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Articles

Beryllium-7 depositions in Hokuriku, Japan in winter (1991–2021): Factors causing the temporal variation

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The factors causing the temporal variation of ^{7}Be deposition in the Hokuriku region (the Sea of Japan side of central Honshu, the main island of Japan) during winter (November to February) were examined using monthly samples of ^{7}Be deposition conducted over 30 years, spanning from 1991 to 2021. The predominant factors on ^{7}Be deposition at a Hokuriku region site were as follows: 1) the amount of ^{7}Be generated by cosmic rays, 2) the volume of air transported from the Arctic, and 3) the amount of precipitation at the observation site. The contribution of each of these factors fluctuated depending on the sampling period. The temporal variations in ^{7}Be deposition during the first half of the sampling period (1991–2005) were primarily driven by cosmic rays. In contrast, during the latter half of the period (2006–2021), meteorological factors, particularly snowfall, emerged as significant contributors. This shift in influence was attributed to the effects of climate change in the Hokuriku region.

Keywords: *^{7}Be deposition, the Hokuriku region, climate change, solar activity*

1. Introduction

Beryllium-7 is a cosmogenic radionuclide with a half-life of 53.3 days that is primarily formed through the nuclear spallation reaction between O_2 and N_2 molecules and cosmic rays within the atmosphere, mainly in the stratosphere at high latitudes[1-3]. Following this, ^{7}Be rapidly adheres to atmospheric aerosol particles and is subsequently deposited onto the ground through precipitation after the transport along with these particles[4-6]. This unique behavior makes ^{7}Be a widely recognized tracer, commonly employed in studies of air mass and aerosol movement dynamics[7,8].

During winter, seasonal winds from the Eurasian Continent prevail over the Japanese archipelago. The air masses transported by these seasonal winds originate from high altitudes in high latitude regions[9], where large amounts of ^{7}Be are produced by the spallation with cosmic rays. As these winds traverse over the warm surface of the Sea of Japan, they absorb large amounts of moisture. The collision of the air mass with the mountainous terrain of the Japanese Archipelago results in powerful updrafts, forming dense clouds and, subsequently, heavy rain or snowfall. Consequently, the Hokuriku region, located on the Sea of Japan side of central Honshu, stands out as one of Japan's foremost areas for ^{7}Be deposition, alongside other coastal regions along the Sea of Japan[9-13].

Notably, the winter monsoon is accompanied by high ^{7}Be deposition every year, but the actual quantity of ^{7}Be deposition varies annually[11]. This fluctuation may be attributed to two primary factors: firstly, alterations in the volume of air masses originating from the Arctic region, and secondly, the 11-year cycle of solar activity as the atmospheric ^{7}Be concentrations are indicative of solar activity levels[14].

In this study, we examined ^{7}Be deposition in the Hokuriku region for 30 years period (1991–2021) focusing on winter season (November–February), and discussed the factor causing the amount of ^{7}Be deposition, comparing with solar activity and meteorological phenomena.

2. Materials and methods

2.1. Study area. The study area and sampling site are illustrated in Fig. 1. The sampling site, referred to as site FK, is situated in Fukui City, located to the north on a plain facing the Sea of Japan (longitude, 36°04'27"N; latitude, 136°15'39"E; height above sea level:12 m). The sampling site is located near the center of the Fukui Plain (approximately 40 km north to south and approximately 10 to 15 km wide from east to west). The north side faces to the Sea of Japan, and the opposite side is characterized by the presence of mountainous backbone about 1000 meters in height, gradually decreasing from east to west to a few hundred meters.

During winter, site FK is greatly affected by the monsoon, making it distinctively representative of the Hokuriku region[15]. Consequently, site FK is an ideal location for observing ^{7}Be deposition and associated meteorological phenomena during the winter season.

2.2. Experiment

2.2.1 Deposition samples. Precipitation and snowfall samples were collected using a metal basin (0.5 m^2) approximately every month from April 1991 to March 2021. To capture ^{7}Be deposition, the precipitation and aerosol samples, which con-

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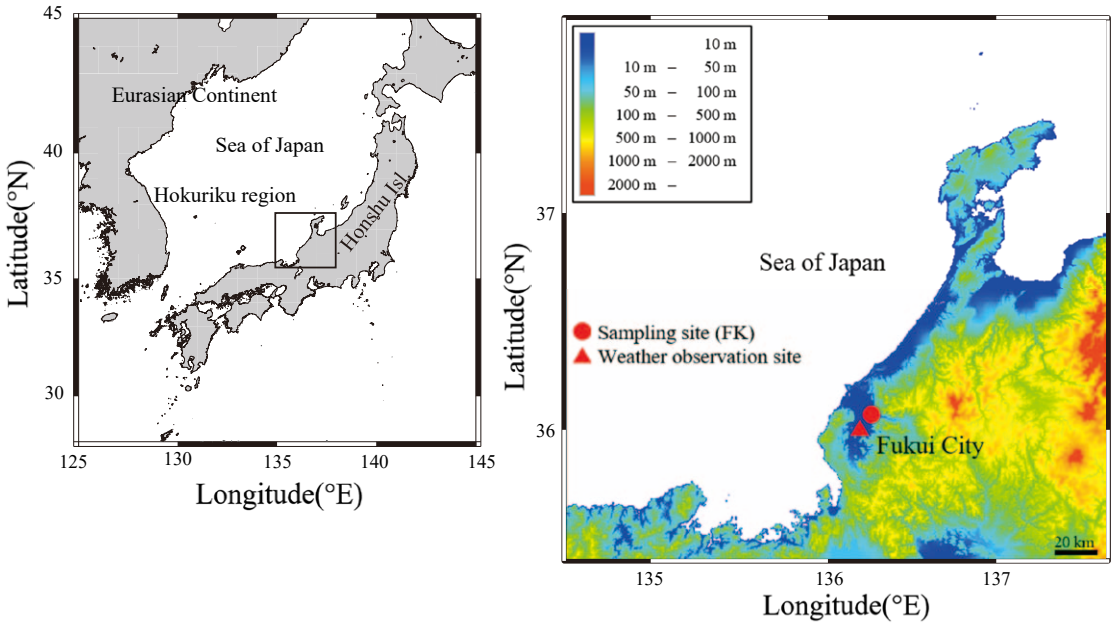

