

Offshore Bars Encyclopedia Article

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Offshore Bars

Bars are elongate ridges and mounds of **sand** or gravel deposited beyond a shoreline by currents and waves. The term offshore bar has been used to describe both submerged bars, and emergent islands separated from a shoreline by a lagoon, features more correctly identified as **barrier islands**. Submerged bars are only exposed at low tide, if ever, while barrier islands remain at least partially exposed, even at high tide. Because of this ambiguity, the term offshore bar is no longer used as a descriptor in coastal geomorphology.

Longshore, tidal, and fluvial currents construct submerged bars in shallow **water** coastal environments. The amount of unconsolidated sediment available in a shore-zone system, called its sand budget, determines the number of bars and other depositional features that form along the coastline. A shore-zone system's dominant mode of sediment transport controls the shapes and orientations of its depositional forms, including the types of submerged bars.

Along wave-dominated shorelines, longshore currents carry sand along the shoreface and deposit it in submerged bars parallel to the shore. Because waves almost never approach a shoreline perpendicularly, there is an angle between approaching and retreating waves, and sediment grains move down the beach in a zigzag pattern called **longshore drift**. Wave refraction and surf-zone interaction also create strong longshore currents that transport and deposit sediment parallel to the shore in deeper water. Along coastlines where **tides** are the dominant sediment transport mechanism, bidirectional tidal currents build submerged tidal bars perpendicular to the coastline. Tides also transport sand into and out of coastal lagoons through barrier island inlets, forming submerged mounds called ebb-tidal and flood-tidal deltas on either side of the inlets. Submerged bars also form where **rivers** enter the ocean. When sediment-laden fresh water from a confined channel discharges into an unconfined salt-water ocean basin, the current slows and deposits its coarse-grained sediment, or bed load, at the river mouth. The resulting submerged mound of sand and gravel is called a channel mouth bar.

Wave action, tidal currents and fluvial input each influence a shore-zone to some extent, and the different types of submerged bars—longshore bars, tidal bars, and channel mouth bars—usually coexist in a single depositional environment. Combinations of shore-parallel and shore-perpendicular processes create bars with intermediate curved or obliquely oriented morphologies. All types of submerged bars typically obstruct natural and man-made outlets into the ocean, and are well-known navigational hazards.

See Also

Beach and Shoreline Dynamics; Bedforms