

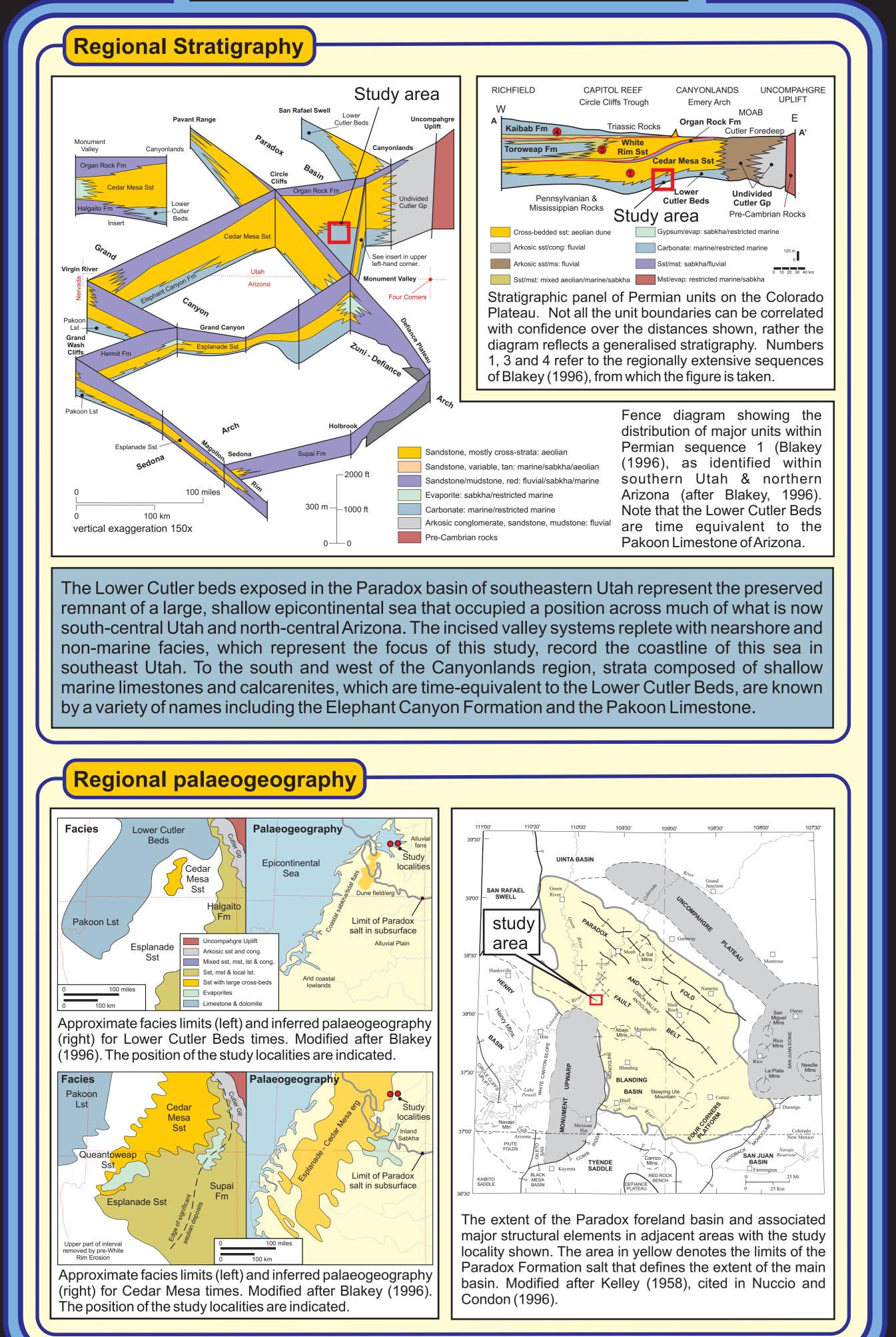
#### Introduction & Study Location

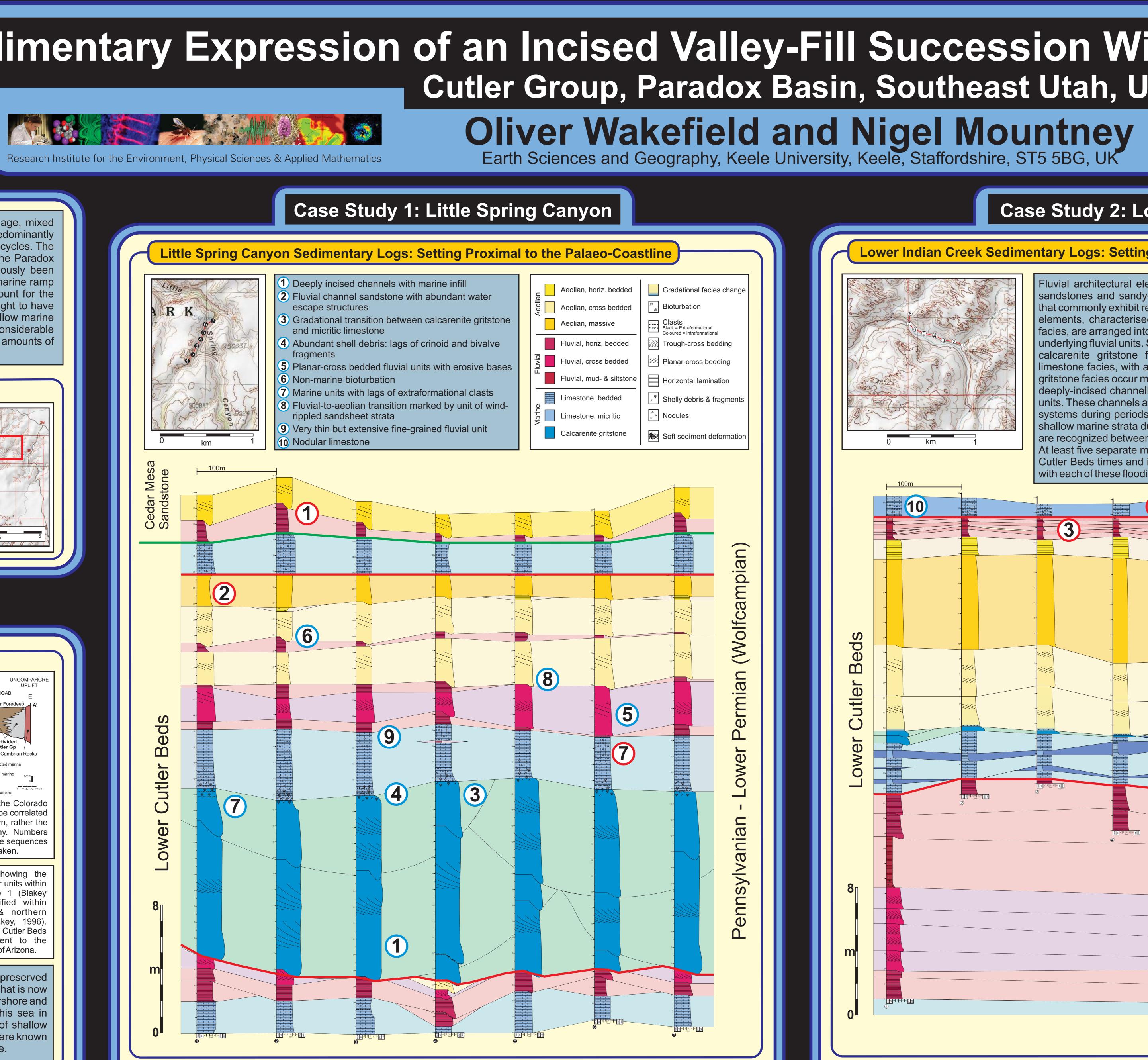
of southeastern Utah represents a Pennsylvanian-to-Permian age, mixed as subject to repeated marine transgressive-regressive cycles. The sed across much of the northern and central parts of the Paradox Ibsequent episodes of relative sea level rise. The valley systems exhibit considerable r preserved expression over distances of only 10 km, reflecting increased amounts of

ed in, and adjacent t Park, where the p incision by tributai ons of the Colorad

eline regions.
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### Regional Stratigraphic Setting





