

Coastal Processes with Improved Tidal Inlet in Chilika Lagoon (East Coast of India)

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Coastal processes in a lagoon depend much on the tidal inlets since they provide the link between the coastal oceans and the main lagoon exchanging nutrients, fresh and saline water, planktonic organisms and pollutants. Additional inlets may not only introduce significant environmental modifications but also socio-economic changes. Chilika Lagoon (19°28'N and 19°54'N and 85°06'E and 85°36'E) on the east coast of India is the largest brackish water lagoon with estuarine character. The threat to its environment is from various factors – eutrophication, weed proliferation, siltation, industrial pollution and depletion of bioresources. A new mouth which was opened in 2000 has changed the lagoon environment significantly with better socio-economic implications. There is a serious concern if the significant improvement in the biological productivity of the lagoon post mouth opening is, indeed sustainable. The present study focuses on the changes in the coastal processes as a result of the additional opening of a new mouth. Our results based on mathematical modeling and numerical simulation compare the dynamics, nutrient and plankton distribution as well as dissolved Oxygen concentration before and after the new mouth opening. The model is first tested for different sectors individually before a complete model including the entire lagoon area is included incorporating their distinct characteristics. The model is validated with observations made before and after the new mouth opening. Keywords: Chilika Lagoon; Numerical Simulation