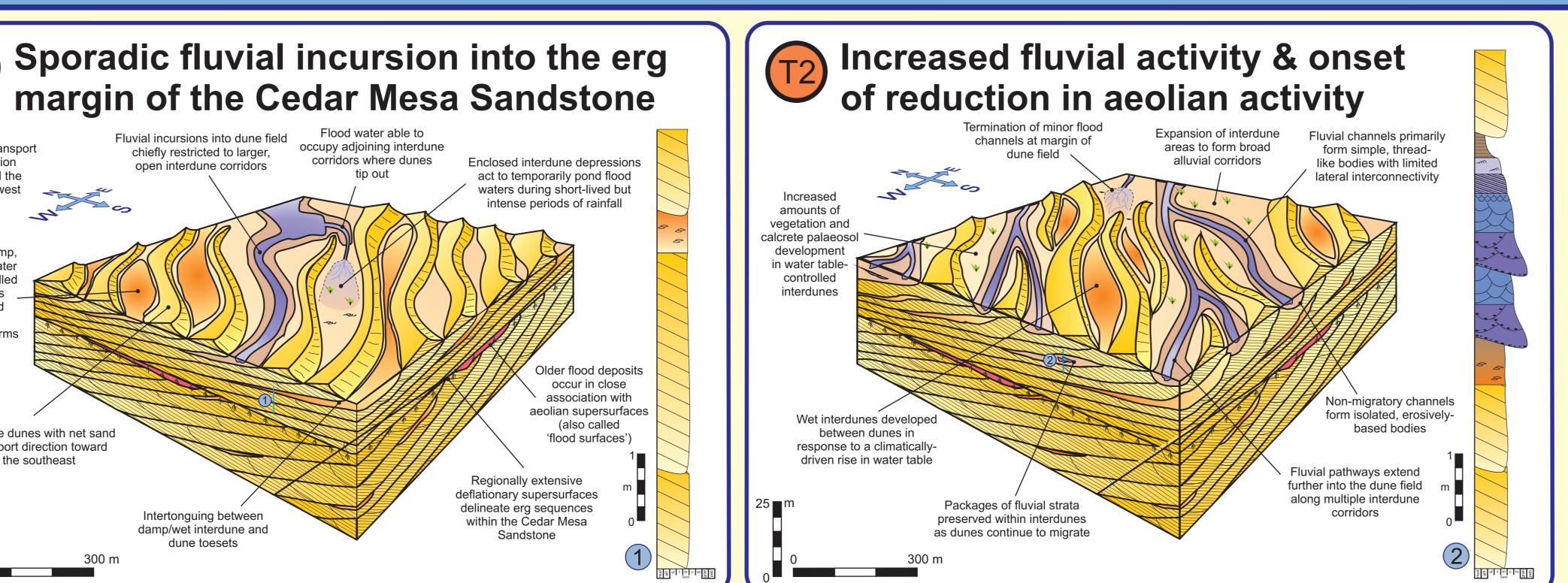
Stacked fluvial channel elements

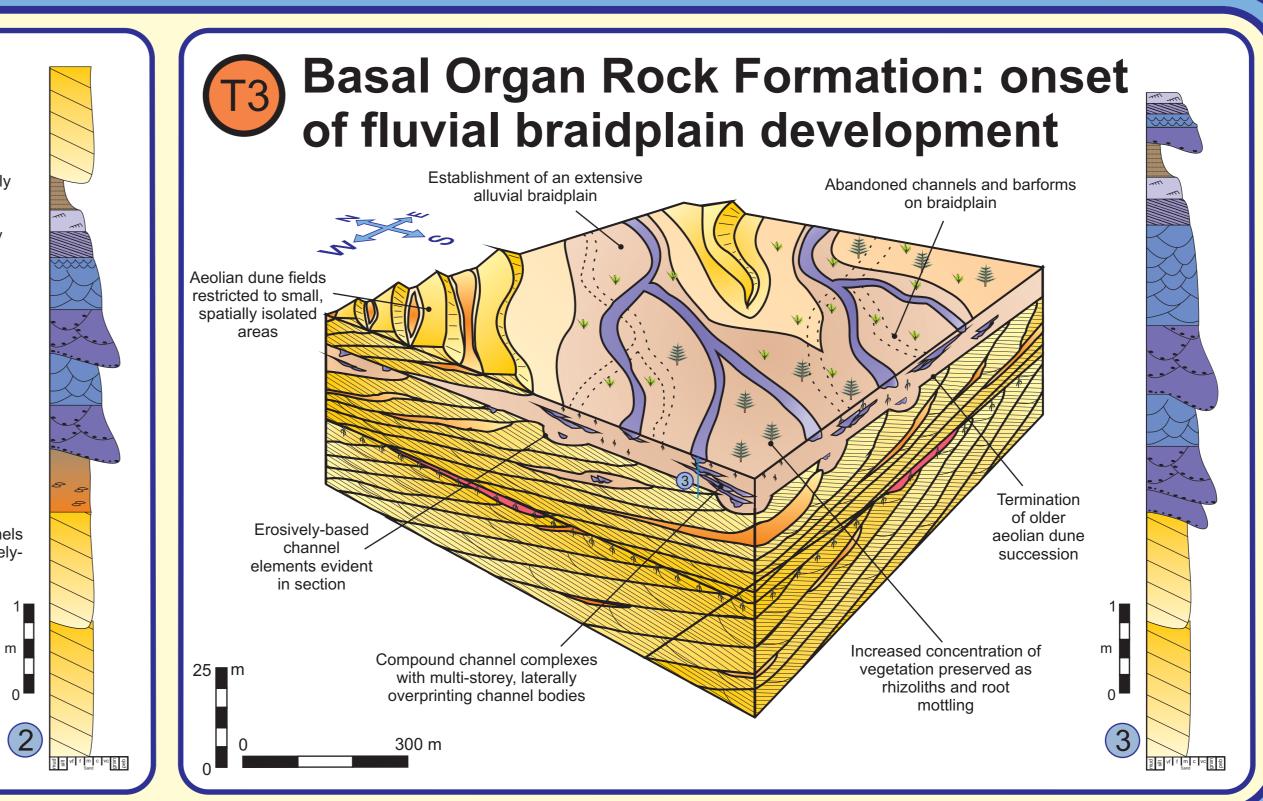


The Lower Cutler Beds exposed in the Paradox Basin of southeastern the preserved remnant of a position across much of what is now south-central Usah and north-central Autrona. The palace-coastiline during Lower Cutler Beds times repeatedly shifted in excess recording to the coast of the coa

Facies Models: Lower Cutler Beds (Incised Valley Fill Units) Facies Models: Cedar Mesa - Organ Rock Transition Zone







Conclusions

The Permian Cutler Group, situated in the Paradox Basin of southeast Utah, records a variety of styles of interaction between aeolian dune deposits, fluvial channel and sheet deposits, and shallow marine transgressive shoreline and shelf deposits. These interactions reflect a range of both sudden and gradual transitions between competing environments and occur on a variety of spatial scales in three separate formations of the Pennsylvanian-Permian Cutler Group. The Lower Cutler Beds represents an arid coastal succession that experienced episodic marine transgressions, which led to the generation of a tripartite series of interactions between marine, aeolian and fluvial components of the depositional system. Shallow marine architectural elements are characterised by both calcarenite gritstone facies, arranged into erosively-based cosets, and by micritic limestone facies occur most commonly as complex cosets of strata, which form the fill of deeply incised channelised elements that cut down into underlying aeolian and fluvial units and which are interpreted as incised valley fill complexes. The overlying Cedar Mesa Sandstone records a basin-wide transition to a predominantly aeolian dune system, accumulation and preservation of which was controlled by a progressive but gradual rise in water table in marginal areas to form a wet aeolian system, and by an excess of sediment supply coupled with ongoing basin subsidence in more central parts of the basin to form a dry aeolian system. Evidence for fluvial incursion is widespread at the outer margin of the aeolian dune system but progressively diminishes with increasing distance into central parts of the palaeo-dune field. The overlying Organ Rock Formation comprises a bipartite succession of aeolian and fluvial strata which is interpreted to represent the preserved remnant of a fluvial terminal fluvial system. Within this system, most examples of fluvial and aeolian interaction demonstrate the contemporaneous nature of the two competing systems and the fluvial channel