Supplementary Information

Atmospheric deposition, CO_2, and change in the land carbon sink

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Figure captions

Fig. S1. Map indicating the locations of the 23 forest sites with eddy-covariance data. The forests were located in temperate and boreal biomes across Europe and the USA. The boxes approximately indicate the extent of the analysis (Europe and the USA). The map was created using R software (version 3.1.1, URL http://www.R-project.org) and “mapdata” package (mapdata: Extra Map Databases, version 2.2), using free vector map data from Natural Earth (URL http://www.naturalearthdata.com).

Fig. S2. Plots showing the relationships between the individual trends in C fluxes and the trend of S deposition in the 23 studied forests.

Table S1. Rates of change in predictors per site. Individual Trends were computed using the robust Theil-Sen slope estimator. *P* indicates a two-tailed *P* (H1: trend $\neq 0$). Units are ppm for CO_2, kg ha^{-1} yr^{-1}for average N (nitrogen) and S (sulphur) deposition, kg ha^{-1} yr^{-2} for N and S deposition trends and, K yr^{-1} for temperature and standard deviation yr^{-1} for SPEI. Abbreviations: TS, Theil-Sen; for CO_2 source, ML indicates Mauna Loa and EC eddy covariance tower.

Table S2. Average rates of change in predictors for 1995–2011. Trends were calculated using GLMMs with random slopes, with the forest as a random effect and year as a fixed effect. Models also used an ARMA (1,0) autocorrelation structure. See Methods further details. Trend units are ppm yr^{-1} for CO_2, kg ha^{-1} yr^{-2} for N and S deposition, K yr^{-1} for temperature and standard deviation yr^{-1} for SPEI.

Fig. S1

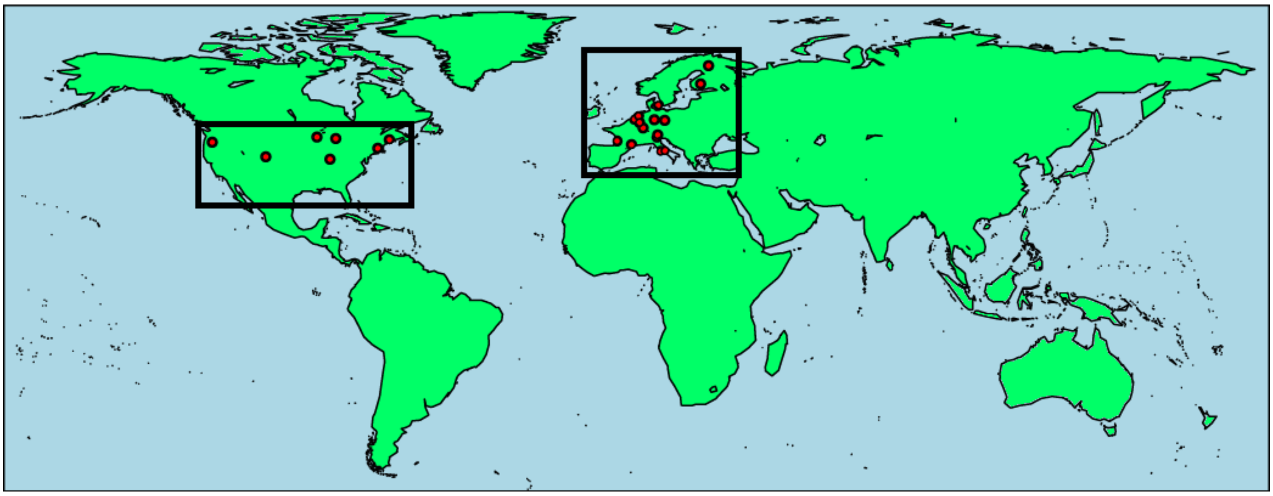
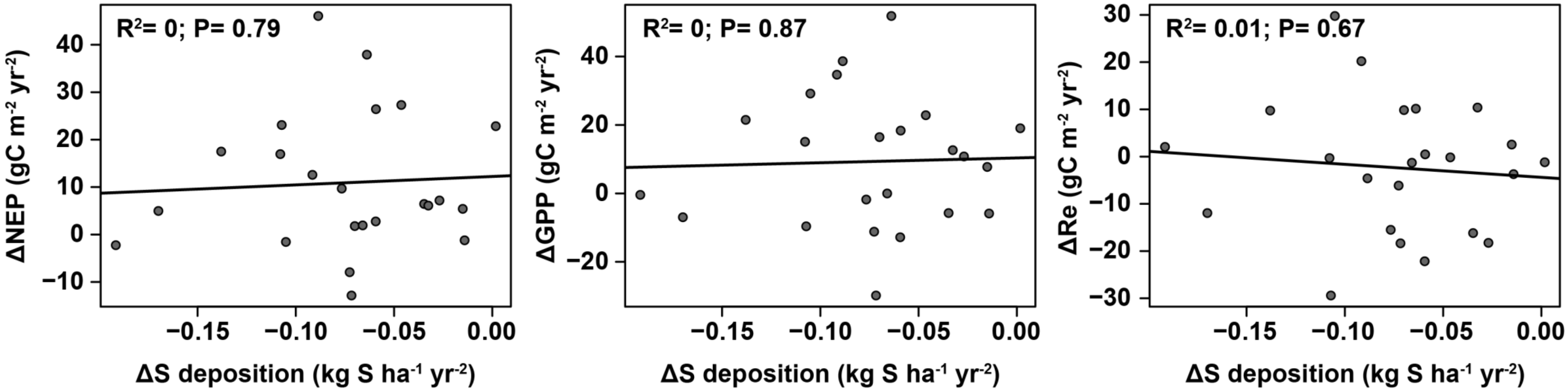


