



RÉPUBLIQUE
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Geoscience for a sustainable Earth

brgm

French geological survey



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.

The "Weeping Rock" spring at the foot of Grainval cliff in Saint-Léonard, Normandy. The cliffs in the background are formed of Lower Senonian flint-bearing chalk. Rainwater absorbs carbon dioxide as it flows into the soil, enabling it to dissolve the chalk. When the water emerges into the open again, it heats up and releases CO₂, creating calcareous moss tufa, microscopic fungi and cyanobacteria. These processes of dissolution and precipitation are thus caused by living organisms.

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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).

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

It thus coordinates BRGM teaching in the Earth Sciences, through several partnerships with higher education establishments. BRGM Campus thus contributes to various initial higher education programmes such as the Master's degree in *Exploration and efficient management of mineral resources* developed in collaboration with the University of Orléans, or the *Licence pro* degree entitled *Technician for decontamination of polluted sites* with the Gustave Eiffel University in Marne-la-Vallée.

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/fr/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.

The BRGM employs

1,047

members of staff, including over 700 engineers and researchers

Operations in

25

countries

28

regional branches (in mainland and overseas France)

Breakdown of BRGM's international operations by country in 2021

Europe

European Union, Serbia, Switzerland

Maghreb

Algeria, Morocco

Africa and Western Indian Ocean

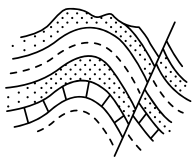
Angola, Cameroon, Chad, Democratic Republic of Congo, Guinea, Malawi, Mali, Mozambique, Namibia, Nigeria

Americas and Caribbean

Brazil, Jamaica, Trinidad and Tobago, Puerto Rico

Middle East

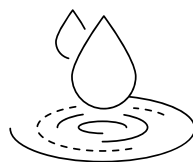
Saudi Arabia, Jordan



GEOLOGY AND KNOWLEDGE OF THE SUBSURFACE

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

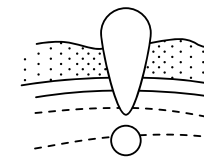
Geological information is exploited for many uses of the subsurface (risk management, natural resources, energy uses, etc.). The sustainable management of regions and their resources requires extensive, reliable and regularly updated knowledge of the subsurface. Knowledge of the ground and subsurface is equally important for public authorities, economic stakeholders, academia, civil society and the general public. As the French Geological Survey, **BRGM acquires, interprets and disseminates reliable geological information** by integrating new processes and tools for investigating and characterising underground space, based on the most recent geological concepts and advances in digital technologies. To this end, the institution develops methodologies and tools for interdisciplinary investigation and interpretation of underground space. In this context, BRGM has been running the **French Geological Reference Programme (RGF)** since 2013. The RGF provides consistent, comprehensive geoscience knowledge for the whole of France for use by the French geologist community.



GROUNDWATER MANAGEMENT

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

Almost 70% of drinking water comes from aquifers, while increasing urbanisation and water abstraction critically affect the quantity and quality of the water. **The monitoring of groundwater availability and quality is a key BRGM mission.** The increase in demand and climate change, which increasingly constrains the natural recharge of aquifers, make a great impact on the resource. Tensions over resources and conflicts over water uses may therefore become more common in certain regions. BRGM studies and continuously monitors large water body systems across France, in terms of both availability and chemical quality, in particular through the French piezometric network. BRGM makes this information available to all citizens and has significant analytical and experimental facilities for predictive modelling to characterise the functioning and quality of aquifers, but also to restore them as necessary. It also develops governance tools using socio-economic approaches to contribute to more sustainable management of groundwater bodies at basin and regional scales.

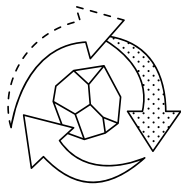


RISKS AND SPATIAL PLANNING

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.

