

Table S1. Soil carbon stocks and shares of dominating tree species and plant functional groups in forests of three areas

Parameter ¹	<i>v</i>			Mean in category			Standard deviation in category			Overall mean	Overall standard deviation	<i>p</i>		
	NK	MK	MKI	NK	MK	MKI	NK	MK	MK I			NK	MK	MKI
<i>Vegetation</i>														
Herbs,%	-3.9	0.2	3.6	2	13	20	4	17	21	12	18	0.000	0.824	0.000
Grasses,%	-3.5	0.7	2.7	1	6	8	2	7	11	5	8	0.000	0.458	0.008
Lichens,%	3.6	-0.6	-2.9	7	2	0	11	7	0	3	8	0.000	0.544	0.004
Mosses,%	-1.0	1.3	-0.3	45	52	47	18	16	29	48	22	0.311	0.184	0.754
Shrubs,%	5.3	-2.0	-3.1	44	26	24	18	12	15	31	18	0.000	0.048	0.002
Pine,%	2.6	-4.7	2.0	70	31	66	31	36	38	56	39	0.010	0.000	0.042
Spruce,%	-2.0	1.9	0.0	17	35	26	27	34	37	26	34	0.049	0.053	0.985
Birch,%	-1.4	4.7	-3.3	13	34	8	17	33	9	18	24	0.165	0.000	0.001
Age, year	-1.3	-0.8	2.0	77	80	92	44	41	13	84	35	0.195	0.444	0.047
Total growing stock, m ³ ha ⁻¹	-5.6	-0.6	6.0	118	179	250	66	73	58	186	85	0.000	0.543	0.000
<i>FH horizon</i>														
C/N	2.4	-0.1	-2.3	43	38	33	11	23	9	38	16	0.017	0.956	0.024
C tot,%	1.9	-2.0	0.1	40.8	35.9	38.5	6.1	11.5	8.2	38.4	9.0	0.057	0.044	0.906
Mass, kg m ⁻²	2.0	3.6	-5.3	10.3	11.5	5.0	5.3	6.5	1.8	8.7	5.6	0.050	0.000	0.000
C stock, t ha ⁻¹	2.3	2.5	-4.7	42.5	42.9	19.3	23.8	31.9	7.5	34.1	25.3	0.020	0.013	0.000
<i>Mineral layers and total C stock</i>														
C stock, 0-30 cm, t ha ⁻¹	-1.9	-0.3	2.2	49.1	61.8	80.0	66.0	44.1	55.4	64.5	56.7	0.056	0.734	0.030
C stock, 30-50 cm, t ha ⁻¹	-1.1	0.3	0.8	20.0	25.3	26.6	21.4	16.2	33.4	24.1	25.2	0.252	0.744	0.433
C stock, 0-50 cm, t ha ⁻¹	-1.9	-0.2	1.9	69.1	87.1	106.6	85.2	46.8	79.6	88.7	73.7	0.063	0.880	0.053
C stock, FH+ 0-50 cm, t ha ⁻¹	-1.0	0.7	0.3	111.7	130.0	125.9	93.7	54.3	81.4	122.8	77.9	0.316	0.503	0.753

¹NK –northern taiga, Karelia (n=34); MK—middle taiga, Karelia (n=35); MKI—middle taiga, the Karelian Isthmus (n=40); ^a Here and in Tables 2-6: *v* – statistics for v-test, *P*- *P*-value of the v-test. Bolding- significant p-values. Herbs—share of cover functional group “herbs”,%; Grasses—share of cover functional group “gramineous plants and sedges”,%; Lichens—share of cover functional group “lichens”,%; Mosses—share of cover functional group “green mosses”,%; Shrubs—share of cover functional group “dwarf shrubs”,%; Pine—share of pine in total growing stock volume ,%; Spruce—share of spruce in total growing stock volume,%; Birch—share of birch in total growing stock volume, %.

