Supplemental of Observations of Atmospheric Chemical Deposition to High Arctic Snow

S1 Measured Snow Mixing Ratios

List of Tables

Table Notes

- Sampling conditions: BS = blowing snow, DD = diamond dust
- SWE = snow-water equivalent
- See body of document for other definitions
- Values presented as “Mixing Ratio ± Uncertainty”
- All provided mixing ratios are background subtracted
- “<#” indicates values below MDL
- For ICP-MS the actual analysis MDL is for the preconcentrated sample, provided are these values corrected by the typical preconcentration correction factors
- Blank values indicate no measurement was completed for this sample
- Only ICP-MS metals with S/N>2 are presented as those with lower S/N are considered too uncertain
- Snow fluxes were calculated from presented measured concentrations, period deposition area, and period length

Table S1: General description of collection periods

Sample #	Date		Length (d)	Sample Collected			Average SWE (mm)	Sampling Conditions
	Start	End		SP2	IC	ICP-MS		
1	14-09-14 00:00	15-09-14 13:30	1.56	Y	Y		1.44	
2	15-09-14 13:40	23-09-14 16:30	8.12	Y	Y		0.99	
3	23-09-14 16:40	24-09-14 13:20	0.86	Y	Y		1.33	
4	24-09-14 13:30	03-10-14 14:15	9.03	Y	Y		3.38	
5	03-10-14 14:30	06-10-14 16:30	3.08	Y	Y	Y	0.35	
6	06-10-14 16:50	07-10-14 15:05	0.93	Y	Y	Y	1.43	
7	07-10-14 15:25	15-10-14 15:20	8.00	Y	Y	Y	1.99	
8	15-10-14 15:45	20-10-14 18:15	5.10	Y	Y	Y	1.72	
9	20-10-14 18:15	24-10-14 15:25	3.88	Y	Y	Y	0.35	BS
10	24-10-14 15:55	27-10-14 17:30	3.07	Y	Y	Y	0.52	
11	27-10-14 17:55	05-11-14 14:45	8.87	Y	Y	Y	1.87	BS
12	05-11-14 15:10	07-11-14 15:45	2.02	Y	Y	Y	0.21	DD
13	07-11-14 16:10	10-11-14 17:15	3.05	Y	Y	Y	0.46	
14	10-11-14 17:35	12-11-14 15:55	1.93	Y	Y	Y	1.05	
15	12-11-14 15:55	14-11-14 15:30	1.98	Y	Y	Y	0.45	
16	14-11-14 15:30	17-11-14 16:20	3.03	Y	Y	Y	0.34	
17	17-11-14 16:45	19-11-14 17:05	2.01	Y	Y	Y	0.35	
18	19-11-14 17:30	26-11-14 14:55	6.89	Y	Y	Y	1.10	
19	26-11-14 15:20	05-12-14 14:45	8.98	Y	Y	Y	0.29	
20	05-12-14 15:05	12-12-14 15:15	7.01	Y	Y	Y	1.02	
21	12-12-14 15:35	15-12-14 18:00	3.10	Y	Y	Y	2.04	
22	15-12-14 18:30	17-12-14 17:25	1.95	Y	Y	Y	2.08	
23	17-12-14 17:45	22-12-14 17:00	4.97	Y	Y	Y	1.44	
24	22-12-14 17:30	10-01-15 16:30	18.96	Y	Y	Y	0.58	
25	10-01-15 16:50	23-01-15 15:55	12.96	Y	Y	Y	0.68	
26	23-01-15 15:55	30-01-15 16:00	7.00	Y	Y	Y	0.13	DD
27	30-01-15 16:00	02-02-15 20:15	3.18	Y	Y	Y	0.41	
28	02-02-15 20:15	13-02-15 17:30	10.89	Y	Y		0.07	BS
29	13-02-15 17:30	17-02-15 14:15	3.86	Y	Y		0.04	
30	17-02-15 14:15	18-02-15 16:50	1.11	Y	Y	Y	0.31	
31	18-02-15 16:50	23-02-15 18:45	5.08	Y	Y	Y	1.55	
32	23-02-15 19:05	04-03-15 14:20	8.80	Y	Y	Y	0.27	
33	04-03-15 14:20	06-03-15 15:15	2.04	Y	Y	Y	0.12	
34	06-03-15 15:15	09-03-15 16:55	3.07	Y	Y	Y	0.50	
35	09-03-15 16:55	11-03-15 14:15	1.89	Y	Y	Y	1.68	
36	11-03-15 14:15	13-03-15 16:55	2.11	Y	Y	Y	2.08	
37	13-03-15 16:55	16-03-15 18:15	3.06	Y	Y	Y	1.22	DD + BS
38	16-03-15 18:15	23-03-15 17:15	6.96	Y	Y	Y	0.97	
39	23-03-15 17:15	27-03-15 13:30	3.84	Y	Y	Y	0.90	
40	27-03-15 13:30	30-03-15 18:30	3.21	Y	Y	Y	1.30	
41	30-03-15 18:30	03-04-15 17:45	3.97	Y	Y	Y	1.47	
42	03-04-15 17:45	05-04-15 14:00	1.84	Y	Y	Y	1.81	
43	05-04-15 14:00	06-04-15 18:15	1.18	Y	Y		0.06	
44-45	06-04-15 18:15	08-04-15 15:45	1.90	Collection for different study				
46	08-04-15 15:45	13-04-15 19:00	5.14	Y	Y	Y	0.87	
47	13-04-15 19:00	15-04-15 14:45	1.82	Y	Y	Y	2.99	
48	15-04-15 14:45	20-04-15 18:00	5.14	Y	Y	Y	0.52	
49	20-04-15 18:00	23-04-15 14:30	2.85	Y	Y	Y	0.99	
50	23-04-15 14:30	27-04-15 15:45	4.05	Y			0.01	DD
51	27-04-15 15:45	30-04-15 15:25	2.99	Y			0.01	DD
52	30-04-15 15:25	04-05-15 19:40	4.18	Y	Y		0.06	DD
53	04-05-15 19:40	11-05-15 18:55	6.97		Y		0.47	
54	11-05-15 18:55	12-05-15 14:33	0.82	Y	Y	Y	1.55	
55	12-05-15 14:33	13-05-15 14:50	1.01	Y	Y	Y	1.53	
56	13-05-15 14:50	18-05-15 18:40	5.16	Y	Y	Y	0.42	
57	25-05-15 16:20	27-05-15 14:10	1.91	Y	Y	Y	0.40	
58	27-05-15 14:10	29-05-15 15:00	2.03	Y	Y	Y	0.51	
59	29-05-15 15:00	01-06-15 16:15	3.05	Y			0.04	

