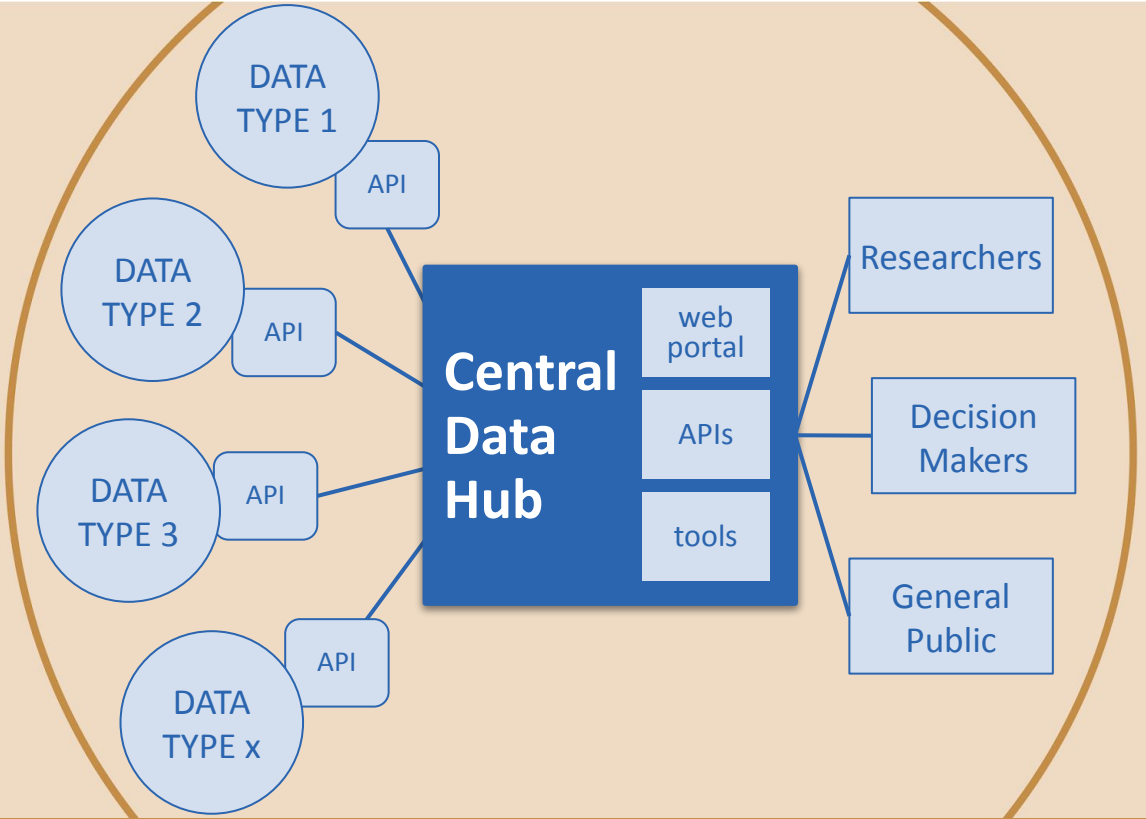
WP11
Italian Platform for Solid Earth Science

Coordinators
Mario Locati, Gabriele Tarabusi

Assigned Budget
2.27 M€, 6.3% of the project



WP11 Italian Platform for Solid Earth Science

Coordinators: Mario Locati, Gabriele Tarabusi (INGV)

