



Supplement of

Validation of a new spatially explicit process-based model (HETERO-FOR) to simulate structurally and compositionally complex forest stands in eastern North America

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Table S1. Characteristics of the 200 plots selected from the permanent sample plots (PSP) of the forest inventory of Québec.

ID	PSP code	Dataset	Latitude	Longitude	Ecoregion	Stand Type	MAT (°C)	MAP (mm)	Soil Texture	Soil Depth (m)	Coarse Fraction (%)	Inventory period	Tree density (nb ha ⁻¹)	Basal area (m ² ha ⁻¹)	DBH ± SD (cm)
1	7100600102	Calibration	46.8646	-71.5609	St. L. Lowlands	Multi. Broad.	4.6	1254	Sandy Loam	0.43	40	2003-2016	1225	13.6	11.6 ± 2.7
2	9109606801	Calibration	46.7698	-72.1150	Canadian Shield	Mono. Conif.	4.5	1202	Loamy Sand	0.59	30	1997-2003	1175	31.9	17.4 ± 6.7
3	9203800101	Calibration	46.9498	-71.3493	Canadian Shield	Multi. Broad.	3.0	1446	Sandy Loam	0.50	30	2003-2016	900	21.1	16.0 ± 6.5
4	0099100802	Calibration	46.0587	-71.8860	St. L. Lowlands	Mono. Broad.	6.1	1208	Sandy Loam	0.25	40	2000-2009	525	19.6	19.5 ± 10.1
5	7000503001	Calibration	45.8172	-72.4834	St. L. Lowlands	Multi. Broad.	6.4	1160	Loamy Sand	0.61	2	1978-1985	1000	10.8	11.5 ± 2.0
6	7000503601	Calibration	45.9837	-72.3820	St. L. Lowlands	Mono. Broad.	6.2	1124	Loamy Sand	0.45	50	1994-2009	625	33.5	25.3 ± 6.5
7	7000503901	Calibration	46.0664	-72.8989	St. L. Lowlands	Mono. Broad.	5.9	1068	Loamy Sand	0.62	0	1978-1985	850	19.0	16.3 ± 4.4
8	7000700301	Calibration	45.8330	-72.1651	St. L. Lowlands	Mixed	6.3	1186	Sand	0.61	0	1994-2009	1050	18.5	14.1 ± 5.2
9	7000700302	Calibration	45.8293	-72.1654	St. L. Lowlands	Multi. Broad.	6.3	1186	Sandy Loam	0.61	5	1994-2009	1725	20.6	12.0 ± 2.9
10	7000701002	Calibration	46.1676	-72.1773	St. L. Lowlands	Mixed	6.0	1125	Loamy Sand	0.93	10	1978-1994	1375	26.7	14.9 ± 4.9
11	7000701302	Calibration	46.2536	-71.5688	Appalachians	Multi. Conif.	5.5	1271	Sandy Loam	0.25	40	1970-1978	1825	30.9	14.1 ± 4.2
12	7000701401	Calibration	46.2842	-72.3816	St. L. Lowlands	Multi. Conif.	5.7	1111	Loamy Sand	0.71	0	1994-2009	800	8.4	11.3 ± 2.6
13	8509700802	Calibration	46.1528	-71.9629	St. L. Lowlands	Mono. Broad.	6.0	1182	Sandy Loam	0.60	10	1994-2009	1175	25.3	15.3 ± 6.4
14	8509701202	Calibration	46.2210	-72.4497	St. L. Lowlands	Mixed	5.7	1111	Sandy Loam	0.58	5	1994-2009	1275	26.4	15.4 ± 5.1
15	9509901201	Calibration	45.9170	-71.7826	Appalachians	Mono. Conif.	5.8	1259	Sandy Loam	0.72	50	1995-2009	1200	36.5	18.3 ± 7.3
16	7601602801	Calibration	45.7838	-74.9165	Canadian Shield	Multi. Broad.	5.2	1133	Sandy Loam	0.62	5	1976-1984	625	18.6	18.7 ± 5.5
17	7000413101	Calibration	46.3336	-70.6159	Appalachians	Mono. Conif.	4.2	1292	Sandy Loam	0.40	45	1998-2010	1550	28.1	14.8 ± 3.5
18	7000600401	Calibration	46.5164	-71.3836	St. L. Lowlands	Multi. Conif.	5.5	1229	Sandy Loam	0.60	25	1979-1992	1925	38.3	15.0 ± 5.4
19	7000601401	Calibration	46.6504	-71.0161	St. L. Lowlands	Mixed	4.8	1319	Loamy Sand	0.71	0	1985-1992	1200	21.2	14.6 ± 3.7
20	7000602702	Calibration	46.7638	-71.0533	St. L. Lowlands	Mixed	4.8	1319	Sandy Loam	1.00	5	2003-2016	1525	31.0	15.3 ± 4.9
21	7000604201	Calibration	47.0501	-70.3498	St. L. Lowlands	Mono. Broad.	3.9	1260	Loamy Sand	0.61	50	1993-2003	850	23.8	17.7 ± 6.8
22	9801703801	Calibration	46.3833	-70.8661	Appalachians	Multi. Broad.	4.8	1343	Sandy Loam	0.40	45	1998-2010	1150	28.3	16.4 ± 6.8
23	7000402502	Calibration	45.3642	-71.4018	Appalachians	Multi. Broad.	5.4	1264	Loam	0.82	17	1997-2008	1325	17.1	12.4 ± 3.1
24	7000403101	Calibration	45.4328	-70.8167	Appalachians	Multi. Broad.	4.2	1321	Loam	1.00	15	1970-1978	1325	33.4	17.1 ± 5.4
25	7000405901	Calibration	45.7168	-70.7997	Appalachians	Mixed	4.5	1278	Loam	0.70	22	1978-1985	1225	17.5	13.1 ± 3.3
26	7000502201	Calibration	45.5324	-72.3002	Appalachians	Multi. Broad.	6.2	1232	Sandy Loam	0.81	20	1997-2008	1500	22.4	13.2 ± 3.8
27	9109602202	Calibration	45.6999	-71.9038	Appalachians	Multi. Conif.	6.1	1239	Loam	0.41	20	1997-2008	2050	30.4	13.3 ± 3.3
28	7000401201	Calibration	45.1665	-72.2333	Appalachians	Mono. Conif.	6.1	1279	Clay Loam	0.65	30	1997-2008	950	21.6	15.9 ± 6.2
29	7000402002	Calibration	45.3029	-71.8801	Appalachians	Mixed	5.8	1311	Loam	0.65	30	1978-1985	850	25.4	17.5 ± 8.7
30	7000406301	Calibration	45.7167	-72.1829	Appalachians	Multi. Broad.	6.3	1186	Loam	1.00	22	1970-1978	925	17.1	14.6 ± 4.8
31	7000700201	Calibration	45.7829	-71.9327	St. L. Lowlands	Mixed	6.1	1239	Loam	1.00	15	1970-1978	1250	24.9	15.4 ± 4.3
32	7000501701	Calibration	45.3667	-73.6827	St. L. Lowlands	Multi. Broad.	7.0	1084	Silt Loam	1.00	20	1970-1978	1150	15.1	12.7 ± 2.4
33	7601503402	Calibration	46.3630	-73.7288	Canadian Shield	Mono. Conif.	3.3	1214	Loamy Sand	0.12	25	2011-2019	1150	23.8	15.5 ± 5.1
34	7601804801	Calibration	46.0832	-73.8663	Canadian Shield	Multi. Broad.	4.2	1241	Silt Loam	0.90	15	1987-1997	1600	26.3	13.9 ± 4.0
35	7601805902	Calibration	46.2146	-73.7276	Canadian Shield	Multi. Broad.	3.3	1214	Sandy Loam	1.00	25	1976-1987	1075	22.9	15.1 ± 6.7
36	7608601801	Calibration	46.4666	-73.9653	Canadian Shield	Mixed	3.1	1153	Sandy Loam	0.63	7	2011-2019	1150	19.4	13.7 ± 5.2
37	7608608601	Calibration	46.9501	-73.7831	Canadian Shield	Mono. Broad.	2.5	1082	Sandy Loam	0.48	20	2009-2019	1300	16.7	12.5 ± 2.8
38	7608802501	Calibration	46.5279	-74.3552	Canadian Shield	Multi. Conif.	3.4	1160	Sandy Loam	0.73	25	2011-2019	1300	20.7	13.7 ± 3.8
39	8809402202	Calibration	46.9001	-74.2187	Canadian Shield	Mixed	2.7	1134	Sand	0.68	36	1988-1997	1800	34.6	14.9 ± 4.8
40	7209401901	Calibration	46.9521	-76.0684	Canadian Shield	Multi. Broad.	3.0	1047	Sandy Loam	0.68	42	1997-2006	1025	22.2	15.9 ± 4.9
41	7601500301	Calibration	46.1000	-74.8504	Canadian Shield	Multi. Broad.	4.4	1160	Sandy Loam	0.95	46	1997-2008	1150	22.3	15.0 ± 4.7
42	7601500302	Calibration	46.1015	-74.8454	Canadian Shield	Mono. Conif.	4.4	1160	Loamy Sand	0.25	11	1997-2008	2525	54.9	16.2 ± 3.8
43	7601604802	Calibration	46.0034	-75.5836	Canadian Shield	Mixed	4.8	1052	Loamy Sand	1.00	12	1984-1995	1425	30.2	15.8 ± 4.5
44	7601701802	Calibration	45.7162	-74.4661	Canadian Shield	Multi. Broad.	5.5	1111	Sandy Loam	0.32	35	1997-2008	950	16.9	14.0 ± 5.5
45	7601701901	Calibration	45.7167	-74.4984	Canadian Shield	Multi. Broad.	5.5	1111	Sandy Loam	0.84	50	2008-2019	875	14.9	13.8 ± 5.2
46	7608804502	Calibration	46.9768	-74.5992	Canadian Shield	Mono. Conif.	2.9	1131	Sand	0.68	36	1984-1997	1075	24.4	16.2 ± 5.2
47	7608902001	Calibration	46.2007	-75.3977	Canadian Shield	Multi. Broad.	4.6	1030	Sandy Loam	0.75	25	2006-2019	850	20.0	16.1 ± 6.4
48	9700900102	Calibration	46.1033	-75.5690	Canadian Shield	Mono. Conif.	4.8	1052	Loam	0.28	10	2006-2019	1250	38.6	18.7 ± 6.6
49	7100802201	Calibration	45.6666	-76.6337	Canadian Shield	Mixed	5.5	935	Sandy Loam	0.25	20	2003-2015	1150	23.1	14.7 ± 6.4
50	9701000501	Calibration	45.7164	-73.8491	St. L. Lowlands	Multi. Conif.	5.4	1194	Sand	0.70	5	2008-2019	1100	12.5	11.8 ± 2.5
51	9701000702	Calibration	45.7644	-74.1781	Canadian Shield	Multi. Broad.	5.4	1137	Loam	0.88	28	2008-2019	1425	18.4	12.5 ± 3.0

