Status of Actions from the last ICM

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Summary

- At the last ICM (ICM-15), the actions were classified as follows:
  - GRUAN general actions (GA) 4 (1 HP, high priority)
  - Lead Center actions (LC) 7 (3 HP)
  - Co-chairs (CC) 4 (1 HP)
  - TT-led actions (TT) 13 (1 HP)
  - Time unbound actions (OA) 6
- We go one by one
- Feel free to provide any further update!

Recommendation

- **Please ensure that your talk includes a clear, realistic timeline for completing the related actions.**
- **We encourage you to be concrete in defining what can reasonably be achieved.**

- This is essential for identifying what can be prioritized and what cannot, and it will help the CC support you effectively in reaching the final goals.
- Establishing a well-defined timeline will also ensure that we can demonstrate substantial progress to report to GCOS AOPC and, more broadly, to the scientific community.

GRUAN general actions (GA)

4 (1 HP)

GA1 (HP): M10 GDP Progression

- Description: Resolve reproducibility issue; complete TD ; start certification
- Responsibility: JC. Dupont (IPSL), A. Farah (MODEM), P. Jann (Meteo-France), Lead Centre, TT radiosonde

- Status: TD manuscript reviewed, under revision now
- Talk on Thursday

GA2: Graw GDP Progression

- Description: Continue the progression of the Graw DFM-17 and DFM-09 GDP
- Responsibility: Graw, TT radiosonde, Lead Centre

- Status: Time-lag and other modules need to be added to the processing
- Two talks on Thursday

GA3: GTH3 GDP progression

- Description: Laboratory characterisation, TD, Data flow
- Responsibility: CMA, TT radiosonde, Lead Centre

- Status: Establish contact for lab measurements
- Talk on Thursday

GA4: Ozonesonde GDP progression

- Descritpion:
  - a) Agree on a common procedure for the additional ground check
  - b) Obtain a larger data set from GRUAN Lead Center and developing processing routines
- Responsibility: Holger Vömel (NCAR), Richard Querel (NIWA), Lead Centre, TT radiosondes, TT sites

- Status: . . .
- Talk on Tuesday

Lead Center actions (LC)

7 (3 HP)

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

- Description:
  - Provide guidance on instrument selection for resuming measurement programs at the GRUAN sites
  - Keep track of resumed or initiated measurement programs
- Responsibility: Lead Centre, Manufacturers, TT sites

- Status:
  - Information letter circulated (May 2024). Action closed.

  - Various sites restored / are planning the measurements – See TT Sites report for the details
  - See also LC report Talk by Ruud

LC2 (HP): Standard Humidity Chamber (SHC)

- Description:
  - Submit paper to justify the use of a SHC in terms of the data quality and the benefits;
  - Provide TN outlining guidance on operating procedures;
  - Provide information on the hardware to enable open design manufacturing, noting that different SHCs are being used within GRUAN.
- Responsibility: Lead Centre

- Status: 1st paper draft after summer 2025 . . . Co-chairs more involved

LC3 (HP): RS92 v3 GDP Progression

- Description:
- a) Complete the processing of the RS92 v3 GDP, that includes: Laboratory experiments; Production of the GDP (beta version).
  - Responsibility: Lead Centre
- b) TT sites to investigate the availability of data and metadata to process historical data prior to when they initiated data sharing with GRUAN.
  - Responsibility: TT Sites

- Status:
- a) Radiation tests performed; New data processor architecture complete; Time-lag tests TBD; Looking for old (A/B/C) sondes to properly account for hardware changes during early life of RS92 product line
- b) Historical data submission completed (Action LC3b closed)

LC4: Site metadata

- Description:
  - a) 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.
    - Responsibility: Lead Centre
  - b) review the document and ensure that the stated requirements are attainable.
    - Responsibility: TT Sites

- Status: TN in preparation

LC5: Data policy for development versions of GDPs

- Description:
  - Produce a TN describing / formalizing a data policy for consideration and review by sites, and approval by WG-GRUAN. Data policy shall cover specialized data and different development versions of GDPs.
- Responsibility: Lead Centre, TT Sites, WG-GRUAN
- Status: TN draft sent to the CC and GCOS Sec; TT Sites will review it
- Talk on Friday (& Forum on Tuesday)

LC6: Resolve data reporting for sites unable to use Rslaunchclient

- Description:
  - a) Work with GRUAN sites making observations but not currently able to submit data for technical/policy reasons, to find solutions
  - b) Agree an acceptable technical solution, that does not put too much of an ongoing onus on the Lead Centre.
- Responsibility: Lead Centre, TT Sites, WG-GRUAN, GCOS Sec

- Status: BOM (IT related restriction), Helwan: LC provided solutions, and is waiting for response
- Talk by LC (data flow)

LC7: RS92-RS41 comparison paper

- Description:
  - Complete the preparation and submission of RS92-RS41 comparison paper. Submission to journal.
- Responsibility: Lead Centre

- Status: Draft shared with TT-radiosonde chairs. Awaiting feedback. Will speed up the process after this week.