Figure 1. Location of a sampling site (FK) with a weather observation site in Fukui City, Hokuriku region, Japan.

tained both water and adhered aerosols, underwent batch processing involving a combination of anion (Powdex® PAO; GTS-PX-1000) and cation exchange resin (Powdex® PCH; GTS-PX-2000) from Graver Technologies, located in Glasgow, Delaware, USA. Additionally, the supernatant was filtered using a resin column (PAO and PCH resin) by column operation. Following this, the resin was dried at 45°C for two days and then homogenized and packed into a cylindrical plastic container measuring 10 cm in diameter and 9.5 cm in depth for γ-spectrometry.

Germanium semiconductor detectors were employed for measuring the γ-ray of ^{7}Be (at 477 keV) within the resin samples. To calibrate the ^{7}Be activity of the samples, a mock-up sample was prepared using a standard source (Eckert & Ziegler Nuclitec, Braunschweig, Germany) containing ^{57}Co, ^{60}Co, ^{85}Sr, ^{88}Y, ^{109}Cd, ^{113}Sn, ^{137}Cs, ^{139}Ce, ^{203}Hg, and ^{241}Am, ranging from 60–1836 keV. The ^{7}Be counting efficiency was determined by interpolation of the counting efficiencies obtained for the γ-rays. The counting time was 70000 seconds. The analytical precision for ^{7}Be, based on one σ of the counting statistics, ranged from 0.1% to 4%.

To compare the data across various sampling collection periods (which spanned from 20 to 41 days), the ^{7}Be depositions underwent correction to values per 30 days. Furthermore, considering its physical half-life, the ^{7}Be activity was decay-corrected to the midpoint of the respective sampling period.

2.2.2 Meteorological data. The meteorological data, including precipitation and snowfall, were obtained from the weather station in the Fukui Plain[16] (longitude, 36°03'21"N; latitude, 136°13'22"E; height above sea level:12 m), locating in a distance of approximately 4 km from the sampling site. The snowfall in this study is the snow depth from the Japan Meteorological Agency[17], which does not directly correspond to the precipitation by the variation of snow density. However, we consider that the snow depth is a useful index to discuss ^{7}Be deposition.

Given the varying number of sampling days across different periods, we adjusted the precipitation and snowfall data to reflect values per 30 days.

Subsequently, the ^{7}Be concentration was calculated by dividing the ^{7}Be deposition by the corresponding amount of precipitation, neglecting the small effect of dry deposition (at approximately 10–20% of the total at mid-latitudes)[5,6].

3. Results and discussion

3.1. Temporal variation in ^{7}Be deposition in winter. The γ-spectrometry results are listed in Table S1. The temporal variations in precipitation, snowfall, sunspot numbers[18], and ^{7}Be deposition and concentration during the winter months (November to February) are illustrated in Fig. 2. In winter, precipitation and snowfall exhibited a wide range, with values spanning from 570 to 1300 mm and 8 to 400 mm, respectively (Fig. 2a). Sunspot numbers in winter displayed significant variability, ranging from 8 to 800, with peak levels observed in 1991, 2001, and 2013, and the lowest recorded in 1995, 2008, and 2019 (Fig. 2b). Beryllium-7 deposition and concentration during winter ranged from 1760 to 4080 Bq/m^2 and 2.0 to 3.9 Bq/L, respectively (Fig. 2c and 2d).

The quantities of ^{7}Be in aerosols in the atmosphere exhibited periodic changes, reflecting an 11-year cycle in galactic cosmic ray intensity[14], with lower ^{7}Be deposition during periods of higher sunspot numbers[13]. Throughout the study period, the years with the highest sunspot numbers were 1991, 1999–2002, and 2011–2014, coinciding with lower ^{7}Be concentrations, which is the same trend observed previously[11]. Therefore, solar activity is considered to be important factor to affect the temporal variation of ^{7}Be deposition.

In the winters of 2006, 2018, and 2019, widely spread areas within the Hokuriku region experienced notably lower snowfall compared to other years[19-21] (Fig. 2a). Correspondingly, during these years, low ^{7}Be deposition levels were observed at site FK (Fig. 2c). In contrast, 2017 stood out with a high ^{7}Be deposition of 4080 Bq/m^2, accompanied by substantial precipitation and snowfall, which exceeded the levels seen in 2018 (2284 Bq/m^2). This suggests that the quantity of ^{7}Be deposition is considered to be influenced by the transport of air masses from the Arctic region, which brings heavy precipitation and snowfall to the Hokuriku region. Furthermore, during the winters of 1991 and 2005, low ^{7}Be concentrations, which were concurrent with low ^{7}Be deposition levels, were observed. Therefore, it can be inferred that temporal variations in the ^{7}Be concentration are correlated with meteorological factors such as precipitation and snowfall, which also

