



PROGRAMME OF THE
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COPERNICUS4REGIONS 2025

DROUGHT MAPS HELP EBRO REGION ADAPT TO NEW IRRIGATION PRACTICES

Maria José Escorihuela, Guillem Sánchez, Pere Quintana

isardSAT | The Ebro Observatory | Spain

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The weekly soil moisture maps can help farmers in Terra Alta (Catalonia) decide when to prioritise vineyard irrigation, saving water and energy

Pere Quintana Seguí

*Researcher in Hydrology, Climate and Meteorology
Ebro Drought Observatory*

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✓ The ACCWA viewer, developed by isardSAT, allows to browse the weekly drought index data in all of the Ebro river basin, providing a clear idea of the anomalies in soil moisture | Credit: Canva

As climate change alters rainfall patterns in the Mediterranean, ACCWA provides drought maps based on soil moisture data to optimise agriculture water management over the Ebro basin (Spain). The Ebro Drought Observatory, part of the Ebro Observatory research institute, develops the methodology and data products, while the Drought Observatories of Terra Alta and Alt Penedès apply these services locally and provide information directly to farmers.

THE CHALLENGE

Recent severe droughts in the Mediterranean area have significantly impacted the local agrifood system, lowering crop production and driving up food prices. In response, farmers are increasingly transitioning from rain-fed to irrigated agriculture, or optimising existing irrigation practices, since dry periods often come with bywater shortages.

As part of the H2020 ACCWA project, the Barcelona-based EO company isardSAT, through the Ebro Drought Observatory and Drought Observatory of Alt Penedès, has developed a methodology to provide a weekly drought index maps at a scale of 1 km. This data is based on the anomaly of remote sensing soil moisture values.

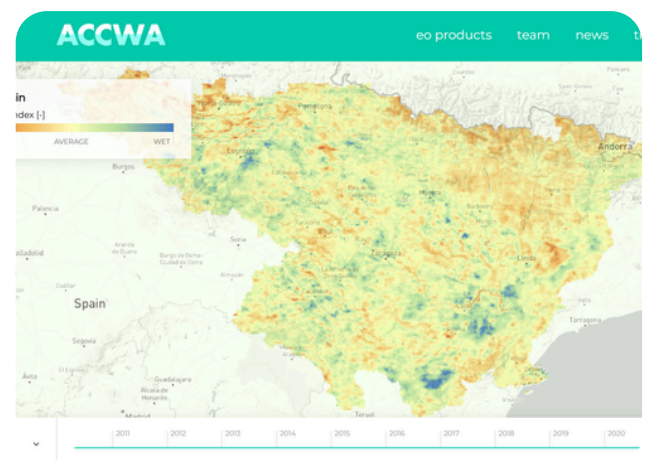
THE SPACE SOLUTIONS

isardSAT gathers remote sensing data from Copernicus Sentinel-3 and ESA's Soil Moisture and Ocean Salinity (SMOS) satellites, and combines them together using an advanced algorithm. This algorithm sharpens the original soil moisture low-resolution data into higher-resolution details by combining it more detailed data from another source, reaching a spatial resolution of 1 km.

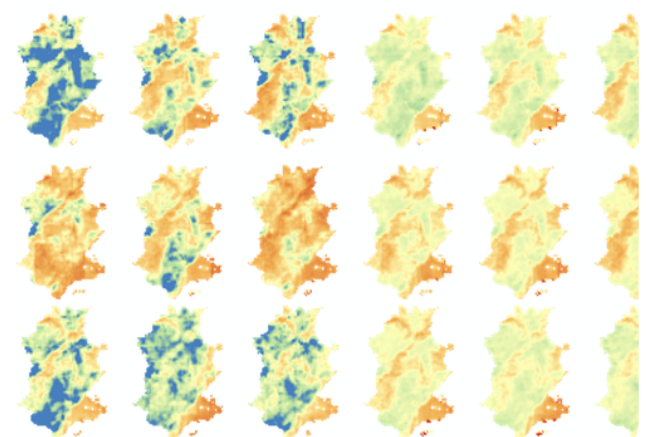
Thanks to the long-term soil moisture data series (back to 2010), we can tell, for each weekly value, how abnormally dry or humid is it in comparison to the value of the same week of the year during the past 15 years, through a validated drought index.

This weekly data is available in the ACCWA viewer, and it is also sent to the farmers on the Terra Alta region through the Drought Observatory of Terra Alta and Drought Observatory of Alt Penedès. These observatories help improve the resilience of the Catalan wine producers, helping farmers adapt their activity to the new Mediterranean climate conditions. Since the start of the project until today, partners have demonstrated the worthy value of this data for water management in agriculture.

"Thanks to ACCWA's maps, from the Ebro Drought Observatory we can provide farmers with extra information to help them take more informed decisions on how to optimise water resources", explains Pere Quintana.



✓ **Weekly maps of drought index in the Terra Alta region (Catalonia) show the amount of water available in the soil, helping make decisions on irrigation** | Credit: Contains Copernicus Modified data 2020.



