

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

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Firstly, we thank the reviewer for the constructive comments they have provided on our discussion paper, which will help improve the quality of the article. We thank them for picking up a few small errors that we did not notice but which could have caused ambiguity. We are pleased that they are positive about the work and appreciate the long perspective our study provides.

Firstly, regarding the general comment on statistical significance, and our decision not to use hypothesis tests. We agree with the reviewer that there is still an important place for hypothesis tests in general, if the hypothesis is carefully defined, and our decision

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not to use them purely reflects the nature of this particular study. We also acknowledge that, even with this purpose in mind, such tests could in theory be carried out. We feel that this is somewhat beyond the scope of the present study, however, but will add some commentary to suggest this as an avenue for the future, and will add reference to the Hamed (2009) paper suggested by the reviewer in this regard.

Specific comments

§3.1: We agree this could help with explanation and we will add an example of a time series plot showing the standardised annual values for a site, along with a loess smooth curve, to illustrate this in the methods

P1868 L7-14: We can express the smoothing parameter in number of years, and we will add this.

P1868 L24-28: We did several sensitivity tests on the clustering method and the span parameter. For the former we tested multiple methods as indicated in the paper. For the latter, we did this for spans 0.2 – 0.5 as indicated in the paper. To assess sensitivity we investigated cluster maps for each span, and for clustering based on Europe as a whole and northern/central Europe separately. We did not do regional trend analyses, but we did produce loess smooth plots for span 0.2 and 0.3 (most closely approximating decadal scale trends), for various clusters solutions. We will clarify and add some specific commentary on how the span parameter had a limited effect on the clustering, but will note we did not look at trends. We would prefer not to feature these plots/maps as supplementary material – they were produced in early 2011 in rough formats which would not be readily suitable for publication, and it would be quite a lot of work to get them polished (although we could do if felt necessary).

P1869 L1-2: This is an oversight, we will modify accordingly.

P1869 L19-P1870 L5: We thank the author for highlighting this work, and we will add reference and discussion in the context of the above point on hypothesis tests.

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Fig.2. (and Fig. 3). These are actually the regionally-averaged 5% and 95% percentiles, across all of the individual sites. These were added to complement the regional mean, to illustrate the range. These are not “confidence intervals” per se (this was a relic from a previous version of the plots) and we will modify this accordingly and explain in the caption and text.

P1871 L14-23: Yes, we have these plots and will upload them as supplementary information

“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”. »>We agree this would be a nice way of capturing homogeneity across the indicators, and will investigate such a metric, and if possible will include a table in the paper.

Figure 8. It would be better to have the Northern Coastal graph closer to the NAOI graph. »>we will modify the figure

P1877 L19: “1940-1979”: This was incorrect, we will modify

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 1859, 2013.