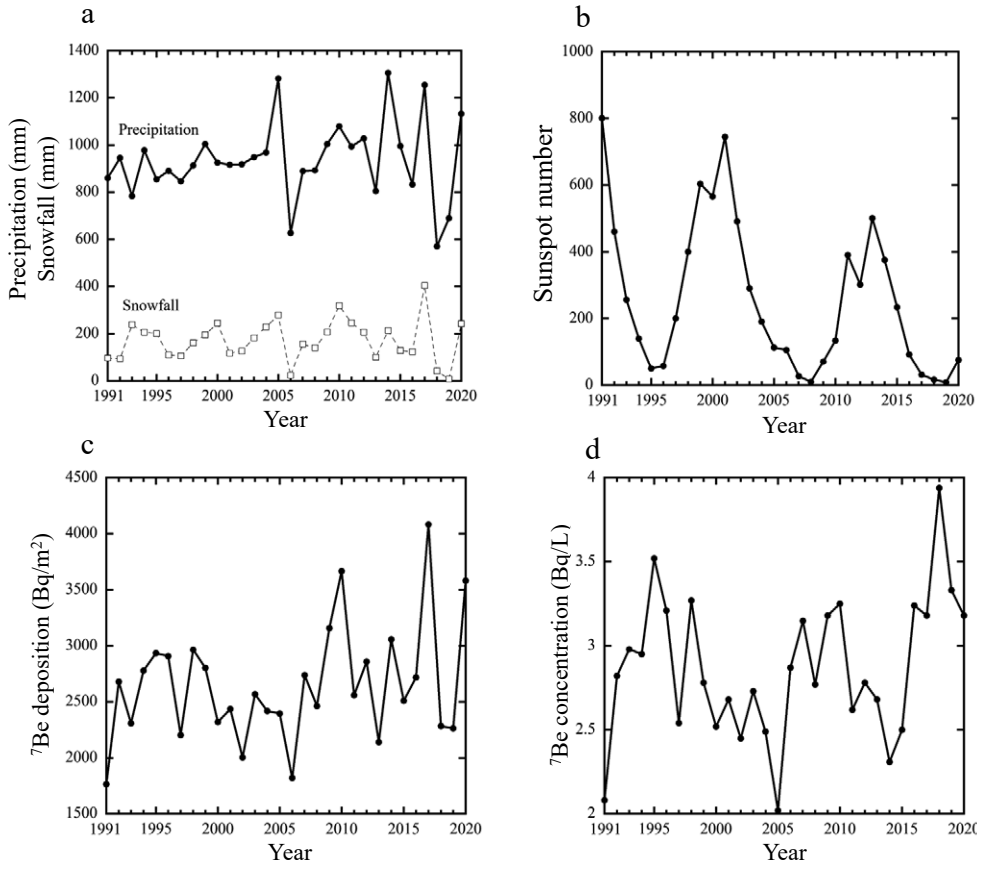

Figure 2. Temporal variations of the arithmetic sums of monthly data from November to February in a) precipitation (total of rainfall and snowfall) and snowfall, b) sunspot number, c) ^{7}Be deposition, and d) ^{7}Be concentration in winter season (November–February) from 1991 to 2021. The ^{7}Be concentration was calculated by dividing total sum of ^{7}Be deposition from November to February by the total sum of precipitation during the same period.

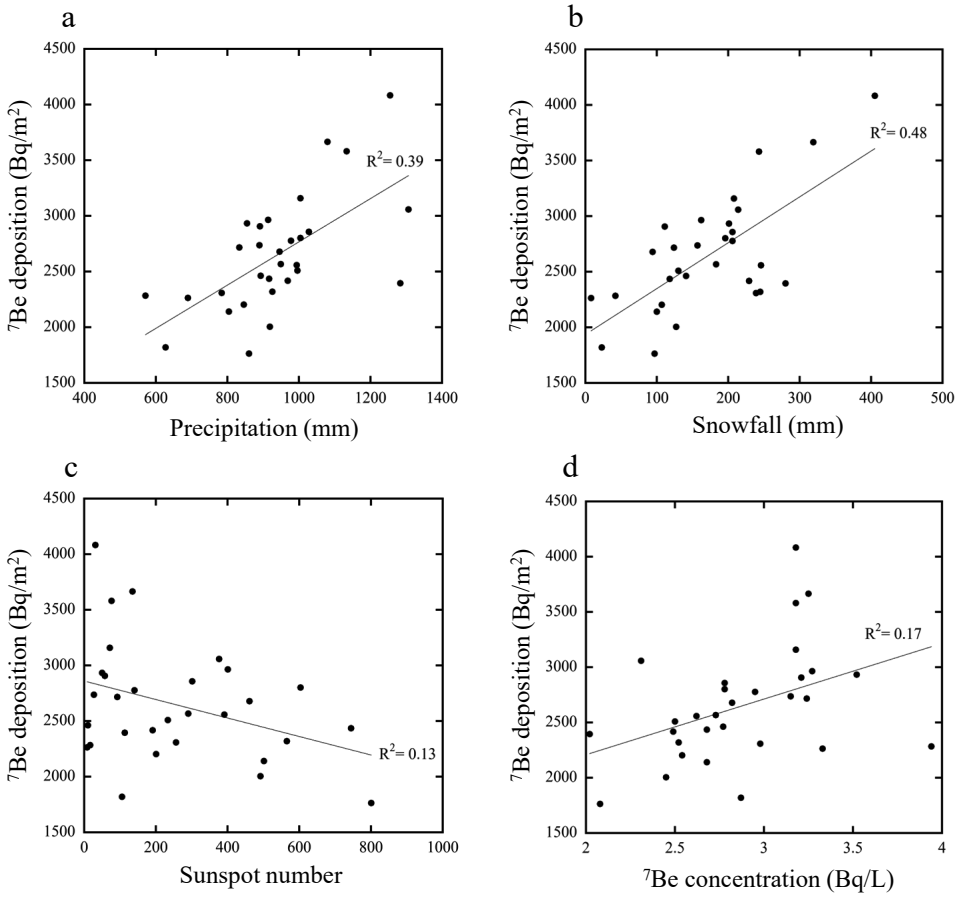

Figure 3. Beryllium-7 deposition *vs.* a) precipitation, b) snowfall, c) sunspot number, and d) ^{7}Be concentration in winter from 1991 to 2021. The calculation method for each value is the same as in Fig. 2.

affect ^{7}Be deposition.