Fig S2



R²= 0; P= 0.79
ΔNEP (gC m⁻² yr⁻²)
ΔS deposition (kg S ha⁻¹ yr⁻²)
R²= 0; P= 0.87
ΔGPP (gC m⁻² yr⁻²)
ΔS deposition (kg S ha⁻¹ yr⁻²)
R²= 0.01; P= 0.67
ΔRe (gC m⁻² yr⁻²)
ΔS deposition (kg S ha⁻¹ yr⁻²)

Table S1

Forest	Source CO_2	ΔCO_2	N	S	N TS Trend	*P*	S TS Trend	*P*	MAT TS Trend	*P*
Brasschaat	ML	27.9	11.64 ± 0.39	2.29 ± 0.18	-0.23 ± 0.07	0.0215	-0.14 ± 0.02	0.0002	0.02 ± 0.02	0.3513
Castelporziano	EC	18.9	6.33 ± 0.57	1.28 ± 0.15	0.06 ± 0.19	0.8580	-0.06 ± 0.05	0.5915	0.00 ± 0.02	1.0000
Collelongo	ML	30.1	5.66 ± 0.20	1.14 ± 0.12	-0.04 ± 0.04	0.3502	-0.07 ± 0.01	0.0018	0.01 ± 0.02	0.2758
Hainich	EC	31.7	8.72 ± 0.38	1.15 ± 0.09	-0.24 ± 0.10	0.1148	-0.07 ± 0.01	0.0032	-0.01 ± 0.04	0.9453
Harvard	EC	36.3	6.23 ± 1.17	4.18 ± 0.32	-0.21 ± 0.04	0.0000	-0.09 ± 0.04	0.0644	0.06 ± 0.03	0.0104
Hesse	EC	35.2	8.76 ± 0.24	1.38 ± 0.08	0.07 ± 0.06	0.4285	-0.06 ± 0.01	0.0008	0.03 ± 0.02	0.4285
Howland MT	EC	22.6	3.00 ± 0.11	3.16 ± 0.12	-0.04 ± 0.02	0.1606	-0.03 ± 0.03	0.5022	-0.02 ± 0.06	0.8548
Howland F	EC	14.4	20.83 ± 0.13	2.91 ± 0.16	-0.04 ± 0.05	0.5334	-0.02 ± 0.06	1.0000	-0.03 ± 0.08	0.6404
Hyytiala	EC	37.4	2.83 ± 0.08	0.66 ± 0.05	-0.01 ± 0.02	0.8431	-0.03 ± 0.01	0.0003	0.05 ± 0.04	0.2350
Lavarone	EC	47.2	16.89 ± 0.32	1.14 ± 0.09	-0.14 ± 0.13	0.1753	-0.09 ± 0.01	0.0012	-0.05 ± 0.07	0.4655
Le Bray	EC	13.2	4.90 ± 0.37	1.16 ± 0.08	0.17 ± 0.10	0.1611	-0.03 ± 0.03	0.5334	-0.04 ± 0.04	0.1844
Loobos	EC	32.7	13.26 ± 0.51	1.80 ± 0.13	-0.33 ± 0.07	0.0041	-0.11 ± 0.02	0.0001	0.03 ± 0.02	0.4884
Metolius	EC	28.1	0.48 ± 0.02	0.38 ± 0.02	-0.01 ± 0.01	0.5915	0.00 ± 0.01	0.8580	-0.15 ± 0.04	0.0200
Morgan Monroe	EC	25.1	6.57 ± 0.29	6.03 ± 0.33	-0.05 ± 0.09	0.5830	-0.19 ± 0.06	0.0124	0.04 ± 0.04	0.2215
Niwot ridge	ML	21.5	3.46 ± 0.28	1.25 ± 0.10	-0.16 ± 0.07	0.0467	-0.07 ± 0.02	0.0075	-0.06 ± 0.03	0.0467
