IAF EARTH OBSERVATION SYMPOSIUM (B1)
Assessing and Mitigating the Global Freshwater Crisis (6)

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MARE : DROUGHT MONITORING WITH HIGH SPATIAL RESOLUTION IN CATALONIA

Abstract

Climate change is one of the main threats to the planet for the s. XXI. The increase in the frequency, intensity and duration of extreme events such as droughts, forest fires or floods has had - and will continue to have - a palpable and growing impact. The models point to the Mediterranean as one of the regions most sensitive to the impacts of climate change. Among the future scenarios, there is a clear trend in the pattern of some climate parameters: an increase in the thermal regime is observed and a decrease in precipitation. The increase in temperatures will lead to a greater potential for evapotranspiration, which in turn will decrease water resources. Among the consequences of global warming, droughts are often one of the slowest developing, longest lasting and least predictable of all atmospheric hazards. Droughts have a significant impact on water resources (both surface and underground), crop yields and fire predictions, among others.

Although soil moisture has proven to be a key element in early drought detection, currently most drought observatories rely on meteorological indices (mainly precipitation) or measure their consequences, such as for example from vegetation indices. This fact is due to the difficulty of measuring soil moisture globally at an adequate resolution. The lack of soil moisture measurements at a spatial and temporal resolution is aggravated in the Mediterranean area since sensors with higher resolution sensitive to soil moisture have severe limitations in semi-arid climates.

The main objective of this project is to improve drought monitoring capabilities in Catalonia using soil moisture products based on remote sensing at high spatial and temporal resolution. These products will simultaneously improve: i) irrigation needs and ii) crop yield estimates. MARE will implement a methodology to monitor drought through the estimation of soil moisture at the plot scale through remote sensing. This tool will make it possible to monitor the water status of the plot, optimize irrigation, as well as assess risks such as the decrease in agricultural roductivity, which are becoming more frequent as a result of climate change.

This project is being developed in collaboration with two Catalan entities: the company Aigües Segarra-Garrigues (ASG) and the agrarian society Consell Regulador de la Denominació d'Origen (CRDO) Terra Alta. Both entities need the water status monitoring system at the plot scale in their communities in order to optimize water (and energy) consumption and make a more accurate harvest forecast.