

Author's Response - "point-by-point reply"

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Dear authors,

The reviewer is satisfied with your improvements, but strongly suggests to add the observed water vapor concentration ranges. Furthermore, some minor corrections are proposed.

More importantly, and I my apologies that I have seen this before, is your data availability statement ("The isotope data are available with a password (to be received from the corresponding author upon request) from the open-access database FRED at IGB"). Aside from the fact that open access data can per definition not be password protected, it does not comply with the HESS-data policy (https://www.hydrology-and-earth-system-sciences.net/policies/data_policy.html). Only in exceptional cases and accompanied with an explanation, deviations are allowed. So please, release the used data via a FAIR-repository.

Best,

Miriam Coenders

Response to the Editor

Dear Miss Coenders-Gerrits,

Again, thank you very much for your thoughtful comments and for coordinating the review process.

Thank you for pointing out the concerns regarding open access data availability. IGB is committed to FAIR data (IGB's current Data Policy is DOI 10.4126/FRL01-006453563) and FRED is listed on re3data (<https://www.re3data.org/repository/r3d100013068>). Due to DFG restrictions we will adjust our data availability statement as follows:

"The dataset used in this study is subject to a three-year embargo following the expiry of DFG Project funding for A-M Ring and will therefore be made openly available on 01.12.2028 in the open-access database FRED at IGB. Until then the isotope and ecohydrology data are available with a password (to be received upon request from Prof. Doerthe Tetzlaff) from the open-access database FRED at IGB – Data package No. 979." (L650-654 209 in the revised manuscript which includes track changes)

Below we address the remaining comments from the reviewer. We included the observed water vapor concentration ranges in a supplementary Figure S11 and reported on the possible effects of water concentration change on SWI measurements (L205-209 in the revised manuscript which includes track changes).

With best regards,

Ann-Marie Ring (on behalf of all co-authors)

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Response to Referee Comment 1:

Dear Reviewer,

We sincerely thank your suggestions for revision. We are confident that addressing the comments will improve the manuscript. Especially the missing examination on the impact of water vapor concentration ranges on SWI measurements is a very important observation. We now include information on the ranges of water vapor concentration of the SWI monitoring documented in our

study in the supplementary material and give reference to it in the methods. Below, we respond to each of the reviewer's points in detail and also give reference to exact line numbers of made changes in the attached revised manuscript, which includes track changes.

Sincerely,

Ann-Marie Ring (on behalf of all co-authors)

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I225 how was the range of water vapor concentrations, so did you observe a wide concentration range during your study? The concentration can significantly affect your isotope measurements.

Please report the concentration range/distribution of your isotope measurements and acknowledge the possible effects of concentration changes on the isotope measurements, if applicable (see e.g., Wassenaar 2008, Haberstroh 2024). The temperature-based conversion (liquid to vapor) does not take this effect into account.

Also, did you test your analyzer for its instrument-specific concentration dependency?

**Thank you for this important comment. We have added reference to the possible effects of water concentration changes on SWI measurements (I184-193) and added a Figure S11 to the supplementary material displaying the water vapor concentration ranges of the analyzed SWI samples covering the whole drought and rewetting period (01.07-30.09.2022). We did not test the instrument-specific concentration dependency, which is an important suggestion for future measurements, but we calibrated the measurements in the field with lab-analysed reference standards (I205-209).

I233: Table 1 is still referred to in the main text, but is now S1

**Thank you, we have corrected this. [I192]

I268: also add unit of Ic excess here

**We have added the unit ‰. [I226]

I291 17.8 (dot instead of ,)

**Thank you, we have corrected this. [I249f]

I289: Just to clarify, the sapflow was not corrected for using a zero flow offset, as it is not included in your list?

**Thank you for pointing this out. We corrected the sap flow data with a zero-flow offset. We now indicate this in I216 in the ecohydrological methods.

Fig. 6: I recommend calibrating your soil moisture sensors once, as the factory calibration might deviate significantly from the actual VWC value

**Thank you for pointing this out. You are right, after specific calibration the accuracy of the sensors would be ± 1 % vol and we will consider this calibration for future field employment. For this study, the factory calibration precision of ± 3 % vol was acceptable to us. Also, in previous installations of these sensors we have found close agreement between factory calibration and field calibration. The range of soil moisture measurements was between 3 and 20 % (very sandy soil), this was enough precision for relative values to compare the depths and the different soil pits. We also had 3 replica of sensors per depth and calculated the median value of the 3 replicates. We have now added the precision of

our soil moisture probe in the supplementary material Table S1 and added information about the installation of 3 replicates per depth (SMT-100; precision $\pm 3\%$ vol in mineral soils).

Wassenaar, L. I., Hendry, M. J., Chostner, V. L., and Lis, G. P.: High Resolution Pore Water $\delta^2\text{H}$ and $\delta^{18}\text{O}$ Measurements by H_2O (liquid) – H_2O (vapor) Equilibration Laser Spectroscopy, *Environ. Sci. Technol.*, 42, 9262–9267, <https://doi.org/10.1021/es802065s>, 2008

Haberstroh, S., Kübert, A., and Werner, C.: Two common pitfalls in the analysis of waterstable isotopologues with cryogenic vacuum extraction and cavity ring-down spectroscopy, *Anal. Sci. Adv.*, 5, 2300053, <https://doi.org/10.1002/ansa.202300053>, 2024.