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52	9701000102	Calibration	45.5843	-73.9052	St. L. Lowlands	Multi. Broad.	6.2	1165	Clay	0.25	0	2008-2019	1250	25.7	14.9 ± 6.4
53	7601806901	Calibration	46.3842	-72.7838	St. L. Lowlands	Mixed	4.2	1138	Sandy Loam	0.57	5	1976-1986	1050	34.4	18.8 ± 8.0
54	7601900101	Calibration	46.3165	-72.7330	St. L. Lowlands	Mixed	5.4	1101	Loamy Sand	0.90	5	1997-2011	1150	15.4	12.6 ± 3.4
55	7601900102	Calibration	46.3127	-72.7330	St. L. Lowlands	Multi. Broad.	5.4	1101	Loamy Sand	0.90	1	1976-1986	525	7.0	12.3 ± 4.3
56	9109605001	Calibration	46.3801	-72.6006	St. L. Lowlands	Mono. Broad.	4.8	1141	Loamy Sand	0.50	5	1997-2011	975	22.8	16.0 ± 6.5
57	0919700302	Calibration	46.0757	-72.9684	St. L. Lowlands	Mono. Broad.	5.9	1068	Clay	0.25	0	2009-2019	925	18.6	15.2 ± 5.0
58	7000501402	Calibration	45.2682	-72.8880	St. L. Lowlands	Mono. Broad.	7.0	1179	Sandy Loam	0.50	28	1970-1978	900	10.0	11.7 ± 2.3
59	7000502301	Calibration	45.5500	-72.4157	St. L. Lowlands	Multi. Broad.	6.5	1190	Loam	1.00	30	1978-1985	1225	18.8	13.5 ± 3.6
60	7000502302	Calibration	45.5489	-72.4207	St. L. Lowlands	Mixed	6.5	1190	Sandy Loam	1.00	30	1978-1985	1300	16.8	12.5 ± 3.0
61	7000503402	Calibration	45.8961	-73.0670	St. L. Lowlands	Mixed	5.9	1068	Clay Loam	1.00	5	1997-2009	2125	33.9	13.8 ± 3.6
62	9109600201	Calibration	45.0626	-73.3241	St. L. Lowlands	Multi. Broad.	6.6	1218	Silty Clay	0.75	5	2012-2019	900	27.0	17.5 ± 10.0
63	9109600202	Calibration	45.0652	-73.3232	St. L. Lowlands	Multi. Broad.	6.6	1218	Silty Clay Loam	0.75	5	2012-2019	600	25.8	20.2 ± 12.0
64	9409800302	Calibration	45.9640	-72.9129	St. L. Lowlands	Multi. Conf.	5.9	1068	Loamy Sand	0.35	0	2009-2019	1525	31.9	15.3 ± 5.8
65	9509901801	Calibration	46.0790	-72.9656	St. L. Lowlands	Multi. Broad.	5.9	1068	Clay	0.50	0	2009-2019	725	47.7	25.4 ± 14.2
66	9801700102	Calibration	45.1358	-73.8198	St. L. Lowlands	Mixed	7.0	1084	Clay Loam	0.23	50	2012-2019	1250	32.7	17.0 ± 6.7
67	9801700702	Calibration	45.7652	-73.1124	St. L. Lowlands	Mono. Broad.	6.4	1107	Loam	1.00	10	1998-2009	550	24.1	21.6 ± 9.9
68	7100800601	Calibration	45.5500	-76.5836	Canadian Shield	Multi. Broad.	5.7	936	Clay	0.30	3	1994-2003	850	11.5	12.6 ± 3.8
69	7100801202	Calibration	45.5821	-76.2385	Canadian Shield	Mono. Broad.	5.7	972	Sandy Loam	0.40	62	2003-2015	700	13.0	14.5 ± 5.3
70	7100804701	Calibration	45.8494	-76.3838	Canadian Shield	Mono. Broad.	5.4	961	Loamy Sand	0.76	36	1994-2003	1000	30.1	18.1 ± 7.5
71	7601600401	Calibration	45.6164	-75.3663	Canadian Shield	Multi. Broad.	6.0	1064	Sand	0.76	2	2003-2015	1050	22.3	15.4 ± 5.8
72	7601603601	Calibration	45.8329	-75.7506	Canadian Shield	Mixed	5.2	1052	Sandy Loam	0.85	30	1977-1984	2225	41.1	14.5 ± 5.1
73	8909200201	Calibration	45.7183	-76.6392	Canadian Shield	Mixed	5.5	935	Sandy Loam	0.19	17	1994-2003	1050	19.9	15.0 ± 4.2
74	9402300301	Calibration	45.5835	-76.4333	Canadian Shield	Mixed	5.7	936	Sandy Loam	0.19	17	2003-2015	1650	30.1	14.5 ± 4.6
75	9402301402	Calibration	45.7803	-76.4471	Canadian Shield	Mono. Conf.	5.4	961	Sandy Loam	1.00	35	1994-2003	1650	28.4	14.2 ± 4.2
76	9402302002	Calibration	45.8472	-77.0530	Canadian Shield	Multi. Conf.	5.3	919	Sand	0.35	0	1994-2003	900	34.7	20.2 ± 9.2
77	7000600302	Calibration	46.4792	-70.2019	Appalachians	Multi. Conf.	3.8	1379	Loamy Sand	0.59	30	2003-2016	1575	19.7	12.3 ± 3.0
78	9309800502	Calibration	46.5155	-75.9893	Canadian Shield	Mixed	4.0	1055	Sand	0.95	15	2003-2015	1075	42.4	20.3 ± 9.6
79	7000602002	Calibration	46.6973	-70.6329	Appalachians	Multi. Broad.	5.0	1269	Sandy Loam	0.76	35	1970-1980	1175	16.8	13.1 ± 3.1
80	7000602101	Calibration	46.7002	-70.7832	Appalachians	Mixed	5.0	1269	Loam	0.38	50	2003-2016	1200	22.5	14.5 ± 5.3
81	7000602602	Calibration	46.7711	-70.6142	Appalachians	Mixed	4.7	1278	Clay Loam	0.38	15	1980-1993	1375	32.6	16.3 ± 5.9
82	7000603502	Calibration	46.8988	-70.1438	Appalachians	Multi. Conf.	3.9	1260	Sandy Loam	0.40	35	2003-2016	825	8.7	11.3 ± 2.6
83	8509701801	Calibration	46.8499	-70.0986	Appalachians	Mixed	3.7	1313	Sandy Loam	0.48	43	2003-2016	1600	27.2	13.9 ± 4.7
84	9109606402	Calibration	46.6874	-70.1931	Appalachians	Mono. Broad.	4.3	1277	Sandy Clay Loam	0.45	30	2003-2016	1025	26.1	16.4 ± 7.5
85	7601902902	Calibration	46.9184	-71.9443	Canadian Shield	Mono. Broad.	3.5	1253	Sandy Loam	0.44	30	1976-1988	900	22.4	16.5 ± 6.7
86	7100600802	Calibration	46.9700	-71.2668	Canadian Shield	Multi. Broad.	3.0	1446	Sandy Loam	0.44	13	1992-2003	1300	26.5	15.4 ± 4.7
87	8509702102	Calibration	46.9700	-69.7627	Appalachians	Mono. Broad.	4.0	1182	Sandy Clay Loam	0.70	30	1993-2003	700	25.6	19.5 ± 9.4
88	9109601202	Calibration	45.5361	-70.9366	Appalachians	Multi. Broad.	4.8	1283	Loam	1.00	25	1997-2008	1200	20.8	14.1 ± 4.6
89	7601902302	Calibration	46.8333	-72.5796	Canadian Shield	Multi. Broad.	3.9	1136	Loam	0.61	25	1986-1997	850	25.1	17.8 ± 7.8
90	1202700101	Calibration	45.0382	-73.7448	St. L. Lowlands	Multi. Broad.	6.7	1141	Loamy Sand	0.84	30	2012-2019	950	33.1	19.3 ± 8.5
91	7000601602	Calibration	46.6694	-70.8537	St. L. Lowlands	Multi. Broad.	5.0	1269	Clay Loam	0.50	10	1970-1985	625	17.9	17.3 ± 8.3
92	7000603201	Calibration	46.8334	-70.7993	St. L. Lowlands	Multi. Broad.	5.0	1269	Clay Loam	0.48	45	1970-1985	725	16.1	15.8 ± 5.8
93	9509901702	Calibration	46.0199	-72.5861	St. L. Lowlands	Mono. Conf.	6.2	1124	Loamy Sand	1.00	0	1995-2009	725	22.4	18.6 ± 7.2
94	1202700302	Calibration	45.1203	-74.3996	St. L. Lowlands	Mono. Conf.	7.1	1110	Loamy Sand	1.00	1	2012-2019	1550	24.6	14.0 ± 2.7
95	9401202302	Calibration	46.0632	-76.0329	Canadian Shield	Multi. Broad.	4.6	1080	Loamy Sand	0.71	40	1994-2003	1100	34.2	18.1 ± 8.4
96	7100804302	Calibration	45.8154	-76.7448	Canadian Shield	Multi. Broad.	5.5	935	Loam	1.00	0	1971-1978	1175	21.5	14.7 ± 4.0
97	9409800301	Calibration	45.9672	-72.9160	St. L. Lowlands	Multi. Conf.	5.9	1068	Loamy Sand	0.35	0	2009-2019	675	35.2	22.8 ± 12.1
98	7000500501	Calibration	45.0336	-74.0829	St. L. Lowlands	Mixed	7.0	1118	Sandy Loam	1.00	25	1970-1978	1575	31.7	15.6 ± 3.7
99	7000500502	Calibration	45.0306	-74.0795	St. L. Lowlands	Multi. Broad.	7.0	1118	Sand	1.00	3	1978-1985	525	13.3	17.2 ± 5.5
100	7000413401	Calibration	46.3674	-71.2666	Appalachians	Mixed	5.0	1323	Sandy Loam	0.50	10	1978-1985	675	12.0	14.4 ± 4.5
101	9203802402	Evaluation	47.4279	-70.8862	Canadian Shield	Multi. Conf.	0.6	1368	Sandy Loam	0.51	25	1992-2003	2725	40.7	13.3 ± 3.8
102	7100601702	Evaluation	47.0986	-70.7944	Canadian Shield	Multi. Broad.	3.3	1405	Sandy Loam	0.66	20	1992-2003	1025	25.1	16.5 ± 6.4
103	7100601402	Evaluation	47.0816	-70.9551	Canadian Shield	Mono. Broad.	3.3	1414	Loamy Sand	0.40	40	1978-1992	1200	33.6	18.2 ± 5.3
104	7000502202	Evaluation	45.5287	-72.3000	Appalachians	Multi. Broad.	6.2	1232	Loam	0.51	20	1970-1978	750	14.4	14.7 ± 5.5

