Potential of carbon uptake and local aerosol production in boreal and hemi-boreal ecosystems across Finland and in Estonia

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Table S1. Analyzer and meteorological sensors for air temperature, humidity, PAR, global radiation

Parameter	Forest			Agricultural fields				Peatland	Urban graden	Coastal area
	Värriö	Hyytiälä	Ränskälänkorpi	Järvselja	Haltiala	Qvidja	Viikki	Siikaneva	Kumpula	Tvärminne
CO_2/H_2O fast analyzer	LI-7200, LI-COR Biosciences, USA	LI-6262 (before 2018.03) and LI-7200 (after 2018.03), LI-COR, Biosciences, USA	LI-7200, LI-COR Biosciences, USA	LI-7200, LI-COR Biosciences, USA	LI-7200, LI-COR Biosciences, USA	LI-7200, LI-COR Biosciences, USA	LI-7200, LI-COR Biosciences, USA	LI-7200, LI-COR Biosciences, USA	LI-7200, LI-COR Biosciences, USA	LI-7200RS, LI-COR Biosciences, USA
3-D sonic anemometer	METEK uSonic-1, Elmshorn, Germany	Gill HS-50 anemometer, Gill Instruments, UK	METEK uSonic-3, Elmshorn, Germany	METEK uSonic-3, Elmshorn, Germany	METEK uSonic-3, Elmshorn, Germany	METEK uSonic-3, Elmshorn, Germany	Metek uSonic-3, Elmshorn, Germany	METEK uSonic-1, Elmshorn, Germany	METEK uSonic-1, Elmshorn, Germany	METEK uSonic-3, Elmshorn, Germany
Air Temperature (°C)	PT-100	PT-100	Hmp155	PT-100	HC2, Rotronic, Switzerland	HMP155, Vaisala, Finland	HMP110, Vaisala	HC2, Rotronic, Switzerland	PT-100	HMP155, Vaisala, Finland
Relative humidity	MP106A, Rotronic, Switzerland	MP102H Rotronic, Switzerland (after 2012.06)	HMP155, Vaisala, Finland	WXT520, Vaisala, Finland	HC2, Rotronic, Switzerland	HMP155, Vaisala, Finland	HMP110, Vaisala	HC2, Rotronic, Switzerland	HMP243, Vaisala, Finland	HMP155, Vaisala, Finland
PAR ($mmol/m^2/s$)	LI-190SB, LI-COR	LI-190SZ quantum sensor,	PQS, Kipp & Zonen B.V., Netherlands	Delta-T Pyranometer (only for	Li-190R, LI-COR	PQS, Kipp & Zonen	Kipp& Zonen PQS 1,	Li-190R, LI-COR	PARlite, Kipp &	----

	Bioscience, USA	LI-COR Biosciences, UK		global radiation)	Biosciences, USA	B.V., Netherlands	B.V., Netherlands	Biosciences, USA	Zonen B.V., Netherlands	
Measurement height	15 m	23.3 m before 3/2018, 27 m after 3/2018	29 m	30 m	3.0 m	2.3 m	2.5m	3.0 m	29 m	4.2 m

Table S2. Comparison of across the hemi-boreal and boreal ecosystems in midday (10:00-14:00) of spring and summer.

Ecosystem	Site	Spring ΔN_{neg} ($1/cm^3$, 50%)	Comparing with Hyytiälä median ΔN_{neg}	Comparing with Hyytiälä 75th percentile ΔN_{neg}	Summer ΔN_{neg} ($1/cm^3$, 50%)	Comparing with Hyytiälä median ΔN_{neg}	Comparing with Hyytiälä 75th percentile ΔN_{neg}
Forest	Hyytiälä	2.03	1	1	1.45	1	1
	Värriö	0.84	0.41	0.43	0.98	0.68	0.98
	Järvselja	0.73	0.36	0.28	0.66	0.45	0.55
Drained peatland forest	Ränskälänkorpi	0.76	0.37	0.5	0.67	0.46	0.59
Agricultural land	Haltiala	7.66	3.77	2.22	1.88	1.30	1.29
	Qvidja	2.36	1.16	1.17	1.70	1.17	1.34
	Viikki	2.28	1.12	0.98	1.69	1.17	1.16
Peatland	Siikaneva	1.09	0.54	0.51	1.51	1.04	1.02
Urban vegetated area	Kumpula	4.86	2.4	2.41	5.03	3.47	3.78
Coastal area	Tvärminne	-0.15	-0.07	0.06	0.42	0.29	0.44

