GNSS DATA AND PRODUCTS

OVERVIEW | OBJECTIVES

Presently, thousands of public and privately owned permanent GNSS stations are operating in Europe. The EPOS Preparatory Phase has demonstrated the willingness of the national networks to provide and distribute GNSS data through common European services which, when implemented, will be used by European researchers in solid Earth science as well as in other environmental sciences. The main challenges of the GNSS community at the present time is therefore to build a joint European GNSS data and product distribution system into which both national networks and EUREF contributes. The aim is to increase the number of available data at European level and build products based on this larger number of stations. For the distribution service, this WP currently focuses on daily data and products (ie. Daily solutions, position time series, velocity fields and strain rate maps) based on these data.

Main objectives:

Archive and distribute GNSS data and products

- At a large, integrated scale (Europe)

- Responding to high and homogeneous quality standards

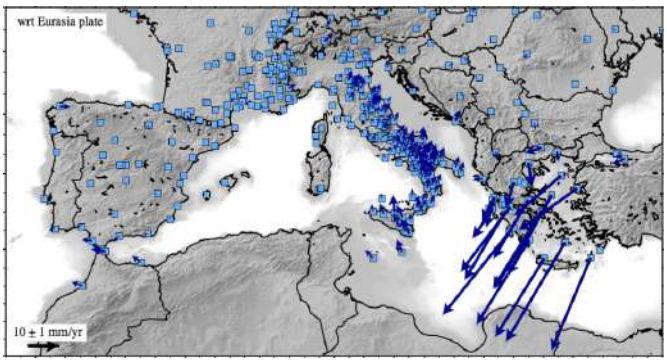
- Through a unique and visible portal

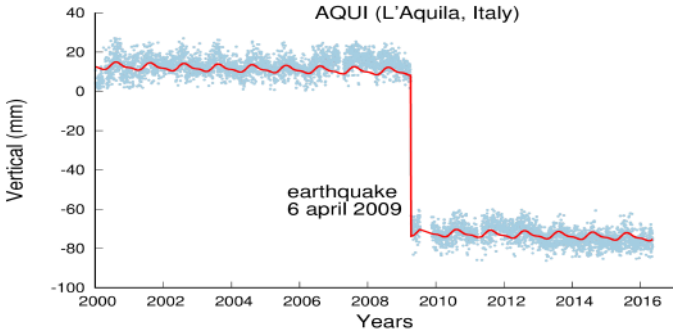
- To facilitate the use of GNSS data, and make it available to a broad community

How do we proceed?

- Construct the future governance of Thematic Core Services (TCS) GNSS Data & Products in EPOS;
- Interact with the geodetic community in Europe, at national and Pan-European (EUREF) levels;
- Ensure interoperability between EPOS GNSS services (data and products) and EPOS Integrated Core Services (ICS);
- Promote multidisciplinary interoperability with other disciplines within EPOS;
- Implement distributed dissemination of validated file-based GNSS data for about 2000 stations in the first 3 years with the goal of reaching 3000 by the end of the EPOS-IP;
- Implement computation and distributed dissemination of GNSS long-term products (position time-series, velocities, strain rate maps) based on the EPOS associated stations;
- Develop plans for the future preservation of GNSS data, dissemination of real-time GNSS data, and generation and dissemination of other geodetic products.

SERVICES





Data Dissemination

- Access to validated data from EPOS stations through EPOS GNSS Data gateway:
  - RINEX data;
  - Station metadata;
- Monitoring of the GNSS data quality;
- Centralised facility to submit/validate EPOS station site logs.

Product Dissemination

- Access to validated EPOS products through EPOS GNSS Product gateway:
  - Positions and time series
  - Velociities
  - Strain rate fields
- Generation of dedicated products:
  - GNSS data analysis generating daily solutions, position time series and velocities (using Precise Point Positionning approach and Double Difference approach);
  - Dense European Velocity including EPOS stations as well as EUREF densifation network;
  - Strain rate fields.

Software Provision

- Distribution and maintenance of software package "GLASS" to provide access to GNSS data;

EUREF:

- EPOS GNSS Data gateway also offers access to data from EUREF stations belonging to EPOS through interface with regional and historical EUREF data repositories.

EPOS GNSS Product gateway also offers access to EUREF products: European reference frame, weekly station positions, and densified EUREF solution.

THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S HORIZON 2020 RESEARCH AND INNOVATION PROGRAMM UNDER GRANT AGREEMENT N° 676564

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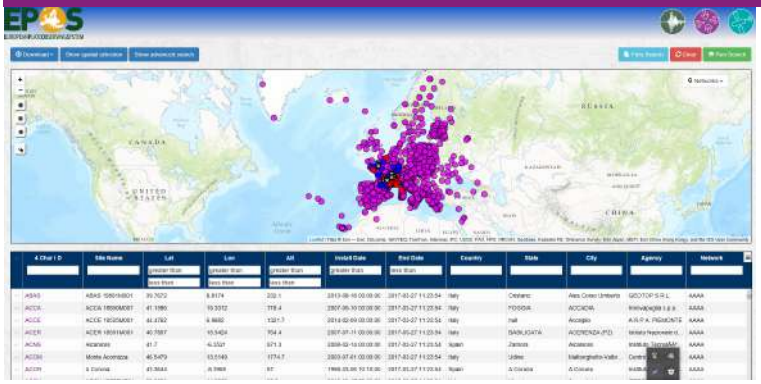
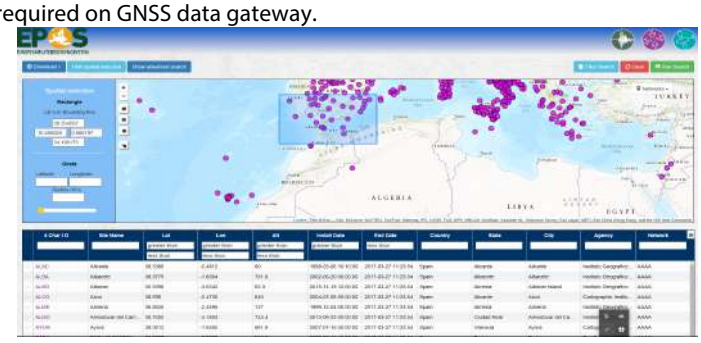
USE CASES



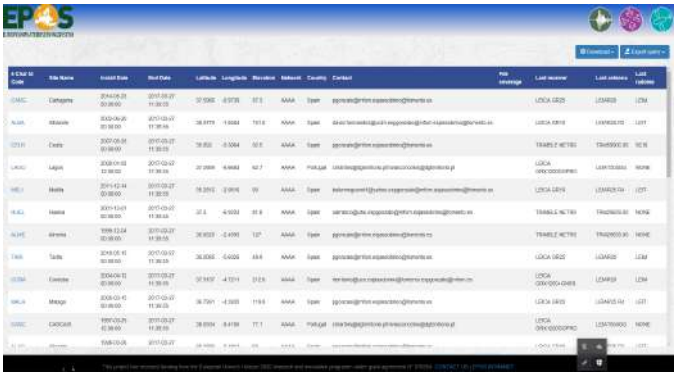
GNSS metadata download for GNSS data analysis
A search for the metadata (e.g. site logs, a priori station information, quality control) for each EPOS station.

Flow of events:

1- User selects a geographical area or a list for which GNSS metadata are required on GNSS data gateway.



2- The metadata (with or without details) for the selected stations is returned.



3- A list of file URL can be requested.

Other use cases:
- Compute the velocity of a station using external information to detect co-seismic offsets;
- Obtaining GNSS data for the estimation of Volcano deformation;
- Volcano velocity/deformation field estimation for multidisciplinary modelling;
- Co-seismic displacements associated with a Mw7 earthquake;
- GNSS time series at the Eurasia-Nubia plate boundary; Compute the velocity of a station to detect post-seismic motion;
- Access to GNSS data quality results for monitoring purposes;

CONTACT

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- INGV - ISTITUTO NAZIONALE DI GEOFISICA E VULCANOLOGIA, ITALY
- NOA - NATIONAL OBSERVATORY OF ATHENS, GREECE
- GOP - GEODETIC OBSERVATORY PECNÝ, RESEARCH INSTITUTE OF GEODESY, TOPOGRAPHY AND CARTOGRAPHY, CZECH REPUBLIC
- IMO - ICELANDIC METEOROLOGICAL OFFICE, VEDURSTOFA ISLANDS, ICELAND
- FOMI - FOLDMERESI ES TAVERZEKELESI INTEZET, HUNGARY
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