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105	9209500601	Evaluation	45.1199	-73.2512	St. L. Lowlands	Mono. Broad.	6.6	1218	Clay Loam	0.75	0	2013-2019	325	15.6	21.4 ± 12.9
106	7000701802	Evaluation	46.3138	-72.1110	St. L. Lowlands	Mono. Broad.	6.0	1182	Sandy Loam	0.78	1	1970-1979	1175	19.7	14.2 ± 3.5
107	9209500602	Evaluation	45.1237	-73.2516	St. L. Lowlands	Multi. Broad.	6.6	1218	Silty Clay Loam	0.75	0	2013-2019	500	29.3	23.0 ± 15
108	9303702201	Evaluation	46.9832	-69.9499	Appalachians	Mono. Conf.	4.2	1186	Sandy Clay Loam	0.70	30	1993-2003	950	18.6	15.2 ± 4.3
109	9801701802	Evaluation	45.9804	-70.6522	Appalachians	Mono. Conf.	4.4	1289	Loam	0.50	50	1998-2010	1325	23.3	14.4 ± 4.1
110	7000410102	Evaluation	46.0991	-71.0720	Appalachians	Mixed	4.5	1344	Sandy Loam	0.75	25	1970-1978	975	14.6	13.5 ± 3.1
111	9204100202	Evaluation	45.4995	-75.9766	Canadian Shield	Multi. Broad.	5.8	982	Loam	1.00	5	2003-2015	850	21.1	15.6 ± 8.6
112	9109602401	Evaluation	45.7401	-71.9541	Appalachians	Multi. Broad.	6.1	1239	Loam	0.61	10	1991-1997	1675	23.4	12.9 ± 3.4
113	7000402901	Evaluation	45.3987	-71.3453	Appalachians	Multi. Broad.	5.2	1308	Sandy Clay Loam	0.36	60	1997-2008	1450	15.4	11.4 ± 2.5
114	7601802402	Evaluation	45.9133	-73.4626	Canadian Shield	Mixed	4.9	1154	Sandy Loam	0.90	2	1997-2011	1275	35.8	17.5 ± 7.2
115	7608500901	Evaluation	46.6672	-73.5334	Canadian Shield	Multi. Conf.	3.0	1020	Loam	0.45	35	1997-2010	1725	51.9	17.3 ± 9.2
116	8809403802	Evaluation	47.3221	-74.2668	Canadian Shield	Mixed	2.5	1091	Sandy Loam	1.00	17.5	1988-1998	1075	13.8	12.5 ± 2.5
117	7601806002	Evaluation	46.2303	-73.6499	St. L. Lowlands	Mono. Broad.	3.3	1214	Silt Loam	0.89	20	1987-1997	925	24.2	17.3 ± 5.9
118	7601801502	Evaluation	45.8343	-74.4604	Canadian Shield	Multi. Broad.	5.5	1111	Sandy Loam	1.00	35	1986-1997	750	14.1	14.9 ± 4.2
119	7601804601	Evaluation	46.0663	-74.0337	Canadian Shield	Mono. Broad.	4.3	1188	Sandy Loam	0.50	25	1976-1984	1000	29.3	18.5 ± 5.6
120	7100601701	Evaluation	47.0997	-70.7998	Canadian Shield	Mixed	3.3	1405	Sandy Loam	0.31	5	1971-1978	1700	21.9	12.5 ± 3.0
121	8909201102	Evaluation	46.5733	-72.9105	Canadian Shield	Mono. Conf.	3.6	1136	Loamy Sand	1.00	50	1997-2011	1000	30.5	18.7 ± 6.2
122	7607906102	Evaluation	47.4971	-72.3372	Canadian Shield	Mixed	2.9	1146	Sandy Loam	0.65	25	1987-1998	950	21.3	15.9 ± 5.8
123	7609500201	Evaluation	46.9499	-72.6706	Canadian Shield	Mixed	3.1	1079	Sandy Loam	0.47	15	1986-1997	1025	20.2	15.5 ± 3.5
124	7000403401	Evaluation	45.4335	-72.4665	St. L. Lowlands	Multi. Conf.	6.5	1190	Loam	1.00	40	1985-1997	1400	31.9	16.2 ± 5.2
125	7608804801	Evaluation	47.0074	-74.6442	Canadian Shield	Mono. Broad.	3.2	1130	Loamy Sand	0.50	28	1997-2007	1450	33.2	15.3 ± 7.7
126	9109602502	Evaluation	45.7280	-72.5387	St. L. Lowlands	Multi. Broad.	6.4	1160	Sand	0.75	5	1997-2009	925	23.6	16.7 ± 6.7
127	8809400101	Evaluation	45.7186	-75.2895	Canadian Shield	Mono. Conf.	5.1	1100	Sandy Loam	0.57	45	2003-2015	1850	60.6	19.0 ± 7.4
128	9401203802	Evaluation	46.3534	-75.9462	Canadian Shield	Mono. Conf.	4.3	1050	Silty Clay	0.50	1	1994-2003	1025	39.0	20.7 ± 7.7
129	7100808302	Evaluation	46.2340	-76.1389	Canadian Shield	Mixed	4.3	1045	Sand	0.90	60	2003-2015	1275	23.9	14.6 ± 5.1
130	7000600102	Evaluation	46.4195	-70.2195	Appalachians	Mono. Broad.	3.8	1379	Clay Loam	0.38	5	1970-1980	1075	14.6	12.9 ± 2.4
131	9801700802	Evaluation	45.7865	-70.9491	Appalachians	Mono. Conf.	4.7	1320	Sandy Loam	0.24	5	1998-2008	1350	39.3	17.8 ± 7.5
132	7000504102	Evaluation	45.9194	-71.9305	St. L. Lowlands	Multi. Broad.	6.1	1208	Sand	0.25	5	1970-1978	775	23.2	18.4 ± 6.7
133	7000404802	Evaluation	45.8630	-71.6532	St. L. Lowlands	Multi. Broad.	5.7	1289	Loam	1.00	30	1970-1978	750	18.6	16.2 ± 7.4
134	9801700902	Evaluation	45.8156	-70.7559	Appalachians	Mono. Broad.	4.5	1258	Loam	0.60	40	2010-2016	825	7.1	10.3 ± 1.8
135	7000500202	Evaluation	45.0300	-73.6461	St. L. Lowlands	Mono. Conf.	6.7	1141	Sandy Loam	0.84	30	1970-1978	1000	36.1	20.7 ± 5.6
136	7209603501	Evaluation	46.9157	-77.1315	Canadian Shield	Multi. Conf.	3.0	1005	Sandy Loam	0.87	15	2003-2016	825	8.4	11.2 ± 2.3
137	1202717401	Evaluation	45.0926	-73.9014	St. L. Lowlands	Mono. Broad.	7.0	1118	Loamy Sand	0.84	30	2012-2019	1225	20.6	14.1 ± 4.1
138	7000502802	Evaluation	45.6796	-72.2663	Appalachians	Mixed	6.3	1186	Sandy Loam	0.29	0	1978-1985	475	9.8	15.8 ± 3.9
139	7100804301	Evaluation	45.8165	-76.7503	Canadian Shield	Multi. Broad.	5.5	935	Silt Loam	0.40	0	1971-1978	525	12.9	16.2 ± 7.4
140	7000702402	Evaluation	46.4522	-71.7023	St. L. Lowlands	Multi. Broad.	5.5	1209	Sandy Loam	0.74	0	1970-1979	700	9.8	13.0 ± 3.1
141	76090001102	Evaluation	46.0629	-75.4531	Canadian Shield	Multi. Broad.	4.8	1052	Sand	0.70	8	1995-2006	350	3.5	10.9 ± 3.0
142	9701000701	Evaluation	45.7664	-74.1827	Canadian Shield	Multi. Broad.	5.4	1137	Sandy Loam	1.00	35	1997-2008	675	19.6	17.6 ± 7.9
143	9204100402	Evaluation	45.6677	-75.1439	Canadian Shield	Mixed	5.1	1100	Loamy Sand	0.76	5	1992-2003	925	24.7	16.6 ± 8.0
144	9109604401	Evaluation	46.2636	-76.0844	Canadian Shield	Multi. Broad.	4.3	1050	Sandy Loam	0.67	30	1991-2003	1225	24.9	15.2 ± 5.2
145	7100811201	Evaluation	46.4670	-76.1840	Canadian Shield	Multi. Broad.	3.9	1020	Sandy Loam	0.45	5	1971-1978	1175	25.1	15.9 ± 4.5
146	9700900701	Evaluation	46.2833	-75.5661	Canadian Shield	Multi. Broad.	4.6	1030	Silt Loam	0.75	0	2006-2019	450	30.1	25.2 ± 15.1
147	9401201902	Evaluation	45.9845	-75.8541	Canadian Shield	Multi. Broad.	4.8	1048	Loamy Sand	0.75	30	1994-2003	1175	31.6	17.4 ± 6.3
148	7109600202	Evaluation	45.8722	-76.2772	Canadian Shield	Mono. Broad.	5.4	993	Sandy Loam	0.70	15	1978-1994	825	21.8	17.6 ± 5.3
149	7109601702	Evaluation	46.1845	-76.1668	Canadian Shield	Mono. Broad.	4.3	1045	Sandy Loam	0.40	75	1978-1992	725	21.5	18.6 ± 5.6
150	7109802102	Evaluation	46.2789	-77.1662	Canadian Shield	Mono. Broad.	4.3	1025	Sandy Loam	0.49	35	1994-2003	850	13.3	13.8 ± 3.2
151	7601805901	Evaluation	46.2160	-73.7328	Canadian Shield	Multi. Broad.	3.3	1214	Sandy Loam	0.63	40	1976-1987	900	10.0	11.7 ± 2.3
152	7100803301	Evaluation	45.7508	-75.8823	Canadian Shield	Mono. Broad.	5.2	1045	Sandy Loam	0.67	80	1989-2003	450	12.2	18.2 ± 3.7
153	7000402001	Evaluation	45.2997	-71.8834	Appalachians	Mono. Conf.	5.8	1311	Loam	0.65	15	1978-1985	950	38.0	21.0 ± 8.5
154	7601701602	Evaluation	45.7160	-74.1380	Canadian Shield	Multi. Broad.	5.4	1137	Sand	0.31	5	1976-1984	875	16.0	14.0 ± 6.2
155	7000602701	Evaluation	46.7672	-71.0504	St. L. Lowlands	Mixed	4.8	1319	Loam	1.00	5	1970-1980	575	8.1	12.7 ± 4.4
156	7000502801	Evaluation	45.6834	-72.2660	Appalachians	Multi. Broad.	6.3	1186	Loam	0.75	20	1970-1978	1450	25.3	14.2 ± 4.6
157	7000401702	Evaluation	45.2630	-72.0988	Appalachians	Mono. Broad.	5.8	1311	Loam	0.65	25	1978-1985	1475	23.6	14.0 ± 2.7