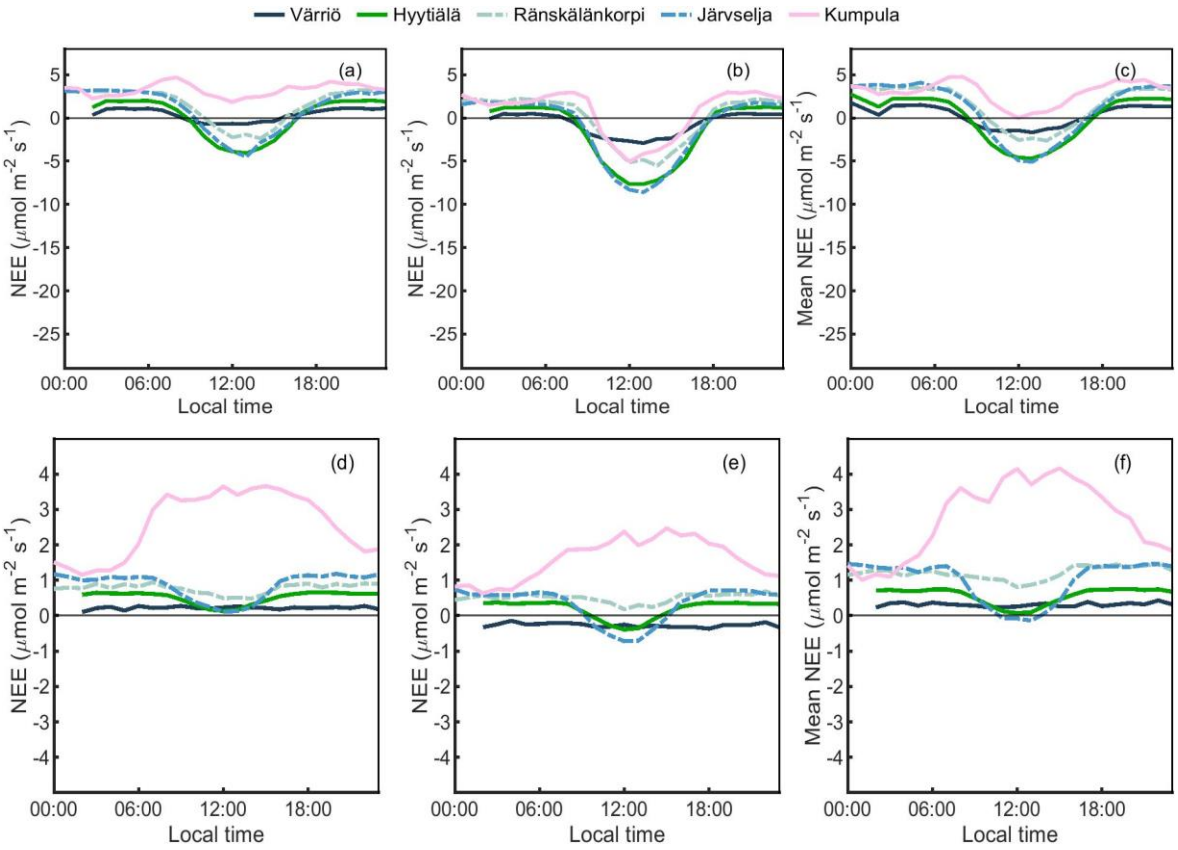

Figure S1. The 50th percentile (a), 25th percentile (b), and mean values (c) of NEE at each hour for the forest sites and urban gardens in the autumn and the corresponding 50th percentile, 25th percentile, and mean values in the winter, (d), (e), (f), respectively.