ittle Spring Canyon: Examples of Facies Arch

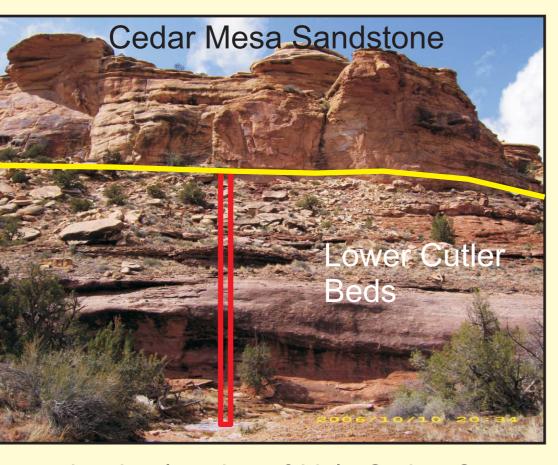
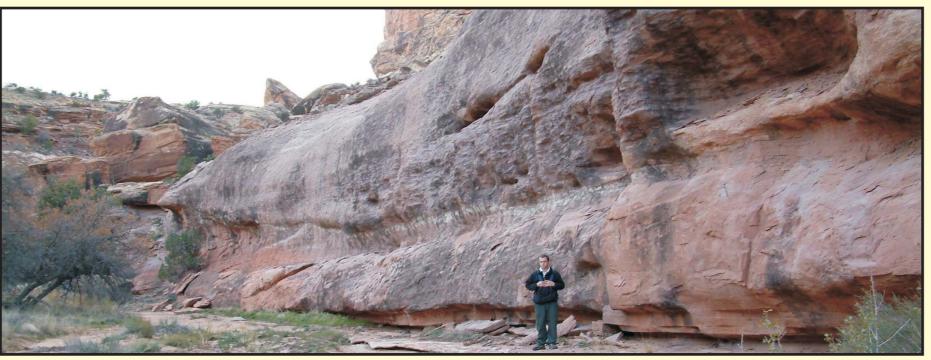


Photo showing location of Little Spring Canyor unit at one-third height is a large, erosively-based annel infilled with calcarentite gritstone and correlation panel above. Cliff is 60 m high. The horizon marked in yellow signifies the top of the uppermost marine limestone that defines the top of the Lower Cutler Beds and the base of the overlying Cedar Mesa Sandstone. This horizon can be traced for over 50 km to the north.



channel with calcarenite gritstone infill. Note lateral thinning.

