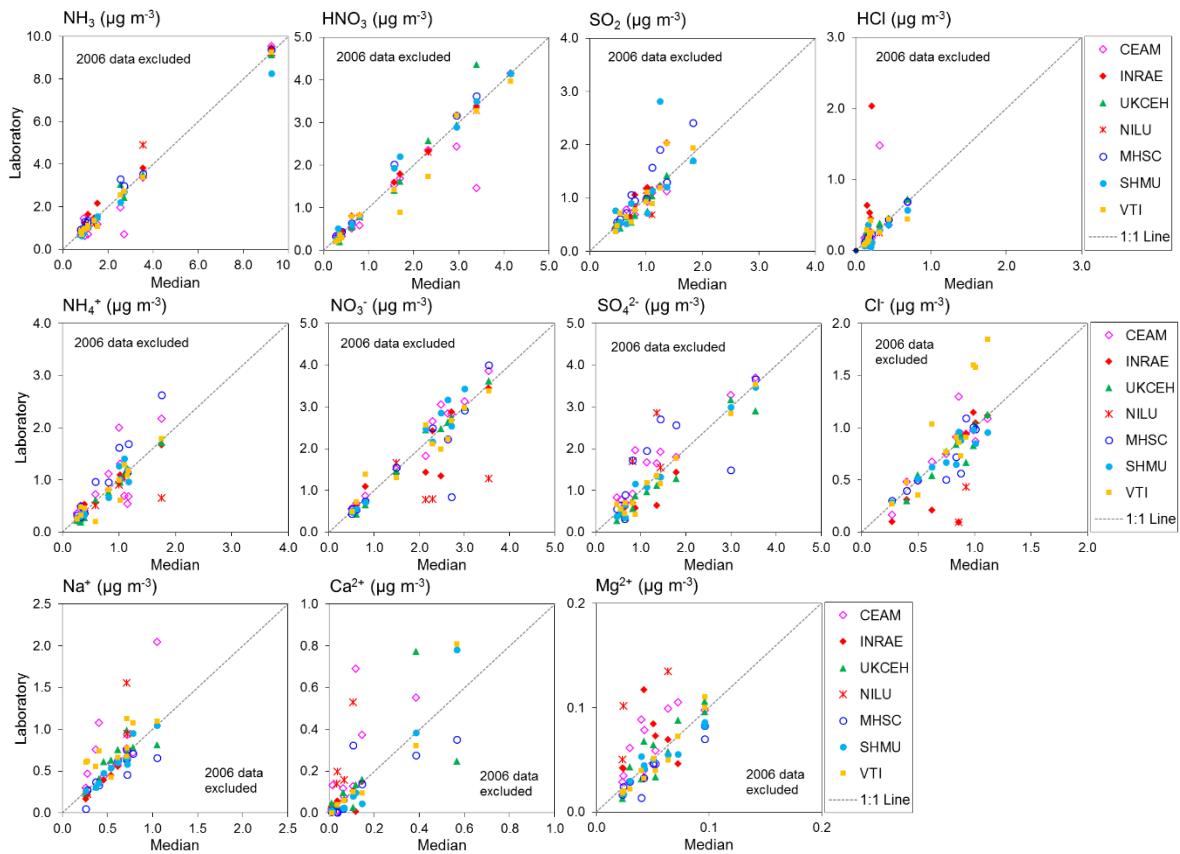


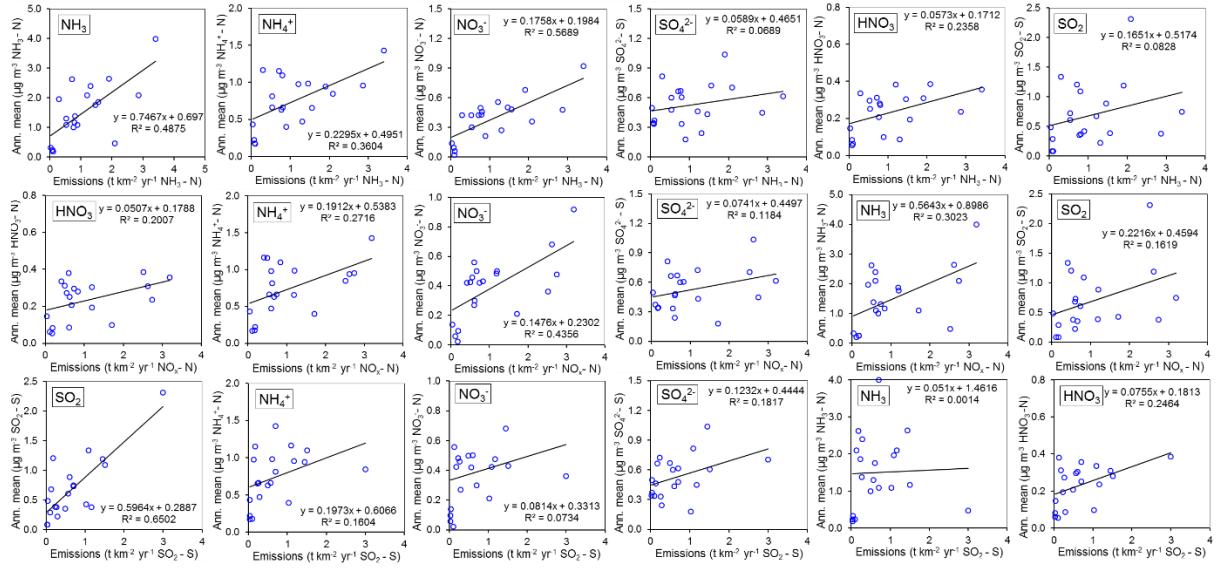
Supplementary material



Lab	Gas: NH ₃			Gas: HNO ₃			Gas: SO ₂			Gas: HCl		
	R ²	slope	n	R ²	slope	n	R ²	slope	n	R ²	slope	n
CEAM	0.94	1.02	12	0.83	0.81	12	0.90	0.85	11	0.88	0.92	11
INRAE	0.99	1.00	8	0.99	0.99	8	0.88	1.25	7	0.02	1.73	8
UKCEH	1.00	0.99	12	0.97	1.12	12	0.94	0.97	12	0.88	1.03	12
NILU	0.97	1.00	4	1.00	0.96	4	0.00	0.02	4	0.08	0.79	3
MHSC	0.99	0.99	10	0.99	1.16	9	0.86	1.33	10	0.99	1.02	10
SHMU	1.00	0.89	10	0.98	0.99	10	0.80	1.10	10	0.74	0.84	10
VTI	1.00	1.00	12	0.95	0.96	12	0.84	1.19	12	0.54	0.58	12
Lab	Particle: NH ₄ ⁺			Particle: NO ₃ ⁻			Particle: SO ₄ ²⁻			Particle: Cl ⁻		
	R ²	slope	n	R ²	slope	n	R ²	slope	n	R ²	slope	n
CEAM	0.51	0.97	12	0.97	1.08	12	0.91	0.96	12	0.78	1.03	12
INRAE	0.98	0.93	8	0.77	0.86	8	0.75	0.75	8	0.64	1.24	8
UKCEH	0.99	1.06	12	0.99	1.05	11	0.95	0.93	11	0.83	0.98	10
NILU	0.01*	0.06*	4	0.03	-0.08	4	0.90	1.63	3	-	-	2
MHSC	0.93	1.48	10	0.97	1.05	9	0.54	0.75	10	0.74	0.92	9
SHMU	0.88	1.08	10	0.96	1.14	10	0.98	1.00	10	0.86	0.83	10
VTI	0.86	0.99	12	0.91	0.86	11	0.97	0.99	12	0.73	1.62	12
Lab	Particle: Na ⁺			Particle: Ca ²⁺			Particle: Mg ²⁺					
	R ²	slope	n	R ²	slope	n	R ²	slope	n			
CEAM	0.20	0.54	11	0.52	1.60	11	0.55	0.94	11			
INRAE	0.99	0.99	8	0.39	0.57	8	0.04	0.33	8			
UKCEH	0.67	0.84	11	0.47	0.85	11	0.82	1.09	12			
NILU	0.84	2.24	4	0.78	4.85	4	0.47	2.49	4			
MHSC	0.74	0.78	9	0.67	0.64	10	0.88	0.79	9			
SHMU	0.91	1.05	10	0.95	1.33	10	0.90	0.78	10			
VTI	0.51	0.70	11	0.93	1.31	8	0.96	1.18	11			

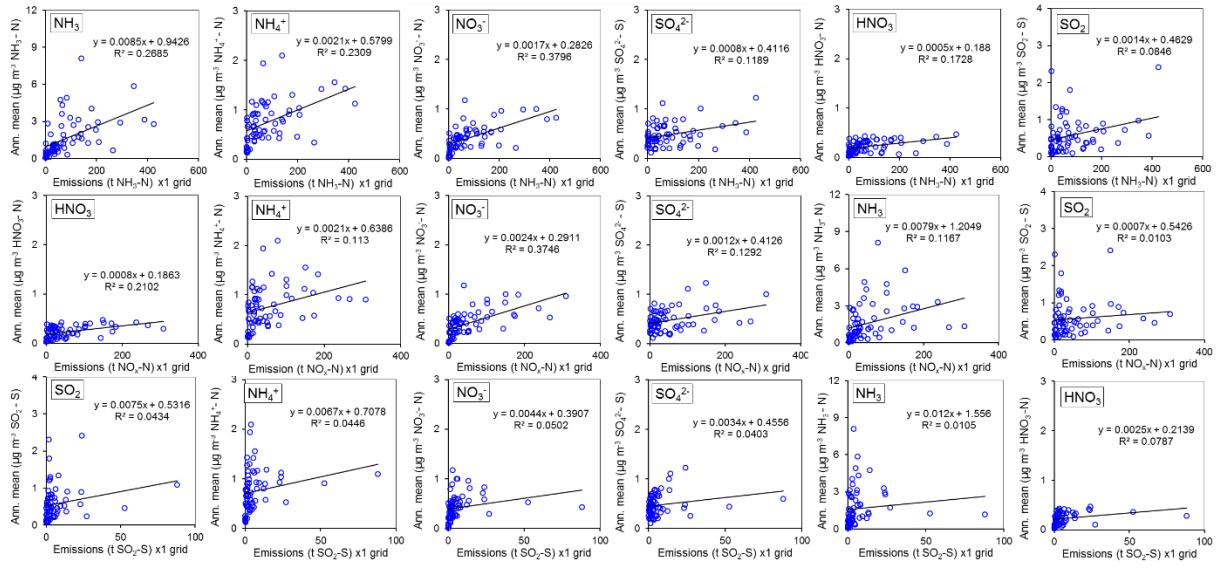
*regression line excluding one outlier; $Y = 0.98x - 0.06$, $R^2 = 1.00$

Figure S1: Scatter plots comparing atmospheric gas (NH₃, HNO₃, SO₂ and HCl) and aerosol (NH₄⁺, NO₃⁻, SO₄²⁻, Cl⁻, Na⁺, Ca²⁺, Mg²⁺) concentrations measured by each of the NEU laboratories with the median estimate of all laboratories for field inter-comparisons conducted between 2007 – 2009 only. Data from the 2006 inter-comparisons are excluded in this analysis, to compare with Figure 6 in main text which included all periods. A summary of the regression results is shown in the table below the graphs. Note (i) There are fewer data points for INRAE because they joined the NEU network later in 2007 and participated in the 2008 and 2009 inter-comparisons only. (ii) Low number of observations in some cases were due to some laboratories not reporting all parameters. NILU: HCl, Cl⁻, Na⁺, Ca²⁺ and Mg²⁺ reported for 2008 inter-comparisons only.



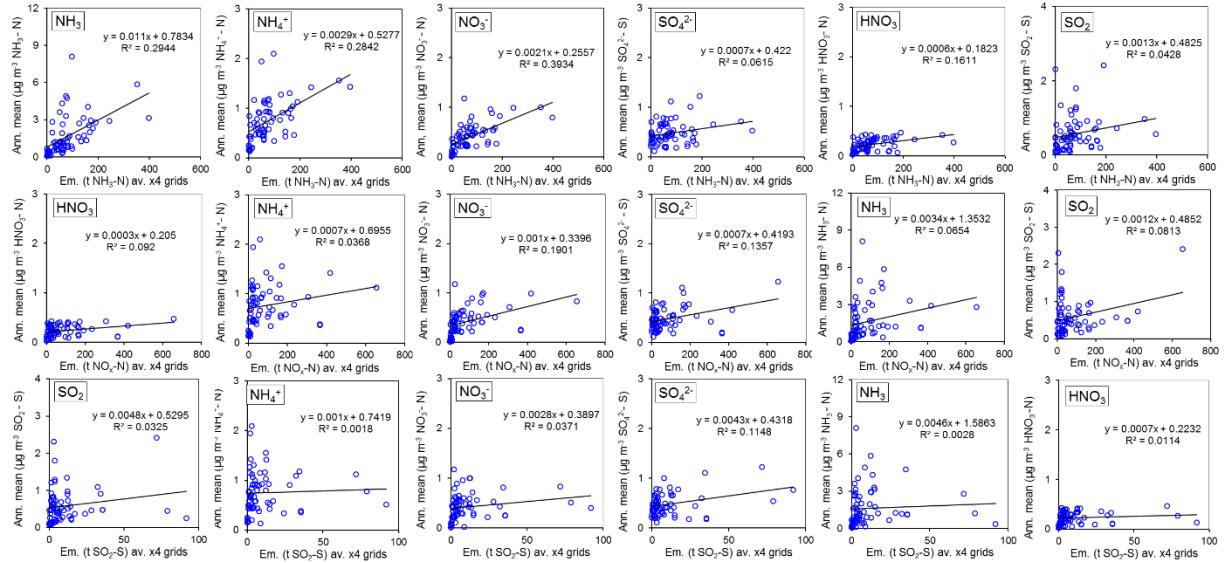
National annual average ($n = 20$) ($\mu\text{g m}^{-3}$)	4-year averaged national emission densities (2007 – 2010, 20 countries)								
	NH ₃ (tonnes N $\text{km}^{-2} \text{yr}^{-1}$)			NO _x (tonnes N $\text{km}^{-2} \text{yr}^{-1}$)			SO ₂ (tonnes S $\text{km}^{-2} \text{yr}^{-1}$)		
	slope	intercept	R ²	slope	intercept	R ²	slope	intercept	R ²
Gas NH ₃ - N	0.75	0.70	0.49***	0.57	0.90	0.30*	0.05	1.46	0.00ns
Gas HNO ₃ - N	0.06	0.17	0.24*	0.05	0.18	0.20*	0.08	0.18	0.25*
Gas SO ₂ - S	0.17	0.52	0.24ns	0.22	0.46	0.16ns	0.60	0.29	0.65***
Aerosol NH ₄ - N	0.23	0.50	0.36**	0.19	0.54	0.27*	0.20	0.61	0.16ns
Aerosol NO ₃ - N	0.18	0.20	0.57***	0.15	0.23	0.44**	0.08	0.33	0.07ns
Aerosol SO ₄ ²⁻ - S	0.06	0.47	0.07ns	0.07	0.45	0.12ns	0.12	0.44	0.18ns

Figure S2: (TOP) Scatter plots and (BOTTOM) summary statistics of regression analyses between national annual averaged gas (NH₃, HNO₃, SO₂) and aerosol (NH₄⁺, NO₃⁻, SO₄²⁻) concentrations, and the national emission densities of NH₃-N (upper plots), NO_x-N (middle plots) and SO₂-S (lower plots) (expressed as emissions per unit area of the country per year, averaged over the 4-year period 2007 to 2010) for each of the 20 countries in the NEU DELTA® network.



