

## **Problem of Storm Surge in the North Indian Ocean and Its Solution**

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### **Background**

The destruction due to storm surge flooding is a serious concern along the coastal regions of the countries around the North Indian Ocean. About 300,000 lives were lost in one of the most severe cyclones that hit Bangladesh (then East Pakistan) in November 1970 again Chittagong cyclone of April 1991 killed more than 130,000 people in Bangladesh. Orissa coast of India was struck by a severe cyclonic storm in October 1999, killing more than 15,000 people besides enormous loss to the property in the region. More recently the Nargis cyclone of May 2008 killed about 140,000 people in Myanmar as well as caused enormous property damage. Thus, provision of precise prediction and warning of storm surges is of great interest in the region.

### **Objectives**

The main objective of the present paper is to highlight the problem of storm surge in the Bay of Bengal and the Arabian Sea and also the future plan to enhance storm surge forecasting capability in the region.

Location specific operational storm surge prediction models have been developed for the coasts of India, Bangladesh, Myanmar, Pakistan, Sri Lanka, Thailand, and Oman. Under the auspices of Tropical Cyclone Programme of the World Meteorological Organization (WMO) the technology (IIT Model) has been transferred to the National Meteorological and Hydrological Services of the region. Present IIT model predicts only residual storm surge at the coast line (i.e., water level over and above normal astronomical tides). With the advantage of simplicity in operation, this model has been used to produce and disseminate timely warnings to serve public safety. From cyclone season of 2009, Regional Specialized Meteorological Centre (RSMC) New Delhi is using IIT Model for providing 'storm surge guidance' to the countries of the region.

While the storm surge prediction for India in particular, and for the North Indian Ocean region in general, was generally satisfactory, improvements are needed both

in storm surge model as well as meso-scale NWP model to further enhance storm surge forecasting capability in the region.

Initiatives of the India Meteorological Department and other Indian national agencies to improve infrastructure required for improved prediction of cyclone and associated surges have been detailed. Paper also describes future plan to enhance the present forecasting capability following the recommendations made at the IOC-UNESCO/JCOMM workshop held during 14-17 July 2009 at New Delhi (<http://www.jcomm.info/SSindia>).