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SEDIMENT DEPOSITION AND PRESERVATION IN MOUTH BAR COMPLEXES OF PROGRADING DELTAS

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In deltaic environments, the largest volumes of sandy deposits occur at the delta top (as channel accretion, overbank deposits) and as distinct or amalgamated sandy mouth bars in the upper delta front. We use process based models to study the preserved sediment composition in four evolving deltas, each with a different input sediment profile. We show how the mouthbars preserve a large volume of the overall preserved sand in the sedimentary record of deltaic systems.

We go on to show how the input grain size signal is altered in the mouth bar deposit for different input sediment profiles. The results show that mouth bar deposition amplifies the contribution of medium to very fine sand grain sizes. However, the exact grain size distribution preserved in the mouthbars superimposes strong supply signal onto the amplified grain size classes, leading to complex sediment distribution patterns.

The results have implication for the selection of modern analogues to describe ancient deposits. It highlights the challenge in comparing modern systems, which are often characterised by their sediment supply or delta top grain sizes, to ancient deposits, which are typically characterised by their sandy delta front clinoforms. The sediment supply signal may be dampened in these delta front mouth bars. Therefore, characterising ancient deltaic environments based on supply grain size will be challenging when the majority of the available data is from the preserved mouth bar deposits.