Table S 2. Soil carbon stocks and shares of dominating tree species and plant functional groups in pine, spruce and

Parameter ¹	birch forests														
	<i>v</i>			Mean in category			Standard deviation in category			Overall mean	Overall standard deviation	<i>p</i>			
	P	S	B	P	S	B	P	S	B			P	S	B	
<i>Vegetation</i>															
Herbs,%	-1.6	0.0	2.3	10	12	21	18	15	20	12	18	0.115	0.966	0.023	
Grasses,%	-2.9	0.1	3.9	3	5	13	5	6	16	5	8	0.004	0.930	0.000	
Lichens,%	2.1	-1.8	-0.6	5	1	2	10	3	6	3	8	0.038	0.073	0.568	
Mosses,%	-0.4	2.6	-2.9	47	56	33	23	18	19	48	22	0.708	0.008	0.003	
Shrubs,%	2.6	-2.7	-0.2	35	24	30	17	13	22	31	18	0.009	0.008	0.873	
Pine,%	9.3	-7.1	-3.7	88	17	23	11	22	26	56	39	0.000	0.000	0.000	
Spruce,%	-7.2	9.3	-2.1	4	71	9	8	23	12	26	34	0.000	0.000	0.037	
Birch,%	-4.8	-1.6	8.8	8	12	68	8	12	25	18	24	0.000	0.117	0.000	
Age, year	0.1	3.0	-4.1	84	99	50	35	30	22	84	35	0.918	0.003	0.000	
Total growing stock, m ³ ha ⁻¹	-1.4	2.6	-1.3	175	217	160	82	83	86	186	85	0.150	0.010	0.184	
<i>FH horizon</i>															
C/N	4.8	-3.0	-2.9	44	31	27	18	8	9	38	16	0.000	0.003	0.004	
C tot,%	2.8	-0.9	-2.8	40.6	37.3	32.5	7.4	8.8	11.9	38.4	9.0	0.005	0.383	0.005	
Mass, kg m ⁻²	-1.3	0.1	1.7	8.1	8.8	10.9	5.4	5.7	6.0	8.7	5.6	0.202	0.949	0.087	
C stock, t ha ⁻¹	-0.3	-0.1	0.6	33.4	33.6	37.7	24.5	25.9	28.5	34.1	25.3	0.751	0.895	0.536	
<i>Mineral layers and total C stock</i>															
C stock, 0-30 cm, t ha ⁻¹	-2.2	0.5	2.4	53.7	68.7	95.6	50.4	45.5	85.0	64.5	56.7	0.030	0.602	0.018	
C stock, 30-50 cm, t ha ⁻¹	-2.3	1.7	1.0	19.1	30.3	29.7	24.8	24.6	25.2	24.1	25.2	0.023	0.085	0.340	
C stock, 0-50 cm, t ha ⁻¹	-2.5	1.0	2.2	72.7	99.0	125.3	69.0	57.0	104.2	88.7	73.7	0.014	0.322	0.031	
C stock, FH+ 0-50 cm, t ha ⁻¹	-2.4	0.9	2.2	106.1	132.7	163.1	68.6	66.5	112.6	122.8	77.9	0.015	0.371	0.025	

¹P - Pine (n=59); S - Spruce (n=34); B - Birch (n=16);

Table S 3. Soil carbon stocks and shares of dominating tree species and plant functional groups in Cajander's site