Co-chairs (CC)

4 (1 HP)

CC1 (HP): Frostpoint Hygrometer GDP progression

- Description:
  - a) Ensure the provision of a TD for at least one instrument measuring water vapour in the UTLS
  - b) Report on regular meetings with co-chairs
  - c) Viable plan for progression of all frostpoint technique GDPs to be presented
- Responsibility: WG-Co-chairs

- Status:
  - CFH: Talk on Tuesday by Holger
  - FPH: “Made progress toward GDP” (Apr 2025) (See also talk by Holger)
  - SKYDEW: Very good progress toward the GDP. Talk on Thursday by Takuji

CC2: GRUAN Manual and Guide

- Description:
  - To review options regarding the Manual and Guide, and discuss with SC-ON (*) during the next intersessional period.
    - (*) SC-ON: WMO Standing Committee on Earth Observing Systems and Monitoring Networks
  - Option 1: Retire both documents and fold-in GRUAN provisions and guidance into the WIGOS Guide and Manual
- Responsibility: WG Co-chairs, GCOS sec, TT co-chairs, AOPC, SC-ON, Lead Centre

- Status: The document named "GRUAN Operations Manual" written, and shared with the WG for final comments.
- Will be finalized during this week.

CC3: GRUAN data dissemination

- Description:
  - Resolve outstanding issues around how to serve data publicly, via one or more hosts, including addressing issues of DOIs and attribution.
  - Include the consideration of exposure of data to a broad range of users, ensuring up-to-date data provision, and minimising management.
- Responsibility: WG Co-chairs, GCOS sec, Lead Centre, NCEI

- Status:
  - NCEI is willing to support current ftp-based data portal for GRUAN GDP data
  - DWD and AWI/PANGAEA are both willing to publish the GRUAN data within PANGEA
- Talk on Friday regarding PANGAEA

CC4: QA/QC framework for GDPs

- Description: Co-chairs to create a team, including all centers providing GRUAN GDPs, to:
  - draft a TN describing a framework for the standardization of QA/QC procedures and nomenclature
  - Assess on whether current GDPs meet the agreed approach or provide an alternative plan
  - All centers providing GDPs should be part of the team
- Responsibility: WG Co-chairs, All centers providing GDPs

- Status: The team created, a TN draft written and shared with the team. Waiting for comments.
- Talks on Friday by Michael and by Fabio

TT-led actions (TT)

13 (1 HP)

TT1 (HP): Justification for high-altitude attainment

- Description: Submit a paper with an analysis of the additional benefits of high-altitude attainment
- Responsibility: TT radiosondes, TT satellite

- Status: Paper has been published in AMT
  - Fujiwara, M., Sun, B., Reale, A., Cimini, D., Larosa, S., Borg, L., von Rohden, C., Sommer, M., Dirksen, R., Maturilli, M., Vömel, H., Kivi, R., Ingleby, B., Kramer, R. J., Demoz, B., Madonna, F., Carminati, F., Lewis, O., Candy, B., Thomas, C., Edwards, D., Noersomadi, Shimizu, K., and Thorne, P.:
  - **Justification for high-ascent attainment for balloon radiosonde soundings at GRUAN and other sites**,
  - *Atmos. Meas. Tech., 18*, 2919–2955, https://doi.org/10.5194/amt-18-2919-2025, 2025.

- Action closed

TT2: GDPs profile uncertainty correlations

- Description:
  - Produce an error covariance matrix for the GRUAN GDPs in support of use in RTM calculations for satellite validation, thereby enhancing the comparison between GDPs and satellite data.
  - This implies elaboration of a smart approach to provide the matrix on a per-profiles to ensure its variability in time and space being properly captured.
- Responsibility: Tom Gardiner (NPL), TT Satellite, TT Radiosonde, Lead Centre

- Status: Tom has drafted a TN, which is under review.
- Talk & Forum on Tuesday led by Tom

TT3: Quality monitoring – Site performance and GCs

- Description:
  - a) LC, in consultation with sites, to provide automatic diagnostics to sites, in addition to the annual reports, and to come up with a means to alert sites when performance are outside expectations
  - b) TT sites to investigate issues identified in present annual reports, and then on a sustained basis resolve issues arising from the new diagnostic tools
- Responsibility: TT Sites, Lead Centre

- Status: A diagnostic web-based tool has been created and revised by Michael, with inputs from sites; sites to give further feedback
- Talk on Monday PM by Michael

TT4: GC for the autolauncher

- Description:
  - A TN is required to describe the approach for the usage of an independent GC for the autolaunchers or an agreed procedure for improving measurements traceability and uncertainty quantification.
- Responsibility: Meteo Swiss, CNR, TT-Sites, TT-Radiosondes, Manufacturers

- Status: A team formed. Two online meetings held. Each of the relevant sites performing experiments.
- Talk on Tuesday PM by Gonzague / Gianni

TT5: Comparison of GNSS and radiosonde GDPs

- Description:
  - TT GNSS 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.
- Responsibility: TT-GNSS, Lead Centre (Tzvetan Simeonov)