ID	PSP code	Dataset	Latitude	Longitude	Ecoregion	Stand Type	MAT (°C)	MAP (mm)	Soil Texture	Soil Depth (m)	Coarse Fraction (%)	Inventory period	Tree density (nb ha ⁻¹)	Basal area (m ² ha ⁻¹)	DBH ± SD (cm)
158	7601803401	Evaluation	45.9832	-73.8179	Canadian Shield	Multi. Broad.	4.2	1241	Sandy Loam	0.67	45	1987-1997	1000	15.5	13.5 ± 4.1
159	7607901602	Evaluation	46.9831	-72.2450	Canadian Shield	Multi. Conif.	3.5	1152	Sandy Loam	0.22	10	2003-2016	1725	19.4	11.7 ± 2.3
160	7608603801	Evaluation	46.6000	-73.6002	Canadian Shield	Multi. Broad.	3.0	1096	Sandy Loam	0.12	70	1987-1997	1050	15.1	13.1 ± 3.4
161	8509700201	Evaluation	45.8831	-72.4666	St. L. Lowlands	Mixed	6.2	1124	Loamy Sand	0.61	2	1994-2009	1300	24.8	14.5 ± 5.6
162	9402301901	Evaluation	45.8501	-76.3501	Canadian Shield	Mixed	5.4	993	Sand	0.76	3	1994-2003	1675	38.8	16.4 ± 5.3
163	7000504002	Evaluation	46.0871	-72.2617	St. L. Lowlands	Mixed	6.2	1167	Sand	0.54	0	1970-1978	1175	14.5	12.3 ± 2.6
164	7601700901	Evaluation	45.6834	-74.2492	St. L. Lowlands	Mono. Conif.	5.4	1137	Sand	0.50	5	2008-2019	675	57.1	27.7 ± 18
165	7109803802	Evaluation	46.4961	-72.2113	Canadian Shield	Multi. Conif.	3.7	1008	Loamy Sand	0.75	35	1994-2003	825	32.1	20.8 ± 8.0
166	9409800501	Evaluation	46.0183	-72.9491	St. L. Lowlands	Mixed	5.9	1068	Sandy Loam	0.50	1	1994-2009	1350	32.3	16.1 ± 6.9
167	7109800101	Evaluation	46.0333	-77.2666	Canadian Shield	Mixed	4.9	970	Sandy Loam	0.17	25	2003-2015	775	18.8	16.0 ± 7.4
168	9209600401	Evaluation	45.9212	-76.0644	Canadian Shield	Mono. Conif.	4.6	1080	Sand	0.50	3	1992-2003	1175	19.3	14.1 ± 3.3
169	9209500902	Evaluation	45.6698	-74.8680	Canadian Shield	Multi. Broad.	5.3	1128	Loamy Sand	0.76	12	1992-2003	850	14.6	13.8 ± 5.5
170	9609800701	Evaluation	46.7574	-73.0509	Canadian Shield	Multi. Conif.	3.2	1062	Sandy Loam	0.75	15	1996-2006	1075	34.5	18.0 ± 9.3
171	9402302502	Evaluation	45.8825	-76.3052	Canadian Shield	Multi. Conif.	4.8	1036	Sand	1.00	5	1994-2003	1050	23.3	16.0 ± 5.3
172	9209600402	Evaluation	45.9251	-76.0650	Canadian Shield	Mono. Conif.	4.6	1080	Sand	0.50	1	1992-2003	700	13.0	15.1 ± 2.9
173	9303800601	Evaluation	46.5504	-70.2329	Appalachians	Mono. Conif.	3.8	1379	Sandy Clay Loam	0.75	20	2003-2016	1425	18.5	12.5 ± 3.2
174	9609800902	Evaluation	46.7910	-72.9640	Canadian Shield	Multi. Conif.	3.2	1062	Loam	0.72	20	1996-2006	1100	37.7	19.5 ± 7.4
175	9209501802	Evaluation	46.5172	-71.7652	St. L. Lowlands	Multi. Conif.	5.5	1209	Clay	0.50	5	2005-2016	900	33.9	20.7 ± 7.1
176	9700901901	Evaluation	46.4170	-74.8495	Canadian Shield	Mixed	3.9	1136	Loamy Sand	0.50	45	1997-2006	975	13.3	12.9 ± 2.5
177	7209600202	Evaluation	46.3537	-77.3827	Canadian Shield	Multi. Conif.	4.3	1025	Loamy Sand	0.40	20	1994-2003	925	23.8	16.4 ± 7.8
178	9801700901	Evaluation	45.8169	-70.7508	Appalachians	Mono. Conif.	4.5	1278	Clay Loam	0.70	20	1998-2010	1600	21.2	12.7 ± 2.7
179	1319601601	Evaluation	46.5942	-71.6289	St. L. Lowlands	Multi. Conif.	5.5	1209	Sandy Loam	0.70	15	2013-2018	1775	21.3	12.1 ± 2.7
180	7601505702	Evaluation	46.8669	-74.4971	Canadian Shield	Mono. Conif.	3.2	1180	Sandy Loam	0.78	35	1984-1997	750	19.0	17.2 ± 5.3
181	9801702101	Evaluation	46.0162	-71.1324	Appalachians	Multi. Conif.	4.8	1350	Loam	0.50	40	1998-2010	1500	25.3	14.0 ± 4.2
182	7601702201	Evaluation	45.7344	-74.6160	Canadian Shield	Mono. Broad.	5.5	1111	Loamy Sand	0.32	30	1997-2008	1350	24.8	14.6 ± 4.6
183	7109803902	Evaluation	46.5364	-77.0026	Canadian Shield	Multi. Conif.	3.7	1008	Loam	0.60	30	2003-2015	800	9.7	12.1 ± 3.0
184	8509702401	Evaluation	47.0833	-69.8498	Appalachians	Multi. Conif.	4.0	1182	Loam	0.73	15	2003-2016	1350	15.9	11.9 ± 2.8
185	7000408601	Evaluation	45.9000	-71.0662	Appalachians	Mono. Conif.	4.5	1344	Sandy Loam	1.00	0	1970-1978	1975	36.5	14.4 ± 5.3
186	9209500101	Evaluation	45.0222	-73.0612	St. L. Lowlands	Mono. Broad.	7.1	1177	Loam	0.28	60	2013-2019	375	12.9	17.7 ± 11.5
187	7601803302	Evaluation	45.9649	-73.8282	Canadian Shield	Multi. Broad.	4.2	1241	Silt Loam	0.28	40	2011-2019	875	10.3	11.9 ± 2.9
188	7100802202	Evaluation	45.6635	-76.6373	Canadian Shield	Mixed	5.5	935	Loam	1.00	0	2003-2015	1200	24.5	14.8 ± 6.5
189	7100600601	Evaluation	46.9669	-70.8997	St. L. Lowlands	Multi. Broad.	3.3	1414	Sandy Clay Loam	0.50	25	2003-2016	675	14.7	14.3 ± 8.8
190	7100801001	Evaluation	45.5832	-76.0660	Canadian Shield	Multi. Broad.	5.8	982	Loamy Sand	0.36	25	1971-1978	850	20.8	16.0 ± 7.5
191	7000603202	Evaluation	46.8347	-70.8047	St. L. Lowlands	Multi. Broad.	5.0	1269	Sandy Loam	0.48	40	1970-1980	800	22.6	18.1 ± 5.9
192	7601902101	Evaluation	46.8168	-72.0332	Canadian Shield	Mono. Broad.	4.5	1202	Sandy Loam	0.20	30	1993-2003	575	21.6	19.6 ± 9.9
193	7000503102	Evaluation	45.8138	-72.9689	St. L. Lowlands	Multi. Broad.	6.4	1107	Loamy Sand	0.90	5	1970-1978	950	31.7	18.1 ± 10.1
194	7609001002	Evaluation	46.0458	-75.6284	Canadian Shield	Multi. Broad.	4.8	1048	Loam	0.70	35	1976-1984	800	30.2	19.4 ± 10.4
195	7000500401	Evaluation	45.0329	-73.7826	St. L. Lowlands	Multi. Broad.	6.7	1141	Loam	0.24	20	1970-1978	1075	15.0	12.5 ± 4.6
196	7000404201	Evaluation	45.5507	-70.7655	Appalachians	Multi. Broad.	4.2	1321	Sandy Loam	0.50	25	1970-1978	1200	22.0	14.7 ± 4.0
197	7609605102	Evaluation	47.2333	-72.9328	Canadian Shield	Mixed	2.7	1056	Sandy Loam	0.50	30	1976-1986	1125	36.6	18.7 ± 8.2
198	7000500902	Evaluation	45.0829	-72.9816	St. L. Lowlands	Multi. Broad.	7.1	1177	Loam	0.28	60	1970-1978	650	9.9	12.9 ± 5.3
199	8809400501	Evaluation	45.8639	-76.6814	Canadian Shield	Mixed	5.5	935	Sand	0.82	10	1994-2003	1000	27.7	17.3 ± 7.4
200	7000501702	Evaluation	45.3706	-73.6827	St. L. Lowlands	Multi. Broad.	7.0	1084	Silt Loam	1.00	25	1978-1985	825	10.0	12.2 ± 2.4

Table S2: Values of the species-specific parameters for the 23 species.

