



EPOS-GNSS data and products for Solid Earth Applications

Rui Fernandes (1), Carine Bruyninx (2), Paul Crocker (1), Anne Socquet (3),
Mathilde Vergnolle (4), EPOS-GNSS Members

1. University of Beira Interior (UBI), Collaboratory for Geosciences, Institute D. Luiz, Institute of Telecommunications, Covilhã, Portugal
2. Royal Observatory of Belgium (ROB), Reference Systems and Planetology, Brussels, Belgium
3. Université Côte d'Azur, CNRS, Observatoire de la Côte d'Azur (OCA), Valbonne, France
4. Université Grenoble Alpes (UGA), ISTERre, Grenoble, France

1. EPOS – GNSS Community
2. Flow of Data & Products
3. e-Infrastructure: Portals
4. High quality GNSS Data and Products for Solid Earth sciences

EPOS – European Plate Observing System



source <http://envri.eu/>

European Plate Observing System

EPOS is the European Research Infrastructure serving Solid Earth science

Multidisciplinary research platform to provide access to quality controlled data from diverse Earth science disciplines, together with tools for their use in analysis and modelling

EPOS – European Plate Observing System



EPOS currently in Pilot Operational Phase

Start of Operational Phase in 2023

EPOS Testing Version 1.0.2
EUROPEAN PLATE OBSERVING SYSTEM

OPEN DATA

All	235
Seismology	58
Near Fault Observatories	37
GNSS Data and Products	14
Volcano Observations	45
Satellite Data	8
Geomagnetic Observations	15
Anthropogenic Hazards	36
Geological Information and Modelling	7
Multi-scale Laboratories	6
Tsunami	9

<https://www.ics-c.epos-eu.org/>

EPOS – European Plate Observing System

GNSS Data & Products

EPOS
TCS GNSS Data
& Products
Community

List of Pan-European Service Providers:

BKG Bundesamt für Kartographie und Geodäsie, DE

CNRS-OCA Observatoire Cote d'Azur, FR

CNRS-UGA Université Grenoble Alpes, FR

INGV Istituto Nazionale di Geofisica e Vulcanologia IT

LM Lantmäteriet, SW

SGO Space Geodetic Observatory, HU

ROB Royal Observatory of Belgium, BE

UBI/C4G U. Beira Interior/Colaboratory for Geosciences, PT

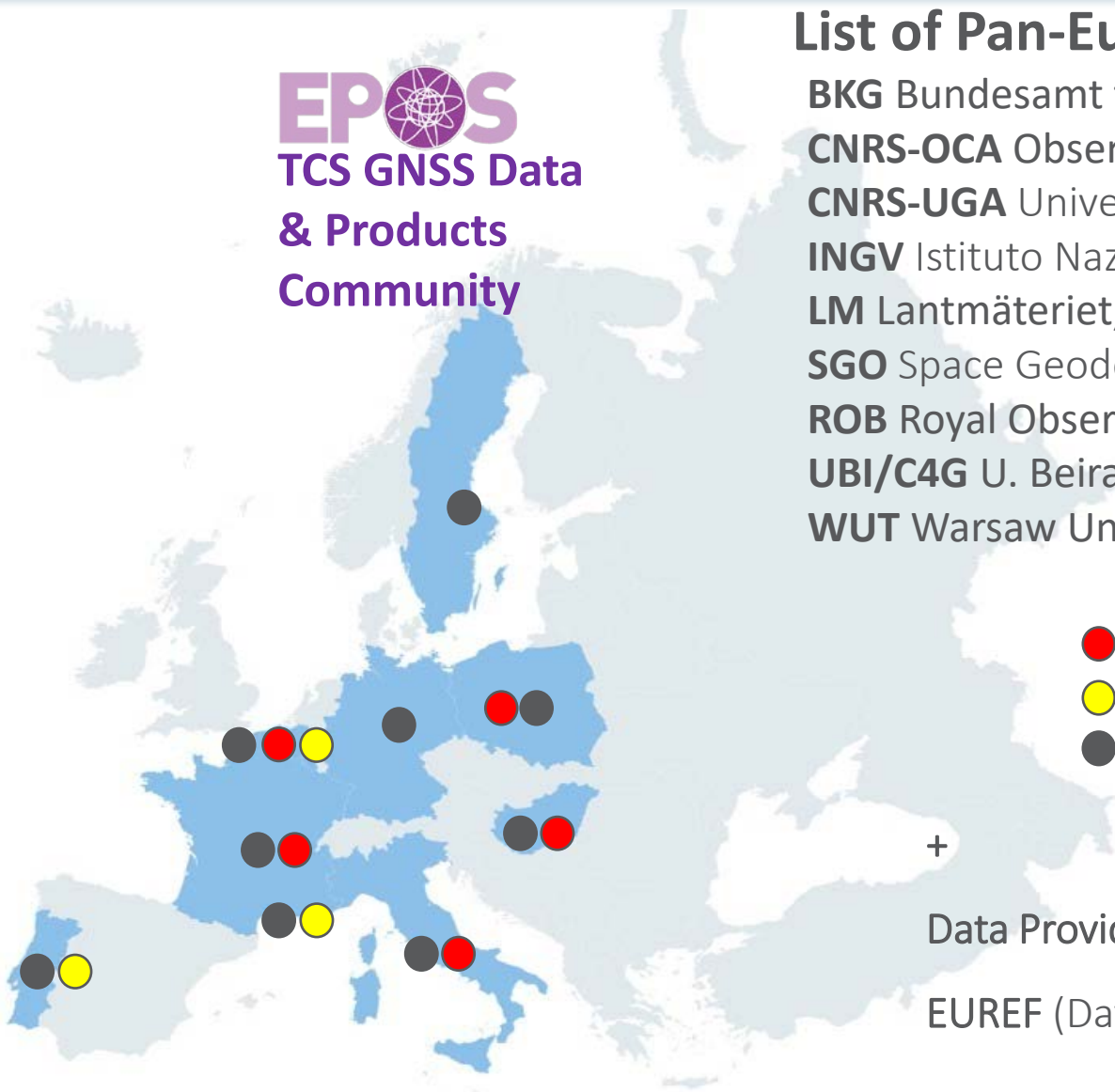
WUT Warsaw University of Technology, PL

- 5 Product Centers
- 3 Portals (M3G, Data, Products)
- 11 Service Providers

+

Data Providers (National Research Infrastructures)

EUREF (Data, Data Products & Services)



EPOS – European Plate Observing System

GNSS Data & Products

Added value of GNSS Data & Products for the GNSS community

Sustainability within EPOS:

Countries that join EPOS-ERIC commit to maintain their GNSS infrastructure integrated in EPOS (stations, operation).

Pan-European Service Providers needed the commitment of their countries to sustain them on long-term (EPOS-ERIC operation).

Provision of software tools (GLASS):

