

Interactive comment on “The influence of decadal-scale variability on trends in long European streamflow records” by J. Hannaford et al.

Anonymous Referee #2

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General comments

This paper is an important contribution to the analysis of trends in river flows and Europe. The longer time series used are much useful for putting previous analyses into perspective. One can only regret the scarcity of available stations and appeal to more historical data rescue and sharing through public databases. This is a view I completely share with the authors.

The authors decided not to perform any hypothesis tests on trends, partly given “the contentious nature of this topic”. I am not sure it is the right way to put it. I acknowl-

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edge the fact that the message delivered by this paper does not really need a statistical significance assessment, and that “qualitative” outputs are sufficient for showing the influence of the decadal-scale variability on the sign and intensity of trends. However, hypothesis tests may be much useful if one carefully defines the associated hypothesis (and related assumptions linked to persistence) and carefully interprets and communicate results. I therefore do not share the views of the first reviewer on this point, maybe due to different previous experiences with journals.

Specific comments

§3.1: It would be good to have here a (graphical) example of standardisation and smoothing.

P1868 L7-14: Loess may indeed give very different results depending on the span parameter. It would be appropriate to express this parameter in terms of number of years. This comment closely relates to the previous one.

P1868 L24-28: You mention here several sensitivity experiments on the span parameter and the clustering method. Did you perform regional trend analyses for all these experiments? If this is the case, it would be great to have them in the paper, or at least as a supplementary material. If not, I think there should be some discussion about the potential impact on the main patterns identified in regional trends.

P1869 L1-2: Given your decision on not assessing the significance of trends, this first sentence should be reformulated.

P1869 L19-P1870 L5: The study by Hamed (2009) could be a good start if one wants to assess the trend significance with persistent data. Could you give some comment on this? (as this study is not referenced in the manuscript)

Fig.2. (and Fig. 3) How are the confidence intervals defined here?

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P1871 L14-23: Would it be possible to also have plots corresponding to Fig. 2 but for monthly flows? (maybe in a supplementary material) Additionally, an open question, could you define an indicator of homogeneity for each cluster/indicator combination? It would be a nice summary statistics for validating clusters on other indicators.

Technical corrections

Figure 8. It would be better to have the Northern Coastal graph closer to the NAOI graph.

P1877 L19: "1940-1979"

References

Hamed, K. H. (2009) Exact distribution of the Mann-Kendall trend test statistic for persistent data. *Journal of Hydrology*, 365, 86-94. doi: 10.1016/j.jhydrol.2008.11.024

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