

Supplementary Table S1. $\delta^2\text{H}$ and $\delta^{18}\text{O}$ values in precipitation, precipitation amounts, and averaged air temperatures in each sampling month at Rokkasho station.

Rokkasho station					Rokkasho station				
Sampling month	P (mm)	T (°C)	$\delta^2\text{H}$ (‰)	$\delta^{18}\text{O}$ (‰)	Sampling month	P (mm)	T (°C)	$\delta^2\text{H}$ (‰)	$\delta^{18}\text{O}$ (‰)
Nov. 2000	101	6.3	-53.4	-9.5	May 2003	31	11.2	-40.7	-6.3
Dec. 2000	88	0.5			Jun. 2003	182	14.4	-69.0	-9.7
Jan. 2001	111	-2.7			Jul. 2003	172	15.1	-49.2	-7.1
Feb. 2001	22	-2.2	-42.0	-8.5	Aug. 2003	200	19.4	-49.6	-7.1
Mar. 2001	57	1.8	-59.2	-9.9	Sep. 2003	154	18.0	-46.7	-7.1
Apr. 2001	17	8.1	-55.9	-8.7	Oct. 2003	49	12.9	-35.4	-6.6
May 2001	119	10.9	-59.4	-8.8	Nov. 2003	85	8.4	-49.5	-9.2
Jun. 2001	140	15.1	-64.8	-9.3	Dec. 2003	95	3.4	-52.4	-9.8
Jul. 2001	241	19.1	-59.3	-8.5	Jan. 2004	101	-0.2	-63.1	-11.0
Aug. 2001	166	19.0	-29.4	-4.4	Feb. 2004	77	0.8	-54.5	-9.8
Sep. 2004	318	17.7	-59.2	-8.8	Mar. 2004	31	2.6	-52.0	-9.2
Oct. 2004	186	13.5	-61.4	-9.5	Apr. 2004	89	7.3	-61.6	-9.4
Nov. 2004	75	7.1	-46.6	-8.9	May 2004	148	12.4	-68.2	-9.6
Dec. 2004	67	-0.8	-47.6	-8.7	Jun. 2004	73	17.0	-58.1	-8.3
Jan. 2002	77	0.0	-72.5	-11.4	Jul. 2004	228	20.6	-61.4	-8.9
Feb. 2002	32	0.9	-53.1	-9.6	Aug. 2004	116	21.9	-38.7	-6.3
Mar. 2002	71	3.9	-77.0	-11.4	Sep. 2004	295	18.9	-55.8	-8.6
Apr. 2002	21	9.4	-44.4	-6.2	Oct. 2004	81	13.4	-53.5	-8.5
May 2002	136	11.9	-62.8	-9.2	Nov. 2004	124	9.3	-36.1	-6.8
Jun. 2002	95	14.7	-50.3	-7.3	Dec. 2004	177	2.4	-68.4	-11.2
Jul. 2002	252	19.0	-73.1	-10.2	Jan. 2005	133	-0.8	-58.2	-10.4
Aug. 2002	312	20.0	-65.4	-9.6	Feb. 2005	124	-2.0	-58.1	-9.8
Sep. 2002	103	18.4	-45.9	-7.5	Mar. 2005	136	1.3	-54.5	-9.6
Oct. 2002	187	13.3	-45.7	-7.7	Apr. 2005	67	7.8	-32.5	-5.9
Nov. 2002	131	4.3	-58.8	-10.2	May 2005	102	10.0	-45.1	-7.1
Dec. 2002	51	0.0	-34.1	-7.1	Jun. 2005	48	15.2	-48.8	-6.7
Jan. 2003	85	-1.2	-46.6	-8.4	Jul. 2005	295	17.9	-47.9	-7.2
Feb. 2003	45	-0.7	-46.2	-8.6	Aug. 2005	70	23.0	-53.3	-7.9
Mar. 2003	65	1.8	-84.3	-11.5	Sep. 2005	201	19.6	-44.2	-7.3
Apr. 2003	93	8.0	-51.0	-7.7	Oct. 2005	117	14.4	-34.5	-6.2

