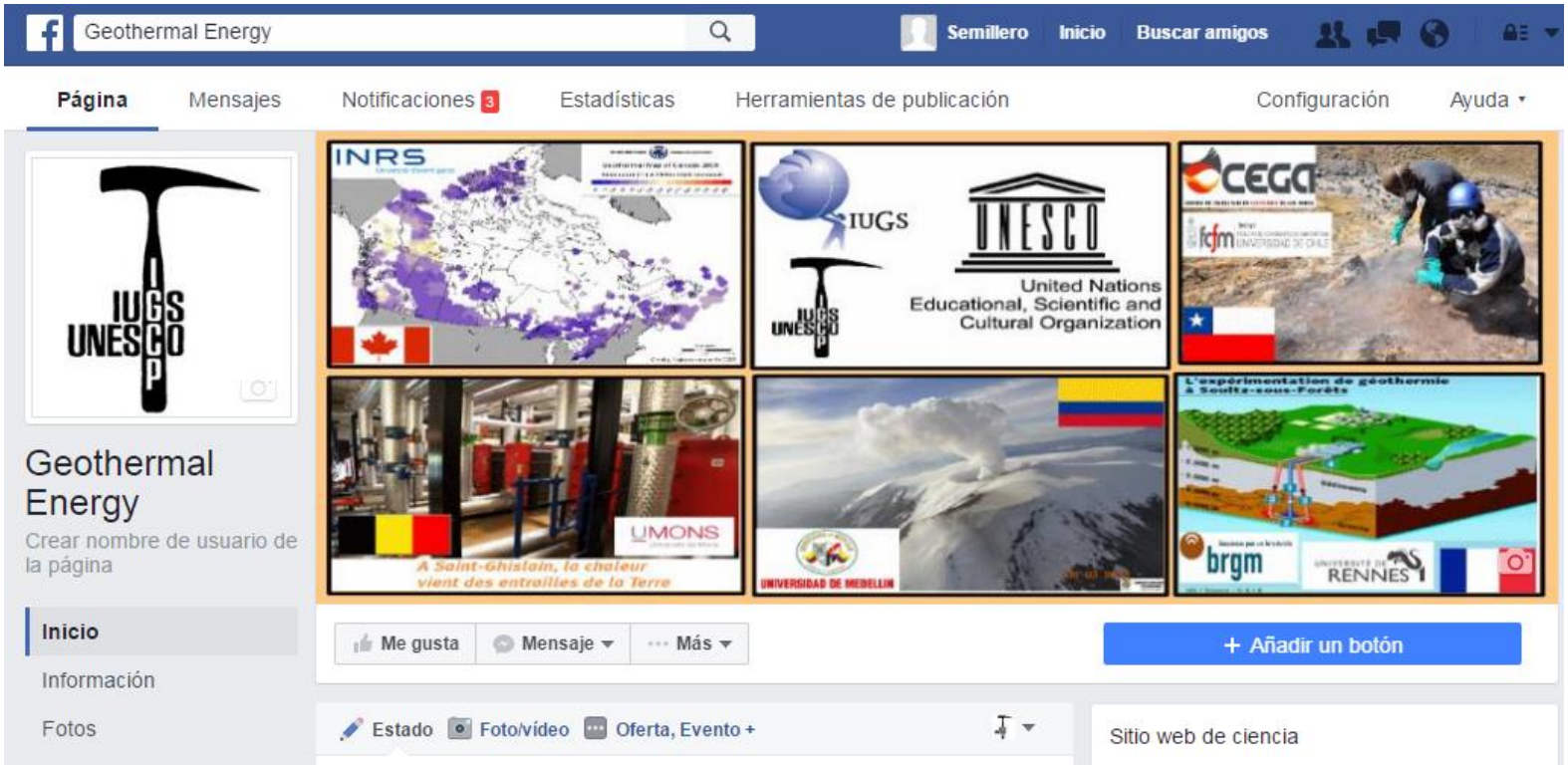
IGCP636 Annual Meeting 2017
Santiago de Chile

Past, present and future of IGCP636



Daniela Blessent, Jasmin Raymond, Pascal Goderniaux, Jacqueline López-Sánchez, Michel Malo, Linda Daniele, Tanguy Le Borgne, Chrystel Dezayes

IGCP 636

2014

The beginning

2020-2025

2016-2018

IGCP 636

United Nations Educational, Scientific and Cultural Organization

EARTH SCIENCES FOR SOCIETY

UNESCO » Natural Sciences » Environment » Earth Sciences » International Geoscience Programme » IGCP Projects

A- A+

Earth Sciences

- International Geoscience and Geoparks Programme
- **International Geoscience Programme**
  - IGCP Projects
  - Proposal Submission
  - National Committees
  - Scientific Board
  - Sustainable Development Goals
- UNESCO Global Geoparks
- Earth Science Education in Africa
- Geo-Hazards Risk Reduction

Project 636 - Characterization and sustainable exploitation of geothermal resources

Geothermal fluids are extracted through deep wells drilled in a geological reservoir, which can be represented by highly heterogeneous volcanic complex, sedimentary basins or deep basement rocks. If the reservoir is not enough permeable for a profitable exploitation of geothermal fluids, it is enhanced through different engineered techniques in order to improve its exploitation.

