

Earth Syst. Sci. Data Discuss., referee comment RC1
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Comment on **essd-2022-304**

Anonymous Referee #1

Referee comment on "Integrated ecohydrological hydrometric and stable water isotope data of a drought-sensitive mixed land use lowland catchment" by Doerthe Tetzlaff et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2022-304-RC1>, 2022

General Comments:

This rich hydrologic dataset will be useful for future analyses of long-term changes in hydrologic functioning in the DMC catchment. The fact that it captured a significant drought period makes it especially unique. The data could also be used for inter-site comparisons to better understand how landscape characteristics influence hydrologic behaviour in response to disturbance (e.g., climatic extremes).

The hydrologic data are useable in the current format and size, although would require significant data wrangling to prepare for specific analyses. The GIS data are useable in the current format and size. I provide some specific comments below to improve the accessibility and useability of the hydrologic data.

The article is well structured and clear. The data collection and analyses methods are described in sufficient detail for the most part. All references to other data sets or papers seem appropriate. I have provided minor technical comments below that could help to clarify certain aspects of the data collection and analyses methods. The figures and tables are high quality and I only have a few minor suggestions for improving them.

Despite my suggestions for improvement, by reading the article and downloading the dataset I am confident that I could use the data.

Specific Comments:

- The majority of the digital object identifiers provided in the manuscript take the reader to the Demnitz_Isotope_Hydrological_Data page (number 623) on the IGP Freshwater Research and Environmental Database website. There a description of the available data is given; however, it is not possible to download the data here. In the 'Data files' section, it says that a user needs to make a request to the three contacts to access the file. However, in section 7 of the manuscript, the reader is directed to data package 622, where the data can be downloaded. I recommend that the 'Data files' – Actions column on package 623 be updated with a link to 622. Or to make the process even more streamlined, just eliminate 623 altogether. It's not clear why there are two data packages.
- There are no apparent inconsistencies in the data and no unusual data formats, however, I think there could be some improvements in the way the data is organized that could reduce the pre-processing time for a user. My recommendations for improving the data organization are to:
 - Make sure that all columns have a header (e.g., on a few sheets the year, date, or date_time header is missing, colP header on 'Forest_A_Isotopes' is missing, etc.).
 - Make sure to standardize the column headers across sheets and I recommend using lower case with an underscore separator between words to keep the headers simple (e.g., don't use different types of brackets around the units).
 - Consider integrating different levels of column headers (e.g., instead of 'Average Moisture [m3/m3]' and '20cm', use 'avgsm_m3_m3_20cm'... or something like that). On the readme page the authors could create a data dictionary that translates these abbreviated headers for the user.
 - Move all the 'readme' textboxes off of the data sheets and onto a single readme sheet (use the 'General Readme' sheet).
 - Use ISO 8601 date format consistently on all sheets.
 - Make sure that blank cells in data columns are replaced with 'NaN'.

Technical Comments:

38: Remove one of the 'long-term'.

43: Consider '... to investigate links between...'.

46: Consider '... importance of links between...'.

50-1: I think the quotation marks should go around "blue water" and "green water", not just around the colours.

53: What do the authors mean by robust data sets? I am familiar with the concept of robust statistics, but unsure what constitutes a robust data set.

81: NGP only used three times – consider just spelling it out.

93: Spell out northeast.

93: Consider removing 'its integrative characteristics;'

103: I recommend explaining here what the characteristics of a drought sensitive region are. The authors could also consider mentioning whether or not the data can potentially be used to understand the hydrologic functioning of other drought sensitive regions beyond northeast Germany.

Fig. 1: Instead of one symbol for all measurements, I recommend using different symbols to represent meteorological, soil, sap flow, groundwater, and isotope measurements.

134: Consider replacing '... historic evolution...' with '... history...'

141: '... high (~90 %) proportions of evapotranspiration...' is a bit confusing – consider '... high water losses due to evapotranspiration (~ 90 % of total precipitation)...'

141-3: Here, the authors explain some of the characteristics of a drought sensitive region. I recommend these be mentioned earlier when the concept is first introduced.

150: Was it net radiation that was measured?

157: Were standard rain gauges used? If so, replace 'simple' with 'standard'.

179-80: Consider reorganizing the sentence, e.g., Water samples were also collected at Bruchmill using an autosampler (ISCO...) and analyzed for stable water isotopes.

197-8: Are these nested sites marked on the map? If so, it needs to be clear which sites they are.

200-1: I recommend putting this information on groundwater levels in the previous section.

202: Were any twigs sampled or did they have to have certain characteristics?

207-8: What was the average and max storage time?

209: Either introduce these abbreviations when the water source is first mentioned in the isotope section or add the water source in front of each abbreviation in the brackets.

211: Replace 'CDRS' with 'CRDS'.

212: Consider revising '... to direct liquid water equilibrium method for soil water' to '... soil water extracted via the direct liquid water equilibrium method'.

Table 2: Instead of repeating the abbreviations in brackets after dates, consider creating sub-rows from the data type column to the far-right column of the table, i.e., a sub-row for each data type.

Table 2: I think for some of the spatial resolution entries the direction (vertical or horizontal) should be given.

Figure 2: In the caption consider replacing 'Spatial data availability...' with 'Measurement period for each parameter at each site...'.

228: Consider 'data' instead of 'amount'.

241: Consider 'hydrologic' instead of 'response'.

243-4: Consider replacing 'Variability was also more sensitive under forested land cover...' with 'There was higher variability in volumetric soil moisture under forested land cover...'.

Figure 4: It looks like the winter 2020 peak groundwater level at both sites is slightly higher than 2019. Could this suggest recovery?

Figure 4: I'm not sure if this really matters, but the panels are introduced out of order in the caption.

Figure 5: The panels could be stretched out a bit more vertically. This would especially help with seeing some of the detail in panel (c). The titles above each panel could be repositioned beside the a), b), c), etc. to achieve this.

312: There was not a lot of information given in the methods on data quality control. I recommend including the accuracy of all the measurements in the dataset.