

Interactive comment on “Using isotopes to understand evaporation, moisture stress and re-wetting in catchment forest and grassland soils of the summer drought of 2018” by Lukas Kleine et al.

Anonymous Referee #2

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The manuscript entitled “Using isotopes to understand evaporation, moisture stress and re-wetting in catchment forest and grassland soils of the summer drought of 2018.” by Lukas Kleine, Dörthe Tetzlaff, Aaron Smith, Hailong Wang, and Chris Soulsby presents an interesting contribution to our understanding of ecohydrological processes in a mixed land cover catchment (forest and agricultural), especially under the influence of climate anomalies. The authors conducted a case study in North-East Germany in the Demnitzer Millcreek catchment. They highlight the use of isotopic tracers together with conventional hydrology to understand the effect of drought progress, the recovery

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of soil water storage and the memory effect of drought evaporation when the catchment could no longer hold streamflow and crop production and further mixing with fresh precipitation.

The study shows an important work with a logical structure and is clearly written, in my opinion, it deserves to be considered for publication in the HESS after some minimal revisions. Most of my editing comments match those of Referee 1 and have already been addressed by the authors.

I recommend the authors to be careful when using the terms “blue and green water”, as it is broad and varied in the literature, so I suggest that they highlight in the introduction section what they specifically refer in this study.

I’m a little concerned about the limited availability of soil water isotope samples (monthly basis) used to drive such a conclusion based on tentative MTTs. The manuscript would benefit for a wider discussion and to clearly state this limitation. In order to reaffirm the credibility of these results, I suggest widening the context of the study by comparing it with similar drought cases in nearby sites or with comparable geographical regions. Further, an extended amount of literature pointed out that MTT (based is a gamma distribution with two parameters and derived MTTs concept) is only a qualitative indicator of catchments for a first screen and basic comparison, however a bit critical when the evolution of water ages is involved. With the available information, I firmly believe that it would be possible to obtain better and accurate results by including more elaborate and non-stationary criteria in the analysis.

Finally, please improve figure 4, the size of the symbols and the colours used make it difficult to identify isotopic signatures.

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