The main objective of this project is to propose suitable methodologies and techniques for the characterization and modeling of fractured geothermal reservoirs, to ensure their sustainable exploitation and, therefore, ensure acceptation of this kind of energy by local communities.

This goal will be achieved with experiences from the volcanic complex of the Nevado del Ruiz (Colombia), the St. Lawrence Lowlands sedimentary basins (Québec, Canada), the Carboniferous limestone reservoir in the area of Mons (Belgium), the Soultz site and the Ploemeur fractured rock experimental site (France). Further, a site in Chile will also be considered. Ongoing and planned work conducted at these sites from international researchers teaming together will provide field data for modeling purposes of highly heterogeneous geological structures. This work will provide new insights into the construction of conceptual and numerical models for geothermal reservoirs, using available information from sites in Europe, North and South America.

RELATED INFORMATION

Project Leader

- Professor Daniela Blessent (Colombia)
- **Address of the Project Leader**: Environmental Engineering, Universidad de Medellin (UdeM), Cra 87 # 30-65, Medellin, Antioquia, (Colombia)

- Duration: 2016-2018
- IGCP Theme: Earth Resources
- Website

Annual reports

- 2016: Annual Report

http://www.unesco.org/new/en/natural-sciences/environment/earth-sciences/international-geoscience-programme/igcp-projects/

IGCP 636 - Young Scientist Project

- **Young Scientists: Daniela Blessent, Jasmin Raymond, Pascal Goderniaux**
- **Objectives**
  - **To investigate the most appropriate conceptual models for fractured geothermal reservoirs**
  - **To conduct a comparative study of numerical software suitable for coupled groundwater flow and heat transfer modeling**
  - **To evaluate the public perception of the geothermal energy in the countries involved**

Talk in the afternoon session

Support from institutions

- Universidad de Medellín
- Institut national recherche scientifique, Centre Eau Terre Environnement
- Universidad de Chile, CEGA
- Université de Rennes1
- Université de Mons
- Bureau de recherches géologiques et minières

When did we start?

At the end of 2013…

The starting point…

- **Grant from *Centre de la francophonie des Amériques***

Daniela Blessent Colombie

Thématique : *Le développement des ressources géothermiques: analogies et différences entre Colombie et Québec*
Date de la mobilité : 28 avril au 1er mai 2014
Lieu de la mobilité : Institut national de recherche scientifique (INRS), Québec
Documents :
- Curriculum vitae (Pdf)
- Résumé de la communication (Pdf)

CENTRE DE LA FRANCOPHONIE DES AMÉRIQUES

MOBILITÉ DES CHERCHEURS DANS LES AMÉRIQUES

Fondecyt Fondo Nacional de Desarrollo Científico y Tecnológico
fcfm 50 AÑOS Geología
VID INVESTIGACIÓN INNOVACIÓN CREACIÓN ARTISTÍCA UNIVERSIDAD DE CHILE
CEGA CENTRO DE EXCELENCIA EN GEOTERMIA DE LOS ANDES
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UNESCO United Nations Educational, Scientific and Cultural Organization

How did we start ?

- Scholarship and mobility grant for researchers
- Good and positive student-teacher relationship
- Support from the institution

ICETEX
Invertimos en el talento de los colombianos

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MOBILITÉ DES CHERCHEURS DANS LES AMÉRIQUES

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Geología

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Field work in the Nevado del Ruiz area

- Collection of rock samples
- Identification of main lithologies at outcrops

Field work 2014

Field work in the Nevado del Ruiz area

- Collection of rock samples
- Identification of main lithologies at outcrops
- Fault zone characterization

Field work 2016

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Field work in the Nevado del Ruiz area

- Collection of rock samples
- Water sampling at hot springs (July 2017)
- Work focused on the Nereidas Botero-Londoño area

Field work 2017

First IGCP636 meeting 2016

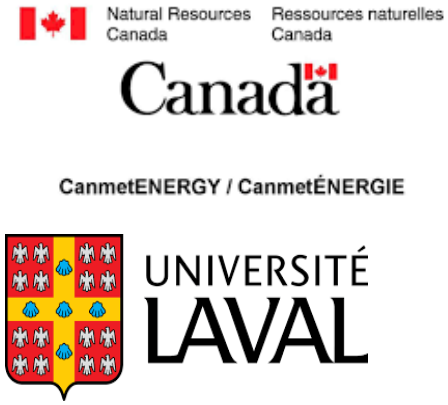
- **Los Nevados Natural National Park (Colombia)**

