

GCOS Reference Upper Air Network (GRUAN) GNSS Precipitable Water (GNSS-PW) Task Team

A Task Team of AOPC Working Group on GRUAN (WG-GRUAN)

Terms of reference

June 1, 2014

Background

The GCOS/WCRP Atmospheric Observation Panel for Climate (AOPC) Working Group on GRUAN was established in 2006 in recognition of the importance of initiating reference-quality observations of atmospheric column properties, in particular temperature and water vapour, from the surface into the stratosphere to enhance the monitoring and understanding of climate variability and change. The initial GRUAN Implementation Plan (GCOS-134), published in 2009, was superseded by a new GRUAN Implementation Plan, covering the period 2013-2017, in January 2013 (GCOS-165). At the second Implementation and Coordination Meeting held in Payerne, Switzerland, in March 2010 the Working Group, Lead Centre and initial sites agreed to the instigation of a number of task teams.

The GRUAN Global Navigation Satellite Systems (GNSS) precipitable water (GNSS-PW) Task Team (TT) was established in summer 2010 as one of then six GRUAN TTs. TTs are charged with addressing critical GRUAN requirements. Ground-based GNSS-PW was identified as a Priority 1 measurement for GRUAN, and the GNSS-PW TT's goal is to develop, update and assist implementing explicit guidance on hardware, software and data management practices to obtain GNSS-PW measurements of consistent quality at all GRUAN sites.

Task Team roles and responsibilities

Under the auspices of the WG-GRUAN the GNSS-PW task team was established to:

1. To define and update GRUAN requirements for GNSS observations of Zenith Total Delay (ZTD) and PW and other relevant parameters including measurement range, precision, long-term stability, temporal resolution and data latency.
2. To define and update GRUAN requirements for a state-of-the-art GNSS station. These include receiver and antenna hardware, antenna monumentation, siting criteria and managing changes. The GRUAN technical document #6 (GRUAN-TD-6) titled "GRUAN Ground-based GNSS Site Guidelines" will be reviewed and updated as needed.
3. To work with the GRUAN GNSS-PW central processing center (GFZ) to develop and implement guidance on the type, number, format, temporal resolution and latency of data and associated metadata needed to be stored from the ground-based GNSS measurements and other auxiliary data sources, and data archive and dissemination methods.

4. To develop methods to calculate GNSS ZTD and PW uncertainties for each data point and to work with GFZ to incorporate them into the GRUAN GNSS data stream.
5. To assist GRUAN sites to interpret and implement GRUAN guidelines on GNSS observations and provide expert advice to the sites on questions related to GNSS observations.
6. To encourage and recommend experiments and research pertinent to GNSS observations, data processing, and scientific applications in collaboration with other relevant programmes and projects, such as the European COST project “GNSS4SWEC - Advanced Global Navigation Satellite Systems tropospheric products for monitoring severe weather events and climate”.
7. To provide expert advice to the GRUAN community on other geodetic techniques and applications, such as GNSS radio-occultation (GNSS-RO).

Reporting and governance

- The task team shall be run by two co-chairs and they should be used as primary points of contact for the co-chair of WG-GRUAN and the Head of the Lead Centre as deemed appropriate.
- The task team co-chairs shall report on a six-monthly basis in February and August to the WG-GRUAN via a brief written progress report which will also be posted as part of official documentation relating to GRUAN. These reports will be discussed on a phone conference between WG-GRUAN, the Lead Centre and all task teams with representation from at least one co-chair from this task team.
- At least one task team co-chair and potentially additional task team members shall attend as deemed appropriate and affordable the annual ICMs to report in person on progress.
- The task team is expected to respond to all reasonable formal requests for advice from the WG-GRUAN, Lead Centre, other task teams or sites made on an ad-hoc basis in a timely manner. Guidance on what constitutes reasonable can be solicited from WG-GRUAN as required.

Operations

- The task team will largely coordinate by email and teleconference and take advantage of other meetings where a quorum is in attendance to undertake in-person meetings.
- Task team co-chairs will seek funding for dedicated meetings if deemed appropriate.
- The task team will exist until such time as its roles and responsibilities are deemed to have been completed by the WG-GRUAN.
- Task team terms of reference and membership will be revised periodically, coincident with revisions to the WG-GRUAN ToR or if requested by either party, by the task team members in consultation with WG-GRUAN.
- The task team will be expected to interact with the GRUAN “Site representation” task team, GRUAN sites and other task teams.

Annex

References:

GCOS-134: GRUAN Implementation Plan 2009-2013. GCOS-134, WMO Tech. Doc. 1506.

GCOS-165: GRUAN Implementation Plan 2013-2017. GCOS-165, June 2013.

GRUAN-TD-6: Shoji et al., GRUAN Ground-based GNSS Site Guidelines, v1.0: 23 May 2012.

Membership roster valid (May 27, 2014)

Co-chair:

1. Junhong (June) Wang, State University of New York at Albany, USA (jwang20@albany.edu)
2. Kalev Rannat, Tallinn University of Technology, Estonia (kalev.rannat@gmail.com)

Members:

1. John Braun, UCAR, USA (braunj@ucar.edu)
2. Galina Dick, GeoForschungsZentrum Potsdam, Germany (dick@gfz-potsdam.de)
3. Gunnar Elgered, Chalmers University of Technology, Sweden (kge@chalmers.se)
4. Seth Gutman, NOAA, USA (Seth.I.Gutman@noaa.gov)
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7. Yoshinori Shoji Meteorological Research Institute, Japan (yshoji@mri-jma.go.jp)
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