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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Flood history of the Bavarian Alpine Foreland since the late Middle Ages in the context of internal and external climate forcing factors" *by* O. Böhm et al.

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Overall comment: This is interesting paper addressing a pertinent question, how have floods changed over a long timeframe. The application of the Alps Foreland to this study is appropriate and provides considerable insight into the challenges faced when using 'long' river flow series augmented by historical records, this represents a challenge though in the many and diverse factors that have influenced changes in the 'natural' flow to the river, though these are discussed. The paper provides a clear explanation of the value of long records, the importance of their consideration and the fact that few studies have identified trends in many of these long flood series and attempts

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to link these to the generating mechanisms. The identification of the flood rich phases needs to be more clearly stated and explained (section 4), with more justification as to why methods are employed. The discussion would benefit from being expanded further to include a short section on how these results relate to those from previous studies, are similar or different flood rich periods being identified, this would provide a greater interest to readers from other regions beyond the Alps – a similar point can be made to the introduction, which could be made of wider appeal by including regions outside Central Europe. The reference list included within this paper is good.

An annotated copy of the manuscript is supplied containing a list of suggested amendments that the authors may wish to consider. These contain suggested re-phasing and minor queries.

Key points requiring attention:

p.4, l.12-16, you need to explain very careful what you mean by multiple river records being merged, as a single event can manifest in different ways on, between or along a river system, with the same event resulting in different magnitude floods at different places.

p.5, l.4, you need to be more specific about what you mean, 'anthropogenic encroachments'.

p.9, l. 20-, you need to explain why you have used the polynomial function rather than another function, a reference to past example would be easy solution, or a couple of lines of justification. Fig.3 starts with a very low polynomial score which shows the early phase as flood rich (similarly the end as poor), but this line is being forced to fit through the data and may need careful consideration at the ends. Why do you use 31 years - justify?

p.10, l1-5, I think you need to explain more clearly what the fractures are being used to indicate, as they reflect periods of change in a series, and not increased numbers

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of flood events, you might consider modifying the title of Fig. 4, to more clearly reflect this.

p.10, l.14, you need to clearly show where the flood rich phases are on Fig.3, insert your grey boxes onto this figure – possibly above the curves/columns.

p.10, l. 12-14, you need to check the numbering of the figures and the discussion associated with them in the text, I think there are a couple of places for example where you discuss flood rich phases in relation to Fig. 3 – these can be deduced but are not clearly shown, see above point. There are a number of places where Fig. numbers need reviewing.

p.10, l.17, The consideration given to increasing frequency of records and the potential implications on flood frequency needs further assessment, can you devise an approach which allows for the increasing frequency of accounts to be compensated into your estimation of frequency - I appreciate the polynomial has been used to identify the phases but then running meas of events are used in Fig. 5. I suspect this in part explains the increased frequencies post 1700.

p.13, l.5, you ask the reader to compare Fig.5 to Wanner et al., (2000), I think you need to be more explicit here, what do I need to compare in Wanner to Fig.5?

p.13, l.8, you may wish to have a look at the flood rich phase termination (phases 4 and 5), as at the end of phases the 31-yr flood frequency line is below 0, can this be reassessed?

Discussion section: Can you link the findings of this work to those from other areas of Europe, UK, Spain, Scandinavia, Czech Republic, are the findings similar, are different patterns emerging? Why might that be?

Fig. 1 – rephrase text beneath caption

Figures 5,6 and 7: can one of these lines be dashed and ticks provided on x-axis so we can see where the years relate too as the grey blocks obscure the lines on the

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figure.

Please also note the supplement to this comment:
http://www.hydrol-earth-syst-sci-discuss.net/11/C2311/2014/hessd-11-C2311-2014-supplement.pdf

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