Site annual average (n = 66) ($\mu\text{g m}^{-3}$)	4-year averaged emissions (2007 – 2010) from single EMEP grid ($0.1^\circ \times 0.1^\circ$) containing monitoring site								
	NH ₃ (tonnes N yr ⁻¹)			NO _x (tonnes N yr ⁻¹)			SO ₂ (tonnes yr ⁻¹)		
	slope	intercept	R ²	slope	intercept	R ²	slope	intercept	R ²
Gas NH ₃ - N	0.0085	0.94	0.27***	0.0079	1.2	0.12**	0.0120	1.56	0.01ns
Gas HNO ₃ - N	0.0005	0.19	0.17***	0.0008	0.19	0.21***	0.0025	0.21	0.08*
Gas SO ₂ - S	0.0014	0.46	0.08*	0.0007	0.54	0.01ns	0.0075	0.53	0.04ns
Aerosol NH ₄ ⁺ - N	0.0021	0.58	0.23***	0.0021	0.64	0.11**	0.0067	0.71	0.04ns
Aerosol NO ₃ ⁻ - N	0.0017	0.28	0.38***	0.0024	0.29	0.37***	0.0044	0.39	0.05ns
Aerosol SO ₄ ²⁻ - S	0.0008	0.41	0.12**	0.0012	0.41	0.13**	0.0034	0.46	0.04ns

Figure S3: (TOP) Scatter plots and (BOTTOM) summary statistics of regression analyses between annual averaged gas (NH₃, HNO₃, SO₂) and aerosol (NH₄⁺, NO₃⁻, SO₄²⁻) concentrations at each NEU DELTA® site, and the emissions of NH₃-N (upper plots), NO_x-N (middle plots) and SO₂-S (lower plots) from individual EMEP grids ($0.1^\circ \times 0.1^\circ$) containing the site (emissions expressed per EMEP grid, averaged over the 4-year period 2007 to 2010).



Site annual average (n = 66) ($\mu\text{g m}^{-3}$)	4-year averaged emissions (2007 – 2010) from 4 x EMEP grids (each = $0.1^\circ \times 0.1^\circ$) surrounding each site								
	NH ₃ (tonnes N $\text{km}^{-2} \text{yr}^{-1}$)			NO _x (tonnes N $\text{km}^{-2} \text{yr}^{-1}$)			SO ₂ (tonnes S $\text{km}^{-2} \text{yr}^{-1}$)		
	slope	intercept	R ²	slope	intercept	R ²	slope	intercept	R ²
Gas NH ₃ - N	0.0110	0.78	0.29***	0.0034	1.35	0.07*	0.0046	1.59	0.00ns
Gas HNO ₃ - N	0.0006	0.18	0.16***	0.0003	0.21	0.09*	0.0007	0.22	0.01ns
Gas SO ₂ - S	0.0013	0.48	0.04ns	0.0012	0.49	0.08*	0.0048	0.53	0.03ns
Aerosol NH ₄ - N ⁺	0.0029	0.53	0.28***	0.0007	0.70	0.04ns	0.0010	0.74	0.00ns
Aerosol NO ₃ - N	0.0021	0.26	0.39***	0.0010	0.34	0.19***	0.0028	0.39	0.04ns
Aerosol SO ₄ ²⁻ - S	0.0007	0.42	0.06*	0.0007	0.42	0.14**	0.0043	0.43	0.11**

Figure S4: (TOP) Scatter plots and (BOTTOM) summary statistics of regression analyses between annual averaged gas (NH₃, HNO₃, SO₂) and aerosol (NH₄⁺, NO₃⁻, SO₄²⁻) concentrations at each NEU DELTA® site, and the averaged emissions of 4 EMEP grids (each grid = $0.1^\circ \times 0.1^\circ$, emissions expressed per EMEP grid, averaged over the 4-year period 2007 to 2010) surrounding each site, of NH₃-N (upper plots), NO_x-N (middle plots) and SO₂-S (lower plots)

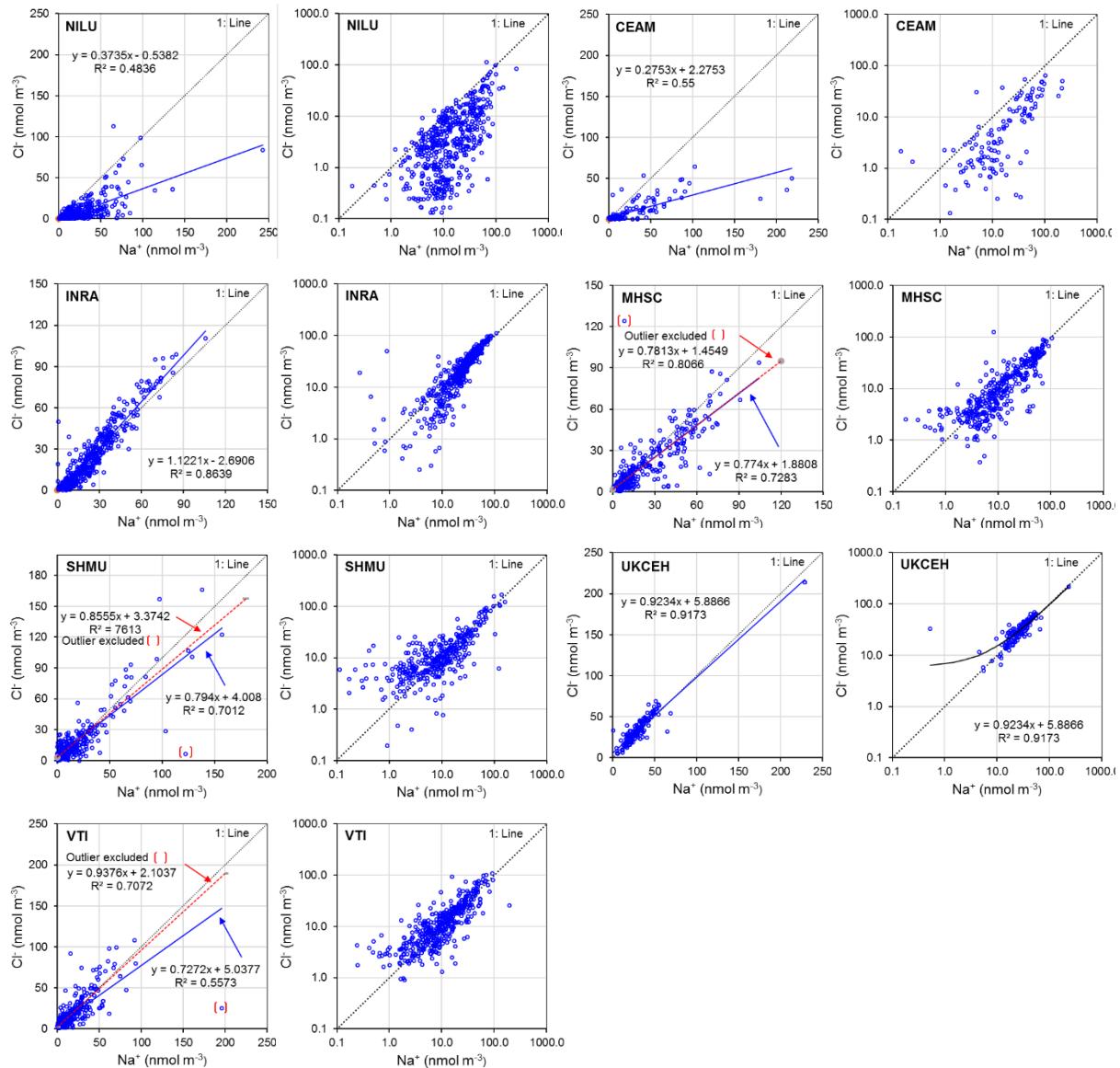


Figure S5: Regression plots between molar concentrations of Na^+ and Cl^- , with analysis grouped by sites with measurements made by each of the seven laboratories, NILU ($n = 16$), CEAM ($n = 3$), INRAE ($n = 10$), MHSC ($n = 9$), SHMU ($n = 9$), UKCEH ($n = 5$) and VTI ($n = 12$). In each case, the same plots are also shown on a log scale, to improve visualisation of data points at the lower concentrations. Each data point is the monthly measured concentration at individual sites.

Table S1: Details of all sites in the NEU DELTA® network.

Site no.	Site name	Site Code	Lat. (°N)	Long. (°E)	Ecosystem Type	Host organisation	START	END
1	Hainich	DE-Hai	51.0792	10.4519	Forests	Max-Planck-Institut für Biogeochemie Technical University Dresden	21/02/07	04/01/11
2	Wetzstein	DE-Wet	50.4533	11.4575	Forests		22/02/07	05/01/11
3	Gebesee	DE-Geb	51.1000	10.9142	Crops		21/02/07	05/01/11
4	Tharandt	DE-Tha	50.9636	13.5669	Forests		07/02/07	28/12/10
5	Grillenburg	DE-Gri	50.9494	13.5125	Grassland		07/02/07	28/12/10
6	Klingenbergen	DE-Kli	50.8931	13.5222	Crops		07/02/07	28/12/10
7	Hogwald	DE-Hog	48.3000	11.1000	Forests	FZK/IMK-IFU (Ins. Meteorology & Climate Research Atmos.Env. Research)	28/02/07	10/01/11
8	Mitra II	PT-Mi1	38.5406	-8.0000	Forests	Lisbon University	01/12/06	24/01/11
9	Petrodolinskoye	UA-Pet	46.5000	30.3000	Crops	Odessa National University	01/12/06	28/12/10
10	Renon	IT-Ren	46.5878	11.4347	Forests	Autonome Provinz Bozen	03/01/07	03/01/11
11	Fyodorovskoe bog	RU-Fyo	56.4617	32.9239	Forests	Russian Academy of Sciences	01/12/06	01/01/11
12	Espirra	PT-Esp	38.6392	-8.6017	Forests	Instituto Superior Technico Lisboa	09/01/07	04/01/11
13	BKFOREST	CZ-BK1	49.5025	18.5383	Forests	Inst. Systems Biology & Ecology	08/11/06	04/01/11
14	Bugac	HU-Bug	46.6917	19.6017	Semi-natural	Hungarian Met.Service	13/11/06	05/01/11
15	POLWET	PL-Pol	52.7622	16.3094	Semi-natural	University of Poznan	10/11/06	03/01/11
16	Oensingen	CH-Oei	47.2856	7.7319	Grassland	VTI (von Thunen Institut)	03/11/06	03/01/11
17	Laegern	CH-Lae	47.4778	8.3653	Forests	ETH	07/11/06	03/01/11
18	Monte Bondone	IT-MBo	46.0294	11.0828	Semi-natural	Centro di Ecologia Alpina	01/12/06	21/01/11
19	Piana del Sele (Borgo Cioffi)	IT-BCi	40.5236	14.9572	Crops	CNR ISAfom	05/12/06	03/01/11
20	Hesse	FR-Hes	48.6742	7.0656	Forests	INRAE (French National Research Institute for Agriculture, Food & Environment) /UHP	19/02/07	10/01/11
21	Dripsey	IE-Dri	51.9867	-8.7517	Grassland	University College Cork	01/12/06	03/06/10
22	Grignon	FR-Gri	48.8439	1.9522	Crops	INRAE / INAPG (Institut National Agronomique Paris-Grignon, France)	29/11/06	20/01/11
23	Fontainebleau	FR-Fon	48.4761	2.7800	Forests	Université Paris-Sud	29/11/06	07/01/11
24	Le Bray	FR-LBr	44.7172	-0.7689	Forests	INRAE Bordeaux	14/12/06	24/01/09
25	Laqueuille	FR-Lq2	45.6392	2.7369	Grassland	INRAE	09/11/06	07/01/11
26	Puechabon	FR-Pue	43.7414	3.5958	Forests	Dream CEFE-CNR (French res. center in Ecology & Evol. Ecology)	27/10/06	28/12/10
27	Griffin	UK-Gri	56.6167	-3.8000	Forests	University of Edinburgh	06/12/06	19/11/08
28	East Saltoun	UK-ESa	55.9000	-2.8380	Crops		07/11/06	21/10/08
29	Carlow	IE-Ca2	52.8500	-6.9000	Grassland	Trinity College Dublin	01/11/06	05/01/11
30	Soroe	DK-Sor	55.4869	11.6458	Forests	RISOE (National Laboratory for Sustainable Energy, Denmark)	31/10/06	15/12/10
31	Sodankylä	FI-Sod	67.3617	26.6378	Forests	Finnish Meteorological Institute	27/11/06	17/01/11
32	Kaamanen	FI-Kaa	69.1407	27.2833	Semi-natural		02/01/09	02/10/09
33	Lompolojänkkä	FI-Lom	68.2144	24.3531	Semi-natural		04/11/06	29/11/06
34	Rimi	DK-Lva	55.6953	12.1178	Grassland	RISOE	30/10/06	11/03/09
35	Risbyholm	DK-Ris	55.5303	12.0972	Crops	Geografisk Institut	30/11/06	04/08/08
36	Norunda	SE-Nor	60.0833	17.4667	Forests	Dept Physical Geography & Ecosystems Analysis	14/11/06	10/12/10
37	Skyttorp	SE-Sk2	60.1294	17.8400	Forests		11/01/07	02/12/08
38	Braschaat	BE-Bra	51.3092	4.5206	Forests	University of Antwerpen	31/10/06	04/01/11
39	Vielsalm	BE-Vie	50.3053	5.9967	Forests	Faculté universitaire des Sciences agronomiques de Gembloux	09/11/06	03/02/11
40	Lonzee	BE-Lon	50.5519	4.7447	Crops		10/11/06	27/01/11
41	Hyytiälä	FI-Hyy	61.8475	24.2950	Forests	University of Helsinki	01/12/06	09/12/10
42	Roccarespampani	IT-Ro2	42.3900	11.9208	Forests	University of Tuscia	01/12/06	05/01/11
43	Cabauw	NL-Ca1	51.9708	4.9269	Grassland	ECN (Energy Research, Netherlands)	31/01/07	29/12/10
44	Horstermeer	NL-Hor	52.0289	5.0675	Semi-natural	Universiteit Amsterdam	13/03/07	04/01/11
45	Speulder	NL-Spe	52.2523	5.6905	Forests	ECN	09/11/06	29/11/10
46	Amplero	IT-Amp	41.9039	13.6050	Semi-natural	University of Tuscia	01/12/06	24/09/08
47	Collelongo	IT-Col	41.8494	13.5881	Forests		14/12/06	20/01/11
48	San Rossore	IT-SRo	43.7278	10.2844	Forests	DC-DG JRC (Joint Research Centre, Italy)	01/02/07	12/01/11
49	Po Valley Pavia	IT-PoV	45.0628	8.6683	Crops		12/12/06	12/01/11
50	Loobos	NL-Loo	52.1678	5.7439	Forests	Alterra	14/12/06	14/01/11
51	SK04 Stara Lesna	SK04	49.1500	20.2833	Grassland	SHMU (Slovak Hydrometeorological Institute)	08/11/06	04/01/11
51P	SK04 Stara Lesna P	SK04P	49.1500	20.2833	Grassland		08/11/06	04/01/11
52	SK06 Starina	SK06	49.0500	22.2667	Grassland		08/11/06	04/01/11
53	SK07 Topolníky	SK07	47.9667	17.8667	Grassland		31/10/06	03/01/11
54	EI Saler	ES-ES1	39.3458	-0.3186	Forests	CEAM Fundación Centro de Estudios Ambientales del Mediterráneo	14/03/07	12/01/11
55	Vall de Aliñá	ES-VDA	42.1519	1.4483	Semi-natural		01/03/07	15/01/11
56	Las Majadas del Tietar (Caceres)	ES-LMa	39.9414	-5.7733	Forests		13/03/07	20/01/11
57	Auchencorth	UK-AMo	55.7917	-3.2389	Semi-natural	UKCEH (UK Centre for Ecology & Hydrology)	01/11/06	05/01/11
57B	Auchencorth	UK-AMoP	55.7917	-3.2389	Semi-natural		01/11/06	05/01/11
58	Easter Bush	UK-EBu	55.8658	-3.2056	Grassland		01/11/06	05/01/11
58P	Easter Bush Parallel	UK-EBu	55.8658	-3.2056	Grassland		01/11/06	01/03/10
59	Mehrstedt	DE-Meh	51.2761	10.6572	Forests		13/08/07	05/01/11
60	Fougeres	FR-Fgs	48.3830	-1.1847	Forests	INRAE	05/08/08	05/01/11
60P	Fougeres Parallel	FR-FgsP	48.3830	-1.1847	Forests		10/02/10	05/01/11
61	Solohead	UK-Sol	52.5100	-8.2100	Forests		26/11/08	05/01/11
62	Birkenes	NO-Bir	58.3833	8.2500	Forests	Dept Physical Geography & Ecosystems Analysis	01/01/09	01/01/10
63	Brandbjerg	DK-Bra	55.8833	11.9667	Semi-natural		08/04/09	13/12/10
64	Bilos	FR-Bil	44.5217	-0.8960	Forests	INRAE Bordeaux	01/10/09	12/01/11

