Case study:
Northern Italy Drought (Jan-Apr 2022)

Credits: AdbPo

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Short Introduction

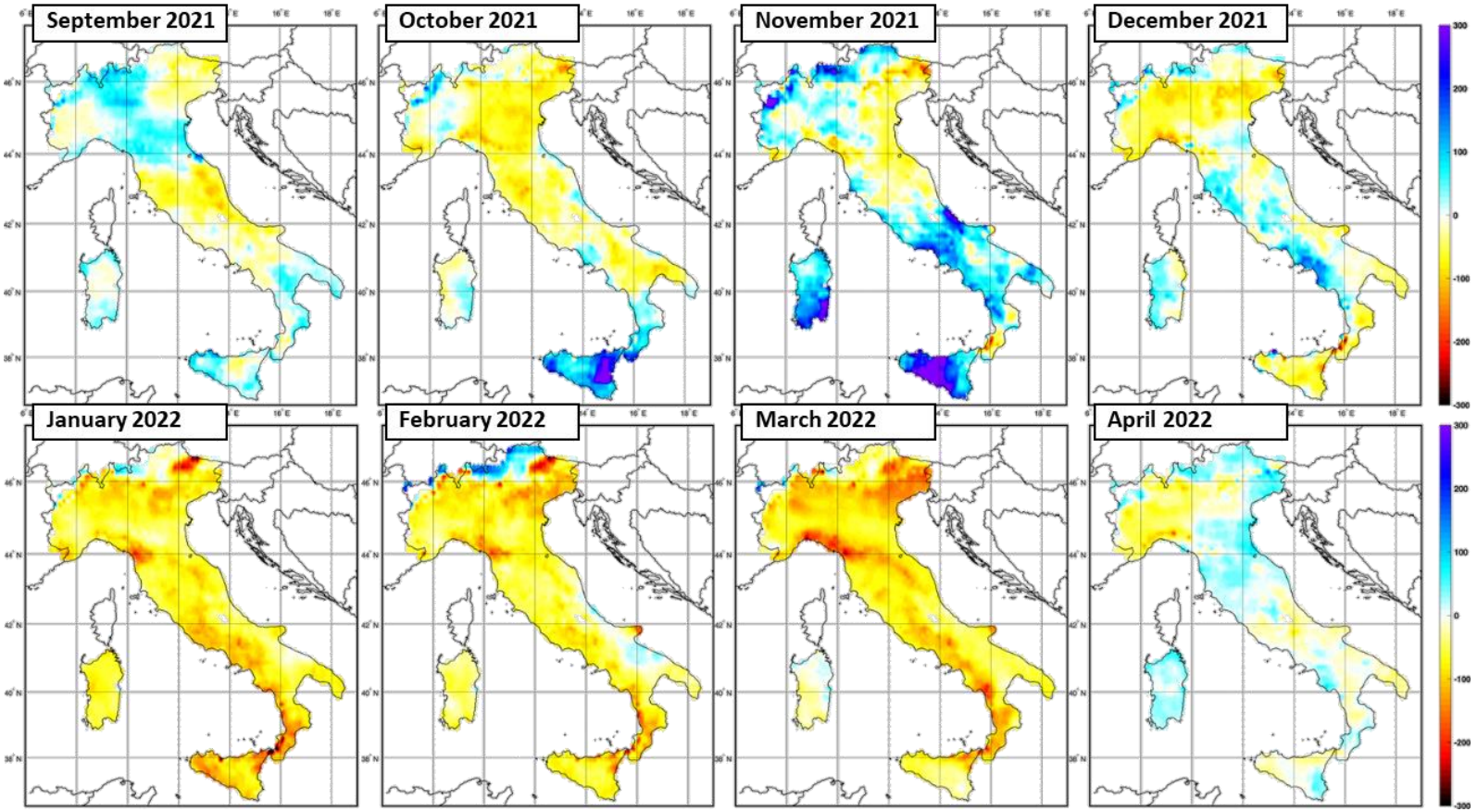
In the hydrological year **2021-2022 northern Italy** has experienced a **very dry period**, in terms of both liquid and solid precipitation, and also 2021 was a moderately dry year.

