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Coastal Hazard Mapping for the Historically Important Mahabalipuram Coast of South India

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The east coast of India is vulnerable to severe flooding and erosion, associated with coastal sea level change due to frequent cyclones and low lying coast. Mahabalipuram is South India's most-visited UNESCO heritage site and is generally believed that out of a total of seven temples originally constructed, all but one have submerged in the sea over a period of time and what is now known as 'Shore Temple' remains (Sundaresh et al., 2004). Previous studies indicate severe erosion to occur along this coast. In this study, an attempt has been made to demarcate composite hazard line for a 5 km coastal stretch along the historically important Mahabalipuram coast of South India. Hazard line mapping was undertaken by statistical analysis of annual maximum water level and the results are overlaid on recent satellite image (2009) using GIS techniques. It has been estimated that the inundation level of a 1 in 100 year flood event would reach an elevation of 3.33 m above MSL. The analysis has been made based on the regional sea level trend obtained from the Survey of India (+0.41mm yr-1) records and the SLR of 0.59m for the year 2100 as projected by the IPCC (2007). This extreme water level is likely to inundate a maximum distance of about ∼400m landward resulting in land loss and causing considerable damage to the tourism industry prevalent along this coast. The maximum inundation line has been demarcated within the bounds of the existing Shore temple, one of India's World Heritage sites in Mahabalipuram. In this study, we also observed that the region north of Shore temple is more vulnerable than the south due to the variation in topographic contours.