



RÉPUBLIQUE
FRANÇAISE

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Fraternité*



Geoscience for a sustainable Earth

brgm

**GEOSCIENCE
FOR A
SUSTAINABLE
EARTH
AT A GLANCE**

FRENCH GEOLOGICAL SURVEY



Geoscience for a sustainable Earth

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BRGM, the French geological survey, is France's leading public institution for Earth Science applications for the management of surface and sub-surface resources with a view to **sustainable development**. Under **partnerships** with numerous public and private stakeholders, it focuses on **scientific research**, providing scientifically-validated information to support **public policy development** and **international cooperation**.

AIMS

Understanding geological phenomena and related risks. **Developing** new techniques and methodologies. **Producing and distributing** data for surface, subsurface and resource management. **Providing** the tools required to manage the surface, subsurface and resources, prevent risks and pollution, and manage policies in response to climate change.

Key roles

Scientific research

The BRGM conducts scientific research in order to expand our knowledge of geology and improve our understanding of surface and subsurface phenomena. We have one main priority: meeting the challenges inherent to global changes. The BRGM's scientific research is based on:

- State-funded projects (subsidies for public service remits), projects with various sources of co-funding (regions, Europe);
- partnerships with agencies (ANR, Ademe, etc.);
- submitting proposals to Ministries when requested;
- rapid research development as per industrial contracts.

Supporting public policies

Our public service operations cover all types of appraisals, monitoring and studies required to support public policies. Subsidies for public service remits and contracts awarded by Government services, public authorities and other state bodies cover the costs incurred.

Four types of initiatives:

- observing the surface and subsurface, using and distributing knowledge;
 - carrying out methodological studies and drafting overviews aiming to transfer knowledge acquired through research to society at large;
 - providing independent expertise for the State
 - passing on knowledge and providing training.
- A national steering committee including the ministries supervising the BRGM defines the general guidelines for our future support programmes for public policies. This committee considers the needs of central authorities and the different regional bodies after working

jointly with the stakeholders involved under the aegis of regional prefects.

International cooperation

The BRGM provides its know-how and expertise worldwide, mainly on "geological infrastructures", mineral resources, natural risks, groundwater, geothermal energy and the protection of the environment.

Target actions:

- contributing to French cooperation policy;
- supporting the initiatives of the EU, the World Bank and other multi-lateral funding bodies;
- supporting national development policies;
- providing corporate services;
- contributing to the works of international geological bodies.

Mine safety

The French Government entrusted the BRGM with monitoring and preventing pollution and other risks relating to former mining sites in 2006. The BRGM is responsible for overseeing safety-related works. A specific service has been created within the BRGM, with one division in Orléans and four regional units (Billy-Montigny, Freyming-Merlebach, Orléans and Gardanne).

Operation in
30
countries.

The BRGM employs
1,077
members of staff,
including over
700 engineers
and researchers.

€ **133.2 M**
operating income for 2019.

A public research establishment, able to provide expertise

The BRGM (Bureau de recherches géologiques et minières - French geological survey) was created in 1959. A state industrial and commercial organisation. The BRGM operates under the supervision of the French Ministry for Higher Education, Research and Innovation, the French Ministry for the Ecological and Solidarity-Based Transition and the French Ministry for the Economy and Finance.

Training

The ENAG (Ecole Nationale d'Applications des Géosciences - National school of applied Earth sciences), part of the BRGM training institute, is now BRGM Campus, a brand-new label covering all of the BRGM's higher education support initiatives. The BRGM Campus can mainly offer a Masters (M2) qualification in "Geology and sustainable mineral resource management" and a vocational first degree course training depollution technicians for work at contaminated sites. BRGM Campus coordinates the BRGM's courses in Earth Sciences as part of the training provided by institutes of higher education.

BRGM Formation can also offer continuous development training courses for companies and government agencies, both in France and worldwide, focusing on its various fields of expertise. www.brgm.fr/content/formation