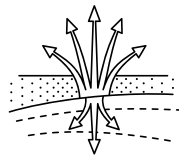




MINERAL RESOURCES AND THE CIRCULAR ECONOMY

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

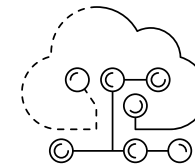
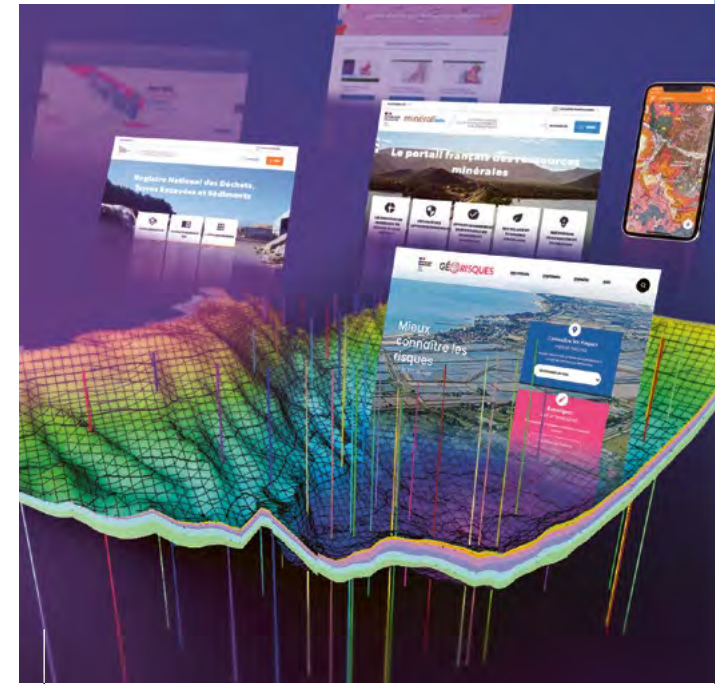
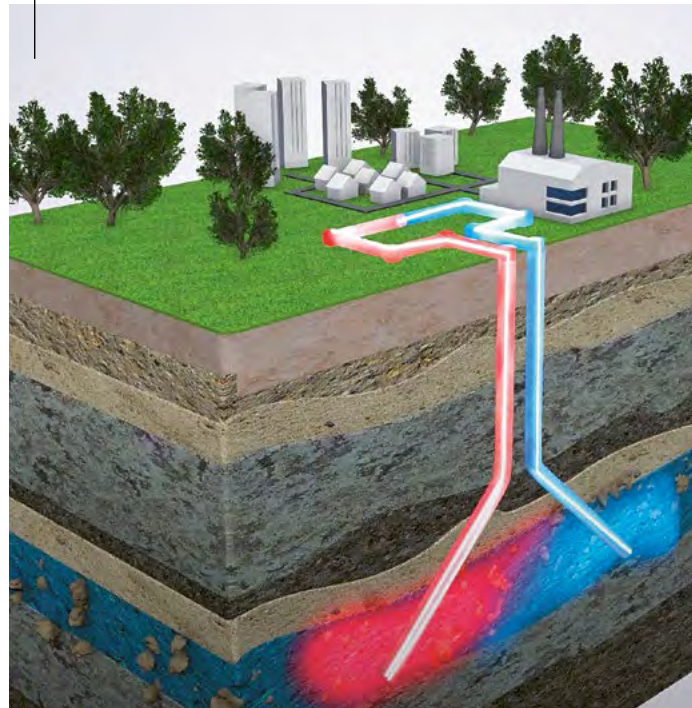
Some industries depend greatly on the supply of metals or materials. These are often strategic and can be critical for the proper functioning of the French and European economy. BRGM observes **the life cycle and value chains of mineral materials and studies the geological, economic, geopolitical, environmental and social factors** that govern them. It also supports the development of more responsible procurement by studying the formation of deposits and **developing predictive approaches** to facilitate their detection and exploration. BRGM's scientific approach covers various stages, from the study of raw materials in a responsible extraction framework to mineral recycling technologies for the implementation of a more circular economy.



SUBSURFACE POTENTIAL FOR THE ENERGY TRANSITION

Research and innovation for energy applications involving the subsurface. Research is being conducted on geothermal energy and underground storage in particular.

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 come up with low-carbon energy solutions that make the best use of the subsurface** and its properties, including the various geothermal energy sources and the potential for underground energy storage, so that these can be integrated in future energy systems. **In the medium and long term, the objective 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.** Drawing on its scientific competence, technical resources and regional network, **BRGM explores the potential of underground space as an energy resource (geothermal energy, H₂) but also as a storage and containment space (energy carriers, CO₂, etc.), and assesses the overall performance of the proposed solutions.**



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. Furthermore, **the scientific and public data held by BRGM must remain open and accessible to the whole of society, professionals and citizens.** 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.**



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