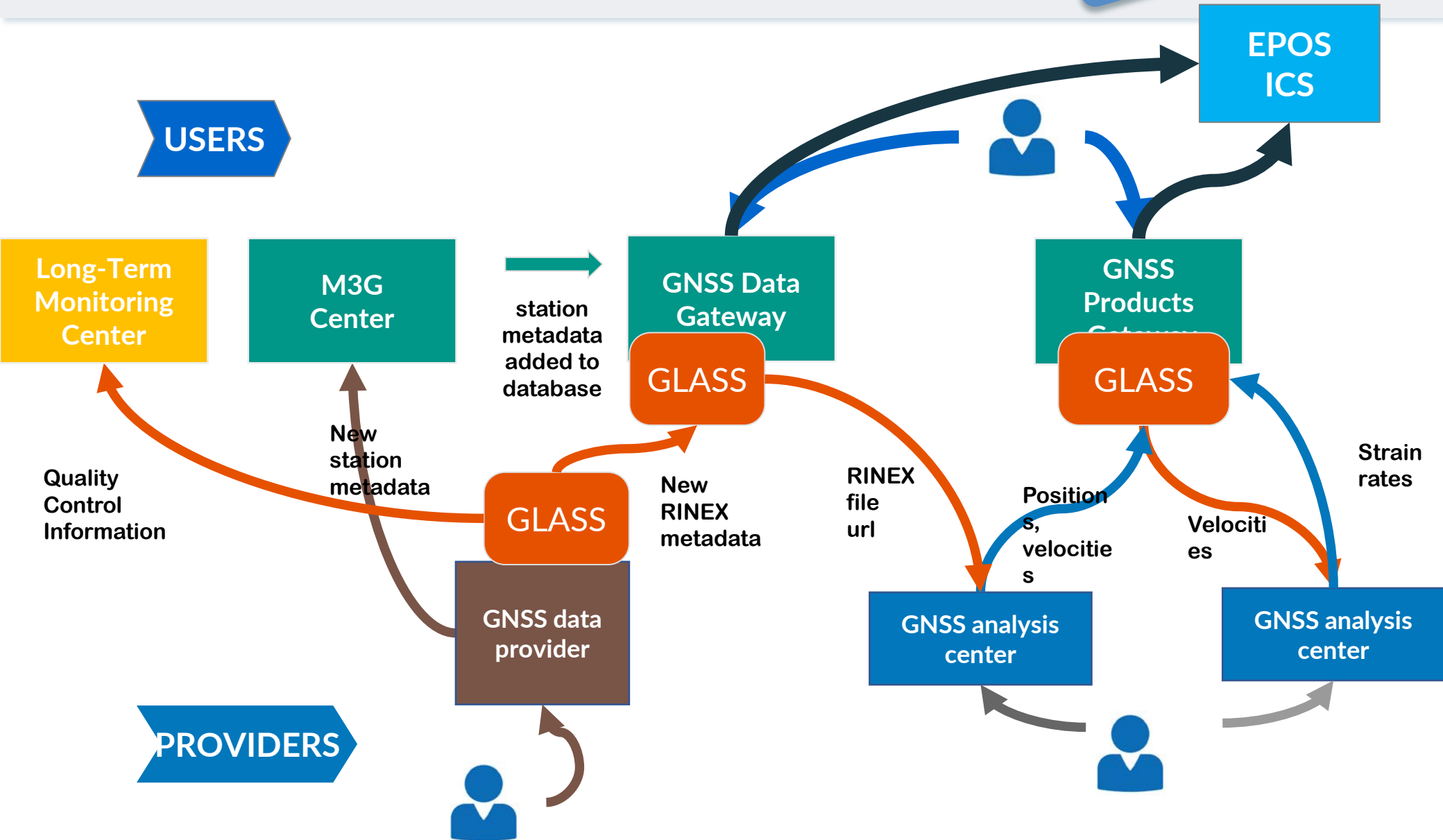
Standardized data quality check and visualization

Standardized exchange of metadata

Seamless data access

To be made globally available

GLASS – Software for Data Management



EPOS-GNSS Portals

M³G – Metadata Management



Welcome!

Supported GNSS networks

-
-
-

2893 GNSS stations with metadata in M³G

Updates

- TOR000ESP** 2 days ago
 Antenna changed to LEIART0 NONE (SN:24098033)
- IST900CHL** 2 days ago
 New
- IST800CHL** 2 days ago
 New
- IST700CHL** 2 days ago
 New
- IST600CHL** 2 days ago
 New
- IST500CHL** 2 days ago
 New
- IST400CHL** 2 days ago
 New
- IST300CHL** 2 days ago
 New

<https://gnss-metadata.eu/>

EPOS-GNSS Portals Data Gateway

The screenshot displays the EPOS-GNSS Data Gateway interface. At the top, there is a navigation bar with the logo and links for 'Command Line Client', 'History', 'Help', 'Products portal', 'M3G', and 'ICS'. Below this is a search bar with 'Rechercher' and buttons for 'Metadata Search', 'Files Search / Download', 'Clear', and 'Show advanced search'. A tooltip for the 'Show advanced search' button reads: 'This button allows to show and hide more advanced parameters'. The main area features a map of Europe with numerous colored circular markers representing GNSS stations. To the left of the map is a 'Spatial selection' panel with options for 'Rectangle' (Lat-Lon Bounding Box) and 'Circle' (Latitude, Longitude, Radius (Km)). Below the map is a data table with columns for Marker, Site Name, Lat, Lon, Alt, Install Date, End Date, Country, State, City, Agency, and Network.

