GNSS PW Task Team Progress Report for ICM-14

(Wednesday 30 November 2022, Saint Denis)

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No changes in membership of the TT.

The GNSS TT has worked on topics listed on the GRUAN Master Action Item list re-scheduled after ICM-13:

C9 GNSS GDP format
GFZ to progress provision of a netCDF format version of the GNSS GDP
Status: **in progress** (mostly completed, detailed overview will be given on Friday by Galina Dick)

C10 Metrological closure of GNSS-IWV and radiosondes
For GRUAN sites that perform both GNSS-IWV measurements and radiosoundings, Analyse the comparison of the GRUAN data products (and their respective uncertainties) for these data streams to establish whether metrological closure is attained.
Status: **in progress** (more detailed overview will be given on Friday by Galina Dick)

GRUAN GNSS data processing (as in November 2022):

1) Stations in routine processing:

cbw1 (Cabauw)
enao (ENAO, Graciosa)
hubc (Beltsville)
ldb2 and **lin0** (Lindenberg)
ldrz (Lauder)
nya2 (NyAlesund)
paye (Payerne)
sctb (Scott Base)
sgpo (SGPO, Billings)
sms1 (Singapore) -
GNSS receiver has been renamed starting from July 19, 2022
old name mss1
soda + **sodf** (Sodankyla)
tskb (Tsukuba, for Tateno)
utqi (Barrow)

2) Stations on the waiting list:

* Tenerife (**TEN**): Markus Ramatschi (GFZ) is in contact
* Xilin Hot (**XIL**): no contact
* Paramaribo (**PMO**): Harald Schuh (GFZ) visited PMO in January, continuing to communicate and planning to set up GNSS there
* Dakar: no contact
* Hong Kong (**HKO**): Galina Dick (GFZ) in contact with George Liu
* Potenza (**POT**): some issues with RINEX data flow
* Trappes/Palaiseau (**TRP**): no contact
* La Reunion (**REU**): no contact
* Australia: no data
* Dolgoprudnyj: no contact

Plans, ideas ...

Finish and publish an article on GNSS and RS metrological closure

Reactivating TT-calls?

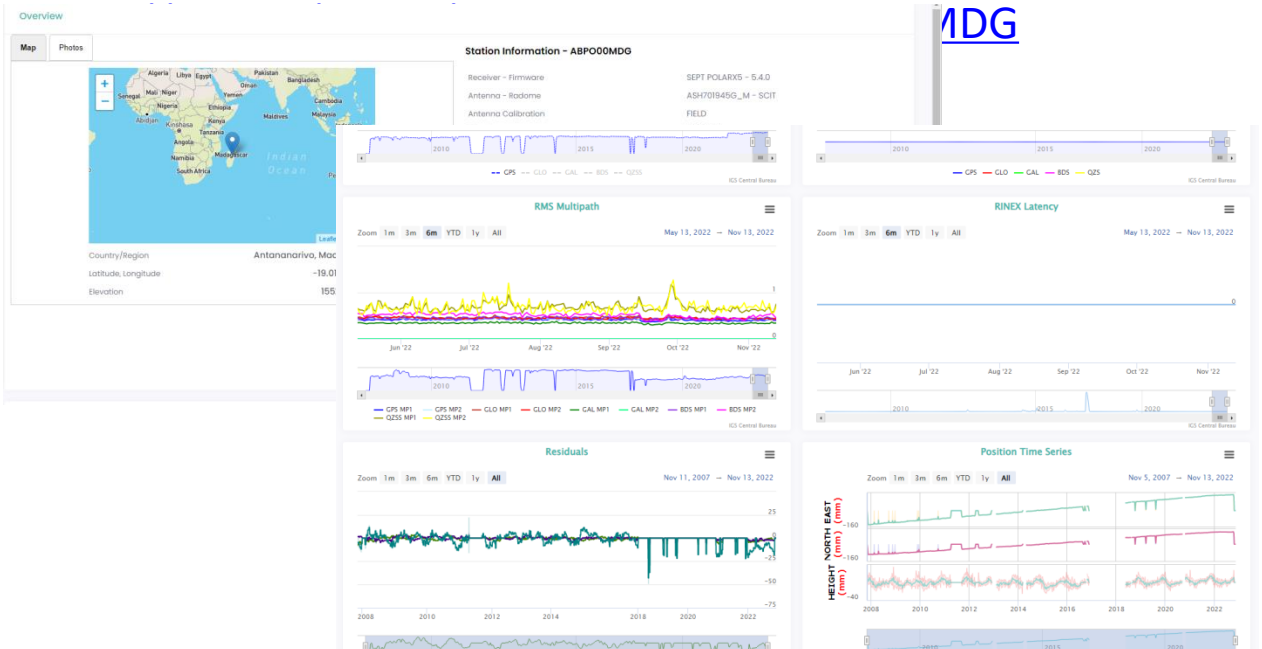
Improvement of GNSS data flow and quality management overview (for GRUAN GNSS GDP users)