Table S2: Details of sites in the NEU Wet Deposition Network.

Site no.	Site name	Site Code	Lat. (°N)	Long. (°E)	Ecosystem Type	Host organisation	START	END
1	Hainich	DE-Hai	51.0792	10.4519	Forests	Max-Planck-Institut für Biogeochemie	04/12/08	11/01/11
2	Wetzstein	DE-Wet	50.4533	11.4575	Forests		19/02/08	12/01/11
5	Grillenburg	DE-Gri	50.9494	13.5125	Grassland		02/12/08	28/12/10
8	Mitra II	PT-Mi1	38.5406	-8.0000	Forests	Lisbon University	08/02/08	09/03/10
15	POLWET	PL-wet	52.7622	16.3094	Semi-natural	University of Poznan	30/01/08	16/02/11
17	Laegern	CH-Lae	47.4778	8.3653	Forests	ETH	29/01/08	03/01/11
19	Piana del Sele (Borgo Cioffi)	IT-BCi	40.5236	14.9572	Crops	CNR ISAForm	28/10/08	23/04/10
23	Fontainebleau	FR-Fon	48.4761	2.7800	Forests	Université Paris-Sud	30/01/08	03/11/10
24	Le Bray	FR-LBr	44.7172	-0.7689	Forests	INRAE Bordeaux	01/02/08	05/01/09
26	Puechabon	FR-Pue	43.7414	3.5958	Forests	Dream CEFE-CNR	01/02/08	28/12/10
39	Vielsalm	BE-Vie	50.3053	5.9967	Forests	Faculté universitaire des Sciences agronomiques de Gembloux	30/01/08	03/02/11
42	Roccarespampani	IT-Ro2	42.3900	11.9208	Forests		03/09/08	05/01/11
48	San Rossore	IT-SR	43.7278	10.2844	Forests	DC-DG JRC	19/12/07	12/01/11
54	El Saler)	ES-ES1	39.3458	-0.3186	Forests	CEAM	18/12/07	01/12/09
55	Vall de Aliñá	ES-VDA	42.1519	1.4483	Semi-natural		28/02/08	15/01/11
56	Las Majadas del Tietar (Caceres)	ES-LMa	39.9414	-5.7733	Forests		20/02/07	20/01/11
60	Fougeres	FR-Fgs	48.3830	-1.1847	Forests	INRAE	23/06/09	31/08/10
64	Bilos	FR-Bil	44.5217	-0.8960	Forests	INRAE Bordeaux	01/10/09	12/01/11

Table S3: Summary statistics on denuder capture efficiencies for atmospheric NH₃ gas by the 7 laboratories from DELTA inter-comparisons conducted at 4 different field test sites for all years (2006 – 2010).

	Denuder capture Efficiency (%) NH ₃ 4 years (2006 - 2009)				Denuder capture Efficiency (%) NH ₃ 3 years (2007 - 2009)			
	mean	min	max	N	mean	min	max	N
	VTI	95	65	99	10	95	65	99
MHSC	88	67	100	41	91	77	99	12
UKCEH	90	58	99	42	91	58	99	13
CEAM	82	49	100	41	78	49	100	13
NILU	92	81	105	30	89	84	98	5
SHMU	93	47	100	38	87	47	96	11
INRAE	97	94	99	8	97	94	99	8
Mean all	91				90			

VTI: denuder capture efficiencies reported for 2008 and 2009 periods only. INRAE: 2009 period only.

Table S4: Annual mean NH₃ gas concentrations measured in the NEU DELTA® network and summary statistics.

Site	Ecosystem type	NH ₃ -N (µg m ⁻³)				Summary statistics					Group Mean
		2007	2008	2009	2010	mean	min	max	sd	N	
UK-ESa	Crops	4.30	1.40	-	-	2.85	1.40	4.30	2.05	2	
DE-Geb	Crops	8.78	2.87	3.22	4.79	4.92	2.87	8.78	2.71	4	
FR-Gri	Crops	3.00	3.33	4.19	2.72	3.31	2.72	4.19	0.64	4	
DE-Kli	Crops	1.81	1.48	1.60	1.31	1.55	1.31	1.81	0.21	4	
BE-Lon	Crops	4.33	3.44	7.34	3.88	4.75	3.44	7.34	1.77	4	
UA-Pet	Crops	2.07	2.93	1.61	1.24	1.96	1.24	2.93	0.73	4	
IT-BCi	Crops	6.82	7.53	10.89	7.20	8.11	6.82	10.89	1.88	4	
IT-PoV	Crops	3.49	3.35	4.16	3.54	3.64	3.35	4.16	0.36	4	
DK-Ris	Crops	3.59	5.07	-	-	4.33	3.59	5.07	1.05	2	
SK07	Crops	2.73	3.98	1.99	2.16	2.72	1.99	3.98	0.90	4	3.81
FR-Bil	Forest	-	-	-	0.43	0.43	0.43	-	-	1	
NO-Bir	Forest	-	-	0.25	0.23	0.24	0.23	0.25	0.01	2	
CZ-BK1	Forest	0.46	0.55	-	0.41	0.47	0.41	0.55	0.07	3	
BE-Bra	Forest	2.75	2.68	3.20	2.57	2.80	2.57	3.20	0.28	4	
IT-Col	Forest	-	0.45	0.74	0.51	0.57	0.45	0.74	0.15	3	
ES-ES1	Forest	1.56	1.56	1.34	0.92	1.35	0.92	1.56	0.30	4	
PT-Esp	Forest	2.12	1.61	1.61	1.42	1.69	1.42	2.12	0.30	4	
FR-Fon	Forest	1.01	0.80	1.17	1.14	1.03	0.80	1.17	0.17	4	
FR-Fgs	Forest	-	-	2.00	2.01	2.01	2.00	2.01	0.01	2	
FR-FgsP	Forest	-	-	-	1.93	1.93	1.93	-	-	1	
RU-Fyo	Forest	0.26	0.29	0.42	0.32	0.32	0.26	0.42	0.07	4	
UK-Gri	Forest	0.13	-	-	-	0.13	0.13	0.13	-	1	
DE-Hai	Forest	0.74	0.67	1.07	1.07	0.89	0.67	1.07	0.21	4	
FR-Hes	Forest	1.02	0.77	0.91	0.81	0.88	0.77	1.02	0.11	4	
DE-Hog	Forest	2.31	2.28	3.18	2.47	2.56	2.28	3.18	0.42	4	
FI-Hyy	Forest	0.07	0.07	0.10	0.11	0.09	0.07	0.11	0.02	4	
CH-Lae	Forest	1.15	1.12	1.48	1.27	1.26	1.12	1.48	0.16	4	
ES-LMa	Forest	1.29	0.82	1.06	0.71	0.97	0.71	1.29	0.26	4	
FR-LBr	Forest	0.97	1.31	-	-	1.14	0.97	1.31	0.24	2	
NL-Loo	Forest	4.04	2.89	3.19	2.50	3.16	2.50	4.04	0.65	4	
PT-Mi1	Forest	0.94	0.94	0.86	-	0.91	0.86	0.94	0.05	3	
SE-Nor	Forest	0.09	0.25	0.44	0.27	0.26	0.09	0.44	0.14	4	
FR-Pue	Forest	0.48	0.38	0.47	0.43	0.44	0.38	0.48	0.05	4	
FR-Ren	Forest	0.28	0.25	0.51	0.28	0.33	0.25	0.51	0.12	4	
IT-Ro2	Forest	1.55	2.13	1.53	1.29	1.63	1.29	2.13	0.36	4	
IT-SRo	Forest	1.04	0.65	2.54	0.58	1.20	0.58	2.54	0.91	4	
SK04	Forest	0.61	0.52	0.56	0.54	0.56	0.52	0.61	0.04	4	
SK04P	Forest	0.60	0.62	0.62	0.54	0.60	0.54	0.62	0.04	4	
SK06	Forest	0.45	0.51	0.50	0.55	0.50	0.45	0.55	0.04	4	
SE-Sk2	Forest	0.15	0.08	-	-	0.12	0.08	0.15	0.05	2	
FI-Sod	Forest	0.19	0.05	0.13	0.17	0.14	0.05	0.19	0.06	4	
DK-Sor	Forest	1.26	1.28	1.28	1.27	1.27	1.26	1.28	0.01	4	
NL-Spe	Forest	3.72	4.08	4.46	3.96	4.06	3.72	4.46	0.31	4	
DE-Tha	Forest	0.53	0.70	0.96	0.96	0.79	0.53	0.96	0.21	4	
BE-Vie	Forest	0.29	0.37	0.35	0.46	0.37	0.29	0.46	0.07	4	
DE-Wet	Forest	0.31	0.50	0.60	0.76	0.54	0.31	0.76	0.19	4	1.04
UK-EBu	Grass	1.34	0.76	0.91	1.39	1.10	0.76	1.39	0.31	4	
UK-EBuP	Grass	1.35	0.98	1.11	-	1.15	0.98	1.35	0.19	3	
NL-Ca1	Grass	6.29	5.60	5.85	5.75	5.87	5.60	6.29	0.30	4	
IE-Car	Grass	1.69	1.44	1.52	2.22	1.72	1.44	2.22	0.35	4	
IE-Dri	Grass	2.28	1.78	2.88	-	2.31	1.78	2.88	0.55	3	
DE-Gri	Grass	0.93	0.79	0.89	1.00	0.90	0.79	1.00	0.09	4	
FR-Lq2	Grass	1.14	1.09	1.45	1.36	1.26	1.09	1.45	0.17	4	
CH-Oe1	Grass	3.20	2.17	3.62	2.76	2.94	2.17	3.62	0.62	4	
DK-Rim	Grass	1.22	1.21	-	-	1.22	1.21	1.22	0.01	2	
UK-Sol	Grass	-	-	2.37	3.94	3.16	2.37	3.94	1.11	2	2.16
IT-Amp	Semi-Natural	0.52	0.61	-	-	0.57	0.52	0.61	0.06	2	
UK-AMo	Semi-Natural	0.64	0.61	0.72	0.69	0.67	0.61	0.72	0.05	4	
UK-AMoP	Semi-Natural	0.61	0.61	0.69	0.69	0.65	0.61	0.69	0.05	4	
DK-Brj	Semi-Natural	-	-	-	0.64	0.64	0.64	0.64	-	1	
HU-Bug	Semi-Natural	2.36	2.18	3.07	2.88	2.62	2.18	3.07	0.42	4	
NL-Hor	Semi-Natural	2.52	2.47	2.85	3.77	2.90	2.47	3.77	0.60	4	
FI-Kaa	Semi-Natural	-	-	1.01	0.29	0.65	0.29	1.01	0.51	2	
FI-Lom	Semi-Natural	0.06	0.06	0.09	0.08	0.07	0.06	0.09	0.02	4	
DE-Meh	Semi-Natural	-	1.80	1.73	2.25	1.93	1.73	2.25	0.28	3	
IT-MBo	Semi-Natural	0.76	0.71	0.82	0.66	0.74	0.66	0.82	0.07	4	
PL-Pol	Semi-Natural	1.12	0.78	1.82	0.95	1.17	0.78	1.82	0.46	4	
ES-VDA	Semi-Natural	-	0.61	0.83	0.63	0.69	0.61	0.83	0.12	3	1.11
		mean	1.75	1.55	1.87	1.58	1.63				
		min	0.06	0.05	0.09	0.08	0.07				
		max	8.78	7.53	10.89	7.20	8.11				
		n	58	60	57	58	68				

Table S5: Annual average NH_3 concentration measured in the NEU 1 DELTA® network and comparison with UNECE critical levels of NH_3 concentrations (annual mean), showing percentage exceedances for all sites and according to sites grouped by ecosystem type.

