

# The GRUAN Workshop to Develop Network Design and Expansion Criteria

**Dates:** 13-15 June 2012 (Wednesday-Friday)

**Venue:** GRUAN Lead Centre, Richard Assmann Observatorium, Lindenberg, Germany (near Berlin)

**Background:** The upper air observations at sites within the GRUAN network will provide long-term, high-quality, error-characterized climate records designed to meet the needs of four primary user communities:

1. The climate detection and attribution community: the long-term stability and homogeneity of GRUAN data will provide the time series needed to robustly detect and attribute changes in the climate of the free atmosphere. GRUAN data will also be used to constrain and calibrate data from more spatially comprehensive global networks for improved climate detection and attribution.
2. The satellite community: GRUAN data products will be used to validate satellite-based measurements and to provide the input needed for radiative transfer calculations required to improve and evaluate retrieval algorithms.
3. The atmospheric process studies community: by providing high precision and high vertical resolution measurements of a range of upper air climate variables, GRUAN data products will aid in developing a deeper understanding of the processes affecting the atmospheric column.
4. The numerical weather prediction (NWP) community: The reference quality of GRUAN data makes them useful for verifying NWP model outputs, and for validating and correcting other data being assimilated into NWP models. GRUAN data can also be directly assimilated into NWP models.

**Workshop goals:** GRUAN is currently in an implementation phase that extends from 2009 to 2013 as defined in the [GRUAN implementation plan](#). The initial network consists of 15 sites but is expected to expand to 35-40 sites when it becomes operational in early 2014. That expansion must be carefully planned to most effectively advance GRUAN's scientific objectives. The purpose of the workshop is to understand the network design requirements of each of the communities listed above with a specific goal of addressing these questions:

- What should be the attributes of new sites joining GRUAN to meet the needs of each community?
- What specific environments need to be considered e.g. stations on remote islands or over snow?
- What geographical coverage of sites would best serve each community's scientific needs?
- What large scale climate regimes need to be sampled?
- What are the key considerations for geographical coverage?
- What is the scientific justification/basis for the design of a network to meet the needs of each of community? Have peer-reviewed studies addressed any of the workshop concerns?
- What additional research is required to ensure that the design and operation of GRUAN is based on sound scientific analyses?

**Indicative site selection:** In preparation for this workshop we are asking people from various communities to consider what they would wish as an optimal configuration of GRUAN sites for their research purposes. We have begun by generating a list of sites already belonging to various atmospheric measurement networks and are now asking people to select 40±20 of these sites as a way of indicating the configuration of a GRUAN network, in terms of site location only, that would best serve their research needs. The web page that facilitates this process is available [here](#). This is a purely hypothetical exercise. This site selection process in no ways suggests that the sites selected will become, or are expected to become, GRUAN sites. The information collated through this process will form a first impression of what people would like to see as a geographical configuration for GRUAN. This web page will remain open until 29 February 2012.

**Workshop structure:** Before the workshop, draft white papers addressing the questions outlined above will be developed for each of the four communities as starting points for workshop discussions. The first two days of the workshop will be dedicated to presentations and open discussions of key scientific issues related to the design of an upper-air climate monitoring network. On the final day, participants will revise the white papers, incorporating the workshop outcomes. After the workshop, one or more papers intended for submission to a peer reviewed journal will be developed, based on the

white papers, which will also inform future GRUAN research plans and inform the GRUAN manual of operations

**Registration and abstract submission:** Abstracts will be due in April 2012. Details forthcoming.

**Scientific organizing committee:** Greg Bodeker (chair), Stephan Bojinski, Dale Hurst, Dian Seidel, Holger Vömel, Russ Vose, June Wang, David Tan, David Whiteman

**Expression of interest:** If you are interested in attending this workshop or want to remain informed on this workshop, please email Marion Fiedler at [Marion.Fiedler@dwd.de](mailto:Marion.Fiedler@dwd.de).