

# ICM-15 Action status

Co-chairs and GCOS secretariat

The actions are now classified as:

- GRUAN general actions (GA) 4 (1 HP)
- LC actions (LC) 7 (3 HP)
- TT-led actions (TT) 12 (1 HP)
- Co-chairs (CC) 3 (1 HP)
- Time unbound actions (OA) 5

# GA1 (HP): M10 GDP Progression

- Make final decisions and complete the first version of M10 GDP:
  - Resolve the remaining inconsistency problem for M10 (inconsistency of the results between MODEM and LC)
  - Complete TD for M10
  - Start the certification process for the M10 GDP
- JC. Dupont (IPSL), A. Farah (MODEM), P. Jann (Meteo-France), Lead Centre, TT radiosonde
- By October 2024

# LC1 (HP): Restoration / continuation of UTLS WV measurements at sites

- (i) In view of the continued risk to long-term UTLS WV measurements globally restore measurement programs at the sites that have paused measurement programs and to encourage additional sites to start such programs. (ii) Development of GDPs
- LC, manufacturers, TT sites
- Guidance note from LC to sites on options (Skydew, Liquid N2 CFH) by April. 2024
- Metric of success: Number of sites resumed or initiated programs by ICM-16

# LC2 (HP): Standard Humidity Chamber (SHC)

- Submit paper to justify the use of the SHC in terms of the data quality and the benefits, including the need for standardisation of operating procedures. Provide information on the hardware design to enable opensource production.
- LC
- By October 2024

# LC3 (HP): RS92 v3 GDP Progression

(i) Complete the processing of the RS92 v3 GDP, that includes

- Laboratory experiments
- Production of the GDP

(ii) TT sites to investigate the availability of data and metadata to process historical data.

- Lead Center, TT radiosonde, TT sites
- Complete by the ICM-16

# CC1 (HP): Frostpoint Hygrometer GDP progression

- To oversee the set up of data processor for chilled mirror techniques, considering the need for different processing / uncertainty estimation depending upon cooling technique and instrument configurations. Ensure the provision of at least one TN document for at least one instrument measuring water vapour in the UTLS by ICM-16.
- Co-chairs
- Report on regular meetings with co-chairs
- Viable plan for progression of all frostpoint technique GDPs by ICM-16 to be presented by co-chairs

# TT1 (HP): Justification for high ascent attainment

- TT radiosondes to submit a paper with an analysis of the additional benefits of high-altitude attainment. TT satellite to finalise contributions.
- TT radiosonde, TT satellite
- By June 2024

# LC4: Site metadata

Lead Centre to draft a TN to describe the extension and homogenization of metadata that is required to be collected from the sites based upon insights gained in GDP processing. TT sites to review the document for whether the stated requirements are attainable.

- LC, TT sites
- Next ICM-16

# LC5: Data policy for development versions of GDPs

Produce a Technical Note describing / formalizing a data policy for consideration and adoption by sites. Data policy shall cover specialized data and different development versions of GDPs.

- LC, TT sites
- Oct. 2024

# LC6: Resolve data reporting for sites unable to use RSlaunchclient

- Work with those sites making observations but not currently able to submit for technical reasons to find solutions
- Ongoing discussions to find an acceptable technical solution that does not put too much onus on the Lead Centre on an ongoing basis
- Lead Centre, WG, TT Sites, GCOS Sec
- By ICM-16

# LC7: RS92-RS41 comparison paper

Complete the preparation and submission of RS92-RS41 comparison paper

- Submission to journal
- Lead Centre
- July 2024

# GA2: Graw GDP Progression

Continue implementation of the Graw DFM-17 and DFM-09 GDP according to the objectives and timeline outlined in ICM-15 presentation 6-2.

- Perform laboratory characterizations and implementation of the GDP, begin drafting of the TD and evaluate topics for the peer reviewed paper.
- Present a workable beta version of the GDP, draft of the TD and clear timeline to certification at the next ICM.
- Graw, TT radiosonde, Lead Center
- Report at ICM-16

# GA3: GTH3 GDP progression

Continue to work towards the elaboration of the GTH3 GDP, that includes

- Laboratory and field experiments to characterize the measurements
- Start drafting TD and peer-reviewed paper
- Establish data flow to LC, including raw data
- CMA, Lead Centre, TT radiosonde
- Report at ICM-16

# GA4: Ozonesonde GDP progression

Further progress ozonesonde GDP, including:

- agree on a common procedure for the additional ground check
- get larger data set from GRUAN lead center and develop processing routines
- Holger Vömel (NCAR), Richard Querel (NIWA), Lead Centre, TT radiosondes, TT sites
- Report at ICM-16

# CC2: GRUAN guide and manual

To review options regarding the Guide and Manual and discuss with SC-ON in the next intersessional period. Options are:

1. Retire both documents and fold in GRUAN into the WIGOS Guide and Manual
2. Retire the Guide (relying upon other documentation) and keep the Manual (and update it)
3. Keep both Guide and Manual updating both
  - Co-chairs, GCOS sec, TT co-chairs, AOPC, SC-ON
  - Next ICM-16

# CC3: GRUAN data dissemination

- Resolve outstanding issues around how to serve data publicly via one or more hosts including addressing issues of DOIs and attribution. Including consideration of exposure of data to a broad range of users, ensuring up-to-date data provision, and minimising management. Regular updates on progress to be made to the WG-GRUAN who shall provide input. Up to date records to be made available through at least one portal by ICM-16.
- Co-chairs, LC, GCOS Secretariat, NCEI
- By ICM-16

# TT1: GDPs profile uncertainty correlations

Articulate the current understanding of the vertical correlation structure of uncertainties of GRUAN GDPs (systematic components that apply throughout the profile and the structured random component of uncertainties arising from e.g. pendulum effect and time-lag effects), whether these vary geographically, diurnally or seasonally and propose a solution to provide in support of use in RTM calculations for satellite validation, thereby enhancing the comparison between GDPs and satellite data.