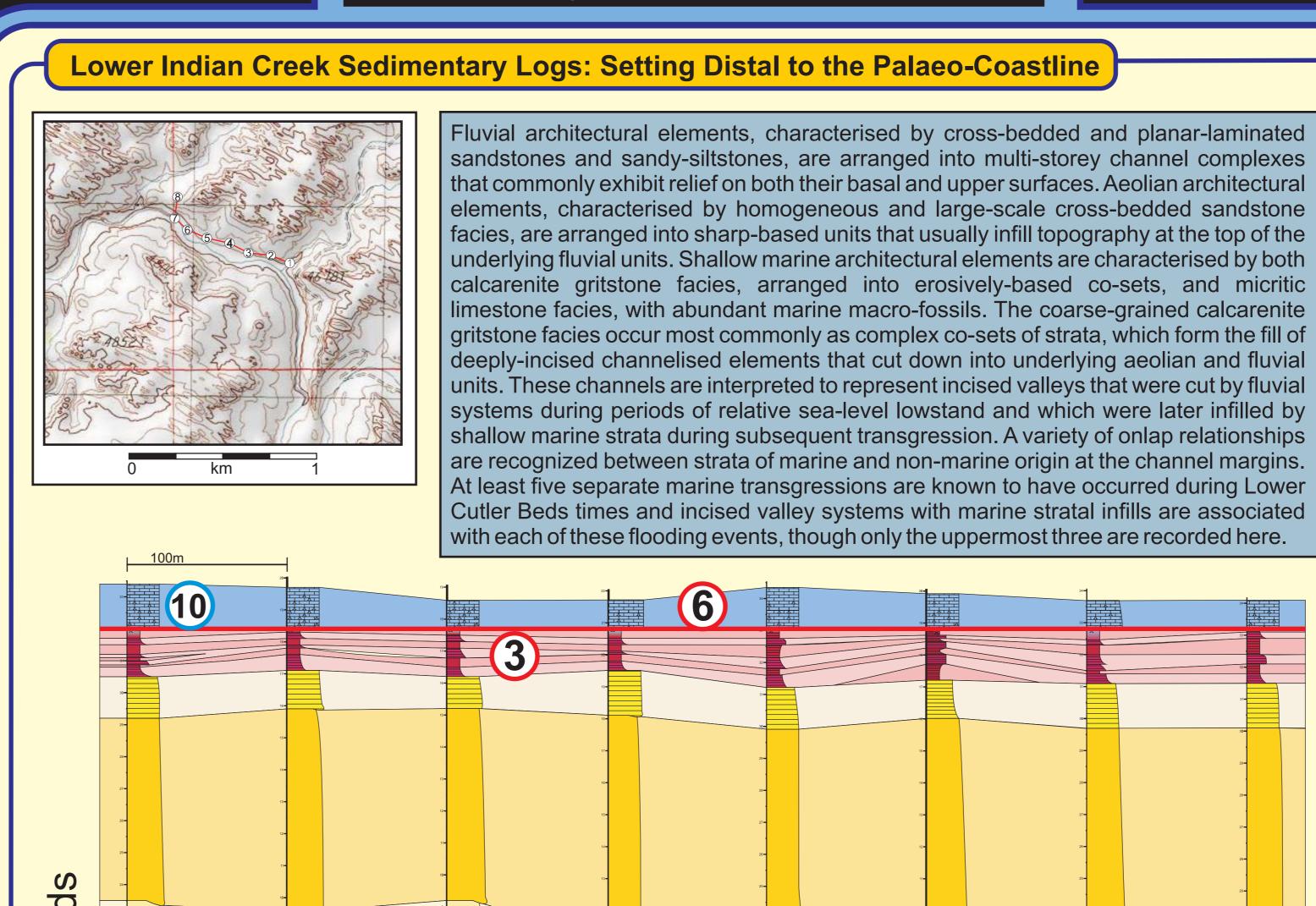


Erosively-based channel (12 m deep) with calcarenite gritstone infill.

## Preserved Sedimentary Expression of an Incised Valley-Fill Succession Within a Transgressive Shoreline System Cutler Group, Paradox Basin, Southeast Utah, USA o.j.w.wakefield@epsam.keele.ac.uk http://www.esci.keele.ac.uk/ +44 (0) 1782 583171

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# Case Study 2: Lower Indian Creek





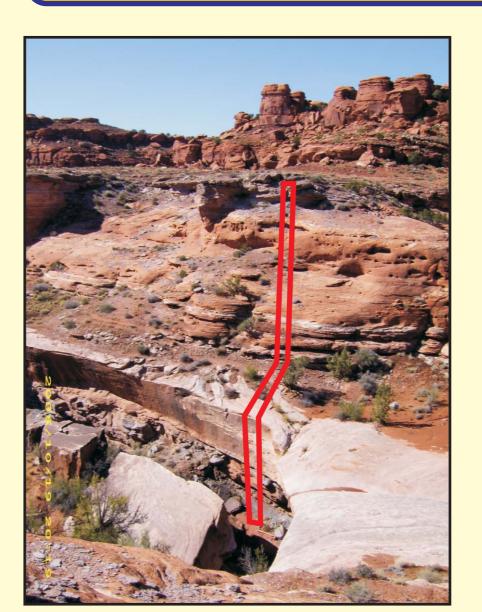


Photo showing location of Lower Indian Creek Log 8 (red, 40 m high). Only three thin shallow marine units are preserved at this locality and relief on the base of these units does not exceed 1-2 m.

