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*Supplement of*

## **The role of blowing snow in the activation of bromine over first-year Antarctic sea ice**

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Table 1: Raw anion concentrations of blowing snow samples collected on 25 October, 2012, and measured using a Dionex-600 IC system.

<b>Site</b>	<b>Height (m)</b>	<b>Cl<sup>-</sup> (g/m<sup>3</sup>)</b>	<b>Br<sup>-</sup> (g/m<sup>3</sup>)</b>	<b>SO<sub>4</sub><sup>2-</sup> (g/m<sup>3</sup>)</b>	<b>NO<sub>3</sub><sup>-</sup> (g/m<sup>3</sup>)</b>
Butter Pt	0.3	400	1.3	26	0.4
Butter Pt	0.3	460	1.6	28	0.4
Butter Pt	2.0	23	0.1	1	0.3
Butter Pt	2.0	62	0.2	4	0.4
Butter Pt	2.0	63	0.2	4	0.5
Butter Pt	3.0	4,500	9.5	160	20
Butter Pt	3.0	670	1.3	18	4.3
Butter Pt	5.5	1,400	1.4	47	9.9
Butter Pt	5.5	4,900	6.0	210	30
Iceberg	0.3	150	0.5	14	0.2
Iceberg	0.3	280	1.3	59	0.4
Iceberg	2.0	6,700	18.5	240	13
Iceberg	3.0	2,600	6.0	100	8.3
Iceberg	5.5	3,900	4.9	150	23

Table 2: Raw anion concentrations of surface snow samples collected in October – November, 2012, and measured using a Dionex-600 IC system. All nitrate samples marked BQL were below the quantification limit of 0.1 g/m<sup>3</sup>.

Site	Date	Cl <sup>-</sup> (g/m <sup>3</sup> )	Br <sup>-</sup> (g/m <sup>3</sup> )	SO <sub>4</sub> <sup>2-</sup> (g/m <sup>3</sup> )	NO <sub>3</sub> <sup>-</sup> (g/m <sup>3</sup> )
Butter Pt	10/15	3,400	13	1,600	0.3
Butter Pt	10/15	2,400	8.0	350	0.3
Butter Pt	10/15	950	3.7	150	BQL
Butter Pt	10/17	940	3.0	120	0.5
Butter Pt	10/25	780	2.8	78	BQL
Butter Pt	10/25	1,800	6.9	210	BQL
Butter Pt	10/25	2,700	9.5	210	BQL
Butter Pt	10/25	420	1.5	29	BQL
Butter Pt	10/25	920	3.7	120	BQL
Butter Pt	10/25	1,300	4.9	250	BQL
Butter Pt	10/26	330	1.2	20	0.5
Butter Pt	10/29	350	1.2	50	BQL
Butter Pt	10/31	470	2.0	77	BQL
Butter Pt	11/02	2,200	7.8	210	BQL
Butter Pt	11/06	3,700	13	590	1.2
Iceberg	10/11	1,400	4.4	87	0.3
Iceberg	10/15	4,600	15	1,200	0.9
Iceberg	10/15	550	2.1	160	0.1
Iceberg	10/15	440	1.7	34	BQL
Iceberg	10/17	3,700	13	1,100	0.5
Iceberg	10/19	1,100	4.7	1,600	BQL
Iceberg	10/25	2,100	7.3	140	BQL
Iceberg	10/25	1,100	4.4	58	BQL
Iceberg	10/25	3,700	13	1,600	BQL
Iceberg	10/25	2,300	8.2	2,300	BQL
Iceberg	10/26	370	1.2	100	0.5
Iceberg	10/29	1700	5.1	480	BQL
Iceberg	10/31	150	0.5	74	0.2
Iceberg	11/02	2,000	6.5	160	BQL
Iceberg	11/06	1,400	5.2	540	BQL
Iceberg	11/08	2,300	7.8	240	BQL

Table 3: Raw anion concentrations of sub-samples taken every 10-cm for the length of two ice cores collected at Butter Point Site and Iceberg Site, respectively, and measured using a Dionex-600 IC system. All nitrate measurements in the two ice cores were below the quantification limit of 0.1 g/m<sup>3</sup>.

Site	Depth (m)	Cl <sup>-</sup> (g/m <sup>3</sup> )	Br <sup>-</sup> (g/m <sup>3</sup> )	SO <sub>4</sub> <sup>2-</sup> (g/m <sup>3</sup> )
Butter Pt	0	7,600	25	1,800
Butter Pt	10	5,500	19	1,300
Butter Pt	20	5,200	17	1,900
Butter Pt	30	3,500	11	670
Butter Pt	40	3,800	11	1,400
Butter Pt	50	3,200	11	490
Butter Pt	60	2,900	9.7	570
Butter Pt	70	3,800	13	470
Butter Pt	80	2,500	8.0	420
Butter Pt	90	3,600	12	330
Butter Pt	100	2,900	9.8	680
Butter Pt	110	2,600	8.7	480
Butter Pt	120	2,800	8.9	590
Butter Pt	130	1,900	5.6	440
Butter Pt	140	2,100	6.2	410
Butter Pt	150	2,200	8.6	440
Butter Pt	160	3,300	11	610
Butter Pt	170	3,200	11	690
Iceberg	0	8,000	30	3,100
Iceberg	10	6,000	21	1,200
Iceberg	20	3,200	13	520
Iceberg	30	3,700	13	450
Iceberg	40	3,300	12	1,600
Iceberg	50	2,900	9.7	230
Iceberg	60	3,000	8.9	840
Iceberg	70	2,800	9.8	270
Iceberg	80	3,100	11	490
Iceberg	90	3,100	12	390
Iceberg	100	2,600	9.5	370
Iceberg	110	3,400	12	690
Iceberg	120	2,500	8.2	480
Iceberg	130	3,200	11	560
Iceberg	140	2,700	8.7	460
Iceberg	150	2,300	7.4	440
Iceberg	160	2,200	8.0	420
Iceberg	170	3,000	11	480
Iceberg	180	3,500	13	460
Iceberg	190	9,100	34	1,400