Geophysical Research Abstracts
Vol. 20, EGU2018-1205, 2018
EGU General Assembly 2018


# New representations of infiltration in JULES applied to intense rainfall on the river flow of UK catchments

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Intense rainfall can lead to flash flooding and may cause disruption, damage and loss of life. Since flooding from intense rainfall (FFIR) occurs usually during a short duration and in a limited area, these events are generally poorly predicted by Numerical Weather Prediction (NWP) models, because of the high spatio-temporal resolution required and because of the way the convective rainfall is described in the model. Moreover, the hydrological process descriptions of land surface models are not necessarily suitable to deal with cases of intense rainfall.

In the framework of the TENDERLY project, we improved the representation of the infiltration of the soil in the land surface model of the UK Met Office (JULES) by introducing a variable maximum infiltration. Different schemes of maximum infiltration have been tested to allow us to better predict the amount of surface runoff which is related to the river discharge.

Here, we present the different representations of the infiltration which has been incorporated into the JULES model in order to improve the river discharge. The impact of these representations on the river flow is evaluated with 8 different catchments located in Great Britain. The modelled river level is compared with the NRFA gauged observations. We show the ability of the JULES model to produce the river flow as a hydrology model where the simulations are driven by the high meteorological resolution of the CHESS database with a spatial resolution of 1km2. The simulations include the river flow model (RFM) routing scheme such as the Probability Distribution Model to generate runoff from the infiltration capacity of the soil. This configuration is being applied to the flash flood event of the 18th of July 2017 in Coverack (Cornwall) using the MOGREPS-UK forecast ensemble at 2.2 km2 of resolution and every 15 minutes.