Country	ID	Ecosystem type	Annual averaged NH_3 ($\mu\text{g m}^{-3}$)					% of sites in exceedance of UNECE Critical Levels of NH_3 concentrations (annual mean)
			mean	min	max	sd	N	
Germany	DE-Kli	C	1.88	1.59	2.20	0.26	4	ALL sites ($n = 64$) mean = $1.98 \mu\text{g NH}_3 \text{ m}^{-3}$ $> 1 \mu\text{g NH}_3 \text{ m}^{-3} = 63 \%$ $> 3 \mu\text{g NH}_3 \text{ m}^{-3} = 27 \%$
Ukraine	UA-Pet	C	2.38	1.50	3.55	0.88	4	
Slovakia	SK07	C	3.30	2.42	4.84	1.09	4	
UK	UK-ESA	C	3.46	1.70	5.22	2.48	2	
France	FR-Gri	C	4.02	3.30	5.09	0.78	4	
Italy	IT-PoV	C	4.41	4.07	5.05	0.44	4	
Denmark	DK-Ris	C	5.26	4.36	6.15	1.27	2	
Belgium	BE-Lon	C	5.77	4.18	8.92	2.15	4	
Germany	DE-Geb	C	5.97	3.49	10.66	3.29	4	
Italy	IT-BCi	C	9.85	8.28	13.22	2.28	4	
Finland	FI-Hyy	F	0.11	0.09	0.13	0.02	4	Crops ($n = 10$) mean = $4.63 \mu\text{g NH}_3 \text{ m}^{-3}$ $> 1 \mu\text{g NH}_3 \text{ m}^{-3} = 100 \%$ $> 3 \mu\text{g NH}_3 \text{ m}^{-3} = 80 \%$
Sweden	SE-Sk2	F	0.14	0.09	0.18	0.06	2	
UK	UK-Gri	F	0.16	0.16	0.16	-	1	
Finland	FI-Sod	F	0.17	0.06	0.24	0.08	4	
Norway	NO-Bir	F	0.29	0.28	0.30	0.02	2	
Sweden	SE-Nor	F	0.32	0.11	0.54	0.17	4	
Russia	RU-Fyo	F	0.39	0.32	0.51	0.08	4	
France	FR-Ren	F	0.40	0.30	0.62	0.15	4	
Belgium	BE-Vie	F	0.45	0.35	0.56	0.09	4	
France	FR-Bil	F	0.52	0.52	0.52	-	1	
France	FR-Pue	F	0.54	0.47	0.58	0.05	4	Forests ($n = 34$) mean = $1.27 \mu\text{g NH}_3 \text{ m}^{-3}$ $> 1 \mu\text{g NH}_3 \text{ m}^{-3} = 50 \%$ $> 3 \mu\text{g NH}_3 \text{ m}^{-3} = 12 \%$
Czech Rep.	CZ-BK1	F	0.58	0.50	0.67	0.09	3	
Slovakia	SK06	F	0.61	0.55	0.67	0.05	4	
Germany	DE-Wet	F	0.66	0.37	0.92	0.23	4	
Italy	IT-Col	F	0.68	0.63	0.74	0.05	4	
Slovakia	SK04	F	0.72	0.66	0.76	0.05	4	
Slovakia	SK04P	F	0.68	0.54	0.89	0.19	3	
Germany	DE-Tha	F	0.95	0.64	1.17	0.26	4	
France	FR-Hes	F	1.06	0.93	1.24	0.14	4	
Germany	DE-Hai	F	1.08	0.82	1.30	0.26	4	
Portugal	PT-Mi1	F	1.11	1.04	1.14	0.06	3	Grassland ($n = 9$) mean = $2.62 \mu\text{g NH}_3 \text{ m}^{-3}$ $> 1 \mu\text{g NH}_3 \text{ m}^{-3} = 100 \%$ $> 3 \mu\text{g NH}_3 \text{ m}^{-3} = 33 \%$
Spain	ES-LMa	F	1.18	0.87	1.56	0.31	4	
France	FR-Fon	F	1.25	0.97	1.43	0.21	4	
France	FR-LBr	F	1.39	1.18	1.60	0.30	2	
Italy	IT-SR	F	1.47	0.71	3.09	1.11	4	
Switzerland	CH-Lae	F	1.52	1.36	1.79	0.20	4	
Denmark	DK-Sor	F	1.54	1.53	1.55	0.01	4	
Spain	ES-ES1	F	1.63	1.12	1.89	0.36	4	
Italy	IT-Ro2	F	1.97	1.57	2.59	0.43	4	
Portugal	PT-Esp	F	2.05	1.73	2.57	0.36	4	
France	FR-Fgs	F	2.43	2.43	2.44	0.01	2	(SK04/SK04P and FR-Fgs/FR-FgsP = parallel measurements)
France	FR-FgsP	F	2.34	2.34	2.34	-	1	
Germany	DE-Hog	F	3.11	2.77	3.87	0.51	4	
Belgium	BE-Bra	F	3.40	3.12	3.89	0.34	4	
Netherlands	NL-Loo	F	3.83	3.04	4.91	0.80	4	
Netherlands	NL-Spe	F	4.92	4.52	5.42	0.38	4	
Germany	DE-Gri	G	1.10	0.96	1.21	0.10	4	
UK	UK-EBu	G	1.34	0.93	1.68	0.37	4	
UK	UK-EBuP	G	1.39	1.18	1.65	0.23	3	
Denmark	DK-Rim	G	1.47	1.46	1.48	0.01	2	
France	FR-Lq2	G	1.53	1.32	1.76	0.21	4	(UK-EBu/UK-EBuP = parallel measurement)
Ireland	IE-Car	G	2.08	1.74	2.69	0.43	4	
Ireland	IE-Dri	G	2.81	2.16	3.50	0.67	3	
Switzerland	CH-Oe1	G	3.57	2.63	4.40	0.75	4	
UK	UK-Sol	G	3.83	2.88	4.79	1.35	2	
Netherlands	NL-Ca1	G	7.13	6.80	7.64	0.36	4	
Finland	FI-Lom	SN	0.09	0.07	0.11	0.02	4	
Italy	IT-Amp	SN	0.69	0.63	0.74	0.08	2	
Denmark	DK-Brj	SN	0.77	0.77	0.77	-	1	
Finland	FI-Kaa	SN	0.79	0.35	1.22	0.62	2	
UK	UK-AMo	SN	0.81	0.75	0.87	0.06	4	Semi-natural (SN) ($n = 11$) mean = $1.34 \mu\text{g NH}_3 \text{ m}^{-3}$ $> 1 \mu\text{g NH}_3 \text{ m}^{-3} = 36 \%$ $> 3 \mu\text{g NH}_3 \text{ m}^{-3} = 18 \%$
UK	UK-AMoP	SN	0.79	0.74	0.84	0.05	4	
Spain	ES-VDA	SN	0.84	0.74	1.01	0.15	3	
Italy	IT-MBo	SN	0.90	0.80	0.99	0.08	4	
Poland	PL-Pol	SN	1.42	0.95	2.21	0.56	4	
Germany	DE-Meh	SN	2.34	2.10	2.73	0.34	3	
Hungary	HU-Bug	SN	3.18	2.64	3.73	0.51	4	
Netherlands	NL-Hor	SN	3.52	3.00	4.58	0.74	4	

Table S6: Annual mean particulate NH_4^+ concentrations measured in the NEU DELTA® network and summary statistics.

Site	Ecosystem type	NH ₄ ⁺ -N ($\mu\text{g m}^{-3}$)				Summary statistics					Group Mean
		2007	2008	2009	2010	mean	min	max	sd	N	
UK-ESa	Crops	0.99	0.41	-	-	0.70	0.41	0.99	0.41	2	
DE-Geb	Crops	1.13	1.05	1.25	1.17	1.15	1.05	1.25	0.08	4	
FR-Gri	Crops	1.15	0.73	0.97	0.86	0.93	0.73	1.15	0.18	4	
DE-Kli	Crops	1.06	1.05	1.06	1.11	1.07	1.05	1.11	0.03	4	
BE-Lon	Crops	1.01	0.82	1.32	1.58	1.18	0.82	1.58	0.34	4	
UA-Pet	Crops	1.16	1.70	0.91	0.89	1.17	0.89	1.70	0.38	4	
IT-BCi	Crops	1.38	1.33	0.83	0.98	1.13	0.83	1.38	0.27	4	
IT-PoV	Crops	2.53	2.22	1.58	1.44	1.94	1.44	2.53	0.52	4	
DK-Ris	Crops	0.49	0.62	-	-	0.56	0.49	0.62	0.09	2	
SK07	Crops	1.44	1.59	1.05	1.01	1.27	1.01	1.59	0.29	4	1.11
FR-Bil	Forest	-	-	-	0.38	0.38	0.38	0.38	-	1	
NO-Bir	Forest	-	-	0.21	0.23	0.22	0.21	0.23	0.01	2	
CZ-BK1	Forest	0.94	0.85	-	0.74	0.84	0.74	0.94	0.10	3	
BE-Bra	Forest	0.87	0.98	1.20	1.45	1.13	0.87	1.45	0.26	4	
IT-Col	Forest	-	0.48	0.52	0.39	0.46	0.39	0.52	0.07	3	
ES-ES1	Forest	0.77	1.03	1.02	0.77	0.90	0.77	1.03	0.15	4	
PT-Esp	Forest	1.03	0.67	0.51	0.70	0.73	0.51	1.03	0.22	4	
FR-Fon	Forest	1.14	0.79	0.94	0.82	0.92	0.79	1.14	0.16	4	
FR-Fgs	Forest	-	-	0.89	0.71	0.80	0.71	0.89	0.13	2	
FR-FgsP	Forest	-	-	-	0.69	0.69	0.69	0.69	-	1	
RU-Fyo	Forest	0.49	0.42	0.33	0.49	0.43	0.33	0.49	0.08	4	
UK-Gri	Forest	0.20	-	-	-	0.20	0.20	0.20	-	1	
DE-Hai	Forest	1.03	0.86	0.96	0.84	0.92	0.84	1.03	0.09	4	
FR-Hes	Forest	0.86	0.75	0.80	0.79	0.80	0.75	0.86	0.05	4	
DE-Hog	Forest	0.98	1.07	1.02	0.90	0.99	0.90	1.07	0.07	4	
FI-Hyy	Forest	0.17	0.09	0.19	0.25	0.18	0.09	0.25	0.07	4	
CH-Lae	Forest	1.12	0.77	0.85	0.90	0.91	0.77	1.12	0.15	4	
ES-LMa	Forest	0.37	0.54	0.47	0.50	0.47	0.37	0.54	0.07	4	
FR-LBr	Forest	0.69	0.48	-	-	0.59	0.48	0.69	0.15	2	
NL-Loo	Forest	1.60	1.60	1.34	1.18	1.43	1.18	1.60	0.21	4	
PT-Mi1	Forest	0.92	0.48	0.38	-	0.59	0.38	0.92	0.29	3	
SE-Nor	Forest	0.10	0.12	0.26	0.28	0.19	0.10	0.28	0.09	4	
FR-Pue	Forest	0.54	0.38	0.43	0.38	0.43	0.38	0.54	0.08	4	
FR-Ren	Forest	0.59	0.46	0.41	0.29	0.44	0.29	0.59	0.12	4	
IT-Ro2	Forest	0.83	0.81	0.70	0.70	0.76	0.70	0.83	0.07	4	
IT-SRo	Forest	0.85	0.94	0.65	0.68	0.78	0.65	0.94	0.14	4	
SK04	Forest	0.74	0.73	0.60	0.55	0.66	0.55	0.74	0.09	4	
SK04P	Forest	0.74	0.79	0.58	0.53	0.66	0.53	0.79	0.12	4	
SK06	Forest	0.75	0.69	0.60	0.60	0.66	0.60	0.75	0.07	4	
SE-Sk2	Forest	0.18	0.12	-	-	0.15	0.12	0.18	0.04	2	
FI-Sod	Forest	0.02	0.10	0.13	0.27	0.13	0.02	0.27	0.10	4	
DK-Sor	Forest	0.60	0.49	0.64	0.56	0.57	0.49	0.64	0.06	4	
NL-Spe	Forest	1.30	1.34	1.35	1.23	1.31	1.23	1.35	0.05	4	
DE-Tha	Forest	0.89	0.85	1.02	0.92	0.92	0.85	1.02	0.07	4	
BE-Vie	Forest	0.52	0.35	0.42	0.79	0.52	0.35	0.79	0.19	4	
DE-Wet	Forest	0.89	0.71	0.81	0.73	0.79	0.71	0.89	0.08	4	0.65
UK-EBu	Grass	0.44	0.33	0.38	0.30	0.36	0.30	0.44	0.06	4	
UK-EBuP	Grass	0.45	0.37	0.33	-	0.38	0.33	0.45	0.06	3	
NL-Ca1	Grass	1.92	1.47	1.40	1.44	1.56	1.40	1.92	0.24	4	
IE-Car	Grass	0.58	0.60	0.44	0.48	0.53	0.44	0.60	0.08	4	
IE-Dri	Grass	0.50	0.57	0.31	-	0.46	0.31	0.57	0.13	3	
DE-Gri	Grass	0.96	0.83	0.89	0.95	0.91	0.83	0.96	0.06	4	
FR-Lq2	Grass	0.54	0.36	0.45	0.39	0.44	0.36	0.54	0.08	4	
CH-Oe1	Grass	1.32	0.99	0.87	0.97	1.04	0.87	1.32	0.20	4	
DK-Rim	Grass	0.66	0.50	-	-	0.58	0.50	0.66	0.11	2	
UK-Sol	Grass	-	-	0.40	0.45	0.43	0.40	0.45	0.04	2	0.67
IT-Amp	Semi-Natural	0.50	0.46	-	-	0.48	0.46	0.50	0.03	2	
UK-AMo	Semi-Natural	0.42	0.33	0.32	0.28	0.34	0.28	0.42	0.06	4	
UK-AMoP	Semi-Natural	0.37	0.29	0.24	0.35	0.31	0.24	0.37	0.06	4	
DK-Brj	Semi-Natural	-	-	-	0.90	0.90	0.90	0.90	-	1	
HU-Bug	Semi-Natural	1.39	1.12	0.89	1.22	1.16	0.89	1.39	0.21	4	
NL-Hor	Semi-Natural	1.47	1.28	1.47	1.45	1.42	1.28	1.47	0.09	4	
FI-Kaa	Semi-Natural	-	-	0.34	0.16	0.25	0.16	0.34	0.13	2	
FI-Lom	Semi-Natural	0.24	0.08	0.05	0.22	0.15	0.05	0.24	0.10	4	
DE-Meh	Semi-Natural	-	1.15	1.13	1.09	1.12	1.09	1.15	0.03	3	
IT-MBo	Semi-Natural	0.82	0.66	0.55	0.64	0.67	0.55	0.82	0.11	4	
PL-Pol	Semi-Natural	1.30	0.90	0.96	1.22	1.10	0.90	1.30	0.19	4	
ES-VDA	Semi-Natural	-	0.52	0.40	0.62	0.51	0.40	0.62	0.11	3	0.70
		mean	0.84	0.75	0.72	0.75	0.73				
		min	0.02	0.08	0.05	0.16	0.13				
		max	2.53	2.22	1.58	1.58	1.94				
		n	58	60	57	58	68				

Table S7: Annual mean HNO₃ gas concentrations measured in the NEU DELTA® network and summary statistics.

