



Supplement of

The Loobos ecosystem first tower dataset: meteorology, turbulent fluxes and net ecosystem exchange (1996 to 2021)

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S.1. Shortwave radiation comparison

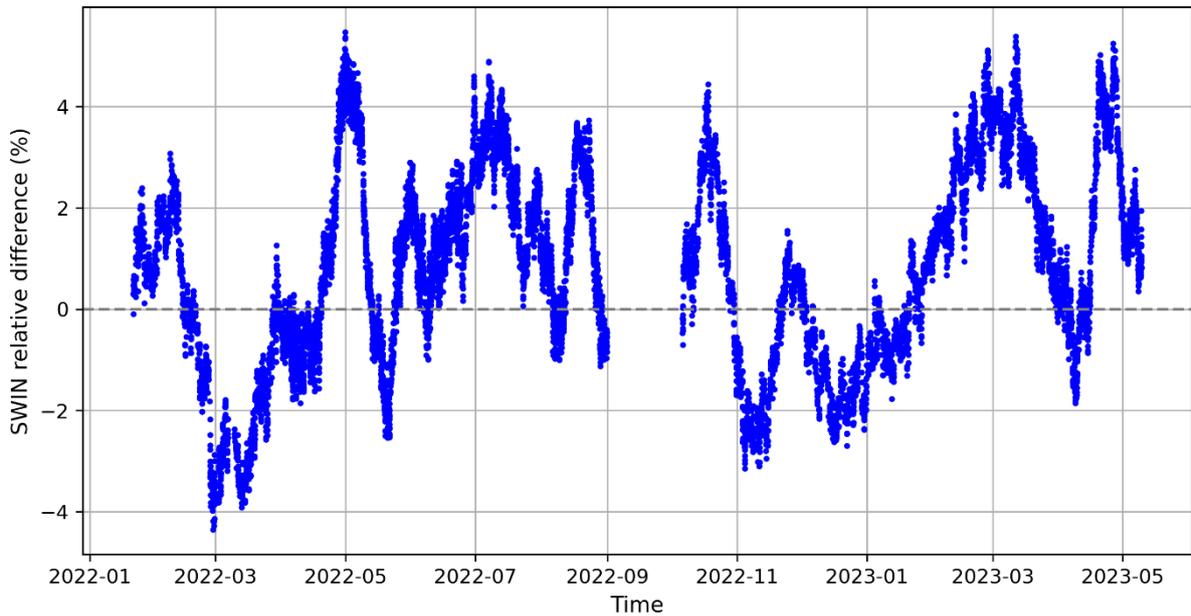


Figure S1. Relative difference of shortwave radiation measured from the first tower and the second tower.

