Interactive
Comment

Interactive comment on "What drives flood trends along the Rhine River: climate or river training?" *by* S. Vorogushyn and B. Merz

Anonymous Referee #1

Received and published: 31 January 2013

First of all I want to apologize for the delay in submitting my comments. This study tries to sort out the different drivers responsible for the changes in flooding along the Rhine River (Germany). This is an interesting topic that has been the object of few papers in the recent years. Moreover, HESS would be a good outlet. With that said, I have a number of comments on this manuscript that would require at least a major revision.

- The English is fine but there are typos here and there (e.g., chnage)

- Pg. 13538: line 6: "This study addresses"

- After reading the manuscript, I ended up finding myself unconvinced about the claims of this work. To me, the last part of the conclusions (caution in interpreting the results)

is more appropriate than what is portrayed in the abstract, where the authors make the case for large scale climate variability. Based on the results by the author (and I don't necessarily agree with the methodology; see below), it seems that river training is just a part of the explanation. However, I didn't see results about large scale climate variability that explained the remaining 80%. In the conclusions, the authors actually discuss some of the limitations of the approach. The finding in the abstract should be made less "conclusive" and more along the lines of the conclusions. As far as I am concerned, the question posed in the title is still unanswered.

- Pg. 13540, line 26: "if data are"

- I was very confused by section 2.2. I am going to try to summarize my problems. I would urge the authors, however, to edit it to make it more understandable.

- Section 2.2: how do I know that there are the 5 regimes listed by the author?

- Section 2.2: the HWSG data seem to go till 1993. What about the most recent time? This would cover only 3 regimes.

- From Table 1: I have no idea what values to use for homogenization.

- Pg. 13544, lines 6-8: what linear regressions are we talking about here? Can the authors please add a scatterplot to show the results? Based on what is the "unique homogenized dataset" created? How do we know that the homogenization included only training and no other drivers? To me, this is a very important section to understand, but it is unclear.

- I have a series of issues with the methodology employed in Section 2.3. First of all, the authors use Mann-Kendall but then use the Theil estimator. As written in the paper, Mann-Kendall tests for the presence of monotonic patterns, which is more general than the linear behaviour assumed by the Theil estimator. Why should the "monotonic pattern" be linear and not exponential, for instance? Also, how sensitive are the results to other robust linear regression methods? More results are needed to support this.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

- Pg. 13545, line 22: Why are the records "pre-whitened"? Are they auto-correlated? If not, there is no need to do it. If they are, why is an AR1 model assumed? The selection of the "de-trending" model is going to have an effect on the trend results. Please justify the use of an AR1 model in this case by showing that the residuals are Gaussian white noise.

- Pg. 13545, line 21: if I remember correctly, Bormann et al. (2011) used a significance level of 5% and 10%, while Villarini et al. (2011) a significance level of 5%. In order to make a meaningful comparison between these results and those in the literature, a 5% level should be used as well. Please show the results with a 5% level.

- Equation 1: I don't understand why the linear trend is assumed. Moreover, a lot of the results are based on this selection. Also, what about data until 2011? Why stopping at 2005?

- Pg. 13546, lines 16-18: I don't understand this sentence, what a "robust resampling method" is, and why it is needed.

- Pg. 13548, line 25: why is Figure 7 mentioned here before many others?

- These are some of the major comments I have. A further and more in-depth evaluation of the results would require sorting them out first.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 13537, 2012.