SUPPLEMENTARY INFORMATION: Global forest thickening

Marqués et al.

Contents

S1 Data

Dataset	N	Description	Filter	Reference
nfi_spain	27642			
nfi_norway	25156			
nfi_sweeden	15954			
bnp	9423			
fia_us	7022			
aus_plots	6259			
luquillo	1993			
nfi_switzerland	1972			
scbi	1572			
wuls	1416			
wytham	1200			
serc	1026			
pasoh	1007			
df_rainfor	988			
nfr_swi	729			
forst	537			
palanam	484			
unito	311			
uholka	200			
df_forestplots	149			
mudumalai	126			
lwf_tree	114			
nwfva_tree	84			
incds	75			
tuzvo_tree	63			
iberbas	57			
efm_swi	51			
france	47			
greece_stand	40			
czu	24			
ul_tree	23			
urk	12			
nbw	7			

Table S1: Constituent forest dataset sizes and descriptions.

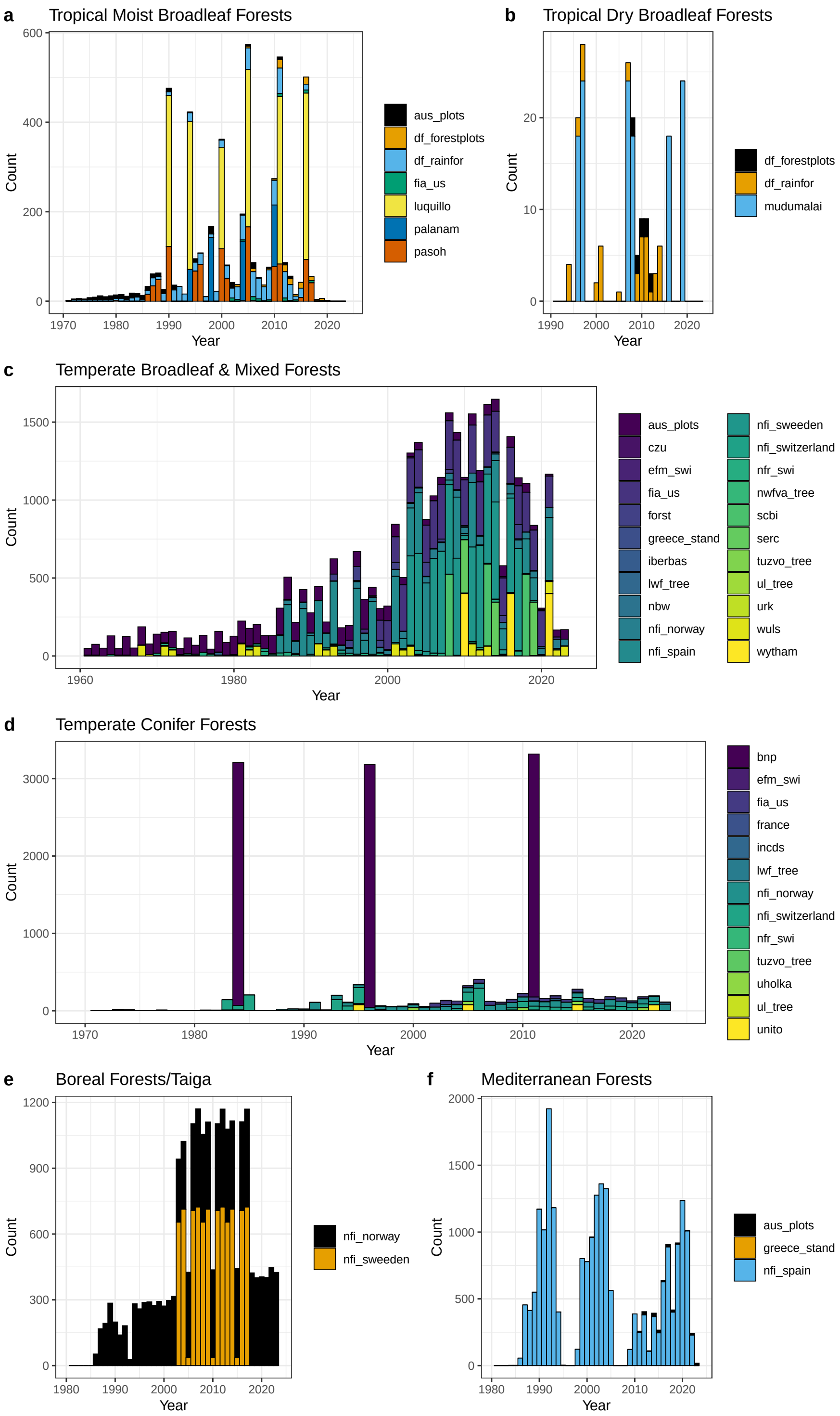

Figure S1: Distribution of forest census data over time, grouped by biome (a-f). Dataset names are explained in Tab. xxxx.

