EXPERIMENTAL SEQUENCE STRATIGRAPHY OF COARSE-GRAINED PARALIC SYSTEMS

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By means of flume model studies we aim to quantify time-averaged erosion and deposition in paralic successions including the fluvial domain in relation to both rates of sea level change and changes in sediment yield. Our analogue model is scaled to real world prototypes by keeping geometry and time-averaged sediment flux similar. The sediment transfer rate is averaged over time periods of approximately 500 years, so that short-term changes (e.g. the shift of a channel) can be ignored. For the applied time scale, the flume experiments proof to be reproducible and give deterministic results. The presentation focuses on a series of analogue experiments where the rate and amplitude of the sea-level fall was varied systematically. Each model run is analysed from video observations and series of topographic maps that allow calculation of volumes of erosion and deposition. The experiments give detailed insight into the residence time (preservation potential) of paralic successions. The results support that: 1) For a given response time of a system, the rate of sea-level fall exerts a dominant control on the timing and amount of sediment supply to the shelf; 2) The variation in supply originates from different rates of up-slope erosion (cannibalism), which adds to the total yield originating from drainage basin denudation; 3) The rate of sea-level fall controls the thickness (volume) of deltaic sediments in transgressive systems tracts.A 3-D forward numerical model is being developed which can be applied to real world studies, as well as to the analogue model.