The two study regions within the Lower Cutler Beds record the style of sediment infi ithin an incised valley complex that likely represents proximal and distal parts of the ne valley system over a distance of 10 km along a transect running inland from the nferred position of the palaeo-coastline. The characteristics of the style of incised valley anyon to the more distal locality at Lower Indian Creek. The Calcarenite gritston channels thin from thickness of 7-12 m at Little Spring Canyon to < 2 m at Lower Indian Creek. Additionally, the style of sedimentation varies noticeably between each location, with Lower Indian Creek exposing thick accumulations of laterally continuous fluvial and lian units, which contrasts with a more fragmentary style of preservation at Little Spring Canyon.



Channel lag with marine fossil debris.



Limestone bedding surface with Scolicia.

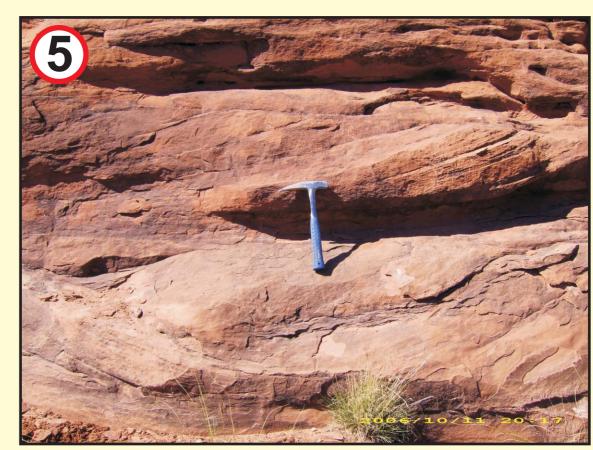


#### Characteristic Lithofacies Examples

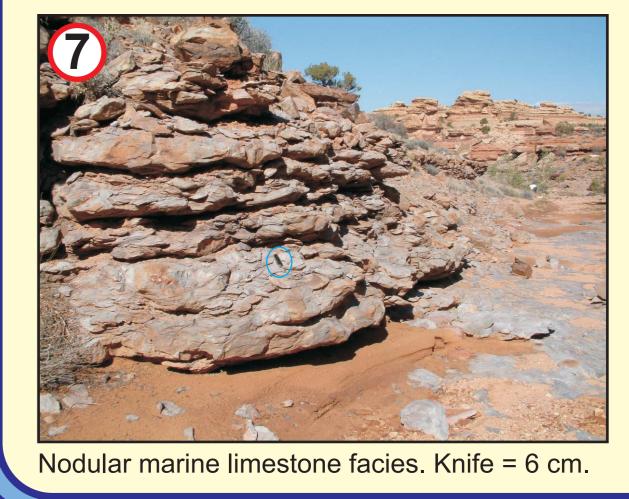


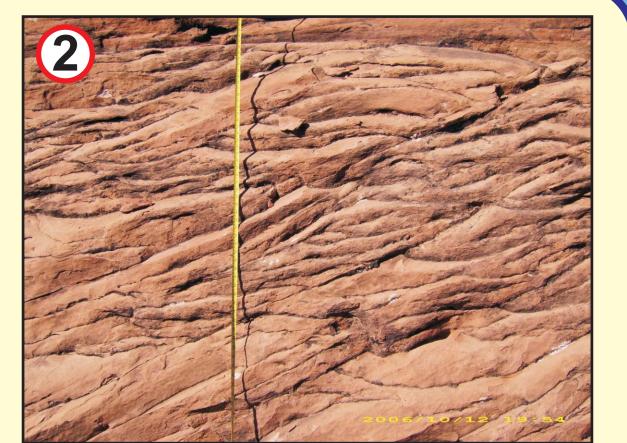


Horizontally laminated fluvial siltstone facies.