Budget 2.27M€
6.3% of the project

Goals

Access to additional types of scientific data, 16 activities

Creation of a unique access point for all data generated in all WPs, 1 activity

Organisations

4 Research Institutes: INGV (Milan, Roma 1, OE, OV), OGS, ISPRA, CNRR-IGG

2 Universities: University of Genova, University of Trieste

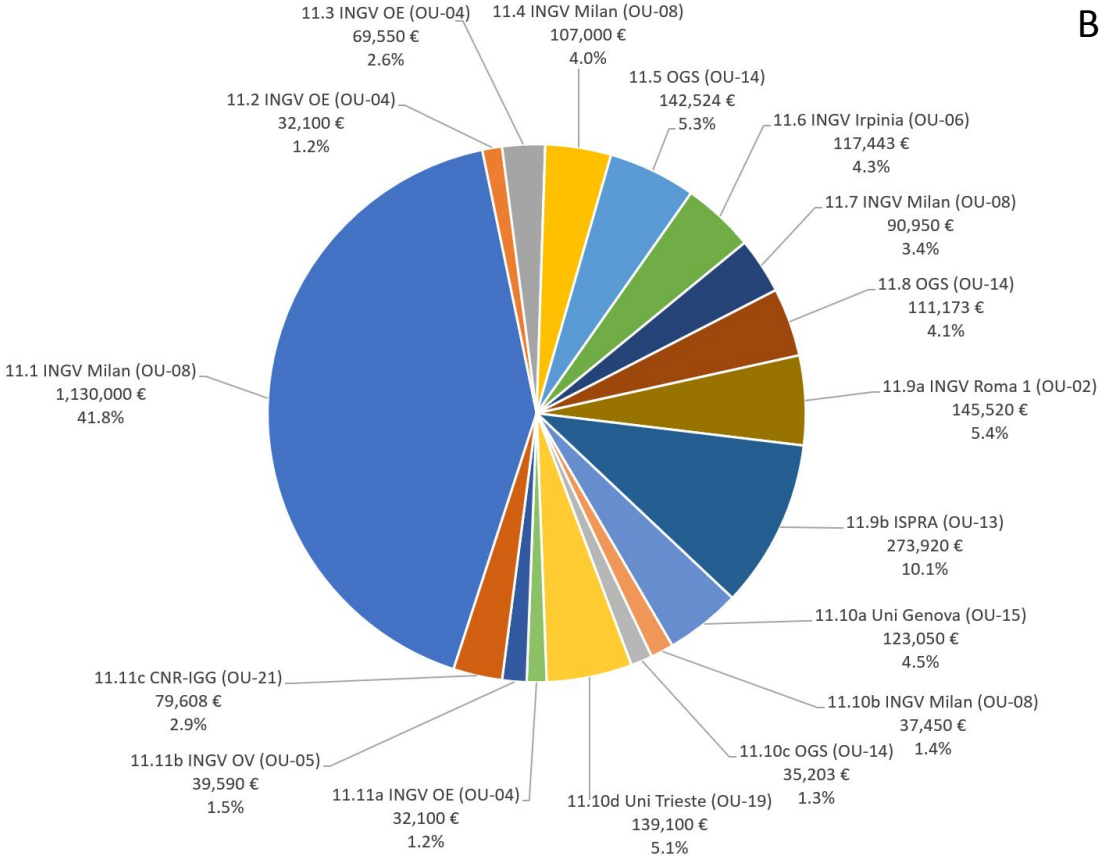
Deliverables

M8	Jun 2023	Phase 1: Requirements
M12	Oct 2023	Phase 2: Access to laboratories and Trans-National Access
M24	Oct 2024	Phase 3: Design and prototypes
M30	Apr 2025	Phase 4: Integration, publication and benchmarks

WP11 Italian Platform for Solid Earth Science

Budget per activity

Budget 2.27M€
6.3% of the project



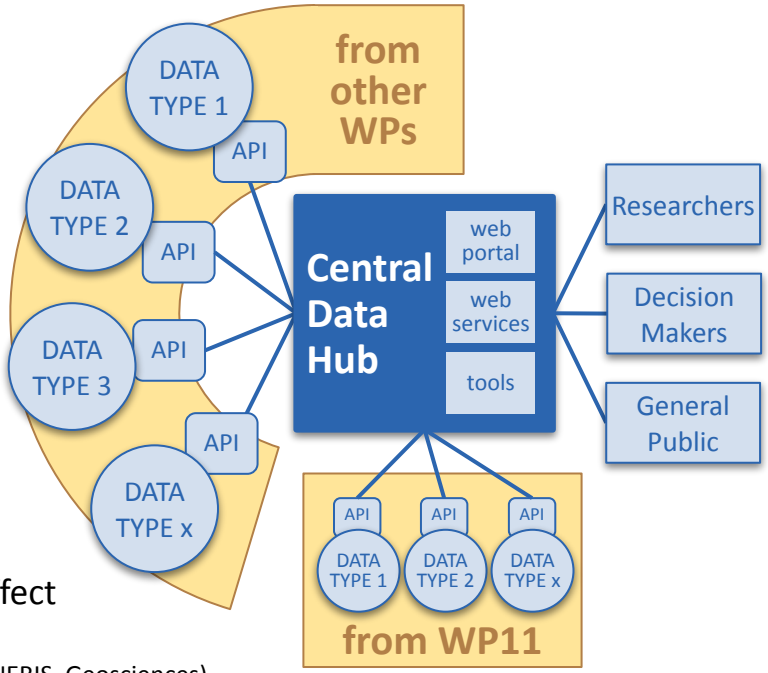
A.11.1 Development of the Italian Platform for Solid Earth Science

Operating Unit: INGV Milan (OU-08)
Person in charge: Mario Locati, Gabriele Tarabusi

Budget 1.13M€
41.8% of WP11

Goals

- Access to all data generated within the project (and beyond after M30)
- Access to TNA facilities
- Become a point of reference primarily for the scientific community
- Become a (meta)data and services incubator for EPOS ERIC
- Share as much (open) source code as possible with EPOS ICS aiming at modules exchange, resource optimization and interoperability
- Modular user interface depending on 3 envisioned user profiles
- Virtual Research Environment (VRE) for data analysis



Challenges

- Very complex design, not all modules might be ready for use at M30
- Making a fully fledged VRE still an heavily experimental activity
- Heavily relying on external developers consultants, risk of a black-box effect
- Overlapping guidelines on multiple levels and by multiple subjects
  EPOS ICS, EOSC, INSPIRE Directives, AgID, Projects EU (e.g. Geo-INQUIRE, DT-GEO) and PNRR (e.g.ITINERIS, Geosciences)

