

EPOS SP – Grant Agreement n. 871121

D4.9 – Plan for integrating new GNSS data providers in EPOS

Document Information Summary

Date	22 January 2021
Document title	Plan for integrating new GNSS data providers in EPOS
Leader Partner	UBI
Main Author(s)	Rui Fernandes, Machiel Bos, Carine Bruyninx
Contributing author(s)	-
Reviewer(s)	-
Approved by	Executive Board (EB)
Target audiences	GNSS data suppliers; GNSS European Community; Project partners; EC
Keywords	Plan; integration; new GNSS data providers; EPOS
Deliverable nature	Report
Dissemination level	Public
Delivery date	29/01/2021
Version/Date	1 / 22 January 2021

HISTORY OF CHANGES		
VERSION	DATE	CHANGE
1		
2		

TABLE OF CONTENTS

INTRODUCTION	3
NEW EPOS-GNSS DATA SUPPLIERS.....	3
DOCUMENTATION	5
LEGAL, TECHNICAL AND FINANCIAL OBSTACLES.....	8
OUTREACH	9

D4.9 Plan for integrating new GNSS data providers in EPOS

Introduction

With the aim of increasing the sustainability of the EPOS data provision, Task 4.5 has taken the necessary steps to attract more GNSS station managers to integrate their GNSS data in the EPOS delivery framework. We focus in four main activities:

- 1) Engaging new data suppliers to contribute to EPOS by making available their data through national repositories or the Pan-European GNSS-EPOS repository;
- 2) Improving the documentation that EPOS provides to the potential GNSS Data Suppliers with the goal to facilitate the integration of their GNSS data in EPOS;
- 3) Mapping of any legal, technical, or financial obstacles that might obstruct the integration of GNSS data assets in EPOS and propose solutions how to tackle them;
- 4) Outreach activities in order to make the GNSS community more familiar with EPOS and encourage them to become an EPOS Data Supplier.

The following sections provide more details about the different activities.

New EPOS-GNSS Data Suppliers

About 20 of the contacted agencies and institutions have already been engaged in EPOS. They are coming from the countries indicated in green in the left map in Figure 1a. We are presently still negotiating with agencies from the countries indicated in pink. From the list of countries that have been engaged, the following countries are not yet a member of EPOS (see Figure 1.b): Bulgaria, Germany, Latvia, Ireland, Ukraine, and Spain.

The dynamic list of EPOS-GNSS Data Suppliers is available from <https://gnss-metadata.eu/site/datasuppliers>.

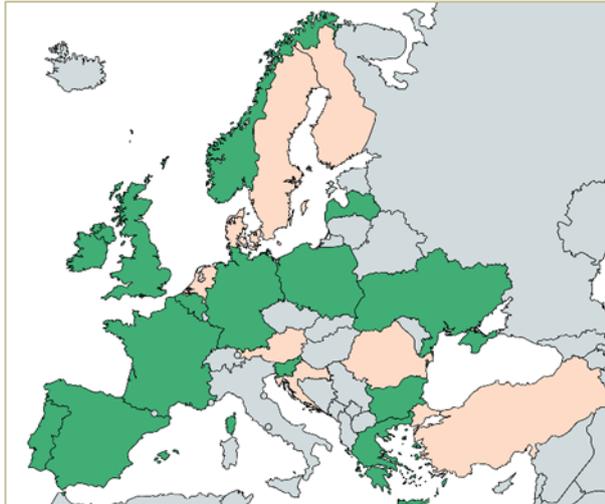


Figure 1a: GNSS stations from countries integrated in green have been integrated in EPOS during EPOS-SP. Negotiations are currently on going with countries indicated in orange.



Figure 1b: Countries not yet member of EPOS which have proposed GNSS stations for inclusion in EPOS.

The dissemination of the data through the GNSS-EPOS Thematic Core Service is done using the GLASS software developed by the GNSS-EPOS partners and that is made available as open-source. All the available RINEX files provided by the partners are accessible through the EPOS-GNSS Data Gateway (<http://gnssdata-epos.oca.eu/>) for more than one thousand of stations as shown in Figure 2.

