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GLOBAL CLIMATE OBSERVING
SYSTEM (GCOS)

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**11th GRUAN Implementation-
Coordination Meeting (ICM-11)**

Session 3

Singapore

20 - 24 May 2019

Task Team Progress Report for April 2019 – GNSS-PW

(Submitted by Jonathan Jones and Kalev Rannat)

Summary and Purpose of this Document

Progress report from the task team on GNSS Precipitable Water (GNSS-PW).

The GNSS TT has worked on topics listed on the GRUAN Master Action Item list (last checked Feb. 2019) and action items re-scheduled after ICM-10.

Action items re-scheduled

Finishing the GNSS PW Omnibus. The Omnibus was finalized in February, 2018 and sent to LC and co-chair for review on Feb. 27, 2018. The manuscript returned from review in December 2018. Necessary changes will be made according to the reviewers notes and the manuscript will be resent for acceptance. The goal is to get ready for ICM-11.

Work continues with improving the GRUAN GNSS data flow.

Action items left after ICM-10

#B3 (New GRUAN Data products): GNSS-PW GDP data flow and certification (deadline ICM-11)

“Certify the GNSS-PW data stream by ICM-11. WG Chair to work with TT-GNSS-PW to ensure review and finalisation of TD. GFZ to advance a data stream with full uncertainties (considering how to ensure as much information as possible expressed). Lead Centre to prepare a package of materials to enable certification by WG to proceed.”

The sites currently delivering GNSS data (and included into the continuous processing chain) are:

- Lindenberg (ldb0, ldb2)
- Lauder (ldrz)
- NyAlesund (nya2)
- Payerne (paye)
- Sodankyla* (sodf)
- Barrow (utqi)
- Lamont* (sgpo)

*) GNSS data processing operational, but (still not) metadata for calculating GNSS-PW

Boulder

GNSS station in Boulder (tms3) will be re-located (last measurements from 4th October 2018, and this does not exist as a GNSS site any more). GFZ has negotiated about a new location of GFZ receiver as a GRUAN GNSS site. The location is fixed, but some administrative issues are still not resolved regarding special agreement for installing the equipment. Negotiations continue.

Tateno (tatn)

GFZ has got GNSS data (2017,2018) from Tateno (tatn). Tateno does not deliver data in real-time, but in larger batches. GFZ negotiates how to get the data with a shorter delay. At GFZ everything is ready for the operational processing chain.

Singapore (mss1)

Some minor technical problems with TRIMBLE RINEX data conversion, the site staff and GFZ stay in contact with TRIMBLE (the manufacturer) to fix these problems. GNSS equipment and meteorological sensors are installed.

Upcoming GNSS sites

- Cabauw (negotiations between GFZ and KNMI, data still not available)
- Potenza (GFZ in contacts with site operators how to organise the data flow, still in progress)
- Beltsville (agreement is in preparation)
- Graciosa (GFZ has got permission to install the station and is in preparation to build a monument and send the equipment out. This might be done by the time of the ICM)
- Tenerife (plans to install their own GNSS receiver, GFZ stays in contact)
- Suriname (GFZ continues negotiations)

The status of GNSS data product

Close to finish the implementation of uncertainty according to (T. Ning et al., 2016). Operational tests start soon.

The data (currently not certified, but experimental) is made available at <ftp.gfz-potsdam.de> for GRUAN sites ldb0, ldb2, ldrz, nya2, sodf, paye, utqi, sgpo:

- user: anonymous
- in pub:
 - cd GNSS/products/nrttrop/product COST GRUAN EPOS8/y****/m**
 - cd GNSS/products/nrttrop/sinex trop GRUAN EPOS8/w****

#C7 (Remaining Actions): Uncertainty terminology and presentation in GRUAN products (*deadline Feb 2019*)

“Brief (max. 8 pages) discussion document to be produced on issues surrounding uncertainty terminology and presentation to users in GDPs including a review of heterogeneity in current approaches in certified and candidate streams to form basis for discussion at ICM-11.”

It will not be ready in time and should be rescheduled (for after ICM-11).