Learning about geothermal energy

- **Undergraduate student poster session during IGCP636 Annual Meeting 2016**
- **Undergraduate student paper writing in about geothermal resource characterization in**
  - **Japan**
  - **Italy**
  - **Chile**
  - **Colombia**
  - **Iceland**
  - **Costa Rica**
  - **United States**

New collaborations

- **Thanks to the IGCP grant new collaborations started:**
  - **ACEG (Asociación Colombiana Profesional y Estudiantil de Geociencias/Geotermia)**
  - **Université Laval (Canada)**
  - **CanMetEnergy (Canada)**
  - **School of Energy of the Reykjavik University**
  - **KTH Royal Institute of Technology in Stockholm**
  - **University of Antananarivo-Madagascar**



New grants related with IGCP636

- UdeM (UdeM, INRS and Universidad de Chile-CEGA (submitted)
- Belgium: Modelling a geothermal limestone reservoir in South Belgium
- ECOS NORD Colombia-France collaboration (2017-2020)
- ADEME project: clogging processes in geothermal systems (Universite de Rennes – ANTEA group)
- FQRNT (J. Raymond) and FQRNT (M. Malo)
  Fond de Recherche Nature et Technologie de Québec
- Canadian Foundation for Innovation (J. Raymond)
  LOG: The Geothermal Open Laboratory

→ Talk in the afternoon session

- Coopération Québec-Italie 2017-2019 (Relations internationales et Francophonie)

→ Previous talk (Nicolo' Giordano)

GRC student chapter

- **Geothermal Research Council (https://geothermal.org/students.html#GRC)**

IGCP 636

2014

The beginning

2020-2025

The future of IGCP636…

2016-2018

Future of IGCP636

- **To apply what we have learnt during the IGCP-Y**
- **There is an interest in applying to a full IGCP 5-years grant**

Proposal Submission

The IGCP financially supports about 30 projects per year which are assessed by a peer-review process and have a lifetime of five years. Annual funding levels range between 5,000 and 10,000 USD to be used exclusively for meetings or workshops. Additional resources are usually needed to ensure realisation of the projects' research goals, and scientists are strongly encouraged to raise such funds.

Projects must focus, *inter alia*, on high-quality science, be of international importance and societal relevance, show interdisciplinary cooperation, and constitute international participation, including scientists from developing countries.

Project proposals may be submitted by individuals or groups to the IGCP Secretariat accompanied by a letter of endorsement from one of the project leader's National IGCP Committees.

Deadline for project proposals: 15 October 2017

- Project proposal form (word)
- IGCP Operational Guidelines (PDF)

ELAP Scolarship

- **5 students from UdeM have won this scholarship since 2015**

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International Scholarships
scholarships.gc.ca

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Emerging Leaders in the Americas Program (ELAP)

Competition: Closed for the 2017-2018 academic year

Who Applies: Canadian institutions

Description: The Emerging Leaders in the Americas Program (ELAP) scholarships provide students and researchers from Latin America and the Caribbean with short-term exchange opportunities for study or research, in Canada, at the college, undergraduate and graduate levels.

Guidelines | Value and duration | Eligibility | Key dates | Application | About

Scholarship Value and Duration

Funding for ELAP scholarships is made available by Global Affairs Canada through its legal title: the Department of Foreign Affairs, Trade and Development (DFATD).

The Canadian institution will receive funding from DFATD for all successful candidates (students and researchers) in the form of a contribution agreement and will be responsible for providing the funds to scholarship recipients.

The scholarship value varies depending on the duration and level of study. The scholarship value for students is:

- $7,200 CAN for college, undergraduate or graduate students (Master's and PhD) for a minimum of four months or one academic term of study or research; or
- $9,700 CAN for graduate students (Master's and PhD) for a period of five to six months of study or research.

Canada-Chile Leadership Exchange Scholarship

http://www.scholarships-bourses.gc.ca/scholarships-bourses/can/institutions/ccles-bdlcc.aspx?lang=eng

Conclusions

- **It is important:**
  - **To have a multidisciplinary research team**
  - **To share and transfer knowledge**
  - **To involve students (undergraduate and graduate)**
  - **To ensure continuous funding (apply for new grants)**
  - **To have support from our institutions**
  - **To have regular meeting and opportunities to talk, not only by videoconference**
  - **To foster student and researcher mobility**

Gracias


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Gracias