A11.2 Physical and Remote Access to Italian Earth Science facilities

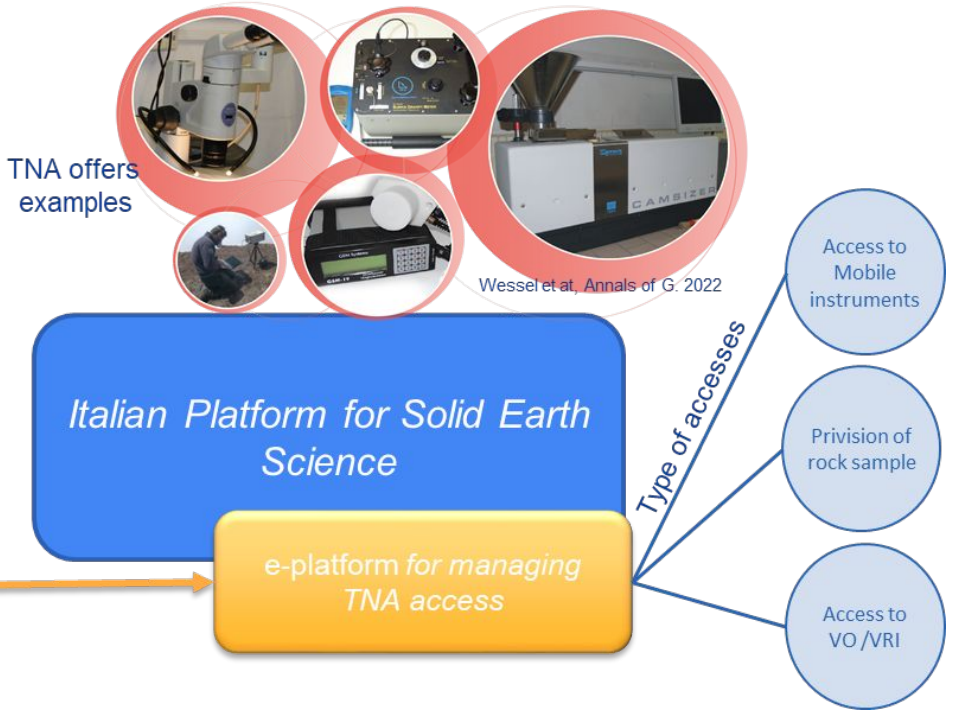
Operating Unit: INGV Osservatorio Etneo (OU-04)
Person in charge: Danilo Reitano

Budget 32,100€
1.2% of WP11

Goals
Provision of services offered by
Transnational Access in laboratories by

- physically accessing to a specific facility of the infrastructure
  (laboratory, observatory, pool of instruments, etc.)
- using remote services
  (e.g. perform laboratory analysis remotely)

Activity
Implementation and test of the TNA framework as part of the Italian Platform for Solid Earth Science



A11.3 Access to historical macroseismic archives

Operating Unit: INGV Osservatorio Etneo (OU-04)
Person in charge: Raffaele Azzaro

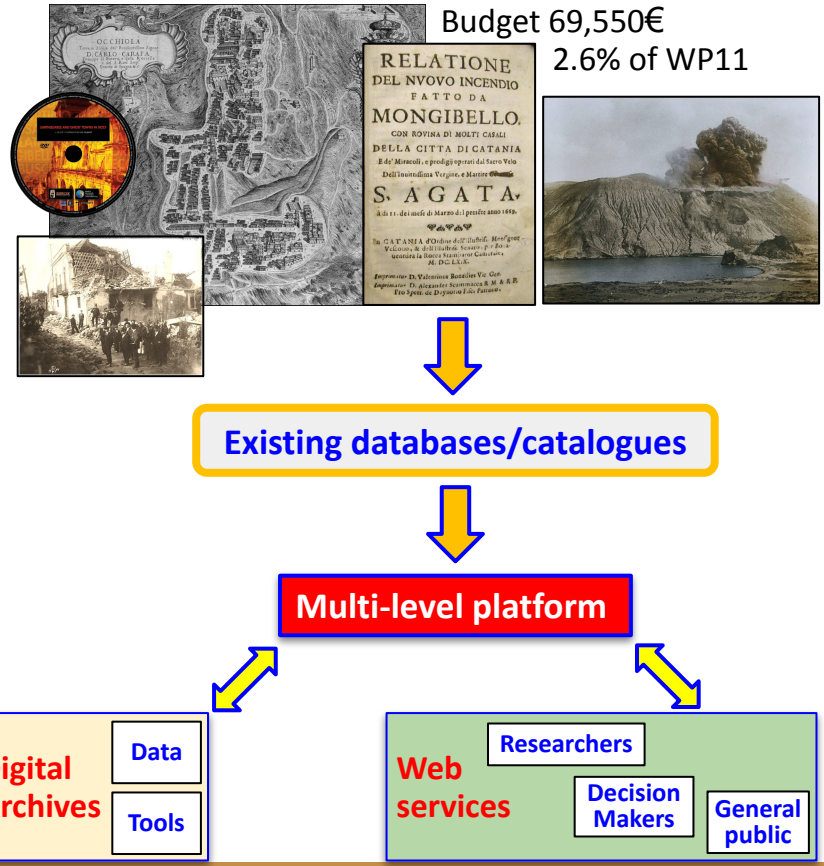
Budget 69,550€
2.6% of WP11

Goals

- Implementing a new generation of Digital Archives for historical data on earthquakes, volcanic eruptions and tsunamis
- Creating a multi-level platform of data available for different typologies of end-users and applications
- Collecting, preserving and sharing on the web metadata (texts, images and original documents) coming from the vast Italian documentary heritage on seismic and volcanic phenomena

