# WWMWIS Committee addition for regional wave model RSMC functions in GDPFS Manual (WMO No.485)

The following is a proposal for the next update.

***2.2.1.6 Regional numerical wave prediction***

**Centres conducting regional numerical wave prediction shall:**

**(a) Prepare, for a defined area or multiple areas, regional analyses of ocean wave parameters;**

**(b) Prepare, for a defined area or multiple areas, regional forecast fields of basic and derived ocean wave parameters;**

**(c) Make available on WIS a range of these products; the list of mandatory and highly recommended products to be made available is given in Appendix 2.2.11;**

**(d) Prepare verification data and make them available to the Lead Centre(s) for Wave Forecast Verification;**

**(e) Make available on a website up-to-date information on the characteristics of their regional numerical ocean wave prediction systems; the minimum information to be provided is given in Appendix 2.2.12.**

Note: The bodies in charge of managing the information contained in the Manual related to numerical ocean wave prediction are specified in Table 7.

**Table 7. WMO bodies responsible for managing information related to regional numerical ocean wave prediction**

|  |  |  |  |
| --- | --- | --- | --- |
| *Responsibility* | | | |
| *Changes to activity specification* | | | |
| To be proposed by: | JCOMM/ET-WCH |  |  |
| To be recommended by: | CBS | JCOMM |  |
| To be decided by: | EC/Congress |  |  |
| *Centres designation* | | | |
| To be recommended by: | RA | CBS | JCOMM |
| To be decided by: | EC/Congress |  |  |
| *Compliance* | | | |
| To be monitored by: | JCOMM/ET-WCH |  |  |
| To be reported to: | CBS | JCOMM |  |

Acronyms not previously defined: ET-WCH – Expert Team on Waves and Coastal Hazards Forecasting Systems; JCOMM – WMO–IOC Joint Technical Commission for Oceanography and Marine Meteorology.

**APPENDIX 2.2.11. MANDATORY AND HIGHLY RECOMMENDED REGIONAL NUMERICAL OCEAN WAVE PREDICTION PRODUCTS TO BE MADE AVAILABLE ON THE WMO INFORMATION SYSTEM**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Parameter* | *Level* | *Minimum resolution* | *Forecast range* | *Time steps* | *Frequency* |
| Significant wave height | Surface | 0.5º x 0.5º | Up to 2 days/ Beyond 3 days up to 7 days | Every 3 hours/ Every 6 hours | Twice a day |
| Peak wave period and mean zero-upcrossing period | Surface |
| Prevailing direction  – Mean wave direction and/or  – Principle wave direction | Surface |

**Additional highly recommended products:**

– u and v component of 10-metre wind;

– Full 2-D wave spectra at subset of grid points;

– Wind sea and swell split at all grid points;

– Derived parameters including wave steepness, directional spreading and rogue wave potential.

**APPENDIX 2.2.37. STANDARDIZED VERIFICATION OF REGIONAL WAVE FORECASTS**

**1. Introduction**

This appendix presents detailed procedures for the generation of a standard set of verification scores for wave forecasts produced by the Lead Centre(s) for WFV, based on gridded wave forecast fields provided by JCOMM-participating centres. The goal is to provide consistent verification information on the wave forecast products from different centres for forecasters in the ocean forecast services and to help JCOMM-participating centres compare and improve their forecasts. The Lead Centre functions, as described in 2.2.3.4, include creating and maintaining a website for wave verification information, so that potential users will benefit from a consistent presentation of the results.

The standardized verification should provide key relevant information appropriate to the state of the art in wave forecasting, ensuring a consistent verification methodology applied to forecasts from different JCOMM-participating centres, and the use of a common set of observations.

**2. Parameters**

Atmospheric forcing:

– 10-metre wind speed u and v components (10-metre u, 10-metre v).

Wave fields:

– Significant wave height;

– Peak period;

– Mean wave period based on the second moment of the frequency spectrum;

– Mean wave direction.

**3. Forecast times**

If available, forecasts from 0000, 0600, 1200 and 1800 UTC should be provided.

**4. Forecast steps**

In as fine temporal granularity as available but at least every six hours to the end of the forecast range.

**5. Verifying observations**

Forecasts of the above parameters will be evaluated against in situ observations from buoys and platforms available at the Lead Centre(s) for WFV. If additional in situ observations become available over time they will be added following a careful selection and quality control. JCOMM-participating centres are encouraged to promote the exchange of in situ wind and wave observations.

**6. Interpolation**

**Verification shall be made using the nearest native model ocean grid point to the observation location.**

**7. Scores**

**The following scores shall be calculated for all parameters against observations:**

**– Mean error;**

**– RMSE;**

- **Reliability percentage within 0.5m**

**– Error standard deviation;**

**– Scatter index (error standard deviation normalized by observed mean);**

**– Symmetric slope (variance ratio);**

**– Quantile-quantile plots.**

**8. Exchange of forecast fields**

**Each JCOMM-participating centre shall provide fields to the Lead Centre(s) for WFV on a regular latitude–longitude grid at the resolution that best matches the native resolution of the direct model output.** Details of the procedure and the required format for the data are provided on the website(s) of the Lead Centre(s) for WFV.

**9. Documentation**

**Information shall be provided by JCOMM-participating centres to the Lead Centre(s) for WFV on any changes to the production of exchanged forecast fields and changes in their wave forecast systems.**