

# WATER MONITORING AND EARTH OBSERVATION, A KEY RESOURCE TO BE MANAGED

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**SeBS**<sup>360</sup>  
FROM SENTINEL  
BENEFITS STUDY  
TO OBSERVATORY

# Water monitoring and Earth Observation, a key resource to be managed

## -Presentation-



Established in 1996 to develop activities related to space in Catalonia in the fields of research, innovation, training and knowledge and technology transfer

Total members: ~300



Established in 1984 as official mapping agency for the government of Catalonia in the fields of cartography, earth observations, geology and geodesy

Total members: ~270



# Water monitoring and Earth Observation, a key resource to be managed

## -Challenge-

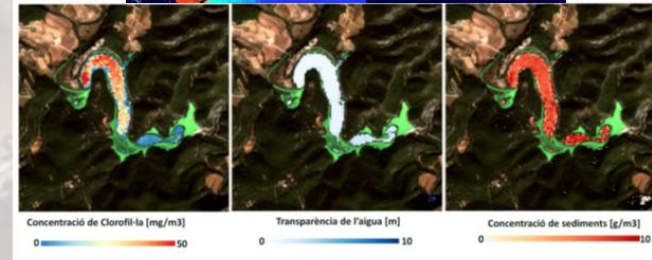
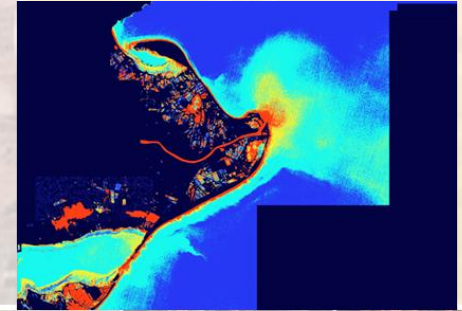
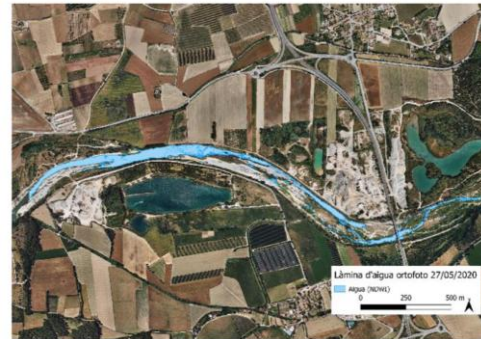
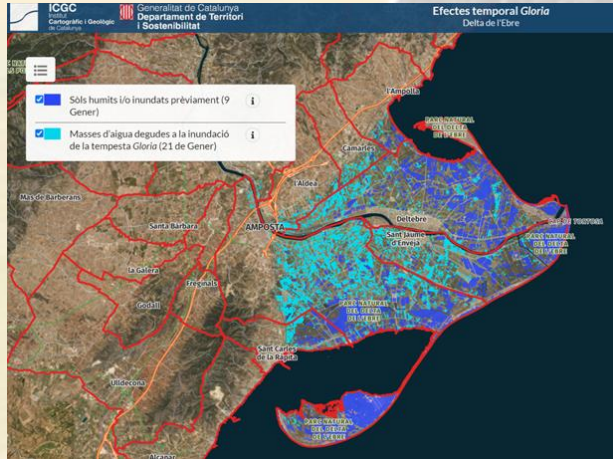
Catalonia, a semi-arid region suffering from **frequent droughts**, relies heavily on groundwater for agricultural irrigation, domestic and industrial use, with aquifers providing almost half (44%) of the total water consumption in the Catalan River Basin. This dependence is even more pronounced in the **agricultural sector**, which is the largest consumer of water.

Effective management of these groundwater reserves is essential not only for maintaining the sustainability of water resources but also for ensuring the **economic viability** and **social cohesion** of many communities and industries across the region. This underscores the importance of utilizing Earth Observation (EO) technologies in water management.