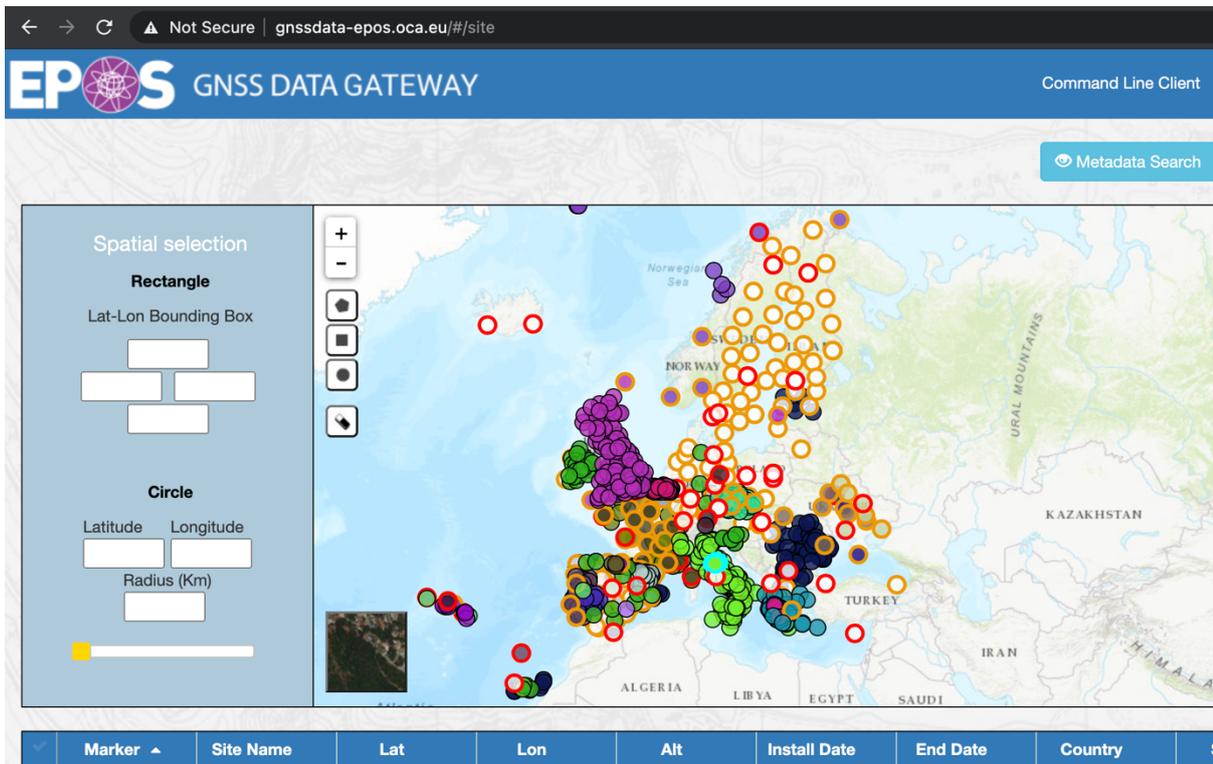


Figure 2: Home page of GNSS-EPOS Data Gateway (<http://gnssdata-epos.oca.eu/>), showing the stations with available GNSS data and the Data Suppliers (different colors).

In order to provide the potential Data Suppliers with an easy tool for the data dissemination, the GNSS-EPOS TCS also implemented a dedicated Pan-European GLASS repository, which currently is already populated with data from 5 different countries/agencies: United Kingdom, Ireland, Slovenia, Norway and GFZ, as shown in Figure 3.

Marker	Site Name	Lat	Lon	Alt	Install Date	End Date	Country	State
<input type="text"/>	<input type="text"/>	greater than less than	<input type="text"/>	<input type="text"/>				

Figure 3: Home page of GNSS-EPOS Data Gateway (<https://glass.gnss-epos.eu/>), showing the stations with available GNSS data and the Data Suppliers (different colors).

Documentation

In order to centralize the management of the interactions with the Data Supplier, we rely on the M³G portal (Metadata Management and Distribution System for Multiple GNSS Network, <https://gnss-metadata.eu>, Figure 4), which has been primarily developed to support EPOS' GNSS Data Suppliers. M³G contains a dedicated section with Documentation (Figure 5).

EPOS-SP extended the documentation section to better respond to needs of potential GNSS Data Suppliers and help them use M³G. Indeed, M³G is the entry point where new GNSS Data Supplier upload, validate, and distribute GNSS station metadata such as IGS-style site logs, information about local networks, DOIs, nominal data provision, licenses on the data, etc... and from which it is distributed throughout the EPOS delivery framework.