S.2. Vertical profile of Carbon dioxide mixing ratio along the tower

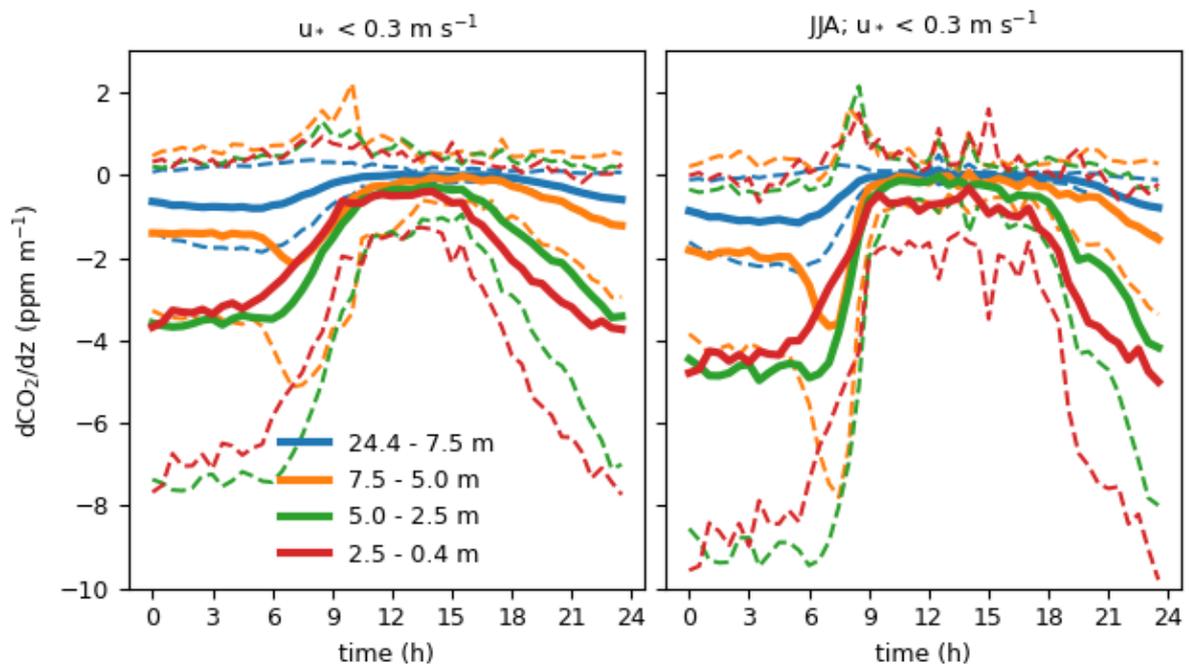


Figure S2. Mean diurnal cycles of the CO_2 mole fraction gradients. Left: for all data with $u^* < 0.3 \text{ m s}^{-1}$. Right: for all data in June, July and August with $u^* < 0.3 \text{ m s}^{-1}$. The solid line refers to mean values and the dashed line denotes the mean ± 1 time standard deviation.

S.3. Allometric relationships

To estimate the biomass from the tree diameter, height and species, we used allometric relations. We adopted the relations used in the 7th Dutch Forest Inventory (Schelhaas et al, 2022). The inventory uses Eq.S1 to estimate the mass of stem wood and bark:

$$m_{stem+bark} = \frac{\rho_w}{1000} \times d_{tree}^\alpha \times h_{tree}^\beta \times e^\gamma \quad (S1)$$

Where $m_{stem+bark}$ refers to the mass of stem wood and bark in kg, ρ_w refers to the wood density, d_{tree} and h_{tree} to the tree diameter at 1.3 m and the tree height. α , β and γ are parameters, the values of which can be found in Table S1. The mass of branches (living and dead), leaves and roots is estimated with Eq. S2:

$$m_X = \kappa \times e^{\lambda + \ln(d_{tree}) \times \mu} \quad (S2)$$

Where m_X is the mass in kg dry biomass and X refers to the categories ‘branches’, ‘leaves’ and ‘roots’. κ , λ and μ are species and category dependent parameters (Table S1).

Table S1. Parameters to Eqs. 1 and 2 for estimating tree biomass.

Species	ρ_w kg m ⁻³	Stem wood and bark			branches			leaves			roots		
		α	β	γ	κ	λ	μ	κ	λ	μ	κ	λ	μ
Pinus sylvestris L.	420	1.821	1.074	-2.881	1.045	-3.664	2.160	1.010	-3.528	1.747	0.951	-3.635	2.304
Prunus serotina Ehrh.	400	1.839	0.972	-2.719	1.135	-2.676	2.206	0.956	-4.106	1.321	1.047	-2.618	2.135
Quercus robur L.	580	1.831	1.094	-2.999	1.181	-4.434	2.953	0.966	-4.466	2.138	0.997	-2.863	2.208
Betula pubescens Ehrh.	510	1.592	1.219	-2.791	1.148	-3.819	2.331	1.163	-4.137	1.886	1.044	-1.756	1.876
Picea abies (L.) H.Karst.	400	1.751	1.109	-2.759	1.008	-3.316	2.198	1.020	-2.796	1.869	1.183	-3.739	2.432
Pinus nigra J.F.Arnold	420	1.892	0.954	-2.725	0.999	-1.135	1.468	1.002	-0.611	0.871	0.999	-3.962	2.447
Quercus rubra L.	580	1.839	0.972	-2.719	1.181	-4.434	2.953	0.966	-4.466	2.138	0.997	-2.863	2.208
Larix decidua Mill.	460	1.871	1.006	-2.875	0.967	-3.241	2.141	0.957	-3.885	1.750	1.169	-4.029	2.496

References

Schelhaas, M., Teeuwen, S., Oldenburger, J., Beerkens, G., Velema, G., Kremers, J., Lerink, B., Paulo, M., Schoonderwoerd, H., Daamen, W., Dolstra, F., Lusink, M., van Tongeren, K., Scholten, T., Pruijsten, L., Voncken, F., and Clercx, A.: Zevende Nederlandse Bosinventarisatie: methoden en resultaten (Seventh Dutch Forest Inventory: Methods and results), Wettelijke Onderzoekstaken Natuur & Milieu2352-2739, 127, 10.18174/571720, 2022.

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