Figure 3 presents the ^{7}Be depositions at site FK during winter against precipitations, snowfalls, sunspot numbers, and ^{7}Be concentrations. Notably, the ^{7}Be deposition positively correlates with meteorological factors, specifically precipitation and snowfall (Fig. 3a and 3b). While the ^{7}Be deposition also demonstrates correlations with the sunspot number, indicative of solar activity, and the ^{7}Be concentration, these relationships are weaker in comparison to the meteorological factors (precipitation and snowfall). It is worth mentioning that Solar activity does influence the ^{7}Be concentration within aerosols[14] (Fig. 3c). Figure 4 presents the correlation between the ^{7}Be concentrations and sunspot numbers (n = 30, R^2 = 0.33) indicating a relatively stronger relationship than that observed between ^{7}Be deposition and sunspot number (n = 30, R^2 = 0.13). Consequently, sunspot number are considered to have a more direct impact on the ^{7}Be concentration in precipitation.

3.2. Factors affecting ^{7}Be deposition in winter. In the Hokuriku region during winter, ^{7}Be deposition is primarily governed by three key factors: 1) the amount of ^{7}Be produced by cosmic rays, 2) the amount of air transport from the Arctic, and 3) the amount of precipitation at the observation site. Quantifying the contribution of each factor is difficult because these factors complicatedly affect to ^{7}Be deposition with different degrees. Especially, the amount of air transport from the Arctic and precipitation are affected by various weather phenomena.

Notably, the temporal variation in sunspot numbers held significance prior to 2005 (Fig. 2b), whereas the variability in precipitation and snowfall after 2006 exceeded that observed before 2005 (Fig. 2a). To examine these variations, the 30-year period was tentatively divided into two halves: the first half spanning from 1991 to 2005 and the latter half from 2006 to 2021. The correlations between ^{7}Be deposition and precipitation, snowfall, sunspot number, and the ^{7}Be concentration within each period are compared in Fig. 5.

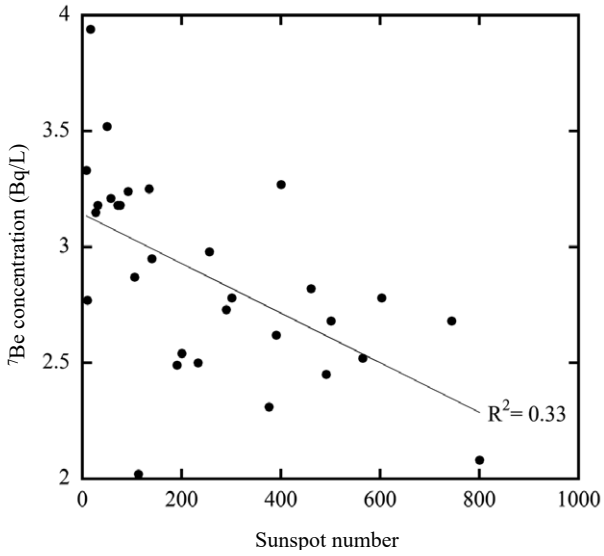

Figure 4. Beryllium-7 concentration *vs.* sunspot number. The calculation method for each value is the same as in Fig. 2.

The correlation between ^{7}Be deposition and precipitation was notably stronger in the latter half of the observation period (n = 15, R^2 = 0.67) when compared with the first half (n = 15, R^2 = 0.010) (Fig. 5a). Particularly, ^{7}Be deposition showed a significant correlation with snowfall in the latter half (n = 15, R^2 = 0.83) contrasting with the first half (n = 15, R^2 = 0.022) (Fig. 5b). It is worth highlighting that the variation in meteorological factors was more extensive in the latter half than in

