REPORT FROM THE WORKING GROUP ON VERIFICATION (WGIII)

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1. Spatial resolution and image repeat cycle (CGMS Action 29.36 and 29.37)

The CGMS action 29.36 requested the 6th IWWS to discuss the compatibility of spatial resolution and image repeat cycle for winds tracking and to provide pertinent recommendations to CGMS satellite operators. At issue is the fact that the optimum repeat cycle and scale of feature are not mutually independent for the derivation of AMVs. The CGMS action 29.37 requested the IWWS to discuss the template size for tracking features in relation to the question of whether the displacement vector represents a local wind vector. It was the view of WGIII that these two actions are related from the tracking and quality point of view and therefore it was decided two discuss them together.

Recent work presented at this as well as previous workshops by e.g. Velden but also by de Smet show that even though the issues are indeed important it is not easy to find one general solution for each and every satellite operator. The selection of the most appropriate spatial resolution, image repeat cycle and template size should be done in close co-operation with the users to meet their requirements. Noting that height assignment is currently the major single source of errors (and also horizontally correlated errors as shown by Bormann at this workshop) WGIII therefore encourages the data producers and users to closely co-operate on the issues in question. WGIII recommends:

Recommendation (IWWS6_WGIII_1.1): A full characterisation of all AMV related errors should be performed. I.e. the errors for every operationally used combination of image frequency, spatial resolution and template size, should be characterised. Further research on scales of representativeness and correlated errors to be performed including detailed analysis on bias corrections.

Recommendation (IWWS6_WGIII_1.2):
Satellite operators to incorporate information on scale and vertical structure in BUFR.

2. Validation and verification of height assignment (CGMS Action 29.38)

The CGMS Action 29.38 requested the 6th IWWS to discuss and encourage the use of geometric (and other height allocation methods) for comparison with and validation of current operational multi-spectral infrared height assignment methods. Several presentations at the 6th IWWS considered the issues in question and showed the great potential of alternative methods for the verification and validation of multi-spectral height assignment methods. The WGIII therefore recommends that:

Recommendation (IWWS6_WGIII_2.1): Data providers to consider implementation of stereo height methods (semi) operationally for validation.

Recommendation (IWWS6_WGIII_2.2): Satellite operators to explore the possibility to use experimental instruments (e.g. MISR and LITE) and to consider alternative data sources (e.g. ARM-sites) for validation.

3. Height assignment (CGMS Action 29.39)

The CGMS Action 29.39 requested the 6th IWWS to revisit concepts of height allocation techniques for assigning a height to the derived AMVs. The WGIII concluded after lengthy discussion that height assignment remains the single largest source of error for the AMVs and in order to solve the problems further research is required. Specific issues to consider are to characterise the vertical representativness of the AMVs, the use of AMVs from cloudy targets as layer means, develop quality indicators for height assignment and to improve verification and validation activities. The use of simulated imagery for these purposes was seen as one promising way forward. Therefore the WGIII re-emphasised the importance of recommendations for CGMS Action 29.38 and further recommended that:

Recommendation IWWS6_WGIII_3.1: Further research should be performed to characterise vertical representativeness of the AMVs and how the data is used in NWP. This should also consider layer averaging/representation for validation purposes.

Recommendation IWWS6_WGIII_3.2: Data producers to incorporate information on height assignment reliability in BUFR.

4. Quality indicators (CGMS Action 29.40)

The CGMS Action 29.40 requested the 6th IWWS to analyse the status of the implementation of quality indicators assigned to wind vectors at each operational data production site. This issue was to a large extent covered by the paper presented at this Workshop by Holmlund. The WGIII noted that the derivation and use of quality indicators has advanced greatly since the last winds workshop and that this information is now successfully used within NWP. However it was also stressed that the use of quality information is not straight forward and that specific care should be taken when this information is incorporated in NWP assimilation/data screening schemes. Additionally to the information given in the paper the WGIII noted that the combined use of the QI/RFF schemes are still not common and that further research and development is required, especially with respect to quality indicators for height assignment. The WGIII recommends that:

Recommendation IWWS6_WGIII_4.1: Data producers and users to provide updated information on the status of the derivation and use of quality indicators to Eumetsat. Eumetsat will maintain this information on their WEB-site.

Recommendation IWWS6_WGIII_4.2: The data providers to further harmonise their approach to derive quality indicators.

Recommendation IWWS6_WGIII_4.3: Data producers should implement both RFF and QI methods as minimum and distribute these flags to the users.

Recent work performed at Eumetsat has shown that reprocessing of historical data is not only interesting to the users. Consistent processing over long time periods provides the possibility to better monitor and understand the performance of not only the AMV extraction software, but also the performance of the satellite instruments. The WGIII therefore further recommends:

Recommendation IWWS6_WGIII_4.4: All data producers to consider reprocessing of historical data not only for reprocessing activities performed by the users but also as a validation of improvements of AMV derivation schemes.

5. Monitoring

Additionally to the CGMS Actions WGIII discussed the following items raised during the Workshop (Note: Only items not covered by the CGMS Actions are presented):

The exchange of information between data providers and users is still not optimal. Cases have been reported where minor modification to the AMV extraction or distribution schemes have caused severe problems to the users. Also, through the highly advanced assimilation schemes, the users can sometimes detect problems earlier that are not obvious to the data producers and should inform the data providers accordingly (when appropriate). The WGIII therefore urged data providers to inform users in advance of any changes in the AMV derivation/distribution schemes. WGIII further emphasised the importance of established contact points between data providers and users and recommended that

Recommendation IWWS6_WGIII_5.1: The mechanisms for explicit feedback on problems or problem reporting should be revisited and updated if required. Especially the

Recommendation IWWS6_WGIII_5.2: NWP centres to provide real-time monitoring on the WEB

The use of CGMS statistics to monitor the performance is currently limited due to recent developments in the derivation and distribution of wind data. E.g. data is now distributed with quality indicators that are used to filter a certain, currently arbitrarily selected level. WGIII therefore recommends:

Recommendation IWWS6_WGIII_5.3: Data providers and users to reconsider the current format of the CGMS statistics in view of recent advances.

Furthermore it was noted that not all data producers are distributing the CGMS statistical tables and therefore WGIII further recommends:

Recommendation IWWS6_WGIII_5.4: NESDIS to reconsider distribution of the statistical tables

6. Polar winds

Finally the WGIII noted the recent advances in the derivation of winds over polar regions that show great potential for the near future. Current work does not however cover the development of specific quality indicators for the AMVs in question. The WGIII therefore recommends:

Recommendation IWWS6_WGIII_6.1: That the production of winds over the polar regions should be made operational s soon as possible, but quality information should be included.

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