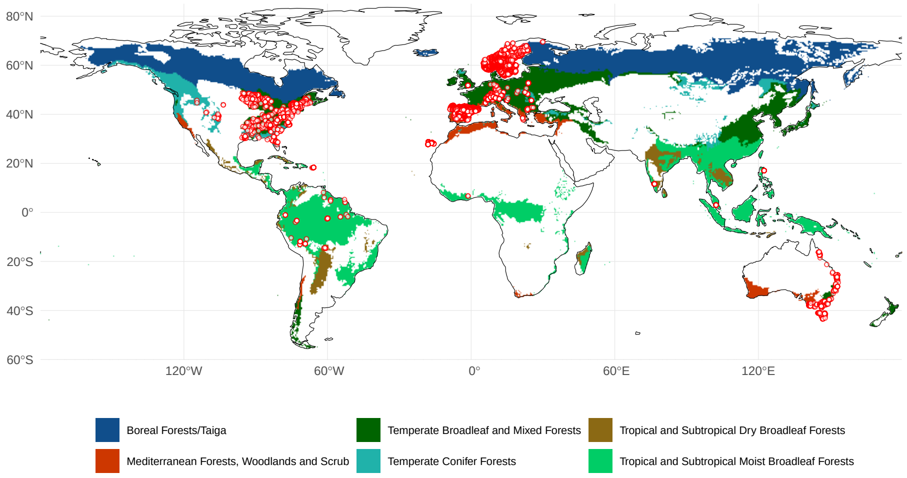

Figure S2: Distribution of forest plots (red circles) and forest biomes.

Biome	Mean	SE
Boreal Forests/Taiga	0.30	0.06
Mediterranean Forests	2.35	0.06
Temperate Broadleaf & Mixed Forests	0.91	0.03
Temperate Conifer Forests	1.18	0.06
Tropical & Subtropical Moist Broadleaf Forests	0.16	0.07
Tropical Dry Broadleaf Forests	-0.38	0.46

Table S2: Mean estimate and standard error (SE) of percentage change (%/yr) of forest stand density (number of trees per ha) by biome, determined from quantile regressions on bootstrapped data samples.

S2 Self-thinning trends

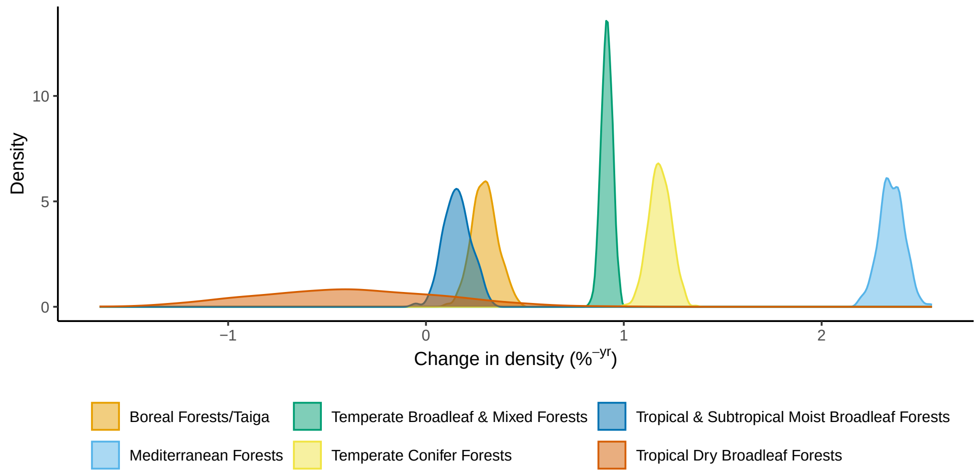

Figure S3: Distribution of percentage change (%/yr) in stand density (number of trees per ha) by biome.