Parameter ¹	types														
	<i>v</i>			Mean in category			Standard deviation in category			Overall mean	Overall standard deviation	<i>p</i>			
	OMT	MT	VT	OMT	MT	VT	OMT	MT	VT			OMT	MT	VT	
<i>Vegetation</i>															
Herbs,%	7.7	-0.8	-5.0	41	11	2	19	12	3	12	18	0.000	0.395	0.000	
Grasses,%	1.2	2.7	-3.6	7	8	2	7	10	4	5	8	0.229	0.008	0.000	
Lichens,%	-1.8	-3.4	4.8	0	0	7	0	0	11	3	8	0.076	0.001	0.000	
Mosses,%	-3.4	1.3	1.3	32	51	51	24	21	20	48	22	0.001	0.204	0.193	
Shrubs,%	-3.3	-0.4	2.9	18	30	37	15	16	18	31	18	0.001	0.660	0.003	
Pine,%	-2.1	-2.8	4.4	38	44	76	43	39	27	56	39	0.035	0.005	0.000	
Spruce,%	0.9	3.1	-3.8	33	37	11	38	38	19	26	34	0.350	0.002	0.000	
Birch,%	2.1	0.2	-1.8	29	19	13	35	24	18	18	24	0.039	0.810	0.072	
Age, year	0.0	2.2	-2.2	84	92	74	19	31	42	84	35	0.997	0.027	0.026	
Total growing stock, m ³ ha ⁻¹	4.6	2.5	-6.0	269	209	127	49	71	69	186	85	0.000	0.012	0.000	
<i>FH horizon</i>															
C/N	-1.5	-1.9	3.1	32	34	43	9	19	13	38	16	0.126	0.053	0.002	
C tot,%	1.4	-1.6	0.6	41.1	36.8	39.0	9.9	9.4	8.1	38.4	9.0	0.167	0.101	0.540	
Mass, kg m ⁻²	-0.8	-1.2	1.8	7.7	8.0	9.9	5.1	5.1	6.2	8.7	5.6	0.422	0.226	0.067	
C stock, t ha ⁻¹	-0.1	-1.4	1.5	33.5	30.2	38.5	29.0	22.4	26.6	34.1	25.3	0.909	0.162	0.134	
<i>Mineral layers and total C stock</i>															
C stock, 0-30 cm, t ha ⁻¹	1.3	1.1	-2.1	80.8	71.1	50.8	62.9	54.3	54.9	64.5	56.7	0.182	0.290	0.038	
C stock, 30-50 cm, t ha ⁻¹	1.2	0.6	-1.4	30.5	25.7	19.9	33.5	24.5	21.6	24.1	25.2	0.239	0.581	0.148	
C stock, 0-50 cm, t ha ⁻¹	1.4	1.0	-2.1	111.3	96.8	70.7	78.4	71.5	71.6	88.7	73.7	0.153	0.316	0.036	
C stock, FH+ 0-50 cm, t ha ⁻¹	1.3	0.5	-1.5	144.8	127.0	109.2	75.3	76.1	79.9	122.8	77.9	0.188	0.621	0.135	

¹OMT –Oxalis-Myrtillus type, site type 2, (n=18); MT – Myrtillus type, site type 3 (n=47); VT – Vaccinium vitis-idaea type, site type 4 (n=44);

Table S 4. Soil carbon stocks and shares of dominating tree species and plant functional groups in Cajander's site type 4 (VT) dominated by different tree species in Karelia

