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Experiences in the parameterization of the surface processes of a large scale hydrological model.

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Distributed models have been proven to be very useful tools in a broad range of hydrological applications. However, their application is driven to match a particular target function, i.e. the observed discharge, and it can happen that the variables and the processes not directly investigated in the cal-val phase remain not tested.
In this work we present our efforts related to the parameterization of the surface processes of a large scale hydrological model and we evaluate how different choices influence the water balance in different climatic and environmental contexts.
Several approaches for the spatialisation of the meteorological information and different model setup choices are discussed, then the results obtained on long term runs (1990 to 2007) over Europe are compared.
Inverse distance, kriging, and regression-kriging, as well as the choice of the sequence of the interpolation (I) and calculation (C) for the derived variables have been tested, with the I-C resulting more effective in the estimation of PET.
The parameterization of surface processes is then investigated.
Calibration for matching observed discharge has a major role in disturbing surface processes dynamics. The runs with default parameters seem to provide more likely soil moisture climatologies. The update of the lookup tables of the land use-related parameters and the use of a proper vegetation phenology have a major influence on model results.
The changes in the interpolation algorithm for the meteorological variables allows to improve the soundness of soil moisture spatial patterns, especially in areas where the meteorological stations are not enough for representing the variability of climatic conditions related to elevation gradients.
Further inconsistencies, with areas appearing unexpectedly dry, can be explained by the underestimation of precipitation in those areas.