Site	Ecosystem type	HNO ₃ -N (µg m ⁻³)				Summary statistics					Group Mean
		2007	2008	2009	2010	mean	min	max	sd	N	
UK-ESa	Crops	0.12	0.12	-	-	0.12	0.12	0.12	0.00	2	
DE-Geb	Crops	0.26	0.25	0.29	0.34	0.29	0.25	0.34	0.04	4	
FR-Gri	Crops	0.54	0.37	0.40	0.39	0.43	0.37	0.54	0.08	4	
DE-Kli	Crops	0.32	0.30	0.31	0.37	0.33	0.30	0.37	0.03	4	
BE-Lon	Crops	0.26	0.32	0.37	0.37	0.33	0.26	0.37	0.05	4	
UA-Pet	Crops	0.38	0.33	0.31	0.32	0.34	0.31	0.38	0.03	4	
IT-BCi	Crops	0.38	0.38	0.43	0.32	0.38	0.32	0.43	0.05	4	
IT-PoV	Crops	0.44	0.44	0.40	0.43	0.43	0.40	0.44	0.02	4	
DK-Ris	Crops	0.14	0.17	-	-	0.16	0.14	0.17	0.02	2	
SK07	Crops	0.37	0.32	0.38	0.41	0.37	0.32	0.41	0.04	4	0.32
FR-Bil	Forest	-	-	-	0.17	0.17	0.17	-	-	1	
NO-Bir	Forest	-	-	0.09	0.08	0.09	0.08	0.09	0.01	2	
CZ-BK1	Forest	0.39	0.42	-	0.34	0.38	0.34	0.42	0.04	3	
BE-Bra	Forest	0.52	0.45	0.49	0.43	0.47	0.43	0.52	0.04	4	
IT-Col	Forest	-	0.12	0.16	0.12	0.13	0.12	0.16	0.02	3	
ES-ES1	Forest	0.33	0.32	0.27	0.27	0.30	0.27	0.33	0.03	4	
PT-Esp	Forest	0.47	0.32	0.32	0.33	0.36	0.32	0.47	0.07	4	
FR-Fon	Forest	0.46	0.35	0.39	0.41	0.40	0.35	0.46	0.05	4	
FR-Fgs	Forest	-	-	0.19	0.19	0.19	0.19	0.19	0.00	2	
*FR-FgsP	Forest	-	-	-	*(0.08)	-	-	-	-	-	
RU-Fyo	Forest	0.15	0.13	0.13	0.17	0.15	0.13	0.17	0.02	4	
UK-Gri	Forest	0.06	-	-	-	0.06	0.06	0.06	-	1	
DE-Hai	Forest	0.23	0.21	0.20	0.31	0.24	0.20	0.31	0.05	4	
FR-Hes	Forest	0.40	0.31	0.32	0.37	0.35	0.31	0.40	0.04	4	
DE-Hog	Forest	0.34	0.35	0.32	0.36	0.34	0.32	0.36	0.02	4	
FI-Hyy	Forest	0.12	0.09	0.10	0.10	0.10	0.09	0.12	0.01	4	
CH-Lae	Forest	0.37	0.34	0.36	0.38	0.36	0.34	0.38	0.02	4	
ES-LMa	Forest	0.24	0.22	0.26	0.25	0.24	0.22	0.26	0.02	4	
FR-LBr	Forest	0.32	0.25	-	-	0.29	0.25	0.32	0.05	2	
NL-Loo	Forest	0.32	0.23	0.28	0.26	0.27	0.23	0.32	0.04	4	
PT-Mi1	Forest	0.32	0.18	0.19	-	0.23	0.18	0.32	0.08	3	
SE-Nor	Forest	0.06	0.04	0.05	0.05	0.05	0.04	0.06	0.01	4	
FR-Pue	Forest	0.26	0.19	0.22	0.22	0.22	0.19	0.26	0.03	4	
FR-Ren	Forest	0.09	0.09	0.09	0.08	0.09	0.08	0.09	0.01	4	
IT-Ro2	Forest	0.21	0.26	0.27	0.23	0.24	0.21	0.27	0.03	4	
IT-SR	Forest	0.36	0.26	0.25	0.21	0.27	0.21	0.36	0.06	4	
SK04	Forest	0.22	0.17	0.18	0.21	0.20	0.17	0.22	0.02	4	
SK04P	Forest	0.22	0.21	0.25	0.21	0.22	0.21	0.25	0.02	4	
SK06	Forest	0.24	0.20	0.22	0.23	0.22	0.20	0.24	0.02	4	
SE-Sk2	Forest	0.08	0.06	-	-	0.07	0.06	0.08	0.01	2	
FI-Sod	Forest	0.06	0.04	0.04	0.06	0.05	0.04	0.06	0.01	4	
DK-Sor	Forest	0.25	0.23	0.20	0.19	0.22	0.19	0.25	0.03	4	
NL-Spe	Forest	0.36	0.36	0.42	0.43	0.39	0.36	0.43	0.04	4	
DE-Tha	Forest	0.32	0.25	0.26	0.32	0.29	0.25	0.32	0.04	4	
BE-Vie	Forest	0.18	0.12	0.09	0.13	0.13	0.09	0.18	0.04	4	
DE-Wet	Forest	0.26	0.26	0.28	0.35	0.29	0.26	0.35	0.04	4	0.23
UK-EBu	Grass	0.12	0.11	0.09	0.11	0.11	0.09	0.12	0.01	4	
UK-EBuP	Grass	0.12	0.12	0.10	-	0.11	0.10	0.12	0.01	3	
NL-Ca1	Grass	0.36	0.45	0.43	0.43	0.42	0.36	0.45	0.04	4	
IE-Car	Grass	0.11	0.10	0.09	0.12	0.11	0.09	0.12	0.01	4	
IE-Dri	Grass	0.07	0.07	0.05	-	0.06	0.05	0.07	0.01	3	
DE-Gri	Grass	0.33	0.38	0.28	0.41	0.35	0.28	0.41	0.06	4	
FR-Lq2	Grass	0.15	0.10	0.13	0.14	0.13	0.10	0.15	0.02	4	
CH-Oe1	Grass	0.43	0.39	0.39	0.38	0.40	0.38	0.43	0.02	4	
DK-Rim	Grass	0.24	0.23	-	-	0.24	0.23	0.24	0.01	2	
UK-Sol	Grass	-	-	0.07	0.11	0.09	0.07	0.11	0.03	2	0.20
IT-Amp	Semi-Natural	0.15	0.13	-	-	0.14	0.13	0.15	0.01	2	
UK-AMo	Semi-Natural	0.09	0.09	0.08	0.10	0.09	0.08	0.10	0.01	4	
UK-AMoP	Semi-Natural	-	-	-	-	-	-	-	-	-	
DK-Brj	Semi-Natural	-	-	-	0.17	0.17	0.17	0.17	-	1	
HU-Bug	Semi-Natural	0.29	0.30	0.35	0.30	0.31	0.29	0.35	0.03	4	
NL-Hor	Semi-Natural	0.35	0.31	0.33	0.36	0.34	0.31	0.36	0.02	4	
FI-Kaa	Semi-Natural	-	-	0.02	0.03	0.03	0.02	0.03	0.01	2	
FI-Lom	Semi-Natural	0.04	0.04	0.02	0.05	0.04	0.02	0.05	0.01	4	
DE-Meh	Semi-Natural	-	0.32	0.30	0.33	0.32	0.30	0.33	0.02	3	
IT-MBo	Semi-Natural	0.23	0.21	0.19	0.21	0.21	0.19	0.23	0.02	4	
PL-Pol	Semi-Natural	0.26	0.26	0.25	0.36	0.28	0.25	0.36	0.05	4	
ES-VDA	Semi-Natural	-	0.08	0.09	0.07	0.08	0.07	0.09	0.01	3	0.18
	mean	0.26	0.23	0.23	0.25	0.23					
	min	0.04	0.04	0.02	0.03	0.03					
	max	0.54	0.45	0.49	0.43	0.47					
	n	57	59	56	56	66					

*Different DELTA® denuder sample train using NaCl coated denuders to collect HNO₃

Table S8: Annual mean particulate NO_3^- concentrations measured in the NEU DELTA® network and summary statistics.

Site	Ecosystem type	p NO_3^- -N ($\mu\text{g m}^{-3}$)				Summary statistics					Group Mean
		2007	2008	2009	2010	mean	min	max	sd	N	
UK-ESa	Crops	0.23	0.25	-	-	0.24	0.23	0.25	0.01	2	
DE-Geb	Crops	0.50	0.62	0.76	0.49	0.59	0.49	0.76	0.13	4	
FR-Gri	Crops	0.88	0.64	0.70	0.62	0.71	0.62	0.88	0.12	4	
DE-Kli	Crops	0.57	0.50	0.55	0.42	0.51	0.42	0.57	0.07	4	
BE-Lon	Crops	0.72	0.67	1.29	0.56	0.81	0.56	1.29	0.33	4	
UA-Pet	Crops	0.50	0.46	0.34	0.39	0.42	0.34	0.50	0.07	4	
IT-BCi	Crops	0.76	0.70	0.56	0.49	0.63	0.49	0.76	0.12	4	
IT-PoV	Crops	1.49	1.36	1.03	0.83	1.18	0.83	1.49	0.30	4	
DK-Ris	Crops	0.48	0.34	-	-	0.41	0.34	0.48	0.10	2	
SK07	Crops	0.67	0.60	0.51	0.43	0.55	0.43	0.67	0.10	4	0.61
FR-Bil	Forest	-	-	-	0.28	0.28	0.28	0.28	-	1	
NO-Bir	Forest	-	-	0.09	0.10	0.10	0.09	0.10	0.01	2	
CZ-BK1	Forest	0.37	0.42	-	0.29	0.36	0.29	0.42	0.07	3	
BE-Bra	Forest	0.90	0.79	0.91	0.71	0.83	0.71	0.91	0.10	4	
IT-Col	Forest	-	0.24	0.22	0.22	0.23	0.22	0.24	0.01	3	
ES-ES1	Forest	0.75	1.23	1.02	0.84	0.96	0.75	1.23	0.21	4	
PT-Esp	Forest	0.54	0.51	0.43	0.52	0.50	0.43	0.54	0.05	4	
FR-Fon	Forest	0.80	0.57	0.66	0.54	0.64	0.54	0.80	0.12	4	
FR-Fgs	Forest	-	-	0.60	0.48	0.54	0.48	0.60	0.08	2	
FR-FgsP	Forest	-	-	-	0.56	-	-	-	-	-	
RU-Fyo	Forest	0.14	0.15	0.10	0.16	0.14	0.10	0.16	0.03	4	
UK-Gri	Forest	0.11	-	-	-	0.11	0.11	0.11	-	1	
DE-Hai	Forest	0.48	0.40	0.64	0.41	0.48	0.40	0.64	0.11	4	
FR-Hes	Forest	0.53	0.44	0.47	0.47	0.48	0.44	0.53	0.04	4	
DE-Hog	Forest	0.45	0.54	0.67	0.48	0.54	0.45	0.67	0.10	4	
FI-Hyy	Forest	0.06	0.04	0.04	0.04	0.05	0.04	0.06	0.01	4	
CH-Lae	Forest	0.64	0.56	0.44	0.48	0.53	0.44	0.64	0.09	4	
ES-LMa	Forest	0.32	0.43	0.30	0.23	0.32	0.23	0.43	0.08	4	
FR-LBr	Forest	0.52	0.39	-	-	0.46	0.39	0.52	0.09	2	
NL-Loo	Forest	0.92	0.66	1.05	0.54	0.79	0.54	1.05	0.23	4	
PT-Mi1	Forest	0.42	0.33	0.28	-	0.34	0.28	0.42	0.07	3	
SE-Nor	Forest	0.06	0.05	0.04	0.05	0.05	0.04	0.06	0.01	4	
FR-Pue	Forest	0.33	0.27	0.31	0.27	0.30	0.27	0.33	0.03	4	
FR-Ren	Forest	0.27	0.25	0.21	0.19	0.23	0.19	0.27	0.04	4	
IT-Ro2	Forest	0.54	0.48	0.41	0.33	0.44	0.33	0.54	0.09	4	
IT-SR	Forest	0.68	0.56	0.34	0.45	0.51	0.34	0.68	0.15	4	
SK04	Forest	0.28	0.22	0.20	0.19	0.22	0.19	0.28	0.04	4	
SK04P	Forest	0.26	0.23	0.17	0.18	0.21	0.17	0.26	0.04	4	
SK06	Forest	0.26	0.23	0.17	0.20	0.22	0.17	0.26	0.04	4	
SE-Sk2	Forest	0.07	0.07	-	-	0.07	0.07	0.07	0.00	2	
FI-Sod	Forest	0.03	0.02	0.02	0.01	0.02	0.01	0.03	0.01	4	
DK-Sor	Forest	0.63	0.55	0.63	0.50	0.58	0.50	0.63	0.06	4	
NL-Spe	Forest	0.98	0.85	0.94	0.77	0.89	0.77	0.98	0.09	4	
DE-Tha	Forest	0.37	0.42	0.55	0.38	0.43	0.37	0.55	0.08	4	
BE-Vie	Forest	0.40	0.33	0.59	0.31	0.41	0.31	0.59	0.13	4	
DE-Wet	Forest	0.47	0.38	0.38	0.40	0.41	0.38	0.47	0.04	4	0.39
UK-EBu	Grass	0.28	0.23	0.22	0.23	0.24	0.22	0.28	0.03	4	
UK-EBuP	Grass	0.27	0.25	0.25	-	0.26	0.25	0.27	0.01	3	
NL-Ca1	Grass	1.22	1.08	1.02	0.68	1.00	0.68	1.22	0.23	4	
IE-Car	Grass	0.30	0.36	0.26	0.28	0.30	0.26	0.36	0.04	4	
IE-Dri	Grass	0.28	0.30	0.22	-	0.27	0.22	0.30	0.04	3	
DE-Gri	Grass	0.47	0.46	0.46	0.42	0.45	0.42	0.47	0.02	4	
FR-Lq2	Grass	0.30	0.21	0.27	0.24	0.26	0.21	0.30	0.04	4	
CH-Oe1	Grass	0.73	0.59	0.48	0.56	0.59	0.48	0.73	0.10	4	
DK-Rim	Grass	0.64	0.47	-	-	0.56	0.47	0.64	0.12	2	
UK-Sol	Grass	-	-	0.24	0.26	0.25	0.24	0.26	0.01	2	0.42
IT-Amp	Semi-Natural	0.22	0.21	-	-	0.22	0.21	0.22	0.01	2	
UK-AMo	Semi-Natural	0.24	0.22	0.21	0.19	0.22	0.19	0.24	0.02	4	
UK-AMoP	Semi-Natural	-	-	-	-	-	-	-	-	-	
DK-Brj	Semi-Natural	-	-	-	0.39	0.39	0.39	0.39	-	1	
HU-Bug	Semi-Natural	0.48	0.44	0.37	0.40	0.42	0.37	0.48	0.05	4	
NL-Hor	Semi-Natural	1.13	0.79	1.13	0.93	1.00	0.79	1.13	0.17	4	
FI-Kaa	Semi-Natural	-	-	0.01	0.01	0.01	0.01	0.01	0.00	2	
FI-Lom	Semi-Natural	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01	4	
DE-Meh	Semi-Natural	-	0.57	0.67	0.55	0.60	0.55	0.67	0.06	3	
IT-MBo	Semi-Natural	0.51	0.43	0.27	0.34	0.39	0.27	0.51	0.10	4	
PL-Pol	Semi-Natural	0.50	0.42	0.35	0.45	0.43	0.35	0.50	0.06	4	
ES-VDA	Semi-Natural	-	0.27	0.21	0.17	0.22	0.17	0.27	0.05	3	0.35
		mean	0.49	0.44	0.45	0.38	0.42				
		min	0.02	0.01	0.01	0.01	0.01				
		max	1.49	1.36	1.29	0.93	1.18				
		n	57	59	56	57	66				

Table S9: Annual mean SO₂ gas concentrations measured in the NEU DELTA® network and summary statistics.