Quality certification

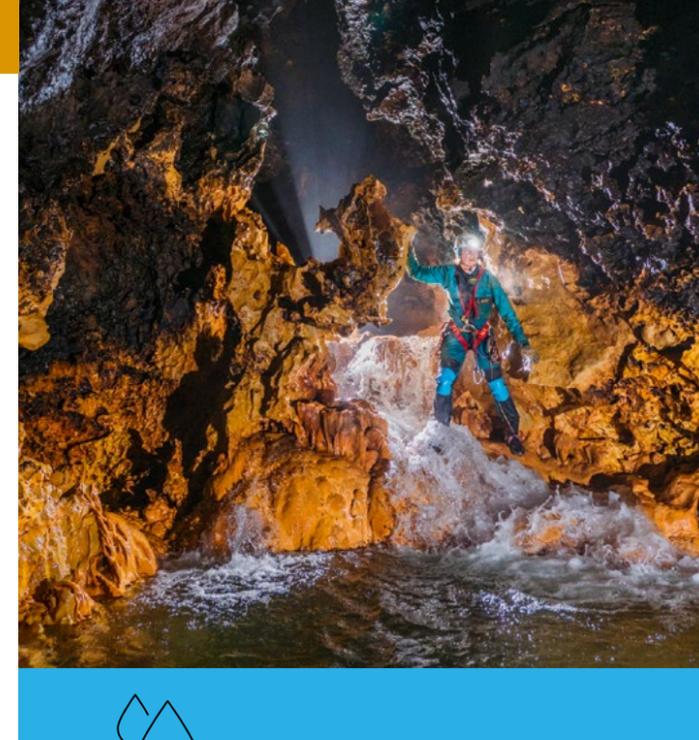
The BRGM obtained ISO 9001 certification in 2004 and ISO 14001 certification in 2012. All BRGM activities are involved. Test laboratories have acquired COFRAC accreditation for environmental matrices.



Geology and knowledge of the subsurface

Producing reference information on the subsurface – a key role for BRGM as the French Geological Survey.

The sustainable management of land and resources on local and regional levels requires extensive, reliable and current knowledge of the subsurface. Geological information is of interest to governments, industry, academia, civil society and the general public. As the French Geological Survey, **BRGM acquires, interprets and disseminates reliable geological information** by integrating new techniques and tools for investigating and characterising underground spaces, based on recent geological concepts and on advanced digital technologies. **Geological information is useful for developing the subsurface** for many purposes, as well as for regional spatial planning. In this context, BRGM has been running the French **Geological Reference Programme (RGF)** since 2013. The RGF provides consistent, comprehensive 3D-mapping of geoscience knowledge across France for use by the whole national geoscience community.



Groundwater management

Contributing to better groundwater management in response to the challenges of global change.

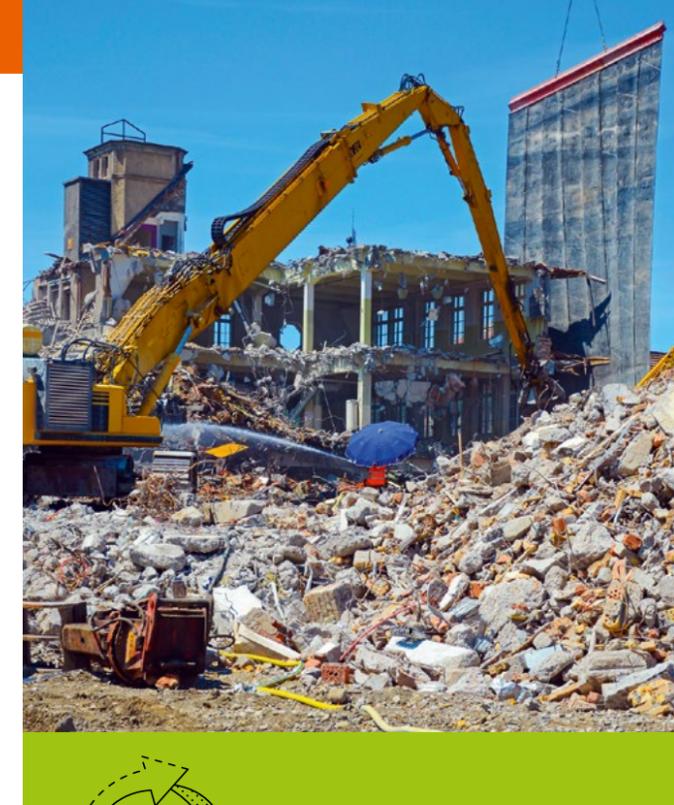
The monitoring of groundwater resource availability and quality is a key activity for BRGM. Groundwater is an essential resource for drinking water and economic activities, including agriculture. However, it is threatened by increasing needs and climate change, which often leads to a reduction in aquifer recharge. Seventy per cent of drinking water comes from groundwater, while the intensification of urbanization and withdrawals are significantly modifying the functioning of aquifers and water quality. Tensions over resources and conflicts over water uses may thus become more common in certain regions. **BRGM studies and continuously monitors large water body systems across France, in particular through the French piezometric network.** It has extensive analytical, experimental and geophysical resources for determining how aquifers work and for assessing their quality. It also develops governance tools using socio-economic approaches to contribute to more sustainable management of groundwater bodies at basin, local and regional scales.



Risks and spatial planning

Developing integrated approaches to the management of natural risks and anthropogenic impacts for more sustainable spatial planning.