Challenges

- Integrating the existing historical-macroseismic databases managed at INGV (ASMI, CFTI, ITED)
- Developing a structure for heterogeneous typologies of themes (effects of earthquakes vs volcanic eruptions vs tsunamis)
- Providing tools for a first-level of semi-automatic classification of the phenomena and their effects
- Enriching by new documentation the existing datasets



A11.4 Structural test data from Italian laboratories for vulnerability assessment of buildings and infrastructure to natural hazards

Operating Unit: INGV Milan (OU-08)
Person in charge: Mario Locati

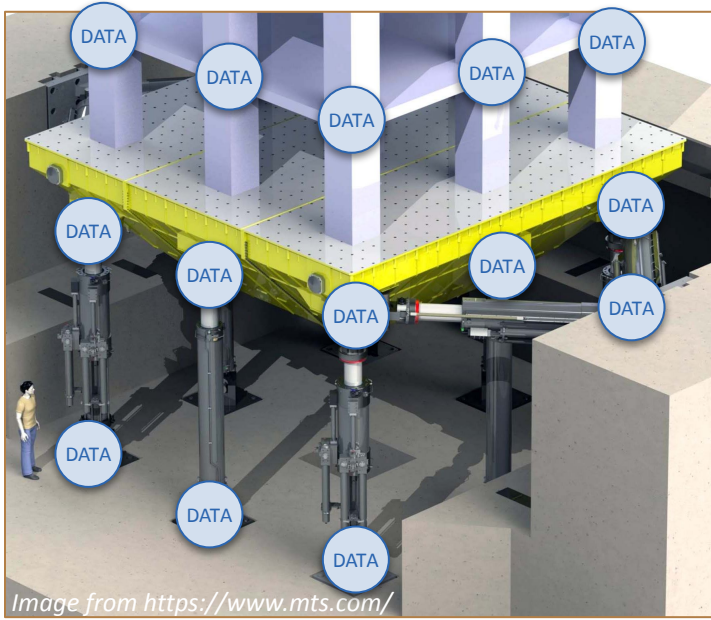
Budget 107,000€
4.0% of WP11

Goals

- Online database of vulnerability data of building and infrastructures
- Access to a vast amount of data generated during labs experiments
- FAIR principles and interoperable with the central data hub of WP11
- Upload mechanism for a future proof and living database after M30

Challenges

- Need to closely interface with other organisations at European level
- Lack of experience, will rely on external consultants for development
- Need to ensure engagement with engineering community as a guarantee of a long-term maintenance
- Engage with ongoing European projects on the field



A11.5 Italian North-Eastern OGS Observatory for Seismology - INEOOS

Operating Unit: OGS (OU-14)
Person in charge: Carla Barnaba

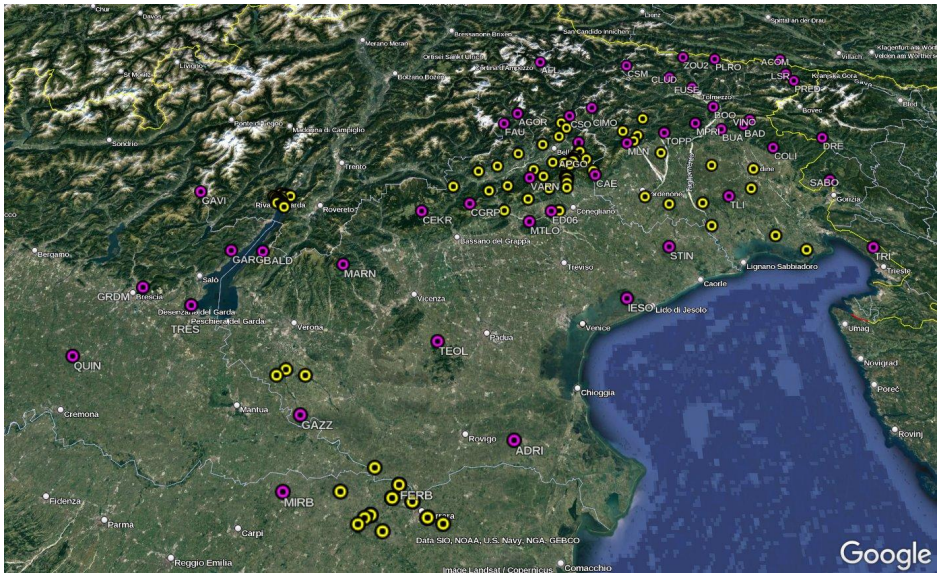
Budget 142,524€
5.3% of WP11

Goals

- Collect, standardise and increase seismological data (time series, strong-motion parameters, …) in the North-Eastern Italy, both from permanent and temporary networks
- Provide seismological services (bulletins, station info, geophysical site characterization, …)
- FAIR principles to guarantee data and metadata provenance and appropriate usage license
- Guarantee of a living database after M30