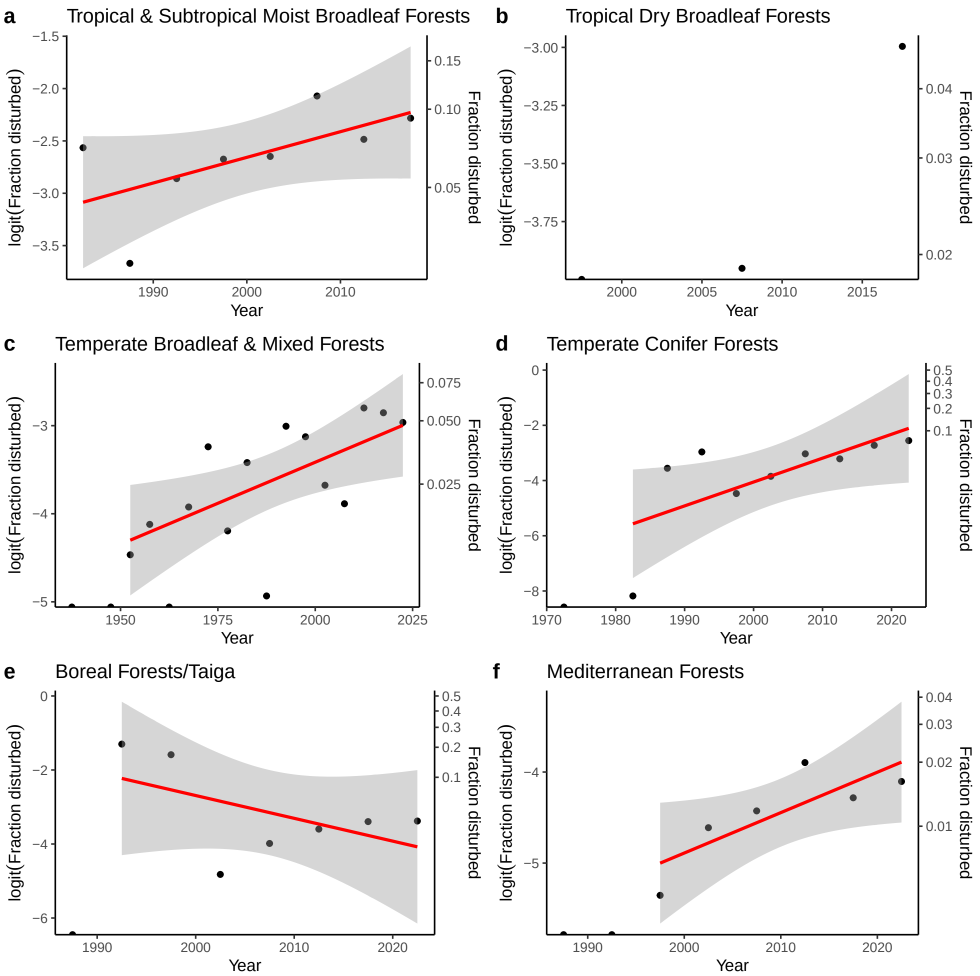

Figure S4: Trends in the fraction of disturbed forest plots, by biome. Fraction values are logit-transformed. The corresponding un-transformed values are indicated by the right y-axis in each plot. No regression fit is shown for tropical dry broadleaf forests (b) as only two points are available with non-zero values for the disturbed fraction.

