

GeoSciences IR

A Research Infrastructure for
Regional Geological Surveys



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<https://geosciences-ir.it>



The financing

Project funded by **PNRR** - European Union - NextGenerationEU - Mission 4
“Education and Research” - Component 2 **“From Research to Business”** –
Investment 3.1 “Fund for the realization of an integrated system of
research and innovation infrastructures”








Finanziato
dall'Unione europea
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GeoSciences IR in a glance

-  National priority RI 2021-2027 PNIR (Area ESFRI Physical and Engineering)
-  Startup: 1st October 2022
-  Project duration: 30 months (extension up to 36 months)
-  **Leading partner: ISPRA**
-  **Sixteen partners** involved: 3 Research Institutions and 13 Universities



The project

GeoSciences IR will create a permanent cloud research infrastructure which will provide data, services, tools and methodologies in the different sectors of geology, to be used for land monitoring, control and planning



The Italian Network of Regional Geological Surveys - RISG target beneficiaries of the infrastructure

Coordination network among the technical structures of
Regions, Autonomous Provinces and ARPA with geological
expertise at regional level, coordinated by ISPRA..

The Regional Geological Services belonging to the RISG are the
target beneficiaries of the infrastructure GeoSciences IR

The priority themes for GeoSciences IR are represented
by the 12 RISG Thematic Tables



