BRAIN-be 2.0
Belgian Research Action through Interdisciplinary Networks

FAIR-GNSS

Open data portal for European and Belgian GNSS reference station data collections, built upon FAIR guiding principles

DURATION
15/12/2020-15/03/2023

BUDGET
299 802 €

PROJECT DESCRIPTION

The Royal Observatory of Belgium (ROB) maintains repositories containing decades of observation data from Belgian and European stations (EUREF public repository) permanently tracking Global Navigation Satellite Systems (GNSS, e.g., GPS or Galileo). These data can be used for a multitude of applications. For example, they allow to precisely measure ground deformations, monitor space weather, study the climatic evolution of the atmospheric water vapour, provide input for numerical weather predictions.

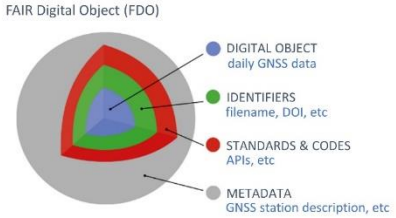
Although many users from different communities already use ROB's public EUREF repository, the procedures to find and access the data are rather complex and non-machine-readable. The GNSS data originate from a significant number of data providers (~100) and can be handled in different ways, but unfortunately, provenance information is lacking. Data licenses are only seldom available and no data citation procedure is in place to recognize the merit of researchers providing the data.

The FAIR-GNSS project addresses these shortcomings and aims to

1. facilitate access and re-use of, and increase trust in, ROB's GNSS data repositories;
2. support the preservation of the GNSS data;
3. contribute to the standardization of GNSS data citation;
4. create a new modern open data portal for European and Belgian GNSS data

Hence, FAIR-GNSS' will upgrade ROB's GNSS data management procedures to align with current best practices in FAIR and Open Data.

The FAIR data principles to make data more Findable, Accessible, Interoperable, and Re-usable (FAIR). These principles serve as guidelines for making scientific data suitable for reuse, by both people and machines, under clearly defined conditions.
During this process, FAIR-GNSS will turn ROB's GNSS data into FAIR Data Objects (FDO), complete them with metadata such as the license of use and Persistent Identifiers (PID) e.g., Digital Object Identifiers (DOI) to enable tracing and citing the data, and use standardized metadata schemes. In addition, FAIR-GNSS will facilitate access to the data through the development of APIs (Application Program Interface).
To ensure the upgraded repositories respond to user needs, FAIR-GNSS will interact with the GNSS and geodetic communities and take advantage of user input from Use Cases throughout the project duration.

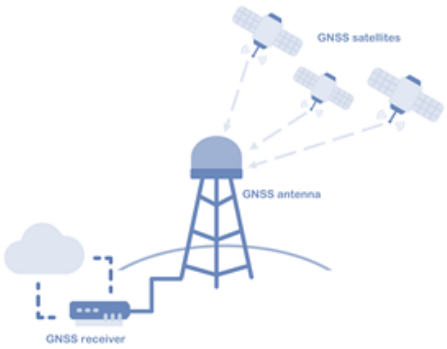


FAIR-GNSS

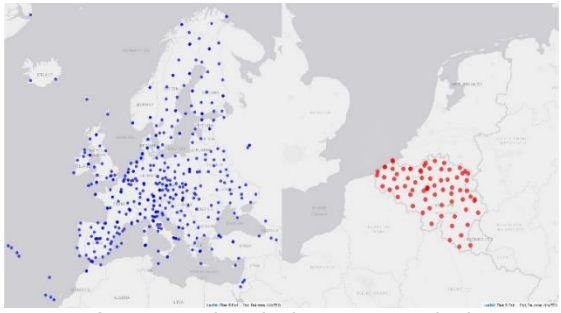
FAIR-GNSS will also support ROB's GNSS data preservation by evaluating the basic level of FAIR-ness of its FDOs and by self-assessing the degree of trustworthiness of the repositories in which they are stored.
Finally, building on ROB's upgraded GNSS data repositories, FAIR-GNSS will create a new open data portal to provide access to the data, including extensive documentation describing the data and data access methods. The portal will not only provide access to the EUREF data, but also to the data from Belgian GNSS-stations, which agreed to share their data through ROB's new data portal. Consequently, FAIR-GNSS will prepare ROB's GNSS repositories to become FAIR-enabling repositories.

Researchers will benefit from the cit ation metrics associated to GNSS data, as it will easily show the impact of their research data while providing evidence of their usage. FAIR-GNSS' enhanced data access procedures will also enable scientists to easily identify and access those GNSS stations data relevant for their specific needs and applications. Indeed, due to the ever-increasing number of GNSS stations, data access has nowadays become too complex and time consuming.
In addition, FAIR-GNSS will supply interoperable GNSS data that are easy to integrate with other datasets (e.g., InSAR or seismic data) and will facilitate their discoverability within the European Plate Observing System (EPOS, https://www.epos-eu.org/).
In its practical applications, providing data provenance and adopting user licenses will also increase trust in the GNSS data and encourage Small and Medium Enterprises, industries, and start-ups to use these GNSS data and innovate.
By making GNSS data more readily available, accessible and citable, FAIR-GNSS will maximize ROB's data re-use for multiple kinds of applications.

FAIR-GNSS will present its results to conferences and/or via webinars and share experience on how to implement FAIR data principles by organising training events. Moreover, FAIR-GNSS will showcase FAIR-enabling data repositories to the international scientific GNSS community and engage it in adopting FAIR principles.



GNSS reference station


GNSS reference stations in the ROB repositories

CONTACT INFORMATION

Coordinator

Carine Bruyninx
Royal Observatory of Belgium (ROB)
Reference Systems and Planetology
carine.bruyninx@oma.be

Partners

Inge Van Nieuwerburgh
Ghent University (UGent)
Library
Inge.VanNieuwerburgh@UGent.be

LINKS

https://fair-gnss.oma.be/

Twitter account of ROB's GNSS team: @be_GNSS

BELGIAN SCIENCE POLICY

WTC III - Simon Bolivarlaan 30 bus 7 - Boulevard Simon Bolivar 30 bte 7
1000 Brussels - Tel. +32 (0)2 238 34 11
http://www.belspo.be/brain-be/ • Email : BRAIN-be@belspo.be

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