Geophysical Research Abstracts
Vol. 15, EGU2013-8123, 2013
EGU General Assembly 2013

Regionalization of response routine parameters

Lena S. Tøfte and Yisak A. Sultan
SINTEF Energy, Water Resources, Trondheim, Norway (lenat@sintef.no)

When area distributed hydrological models are to be calibrated or updated, fewer calibration parameters is of a considerable advantage. Based on, among others, Kirchner, we have developed a simple non-threshold response model for drainage in natural catchments, to be used in the gridded hydrological model ENKI. The new response model takes only the hydrogram into account, it has one state and two parameters, and is adapted to catchments that are dominated by terrain drainage.

The method is based on the assumption that in catchments where precipitation, evaporation and snowmelt is neglect able, the discharge is entirely determined by the amount of stored water. It can then be characterized as a simple first-order nonlinear dynamical system, where the governing equations can be found directly from measured stream flow fluctuations. This means that the response in the catchment can be modelled by using hydrogram data where all data from periods with rain, snowmelt or evaporation is left out, and adjust these series to a two or three parameter equation.

A large number of discharge series from catchments in different regions in Norway are analyzed, and parameters found for all the series. By combining the computed parameters and known catchments characteristics, we try to regionalize the parameters. Then the parameters in the response routine can easily be found also for ungauged catchments, from maps or data bases.