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Supplement of

Climate seasonality limits leaf carbon assimilation and wood productivity in tropical forests

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SUPPLEMENT TABLES

Table S1. Number of sites with significant negative (neg), significant positive (pos) or non-significant relationship (no) between the seasonality of wood productivity and each of the climate variables (varclim). Signs + and − indicate the mean sign of the climate variable relationship with the seasonality of wood productivity at lag -1, 0 and +1 month.

sign (lag -1, 0, +1 month)	varclim	neg	no	pos
+ + +	pre	3	6	59
+ + +	cld	2	8	58
− − −	dtr	4	9	55
+ + +	swc	8	9	51
+ + +	rad	2	21	45
+ + +	vap	3	21	44
+ + +	tmn	4	21	43
+ + +	tmp	17	15	36
− − −	pet	13	20	35
− − +	tmx	20	26	22

Table S2. McNemar test of proportion p-values for each of the climate variables used to predict wood productivity. p-value < 0.05 indicates that a different proportion between the two climate variables cannot be rejected.

	pre	cld	dtr	vap	tmn	swc	rad	pet	tmp	tmx
pre	1.00	0.39	0.52	0.01	0.00	0.13	0.02	0.00	0.00	0.00
cld	0.39	1.00	0.54	0.02	0.01	0.20	0.02	0.00	0.00	0.00
dtr	0.52	0.54	1.00	0.01	0.00	0.53	0.02	0.00	0.00	0.00
vap	0.01	0.02	0.01	1.00	0.96	0.00	0.80	0.02	0.01	0.00
tmn	0.00	0.01	0.00	0.96	1.00	0.04	0.55	0.06	0.00	0.00
swc	0.13	0.20	0.53	0.00	0.04	1.00	0.03	0.01	0.04	0.00
rad	0.02	0.02	0.02	0.80	0.55	0.03	1.00	0.04	0.00	0.00
pet	0.00	0.00	0.00	0.02	0.06	0.01	0.04	1.00	0.48	0.00
tmp	0.00	0.00	0.00	0.01	0.00	0.04	0.00	0.48	1.00	0.05
tmx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	1.00

Table S3. McNemar test of proportion p-values for each of the climate variables used to predict wood productivity for the cluster where *vap* has a positive effect. p-value < 0.05 indicates that a different proportion between the two climate variables cannot be rejected. For this subset, *vap* and *pre* are highly correlated ($\rho_{Pearson} = 0.849$, p-value < 0.001).

	pre	vap	tmn	rad
pre	1.00	0.80	0.80	0.80
vap	0.80	1.00	0.92	0.99
tmn	0.80	0.92	1.00	0.99
rad	0.80	0.99	0.99	1.00

Table S4. McNemar test of proportion p-values for each of the climate variables used to predict wood productivity for the cluster where tmp has a positive effect. p-value < 0.05 indicates that a different proportion between the two climate variables cannot be rejected. For this subset, tmp and pre are correlated ($\rho_{Pearson} = 0.659$, p-value < 0.001).

	pre	tmp	tmx	pet
pre	1.00	0.80	0.02	0.00
tmp	0.80	1.00	0.39	0.00
tmx	0.02	0.39	1.00	0.06
pet	0.00	0.00	0.06	1.00

Table S5. Number of sites with significant negative (neg), significant positive (pos) or non-significant relationship (no) between the seasonality of litter productivity and each of the climate variables (varclim). Signs + and − indicate the mean sign of the climate variable relationship with the seasonality of litter productivity at lag -1, 0 and +1 month.

sign (lag -1, 0, +1 month)	varclim	neg	no	pos
− − −	cld	0	8	27
+ + +	dtr	1	8	26
− − −	pre	1	12	22
+ + +	pet	1	14	20
+ − −	rad	4	12	19
+ + +	tmx	3	13	19
− − −	vap	3	15	17
− − −	tmn	5	13	17
− − +	swc	5	15	15
+ + −	tmp	8	15	12

Table S6. McNemar test of proportion p-values for each of the climate variables used to predict litter productivity. p-value < 0.05 indicates that a different proportion between the two climate variables cannot be rejected.

