

Shoreline Change Detection Based on the Monsoon Seasonality by Means of 'Coastsat' Toolkit

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The sand accretion/erosion process is mainly responsible for the shoreline position changes in coastal zones. Understanding sand accretion/erosion response due to monsoon seasonality and anthropogenic effects is vital for coastal management to apply the best suitable coastal protection strategies. However, long-term monitoring of shoreline changes is expensive, time-consuming and labour-intensive. Instead, satellite imagery (Remote sensing technology) can be utilised as a substitute method to the field data collection, provided that time-series imagery is obtainable at the same location and freely downloadable using the Google Earth Engine archive. This study is mainly focused on shoreline change detection and geomorphological changes, Mirissa in the Southern coast of Sri Lanka. The 'CoastSat' software was employed to obtain the time-series of shoreline positions. According to the analysis of data, the beach was in 3 states: erosion, accretion, and steady state. Further, most of the transect locations indicate a steady beach state and it is good for the development of tourism industry. In addition, the average horizontal shoreline difference ('CoastSat' and field measurement) was 7.95 ± 1 m and that is in an acceptable range. Accordingly, satellite images downloaded from the Google Earth Engine using 'CoastSat' can be used to analyse shoreline change detection very effectively with appropriate tidal correction when there is a lack of long-term field data in the area, and it will be very useful for planning and evaluating coastal management strategies.

Keywords: accretion, coastsat, erosion, shoreline