

Supplementary Material

Paré et al. Effects of climate and forest composition on soil carbon cycling, soil organic matter stability and stocks in a humid boreal region

SM Table 1 Estimated parameters describing the linear regressions between component of soil respiration ($\text{kg C ha}^{-1} \text{ yr}^{-1}$) and cumulative degree days ($>5^\circ\text{C}$) for total soil respiration (Rs), heterotrophic respiration (Rh) as derived from the Bond-Lamberty (2004) equation and autotrophic respiration (Ra) calculated as the difference between the Rs and Rh for 183 days (May 1st-October 1st). No distinction is made per tree species given the absence of a significant species effect (Table 3).

Component	a	b (slope)	R ²	p
Rs	1618	3.71	0.64	<0.0001
Rh	1663	1.64	0.64	<0.0001
Ra	-45	2.07	0.65	<0.0001

SM Table2. Coefficients of the exponential function ($R_s = ae^{b(T_s)}$) relating field soil respiration (Rs) in $\mu\text{mol m}^{-2} \text{s}^{-1}$ to soil temperature (Ts) in $^{\circ}\text{C}$ taken at a depth of 10-15cm for each site for control and trenched plots. Nb indicates the number of respiration measurements performed by site.

Year(s)	Species	T.reg	Site	<i>a</i>	<i>b</i>	<i>R</i> ²	<i>Rs</i> 10°C ¹	<i>Q</i> ₁₀	<i>Nb</i>
control									
2002-2005	BF	Cold	FM	1.15	0.1139	0.46	3.59	3.12	420
2002-2005	BF	Cold	RIVM	1.26	0.0802	0.41	2.81	2.23	150
2002-2005	BF	Cold	RIVN1	1.35	0.0911	0.46	3.36	2.49	160
2002-2005	BF	Cold	RIVN2	1.40	0.0801	0.33	3.12	2.23	160
2003-2005	BF	Cold	SAUT	1.36	0.0984	0.41	3.64	2.68	120
2002-2005	BF	Mild	FR	1.49	0.0954	0.46	3.87	2.60	391
2002-2005	BF	Mild	KM82	1.01	0.1092	0.52	3.01	2.98	160
2002-2005	BF	Mild	PTR	1.49	0.0785	0.32	3.27	2.19	160
2002-2005	BF	Warm	SE	1.17	0.1066	0.58	3.40	2.90	520
2002-2005	BF	Warm	STMAT	1.12	0.1033	0.50	3.15	2.81	190
2002-2005	BF	Warm	SLAC7	1.32	0.0865	0.42	3.14	2.38	190
2002-2005	BF	Warm	DUC2	0.95	0.0959	0.58	2.48	2.61	160
2002-2005	BS	Cold	J1	0.85	0.1042	0.31	2.41	2.83	190
2002-2005	BS	Cold	J2	0.96	0.1020	0.52	2.66	2.77	399
2003-2005	BS	Cold	J3	2.03	0.0437	0.17	3.14	1.55	110
2002-2005	BS	Cold	CJC	1.01	0.0876	0.35	2.43	2.40	160
2004-2006	BS	Cold	EOBS	0.89	0.1040	0.35	2.51	2.83	250
2002-2005	BS	Cold	TIR	1.67	0.0742	0.28	3.51	2.10	522
2003-2005	BS	Warm	AVRP	1.39	0.0786	0.62	3.05	2.19	130
2003-2005	BS	Warm	REPO	1.26	0.0894	0.53	3.08	2.44	140
2002-2005	BS	Warm	PR	1.31	0.0901	0.52	3.23	2.46	409
trenched									
2002-2005	BF	Cold	FM	0.66	0.1211	0.43	3.36	2.22	421
2002-2005	BF	Mild	FR	1.04	0.0956	0.40	2.60	2.70	421
2002-2005	BF	Warm	SE	1.05	0.0942	0.53	2.57	2.69	421
2002-2005	BS	Cold	J2	0.65	0.1180	0.58	3.29	2.11	439
2004-2006	BS	Cold	EOBS	0.67	0.0978	0.36	1.79	2.66	250
2002-2005	BS	Cold	TIR	1.36	0.0661	0.24	1.94	2.63	504
2002-2005	BS	Warm	PR	1.09	0.0768	0.42	2.16	2.35	450

SM Table 3. Model coefficients estimated from the linear regressions on the laboratory incubation data. Effects of incubation temperature (°C), species (balsam fir vs. black spruce) and climate (cold vs. warm) on cumulative C and N mineralization were analyzed separately for each element in the two soil layers (organic and mineral), on 16 observations. Temperature was centered on its mean before analysis. Therefore, intercepts represent estimated means for balsam fir in cold climate at average temperature.

Response variable	Soil layer	Coefficient	Estimate	Stand. Error	<i>t</i>	<i>p</i> value	Adjusted R ²
Cumulative C mineralization	Organic	Intercept	68.35	4.98	13.71	< 0.001	0.93
		Species (spruce)	-11.96	5.75	-2.08	0.06	
		Climate (warm)	23.78	5.75	4.13	0.001	
		Temperature	5.64	0.41	13.63	< 0.001	
	Mineral	Intercept	19.41	1.65	11.73	< 0.001	0.86
		Species (spruce)	-2.41	1.91	-1.26	0.23	
		Climate (warm)	1.93	1.91	1.01	0.33	
		Temperature	1.31	0.14	9.55	< 0.001	
Cumulative N mineralization	Organic	Intercept	26.17	4.29	6.10	< 0.001	0.68
		Species (spruce)	-12.63	4.95	-2.55	0.03	
		Climate (warm)	21.84	4.95	4.41	< 0.001	
		Temperature	1.06	0.36	2.96	0.01	
	Mineral	Intercept	21.05	2.71	7.76	< 0.001	0.43
		Species (spruce)	-4.31	3.13	-1.38	0.19	
		Climate (warm)	-4.31	3.13	-1.38	0.19	
		Temperature	0.73	0.23	3.24	0.007	