# Water monitoring and Earth Observation, a key resource to be managed

## -From space assets- context (1/2)-

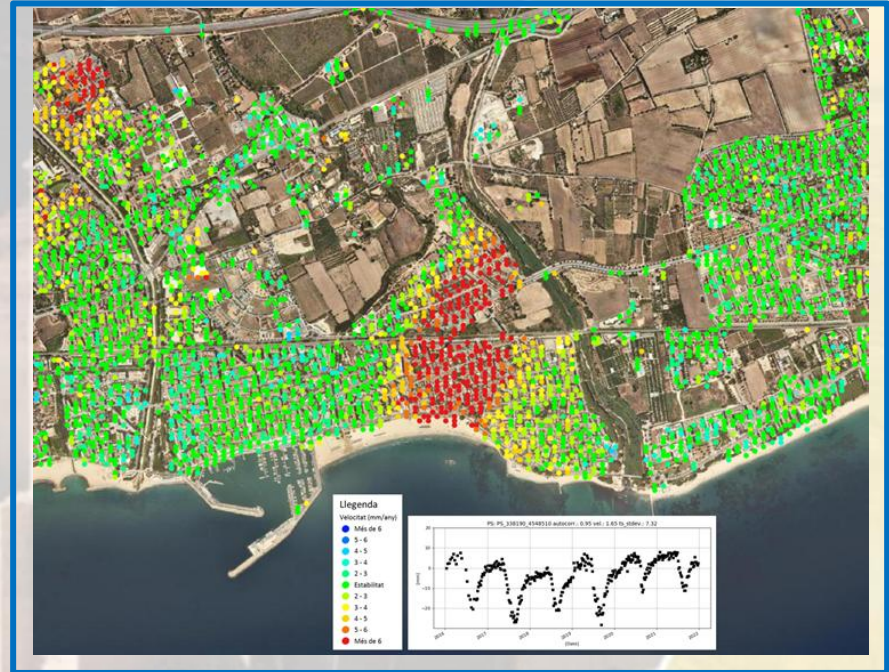
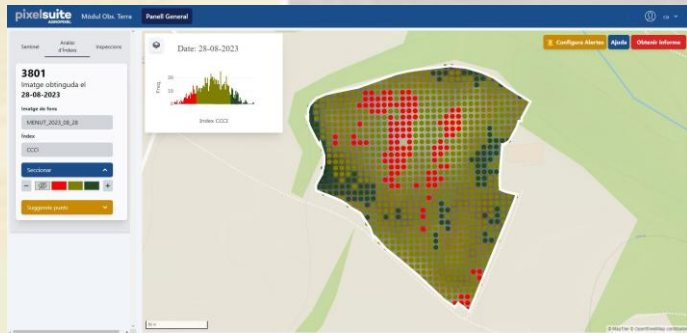
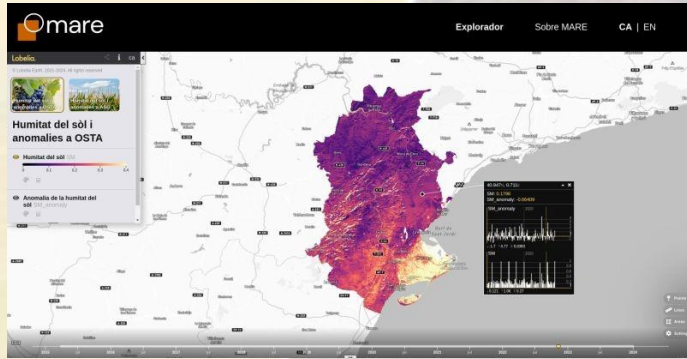


Coastal and inland water reservoirs biophysical variables: Chlorophyll-a, Turbidity and Transparency ICGC

Ecological continuity on rivers of water layer—source ICGC

# Water monitoring and Earth Observation, a key resource to be managed

## - From space assets- context (2/2)-



SBES →

Drought indexes and vineyards water demands-pilot projects led by IEEC (LOBELIA/SPASCAT)

Ground Deformation movements –source ICGC  
<https://visors.icgc.cat/subsidencia-projectes/#!/0419>

# Water monitoring and Earth Observation, a key resource to be managed

## -SBES\_EARSC initiative- Catalan Use Case-



### WATER RESOURCES MANAGEMENT IN SPAIN

[Water Resources Management in Spain - earsc.org/sebs](https://www.earsc.org/sebs)

[Water-Management-in-Catalonia\\_Report\\_Final.pdf](#)



KEY END USER



Destination Earth Platform presentation-CAT Use Case



European Association of Remote Sensing Companies

Sentinels Benefits Study (SeBS)