Marker	Site Name	Lat	Lon	Alt	Install Date	End Date	Country	State	City	Agency	Network
▼ AARS00BEL	AARSCHOT	50.963	4.836	104.660	2002-10-04 00:00:00		Belgium	Vlaams-Brabant	Aarschot	Royal Observatory ...	FLEPOS
▼ ABAN00ESP	Abanilla	38.175	-1.054	207.620	2013-02-11 00:00:00		Spain	Región De Murcia	Parque De Bomber...	Red Geodésica Acti...	REGAM
▼ ABEP00GBR	Aberporth	52.139	-4.571	187.510	2005-07-21 00:00:00		United Kingdom	Ceredigion	Aberporth	Ordnance Survey LI...	OS Net
▼ ABG000GLP	Abri_geophysique	16.041	-61.659	1.254.510	2017-05-18 00:00:00		Guadeloupe	Guadeloupe (971)	Saint Claude	Guadeloupe Seismi...	VOLC
▼ ACAL00ESP	Los Alcázares	37.731	-0.861	67.590	2013-02-11 00:00:00		Spain	Región De Murcia	Parque De Bomber...	Red Geodésica Acti...	REGAM
▼ ACER00ITA	Acerenza (PZ)	40.787	15.942	764.700	2007-07-11 00:00:00		Italy	Basilicata	Acerenza (Pz)	Istituto Nazionale di ...	RING
▼ ACIN00ESP	Albarracín	40.409	-1.437	1.177.850	2010-01-19 00:00:00		Spain	Teruel	Albarracín	Instituto Geografico ...	N/A
▼ ACNS00ESP	Alcanices	41.700	-6.352	871.200	2008-02-14 00:00:00		Spain	Zamora	Alcanices	Instituto Tecnologic...	N/A
▼ ACOR00ESP	A Coruña	43.364	-8.399	66.960	1998-03-06 10:10:00		Spain	A Coruña	A Coruña	Instituto Geografico ...	EPN
▼ ADAR00GBR	Aberdaron	52.789	-4.741	148.360	2009-03-04 00:00:00		United Kingdom	Gwynned	Aberdaron	Ordnance Survey LI...	EPN & OS Net
▼ ADCS00ROU	Adamclisi	44.088	27.966	189.150	2019-05-14 00:00:00		Romania	Constanta	Adamclisi	National Institute for...	N/A
▼ ADE000GLP	DESIKRADE AIRPORT	16.297	-61.087	-40.330	2002-09-05 00:00:00		Guadeloupe	Guadeloupe (971)	Beausejour, La Desi...	Guadeloupe Seismi...	VOLC

