



Lagoon Entrances and Sediment Dynamics Challenges Faced by Coastal Engineers

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DESCRIPTION

Lagoon entrances and sediment dynamics are important topics in coastal engineering. Lagoons are shallow bodies of water separated from the ocean by a barrier island or reef. Lagoon entrances are the channels that connect lagoons to the ocean. Sediment dynamics refer to the movement of sand and other materials in the lagoon and at the entrance.

Lagoon entrances are dynamic systems that are influenced by waves, tides, currents, and sediment transport. The shape and size of the entrance channel can change over time due to these factors. Coastal engineers must consider these factors when designing and maintaining lagoon entrances.

Sediment dynamics in lagoons are also influenced by waves, tides, currents, and sediment transport. Sediment can accumulate in lagoons over time, which can lead to changes in water depth and shoreline position. Coastal engineers must consider these factors when designing and maintaining lagoons. Some challenges faced by coastal engineers when dealing with lagoon entrances

Coastal engineers face several challenges when dealing with lagoon entrances. One of the main challenges is maintaining a balance between sediment transport and water flow. Sediment can accumulate in the entrance channel, which can lead to changes in water depth and shoreline position. Coastal engineers must design and maintain entrance channels that allow for sediment transport while also maintaining adequate water flow.

Another challenge is the impact of storms and hurricanes on lagoon entrances. Storms and hurricanes can cause significant changes to the shape and size of entrance channels, which can lead to flooding and erosion. Coastal engineers must design entrance channels that can withstand these events while also allowing for sediment transport and water flow.

A third challenge is the impact of human activities on lagoon entrances. Human activities such as dredging, construction, and

pollution can have significant impacts on lagoon entrances. Coastal engineers must consider these impacts when designing and maintaining entrance channels.

Recent developments in lagoon entrances and sediment dynamics include research into the impact of climate change on lagoon systems, the use of numerical models to predict sediment transport, and the development of new technologies for monitoring lagoon systems.

Researchers are studying how climate change will impact lagoon systems, including changes in sea level, temperature, and precipitation. This research can help coastal engineers design and maintain lagoon entrances that are resilient to future changes.

Numerical models are being used to predict sediment transport in lagoon systems. These models can help coastal engineers design entrance channels that allow for sediment transport while also maintaining adequate water flow.

New technologies are being developed for monitoring lagoon systems. These technologies include remote sensing techniques such as satellite imagery and drones, as well as the *insitu* sensors that can measure water quality and sediment transport.

These recent developments are helping coastal engineers design and maintain lagoon entrances that are resilient to future changes while also allowing for sediment transport and water flow.

Threats to lagoon ecosystems

Coastal lagoons are seriously threatened by eutrophication, pollution, urbanization, and diverse forms of modification in their watersheds caused by human activity in the coastal zones of all continents¹. In addition to this, worldwide, one of the most common threats to coastal lagoons is the modification of their natural hydrology, particularly the artificial connection with the ocean. Sea level rise could also drown lagoons and even their ringed atolls.

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