General comments

I would like to thank the authors for revising the manuscript and for answering most my questions. The quality of the manuscript was improved largely by the revisions. However, some of my comments in the first review round were in my opinion not sufficiently addressed. I think the topic and scope of this manuscript are highly scientifically significant and I would like to see this paper published at some point. However, especially the answer to the second insufficiently addressed comment (regarding Figure 8) makes me question the scientific quality of the manuscript, and I think the manuscript still needs major revisions. However, I may be on my own with this judgement and I am looking forward to see the opinion of the other reviewers and of the editor.

Besides the insufficiently addressed comments from the first review round, I also have a few additional comments to the manuscript that are listed below. The line numbers relate to the author's tracked changes version of the manuscript.

Insufficiently addressed comments from the first review round

1) L251-252: I still strongly disagree with your statement that open source geodata of crop statistics are not available for the Baldegg catchment. This is simply wrong.
   As mentioned in the previous review, these open source geodata are actually available in high resolution. They can be downloaded within few minutes using the link below and can be used for free (creative commons by license): https://geodienste.ch/services/lwb_nutzungsflaechen
   (Additional information is provided here: https://daten.geo.lu.ch/produkt/lwnfmgdm_ref_v1)
   Since in the dataset some of the agricultural areas (probably 10-20%) are missing a crop classification, you would still have to take some assumptions, but you would be able to represent the cropping reality much better.
   The canton of Lucerne recently changed his law with regards to open data. Therefore it is correct that most probably this dataset was not completely open source by the time when you handed in the manuscript (e.g. for commercial use there was indeed a fee which had to be paid). However, I am pretty sure that the dataset was already available freely for governmental institutions and universities by that time.
   Here, I must say that I have the feeling that, after being told about this dataset in the first revision, the authors did not really put a lot of effort into obtaining this dataset. I understand that using this dataset would mean a lot of additional effort for the authors, and that probably the added benefit to the manuscript would be small. However, it should be at least stated correctly in the manuscript that this dataset is available, but was not used due to reason XY.

2) L443-445: In the previous review round, I already asked the following question: *In the "Ron" stream, the 95% prediction interval seems much narrower than in the other rivers (Figure 8). Therefore, the observed values are mostly outside of this interval and the out of bound percentage is much higher than for the other streams. Can you explain this?*
   Your answer was: *The interval is narrower because the model fit was better, and the residuals were lower. This led to a lower proportion of the observed values being outside the prediction interval.*
   However, in Table 4, you report that the percentage of observations outside of the prediction interval was 61%, which is much higher than for the other catchments. This strongly contradicts your answer. In my opinion, there is something wrong with your fitted rating curve and you should fix this. (It is possible that I simply did not understand your answer correctly. In this case, I

would be very happy if you could explain it to me in a version "for dummies". Additionally, I would suggest that add a discussion to the manuscript regarding the influence of this high percentage of observations outside the prediction interval on your results.)

Major comments

L357: In Figure 5, the MSE increase for CP_{arable} is missing. Additionally, the MSE increase reported for road connectivity does not correspond to the numbers in the text.

Minor comments

L133-134: What are these 10 degrees relating to? Average slope? Please clarify in the manuscript.

L249-250: Do you mean the dataset swissTLM3D (as referenced here) or the Swiss Map Vector 25 BETA (which you mention in your answer to the review)? In the first case, it does not make sense to me to mention the "1:25'000" scale, since – to my knowledge – there is no scale related to the swissTLM3D dataset. Additionally, to improve reproducibility of your work, you should in my opinion specify here that you first converted the roads to polygons by using buffers considering their widths.

L357: Explain the abbreviation RFA here. I know that you explain it in the text, but each Figure should be readable by itself.

L365: From what you write in the manuscript, I did not make the link to Table 3. This was only clear to me after your explanations to my questions. I therefore suggest to refer to Table 3 here.

L367: The combined use of hyphen and minus makes the legend of Figure 6 rather confusing. Please use another symbology for this (e.g. use "to" instead of the minus).

L420: Figure 7 is now much more convincing to me than it was in the previous version. Thanks for the adaptations.

L428-429: An additional question to your model came up when trying to understand why the model does represent the Ron catchment well. In L428-429 you write: "It is important to note that the median sediment concentrations calculated by the rating curve (Equation 1) underestimated the actual observations, for all tributaries." If your model aims on predicting mean annual sediment loads, should the median of your model not have a mean error of approximately zero?

L476-478: Thanks for clarifying which characteristics you analysed. You should not only mention that you determined the corresponding numbers for each catchment (stream density, road density, fraction covered by agricultural land/forest/infrastructure), but also provide them somewhere in the manuscript or in the supplementary information.
Furthermore, it is unclear to me what you mean exactly with land cover. Do you mean "(agricultural land, forests, and infrastructure (e.g. settlements, developed areas, and roads)", as you mention it in L113-114? In the next sentence, you are hypothesizing about the influence cropping specifities, which also relate to land cover. This makes this paragraph rather confusing. You should state more clearly, what you mean with "land cover" here.

Technical corrections

L147-149: Not sure if this sentence is grammatically correct.

L154: y-axis: Sediment Concentration → Sediment concentration

L157: Equation → equation

L162: x_k → $x_{k,i}$

L165: The variable z (row 5) is not explained. Please explain.

L171: R package version?

L321-322: R package version?