Table S2: SP2 analysis and IC analysis – Part 1

Sample #	Snow Mixing Ratio (ppb)								
	BC	MSA	ACE	PRP	FOR	PYR	Cl^-	NO_2^-	Br^-
1	0.41 ± 0.10	3.9 ± 3.1	4 ± 11	<1.5	5.2 ± 2.5	<11	26 ± 27	<5	<5
2	1.28 ± 0.26	48.3 ± 11.7	44 ± 11	1.6 ± 1.9	9.8 ± 2.6	<11	136 ± 37	22 ± 7	6 ± 5
3	0.60 ± 0.13	7.3 ± 3.4	11 ± 7	<1.5	3.8 ± 2.0	<11	131 ± 48	8 ± 7	<5
4	0.44 ± 0.10	5.8 ± 8.0	10 ± 17	<1.5	1.9 ± 5.3	<11	142 ± 130	8 ± 18	<5
5	0.94 ± 0.10	2.2 ± 0.9	37 ± 4	6.2 ± 0.8	26.9 ± 2.7	6 ± 4	158 ± 18	<5	<5
6	1.66 ± 0.17	1.1 ± 2.9	24 ± 13	5.6 ± 3.1	23.2 ± 9.8	6 ± 16	104 ± 57	<5	<5
7	1.08 ± 0.11	4.3 ± 2.2	38 ± 10	7.7 ± 2.1	24.4 ± 5.8	11 ± 18	66 ± 25	<5	<5
8	1.28 ± 0.13	1.1 ± 3.8	10 ± 6	1.8 ± 2.9	9.3 ± 2.6	5 ± 21	117 ± 40	<5	<5
9	0.83 ± 0.09	1.4 ± 0.7	10 ± 1	<1.5	29.5 ± 1.5	3 ± 4	245 ± 13	8 ± 1	<5
10	0.85 ± 0.09	1.5 ± 0.9	12 ± 1	1.1 ± 0.7	9.0 ± 0.6	3 ± 5	291 ± 20	7 ± 1	<5
11	0.34 ± 0.04	0.8 ± 3.3	9 ± 6	1.8 ± 2.6	11.0 ± 2.7	4 ± 18	47 ± 22	<5	<5
12	0.44 ± 0.05	0.6 ± 0.4	33 ± 1	4.4 ± 0.2	28.2 ± 0.7	3 ± 2	185 ± 6	8 ± 1	<5
13	4.20 ± 0.42	1.2 ± 0.8	21 ± 2	3.0 ± 0.6	17.6 ± 1.0	2 ± 4	253 ± 16	<5	<5
14	3.75 ± 0.38	0.5 ± 2.9	10 ± 6	1.4 ± 2.3	8.6 ± 1.9	4 ± 16	457 ± 103	<5	<5
15	3.16 ± 0.32	1.3 ± 0.8	31 ± 2	3.4 ± 0.6	16.7 ± 1.0	3 ± 4	815 ± 50	16 ± 2	<5
16	2.47 ± 0.25	0.5 ± 0.7	11 ± 1	2.1 ± 0.5	13.2 ± 0.6	4 ± 4	704 ± 36	<5	<5
17	1.49 ± 0.15	0.4 ± 0.7	8 ± 1	1.6 ± 0.6	11.3 ± 0.6	3 ± 4	810 ± 46	<5	<5
18	1.83 ± 0.19	0.7 ± 1.9	7 ± 3	1.5 ± 1.5	6.4 ± 1.0	1 ± 11	1264 ± 184	<5	<5
19	3.86 ± 0.39	0.3 ± 0.9	9 ± 2	2.7 ± 0.7	11.4 ± 0.8	6 ± 5	2049 ± 142	<5	7 ± 2
20	5.51 ± 0.55	0.2 ± 1.8	24 ± 4	5.3 ± 1.0	8.8 ± 1.2	7 ± 10	245 ± 36	5 ± 3	<5
21	4.12 ± 0.41	0.4 ± 4.5	4 ± 10	4.4 ± 2.2	8.6 ± 2.9	8 ± 25	104 ± 43	6 ± 7	<5
22	1.56 ± 0.32	0.2 ± 3.6	20 ± 7	4.2 ± 1.8	12.0 ± 3.1	7 ± 20	56 ± 26	4 ± 10	<5
23	1.65 ± 0.17	0.2 ± 2.7	8 ± 5	2.4 ± 2.1	6.6 ± 1.4	2 ± 15	121 ± 29	7 ± 4	<5
24	1.89 ± 0.19	0.7 ± 1.2	14 ± 2	3.6 ± 0.9	18.6 ± 1.6	7 ± 7	4215 ± 386	<5	44 ± 4
25	2.99 ± 0.30	0.2 ± 1.3	16 ± 2	4.5 ± 0.6	6.6 ± 0.7	3 ± 7	208 ± 21	8 ± 2	6 ± 2
26	1.55 ± 0.16	0.4 ± 0.4	14 ± 1	4.0 ± 0.2	10.0 ± 0.3	3 ± 2	2226 ± 69	<5	12 ± 1
27	2.40 ± 0.24	0.3 ± 0.9	24 ± 2	6.2 ± 0.5	10.4 ± 0.6	7 ± 5	450 ± 29	8 ± 1	5 ± 2
28	13.45 ± 1.35	1.5 ± 0.2	24 ± 0	5.9 ± 0.1	19.9 ± 0.3	4 ± 1	3768 ± 66	<5	25 ± 1
29	10.18 ± 1.02	0.8 ± 0.1	27 ± 0	7.0 ± 0.1	14.5 ± 0.1	3 ± 1	1023 ± 11	<5	<5
30	5.16 ± 0.52	1.0 ± 1.0	30 ± 2	7.8 ± 0.6	10.9 ± 0.8	9 ± 5	208 ± 17	<5	<5
31	2.82 ± 0.28	0.6 ± 2.9	12 ± 5	4.3 ± 1.4	8.8 ± 1.9	12 ± 16	179 ± 42	<5	<5
32	14.79 ± 1.48	0.8 ± 0.5	25 ± 1	7.6 ± 0.3	12.5 ± 0.5	4 ± 3	898 ± 36	9 ± 1	6 ± 1
33	6.83 ± 0.68	1.0 ± 0.4	47 ± 1	12.6 ± 0.4	16.5 ± 0.5	13 ± 2	352 ± 10	6 ± 1	8 ± 1
34	5.30 ± 0.53	0.7 ± 1.0	14 ± 2	4.2 ± 0.6	13.9 ± 1.0	5 ± 6	333 ± 26	<5	<5
35	2.33 ± 0.24	0.4 ± 2.8	10 ± 4	3.6 ± 2.1	10.1 ± 2.1	7 ± 15	57 ± 20	<5	<5
36	2.26 ± 0.23	0.7 ± 3.8	14 ± 6	5.3 ± 2.0	10.8 ± 3.0	6 ± 21	312 ± 92	<5	8 ± 6
37	4.61 ± 0.46	0.7 ± 2.5	25 ± 6	8.0 ± 1.6	12.6 ± 2.3	8 ± 14	241 ± 48	5 ± 4	9 ± 4
38	4.51 ± 0.45	1.4 ± 2.2	35 ± 6	12.1 ± 1.9	14.0 ± 2.2	6 ± 12	651 ± 109	<5	14 ± 4
39	0.95 ± 0.10	0.7 ± 1.7	23 ± 4	8.8 ± 1.2	14.6 ± 1.8	8 ± 9	256 ± 34	<5	9 ± 3
40	1.23 ± 0.13	1.2 ± 2.2	28 ± 5	9.9 ± 1.6	10.4 ± 1.7	5 ± 12	297 ± 51	<5	30 ± 6
41	3.71 ± 0.37	1.1 ± 2.4	24 ± 5	10.4 ± 1.9	14.4 ± 2.5	7 ± 13	198 ± 39	<5	18 ± 5
42	1.31 ± 0.13	1.7 ± 3.4	46 ± 12	17.7 ± 4.3	13.6 ± 3.3	8 ± 19	1301 ± 335	<5	24 ± 8
43	2.50 ± 0.25	2.5 ± 0.1	51 ± 1	19.8 ± 0.3	17.1 ± 0.2	10 ± 1	623 ± 9	<5	12 ± 0
46	1.47 ± 0.15	2.0 ± 0.9	25 ± 3	12.1 ± 1.3	12.6 ± 1.3	7 ± 8	917 ± 104	<5	28 ± 4
47	0.62 ± 0.07	3.7 ± 3.6	14 ± 9	5.1 ± 2.8	10.8 ± 4.3	7 ± 30	72 ± 43	<5	7 ± 9
48	2.45 ± 0.25	18.2 ± 1.2	25 ± 2	8.5 ± 0.6	12.8 ± 0.8	9 ± 5	553 ± 35	<5	22 ± 2
49	4.18 ± 0.42	10.9 ± 1.7	11 ± 3	<1.5	14.2 ± 1.7	6 ± 9	236 ± 32	<5	8 ± 3
50	10.84 ± 1.09								
51	2.40 ± 0.24								
52	7.55 ± 0.76	75.5 ± 1.1	26 ± 0	8.3 ± 0.1	16.2 ± 0.2	12 ± 1	266 ± 4	<5	14 ± 0
53		5.2 ± 0.5	28 ± 2	3.2 ± 0.4	68.8 ± 3.9	<11	127 ± 8	<5	<5
54	0.36 ± 0.04	<1.9	10 ± 4	0.0 ± 2.0	30.1 ± 6.1	<11	123 ± 29	<5	12 ± 5
55	0.46 ± 0.05	1.5 ± 2.8	8 ± 4	<1.5	14.2 ± 3.2	<11	540 ± 117	<5	25 ± 7
56	5.20 ± 0.52	2.3 ± 0.5	175 ± 10	<1.5	487.5 ± 27.9	<11	179 ± 11	<5	12 ± 1
57	1.50 ± 0.15	19.9 ± 1.1	88 ± 5	1.4 ± 0.5	42.5 ± 2.2	<11	225 ± 12	<5	24 ± 2
58	0.94 ± 0.10	16.8 ± 1.3	21 ± 2	<1.5	14.5 ± 1.1	<11	79 ± 8	<5	7 ± 2
59	7.37 ± 0.74								

