



Modelling (flash) floods in a Dutch lowland catchment

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On 26 August 2010 the eastern part of The Netherlands and the bordering part of Germany were struck by a series of rainfall events. We investigated the unprecedented flash flood triggered by this exceptionally heavy rainfall event (return period > 1000 years) in the 6.5 km² Hupsel Brook catchment, which has been the experimental watershed employed by Wageningen University since the 1960s. This study improved our understanding of the dynamics of such lowland flash floods and the results have been published in HESS (Brauer et al., 2011). During this extreme event some thresholds became apparent that do not play a role during average conditions and are not incorporated in rainfall-runoff models.

We present a detailed analysis of this extreme event, focusing on (1) the measured soil moisture, groundwater and discharge response of the catchment, (2) the thresholds we found, (3) the manner in which these processes and thresholds are incorporated in some well-known conceptual hydrological models and (4) how well these models are able to simulate the rainfall-runoff processes during the 2010 flash flood.

References

Brauer, C. C., Teuling, A.J., Overeem, A., van der Velde, Y., Hazenberg, P., Warmerdam, P. M. M and Uijlenhoet, R.: Anatomy of extraordinary rainfall and flash flood in a Dutch lowland catchment, *Hydrol. Earth Syst. Sci.*, 15, 1991–2005, 2011.