THEMATIC AREA



Territorial Management
and Urban Planning

REGION OF APPLICATION



Catalonia

SENTINEL MISSION USED



S3, CCM

COPERNICUS SERVICE USED

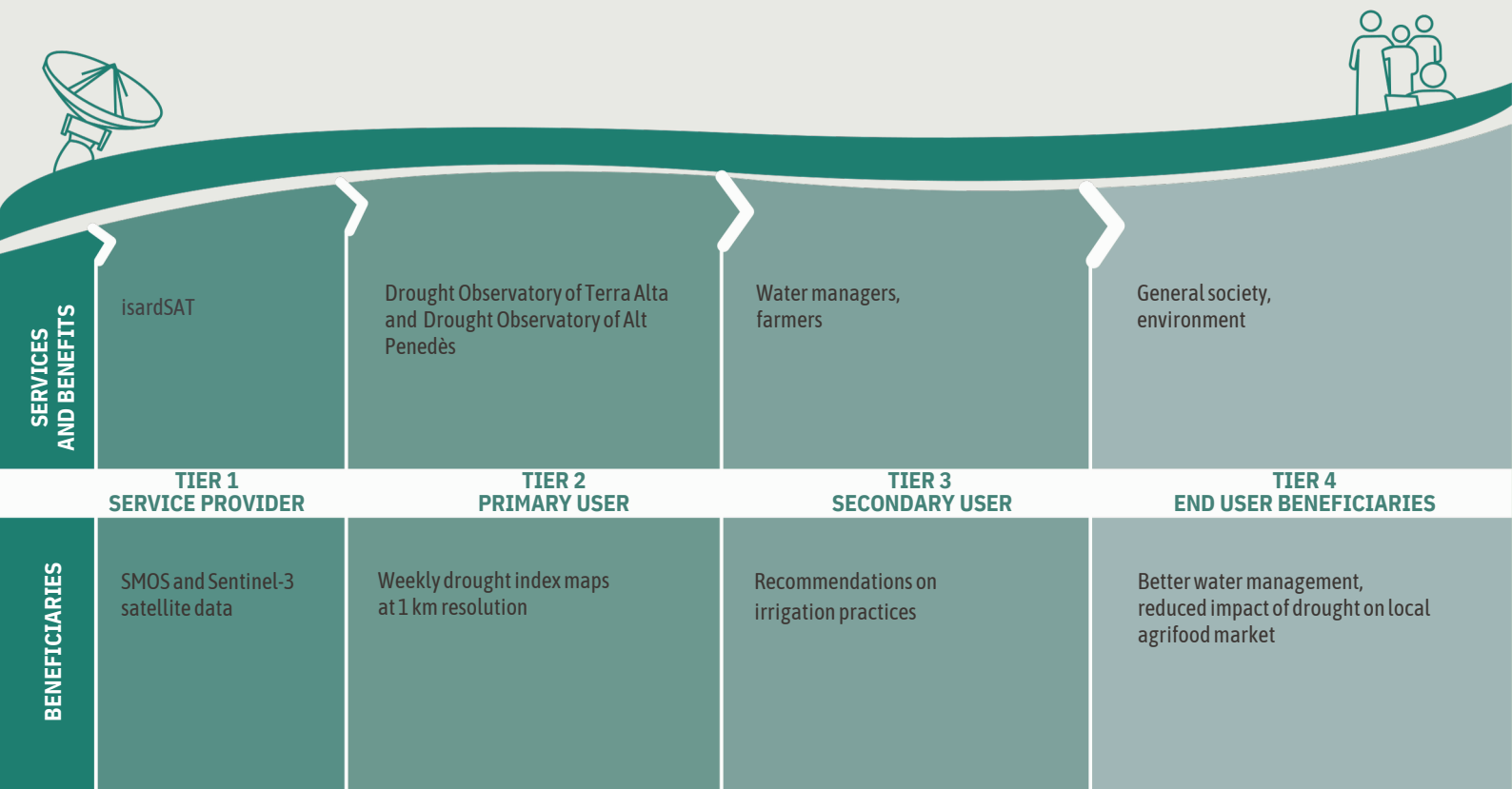


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THE BENEFITS AND THE BENEFICIARIES

The available time series of soil moisture data offer a perspective view of drought extension and repercussions. A clear example can be found in the drought that affected the Iberian Peninsula on 2022, where the regions that in March showed the driest conditions, had the greatest yield cut-offs three months later, representing a loss of 13% of its yearly crop production accounted up to 9 M euro only in Catalonia.

As ACCWA research shows, there is a strong correlation between drought indices and wheat crop yield production. “A critical stage in the growth of wheat is the jointing stage, which happens months before the harvest”, explains Maria José Escorihuela, Principal Investigator of the project. As a result, any soil moisture stress in the spring can negatively impact crop health and cause crop loss.



EU POLICY / DIRECTIVE



EU Water Framework Directive

TYPE OF SERVICE PROVIDER



Public Service

TYPE OF FUNDING SOURCE



EU Research Programme, ESA

USAGE MATURITY LEVEL



4



A FUTURE WITH COPERNICUS

Thanks to the global coverage of the ESA satellites involved in the data acquisition, the ACCWA drought index product is scalable in any other agricultural region in the world. In the future, new algorithms can improve its spatial resolution, and allow data from other satellites that will improve the frequency of the soil moisture values, and thus, the drought index



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Contacts

Maria José Escorihuela | mj.escorihuela@isardsat.cat
Guillem Sánchez | guillem.sanchez@isardsat.cat
Pere Quintana | pquintana@gencat.cat

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