

First JCOMM Scientific and technical Symposium on Storm Surges
Seoul, Republic of Korea, 2-6 October 2007

Agreed Recommendations and Actions

Recommendation or Action	By whom
<i>Future research and development</i>	
Improved physics and physical processes in the models; e.g. wave/current and wind/current interactions	SS research community
Need development of fully coupled basin / coastal / tide / wave / atmosphere <u>models</u> and programme for continuous improvement	SS research community
Improvements required in total water level <u>predictions</u> as a result of tide, wave and surge interactions	SS research community
Coupled hydrologic, hydraulic and surge models for inundation	SS research community
Research required on mesoscale wind forced events and remotely forced inundation events	SS research community
Pursue studies of model sensitivity to spatial and temporal resolution for specific locations	SS research community
Enhance and expand use of ensemble modeling techniques	SS research community
Develop methodologies to project changes in storm surge climate over the next century, with associated measures of uncertainty	SS research community
Further development of empirical techniques, e.g. AI, neural networks, statistical	SS research community
Further field work and laboratory and numerical modeling required to determine effectiveness of wetland and island barrier restoration in surge and wave attenuation	SS research community
More research, including case studies, to understand the cause of deviations from normal predictions and forecast failures, such as the sharp structural and intensity changes/variability in TC wind fields	Meteorological and SS research communities
Develop fully coupled models to improve NWP for tropical cyclones, extra-tropical storms and for winds in coastal areas	Meteorological research community
Improvements in wind field analyses and forecasting (including TC track and intensity forecasts) remain essential	Meteorological research community
Improved boundary layer specification over water and land	Meteorological research community
Forum required for enhanced and rapid exchange of information and ideas on surge modeling among existing and future national efforts	JCOMM/ETWS and Secretariat

<i>Research to Operations</i>	
Downscaling of existing high resolution, integrated models for a range of practical applications	SS research community
Investigate improved means to incorporate uncertainty into forecast guidance	SS research community and national agencies
Support for a limited subset of models, as “community models”, for use by smaller countries and as capacity building tools	JCOMM/ETWS, Secretariat
Recognizing that models have been mostly used in hindcast mode or to develop simulations and scenarios, build on experience to develop better real time forecasting	JCOMM/ETWS and national agencies
Provide inventory and description of inundation models	JCOMM/ETWS, Secretariat
Assess appropriate ensemble techniques for forecasting	JCOMM/ETWS
Document storm surge forecasting practices in a standard way to make them internationally interoperable	JCOMM/ETWS
More effective cooperation of meteorologists, oceanographers, coastal and ocean engineers and hydrologists required; e.g. for inundation mapping	National agencies
Develop better visualization tools	National agencies
Adopt appropriate resolution models, based on sensitivity assessments and subject to data availability and requirements	National agencies
<i>Observations and Data</i>	
National access to, or development of, high resolution, near shore, bathymetric data sets highly desirable	National agencies
Space agencies should contribute to high resolution bathymetric and coastal zone topographic data for better storm surge and coastal inundation forecasts	Space agencies
Documentation of satellite earth observation data requirements for storm surge modeling and forecasting; e.g. scatterometer, ASAR, altimeter, nearshore	JCOMM/ETWS, Secretariat
Assessment and evaluation of the accuracy and value of satellite data for storm surge and wave modeling and forecasting	JCOMM/ETWS and SS research community
Assess value and practicability of other remote sensing; e.g. airborne LIDAR, HF radar	SS research community

Monitor coastal flooding by remote sensing	National agencies
Enhanced GLOSS network to support storm surge risk assessments, research and forecasting, with recommended 1 minute sampling	JCOMM/GLOSS GE
Enhance in situ networks for all relevant variables, including higher time resolution	National agencies
Look to utilise other observation platforms to enhance in situ data; e.g. tsunameters	National agencies, JCOMM and Secretariat
Countries should prioritise data acquisition on the basis of risk analysis, including vulnerability and hazard impact probability	National agencies
Global access to existing storm surge data sets, perhaps through a storm surge metadata catalogue; Development of interoperable storm surge databases and climatologies	JCOMM/ETWS, Secretariat
<i>Capacity Building and Outreach</i>	
Develop generic storm tide: (i) Public education packages; (ii) Public warning packages; (iii) Evacuation guidelines	WMO/DRR and PWS, with JCOMM and IOC/ICAM
Training: (i) Training of trainers essential; (ii) Storm surge forecasting and modeling; (iii) Storm surge outreach; (iv) Training needs to be continuous, to upgrade skills and to ensure lessons are not forgotten for relatively infrequent phenomena	(i) and (ii) JCOMM (iii) WMO/DRR and PWS with IOC/ICAM
Inundation mapping support	WMO and IOC
Reactivate regional storm surge development projects; e.g. North Indian Ocean and West Africa	WMO and IOC
Support for participation in post-impact assessment and data collection	WMO and IOC
Outreach activities required, strengthening links with other relevant programmes and communities (* mitigation is social issue covering wide range up to national defence.)	WMO and IOC
Investigate forecast requirements for vertical vs horizontal evacuation	National agencies with JCOMM
Assist in identification of risk levels to ensure that the information provided is appropriate to level of risk	WMO and IOC

<p>Recognize the importance of development of risk assessments</p> <ul style="list-style-type: none"> • Need a more strategic approach to risk assessments – act for both short and long term • Identify and apply multiple approaches to risk assessment • Include non-stationary climate effects, land use and demographic changes • Ensemble methods can quantify risks with long lead times • Identification of and focus on high risk regions • Define vulnerability before defining solutions 	<p>WMO and IOC, national agencies</p>
<p><i>The Guide</i></p>	
<p>Dynamic part to be proactive in distributing new developments in modeling and forecasting</p>	<p>ETWS/JCOMM</p>
<p>How to develop future input to dynamic part of the Guide? See next section</p>	<p>ETWS/JCOMM</p>
<p>Guide to include description of mesoscale wind forcing and remote forcing events, to stimulate future research</p>	<p>ETWS/JCOMM</p>
<p>Recognize differences between tropical and extra-tropical surges, for example in terms of scale</p>	<p>ETWS/JCOMM</p>
<p>Ensure effective linkage with ICAM hazard guidelines and manual on flood forecasting</p>	<p>ETWS/JCOMM with IOC/ICAM</p>
<p><i>The Future</i></p>	
<p>General agreement on value and need for future symposia</p>	<p>JCOMM</p>
<p>Full symposium on a 4-year cycle; Recommend second storm surge symposium in approximately 4 years</p>	<p>JCOMM</p>
<p>Potential synergies with related work on waves and currents</p>	<p>JCOMM</p>
<p>Recommend possible association with coastal hazards symposium as part of biennial waves workshops</p>	<p>JCOMM</p>