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INTERNATIONAL SCIENTIFIC WORKING GROUPS

STATUS REPORT FROM IWWG INCLUDING IWWG-13 WORKSHOP RESULTS

(Submitted by Jaime Daniels, NOAA and CGMS Rapporteur of IWWG)

Summary and Purpose of Document

This document reflects the draft report of the International Winds Working Group to the 45th session of the Coordination Group for Meteorological Satellites (CGMS-45), also provided herewith to IPET-SUP-3.

ACTION PROPOSED

The third session is invited to note content and recommendations provided in this report.

CGMS-45 IWWG-WP-01
June 2017

Prepared by EUMETSAT
Agenda Item: 04/E1.1
Discussed in WGII/Plenary

ATMOSPHERIC MOTION VECTORS AND IWWG TOPICS: REPORT FROM THE INTERNATIONAL WINDS WORKING GROUP

The paper summarizes the ongoing activities and relevant discussion items of the IWWG.

This paper summarises the main outcomes of the 13th International Winds Workshop (IWW13). The workshop was held at the Asilomar Conference Center, Monterey, California USA between 27 June and 2 July 2016. There was a good cross-spectrum of attendance with 60 participants from a wide range of satellite producers, NWP centers, and research centers. This paper:
i) recalls recommendations from CGMS-44 to IWW13
ii) highlights some high priority activities and outcomes and recommendations from IWW13

CGMS-45 is invited to discuss the outcomes and recommendations from IWW13.

Status report from the International Winds Working Group

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1 INTRODUCTION

This paper summarises the main outcomes of the 13th International Winds Workshop (IWW13) held at the Asilomar Conference Center, Monterey, California USA between 27 June and 2 July 2016.

The local Coordinator was Dr. Nancy Baker (U.S. Naval Research Laboratory).
The worshop was sponsored by: EUMETSAT, NOAA, and the WMO and co-chaired by Mary Forsythe (Met Office) and Jaime Daniels (NOAA/NESDIS). Approximately 60 participants from 14 countries attended the IWW13.

The workshop included the following sessions:

1) Updates on operational products
2) Latest developments in AMV derivation
3) AMV quality and impact
4) Use of satellite derived winds in NWP
5) Hyperspectral and stereo-height AMVs
6) High resolution satellite-derived winds
7) Doppler wind lidar

Two parallel working groups on Thursday afternoon discussed:

- WG1: Wind Extraction Methods
- WG2: Data Assimilation

Three plenary discussions included:

- AMV quality information from derivation
- Review of WMO/OSCAR wind requirements
- 3rd AMV intercomparison

The workshop also included a poster session. A total of 16 posters, covering a wide variety of topics, were on display over the course of the workshop and provided discussion topics during coordinated breaks in the schedule.

2 IWW13 HIGHLIGHTS

Winds from New and Future Instruments

Updates to operational products focused mainly on the next generation of geostationary satellites, with the operations of Himawari-8 at JMA, the preparation of

GOES-R launch at NOAA (now GOES-16), and the presentation of MTG-FCI AMV extraction algorithm at Eumetsat. Low Earth Orbit satellite presentations included VIIRS winds extracted at high latitudes, the Leo-Geo AMV product developed at CIMSS, and Global AVHRR AMV product produced at EUMETSAT to fill the gap of AMV observations in the 50-70 (north and south) latitude bands.The end of operations of Meteosat-7, and the drift of MSG Meteosat-8 over the Indian Ocean were also discussed, A scenario planned for the end of life of Metop-A and the launch of Metop-C was presented. All of these upcoming operational changes are expected to produce more AMVs with a better resolution and a better quality.

Extraction of wind profiles from satellites has been a prominent topic within the IWWG. At IWW13, several presentations on lidar (ADM-Aeolus, Athena-OAWL missions), and on hyperspectral sounders (AIRS, IASI. MISTiC winds) were presented. ADM-Aeolus is presently planned to be launched in December 2017. Working Group 2 on data assimilation is looking forward to Aeolus data which will provide profiles of line-of-sight winds, but noted that currently there is no secure follow-on mission. A demonstration of a 3D AMV product extracted from AIRS moisture retreivals was discussed by CIMSS, and new 3D winds algorithm using optical flow methods on IASI L2 humidity products is in development at EUMETSAT. Even though the way to use wind profiles extracted from hyperspectral IR sounders in NWP models is not very clear yet, both IWW13 working groups WG1 (Methods) and WG2 (Assimilation) recommended pursuing further investigations into this topic.

