

Bernet et al – Surface water floods in Switzerland: NHESS 2017_REMARKS

Scientific Significance: Excellent (1)

Scientific Quality: Excellent (1)

Presentation Quality: Good (2)

GENERAL REMARKS:

1. The paper discusses a very interesting theme as surface water floods are felt as an increasing problem in intensively settled areas more and more and demand for research on this theme is increasing. Thus, the paper gives significant contribution on objectifying the discussion on losses due to natural hazards like surface water flow (SWF) and matches the scope of NHESS.
2. In addition the paper presents a new way to interpret insurance data in terms of natural hazards.
3. Tools, methods, results are up to international standards.
4. Results of the investigations strongly support the interpretation and the conclusions drawn in the paper.
5. Description of data and methods used is sufficient except three points (pages 3, 9 and 12, see further comments below).
6. The title clearly describes the main concern of the paper
7. Title and abstract are clearly presented and easy to read
8. Connex to previous and related research is sufficiently described in chapter 1
9. Number of references should be enlarged in chapter 5. The results of the presented project should be discussed more in context of supranational and international studies (see further comments below)
10. Presentation of the paper is structured well and clearly presented except parts of chapters 2 and five (see further comments below)
11. Length of the paper seems adequate
12. Figures and tables are clearly presented, except figures 12 and 14 (some symbols are hard to distinguish)
13. Technical and english language are of good quality, fluently presented and understandable for an interdisciplinary audience

FURTHER COMMENTS:

Ad chapter Introduction

Gives a good overview about the actual situation.

Page 2, line 16-17: „*In order to reduce the risk, it is suggested to focus on the physical protection of exposed objects (e.g., Kron, 2009; DWA, 2013)....*“

Remark: This is one point of concern. But one step before: Adaptation and improvement of spatial management (hazard zone mapping, spatial development / management plans etc.) to reduce construction activities or to allow building activities only with special obligations in areas prone to SWF is necessary.

Ad chapter 2 – Terminology

Presented in a more descriptive manner. From the announcement in the last paragraph of chapter 1 (page 3) a short and precise presentation of the most important terms, a precise definition for every term has been expected. Thus, presentation in form of a table with precise definitions would be useful, in addition the chapter could be shortened and kept more precise.

Page 5, Figure 1: A title / precise description is missing – what is Fig.1 showing?

Page 5, lines 15-17, page 6, lines 1-5: No contribution of this text to improve systematic understanding. When it is the authors' opinion that these explanations are absolutely necessary – put them at the beginning of this chapter.

Ad Chapter 3 – Material and methods

Page 6, line 31: „*The provided data provided by...*“ – improvement of wording necessary

Page 8, line 6-7: „*...obvious errors were corrected, if possible, or removed otherwise...*“.
Suggestion for further specification: „*...obvious errors were corrected, if possible, or **the invalid data** removed otherwise...*“

Page 9, line 16: „*...Thereby, the question ist how **these** distance...*“

Suggestion: „*...Thereby, the question is how **this** distance...*“

Page 9, lines 30-31: „*...To take regional geographical characteristics into account, the percentiles are calculated for each region separately (Table 3)...*“.

Question: How have special geographical characteristics been taken into account for the different regions. Give a short description or a reference where the procedure has been described already.

Page 11, Figure 5: wrong: „*...Intersects Aqua-**protect** flood zone...*“

Suggestion: „*...Intersects Aqua-protect flood zone...*“

Page 11, lines 4-5: „*...The smallest rivers were not considered by Aquaprotect, but there is no objective way of knowing where the cut-off was set...*“

Question: Definition of the term „the smallest rivers“. A more precise information is necessary. Brooklets with l/sec, brooks with a few m³/sec – which type of running water?

Page 12, lines 2-4: „...Nevertheless, the level of detail of the Swiss flood hazard maps far exceeds the one of Aquaprotect. This is taken into account by applying lower percentile levels for claims located within the flood hazard perimeters, as shown in Fig. 5 and 6...”

Question: On which basis of the lower percentile levels have been assessed? Systematic algorithm / empirical decision?

Ad chapter 4 – Results

Page 13, lines 4-8: The passus „In Switzerland, there are few quantitative studies.....and covers only a small part of Switzerland.“ should be moved to chapter 5 – Discussion.

Page 13, lines 30-31: „Nevertheless, the indicated hazard zones were mostly located in the vicinity of SWF claims.“

Improved precision of the statement necessary. Suggestion: „Nevertheless, the indicated hazard zones were mostly located in the vicinity of SWF claims, **forming the data-basis of the investigations presented in this paper**“

Page 17, line 10: „For instance, the event on the 21–22 June 2007 was caused by high intensity rainfall (Hilker et al., 2008)...“

Numerical data information desired, a range of the occurred rain intensities should be given (e.g. 5 mm h⁻¹ over 30 hours, 200 mm d⁻¹)

Page 20, Figure 12: dashed, dotted and solid ellipses are very hard to distinguish

Page 22, Figure 14: red lines (Jura and Western Plateau) are very hard to distinguish too

Chapter 5 – Discussion

General remark:

In this chapter the results of the presented project should be discussed more in context of supranational and international studies. The chapter lacks citations. So e.g. on

Page 24, lines 26-30 and page 25, lines 1-4 (e.g. „Nevertheless, it is important to note that increasing absolute losses are most likely not attributable to climate change, but to socio-economic factors...“)

Page 25, lines 5-24: Discussing methodological issues. Should be put at the beginning of chapter 5 - Discussion