Table S3: IC analysis – Part 2

Sample #	Snow Mixing Ratio (ppb)								
	NO_3^-	SO_4^{2-}	$C_2O_4^{2-}$	Na^+	NH_4^+	K^+	Mg^{2+}	Ca^{2+}	H^+
1	47 ± 18	134 ± 53	<18	11 ± 43	8 ± 8	12 ± 8	13 ± 43	102 ± 319	1.27 ± 0.44
2	76 ± 19	5136 ± 1222	4 ± 30	128 ± 35	17 ± 6	16 ± 6	177 ± 46	1167 ± 307	22.56 ± 5.37
3	31 ± 12	1138 ± 365	6 ± 40	77 ± 34	12 ± 8	19 ± 9	80 ± 35	402 ± 219	3.34 ± 1.07
4	107 ± 88	1318 ± 1070	<18	64 ± 80	10 ± 19	17 ± 22	51 ± 73	330 ± 523	10.55 ± 8.55
5	520 ± 54	557 ± 58	23 ± 8	93 ± 12	11 ± 2	65 ± 7	25 ± 8	287 ± 65	
6	240 ± 106	538 ± 240	18 ± 34	56 ± 41	13 ± 11	26 ± 15	27 ± 35	235 ± 266	
7	93 ± 24	870 ± 217	12 ± 31	46 ± 22	13 ± 6	11 ± 6	22 ± 19	189 ± 146	3.42 ± 0.85
8	33 ± 11	327 ± 96	15 ± 36	63 ± 28	10 ± 7	8 ± 6	12 ± 36	41 ± 264	5.67 ± 1.62
9	86 ± 5	344 ± 18	22 ± 4	126 ± 8	9 ± 1	14 ± 1	53 ± 5	628 ± 44	0.52 ± 0.03
10	93 ± 6	2055 ± 138	13 ± 8	154 ± 12	10 ± 2	23 ± 2	44 ± 6	352 ± 44	24.18 ± 1.63
11	55 ± 15	99 ± 31	10 ± 32	19 ± 19	<5	5 ± 5	9 ± 32	159 ± 145	4.50 ± 1.13
12	97 ± 3	635 ± 18	21 ± 2	100 ± 3	12 ± 1	10 ± 1	43 ± 2	461 ± 20	1.08 ± 0.03
13	100 ± 6	480 ± 29	39 ± 5	122 ± 9	11 ± 1	39 ± 3	184 ± 12	1663 ± 106	0.64 ± 0.04
14	49 ± 12	243 ± 56	16 ± 28	229 ± 54	12 ± 5	22 ± 7	93 ± 27	570 ± 177	0.54 ± 0.12
15	128 ± 8	588 ± 36	12 ± 8	432 ± 27	44 ± 3	22 ± 2	64 ± 6	134 ± 35	6.07 ± 0.37
16	119 ± 6	271 ± 14	18 ± 4	301 ± 16	12 ± 1	18 ± 1	77 ± 5	336 ± 33	1.42 ± 0.07
17	43 ± 3	171 ± 11	17 ± 7	352 ± 20	8 ± 1	18 ± 2	61 ± 5	134 ± 32	2.65 ± 0.15
18	154 ± 23	440 ± 65	33 ± 12	561 ± 82	10 ± 3	26 ± 5	133 ± 22	442 ± 103	1.63 ± 0.24
19	100 ± 7	1289 ± 90	20 ± 5	991 ± 69	27 ± 2	44 ± 3	222 ± 16	494 ± 52	3.83 ± 0.27
20	453 ± 63	306 ± 44	13 ± 17	68 ± 14	12 ± 3	9 ± 3	34 ± 12	213 ± 83	6.51 ± 0.91
21	452 ± 153	348 ± 120	21 ± 26	43 ± 29	14 ± 9	14 ± 9	19 ± 26	150 ± 194	9.19 ± 3.11
22	268 ± 74	197 ± 58	11 ± 34	8 ± 34	6 ± 6	4 ± 10	3 ± 34	33 ± 255	6.97 ± 1.92
23	640 ± 131	242 ± 52	<18	24 ± 16	6 ± 4	5 ± 4	7 ± 25	38 ± 189	9.63 ± 1.96
24	223 ± 20	1267 ± 116	102 ± 12	1601 ± 147	37 ± 4	128 ± 12	511 ± 47	582 ± 74	3.92 ± 0.36
25	93 ± 9	287 ± 28	18 ± 7	60 ± 9	7 ± 2	14 ± 2	38 ± 8	135 ± 54	4.40 ± 0.42
26	258 ± 8	544 ± 17	39 ± 3	951 ± 30	17 ± 1	46 ± 2	252 ± 8	895 ± 33	1.18 ± 0.04
27	85 ± 6	257 ± 17	13 ± 8	134 ± 10	7 ± 1	10 ± 1	60 ± 6	197 ± 38	2.65 ± 0.17
28	660 ± 12	1764 ± 31	100 ± 2	1489 ± 26	58 ± 1	106 ± 2	647 ± 11	6035 ± 106	0.07 ± 0.00
29	639 ± 7	882 ± 9	64 ± 1	327 ± 3	34 ± 0	37 ± 0	162 ± 2	1135 ± 13	0.13 ± 0.00
30	188 ± 14	232 ± 18	18 ± 6	51 ± 7	9 ± 2	10 ± 2	40 ± 6	290 ± 47	4.11 ± 0.31
31	191 ± 42	192 ± 45	8 ± 27	48 ± 19	7 ± 5	21 ± 6	17 ± 27	83 ± 202	4.40 ± 0.96
32	319 ± 13	645 ± 26	27 ± 3	342 ± 14	34 ± 2	34 ± 2	117 ± 5	241 ± 24	6.21 ± 0.25
33	170 ± 5	517 ± 15	9 ± 4	146 ± 5	16 ± 1	6 ± 1	22 ± 2	31 ± 27	9.63 ± 0.28
34	166 ± 13	238 ± 19	13 ± 10	108 ± 10	16 ± 2	7 ± 2	22 ± 6	5 ± 71	10.80 ± 0.83
35	37 ± 9	130 ± 32	7 ± 26	25 ± 17	11 ± 5	2 ± 7	9 ± 26	<133	5.94 ± 1.25
36	50 ± 16	191 ± 59	13 ± 36	123 ± 41	12 ± 7	4 ± 10	24 ± 23	4 ± 266	5.29 ± 1.52
37	38 ± 8	340 ± 67	11 ± 24	98 ± 24	14 ± 5	6 ± 4	28 ± 15	59 ± 177	6.21 ± 1.19
38	151 ± 25	282 ± 48	23 ± 13	239 ± 41	19 ± 5	14 ± 4	70 ± 17	66 ± 153	6.51 ± 1.08
39	80 ± 11	109 ± 17	12 ± 16	70 ± 13	12 ± 3	6 ± 3	34 ± 11	16 ± 119	4.50 ± 0.58
40	97 ± 16	178 ± 32	6 ± 21	77 ± 18	12 ± 4	4 ± 6	30 ± 13	12 ± 154	6.97 ± 1.16
41	<5	286 ± 54	9 ± 23	51 ± 17	13 ± 4	4 ± 6	18 ± 23	9 ± 169	4.71 ± 0.86
42	25 ± 8	269 ± 72	10 ± 32	346 ± 91	13 ± 6	8 ± 6	64 ± 25	46 ± 237	14.91 ± 3.83
43	211 ± 3	414 ± 6	23 ± 1	208 ± 3	15 ± 0	8 ± 0	43 ± 1	54 ± 14	7.30 ± 0.11
46	458 ± 52	202 ± 24	22 ± 9	291 ± 34	15 ± 3	14 ± 3	78 ± 12	121 ± 104	8.58 ± 0.97
47	<5	56 ± 38	9 ± 52	51 ± 37	12 ± 10	2 ± 14	10 ± 52	11 ± 381	1.56 ± 0.64
48	209 ± 13	426 ± 27	21 ± 5	236 ± 15	16 ± 2	12 ± 1	70 ± 6	458 ± 45	1.06 ± 0.07
49	201 ± 26	407 ± 53	19 ± 10	114 ± 18	16 ± 3	11 ± 3	99 ± 16	1332 ± 186	0.42 ± 0.05
50									
51									
52	1152 ± 16	989 ± 14	28 ± 1	133 ± 2	87 ± 1	45 ± 1	53 ± 1	412 ± 10	12.98 ± 0.18
53	736 ± 41	194 ± 12	9 ± 7	51 ± 5	46 ± 3	46 ± 3	44 ± 5	390 ± 38	1.56 ± 0.09
54	87 ± 18	46 ± 18	<18	55 ± 19	10 ± 5	23 ± 6	17 ± 25	107 ± 185	0.86 ± 0.17
55	167 ± 36	96 ± 26	<18	274 ± 61	15 ± 5	24 ± 7	51 ± 19	84 ± 198	2.78 ± 0.59
56	319 ± 18	255 ± 15	15 ± 7	76 ± 6	70 ± 4	21 ± 2	457 ± 27	3468 ± 201	0.42 ± 0.02
57	342 ± 18	331 ± 18	7 ± 7	134 ± 8	41 ± 2	55 ± 3	38 ± 4	320 ± 34	1.27 ± 0.07
58	418 ± 30	210 ± 16	<18	36 ± 6	22 ± 2	24 ± 2	15 ± 9	141 ± 41	1.06 ± 0.07
59									

