



## **Addressing global demands of water, energy and food with satellite based soil moisture data in a changing climate**

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According to United Nations estimates, we will need 30% more water, 45% more energy and 50% more food by 2030 globally. Water is needed for almost all forms of energy production and power generation while energy is required to treat and transport water. Both, water and energy are needed to produce food. Climate change is likely to further modify the availability of these resources. One key to face our growing demands is the Essential Climate Variable (ECV) soil moisture. It influences hydrological and agricultural processes, runoff generation, and drought development and impacts on the climate system through atmospheric feedbacks. Soil moisture is a source of water for evapotranspiration over the continents, and is involved in both the water and the energy cycles. Within the European Space Agency Climate Change Initiative, the most complete and most consistent global soil moisture data record based on active and passive microwave sensors is produced operationally. Besides the importance for climate modelling, soil moisture data can be used to derive tailored climate indicators addressing specific sectors identified by the Copernicus Climate Change Service. Climate change and variability are important components in many sectors, amongst others agriculture and water.

The analysis of satellite based soil moisture data allows detecting both short term (forecasting, anomalies) and long term (trend analysis) changes in agro-environmental conditions. The start and duration of agricultural seasons can be detected in near-real time. Satellite-based soil moisture data also supports the monitoring of droughts, floods and wetlands. Information on wetlands and their changing extent is particularly important in the frame of the post-Kyoto monitoring requirements. Besides the existing satellite capacities, the new European Sentinel satellites will support climate research and allow for a timely and effective monitoring of climate change impacts in various socio-economic sectors based on the Essential Climate Variable soil moisture.