

Supplemental Materials

Arboreal epiphytes: How often are the biggest “buckets” in the canopy empty?

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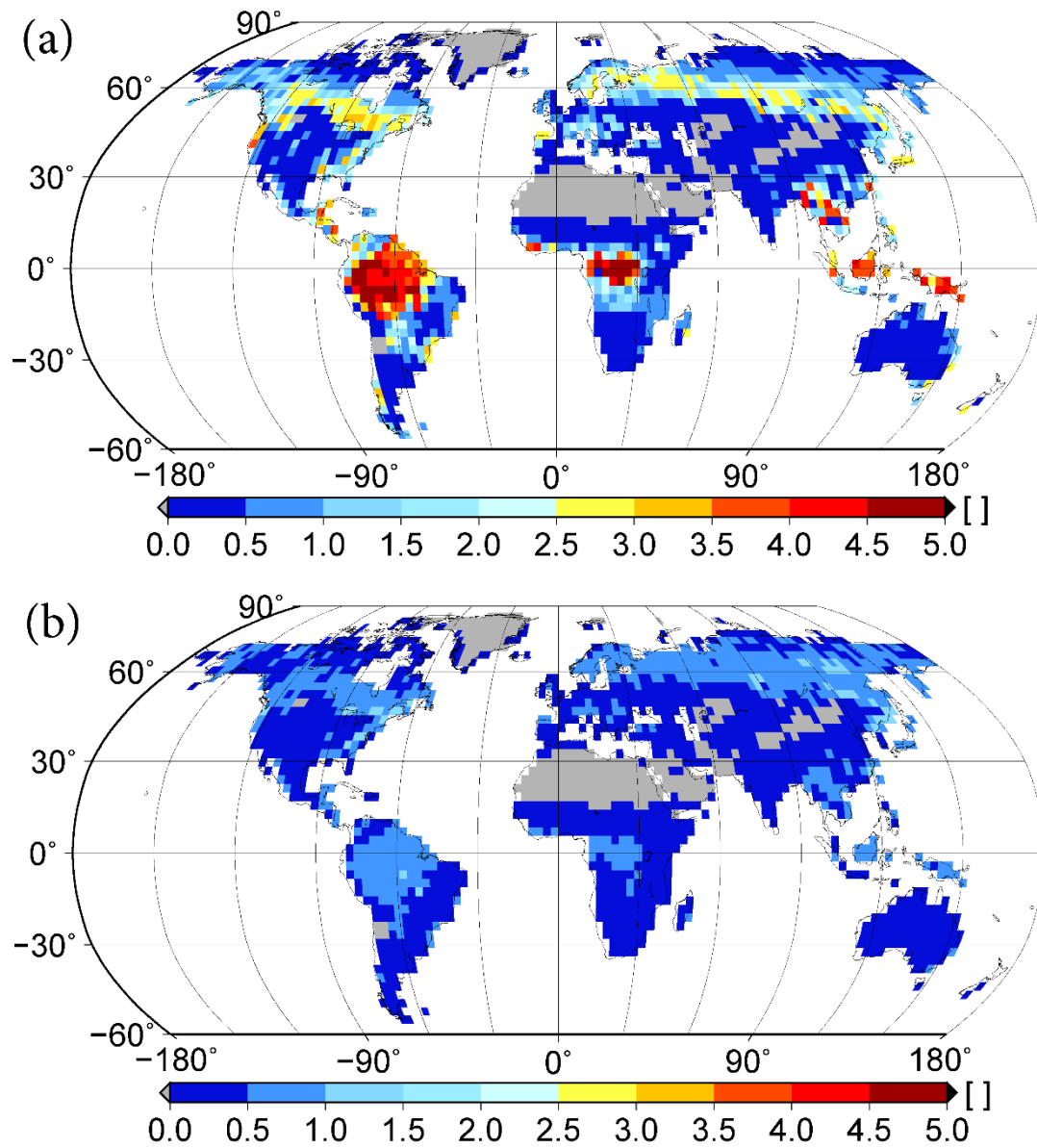


Figure S1. Annual average values of (a) leaf area index and (b) stem area index used in the LiBry model. The maps are taken from the CLM model [1].

