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Database of small research watersheds for the territory of former Soviet Union as a source of data for improving hydrological models and their parameterizations in different geographical conditions

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One of widely claimed problems in modern modelling hydrology is lack of available information to investigate hydrological processes and improve their representation in the models. In spite of this, one hardly might confidently say that existing "traditional" data sources have been already fully analyzed and made use of.
There existed the network of research watersheds in USSR called water-balance stations where comprehensive and extensive hydrometeorological measurements were conducted according to more or less single program during the last 40-60 years. The program (where not ceased) includes observations of discharges in several, often nested and homogeneous, small watersheds, meteorological elements, evaporation, soil temperature and moisture, snow depths, etc. The network covered different climatic and landscape zones and was established in the middle of the last century with the aim of investigation of the runoff formation in different conditions. Until recently the long-term observational data accompanied by descriptions and maps had existed only in hard copies. It partly explains why these datasets are not enough exploited yet and very rarely or even never were used for the purposes of hydrological modelling although they seem to be much more promising than implementation of the completely new measuring techniques not detracting from its importance.
The goal of the presented work is development of a database of observational data and supportive materials from small research watersheds across the territory of the former Soviet Union. The first version of the database will include the following information for 12 water-balance stations across Russia, Ukraine, Kazahstan and Turkmenistan: daily values of discharges (one or several watersheds), air temperature, humidity, precipitation (one or several gauges), soil and snow state variables, soil and snow evaporation. The stations will cover desert and semi desert, steppe and forest steppe, forest, permafrost and mountainous zones. Supportive material will include maps of watershed boundaries and location of observational sites. Text descriptions of the data, measuring techniques and hydrometeorological conditions related to each of the water-balance station will accompany the datasets. The database is supposed to be expanded with time in number of the stations (by 20) and available data series for each of them. It will be uploaded to the internet with open access to everyone interested in.
Such a database allows one to test hydrological models and separate modules for their adequacy and workability in different conditions and can serve as a base for models comparison and evaluation. Special profit of the database will gain models that don't rely on calibration but on the adequate process representation and use of the observable parameters. One of such models, process-based Hydrograph model, will be tested against the data from every watershed from the developed database. The aim of the Hydrograph model application to the as many as possible number of research data-rich watersheds in different climatic zones is both amending the algorithms and creation and adjustment of the model parameters that allow using the model across the geographic spectrum.