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Lateral Lobes in Campos Basin Turbiditic Reservoirs

Lobes formed laterally to channels are being increasingly recognized as important elements of turbiditic systems, in addition to frontal lobes, formed at channel mouths. The investigation of turbiditic systems in Campos Basin, Brazil, using high-resolution 3D seismic integrated to well-log and core data has provided more information about the origin, morphology and facies associations of lateral lobes. These features include spill lobes and crevasse lobes. Spill lobes are produced by flow stripping, i.e., the loss of the upper, finer portion of the load to the channel margin. In proximal areas, where flows are richer in mud, flow stripping forms continuous fine-grained overbank deposits. In the more distal reaches, where flows become sand-rich, flow stripping is more restricted to channel bends, forming sandy lobes. Crevasse lobes form where flows breach the channel walls, and deposit virtually the entire load laterally to the channel. Crevasse lobes are more common in proximal areas, and are also favored by channel bends, especially sharp bends induced by tectonic features. In terms of facies associations, spill lobes are characterized by decimetric intercalations of unstratified ("massive") with sandstones showing horizontal to low-angle cross-stratification, and rippled sandstones. Crevasse lobes are coarser-grained than spill lobes, dominated by thick (metric) beds of unstratified ("massive") sandstones, with abundant mud clasts and fluid-escape structures. Stratified sandstones are rare. In addition, crevasse lobes tend to show more abrupt pinch outs than spill lobes. Distinguishing different types of lobes is important not only sedimentologically but also economically, as they often show contrasting reservoir properties.