- Status: Paper draft available
- Talk on Tuesday AM by Olivier

TT6: Uncertainty of the GNSS GDP

- Description:
  - TT GNSS 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.
- Responsibility: TT-GNSS

- Status: TD6 is under review
- Talk on Tuesday AM by Olivier

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

- Description:
  - a) Finalise production of netCDF format files including reprocessing of GDP for GRUAN sites
  - b) Agree on the netCDF format with LC and then provide the netCDF GDP to the LC by summer 2024.
- Responsibility: TT-GNSS, Lead Centre

- Status: The last updates have been made, and reviewed by the end of October 2025.
- Talk on Tuesday AM by Olivier

TT8: LIDAR GDP progression

- Description:
  - a) Provide a TD on the Lidar GDP
  - b) Complete the setup of the data flow for all the GRUAN sites equipped with a water vapour lidar
- Responsibility: TT-Ground-Based, Lead Centre

- Status: GLASS installed onto LC GRUAN Lidar server; data flow in progress; . . .
- (related? lidar talk on Tuesday)

TT9: Microwave Radiometer GDP progression

- Description:
  - a) Provide a document on the state-of-art data processing investigating the work made within ACTRIS and ARM program
  - b) Report on the development of the Microwave Radiometer GDP through ACTRIS
- Responsibility: TT-GB

- Status:
  - a) Done by Nico
  - b) The procedure is to establish a MoU with ACTRIS. Currently ACTRIS is establishing a MoU with E-Profile. This will be the base for the MoU with GRUAN

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

- Description:
  - a) Work with LC to provide searchable database for satellite instrument collocation, based on queries or files including radiosonde metadata to download co-located profiles only.
  - b) Propose how to apply this for triple co-location (satellite, radiosounding and lidar) in clear-sky conditions for tropospheric humidity.
- Responsibility: TT-Satellite, TT-Ground Based, TT-Radiosonde, Lead Centre
- Status:
  - Satellite collocation tool developed by LC (access restricted to DWD-internally). Further, Michael (LC) has implemented a web tool very recently.
- Talk by LC

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

- Description:
  - a) Technical Note for sites with guidance issued (by LC)
  - b) Sites submitting data (by Sites)
- Responsibility: TT-Sites, Lead Centre

- Status: TN draft reviewed by TT-Sites. After revision, TT-Radiosonde will also review it.

TT12: Collocation metadata

- Description:
  - To investigate the capability to set up collocation tools (e.g. VICIRS) and enable queries for the GRUAN station via APIs (Application Programming Interfaces).
  - Tools may operate in the EUMETSAT infrastructure rather than at the LC.
- Responsibility: TT-Satellite, Lead Centre

- Status: Re: the VICIRS tool provision, Met Office internal admin part completed, waiting for NWP SAF (Sat. App. Facility) partner confirmations... License issues still under discussion, approved at Met Office and now with NWP SAF partners (June '25).

TT13: Establishment of the Scientific Coordination Group

- Description:
  - Provide a white paper describing the mission of the Scientific Coordination Group (SCG) and initial proposal for science topics to address as priorities for the GRUAN data users.
  - Agreed procedure to set up the membership to the SCG and coordinate proposal for funding (e.g. EU COST Actions).
- Responsibility: Tom Gardiner (NPL), Arnoud Apituley (KNMI)

- Status: . . .
- Talk on Thursday by Arnoud

Time unbound actions (OA)

6

OA1: Radiosonde fundamental documentation

- Description: a) Completion of radiosonde fundamental TD; b) Continued drafting of the TD
- Responsibility: Lead Centre, TT-Radiosonde

- Status: No progress

OA2: Refresh of presentation materials

- Description:
  - a) Revise and refresh various materials (flyer for sites, brochure, poster, PowerPoint)
  - b) 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.
  - c) Synchronization with GRUAN website
- Responsibility: WG GRUAN, Lead Centre

- Status: All the materials have been prepared and reviewed
- Talk on Friday by Simone

OA3: Improved management and reporting

- Description:
  - 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.
- Responsibility: GCOS Secretariat, WG Co-chairs

- Status: Continuous
- Talks on Monday & Friday by Co-chairs

OA4: GRUAN sites

- Description:
  - a) Certification of new sites and re-certification of existing sites during the period to the next ICM
  - b) Application of the silent sites policy
- Responsibility: Lead Centre, TT-Sites, GCOS Secretariat

- Status: Continuous
- Talks on Monday PM

OA5: Sites photographs

- Description:
  - a) Verification that sites are submitting photos.
  - b) Use of aerial/satellite images to corroborate the metadata.
- Responsibility: Lead Centre, WG Co-chairs
- Status: Continuous, going as planned

OA6: Monitor progress of the GRUAN IP

- Description: Regularly review and quantify the progress towards completing the actions of the GRUAN Implementation Plan 2024-2030, using performance indicators
- Responsibility: WG Co-chairs, GCOS Secretariat

- Status: Continuous
- Talk on Friday by Fabio

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  - Time unbound actions (OA) 6

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