Natural Hazards
and Earth System
Sciences
Discussions

Interactive comment on "Ensemble flood forecasting considering dominant runoff processes: I. Setup and application to nested basins (Emme, Switzerland)" by Manuel Antonetti et al.

Anonymous Referee #2

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1   Evaluation of principal criteria

Scientific Significance: Good (2) to Fair (3)

Scientific Quality: Good (2) to excellent (1)

Presentation Quality: Excellent (1)

2   General comments

The paper investigates the potential of a process-based runoff generation module, compared to classical (i.e., calibrated) runoff generation assessment with a special focus on smaller, nested, and potentially ungauged catchments.

The paper itself is well-written and well-structured and features high-quality figures. There are only little technical issues, which were found by the reviewer and which are addressed in the respective section ("technical corrections").

However, it should be considered that the paper has some conceptual/methodological limitations:

- The investigation period (of some months) is very limited in order to gain substantial data for further statistical analyses (e.g., skill determination, etc.). However, the authors address and discuss this issue in their text.

- The number of investigated catchments is low; conclusions on regional transferability of the suggested methods remains limited due to lacking statistical significance. However, the authors anticipate these shortcomings within the study design (by using MC methods) and briefly discuss the matter.

For the reviewer, it was a bit hard to get the methodological (?) connection of the reviewed paper to the "accompanying paper" (Horat et. al., 2018), as well as to previous work of the researchers (e.g., Zappa et al., 2011 or Antonetti, 2017). Maybe, a graphical, structured representation of the questions covered in those papers would offer a way to better comprehend the overarching research activities of authors/group/lab and serve the scientific significance of the manuscript.

3 Specific comments

P1-L1: Add "potential" before the word "risk" >> if there is no vulnerability, a hazard (i.e., heavy rain) would pose no risk.

P1-L21: What is meant by "satisfying skill" here? Please give a brief comment on that in the manuscript.

P2-L31: Maybe add a reference to Collier & Fox (2003) who propose a Flash Flood Susceptibility Assessment Procedure (FFSAP) which is quite comparable to the one proposed by Mani et. al (2012).

P2-L32: What is meant here by the word "torrent"?

P3-L2: What is determined "with radar" and why?

P4-Ls27-30: The systematic of "physically-based" and "conceptual" models excludes other approaches (e.g., FFSAPs) which are potentially useful for deriving information on "timing and magnitude" (e.g., see http://www.hochwasserzentrum.sachsen.de/fruehwarnung which is based on a simple FFSAP).

P5-L4: Does this mean "assimilation (of transient data)"? If this is not the case, would not it be better to talk of "estimation", rather than "assimilation"?

P5-L12: What is the "statistical approach"? Better replace with something like "skill assessment procedures. . ."?

P8-L1: What is meant by ". . . served as fingerprint"?

P8-L3: "Traditional benchmark version. . . " . . . of what?

P9-L2: From our point of view, using continuous measures for skill assessment (e.g., NSE or KGE) should be called "validation". On the other hand, employing event or threshold-based (binary, dichotomous) methods (e.g., AUC or BSS), it is "verification".

P11-L5: Are the probabilistic forecasts post-processed? This should be stated if this applies. . .

4 Technical corrections

P5-L8: Please rewrite ". . . model is executed at the runoff gauge" (language).

P8-L8: Better replace "completed" with "conducted".

P19-L21: "bericht" should be "Bericht" (capitalized).

Larger figures/numbers (e.g., "2120") are not separated in the manuscript. Please check, if this is in agreement with the NHESS style guide (e.g., be written as "2,120").