Assimilation of Satellite Winds in Numerical Weather Prediction (NWP) Systems

The assimilation of Himawari-8 AMVs produced positive impacts in NWP forecasts at a number of NWP centres (JMA, ECMWF, DWD, NCEP) due to their improved quality as a result of the improved spectral, temporal, and spatial resolution of the Advanced Himawari Imager (AHI) observations. VIIRS AMVs have been found to have similar quality compared to existing MODIS and AVHRR AMVs over the polar regions, and produces a neutral to slightly positive impact in global forecasts at NWP centres (ECMWF, NCEP, Met Office, DWD). Finally, the assimilation of the new Global AVHRR product resulted in positive forecast impacts at several NWP centres as a result of the introduction of winds observation in the 50-70 latitude band (north and south) where gaps in coverage occur between geo and polar AMVs (ECMWF, DWD, NCEP, Met Norway). Scatterometer data from RapidSCAT, OceanSAt-2 or HY-2A have also shown a significant positive impact on analysis and forecast wind fields (Meteo-France, DWD, Met-Office).

Surface winds continue to be an important component of NWP data assimilation. NRL showed small positive Forecast Sensitivity to Observation Impact (FSOI) scores for all instruments within the U.S. Navy's Navy Global Environmental Model (NAVGEM). Greater forecast impacts for the 6 and 18 UTC runs were observed. DWD performed a data denial experiment involving HY-2A and OceanSat-2 scatterometer AMVs. Data denials of these two datasets showed a clear degradation of the forecast. In general, the use of scatterometer data at DWD shows significant positive impacts in both the analysis and forecast.

The Met Office assimilates surface wind vectors from scatterometers in their models. They reported on the use of the RapidScat dataset (Septemer 2015) in their global model. Overall, neutral or small positive impacts in the forecasts were observed, but some negative impacts in the SH were seen.

The addition of RapidScat winds in a number of forecast systems led to a reduction in the mean positional error of tropical cyclones. The Meteorological Service of Canda (MSC) began assimilating RapidScat winds in March of 2016. Combined with the new datasets of Himawari-8 and SNPP, these winds showed a neutral to positive impact. ASCAT are given precedence over the RapidScat vectors in MSC. Meteo France also reported on RapidScat AMVs and found that they improve the global forecasts and the tracking of Tropical Cyclones. ECMWF discussed their attempts to improve the assimilation of ASCAT AMVs. The use of the Huber Norm error measure for ASCAT data showed positive impacts in the Tropics and Southern Hemisphere. Tests on the use of reduced thinning with a higher observation error showed promising results. Future tests will attempt to combine thinning + observation errors + Huber Norm are ongoing. Initial evaluations using the Soil Moisture and Ocean Salinity (SMOS) wind speed database is ongoing.

The improvement of AMV quality and better use of AMVs in NWP systems are both long standing discussion items at wind workshops. Height assignment remains the dominant source of error in AMV retrievals and several NWP centres (ECMWF, Met Office, CIMSS, NASA/GFSC) reported on their work involving the assessment and use of cloud property information provided by a number of satellite producers to improve the use of AMVs in their NWP systems. Studies at the Met Office and NOAA/NCEP, for example, tested the potential of new cloud property parameters associated with NOAA's nested tracking algorithm that may help the assimilation of AMVs in their NWP models. Cloud microphysical parameters, such as the median optical depth and the median cloud top pressure error, have shown potential and are expected to be introduced in the new AMV BUFR sequence currently being developed. Close collaboration with the ICWG is highly encouraged to understand and better define the microphysical parameters that can be useful for AMV assimilation in forecast models.
The plenary discussion on AMV quality also emphasized the need to investigate and develop specific feature tracking error estimates that could then be used within NWP systems.

Reprocessing activities

Eumetsat was the most active reprocessing center during this reporting period. Eight years of MSG AMVs have been reprocessed with the latest AMV software (2004 – 2012). Plans to include Meteosat first generation are dependent on the new software development (1981 – 2004). Metop-A has been reprocessed for the entire period (2007 – 2014), using both the heritage NOAA/CIMSS algorithm and the latest Eumetsat algorithm. CIMSS is finalizing plans to reprocess the GOES GVAR series (8-15) with the NOAA GOES-R AMV algorithm software.

The current status of the reprocessing for polar and geostationary AMVs in the framework of SCOPE-CM project can be found in Annex 2 of this report.

