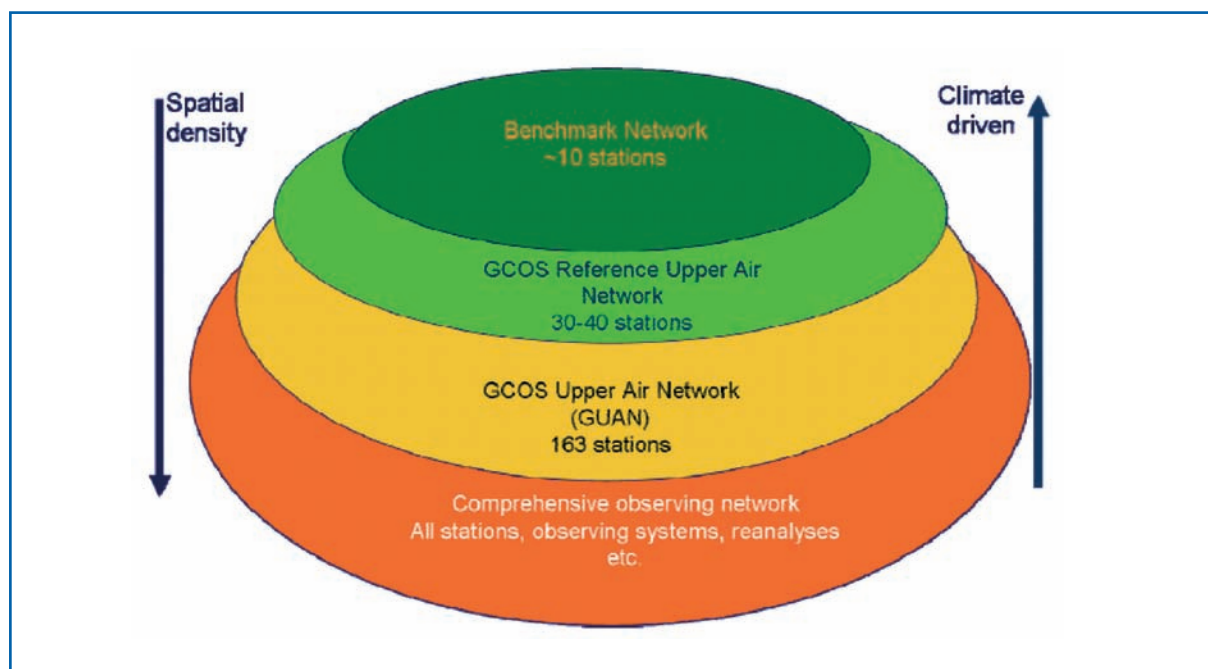


The GCOS Upper-Air Reference Network, GRUAN

Description

The GCOS Reference Upper-Air Network (GRUAN), a network for atmospheric reference observations, will form the high quality climate reference sites needed for many applications. Scientific evidence clearly shows that there is a pressing need to implement such a network. It is also emphasized that the GRUAN would be part of a system of networks to which both the GCOS Upper-Air Network (GUAN) and the WMO Global Observing System (GOS) are vital components. The Deutscher Wetterdienst, DWD, will host a GRUAN Lead Centre at its Meteorological Observatory Lindenberg – Richard-Abmann-Observatory for training, education and detailed quality control.



GRUAN tiered-system: Tiered observing system architecture for climate. (GCOS-112)

Added value

The GRUAN is required to provide the foundation for long-term datasets that can be used to reliably monitor and detect emerging signals of global and regional climate change. Thus the GRUAN is required to provide long-term high quality climate records, constrain and calibrate data from more spatially-comprehensive global observing systems, and fully characterize the properties of the atmospheric column. A successfully implemented GRUAN inter alia will closely coordinate with the user community, have high-quality instrumentation, provide for redundancy of measurements of climate variables at network sites, and manage changes in the network in such a way that non-climatic influences can be accurately adjusted for. The GRUAN will also need to have real-time calibration and validation and a strong lead centre managing the network in conjunction with station operators. Data and metadata from GRUAN should be easily, freely accessible at least bona fide research purposes. GRUAN sites need to fully adhere to the GCOS Climate Monitoring Principles and have complementary measurements from other networks in a collocation database, to enable cross-calibration.

Relevance to GEO

The idea for a GRUAN is based on an activity outlined in the Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC, the GCOS-IP (GCOS, 2004). This key action in the GCOS-IP asks to establish a high quality reference network of about 30 precision radiosonde stations and other collocated observations. This activity is also reflected in a 2 year target of the climate SBA. In addition the GCOS-IP is recognised as climate module of the GEOSS 10-year implementation. Justification, requirements, siting and instrumentation options for GRUAN are further detailed in GCOS, 2007.

The GRUAN is of special interest to the climate SBA but will support the weather SBA as well. It is reflected in and a contribution to Weather Task WE-06-01.

Participants

As the GRUAN will be a carefully selected network of high quality upper-air stations, many GEO Members will contribute to this activity. The development of GRUAN is mainly driven by the Atmospheric Observation Panel for Climate (AOPC) of GCOS. The AOPC is co-sponsored by GCOS and the World Climate Research Program (WCRP).

Current status and next steps

The DWD's offer to host the GRUAN Lead Centre has been accepted by AOPC for an initial period or "pilot phase" of five years. During this phase the GRUAN concept will be further refined in cooperation with all partners, leading to the establishment of an initial GRUAN with a limited number of stations.

References:

GCOS, 2004:

Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC (GCOS-92)

GCOS, 2007:

GCOS Reference Upper-Air Network (GRUAN):

justification, requirements, siting and instrumentation options, GCOS-112