Park Falls	EC	31.2	4.48 ± 0.32	2.17 ± 0.16	-0.09 ± 0.05	0.1889	-0.08 ± 0.02	0.0160	-0.01 ± 0.05	0.9128
Puechabon	ML	25.4	6.18 ± 0.30	1.20 ± 0.10	-0.17 ± 0.07	0.2758	-0.07 ± 0.02	0.0617	0.02 ± 0.05	0.9378
Renon	EC	33.8	10.18 ± 0.25	0.83 ± 0.09	-0.10 ± 0.06	0.0769	-0.06 ± 0.01	0.0000	-0.03 ± 0.04	0.4277
Sodankyla	EC	28.8	1.12 ± 0.05	0.26 ± 0.02	0.00 ± 0.01	0.9453	-0.01 ± 0.00	0.0020	0.04 ± 0.07	0.6800
Soroe	EC	38.7	7.72 ± 0.24	1.25 ± 0.07	-0.02 ± 0.05	0.6693	-0.05 ± 0.01	0.0019	0.05 ± 0.03	0.0995
Tharandt	EC	27.2	9.72 ± 0.32	1.65 ± 0.15	-0.18 ± 0.06	0.0294	-0.11 ± 0.02	0.0001	0.04 ± 0.03	0.2763
UMBS	EC	26.7	4.79 ± 0.19	3.05 ± 0.20	-0.12 ± 0.04	0.0240	-0.17 ± 0.02	0.0012	0.02 ± 0.05	0.9514
Vielsalm	ML	23	10.07 ± 0.38	1.75 ± 0.13	-0.27 ± 0.07	0.0124	-0.11 ± 0.01	0.0001	0.03 ± 0.03	0.0995

Table S2

	Mean	SE	Total change 1995–2011	SE	*P*
CO_2	2.043	0.139	34.731	2.370	<0.001
Nitrogen	-0.087	0.017	-1.478	0.294	<0.001
Sulphur	-0.086	0.008	-1.464	0.138	<0.001
Temperature	0.003	0.008	0.047	0.136	0.73
SPEI	-0.001	0.005	-0.011	0.091	0.91

Summary of models and statistical analyses

1. Spatial variability of trends in C fluxes: relationships between annual trends in carbon fluxes and predictors

Models were adjusted using stepwise forward models using the following saturated model: C flux trend ~ MATc + MAPc + N dep + S dep + Age + corrected maturity age + leaf type + (ph + n.wet.t + s.wet.t)^2 + n.wet.t + deltacdioxide + MAT.t + SPEI.t + lai.max.t + Total Biomass, where ^2 indicates a first-order interaction of the variables within the brackets. Models were weighted for the n years of the plots. ".t" suffixes in variables indicate the trends of the variable. Significance levels: $^{(*)}$, *P* < 0.1; *, *P* < 0.05; **, *P* < 0.01; ***, *P* < 0.001.