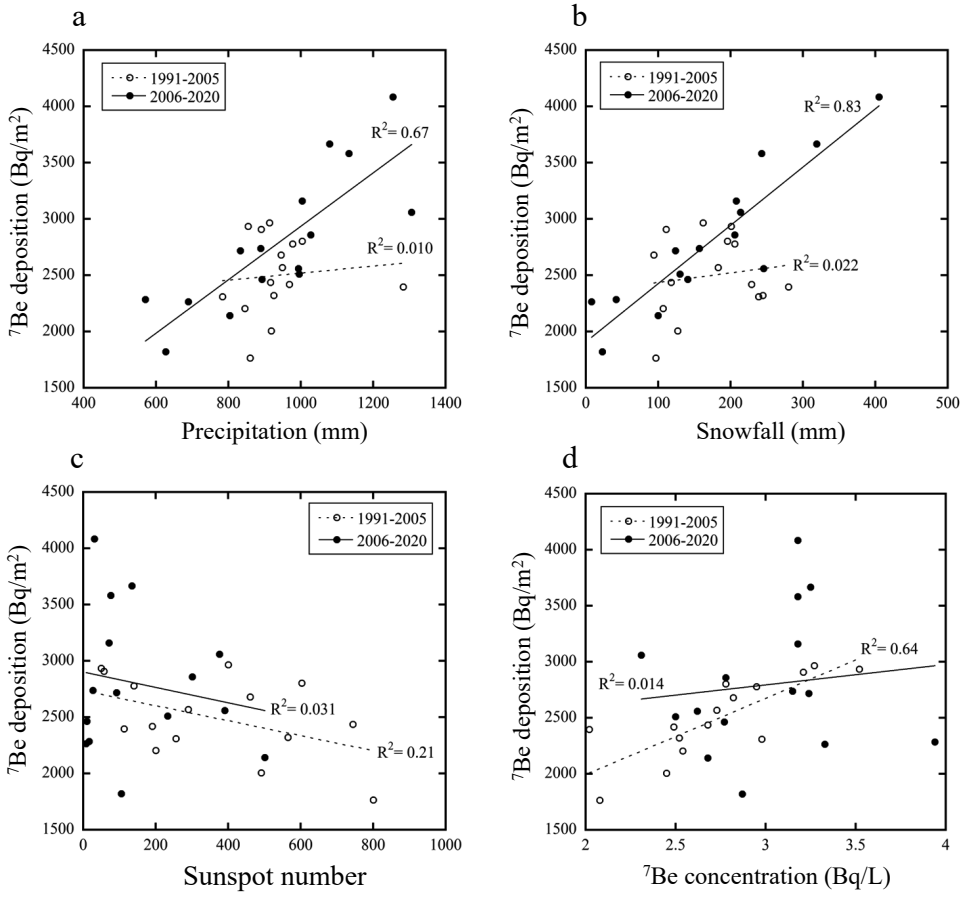

Figure 5. Beryllium-7 deposition *vs.* a) precipitation, b) snowfall, c) sunspot number, and d) ^{7}Be concentration. Dotted and solid lines indicate the period during the first (1991 to 2005) and latter (2006 to 2020) halves in this study, respectively. The calculation method for each value is the same as in Fig. 2.

the first half (Fig. 2a). This observation suggests that meteorological factors had a more substantial impact on the temporal variation in ^{7}Be deposition during the latter half of the study period. Furthermore, during the latter half, the correlation with snowfall was more pronounced than precipitation. In the Hokuriku region, the southeastward monsoon frequently brings heavy snowfall and cold air from high latitudes. Snow turns into rain when the temperature rises above 0°C, and cold air is essential for snowfall. In contrast, rain can occur during the passage of a low-pressure system, independent of the southeastward monsoon and cold air. Therefore, an increase of snowfall may show a better correlation with ^{7}Be than that of precipitation because the increase of snowfall means the arrival of cold air from high latitudes.

In the first half, ^{7}Be deposition displayed a strong correlation with the ^{7}Be concentration ($n = 15$, $R^2 = 0.64$) (Fig. 5d). However, this correlation was unclear in the latter half of the study period ($n = 15$, $R^2 = 0.014$). Similarly, the correlation between ^{7}Be deposition and sunspot number in the first half ($n = 15$, $R^2 = 0.21$) is stronger than that of in the latter half ($n = 15$, $R^2 = 0.031$) (Fig. 5c). Whereas the amounts of precipitation and snowfall in the first half have been less variable than those in later half (Fig. 2a), the number of sunspots in the first half was approximately double that of the latter half (Fig. 2b). The solar activity affects to the ^{7}Be concentration as discussed section 3.1. Therefore, the ^{7}Be concentration is considered to exert a more significant influence on the temporal variation in the ^{7}Be deposition during the first half.

3.3. ^{7}Be deposition in winter and climate change. Snowfall in the Hokuriku region has declined since 1962, reflecting the effects of climate change[22]. Paradoxically, climate change may increase the water vapor supply from the Sea of Japan, and the Japan Sea polar air mass convergence zone (JPCZ), a mesoscale meteorological phenomenon which locally causes heavy snowfall in the Hokuriku region, is considered to become active[23]. If climate change continues, it is anticipated that the temporal variations in winter precipitation and snowfall in the Hokuriku region will intensify. This suggests that the influence of meteorological factors, specifically precipitation and snowfall, could surpass that of solar activity. To gain a deeper understanding of how climate change affects the temporal variation in ^{7}Be deposition during winter, it is imperative to conduct continuous observations of ^{7}Be deposition. Currently, we are actively engaged in a project focused on this subject.

4. Conclusion

From 1991 to 2021, we conducted a 30-year investigation into the temporal variations of ^{7}Be deposition and concentration in Fukui City, located in the Hokuriku region of Japan, during the winter months (November to February). The primary objective of our study was to elucidate the factors driving the temporal variations in ^{7}Be deposition. The temporal fluctuations in ^{7}Be deposition are primarily influenced by three key factors: the rate of ^{7}Be production due to cosmic ray intensity, the amount of precipitation, and the volume of air transported from the Arctic region. In the initial half of our observation period (1991–2005), the temporal variations in ^{7}Be deposition predominantly mirrored the fluctuations in cosmic rays.

However, during the latter half of our study period (2006–2021), a more pronounced correlation emerged between ^{7}Be deposition and meteorological factors, particularly snowfall. The shift in influence may be attributed to the increase of variability in precipitation and snowfall in the Hokuriku region, which is considered to be caused by climate change.

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Appendix

TABLE S1. Monthly ^{7}Be deposition, concentration, precipitation, and snowfall at sampling site.