S3 Environmental drivers

Table S3: Regression Results

	Complete	No PBR	No PBR, ORGC	No PBR, C:N
scale(logQMD)	-0.861***	-0.862***	-0.862***	-0.864***
	(0.002)	(0.002)	(0.002)	(0.002)
scale(year)	0.129***	0.130***	0.130***	0.132***
	(0.001)	(0.001)	(0.001)	(0.001)
scale(tavg)	-0.033*	-0.026+	-0.007	-0.018
	(0.015)	(0.015)	(0.014)	(0.015)
scale(ai)	0.086***	0.095***	0.097***	0.087***
	(0.010)	(0.009)	(0.009)	(0.009)
scale(ndep)	0.153***	0.140***	0.146***	0.131***
	(0.010)	(0.010)	(0.010)	(0.010)
scale(ORGC)	-0.039**	-0.048***		-0.001
	(0.013)	(0.012)		(0.009)
scale(PBR)	0.004			
	(0.008)			
scale(CNrt)	0.057***	0.060***	0.031***	
	(0.011)	(0.011)	(0.008)	
scale(year) × scale(tavg)	0.006**	0.009***	0.013***	0.006**
	(0.002)	(0.002)	(0.002)	(0.002)
scale(year) × scale(ai)	-0.022***	-0.018***	-0.018***	-0.017***
	(0.002)	(0.001)	(0.001)	(0.001)
scale(year) × scale(ndep)	-0.016***	-0.015***	-0.015***	-0.011***
	(0.002)	(0.002)	(0.002)	(0.001)
scale(year) × scale(ORGC)	-0.012***	-0.011***		-0.028***
	(0.002)	(0.002)		(0.002)
scale(year) × scale(PBR)	0.006***			
	(0.002)			
scale(year) × scale(CNrt)	-0.021***	-0.023***	-0.028***	
	(0.002)	(0.002)	(0.001)	
SD (Observations)	0.176	0.178	0.178	0.178
Num.Obs.	36133	37652	37652	37652
R2 Marg.	0.521	0.530	0.531	0.527
R2 Cond.	0.980	0.980	0.980	0.980
AIC	17693.1	19142.8	19162.9	19315.9
BIC	17846.0	19279.3	19282.4	19435.4
ICC	1.0	1.0	1.0	1.0
RMSE	0.15	0.15	0.15	0.15

S4 Global C sink

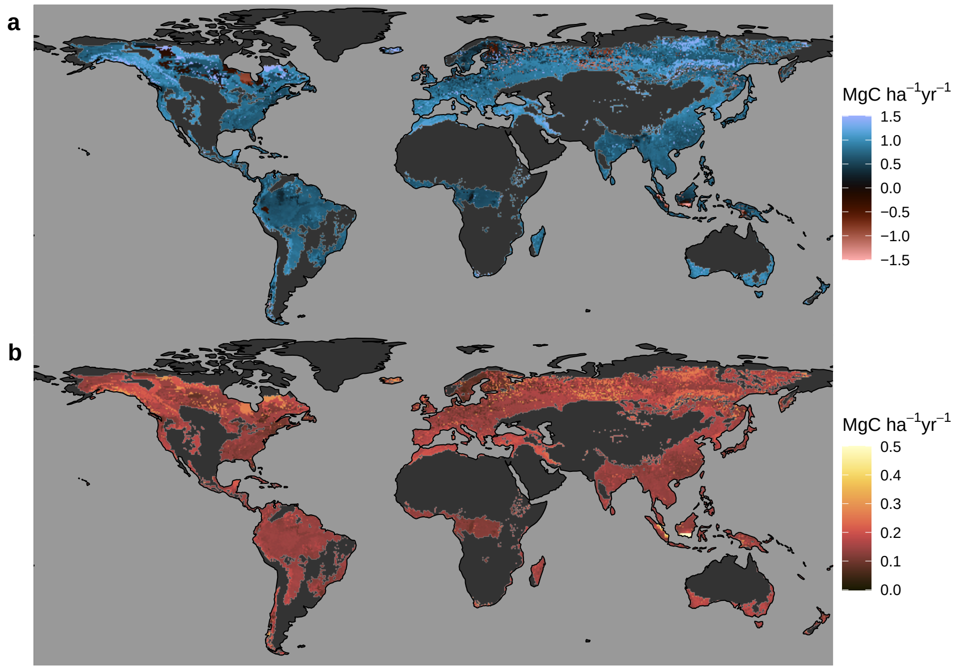

Figure S5: (a) C sink in aboveground biomass due to temporal changes in the self-thinning relationship. (b) Standard deviation of estimates across bootstraps. Values are expressed per unit forest area (gC m^{-2} yr^{-1}).

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