A Case Study

### Water Resources Management in Spain

Using Sentinels to monitor groundwater resources in Catalan aquifers



Source of the picture: <https://www.bbc.co.uk/news/world-europe-65129735>

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July 2024

# Water monitoring and Earth Observation, a key resource to be managed

## -SBES\_EARSC initiative direct and indirect benefits (1/3)-

Tier	Benefits identified	Type	Value where economic (annual)
Tier 1 (ICGC)	Employment	Economic	
	Funding for R&D projects	Economic	
	Improved allocation of the monitoring budget	Economic	
	Innovative software and services	Entrepreneurship and innovation	
	Scientific research and publications	Science	
	Better work for environmental mission.	Environmental	
Tier 2 (ACA)	Improved allocation of the monitoring budget	Economic	€165-465 k
	Cost savings in avoiding finding/creating alternative water sources	Economic	
	Regulatory compliance	Regulatory	
	Improved water allocation and management	Environmental	
	Improved policy enforcement	Regulatory	

Tier	Benefits identified	Type	Value where economic (annual)
Tier 3 (Municipalities and water utilities)	Damage mitigation from subsidence	Economic	
	Optimized distribution from water utilities	Economic	
	Improved public services and policy enforcement	Regulatory	
Tier 4 (Citizens and Society)	Efficient agricultural water use	Economic	€ 10,85-21,70 m
	Fairness and social cohesion	Societal	
		Economic	
	Savings on water bills due to efficient water management		
	Avoiding drastic water usage limitations	Societal	
	Environmental benefits for groundwater-dependent ecosystems	Environmental	
	Avoided permanent deterioration of aquifer (compaction)	Environmental	
<b>TOTALS</b>			<b>€11,00-22,16m</b>

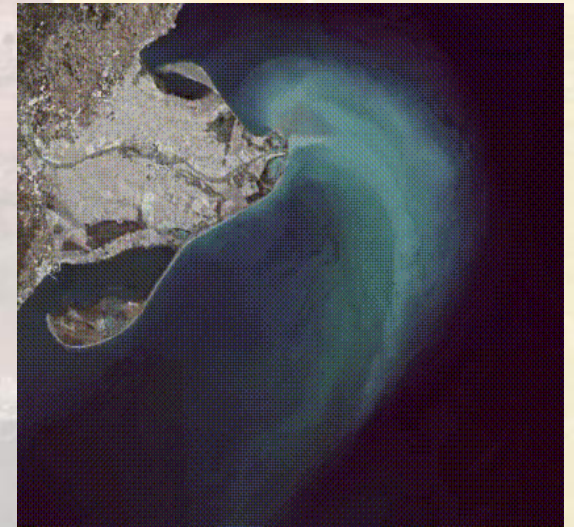
- Candidate Barcelona-IAC 2029: “Water Resilience from Space”
- PCP\_WISE: Rural drought and flood use case-Catalonia
- HACKATON CASSINI 2026: From Orbit to the Water

## Water monitoring by satellite, a key resource to be managed: -SBES\_EARSC initiative direct and indirect benefits (2/3)-

**FEASIBILITY:** The solutions are technically feasible as long as satellite data is used with an available time window to be processed. Open data is used and the indexes that are calculated required standard spectral bands. Upscale solutions to another region there is a huge dependency with the field data to validate the solutions.

**VIABILITY:** The solutions are based on open data, in case of E.O, with long-term continuity. Use processes that are easily automated. In case of communications a balance should be done in terms of cost and benefits (direct and indirect ones)

**USABILITY:** The solutions have been tested by end users participating in the SBES program to analyze its usability. Apart from these end users there are other potential users who can benefit from these solutions. Solutions are moving to be used as a manager of alerts, precursors and trend analysis.



## Water monitoring by satellite, a key resource to be managed: -SBES\_EARSC initiative direct and indirect benefits (3/3)-

The climate and environmental data is acquiring a differential value: there is a need for continuity in the sensors and capture systems to assure integrity and continuity of products and services oriented as decision support tools

**THANKS FOR  
YOUR ATTENTION**

Participation in initiatives as SBES\_EARSC use cases apport us:

- **Visualization of our works at international level**
- **Prestige and confidence on our innovative solutions**
- **Metrics about the benefits, direct and indirect of our products and services**

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**“A new period of heavy rains and not water scarcity, started just after the SBES Cataln use case publication !!!” 😊**