

GRUAN IP refresh

Peter Thorne

Greg Bodeker

What, why and when?

- What?
 - A revision to the long-standing Implementation Plan that ran through 2013
- Why?
 - Called for at the previous ICM
- When?
 - Due to be published soon.

Guiding ethos ...

In developing this IP update, the WG-GRUAN has detailed the minimum set of actions required to ensure that GRUAN delivers the services called for by its sponsors and stakeholders, whilst recognizing that not all of these activities can be achieved under current levels of funding. Support by funding agencies for GRUAN within the period 2013 – 2017 as covered by this IP, will largely determine whether GRUAN succeeds or fails in meeting the outcomes requested by its stakeholders.

By 2017 ...

- A network of 20 to 30 sites. Beyond 2017, the time horizon for this IP, the network is envisaged to further expand to reach the longer-term goal of 40 sites. Locations for new sites will be guided using network expansion criteria developed to ensure that GRUAN meets the needs of its four primary user communities (see below). All of these sites shall have been subject to regular assessment and certification. The location of new sites will be chosen proactively to meet documented stakeholder requirements.
- A network serving reference-quality measurements of vertical profiles from the surface through the lower stratosphere (or higher where feasible) of temperature, pressure, water vapour, wind speed and direction, and ozone . To the extent possible, these measurements will be made using redundant measurement systems including sondes and ground based remote sensing equipment. Measurements will be made to GRUAN standards with each data stream processed centrally, and well documented by metadata.
- A set of sustainable long-term measurements being used by recognized target stakeholders (climate change monitoring and detection, satellite-based measurements, NWP, process studies), as demonstrated in the peer-reviewed literature, to improve scientific understanding.
- A network with operational and research functions, embedded within the overarching WIGOS framework and leading to improved capabilities and practices in other broader components of the Global Observing System and its applications.

Ongoing tasks

- Reporting
- Management
- Cooperation with other networks
- Annual ICMs still envisaged
 - Continues to be the case that these ICMs will consider the within year items, modify and update plans as has been the case historically.

Well defined reference observations

- From just RS92 radiosondes to a richer mix of streams:
 - Other operational radiosondes (by 2016)
 - Frostpoint hygrometers (by 2015)
 - Ozonesondes (by 2015)
 - GNSS-PW (by 2015)
 - Lidar (by 2014)
 - MWR (by 2015)
 - FTIR (by 2015)
 - Brewer / Dobson (by 2017)
- For each stream require:
 - Technical documents (see later item)
 - Paper describing the GRUAN data product in peer reviewed literature

Data dissemination / usage: Generic

- Monitoring usage (within the extent permitted) (2013)
- Appending feedback files from analyses centres for data shared over the WIS (2013)
- Sharing with satellite agencies and providing tools (various goals through 2015)
- Real-time QC/QA and feedback to sites (2014)

Data dissemination / usage: specific data flows

- Flow (first date) and formal assessment (second date) of the following data streams:
 - non-RS-92 operational sonde data (2015/2016)
 - Frostpoint hygrometer data (2014/2015)
 - Ozonesonde data (2016/2017)
 - GNSS-PW data (2015/2016)
 - Lidar data (2014/2015)
 - MWR data (2015/2016)
 - FTIR data (2015/2016)

Site certification expansion

- At least 4 sites to be certified per year.
- Formalize outcomes of the Network Expansion Workshop (2013) and solicit expressions of interest from identified top target stations (by 2015)
- Periodic review of the network composition to ensure we are still meeting stakeholder needs (2016 and thereafter)

Address science issues

- Scheduling requirements
 - Temperature and water vapour focus (2014/2015)
- Scientific basis for choosing different instrument combinations (2014)
- Collocation (2013)
- Comparison tools to satellites (2014)

Organizational structure

- Instigate user review group (2015) – see talk on Friday
- Creation of metadata task team (2013)
 - Metadata accessibility (2014)
 - Metadata discoverability (2015)
 - Metadata completeness evaluation (2016)

Visibility

- Launch event (2013)
- GRUAN side event at WMO congress (2015)
- GRUAN network explorer online (2014)
 - Data discovery and visualization

Additional parameters

- Review with partner networks on the state of the measurement science for remaining parameters identified as GRUAN targets in GCOS-112 (2014)
- Report with BSRN on surface radiation measurements (2015)
- Report with GAW on aerosol properties (2016)
- Report with relevant experts / partners (TBD) on cloud properties (2017)

New in this IP ... Tasks that remain open and need to be assigned in future

- Those involved in drafting / reviewing recognized that certain tasks were required but were one or more of:
 - ill-posed
 - had no owner
 - Outside the IP update horizon
 - Dependent upon an action for which one of the above applied.
- The intent of retaining this section is that these actions do not get forgotten and get revisited until resolved.

What is in this section?

- Surface measurement specifications
- NRT data delivery quality of GRUAN processing vs. black box vendor software
- NRT delivery
- Change management assessment procedures
- Holistic assessment of error terms in GRUAN-satellite comparisons
- Combined uncertainties from multiple measurements methodology
- Pedagogical paper on analysis and propagation of GRUAN uncertainties to various applications incl. code
- Combined uncertainty task team?
- Funder involvement

Final plea from me ...

- Please look at Section 6 'within the coming year' activities (up to and incl. March 2014; pp18-23) between now and Friday
- These will form the starting point for putting together the annual plan on Friday afternoon!

Now handing over to Greg...

A meta-discussion on the IP

- Is this the **vision** for GRUAN that the WG agrees on?
- Are we being unrealistic?
- Are we as a group committed to see this happen?
- Do we need to have a target to aim for or is it enough to push ahead doing the best that we can with the (limited) resources available?
- When will we know that GRUAN has succeeded i.e. what is our specific definition of success?
- When will we know that GRUAN has failed i.e. what is our specific definition of failure?

An implementation plan pre-mortem

To ensure that we have carefully considered all the possible ways in which this IP could fail, we would like you all to conduct the following exercise: Start by assuming that the GRUAN IP is adopted as is. Then assume that by 2017 GRUAN has completely failed, the WG and Task Teams have either been disbanded or have become completely ineffectual. Now write down the history of that development as seen from 2017. What went wrong and how did it go wrong? Be creative. Think widely. Have fun with it – it is a thought experiment so don't be shy. Send your contributions to Greg who will synthesize your responses into something (don't quite know what yet).