

Interactive comment on “Future runoff regime changes and their time of emergence for 93 catchments in Switzerland” by Regula Muelchi et al.

Anonymous Referee #1

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The article analyses climate change impacts on runoff regimes in 93 rivers in Switzerland. The study is based on the results of a large Swiss research project, which provided consistent downscaled local climate projections under three emission pathways. The changes are presented with respect to seasonal and yearly changes in the mean discharge and with respect to the timing (seasonal shifts). Next, a time of emergence is presented, which is the time when a significant change of the seasonal and yearly means is detected. Additionally, changes of the runoff regimes are related to increasing global mean temperatures. Evaluation of review criteria (details are provided by annotations in the PDF manuscript): 1. Does the paper address relevant scientific questions within the scope of HESS? Yes. The focus is

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on regimes in Switzerland, but methods and results are certainly of interest for other (alpine) countries. 2. Does the paper present novel concepts, ideas, tools, or data? Yes. 3. Are substantial conclusions reached? Yes. 4. Are the scientific methods and assumptions valid and clearly outlined? Yes. 5. Are the results sufficient to support the interpretations and conclusions? Yes. 6. Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? Due to the huge amount of data involved, not easily. But all datasets are publicly accessible. 7. Do the authors give proper credit to related work and clearly indicate their own new/original contribution? Yes. 8. Does the title clearly reflect the contents of the paper? Yes. 9. Does the abstract provide a concise and complete summary? It is rather long and not easy to read (too many numbers). 10. Is the overall presentation well structured and clear? In general, yes. Subsections of section Methods should be reordered to be consistent with section Results. 11. Is the language fluent and precise? In my opinion, many paragraphs seem to be too closely translated from German, which makes the text difficult to read. One specific concern: the frequently used expression “signal of change” apparently refers to the sign of changes only (up or down), not to the magnitude of change – while in my opinion the term “signal” includes both, sign and magnitude. 12. Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? N.a. 13. Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? See PDF annotations. 14. Are the number and quality of references appropriate? Yes. 15. Is the amount and quality of supplementary material appropriate? Yes.

Please also note the supplement to this comment:

<https://hess.copernicus.org/preprints/hess-2020-516/hess-2020-516-RC1-supplement.pdf>