Challenges

- Close interaction with other WPs/OUs
- Close interaction with real-time services provide to seismic monitoring



- OGS Permanent Stations
- OGS Temporary Stations

A11.6 Access to GNSS data

Operating Unit: INGV Irpinia (OU-06)
Person in charge: Annamaria Vicari

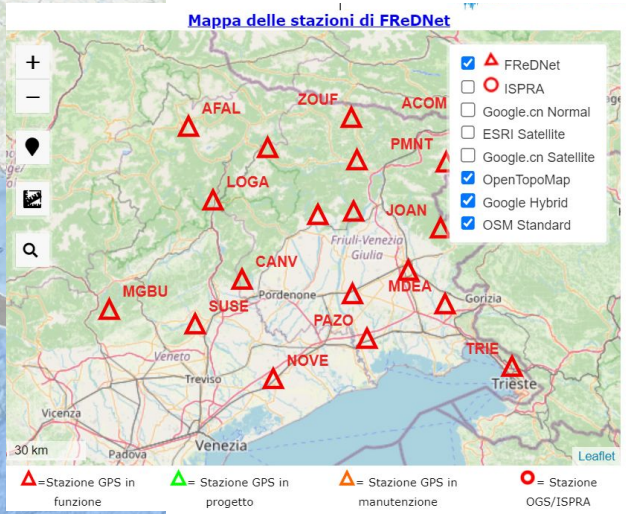
Budget 117,443€
4.3% of WP11

Goals

- Harmonisation and interoperability of RING and OGS GNSS infrastructure portals with services developed in Italian Platform for Solid Earth Science
- FAIR principles to guarantee data and metadata provenance and appropriate usage license

Challenges

- Ensure interoperability with other services or databases
- Check the respect of FAIR principles and guarantee the service continuity



A11.7 Digital services for strong motion data

Operating Unit: INGV Milan (OU-08)
Person in charge: Giovanni Lanzano

Budget 90,950€
3.4% of WP11

Goals

- Provide a suite of web-services for IPSES
- Ensure interoperability with other services/databases developed by other WPs/OUs
- Review the available information existing or developed by other WPs/OUs for site characterization
- Check the respect of FAIR principles and guarantee the service continuity

Challenges

- Coordination with European projects/activities on the field
- Support of external consultants for development
- Need to ensure engagement with engineering community as a guarantee of a long-term maintenance

FDSN event

FDSN station

site characterization

event data

shakemaps input

flatfile

A11.8 Development of interoperable data access services for exploration seismics

Operating Unit: OGS (OU-14)
Person in charge: Paolo Diviacco

Budget 111,173€
4.1% of WP11

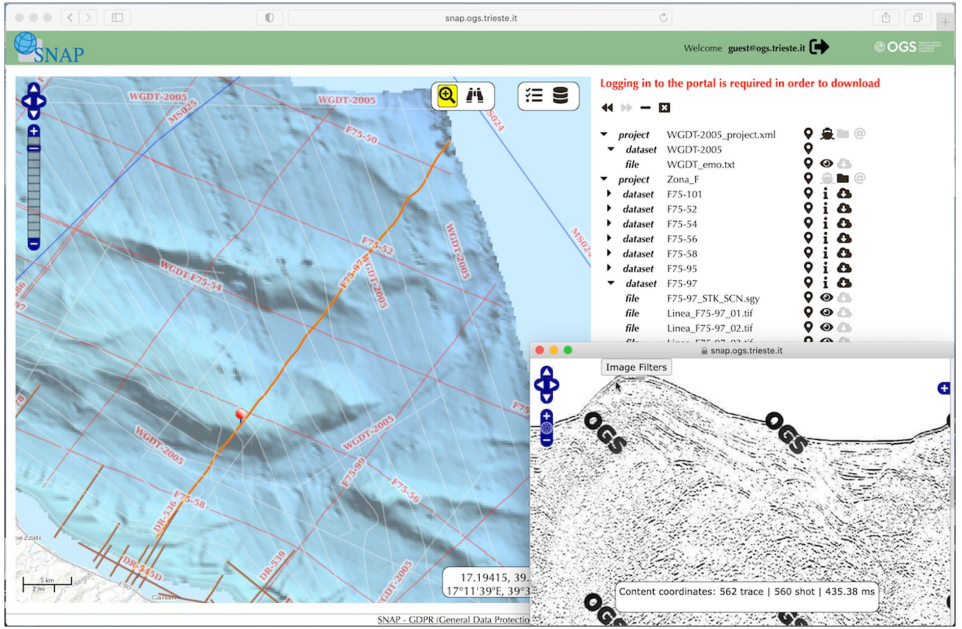
SNAP is the OGS exploration geophysics data portal.