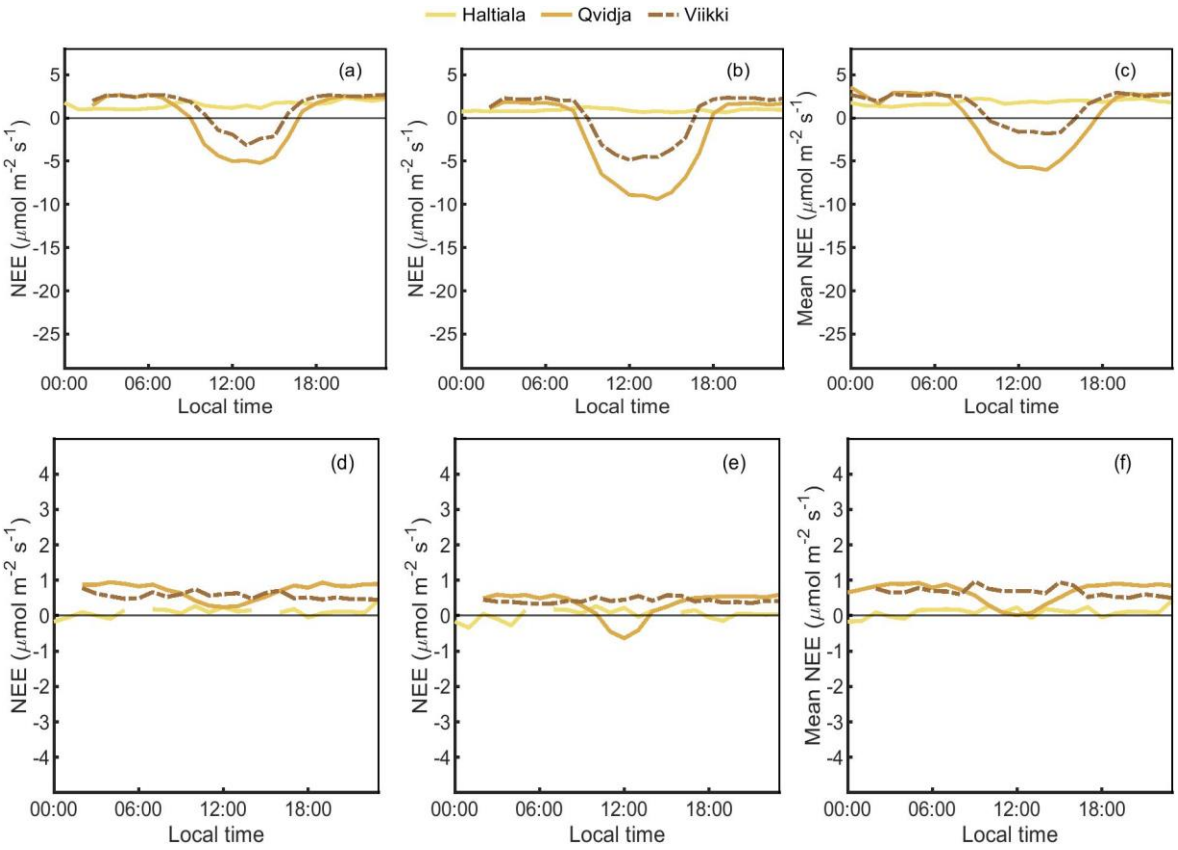

Figure S2. The 50th percentile (a), 25th percentile (b), and mean values (c) of NEE at each hour for the agricultural lands in the autumn and the corresponding 50th percentile, 25th percentile, and mean values, (d), (e), (f) in the winter, respectively.