GPP

	Estimate	**SE**	**Beta**	**SE**	***t***	**Pr(>|t|)**		**PMVD**
(Intercept)	-77.6300	15.5900	0.0000	0.0000	-4.979	0.000252	***	
deltacdioxide	2.1190	0.4382	0.7630	0.1578	4.836	0.000325	***	0.40
Total Biomass	0.0027	0.0006	0.6834	0.1600	4.271	0.000912	***	0.31
R^2	0.71	**R^2 adj**	0.66					

Re

	Estimate	**SE**	**Beta**	**SE**	***t***	**Pr(>|t|)**		**PMVD**
(Intercept)	-11.1942	11.1889	0.0000	0.0000	-1.000	0.336826		
Total Biomass	0.0041	0.0009	1.1697	0.2511	4.658	0.000553	***	0.37
MAT.t	228.3477	63.5489	0.7543	0.2099	3.593	0.003691	**	0.20
Corrected Mat. Age	-38.7487	15.8033	-0.5851	0.2386	-2.452	0.030485	*	0.11
R^2	0.68	**R^2 adj**	0.60					

NEP

	Estimate	**SE**	**Beta**	**SE**	***t***	**Pr(>|t|)**		**PMVD**
(Intercept)	-36.1746	7.3628	0.0000	0.0000	-4.913	9.65E-05	***	
deltacdioxide	1.4555	0.2473	0.7462	0.1268	5.885	1.15E-05	***	0.43
N dep	1.1745	0.3706	0.3943	0.1244	3.169	0.00505	**	0.14
MAT.t	-135.7225	39.6104	-0.4430	0.1293	-3.426	0.00283	**	0.14
R^2	0.71	**R^2 adj**	0.66					

LAI max

	Estimate	SE	Beta	SE	*t*	Pr(>|t|)	PMVD
(Intercept)	-0.1257	0.0427	0.0000	0.0000	-2.941	0.00807	
pH	0.0293	0.0084	0.5295	0.1520	3.483	0.00235	0.38
MAT.t	-0.3992	0.1849	-0.3345	0.1549	-2.159	0.04315	0.15

R^2 0.53 **R^2 adj** 0.48

2. Models to assess temporal contributions: relationships between C fluxes and predictor annual values using model averaging of generalized mixed models (only models with ΔAICc <4).

2.1 – Model averaging using inteannual data from the 23 forests

Saturated models' formulation: Response variable ~ maximum lai anomalies + (mean S deposition + S anomalies + CO_2)^2 + (mean N deposition + N anomalies + CO_2)^2 + (MATc + MAT anomalies + CO_2)^2 + (MAPc + SPEI + CO_2)^2 + mean S deposition * mean N deposition + MATc * MAPc + age * CO_2, where ^2 indicates a first-order interaction of the variables within the brackets. SE, standard error; Rel. Imp, relative importance of the predictors. Significance levels: $^{(*)}$, $P < 0.1$; *, $P < 0.05$; **, $P < 0.01$; ***, $P < 0.001$.