The impact of water scarcity is evident in the different compartments (soil, rivers, reservoirs) and is expected to have a significant impact on the agricultural sector, and potentially also on the drinking water sector.

A significant reduction of energy production from the hydroelectric sector has been also observed.

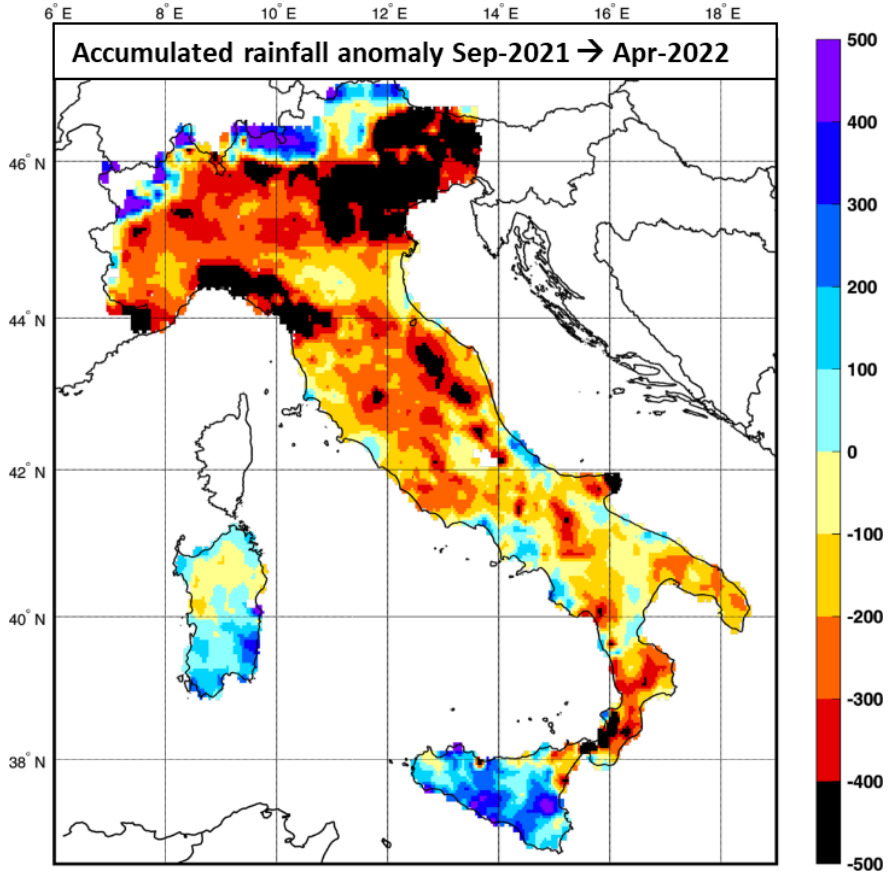
Satellite observations from H SAF can play a significant role in monitoring drought conditions in space and time.

Satellite Precipitation Analysis



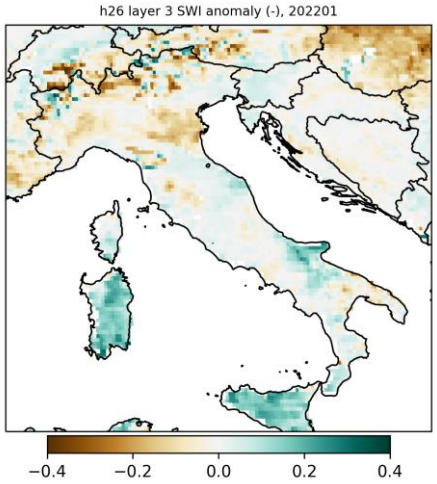
P-AC-SM2R-PMW [H64] Monthly rainfall anomalies [mm] with respect to the reference period 2007-2021 from September 2021 to April 2022.

