Comments to the general suggestions and questions (from reviewer 2)

R2: I found the manuscript overall improved with respect to the previous version. The authors have successfully addressed my previous concern regarding the statement of objectives and tried to illustrate the effects of considering the different processes. The new model is overall easier to understand now, but the section on Psi_dehydration and how plant draws from water storage for transpiration after soil disconnection is still hard to understand.

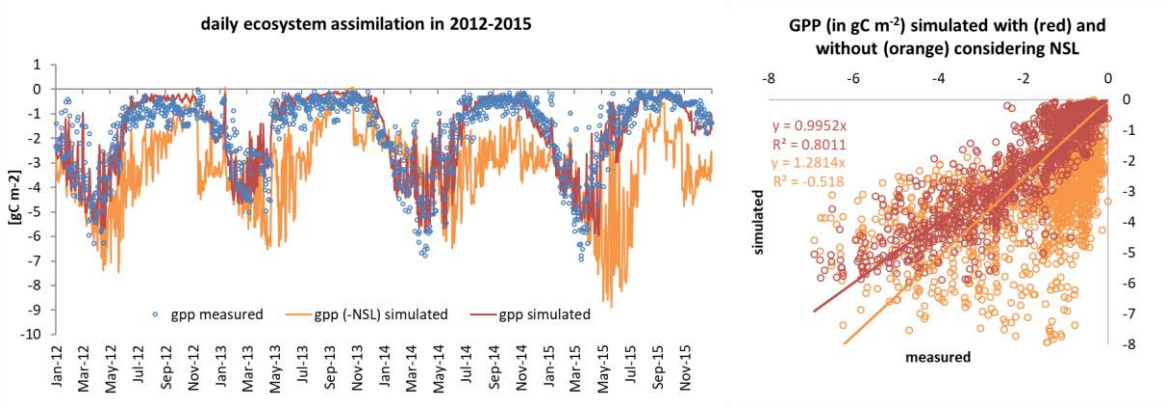
A: Thanks for the acknowledgement of the improvements. We are happy that the new version is clearer and easier to understand now, which is also due to the good comments. Regarding the description of water uptake and dehydration, we have tried to further improve it (L282-297, see also specific comment below).

R2: I wonder whether the need to include NSL for proper stomatal behavior (Fig. 5) is related to the fact that direct hydraulic effects on stomatal conductance are based on a rather resistant stem vulnerability curve. Despite the better fit of transpiration when including NSL, it would be interesting to see whether the fit GPP also improves.

A: Indeed, a resistant vulnerability curve and a strong dependence of stomatal conductance on NSL seems to be a likely trait combination under dry conditions since it enables a high drought stress resistance. Despite this is clearly supported by our study as well as the measurements at the site, it is still not quite clear from literature results. We have added this remark in the discussion (L523-25).

The modeled GPP response depends indeed strongly on the NSL effect. In our simulations, the NSL effect is determined via our initial Bayesian parameter calibration to GPP. In fact, the sensitivity of the model to NSL seems quite large, as indicated in the example figure below were PSI_EXP has been set to zero, letting all the other parameters untouched. It should be noted that the (overall) 28 % higher GPP (difference between the trend lines in the figure) in the simulations goes along with an overestimation of evaporation and a consequently unrealistic drop of predawn water potential down to -4MPa (not shown), which has been also pointed out by Sabot et al. (2022).

Sabot, M. E., De Kauwe, M. G., Pitman, A. J., Medlyn, B. E., Ellsworth, D. S., Martin-StPaul, N. K., ... & Serbin, S. P. (2022). One stomatal model to rule them all? Toward improved representation of carbon and water exchange in global models. *Journal of Advances in Modeling Earth Systems*, *14*(4), e2021MS002761.



Comments to the specific suggestions and questions (from reviewer 2)

L34: “it” also disclosed

A: corrected

L299: How is the value of soil water uptake (UPTsw) determined?

A: UPTsw is defined by transpiration demand as long as the soil water potential threshold is not reached. Across the soil profile, water in different layers is taken according to their relative water content as well as fine root abundance. We have added these explanations in L282-285.

L607. Package MEDFATE (4.1.0) implements SurEau, including capacitance effects and temperature-effects on gmin.

A: MEDFATE has been mentioned, capacitance has been added and the reference has been switched to De Cáceres et al. (L609-611)

De Cáceres, M., Molowny-Horas, R., Cabon, A., Martínez-Vilalta, J., Mencuccini, M., García-Valdés, R., Nadal-Sala, D., Sabaté, S., Martin-StPaul, N., Morin, X., D'Adamo, F., Batllori, E., & Améztegui, A. (2023). MEDFATE 2.9.3: a trait-enabled model to simulate Mediterranean forest function and dynamics at regional scales. *Geoscientific Model Development*, *16*(11), 3165-3201. https://doi.org/10.5194/gmd-16-3165-2023

In addition, we like to indicate that we have switched the order of the first two paragraphs in the discussion and homogenized the different naming of krc/kxyl in figure and caption of Fig. 1.