Outcomes of the plenary discussion on OSCAR database update are summarized below in response to **CGMS R43.12 WG/II.**

Outcomes of the plenary discussion on the preparation of 3rd Intercomparison study are summarized in section 4.1 below.

The proceedings of IWW13 can be found on the IWWG website at:
http://cimss.ssec.wisc.edu/iwwg/iww13/proceedings_iww13/index.html

3. STATUS OF CGMS-44 RECOMMENDATIONS

The current status of CGMS-44 and IWW13 recommendations are presented below and focus particularly on the higher priority items. The complete list of IWW13 recommendations can be found in Annex 1 together with the IWW13 Working Groups reports.

HLPP 3.2.1: Infer guidance from the ongoing intercomparison of AMV products for the future developments towards consistent AMV products. Consider in the guidance the future perspective of having the geostationary ring populated with 16-channel imagers.

Several IWW13 recomendations are directly relevant to HLPP 3.2.1:

1) Conduct a third AMV Intercomparison study in 2017 primarily to investigate the following:
- The effect of using imagery from the newest satellite series (Himawari 8/9 or GOESR),with higher spatial resolution, higher temporal resolution, and more spectral channels in the AMV calculation. The new spectral channels will bear new information on cloud microphysics, especially the temporal changes (from slot to slot) will be useful to better understand the characteristics of the tracked cloud.
- The effect of using different QI processes and different target selection processes in the different AMV algorithms.

2)Develop a Common Quality Indicator (QI) software routine that will be implemented by all satellite producers.
3) Complete a proposal for a new AMV BUFR sequence.

HLPP 3.5.2: Address the error characteristics of wind products at the next International Winds Workshop in 2014 and provide a set of guidelines to be considered at the operational centres.

This work is in progress. Several studies presented at IWW13 investigated the possibility to improve the AMV altitude estimation, the height errors, and the use

of cloud microphysical parameters in NWP models. It is especially noteworthy that new cloud parameters estimated from the Nested tracking algorithm and cloud products calculated by optimal estimation methods have the potential to be very useful in AMV assimilation. Long discussions were conducted, including people from ICWG, to define which of these parameters must be stored in the new AMV BUFR sequence. In addition, investigations on how to characterize and capture tracking errors for potential use in NWP data assimilation systems are still encouraged and must be pursued by the agencies.

CGMS A44.11: Plenary session: IWWG to develop a detailed plan for the 3rd wind intercomparison, including concept and deliverables, and an estimate of the required resources.

Plans for the 3rd Intercomparison study are described in section 4.1 below.
A key goal of these AMV inter-comparison exercises is to learn and understand similarities and differences in AMVs produced at different operational centres, and ultimately, to improve quality and consistency. However, even if absolutely necessary, the adaptation of the algorithm and the workload generated by these intercomparison exercises arrive in addition to the normal work load on operations and preparation of future programs. The intercomparisons itself, and especially the analysis of the results is very time demanding. None of the agencies have the resources and a budget available for this. For the 2nd Intercomparison exercise the analysis was funded by NWCSAF via a VSA contract.

The 3rd Intercomparison study is again going to be funded by NWCSAF in the framework of CDOP3, via a VS contract. It is still not decided yet how much funding can be allocated to the analysis of the results by NWCSAF, but we anticipate a slightly smaller budget than allocated for the 2nd Intercomparison study.
As intercomparison exercises occur periodically (more or less every 3 to 4 years) and are recommended by the CGMS, we would like to suggest that the CGMS plan a budget for this and to directly fund these activities in the future.

CGMS A44.10 WG/II: IWWG to pursue intercomparisons of Meteosat-8 and FY-2/4 winds over the IODC region. During the transition phase also Meteosat-7 should be considered.

CMA has been given special access rights by EUMETSAT to access Meteosat-8 data over the IODC since December 2016 which is before the satellite was declared operational. Results of the intercomparisons between Meteosat-8 and FY-2 AMVs realised by CMA are compiled in a separate CGMS-45 CMA working paper. Other European NWP centers are also presently doing some comparisons between Meteosat-8 and FY-2 AMVs, but these studies are still ongoing and no results are presently available for this report.

CGMS R43.12 WG/II: IWWG to liaise with the application focal points in the WMO RRR process (on IPET-OSDE) to provide feedback on the winds-related observation requirements in the RRR database.

