The Geological Surveys of Europe

Call for support to strengthen the ambition of a Geological Service for Europe
through a Joint Programme under Horizon Europe

ESTABLISHING A GEOLOGICAL SERVICE FOR EUROPE

Geoscience, and understanding Earth's systems, is not only essential to providing the resources we need in the pursuit of climate and carbon neutrality targets but will also play a key role in preparing for climate change (for example the increased frequency of extreme events across Europe). Natural resources from the subsurface, such as groundwater, geo-energy and raw materials, represent essential elements in delivering on the EU 2050 targets. A Geological Service for Europe can provide key advice to the EU on all aspects of subsurface related questions and challenges in line with the EU objective to promote global action on climate change. By enabling the capability to predict and monitor environmental extremes and their impacts on society, while guaranteeing a secure, responsible and affordable supply of water, energy and mineral resources to meet basic societal needs, a Geological Service for Europe would contribute towards a safe and healthy environment[1].

A Geological Service for Europe (GSE) aims to further consolidate national services to provide key advice to the European Union on management of our natural resources and how Earth systems are likely to respond to climate stressors.

The GSE may also contribute to the so-called adaptation needs, that is, anticipating the adverse effects of climate change and taking appropriate action to prevent or minimise the damage they can cause, or taking advantage of opportunities that may arise. A well planned, early adaptation action will contribute to economic development through reducing imports of energy and mineral resources, increasing resilience and reducing the impact of extreme natural events, securing and enhancing safety in a long-term strategy on use of scarce water resources and improved land-use planning.

Creating the Geological Service for Europe

Growing population and the consequent socio-economic development expected across Europe will lead to a higher demand for natural resources and will put the subsurface increasingly under pressure. Although the extraction of subsurface resources stimulates economic growth, if not managed correctly it may have negative consequences to the environment. Therefore trans-national knowledge, sharing of improved processes and the use of new innovative technologies throughout the value chain will be essential.

The role of the Geological Survey Organisations (GSOs), in advising their governments directly and providing information to the public, requires a range of skills. Considering the pressures facing Europe in relation to climate change and our natural resources, it is now time to scale this

[1] As emphasized in EEA Megatrends SOER2015 and the UN Sustainable Development Goals to 2030; 3, 6, 7, 8, 9, 14, 15 and 17.

knowledge and expertise to a European service. Since geological challenges do not stop at borders, there is a constant drive for GSOs to collaborate in their work, gaining:

- A better understanding of their subsurface knowledge through harmonized and shared data and information;
- Access to new expertise and best practices by exchange of knowledge and capacity building;
- Broad internationally acknowledged scientific evidence to support policy making and the development of trust in scientific results[2].

Objectives

Strong and integrated geological knowledge and expertise is essential: this allows us to acquire data and transform it into reliable and functional information to underpin European policy in relation to natural resources and climate adaptation.

At the national and regional level, public authorities across Europe and indeed globally have recognised this need, leading to the establishment of Geological Survey Organisations (GSOs). They represent the national and regional custodians of knowledge, geological data and information, with a long tradition in working on natural resources issues with established independent expertise. GSOs have the mandate to:

- Gather, ensure quality control, store, and make use of subsurface data and information in the national interest;
- Apply geoscientific research and services based on this data and information;
- Advise their government on policy- and decision making based on this knowledge, data and information;
- Create data products, services and improve knowledge of our subsurface for all stakeholders.

It is envisaged that the GSE will mirror these mandates at a pan-European level.

International relevance

The above statements are equally relevant on a country-to-country, pan-European and global scale. The European Parliament[2], the European Commission (EC)[3] and several EU initiatives in policy areas such as the Raw Materials Initiative[4,5], the Groundwater Directive[6] and the CCS Directive[7], need access to the expertise and data of the GSOs. Unfortunately, today, only partially harmonized data are available and thus incomparable between countries.

Broadening the effort of collaboration of GSOs towards a pan-European scale can deliver a strong and sustainable pan-European geological knowledge base regarding Europe's subsurface resources and its related societal challenges. It also promotes the sharing of open knowledge and innovation and the capacity to act at a global level by strengthening international cooperation.

