



Improved well-field management with Sentinel-1 SAR data

Summary

Aquifer-systems need a solution to monitor the land subsidence over wide areas and manage the groundwater extraction strategy

Sponsor	Project	Soluti provi
<div></div> <div>The e-shape project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement 82085</div>	<div></div>	

Taxonomy

- Monitor urban areas
- Detect and monitor ground movement
- Asses groundwater and run-off

User profile

Confederación Hidrográfica del Segura, O.A. is an autonomous organization of Spanish Administration, assigned to the Green Transition and Demographic Challenge Ministry with the following roles:

- Generation, monitoring and evaluation of the Segura basin hydrological program.
- Management and overseeing of the public hydraulic domain.

Project, build and exploitation of the hydraulic works considered in the hydrological program and those derived from agreements with National, Regional or Local authorities, or private citizens and companies.

Service description

EuroGeoSurveys (EGS), The Geological Surveys of Europe, is a not-for-profit organization representing 38 National Geological Surveys and some regional Surveys in Europe, carrying out operations and research in the field of geosciences.

EuroGeoSurveys provides the European Institutions with expert, neutral, balanced and practical pan-European advice and information as an aid to problem-solving, policy, regulatory and program formulation. In this project the focus is on the identification of natural hazards of geological origin, their monitoring and the mitigation of their impacts.

Murcia Region case study is developed by the Spanish Geological Survey (IGME-CSIC), created on 12th July 1849, to provide the State Administration, the Autonomous Regions Administrations and the general society, with precise knowledge and information regarding the Earth Sciences and related technologies for any development on the Spanish territory.

Customer experience

Co-designed with the CHS, the groundwater management products generated provide an accurate and fast assesment about the influence of the pumping rates in the piezometric levels and land subsidence. The land surface displacement results are essential to monitor the behaivior of the aquifer-system and organize the extraction strategy in order to avoid the generation of high subsidence rates that could be dangerous to structures and infraestructures.

Need

Affected by regular drought seasons, Segura basin has usually resorted to the exploitation of the groundwater resources to complement the fresh-water supply for urban and agricultural necessities. After the severe drought periods of 1992-1995 and 2005-2009, relevant damages over some Murcia building due to subsidence processes led to the need of an ambitious reorganization of the well-field network and the integration of advanced monitoring systems to limit the appearance of those processes.

Challenges

In order to evaluate the affection generated by the groundwater pumping large areas must be monitored. InSAR products designed allow to cover these wide areas with enogh measurement density to carry out definition of the influence area and well-field response analysis. In those products CHS found a way to maintain a close knowledge of their activities and maintain the fresh-water supply capability while maintaining the impact below security thresholds.

Results

- Regular monitoring of a wide area with accurate displacement rates and time-series.
- Fast interpretation of the basin subsidence evolution.
- Improved cost/benefit ratio regarding other monitoring techniques.
- The products constitute a valuable decision-making information for aquifer-system management.

References

Learn more about the service: *(The service is still in the internal test/development environment; the production environment will be released soon)*

Learn more about e-shape: www.e-shape.eu

A question? Contact the Helpdesk: <https://helpdesk.e-shape.eu>