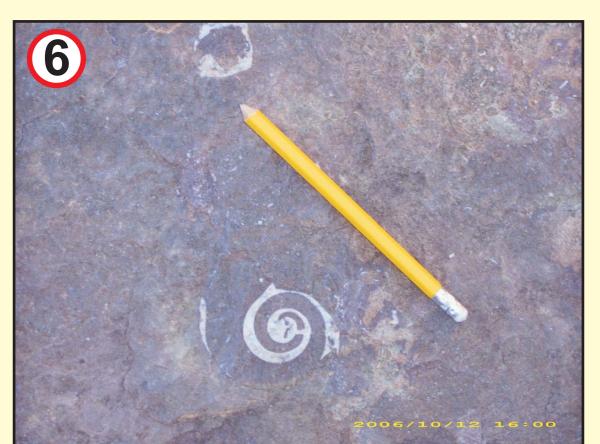
rough-cross bedded aeolian dune facies



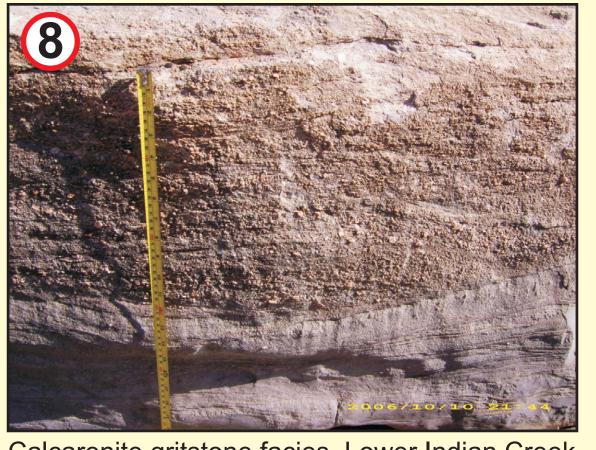




Wavy-to-ripple laminated fluvial sandstone facies



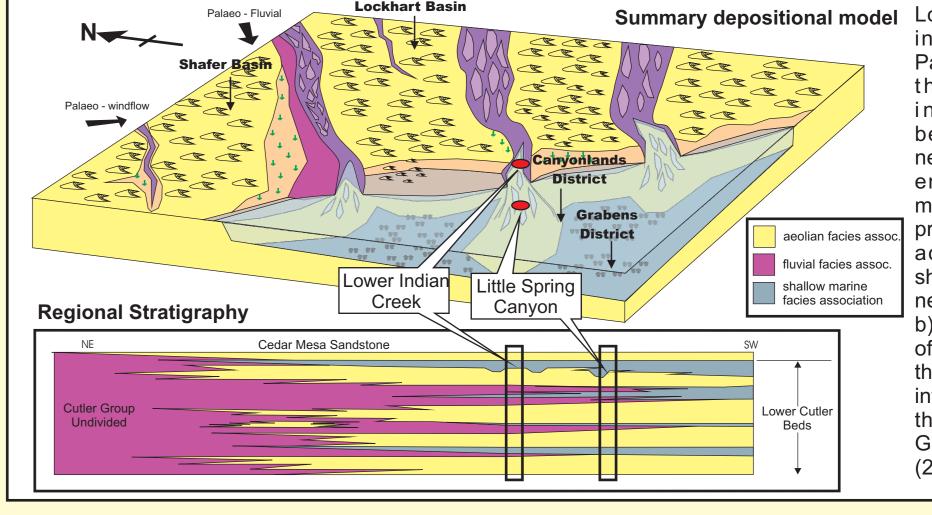
-ossiliferous, bedded limestone facies



Calcarenite gritstone facies, Lower Indian Creek.

### Summary Model and Conclusions

The Lower Cutler Beds exhibit a variety of complex architectural relationships between marine, fluvi and aeolian depositional units. These represent the preserved stratigraphic expression of a margina marine, shoreline and arid terrestrial system that was subject to repeated marine transgressive an egressive events. Whilst the marine units, which represent the product of transgressive events, ar typically only 2-5 m thick, in places they infill broad incised thicknesses of 12-15 m and exhibit a complex array of facies interactions and architectural styles. series of high-resolution sedimentary logs, measured from two study regions within the Lower Cu Beds, record the style of sediment infill within an incised valley complex that likely represents shoreproximal and shore-distal parts of the same valley system over a distance of 10 km



interaction summary. the multiple styles of interactions observed petween aeolian. fluvial nearshore and shallow marine environments. While model shows each of the thre orincipal environment type active simultaneously, hould be noted that this is no ecessarily always the case ) Schematic regional mode of stratigraphic relationships i the Lower Cutler Beds and the inter-tonguing of the unit with the undifferentiated Cutle Group. Modified after Jorda (2006).

(Society for Sedimentary Geology, 405-426.

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