

# Controls on internal structure and architecture of sandstone bodies within Upper Carboniferous fluvial-dominated deltas, County Clare, western Ireland

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## Abstract

Deposition of Upper Carboniferous (Namurian R1-R2) deltas in the Clare Basin, western Ireland, was influenced by a combination of processes: fluvial, basinal (notably waves), synsedimentary deformation, and rapid subsidence rates within the receiving basin. Fluvial processes predominate; consequently the major deltaic sandstone bodies are fluvial channels and fluvial-dominated mouth bars. The internal structure of single channel sandstones reflects high energy tractive processes and aggradation of sands in relatively straight channel reaches. The structure of mouth-bar sandstone bodies reflects a variety of frictional and buoyant river-mouth processes. Depositional processes within the Clare Basin are often overprinted by syndepositional deformation. Delta-front sequences exhibit abundant evidence of synsedimentary faulting, slumping, clay diapirism and gravity sliding. Deformed packets of sediment are up to 60 m thick and over half of all delta-front sequences are disturbed. These processes led to a modification of mouth-bar structure and geometry. Some fault-bounded delta-front sandstone bodies fill fault-induced depocentres. Large, multistorey and laterally composite channel sandstones in the S of the basin may reflect major deformation across the delta plain, related to rapid subsidence and compaction rates. In contrast, the architecture and structure of delta-plain sequences in the N of the basin are consistent with a more stable fluvial-dominated setting.