List of acronyms

age: Stand age

cdioxide.an: CO_2 concentration anomalies

lai.max.an: Maximum LAI anomalies

ndep: Mean N deposition

sdep: Mean S deposition

n.wet.an: N deposition anomalies

s.wet.an: S deposition anomalies

mat: climatic mean annual temperature

map: climatic mean annual precipitation

tmean.an: mean annual temperature anomalies

spei: Standardized Precipitation Evapotranspiration Index

2.1.1 Average model for NEP (for years 1995 - 2011)

Variable	Estimate	SE	Adj. SE	Rel. Imp	z value	Pr(>|z|)	
(Intercept)	11.420	24.240	24.350		0.47	0.6391	
age	-0.074	0.179	0.191	1.00	0.39	0.6973	
cdioxide.an	6.825	2.290	2.300	1.00	2.97	0.0030	**
lai.max.an	-1.413	6.981	7.006	0.14	0.20	0.8401	
n.wet.an	-7.667	14.370	14.390	0.39	0.53	0.5943	
ndep	0.018	1.876	1.999	0.97	0.01	0.9929	
s.wet.an	20.320	19.860	19.920	0.99	1.02	0.3078	
sdep	0.718	3.030	3.191	0.20	0.23	0.8219	
map	0.002	0.017	0.018	0.11	0.11	0.9157	
spei	-1.396	7.512	7.540	0.15	0.19	0.8531	
mat	0.067	0.769	0.818	0.11	0.08	0.9350	
tmean.an	-13.340	11.190	11.220	0.77	1.19	0.2344	
age:cdioxide.an	-0.064	0.019	0.019	1.00	3.29	0.0010	***
cdioxide.an:map	0.000	0.001	0.001	0.01	0.05	0.9620	
cdioxide.an:mat	-0.002	0.034	0.034	0.01	0.06	0.9561	
cdioxide.an:n.wet.an	-0.015	0.171	0.171	0.03	0.09	0.9291	
cdioxide.an:ndep	0.536	0.222	0.223	0.97	2.40	0.0162	*
cdioxide.an:s.wet.an	3.040	1.285	1.291	0.99	2.36	0.0185	*
cdioxide.an:sdep	-0.007	0.098	0.098	0.01	0.07	0.9454	
cdioxide.an:spei	0.009	0.202	0.203	0.01	0.05	0.9641	
cdioxide.an:tmean.an	-0.025	0.302	0.304	0.08	0.08	0.9335	
ndep:n.wet.an	0.533	1.273	1.275	0.21	0.42	0.6760	
ndep:sdep	0.002	0.160	0.172	0.01	0.01	0.9888	
sdep:s.wet.an	0.253	1.947	1.951	0.03	0.13	0.8970	

57 with models ΔAICc < 4

2.1.2 Average model for GPP (for years 1995 - 2011)

Variable	Estimate	SE	Adj. SE	Rel.Imp	z value	Pr(>|z|)	
(Intercept)	-9.272	27.020	27.140		0.342	0.7326	
age	-0.001	0.074	0.079	0.09	0.02	0.9869	
cdioxide.an	5.120	2.138	2.144	1.00	2.39	0.0169	*
lai.max.an	0.619	7.112	7.142	0.08	0.09	0.9309	
n.wet.an	9.598	11.720	11.760	0.71	0.82	0.4142	
ndep	-0.072	0.869	0.919	0.12	0.08	0.9374	
s.wet.an	-34.990	27.690	27.780	0.92	1.26	0.2079	
sdep	-0.007	2.101	2.224	0.08	0.00	0.9973	
map	0.001	0.021	0.022	0.10	0.03	0.9740	
spei	16.000	31.420	31.480	0.42	0.51	0.6113	
mat	0.574	1.901	1.989	0.28	0.29	0.7728	
tmean.an	15.790	18.100	18.140	0.73	0.87	0.3841	
age:cdioxide.an	0.000	0.004	0.004	0.01	0.08	0.9350	
cdioxide.an:map	0.000	0.001	0.001	0.01	0.04	0.9663	
cdioxide.an:mat	-0.063	0.223	0.224	0.11	0.28	0.7791	
cdioxide.an:n.wet.an	-0.677	1.092	1.093	0.37	0.62	0.5360	
cdioxide.an:ndep	0.014	0.089	0.089	0.04	0.15	0.8792	
cdioxide.an:s.wet.an	-2.775	2.448	2.453	0.70	1.13	0.2578	
cdioxide.an:sdep	0.002	0.060	0.061	0.00	0.03	0.9737	
cdioxide.an:spei	-0.037	0.516	0.518	0.03	0.07	0.9430	
cdioxide.an:tmean.an	0.339	0.941	0.943	0.21	0.36	0.7193	
map:spei	-0.002	0.022	0.022	0.01	0.08	0.9338	
mat:tmean.an	0.274	1.527	1.530	0.05	0.18	0.8579	