To increase the transparency of what is expected from EPOS' GNSS Data Suppliers, the Guidelines section of M³G (Figure 6) includes the:

- *“Procedure for including GNSS stations in EPOS”* which contains the 7 steps that need to be followed by the potential GNSS Data Supplier. During EPOS-SP, this procedure was adapted twice to respond to practical questions of Data Suppliers and improve clarity.
- Template of the *“EPOS-GNSS Data Supplier Letter”* which is the letter to be completed and signed by the GNSS Data Supplier. During EPOS-SP, this letter was adapted in order to manage co-owned stations (or stations owned by a consortium).
- *“Guidelines for EPOS-GNSS stations, Data Suppliers, and Operational Centers”* which provides a list of EPOS requirements that GNSS stations need to fulfill (e.g. in terms of equipment) as well as the responsibilities of the different agencies involved in the operation of the GNSS station. This document was updated twice to take into account user feedback.

In addition to the publicly available user part of M³G, M³G also has an administrator section, which is used to perform crosschecks on the EPOS GNSS station metadata, store the Data Supplier Letters, or link stations with EPOS data nodes. This administrator section was extended with several new tools to facilitate the management of EPOS' GNSS Data Suppliers (as is shown in the next section).

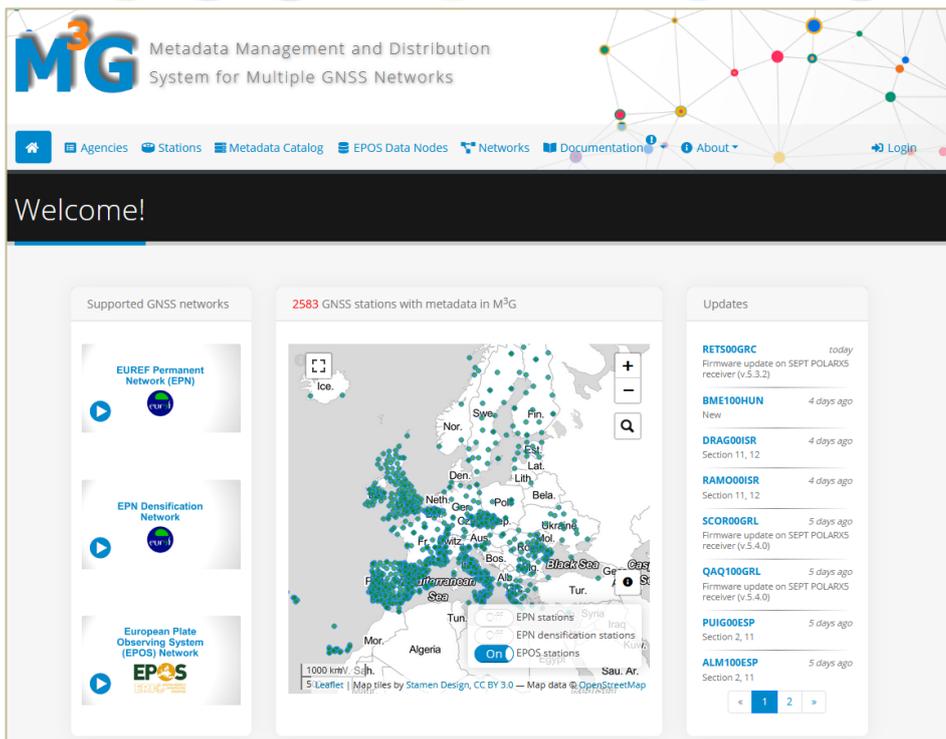


Figure 4: Home page of M³G (<https://gnss-metadata.eu>), including a map the GNSS stations who have been proposed for inclusion in EPOS so far.

