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Developing Coastal Digital Elevation Model (DEM) to Indicate Tsunami Flooding Topography in Arugam Bay, Sri Lanka

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Developing onshore digital elevation model (DEM) is useful to predict sea level rise, coastal erosion, and tsunami inundation. This study compares historic changes of coastline in Arugam Bay in Sri Lanka from 2003 to 2015 to indicate flooding and elevation profile changes over time. Bathymetric DEMs have been created using Differential Global Positioning System (DGPS) and interpolation techniques such as, inverse distance weighting, spline, and triangulation. In addition, coupling C- and L-bands of Moderate Resolution Imaging Spectroradiometer (MODIS) for 2003, 2006 and 2015 were used to create bathymetric models to identify degraded coastal lands. A loss of coastal lands were observed from 2003 to 2006 resulted in weathering and erosion of sea shore habitat and then coastal line was gradually gained in 2015 as a result of natural sand deposition. We mapped eroded cut in an enfield costal sandy soil along the coastal line in Arugam Bay and elevation profile was made using Google Earth platform. In conclusion, our historic bathymetric maps are useful to identify eroded cut vulnerable areas to implement best management practices to protect the coast from tsunami disaster.

Keywords: DEM model, Tsunami, Disaster management, Arugam Bay, Sri Lanka
Fig 01: Thematic map of comparative analysis of Arugambay Costal sandy lines

Fig 02: Eroded cut in an Enfield soil following costal sandy. About 200 ft of soil was eroded in Arugambay. (BHANU©2018)
Fig 03: DEM model for Eroded cut in an Enfield costal sandy in Arugambay, Sri Lanka
Fig 04: Elevation Profile Analysis in between 2003 & 2006 in Arygambay, Sri Lanka
Fig 05: Elevation Profile Analysis in between 2003 & 2015 in Arygambay, Sri Lanka