

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



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Impact of UKV soil moisture data assimilation on potential operational forecast of river flows

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The UKV is the Met Office operational modelling system for the UK area. An hourly cycling 4DVAR algorithm provides atmospheric initial conditions; meanwhile the initial land state is provided by interpolating a global soil moisture analysis at a daily frequency. The forecast step uses the Unified Model for the atmosphere coupled to JULES for the land state at 1.5km.

The Met Office has recently developed a Soil Moisture analysis for the UKV where MetOp A&B ASCAT soil wetness, and screen observations of temperature and relative humidity, are assimilated in a Simplified Extended Kalman Filter. Although verification against screen observations shows an overall neutral impact, the hydrology estimation is significantly improved.

In our work, surface and sub-surface runoffs from the UKV are routed through a standalone river scheme and compared against river flow observations. Results shows that the current operational system produces river flows that are several times larger than observations, while the new soil moisture analysis, planned for implementation in November 2019, is able to provide estimations which reproduce the magnitude and day-to-day variability reported by the measurements. This opens the possibility to develop an operational hydrology system with applications areas such as flood forecasting, coupled modelling or land verification.

Which session would you like to present in?

1. Hydrological data assimilation for NWP

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