

Long term and short term coastal erosion in South Western coast of Sri Lanka

R.M.R.M. Jayathilaka*

National Aquatic Resources Research and Development Agency (NARA), Crow Island, Colombo 15, Sri Lanka

The ever-increasing economical and environmental considerations of the South Western coast of Sri Lanka have provoked further studies on ongoing coastal erosion and future shoreline changes due to wave climate and sea level rise. The issue of shoreline changes over the next century has increasingly become a major social, economic and environmental concern where it poses a serious problem to the environment and future developments. In the current study, pre-defined coastal cells from Matara to Puttalam was considered for evaluating the corresponding long-term (1956-2005) and short-term (2005-2014) erosion/deposition rates and sand volumes. Digital Globe satellite images in Google Earth Pro and aerial photographs were used in the period between 1956 and 2014. Shoreline changes were detected using Digital Shoreline Analysis System in ArcGIS. The relative uncertainties due to coastline positions that were affected by tidal phase at the moment of the images were also calculated using Bruune rule. Results showed that the erosion rate was more intense towards the northern part of the study area whereas the Southern cells were relatively protected by revetments and small groins. During the period between 2005 and 2014, the coastal belt between Marawila and Chilaw was subjected to severe erosion, with the amount of 186 000 m³/year and that was 20 times greater than the erosion volume recorded in 1956 to 2005. The coastal cell from Chilaw to Udappu showed the second largest increase of erosion rate, with the amount of 96 000 m³/year and it was four times higher compared to the erosion volume in 1956 to 2005. The reduction of sand supply from rivers due to extensive sand mining and coastal structures could be the contributory factors that governed the ongoing sea erosion in the area.

Keywords: coastal erosion, Bruune rule, ArcGIS, sand mining, aerial photographs

*Corresponding author- email: ruchira@nara.ac.lk