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Evaluation of river discharges from ensemble global water resources reanalysis in the Upper Blue Nile basin

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The increased capacity of observational datasets, both from in-situ and remote sensors, along with the continuous advancements in earth system models and data assimilation algorithms, have led to the generation of a number of water resources reanalysis products that are available at global scale and high spatial and temporal resolution. These products hold a great potential for studies and applications related to water resources but their level of accuracy and range of uncertainty needs to be investigated and understood. In this work, we analyze and evaluate the runoff estimates from a multi-model global water resources reanalysis (WRR) dataset that was recently produced within the framework of Earth2Observe project (http: //www.earth2observe.eu). Evaluation of the WRR reanalysis is based on the comparison of streamflows derived from the ensemble WRR and available in situ observations for a range of basin scales in the Upper Blue Nile basin in Ethiopia.

Analysis is carried out for different runoff properties (e.g. volume, maximum flows, duration curves) and for different temporal scales (daily, seasonal, annual) in order to evaluate the ability of WRR-based runoff estimates to represent various runoff characteristics. Results clearly indicate that the basin area and temporal scale are the most important controls on the performance of WRR streamflow simulations. Furthermore, results allow providing recommendations on application-specific use of WRR products and discussing potential bias correction techniques for improving river streamflow simulations.