Table S4: ICP-MS analysis – Insoluble (IS) metals Part 1

Sample #	Snow Mixing Ratio (ppb)								
	IS Al	IS Fe	IS Ti	IS Mn	IS Mg	IS K	IS Ca	IS Pb	IS Zn
1									
2									
3									
4									
5	<3	7 ± 6	<0.3	0.05 ± 0.03	5 ± 4	4 ± 2	<9	0.08 ± 0.03	<1.7
6	<3	15 ± 7	<0.3	0.17 ± 0.04	9 ± 4	3.5 ± 2.1	<9	0.22 ± 0.04	<1.7
7	8 ± 3	14 ± 3	<0.3	0.09 ± 0.02	6 ± 2	4.0 ± 0.9	<9	0.12 ± 0.02	<1.7
8	<3	6 ± 3	<0.3	0.06 ± 0.01	<2	1.6 ± 0.7	<9	0.02 ± 0.01	<1.7
9	31 ± 3	76 ± 8	0.6 ± 0.2	0.93 ± 0.09	54 ± 5	12.0 ± 1.3	98 ± 10	0.32 ± 0.03	2.3 ± 0.9
10	7 ± 2	10 ± 3	<0.3	0.05 ± 0.01	<2	4.2 ± 0.8	<9	0.05 ± 0.01	<1.7
11	<3	5 ± 2	<0.3	0.05 ± 0.01	3 ± 1	2.0 ± 0.6	<9	0.04 ± 0.01	1.9 ± 1.2
12	5 ± 1	8 ± 1	<0.3	0.05 ± 0.01	2 ± 1	2.4 ± 0.4	<9	0.08 ± 0.01	<1.7
13	97 ± 10	219 ± 22	1.1 ± 0.2	3.19 ± 0.32	124 ± 13	44.2 ± 4.4	334 ± 34	0.37 ± 0.04	8.2 ± 1.2
14	38 ± 4	65 ± 7	0.8 ± 0.3	0.63 ± 0.06	29 ± 3	21.6 ± 2.2	48 ± 8	0.18 ± 0.02	<1.7
15	<3	<3	<0.3	0.03 ± 0.02	<2	1.4 ± 0.8	<9	0.05 ± 0.01	<1.7
16	18 ± 2	31 ± 3	<0.3	0.35 ± 0.04	17 ± 2	8.8 ± 1.0	38 ± 6	0.11 ± 0.01	<1.7
17	7 ± 3	<3	<0.3	0.15 ± 0.02	9 ± 2	3.4 ± 0.8	26 ± 9	0.09 ± 0.02	<1.7
18	49 ± 5	92 ± 9	1.5 ± 0.2	1.02 ± 0.10	40 ± 4	19.9 ± 2.0	77 ± 8	0.16 ± 0.02	<1.7
19	33 ± 5	49 ± 7	<0.3	0.37 ± 0.05	19 ± 4	18.8 ± 2.3	<9	0.18 ± 0.03	<1.7
20	17 ± 2	23 ± 3	0.4 ± 0.2	0.20 ± 0.02	9 ± 1	6.8 ± 0.8	<9	0.15 ± 0.02	<1.7
21	33 ± 4	34 ± 4	<0.3	0.29 ± 0.03	9 ± 2	14.5 ± 1.5	<9	0.37 ± 0.04	<1.7
22	<3	<3	<0.3	<0.02	<2	<1.0	<9	0.02 ± 0.01	<1.7
23	<3	<3	<0.3	<0.02	<2	<1.0	<9	0.08 ± 0.01	<1.7
24	84 ± 9	153 ± 15	0.7 ± 0.2	2.38 ± 0.24	70 ± 7	24.9 ± 2.5	146 ± 15	0.47 ± 0.05	7.1 ± 1.0
25	13 ± 2	22 ± 3	<0.3	0.21 ± 0.02	10 ± 1	6.7 ± 0.8	18 ± 6	0.08 ± 0.01	<1.7
26	58 ± 6	86 ± 9	1.3 ± 0.2	0.82 ± 0.08	43 ± 5	27.2 ± 2.8	84 ± 9	0.16 ± 0.02	<1.7
27	34 ± 4	31 ± 4	4.4 ± 0.6	0.19 ± 0.02	10 ± 2	15.5 ± 1.7	<9	0.05 ± 0.01	<1.7
28									
29									
30	12 ± 2	11 ± 2	<0.3	0.10 ± 0.01	6 ± 1	3.6 ± 0.6	<9	0.04 ± 0.01	<1.7
31	3 ± 2	4 ± 2	<0.3	0.04 ± 0.01	<2	1.4 ± 0.7	<9	0.02 ± 0.01	<1.7
32	7 ± 2	10 ± 2	<0.3	0.10 ± 0.01	4 ± 1	3.3 ± 0.6	<9	0.08 ± 0.01	<1.7
33	6 ± 2	7 ± 2	<0.3	0.06 ± 0.01	3 ± 1	2.2 ± 0.5	<9	0.08 ± 0.01	<1.7
34	<3	<3	<0.3	<0.02	<2	<1.0	<9	0.02 ± 0.01	<1.7
35	<3	<3	<0.3	0.05 ± 0.01	<2	1.5 ± 0.8	<9	0.03 ± 0.01	<1.7
36	<3	<3	<0.3	0.03 ± 0.02	<2	<1.0	<9	0.12 ± 0.03	<1.7
37	<3	6 ± 2	<0.3	0.09 ± 0.01	3 ± 1	<1.0	<9	0.20 ± 0.02	<1.7
38	13 ± 2	24 ± 3	<0.3	0.25 ± 0.03	6 ± 1	5.7 ± 0.7	<9	0.14 ± 0.02	<1.7
39	3 ± 1	4 ± 2	<0.3	0.06 ± 0.01	<2	1.7 ± 0.5	<9	0.04 ± 0.01	<1.7
40	<3	3 ± 2	<0.3	0.04 ± 0.01	<2	1.3 ± 0.6	<9	0.04 ± 0.01	<1.7
41	4 ± 2	<3	<0.3	0.05 ± 0.01	<2	1.9 ± 0.5	<9	0.05 ± 0.01	<1.7
42	5 ± 2	6 ± 2	<0.3	0.07 ± 0.01	<2	2.3 ± 0.5	<9	0.03 ± 0.01	<1.7
43									
46	10 ± 2	12 ± 2	0.9 ± 0.2	0.13 ± 0.02	4 ± 1	4.8 ± 0.7	<9	0.11 ± 0.01	<1.7
47	<3	<3	<0.3	0.03 ± 0.01	<2	0.9 ± 0.6	<9	0.02 ± 0.01	<1.7
48	12 ± 2	23 ± 3	<0.3	0.13 ± 0.02	11 ± 2	5.3 ± 0.7	<9	0.07 ± 0.01	<1.7
49	57 ± 6	126 ± 13	0.6 ± 0.2	1.39 ± 0.14	70 ± 7	27.9 ± 2.8	129 ± 13	0.25 ± 0.03	3.2 ± 0.7
50									
51									
52									
53									
54	<3	<3	<0.3	0.05 ± 0.02	<2	2.0 ± 1.0	<9	<0.02	<1.7
55	3 ± 1	<3	<0.3	0.04 ± 0.01	<2	1.1 ± 0.5	<9	<0.02	<1.7
56	247 ± 25	442 ± 44	2.7 ± 0.4	5.76 ± 0.58	447 ± 45	99.7 ± 10.0	1295 ± 130	0.51 ± 0.05	14.2 ± 1.8
57	8 ± 7	<3	<0.3	0.09 ± 0.05	7 ± 6	<1.0	<9	<0.02	<1.7
58	3 ± 1	4 ± 1	<0.3	0.04 ± 0.01	<2	1.4 ± 0.4	<9	<0.02	<1.7
59									