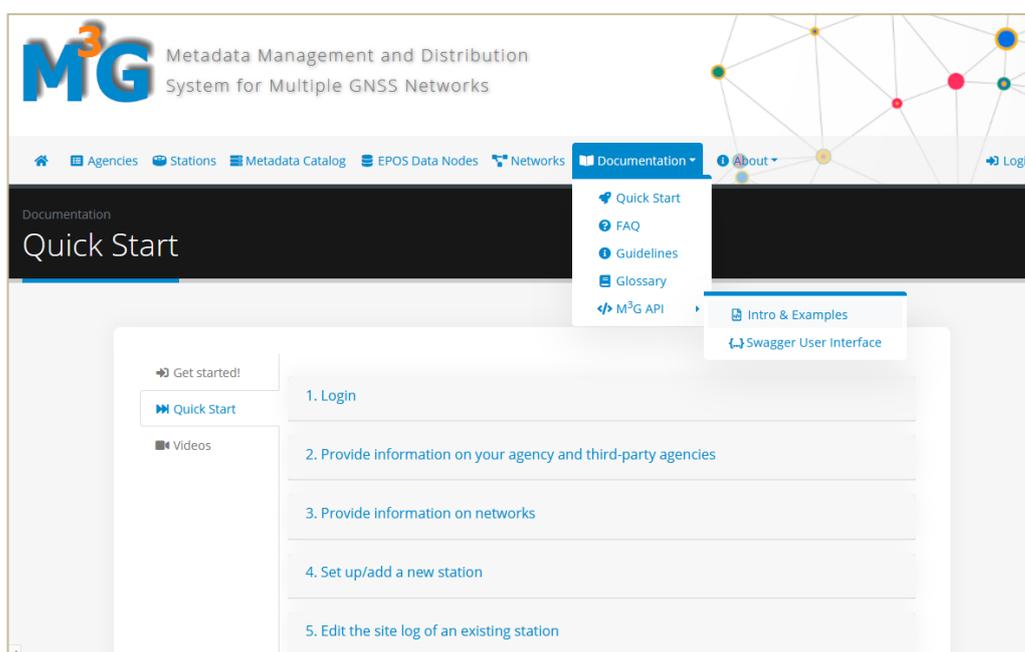
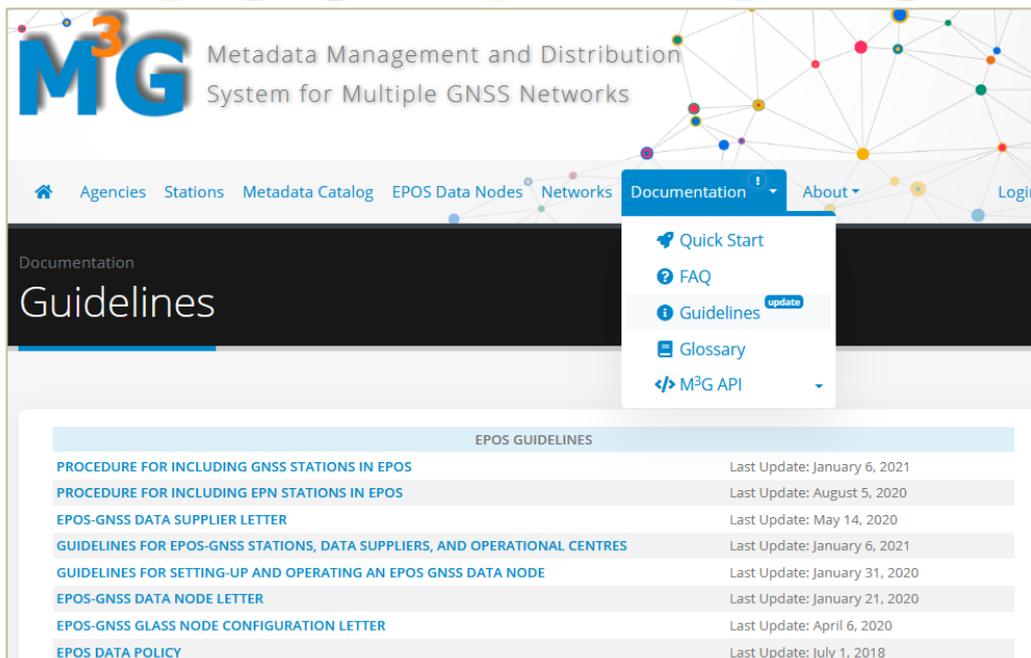


Figure 5: Documentation section of M³G.


 Figure 6: Guidelines section of M³G.

