Geophysical Research Abstracts
Vol. 14, EGU2012-6516, 2012
EGU General Assembly 2012

Catchments as simple dynamical systems: uncertainty, calibration and catchment characteristics

A.J. Teuling (1), S.W. van Berkum (1), R. Uijlenhoet (1), S.I. Seneviratne (2), and I. Lehner (2)
(1) Wageningen University, Wageningen, Netherlands (ryan.teuling@wur.nl), (2) ETH Zurich, Zurich, Switzerland

Considering catchments as simple dynamical systems is a promising approach to model rainfall-runoff dynamics in small catchments. This approach uses the storage-discharge relation as the main component of the rainfall-runoff model. This is the basis of our simple non-linear model, which can be used for small catchments in temperate climates. The storage-discharge function in the model can be obtained through recession analysis on the discharge time-series or through calibration of the whole model. However, the frequency, length, and resolution of the discharge observations available for estimating the storage discharge relation can have a large impact upon the accuracy of the model predictions. We investigate the accuracy of model simulations with parameters derived from:

1. calibration of the model,
2. recession analysis,
3. catchment characteristics and the boussinesq equation.

In the evaluation of the model simulations, special emphasis is put on the ability of the model to correctly simulate yearly high and low flows. In the current study, we focus on the Rietholzbach catchment located in the pre-alpine North-East of Switzerland. Further research will include analysis of multiple catchments to investigate the applicability of this approach for ungauged basins.