

Interactive comment on “Copulas for hydroclimatic applications – A practical note on common misconceptions and pitfalls” by Faranak Tootoonchi et al.

Geoff Pegram (Referee)

pegram@ukzn.ac.za

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What a pleasure it was to review this article. This is possibly the best Hydrometeorological paper that I have read in the last few years and is a must-read in this genre. It is targeted at authors involved with, or starting off to work with, copulas in time series. The difficulty that presents itself when analysing time series characterised by serial correlation, is that that for analysis, modelling or forecasting, the leading question is: ‘how do I get a handle on this problem?’ The beauty of the paper is that it a distillation of ideas into a rubric for preparing an analysis of one or more time series, to be finished off with a flow chart for guidance.

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It is an important reminder and guide for time series analysts, and is not only tutorial, but is wisely, simply, and authoritatively compiled. In my judgement this should be published once some small issues have been dealt with. For example, the authors should attend to some cosmetic suggestions to fix the few spelling and grammatical errors, as well as embellishments in the figure and table captions to make them more readable. Again, stylistically, it would improve the readability if you either add a space between all paragraphs or indent the leading line. Also, I could not find 'saturation water vapor mixing ratio' this paper. My more pertinent remarks follow.

In section 3, line 326, you state: 'We adopted a copula framework on July, because it has significant correlation at both daily and monthly resolutions (Fig. 5(a)-(b)).'

Did you try lagging the daily precipitation and streamflow data? Surely the delay depends on the size of catchment.

Line 338: 'It is important to consider the degree of autocorrelation in the studied data.' Without pushing my co-authorship of a relevant paper, to check the effect of autocorrelation, you might like to look at: Sugimoto, Takayuki, András Bárdossy, Geoffrey G.S. Pegram, and Johannes Cullmann (2016), Investigation of hydrological time series using copulas for detecting catchment characteristics and anthropogenic impacts, *Hydrol. Earth Syst. Sci.*, 20, 2705 -2720, doi:10.5194/hess-20-2705-2016.

In Figure 6: What is the spread of the confidence intervals - 95%? In (d) it looks like 100%

In Figure 8: that's a very helpful flow-chart - especially the '!!'

In Table 2: please define the symbols in the caption to help the reader: ERMS, ENS, Sn and Dn

There are also a few minor suggestions that I have made for alteration, so I am uploading my marked-up copy of the paper with this review for the authors' information. Well done!

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Please also note the supplement to this comment:

<https://hess.copernicus.org/preprints/hess-2020-306/hess-2020-306-RC2-supplement.pdf>

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2020-306>, 2020.

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