233 models with ΔAICc < 4

2.1.3 Average model for Re (for years 1995 - 2011)

Variable	Estimate	SE	Adj. SE	Rel.Imp	z value	Pr(>|z|)	
(Intercept)	-18.530	27.210	27.330		0.678	0.4977	
age	0.003	0.071	0.075	0.088	0.04	0.9721	
cdioxide.an	0.507	2.912	2.920	1.000	0.17	0.8622	
lai.max.an	8.362	17.610	17.650	0.314	0.47	0.6356	
ndep	-0.023	0.642	0.682	0.071	0.03	0.9729	
n.wet.an	19.640	12.050	12.090	0.896	1.62	0.1043	
sdep	-0.363	3.764	3.987	0.268	0.09	0.9275	
s.wet.an	-65.780	26.510	26.620	1.000	2.47	0.0135	*
mat	0.695	2.328	2.461	0.550	0.28	0.7778	
tmean.an	32.250	22.350	22.410	1.000	1.44	0.1502	
map	-0.001	0.019	0.020	0.081	0.04	0.9709	
spei	26.350	28.090	28.150	0.642	0.94	0.3492	
age:cdioxide.an	0.000	0.004	0.004	0.014	0.08	0.9332	
cdioxide.an:n.wet.an	-0.014	0.290	0.291	0.068	0.05	0.9628	
cdioxide.an:sdep	0.309	0.772	0.773	0.181	0.40	0.6889	
cdioxide.an:s.wet.an	-6.568	1.760	1.768	1.000	3.72	0.0002	***
cdioxide.an:mat	-0.321	0.463	0.464	0.422	0.69	0.4883	
cdioxide.an:tmean.an	1.172	1.466	1.469	0.547	0.80	0.4251	
cdioxide.an:map	0.000	0.001	0.001	0.003	0.04	0.9718	
cdioxide.an:spei	-0.068	0.665	0.668	0.061	0.10	0.9184	
sdep:s.wet.an	0.025	1.195	1.200	0.010	0.02	0.9835	
mat:tmean.an	1.214	2.966	2.971	0.219	0.41	0.6828	

181 models with ΔAICc < 4

2.1.4 Average model for LAI (for years 1995 - 2011)

Variable	Estimate	SE	Adj. SE	Rel.Imp	z value	$Pr(>\lvert z\rvert)$	
(Intercept)	0.030	0.096	0.096		0.31	0.754	
age	0.000	0.000	0.000	0.36	0.18	0.854	
cdioxide.an	0.018	0.015	0.015	1.00	1.22	0.223	
map	0.000	0.000	0.000	0.23	0.19	0.848	
spei	0.002	0.039	0.039	0.09	0.06	0.952	
mat	0.000	0.007	0.007	0.74	0.01	0.992	
tmean.an	-0.038	0.045	0.045	0.77	0.84	0.402	
ndep	0.000	0.002	0.002	0.09	0.02	0.981	
n.wet.an	0.001	0.009	0.009	0.11	0.07	0.945	
sdep	-0.012	0.018	0.019	0.89	0.63	0.528	
s.wet.an	-0.098	0.093	0.094	0.98	1.04	0.298	
age:cdioxide.an	0.000	0.000	0.000	0.31	0.58	0.565	
cdioxide.an:map	0.000	0.000	0.000	0.14	0.36	0.721	
cdioxide.an:mat	0.002	0.001	0.001	0.73	1.26	0.209	
cdioxide.an:tmean.an	-0.004	0.004	0.004	0.59	0.92	0.360	
cdioxide.an:sdep	-0.007	0.004	0.004	0.89	1.89	0.059	.
cdioxide.an:s.wet.an	-0.011	0.005	0.005	0.96	2.10	0.036	*
s.wet.an:sdep	0.004	0.015	0.015	0.18	0.27	0.787	
map:spei	0.000	0.000	0.000	0.01	0.06	0.953	
mat:tmean.an	0.001	0.004	0.004	0.10	0.19	0.852	

103 models with ΔAICc < 4

2.2. Results from the saturated (i.e., full) models (model summaries and temporal contributions) using temperature and SPEI for the warm half of the year (April – September) for the 23 forests.

