

RC2: '[Comment on bg-2023-5](#)', Laura Benegas, 10 May 2023

This paper addresses the issue of green infrastructure effect on ecosystem services like carbon sequestration, reports on the influence in water cycle processes like transpiration, and overall, provide insights on trees contributing to human well-being. The issue of urban trees improving such ecosystem services is fundamental to support the pertinence of nature-based solutions (NbS) Scientific evidence for these innovative approaches (NbS) are still scarce. The authors provide valuable evidence on this line of research.

[I would like to thank the reviewer for the valuable comments and suggestions in the manuscript! We have agreed with the comments and corrected them accordingly.](#)

Park and street sites have the same tree (species), but forest and orchard have two different tree species. This give a better condition to compare in a fair way the first two sites but could be questionable the comparison of the four sites together. In line 348 to 350, the authors state "The difference in saturation levels may be species-specific or caused by differences in the availability of soil moisture as the Orchard site had higher soil moisture than the Forest site during the heatwave and dry period". How can we separate these effects from the whole variables analyzed? Could the authors provide a section in discussion where it is addressed something like limitations and recommended improvements in this type of methodologies to cope with such result?

[Thank you again for this comment! Yes, it is difficult to do the comparison of the four sites as the tree species are different with different site conditions. We have removed the comparison of site and species in the manuscript accordingly, as it is also not the main objective of the study. We have added a short paragraph about the limitation and a recommendation in the text as per the suggestion.](#)

L442: "In our study, we have observed these responses of urban tree transpiration and leaf gas exchanges pattern during heatwave and dry periods. However, there are challenges and limitations in the methods to conduct a detailed comparison of tree species. This is mainly because different tree species were measured at different sites. Also, the limited measurements of leaf gas exchanges could not be addressed more about water use efficiency during these local extreme periods. Further study with complex model capturing the effect of site conditions and tree species behaviour separately would be useful in addressing the main factor affecting the different responses of urban vegetation during the heatwave and dry period."

Also, it will contribute to clarify the context if the authors add a line within the descriptive table 1, the main drought-resistant features of trees analyzed as their

defense strategies (escaping, avoiding or tolerating the loss of water) if there is something noticeable.

We have added the drought strategies behaviour of the studied tree species in the table caption, as per the suggestion.

There are differences in soil type between sites too, although all of them contains sand in some proportion, specifically speaking the authors are not comparing the exact soil conditions. The data provided on soil is reduced to the names of soil types. To provide more accurate information about the potential effects of soil type on the analysis, it would be desirable to also have a short description of the soil class (taxonomy) specially in terms of water retention properties.

Thank you for the comment! We agree that it would be informative with more soil properties parameters even though we are not comparing based on the soil conditions. Thus, we have added more information on soil properties with related to soil porosity, soil field capacity, wilting point and available water capacity of the four sites (together in Appendix A1) where we have calculated those parameters based on soil texture type and USDA classification scheme following Hagemann,S. & Stacke,T.(2015).

	Park	Street	Forest	Orchard
Soil porosity	41.59 %	41.59 %	41.59 %	46.13 %
Field capacity	22.9 %	22.9 %	22.9 %	38.4 %
Wilting point	10 %	10 %	10 %	25 %
Available water capacity	12.9 %	12.9 %	12.9 %	13.4 %

*Available water capacity = Field capacity – Wilting point

In Figure 4, for the sake of clarity, it is important to explain here why there is no data the month 8 for street site at panel b. Figures should be interpreted as stand-alone piece in the paper, or self-explained.

Thank you for the suggestion! There were no data in August at Street site as the datalogger and sensor were broken. We have added this information in the figure caption as per the suggestion.

In table 3, please explain here why there is no pre-heatwave in street, and why is no data for no heatwave for orchard site. Such information also affects figure 5.

At the Orchard site, measurements started only in the summer 2021 and at the Street site, the intensive measurement days were started a bit late after the pre-heatwave period, thus no data for pre-heatwave at the Street site. Now, we have added this information in the Table 3 caption.

Added reference:

Hagemann,S., Stacke,T.(2015). Impact of the soil hydrology scheme on simulated soil moisture memory. *Climate Dynamics*. 44:1731–1750.<https://doi.org/10.1007/s00382-014-2221-6>