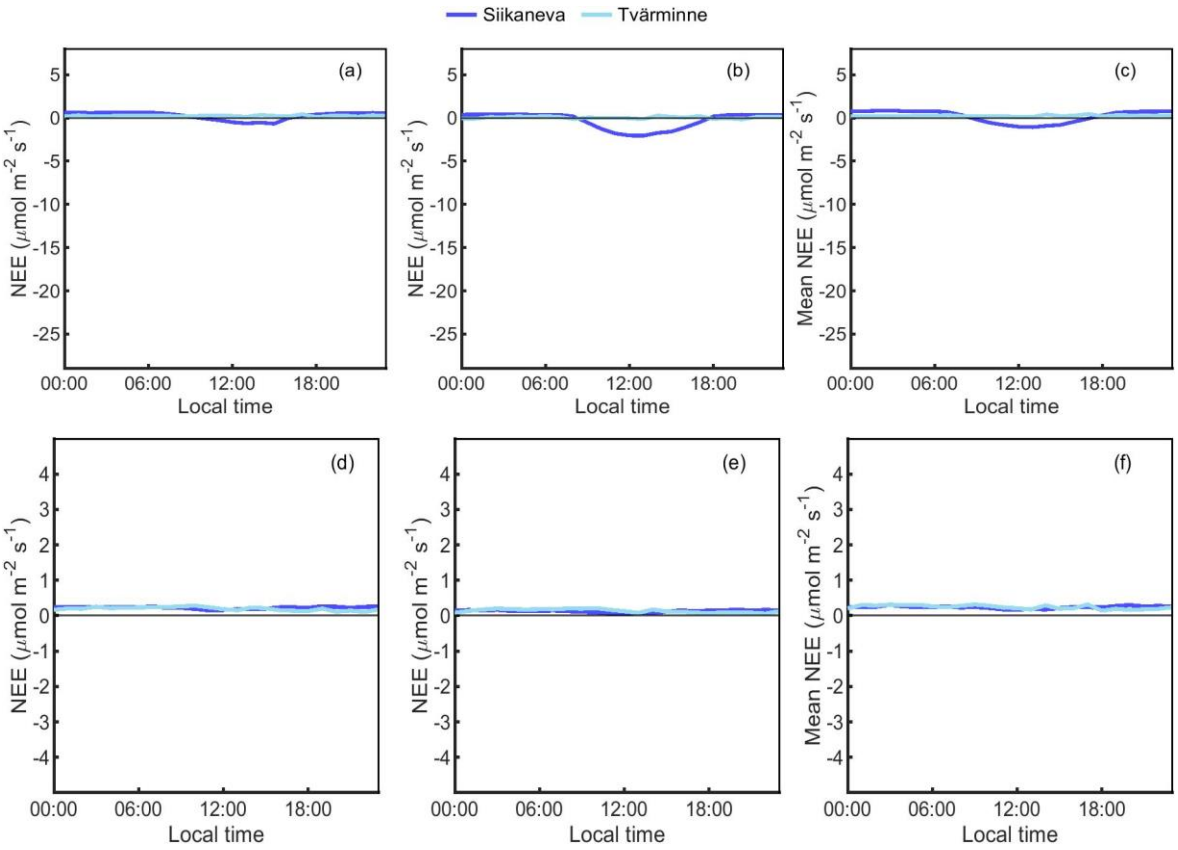

Figure S3. The 50th percentile (a), 25th percentile (b), and mean values (c) of NEE at each hour for the open peatland and coastal area in the autumn and the corresponding 50th percentile, 25th percentile, and mean values, (d), (e), (f) in the winter, respectively.

