



Shoreline and seabed level changes along the central Orissa coast, India

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Shoreline and the sea bed level change analysis have become very important at the vulnerable places of natural disasters and to estimate the impacts of coastal development. A coastal geomorphologic analysis using the recent techniques such as remote sensing, numerical modeling with measurements using RTK-GPS help to infer the extent of changes and its contributing forces. This study was carried out along the Orissa coast which lies in the east coast of India. Extent of seafloor changes occurred in the last 30 years using the historic and latest bathymetric data is fused with the inter-annual shoreline changes prepared from the latest remote sensing images. Changes in the shoreline position and development of spits were analysed for 14 years and results show the dynamic nature of the study region. The year-wise length of the Ekakula spit estimated from satellite data for the period 1999-2008 showed that the Ekakula spit length increased from 1999 by 2712 m up to 2008 towards northeast. Near shore bathymetry data of 1975, 2002 and 2010 has been collaboratively fused to detect the changes. The results confirm the marked changes in the seabed levels. It has been estimated that from the study area, only 3% of the ocean floor has not shown changes while 97% has been modified. The overview of physical forces responsible for these changes and the corresponding year's shoreline changes supports that this region is continuously evolving. The changes of these coasts and seabed are attributed to the natural and anthropogenic activities which are modifying the nearshore coastal geomorphology. This study highlights the areas that have changed with great precision. This kind of study helps for calculating the net movement of sediments, pathways, volumetric estimates of sediment in general and also to quantify the temporal changes.