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Coastal flooding events due to remote forcing along the South-West coast of India

L Sheela Nair
National Centre for Earth Science Studies, India

The paper deals with the study of coastal flooding events along the southwest coast of India particularly during the non-monsoon period when the sea conditions are calm. In recent years there has been an increase in the number of coastal flooding events reported and because of this several studies have been initiated to understand the causative factors responsible for the occurrence of such events. It is observed that this type of flooding events usually occurs without any precursors and sometimes may last for a few hours causing hardship to the coastal community. During such events, the fishermen community is most affected as their boats and houses (which are located in low lying coastal areas) are badly damaged due to the surging of water inland especially when the berm-beach face is narrow and the backshores are of low elevations. Detailed analysis of the hydrodynamic data available during such localized events indicates that the flooding in most of the cases is due to remote forcing. Here the remote forcing is due to the arrival of distant storm waves in the form of swells from the Southern Indian Ocean. Whenever the height of the swell waves rises above 1.5m and the peak period exceeds 15 seconds the swell waves have a damaging effect compared to the conducive environment favorable for beach building which the swell waves normally create when their heights are less than 1m and the period is around 10-14 s. Depending on other factors like the orientation of the shoreline magnitude and direction of the coastal wind, tidal conditions, beach sediment characteristics, foreshore and berm characteristics, coastal vegetation etc. the intensity of coastal flooding can vary spatially even if the nearshore wave conditions are more or less similar. Hence site-specific long-term field data collection is essential to understand the actual processes that lead to the flooding events.

sheela.lnair@ncess.gov.in