Table S5: ICP-MS analysis – Insoluble (IS) metals Part 2

Sample #	Snow Mixing Ratio (ppb)			Snow Mixing Ratio(parts per trillion mass/mass, i.e., ppt)					
	IS Se	IS Cu	IS Ba	IS As	IS V	IS Cd	IS Tl	IS Co	IS Sb
1									
2									
3									
4									
5	0.02 ± 0.01	0.08 ± 0.04	<1.5	8.5 ± 2.5	6.0 ± 4.8	4.0 ± 1.6	<0.11	<2.4	10.2 ± 3.0
6	<0.01	0.31 ± 0.05	<1.5	<1.1	13.2 ± 4.9	3.5 ± 1.8	<0.11	<2.4	29.2 ± 3.7
7	<0.01	0.06 ± 0.03	9.9 ± 1.6	15.5 ± 1.8	12.2 ± 2.7	<0.9	<0.11	5.4 ± 2.6	15.6 ± 1.9
8	<0.01	<0.02	<1.5	5.2 ± 0.8	5.1 ± 1.7	<0.9	<0.11	3.7 ± 1.8	6.3 ± 1.0
9	0.14 ± 0.01	0.47 ± 0.05	3.1 ± 0.7	57.2 ± 5.7	48.2 ± 5.0	28.3 ± 2.8	0.57 ± 0.07	38.7 ± 4.0	19.6 ± 2.0
10	0.03 ± 0.01	<0.02	<1.5	8.5 ± 1.1	9.0 ± 2.2	1.7 ± 0.8	0.14 ± 0.09	4.1 ± 2.1	22.9 ± 2.5
11	<0.01	0.03 ± 0.02	<1.5	7.9 ± 1.0	4.9 ± 1.6	<0.9	<0.11	<2.4	<1.4
12	0.02 ± 0.00	0.07 ± 0.01	<1.5	12.4 ± 1.3	6.6 ± 1.1	1.6 ± 0.3	0.09 ± 0.04	3.3 ± 0.8	12.6 ± 1.3
13	0.40 ± 0.04	0.75 ± 0.08	6.2 ± 1.0	114.7 ± 11.5	173.4 ± 17.4	<0.9	2.02 ± 0.21	99.1 ± 10.0	29.0 ± 3.0
14	0.12 ± 0.01	0.27 ± 0.03	2.2 ± 1.2	50.2 ± 5.1	72.5 ± 7.5	6.6 ± 0.9	0.79 ± 0.10	23.6 ± 2.8	41.5 ± 4.2
15	<0.01	<0.02	<1.5	8.5 ± 1.1	<2.9	<0.9	<0.11	<2.4	4.8 ± 1.0
16	0.06 ± 0.01	0.33 ± 0.03	3.6 ± 0.8	23.2 ± 2.4	30.7 ± 3.3	2.8 ± 0.5	0.36 ± 0.06	12.8 ± 1.6	10.8 ± 1.2
17	0.02 ± 0.01	0.16 ± 0.02	<1.5	14.8 ± 1.7	10.6 ± 2.4	2.7 ± 0.7	<0.11	4.0 ± 2.3	20.5 ± 2.3
18	0.15 ± 0.01	0.28 ± 0.03	2.5 ± 0.6	64.4 ± 6.5	91.3 ± 9.2	2.9 ± 0.4	0.95 ± 0.10	53.2 ± 5.4	13.9 ± 1.5
19	0.12 ± 0.02	0.09 ± 0.04	<1.5	60.8 ± 6.3	60.9 ± 7.3	<0.9	0.79 ± 0.16	20.0 ± 3.8	9.8 ± 2.1
20	0.05 ± 0.01	0.07 ± 0.01	2.1 ± 0.9	38.7 ± 3.9	28.0 ± 3.1	<0.9	0.38 ± 0.06	10.2 ± 1.5	13.7 ± 1.5
21	0.07 ± 0.01	0.18 ± 0.02	<1.5	58.0 ± 5.8	68.4 ± 7.0	2.1 ± 0.5	0.69 ± 0.09	10.9 ± 1.6	24.7 ± 2.6
22	<0.01	0.03 ± 0.01	3.0 ± 0.8	2.1 ± 0.5	<2.9	<0.9	<0.11	<2.4	9.6 ± 1.1
23	<0.01	0.11 ± 0.02	<1.5	<1.1	<2.9	<0.9	<0.11	<2.4	<1.4
24	0.23 ± 0.02	0.56 ± 0.06	3.7 ± 0.8	92.7 ± 9.3	110.2 ± 11.1	12.6 ± 1.3	1.21 ± 0.13	82.5 ± 8.3	20.6 ± 2.1
25	<0.01	0.05 ± 0.01	3.4 ± 0.8	16.2 ± 1.7	21.5 ± 2.5	<0.9	0.28 ± 0.05	10.4 ± 1.5	2.8 ± 0.8
26	0.10 ± 0.01	0.12 ± 0.02	<1.5	32.2 ± 3.3	105.4 ± 10.6	1.9 ± 0.4	1.18 ± 0.13	41.2 ± 4.3	3.6 ± 0.7
27	<0.01	0.04 ± 0.02	<1.5	14.5 ± 1.6	89.4 ± 9.1	<0.9	<0.11	10.6 ± 1.8	4.7 ± 1.0
28									
29									
30	<0.01	<0.02	<1.5	13.6 ± 1.5	14.4 ± 2.0	<0.9	0.16 ± 0.05	4.3 ± 1.3	2.7 ± 0.9
31	0.01 ± 0.01	<0.02	<1.5	10.7 ± 1.2	6.7 ± 1.6	1.4 ± 0.6	<0.11	<2.4	3.3 ± 0.8
32	0.03 ± 0.01	0.03 ± 0.02	<1.5	24.2 ± 2.5	13.4 ± 2.0	<0.9	0.18 ± 0.06	5.5 ± 1.3	6.6 ± 1.0
33	<0.01	0.06 ± 0.01	<1.5	12.1 ± 1.3	9.7 ± 1.6	14.3 ± 1.5	0.14 ± 0.06	3.4 ± 1.4	32.4 ± 3.3
34	<0.01	<0.02	<1.5	1.9 ± 0.8	<2.9	1.9 ± 0.5	<0.11	<2.4	1.9 ± 0.9
35	<0.01	0.05 ± 0.02	1.8 ± 1.1	3.4 ± 0.7	<2.9	1044 ± 104	<0.11	<2.4	23.2 ± 2.5
36	<0.01	0.05 ± 0.02	<1.5	39.2 ± 7.9	<2.9	5.4 ± 1.3	<0.11	<2.4	16.9 ± 3.6
37	<0.01	0.05 ± 0.01	<1.5	91.2 ± 9.1	12.3 ± 1.8	<0.9	<0.11	4.6 ± 1.1	31.7 ± 3.2
38	0.04 ± 0.01	0.03 ± 0.01	2.0 ± 0.9	25.0 ± 2.5	18.8 ± 2.2	<0.9	0.30 ± 0.05	10.2 ± 1.4	6.3 ± 0.9
39	<0.01	<0.02	1.7 ± 0.8	10.1 ± 1.1	8.6 ± 1.5	<0.9	0.13 ± 0.06	2.3 ± 1.3	8.1 ± 1.0
40	<0.01	0.02 ± 0.01	<1.5	5.3 ± 0.7	4.6 ± 1.3	<0.9	<0.11	<2.4	3.3 ± 0.7
41	0.02 ± 0.00	0.04 ± 0.01	<1.5	6.2 ± 0.8	7.6 ± 1.5	<0.9	0.17 ± 0.05	2.2 ± 1.4	3.7 ± 0.7
42	0.02 ± 0.00	<0.02	8.4 ± 1.1	6.8 ± 0.9	9.1 ± 1.6	<0.9	0.17 ± 0.05	3.7 ± 1.5	2.4 ± 0.8
43									
46	0.02 ± 0.00	0.04 ± 0.01	2.5 ± 0.7	35.9 ± 3.6	17.2 ± 2.1	1.2 ± 0.5	0.24 ± 0.05	4.5 ± 1.1	7.6 ± 1.0
47	<0.01	<0.02	<1.5	3.5 ± 0.6	<2.9	1.2 ± 0.5	<0.11	<2.4	2.8 ± 0.7
48	0.04 ± 0.01	0.07 ± 0.01	<1.5	30.2 ± 3.1	17.2 ± 2.2	1.1 ± 0.5	0.24 ± 0.05	8.9 ± 1.4	12.6 ± 1.4
49	0.20 ± 0.02	0.30 ± 0.03	2.1 ± 0.6	82.0 ± 8.2	91.4 ± 9.2	3.4 ± 0.5	1.04 ± 0.11	56.8 ± 5.8	7.1 ± 0.9
50									
51									
52									
53									
54	<0.01	<0.02	<1.5	2.2 ± 1.1	5.9 ± 3.0	<0.9	<0.11	<2.4	2.3 ± 1.4
55	<0.01	0.03 ± 0.01	<1.5	2.5 ± 0.5	5.1 ± 1.3	<0.9	<0.11	<2.4	2.5 ± 0.8
56	0.73 ± 0.07	0.53 ± 0.06	5.9 ± 1.2	167.1 ± 16.7	344.7 ± 34.5	10.6 ± 1.2	3.69 ± 0.38	192.9 ± 19.4	22.0 ± 2.4
57	<0.01	2.38 ± 0.48	<1.5	6.8 ± 2.8	9.9 ± 6.7	<0.9	<0.11	<2.4	16.8 ± 4.5
58	<0.01	0.03 ± 0.01	<1.5	3.9 ± 0.5	5.1 ± 1.1	<0.9	<0.11	<2.4	4.8 ± 0.7
59									