- TT radiosonde, LC, TT satellite
- By December 2024

# TT2: QA/QC framework for GDPs

- Create an ad hoc work team and draft a TN describing a general framework for standardization of QA/QC procedures and nomenclature of GRUAN data products following the principles agreed and discussed at ICM-15. Assess whether current products meet the agreed approach or provide an alternative plan.
- TT sites, LC (Tzvetan), other experts
- Next ICM-16

# TT3: Quality monitoring – Site performance and GCs

LC to provide more regular diagnostics to sites than the annual reports and to come up with a means to alert sites when something is outside expectations with minimal / no manual intervention (minimise LC workload). TT sites to investigate issues identified in present annual reports and then on a sustained basis resolve issues arising from the newly instigated LC tracking moving forwards.

- TT sites, LC
- Report at ICM-16

# TT4: GC for the autolauncher

Autolaunchers are widely used in GRUAN, but they are not equipped with an independent GC. Research is needed to identify solutions. Summarize in a TN the approach to adopt for the implementation of an independent GC for the autolaunchers or the agreed procedure for improving measurements traceability and uncertainty quantification.

- TT-Sites, Meteo Swiss, CNR, manufacturers
- Report at ICM-16

# TT5: comparison of GNSS and radiosonde GDPs

GNSS TT to provide a paper on the comparison between radiosonde and GNSS GDPs. To include additional results as discussed at ICM-15 around co-location uncertainty estimation and possible insights around causes of systematic offsets.

- GNSS TT, LC (Tzvetan)
- By October 2024

# TT6: Uncertainty of the GNSS GDP

GNSS TT to review the TD for the GNSS GDP and to reassess the uncertainties on the IPW GDP. Based upon this review to decide if it is necessary to reprocess with updated knowledge to have a version 2 of the GDP.

- GNSS TT
- By Mar. 2025

# TT7: GNSS-PW data product serving (netcdf files)

- Finalise production of netcdf format files including reprocessing of PoR for GRUAN sites
- Agree netcdf format with Lead Centre and then provide the period of record reformatted.
- TT-GNSS, LC
- Apr 2024

# TT8: LIDAR GDP progression

- i) Provide a TN on the Lidar GDP. ii) Complete the setup of the data flow for all the GRUAN sites equipped with a water vapour lidar
- TT GB
- i) By October 2024, ii) by ICM-16

# TT9: Microwave Radiometer GDP progression

- i) Provide a document on the state-of-art data processing investigating the work made within ACTRIS and ARM program. ii) Report on the development of the Microwave Radiometer GDP through ACTRIS
- TT GB
- i) By June 2024, ii) by ICM-16

# TT10: Satellite co-locations with in situ and ground-based

(i) Progress the how to associate appropriate satellite co-locations with special ascents starting with the RS92/RS41 database. (ii) Experiment for triple co-location (satellite, radiosounding and lidar) in clear-sky conditions for tropospheric humidity.

Work with Lead Centre to implement improved radiosonde database search capabilities wrt satellite overpasses.

- TT-SAT, TT-GB, TT radiosonde, LC
- (i) Mar 2025, (ii) ICM-16

# TT11: RS92-RS41 Parallel soundings database augmentation with ancillary data

- i) Technical Note for sites with guidance issued. ii) Sites submitting data
  - TT Sites, Lead Centre
  - i) by May 2024, LC, ii) by December 2024, TT sites

# TT12: Collocation metadata

To investigate the capability to set up collocation tools (e.g. VICIRS) and enable queries for the GRUAN station via APIs. Tools may operate in the EUMETSAT infrastructure rather than at the LC.

- TT satellite, LC
- By December 2024

# OA1: Radiosonde fundamental documentation

- Completion of radiosonde fundamental TD
- Continued drafting of the TD
- Lead Centre, TT Radiosondes

# OA2: Refresh of presentation materials

- Revise and refresh various materials (flyer for sites, brochure, poster, PowerPoint)
- Identify a priority list of materials to be refreshed and revised and do this as time permits. Improved documentation of status and revision needs (document lifetimes). Consider videos or other methods.
- WG, Lead Centre

# OA3: Improved management and reporting

Manage with a focus to progress High Priority Actions. Regular meetings with the task teams and the Lead Centre. At least quarterly meetings to discuss progress, report issues and update as agreed.

- GCOS Secretariat, WG co-chairs
- Continuous

# OA4: GRUAN sites

- Certification of new sites and recertification of existing sites during the period to the next ICM. Application of the silent data policy
- LC, TT Sites, GCOS Secretariat
- Continuous

# OA5: Sites photographs

Verification that sites are submitting photos. Use of aerial/satellite images to corroborate the metadata.

- Co-chairs
- Continuous

# Anything missing?

- Are there any activities people feel should be in the ICM-15 action list that they have not seen?