

Interactive comment on “Rosalia: an experimental research site to study hydrological processes in a forest catchment” by Josef Fürst et al.

Anonymous Referee #1

Received and published: 22 December 2020

This data publication aims to describe the Rosalia experimental watershed, and introduce the data that is collected between 2015 and 2019. The authors give a very detailed description of all sensors and data storage application used, which I feel came at the expense of more information about the actual watershed and data. The geological background is summarized in one sentence only, and no geologic, vegetation or soil maps are shown, which are key if other researchers are to work with the data. No information is given about the process of data cleaning, or the analysis of the isotopic samples in the lab. Since one of the main aims of a data publication is that other people can work with the data after, I suggest that the article is adapted so that such crucial (!) information is described, and other researchers can also work with the data. Some timeseries of the actual data are shown (i.e., of discharge, soil moisture, rainfall, elec-

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trical conductivity and the stable isotopic composition of discharge and rainfall), but the presentation of these is very minimal. Furthermore, for or one of the figures the axes were not correctly chosen (i.e., cutting off part of the data), and the figure captions cover only the bare minimum of information.

When reading this article, I stumbled over numerous grammar mistakes, wrong interpunction, colloquial language, use of the imperial system, and sentences that were clearly not formulated in correct English. I felt like I was doing the final reading before submitting, rather than a review. I was surprised that this was the case because from the abstract it sounded like the Rosalia catchment is the flagship of BOKU, and its documentation thus would deserve adequate attention. In addition to the language of this article, the structure also clearly needs more time and attention. Some definitions and topics are introduced but not fully discussed, and come back multiple times in the manuscript. This does not help the future reader of this article to find the information needed.

I apologize for my lack of in-depth comments to this article, but this article needs more time and attention before an in-depth review can be helpful. I suggest that the authors take this task serious and resubmit after careful re-structuring and rewriting. Documentation for a long-term research site (1875!) should be more comprehensive than this, and should for instance also include a background of the most important findings and the mechanistic understanding of how this watershed functions, in addition to the missing information with regard to data processing as mentioned above.

Detailed comments:

L21: remove additionally

L24: one site of how many sites? The discharge gauging stations?

L24: nitrate is capitalized where it should not be

L28: remove 'their'

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L32: Global change impacts, such as climate warming? I don't see how climate itself is a global change impact.

L33-35: Although I somewhat agree, who realized this? reference needed

L35: experimental catchments? remove sites

L45: unclear which framework is referred to

L57-65: why is the LTER not introduced together with the other networks?

L74: if the object "was and still is" the word "is" is sufficient to indicate that

L76: if this is "a research emphasis" what are other important points?

L79: what are 'point related measurements'? point measurements?

L79-80: please rephrase this sentence to provide more clarity.

L83: how does the set-up allow for these experiments, in comparison to other sites?

L89: "are and will be investigated by a team of researchers" this sounds as if the team is already chosen, and cannot be adapted anymore. This is contrary to what I would expect is the aim of publishing this article, which is to promote other researchers to also use the data that is being published in this publication.

L89: same comment as with "was and still is" in L77

L95-98: since this is such a standard article lay-out, I would suggest that the others consider removing this description.

L100-101: this sentence is grammatically incorrect.

L102: 'is' steeper than

111-112: grammatically incorrect sentence

L129: the names of the watersheds, and their respective sizes, have not been intro-

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duced yet.

L30: monitored "with" a spectrometer probe

Line 131-135: every sentence starts on a new line.

L312: which altitudes?

L136-137: this sentence is redundant because this is mentioned in the figure and table captions.

L148: please specify what the "DMBS addVANTAGE Pro' is directly when first mentioning it.

L154: can the authors be more specific about the treatment samples after being collected by the totalisers or as grab samples? How are these samples stored in the samplers to ensure that the chemistry and isotope samples can both be analyzed adequately?

157: The field courses are organized by students? Or should this be "by students during field courses"

L158: which other (LiDAR-based) DEMs are available? and, LiDAR is commonly spelled with a lower-case 'i'.

L161: what is a "hydrological" site? A site at which hydrological measurements are being performed? in this case, the word 'hydrological' is redundant, given the sentence that follows.

L163: new line started where not needed.

L169: grammatically incorrect sentence. L170: grammatically incorrect sentence.

L168: please use the metric system.

L178: Reference missing for the "Thompson" weir.

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L181: is their SDI-12 interface really important to mention in this article? And if so, be specific as to why the SDI-12 interface is preferred.

L181-184: Colloquial language. Please rewrite.

L183-184: please rewrite to make the sentence clearer.

L189: should be "are' possible.

L190: atmospheric deposition of what? Salts, leaves? please be specific.

L193: please rewrite to clarify the meaning of the sentence. Also, please quantify and be specific about how the rain measurements are affected, and why they are reliable in this data publication.

L212: d18O and d2H are already defined earlier in the manuscript. Please use the short-hand notation to make the text more concise, or refrain from defining the short-hand notations..

L230: 'using' addVantage Pro?' or does the program also assess the data? If so, please be specific about which protocols are used.

L234: can the authors be more specific about this data cleaning process?

L247: redundant to describe what Figure 5 illustrates, because this is mentioned in the caption. Please refer to the figure in the text itself.

L247: hydrographs 'for' July and August 2018

L273: could it not also be due to natural preferential flow paths? and if not, why not? and since in L274 the natural pref. flowpaths are mentioned, please be more specific about the limits to the period at which the disturbance affected the measurements.

L288: I would expect to find this sentence in an introduction, not in a 'results' section

L298: reference?

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L300: which stable isotope? oxygen18 I assume?

L305: I think the spatial data can be introduced where the DEMS are introduced first, and don't need a separate section dedicated to them.

L311: please avoid one-sentence paragraphs at all times.

L314: what are the assumptions to this two end-member mixing model, and are these assumptions valid in the Rosalia catchment? What is the influence of soil water during rainfall events, and what is the EC signature of soil water vs. groundwater?

Section 5.1: please be more specific and actually quantify the results of your baseflow separation (don't forget to include uncertainties).

L320: please provide a reference for end-member splitting analysis.

L343: please give a measure of how well they match, NSE for instance.

L348: please be more specific about the data cleaning process. This is a very important part of the data collection and publication process, and is not mentioned at all in the manuscript.

Table 1: what does 0.2 mm 'events' or 0.1 mm 'events' mean? usually, 0.2 mm is the resolution of individual tips.

Table 1: Does the "tipping bucket device" have any other specification?

Table 1: please also mention the size (i.e., area in ha) of the different sites.

Figure 1: The cities on the inset map of Figure 1 are unreadable, and even the font size of the different sites in the main figure are a bit small. The legend nor caption describes what the green shading or crosshatching indicates. What is a "relais" in this context?

Figure 3: Please use the metric system.

Figure 5: y-axis is too low (Q2 peak cut off).

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Figure 10: "stream water" or "river water" isotopes rather than river isotopes.

Figure 11: in its current form, Figure 11 does not add much to the article. The precipitation and discharge timeseries have already been shown in previous figures, and the results of the end-member mixing analyses are not shown.

Figure 12: is this specific discharge or absolute discharge?

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