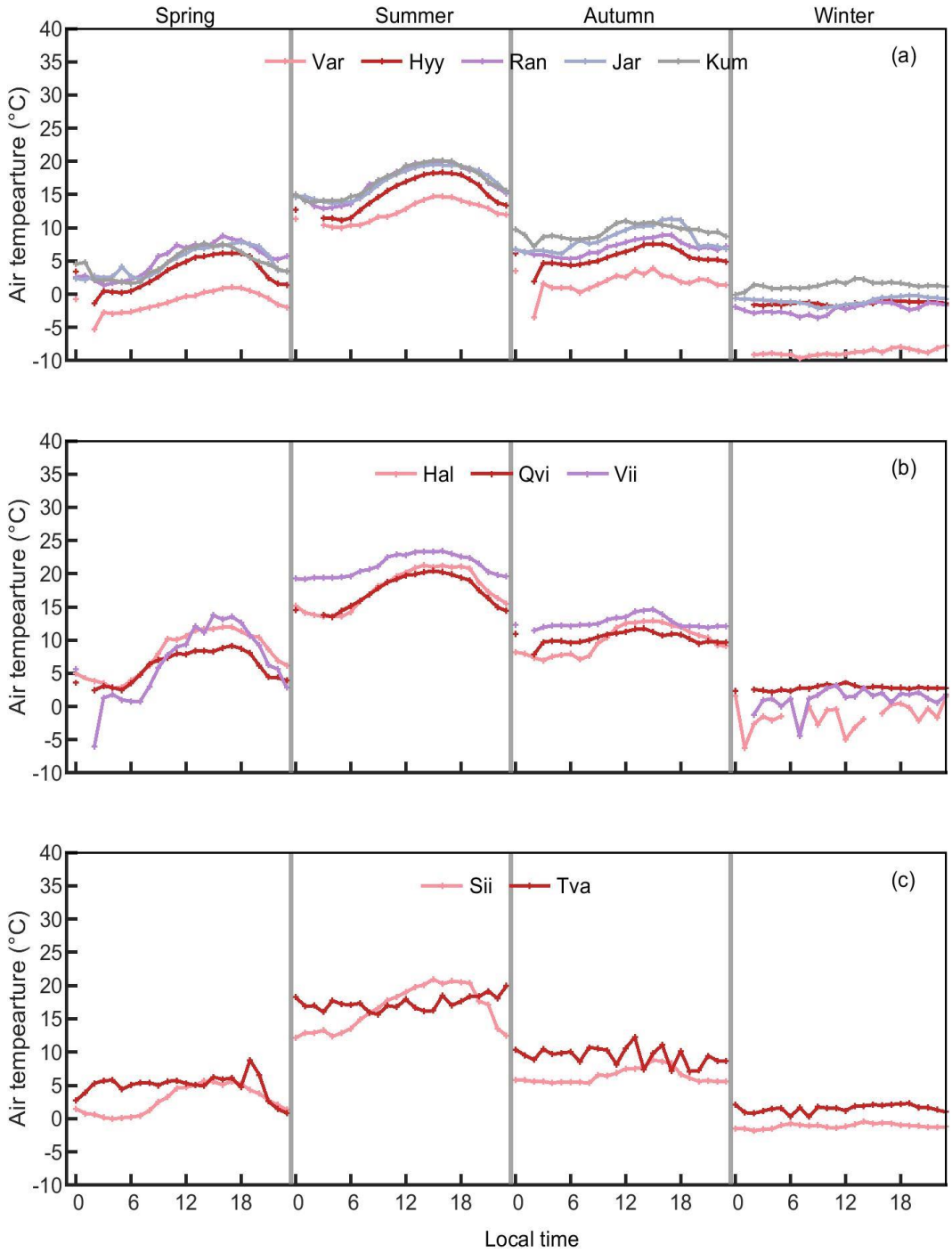

Figure S4. The median diurnal variation of the air temperature in the forests (a), agricultural fields (b), and peatland and coastal area (c) in each season.

