



## **SMOS Soil Moisture and its potential within the Copernicus Emergency Management Service for Flood Forecasting at ECMWF**

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The flood forecasting component of the Copernicus Emergency Management Service Early Warning System (CEMS-EWS Floods), run at the European Centre for Medium Range Weather Forecasts (ECMWF), provides medium range flood forecasts at both the European and global scales. Forecast accuracy correlates strongly with accurately representing the initial status of hydrological variables including soil moisture. Initial soil moisture status within CEMS-EWS Floods is currently obtained by a hydrological analysis of point scale temperature and precipitation observations. Remotely sensed soil moisture from SMOS may provide a better representation of the initial soil moisture status than the current methodology.

ECMWF, in partnership with the European Space Agency (ESA), are undertaking an 18 month project to demonstrate the potential use of SMOS soil moisture data within CEMS-EWS Floods. This will use the level 1 Near Real Time (NRT) SMOS soil moisture Neural Network product trained on the ECMWF land surface scheme. The work will firstly perform a long term comparison against existing re-analysis datasets, including the CEMS-EWS Floods analysis in Europe and ERA5 globally, to ascertain spatial and temporal correlations. Data assimilation experiments will then be conducted within the European and global components of CEMS-EWS Floods. The resulting changes in streamflow accuracy will be analysed to conclude about the benefits offered by assimilating SMOS soil moisture data.

We will present the outline of this project as well as some of the initial results from the inter-comparison with other soil moisture re-analysis products.