Table S6: ICP-MS analysis – Soluble (S) metals

Sample #	Snow Mixing Ratio (ppb)								Mixing Ratio (ppt)	
	S Ti	S Mn	S Mg	S K	S Ca	S Na	S Cu	S Ni	S As	S Cd
1										
2										
3										
4										
5	<0.01	0.50 ± 0.17	13.0 ± 8.5	16.5 ± 5.5	121 ± 79	44 ± 17	<0.07	<0.19	<3	67 ± 24
6	<0.01	0.75 ± 0.10	15.3 ± 4.3	37.6 ± 4.3	165 ± 51	29 ± 10	<0.07	<0.19	<3	55 ± 12
7	<0.01	0.74 ± 0.10	16.2 ± 4.3	12.4 ± 3.1	207 ± 43	29 ± 10	0.84 ± 0.43	<0.19	<3	39 ± 14
8	<0.01	0.25 ± 0.07	10.0 ± 4.1	6.5 ± 2.8	<8	53 ± 9	<0.07	<0.19	<3	<2
9	0.56 ± 0.09	2.98 ± 0.30	55.6 ± 6.9	42.7 ± 4.8	582 ± 69	215 ± 23	<0.07	<0.19	30 ± 15	149 ± 18
10	<0.01	0.55 ± 0.09	24.6 ± 4.7	13.9 ± 2.6	<8	122 ± 14	<0.07	8.01 ± 1.21	<3	57 ± 12
11	<0.01	<0.01	<0.9	<0.5	<8	<2	<0.07	<0.19	<3	<2
12	<0.01	0.78 ± 0.10	17.8 ± 4.4	16.1 ± 2.7	<8	59 ± 9	<0.07	<0.19	47 ± 16	72 ± 12
13	<0.01	4.49 ± 0.45	54.8 ± 6.8	17.4 ± 2.8	792 ± 88	61 ± 10	<0.07	<0.19	<3	<2
14	<0.01	1.41 ± 0.16	47.6 ± 6.2	22.2 ± 3.1	228 ± 44	210 ± 22	<0.07	<0.19	<3	37 ± 14
15	<0.01	0.18 ± 0.07	59.1 ± 7.1	24.4 ± 3.3	<8	457 ± 46	<0.07	<0.19	58 ± 17	<2
16	<0.01	1.04 ± 0.12	50.1 ± 6.4	20.2 ± 3.0	201 ± 53	252 ± 26	<0.07	<0.19	<3	32 ± 13
17	<0.01	0.41 ± 0.08	37.7 ± 5.5	19.7 ± 2.9	107 ± 49	223 ± 24	<0.07	<0.19	<3	31 ± 13
18	0.19 ± 0.09	1.66 ± 0.18	70.2 ± 8.1	24.4 ± 3.3	252 ± 45	333 ± 34	<0.07	1.91 ± 1.16	<3	<2
19	0.49 ± 0.09	2.24 ± 0.23	240.7 ± 24.4	65.4 ± 6.9	420 ± 56	1281 ± 128	1.94 ± 0.48	<0.19	83 ± 15	87 ± 13
20	0.13 ± 0.08	0.84 ± 0.11	26.8 ± 4.8	11.1 ± 3.0	120 ± 49	120 ± 14	<0.07	<0.19	48 ± 16	23 ± 13
21	<0.01	1.27 ± 0.14	13.6 ± 4.3	12.3 ± 3.1	80 ± 48	45 ± 9	<0.07	<0.19	55 ± 16	40 ± 14
22	<0.01	<0.01	<0.9	<0.5	<8	<2	<0.07	2.45 ± 1.17	<3	<2
23	<0.01	0.23 ± 0.07	<0.9	7.6 ± 2.9	<8	24 ± 10	2.45 ± 0.41	6.45 ± 1.11	<3	47 ± 14
24	0.46 ± 0.08	4.16 ± 0.42	318.0 ± 32.1	94.8 ± 9.7	633 ± 74	1009 ± 101	<0.07	<0.19	42 ± 16	29 ± 13
25	<0.01	0.87 ± 0.11	28.7 ± 5.0	7.5 ± 2.9	146 ± 50	79 ± 11	<0.07	<0.19	43 ± 16	<2
26	<0.01	2.54 ± 0.26	146.7 ± 15.2	39.4 ± 4.5	584 ± 69	689 ± 69	<0.07	<0.19	<3	<2
27	<0.01	0.49 ± 0.08	45.4 ± 6.1	15.6 ± 2.7	<8	121 ± 14	<0.07	<0.19	40 ± 16	<2
28										
29										
30	<0.01	0.50 ± 0.08	22.5 ± 4.6	9.6 ± 3.0	<8	49 ± 9	<0.07	1.83 ± 1.16	25 ± 15	<2
31	<0.01	0.16 ± 0.07	9.7 ± 5.2	<0.5	<8	35 ± 8	<0.07	<0.19	35 ± 16	<2
32	<0.01	0.60 ± 0.09	63.2 ± 7.5	19.4 ± 2.9	96 ± 48	192 ± 21	<0.07	<0.19	63 ± 14	<2
33	<0.01	0.27 ± 0.07	17.8 ± 4.4	12.9 ± 3.2	<8	114 ± 14	<0.07	<0.19	48 ± 16	566 ± 57
34	<0.01	<0.01	18.8 ± 4.4	9.4 ± 3.0	<8	90 ± 12	<0.07	<0.19	<3	38 ± 14
35	<0.01	<0.01	<0.9	8.1 ± 2.9	<8	23 ± 10	<0.07	<0.19	<3	354 ± 37
36	<0.01	<0.01	11.8 ± 8.4	9.6 ± 4.8	<8	71 ± 20	<0.07	<0.19	265 ± 58	102 ± 29
37	<0.01	0.35 ± 0.07	17.5 ± 4.4	12.9 ± 3.2	<8	67 ± 10	<0.07	<0.19	314 ± 34	50 ± 14
38	<0.01	0.91 ± 0.23	53.1 ± 13.3	18.8 ± 5.8	<8	141 ± 32	<0.07	2.48 ± 1.88	47 ± 26	<2
39	<0.01	0.14 ± 0.07	21.9 ± 4.6	10.0 ± 3.0	<8	46 ± 9	<0.07	<0.19	38 ± 16	<2
40	<0.01	<0.01	24.0 ± 4.7	10.4 ± 3.0	<8	56 ± 9	<0.07	<0.19	<3	<2
41	<0.01	0.28 ± 0.07	8.1 ± 5.1	5.9 ± 2.8	<8	36 ± 8	<0.07	<0.19	<3	<2
42	<0.01	<0.01	61.7 ± 7.4	20.4 ± 3.0	<8	322 ± 33	<0.07	<0.19	<3	<2
43										
46	<0.01	0.81 ± 0.10	67.0 ± 7.8	21.9 ± 3.1	96 ± 48	242 ± 25	<0.07	<0.19	119 ± 17	23 ± 13
47	<0.01	<0.01	<0.9	<0.5	<8	26 ± 10	<0.07	<0.19	<3	<2
48	0.21 ± 0.09	0.88 ± 0.11	57.7 ± 7.0	22.5 ± 3.1	248 ± 45	246 ± 26	<0.07	8.54 ± 1.25	<3	37 ± 14
49	0.69 ± 0.10	3.56 ± 0.36	61.3 ± 7.3	24.2 ± 3.3	785 ± 87	84 ± 11	<0.07	2.03 ± 1.16	<3	<2
50										
51										
52										
53										
54	<0.01	<0.01	<0.9	8.8 ± 2.9	<8	42 ± 9	<0.07	<0.19	<3	<2
55	<0.01	0.15 ± 0.07	43.0 ± 5.9	19.4 ± 2.9	<8	258 ± 27	<0.07	<0.19	<3	<2
56	1.25 ± 0.16	5.40 ± 0.54	41.2 ± 5.8	66.3 ± 7.0	1772 ± 181	74 ± 10	<0.07	<0.19	<3	<2
57	<0.01	0.65 ± 0.19	21.6 ± 9.1	45.6 ± 10.1	156 ± 81	111 ± 27	0.73 ± 0.68	<0.19	<3	39 ± 22
58	<0.01	0.25 ± 0.07	<0.9	9.2 ± 3.0	<8	<2	<0.07	<0.19	<3	21 ± 13
59										