Inputs from the IWWG for the WMO OSCAR Database regarding the 'wind (Horizontal)' capabilities have been provided to the WMO in November 2016. Several updates have been proposed, mainly concerning the gap analysis due to the recent production of new wind products at high latitudes (Leo-Geo, Single and Global AVHRR wind products). The global AVHRR wind product extracted from dual Metop operation also has global coverage. Moreover, 3D winds are presently produced over Polar Regions in a demonstration mode at CIMSS from the AIRS instrument.
The IWWG will continue to provide feedback on the requirements as needed.

4 KEY IWW13 RECOMMENDATIONS

The highest priorities of the IWW13 Recommendations are detailed below. A complete list of the working groups recommendations can be found in Annex 1 of this report.

IWW13.1 Investigate the possibility of completing the 3rd AMV intercomparison by the next IWWG in mid-2018. This includes coordinating with the ICWG intercomparison and including the examination and use of MISR winds and heights.

See section 5 which describes the detailed plan for the 3rd AMV Intercomparison study.

IWW13.2 IWW13 supports August 2016 as the deadline for initial BUFR content definition. This definition should include cloud properties and the definition of error characterisation elements.

IWW13.3 All AMV producers to adopt the new AMV BUFR format once it has been finalised. A 2-3 month overlap period of providing the same data in the new and old format should be provided, assuming the above-mentioned test data has been provided 3 months earlier.

The development of a new AMV BUFR sequence has been discussed within the IWWG and its members over the last two years. The new capabilities of the AMV algorithms developed for the next generation of geostationary satellites (Himawari, GOES-R, MTG-FCI) and the use of Cloud products estimated from Optimal Estimation (OE) schemes provide the possibility to store several new cloud parameters in the AMV output files. There is some initial evidence that some of these cloud parameters enable improved AMV error characterization. One example includes cloud top pressure estimates eminating from the cloud height retrieval OI scheme. New cloud parameters that contain microphysical cloud information, may be linked to the AMV extraction scheme itself (the tracking cluster size for example). Discussions at IWW13 were very long as these new parameters need to be tested first in order to determine which ones must be stored in the AMV output file for better use in NWP applications. It is understood that the new AMV BUFR

sequence will likely include new variables that not all satellite wind producers will be able to fill immediately since they do not apply to their specific algorithm. Recently, a good consensus on the new AMV BUFR sequence was achieved between satellite operators and it will be submitted to the WMO Codes Team.

IWW13.4 IWW13 recommends the production of a succinct report detailing global wind processing status in relation to the production of a historic global wind datasets suitable for use in reanalysis and climate studies. This report should be available at CGMS (2017) and for IWW14.

The current status of the reprocessing for polar and geostationary as for April 2017 can be found in Annex 2 of the report.

IWW13.5 AMV producers to provide higher-density AMV products that capture small-scale detail for mesoscale applications. Rapid scan configurations are particularly suitable for this.

IWW13-WG1 Rec. 1: IWW13 encourages collaboration and sharing of software modules and elements between producer centres to compare the methods and algorithms components and assist in the production of consistent high quality products.

IWW13.6 Recommendation to space agencies: to implement satellite missions that allow the provision of wind profile information with global coverage (e.g., DWL, hyperspectral IR with high temporal frequency and spatial resolution).

There continues to be an unmet requirement of wind profile observations with sufficient global and temporal coverage. The NWP community is looking forward to Aeolus data which will provide profiles of line-of-sight winds, but notes that currently there is no secure follow-on mission.

5 PREPARATION FOR THE 3RD AMV INTERCOMPARISON STUDY

For the 3rd AMV inter-comparison study it is proposed to use images from JMA's Himawari-8/AHI, the first of the next generation series of geostationary imagers with higher spatial resolution, higher temporal resolution, and more spectral channels. The new spectral channels bear new information on cloud microphysics and the higher temporal resolution should allow us to better understand the characteristics of the tracked cloud. The IWWG co-chairs discussed with the ICWG liaison, Dr. Andrew Heidinger (NOAA/NESDIS), the IWWG's desire to select image triplets from H-8/AHI data that the ICWG intends also to use for its next cloud intercomparison study.
The date finally chosen is 21 July 2016, allowing collocation with Radiosonde observations at 12:00 UTC and with A-Train and MISR winds around 05:23 UTC.