Satellite Precipitation Analysis

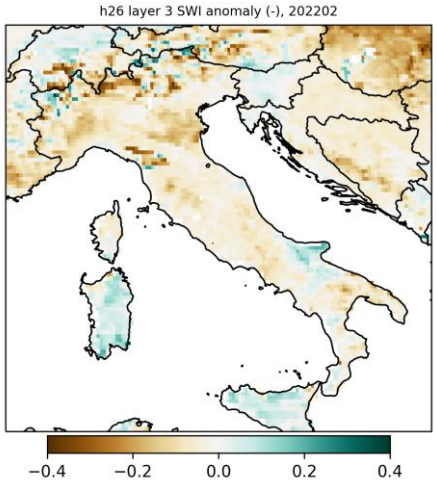


P-AC-SM2R-PMW [H64] Accumulated rainfall anomaly [mm] from September 2021 to April 2022.

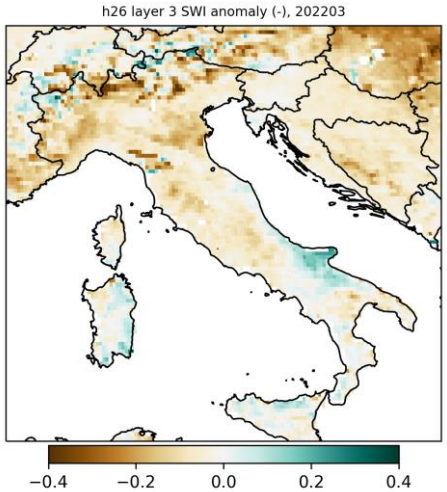
Root-Zone Soil Wetness Analysis



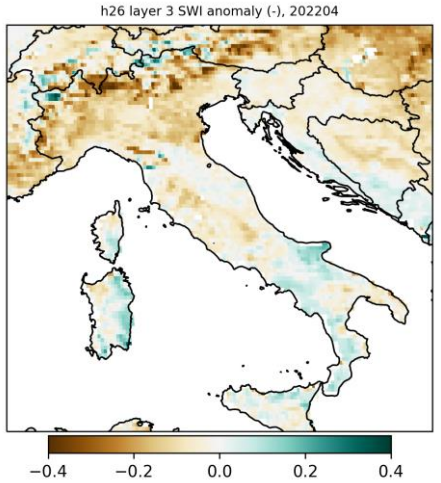
January 2022



February 2022