Site	Ecosystem type	SO ₂ -S (µg m ⁻³)				Summary statistics					Group Mean
		2007	2008	2009	2010	mean	min	max	sd	N	
UK-ESa	Crops	0.70	0.59	-	-	0.65	0.59	0.70	0.08	2	
DE-Geb	Crops	0.58	0.45	0.42	0.68	0.53	0.42	0.68	0.12	4	
FR-Gri	Crops	0.78	0.53	0.47	0.50	0.57	0.47	0.78	0.14	4	
DE-Kli	Crops	1.80	1.46	1.60	2.32	1.80	1.46	2.32	0.38	4	
BE-Lon	Crops	1.17	0.94	0.78	0.75	0.91	0.75	1.17	0.19	4	
UA-Pet	Crops	1.26	1.30	1.35	1.44	1.34	1.26	1.44	0.08	4	
IT-BCi	Crops	0.75	0.78	1.18	0.60	0.83	0.60	1.18	0.25	4	
IT-PoV	Crops	0.98	0.85	0.69	0.77	0.82	0.69	0.98	0.12	4	
DK-Ris	Crops	0.34	0.28	-	-	0.31	0.28	0.34	0.04	2	
SK07	Crops	1.00	0.85	0.79	1.05	0.92	0.79	1.05	0.12	4	0.87
FR-Bil	Forest	-	-	-	0.21	0.21	0.21	-	-	1	
NO-Bir	Forest	-	-	0.07	0.10	0.09	0.07	0.10	0.02	2	
CZ-BK1	Forest	2.52	2.27	-	2.14	2.31	2.14	2.52	0.19	3	
BE-Bra	Forest	3.55	2.69	2.05	1.37	2.42	1.37	3.55	0.93	4	
IT-Col	Forest	-	0.13	0.15	0.12	0.13	0.12	0.15	0.02	3	
ES-ES1	Forest	0.89	0.76	0.59	0.52	0.69	0.52	0.89	0.17	4	
PT-Esp	Forest	0.97	0.74	0.66	0.63	0.75	0.63	0.97	0.15	4	
FR-Fon	Forest	0.72	0.48	0.44	0.43	0.52	0.43	0.72	0.14	4	
FR-Fgs	Forest	-	-	0.39	0.38	0.39	0.38	0.39	0.01	2	
FR-FgsP	Forest	-	-	-	-	-	-	-	-	-	
RU-Fyo	Forest	0.47	0.43	0.50	0.55	0.49	0.43	0.55	0.05	4	
UK-Gri	Forest	0.14	-	-	-	0.14	0.14	0.14	-	1	
DE-Hai	Forest	0.50	0.35	0.33	0.67	0.46	0.33	0.67	0.16	4	
FR-Hes	Forest	0.60	0.51	0.45	0.53	0.52	0.45	0.60	0.06	4	
DE-Hog	Forest	0.46	0.38	0.35	0.39	0.40	0.35	0.46	0.05	4	
FI-Hyy	Forest	0.31	0.20	0.31	0.27	0.27	0.20	0.31	0.05	4	
CH-Lae	Forest	0.56	0.49	0.41	0.39	0.46	0.39	0.56	0.08	4	
ES-LMa	Forest	0.26	0.27	0.16	0.21	0.23	0.16	0.27	0.05	4	
FR-LBr	Forest	0.48	0.31	-	-	0.40	0.31	0.48	0.12	2	
NL-Loo	Forest	0.74	0.52	0.53	0.48	0.57	0.48	0.74	0.12	4	
PT-Mi1	Forest	0.71	0.42	0.28	-	0.47	0.28	0.71	0.22	3	
SE-Nor	Forest	0.10	0.06	0.08	0.09	0.08	0.06	0.10	0.02	4	
FR-Pue	Forest	0.34	0.21	0.24	0.24	0.26	0.21	0.34	0.06	4	
FR-Ren	Forest	0.10	0.08	0.08	0.13	0.10	0.08	0.13	0.02	4	
IT-Ro2	Forest	0.40	0.36	0.36	0.34	0.37	0.34	0.40	0.03	4	
IT-SR	Forest	0.68	0.46	0.39	0.30	0.46	0.30	0.68	0.16	4	
SK04	Forest	0.63	0.48	0.47	0.60	0.55	0.47	0.63	0.08	4	
SK04P	Forest	0.73	0.61	0.58	0.58	0.63	0.58	0.73	0.07	4	
SK06	Forest	1.06	0.82	0.58	0.80	0.82	0.58	1.06	0.20	4	
SE-Sk2	Forest	0.10	0.08	-	-	0.09	0.08	0.10	0.01	2	
FI-Sod	Forest	0.29	0.28	0.27	0.31	0.29	0.27	0.31	0.02	4	
DK-Sor	Forest	0.51	0.48	0.43	0.40	0.46	0.40	0.51	0.05	4	
NL-Spe	Forest	0.82	0.75	0.70	0.63	0.73	0.63	0.82	0.08	4	
DE-Tha	Forest	1.31	0.99	1.14	1.53	1.24	0.99	1.53	0.23	4	
BE-Vie	Forest	0.38	0.22	0.19	0.22	0.25	0.19	0.38	0.09	4	
DE-Wet	Forest	0.76	0.56	0.66	0.90	0.72	0.56	0.90	0.15	4	0.54
UK-EBu	Grass	0.65	0.42	0.28	0.58	0.48	0.28	0.65	0.17	4	
UK-EBuP	Grass	0.64	0.47	0.34	-	0.48	0.34	0.64	0.15	3	
NL-Ca1	Grass	1.12	1.17	0.81	0.79	0.97	0.79	1.17	0.20	4	
IE-Car	Grass	0.29	0.24	0.20	0.24	0.24	0.20	0.29	0.04	4	
IE-Dri	Grass	0.25	0.19	0.17	-	0.20	0.17	0.25	0.04	3	
DE-Gri	Grass	1.31	1.15	1.06	1.66	1.30	1.06	1.66	0.26	4	
FR-Lq2	Grass	0.19	0.14	0.13	0.14	0.15	0.13	0.19	0.03	4	
CH-Oe1	Grass	1.48	1.28	0.43	0.37	0.89	0.37	1.48	0.57	4	
DK-Rim	Grass	0.39	0.35	-	-	0.37	0.35	0.39	0.03	2	
UK-Sol	Grass	-	-	0.19	0.25	0.22	0.19	0.25	0.04	2	0.53
IT-Amp	Semi-Natural	0.15	0.13	-	-	0.14	0.13	0.15	0.01	2	
UK-AMo	Semi-Natural	0.45	0.29	0.26	0.47	0.37	0.26	0.47	0.11	4	
UK-AMoP	Semi-Natural	-	-	-	-	-	-	-	-	-	
DK-Brj	Semi-Natural	-	-	-	0.42	0.42	0.42	0.42	-	1	
HU-Bug	Semi-Natural	0.96	1.27	1.28	1.31	1.21	0.96	1.31	0.16	4	
NL-Hor	Semi-Natural	0.78	0.71	0.81	0.63	0.73	0.63	0.81	0.08	4	
FI-Kaa	Semi-Natural	-	-	0.36	0.57	0.47	0.36	0.57	0.15	2	
FI-Lom	Semi-Natural	0.14	0.16	0.14	0.07	0.13	0.07	0.16	0.04	4	
DE-Meh	Semi-Natural	-	0.56	0.48	0.89	0.64	0.48	0.89	0.22	3	
IT-MBo	Semi-Natural	0.20	0.16	0.16	0.16	0.17	0.16	0.20	0.02	4	
PL-Pol	Semi-Natural	1.13	0.95	0.84	1.46	1.10	0.84	1.46	0.27	4	
ES-VDA	Semi-Natural	-	0.17	0.13	0.12	0.14	0.12	0.17	0.03	3	0.50
		mean	0.73	0.60	0.52	0.62	0.58				
		min	0.10	0.06	0.07	0.07	0.08				
		max	3.55	2.69	2.05	2.32	2.42				
		n	57	59	56	56	66				

Table S10: Annual mean particulate SO_4^{2-} concentrations measured in the NEU DELTA® network and summary statistics.

Site	Ecosystem type	p SO_4^{2-} -N ($\mu\text{g m}^{-3}$)				Summary statistics					Group Mean
		2007	2008	2009	2010	mean	min	max	sd	N	
UK-ESa	Crops	0.21	0.22	-	-	0.22	0.21	0.22	0.01	2	
DE-Geb	Crops	0.57	0.51	0.56	0.32	0.49	0.32	0.57	0.12	4	
FR-Gri	Crops	0.53	0.41	0.39	0.34	0.42	0.34	0.53	0.08	4	
DE-Kli	Crops	0.60	0.46	0.51	0.41	0.50	0.41	0.60	0.08	4	
BE-Lon	Crops	1.20	1.00	1.37	0.90	1.12	0.90	1.37	0.21	4	
UA-Pet	Crops	0.83	1.15	0.71	0.57	0.82	0.57	1.15	0.25	4	
IT-BCi	Crops	0.91	1.08	0.56	0.63	0.80	0.56	1.08	0.24	4	
IT-PoV	Crops	0.87	0.75	0.54	0.43	0.65	0.43	0.87	0.20	4	
DK-Ris	Crops	0.78	0.55	-	-	0.67	0.55	0.78	0.16	2	
SK07	Crops	0.81	0.63	0.55	0.44	0.61	0.44	0.81	0.16	4	0.63
FR-Bil	Forest	-	-	-	0.27	0.27	0.27	0.27	-	1	
NO-Bir	Forest	-	-	0.35	0.34	0.35	0.34	0.35	0.01	2	
CZ-BK1	Forest	0.68	0.96	-	0.48	0.71	0.48	0.96	0.24	3	
BE-Bra	Forest	1.56	1.32	1.16	0.88	1.23	0.88	1.56	0.29	4	
IT-Col	Forest	-	0.30	0.25	0.21	0.25	0.21	0.30	0.05	3	
ES-ES1	Forest	1.23	1.14	0.93	0.73	1.01	0.73	1.23	0.22	4	
PT-Esp	Forest	0.55	0.67	0.38	0.57	0.54	0.38	0.67	0.12	4	
FR-Fon	Forest	0.53	0.39	0.38	0.29	0.40	0.29	0.53	0.10	4	
FR-Fgs	Forest	-	-	0.36	0.29	0.33	0.29	0.36	0.05	2	
FR-FgsP	Forest	-	-	-	-	-	-	-	-	-	
RU-Fyo	Forest	0.47	0.66	0.29	0.57	0.50	0.29	0.66	0.16	4	
UK-Gri	Forest	0.11	-	-	-	0.11	0.11	0.11	-	1	
DE-Hai	Forest	0.52	0.32	0.53	0.29	0.42	0.29	0.53	0.13	4	
FR-Hes	Forest	0.40	0.35	0.36	0.31	0.36	0.31	0.40	0.04	4	
DE-Hog	Forest	0.41	0.47	0.42	0.23	0.38	0.23	0.47	0.11	4	
FI-Hyy	Forest	0.47	0.42	0.52	0.43	0.46	0.42	0.52	0.05	4	
CH-Lae	Forest	0.47	0.59	0.37	0.37	0.45	0.37	0.59	0.10	4	
ES-LMa	Forest	0.72	0.57	0.51	0.65	0.61	0.51	0.72	0.09	4	
FR-LBr	Forest	0.46	0.33	-	-	0.40	0.33	0.46	0.09	2	
NL-Loo	Forest	0.64	0.49	0.68	0.30	0.53	0.30	0.68	0.17	4	
PT-Mi1	Forest	0.73	0.97	0.27	-	0.66	0.27	0.97	0.36	3	
SE-Nor	Forest	0.40	0.30	0.39	0.37	0.37	0.30	0.40	0.05	4	
FR-Pue	Forest	0.38	0.28	0.30	0.22	0.30	0.22	0.38	0.07	4	
FR-Ren	Forest	0.21	0.18	0.23	0.17	0.20	0.17	0.23	0.03	4	
IT-Ro2	Forest	0.51	0.54	0.43	0.38	0.47	0.38	0.54	0.07	4	
IT-SR	Forest	0.73	0.62	0.38	0.42	0.54	0.38	0.73	0.17	4	
SK04	Forest	0.67	0.42	0.37	0.36	0.46	0.36	0.67	0.15	4	
SK04P	Forest	0.57	0.43	0.34	0.29	0.41	0.29	0.57	0.12	4	
SK06	Forest	0.60	0.47	0.37	0.36	0.45	0.36	0.60	0.11	4	
SE-Sk2	Forest	0.42	0.35	-	-	0.39	0.35	0.42	0.05	2	
FI-Sod	Forest	0.36	0.35	0.53	0.41	0.41	0.35	0.53	0.08	4	
DK-Sor	Forest	0.88	0.68	0.77	0.76	0.77	0.68	0.88	0.08	4	
NL-Spe	Forest	0.58	0.64	0.58	0.42	0.56	0.42	0.64	0.09	4	
DE-Tha	Forest	0.49	0.45	0.55	0.33	0.46	0.33	0.55	0.09	4	
BE-Vie	Forest	0.86	0.70	0.62	0.88	0.77	0.62	0.88	0.13	4	
DE-Wet	Forest	0.46	0.32	0.34	0.28	0.35	0.28	0.46	0.08	4	0.48
UK-EBu	Grass	0.26	0.17	0.13	0.17	0.18	0.13	0.26	0.05	4	
UK-EBuP	Grass	0.25	0.20	0.17	-	0.21	0.17	0.25	0.04	3	
NL-Ca1	Grass	1.10	0.74	0.63	0.39	0.72	0.39	1.10	0.30	4	
IE-Car	Grass	0.26	0.31	0.25	0.23	0.26	0.23	0.31	0.03	4	
IE-Dri	Grass	0.25	0.28	0.22	-	0.25	0.22	0.28	0.03	3	
DE-Gri	Grass	0.49	0.51	0.48	0.35	0.46	0.35	0.51	0.07	4	
FR-Lq2	Grass	0.26	0.19	0.23	0.16	0.21	0.16	0.26	0.04	4	
CH-Oe1	Grass	0.58	0.63	0.32	0.40	0.48	0.32	0.63	0.15	4	
DK-Rim	Grass	0.82	0.74	-	-	0.78	0.74	0.82	0.06	2	
UK-Sol	Grass	-	-	0.24	0.18	0.21	0.18	0.24	0.04	2	0.38
IT-Amp	Semi-Natural	0.34	0.31	-	-	0.33	0.31	0.34	0.02	2	
UK-AMo	Semi-Natural	0.23	0.19	0.16	0.16	0.19	0.16	0.23	0.03	4	
UK-AMoP	Semi-Natural	-	-	-	-	-	-	-	-	-	
DK-Brj	Semi-Natural	-	-	-	0.67	0.67	0.67	0.67	-	1	
HU-Bug	Semi-Natural	0.72	0.82	0.62	0.49	0.66	0.49	0.82	0.14	4	
NL-Hor	Semi-Natural	0.77	0.53	0.78	0.55	0.66	0.53	0.78	0.14	4	
FI-Kaa	Semi-Natural	-	-	0.18	0.25	0.22	0.18	0.25	0.05	2	
FI-Lom	Semi-Natural	0.24	0.24	0.30	0.28	0.27	0.24	0.30	0.03	4	
DE-Meh	Semi-Natural	-	0.49	0.48	0.32	0.43	0.32	0.49	0.10	3	
IT-MBo	Semi-Natural	0.39	0.47	0.28	0.30	0.36	0.28	0.47	0.09	4	
PL-Pol	Semi-Natural	0.69	0.70	0.45	0.59	0.61	0.45	0.70	0.12	4	
ES-VDA	Semi-Natural	-	0.39	0.41	0.37	0.39	0.37	0.41	0.02	3	0.43
		mean	0.58	0.53	0.46	0.41	0.48				
		min	0.11	0.17	0.13	0.16	0.11				
		max	1.56	1.32	1.37	0.90	1.23				
		n	57	59	56	56	66				

Table S11: Annual mean HCl gas concentrations measured in the NEU DELTA® network and summary statistics.