Parameter	<i>Abies balsamea</i>	<i>Acer rubrum</i>	<i>Acer saccharinum</i>	<i>Acer saccharum</i>	<i>Betula alleghaniensis</i>	<i>Betula papyrifera</i>	<i>Betula populifolia</i>	<i>Fagus grandifolia</i>
<u>Light interception</u>								
k	0.52	0.5	0.5	0.5	0.5	0.44	0.5	0.5
SLA _{min}	4	13	13	13	12	12	12	18
SLA _{max}	10	29	29	31	30	26	26	38
<u>Tree dimensions</u>								
hcb%	0.385	0.514	0.435	0.432	0.441	0.55	0.529	0.342
Dd	13.39, 0, 377.28, 0	14.36, 0, 808.02, 0	11.18, 0, 1154.1, 0	13.69, 0, 1009.3, 0	16.25, 0, 731.36, 0	27.87, -0.054, 0, 0	27.87, -0.054, 0, 0	14.46, 0, 1066.1, 0
sh	1.45	1.5	1.4	1.4	1.35	1.45	1.45	1.45
Δdbh	0.27	0.26	0.36	0.24	0.31	0.21	0.14	0.33
Δhcb _{max}	0.57	0.67	0.72	0.79	0.66	0.58	0.53	0.77
Δh	-0.01458, 0, 0.35843, -0.05162, 0, 0, 0.00031	0.03254, 0, 0.32081, -0.04293, -0.00369, 0, 0	0.02796, 0, 0.16324, 0, 0, 0	0.02599, 0, 0.25119, 0, -0.00133, 0, 0	0.03775, 0, 0.22360, 0, -0.0028, 0, 0	-0.01292, 0, 0.26609, 0, 0, 0, 0	0.69964, 0, 0.4761, -0.14739, -0.12021, 0.0048, 0	0.01332, 0, 0.32819, 0, -0.00456, 0, 0
V _{tot}	0.53084, 1.75592, 0.00038	0.49607, 0.66107, 0.00303	0.54602, 0.66107, 0.00164	0.53996, 0.66107, 0.00207	0.45721, 0.66107, 0.0051	0.6992, 0.66107, -0.00313	0.59629, 0.66107, 0.00274	0.41566, 0.66107, 0.00555
V _{stem}	0.79719, 0.09193, -3.19374, 0.01073	0.80641, 0.18371, -2.06072, 0.01079	1.26747, 0.03923, -13.0956, 0.04836	1.03538, 0.02322, -6.47075, 0.03235	1.02541, 0.16264, -6.27454, 0.00283	0.99551, 0.1762, -4.26976, 0.01132	1.05144, 0.121, -3.4045, 0.00163	0.72585, 0.63748, -2.44405, 0.00217
<u>Carbon allocation</u>								
b _{leaf}	13.757, 1.672, 0	4.225, 1.691, 0	13.251, 1.453, 0	6.858, 1.661, 0	15.743, 1.475, 0	10.397, 1.567, 0	0.155, 2.44, 0	4.521, 1.671, 0
b _{structural_above}	0.694, 163, 0.94	0.45, 230.5, 0.945	2.212, 209.2, 1.019	0.479, 277.6, 0.971	0.093, 269.6, 0.951	0.488, 246.4, 0.985	0.348, 250.7, 0.994	0.266, 260.9, 0.946
p _{stem}	330	490	440	560	550	480	450	560
δ _{leaf}	0.126	1	1	1	1	1	1	1
δ _{fr}	0.84	1	1	1	1	1	1	1
<u>Respiration</u>								
a _{apwood}	0, 0.012, 0.345	0, 8.2348, 0.3589	0, 8.2348, 0.3589	0, 3.6951, 0.5191	0, 5.3663, 0.4044	0, 0, 0.8312	0, 0, 0.8312	0, 0.6236, 0.4818
CUE	0.2013, -0.0004, 0, -0.2348, 0	-0.2741, 0.0385, -0.0007, -0.2532, 0	-0.4455, 0.041, -0.00055, -0.2691, 0	-0.3074, 0.0333, -0.00051, -0.264, 0	-0.0012, 0.015, 0, -0.2411, 0	0.191, -0.00105, 0, -0.2634, 0	0.3038, 0, 0, 0	-0.2524, 0.0434, -0.00079, -0.1994, 0
<u>Water balance</u>								
bark%	0.107	0.079	0.079	0.135	0.089	0.112	0.112	0.057
p _{bark}	400	600	570	540	620	560	550	670
Chark _{ll}	-	-9.53, 0.18, 1.5	-9.53, 0.18, 1.5	-9.53, 0.18, 1.5	-9.53, 0.18, 1.5	-9.53, 0.18, 1.5	-9.53, 0.18, 1.5	-9.53, 0.18, 1.5
Chark _{ld}	-	-4.15, 0.09, 3.4	-4.15, 0.09, 3.4	-4.15, 0.09, 3.4	-4.15, 0.09, 3.4	-4.15, 0.09, 3.4	-4.15, 0.09, 3.4	-4.15, 0.09, 3.4
p _{1sw} , p _{2sw}	3.278, 1.452	1.53, 1.989	0.149, 4.456	0.61, 2.813	0.114, 4.821	1.022, 2.327	0.499, 3.02	3.278, 1.452
<u>Phenology</u>								
t ₀	-	244	244	244	244	244	244	244
T _{min} , T _{max} , T _{opt}	-	-	-39.02, 28.33, 6.61	-	-	-	-	-
C _a , C _b , C _c	-	9.75, -22.99, -6.42	-	0.58, -23.04, -15.36	1.11, -21.70, -20.77	0.98, -15.58, -11.91	0.98, -15.58, -11.91	5.16, -17.87, -8.30
C*	-	1.09	153.44	171.99	8.96	90.65	90.65	2
F _b , F _c	-	-0.54, 6.83	-40, 6.38	-0.44, 6.86	-0.26, 7.39	-1.09, 0.80	-1.09, 0.80	-0.33, 3.95
T _{b_for}	-	0	0	0	0	0	0	0
F*	-	17.70	8.82	15.46	25.92	33.54	33.54	34.53

Parameter	<i>Fraxinus americana</i>	<i>Larix laricina</i>	<i>Picea glauca</i>	<i>Picea mariana</i>	<i>Picea rubens</i>	<i>Pinus resinosa</i>	<i>Pinus strobus</i>	<i>Populus grandidentata</i>
<u>Light interception</u>								
k	0.5	0.5	0.52	0.5	0.5	0.42	0.45	0.5
SLA _{min}	11.5	9	2.8	2.8	2.8	2.8	2.8	10
SLA _{max}	22	15	5.5	7	7	6.4	8	20
<u>Tree dimensions</u>								
hcb%	0.559	0.42	0.389	0.527	0.475	0.606	0.523	0.652
Dd	15.76, 0, 630.89, 0	7.88, 0, 772.86, 0	11.64, 0, 498.69, 0	8.52, 0, 273.51, 0	12.98, 0, 351.01, 0	12.68, 0, 495.34, 0	12.68, 0, 495.34, 0	15.92, 0, 357.61, 0
sh	1.35	1.25	1.4	1.5	1.4	1.45	1.45	1.4
Δdbh	0.45	0.25	0.28	0.18	0.20	0.31	0.45	0.41
Δhcb _{max}	0.89	0.63	0.61	0.40	0.50	0.62	0.59	0.90
Δh	-0.02761, 0, 0.25853, 0, 0, 0	0.02271, 0, 0.24087, 0, 0, 0	-0.00493, 0, 0.31983, -0.03447, 0, 0	0.00503, 0, 0.32143, -0.02373, 0, 0	-0.00832, 0, 0.28869, 0, 0	-0.03786, 0, 0.3715, 0, 0	0.00167, 0, 0.36215, -0.07123, 0, 0	0.02202, 0, 0.32528, -0.03828, -0.00469, 0, 0
V _{tot}	0.38797, 0.66107, 0.00587	0.21216, 1.75592, 0.00848	0.46163, 1.75592, 0.00349	0.4975, 1.75592, 0.00241	0.4975, 1.75592, 0.00241	0.3454, 1.75592, 0.00295	0.43701, 1.75592, 0.00309	0.68385, 0.66107, -0.00229
V _{stem}	0.88692, 0.44252, -4.04065, 0.00604	0.63602, 0.16289, -4.36819, 0.01041	0.81774, 0.10166, -3.71798, 0.00527	0.9591, 0.10757, -5.4776, 0.00229	0.9591, 0.10757, -5.4776, 0.00229	0.89162, 0.10043, -5.51422, 0.02709	1.00336, 0.05625, -5.99562, 0.02365	1.05805, 0.08529, -4.62055, 0.00502
<u>Carbon allocation</u>								
b _{leaf}	10.719, 1.445, 0	20.271, 1.404, 0	32.006, 1.456, 0	26.732, 1.469, 0	28.04, 1.492, 0	1.402, 2.149, 0	3.678, 1.885, 0	4.597, 1.568, 0
b _{structural_above}	0.674, 250.4, 0.909	0.3, 186.2, 0.9	0.498, 166.3, 0.894	0.765, 182.9, 0.906	0.765, 182.9, 0.906	0.496, 162.9, 0.976	0.237, 166.3, 0.947	0.853, 180.2, 1.031
p _{stem}	550	490	330	380	370	410	340	360
δ _{leaf}	1	1	0.185	0.2182	0.2182	0.3333	0.6	1
δ _{fr}	1	1	1	1	1	1	1	0.9125
<u>Respiration</u>								
resapwood	14.57, -5.95, 0.603	0, -2.0852, 0.6455	0, 1.7229, 0.2557	0, 0.2637	0, 0.2637	0, 0.5362	0, 0.6132, 0.165	0, 2.9998, 0.3977
CUE	0.1304, 0.008, 0, -0.26, 0	-0.4230, 0.0563, -0.00112, -0.3355, 0	0.32257, 0, -0.00015, -0.23955, 0	0.475, -0.0092, 0, -0.2704, 0	0.20167, 0, 0, -0.333386, 0	0.234227, 0, 0, -0.2480907, 0	0.3876, 0, 0, -0.15016, 0	0.25466, 0, 0.00019, -0.29478, 0
<u>Water balance</u>								
bark%	0.138	0.123	0.115	0.115	0.115	0.138	0.138	0.126
p _{bark}	500	300	390	420	320	270	470	590
Chark _{ll}	-9.53, 0.18, 1.5	-	-	-	-	-	-	-9.53, 0.18, 1.5
Chark _{ld}	-4.15, 0.09, 3.4	-	-	-	-	-	-	-4.15, 0.09, 3.4
p _{1sw} , p _{2sw}	0.456, 3.114	1.069, 2.287	0.149, 4.456	1.069, 2.287	0.348, 3.41	0.114, 4.821	0.558, 2.904	0.348, 3.41
<u>Phenology</u>								
t ₀	244	244	-	-	-	-	-	244
T _{min} , T _{max} , T _{opt}	-39.83, 49.92, 13.05	-	-	-	-	-	-	-
C _a , C _b , C _c	-	0.60, -23.82, -29.05	-	-	-	-	-	0.62, -21.62, -22.94
C*	179.57	106	-	-	-	-	-	129.45
F _b , F _c	-40, 12.42	-0.15, -2.84	-	-	-	-	-	-0.08, 18.88
T _{b_for}	0	0	-	-	-	-	-	0
F*	1.00	42.92	-	-	-	-	-	14.99