Parameter ¹	<i>v</i>			Mean in category			Standard deviation in category			Overall mean	Overall standard deviation	<i>p</i>		
	P	S	B	P	S	B	P	S	B			P	S	B
<i>Vegetation</i>														
Herbs,%	-2.0	0.3	2.4	1	2	5	2	2	3	2	3	0.044	0.750	0.015
Grasses,%	-2.6	0.3	3.2	1	3	9	2	3	12	2	5	0.010	0.747	0.001
Lichens,%	0.4	-0.4	-0.1	9	7	8	13	6	10	9	12	0.705	0.715	0.903
Mosses,%	-0.2	0.9	-0.6	47	54	42	19	12	20	47	18	0.815	0.394	0.539
Shrubs,%	1.0	-0.8	-0.5	42	35	36	18	12	22	40	17	0.341	0.452	0.622
Pine,%	5.0	-3.5	-3.1	86	32	32	13	26	26	73	28	0.000	0.000	0.002
Spruce,%	-3.5	4.8	-0.4	6	53	9	10	24	12	13	20	0.000	0.000	0.675
Birch,%	-3.8	0.2	5.1	8	16	59	8	8	22	14	19	0.000	0.831	0.000
<i>FH horizon</i>														
C/N	2.7	-0.6	-3.1	48	41	24	12	7	7	44	13	0.006	0.550	0.002
C tot,%	2.6	-0.5	-3.1	40.6	36.9	26.3	6.9	4.8	13.2	38.6	8.5	0.010	0.637	0.002
Mass, kg m ⁻²	-0.1	0.2	-0.1	10.8	11.4	10.6	5.5	10.8	5.6	10.8	6.2	0.932	0.843	0.921
C stock, t ha ⁻¹	0.7	0.0	-0.9	43.7	42.1	30.2	24.9	39.2	29.5	42.1	26.9	0.501	0.998	0.349
<i>Mineral layers and total C stock</i>														
C stock, 0-30 cm, t ha ⁻¹	-2.9	-0.1	4.2	33.6	46.2	163.0	19.9	13.7	132.5	48.9	57.8	0.003	0.912	0.000
C stock, 30-50 cm, t ha ⁻¹	-3.0	1.2	2.9	16.1	33.6	52.4	14.7	19.2	42.9	22.2	22.3	0.002	0.221	0.004
C stock, 0-50 cm, t ha ⁻¹	-3.1	0.3	4.0	49.7	79.8	215.5	29.2	27.4	174.8	71.1	76.3	0.002	0.783	0.000
C stock, FH+ 0-50 cm, t ha ⁻¹	-2.6	0.2	3.3	93.4	121.9	245.6	37.9	65.6	203.8	113.2	84.5	0.010	0.803	0.001

¹ P - Pine (n=29); S - Spruce (n=5); B - Birch (n=4);

Table S 5. Soil carbon stocks and shares of dominating tree species and plant functional groups in Cajander's site type 3 (MT) dominated by different tree species in Karelia

Parameter ¹	<i>v</i>			Mean in category			Standard deviation in category			Overall mean	Overall standard deviation	<i>p</i>		
	P	S	B	P	S	B	P	S	B			P	S	B
<i>Vegetation</i>														
Herbs,%	-2.5	-0.9	3.6	2	7	16	2	4	5	8	6	0.013	0.344	0.000
Grasses,%	-1.0	-1.3	2.5	3	4	10	5	5	5	5	6	0.298	0.203	0.011
Lichens,%	1.7	-1.2	-0.3	0	0	0	0	0	0	0	0	0.091	0.236	0.759
Mosses,%	0.3	2.4	-3.1	55	60	35	10	10	18	53	16	0.732	0.017	0.002
Shrubs,%	1.2	-1.8	0.9	39	28	38	16	10	18	33	14	0.245	0.077	0.363
Pine,%	4.5	-3.0	-1.1	80	9	14	16	9	14	27	33	0.000	0.003	0.277
Spruce,%	-2.9	4.6	-2.5	6	75	11	6	14	14	43	36	0.004	0.000	0.012
Birch,%	-1.5	-2.5	4.4	14	16	75	13	13	15	30	29	0.134	0.014	0.000
<i>FH horizon</i>														
C/N	3.1	-1.7	-1.1	64	29	27	39	6	12	37	25	0.002	0.099	0.253

