Introducing Actions/Recommendations from CGMS to the 15th International Winds Workshop

Jaime Daniels (NOAA)
CGMS Rapporteur for IWWG

with IWWG co-chairs
Regis Borde (EUMETSAT)
Steve Wanzong (UW/CIMSS)

Welcome to IWW15!

Thank You!!

- To KNMI for hosting this workshop and to Ad Stoffelen (KNMI; local coordinator).
- To our IWWG co-chairs, Regis Borde (EUMETSAT) and Steve Wanzong (U/W CIMSS).
- To all of you for your contributions and “Virtual” attendance at this and past workshops.
- To our meeting sponsors: WMO, CGMS, KNMI, EUMETSAT, NOAA, UW-Madison.

OUTLINE

- CGMS Goals
- CGMS International Science Working Groups.
- IWWG Terms of Reference (ToR)
- CGMS High Level Priority Plans (HLPPs)

  Actions and Recommendations Reviewed at CGMS-48

Coordination Group for Meteorological Satellites (CGMS)

- The main goals of the coordination activities of the Coordination Group for Meteorological Satellites
  - Support operational weather monitoring and forecasting as well as climate monitoring, in response to requirements formulated by WMO, its programmes and other programmes jointly supported by WMO and other international agencies.

- It is the policy of CGMS to coordinate satellite systems of its members in an end-to-end perspective, including protection of in orbit assets and support to users - e.g. through appropriate training - as required to facilitate and develop shared access to and use of satellite data and products in various applications. This policy is reflected in the structure of the **High Level Priority Plan (HLPP)**, which covers:
  1. Operational Continuity and Contingency Planning
  2. Coordination of Satellite Systems and Operations
  3. Coordination of Data Access and End User Support
  4. Enhancement of the quality of satellite-derived data and Products
  5. Monitoring of Climate including Greenhouse Gases
  6. Space Weather Monitoring
  7. Outreach and training activities

https://www.cgms-info.org/documents/CGMS_HIGH_LEVEL_PRIORITY_PLAN.pdf

The Five International Science Working Groups under CGMS

- **ITWG:** The ITWG was established as a permanent Working Group of CGMS in 1983.
- **IWWG:** The International Winds Working Group was established in 1991 and became a Working Group of CGMS in 1994.
- **IPWG:** The International Precipitation Working Group was established as a permanent Working Group of the Coordination Group for Meteorological Satellites (CGMS) in June 2001.
- **IROWG:** The International Radio Occultation Working Group was established as a permanent Working Group of CGMS at the 37th meeting in October 2009.
- **ICWG**: The International Cloud Working Group was established as a permanent Working Group of CGMS at the 42nd meeting in May 2014.

CGMS WG II (Satellite Data and Products): Serves as a link between the annual CGMS meetings and the CGMS International Science Working Groups which provide regular reports and feedback to CGMS.

The IWWG is to report key outcomes of IWW15 at

- CGMS-49 WG II Session (April 26-28, 2021)
- CGMS-49 Plenary Session (May 19-21)

International Winds Working Group Terms of Reference (ToR)

- CGMS secretariat recently realised that the oldest Scientific Working Groups did not have Terms of References (ToR) that define their purpose and structure.

- **IWWG ToR Status**
  - First draft of ToR for IWWG distributed 31 March to IWW15 mailing list for comments
  - Final version including comments to be distributed before IWW15

- **Next Steps**
  - The IWWG ToR needs to be endorsed by IWWG members at IWW15
  - Will be presented at CGMS-49 WG II Session (April 26-28, 2021)
  - To be endorsed then by CGMS-49 Plenary (May 19-21, 2021)

Actions and Recommendations Reviewed at CGMS-48

- **CGMS-48 Action on the Scatterometer Task Team**

CGMS-48 actions – Plenary Session					
Actionee	AGN item	Action #	Description	Deadline	Status
CGMS members	7.3	A48.	CGMS members to provide point(s) of contact to be part of the SCAT task team (together with Ad Stoffelen, OSVW-VC (Co-chairs Paul Chang/NOAA, Raj Kumar/ISRO, Stefanie Linow/EUM), and IWWG (Co-chairs Regis Bordes/Steve Wanzong),		OPEN
SCAT task team	7.3	A48.	SCAT task team to present the **Terms of Reference, and roadmap** for the work to CGMS-49 plenary for endorsement	CGMS-49	OPEN

- **Scatterometer:** Terms of Reference (TOR) and roadmap will be introduced at CGMS-49 Plenary (May 19-21, 2021).
- Please see Ad Stoffelen's presentation ("CGMS Ocean Vector Winds Task Team") on Friday.