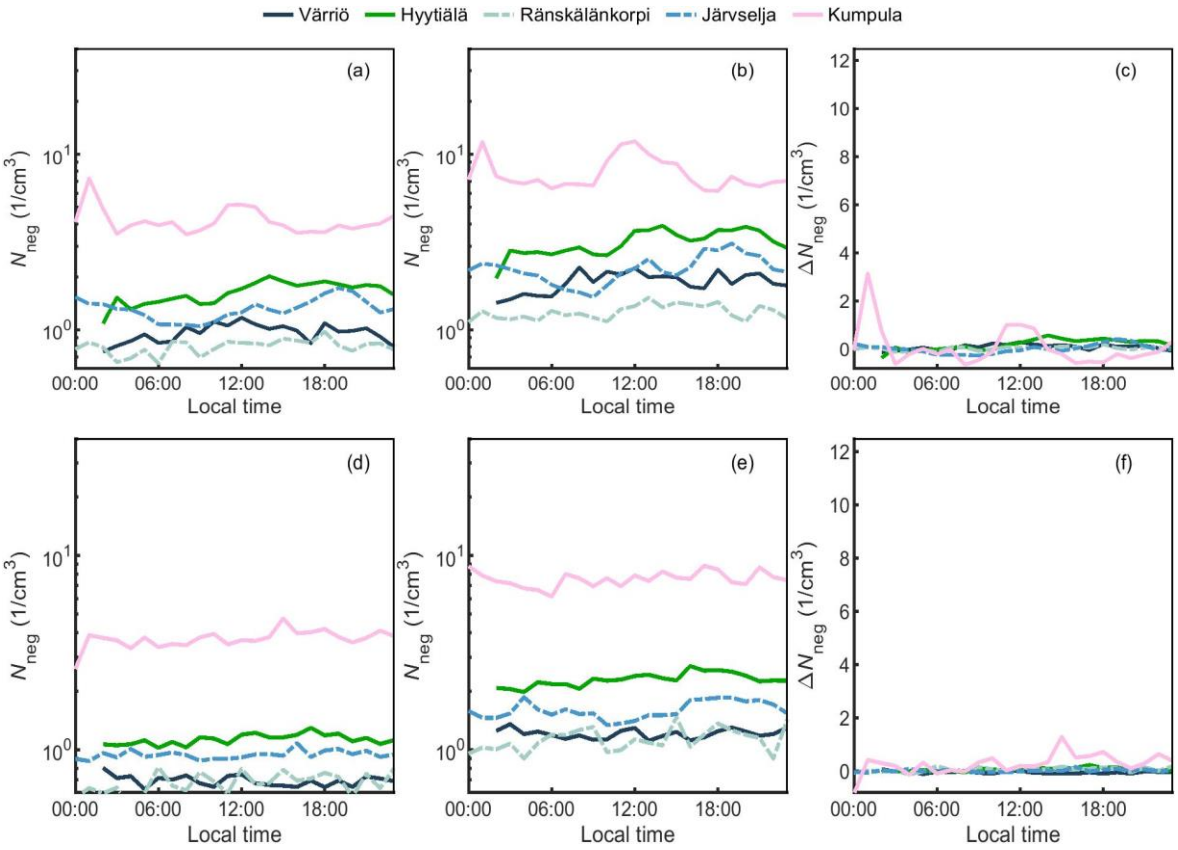

Figure S5. The 50th percentile (a), 75th percentile (b), and median daily fluctuations (c) of negative ions at each hour for the forest sites and urban gardens in the autumn and the corresponding 50th percentile, 75th percentile, and median daily fluctuations in the winter, (d), (e), (f), respectively.

