

## ***Interactive comment on “Changes in flood frequencies in Switzerland since 1500” by P. Schmocker-Fackel and F. Naef***

**P. Allamano (Referee)**

paola.allamano@polito.it

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The paper investigates flood frequency fluctuations in 14 Swiss catchments since 1500 and identifies four periods of frequent flooding. The results of the analysis are compared with floods patterns in different European countries with the aim to find out if there is some relation between the re-occurrence of floods on a European scale and reconstructed spatial indexes (such as NAO, solar activity indicators or simply temperature). No evident relation is found. In the conclusions the authors state that flood frequency fluctuations may be due to the effects of climatic variations.

### Major Comments

The authors efforts to collect a the huge amount of historical data represent indeed a

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significant contribution in the scope of HESS. However I believe that the paper, in this current version, lacks of clarity in the result/conclusive parts. An introductory section (#2, which I would entitle “Material and Methods” rather than just Methods) in which the dataset and the criteria to homogenise it are presented, opens the paper. The analysis seems to be accurate but the exposition is a bit chaotic. Perhaps the reading of Bayliss & Reed (2001) could be of help to reorganize the concepts. A huge and heterogeneous section of results is then presented. In this part, the discussion on “flood periodicities” (paragraph #3.2) is too peculiar and very often subjective in its conclusions. It is not clear how these results could be extended or employed by other scientists. Moreover, given the statistical definition of flood event at line 533-10 (i.e., a discharge larger than the 10-year flood), I’m doubtful about the possibility of identifying periods less-than-50-years long as possible evidences of floods fluctuations. A review of the literature that reports on the connections between flood frequency and climatic parameters follows (paragraph #3.3), interspersed with few (and very well hidden) results. The consequence is that the paragraph sounds more like an introductory evaluation of the state of the art than as a quantitative discussion on the outcomes of the study. Also the comparison with flood patterns in other countries, despite the valuable set of information presented, does not help to reach conclusive indications. In the conclusion the authors report on the impossibility to find quantitative relations between flood fluctuations and climate and they suggest that the analysis could be extended by considering the effects of global warming. I agree with this comment and I suggest that the authors may try to extend their analysis by considering all year round temperatures (not only summer temperature) or basin thermal regimes. Interesting evidences of the possible links between temperature and flood frequency were presented in a recent study by Allamano et al. (2009).

#### Minor Comments

- At line 532-5 and following it is not clear if the authors mean that a difference exist between historical record and written source. Please check the English.

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- Figures present different colours but do not have legends. Please introduce it or explain.

- Figures refer to periods L1, P1 etc, but these acronyms are not reported in the text.

#### References

- Bayliss A.C. & Reed D.W., The use of historical data in flood frequency estimation, CEH Tech. Report, 2001

- Allamano P., Claps P. & Laio F., Global warming increases flood risk in mountainous areas, Geophys. Res. Lett., 36, 2009

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