Connections to similar related initiatives (C3S)?

Sites' maintenance ..., site introduction/overview
What could be improved?

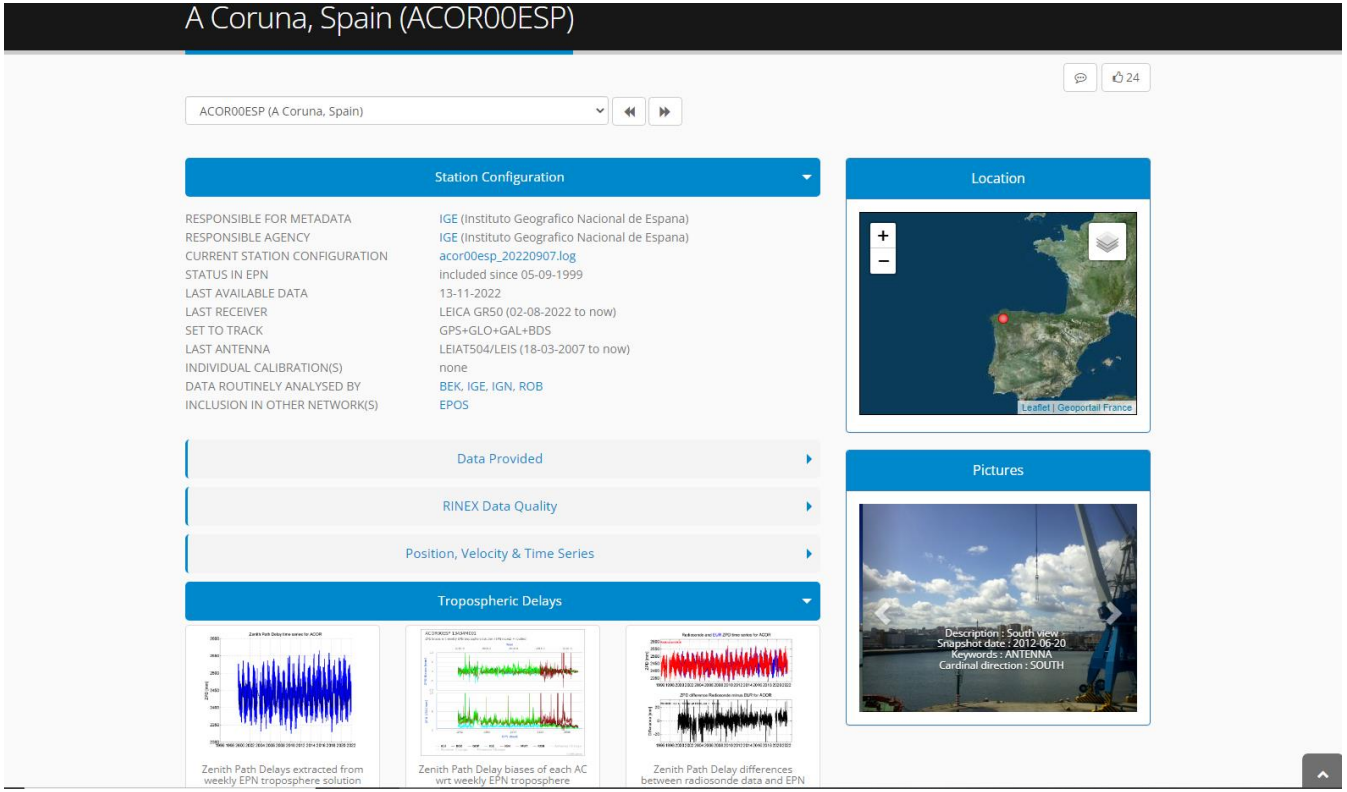
Questions asked: GRUAN GNSS (reference) stations – what is special?
Possible answers: We have high technical requirements (mostly the same as IGS), the data being reprocessed (i.e. having a consistent long-term time-series), special care foreseen for maintenance of change, ...

