Geophysical Research Abstracts, Vol. 7, 06615, 2005
SRef-ID: 1607-7962/gra/EGU05-A-06615

Parameterisation strategies for distributed hydrological modelling across scales

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The main difficulty with spatially distributed hydrological models arises from the enormous spatial variability of hydrological processes which complicates the scaling up of point measurements. In this paper it is argued that "finer" is not necessarily "better" and that model choice should be guided by the principle of parsimony. Distributed models always need a degree of calibration based on hydrological response data. It is further argued that runoff data do not suffice for reliably calibrating a distributed model. Rather, observed spatial patterns of hydrologic response are needed for calibration. The feasibility of this approach is illustrated by a number of case studies at a range of scales. Some guidance is given on how to calibrate and verify distributed models for large river basins.