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Contrasting Lateral and Oblique Frontal Submarine Fan Pinch-outs from the Tanqua Basin, South Africa

Excellent exposure of the Tanqua deep-water deposits allows detailed analysis of abruptly thinning submarine fans. In Fan 3, lateral and oblique frontal pinch-outs are exposed along >8 km sections. The lateral pinch-out is more abrupt than the oblique frontal pinch-out, which thins in a series of steps. At the frontal pinch-out the submarine fan architecture changes from typically progradational, to a style where the fan becomes erosive at the base, forming linear channels, which are topped by amalgamated sheet sands. Here the fan fringe does not follow a typical radial style. There is no significant facies change across the lateral fan pinch-out where large amalgamated channels have no adjacent overbank sediments. ?Sandwich beds?, composed of turbidite-debrite-turbidite, and turbidites topped with debrites, are common near both fan pinch-outs. This is contrary to the commonly held view that debrites imply a slope proximal setting. An up-section shift in paleoflow direction of >90° suggests deflection of turbidity currents against subtle confining topography. The direction of abrupt lateral pinch-out and stepped oblique frontal pinch-out and the deflection of turbidity currents imply a confining slope trending ~NNW-SSE. In seismic-poor subsurface areas it is essential to understand observations made from core or high-quality log image data in order to improve the assessment of pinch-out character and the positioning of wells to exploit subtle stratigraphic traps. It is possible to improve estimates of the rate of pinch-out and nature of stratigraphic trapping in basin floor fans from outcrop observations and collecting accurate geometric data from GPS measurements.