Legal, Technical and Financial Obstacles

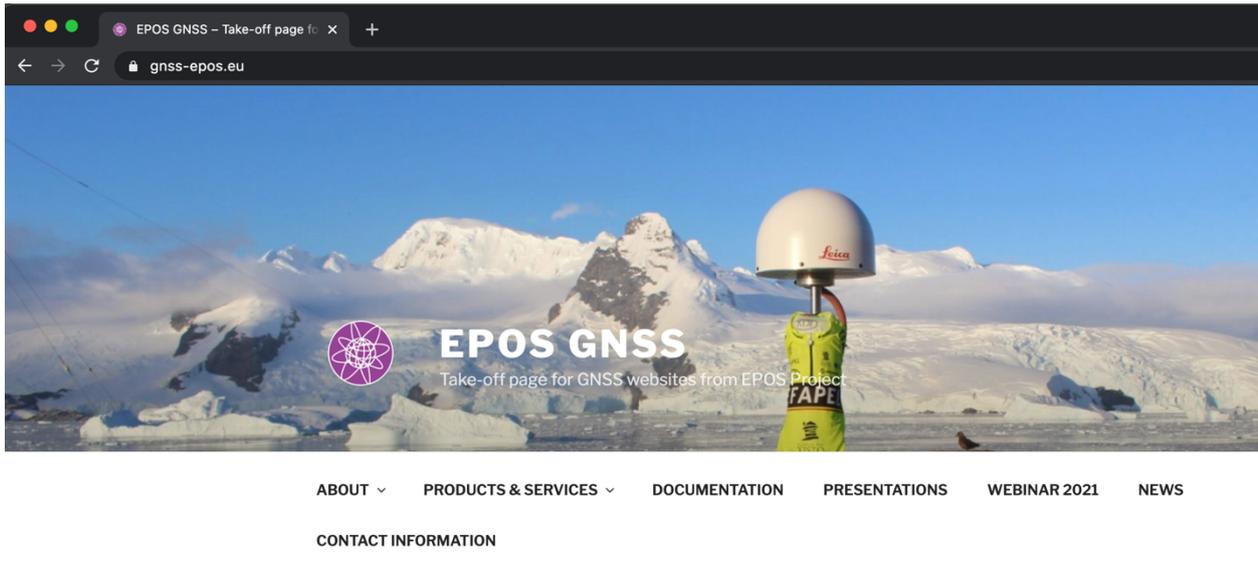
Potential EPOS-GNSS Data Suppliers from all over Europe have been contacted by email or video calls in order to map any obstacles (legal, technical, financial) that might obstruct the integration of GNSS data assets in EPOS. Following these discussions, possible solutions to tackle any hurdles have been proposed. The table below provides a status report.

	Obstacle	Proposed solution	Implementation status of proposed solution
Financial	GNSS data are not openly available because used for commercial applications.	Translation of EU Open data and PSI directive 2019/1024 into national legislation will stimulate open access to data	In progress (e.g. in Poland)
Legal	Non-standard national data license in use and compatibility with EPOS data policy unclear	Discuss with legal contacts	In progress
	Data Supplier uses CC-BY NC data license	Under discussion: Use DOI to attach data license to data and indicate DOI/data license in raw data files?	Not yet started
	Data Supplier uses CC-BY SA license	Under discussion: Does data respond to EPOS Data Policy?	Not yet started

	Disagreement/confusion about which agency has to sign the EPOS-GNSS data supplier letter	<ul style="list-style-type: none"> – Explanations and discussions with concerned agencies. – Implementation of additional administrator tools in M³G. 	Solution in place
	Confusion on how to handle the EPOS data supplier letters if stations are co-owned by several agencies (e.g. consortium).	<ul style="list-style-type: none"> – Explanations and discussions with concerned agencies. – Adaption of template of EPOS-GNSS data supplier letter. 	Solution in place
Technical	Data provider requires EPOS' data access reports	Implementation of AAI and generation of data access statistics	Under discussion
	Data provider requires APIs to submit and maintain its GNSS station metadata	Implementation of APIs in M ³ G	Solution in place
	Data provider cannot install its own GNSS data node	Set up an European EPOS data node that can be used by all GNSS data providers	Solution in place
	Data provider requires different methods to submit its GNSS station RINEX files to the Pan-European node	Implementation of different methods in cooperation with the Data providers	Solution in place
	Disagreement between data supplier indicated in EPOS data supplier letter and GNSS station owner indicated in GNSS station metadata.	Implement crosschecks for administrator in M ³ G.	In progress

Outreach

The GNSS-EPOS Landing Page (Figure 7), maintained by the EPOS-SP partner UBI/C4G, is the website with links (e.g., Guidelines section of M³G, Figure 6) where future data providers find useful information about the procedures for contributing to EPOS.



EPOS GNSS THEMATIC CORE SERVICE PORTAL

TAKE-OFF PAGE FOR GNSS WEBSITES FROM EPOS PROJECT

What is EPOS for...

The European Plate Observing System (EPOS) simplifies the integrated use of data, data products, and facilities from distributed research infrastructures for Solid Earth Science in Europe.

Figure 7: GNSS-EPOS Landing Page.

We are also active at some social media networks where we disseminate information for the stakeholders, including the potential new Data Suppliers.