Table S7: Overview of Arctic snow measurements by others for comparison with measured median

Chemical Species	Median Measured by this Study (ppb)	Typical Range Reported by Others (ppb)		
		Lower	Upper	References
BC	2.3	0.5	60	Noone and Clarke, 1988; Peters et al., 1995; Slater et al., 2002; Hagler, Bergin, Smith and Dibb, 2007; Ming et al., 2009; Doherty et al., 2010; Hegg et al., 2010; Forsström et al., 2003
MSA	1.1	0.5	20	Ross and Granat, 1986; Li and Winchester, 1993; Legrand and Angelis, 1995; Osada et al., 1996; Toom-Sauntry and Barrie, 2002; Hegg et al., 2010
ACE	21	50	300	
PRP	4	<10 (few measurements)		
FOR	13	10	80	
PYR	5*	<10 (few measurements)		
Cl^-	245	50	5000	
Br^-	2	1	15	
NO_3^-	140	20	300	
SO_4^{2-}	316	10	700	
$C_2O_4^{2-}$	13	5	30	
Na^+	111	100	3000	
NH_4^+	12	1	60	
K^+	14	10	100	
Mg^{2+}	43	10	300	
Ca^{2+}	193	50	400	
H^+	4.3	1	20	
Al	7	1	25	Ross and Granat, 1986; Wolff and David, 1988; Gorzelska, 1989; Boutron et al., 1993; Davidson et al., 1993; Osada et al., 1996; Cheam et al., 1998; Hegg et al., 2009
Fe	10	1	20	
Mn	0.1	0.1	5	
Pb	0.08	0.01	5	
Cu	0.05	0.01	5	
V	0.01	0.01	1	
Cd	0.001*	0.001	0.01	
Tl	0.0001	0.0001	0.001	

Notes: **Metals measured by ICP-MS in this study are described as their insoluble median as this was the most common metric measured by others.**

*** Indicates an analyte defined as weak in this study (i.e., 0.2 < signal-to-noise < 2).**

S2 Ambient Atmospheric Measurements

Table S8: Monthly average atmospheric concentrations

Year	Month	Monthly Average Atmospheric Concentration (ng/m^3)											
		SP2	Hi-Vol										
		BC	MSA	Cl^-	Br^-	NO_3^-	SO_4^{2-}	$C_2O_4^{2-}$	Na^+	NH_4^+	K^+	Mg^{2+}	Ca^{2+}
2014	September	2.2	6.5	<9	<0.4	9	980	1.9	18	<28	1	8	46
	October	2.7	2.9	17	<0.4	15	937	1.4	56	48	4	10	23
	November	11.9	1.9	504	4.5	64	772	5.9	365	40	19	61	70
	December	30.3	1.4	158	4.5	80	1392	8.2	292	72	22	47	46
2015	January	19.0	0.6	413	15.5	69	1032	6.9	322	42	30	94	64
	February	38.7	0.7	642	6.6	143	1053	15.2	365	129	44	123	158
	March	25.6	1.5	316	10.8	99	1037	11.1	264	114	27	62	36
	April	18.8	4.2	400	13.5	120	1374	17.3	421	105	32	87	108
	May	4.8	8.5	154	10.3	93	367	6.2	115	38	8	24	101