C tot,%	2.5	-0.2	-2.2	45.8	36.1	28.5	7.8	7.7	11.0	36.6	10.3	0.012	0.810	0.026
Mass, kg m ⁻²	-0.3	-0.4	0.8	10.1	10.1	12.1	5.9	5.2	6.9	10.6	5.6	0.803	0.655	0.440
C stock, t ha ⁻¹	0.8	-0.6	-0.1	48.1	37.1	38.8	34.6	22.3	29.7	40.2	26.5	0.400	0.553	0.882
<i>Mineral layers and total C stock</i>														
C stock, 0-30 cm, t ha ⁻¹	-1.2	0.1	1.1	37.1	59.8	76.8	16.7	55.2	52.4	58.4	48.5	0.215	0.881	0.287
C stock, 30-50 cm, t ha ⁻¹	-2.1	2.0	-0.2	10.8	28.7	21.4	5.0	16.8	14.1	22.7	15.6	0.033	0.044	0.822
C stock, 0-50 cm, t ha ⁻¹	-1.7	0.7	0.9	47.9	88.5	98.2	20.1	62.8	45.2	81.1	53.5	0.081	0.470	0.368
C stock, FH+ 0- 50 cm, t ha ⁻¹	-1.1	0.4	0.7	96.0	125.7	137.0	43.6	75.6	61.3	121.3	65.3	0.277	0.726	0.499

¹P - Pine (n=6); S - Spruce (n=13); B - Birch (n=6);

Table S6. Soil carbon stocks and shares of dominating tree species and plant functional groups in sites with main functional vegetation types

Parameter ¹	<i>v</i>			Mean in category			Standard deviation in category			Overall mean	Overall standard deviation	<i>p</i>		
	1	2	3	1	2	3	1	2	3			1	2	3
<i>Vegetation</i>														
Herbs,%	7.5	-5.9	-2.0	29	2	4	20	3	4	12	18	0.000	0.000	0.047
Grasses,%	5.5	-4.7	-0.9	11	2	3	11	2	4	5	8	0.000	0.000	0.353
Lichens,%	-3.0	0.8	3.1	0	4	9	0	6	18	3	8	0.003	0.400	0.002
Mosses,%	-4.8	1.8	4.1	35	52	71	22	15	21	48	22	0.000	0.068	0.000
Shrubs,%	-2.9	5.5	-4.1	25	40	13	17	14	6	31	18	0.004	0.000	0.000
Pine,%	-4.0	2.7	1.7	36	66	73	40	34	36	56	39	0.000	0.007	0.084
Spruce,%	1.8	-1.5	-0.4	34	21	23	39	29	34	26	34	0.068	0.131	0.708
Birch,%	3.8	-2.2	-2.2	30	13	4	33	15	4	18	24	0.000	0.028	0.025
<i>FH horizon</i>														
C/N	-2.3	2.5	-0.4	33	41	36	20	13	11	38	16	0.023	0.014	0.685
C tot,%	-1.4	1.4	-0.1	36.8	39.6	38.2	11.2	7.4	7.7	38.4	9.0	0.174	0.169	0.926
Mass, kg m ⁻²	-0.6	2.1	-2.4	8.3	9.8	5.4	5.2	6.1	2.7	8.7	5.6	0.574	0.033	0.017
C stock, t ha ⁻¹	-0.5	1.9	-2.1	32.4	38.8	20.8	27.0	25.6	11.8	34.1	25.3	0.586	0.053	0.035
<i>Mineral layers and total C stock</i>														
C stock, 0-30 cm, t ha ⁻¹	2.3	-2.3	0.0	81.0	52.4	65.1	61.4	52.1	51.8	64.5	56.7	0.021	0.024	0.969
C stock, 30-50 cm, t ha ⁻¹	1.6	-0.8	-1.2	29.3	22.3	16.7	29.4	23.8	13.1	24.1	25.2	0.106	0.441	0.238
C stock, 0-50 cm, t ha ⁻¹	2.3	-2.0	-0.4	110.3	74.7	81.8	78.7	70.8	58.5	88.7	73.7	0.020	0.046	0.709
C stock, FH+ 0- 50 cm, t ha ⁻¹	2.0	-1.3	-1.0	142.6	113.5	102.6	81.4	77.5	59.1	122.8	77.9	0.043	0.208	0.298

¹ dominating functional plant types: 1 – with a high proportion of herbs and grasses, (n=40); 2 – dwarf shrubs with green mosses (n=55); 3 – green mosses with lichens/green mosses (n=14)