



Aims & Objectives

➔ Looking for alternative solutions to conventional water resources:

- Investigating the structure and mechanisms of complex (karst, fractured-rock and volcanic) aquifers and assessing their potential.
- Developing modelling and decision-making support tools to contribute to a better management of these aquifers.
- Predicting the impact of global changes.

➔ The research also focuses on a number of other questions: economic assessment of water management programmes and policies according to the usages, economic optimisation of water management plans, cost-benefit analysis, comparison of different approaches, contingent valuation based on field surveys, and future water use trend scenarios (foresight study).



IM2E research teams

New Water Resources and Economy (NRE) unit

Led by:

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Linkage with IM2E disciplines and challenges

Current fields of excellence

As the coordinating unit for one of the current fields of excellence, BRGM Montpellier will be involved in developing investigation and modelling methods and tools for fractured-rock and karst aquifers.

It is also involved in:

- > Research into pesticide transfer in volcanic aquifers in the West Indies.
- > Karst flash-flood analysis and forecasting.
- > Analysis of public instruments and policies for water demand management.
- > Foresight study and analysis of the impact of global changes on groundwater.
- > Hydro-economic modelling.

Locations

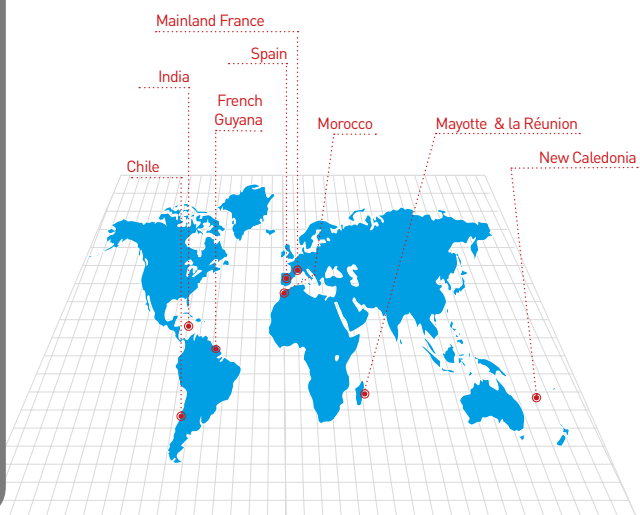


Photo: Source Ravine St-Gilles : île de la Réunion

highlights

Scientific and/or technical

● Thesis topic:

Flow, structure and transport properties of fractured and weathered crystalline-rock aquifers in Choutuppall, southern India.

● Thesis topic:

Design and assessment of combined financial incentive and social preference water management instruments: the case of groundwater abstraction for agricultural use.

● Thesis topic:

Hydrogeology and transport processes in karst formations in the Jura Mountains.

● Thesis topic:

Integrating top-down and bottom-up approaches to design a cost-effective and equitable programme of measures for adaptation of a river basin to global change.

CO-tutelle : SupAgro, Universitat Politècnica de Valencia

● Tool:

ESPERE (ESTimation de la Pluie Efficace et de la REcharge selon différentes méthodes): an Excel spreadsheet designed to assess natural aquifer recharge.

Link: www.brgm.fr/production-scientifique/logiciels-scientifiques/espere

Reference: <http://onlinelibrary.wiley.com/doi/10.1111/gwat.12390/full>

Platforms and technologies

The experimental sites in India (<http://hplus.ore.fr/inde>) are part of SOERE H+ International, an international network of hydrogeological sites set up to measure and model transfer processes in different types of aquifers. Large volumes of water are withdrawn from the aquifer beneath the Maheshwaram watershed, in rural southern India, for irrigation purposes. The experimental site at Choutuppall consists of around 30 boreholes, which are used for hydrodynamic and transport experiments. These sites are under long-term monitoring to assess how global changes are affecting groundwater resources.

The Fontaine de Nîmes spring (SO Karst - www.sokarst.org) is monitored to study the behaviour of an urban karst aquifer with regular flash floods.



Academic, public and industrial partners

France

- G-Eau
- Geosciences Rennes
- Hydrosiences Montpellier
- CEREGE
- CESBIO
- GET
- Groupe Fabre
- Nestlé Waters
- CERFACS
- AERMC
- Water Agencies
- Société du Canal de Provence
- University of Rennes
- University of Franche-Comté (Besançon)
- Montpellier Méditerranée Métropole, ISTO, LISAH, CIRAD
- University of La Réunion

Europe

- Danone
- University of Valencia
- University of Neuchâtel
- University of Göttingen
- Swiss Institute for Speleology and Karst Studies

Worldwide

- National Geophysical Research Institute
- Australian National University
- University California, Davis



Examples of partnership projects

ANR Shiva (2009-2013)

> BRGM Montpellier coordinated this project, which aimed to map the vulnerability of rural water users in southern India in the context of global change.

Lez-GMU (2009-2014)

> BRGM Montpellier coordinated this multi-partner study of the Lez karst system – a system under active management that supplies drinking water to the Montpellier city. The study looked at the aquifer status, quality and vulnerability, and included global change modelling and recommendations.

Water cap & Trade - Era Net IWRM Net (2013-2016)

> BRGM Montpellier coordinated this study, which used participatory methods and micro-economic modelling techniques to explore water trading scenarios in three southern European countries (France, Spain and Italy).

BRGM keywords

Hydrogeology
Groundwater
Crystalline Rock
Economy
Foresight
Modelling
Financial Instrument
Water Usages
Aquifer
Karst

BRGM Languedoc-Roussillon

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