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Problem of storm surges in the North Indian Ocean and plan for enhancing its forecasting capability

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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. More recently the Nargis cyclone of May 2008 killed about 140,000 people in Myanmar and caused enormous property damage. Thus, provision of precise prediction and warning of storm surges are of great interest in the region.

Objectives and Progress

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 to introduce future plans to enhance storm surge forecasting capability in the region.

Location specific operational storm surge prediction models have been developed by the Indian Institute of Technology (IIT) for the coasts of North Indian Ocean. The technology (IIT Model) has been transferred to the National Meteorological and Hydrological Services (NMHSs) of the region including those of India, Bangladesh, Myanmar, Pakistan, Sri Lanka, Thailand, and Oman under the auspices of Tropical Cyclone Programme of the World Meteorological Organization (WMO). 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 performance of this operational model is generally satisfactory, in terms of forecasting residual storm surge at the coast line (i.e., water level over and above normal astronomical tides), improvements are needed both in storm surge prediction as well as meso-scale weather prediction to further enhance storm surge warning capability in the region. Therefore the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM), with support of the governments of India and Republic of Korea, initiated collaborative activities to; (i) review the current status/performance of an operational storm surge forecasting model (IIT-D Model) for the North Indian Ocean region, and; (ii) address requirements for upgrading and improving storm surge forecasting capability in the region. Recommendations and according plans also cover the enhanced observing networks operated by the India Meteorological Department and other Indian national agencies for cyclone and associated surges.

This is a line of activities following the recommendations made at the 1^{st} JCOMM Scientific and Technical Symposium on Storm Surges (2-6 October 2007, Seoul, Korea: http://www.surgesymposium.org). This particular project for North Indian Ocean is designed and conducted under the framework of the UNESCO project on "Enhancing regional capabilities for Coastal Hazards Forecasting and Data Portal Systems".