Interactive comment on "Hydrostreamer v1.0 – improved streamflow predictions for local applications from an ensemble of downscaled global runoff products" *by* Marko Kallio et al.

Anonymous Referee #2

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The study presents an R package, a software library hydrostreamer v1.0 which aims to improve the usability of existing runoff products by addressing the Modifiable Area Unit Problem, and allows nonexperts with little knowledge of hydrology-specific modelling issues and methods to use them for their analyses. The topic is well suited for publication in GMD, however, the manuscript has some unclear reasoning that requires significant revision before the manuscript can be accepted for publication. My major comments are provided as follows.

1. The work was motivated by providing a tool that can be used by non-hydrologist to downscale global runoff products to river-basin scale for follow us analysis. How-

ever, Hydrostreamer requires users to provide runoff and stream network or catchment boundaries as inputs. It is not clear to me nonexperts can provide such information. Even if they can, there should be a minimal requirement to make sure that projects/coordinate systems used by these inputs are consistent with each. More descriptions on the pre-processing step are necessary.

2. The use of the interpolation methods implies that the resolutions of selected global runoff products shall be comparable to the catchment sizes of case studies. A threshold of watershed/catchment size should be provided so that the applicability of Hydrostreamer can be better understood.

3. It is not clear how the ancillary variables in dasymetric mapping are selected.

4. In the area-to-line interpolation method, it is assumed that contributing area can be replaced by the length of river segment. However, when the river network is delineated based on DEMs, it is typical to make an assumption on the threshold of stream cells. Such an assumption by itself could be subjective. Such uncertainty needs to be acknowledged.

5. The two routing methods are very simplified but can be reasonable options for watersheds of reasonable sizes. The instantaneous routing method is only applicable to large basins. Please add discussions on the size threshold. The constant velocity routing method is highly dependent on its parameter, the flow velocity. However, there is no discussion on how the parameter value is selected in the text.

6. Based on the case study presented, the tool can be useful for downscaling global runoff products at monthly scales or above. However, without validation in other flow regimes, it is hard to tell how transferable the results. Such a limitation needs to be acknowledged in the text.

7. In general, the style of writing needs to be improved to provide additional background materials for non-expert users.

8. The inputs/outputs of the case studies shall be provided for reproducibility.