In response to growing requests, intensified collaboration amongst GSOs, under the umbrella organisation EuroGeoSurveys, recently led to the launch of the ERA-NET Cofund Action GeoERA: "Establishing the European Geological Surveys Research Area to deliver a Geological Service for Europe". The mission of a Geological Service for Europe (GSE) represents a robust and sustainable single access point to pan-European harmonized and interoperable expertise, geoscientific data and information through increased collaboration of the Geological Survey Organizations within Europe. This GSE will provide the European Commission and other stakeholders with **open access to relevant**

[2] European Parliament resolution of 13 September 2011 on an effective raw materials strategy for Europe (2011/2056(INI))

[3] Letter from Máire Geoghegan-Quinn, and 6 other Commissioners, to Secretary General of EGS, 17-12-2013

[4] European innovation partnership on raw materials (COM)2012)82):

[5] European competitiveness report 2011 (SEC(2011)1188)

[6] Blueprint to safeguard European water resources SWD(2012)381/2

[7] Review of the CCS Directive COM(2015) 576 final ANNEX 2

and FAIR subsurface knowledge, represented in pan-European maps and RDI projects/publications, to support decision making and sustainable use of the subsurface.
A GSE will represent a strong *European* partnership between GSOs, not only within Europe, but also fostering world-wide cooperation and including knowledge sharing and capacity building. To ensure end-user needs are incorporated, a GSE will be set up in close consultation with stakeholders. It will deliver data information and expertise that will support the implementation of important policies, such as those related to Energy, Climate and Raw Materials and support jobs and growth. It will address the Sustainable Development Goals related to the Earth system through delivering expertise, data and information to e.g. assess our water resources (SDG#6), assess and develop affordable and clean energy (SDG#7), support sustainable economic growth and employment (SDG#8), support innovation in subsurface management (SDG#9), assess risks of subsurface use that can jeopardize safe and resilient human cities and settlements (SDG#11) and minimize and mitigate climate change impacts and support research on sustainable alternatives (SDG#13).
The GSOs of Europe represent a considerable workforce of experts and hold a significant public budget to carry out their task for their governments. Equipped with additional support from the EC, the GSOs can establish a Geological Service for Europe that builds on the ongoing GeoERA projects and is tailored to suit the dynamic needs of society, policy and decision makers.

GeoERA – a demonstrator project for a Geological Service for Europe
GeoERA (2017-2021) is a 30M EUR programme supported by 45 national and regional GSOs from 33 countries in Europe. It contributes to the sustainable use of the subsurface by delivering expertise, data and information to policy and decision makers through a single access point, based on the European Geological Data Infrastructure (EGDI). GeoERA and EGDI are both initiatives of EuroGeoSurveys (EGS), an international non-profit organization representing the national GSOs from 36 European countries. By 2021 GeoERA will have made the first steps towards a GSE. It will deliver:

- Initial alignment of national research agendas;
- Innovations for the opening of new and upcoming markets and better understanding of the subsurface to improve decision making;
- A single data access point via EGDI with good functionality and a critical mass of available results;
- A strong network between GSOs and interoperability with other relevant data infrastructures;
- Addition of high value products to end-users from academia, research institutes, governments and industry, enabling efficient alignment of national agendas on geoscience.

GeoERA lays down the first foundation for a sustained collaboration and alignment of national research programmes on applied geosciences. The expansion, prosperity and success of this collaboration depends on the support of the Member States and the EC. Consequently, EGS is looking at the available tools to sustain the geological knowledge platform beyond GeoERA, and to upgrade the initiative towards this GSE at pan-European and also global scale, with an international cooperation component (in particular with African, Latin American and other GSOs) by sharing knowledge, infrastructure and capacities.

Themes within Geological Service for Europe
Making geological challenges an integral part of European and national research agendas is required to tackle current and future challenges related to subsurface management. It is therefore the time to develop a Geological Service for Europe within the Horizon Europe Framework Programme that is designed around three pillars: Open Science, Global Challenges and Open Innovation.
The Geological Service for Europe will represent a strong knowledge and research base for Earth system sciences, founded on the long-standing expertise of GSOs and trans-national cooperation, and will provide answers regarding our subsurface to today's and future scientific and societal questions and challenges that we face in the dynamic world we live in.