

REPORT FROM THE WORKING GROUP ON UTILISATION (WG II)

Chairperson: Brian Soden

The Working Group on Utilisation (WG II) considered the application of satellite wind information in Climatological Analyses, Numerical Weather Prediction, and Nowcasting, discussed importance of Data Formatting and Access in its application, and noted the role of Education and Training in promoting the effective use of satellite AMVs. A discussion of the key achievements since the last workshop and recommendations for future efforts in these five areas are outlined below.

(1) Climatological Analyses

The potential of wind information from geostationary satellites to substantially enhance our understanding of the atmospheric circulation for climate diagnostics and model evaluation was clearly established. In light of this potential, the reprocessing of the existing geostationary archive using a consistent set of wind algorithms (to the extent feasible) was recognized as a high priority. Such an undertaking should provide near-global coverage and be designed for use by both the NWP-reanalysis and the climate diagnostics community. To facilitate the use of the wind data by this broader community, the reprocessing of the satellite archive should also offer a set of gridded, model-independent wind products. The working group further recommends that the wind retrievals be performed in conjunction with the retrieval of other quantities from the geostationary archive, such as precipitation, cloud cover, and water vapor, so that the relationship between these variables and the atmospheric dynamics can be studied.

(2) Numerical Weather Prediction

The presentations during the meeting clearly demonstrated that the production and use of AMVs for NWP has greatly expanded since the previous workshop. Presentations at this workshop offered further demonstration of the utility of cloud and water vapor motion vectors, and scatterometer data for tropical cyclone forecasting in a variety of numerical models (GFDL, NOGAPS, NCMRWF, BMRC) using both intermittent and continuous assimilation techniques. Positive impacts were also demonstrated for model forecasts on both regional (UW-Eta) and global (ECMWF) scales. In particular, several studies highlighted the importance of assimilating AMV fields in combination with other satellite products (e.g., radiances or temperature/moisture retrievals) to achieve optimal impact of the satellite AMV data. It was also noted that the assimilation of satellite data improved forecasts in both the northern and southern hemispheres, with impacts comparable to that obtained from the global radiosonde network. However, achieving these improvements required considerable effort in the development and tuning of the assimilation methods specifically for the satellite data. Furthermore, as the assimilation algorithms become more sophisticated (e.g., 4DVAR), the quality of the analysis becomes more vulnerable to the quality of the ingested data. Fortunately, data providers have made considerable progress in developing consistent and meaningful Quality Indicators (QIs) for AMVs. However, the WG recommends that the data providers continue to make improvements in the quality of the data itself, in addition to the quality of the QIs. In particular, a better understanding of the nature of the speed and altitude biases in AMVs and their possible correlation with each other was noted to be a high priority.

(3) Nowcasting

Presentations at the meeting also highlighted the continued importance of AMVs for tropical cyclone nowcasting. In addition to the AMVs themselves, products derived from AMVs, such as the UW/CIMMS vertical wind shear index, have been particularly useful for real-time monitoring and prediction of cyclone intensification. Currently, the real-time wind products are distributed via the World Wide Web (WWW). However, UW/CIMSS has recently rewritten their software to allow users to run the wind retrievals locally, rather than relying upon the WWW to obtain the real-time data.

(4) Data Format and Accessibility

The WG recognized the need for a standardized BUFR format to encode satellite wind data. Specifically, the WG recommends that CGMS requires:

- Wherever possible, the use of local BUFR table entries is avoided; and
- Where no existing table entry exists, the data provider should instigate the introduction of such an entry through the standardized WMO procedure.

Furthermore, despite the widespread availability and reliability of the core BUFR encoding/decoding software provided by ECMWF, the WG noted that some data providers and users still have difficulty encoding and decoding satellite data. To help resolve the issue, the WG recommends that CGMS:

- Ask the centers with existing BUFR software to make their software available. This software would be provided as it is, and would form an example of the necessary procedure for other data providers.

Finally, the WG noted that the current difficulties in obtaining high-resolution satellite radiance data, from both historical and real-time archives, was a substantial impediment and prevents a significant portion of the research community from using the data. Such limitations clearly hinder the effective utilisation of the data and the WG therefore recommends that efforts be taken to facilitate the free and open access to the satellite archives. This is important in the view of a better understanding of the benefits and drawbacks between assimilation of wind data vs. radiance data.

(5) Education and Training

The WG noted the recent enhancement to the WMO strategy for Education and Training in Satellite Matters through the development of a virtual laboratory to improve satellite data utilisation, education and training. The virtual laboratory has at its core a global network of specialized centers of excellence for education and training. The virtual laboratory, with the group of centers having access to the Internet, would provide a global forum for the exchange of expertise, knowledge, and education and training with specialized focus groups such as found at the International Winds Workshops. The WG requests that the IWW use the CGMS Winds listservers and the virtual laboratory to assist in education and training for interested participants.

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