Actions and Recommendations Reviewed at CGMS-48

CGMS High Level Priority Plan (HLPP) Tasks relevant to IWWG

HLPP 4.2.1 Establish commonality in the derivation of AMV products for global users, where appropriate (e.g., through sharing of prototype algorithms), and consider backwards compatibility when designing AMV algorithms for the 16-channel imagers, so that present state-of-the-art algorithms can be applied to old imagery

Action A46.02: All AMV producers to implement the "Common QI module" in their algorithms.

Action A46.03: AMV producers to adopt the new AMV BUFR template.

Recommendation R47.04: ICWG to work with IWWG on the golden days observations to provide cloud height uncertainty for AMV applications *(Tied to 4th AMV Inter-comparison study)*

A46.02: All AMV producers to implement the "Common QI module" in their algorithms

Agency	Status
NOAA	Plan to output it in BUFR files in June 2021.
EUMETSAT	Applied since fall 2019
JMA	Applied since 17 March 2019
KMA	Applied since November 2019
CMA	No answer
NWCSAF	included inside version v2018, since February 2019
ISRO	Not implemented yet

Review at IWW15 and report status to CGMS-49

A46.03: AMV producers to adopt the new AMV BUFR template

Agency	Status
NOAA	New BUFR sequence implemented (3.10.077) in operations on April 23, 2019 and then retired the heritage BUFR sequence on June 16, 2020.
EUMETSAT	New BUFR sequence implemented (3.10.077) in operations on February 3, 2021.
JMA	Scheduled in the second half of 2021
KMA	Scheduled in May 2021
CMA	No answer
NWCSAF	Included inside version v2018.1, since January 2020
ISRO	Not implemented yet

Discuss at IWW15 and report to CGMS-49

Recommendation R47.04: ICWG to work with IWWG on the golden days observations to provide cloud height uncertainty for AMV applications

IWWG 4th AMV Inter-comparison Study

- **Goals of these AMV inter-comparison studies include:**
  - Learn and understand similarities and differences in AMVs produced at different operational centres;
  - Leverage advances in cloud retrieval approaches made by ICWG members to improve AMV height assignment;
  - Improve the quality and consistency of AMVs

- **Golden Day : October 20, 2019**
  - Use GOES-16 imagery for the AMVs
  - Work closely with the Aeolus & MISR teams and the ICWG for processing decisions.
  - Results to be presented at IWW16
  - Final processing decisions will need to be discussed in WG1 and finalized through the email list (4th_amv_comp@g-groups.wisc.edu)

Discuss at IWW15 and report to CGMS-49

Actions and Recommendations Reviewed at CGMS-48

CGMS High Level Priority Plan (HLPP) Tasks relevant to IWWG

HLPP 4.2.2 Investigate the best configurations to be used by the AMV producers for use in global and regional NWP models respectively, and clearly define the appropriate requirements for each of them

Action A46.04: NWP community to define the best configuration to be used by the AMV producers, for use in global and regional NWP models.

Action A46.06: IWWG to look at improving quality indicators for high resolution wind derivation for mesoscale and regional applications. (Ref. CGMS-46-IWWG-WP-01)

Action A46.04: NWP community to define the best configuration to be used by the AMV producers, for use in global and regional NWP models

❑ Context of this action:

- The advent of the next generation geostationary imagers with higher spatial, temporal and spectral resolution brings unprecedented opportunities to generate higher spatial resolution winds (capturing smaller scales?) at higher cadence

- **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.
  - ➢ Emerging approaches: Optical Flow, Stereo, Machine Learning and AI

- Need for the development of high resolution winds and an accompanying assimilation strategy for improving forecasts of high impact weather events using high resolution regional models

❑ Perhaps this Action is not well formulated. If not, what is the correct action(s)?

❑ What are the critical considerations on the AMV producer side and on the NWP side?

❑ What are the Lessons Learned?
- From assimilation studies of high resolution scatterometer winds
- From assimilation studies of AMVs in high resolution regional models

