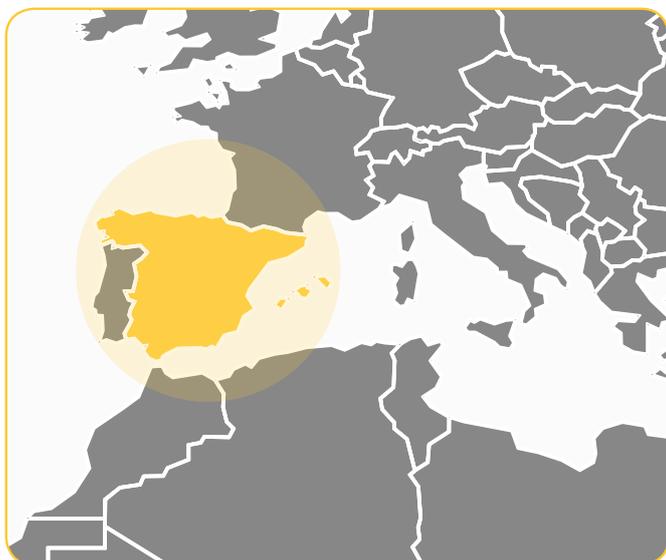


AQUIFER MANAGEMENT IN SPAIN

What it is about

Aquifer management is little known to the general public yet extremely important. In semi-arid areas such as agriculture-heavy Murcia, productivity is often hit by severe droughts. This combination results in extreme strain on the management of water resources, which, in absence of other viable alternatives, often results in overexploitation of the aquifer. The impact of overexploitation can be devastating leading to ground deformation that can cause building damages and aquifer depletion, while endangering water quality,

reducing the productivity of agricultural soils and threatening protected natural areas. The responsible water authority Confederación Hidrográfica del Segura (CHS) contracted services from the DARES company and from the Geological Survey of Spain, IGME to produce regular ground deformation maps based on InSAR measurements using Sentinel-1. This has allowed CHS to make better, informed decisions on the sustainable management of the aquifer.



What we found

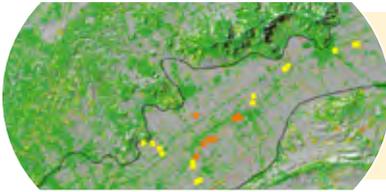
- Sentinel-1 enabled InSAR measurements can provide millions of measurement points over the region at considerably lower cost and superior performance when compared to alternatives.
- Interdisciplinary cooperation between InSAR-specialised company DARES and geological experts from IGME is key in providing insightful ground deformation maps upon which CHS can build long-term strategies.
- The impact of the use of InSAR-based ground deformation maps not only generates significant economic benefits; it also supports sustainable aquifer management, increased environmental protection, compliance with regulations and more effective land management/city planning.

AQUIFER MANAGEMENT IN SPAIN



The Satellite Data

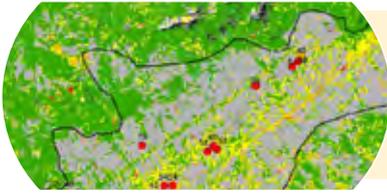
Copernicus Sentinel-1 provides free-of-charge frequent all-weather, day-and-night C-band radar images over Spain.



The Service Provider

DARES, a small and innovative company based in Catalonia, uses Sentinel-1 data to provide millions of InSAR measurements over the Segura River Basin as the basis of ground deformation maps. The viability of the DARES business model is directly tied to the availability of world-class Sentinel data in a free, full and open manner.

€364.4-728.8k pa



The Intermediate User

IGME, the Geological Survey of Spain, adds an extra layer of analytics to these ground deformation maps based on their geological expertise and long-term experience and research in ground subsidence.

€0,546-1.1Me pa



The Primary User

The Confederación Hidrográfica del Segura (CHS) uses the maps to ensure the safe operation of the extraction wells and avoid damages in buildings, compose well-informed environmental impact analyses, optimise the exploitation of the aquifer within the limits imposed by regulation and inform longer-term strategies for the exploitation of the aquifer.

€2.3-13m pa



End User Beneficiary

Local administrations and citizens benefit from the improvements in aquifer management that allows quick reactions to potential excessive subsidence by increased protection for their homes or business buildings. Increased trust of the public into the work of a competent public authority (CHS) using cutting edge technologies to supervise its operations plays an important role in social cohesion.

€29.3-58.7m pa



Other Beneficiaries

The use of InSAR-based ground deformation maps has triggered other public organisations to use it resulting in better informed land management plans as well as appropriate building structures and foundations for specific locations.

Total benefits

Economic



Environmental



Innovation



Regulatory



Science & Tech



Societal



€31.7 - 71.8m pa

About the project

Through a series of case studies, EARSC aims to gather quantitative evidence that the usage of Copernicus Sentinel data provides an effective and convenient support to various market applications. These studies are undertaken in the frame of the project "Assessing the detailed economic

benefits derived from Copernicus Earth Observation data within selected value chains: a bottom-up study survey", under an assignment from the European Space Agency.

Download the full report from the project website



<http://earsc.org/sebs>

