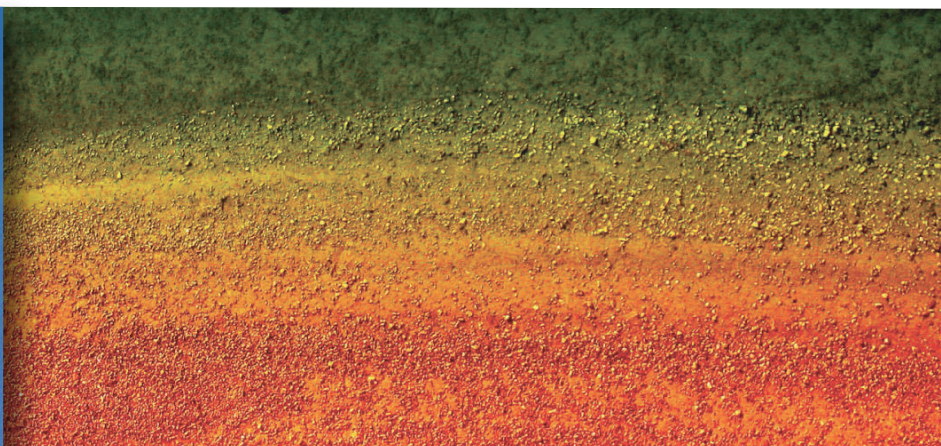


# Développement d'outils pour le Suivi des Mouvements de Sol pour la gestion durable de SUDOE



## PROJECT DETAILS

Funding Programme:  
SUDOE Territorial  
Cooperation Programme  
Sub-Programme:  
INTERREG IV B  
Funding Scheme:  
Priority Environment  
Project Reference:  
SOE1/P2/F157;  
UE-09-DO-SMS  
Project Duration:  
36 Months (from 2009-03-15  
to 2012-03-31)  
Total Project Value:  
€ 1.686.710'25  
EU Grant-Aid:  
€ 1.265.032'72  
Funding to UniOvi:  
€ 136.205'72  
Website:  
<http://dosms.get.obs-mip.fr/cosiweb/actualites-50.html>

## PROJECT DESCRIPTION

The objective of the Project is to develop a program to monitor and supervise the soil movements in high-risk areas. These movements may be due to different processes: landslides, sinkholes in Karst areas (Zaragoza for example), clays (in the south of France), subsidence due to mining activities (Murcia), or even due to climatic factors (like in Lisbon). In order to study and analyze these factors, we consider appropriate, as an innovative factor, to carry out a dynamic surveillance with a temporal monitoring of the soil deformations through in situ measurement tools that we will use as "ground truth" for the tools devoted to the analysis of the deformations with satellite images. The procedures to be followed, regarding the different areas of the SUDOE area are described below:

- The first work package is devoted to the management of the Project.
- The second work package GT2, supervised by BRGM will allow for the development and elaboration of susceptibility models, therefore, it is important to identify pilot sites including geological data (BRGM, IGME), data related to the use of soils and quantifying and analyzing soil geometry, (UNIZAR, CNRS), hydrological and geotechnical parameters (LRPC). A cartographic database will be created, effective for gravitational instabilities and their main triggering factors (UNIZAR, CNRS-LMTG). All this information must be easily accessible for all the partners, so it seems essential to create a website, to manage, quantify and access this data.
- The third work package GT3, coordinated by the University of Lisbon (UL), will allow for the establishment of risk prediction models. In addition to the susceptibility models, it will also require the establishment of the frequency of movements, depending on their type, which will be combined with climatic models (CNRS-GAME), so we will have information related to the humidity of soils.

- All these main work packages, in combination with the damage maps and the analysis of cost/benefit, will allow for the establishment of risk maps, which will be the fourth work package, based on practical and specific tools to assist entities in charge of territory, its sustainable development and public policies for risk management. These new tools will: i) generate material behavior models applicable to the territory as a whole or the geological and climatic conditions. Thus, the expert system will facilitate the application on areas that have not been studied; ii) preview, considering sites that are geologically equivalent, in increasingly arid areas of the SUDOE from north to south or west to east, the behavior of materials according to the climatic evolution, taking into account situations with lots of rain, in a context of growing draught. All this work will be based on measurement techniques (geotechnical, characterization of sites etc.) which will be combined among the countries of the SUDOE. The IGME will coordinate this work, considered a cross-cutting task, which could be eventually integrated in any other main work package.

- The work package GT5 will consist of the Project assessment and control. We will establish a Supervision Commission composed of the coordinators of the work packages. There will be two types of assessment; an internal assessment, related to the development of the sites, and an external one, aimed at the global development of the project by the competent bodies of the different countries.

- The last work package GT6 will refer to marketing procedures and capitalization models.

## PROJECT PARTNERS

**Project Coordinator**  
Centre National de la Recherche Scientifique – CNRS, France

**Spain**  
Universidad de Oviedo  
Universidad de Cantabria  
Universidad de Zaragoza  
Ministerio de Ciencia e Innovación  
Universidad Politécnica de Cataluña  
**France**  
Bureau de Recherches Géologiques et Minières – BRGM  
Centre d'études techniques Sud Ouest  
**Portugal**  
Universidade de Lisboa

## UNIOVI TEAM

Celestino González Nicieza <sup>1</sup>  
cgonzalez@uniovi.es  
Arturo Ernesto Álvarez Vigil <sup>2</sup>  
arturoav@uniovi.es  
Martina Inmaculada Álvarez Fernández <sup>1</sup>  
inma@uniovi.es  
María José Vallhonrat Iglesias <sup>1</sup>  
mjvallhonrat@uniovi.es

<sup>1</sup> Department of Mining Exploitation and Prospecting

<sup>2</sup> Department of Mathematics