World Meteorological Organization
Organisation météorologique mondiale

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Weather • Climate • Water
Temps • Climat • Eau

Our ref.: WDS/MAP/MMO/SS-survey GENEVA, 15 January 2014

Annex: 1 (available in English only)

Subject: JCOMM Worldwide Survey on Operational Storm Surge Models and Data

Action required: To complete and submit the survey by **31 May 2014**

Dear Sir/Madam,

As you are aware, the Guide to Storm Surge Forecasting (WMO-No. 1076), developed by the Expert Team on Waves and Coastal Hazard Forecasting Systems (ETWCH) of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM), provides the relevant technical advice and guidance for the storm surge forecasting services for a wide range of maritime and coastal activities, in support of the marine meteorological and oceanographic services provided by WMO Members and IOC Member States.

As part of the regular review/update of technical guides and procedures published by WMO, I would like to request your cooperation by arranging participation of your Service in a new survey to review the status of operational storm surge models and data, given in the Annex to this letter, **by 31 May 2014**. Please note that, in particular, the survey includes a request to append examples of bulletin or advisory on storm surge, either in text or in graphical forms, if your Service produces such information.

The analysis of all responses will lead to the update of the Dynamic part of the Guide, published online at http://www.jcomm.info/SSguide. It is designed also to contribute to the establishment of a storm surge dataset, and to the development of general guidelines for impact-based storm surge information services.

To: Members of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM-435)

cc: IOC Secretariat)
Operational centres for storm surge forecasting)
Co-presidents of JCOMM) (for information)
Coordinator, JCOMM Services and Forecasting Systems Programme Area)
Chairperson, JCOMM Expert Team on Waves and Coastal Hazard Forecasting Systems)

Considering the required knowledge relating to this survey, it is strongly recommended that the responses would be completed directly by and/or in consultation with the responsible person in the operation and maintenance of the storm surge modelling and forecasting.

For efficiency and smooth conduct of the analysis and review, I kindly request the submission of responses in electronic format (in MS document format, by e-mail to mmo@wmo.int) including the requested attachments. The electronic copy of this survey can be downloaded from the Dynamic part of the Guide (http://www.jcomm.info/SSguide).

Yours faithfully,

(J. Lengoasa)
for the Secretary-General

WORLD METEOROLOGICAL ORGANIZATION

WDS/MAP/MMO/SS-survey, ANNEX

JCOMM Worldwide Survey on Operational Storm Surge Models and Data

QUESTIONNAIRE ON OPERATIONAL AND PRE-OPERATIONAL NUMERICAL STORM SURGE MODELS

Identification
Member State/territory: Name of contact: Position/role of contact: Mailing address: Telephone: E-mail: Website:
Does your Service use operational or pre-operational† numerical ocean models for storm surge forecasting? **If yes, please have the form below completed by someone with significant knowledge and experience of the system. If different forecast models are used for more than one application (e.g. tropical/extra-tropical storms) then please copy and complete the page for all applications.**

1. Name or reference for model	
2. Description of model/operational mode: a) hydrodynamic approach (depth-averaged, full baroclinic, other) b) any coupling (e.g. waves, ice) c) ensemble forecasts (briefly detail method) d) inundation or wetting-drying (give details) e) any other important features	
3. Discretization: a) horizontal grid type (structured/unstructured) b) resolution c) vertical coordinate (if any) and number of levels	
4. Open boundary conditions: a) tide (state constituents) b) storm surge at open boundary c) other ocean forcing (e.g. temperature)	
5. Domain (give coordinates of model area)	
6. Atmospheric forcing: a) source of atmospheric forcing (name of met model) b) variables used (SL pressure, 10m wind, other) c) spatial resolution of atmospheric forcing d) temporal resolution of atmospheric forcing	
7. Use of real-time observations, if any: a) data assimilation (state method) b) forecaster corrections (state method) c) other	
8. Forecast period and cycle	
9. Products: a) description (text, graphical). *If a bulletin or advisory is issued, please append an example* b) frequency interval for products c) who receives the products?	
10. Applications: a) water level forecasts b) currents c) inundation d) other (please state)	
11. Model Verification: a) methods/metrics b) frequency and period of verification c) links/references	
Is the model freely available/open source? Please note any restrictions	

† Pre-operational models are those which are in the final stages of development before implementation in an operational centre. This survey is not intended to capture purely scientific or experimental models.

QUESTIONNAIRE ON STORM SURGE HINDCASTS/DATA BASES

Identification
Member State/territory: Name of contact: Position/role of contact: Mailing address: Telephone: E-mail: Website:
Does your Service use numerical storm surge models to produce hindcast procucts? **If yes, please have the form below completed by someone with significant knowledge and experience of the system. If several different hindcast models are run then please copy and complete the page for each. If configuration details are the same as the operational model then insert, "as operational model".**

1. Name or reference for model	
2. Description of model: a) hydrodynamic approach (depth-averaged, full baroclinic, other) b) any coupling (e.g. waves, ice) c) inundation or wetting-drying (give details) d) any other important features	
3. Discretization: a) horizontal grid type (structured/unstructured) b) resolution c) vertical coordinate (if any) and number of levels	
4. Open boundary conditions: a) tide (state constituents) b) storm surge at open boundary c) other ocean forcing (e.g. temperature)	
5. Domain (give coordinates of model area)	
6. Atmospheric forcing: a) source of atmospheric forcing (name and details of reanalysis) b) variables used (SL pressure, 10m wind, other) c) spatial resolution of atmospheric forcing d) temporal resolution of atmospheric forcing	
7. Use of observations, if any: a) data assimilation (state method) b) other	
8. Period of hindcast	
9. Products: a) description (text, graphical) b) interval	
10. Statistical products: a) description b) links/references	
11. Model Validation: a) methods/metrics b) links/references	
Are the data or the climatology available or published? Please note any restrictions	

QUESTIONNAIRE ON OBSERVED DATA BASES OF STORM SURGES

Identification
Member State/territory: Name of contact: Position/role of contact: Mailing address: Telephone: E-mail: Website:
Does your Service maintain data bases of observed water levels that capture storm surges? **If yes, please have the form below completed by someone with significant knowledge and experience of the system. If several data bases exist then please copy and complete the page for each.**

1. Number of stations	
2. Technology of instruments	
3. Variables measured	
4. Averaging/sampling interval	
5. Description of any metadata	
6. Media of storage for data	
7. Please provide links and/or references, if available	
8. Please describe which coastal areas may be prone to storm surges in your territory	
9. Please mention any other institutions in your country holding storm surge data bases and/ or conducting research on storm surges	
10. Are the data and/or analyses of the data available/published? Please note any restrictions	