GCOS Reference Upper-Air Network

GRUAN Technical Note 4

Guidelines on requirements for the initial development of a GRUAN data product

PETER THORNE

Publisher

GRUAN Lead Centre

Number & Version

GRUAN-TN-4
Rev. 1.0 (2016-04-21)

Document Info

Title:	*Guidelines on requirements for the initial development of a GRUAN data product*
Topic:	Data
Authors:	Peter Thorne
Publisher:	GRUAN Lead Centre, DWD
Document type:	Technical note
Document number:	GRUAN-TN-4
Page count:	6
Revision / date:	1.0

Abstract

This Technical Note outlines the generic steps required to constitute a new GRUAN data product.

Revision History

Version	Author / Editor	Description
Rev. 1.0 (2016-04-21)	P. Thorne	First published version as GRUAN Technical Note 4 (GRUAN-TN-4)

Table of Contents

1 Introduction

This Technical Note outlines the generic steps required to constitute a new GRUAN data product. It is commensurate with the detailed descriptions given in the GRUAN Guide and Manual (GCOS-170 and GCOS-171). As described in these documents the key scientific requirements of a GRUAN data product are:

1. That the raw data and measurement metadata are retained in a secure archive such that they can be reprocessed at any time in the future to generate a revised final data product.
2. That all aspects of the measurement processing are open and transparent.
3. That the measurements are traceable to SI units or accepted community standards.
4. That the uncertainty in every processing step is identified, assessed and robustly quantified (commensurate with the Guide to Uncertainties in Measurements, JCGM 2008) to provide a comprehensive estimate of the uncertainty on each measurement and, in the case of profile measurements, at each point in the measured profile.

If a proposed GRUAN product does not fulfil these criteria, then it cannot constitute a GRUAN product and further scientific work will be required.

2 Generic steps

Even after a sound scientific understanding of the measurement has been achieved, certain processes and checks need to be in place to ensure that a sustainable and high-quality GRUAN measurement series can be provided to users of GRUAN data products. In the likely chronological order in which they can be completed, these are as follows:

1. A technical document (commensurate with the structure detailed in GRUAN-TN-2) is required that describes the underlying measurement principles, uncertainty quantification, measurement technique specifications, metadata and data collection requirements etc. for both operators of the associated instrument(s) and users of the resultant data products. Such Technical Documents undergo a formal review overseen by the WG-GRUAN prior to adoption and publication.
2. A peer reviewed paper submitted and preferably published that describes the scientific foundation for the data product with particular emphasis on the uncertainty quantification.
3. The measurement system must be ready to be adopted at at least one GRUAN site, and, at least theoretically, could be deployed at other sites. The system must be run as stipulated in the associated Technical Document.
4. A central processing facility must be identified that has the capability to ingest, process and disseminate data from any GRUAN site that wishes to submit a product to the data stream.
5. The data stream should be run as a beta release for a period of time sufficient to ascertain that the measurements can be made in the manner described in the technical document and that the central processing and data exchange protocols are both stable and functional. The beta release period shall depend upon the nature and frequency of the measurement system.
6. The data stream must be reviewed for appropriateness.
   a) This review will be conducted by the WG-GRUAN following a recommendation from the Lead Centre.

b) The review may include additional invited technical and scientific input from the Lead Centre, relevant task teams, or relevant user groups of the data product who have volunteered to test the beta product.

c) This appropriateness review shall include aspects such as sampling frequency, whether the uncertainties are sufficiently small as to be usable and useful for likely applications etc.

Because suitability will be instrument, ECV and application specific, it is not possible to provide definitive guidance on this step. The proposer of a new data stream should work with the relevant task teams (at a minimum the task team of site representatives), Lead Centre and Working Group to agree what specific requirements for this final review shall be in their instance.

The review for appropriateness shall always constitute the final step and shall represent the point at which sites can apply to have the measurement stream certified and at which time the product shall be served as a formal GRUAN data product.

3 References

GCOS-170, The GCOS Reference Upper-Air Network (GRUAN) Manual, version 1.1.0.3, WIGOS Technical Report No. 2013-02, 2013.

GCOS-171, The GCOS Reference Upper-Air Network (GRUAN) Guide, version 1.1.0.3, WIGOS Technical Report No. 2013-03, 2013.

GRUAN-TN-2, Guidelines on the Structure of Instrument Specific Technical Documents for GRUAN, Rev. 2.0 (2014-12-05), 2014.

JGCM, Evaluation of measurement data – Guide to the expression of uncertainty in measurement, 2008.