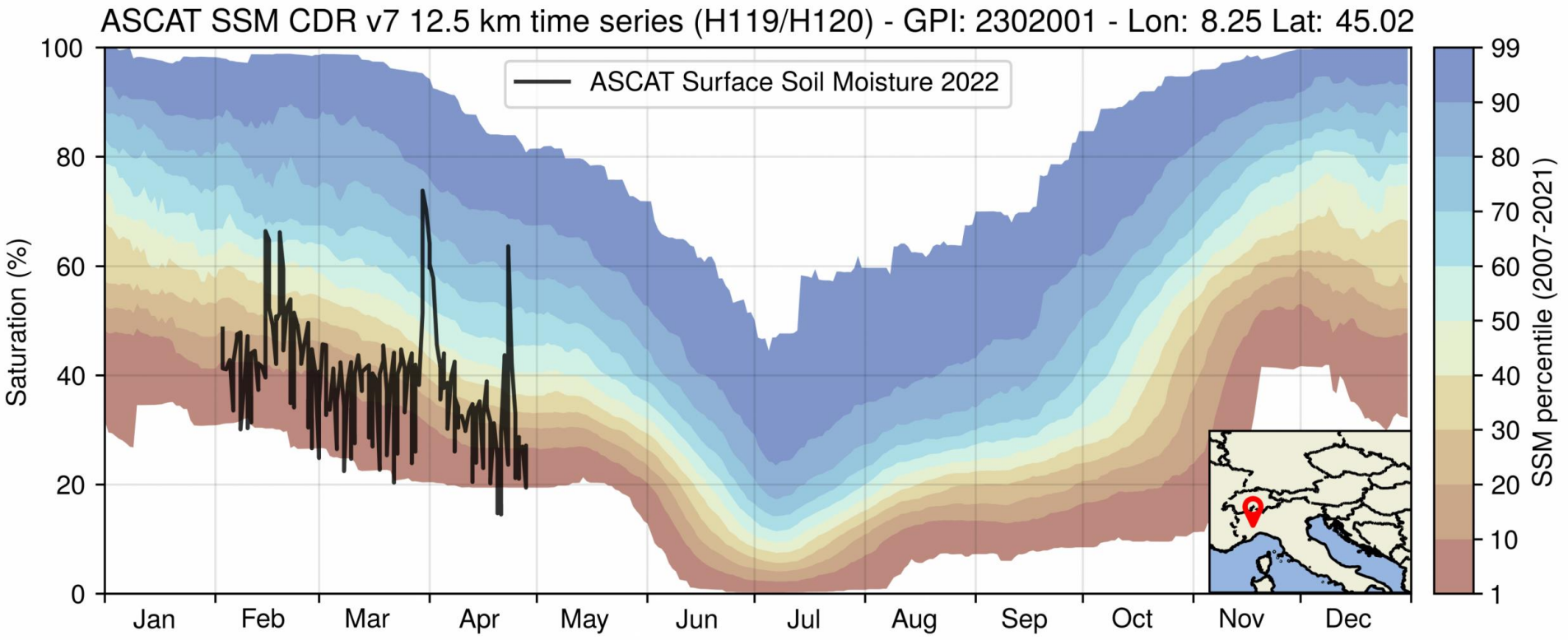
March 2022



April 2022

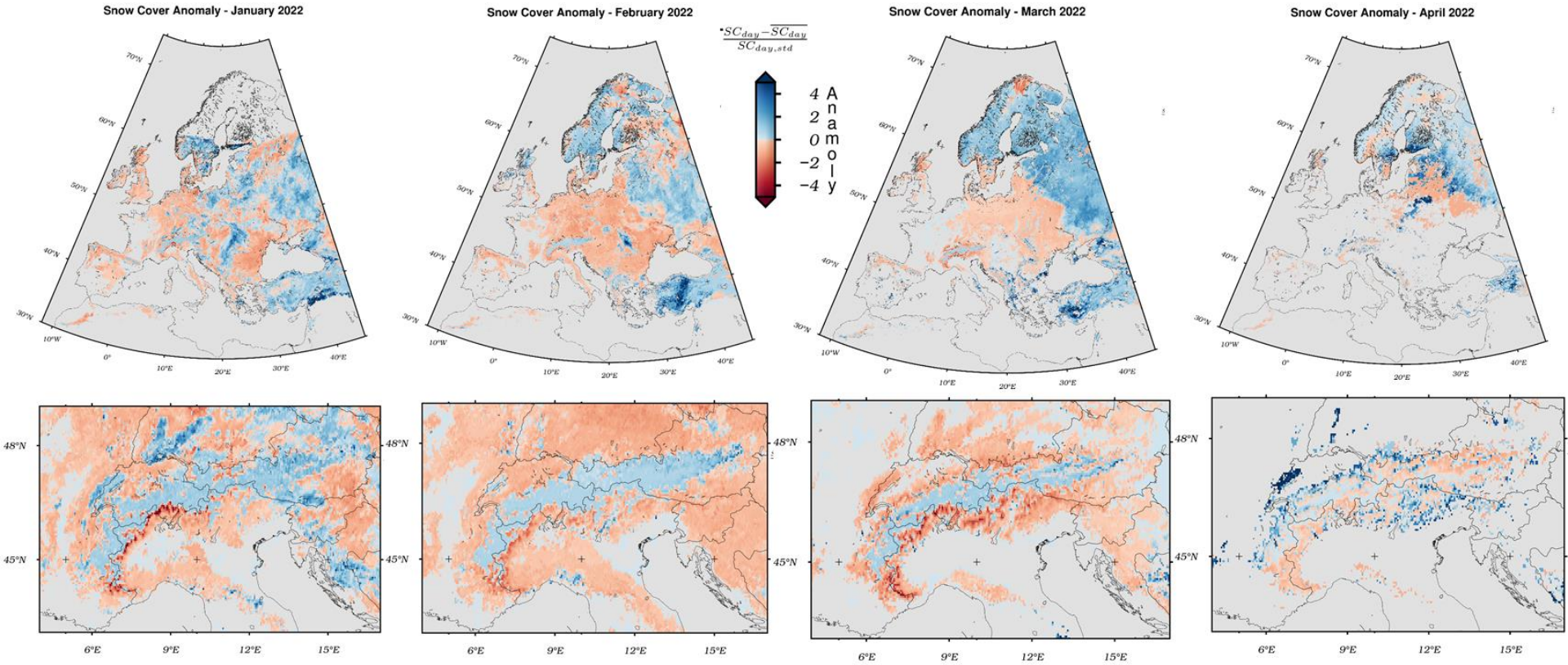
RZSM-ASCAT-NRT-10km [H26] monthly anomaly (January-April 2022) for layer 3 (28-100 cm depth) with respect to 1992-2021 **RZSM-DR-2019-10km [H141]** monthly mean.
Anomalously dry conditions are present in parts of northern Italy.

