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Criteria for discharge data selection in large-scale hydrological modelling

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The issue of disinformative data has received interest in hydrological research recently. Hydrological data is bound with uncertainties and these can affect conclusions drawn about models and model results. This is certainly true for large-scale hydrological modelling, where datasets used as forcing and for model evaluation are commonly hampered by disinformative data. In an attempt to identify these data issues, this study proposes a methodology to select discharge datasets appropriate for calibration and evaluation of large-scale hydrological models. Discharge data from the Global Runoff Data Centre were analysed with regard to basin areas, record lengths and completeness, hydrographic representations, precipitation and discharge data consistency and degree of regulation in order to find informative datasets where human impact was not apparent in the time-series data. This pre-modelling data analysis rendered a collection of 679 discharge datasets. The effects of the analysis were exemplified by simulations with the global water-balance model WASMOD-M. The results of the simulations showed little gain in overall model performance, but that negligence of data inconsistencies could have large effects on model inference.