Goals

- Develop the necessary software to integrate SNAP
- Harmonize SNAP in order to guarantee SNAP semantic interoperability
- Share datasets compliant with FAIR principles

Challenges

- Ensure interoperability with other services or databases
- Check the respect of FAIR principles and guarantee the service continuity



A11.9a Services and interoperability layers for distributing earthquake faulting data in 4D
A11.9b Geological data and services provision and fault geometries interoperability layers

Operating Unit (a): INGV Roma 1 (OU-02) Budget 145,520€
Person in charge: Roberto Basili 5.4% of WP11

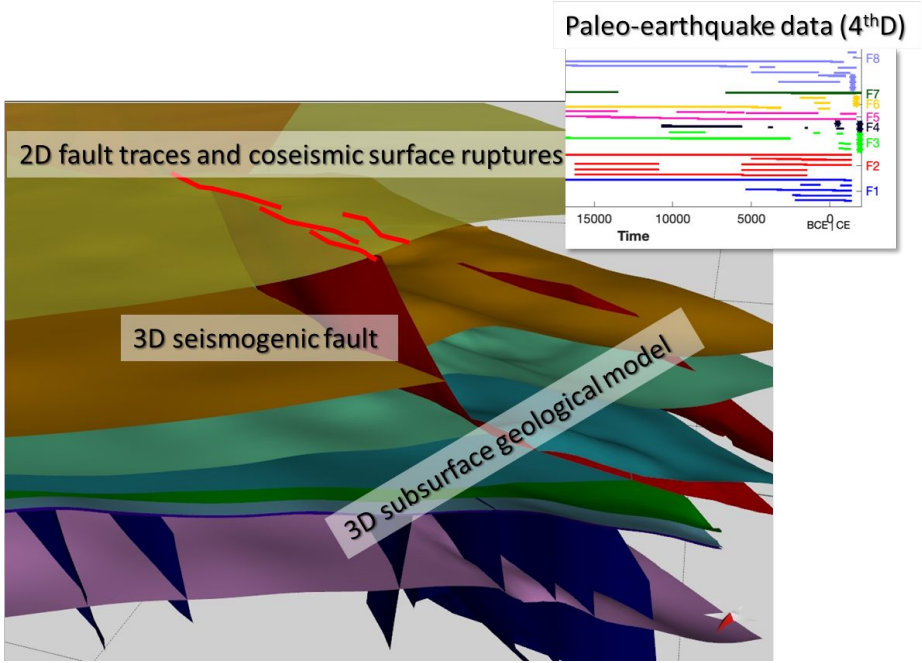
Operating Unit (b): ISPRA (OU-13) Budget 273,920€
Person in charge: Maria Pia Congi 10.1% of WP11

Goals

- develop new datasets and strengthen existing ones on 2D fault surface traces, coseismic surface ruptures, subsurface 3D geological models, 3D seismogenic faults, paleoearthquake data (4thD)

Challenges

- Seek compliance of subsurface 3D geological object with INSPIRE Geology Data Model and other standards
- Enable users to explore and retrieve information from traditionally disconnected datasets at different spatial scales



A11.10 Web service for seismic source parameters dissemination

11.10a - Operating Unit: University of Genoa (OU-15)
Person in charge: Daniele Spallarossa
Budget 123,050€
4.5% of WP11

11.10b - Operating Unit: INGV Milan (OU-08)
Person in charge: Francesca Pacor
Budget 37,450€
1.4% of WP11

11.10c - Operating Unit: OGS (OU-14)
Person in charge: Angela Saraò
Budget 35,203€
1.3% of WP11

11.10d - Operating Unit: University of Trieste (OU-19)
Person in charge: Giovanni Costa
Budget 139,100€
5.1% of WP11

Goals

- Development of an IT platform and relative web services for the rapid estimation of seismic data, both static and dynamic (i.e. seismic moment, radiated energy) parameters, and their dissemination at a national scale
- Towards the next generation of seismic catalogs

Challenges

- Ensure interoperability with other services or databases
- Check the respect of FAIR principles and guarantee the service continuity

A11.10 Web service for seismic source parameters dissemination

Operating Units: University of Genoa (OU-15), INGV Milan (OU-08), OGS (OU-14), University of Trieste (OU-19)

Visualizza 12 elementi Cerca: Copy CSV

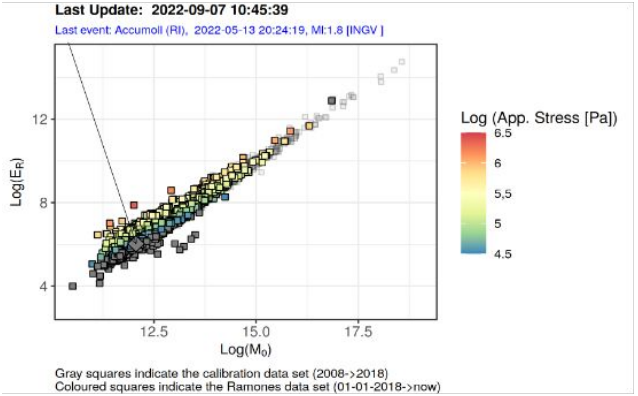
Area	Pdf	ID	ID-INGV	Tempo origine (UTC)	Lat.	Lon.	Prof. (km)	M_L INGV	M_W INGV	M_L IT16	M_W	LogM0	LogE	M_L ER	Stress apparente (Pa)	N°sta mag
Adriatico centro-sett.		221109065719	33305051	2022-11-09 06:57:19	43.975	13.288	9.7	3.2 ± 0.3	-	3.16 ± 0.33	3.23	13.95 ± 0.35	8.62 ± 0.41	3.01	1.50e+5	76
Adriatico centro-sett.		221109063040	33303551	2022-11-09 06:30:40	43.938	13.294	9.3	3.7 ± 0.3	-	3.55 ± 0.29	3.62	14.53 ± 0.25	9.37 ± 0.33	3.42	2.20e+5	77
Adriatico centro-sett.		221109061655	33302251	2022-11-09 06:16:55	43.994	13.363	7.2	3.4 ± 0.2	-	3.12 ± 0.31	3.17	13.85 ± 0.42	8.73 ± 0.46	3.07	2.38e+5	68
Adriatico centro-sett.		221109061257	33302041	2022-11-09 06:12:57	44.017	13.327	2.2	4.0 ± 0.3	-	3.97 ± 0.31	3.81	14.81 ± 0.53	10.06 ± 0.42	3.81	5.67e+5	76