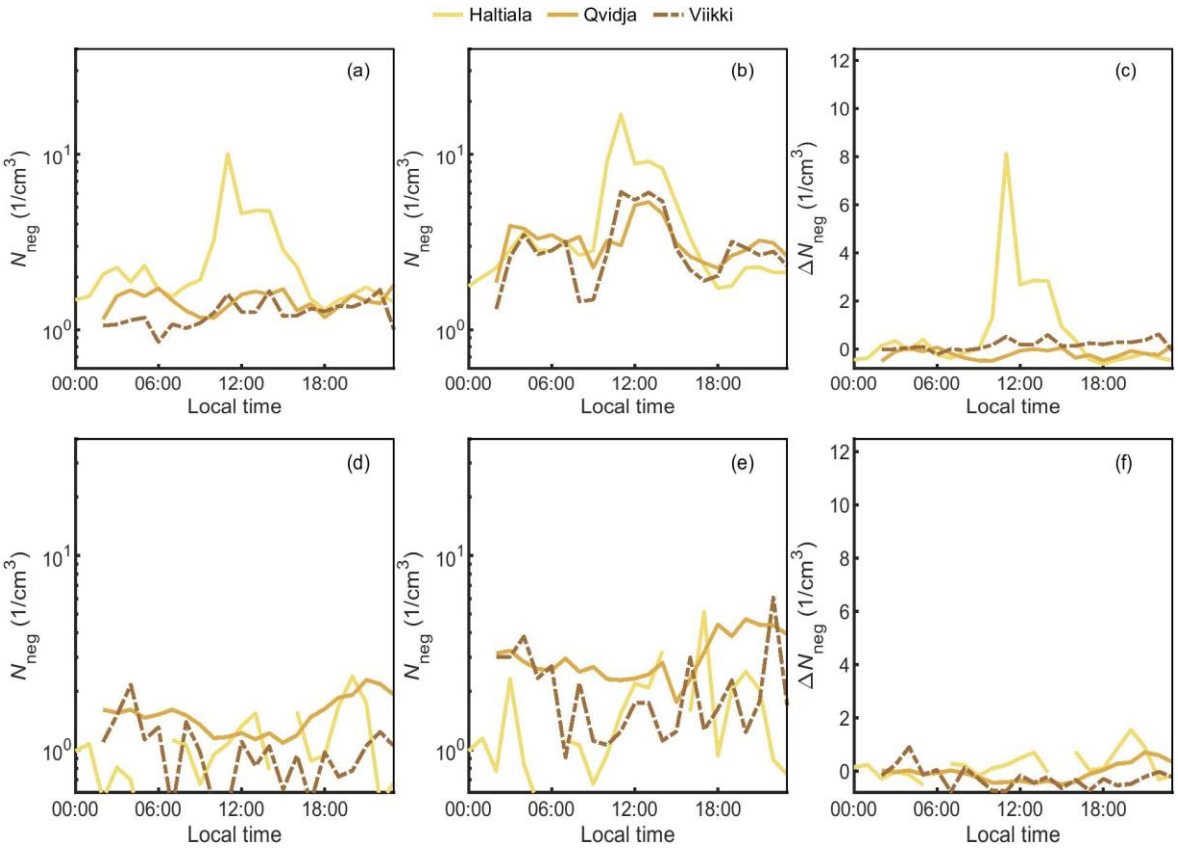

Figure S6. The 50th percentile (a), 75th percentile (b), and median daily fluctuations (c) of negative ions at each hour for agricultural fields in the autumn and the corresponding 50th percentile, 75th percentile, and median daily fluctuations in the winter, (d), (e), (f), respectively.

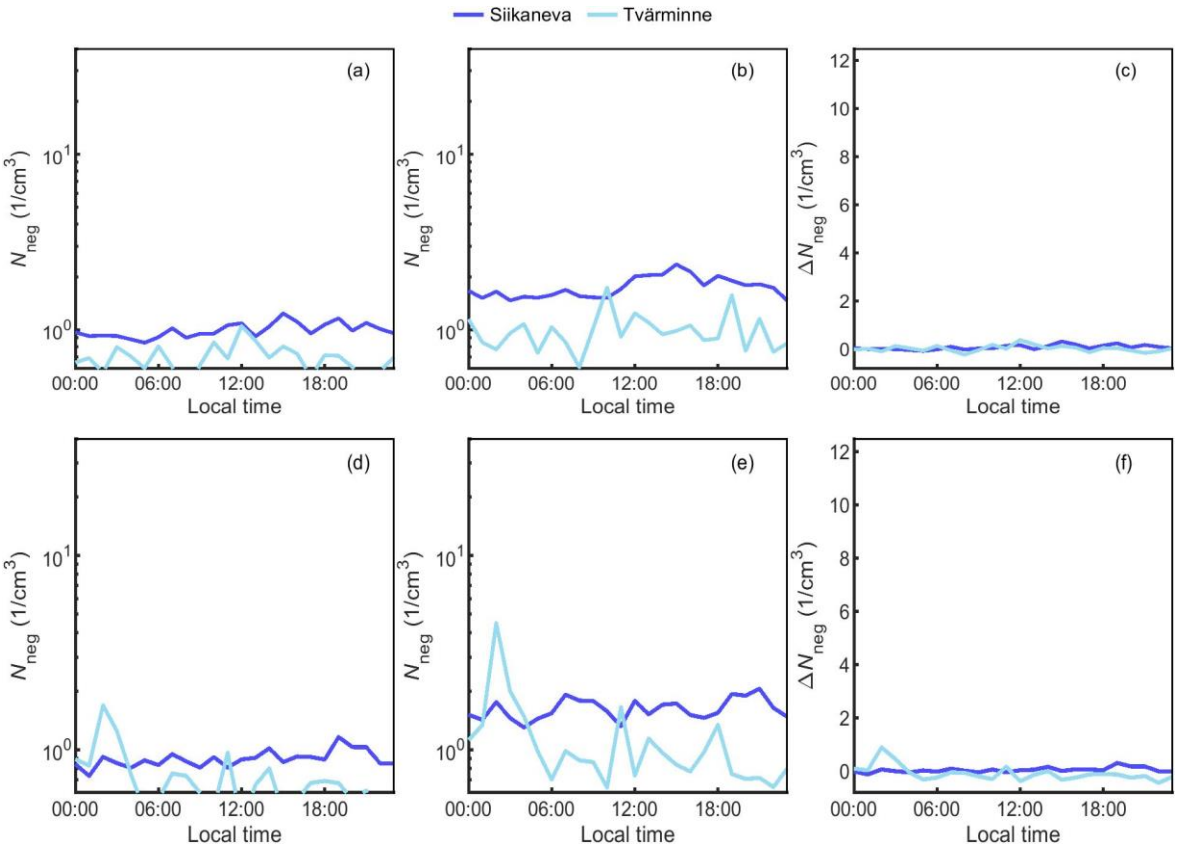

Figure S7. The 50th percentile (a), 75th percentile (b), and median daily fluctuations (c) of negative ions at each hour for open peatland and coastal area in the autumn and the corresponding 50th percentile, 75th percentile, and median daily fluctuations in the winter, (d), (e), (f), respectively.