Two sets of data will be gathered and used during the study:

1) Collocations with Radiosondes
- Himawari image radiance files (21 July 2016, 12:00 ; 12:10 ; 12:20, UTC)
- Forecast files for 12:00 and 18:00 UTC (ECMWF)
- Radiosonde observations for 12:00 UTC
- Corresponding Scene and cloud mask files
- Corresponding CLA/CTH files

2) Collocations with A Train
- Himawari image radiance files (21July 2016, 05:30, 05:40 and 05:50 UTC)
  A- Train overpass being at 05:23:19 UTC
- Forecast files for 00:00 and 06:00 UTC
- Corresponding Scene and cloud mask files
- Corresponding CLA/CTH files

For each datasets, two specific tests will be performed:

Test 1: All wind producers use a prescribed configuration. The intent of this test is to remove the impact of different configurations used by the satellite operators, thus allowing for the best possible apples-to-apples comparison of target selection, feature tracking, height assignment, and quality control algorithms used by the different satellite operators.

Test 2: Each wind producer can use their own configuration. The intent of this test is to compare the performance of the AMV datasets generated by each satellite producer using their best practices.

Comparisons against model background winds and model best-fit pressures will also be performed.

The data are available on the EUMETSAT FTP server, and the AMV extraction test will end in September 2017 to allow an analysis of the results before the next International Wind Workshop (April 2018).

6 CONCLUSIONS

The 13th International Winds Workshop hosted at the Asilomar Conference Center, Monterey, California continued the series of successful meetings. All recommendations from CGMS-44 were discussed, together with other key scientific issues, during the working group and plenary discussion sessions. During the workshop, a number of recommendations were proposed which are listed in Annexe 1. IWW13 presentations illustrated the starting of a new era for satellite observations with the AMVs extracted from the new generation of geostationary satellites (Himawari, GOES-R and preparation of MTG-FCI), the increase of AMV production over high latitude areas (VIIRS, Leo-geo, global AVHRR, MISR) and the first wind profiles extraction algorithms from IR sounders data (AIRS, IASI). The latest versions of the AMV algorithms and the use of the new Cloud Products obtained by optimal

estimation methods provide new possibilities to better characterize both the tracking and height assignment errors. This creates several rooms of improvements of the use AMV in NWP models, and necessitated a long discussion on the change of the AMV BUFR sequence.

The continued success of IWWG is greatly helped by the collaborative projects ongoing within the community, and especially the Intercomparison studies. These are a very useful way to address a number of issues and we invite CGMS-45 to support continued collaboration by enabling specific studies and by providing appropriate funding. A fruitful collaboration started with ICWG that is highly encouraged to continue in the future given the the number of common scientific questions shared by the two groups.

We also continue to advocate that CGMS agencies provide support for future IWWG workshops including travel for its scientists to attend and participate in them. As a final point to note, the current IWWG co-chairs would like to announce that the Fourteenth International Winds Workshop (IWW14) planned in April of 2018 on Jeju Island, South Korea.

Annex-1

IWW13 Working Group 1 Recommendations.

- **Rec .1**: IWW13 encourages collaboration and sharing of software modules and elements between producer centres to compare the methods and algorithms components and assist in the production of consistent high quality products.
- **Rec. 2**: IWW13 encourages all producers to document the settings used in their systems in production of high resolution winds. To assist in this task a template will be available on the IWW website and the collected data will be made available to the community.
- **Rec. 3**: There should be continued discussion with wind product users and NWP centres in order to determine the optimal error characterisation that should be included in data products.
- **Rec. 4**: There should be a Common QI (CQI) defined before the Third AMV Intercomparison Study for use by participants and for consideration for wider use afterwards in data/BUFR files. There should also be an EE included where computed, in data/BUFR files.
- **Rec. 5**: IWW13 supports August 2016 as the deadline for initial BUFR content definition. This definition should include cloud properties and the definition of error characterisation elements. IWW13-WG1 Recommendation 6: IWW13 supports a CF-compliant netCDF format for AMVs.
- **Rec. 6**: IWW13 supports a CF-compliant netCDF format for AMVs.
- **Rec. 7**: IWW 13 recommends the production of a succinct report detailing global wind processing status in relation to the production of a historic global wind datasets suitable for use in reanalysis and climate studies. This report should be available at CGMS (2017) and for IWW 14.
- **Rec. 8**: Investigate the possibility of completing the next winds intercomparison by the next IWWG in mid-2018. This includes coordinating with the ICWG intercomparison and including the examination and use of MISR winds and heights
- **Rec. 9**: Further studies should be undertaken to assess the value of winds from hyperspectral retrievals.
- **Rec.10**: Further studies should be undertaken to further assess the value of MISR or MISR-like instrumentation for global wind retrieval.