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Rokkasho station					Rokkasho station				
Sampling month	P (mm)	T (°C)	$\delta^2\text{H}$ (‰)	$\delta^{18}\text{O}$ (‰)	Sampling month	P (mm)	T (°C)	$\delta^2\text{H}$ (‰)	$\delta^{18}\text{O}$ (‰)
Nov. 2005	161	7.3	-47.3	-9.4	May 2008	63	11.5	-58.0	-8.7
Dec. 2005	116	-0.1	-47.7	-9.6	Jun. 2008	205	14.7	-57.9	-8.5
Jan. 2006	70	-1.7	-49.2	-9.6	Jul. 2008	178	19.6	-53.2	-8.2
Feb. 2006	63	-0.9	-62.2	-10.3	Aug. 2008	222	20.5	-46.8	-7.8
Mar. 2006	81	2.4	-65.4	-10.2	Sep. 2008	11	19.1	-44.6	-7.1
Apr. 2006	128	5.5	-58.2	-9.2	Oct. 2008	67	14.3	-48.1	-9.3
May 2006	73	12.0	-54.5	-8.1	Nov. 2008	74	7.2	-57.2	-10.8
Jun. 2006	51	14.1	-64.2	-8.6	Dec. 2008	94	3.1	-52.1	-10.0
Jul. 2006	163	17.7	-46.1	-6.5	Jan. 2009	109	0.6	-75.1	-12.5
Aug. 2006	48	22.7	-51.9	-7.3	Feb. 2009	90	0.3	-50.9	-8.7
Sep. 2006	168	19.2	-61.5	-9.8	Mar. 2009	41	2.7	-52.3	-8.3
Oct. 2006	214	13.4	-91.1	-13.7	Apr. 2009	154	8.1	-66.6	-9.8
Nov. 2006	181	8.1	-47.8	-9.4	May 2009	95	12.9	-48.7	-6.9
Dec. 2006	155	2.2	-70.8	-12.0	Jun. 2009	153	14.6	-54.4	-7.4
Jan. 2007	152	1.2	-79.8	-12.7	Jul. 2009	292	18.8	-70.0	-9.6
Feb. 2007	62	1.5	-60.8	-10.4	Aug. 2009	104	20.3	-75.0	-10.1
Mar. 2007	76	2.2	-58.9	-10.4	Sep. 2009	112	18.3	-24.7	-4.4
Apr. 2007	114	7.0	-51.0	-9.1	Oct. 2009	95	13.9	-64.9	-9.3
May 2007	66	12.3	-48.3	-7.9	Nov. 2009	103	7.5	-35.5	-6.7
Jun. 2007	76	17.3	-51.0	-7.3	Dec. 2009	99	1.9	-46.3	-9.1
Jul. 2007	106	17.9	-55.4	-7.9	Jan. 2010	129	-0.4	-54.3	-9.6
Aug. 2007	101	23.4	-22.7	-4.0	Feb. 2010	67	-1.0	-45.4	-9.4
Sep. 2007	207	20.2	-45.1	-7.3	Mar. 2010	92	1.5	-83.6	-12.2
Oct. 2007	34	13.7	-15.4	-4.4	Apr. 2010	56	6.0	-50.4	-7.8
Nov. 2007	241	6.7	-68.9	-11.7	May 2010	202	10.6	-66.8	-9.6
Dec. 2007	149	1.9	-52.2	-9.9	Jun. 2010	91	16.3	-76.4	-10.7
Jan. 2008	77	-1.7	-47.0	-9.3	Jul. 2010	214	21.4	-76.8	-10.9
Feb. 2008	25	-1.0	-47.2	-8.5	Aug. 2010	77	24.6	-66.5	-9.5
Mar. 2008	41	3.9	-40.9	-6.8	Sep. 2010	174	20.5	-47.6	-7.5
Apr. 2008	51	7.7	-48.2	-7.5	Oct. 2010	143	14.5	-43.0	-6.6

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Rokkasho station				
Sampling month	P (mm)	T ($^{\circ}\text{C}$)	$\delta^2\text{H}$ (‰)	$\delta^{18}\text{O}$ (‰)
Nov. 2010	108	7.7	-47.0	-9.0
Dec. 2010	200	3.3	-62.1	-10.9
Jan. 2011	82	-2.2	-56.2	-10.5
Feb. 2011	25	0.6	-48.7	-8.8
Mar. 2011	59	1.3	-65.8	-11.1
Apr. 2011	74	7.4	-54.4	-8.2
May 2011	100	11.0	-59.2	-8.5
Jun. 2011	71	16.5	-69.0	-9.6
Jul. 2011	29	20.7	-34.1	-4.4
Aug. 2011	162	22.7	-53.1	-7.6
Sep. 2011	361	19.5	-77.2	-11.2
Oct. 2011	82	13.5	-56.0	-9.1
Nov. 2011	96	8.1	-46.6	-8.6
Dec. 2011	204	0.3	-57.2	-10.5

Supplementary Table S1. $\delta^2\text{H}$ and $\delta^{18}\text{O}$ values in precipitation, precipitation amounts, and averaged air temperatures in each sampling month at Ajigasawa station and Hakkoda station.

