



Toward an integrated storm surge application: ESA Storm Surge project

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Storm surges and their associated coastal inundation are major coastal marine hazards, both in tropical and extra-tropical areas. As sea level rises due to climate change, the impact of storm surges and associated extreme flooding may increase in low-lying countries and harbour cities. Of the 33 world cities predicted to have at least 8 million people by 2015, at least 21 of them are coastal including 8 of the 10 largest. They are highly vulnerable to coastal hazards including storm surges.

Coastal inundation forecasting and warning systems depend on the crosscutting cooperation of different scientific disciplines and user communities. An integrated approach to storm surge, wave, sea-level and flood forecasting offers an optimal strategy for building improved operational forecasts and warnings capability for coastal inundation.

The Earth Observation (EO) information from satellites has demonstrated high potential to enhanced coastal hazard monitoring, analysis, and forecasting; the GOCE geoid data can help calculating accurate positions of tide gauge stations within the GLOSS network. ASAR images has demonstrated usefulness in analysing hydrological situation in coastal zones with timely manner, when hazardous events occur. Wind speed and direction, which is the key parameters for storm surge forecasting and hindcasting, can be derived by using scatterometer data. The current issue is, although great deal of useful EO information and application tools exist, that sufficient user information on EO data availability is missing and that easy access supported by user applications and documentation is highly required. Clear documentation on the user requirements in support of improved storm surge forecasting and risk assessment is also needed at the present.

The paper primarily addresses the requirements for data, models/technologies, and operational skills, based on the results from the recent Scientific and Technical Symposium on Storm Surges (www.surgesymposium.org, organized by the WMO-IOC Joint technical Commission for Oceanography and Marine Meteorology, JCOMM) and following activities, that have been supported by the Intergovernmental Oceanographic Commission (IOC) of UNESCO through JCOMM. The paper also reviews the capabilities of storm surge models, and current status in using Earth Observation (EO) information for advancing storm surge application tools, and further, for improving operational forecasts and warning capability for coastal inundation. In this context, the plans and expected results of the ESA Storm Surge Project (2010-2011) will be introduced.