<http://gnssdata-epos.oca.eu/>

EPOS-GNSS Portals Nodes

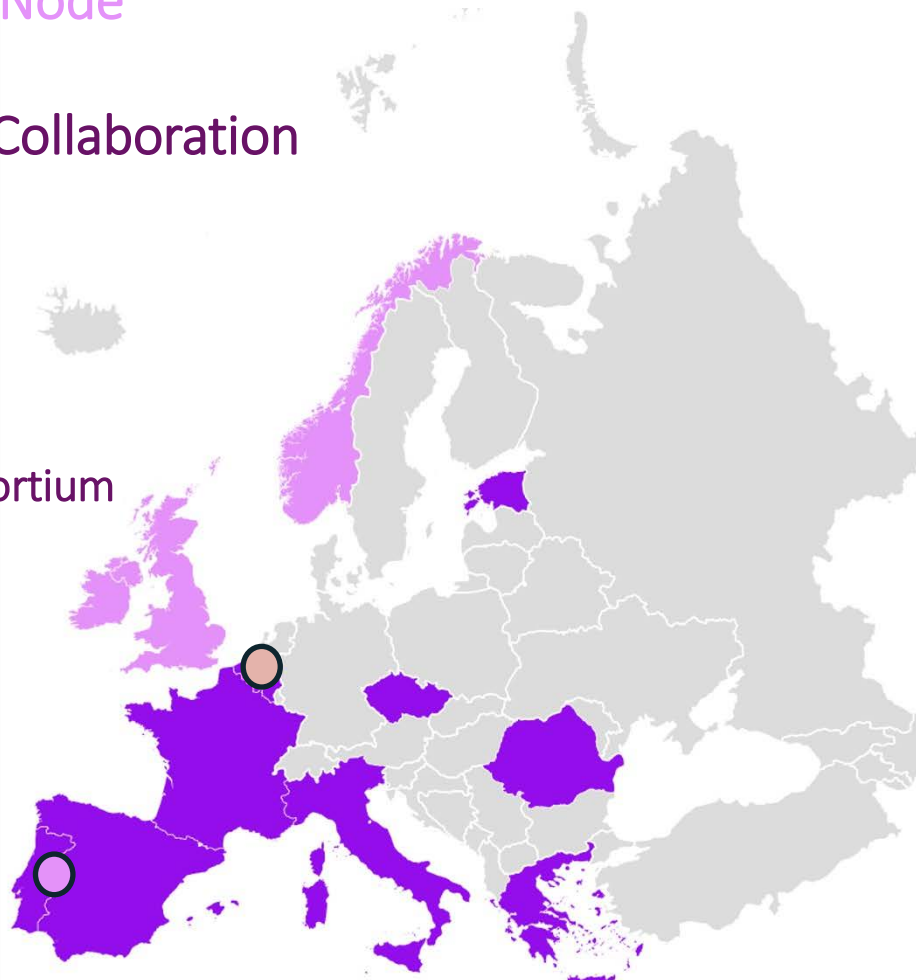
National Nodes

PanEuropean Node

EUREF Node

International Collaboration

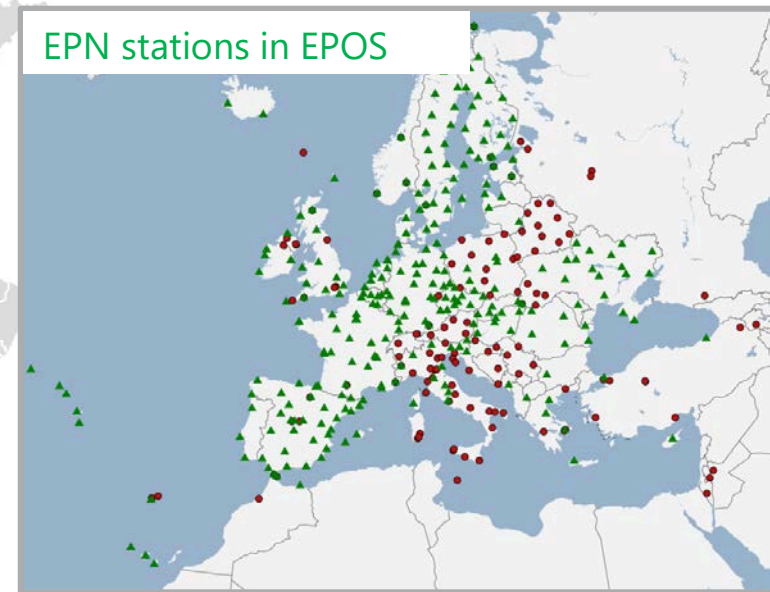
EarthScope Consortium



North Africa & Middle East
in the future?

EUREF Node

EPN stations in EPOS



EPOS-GNSS Portals Products Portal

EPOS GNSS PRODUCTS PORTAL

Data Controls

Analysis Centres

 INGV
 UGA-CNRS
 ROB-EUREF
 SGO-EPND

Show all entries

Show 10 entries

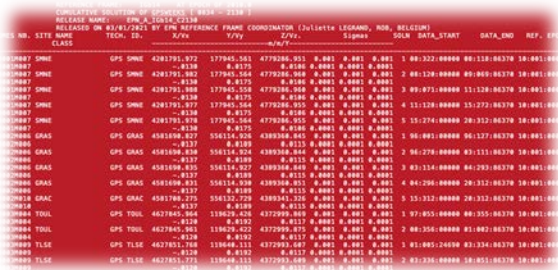
9-Char ID	Site Name	Country	Agency	Network	Availability
<input type="text" value="Search 9-Char ID"/>	<input type="text" value="Search Site Name"/>	<input type="text" value="Search Country"/>	<input type="text" value="Search Agency"/>	<input type="text" value="Search Network"/>	
002200DEU	Frankfurt Oder, DE	Germany	Not disclosed	UNKNOWN	<input checked="" type="checkbox"/>
002600DEU	Guben, DE	Germany	Not disclosed	UNKNOWN	<input checked="" type="checkbox"/>
013900DEU	Rothenburg, DE	Germany	Not disclosed	UNKNOWN	<input checked="" type="checkbox"/>

