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ROLE OF A GROUNDED SHIP 'MV RIVER PRINCESS' IN TRIGGERING EROSION: A CASE STUDY FROM CANDOLIM SINQUERIM COAST, GOA

**R. Mani Murali, M.T. Babu, K. Sudheesh,
Antonio Mascarenhas and P. Vethamony**

National Institute of Oceanography, Dona Paula, Goa, India
mmurali@nio.org,

Indian remote sensing (IRS) LISS-III satellite imageries, wave model (Mike 21) results and field observations have been used to evaluate whether the grounded vessel *MV River Princess* has triggered erosion along the Candolim-Sinquerim coast in Goa, western India. The vessel was grounded on 6th June, 2000, 500 m off coast. The results suggest that the orientation, length and distance of the vessel from the coastline and, more importantly, the direction of the waves (Fig. 1) prevailing over the region, have prompted the ship to act as an offshore breakwater. Due to wave action, a tombolo has been formed on the lee side of the vessel, which has eventually helped the formation of an accretion zone on the lee side. This accretion zone can be demarcated with the presence of a sand bar, which gets partially exposed during low tide. The littoral current along this coast is mostly southward. The sand bar obstructs southward along-shore littoral drift and causes sand depletion and subsequently causing the erosion along the southern shoreline. Quantitative analysis of satellite imageries (Fig 2) indicate that the landward shift of coastline from February 1997 to February 2001 was ~40 m, and February 2001 to January 2006 was ~50 m.

The approximate landward shift in the shoreline from 1997 (before grounding) to 2006 (after grounding) is 90 m, within a period of 5 and half years. Wind and wave directions are conducive for sand bar formation on the lee side throughout the year. The intensity of winds and higher significant wave height (H_s) during SW monsoon further deteriorates the shorefront, which has already become fragile due to severe erosion along beach front.

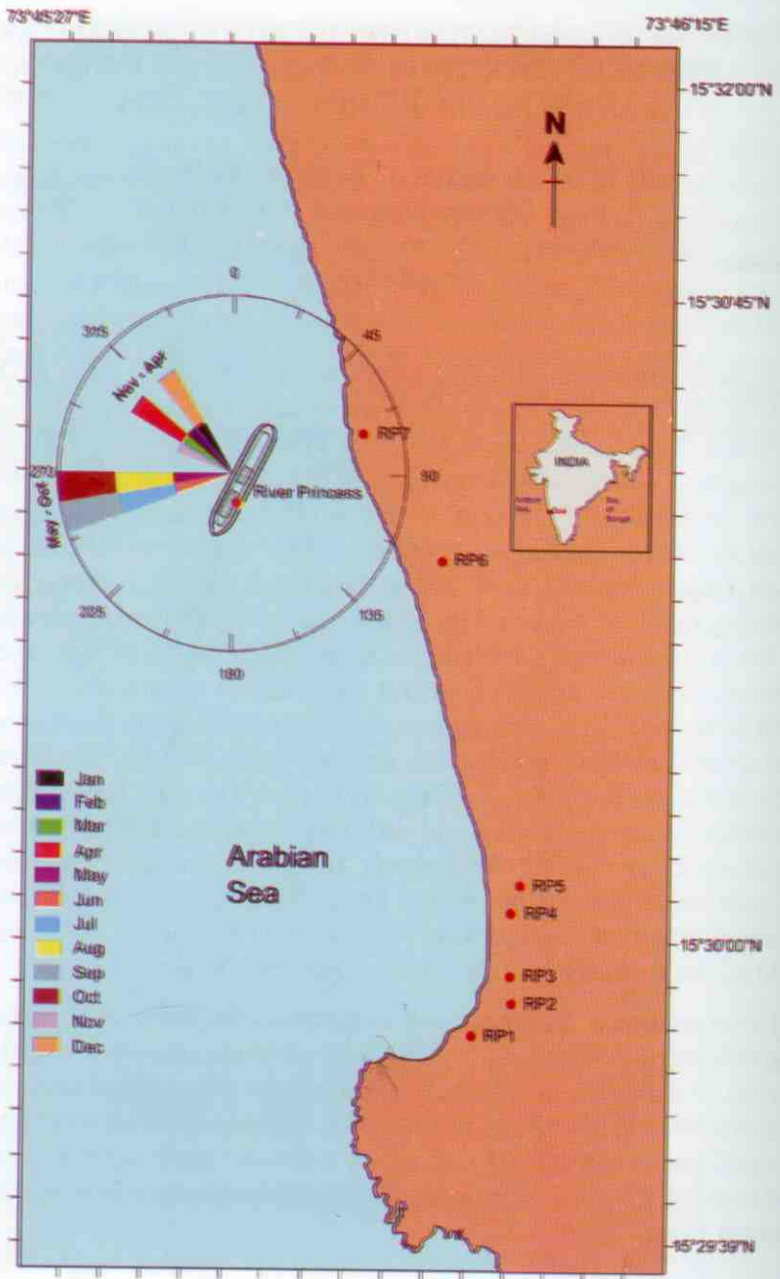


Fig. 1: Monthly wave directions

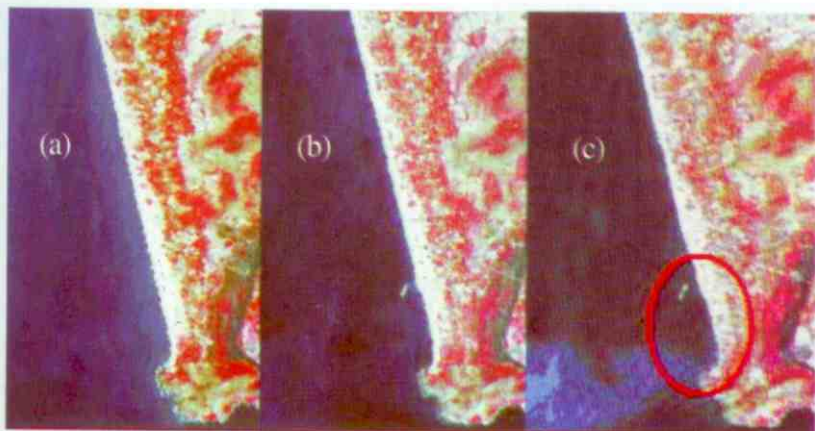


Fig. 2: Satellite imageries showing erosion at Candolim - Sinquerim beach during (a) February 1997, (b) January 2001 and (c) January 2006

Key Words: Erosion, Tombolo, Significant Wave Height, LISS III images, Goa, India