Site	Ecosystem type	HCl-Cl ($\mu\text{g m}^{-3}$)				Summary statistics					Group Mean
		2007	2008	2009	2010	mean	min	max	sd	N	
UK-ESa	Crops	0.21	0.30	-	-	0.26	0.21	0.30	0.06	2	
DE-Geb	Crops	0.12	0.19	0.23	0.25	0.20	0.12	0.25	0.06	4	
FR-Gri	Crops	0.39	0.19	0.29	0.29	0.29	0.19	0.39	0.08	4	
DE-Kli	Crops	0.16	0.19	0.19	0.24	0.20	0.16	0.24	0.03	4	
BE-Lon	Crops	0.48	0.22	0.57	0.15	0.36	0.15	0.57	0.20	4	
UA-Pet	Crops	0.29	0.23	0.18	0.22	0.23	0.18	0.29	0.05	4	
IT-BCi	Crops	0.40	0.36	0.32	0.40	0.37	0.32	0.40	0.04	4	
IT-PoV	Crops	0.17	0.18	0.17	0.06	0.15	0.06	0.18	0.06	4	
DK-Ris	Crops	0.25	0.16	-	-	0.21	0.16	0.25	0.06	2	
SK07	Crops	0.23	0.09	0.19	0.05	0.14	0.05	0.23	0.08	4	0.24
FR-Bil	Forest	-	-	-	0.34	0.34	0.34	0.34	-	1	
NO-Bir	Forest	-	-	0.46	0.23	0.35	0.23	0.46	0.16	2	
CZ-BK1	Forest	0.27	0.26	-	0.20	0.24	0.20	0.27	0.04	3	
BE-Bra	Forest	0.54	0.26	0.45	0.19	0.36	0.19	0.54	0.16	4	
IT-Col	Forest	-	0.19	0.17	0.06	0.14	0.06	0.19	0.07	3	
ES-ES1	Forest	0.40	0.53	0.27	0.22	0.36	0.22	0.53	0.14	4	
PT-Esp	Forest	0.51	0.51	0.44	0.58	0.51	0.44	0.58	0.06	4	
FR-Fon	Forest	0.31	0.26	0.33	0.26	0.29	0.26	0.33	0.04	4	
FR-Fgs	Forest	-	-	0.24	0.27	0.26	0.24	0.27	0.02	2	
FR-FgsP	Forest	-	-	-	-	-	-	-	-	-	
RU-Fyo	Forest	0.06	0.06	0.06	0.10	0.07	0.06	0.10	0.02	4	
UK-Gri	Forest	0.16	-	-	-	0.16	0.16	0.16	-	1	
DE-Hai	Forest	0.09	0.12	0.11	0.32	0.16	0.09	0.32	0.11	4	
FR-Hes	Forest	0.19	0.15	0.17	0.19	0.18	0.15	0.19	0.02	4	
DE-Hog	Forest	0.08	0.09	0.10	0.16	0.11	0.08	0.16	0.04	4	
FI-Hyy	Forest	0.13	0.07	0.42	0.17	0.20	0.07	0.42	0.15	4	
CH-Lae	Forest	0.11	0.11	0.10	0.18	0.13	0.10	0.18	0.04	4	
ES-LMa	Forest	0.22	0.45	0.16	0.15	0.25	0.15	0.45	0.14	4	
FR-LBr	Forest	0.37	0.26	-	-	0.32	0.26	0.37	0.08	2	
NL-Loo	Forest	0.24	0.13	0.22	0.15	0.19	0.13	0.24	0.05	4	
PT-Mi1	Forest	0.26	0.28	0.19	-	0.24	0.19	0.28	0.05	3	
SE-Nor	Forest	0.18	0.06	0.26	0.08	0.15	0.06	0.26	0.09	4	
FR-Pue	Forest	0.27	0.16	0.26	0.26	0.24	0.16	0.27	0.05	4	
FR-Ren	Forest	0.05	0.01	0.10	0.09	0.06	0.01	0.10	0.04	4	
IT-Ro2	Forest	0.36	0.39	0.25	0.14	0.29	0.14	0.39	0.11	4	
IT-SR	Forest	0.53	0.36	0.35	0.13	0.34	0.13	0.53	0.16	4	
SK04	Forest	0.13	0.08	0.10	0.05	0.09	0.05	0.13	0.03	4	
SK04P	Forest	0.09	0.14	0.20	0.03	0.12	0.03	0.20	0.07	4	
SK06	Forest	0.20	0.10	0.09	0.02	0.10	0.02	0.20	0.07	4	
SE-Sk2	Forest	0.16	0.18	-	-	0.17	0.16	0.18	0.01	2	
FI-Sod	Forest	0.16	0.18	0.25	0.10	0.17	0.10	0.25	0.06	4	
DK-Sor	Forest	0.39	0.36	0.40	0.21	0.34	0.21	0.40	0.09	4	
NL-Spe	Forest	0.40	0.41	0.50	0.49	0.45	0.40	0.50	0.05	4	
DE-Tha	Forest	0.17	0.13	0.14	0.22	0.17	0.13	0.22	0.04	4	
BE-Vie	Forest	0.13	0.08	0.26	0.09	0.14	0.08	0.26	0.08	4	
DE-Wet	Forest	0.12	0.16	0.16	0.28	0.18	0.12	0.28	0.07	4	0.22
UK-EBu	Grass	0.28	0.20	0.15	0.19	0.21	0.15	0.28	0.05	4	
UK-EBuP	Grass	0.22	0.21	0.20	-	0.21	0.20	0.22	0.01	3	
NL-Ca1	Grass	0.29	0.46	0.37	0.37	0.37	0.29	0.46	0.07	4	
IE-Car	Grass	0.24	0.15	0.19	0.24	0.21	0.15	0.24	0.04	4	
IE-Dri	Grass	0.21	0.14	0.26	-	0.20	0.14	0.26	0.06	3	
DE-Gri	Grass	0.16	0.30	0.20	0.31	0.24	0.16	0.31	0.07	4	
FR-Lq2	Grass	0.16	0.10	0.14	0.13	0.13	0.10	0.16	0.03	4	
CH-Oe1	Grass	0.09	0.09	0.08	0.16	0.11	0.08	0.16	0.04	4	
DK-Rim	Grass	0.34	0.19	-	-	0.27	0.19	0.34	0.11	2	
UK-Sol	Grass	-	-	0.11	0.17	0.14	0.11	0.17	0.04	2	0.21
IT-Amp	Semi-Natural	0.17	0.21	-	-	0.19	0.17	0.21	0.03	2	
UK-AMo	Semi-Natural	0.22	0.19	0.19	0.18	0.20	0.18	0.22	0.02	4	
UK-AMoP	Semi-Natural	-	-	-	-	-	-	-	-	-	
DK-Brj	Semi-Natural	-	-	-	0.26	0.26	0.26	0.26	-	1	
HU-Bug	Semi-Natural	0.12	0.10	0.07	0.10	0.10	0.07	0.12	0.02	4	
NL-Hor	Semi-Natural	0.20	0.32	0.35	0.97	0.46	0.20	0.97	0.35	4	
FI-Kaa	Semi-Natural	-	-	0.26	0.09	0.18	0.09	0.26	0.12	2	
FI-Lom	Semi-Natural	0.15	0.04	0.19	0.54	0.23	0.04	0.54	0.22	4	
DE-Meh	Semi-Natural	-	0.24	0.20	0.30	0.25	0.20	0.30	0.05	3	
IT-MBo	Semi-Natural	0.11	0.20	0.37	0.32	0.25	0.11	0.37	0.12	4	
PL-Pol	Semi-Natural	0.15	0.16	0.12	0.39	0.21	0.12	0.39	0.12	4	
ES-VDA	Semi-Natural	-	0.11	0.10	0.07	0.09	0.07	0.11	0.02	3	0.22
		mean	0.23	0.20	0.23	0.22	0.22				
		min	0.05	0.01	0.06	0.02	0.06				
		max	0.54	0.53	0.57	0.97	0.51				
		n	57	59	56	56	66				

Table S12: Annual mean particulate Cl⁻ concentrations measured in the NEU DELTA® network and summary statistics.

Site	Ecosystem type	pCl ⁻ ($\mu\text{g m}^{-3}$) ($\mu\text{g m}^{-3}$)				Summary statistics					Group Mean
		2007	2008	2009	2010	mean	min	max	sd	N	
UK-ESa	Crops	1.18	1.23	-	-	1.21	1.18	1.23	0.04	2	
DE-Geb	Crops	0.33	0.45	0.30	0.31	0.35	0.30	0.45	0.07	4	
FR-Gri	Crops	1.07	0.98	0.79	0.41	0.81	0.41	1.07	0.29	4	
DE-Kli	Crops	0.36	0.30	0.23	0.40	0.32	0.23	0.40	0.07	4	
BE-Lon	Crops	0.37	0.36	0.29	0.14	0.29	0.14	0.37	0.11	4	
UA-Pet	Crops	0.41	0.41	0.24	0.43	0.37	0.24	0.43	0.09	4	
IT-BCi	Crops	1.54	1.41	0.88	2.12	1.49	0.88	2.12	0.51	4	
IT-PoV	Crops	0.34	0.47	0.33	0.31	0.36	0.31	0.47	0.07	4	
DK-Ris	Crops	0.36	0.30	-	-	0.33	0.30	0.36	0.04	2	
SK07	Crops	0.53	0.28	0.20	0.23	0.31	0.20	0.53	0.15	4	0.58
FR-Bil	Forest	-	-	-	0.80	0.80	0.80	0.80	-	1	
NO-Bir	Forest	-	-	0.37	0.16	0.27	0.16	0.37	0.15	2	
CZ-BK1	Forest	0.29	0.29	-	0.17	0.25	0.17	0.29	0.07	3	
BE-Bra	Forest	0.67	0.60	0.41	0.29	0.49	0.29	0.67	0.17	4	
IT-Col	Forest	-	0.33	0.54	0.45	0.44	0.33	0.54	0.11	3	
ES-ES1	Forest	0.99	1.06	0.55	0.64	0.81	0.55	1.06	0.25	4	
PT-Esp	Forest	1.09	1.27	1.51	1.72	1.40	1.09	1.72	0.28	4	
FR-Fon	Forest	0.99	0.83	0.82	0.42	0.77	0.42	0.99	0.24	4	
FR-Fgs	Forest	-	-	1.47	0.96	1.22	0.96	1.47	0.36	2	
FR-FgsP	Forest	-	-	-	1.11	-	-	-	-	-	
RU-Fyo	Forest	0.14	0.12	0.07	0.22	0.14	0.07	0.22	0.06	4	
UK-Gri	Forest	0.85	-	-	-	0.85	0.85	0.85	-	1	
DE-Hai	Forest	0.36	0.32	0.22	0.23	0.28	0.22	0.36	0.07	4	
FR-Hes	Forest	0.45	0.35	0.25	0.03	0.27	0.03	0.45	0.18	4	
DE-Hog	Forest	0.12	0.15	0.17	0.12	0.14	0.12	0.17	0.02	4	
FI-Hyy	Forest	0.06	0.04	-	-	0.05	0.04	0.06	0.01	2	
CH-Lae	Forest	0.21	0.18	0.16	0.14	0.17	0.14	0.21	0.03	4	
ES-LMa	Forest	0.14	0.38	0.09	0.19	0.20	0.09	0.38	0.13	4	
FR-LBr	Forest	1.50	1.29	-	-	1.40	1.29	1.50	0.15	2	
NL-Loo	Forest	1.19	0.67	0.79	0.58	0.81	0.58	1.19	0.27	4	
PT-Mi1	Forest	1.04	0.96	0.90	-	0.97	0.90	1.04	0.07	3	
SE-Nor	Forest	0.08	0.08	0.04	0.02	0.06	0.02	0.08	0.03	4	
FR-Pue	Forest	0.52	0.50	0.54	0.18	0.44	0.18	0.54	0.17	4	
FR-Ren	Forest	0.12	0.17	0.15	-	0.15	0.12	0.17	0.03	3	
IT-Ro2	Forest	0.99	0.68	0.83	0.73	0.81	0.68	0.99	0.14	4	
IT-SR	Forest	2.60	1.92	1.16	1.68	1.84	1.16	2.60	0.60	4	
SK04	Forest	0.41	0.26	0.17	0.24	0.27	0.17	0.41	0.10	4	
SK04P	Forest	0.39	0.28	0.17	0.22	0.27	0.17	0.39	0.09	4	
SK06	Forest	0.35	0.25	0.17	0.30	0.27	0.17	0.35	0.08	4	
SE-Sk2	Forest	0.09	0.09	-	-	0.09	0.09	0.09	0.00	2	
FI-Sod	Forest	0.07	0.06	0.06	0.06	0.06	0.06	0.07	0.01	4	
DK-Sor	Forest	0.59	0.78	0.46	0.28	0.53	0.28	0.78	0.21	4	
NL-Spe	Forest	1.61	1.21	0.80	0.96	1.15	0.80	1.61	0.35	4	
DE-Tha	Forest	0.27	0.24	0.22	0.23	0.24	0.22	0.27	0.02	4	
BE-Vie	Forest	0.13	0.09	0.17	0.03	0.11	0.03	0.17	0.06	4	
DE-Wet	Forest	0.25	0.22	0.16	0.21	0.21	0.16	0.25	0.04	4	0.52
UK-EBu	Grass	1.38	0.86	1.04	1.11	1.10	0.86	1.38	0.22	4	
UK-EBuP	Grass	1.33	1.02	1.27	-	1.21	1.02	1.33	0.16	3	
NL-Ca1	Grass	1.02	1.20	0.93	0.88	1.01	0.88	1.20	0.14	4	
IE-Car	Grass	1.85	1.78	1.82	1.02	1.62	1.02	1.85	0.40	4	
IE-Dri	Grass	1.94	1.94	1.69	-	1.86	1.69	1.94	0.14	3	
DE-Gri	Grass	0.29	0.29	0.18	0.33	0.27	0.18	0.33	0.06	4	
FR-Lq2	Grass	0.35	0.28	0.23	0.01	0.22	0.01	0.35	0.15	4	
CH-Oe1	Grass	0.23	0.20	0.17	0.21	0.20	0.17	0.23	0.02	4	
DK-Rim	Grass	0.95	0.81	-	-	0.88	0.81	0.95	0.10	2	
UK-Sol	Grass	-	-	1.87	1.01	1.44	1.01	1.87	0.61	2	0.98
IT-Amp	Semi-Natural	0.29	0.25	-	-	0.27	0.25	0.29	0.03	2	
UK-AMo	Semi-Natural	1.27	1.16	1.00	1.02	1.11	1.00	1.27	0.13	4	
UK-AMoP	Semi-Natural	-	-	-	-	-	-	-	-	-	
DK-Brj	Semi-Natural	-	-	-	0.21	0.21	0.21	0.21	-	1	
HU-Bug	Semi-Natural	0.23	0.16	0.10	0.10	0.15	0.10	0.23	0.06	4	
NL-Hor	Semi-Natural	1.28	1.23	1.31	1.20	1.26	1.20	1.31	0.05	4	
FI-Kaa	Semi-Natural	-	-	0.11	0.19	0.15	0.11	0.19	0.06	2	
FI-Lom	Semi-Natural	0.13	0.06	0.06	0.02	0.07	0.02	0.13	0.05	4	
DE-Meh	Semi-Natural	-	0.44	0.31	0.31	0.35	0.31	0.44	0.08	3	
IT-MBo	Semi-Natural	0.12	0.12	0.08	0.09	0.10	0.08	0.12	0.02	4	
PL-Pol	Semi-Natural	0.59	0.44	0.28	0.30	0.40	0.28	0.59	0.14	4	
ES-VDA	Semi-Natural	-	0.04	0.04	0.05	0.04	0.04	0.05	0.01	3	0.37
		mean	0.67	0.58	0.53	0.47	0.57				
		min	0.06	0.04	0.04	0.01	0.04				
		max	2.60	1.94	1.87	2.12	1.86				
		n	57	59	55	55	66				

Table S13: Annual mean particulate Na⁺ concentrations measured in the NEU DELTA® network and summary statistics.

