



Recent advances in using satellite soil moisture and precipitation for flood and landslide prediction in the Mediterranean basin

Luca Brocca, Stefania Camici, Luca Ciabatta, Angelica Tarpanelli, Sara Modanesi, Paolo Filippucci, Christian Massari, Maria Teresa Brunetti, Silvia Peruccacci, Stefano Luigi Gariano, and Massimo Melillo

National Research Council, Research Institute for Geo-Hydrological Protection, Perugia, Italy (luca.brocca@irpi.cnr.it)

The Mediterranean region has been identified as one of the main climate change hotspots: its sensitivity to global change is high and its evolution remains uncertain. The region experiences many interactions and feedbacks at the oceanic, atmospheric, and hydrological levels, while facing high anthropogenic activities. Analysing the water cycle over the Mediterranean region is of major importance to environmental and socio-economic aspects. The satellite monitoring of the Mediterranean water cycle represents one of the key challenges for the hydrological community.

The presentation will show recent results on using satellite soil moisture and precipitation products for hydrometeorological prediction in the Mediterranean region, and particularly for the prediction of floods and landslides. Specifically, we will show the comparison of multiple satellite precipitation products for predicting flood in 100+ basins over the Mediterranean Basin by also using different hydrological models. Moreover, the assessment of satellite precipitation products for predicting the occurrence of landslides in Italy is carried out. Among the investigated satellite products, we have firstly considered state-of-the-art products such as TMPA (TRMM Multisatellite Precipitation Analysis), GPM (Global Precipitation Measurement), and H SAF (EUMETSAT Satellite Application Facility on Support to Operational Hydrology and Water Management). Secondly, we have tested the innovative products using the SM2RAIN algorithm for rainfall retrieval from multiple satellite soil moisture products including ASCAT (Advanced SCATterometer), SMOS (Soil Moisture and Ocean Salinity mission) and SMAP (Soil Moisture Active and Passive mission).