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Comparison of Reservoir Architecture in a High Transport Efficiency Basin Floor Fan (Pab Sandstone, Pakistan) and in a Confined Basin Turbiditic System (Annot Sandstone, France) from Outcrop Models

One of the key factors which controls the architecture of turbiditic fans is linked to the basin morphology in which gravity flow sediments are deposited. In the case of passive margin basin floor fans, sediment is often transported from platform to basin through a single turbiditic canyon. Transport capacity is high, and channels with well developed levees and depositional lobes extend on the oceanic floor far away from the platform margin. On the contrary, in confined basins, multiple sediment sources often interfere. The geometry of the fans are influenced by the basin bottom morphology and its deformation through time. These systems are characterized by low-transport efficiency processes, the confinement also controlling channel and lobe geometry. The geometry of two turbiditic systems in a passive margin setting (the Pab Sandstone, Pakistan) and in a confined basin setting (the Annot Sandstone, France) will be compared from detailed outcrop models. The Pab fan was developed at the mouth of a canyon incising the margin during Maastrichitian time. The fan consists of large channel complexes with well-defined levees interbedded in hemipelagic shales. The channels fed attached sand-rich depositional lobes basinward. The channel complexes are typically 2 km wide and 50m thick, in which tens of single channels are amalgamated. The Annot Sandstone was deposited in the alpine foreland basin during Eocene times. The basin formed a gutter with several sub-basins, depocenter migrating through time as the basin was deformed. At least two turbiditic fans interfered in the basin, with both longitudinal and lateral and flow directions. The typical depositional system includes a fan delta prograding on the platform margin feeding massive turbiditic ramp channel which in turn passed to vertically stacked sand sheets.