S3 Collection Campaign Details

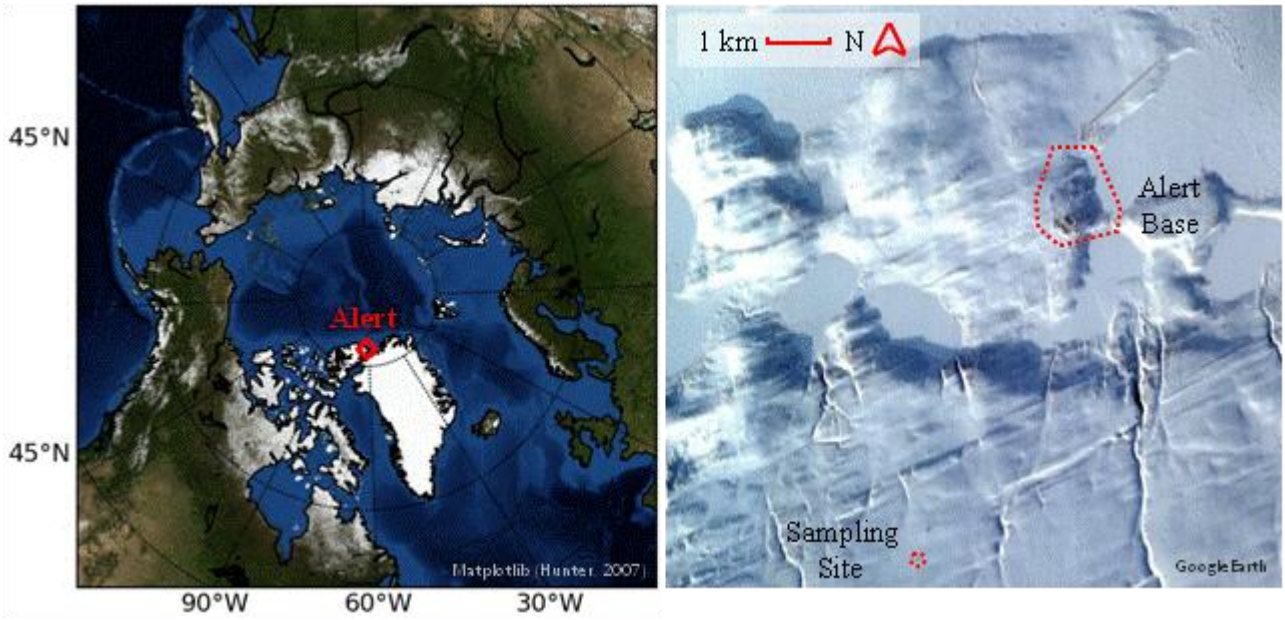

Figure S1: Alert location and base camp map

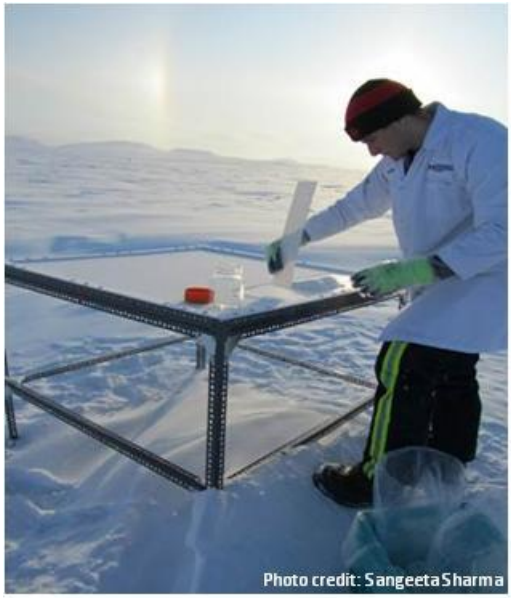

Figure S2: Alert snow table

Table S9: Overview of campaign meteorological conditions

Year	Month	Temperature (°C)	Relative Humidity (%)	Wind Speed (km/h)	Pressure (kPa)	Total Precipitation (mm/month)
2014	September	-10 [-16, -5]	89 [66, 95]	9 [0, 36]	100.3 [99, 101]	16.8
	October	-17 [-29, -5]	85 [54, 92]	5 [0, 30]	101.4 [100, 103]	11.6
	November	-25 [-32, -9]	78 [56, 89]	6 [0, 54]	100.4 [98, 103]	7.4
	December	-30 [-39, -7]	74 [64, 93]	4 [0, 70]	100.6 [99, 102]	19.6
2015	January	-28 [-39, -10]	75 [52, 90]	7 [0, 67]	100.2 [98, 102]	12.4
	February	-30 [-41, -17]	72 [53, 84]	9 [0, 72]	100.1 [98, 102]	17.6
	March	-31 [-41, -22]	72 [62, 81]	5 [0, 45]	100.3 [98, 103]	25.4
	April	-21 [-35, -8]	74 [52, 87]	5 [0, 77]	100.6 [98, 104]	21.4
	May	-14 [-23, -6]	82 [54, 95]	6 [0, 34]	100.9 [99, 103]	6.4
Data Coverage		99%	99%	99%	99%	98%

Notes: **Data are reported as: Median [Minimum, Maximum].**
Data include only the portion of each month covered by snow collection campaign.

S4 Speciated Monthly Effective Deposition Velocities

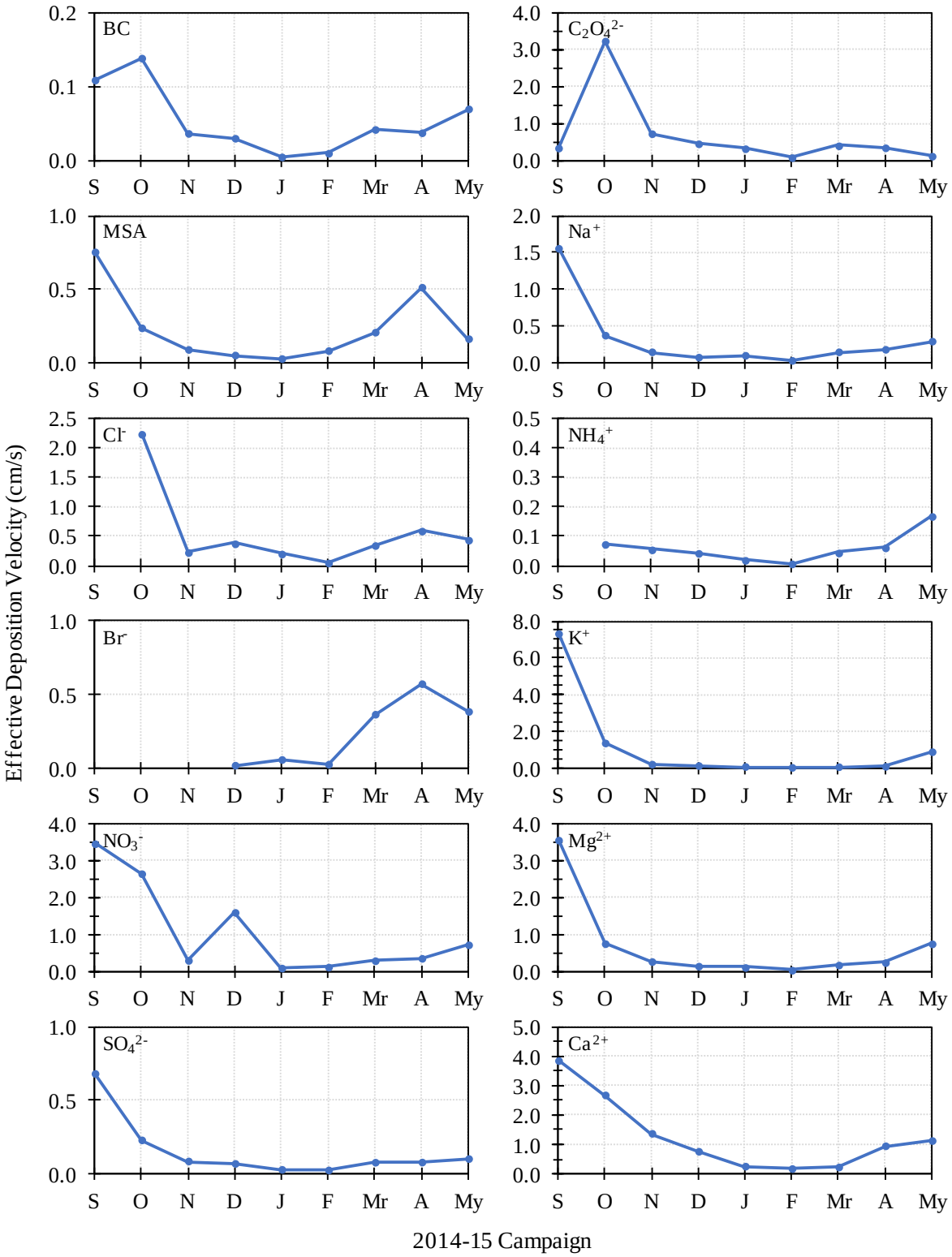

Figure S3: Seasonal trend of monthly effective deposition velocities over the campaign. Missing values indicate months with snow and/or atmospheric measurements below detection limits.

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