The Facebook account (maintained by the Secretariat of the GNSS-EPOS TCS at UBI/C4G) is posting news about the activities including related with the engagement of new Data Suppliers, as shown in Figure 8. The Secretariat also maintains another account in Instagram with similar objectives (Figure 9).

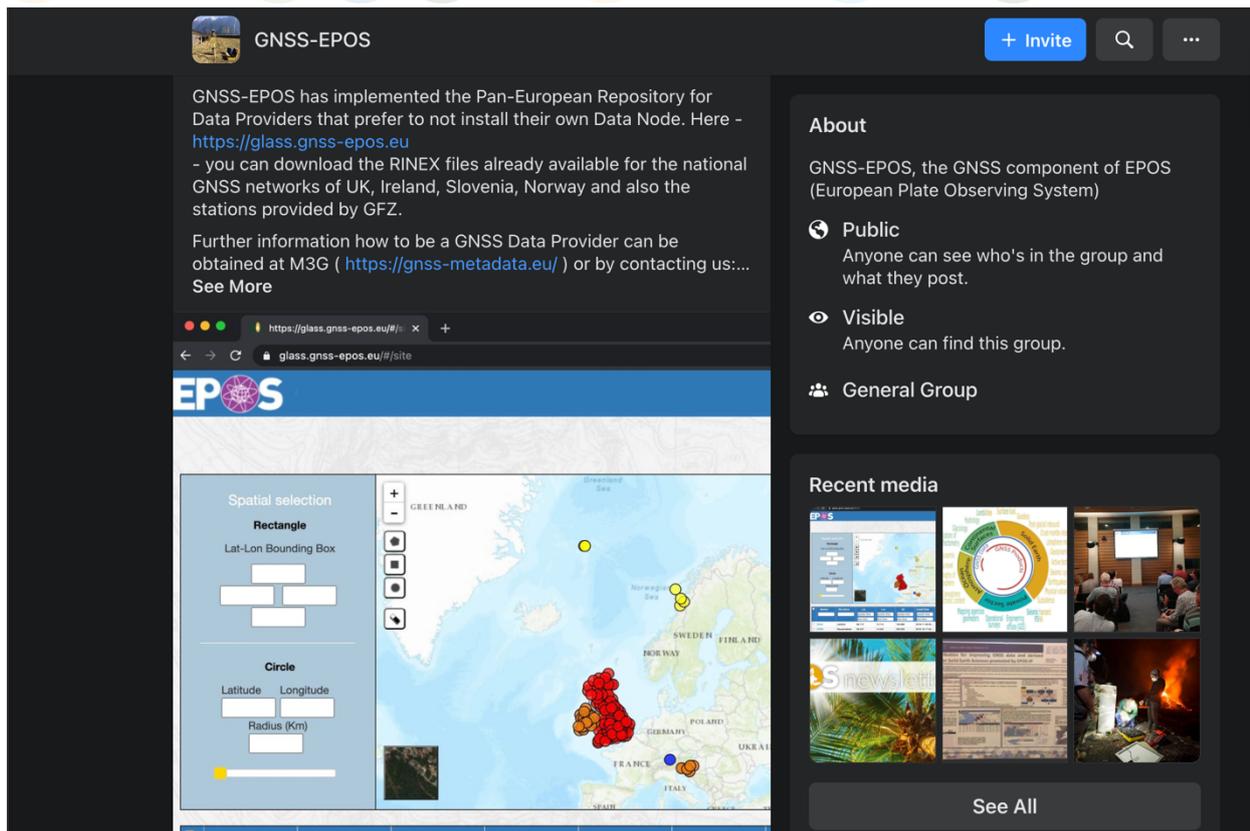


Figure 8: Example of a post sent out announcing the Pan-European Repository.



Figure 9: Example of a post sent out in Instagram after the Webinar.

A twitter account @GNSS_be (which is maintained by the EPOS-SP partner ORB) has been set up and it sends out a tweet each time a new GNSS Data Supplier is integrated in EPOS (Figure 10).



Figure 10: Example of tweet sent out when a new GNSS Data Supplier joins EPOS.

Figure 9 also shows one of the major outreach activities prepared during the first year of the EPOS-SP project by the GNSS-EPOS members: a webinar focused on demonstrating the diverse services offered by the GNSS-EPOS members. Particular attention was devoted to the engagement of new Data Suppliers, explaining them how they could be part of the EPOS community by sharing their data and benefiting of the services offered. This webinar was very successful with the registration of approximately 350 persons from about 45 countries.