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GeoSciences IR: a geological research infrastructure for land management in urban areas

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A full access to high-quality geological data is fundamental to address all different aspects of land management, such as adapting to existing geohazard and ensuring the availability of georesources (e.g. critical raw materials and geothermal energy). This is particularly relevant in urban areas, where a multidisciplinary and integrated approach to diverse geological issues is imperative.

GeoSciences IR is a geological research infrastructure currently being implemented through NextGenerationEurope funds, with the aim of meeting the needs of Regional Geological Surveys (RGS), the local technical offices having a specific mandate on geological topics at regional and local level, including the urban environment.

Through the GeoSciences IR platform, it will be possible to access data, services, tools, and training modules developed in accordance with the FAIR principles and the INSPIRE Directive, which require fully open accessibility, interoperability, and reusability.

The priority topics of GeoSciences IR have been selected according to the RGS'needs and encompass various geological themes, including 2D and 3D geological mapping, marine geology, geoheritage conservation, geohazard mapping and monitoring, sustainable mining, and land consumption.

Among datasets under preparation, some will be of more specific interest for the urban environment, including i) stratigraphies from boreholes; ii) characterization of local geohazard related to landslides, sinkholes, active and capable faulting; iii) structural works for the mitigation of hydrogeological risk; iv) ground motion mapping and monitoring for low-velocity slope movements and subsidence; v) soil sealing and land consumption monitoring.

Users will also benefit from the full interoperability among services and will be able to access innovative tools based on specific algorithms available for cloud data processing.

Furthermore, a specific section of GeoSciences IR will be dedicated to e-learning modules built to increase the transfer of knowledge from scientists to end-users of GeoSciences IR. These modules have mainly focused on the methodological approach for data collection and on the use of available datasets and tools.

GeoSciences IR is under implementation by a large consortium composed by 13 Italian universities and 3 research institutes, coordinated by ISPRA, Geological Survey of Italy. The infrastructure will open to the public in 2025 and will be maintained for at least 10 years.

In this long-term perspective, a dialogue with external stakeholders (from institutions and the private sector) has already started with the aim of building a reference infrastructure for geological data in Italy, taking into account also their feedback and, in some cases, including additional contributions in terms of data, services and tools. Meanwhile, a constant interaction has been established with other existing research infrastructures available at European level (e.g. EPOS ERIC, EGD) to ensure their complementarity and identify eventual gaps and overlaps.