

Interactive comment on “HESS Opinions “More efforts and scientific rigour are needed to attribute trends in flood time series”” by B. Merz et al.

A. Castellarin (Referee)

attilio.castellarin@unibo.it

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I really enjoyed reading manuscript “More efforts and scientific rigor are needed to attribute trends in flood time series”, which I found to be very significant in the context of the analysis of possible changes of streamflow regimes. In my opinion this is an outstanding paper, which is clearly written, well organized and to the point. The paper delivers innovative and sensible opinions and ideas, and it definitely deserves to be published in HESS. I list some very minor remarks below, that the authors may consider while revising their manuscript.

The main idea of the paper is to structure trend attribution into three main steps, aimed at providing: (1) a proof of consistency; (2) a proof of inconsistency; (3) a confidence statement (which are called ingredients in the manuscript). I fully agree with the authors

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that a sound trend attribution should be quantitatively based on these “ingredients”. Perhaps fully addressing point (2), and accurately evaluating (3) are ambitious aims. Nevertheless, I perfectly agree with the authors when they state that difficulties should not prevent us from making the effort, if our final goal is fostering scientific progress.

Specific Remarks

I would encourage the authors to discuss a little further trend-detection. I am aware that this manuscript focuses on trend attribution, not on trend detection. Nevertheless, in my opinion, the current version of the manuscript may indirectly deliver the message that trend detection is a mature topic, for which objective and “unbiased” procedures are available. I believe that the general considerations raised by authors concerning trend-attribution hold also for trend-detection (and perhaps on trend-modelling) too. Biased search and interpretation may also characterize trend-detection studies. Literature on flood and streamflow trend-detection reports contradictory and conflicting results for the same study areas and on the basis of the same data (see e.g. Villarini et al. 2010 and references therein).

Still on this point, perhaps the authors could better underline that attribution in itself is not a necessary ingredient of a trend analysis. I believe that robust and objective investigations on the possible presence of trends or step changes in long and reliable observed series (streamflows, low-flows, flood flows, annual precipitation, etc.) that tests the hypotheses on the basis of a number (and not a single) of robust statistical tests (e.g., distribution-free, or non-parametric tests, see e.g. Villarini et al. 2009 and 2010; Pistocchi et al., 2011; Castellarin and Pistocchi, 2011) may provide very useful information for practical purposes, even without a trend attribution. Nevertheless, I totally agree that if one claims a trend attribution, he/she should provide the reader with the three ingredients outlined in this opinion article.

Among the “simulation-based attribution” I would also probably include approaches based on simplified rainfall-runoff models, such as the model adopted by Allamano et

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al. (2009).

p.13355 – lines 11-14: I would mention here that the influence of flood retention basins is also strictly connected with the magnitude of the flood event being considered (i.e. the influence becomes negligible when the magnitude of the flood event significantly exceeds the magnitude of the design-flood)

p.1359, lines 9-11: please double-check this sentence, it does not seem to be complete, but this may be a problem on my side.

I found section 4.2 to be less operative and practically oriented than the rest of the manuscript. It would be interesting if the authors could provide the reader with some practical indications and examples in this section too.

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