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Coastal Processes FAQ - Is there a difference between a jetty and a groin?

These two terms are often used interchangeably to refer to the short, shore-perpendicular structures that are built along a shoreline to hold sand in place. However, technically speaking, groins and jetties are not the same thing. Groins are the smaller shore-perpendicular structures, built to trap sand and stabilize a sandy beach. Jetties are large structures typically used to stabilize inlet channels.

Groins

A groin is constructed across the beach, perpendicular to the shoreline, and is designed to trap sand moving in the longshore transport system. Sometimes, the term jetty (a structure used to stabilize an inlet) is misused to refer to a groin. The coastal structures used to hold sand in place in Rehoboth Beach and Bethany Beach are technically groins, although many people refer to them as jetties. Jetties, as explained below, are larger structures used to maintain the opening to a navigational channel such as a tidal inlet.

As sand accumulates on the updrift side of the groin, the beach at that location becomes wider. However, this is often accompanied by accelerated erosion of the downdrift beach, which receives little or no sand via longshore transport. It is important to realize that groins do not add any new sand to the beach, but merely retain some of the existing sand on the updrift side of the groin.

Groins are usually constructed from materials including steel, timber, or stone. The length, elevation, and spacing between groins should be designated on the basis of local wave energy and beach slope. Groins that are too long or too high tend to accelerate downdrift erosion because they trap too much sand. Groins that are too short, too low, or too permeable are ineffective because they trap too little sand. Flanking may occur if a groin does not extend far enough landward. Groins are generally constructed in groups called groin fields, such as those at Bethany Beach. Since the net direction of longshore transport is northward there, sand accumulates on the south side of the groins, and erosion occurs on the north side.

Jetties

Jetties are structures built at tidal inlets to stabilize the locations of the inlets. Jetties constructed of a variety of materials have been placed at numerous tidal inlets along the Delaware coast. Indian River Inlet, located on the Atlantic coast, is stabilized by stone jetties that were built in 1939. Stone jetties are located at Roosevelt Inlet in Lewes, and timber and stone jetties stabilize the mouth of the Mispillion River near Slaughter Beach.

Because jetties interrupt longshore sand transport, the effect of jetties on adjacent beaches is similar to the effect of groins: accretion occurs on the updrift side, and erosion occurs downdrift. The offset is generally more extreme at jettied inlets, due to the length and relative impermeability of the jetties and the presence of strong tidal flow in the inlet channel. Long, impermeable jetties, combined with tidal currents in the inlet, allow very little sand to flow across the inlet. Material that does pass through or around the jetties contributes to shoaling either in the interior of the inlet or offshore, depending upon the direction of tidal flow.