



The potential of a general approach in hydrological modelling for PUB applications

Olga Semanova

State Hydrological Institute, Department of Experimental Hydrology and Modelling of Hydrological Processes, St. Petersburg, Russian Federation (omakarieva@gmail.com)

Currently the development of hydrological models is often based on the observational data of a very limited number of basins located in similar conditions. Such single-case studies produce region-specific structures of the models with narrow ranges of applicability. “Flexible” model philosophy and following it countless “modelling exercises” which completely rely on the use of parameter calibration techniques are spreading dangerously fast. They bring up and concentrate the efforts on the problems of non-uniqueness, equifinality, uncertainty, etc. meanwhile eliminating the questions of further investigation and possible conceptualization of real hydrological processes. It is unlikely that such approaches could be usefully applied to the tasks of forecasts and predictions in data rich basins in a changing environment, let alone on the PUB. Clearly, given the scarcity of observations, PUB should rely on models with physically observable parameters, and, therefore, the PUB community’s fate is to become the leader in the development and testing of these models. PUB activities should be focused on the search of new approaches rather than on the uncertainty estimation of different parameterization schemes common to the current generation of models, most of which have remained unchanged during several decades.

The Hydrograph model is being developed with an aim to give it a universal character so that it could be applied in mountainous and flat terrain, and in basins of different climatic zones regardless of their size attempting to reach the relative balance between searching for the simplest solutions and adequate representation of the natural processes. The conceptualization used for description of slope and underground runoff transformation in the Hydrograph model is the theory of runoff elements; which is quite different from widely used approaches based on the equations of mathematical physics.

The report will focus on the results of Hydrograph model application in different regions of the world. Detailed presentation of the stages of the model implementation including initial estimation of model parameters and their further possible calibration on some data scarce basins will be explained.