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A Comparison of Late Quaternary Deltaic/Estuarine Depositional Systems from Wave- and Tide-Dominated Shelves

In the stratigraphic record, shelf sand bodies encased in mudstones are concurrently interpreted as shelf ridges or (lowstand) shorefaces. A comparison of Quaternary continental margins with high sediment supply and high subsidence rate (in the order 200-300m/million year) demonstrate that both types of sand bodies can be preserved. The Rhone (NW Mediterranean Sea) and the Yang Tze (East China Sea) both exhibit large sand bodies, up to 30 m thick, 3-10 km wide and 10 to more than 100 km long. Their seismic internal structure displays clinofolds dipping at about 5°. Despite a very similar morphology and internal structure, these sand bodies are interpreted as resulting from very different processes. On the wave-dominated Rhone deltaic margin, they correspond to forced-regressive shoreface sands, encased in prodeltaic muds. They parallel the paleo-bathymetric contour lines and they are encased in prodeltaic mud. The corresponding deltaic facies are not preserved. On the tide- and storm-dominated Yang Tze margin, sand is concentrated into large tidal ridges formed during post-glacial sea-level rises. They also are encased in prodeltaic muds, but deltaic/estuarine facies have also been preserved and their orientation is almost perpendicular to the general paleoshoreline. In the stratigraphic record, only three-dimensional exploration could allow to determine to which category such sand bodies belong. The Danube wave-dominated deltaic margin is a third category where most of shelf sediment consist of prodeltaic muds and deltaic heterogeneous deposits. Sand dunes from the last deglacial sea-level rise are observed, but they have no preserved equivalent in the Pleistocene.