	pre	cld	dtr	vap	tmn	swc	rad	pet	tmp	tmx
pre	1.00	0.11	0.57	0.23	0.25	0.07	0.39	0.53	0.03	0.55
cld	0.11	1.00	0.26	0.00	0.05	0.02	0.05	0.11	0.02	0.11
dtr	0.57	0.26	1.00	0.06	0.06	0.01	0.23	0.13	0.00	0.07
vap	0.23	0.00	0.06	1.00	0.88	0.70	0.28	0.42	0.10	0.23
tmn	0.25	0.05	0.06	0.88	1.00	0.78	0.88	0.43	0.76	0.92
swc	0.07	0.02	0.01	0.70	0.78	1.00	0.69	0.26	0.39	0.51
rad	0.39	0.05	0.23	0.28	0.88	0.69	1.00	0.54	0.43	0.94
pet	0.53	0.11	0.13	0.42	0.43	0.26	0.54	1.00	0.01	0.53
tmp	0.03	0.02	0.00	0.10	0.76	0.39	0.43	0.01	1.00	0.03
tmx	0.55	0.11	0.07	0.23	0.92	0.51	0.94	0.53	0.03	1.00

Table S7. McNemar test of proportion p-values for each of the climate variables used to predict wood productivity for the cluster where tmp has a positive effect. p-value < 0.05 indicates that a different proportion between the two climate variables cannot be rejected. For this subset, cld and tmn are correlated ($\rho_{Pearson} = 65.0$, p-value < 0.001).
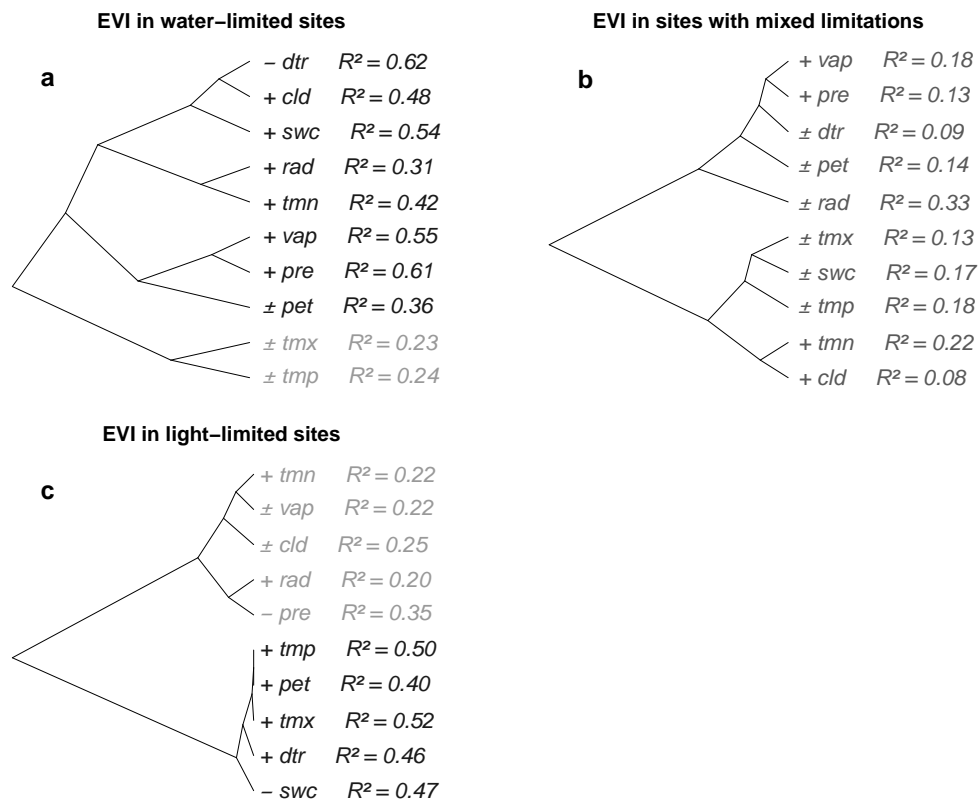
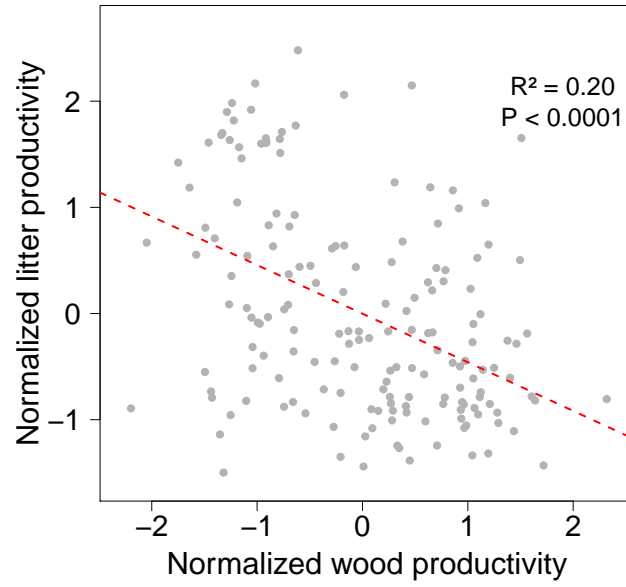|	cld	tmn	vap	swc
cld	1.00	0.39	0.26	0.17
tmn	0.39	1.00	0.80	0.57
vap	0.26	0.80	1.00	0.30
swc	0.17	0.57	0.30	1.00