An example: 2022 Ancona-Fano seismic sequence

Source parameters

- Coordinates
- Deph
- Local magnitude, Moment magnitude and Energy magnitude
- Energy
- Apparent stress

Evaluated using more than 70 seismic stations



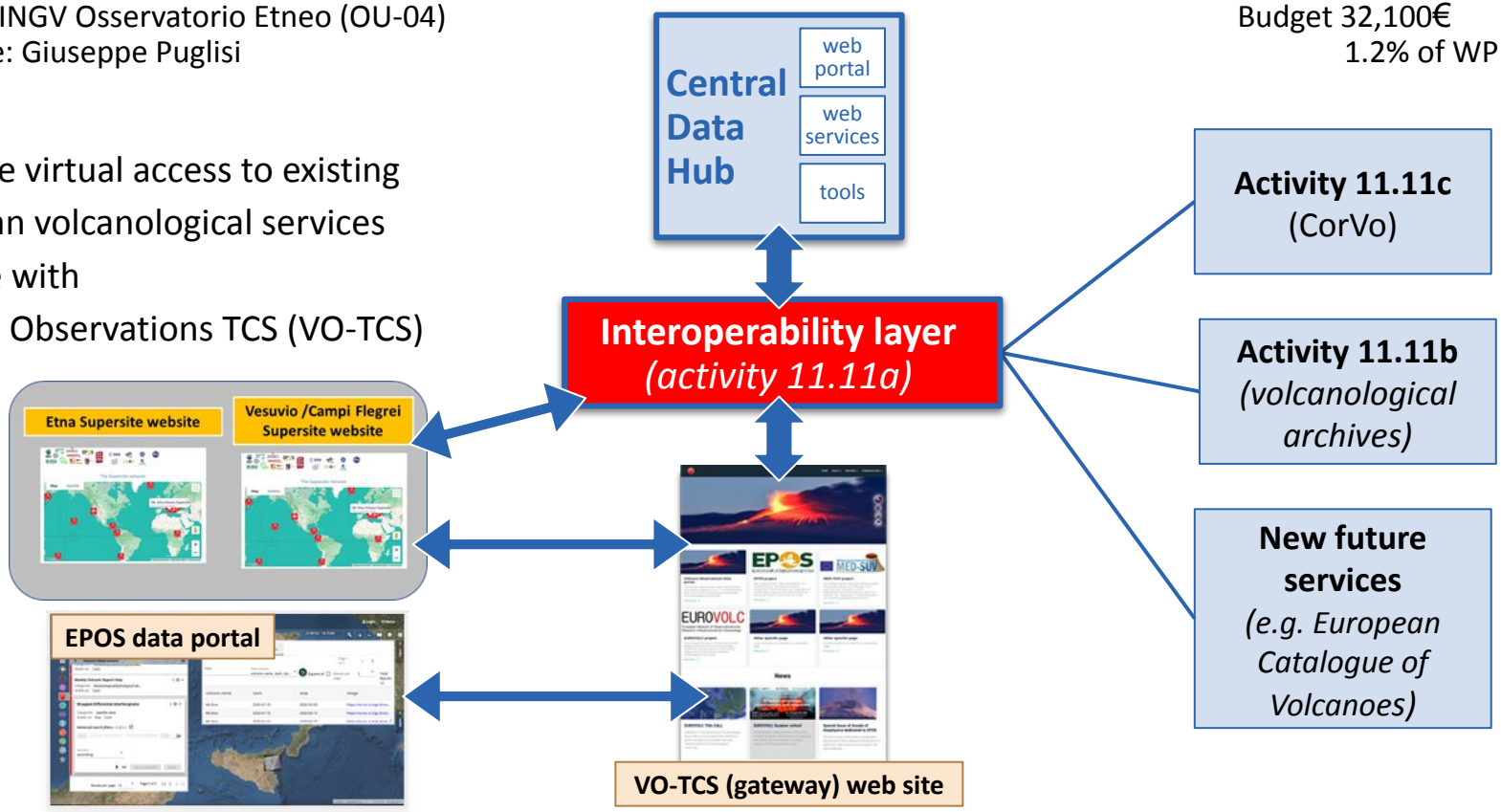
A11.11a Virtual Access to Italian volcanological services