3 macro-objectives

Sharing of data, services, tools,
and e-learning modules in open
format



GeoSciencesIR

Implementation of
specific databases
in various fields of
geology

Creation of the
permanent cloud
research
infrastructure

Benefits for society

Access to all infrastructure products built according to

FAIR principles and INSPIRE standards

Findable



Accessible



Interoperable

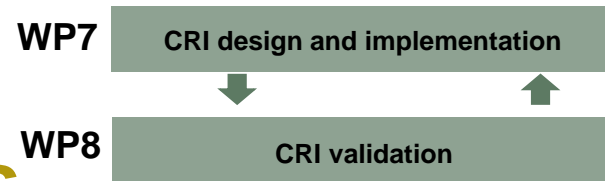


Reusable

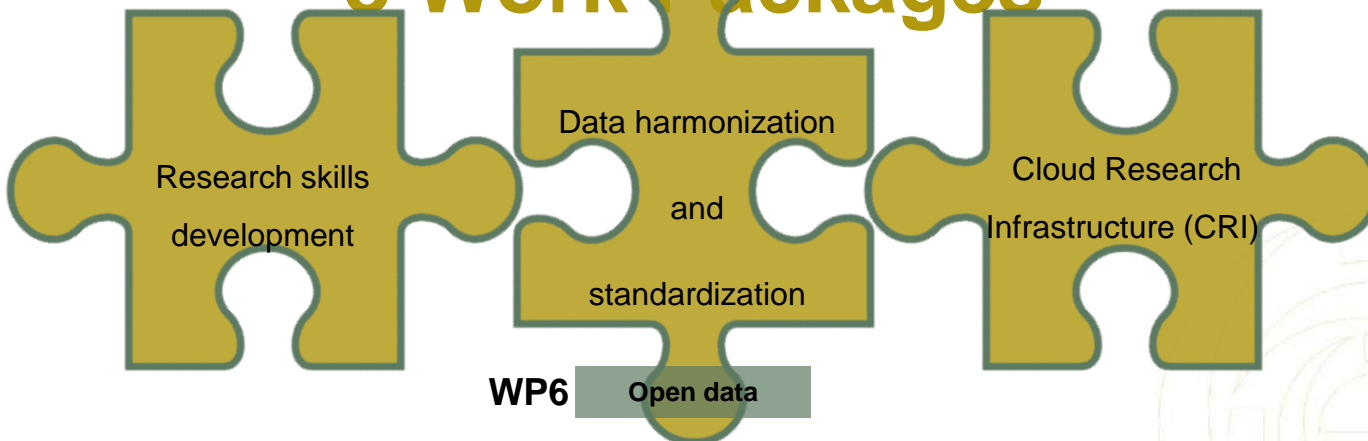


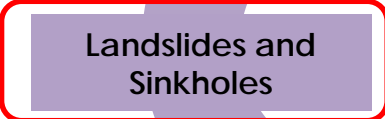
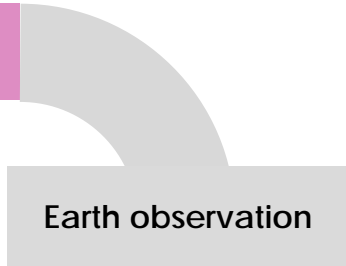
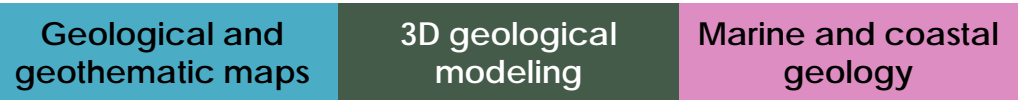
The structure

- WP2 Geological and geothematic mapping and modeling
- WP3 Landslides and sinkholes
- WP4 Risk monitoring and management
- WP5 Georesources and land monitoring