Table S8. Intercepts and slopes of the fitted linear models to explain seasonal EVI of Fig. 5 (b) and (c) with the seasonal climate variables precipitation (pre) and maximal temperature (tmx) according to the climate limitation class.

model response	site limitation	parameters	Estimate	std. error	t value	p-value	R^2
EVI	water	(Intercept)	0.0000	0.0231	0.0000	1.0000	0.6518
		Precipitation	0.8073	0.0241	33.4551	< 0.001	
EVI	mixed	(Intercept)	0.0000	0.0684	0.0000	1.0000	0.0921
		Precipitation	0.3035	0.0714	4.2503	< 0.001	
EVI	light	(Intercept)	-0.0000	0.0510	-0.0000	1.0000	0.1882
		Precipitation	-0.4338	0.0533	-8.1418	< 0.001	
EVI	water	(Intercept)	0.0000	0.0391	0.0000	1.0000	0.0029
		Maximal temperature	-0.0535	0.0408	-1.3112	0.1903	
EVI	mixed	(Intercept)	0.0000	0.0717	0.0000	1.0000	0.0005
		Maximal temperature	0.0230	0.0749	0.3063	0.7597	
EVI	light	(Intercept)	-0.0000	0.0365	-0.0000	1.0000	0.5841
		Maximal temperature	0.7643	0.0381	20.0410	< 0.001	

EVI in water–limited sites

a

– dtr	R² = 0.62
+ cld	R² = 0.48
+ swc	R² = 0.54
+ rad	R² = 0.31
+ tmn	R² = 0.42
+ vap	R² = 0.55
+ pre	R² = 0.61
± pet	R² = 0.36
± tmx	R² = 0.23
± tmp	R² = 0.24

EVI in sites with mixed limitations

b

+ vap	R² = 0.18
+ pre	R² = 0.13
± dtr	R² = 0.09
± pet	R² = 0.14
± rad	R² = 0.33
± tmx	R² = 0.13
± swc	R² = 0.17
± tmp	R² = 0.18
+ tmn	R² = 0.22
+ cld	R² = 0.08