If we (GRUAN) have technical requirements at the same level of IGS, that's fine. But shouldn't we need to offer an option to **demonstrate it** (by offering open on-line monitoring of the data flow and coordinates' stability, etc)? Something similar as [MDG]



It is simply a question of image. Documenting high requirements without transparency of the work cannot be a goal.

Or, from EUREF:
https://www.epncb.oma.be/_networkdata/siteinfo4onestation.php?station=ACOR00ESP



The idea is not to copy anything, but we could have something functionally comparable.

It is just **a question of image and reputation**. Everybody can read the documents (if having enough motivation and time, but as often said « .. One photo can say more than 1000 words».

All having an interest and using GRUAN (GNSS) data should be convinced about the setup, realisation and maintenance of the data sources and instrumental facilities. GRUAN cannot give up any goal of monitoring of GNSS sites' setup and data flow quality (ref. https://www.gruan.org/documentation/gruan/td/gruan-td-6).

GRUAN has nothing to hide, we have a good documentation, etc., but we could have a bit better visual demo to illustrate how we put it all into practice.

Already present, but not complete:

Site metadata, including the site panoramic view (regularly updated, not all sites have). If talking about GNSS – it is an important information (to show if the site's GNSS antenna (still) has open horizon as written into the requirements). Open horizon – it is directly related to the GNSS observations' quality.

Collecting/updating site metadata needs help from the sites (not all sites with GNSS have sent/updated site metadata).

Being for reference – nothing should be hidden, every user must get convinced, that using the best available data from the best available sources and processed by the best methods currently available.

Otherwise, we just ask the data users to believe, but nobody needs to believe.

GNSS sites' maintenance

Not all (mostly none) GRUAN GNSS sites belong to national or continental geodetic networks -- they (potentially) miss regular technical surveillance. A lot, but not everything can be done remotely.

The question is – who maintains or who should maintain GRUAN GNSS sites, is it or will it get regulated?

It is also a question of money, the surveillance and maintenence must be done professionally. As long as the sites (and apparatus) are new, one can expect that let's go until it (still) works – but it would not be a responsible and sustainable approach. Providing data with high quality needs regular care and attention. GRUAN needs high quality.

Not all instruments are as robust ...

Copernicus C3S

(possible connections for GRUAN GNSS)

C3S2_311 Lot 2
Collection and Processing of *In Situ* Observations
Lot 2: Access to Observations from Baseline and Reference Networks, and Comprehensive Upper-air Observations

Reprocessed meteorological data, incl. GNSS IPW.

- IGS-daily (NRT)
- EPN-repro2, IGS-repro3 (up-coming), possibly adding different reprocessed GNSS IPW time-series if they come public and available.
- Additionally, creating a GNSS raw data and meta-data repository.

GRUAN GNSS GDP → C3S ? (like GRUAN RS https://cds.climate.copernicus.eu/cdsapp#!/dataset/insitu-observations-gruan-reference-network?tab=overview)?

Thank you for your attention!