

**SHORELINE CHANGES OF SOUTHERN AND EASTERN COASTS OF SRI LANKA  
OVER 15 YEARS: A GIS APPROACH**

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The shoreline is a dynamic and complex area that is specified as a boundary between land and sea. Its changes arise as short or long-term by leading to erosion or accretion. Since its vast socio-economic, ecological, and cultural values, those changes are highly important to monitor. GIS and Remote Sensing techniques are cost-effective and accurate for investigating coastal monitoring activities quantitatively and qualitatively. Therefore, this study aimed to determine the shoreline changes on the southern and eastern coasts of Sri Lanka. The position of shorelines was delineated by high-resolution satellite images from Google Earth (GE) Pro software from 2005 to 2020. Shoreline changes were estimated by calculating shoreline change statistics using by Digital Shoreline Analysis System (DSAS) in Arc-GIS 10.8 software. Average End Point Rate (EPR) and Net Shoreline Movement (NSM) values were used to identify the erosion and accretion rates. Results show that these coasts are highly dynamic, with site-based erosion and accretion along with them. On the southern coast, the average coastal accretion rates are recorded in Galle and Matara Districts as  $0.37 \pm 1.18$  m yr<sup>-1</sup> and  $0.02 \pm 0.99$  m yr<sup>-1</sup>, respectively. However, an average erosion rate is recorded in the Hambanthota District as  $-0.45 \pm 1.21$  m yr<sup>-1</sup>. On the eastern coast, the average erosion rates are recorded as  $-0.38 \pm 0.42$  m yr<sup>-1</sup> in the Trincomalee District,  $-0.8 \pm 0.29$  m yr<sup>-1</sup> in the Ampara District, while the average accretion rate is recorded as  $0.05 \pm 0.5$  m yr<sup>-1</sup> in Batticaloa District. Both coasts have widely applied different protective methods to control these changes. Both natural and human influences, such as coastal development activities and physical alterations, might have contributed to these changes. Therefore, continuous monitoring of changes in coastal morphology is essential to environmental management, conservation, protection and development along the coastal regions.

**Keywords:** Coastal erosion, East coast, Remote sensing, Satellite images, Shoreline changes