Parameter	<i>Populus tremuloides</i>	<i>Prunus serotina</i>	<i>Quercus rubra</i>	<i>Thuja occidentalis</i>	<i>Tilia americana</i>	<i>Tsuga canadensis</i>	<i>Ulmus americana</i>
<u>Light interception</u>							
k	0.64	0.5	0.53	0.52	0.5	0.5	0.5
SLA _{min}	10	9.9	9.5	3.2	15	4.2	8
SLA _{max}	20	28.8	22	7.9	35	7.9	18
<u>Tree dimensions</u>							
hcb%	0.613	0.545	0.509	0.352	0.536	0.317	0.438
Dd	15.92, 0, 357.61, 0	11.58, 0, 879.34, 0	16.54, 0, 653.97, 0	7.38, 0, 647.36, 0	9.91, 0, 1073.95, 0	12.58, 0, 840.29, 0	27.43, 0, 244.6, 0
sh	1.35	1.35	1.35	1.4	1.4	1.45	1.35
Δdbh	0.35	0.34	0.49	0.19	0.31	0.25	0.34
Δhcb _{max}	0.78	0.67	0.63	0.35	0.67	0.54	0.77
Δh	0.03288, 0, 0.29206, - 0.03627, -0.00206, 0, 0 0.66235, 0.66107, - 0.000014	0.08689, 0, 0.14758, 0, 0, 0, 0	0.0613, 0, 0.26568, 0, - 0.00577, 0, 0	-0.02629, 0, 0.31975, - 0.01188, 0, 0, 0.00035	-0.02057, 0, 0.31176, 0, 0, 0, 0	0.00224, 0, 0.31578, - 0.02399, 0, 0, 0	-0.04116, 0, 0.34009, 0, 0, 0, 0
V _{tot}	0.92019, 0.59256, - 5.62921, 0.00232	0.52901, 0.66107, 0.0029	0.60311, 0.66107, - 0.00063	0.23046, 1.75592, 0.01318	0.55324, 0.66107, 0.00332	0.44935, 1.75592, 0.00355	0.70379, 0.66107, - 0.00477
V _{stem}		0.9689, 1.02493, - 4.68341, 0.00934	0.94214, 0.2589, - 1.66521, 0.00105	0.8946, 0.06342, - 2.98938, -0.00153	0.8718, 0.15357, - 0.65698, -0.00943	0.82125, 0.0956, - 2.75837, -0.00781	0.90049, 0.12354, - 2.5578, -0.00236
<u>Carbon allocation</u>							
b _{leaf}	5.468, 1.537, 0	9.271, 1.42, 0	3.041, 1.804, 0	2.326, 2.01, 0	5.786, 1.569, 0	5.804, 1.837, 0	6.603, 1.552, 0
b _{structural_above}	0.182, 190.9, 0.985	0.462, 236.1, 0.935	0.308, 281.5, 0.975	0.431, 130, 0.906	0.892, 169.7, 0.966	0.645, 192, 0.937	0.248, 237.6, 1
p _{stem}	350	470	560	290	320	380	460
δ _{leaf}	1	1	1	0.4083	1	0.2	1
δ _{fr}	1	1	1	1	1	0.8588	1
<u>Respiration</u>							
r _{asapwood}	0, 0, 0.487	-12.769, 4.0722, 0.0282	-13.88, 4.0108, 0.05	0, 8.1887, 0.2368	0, -5.0683, 0.608	0, 1.988, 0.2422	14.57, -5.95, 0.603
CUE	0.4471, 0, 0, 0	0.6415, 0, 0, 0	-0.5545, 0.0506, - 0.0008, -0.3427, 0	0.3751, 0, 0, 0	-0.65807, 0.05238, - 0.000729, -0.32519, 0	-0.3283, 0.0418, - 0.00075, -0.2164, 0	-0.1282, 0.01911, 0, - 0.3006, 0
<u>Water balance</u>							
bark%	0.126	0.084	0.167	0.123	0.095	0.145	0.123
p _{bark}	500	630	680	420	480	460	440
Chark _{ll}	-9.53, 0.18, 1.5	-9.53, 0.18, 1.5	-9.08, 0.16, 6	-	-9.53, 0.18, 1.5	-	-9.08, 0.16, 6
Chark _{ld}	-4.15, 0.09, 3.4	-4.15, 0.09, 3.4	-4.21, 0.08, 10.9	-	-4.15, 0.09, 3.4	-	-4.21, 0.08, 10.9
p _{lsw} , p _{2sw}	1.79, 1.867	0.109, 4.883	0.149, 4.456	0.218, 3.968	0.149, 4.456	3.278, 1.452	0.136, 4.576
<u>Phenology</u>							
t _o	244	244	244	-	244	-	244
T _{min} , T _{max} , T _{opt}	-	-12.69, 23.58, 18.42	-	-	-	-	-
C _a , C _b , C _c	0.62, -21.62, -22.94	-	4.11, 12.03, 1.96	-	2.70, 13.72, 3.24	-	2.70, 13.72, 3.24
C*	129.45	89.24	10.74	-	19.22	-	19.22
F _b , F _c	-0.08, 18.88	-0.97, 11.67	-0.43, 7.13	-	-15.38, 3.70	-	-15.38, 3.70
T _{b_for}	0	0	0	-	0	-	0
F*	14.99	1.94	18.70	-	34.27	-	34.27

Table S3: Description and values for generic parameters used in HeteroFor.

Symbol	Description	Units	Conifers	Broadleaved	Source
<u>Tree dimensions</u>					
hlce%	height of largest crown extension	m m ⁻¹	-	0.44	Jonard et al. (2020)
<u>Carbon allocation</u>					
I _{root_shoot}	root to shoot ratio	kgC kgC ⁻¹	0.20	0.18	Schepaschenko et al. (2017)
I _{fr_leaf}	fine root to leaf ratio	kgC kgC ⁻¹		1	Fixed
δ _{root}	root relative loss rate	kgC kgC ⁻¹ yr ⁻¹	0.01	0.02	Fixed
δ _{branch}	branch relative loss rate	kgC kgC ⁻¹ yr ⁻¹	0.01	0.02	Fixed
r _{leaf}	leaf retranslocation rate	kgC kgC ⁻¹ yr ⁻¹	0.255	0.216	Vergutz et al. (2012)
r _{root}	fine root retranslocation rate	kgC kgC ⁻¹ yr ⁻¹	0.255	0.216	Vergutz et al. (2012)
<u>Water balance</u>					
C _{foliage_sp}	foliage storage capacity	l per m ² of leaf	0.03	0.22	André et al. (2008)
g _{s_bark_min}	bark minimum vapour conductance	m s ⁻¹	0.0077519		soil values x 100
g _{s_bark_max}	bark maximum vapour conductance	m s ⁻¹		0.125	soil values x 100
g _{s_soil_min}	soil minimum vapour conductance	m s ⁻¹	0.000077519		Dufrêne et al. (2005)
g _{s_soil_max}	soil maximum vapour conductance	m s ⁻¹		0.00125	Dufrêne et al. (2005)
<u>Phenology</u>					
			Evergreen	Deciduous	
t2a_shift	budburst shift	Days	-	15	de Wergifosse et al. (2020)
LD*	leaf development threshold	°C	-	312.0	de Wergifosse et al. (2020)
t ₃	ageing starting date	day of year	-	213	Dufrêne et al. (2005)
T _{b_age}	base temperature for ageing	°C	-	20.0	Dufrêne et al. (2005)
A*	ageing threshold	°C	-	230.0	Dufrêne et al. (2005)
y	leaf yellowing parameter	adimensional	-	0.27	de Wergifosse et al. (2020)
Y*	yellowing threshold	°C	-	0.01	Fixed
R _{fall}	falling rate	s m ⁻¹ d ⁻¹	-	0.0075	de Wergifosse et al. (2020)
F _{ampl}	frost amplifier coefficient	adimensional	-	2.0	de Wergifosse et al. (2020)