<https://gnssproducts.epos.ubi.pt/>

EPOS-GNSS Portals GNSS Products

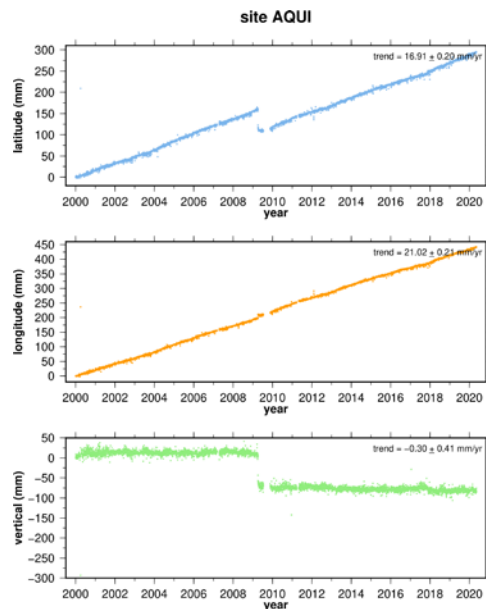
Daily/Weekly Positions

In Sinex format



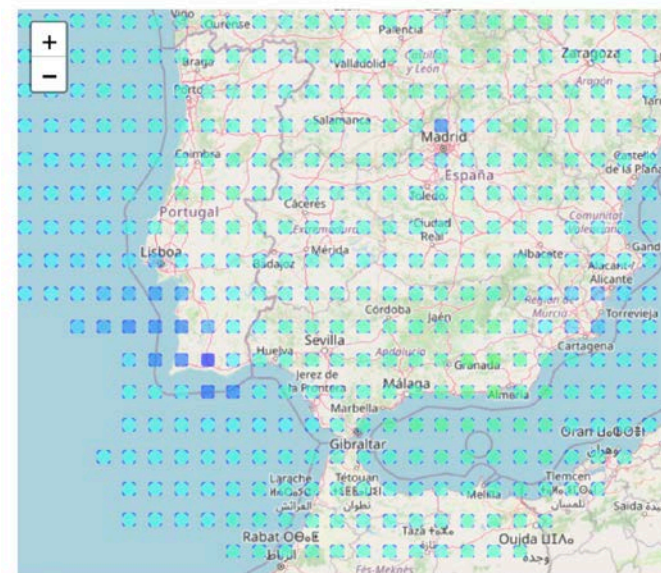
Time-Series

In PBO format



Strain-rate Maps

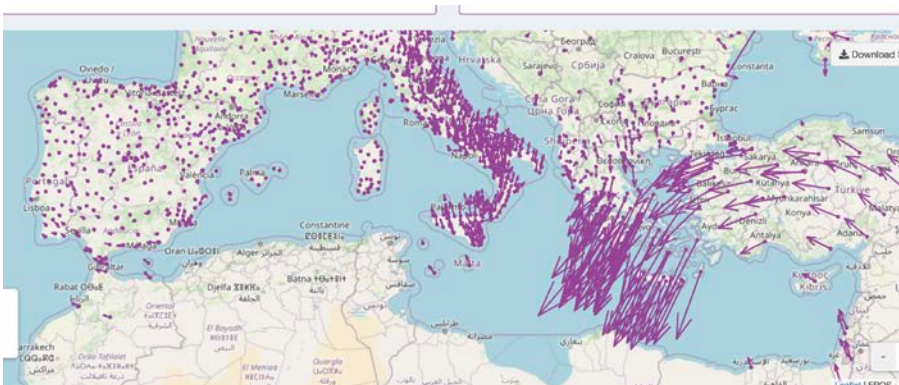
In dat format



Dilatation E-Max E-Min Shear

Velocities

In PBO format



EPOS Ambition: Provide data and information on ground motions based on permanent GNSS stations in Europe and plate boundary regions

Data Services

Centralized access to daily RINEX data through EPOS-GNSS Data Gateway 1600+ stations (xx EPN stations)

Common EUREF-EPOS system (M³G) for collection of, and access to, station metadata :

Product Services

Centralized access to GNSS products through EPOS-GNSS Product Portal

EPOS-specific products

EUREF products

Common EUREF-EPOS products



Thank you!

Rui Fernandes

rui@segal.ubi.pt