

Variability within a River-Dominated Shelf-Edge Delta and Associated delivery of Sand to the Deep Water

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Shelf-edge deltas record the sediment delivery from the shallow water shelf into the deep water slope and basin floor, and, in cases without incision, represent a major way in which shelf-margins grow into the basin. The three-dimensional (3-D) complexity of shelf-edge deltaic systems, along-strike variability at the shelf-edge and its relationship to deeper-water deposits in particular, remains understudied. The Permian-Triassic Kookfontein Formation of the Tanqua Karoo Basin, South Africa offers extensive 3-D exposure (>100km²) and therefore a unique opportunity to evaluate shelf-edge deposits.

To gain further insight into shelf-edge systems, this research will utilize a four-phase approach, this includes: (1) physical correlation of sand bodies in the lower Kookfontein Formation by ‘walking out’ surfaces between high-quality outcrops; (2) measuring detailed sedimentological and stratigraphic sections through the regionally correlated strata; (3) identification and interpretation of deep-water sand ‘entry points’ at the shelf edge; and (4) synthesis of the sedimentological variability from both shelf to slope and along the shelf margin its self. These data will ultimately be used to assess along strike shelf-edge variability and how the style of shelf-edge strata can be used to predict transport of sand to the deep-water slope and basin floor. These results will allow us to both reduce risk in exploration of shelf-edge settings and to improve accuracy in the predictions of the presence, volume and character of deep-water sand accumulations.