Operating Unit: INGV Osservatorio Etneo (OU-04)
Person in charge: Giuseppe Puglisi

Budget 32,100€
1.2% of WP11

Goal

Harmonize the virtual access to existing and new Italian volcanological services in compliance with EPOS Volcano Observations TCS (VO-TCS)



A11.11b Access to volcanological archives recorded by the ash dispersion

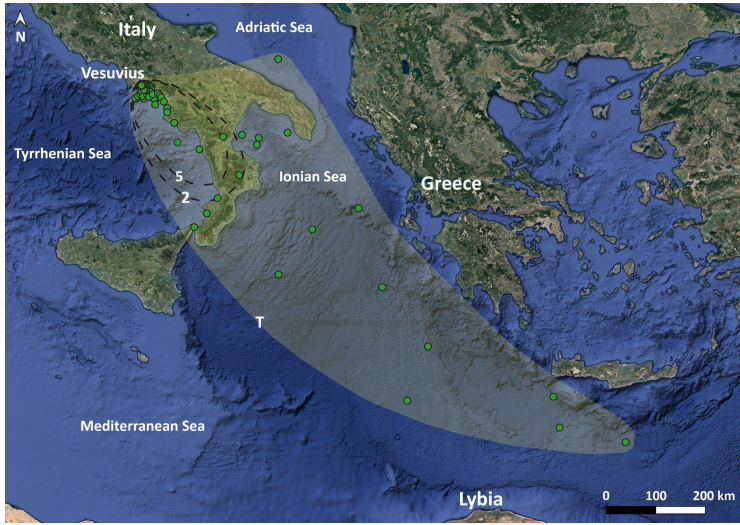
Operating Unit: INGV Osservatorio Vesuviano (OU-05)
Person in charge: Mauro Antonio Di Vito

Budget 39,590€
1.5% of WP11

Goals

- Build a database about volcanic ash dispersal for selected eruptions
- Compliance with European Catalogue of Volcanoes (activity 11.11a)
- Relevant parameters
  - Timing of eruptions
  - Dispersal
  - Pyroclastic product features
  - Impacts
  - Secondary phenomena (lahars, seismicity, tsunami)

The impact of explosive eruptions has an important relapse in hazard and risk assessment



Examples of the area of ash dispersal in the 79 CE ''Pompeii'' eruption

Challenges

Global view definition of hazard and risk accounting for multiple eruptions in global areas

A11.11c Using text corpora for volcanic eruption forecasting, impact assessment and resilience planning

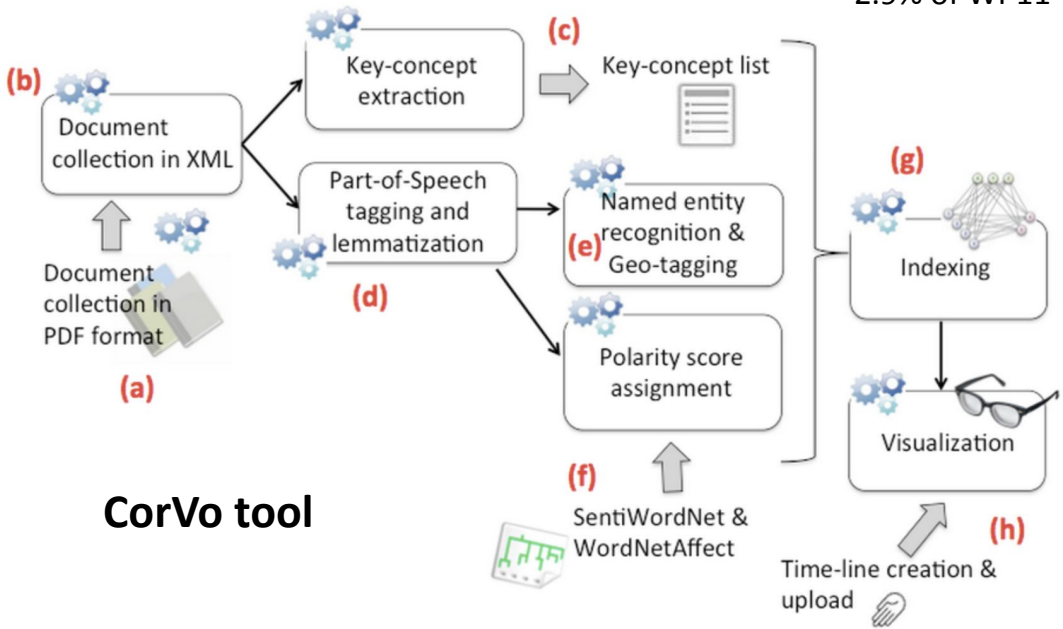
Operating Unit: CNR-IGG (OU-21)
Person in charge: Claudia Principe

Budget 79,608€
2.9% of WP11

Goals

By querying linguistically annotated corpora, end users will be able to

- quickly obtain important information from past eruptive scenarios *(e.g. precursors, phenomenology, deposit distribution and damages)*
- define social impact of past eruptions and reactions they provoked in the institutions
- tackle future emergency scenarios and plan response strategies



Documents → CorVo (extraction of information) → End users