

Interactive comment on “Value of river discharge data for global-scale hydrological modeling” by M. Hunger and P. Döll

Anonymous Referee #1

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General remarks: the Authors convey a clear, comprehensive, and interesting contribution on the value of global river discharge data, provided by the Global Runoff Data Centre (GRDC), for hydrological modeling (e.g. calibration/validation exercises). Important science questions are addressed thanks to ad-hoc selections of catchments and verification periods. Although a model (WGHM) is used, the simple nature of model tuning (3 coefficients: a runoff coefficient, an areal correction factor and a station correction factor) allows from some generalizations of the study. The choice of metrics (SDF, R2) for evaluating model performance is pertinent, separates well the moments of the distribution, and avoids falling into classic problems of "unfair" metrics (e.g. RMSE-like). Limitations are carefully pointed out (e.g. value of precipitation,

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lacking complexity of models for extreme warm/cold conditions). The paper is well structured and readability is fairly good and I definitely recommend its publication. In the following I list possible changes that can lead to marginal improvements of the present paper and are proposed to the Authors.

Minor comments for possible improvements: (1) A diagram illustrating the model flow-chart (input data and its frequency, main parameterizations, output and its frequency) can be helpful to summarize what is described in section 2.1. (2) Please clarify if the technical constraint in paragraph 2.2.3 is really unavoidable and why. (3) Geographical plots could be improved by adding colors legends (Fig 2 and 4). (4) The authors could consider to had a table at the end of section 3, summarizing conclusions per basin (at least for the major catchments, avoiding small ones) to list pertinence for modeling verification and main difficulties (e.g snow-dominant, ephemeral ponding) that have required/justified CFA, CFS tuning. This would ease the goal (mentioned in the conclusions) of using this study to guide the global-hydrological model cal/val. I acknowledge the fact that Table 3 partially contains this information although the nature of processes is mixed since basins are clustered by extension. (5) Guidelines for the gauging strategy are embedded in the conclusions. A clear statement can be introduced (e.g. gauging un-gauged or too large basins can be valuable especially in humid climate). Please consider reply to these suggestions with motivations in case proposed changes are to be neglected.

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