

Referee comments are shown in black. Our responses in yellow.

RC2: 'Comment on hess-2023-255', Anonymous Referee #2

After reading the new version of the manuscript, it seems that most of the minor issues have been considered. However, some of my previous suggestions have only been partially addressed. They are not major issues, but I think that thoughtfully addressing them will improve your paper. I refer to lines in the track-changes version of the manuscript.

Thank you very much for your positive comments.

Specific comments

On the issue of the simulation of understorey fluxes by the model. I may have overlooked the text where this was explained, but my misunderstanding is probably a sign that this should be more clearly explained, in the right section of the paper. The sentence you refer to in your response #R23 describes the inventory data, and it's fine where it is, but I think you should remind the reader that understorey is included in the transpiration simulations, where the reader expects to find this information. For example,

“To assess plant transpiration, the model initially calculates a distinct estimation of the maximum transpiration for the entire woody plant community, including trees and shrubs. This estimate represents transpiration demand imposed by the atmosphere, without including soil water limitations (L. 173 of track changes version)”.

We have included more references along the text: L147-148: "the model initially calculates a distinct estimation of the maximum transpiration for the entire plant community (including trees and shrubs)"; L172-173: "In shrubs, foliar biomass is calculated from shrub height via species-specific allometries."

Related to this, I mentioned the case that transpiration from tree-grass savannas (dehesas) may be dominated by grasses, as tree cover is relatively low. This will also change seasonally, as grasses will transpire at high rates in Spring but dry out in the Summer. MEDFATE does not include a grass layer, right? Why is this issue not addressed in your #R23, by including some text in the discussion? Dehesas, and other tree-grass ecosystems, occupy a substantial area in Spain, so I think that this issue requires some discussion.

MEDFATE can include the grass layer but we don't have this information from the Spanish forest inventory. We agree that in Dehesas or other tree-grass ecosystem the transpiration of the grass layer is important. Nevertheless, we removed the SFI plots with low basal area for avoiding this problem and we only analyse forest ecosystems: L107/108: "and an overall basal area of > 3 sq m/ha (to ensure that very sparse woodlands, which can hardly be considered a forest, were excluded)". Therefore, we did not include the Dehesa ecosystem in this work since in most cases their basal area is very low to consider them a forest.

About your arguments for not including the comparisons with GLEAM and SIMPAT in the main text, they're not very convincing; having more panels in Fig. 1 is doable within a reasonable size and this composition would not impair understanding of the figure.

Nevertheless, I'm not going to insist more on this. I just think it's a missed opportunity to reinforce the validity and strengths of your approach, especially given the fact that you include forest structure and composition at the plot scale, something that is not considered by the other approaches. which would make your paper stronger and potentially increase citations.

We included the comparison between the GLEAM/SIMPAL and MEDFATE maps as a new figure 1 in the results.

L. 441. I understand that you're comparing your results with those by Ungar et al. but the way it's written one doesn't know which are which. Do you mean, for example:

"The rest of forest types had lower values (Figure 3), mainly the Mediterranean coniferous, which have shown a high green water of almost 90 %, as also observed in studies at the plot level (Ungar et al., 2013)".

We have included your sentence: L383-385: "The rest of forest types had lower values (Figure 3), mainly the Mediterranean coniferous, which have shown a high green water of almost 90 %, as also observed in studies at the plot level (Ungar et al., 2013)."

Grammar: the text can be generally understood, but there are still several grammatical errors, please revise grammar carefully."

We reviewed the grammar along the text.