IWW13 Working Group 2 Recommendations.

- **Rec.1** to NESDIS: To make the GOES AMVs processed with the GOES-R algorithm available to the community in the current BUFR format as soon as practical.
- **Rec. 2** to AMV producers: To provide a 9-month overlap period when transitioning to a new generation of satellites and for major derivation changes.
- **Rec. 3** to AMV producers: to provide notification of significant upcoming changes in the data provision via the IWWG email list with sufficient notice according to the nature of the change
- **Rec. 4** to EUMETSAT: to introduce an AMV-specific UNS category
- **Rec. 5** to NESDIS: to make offline test data available for the new BUFR template once it has been approved by WMO (e.g., 1 time slot would be sufficient) for technical testing/implementation.

- **Rec. 6** : All AMV producers to adopt the new AMV BUFR format once it has been finalised. A 2-3 month overlap period of providing the same data in the new and old format should be provided, assuming the above-mentioned test data has been provided 3 months earlier.
- **Rec. 7** to AMV producers: to provide comprehensive documentation on the derivation algorithms, including a clear description of what will be provided in the new BUFR format
- **Rec. 8** to space agencies: to implement satellite missions that allow the provision of wind profile information with global coverage (e.g., DWL, hyperspectral IR with high temporal frequency and spatial resolution).
- **Rec. 9** to AMV producers: to consider backwards compatibility when designing current AMV algorithms, so that present state-of-the-art algorithms can be applied to old imagery.
- **Rec. 10** to AMV producers: to provide higher-density AMV products that capture small-scale detail for mesoscale applications. Rapidscan configurations are particularly suitable for this.

Annex-2

Report on wind processing status in relation to the production of a historic global wind datasets suitable for use in reanalysis and climate studies

From Marie Doutriaux-Boucher, EUMETSAT

Table 1 below presents the status of the reprocessing for polar and geostationary AMVs as of April 2017. The SCOPE-CM project, led by JMA, is coordinating the AMV reprocessing efforts.

Space Agency	Contact	Status
EUMETSAT	Marie Doutriaux-Boucher (marie.doutriauxboucher@eumetsat.int)	**Available (from EUMETSAT archive)** **MSG SEVIRI geostationary** Meteosat-8 (01/01/2004 - 25/09/2006) Meteosat-9 (25/09/2004 - 31/12/2012) **AVHRR polar** Metop-A March 2007 - 2014 using EUMETSAT and CIMSS algorithms Those dataset where made available to NWP for reanalysis activities.
		Planned (2018) **Geostationary AMVs** MFG/MSG (Meteosat2 to Meteosat 10) AMVs from 1982 using an adapted version of the MSG EUMETSAT algorithm for AMVs from MVIRI onboard MFG satellites **Polar AMVs** Entire series of polar AMVs derived from AVHRR instrument onboard NOAA and Metop satellites (inputs are AVHRR level1c pygac data).
CIMSS	Dave Santek (dave.santek@ssec.wisc.edu) Chris Velden (chris.velden@ssec.wisc.edu)	**Available** **Geostationary AMVs** Phase A: UW-CIMSS reprocessed AMVs from GOES satellites back to 1995 and up through 2013 using the heritage operational NESDIS processing algorithm. Data was made available to NWP centers for reanalysis efforts. **Polar AMVs** AVHRR AMVs. It covers 1982-2014 for the two operational NOAA

		satellites (NOAA-7 to NOAA-18).
		Planned **Geostationary AMVs** *Ongoing*: Phase B: updated phase A AMV record to the period 1995-2016. *End of 2017*: NESDIS will reprocess the entire period (1982-2016) using the new GOES-R processing algorithm. **Polar AMVs** MODIS AVHRR reprocessing is planned (no date to when available).
JMA	Kazuki Shimoji (kazuki.shimoji@met.kishou.go.jp)	**Available** **Geostationary AMVs** Reprocess for MTSAT AMV for 2014.
		Planned **Geostationary AMVs** *Ongoing*: MTSAT AMVs for 2013
ISRO	Sanjib Deb (sanjib_deb@sac.isro.gov.in)	None
CMA	Lu Feng (lufeng@cma.gov.cn)	
KMA	Sung-Rae Chung (csr@korea.kr)	

Table 1: Status of the reprocessing at various space agencies as reported at the end of April 2017.