

Interactive comment on “Taxation records as a source of information for the study of historical floods in South Moravia, Czech Republic” by R. Brázdil et al.

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We thank both reviewers for their very valuable comments. Below are mentioned responses to them point-by-point:

Responses to the review by N. Macdonald

An annotated manuscript is provided which includes several suggestions/recommendations of minor edits the authors may wish to consider. Response: All additions accepted and included in the text.

Key Comments: Text: The title is rather long, the authors might consider: The use
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of taxation records in assessing historical floods in South Moravia, Czech Lands Response: Accepted, but we used Czech Republic instead of Czech Lands.

Both Czech Lands and Czech Republic are used, is there a difference and should this be consistent throughout? Response: We consider the use of both words as correct. South Moravia is a part of the recent Czech Republic which exists politically from 1993. From this reason, the use of the term “Czech Lands” (to which Moravia in the past belonged) is fully appropriate in the historical context.

The authors may wish to address the issue of urban encroachment and wider use of the landscape as we near the present, this is often felt most keenly on the floodplain, as such the use of taxation reports may also reflect the development of the floodplain and expansion of activities during the study period undertaken on this area, and investment of it. Some discussion of this should be made as this will potentially increase applications for assistance/loss and may help mask climate signals. This has been implicitly discussed, but may benefit from a more explicit discussion. Response: We tried to discuss various potential influences of human activity on the floodplain. There is clear that greater part of settlements on the studied rivers was growing and flood-plain was changed and partly built-up by various objects. But since we are working with damage records, already this past changes in the agricultural use of floodplains are included in our results. We are opinion that any explicit discussion of the above aspects will bring not any new important knowledge for better understanding of existing processes. Importance of such information is growing in a case of the study in local scale with well documented changes. But in our opinion the effect of urban encroachment and wider use of the landscape on “masking climate signal” is rather insignificant.

Figures: On a couple of the figures (3 & 6) it is difficult to discern classes on a black and white print out, I appreciate the journal provides free colour imagery, but would be good to see in B&W too - as I am sure a number of people will read a printed copy. Response: If the printed version will be black-and-white, figures will be changed in the requested direction.

Figure 8 is difficult to see the detail, consider splitting figure into two, or using just one example so that the changes in channel form and landuse are more clearly visible. Response: The Morava River (Fig. 8b) is different by its size and human influences from other three rivers in mind (Fig. 8a). From this reason we prefer two examples, not only one. Visible details will be depending on the size of this figure in the final printed version (it is a task of technical editor).

Responses to the review by G. R. Demarée

A minor comment deals with the use of ML technique for estimating the parameters of a GEV-distribution. In certain hydrological research the use of the method of moments is recommended to estimate the GEV-parameters in order to minimize the potential influence of an outlier (for this technique see Hosking, Wallis & Wood, 1985). Response: Good comment, but we followed the method used in publication by Brázdil et al. (2011) dealing with Morava floods from AD 1691 to have fully comparable results (for the recurrence interval of peak water-levels). Recurrence interval of discharges is provided by CHMI and we took only their results; we do not solve methodology of their evaluation. We believe that the method used is not influencing final flood frequencies in any significant way.

In many European rivers important hydraulic works like dams and sluices were carried out in the 19th century in order to facilitate navigation. Those works influenced the occurrence of floods. Was this the case of the Morava river? Response: Yes, the River Morava was for a long time topic of a great interest for navigation use. But many existing projects were not realised due to lack of money. As mentioned in the text, no dam was built on the River Morava up to now. Of course, there existed various weirs and the use of water for water mills but there is difficult to give any detail overview of all these changes during centuries. There is supposed that this local waterworks did not influence the flood occurrence in any important way.

Figure 6 which is according to this reviewer the main result of the study combining

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the documentary evidence, the water level data and the computed discharge data to produce long-term decadal flood frequency series. The area of South Moravia is not a large geographical area. May it be supposed that those river areas do belong to the same hydrometeorological / climatological region? In that case the decadal flood frequency curves may be expected to have the same bimodal appearance two peaks). This is more or less the case (however the Morava river seems to present a third peak in the discharge data information). Response: This premise is generally true but it is only partly valid for the Jihlava, Svratka and Dyje rivers as follows from data of the instrumental period 1931–2010 (see Table 1). Important factor is the size of catchment as well as its position with respect to precipitation distribution. For example, the River Morava is originating in north Moravia in regions with higher precipitation (compare to the three others) which are territorially very variable. It concerns also reserves of snow in the winter time. Quite high are already differences in the number of floods recorded and in the portion of winter (from the half to the three third all of them) and summer floods as well. This demonstrates that the River Morava needs not necessarily to follow features typical for other three rivers which are more close each other.

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