GRUAN PILOT PROJECT FOR WIGOS

Project Name	**GCOS Reference Upper Air Network Pilot Project for WIGOS**
Acronym	GRUAN-WPP
Project Type	Pilot
Project Status	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. The strategy to implement GRUAN in the next five years is described in the "GRUAN Implementation Plan 2009 – 2013" (GCOS-134) (available from: http://gcos.wmo.int). 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 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 DWD Richard Assmann Observatory Lindenberg, Germany, has been designated as GRUAN Lead Centre and the establishment of a data archive is currently under development. Up to now, 13 out of 14 initial GRUAN candidate sites have been confirmed. 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. The GRUAN Lead Centre became fully operational in June 2008 for an initial period of five years. The head of GRUAN Lead Centre is a member of the international organizing committee for the 2010 CIMO radiosonde intercomparison campaign. For progressing GRUAN in accordance with the GRUAN Implementation Plan (GCOS-134), support and guidance through WIGOS will be necessary in the areas outlined in the project overview below.

Project Overview	Under the overall guidance of WMO and GCOS, implementation of GRUAN will aim to, amongst other things: • Develop guidelines and protocols for operation including a GRUAN Manual of Operations. • Develop data quality management and intercomparison procedures. • Design and implement a data dissemination model, including GRUAN Metadata congruent with WIS metadata standards. • Expand to a network that samples major global climatic zones. • Interface with other WMO programs as appropriate (e.g. CIMO for intercomparison expertise; GSICS to ensure best use for satellite monitoring). Implementation of GRUAN is overseen by the GCOS AOPC, with assistance by the GCOS Secretariat. Scientific and technical activities will be performed by the Lead Centre, Working Group and site staff, in accordance with a GRUAN Implementation Plan (GCOS-134).
Project Aims	It is recognised that for GRUAN to be scientifically- and cost-effective, it will be necessary to optimally interface with other networks and activities in a manner consistent with WIGOS principles. Obtaining an irrefutable upper-air climate data record will require several independent pillars: GRUAN, GSICS, and the existence of satellites with calibration payloads (e.g. CLARREO). It cannot be a case of either / or. The GRUAN WPP is expected to: - Undertake preparation of regulatory material for GRUAN. - Partake in assessments of best instrumentation by means of major intercomparison campaigns. - Ensure the availability of high-quality consistent atmospheric profile data. - Provide an interface for GRUAN to the implementation of WIGOS, to WMO in general, and to other WPPs, the GSICS WPP in particular.

Partners/ Participants	Participating organizations: • GCOS • CMA • DWD • FMI • Harvard University • IMAA-CNR (Italy) • JMA • KNMI • Met Office (UK) • MeteoSwiss • NASA • National Physical Laboratory (UK) • NIWA (New Zeeland) • NOAA • University of Oklahoma • US DOE Coordination and support: • WMO • GCOS • DWD • NOAA Partner organizations or projects: • GSICS • CLARREO • 8th WMO CIMO Intercomparison of High Quality Radiosonde Systems, to take place in Southern China in 2010
Funding Source(s)	Each GRUAN site is responsible for covering operational and staff expenses through its own funding sources. The GRUAN Lead Centre (with 3 ½ dedicated staff) is supported by the German Weather Service, DWD. The US GCOS office at NOAA is providing a small amount of additional support to sites to meet stated requirements and covering annual ICMs. The next such meeting will be in Payerne, Switzerland, 2-4 March 2010, and affords an opportunity for substantial input from WIGOS Planning Office and other departments of WMO. The GCOS Secretariat provides additional in-kind support to GRUAN. Additional support through the WMO budget and/or WIGOS-WIS Trust Fund and/or WMO Commissions will be required to meet all key deliverables on time (see Key Deliverables).
Project Timescale	• WIGOS PP specific deliverables: to be completed by 2010 (pending funding support) • GRUAN overall implementation: fully operational network by 2013 (see GRUAN Implementation Plan, GCOS-134)

Expected Key Deliverables	The 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.
Project links	http://www.gruan.org
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