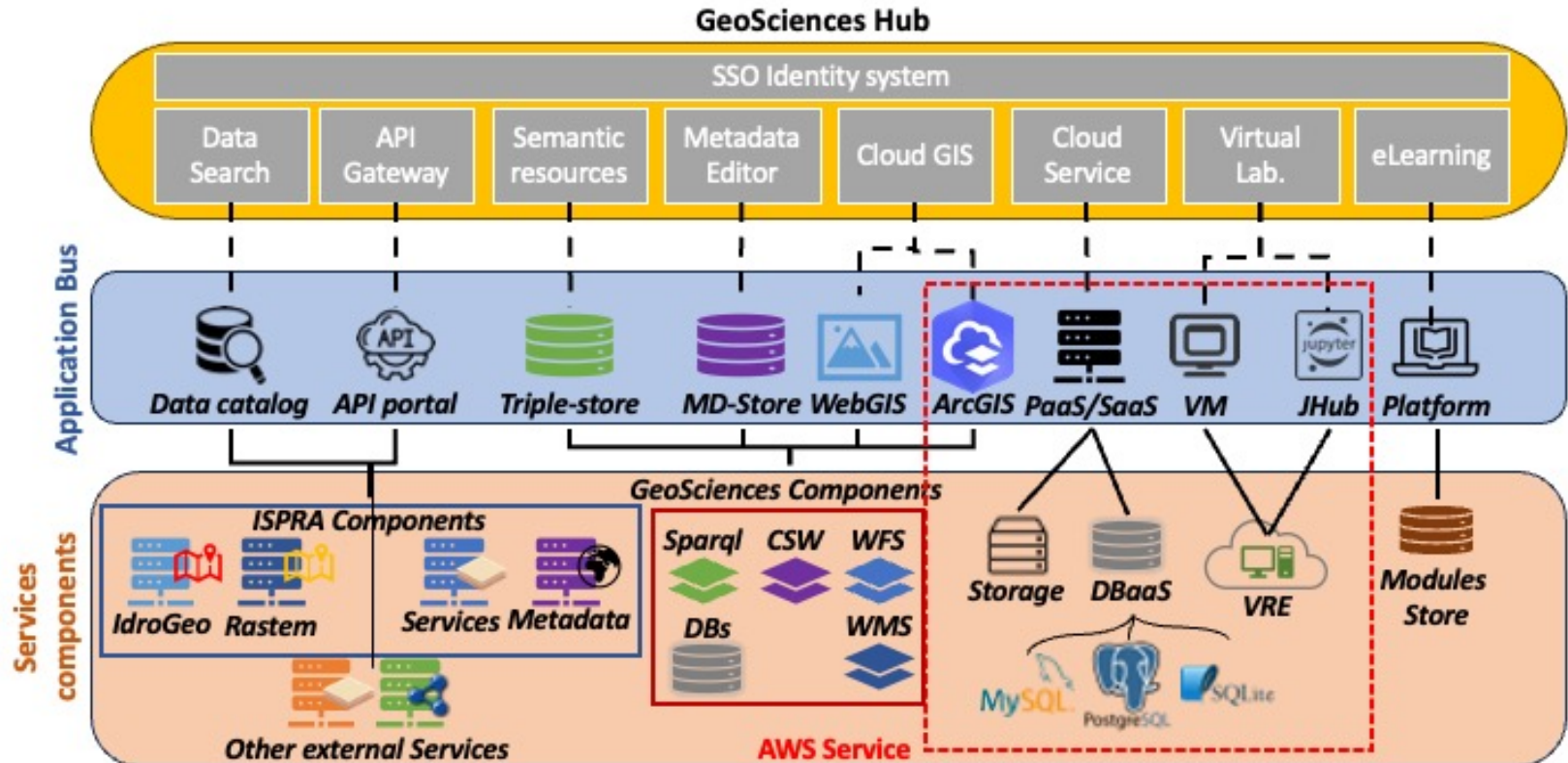


8 Work Packages

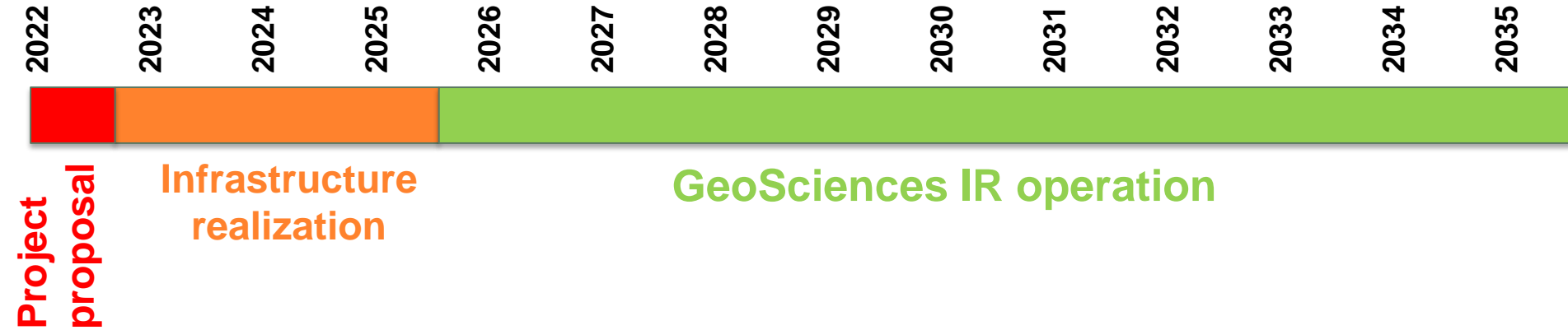




CRI architecture



An operational infrastructure for at least 10 years





 GeoSciences IR will be operational for at least 10 years from the end of the PNRR project

 During this period, all **functions and updates of the products must be ensured**

 Need to develop a sustainability plan

WP3 «Landslides and Sinkholes»

OBJECTIVES

-  Applied research, new technologies, innovative experimental applications, data and services in the field of **landslides and sinkholes**
-  Transfer of technical-scientific knowledge to the **Regional Geological Surveys**



WP3 - Database updating

- * **Analysis, integration and updating of “Inventari dei Fenomeni Franosi (IFFI)” (Inventories of Landslide Phenomena)**
 - **Campania** (UniNa Federico II)
 - **Sicilia** (UniPalermo)
 - **Sardegna** (UniCagliari)
- * **Analysis, integration and updating of the National Sinkhole Database**
 - City of **Napoli** and **Palermo** (UniNa Federico II)
 - City of **Rieti** and **Viterbo** (UniTuscia)
 - Region **Friuli Venezia Giulia** (UniTrieste)



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WP3 - Experimentation of innovative technologies

* In situ landslide monitoring:

- Application of **Radar doppler** at the Gallivaggio site - SO (OGS-UniFi)
- Application of **Photo Monitoring** in 15 sites in Italy (UniSapienza)
- **High altitude** monitoring in Corvara- BZ (UniMi Bicocca)
- Monitoring in **pyroclastic** soils in Sarno - SA (UniNa Federico II)

* In situ monitoring of sinkholes:

- Application of **GeoRadar** (Monte Cucco Park Roma) (ISPRA)
- Application of **geochemical and geophysical investigations** to multiple sites in Lazio (ISPRA)
- Monitoring of Quinis **Udine** (UniTrieste)
- Monitoring of a sinkhole at **Latera** (VT) (UniTuscia)



WP3 – Training modules

- * Training course on landslide mapping and monitoring (17 training modules)
- * Training course on sinkholes and underground cavities (4 training modules)

WP3 – Other products

- * **IdroGEO** platform enhancement (ISPRA)
- * Maps of **permafrost degradation processes and seismic-induced landslides** (UnInsubria)
- * **Landslide risk** map (ISPRA - OGS - UniFi)
- * Landslide study and monitoring **protocol on a local scale** (UniBari)
- * **Sinkhole susceptibility** maps (ISPRA, UniTuscia, UniTrieste, UniNa Federico II)
- * **Sinkhole classification** (ISPRA, UniTuscia, UniTrieste, UniNa Federico II)
- * **Guidelines** on sinkholes and underground cavities (ISPRA, UniTuscia, UniTrieste, UniNa Federico II)



WP4 «Risk monitoring and management»

OBJECTIVES

- **Action 4.1 - Hydrogeological risk mitigation**

Provide standards, tools and guidelines for the design of hydrogeological risk mitigation measures. Furthermore, the activity aims to implement the RaStEM application to support regional authorities in the evaluation of information data associated with risk mitigation interventions.

- **Action 4.2 - Satellite and in situ monitoring**

Satellite monitoring of ground motion, strengthening and integration of monitoring systems, conscious use of Copernicus Services, hydro-meteorological monitoring of rainfall events using HR dual-band meteo-radar, creation of interfaces for the distribution of GNSS data for temporary geodetic monitoring, multi-spectral detection of areas subject to permafrost degradation, multi-scale mapping for flood risk and danger.

- **Action 4.3 - Active and capable faults**

Deepen knowledge on active tectonics throughout the national territory, identification and characterization of active and capable faults affecting the national territory, both on land and offshore, also in relation to sensitive infrastructures with implementation of the ITHACA database

WP4 – Data, services and applications

Data and services:

- * **National dataset RaStEM** (ISPRA)
- * **Nationwide usability of Copernicus SGMS data and services** (CNR, OGS)
- * **Multi-spectral and UAV data for downstream services aimed at permafrost evolution** (UnInsubria)
- * **ITHACA DATABASE implementation** (ISPRA, UnInsubria, UniNa Federico II, UniBari, OGS)
- * **EEE Catalogue implementation** (ISPRA, UnInsubria)
- * **Processing and interpretation of 2D and 3D marine geophysical/geological data** (UniPalermo)

Applications:

- * **Implementation of RaStEM interface and dedicated tools** (ISPRA, UniCagliari, UniSalerno)
- * **Improvement of meteo nowcasting capabilities (installation of a dual polarimetric X-band radar)**(UniCagliari)
- * **Deployment of low-cost sensors and systems for GNSS (OGS) networks** (OGS)
- * **Multi-scale mapping for flood hazard and risk** (UniBari)
- * **Desktop version of the mobile app (Android and IOS) for survey data collection on environmental effects “ES107-Survey App”** (UnInsubria)



WP4 – Training modules

Knowledge transfer:

- * **Guidelines and case studies for hydrogeological risk mitigation interventions** (ISPRA, UniCagliari, UniSalerno)
- * **Training activities and improvement of skills on environmental emergencies and action plans** (PoliTorino)
- * **E-learning modules for the study of active and capable faults and for paleoseismological analysis** (ISPRA, UnInsubria, UniNa Federico II)



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Thanks for your attention



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