

Response to reviewers

Reviewer 1

Thank you very much for your very positive assessment of this work. As it seems, no replies to specific comments or manuscript revisions are requested.

Reviewer 2

Thank you very much for your very positive assessment of this work. Specific comments are hereafter addressed.

Fig. 1. I agree that the distinction between arrow types in Fig. 1b may be unclear. In the revised manuscript, I used dashed arrows for category "real river & OCN", hence making the distinction clearer. Thanks for spotting this. Moreover, I modified Fig. 1b by adding a box for function "river_to_AEM", which has been added to the package as of version 0.3.0. An explanation of this function's scope has been added to the text.

Fig. 2. The river structure in Fig. 2a is indeed hardly visible, which is due to each pixel being assigned a color, as opposed to the catchment outline, which is a polygon and can thus be plotted with increased line width. This is unfortunately unavoidable, because this figure appears when calling `extract_river()`, that is before streams have been delimited (which actually occurs when the subsequent function `aggregate_river()` is called). I already tried alternative color palettes, which however did not improve the quality of the figure. In the revised manuscript, I recreated Fig. 2a with a coarser DEM resolution, thus resulting in larger pixels and hence better readability of the figure. By the way, the catchment shown in Fig. 2a is river Ilfis, as already mentioned in the caption.

Fig. 3b. Thank you for this suggestion. However, I do not think that the inset figure (i.e., the map of Switzerland) should be a figure in itself, as this does not show an application of the use of rivnet, but only supports the two applications shown. However, I agree that some more details could be added to the inset. In the revised manuscript, I placed the y-axis of Fig. 3b on the right-hand side, thus making space for a bigger inset, in which borders of neighbouring countries, and meridians and parallels have been added.

Use of D8 in combination with Dinf. Thank you very much for this insightful comment. It is indeed possible to extract catchment features obtained via the D8 method and apply them in combination with the Dinf method (or alternative algorithms) for more detailed catchment analyses. Indeed, the application of the Dinf method from the TauDEM library in R is allowed by the general-purpose function `taudem_exec()` of package `traudem`, while streamlines derived via the D8 method are produced as output of rivnet's `aggregate_river()`. Nonetheless, I deem that building a dedicated workflow for this option in rivnet would be out of scope with respect to the main focus of the package, which is supporting ecohydrological, ecological and biogeochemical models at catchment scale. However, in the revised manuscript, I mentioned in the concluding section that it is possible to export river objects in free format and use them in subsequent landscape analyses with the Dinf or other methods.