NEP

	Value	Std.Error	DF	t-value	p-value
(Intercept)	25.26972	92.60895	250	0.272865	0.7852
lai.max.an	-13.9428	17.10382	250	-0.81519	0.4157
age	-0.08846	0.20282	14	-0.43614	0.6694
cdioxide.an	7.843715	5.1522	250	1.5224	0.1292
sdep	-3.33984	33.42586	14	-0.09992	0.9218
s.wet.an	10.18673	53.0002	250	0.192202	0.8477
ndep	-0.14425	6.85113	14	-0.02106	0.9835
n.wet.an	-26.7314	18.71101	250	-1.42864	0.1544
mat	1.342473	14.50814	14	0.092532	0.9276
temp.warm.an	-9.8591	19.28865	250	-0.51113	0.6097
map	-0.02279	0.1408	14	-0.16182	0.8738
spei.hot	21.19634	66.55602	250	0.318474	0.7504
age:cdioxide.an	-0.05766	0.02085	250	-2.76498	0.0061
sdep:s.wet.an	2.568747	9.23095	250	0.278276	0.781
cdioxide.an:sdep	-0.62546	0.949	250	-0.65907	0.5105
cdioxide.an:s.wet.an	3.690413	1.82765	250	2.019212	0.0445
ndep:n.wet.an	2.103415	1.7637	250	1.192614	0.2342
cdioxide.an:ndep	0.653451	0.23053	250	2.83462	0.005
cdioxide.an:n.wet.an	-0.81433	0.92146	250	-0.88373	0.3777
mat:temp.warm.an	-1.72551	2.32907	250	-0.74086	0.4595
cdioxide.an:mat	0.049929	0.3242	250	0.154004	0.8777
cdioxide.an:temp.warm.an	-0.48956	1.12629	250	-0.43466	0.6642
map:spei.hot	-0.03304	0.07926	250	-0.41688	0.6771
cdioxide.an:map	-0.00116	0.00674	250	-0.172	0.8636
cdioxide.an:spei.hot	1.309095	1.72203	250	0.760206	0.4478
sdep:ndep	0.05407	1.80042	14	0.030032	0.9765
sdep:map	0.005158	0.03464	14	0.148915	0.8837
mat:map	-0.0008	0.01802	14	-0.04414	0.9654
Phi	**Rsqm**	**Rsqc**	**AICc**	**BIC**	**logLik**
0.2954446	0.242374	0.242374	3546.102	3652.451	-1738.24

2.2.1 – NEP Temporal contributions

	mean y^{-1}	SE	*t*	*P*
Data trend	**7.599**	**2.099**	**3.62000**	**0.00040**
cdioxide	**10.640**	**1.090**	**9.75797**	**0.00000**
n.wet.an	0.775	1.520	0.50941	0.30710
s.wet.an	**-1.985**	**1.411**	**-1.40674**	**0.08489**
tmean.an	-1.015	1.502	-0.67621	0.25204
spei	0.130	1.500	0.08672	0.46574
LAI	-0.357	1.489	-0.23980	0.40606
Unknown	-0.588	4.077	-0.14418	0.44316

2.2.2 – GPP

	Value	Std.Error	DF	t-value	p-value
(Intercept)	15.1771	124.9807	250	0.121436	0.9034
lai.max.an	0.05699	24.90648	250	0.002288	0.9982
age	-0.01349	0.27361	14	-0.0493	0.9614
cdioxide.an	11.77647	7.11432	250	1.655319	0.0991
sdep	-7.17418	45.15145	14	-0.15889	0.876
s.wet.an	-74.7771	76.54979	250	-0.97684	0.3296
ndep	-1.43882	9.26116	14	-0.15536	0.8788
n.wet.an	7.18204	27.33785	250	0.262714	0.793
mat	2.86488	19.61705	14	0.146041	0.886
temp.warm.an	57.18129	28.53551	250	2.003864	0.0462
map	-0.03458	0.19014	14	-0.18187	0.8583
spei.hot	206.3117	97.88954	250	2.107597	0.0361
age:cdioxide.an	-0.05562	0.02882	250	-1.93013	0.0547
sdep:s.wet.an	6.93231	13.3947	250	0.517542	0.6052
cdioxide.an:sdep	2.1749	1.32897	250	1.636533	0.103
cdioxide.an:s.wet.an	-3.17238	2.63689	250	-1.20308	0.2301
ndep:n.wet.an	0.90267	2.5985	250	0.347381	0.7286
cdioxide.an:ndep	0.51316	0.32177	250	1.594812	0.112
cdioxide.an:n.wet.an	-0.94639	1.34532	250	-0.70347	0.4824
mat:temp.warm.an	-6.08596	3.46873	250	-1.75452	0.0806
cdioxide.an:mat	-0.87045	0.44943	250	-1.9368	0.0539
cdioxide.an:temp.warm.an	0.2967	1.66495	250	0.178203	0.8587
map:spei.hot	-0.19894	0.11673	250	-1.7042	0.0896
cdioxide.an:map	-0.00978	0.00927	250	-1.05477	0.2925
cdioxide.an:spei.hot	-0.16655	2.53177	250	-0.06578	0.9476
sdep:ndep	0.14508	2.43395	14	0.059605	0.9533
sdep:map	0.00852	0.04681	14	0.181913	0.8583
mat:map	-0.00079	0.02437	14	-0.03223	0.9747