Ajigasawa station					Hakkoda station				
Sampling month	P (mm)	T (°C)	$\delta^2\text{H}$ (‰)	$\delta^{18}\text{O}$ (‰)	Sampling month	P (mm)	T (°C)	$\delta^2\text{H}$ (‰)	$\delta^{18}\text{O}$ (‰)
Nov. 2003	133	8.3	-34.1	-7.2	Nov. 2003	141	2.8	-48.9	-9.2
Dec. 2003	151	3.9	-60.7	-10.9	Dec. 2003	123	-3.1	-58.0	-11.1
Jan. 2004	124	0.2	-57.8	-10.8	Jan. 2004	131	-6.8	-59.6	-11.5
Feb. 2004	109	1.4	-40.3	-7.4	Feb. 2004	201	-5.5	-49.3	-9.7
Mar. 2004	41	3.2	-59.9	-10.0	Mar. 2004	91	-3.6	-35.2	-7.9
Apr. 2004	134	8.1	-53.6	-8.3	Apr. 2004	163	2.3	-61.5	-9.5
May 2004	108	14.3	-61.0	-8.7	May 2004	368	10.5	-90.0	-12.8
Jun. 2004	63	18.1	-55.1	-7.8	Jun. 2004	61	14.8	-65.5	-10.1
Jul. 2004	65	22.4	-42.3	-6.2	Jul. 2004	53	18.8	-61.1	-9.3
Aug. 2004	111	22.7	-38.7	-6.3	Aug. 2004	37	17.6	-45.5	-7.5
Sep. 2004	258	19.1	-64.0	-9.7	Sep. 2004	31	14.5	-66.3	-10.2
Oct. 2004	23	13.6	-58.9	-9.4	Oct. 2004	22	7.8	-61.2	-11.0
Nov. 2004	157	10.4	-40.4	-7.2	Nov. 2004	22	3.9	-74.7	-12.3
Dec. 2004	188	3.4	-59.2	-10.5	Dec. 2004	161	-3.7	-83.2	-14.0
Jan. 2005	193	-0.1	-46.6	-9.2	Jan. 2005	132	-7.1	-67.1	-12.2
Feb. 2005	117	-1.6	-51.7	-9.5	Feb. 2005	55	-8.6	-71.5	-12.8
Mar. 2005	114	1.9	-45.9	-8.3	Mar. 2005	183	-4.7	-61.3	-11.0
Apr. 2005	74	8.4	-25.0	-4.5	Apr. 2005	344	2.1	-36.0	-6.9
May 2005	52	11.7	-42.8	-6.5	May 2005	139	6.6	-55.3	-7.8
Jun. 2005	70	18.4	-70.2	-10.1	Jun. 2005	91	15.0	-70.8	-9.4
Jul. 2005	216	19.9	-61.6	-8.9	Jul. 2005	483	16.1	-71.6	-10.0
Aug. 2005	146	24.4	-64.0	-9.3	Aug. 2005	779	19.8	-72.4	-10.8
Sep. 2005	135	19.1	-47.8	-7.5	Sep. 2005	306	14.1	-66.6	-10.4
Oct. 2005	119	14.1	-38.9	-6.7	Oct. 2005	295	8.7	-52.9	-9.3
Nov. 2005	177	8.2	-48.8	-9.0	Nov. 2005	141	0.9	-56.5	-10.9
Dec. 2005	122	-0.3	-57.9	-10.3	Dec. 2005	90	-7.3	-53.3	-11.0
Jan. 2006	67.4	-1.2	-52.1	-9.4	Jan. 2006	111	-8.5	-51.9	-10.9
Feb. 2006	65.1	-0.4	-66.5	-10.5	Feb. 2006	160	-6.8	-55.2	-10.1
Mar. 2006	48.0	2.5	-53.0	-8.6	Mar. 2006	85	-3.7	-64.4	-10.9