Verification results

Forecast performance of different centres for forecasts initialised at 00 UTC and 12 UTC are shown in terms of scatter index over the Northern-hemisphere and the Mediterranean Sea for:

1. **significant wave height**
2. **wave peak period**
3. **wind speed**

Data

Sea state and ocean surface meteorological in-situ observations are routinely collected by several national organisations via networks of moored buoys or weather ships and fixed platforms deployed in their near-shore and offshore areas of interest. The data are usually exchanged via the GTS. As part of this inter comparison, observations that are not commonly available on the GTS are also gathered on a case-by-case basis.

The processing of the in-situ data is twofold. First, data for those sites reporting twice or more per hour are averaged after a basic quality control to produce an hourly data set. This hourly data set is then combined with other locations which are only reporting every hour. This hourly dataset is made available to the participants

Second, before using these hourly observations for verification, care has to be taken to process the data to remove any erroneous observations. Moreover, extra care has to be taken to match the scale of both model and observations. This scale matching is achieved by averaging the hourly data in ±1 hour time windows centered on the four major synoptic times corresponding. The original quality control and averaging procedure was discussed in Bidlot et al. (2002). It was extended to include platform data as described in Sætra and Bidlot (2004).

Match-up between observations and the model data

The interpolation method for deriving forecast values at the observation location for the ocean waves is called the inverse-distance-weighting interpolation (IDWI). The interpolated value is determined by the weighted average of the values of those of four neighbour points which hold valid values.

The weight function follows:

$w = 1/d^2$,

with d the distance between forecast and observation locations.

Scatter index

The scatter index is a measure of the size of the deviation of forecasts from observations relative to the magnitude of the observations. A smaller scatter index value means better forecasts.

Mathematically the scatter index is defined as the standard deviation of the difference between predicted values and observations normalised by the mean of the observations. For example, if the standard deviation of the difference between predicted values of significant wave height and observations is 0.5 metres and the mean of the observations is 2 metres, then the scatter index value is 0.5/2, which is 25%.

References

Bidlot J.-R., D. J. Holmes, P. A. Wittmann, R. Lalbeharry, H. S. Chen, 2002: Intercomparison of the performance of operational ocean wave forecasting systems with buoy data. Wea. Forecasting, 17, 287-310.

Sætra, Ø. and J.-R. Bidlot, 2004: On the potential benefit of using probabilistic forecast for waves and marine winds based on the ECMWF ensemble prediction system. Wea. Forecasting, 19, 673-689.