Table S4: Description of the species-specific parameters used in the regeneration module

Parameter ⁽¹⁾	Unit	Equation	<i>Acer rubrum</i>	<i>Acer saccharum</i>	<i>Betula alleghaniensis</i>	<i>Fagus grandifolia</i>	<i>Fraxinus americana</i>	<i>Prunus serotina</i>
Height (a, b, c)	cm	$h = a + b \cdot d_{collar} + c \cdot d_{collar}^2$	18.8311, 141.8704, -4.8422	-5.2555, 130.4936, -2.9751	49.3907, 132.3505, -4.3743	19.2229, 111.9764, -2.3895	-23.6296, 171.6066, -6.6322	14.2146, 119.8121, -3.0396
Collar diameter (a, b, c)	cm	$d_{collar} = a + b \cdot h + c \cdot h^2$	1.9987e-01, 5.7729e-03, 2.6755e-06	4.561e-01, 8.1325e-03, 3.184e-06	-2.6954e-01, 7.7776e-03, 4.1524e-07	0, 6.4507e-03, 6.1948e-06	1.318e-01, 5.4801e-03, 3.1385e-06	-1.3506e-01, 7.952e-03, 2.3195e-06
Dbh (a, b)	cm	$dbh = a + b \cdot d_{collar}$	-0.3276, 0.7841	-0.3362, 0.8215	-0.4305, 0.8166	-0.2832, 0.7517	-0.2175, 0.7908	-0.5561, 0.8702
Maximum crown radius (a, b)	cm	$r_{crown_max} = a + b \cdot h$	13.6977, 0.226	42.7304, 0.1686	0, 0.316	2.0317, 0.3486	19.8907, 0.1762	5.5739, 0.3042
Aboveground woody biomass (b)	g OM	$b_{abg_woody} = b \cdot (h \cdot d_{collar}^2)$	0.1201	0.1445	0.115	0.1211	0.1895	0.1066
Leaf biomass (a, b)	g OM	$b_{leaf} = a \cdot d_{collar}^b$	15.008, 1.726	21.341, 1.697	24.4, 1.682	13.795, 1.613	35.896, 1.513	23.589, 1.459
Height growth function (a, b, c)	cm yr ⁻¹	$\Delta h = a + b \cdot \sqrt{h} \cdot \left(\frac{1}{1 + e^{\frac{1 - transmittance}{c}}} \right)$	-0.7865, 2.1705, 5.8235	7.1005, 1.9542, 17.2849	10.816, 1.4484, 11.8575	-1.4656, 1.8657, 4.2172	0.7866, 2.4417, 4.2755	-5.6705, 2.6305, 4.1958

⁽¹⁾ All parameters for these 6 species were obtained by fitting equations with data from Beaudet (2004).

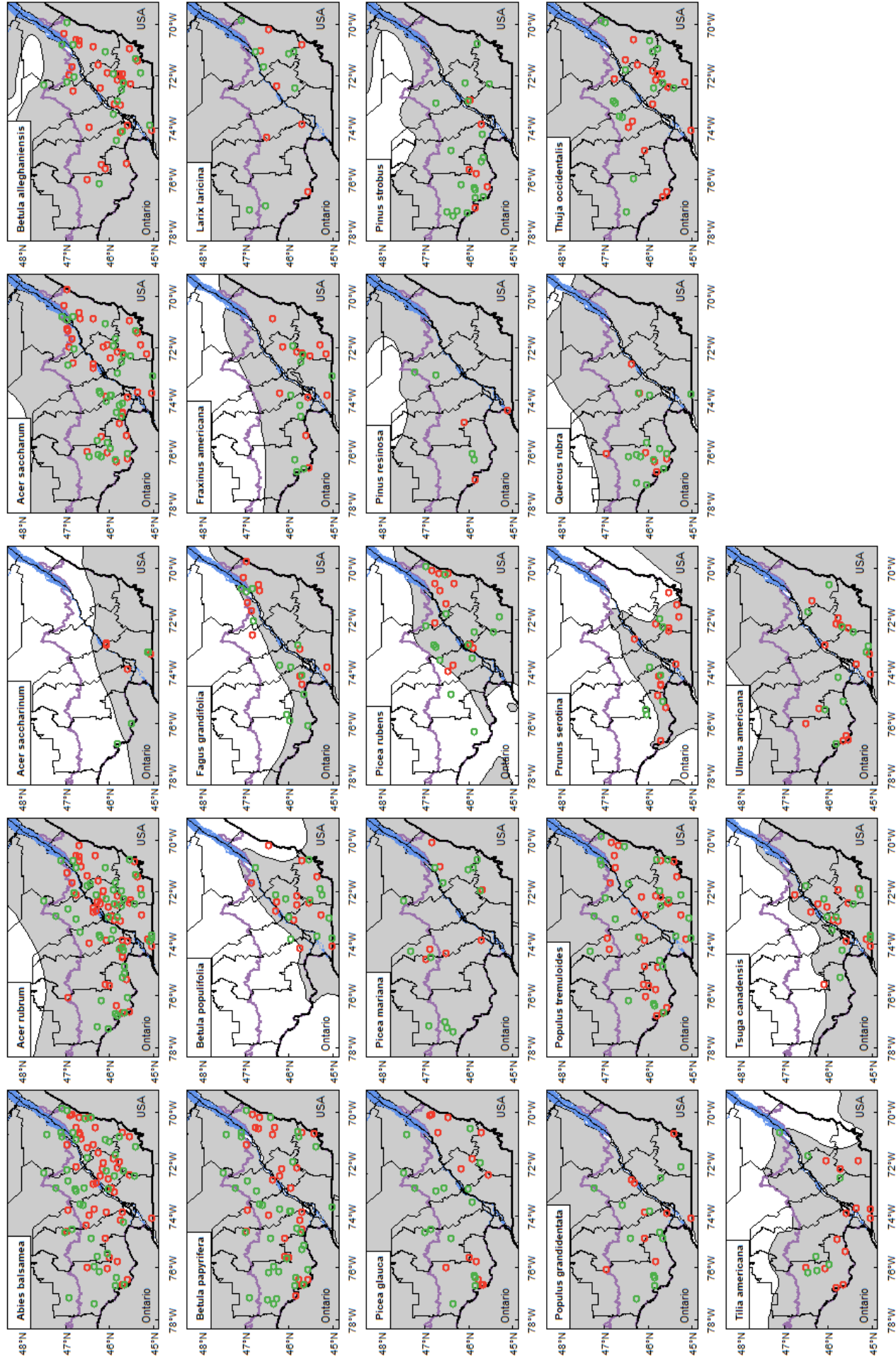
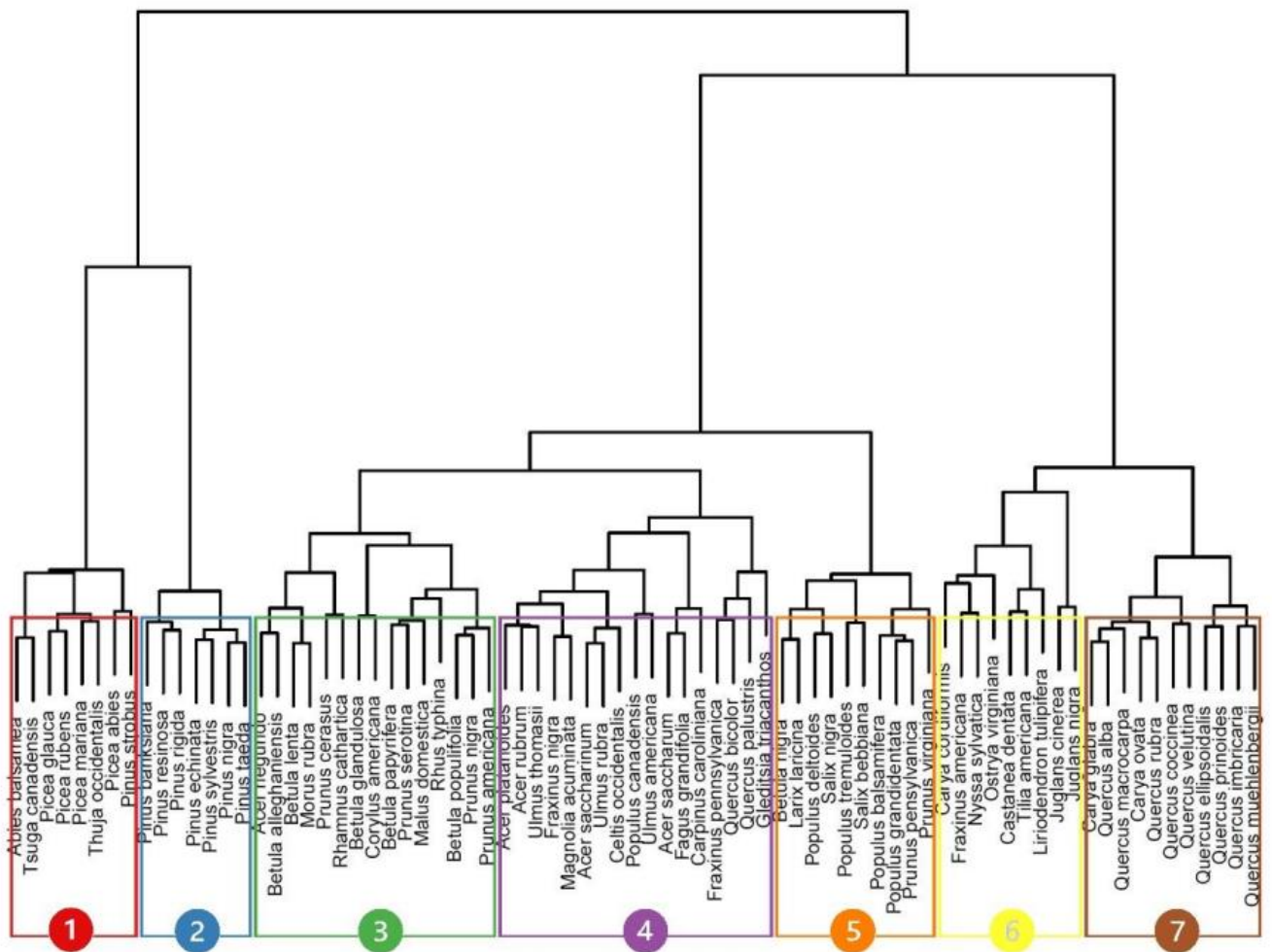


Figure S1. Distribution map of each species with inventory plots where the species was present. Red and green circles represent the calibration and evaluation plots respectively, and the purple line shows the upper limit of the temperate deciduous forest area.