1. Bonan, G.; Oleson, K.; Vertenstein, M.; Levis, S.; Zeng, X.; Dai, Y.; Dickinson, R.; Yang, Z.-L. The land surface climatology of the Community Land Model coupled to the NCAR Community Climate Model. *J. Clim.*, **2002**, *15*, 3123–3149.

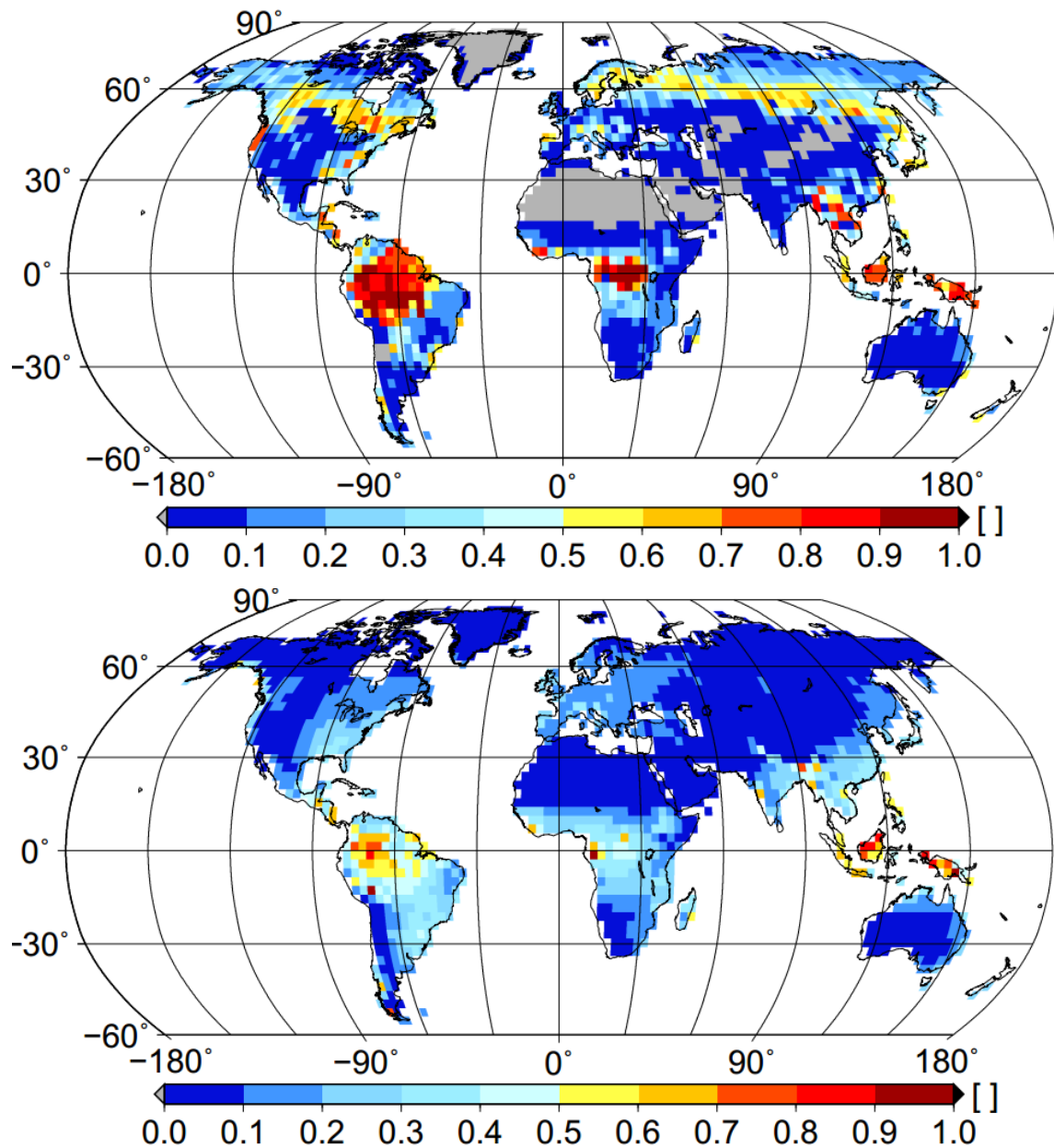


Figure S2. Global maps showing patterns of normalized (top) canopy water storage capacity and (bottom) rainfall amount. These are provided to explain why the fraction of time epiphytes spend near saturation is relatively elevated compared to other regions (Figure 4). Where low leaf area and stem area indices (LAI+SAI) yield relatively low canopy water storage capacities, and relatively higher rainfall amounts.

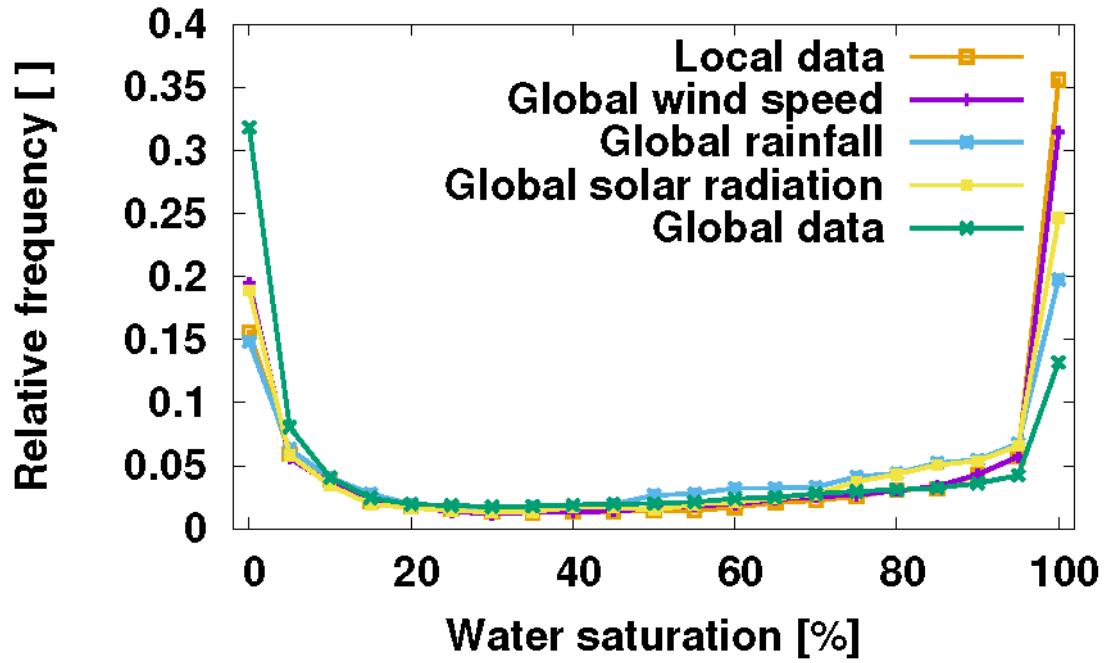


Figure S3. Saturation state of non-vascular epiphytes simulated by the LiBry model for five different climate data sets: 'Local data' and 'global data' are the same as in Figure 5 (of the main manuscript). Global 'wind speed', 'rainfall', and 'solar radiation' correspond to simulations driven by the local data set where the respective variable has been replaced by the one from the global data set.



Figure S4. Photographs showing an example mat of abundant *Pleopeltis polypodioides* (resurrection fern) covering the bark of a host tree, *Quercus virginiana* (southern live oak), in downtown Savannah, Georgia (USA, 32.058535, -81.099030) when fully saturated (left) and when desiccated (right).



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