

Breakout Session 2 –
QA Framework and Quality Flagging

GRUAN guide data levels

- **Primary Raw Data (PRD):** This is the “rawest” form of data available e.g. measured voltages before any processing has been applied. Even for the same instrument, formats of PRD data files are likely to differ between sites. PRD are expected to be archived in perpetuity at the site where the measurements took place, at the internal GRUAN data archive at the Lead Centre, and at the nominated GRUAN central data processing facility for that product.
- **Converted Raw Data (CRD):** These data are stored in a common well-described file format intended for long-term storage. They are pre-processed raw data and might already represent parameters to be used in end-user’s application, e.g. brightness temperature for microwaves or zenith total delay for GPS. CRD are expected to be stored at the site where the measurements took place, at the internal GRUAN data archive at the Lead Centre, and at the nominated GRUAN central data processing facility for that product.
- **Near-real-time Data (NRTD):** This is a data product resulting from preliminary processing of the GRUAN data subject to as many of the additional GRUAN processing steps as can be achieved in the nominal 2 hour NRT window. Increasing efficiencies and streamlining of data processing with time is expected to lead to more of the additional GRUAN processing steps being incorporated into the NRTD. When NRTD are submitted on the WIS to analysis centres, they must be flagged as having originated at a GRUAN site so that they can be treated appropriately. NRTD are expected to be stored at the site where the measurements took place, at the nominated GRUAN central data processing facility for that product, at the internal GRUAN data archive at the Lead Centre, and at the analysis centres to which the data are submitted.
- **Standard GRUAN Product Data (SGPD):** The GRUAN product resulting from all processing steps associated with a single instrument. SGPD are expected to be stored at the nominated GRUAN central data processing facility for that product, at the internal GRUAN data archive at the Lead Centre, and currently at NCDC.
- **Integrated GRUAN Product Data (IGPD):** This is a product that results from the combination of measurements from multiple instruments e.g. a SASBE product (Tobin et al., 2006). IGPD are expected to be stored at the nominated GRUAN central data processing facility for that product at the internal GRUAN data archive at the Lead Centre, and currently at NCDC.

From GRUAN Guide

Quality assurance (QA): The purpose of quality assurance is to provide confidence that the requirements for achieving quality will be fulfilled. QA includes all the planned and systematic activities that will be implemented such that quality requirements for a product or service will be fulfilled.

Quality control (QC): The purpose of quality control is to ensure that the expectations created by QA are fulfilled. QC is associated with those operational methods, techniques and activities used to ensure that the quality requirements (as defined by QA) are fulfilled.

Quality Management (GRUAN Manual)

13.1 The GRUAN quality management policy shall achieve a level of data quality that allows the primary goals of GRUAN to be met for all potential users of GRUAN data products.

13.2. An important aspect of quality management is publication in the international peer-reviewed literature of GRUAN's methods, data, underlying analyses and scientific rationale for decisions made.

13.3. Laboratory tests and intercomparisons are fundamental methods for establishing and confirming uncertainty estimates for GRUAN data products. Field experiments are particularly useful for assuring the quality of GRUAN data products.

13.4. The use of GRUAN data in meteorological analyses and reanalyses also adds to the assurance of GRUAN data quality since the measurements, with their uncertainties, can be tested for comparability with the data assimilation model values in an assimilation setting within the known internal variability of the system.

13.5. The purpose of quality management is to ensure that GRUAN data meet the requirements in terms of uncertainty, resolution, continuity, homogeneity, representativeness, timeliness, format etc. for their intended use, at a minimum practicable cost.

13.6. Establishing close working relationships with instrument manufacturers, metrologists through National Metrological Institutes, and the BIPM (Bureau International des Poids et Mesures), will also be central to quality assurance within GRUAN.

13.7. Performance monitoring within GRUAN will primarily be the responsibility of the Lead Centre, but where other specialists may be co-opted to assist in performance assessments.