EVI in light–limited sites

c

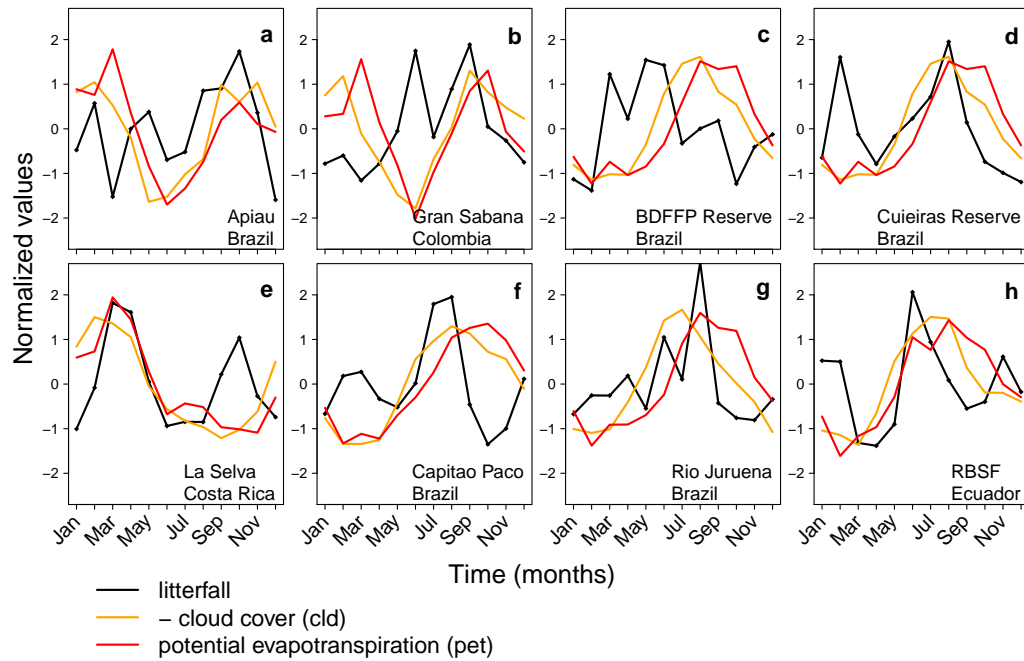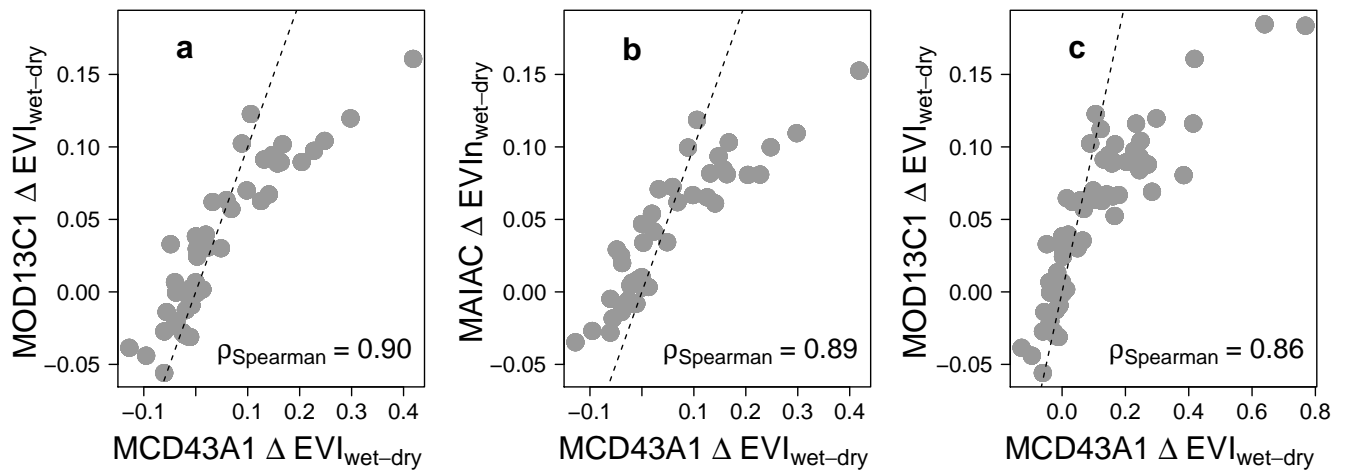|	
+ tmn	R² = 0.22
± vap	R² = 0.22
± cld	R² = 0.25
+ rad	R² = 0.20
– pre	R² = 0.35
+ tmp	R² = 0.50
+ pet	R² = 0.40
+ tmx	R² = 0.52
+ dtr	R² = 0.46
– swc	R² = 0.47

Figure S1. Dendrogram of monthly associations of climate variables and EVI for water-limited, mixed and light-limited sites. $+$ indicates a positive correlation between the climate variable and EVI in all the sites of the group (groups: water-limited, mixed or light-limited), $-$ indicates a negative correlation in all the sites of the group, while $\pm$ indicates a positive correlation for a part of the sites of the group while a negative for the other. Climate variables in the same cluster indicates that they are highly correlated, that is, they produce the same prediction in terms of values but also predict the same effect for the same sites. Different shades of grey indicate the relative strength of associations for each cluster with the seasonality of EVI; black indicates the strongest association. cld: cloud cover; pre: precipitation; rad: solar radiation at the top of the atmosphere; tmp, tmn and tmx are respectively the daily mean, minimal and maximal temperatures; dtr: temperature amplitude; vap: vapour pressure; pet: potential evapotranspiration; and swc: relative soil water content.

Figure S2. Wood productivity versus litter productivity observations. The red dashed line is the linear model between both variables.

Figure S3. Normalized litter productivity, potential evapotranspiration (*pet*) and cloud cover (*cld*) for the sites with no relationship to cloud cover in linear analysis. Cloud cover is multiplied by -1 to facilitate the representation.

Figure S4. Relationships between $\Delta EVI_{wet-dry}$ from MODIS MCD43A1 (this article) and MOD13C1 and MAIAC products for the South American sites (a) and (b), and for all the sites (c) Guan et al. (2015). The climate data used for the computation of $\Delta EVI_{wet-dry}$ from MODIS MCD43A1 (this article) and MOD13C1 and MAIAC products Guan et al. (2015) are independent. The black dashed line is the identity line y = x.