Satellite Soil Moisture Analysis



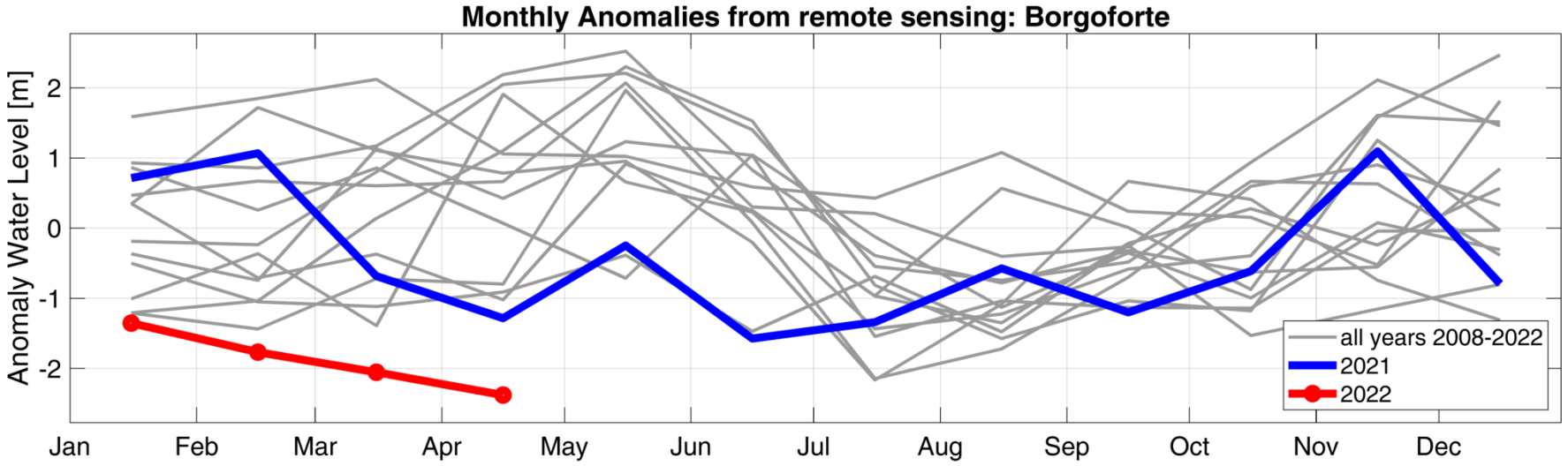
ASCAT Surface Soil Moisture (SSM) time series (based on the H SAF ASCAT SSM Data Record (DR) v7 product - H119/H120) over northern Italy. Low surface soil moisture conditions can be seen in Mar/Apr 2022 compared to surface soil moisture percentiles derived from previous years 2007-2021.

Satellite Snow Analysis



SE-E-SEVIRI-5km [H10] Monthly snow cover anomalies [day] with respect to the reference period 2010-2021 from January 2022 to April 2022

Satellite River Water Level Analysis



Water level from altimetry: data source https://hydroweb.theia-land.fr/?lang=en&
Water level anomaly timeseries [m] for the Po river close to Borgoforte.
Comparison of 2022 with respect to previous years (2008-2021).

Summary and Conclusion

- Satellite products from H SAF have been found an **important tool for monitoring drought conditions**.
- The availability of observations for more than 15 years allowed us to compute robust anomalies for the different component of the water cycle, i.e., **precipitation**, **soil moisture**, **snow cover area** and **river water level**.

Drought conditions in northern Italy are still critical and without important precipitation in the months of May and June, water saving actions will be needed.

Credits: Copernicus