Sampling information				^{7}Be deposition	^{7}Be concentration	Precipitation	Snowfall
Year	Month	Period	Days	(Bq/m^2)	(Bq/L)	(mm)	(mm)
1991	4	1991/04/05 - 1991/05/09	34	213 ± 1	0.80 ± 0.008	134	0
	5	1991/05/09 - 1991/06/06	28	167 ± 3	1.65 ± 0.024	115	0
	6	1991/06/06 - 1991/07/05	29	237 ± 1	0.97 ± 0.005	252	0
	7	1991/07/05 - 1991/08/07	33	248 ± 1	0.99 ± 0.005	227	0
	8	1991/08/07 - 1991/09/09	33	39 ± 1	0.56 ± 0.010	69	0
	9	1991/09/09 - 1991/10/05	26	98 ± 1	0.63 ± 0.008	173	0
	10	1991/10/05 - 1991/11/07	33	266 ± 1	2.20 ± 0.008	121	0
	11	1991/11/07 - 1991/12/04	27	457 ± 1	2.24 ± 0.007	226	0
	12	1991/12/04 - 1992/01/09	36	286 ± 1	1.70 ± 0.006	159	12
1992	1	1992/01/09 - 1992/02/06	28	535 ± 3	1.87 ± 0.010	286	35
	2	1992/02/06 - 1992/03/04	27	486 ± 3	2.65 ± 0.015	190	50
	3	1992/03/04 - 1992/04/08	35	246 ± 1	1.13 ± 0.005	186	0
	4	1992/04/08 - 1992/05/08	30	255 ± 1	1.72 ± 0.007	163	0
	5	1992/05/08 - 1992/06/02	25	189 ± 1	1.85 ± 0.014	118	0
	6	1992/06/02 - 1992/07/07	35	102 ± 1	1.11 ± 0.010	84	0
	7	1992/07/07 - 1992/08/04	28	114 ± 1	0.76 ± 0.007	167	0
	8	1992/08/04 - 1992/09/01	28	87 ± 1	0.94 ± 0.010	93	0
	9	1992/09/01 - 1992/10/06	35	88 ± 1	1.35 ± 0.014	60	0
	10	1992/10/06 - 1992/11/05	30	433 ± 1	2.21 ± 0.006	203	0
	11	1992/11/05 - 1992/12/01	26	268 ± 1	1.97 ± 0.010	152	0
	12	1992/12/01 - 1993/01/06	36	863 ± 3	3.20 ± 0.010	263	13
1993	1	1993/01/06 - 1993/02/04	29	824 ± 2	2.68 ± 0.009	286	59
	2	1993/02/04 - 1993/03/04	28	723 ± 3	2.94 ± 0.011	246	21
	3	1993/03/04 - 1993/04/06	33	223 ± 1	3.07 ± 0.015	70	0
	4	1993/04/06 - 1993/05/07	31	212 ± 1	1.57 ± 0.008	152	0
	5	1993/05/07 - 1993/06/01	25	137 ± 1	1.31 ± 0.017	101	0
	6	1993/06/01 - 1993/07/07	36	254 ± 1	0.86 ± 0.003	264	0
	7	1993/07/07 - 1993/08/03	27	203 ± 1	0.94 ± 0.006	249	0
	8	1993/08/03 - 1993/09/02	30	124 ± 1	0.61 ± 0.006	219	0
	9	1993/09/02 - 1993/10/04	32	205 ± 1	0.73 ± 0.004	262	0
	10	1993/10/04 - 1993/11/02	29	324 ± 1	2.39 ± 0.010	136	0
	11	1993/11/02 - 1993/12/01	29	343 ± 1	2.64 ± 0.009	143	0
	12	1993/12/01 - 1994/01/06	36	888 ± 2	3.59 ± 0.007	240	13
1994	1	1994/01/06 - 1994/02/02	27	625 ± 3	2.36 ± 0.012	245	136
	2	1994/02/02 - 1994/03/01	27	451 ± 1	3.01 ± 0.009	156	91
	3	1994/03/01 - 1994/04/06	36	310 ± 1	3.16 ± 0.010	90	1
	4	1994/04/06 - 1994/05/10	34	117 ± 1	1.20 ± 0.012	95	0
	5	1994/05/10 - 1994/06/07	28	140 ± 1	1.39 ± 0.015	90	0
	6	1994/06/07 - 1994/07/06	29	133 ± 1	1.15 ± 0.010	131	0
	7	1994/07/06 - 1994/08/02	27	18 ± 0.5	0.38 ± 0.010	51	0
	8	1994/08/02 - 1994/09/05	34	75 ± 1	1.97 ± 0.021	37	0

