

REPORT FROM THE WORKING GROUP ON VERIFICATION AND QUALITY INDICES (WG III)

Chairmen: Christopher S. Velden and Kenneth Holmlund

The Working Group was tasked to address the following two key issues:

- 1) Validation of Atmospheric Motion Vectors against R/S measurements
 - Ellipse vs. circle collocation areas
 - Update to Annex 9 on the CGMS consolidated report
- 2) Quality indicators
 - Uniform quality indices from all data producers
 - BUFR encoding

III/I Validation of Atmospheric Motion Vectors against collocated R/S data

The WG III started on a discussion based on the report presented by M. Tokuno earlier during the Workshop. The advantages and disadvantages of elliptical collocation areas were discussed but a uniform agreement on the applicability of the method to monitoring the quality of the AMVs was not found. The elliptical collocation area as suggested by CGMS in 1982 is larger than the circular area with a 150 km radius. Therefore the simpler and more stringent circular collocation area is preferable, especially as the differences in the statistics provided by the elliptical collocation area and the circular area are quite small as shown in the paper by M. Tokuno (Annex). Therefore it was uniformly agreed that the best approach for deriving the collocation statistics should be based on the already common approach of a circular collocation area.

The WG III then proceeded to discuss the Annex 9 of the CGMS consolidated report for which a draft revised version was prepared by W. P. Menzel. The WG III found the criteria presented in the revised Annex to be good, however identifying some shortcomings. The WG III agreed to the following basic recommendations i.e. the collocation area should be:

- time: satellite wind and its companion radiosonde observation must differ by no more than 1.5 hours;
- location: satellite wind and its companion ground truth observation must be within the distance of 150 km.
- height: in general, the height of satellite winds and the height of the radiosonde observation must be within 25 hPa.

The WG III suggests the following amendments to the draft:

- The R/S ascent time and displacement should be taken into account when applying the above criteria.
- Each collocation box should be constrained to the nearest match only as defined by the following formula:

where $x_l=150$ km, $p_l=25$ hPa and $t_l=90$ min. The choice for the match with the R/S for comparison is obtained from:

$$\min \left[\left(\frac{dx}{x_l} \right)^2 + \left(\frac{dp}{p_l} \right)^2 + \left(\frac{dt}{t_l} \right)^2 \right]$$

The values dx , dp and dt are the computed differences between the actual R/S time, height and location for the AMV in question.

The WG recognises that the new reporting procedure may cause a discontinuity in the statistical trend analysis. However accurate statistical comparisons are mandatory for proper error-analysis for NWP and the development of quality control procedures.

The WG III also recommends that the total number of produced winds should be incorporated in the statistical tables for quarterly statistics.

Finally the WG discussed the benefits of deriving statistics against other data sources and NWP data for internal investigations.

III/II Quality indicators

The WG III noted that the session relevant to the WG would be only the following day. Therefore the discussion was initiated by a brief summary of the current situation on the derivation and utilisation of quality control and estimates at CIMSS (Auto-Editor, AE) (NOOA/NESDIS) and EUMETSAT (Quality Indicator, QI), These summaries were provided by C. Velden and K. Holmlund.

The WG III discussed the different approaches in some detail and came to the following conclusions:

- Both methods have some advantages and disadvantages.
- The simplicity of the QI approach lends itself more easily for implementation into different data production centres.
- The current set of tests in the QI could form an adequate baseline for a common approach to provide quality information.
- The QI test functions require further tuning and improvement and research into a optimum set of tests is required.
- The centres utilising the AE procedure should continue this approach but provide the QI values as additional information.
- The combined use of and development related to the AE and the QI is encouraged.
- The data production centres should provide all their derived vectors in the BUFR format including all available quality information.