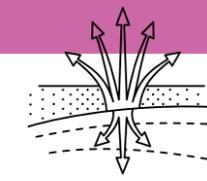
BRGM assesses the risks associated with natural hazards affecting the soil, subsurface and coastline and the risks due to post-mining, and contaminated sites and soils. Its expertise covers a range of time scales and geographical areas and spans the entire risks chain from prevention to preparedness, early warning, crisis management, recovery, adaptation, remediation and resilience. Risk management and spatial planning now involve diverse, interdependent factors. This complexity requires cross-cutting approaches at the interface between geosciences and other environmental and social science disciplines. **BRGM thus improves understanding of physical and biogeochemical processes and their societal impacts** to help increase the resilience of local and regional communities.



Mineral resources and the circular economy

Confronted with increasing pressures on mineral resources, BRGM is working for a responsible procurement and for a more circular economy.

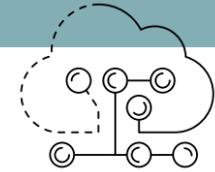
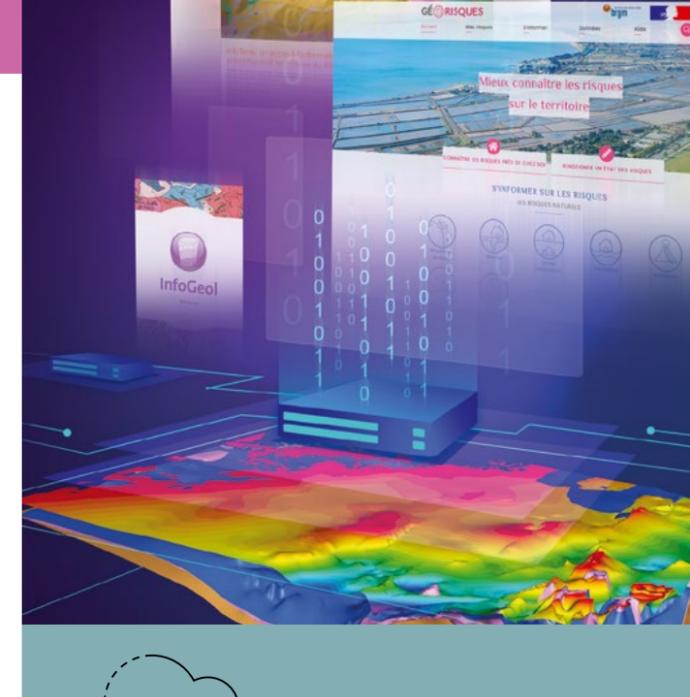
Access to mineral resources is a major issue: the supply of several commodities and raw materials is becoming critical and the circular economy alone cannot satisfy the growing needs of society. BRGM develops predictive approaches to facilitate prospecting and detection of primary mineral resources. It observes mineral life cycles and value chains and is thus able to analyse the flows and dynamics involved, integrating environmental, economic and social factors to support the development of a more circular economy and more responsible mining. It also designs innovative solutions optimising the processing of mineral materials and recycling, using technologies with reduced environmental impact and energy consumption.



Subsurface potential for the energy transition

Research and innovation for energy applications involving the subsurface.

The energy transition implies a shift towards less centralised and more varied renewable and low-carbon energy sources. Similarly, reducing greenhouse gas emissions will require CO₂ capture and storage. **The challenge is to provide low-carbon energy solutions, which make use of the subsurface**, including geothermal energy and underground storage. **In the medium and long term**, the aim is to implement cost-effective solutions on specific sites or at local and regional scales to ensure that underground space is used sustainably and with minimal impact on the environment. With its scientific expertise, technical resources and regional network, **BRGM explores and assesses the performance of the subsurface and harnesses its potential as an energy resource (geothermal energy) and a space for storage (energy carriers, CO₂) and confinement.**



Digital data, services and infrastructure

Collecting, hosting and disseminating geological and environmental data, a raw material in its own right for a new scientific field.

Data and information on the subsurface and the environment are becoming more massive and varied while being produced by more stakeholders, sources and sensors. Their management is a critical issue for characterising the status of environments and natural resources, and managing natural and anthropogenic risks. With its internationally recognised expertise, BRGM is a benchmark institution for the use, management and dissemination of reliable, future-proofed geological and environmental data. **It ensures that these data are available and accessible** through official, interoperable repositories. BRGM has the capability to acquire, process and combine a broader spectrum of data in order to efficiently inform stakeholders about aspects of the soil and subsurface. It also develops applications and innovative tools based on data science and geoscience to model, predict and produce information on the state of the soil and subsurface, underground resources and related risks.

BRGM international activity in 2019

Americas

Antigua and Barbuda, Cuba, Jamaica, Haiti, Puerto Rico, Trinidad and Tobago, Brazil

Europe

European Union, Switzerland, Belgium

Maghreb

Algeria, Morocco

Asia

China

Middle East

Jordan, Saudi Arabia

Africa

Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Gabon, Guinea, Madagascar, Malawi, Mali, Mozambique, Niger, Nigeria, Republic of Mauritius, Senegal, Togo



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