Sampling information					^{7}Be deposition	^{7}Be concentration	Precipitation	Snowfall
Year	Month	Period		Days	(Bq/m^2)	(Bq/L)	(mm)	(mm)
	9	1994/09/05 -	1994/10/03	28	349 ± 2	1.88 ± 0.013	199	0
	10	1994/10/03 -	1994/11/09	37	254 ± 1	2.03 ± 0.012	98	0
	11	1994/11/09 -	1994/12/08	29	555 ± 3	4.04 ± 0.018	147	0
	12	1994/12/08 -	1995/01/13	36	1119 ± 4	2.91 ± 0.008	373	43
1995	1	1995/01/13 -	1995/02/07	25	730 ± 4	2.59 ± 0.015	316	143
	2	1995/02/07 -	1995/03/07	28	375 ± 2	2.63 ± 0.016	143	20
	3	1995/03/07 -	1995/04/06	30	322 ± 2	2.50 ± 0.017	133	0
	4	1995/04/06 -	1995/05/10	34	286 ± 2	1.84 ± 0.012	151	0
	5	1995/05/10 -	1995/06/06	27	413 ± 2	1.82 ± 0.012	227	0
	6	1995/06/06 -	1995/07/06	30	307 ± 2	1.15 ± 0.008	276	0
	7	1995/07/06 -	1995/08/09	34	355 ± 2	0.92 ± 0.006	329	0
	8	1995/08/09 -	1995/09/06	28	163 ± 2	1.42 ± 0.014	132	0
	9	1995/09/06 -	1995/10/01	25	93 ± 1	2.94 ± 0.044	38	0
	10	1995/10/01 -	1995/11/07	37	412 ± 2	2.97 ± 0.014	124	0
	11	1995/11/07 -	1995/12/06	29	1055 ± 4	3.50 ± 0.014	291	0
	12	1995/12/06 -	1996/01/08	33	809 ± 4	4.36 ± 0.016	202	18
1996	1	1996/01/08 -	1996/02/05	28	843 ± 3	3.08 ± 0.014	264	117
	2	1996/02/05 -	1996/03/01	25	227 ± 2	2.61 ± 0.025	97	66
	3	1996/03/01 -	1996/04/02	32	370 ± 2	2.06 ± 0.010	169	4
	4	1996/04/02 -	1996/05/07	35	169 ± 1	2.06 ± 0.015	66	2
	5	1996/05/07 -	1996/06/04	28	279 ± 2	3.32 ± 0.020	99	0
	6	1996/06/04 -	1996/07/02	28	126 ± 1	0.62 ± 0.006	218	0
	7	1996/07/02 -	1996/08/07	36	25 ± 1	0.53 ± 0.010	43	0
	8	1996/08/07 -	1996/09/02	26	77 ± 1	0.32 ± 0.005	273	0
	9	1996/09/02 -	1996/10/01	29	283 ± 0.2	1.39 ± 0.001	196	0
	10	1996/10/01 -	1996/11/07	37	264 ± 1	1.78 ± 0.008	140	0
	11	1996/11/07 -	1996/12/10	33	1000 ± 3	2.65 ± 0.009	320	35
	12	1996/12/10 -	1997/01/08	29	586 ± 3	3.35 ± 0.016	211	2
1997	1	1997/01/08 -	1997/02/03	26	810 ± 4	4.11 ± 0.019	212	53
	2	1997/02/03 -	1997/03/05	30	510 ± 2	3.24 ± 0.016	147	20
	3	1997/03/05 -	1997/04/09	35	392 ± 2	1.72 ± 0.008	183	0
	4	1997/04/09 -	1997/05/07	28	140 ± 1	3.04 ± 0.027	56	0
	5	1997/05/07 -	1997/06/04	28	251 ± 2	1.10 ± 0.008	235	0
	6	1997/06/04 -	1997/07/10	36	267 ± 1	0.93 ± 0.006	207	0
	7	1997/07/10 -	1997/08/08	29	287 ± 2	1.11 ± 0.006	303	0
	8	1997/08/08 -	1997/09/03	26	44 ± 1	4.33 ± 0.094	11	0
	9	1997/09/03 -	1997/10/08	35	322 ± 2	2.28 ± 0.011	121	0
	10	1997/10/08 -	1997/11/05	28	309 ± 2	2.63 ± 0.015	143	0
	11	1997/11/05 -	1997/12/09	34	570 ± 2	1.77 ± 0.007	255	2
	12	1997/12/09 -	1998/01/09	31	458 ± 3	2.82 ± 0.013	183	8
1998	1	1998/01/09 -	1998/02/04	26	894 ± 3	3.35 ± 0.013	287	81
	2	1998/02/04 -	1998/03/05	29	281 ± 1	2.26 ± 0.013	120	17
	3	1998/03/05 -	1998/04/09	35	363 ± 2	2.08 ± 0.009	149	0
	4	1998/04/09 -	1998/05/07	28	90 ± 1	0.66 ± 0.006	171	0
	5	1998/05/07 -	1998/06/03	27	177 ± 2	0.72 ± 0.007	236	0
	6	1998/06/03 -	1998/07/09	36	166 ± 1	0.87 ± 0.005	160	0
	7	1998/07/09 -	1998/08/05	27	99 ± 1	0.39 ± 0.005	307	0
	8	1998/08/05 -	1998/09/02	28	215 ± 2	0.76 ± 0.006	292	0
	9	1998/09/02 -	1998/10/08	36	326 ± 2	0.85 ± 0.004	331	0
	10	1998/10/08 -	1998/11/05	28	108 ± 1	0.74 ± 0.005	162	0
	11	1998/11/05 -	1998/12/02	27	789 ± 4	3.88 ± 0.018	218	0
	12	1998/12/02 -	1999/01/05	34	611 ± 3	4.59 ± 0.019	133	1
1999	1	1999/01/05 -	1999/02/04	30	1102 ± 5	2.82 ± 0.013	365	113
	2	1999/02/04 -	1999/03/03	27	462 ± 2	2.41 ± 0.014	198	48
	3	1999/03/03 -	1999/04/08	36	361 ± 2	2.30 ± 0.011	135	0
	4	1999/04/07 -	1999/05/07	30	193 ± 2	2.03 ± 0.014	111	0
	5	1999/05/07 -	1999/06/03	27	93 ± 1	0.89 ± 0.011	100	0
	6	1999/06/03 -	1999/07/08	35	270 ± 2	1.01 ± 0.006	228	0

