

Response to Interactive comment by Referee #2.

Comments from referee are printed in black. Our responses are printed in red.

General comments: This paper provides a detailed discussion of a densely instrumented observatory that is focused on soil water content measurements. The paper is well-written and thoroughly explains how the data was obtained, processed and analyzed.

Thanks a lot!

L56 and L64: “state-of-the-art” is a bit repetitive.

We will adapt the “state-of-the-art”.

L58: Who has TERENO enabled?

This is explained in the acknowledgement, but we will add information here as well.

L134: “soil water content was” measured?

Correct. We will correct this accordingly.

L193-194: I suggest making this point earlier. Otherwise, it was not clear to me why you were trying to correct the data.

We will correct this accordingly.

L204: The 0.59 cm³ cm⁻³ was a bit hard for me to pick out – perhaps include a dashed horizontal line that makes it clear.

We will add a dashed line.

L213: What do you mean that the mid-infrared spectroscopy complements the elemental analysis results?

The mid-infrared spectroscopy method was used to measure most of the samples. We will add information.

L276: Was there low quality data that was excluded? If so, comment on this.

Yes. We will add information.

L288: Not clear how a soil moisture content of 0.85 cm³ cm⁻³ is plausible, given the soil porosity values reported.

This is just an arbitrary upper limit, which can be also used for highly organic forest soils.

L316: It is not clear to me how change in storage can contribute 7% of the long-term water balance, when the time-series data seems to indicate that the soil repeatedly reaches the same near-saturated water content. In other words, there does not appear to be a long term reduction of soil water storage when looking at the time series data. Many studies assume that the change in storage is zero when water balances are done on an annual basis, so this point should be clarified. On the

other hand, the time series data does appear to indicate some short-term periods when soil water storage decreases (e.g., fall of 2013).

It is true that the water storage contribution should be nearly zero on the long-term, e.g. for a period of 10 years. However, as already shown by Graf et al. (2014) and others, on the annual basis the soil water storage can easily contribute 7 % water balance. Clearly this value will also largely depend on time periods used as shown by Graf et al. (2014).

Literature

Graf, A., Bogena, H. R., Druce, C., Hardelauf, H., Puetz, T., Heinemann, G., and Vereecken, H., 2014, Spatiotemporal relations between water budget components and soil water content in a forested tributary catchment: *Water Resources Research*, v. 50, no. 6, p. 4837-4857.