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Hydrology and Earth System Sciences Discussions

Interactive comment on "A consistent set of trans-basin floods in Germany between 1952–2002" *by* S. Uhlemann et al.

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First of all we want to thank the reviewer for his/her valuable and thoughtful comments. Following, we will reply to each of the comments made.

Comment 1: The authors show in their sensitivity analysis that the number of summer versus winter floods considered in the data set depends on the parameters selected. This might be justified by the fact that winter and summer floods are of very different meteorological origin and different hydrological processes occur. Why did you not determine them separately?

Reply: It was the purpose of this study to develop a unified approach to detect any

trans-basin flood that had occurred in Germany in the past 50 years without making prior assumptions on the flood type. The methodology with the data at hand proved to be suitable for this purpose. However, for any further studies the conclusions drawn on the seasonal differences will play a role, i.e. will soon publish a study looking at various flood types. Also, for generating synthetic flood scenarios the differences in the spatial dependencies for each flood type, as they can be deferred from the event set, will certainly be considered.

Comment 2: Figure 11 shows that the class 1 and 2 events can be identified even if 90 stations are removed from the analysis. This might offer the possibility to extend the analysis further back in time. How far back in time would it be possible to extend your analysis by still getting a consistent set of class 1 and or class 2 events for Germany?

Reply: From the daily time series used in this study (n=162) about 41 stations date back to 1922 or earlier, about 97 stations date back to 1932 or earlier. The series are more or less continuous with a major data gap for many stations during world war second. For better understanding we have uploaded a figure as supplementary material showing a map of all stations used, colour coded according to the starting year of the time series. The spatial spread is not very even in the early 20th century, with many stations along the major rivers being established since long, but many (also large) tributaries only starting to be gauged in the 30s to 50s. Also, until 1930 a strong regional bias can be observed with a dense network in the Danube but a poor coverage in Rhine and Weser. Since the sensitivity analysis of the paper is performed by randomly removing stations from the set of time series, the spatial spread is more or less preserved. Now, for the real world situation a bias could be expected due to the location of the stations. If the event set is to be extended back in time this must carefully be taken into account. Under this condition I would recommend that the event set could be extended roughly 10 years back in time easily (with caution on data gaps in 1945). With some more effort (taking into account the regional bias of the gauging station network) the set may be extended to the mid to late 1920s.

Comment 3: It might be promising to determine the responsible atmospheric circulation patterns for the 80 trans-basin floods.

Reply: As the referee points out rightly, the analysis of the determining hydro-meteorological processes for flood development is a logical extension of the work presented here. By now, we already have analysed the major processes including the atmospheric circulation patterns. However, these results are to be published in another paper shortly.

Comment 4: However, I would like the authors to include a paragraph in their discussion section which gives some ideas how their flood data could be used in hydrological research and risk assessment and also for which type of analysis their data might be less well suited.

Reply: In the last paragraph of the paper we shortly highlight the potential use of the event set for accumulated risk assessment. To arrive at risk assessment the following steps have to be added. We will extend this paragraph highlighting some more potential uses of the set of trans-basin floods and also their limitations.

Reply to the 3 minor comments: We will pay attention to the suggested corrections in the text.

Please also note the supplement to this comment:
http://www.hydrol-earth-syst-sci-discuss.net/7/C1186/2010/hessd-7-C1186-2010-supplement.pdf

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 1485, 2010.