Phi	Rsqm	Rsqc	AICc	BIC	logLik
0.2308718	0.220671	0.220671	3764.943	3871.291	-1847.66

Temporal contributions

	mean y-1	SE	*t*	*P*
Data trend	**10.386**	**2.854**	**3.63935**	**0.00030**
cdioxide	**9.308**	**1.330**	**6.99874**	**0.00000**
n.wet.an	-1.001	1.831	-0.54696	0.29423
s.wet.an	**4.498**	**1.594**	**2.82223**	**0.00419**
tmean.an	0.675	1.741	0.38795	0.35040
spei	1.790	2.453	0.72962	0.23564
LAI	0.001	1.766	0.00076	0.49970
Unknown	-4.886	5.289	-0.92377	0.18149

2.2.3 – Re

	Value	Std.Error	DF	t-value	p-value
(Intercept)	-12.1282	121.3939	250	-0.09991	0.9205
lai.max.an	15.39452	23.30676	250	0.660517	0.5095
age	0.07416	0.26581	14	0.279013	0.7843
cdioxide.an	4.39585	6.83368	250	0.643262	0.5206
sdep	-2.5121	43.83465	14	-0.05731	0.9551
s.wet.an	-85.2725	71.92902	250	-1.18551	0.2369
ndep	-1.70817	8.98793	14	-0.19005	0.852
n.wet.an	34.17782	25.53889	250	1.338266	0.182
mat	0.87198	19.0355	14	0.045808	0.9641
temp.warm.an	66.02805	26.4901	250	2.492555	0.0133
map	-0.00787	0.18462	14	-0.04262	0.9666
spei.hot	181.3342	91.1403	250	1.989616	0.0477
age:cdioxide.an	-0.0013	0.02767	250	-0.04704	0.9625
sdep:s.wet.an	4.50885	12.55709	250	0.359068	0.7198
cdioxide.an:sdep	2.87246	1.26747	250	2.266287	0.0243
cdioxide.an:s.wet.an	-7.00665	2.4785	250	-2.82697	0.0051
ndep:n.wet.an	-1.30446	2.41737	250	-0.53962	0.5899
cdioxide.an:ndep	-0.16081	0.30741	250	-0.52312	0.6014
cdioxide.an:n.wet.an	0.07522	1.25717	250	0.059829	0.9523
mat:temp.warm.an	-4.09729	3.20912	250	-1.27676	0.2029
cdioxide.an:mat	-0.90676	0.43085	250	-2.10459	0.0363
cdioxide.an:temp.warm.an	1.00636	1.54592	250	0.650974	0.5157
map:spei.hot	-0.1599	0.10861	250	-1.4722	0.1422
cdioxide.an:map	-0.00913	0.00892	250	-1.02256	0.3075
cdioxide.an:spei.hot	-1.67028	2.35747	250	-0.70851	0.4793
sdep:ndep	0.20576	2.36206	14	0.087112	0.9318
sdep:map	0.00105	0.04544	14	0.023075	0.9819
mat:map	0.00088	0.02365	14	0.037319	0.9708

Phi	Rsqm	Rsqc	AICc	BIC	logLik
0.263431	0.202652	0.202652	3726.29	3832.639	-1828.33

Temporal contributions

	mean y-1	SE	*t*	***P***
Data trend	2.792	2.818	0.99108	0.32250
cdioxide	-1.733	1.542	-1.12366	0.135034
n.wet.an	-1.561	2.087	-0.74765	0.230246
s.wet.an	**6.464**	**1.634**	**3.95578**	**0.000216**
tmean.an	1.585	1.937	0.81845	0.209777
spei	0.441	1.990	0.22161	0.41306
LAI	0.333	1.980	0.16795	0.433875
Unknown	-2.737	5.383	-0.50838	0.30745

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