

IMPLEMENTATION PLAN FOR THE GRUAN WIGOS PILOT PROJECT

Background

The Global Climate Observing System (GCOS) Reference Upper Air Network (GRUAN) is an incipient network of ground-based upper-air monitoring stations called for in the 2004 GCOS Implementation Plan. Its over-arching aim is to create an unimpeachable record of changes in atmospheric column characteristics on multi-decadal timescales to support climate monitoring activities and climate dataset development. Details on progress to date are given in the publications, GCOS-112, GCOS-121, and GCOS-131 (see list of References below). The strategy to implement GRUAN in the next five years is described in the "GRUAN Implementation Plan 2009 – 2013" (GCOS-134). The GRUAN Implementation Plan is complemented by the short- and medium-term GRUAN work plans, which are updated on an annual basis following the Implementation-Coordination Meetings.

The GCOS Programme provides direction and oversight of GRUAN through the Atmospheric Observation Panel for Climate (AOPC), which is jointly sponsored by GCOS and the World Climate Research Programme (WCRP). The AOPC has established a Working Group on Atmospheric Reference Observations (WG-ARO) to provide direct guidance to GRUAN. The GRUAN Lead Centre is responsible for the coordination among stations, including training, education and research, and ensuring the archival and dissemination of GRUAN data.

Status of GRUAN

The first GRUAN Implementation & Coordination Meeting (ICM-1) took place in March 2009 in Oklahoma, USA. Implementation of the network has started, involving the identification of eligible measurement sites, development of a data policy, a data dissemination scheme and the quest for a common mode of operations. The establishment of a data archive is currently under development. The DWD Richard Assmann Observatory Lindenberg, Germany, has been designated as GRUAN Lead Centre, which became fully operational in June 2008 for an initial period of five years. Up to now, 13 out of 14 initial GRUAN candidate sites have been confirmed. The head of GRUAN Lead Centre is a member of the international organizing committee for the 2010 CIMO radiosonde intercomparison campaign.

GRUAN Pilot Project

For progressing GRUAN, support and guidance through WMO and WIGOS will be particularly necessary in the areas outlined in the Pilot Project work plan below. These areas are essential elements of the overall implementation of GRUAN, the strategy for which is described in the GRUAN Implementation Plan which was completed in July 2009. The Pilot Project specific deliverables are to be completed by 2010 (pending funding support), while the overall implementation of GRUAN as a fully operational network is planned to be completed by 2013.

The GRUAN Pilot Project has the following deliverables:

- (i) Over-arching GRUAN Implementation Plan (July '09) - completed
- (ii) Revised GRUAN WPP scope document including any additional GRUAN-WPP components. (Aug '09) - completed
- (iii) Report on data quality management and intercomparison procedures ("What constitutes a GRUAN measurement?") (Sept '09)
- (iv) Develop proposal to define data dissemination among all GRUAN partners, including GRUAN Metadata congruent with WIS metadata standards (Mar'10)

- (v) Output from CIMO upper-air intercomparison (Summer '10; dependent on availability of support to participation by GRUAN scientists; estimated at 25K CHF)
- (vi) Development of a mature draft GRUAN Manual of Operations (Summer '10, dependent on availability of support: 20K CHF or in-kind support by a dedicated WMO Commission expert team)

In addition, regular reporting to WIGOS governance bodies is partly dependent upon the availability of travel support to key GRUAN scientists, estimated at 10K CHF annually.

Workplan for the GRUAN Pilot Project (the comprehensive work plan for the implementation of GRUAN is described in GCOS-134):

Continuous				
Area	Sub-section	What	By whom	Notes
Partnerships	WIGOS	Report to WIGOS Planning Office as required.	WG-ARO Chair, Lead Centre, GCOS Secretariat	
Periodic				
Area	Sub-section	What	By whom	Notes
Organizational issues	Communication / coordination	Annual meetings of Lead Centre, WG-ARO, Secretariat and sites (in Feb / March).	WG-ARO (lead), Lead Centre, Secretariat	Annually in Feb / March until superseded
2009				
Area	Sub-section	What	By whom	Notes
Partnerships	WIGOS	Submit full proposal for WIGOS-PP in conjunction with development of GRUAN-IP.	WG-ARO, Lead Centre, GCOS Secretariat	
Reference observations		Develop a common GRUAN definition and terminology for measurement uncertainty and stability. A guide that ensures the quality of all GRUAN measurements (including a common definition of terminology (accuracy, stability, uncertainty etc.)).	Franz Immler, John Dykema, Tom Gardiner and others	
Partnerships	Participation in intercomparisons	Provide a list of technically competent potential participants (2-3) in 2010 CIMO intercomparison campaign in China to CIMO secretariat; head of lead centre to be formally involved in organization of the campaign.	WG-ARO	
Partnerships	Participation in intercomparisons	Foster participation of research radiosondes in 2010 CIMO intercomparison campaign.	WG- ARO (lead), Lead Centre	
Partnerships	Participation in intercomparisons	Nominate members on expert team analyzing results from CIMO intercomparison campaign.	WG-ARO	
2010				

Area	Sub-section	What	By whom	Notes
Network protocols and documentation	Manuals	Perform a gap analysis on existing documentation (manuals) vis-à-vis the adopted GRUAN skeletal manual of operation, and provide a summary document of where these gaps are.	Lead Centre, GCOS Secretariat (from WIGOS-PP resources?), WG-ARO, sites	
Network protocols and documentation	Manuals	Draft a GRUAN manual of operations.	Lead Centre, GCOS Secretariat, WG-ARO	Potential assistance by WMO CBS expert team, and through WIGOS-PP; Manual to be finalized by 2011; Formal adoption by WMO CBS by 2012
Data dissemination		Develop proposal to define data dissemination among all GRUAN partners, in full compliance with GRUAN data policy (i.e., delayed mode and near-real time data dissemination addressed).	Lead Centre, WG-ARO, NCDC, ACRF	Data dissemination model implemented by 2011
Data dissemination		Define reprocessing and version control procedures.		
Data dissemination	metadata	Explore the possibility to publish GRUAN metadata congruent with WIS metadata standards.	Lead Centre, GCOS Secretariat	Many or most stations, e.g. NOAA stations, provide already station metadata following WIS requirements. A user description document shall be available soon.
Data dissemination	Near-real-time data	Explore the possibility to disseminate near real time data via the WMO Information System (WIS) including the	Lead Centre, GCOS Secretariat	Data dissemination

		Global Telecommunication System (GTS) using existing infrastructure existing connections.		model implemented by 2011
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References

GCOS-134, GRUAN Implementation Plan 2009 – 2013, *July 2009*:

<http://www.wmo.int/pages/prog/gcos/Publications/gcos-134.pdf>

GCOS-131, Report of the First GCOS Reference Upper Air Network Implementation and Coordination Meeting (GRUAN ICM-1), *Norman, Oklahoma, USA, 2-4 March 2009*:

<http://www.wmo.int/pages/prog/gcos/Publications/gcos-131.pdf>

GCOS-121, Report of the GCOS Reference Upper Air Network Implementation Meeting, *Lindenberg, Germany, 26-28 February 2008*:

<http://www.wmo.int/pages/prog/gcos/Publications/gcos-121.pdf>

GCOS-112, GCOS Reference Upper Air Network (GRUAN): Justification, requirements, siting and instrumentation options, *April 2007*:

<http://www.wmo.int/pages/prog/gcos/Publications/gcos-112.pdf>