Are gridded precipitation datasets a good option for streamflow simulation across the Juruá river basin, Amazon?

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Over the past few decades, many gridded P-datasets with nearly global coverage have become available. These P-datasets offer an unprecedented opportunity to constrain hydrological modeling in remote region where the gauge network is sparse. However, few studies report on P-datasets reliability for discharge simulations limiting the use of these datasets. This study investigates the reliability of available gridded P-datasets for streamflow simulations for 10 basins of the Juruá watershed, located in the Amazon region. A total of 19 P-datasets including both satellite-based and reanalysis-based precipitation estimates, are considered to provide a comprehensive overview of currently available options. Used as forcing data in two lumped hydrological models (GR4j and HyMOD), some P-datasets led to a more realistic simulation of daily and monthly streamflow than the simulation based on precipitation estimates derived from the gauges network. P-dataset ranking depends on the considered basin and time step (i.e. daily, monthly), suggesting variability in spatial reliability for all considered P-datasets. In addition, the P-dataset reliability increases with the surface area of the considered basins. This can be partially explained by the aggregation of precipitation on larger spatial scales counterbalancing potential spatial inconsistencies at more local scales in the P-dataset, and by the better modeling of smoother hydrographs at the outlets of larger basins. Overall, IMERG-F v.6 and CMORPH-BLD appear to be the most efficient P-datasets for the region under consideration.