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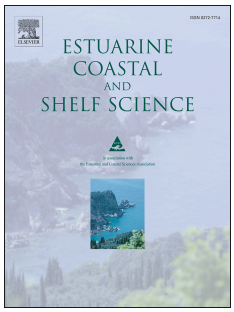


An operational wave forecasting system for the east coast of India

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PII: S0272-7714(17)31041-7

DOI: 10.1016/j.ecss.2017.12.010

Reference: YECSS 5705

To appear in: *Estuarine, Coastal and Shelf Science*

Received Date: 25 October 2017

Revised Date: 24 November 2017

Accepted Date: 18 December 2017

Please cite this article as: Sandhya, K.G., Murty, P.L.N., Deshmukh, A., Balakrishnan Nair, T.M., Shenoi, S.S.C., An operational wave forecasting system for the east coast of India, *Estuarine, Coastal and Shelf Science* (2018), doi: 10.1016/j.ecss.2017.12.010.

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# An operational wave forecasting system for the east coast of India

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## Abstract

Demand for operational ocean state forecasting is increasing, owing to the ever-increasing marine activities in the context of blue economy. In the present study, an operational wave forecasting system for the east coast of India is proposed using unstructured Simulating WAves Nearshore model (UNSWAN). This modelling system uses very high resolution mesh near the Indian east coast and coarse resolution offshore, and thus avoids the necessity of nesting with a global wave model. The model is forced with European Centre for Medium-Range Weather Forecasts (ECMWF) winds and simulates wave parameters and wave spectra for the next 3 days. The spatial pictures of satellite data overlaid on simulated wave height show that the model is capable of simulating the significant wave heights and their gradients realistically. Spectral validation has been done using the available data to prove the reliability of the model. To further evaluate the model performance, the wave forecast for the entire year 2014 is evaluated against buoy measurements over the region at 4 waverider buoy locations. Seasonal analysis of significant wave height (Hs) at the four locations showed that the correlation between the modelled and observed was the highest (in the range 0.78-0.96) during the post-monsoon season. The variability of Hs was also the highest during this season at all locations. The error statistics showed clear seasonal and geographical location dependence. The root mean square error at Visakhapatnam was the same (0.25) for all seasons, but it was the smallest for pre-monsoon season (0.12 m and 0.17m) for Puducherry and Gopalpur. The wind sea component showed higher variability compared to the

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