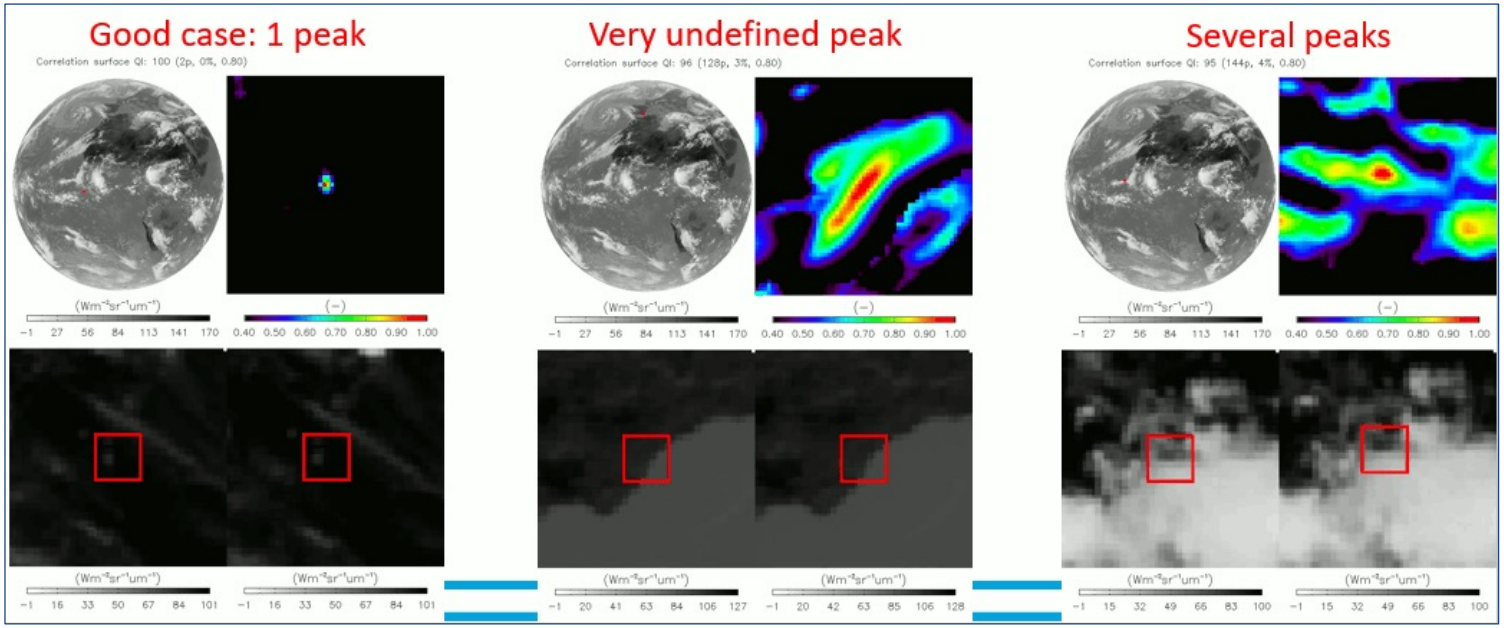
❑ What is the Best Way forward?

To be discussed at IWW15 and reported to CGMS-49

Action A46.06: IWWG to look at improving quality indicators for high resolution wind derivation for mesoscale and regional applications. (Ref. CGMS-46-IWWG-WP-01)

- Both MET Office and EUMETSAT began to investigate the use of surface correlation to improve the quality indicators associated to wind vectors. It should allow a clearer separation of the errors coming from tracking and the errors coming from the height assignment. See G. Kelly presentation in Session 2

Discuss at IWW15 and report to CGMS-49



Actions and Recommendations Reviewed at CGMS-48

A46.07: IWWG to consider developing climate projects from Atmospheric Motion Vectors (AMVs) and to report to the CEOS/CGMS WGClimate with a potential pilot project. (Ref. CGMS-46-IWWG-WP-01)

- IWWG has reviewed the gaps identified by the last Essential Climate Variables (ECV) inventory (https://gcos.wmo.int/en/essential-climate-variables/about/ecv-inventory).
- Status of AMV reprocessing being updated.
- According with the importance of reprocessed AMVs for reanalyses and the remaining gaps in Climate Datasets for horizontal winds, the future plans and international coordination of AMV reprocessing activities will be discussed/assessed at IWW15. ***(IWW15 Session 6)***

Actions and Recommendations Reviewed at CGMS-48

CGMS High Level Priority Plan (HLPP) Tasks relevant to IWWG

HLPP4.2.3: Assess the impact of Aeolus HLOS wind profiles on NWP and investigate height assignment issues using Aeolus data. *(Newly added to HLPP 2020–2024)*

- ❑ Two Aeolus workshops held where it was reported that Aeolus HLOS winds have positive impact on the skill of NWP foreecasts.
- ❑ AMVs compared to Aeolus data will be ongoing with many centers participating.
  - This should be a component of the 4th AMV Inter-comparison Study

We propose to close this HLPP and to discuss a **Recommendation from IWWG to CGMS** on future lidar missions and production of 3D wind profiles.

- ➢ Discussion planned Thursday 13:00-13:30 UTC