

Feasibility of Artificial Waterways to Preserve Hydraulic Environment of Tidal Inlets

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Entrance channels of tidal inlets on sandy coast change always their forms i.e., depth, width and length because of variable tidal and wave conditions. Thus the capability of water exchanges between sea and inlet, and hence the water quality of inlet depends on the stability of minimum flow area of channel. The minimum flow area is expected to be within a small deviation from its mean value for so-called an equilibrium entrance.

However the recovery of flow area after a heavy storm requires a long period, usually few months for medium and small inlets, which brings deterioration of hydraulic environments and economical damages for users of inlet.

In this paper we focus our discussions on the two cases as in the following.

Single Entrance: The flow area of entrance channel with two jetties may be controlled if the depth is changeable. The vertically moving bed along the entrance channel is ideal one for the purpose. But the channel having a moving section may bring considerable work. The expense of the moving bed facility is crucial in the case.

Main Entrance and The Secondary Waterway:

For a larger scale inlet with single entrance, inlet is utilized for multiple purposes i.e., navigational channels for port, fishery, sport and etc. Thus the maintenance for entrance channel is important and hence requires dredging to keep a minimum depth.

The additional waterway may be sought of which purpose is to control partly the discharge of main entrance by changing the own discharge arbitrary.

Two possibilities for the waterway are predicted. One is a open channel with gate, and another is a pipeline conduit, both of which are able to control the discharge.

Illustrative analyses are performed for the some of above cases.

Total cost effectiveness will be key for the realization of this new technology for the preservation of tidal inlet environment.