Site	Ecosystem type	pNa ⁺ ($\mu\text{g m}^{-3}$) ($\mu\text{g m}^{-3}$)				Summary statistics					Group Mean	
		2007	2008	2009	2010	mean	min	max	sd	N		
UK-ESa	Crops	0.61	0.76	-	-	0.69	0.61	0.76	0.11	2		
DE-Geb	Crops	0.18	0.31	0.21	0.12	0.21	0.12	0.31	0.08	4		
FR-Gri	Crops	0.63	0.66	0.60	0.43	0.58	0.43	0.66	0.10	4		
DE-Kli	Crops	0.22	0.23	0.13	0.13	0.18	0.13	0.23	0.05	4		
BE-Lon	Crops	0.78	0.60	0.71	0.42	0.63	0.42	0.78	0.16	4		
UA-Pet	Crops	0.25	0.32	0.19	0.28	0.26	0.19	0.32	0.05	4		
IT-BCi	Crops	1.21	1.09	0.80	1.14	1.06	0.80	1.21	0.18	4		
IT-PoV	Crops	0.23	0.24	0.15	0.18	0.20	0.15	0.24	0.04	4		
DK-Ris	Crops	0.91	1.13	-	-	1.02	0.91	1.13	0.16	2		
SK07	Crops	0.13	0.13	0.09	0.08	0.11	0.08	0.13	0.03	4	0.49	
FR-Bil	Forest	-	-	-	0.62	0.62	0.62	0.62	-	1		
NO-Bir	Forest	-	-	0.58	0.28	0.43	0.28	0.58	0.21	2		
CZ-BK1	Forest	0.20	0.27	-	0.09	0.19	0.09	0.27	0.09	3		
BE-Bra	Forest	1.09	1.15	1.03	0.69	0.99	0.69	1.15	0.21	4		
IT-Col	Forest	-	0.26	0.37	0.21	0.28	0.21	0.37	0.08	3		
ES-ES1	Forest	2.30	1.46	1.10	0.94	1.45	0.94	2.30	0.61	4		
PT-Esp	Forest	0.80	1.07	1.15	1.18	1.05	0.80	1.18	0.17	4		
FR-Fon	Forest	0.56	0.62	0.55	0.44	0.54	0.44	0.62	0.07	4		
FR-Fgs	Forest	-	-	0.82	0.67	0.75	0.67	0.82	0.11	2		
FR-FgsP	Forest	-	-	-	0.71	-	-	-	-	-		
RU-Fyo	Forest	0.08	0.09	0.04	0.10	0.08	0.04	0.10	0.03	4		
UK-Gri	Forest	0.38	-	-	-	0.38	0.38	0.38	-	1		
DE-Hai	Forest	0.18	0.22	0.14	0.10	0.16	0.10	0.22	0.05	4		
FR-Hes	Forest	0.20	0.23	0.24	0.18	0.21	0.18	0.24	0.03	4		
DE-Hog	Forest	0.05	0.12	0.09	0.07	0.08	0.05	0.12	0.03	4		
FI-Hyy	Forest	0.21	0.20	-	-	0.21	0.20	0.21	0.01	2		
CH-Lae	Forest	0.20	0.18	0.16	0.10	0.16	0.10	0.20	0.04	4		
ES-LMa	Forest	0.32	0.40	0.30	0.28	0.33	0.28	0.40	0.05	4		
FR-LBr	Forest	1.05	0.91	-	-	0.98	0.91	1.05	0.10	2		
NL-Loo	Forest	0.80	0.47	0.54	0.41	0.56	0.41	0.80	0.17	4		
PT-Mi1	Forest	1.00	0.79	0.74	-	0.84	0.74	1.00	0.14	3		
SE-Nor	Forest	0.20	0.31	0.22	0.13	0.22	0.13	0.31	0.07	4		
FR-Pue	Forest	0.33	0.41	0.44	0.33	0.38	0.33	0.44	0.06	4		
FR-Ren	Forest	0.00	0.14	0.01	-	0.05	0.00	0.14	0.08	3		
IT-Ro2	Forest	0.56	0.59	0.53	0.63	0.58	0.53	0.63	0.04	4		
IT-SR	Forest	1.56	1.42	0.76	0.88	1.16	0.76	1.56	0.39	4		
SK04	Forest	0.38	0.10	0.06	0.03	0.14	0.03	0.38	0.16	4		
SK04P	Forest	0.17	0.10	0.09	0.05	0.10	0.05	0.17	0.05	4		
SK06	Forest	0.18	0.20	0.13	0.12	0.16	0.12	0.20	0.04	4		
SE-Sk2	Forest	0.23	0.17	-	-	0.20	0.17	0.23	0.04	2		
FI-Sod	Forest	0.18	0.15	0.16	0.15	0.16	0.15	0.18	0.01	4		
DK-Sor	Forest	1.03	1.04	0.98	0.62	0.92	0.62	1.04	0.20	4		
NL-Spe	Forest	1.33	0.78	0.46	0.35	0.73	0.35	1.33	0.44	4		
DE-Tha	Forest	0.17	0.27	0.15	0.09	0.17	0.09	0.27	0.07	4		
BE-Vie	Forest	0.37	0.35	0.35	0.20	0.32	0.20	0.37	0.08	4		
DE-Wet	Forest	0.11	0.17	0.10	0.10	0.12	0.10	0.17	0.03	4	0.45	
UK-EBu	Grass	0.75	0.60	0.67	0.60	0.66	0.60	0.75	0.07	4		
UK-EBuP	Grass	0.68	0.66	0.61	-	0.65	0.61	0.68	0.04	3		
NL-Ca1	Grass	0.80	0.70	0.52	0.42	0.61	0.42	0.80	0.17	4		
IE-Car	Grass	0.97	0.99	0.93	0.65	0.89	0.65	0.99	0.16	4		
IE-Dri	Grass	1.02	1.12	0.89	-	1.01	0.89	1.12	0.12	3		
DE-Gri	Grass	0.15	0.21	0.09	0.07	0.13	0.07	0.21	0.06	4		
FR-Lq2	Grass	0.22	0.23	0.19	0.17	0.20	0.17	0.23	0.03	4		
CH-Oe1	Grass	0.23	0.16	0.15	0.17	0.18	0.15	0.23	0.04	4		
DK-Rim	Grass	1.05	1.52	-	-	1.29	1.05	1.52	0.33	2		
UK-Sol	Grass	-	-	1.00	0.67	0.84	0.67	1.00	0.23	2	0.64	
IT-Amp	Semi-Natural	0.24	0.39	-	-	0.32	0.24	0.39	0.11	2		
UK-AMo	Semi-Natural	0.67	0.64	0.65	0.48	0.61	0.48	0.67	0.09	4		
UK-AMoP	Semi-Natural	-	-	-	-	-	-	-	-	-		
DK-Brj	Semi-Natural	-	-	-	0.63	0.63	0.63	0.63	-	1		
HU-Bug	Semi-Natural	0.13	0.12	0.08	0.07	0.10	0.07	0.13	0.03	4		
NL-Hor	Semi-Natural	0.98	0.77	0.51	0.74	0.75	0.51	0.98	0.19	4		
FI-Kaa	Semi-Natural	-	-	0.10	0.17	0.14	0.10	0.17	0.05	2		
FI-Lom	Semi-Natural	0.18	0.12	0.13	0.08	0.13	0.08	0.18	0.04	4		
DE-Meh	Semi-Natural	-	0.28	0.14	0.13	0.18	0.13	0.28	0.08	3		
IT-MBo	Semi-Natural	0.12	0.09	0.16	0.16	0.13	0.09	0.16	0.03	4		
PL-Pol	Semi-Natural	0.43	0.26	0.16	0.18	0.26	0.16	0.43	0.12	4		
ES-VDA	Semi-Natural	-	0.12	0.12	0.07	0.10	0.07	0.12	0.03	3	0.30	
		mean	0.53	0.49	0.40	0.35	0.46					
		min	0.00	0.09	0.01	0.03	0.05					
		max	2.30	1.52	1.15	1.18	1.45					
		n	57	59	55	55	66					

Table S14: Annual wet deposition of inorganic components ($\text{kg ha}^{-1} \text{ yr}^{-1}$) estimated from Rotenkamp bulk precipitation collectors in the NEU bulk wet deposition network and percentage composition by mass measured. The data shown are 2-year averaged deposition, made between 2008 and 2010, except at 5 sites with 1 year of measurement only (BE-Vie, FR-Fgs, FR-LBr, DE-Wet, IT-BCi).

Site ID / Ecosystem type		Annual Wet Deposition ($\text{kg ha}^{-1} \text{ yr}^{-1}$)										% contribution to total (by mass)						
		$\text{NH}_4^+ \text{-N}$	$\text{NO}_3^- \text{-N}$	$\text{SO}_4^{2-} \text{-S}$	$\text{SS-} \text{SO}_4^{2-} \text{-S}$	$\text{nss-} \text{SO}_4^{2-} \text{-S}$	Cl^-	H^+	Na^+	Ca^{2+}	K^+	$\text{NH}_4^+ \text{-N}$	$\text{NO}_3^- \text{-N}$	$\text{SO}_4^{2-} \text{-S}$	$\text{nss-} \text{SO}_4^{2-} \text{-S}$	$\text{Na}^+ + \text{Cl}^-$	$\text{Ca}^{2+} + \text{K}^+ + \text{Mg}^{2+}$	
*BE-Vie	F	3.67	2.38	4.10	0.42	3.69	8.03	0.13	4.94	4.31	2.35	1.20	11.8%	7.6%	13.2%	11.9%	41.7%	25.3%
FR-Bil	F	1.25	0.65	2.70	1.73	0.96	36.8	0.09	20.6	2.34	1.50	2.18	1.8%	1.0%	4.0%	1.4%	84.3%	8.8%
FR-Pue	F	2.33	3.35	3.55	0.86	2.68	17.0	0.10	10.3	3.85	1.17	1.33	5.4%	7.8%	8.3%	6.3%	63.4%	14.8%
FR-Fon	F	0.72	0.61	1.52	0.23	1.29	4.37	0.12	2.78	2.30	0.94	0.46	5.2%	4.4%	11.0%	9.3%	51.7%	26.7%
*FR-Fgs	F	3.20	2.06	3.68	0.87	2.81	18.4	0.05	10.4	1.64	0.49	1.18	7.8%	5.0%	9.0%	6.9%	70.1%	8.1%
*FR-LBr	F	1.86	3.31	6.84	2.57	4.27	59.9	0.02	30.6	5.50	1.75	4.23	1.6%	2.9%	6.0%	3.7%	79.4%	10.1%
DE-Gri	G	3.80	4.00	4.26	0.17	4.09	3.51	0.20	2.06	2.38	1.07	0.44	17.5%	18.4%	19.6%	18.8%	25.6%	17.9%
*DE-Wet	F	5.00	5.33	4.60	0.27	4.33	4.91	0.31	3.21	1.94	0.73	0.59	18.8%	20.0%	17.3%	16.3%	30.5%	12.2%
DE-Hai	F	3.19	4.14	3.36	0.22	3.14	3.51	0.22	2.57	1.86	1.31	0.41	15.5%	20.1%	16.3%	15.3%	29.6%	17.4%
IT-SoR	F	2.20	3.22	6.84	3.23	3.61	70.1	0.18	38.5	8.16	2.65	4.62	1.6%	2.4%	5.0%	2.6%	79.6%	11.3%
IT-Ro2	F	3.36	1.57	4.07	1.07	3.00	22.7	0.08	12.8	8.47	1.97	2.07	5.9%	2.8%	7.1%	5.3%	62.1%	21.9%
*IT-BCi	C	5.09	2.54	5.51	2.09	3.41	47.3	0.00	24.9	13.0	5.27	3.61	4.7%	2.4%	5.1%	3.2%	67.3%	20.4%
PL-wet	SN	2.21	2.31	2.69	0.11	2.57	2.42	0.11	1.36	1.77	0.69	0.34	15.9%	16.6%	19.3%	18.5%	27.2%	20.1%
ES-Lma	F	12.4	4.38	3.93	0.53	3.39	13.0	0.00	6.35	14.7	4.52	2.22	20.2%	7.1%	6.4%	5.5%	31.5%	34.8%
ES-VDA	SN	14.6	6.03	7.74	0.38	7.36	9.38	0.01	4.55	25.0	2.99	1.72	20.3%	8.4%	10.7%	10.2%	19.3%	41.3%
ES-ES1	F	1.66	2.47	4.67	1.16	3.51	24.4	0.01	13.8	8.95	1.59	2.11	2.8%	4.1%	7.8%	5.9%	64.0%	21.2%
CH-Lae	F	2.82	2.56	2.64	0.11	2.53	2.24	0.13	1.28	2.93	2.05	0.39	16.6%	15.0%	15.5%	14.9%	20.7%	31.5%
mean		4.1	3.0	4.3	0.9	3.3	20.5	0.1	11.2	6.4	1.9	1.7	10.2%	8.6%	10.7%	9.2%	49.9%	20.2%
min		0.7	0.6	1.5	0.1	1.0	2.2	0.0	1.3	1.6	0.5	0.3	1.6%	1.0%	4.0%	1.4%	19.3%	8.1%
max		14.6	6.0	7.7	3.2	7.4	70.1	0.3	38.5	25.0	5.3	4.6	20.3%	20.1%	19.6%	18.8%	84.3%	41.3%
N		17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	

*1 year of data only