

Satellite inspired hydrology in an uncertain future: a H SAF and HEPEX workshop



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Data assimilation for continuous global assessment of severe conditions over terrestrial surfaces

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This study investigates the capability of LDAS-Monde global offline LDAS to monitor and forecast the impact of extreme events on Land Surface Variables (LSVs). LDAS-Monde is driven by ERA-5 atmospheric forcing from ECMWF and is able to ingest information from satellite-derived surface soil moisture (SSM) and leaf area index (LAI) observations to constrain the ISBA land surface model.

A global 2010-2018, 0.25°x0.25° spatial resolution, reanalysis of the LSVs is first evaluated thanks to global estimates of SSM, LAI, evapotranspiration, Gross Primary Production, Sun Induced Fluorescence and several in situ measurements of soil moisture, river discharge, and flux measurements. This 9-yr reanalysis is used to provide a climatology of the LSVs. Significant anomalies are used to decide on where to focus for a more detailed monitoring and forecasting activity. 19 regions across the globe were investigated for 2018. Two of them, presenting large negative anomalies of SSM and LAI were further analysed: Western-Europe and the Murray-Darling river basin in southeastern Australia. LDAS-Monde was operated forced by ECMWF IFS high-resolution atmospheric analysis leading to a 0.1°x0.1° reanalysis. It complements the coarse-resolution LDAS-Monde operated using ERA5. The IFS forecast capacity initialised by LDAS-Monde analysis is also presented.

Which session would you like to present in?

1. Remote sensing, hydrological modelling and data assimilation

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