Shade Tolerance ^Δ	4.2	1.84	2.23	3.3	1.46	2.84	2.75
Drought Tolerance ^Δ	2.02	4.03	2.78	2.71	1.9	2.76	3.83
Seed mass (mg)	5.17	11.87	129	344.16	13.21	3572.89	2717.71
Maximum Height (m)	29.66	32.22	13.28	28.63	21.24	31.14	27.25
SLA (m ² kg ⁻¹)	5.8	6.23	21.2	19.22	15.98	23.11	14.98
Leaf N (mg g ⁻¹)	13.75	12.23	24.17	21.09	22.8	23.72	20.16
Wood Density (g cm ⁻³)	0.38	0.47	0.54	0.54	0.41	0.48	0.62
Phenology	Evergreen	Evergreen	Deciduous	Deciduous	Deciduous	Deciduous	Deciduous
Root architecture	Shallow	Tap	Shallow	Shallow	Shallow	Tap	Tap

Figure S2. The top panel is extracted from Mina et al. (2022) and shows the functional dendrogram of the 77 Eastern North American tree species clustered in seven functional groups according to the approach from Aquilué et al. (2021). The bottom table represents the average value of the nine functional traits of interest for each group. The most represented functional groups (FG) among our 23 selected species correspond to late seral drought-intolerant evergreen species (FG1), small deciduous species with lightweight seed mass (FG3) and shade-tolerant deciduous species (FG4).

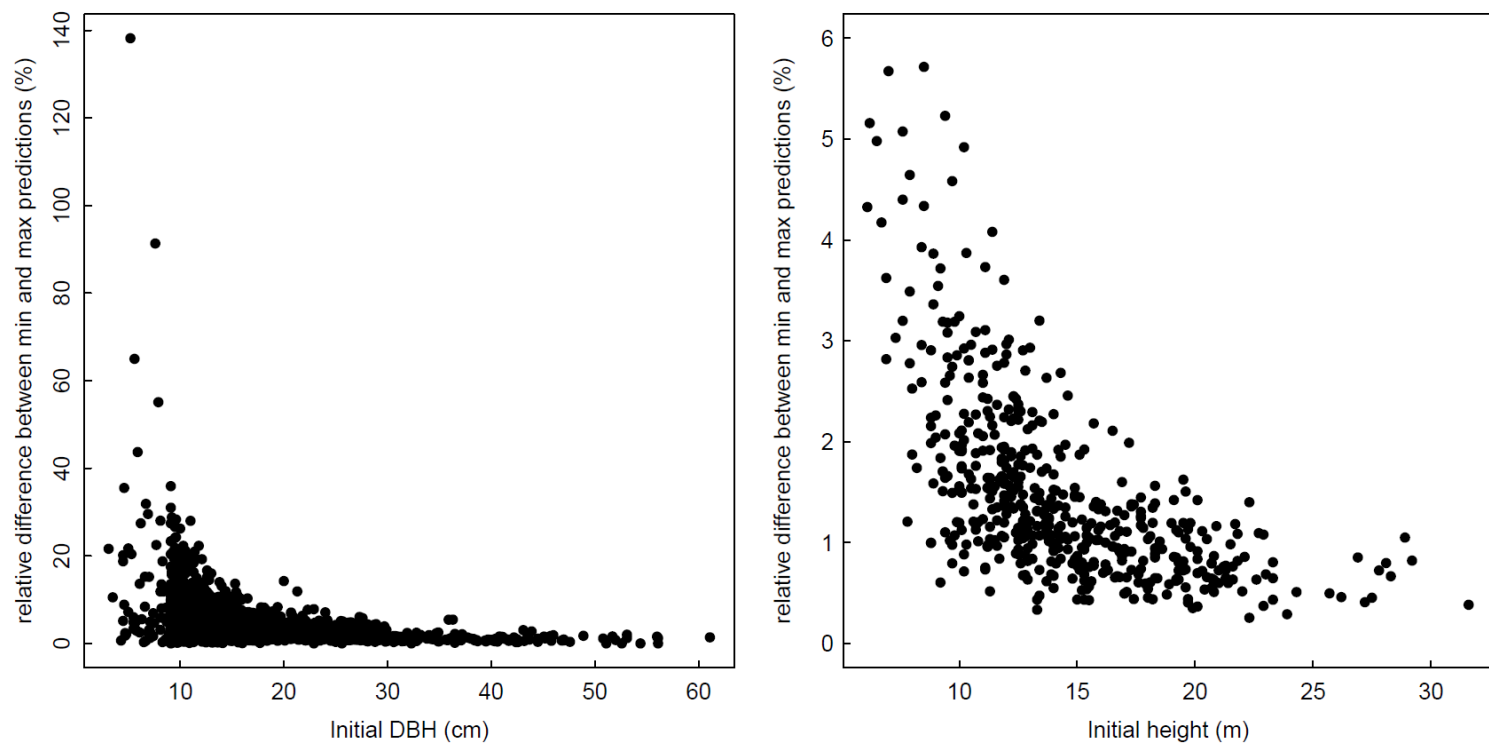


Figure S3. Relative differences between minimum and maximum predicted basal area (left panel) and predicted height (right panel) from a set of 10 simulations using different tree positions, as a function of initial tree size.

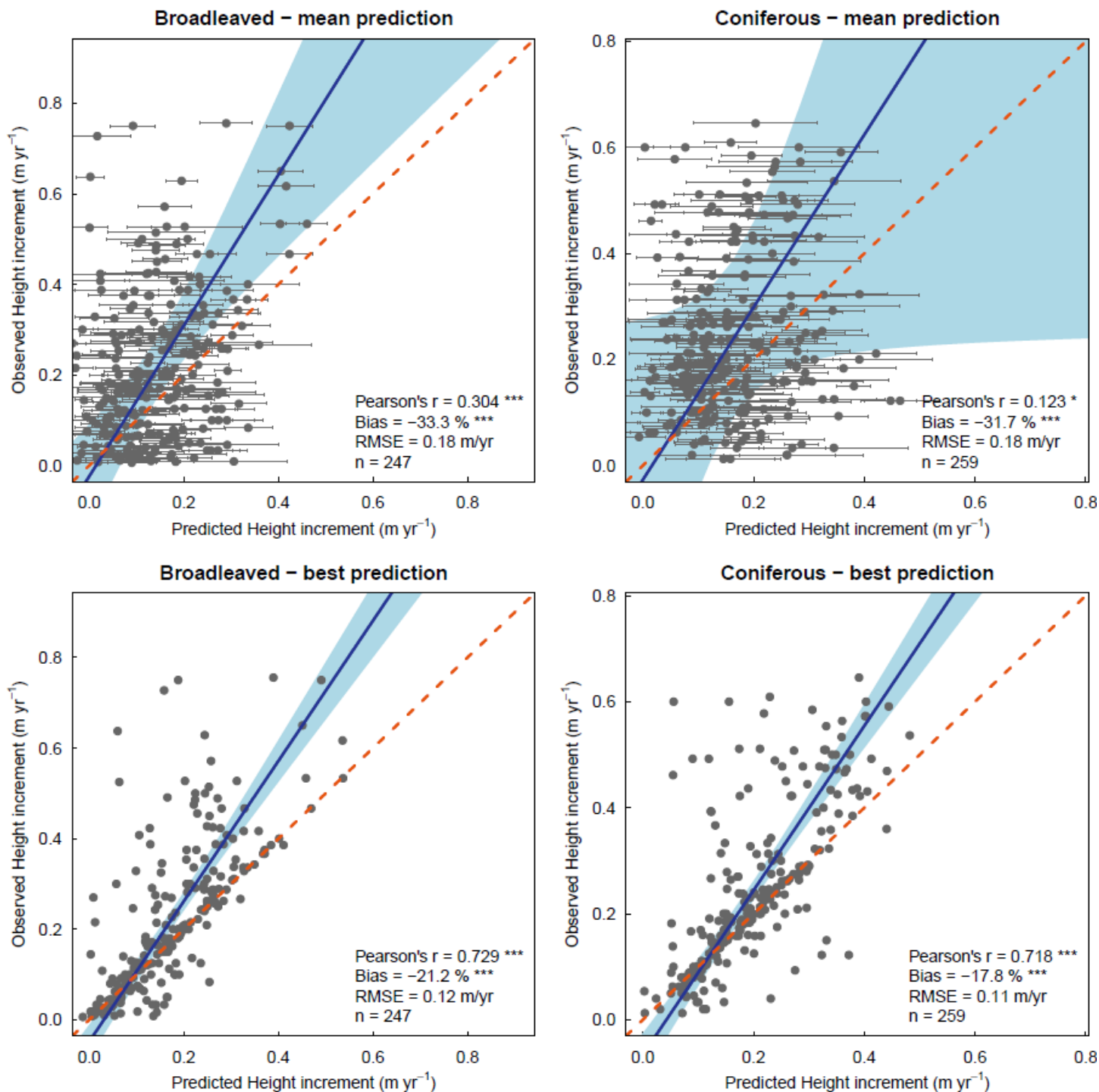


Figure S4. Observed versus predicted height increment for broadleaved species (left panels) or coniferous species (right panels) using the evaluation dataset. Predicted values in upper panels shows the mean of the 10 predictions for a single tree ($\pm\text{SD}$) while predicted values in bottom panels shows the best prediction within the 10 simulations for a single tree. The blue line represents the Deming regression between observed and predicted values, the light blue area is the confidence interval at 95%, and the red dashed line corresponds to the 1:1 line. Model performance is indicated using Pearson's r (p-value: *** <0.001 ; * <0.05), the relative bias (paired t-test, p-value: *** <0.001) and the RMSE.

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