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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Historical changes in frequency and seasonality of extreme floods in Prague" *by* L. Elleder

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General comments:

Congratulation to the valuable contribution of a remarkable well documented historic flood event inventory from Bohemia, especially Prague. It strongly support its consideration in the special issue and its publication in HEES. The next stop to derive frequencies and periods of increased flood frequency and magnitude is a logical, useful and necessary step in addition to previous work of the quantification of historic peak discharges.

Specific comments:

Flood frequency analysis (FFA) is a challenge for limited data sets, especially if one cannot be sure that the data set is complete (note, e.g. your comment about probably missing floods of minor magnitude page 1639 line 20 (= 1639-20). This problem should be explained in the beginning, reference to appropriate publications given (e.g. Stedinger, J. R., and Cohn, T. A., 1986, Flood frequency analysis with historical and paleoflood information. : Water Resources Research, v. 22, no. 5, p. 785-793. ——— Stedinger, J. R., R.M., V., and Foufoula-Georgiou, E., 1993, Frequency Analysis of Extreme Events, in Maidment, D. R., ed., Handbook of Hydrology: New York, McGraw-Hill.) and reasons explained why you have chosen your approach and what are benefits of it. It might be useful to give reference to previous publications on the topic as other approaches were applied (e.g. Glaser, R. et al., 2010a, The variability of European floods since AD 1500: Climatic Change, v. 101, no. 1-2, p. 235-256. ———— Mudelsee, M. et al., 2003, No upward trends in the occurrence of extreme floods in central Europe: Nature, v. 425, no. 6954, p. 166-169).

1644-26: How can you make a conclusion for "Central Europe considered as a whole" if you only analyse data from Czech Republic? It might be useful to consider also previous studies on the topic and related your finding in detail (!) to what was found before (e.g. by Glaser, R. et al., 2010a, respectively Mudelsee, M. et al., 2003 - references like above)

After reading the manuscript, I am a little bit confused about a definite calculation of frequencies or finding clusters of increased numbers of handed-down flood events. You mention periods (periods of homogenous topography in Prague and periods of increased flood events 1640-40) and calculate numbers of floods per century (1639-22). I assume not being the only one who gets confused ...

In your publication (Elleder et al. 2013), no data table is listed. To give some impression of the data (in addition to the marks in your Fig. 3 in this manuscript) before starting an FFA on its base, please check if a data table is useful (e.g. as online-supplement for this manuscript). Make sure to differ for the origin of the data (previous publication /

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added on "acceptable level of reliability" (1638-1) in this manuscript) and give data on the date, reason, water level and estimated peak discharge.

Technical corrections:

The structure of the manuscript might benefit of some modifications as origin of data is mentioned in the chapter of the explanation of the applied method or abbreviations are explained in details after their first use. Some details are listed below:

Chapter 2.2.: Can you find e.g. names for the periods P1-P7 (or find another term than "period") to avoid confusion with your flood rich periods FRP, which in the text are called "periods", too?

1638-1: what level of reliability is acceptable for you to consider the handed-down water level for further analysis (I know, hard to say in general, but please give some impression about your criteria like probably: "uncertainty of water level with in few centimetres, definitely less than ....").

1638-10: please make sure, that no ice-jam ponded waterlevels are considered as regular discharge in your data set (e.g. Feb./ Mar. 1784).

1638-21: please explain the filling of missing values, was it extrapolation between two known datapoints? Probably a graphical illustration for which event data could be added could be useful (e.g. somehow a modification of your Fig. 3; cf. further comments on this figure below)

1638-26: What is the "B set" of Brazdil et al. 2005?

1639-4f: please introduce abbreviations like AMF and POT before the first use (hence, move this paragraph towards somewhere above -POTQ10 mentioned already at 1638-11 without explanation)

1639-12f: description of considered data again - move into previous chapter on data.

1644-5f: this is a conclusion - move into the following chapter

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1644-20: about the current period: how can you be sure that it is already terminated? Consequently, a mean frequency of floods cannot be determined!?

Fig. 3: please spread the figure on twice its recent width and please explain: # the different colours for different periods # difference between bold and regular flood event labels # avoid vertical accumulation of flood labels as they cannot be identified # FR1 might FRP1 - when does each period begin respectively end?

As I am not a native speaker, I do not comment on phrases or expressions sounding slightly strange to me - I suggest to ask a native speaker for some improvements on the language after modifications of the content. I am looking forward to get your statements on the suggestions made above - do not hesitate to explain if I am probably too tired today and criticise obvious explanations or contexts without need. - JH

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 1633, 2015.