

PRODUCT QUALITY DURING OPERATIONAL SATELLITE CHANGES

(Submitted by WMO)

Summary and purpose of document

The purpose of this document is to highlight the importance to the Numerical Weather Prediction (NWP) community of achieving an orderly transition in the generation and distribution of satellite data and products during changes to the configuration of the space-based Global Observing System. It illustrates the subject by stressing the need for satellite operators to maintain an effective dialogue with NWP centres in order that Atmospheric Motion Vector (AMV) products from new satellites achieve at least the quality of the products from predecessor satellites and that the latter are not withdrawn before this quality is attained.

ACTION PROPOSED

- (1) To note the importance to NWP of maintaining continuity in the quality of derived products upon satellite changes,
- (2) To discuss the proposal to seek for a contribution of NWP centres in the validation process of new derived products such as AMW that are intended for NWP use.

DISCUSSION

Background

1. This document is based on a contribution from the United Kingdom Met Office to the first session of the Expert Team on Satellite Utilization and Products (ETSUP-1) held 17-21 October 2005 in Geneva.
2. The impact of satellite products on NWP model performance is as great, or arguably even greater, than all other observation types combined. When changes to the configuration of the space-based Global Observing System occur it is vital that this impact on NWP models is not adversely affected by the associated transition in the generation and distribution of operational satellite data and products by satellite operators.

Discussion of issues raised by the introduction of new operational satellites

3. The practice generally adopted by satellite operators is that new satellites achieve "operational" status after a period of in-orbit testing and that the declaration of the achievement of this status is the responsibility of the operator concerned with the routine operation of the satellite.
4. There is some variability, however, in how such changes are reflected in the space-based component of the Global Observing System as sometimes newly declared operational satellites complement existing ones whereas sometimes they replace them. Typically, although not exclusively, the former applies to polar orbiting satellites and the latter to geostationary ones. The scope of this document is limited to the case in which a new satellite replaces an existing one.
5. The decision to declare data and products operational typically depends on the verification of a priori requirements on attributes such as accuracy, stability and availability. Such requirements, if they exist, are typically formulated well in advance of the in-orbit testing phase and hence do not usually take into account advances in techniques and improvements in the quality of the data and products that they will replace.
6. In the case of AMV products quality is measured primarily via comparison with independent measurements (e.g., radiosondes) and with model analysis fields.
7. In the scenario when new products are declared operational and predecessor products withdrawn there exists the potential to degrade NWP model performance if the new products are of a lower quality than the predecessor ones.
8. It is proposed that satellite operators assign a period of time during which AMV products from new satellites are distributed in parallel with those from predecessor satellites and moreover that activities are initiated during this period to ensure new products achieve at least the quality of predecessor products (by common agreement) before the latter are withdrawn.
9. It is further proposed that common agreement about AMV quality requires that satellite operators engage NWP centres in these activities in order that the impact of the new products on NWP models forms part of the decision-making process. It should be noted that several NWP centres already monitor AMV quality as a routine activity (although not always in real time).
10. It would be of considerable benefit to AMV users if the results of product quality monitoring were placed in the public domain.
11. It may be worthwhile to note that experience at the Met Office has shown that new AMV products typically require a period of 6-8 weeks, and sometimes longer (especially in the case of

the introduction of 'new generation' spacecraft), before they are consistently of sufficient quality to consider for assimilation into models.

Conclusion

12. CGMS satellite operators are invited to consider the proposals above. The meeting will be informed verbally of the outcome of the ET-SUP discussions on this issue.
