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Distinguishing Tidal Bank-Margin Accretion Bars from Fluvial Point Bars

Paleogeographic reconstruction in some settings can depend on discriminating between fluvial and tidal deposits. Point bars are important constituents of both environments, and our analyses of modern and Pleistocene tidal deposits in Willapa Bay, Washington and Lower Cretaceous Muddy and Newcastle Formation deposits in Wyoming suggest that point bar facies may be useful for making the distinction.

Fluvial point bars have been described from numerous modern and ancient deposits; tidal point bars are less well documented. Because of their location near shorelines tidal bars may be subjected to strong variations in salenity, texture (mud and sand), and flow parameters (velocity, fluctuations and directionality including reversals), all of which influence their character.

Fluvial point bars are almost entirely current deposits as exhibited by the abundance of high-angle stratification. Many tidal accretion bars are deposited primarily from suspension and contain only very small ripples resulting from gentle current reworking.

The overall shape of fluvial point bars is curved while tidal accretion bars are more variable (curved, sinuous, straight); the muddier bars being the more sinuous. Intertidal accretion bars, which occur mostly on runoff channels (tidal creeks) differ in many respects from subtidal accretion bars (thickness, lateral extent , stratification, stacking sequence, distribution and amount of mud and preservability). Although mud is abundant and takes many forms in tidal bars (laminae, drapes, beds, clasts, burrow fills, etc), it is rare in fluvial bars except for scattered clasts. Mud plugs may occur above fluvial point bars.