Sampling information					^{7}Be deposition	^{7}Be concentration	Precipitation	Snowfall
Year	Month	Period		Days	(Bq/m^2)	(Bq/L)	(mm)	(mm)
	7	1999/07/08 - 1999/08/04		27	65 ± 1	0.78 ± 0.010	99	0
	8	1999/08/04 - 1999/09/07		34	56 ± 1	0.30 ± 0.003	168	0
	9	1999/09/07 - 1999/10/07		30	182 ± 1	1.21 ± 0.009	151	0
	10	1999/10/07 - 1999/11/08		32	136 ± 1	1.16 ± 0.009	113	0
	11	1999/11/08 - 1999/12/10		32	885 ± 3	3.21 ± 0.011	258	0
	12	1999/12/10 - 2000/01/07		28	745 ± 3	2.33 ± 0.009	389	70
2000	1	2000/01/07 - 2000/02/02		26	402 ± 2	3.35 ± 0.022	129	29
	2	2000/02/02 - 2000/03/09		36	770 ± 3	2.73 ± 0.010	227	98
	3	2000/03/09 - 2000/04/06		28	307 ± 2	1.77 ± 0.011	204	28
	4	2000/04/06 - 2000/05/10		34	330 ± 2	2.35 ± 0.013	116	0
	5	2000/05/10 - 2000/06/05		26	127 ± 1	2.15 ± 0.022	70	0
	6	2000/06/05 - 2000/07/06		31	101 ± 1	0.76 ± 0.007	137	0
	7	2000/07/06 - 2000/08/03		28	55 ± 1	0.75 ± 0.011	77	0
	8	2000/08/03 - 2000/09/06		34	11 ± 0.4	0.15 ± 0.005	65	0
	9	2000/09/06 - 2000/10/05		29	190 ± 2	0.54 ± 0.004	377	0
	10	2000/10/05 - 2000/11/07		33	259 ± 1	1.29 ± 0.007	182	0
	11	2000/11/07 - 2000/12/05		28	182 ± 1	1.88 ± 0.015	104	0
	12	2000/12/05 - 2001/01/06		32	864 ± 4	3.29 ± 0.013	279	24
2001	1	2001/01/06 - 2001/02/05		30	874 ± 3	2.10 ± 0.009	389	188
	2	2001/02/05 - 2001/03/06		29	398 ± 2	2.50 ± 0.014	154	33
	3	2001/03/06 - 2001/04/02		27	292 ± 2	2.83 ± 0.015	122	33
	4	2001/04/02 - 2001/05/07		35	133 ± 1	1.56 ± 0.011	70	0
	5	2001/05/07 - 2001/06/05		29	118 ± 1	1.85 ± 0.019	68	0
	6	2001/06/05 - 2001/07/02		27	189 ± 2	0.66 ± 0.006	329	0
	7	2001/07/02 - 2001/08/02		31	82 ± 1	1.09 ± 0.012	73	0
	8	2001/08/02 - 2001/09/04		33	123 ± 1	0.99 ± 0.009	124	0
	9	2001/09/04 - 2001/10/02		28	249 ± 2	0.76 ± 0.006	326	0
	10	2001/10/02 - 2001/11/05		34	128 ± 1	0.86 ± 0.007	136	0
	11	2001/11/05 - 2001/12/04		29	480 ± 3	3.38 ± 0.017	157	0
	12	2001/12/04 - 2002/01/07		34	999 ± 4	3.22 ± 0.012	293	27
2002	1	2002/01/07 - 2002/02/04		28	679 ± 3	1.94 ± 0.010	350	47
	2	2002/02/04 - 2002/03/05		29	278 ± 2	2.28 ± 0.017	118	43
	3	2002/03/05 - 2002/04/04		30	164 ± 1	0.99 ± 0.008	171	0
	4	2002/04/04 - 2002/05/08		34	325 ± 2	1.51 ± 0.007	190	0
	5	2002/05/08 - 2002/06/04		27	93 ± 1	1.50 ± 0.019	76	0
	6	2002/06/04 - 2002/07/04		30	153 ± 1	1.43 ± 0.014	100	0
	7	2002/07/04 - 2002/08/06		33	125 ± 1	0.63 ± 0.005	188	0
	8	2002/08/06 - 2002/09/04		29	39 ± 1	1.25 ± 0.024	34	0
	9	2002/09/04 - 2002/10/03		29	150 ± 1	0.87 ± 0.007	172	0
	10	2002/10/03 - 2002/11/13		41	1225 ± 3	2.99 ± 0.008	310	0
	11	2002/11/13 - 2002/12/03		20	365 ± 3	2.26 ± 0.015	259	0
	12	2002/12/03 - 2003/01/08		36	859 ± 3	2.87 ± 0.009	291	62
2003	1	2003/01/08 - 2003/02/04		27	533 ± 3	2.76 ± 0.015	193	62
	2	2003/02/04 - 2003/03/04		28	249 ± 2	1.41 ± 0.009	176	3
	3	2003/03/04 - 2003/04/01		28	270 ± 2	2.55 ± 0.017	109	16
	4	2003/04/01 - 2003/05/07		36	276 ± 1	1.25 ± 0.006	184	0
	5	2003/05/07 - 2003/06/04		28	76 ± 1	1.20 ± 0.015	72	0
	6	2003/06/04 - 2003/07/01		27	187 ± 2	0.96 ± 0.010	209	0
	7	2003/07/01 - 2003/08/05		35	237 ± 2	0.91 ± 0.006	232	0
	8	2003/08/05 - 2003/09/03		29	136 ± 1	0.78 ± 0.007	188	0
	9	2003/09/03 - 2003/10/07		34	96 ± 1	1.37 ± 0.012	62	0
	10	2003/10/08 - 2003/11/04		27	158 ± 1	2.18 ± 0.017	92	0
	11	2003/11/04 - 2003/12/02		28	285 ± 2	1.45 ± 0.010	190	0
	12	2003/12/02 - 2004/01/06		35	725 ± 3	2.99 ± 0.011	249	13
2004	1	2004/01/06 - 2004/02/03		28	944 ± 4	3.82 ± 0.018	247	94
	2	2004/02/03 - 2004/03/02		28	613 ± 3	2.33 ± 0.010	263	76
	3	2004/03/02 - 2004/04/05		34	225 ± 1	1.91 ± 0.010	108	35
	4	2004/04/05 - 2004/05/07		32	213 ± 1	1.44 ± 0.008	157	0

Sampling information					^{7}Be deposition	^{7}Be concentration	Precipitation	Snowfall
Year	Month	Period		Days	(Bq/m^{2})	(Bq/L)	(mm)	(mm)
	5	2004/05/07 - 2004/06/02		26	252 ± 1	0.70 ± 0.004	359	0
	6	2004/06/02 - 2004/07/06		34	117 ± 1	0.68 ± 0.005	153	0
	7	2004/07/06 - 2004/08/02		27	93 ± 1	0.39 ± 0.004	283	0
	8	2004/08/02 - 2004/09/03		32	82 ± 1	0.94 ± 0.010	82	0
	9	2004/09/03 - 2004/10/05		32	241 ± 1	0.71 ± 0.004	319	0
	10	2004/10/05 - 2004/11/02		28	179 ± 1	0.72 ± 0.005	276	0
	11	2004/11/02 - 2004/12/01		29	315 ± 2	2.12 ± 0.011	154	0
	12	2004/12/01 - 2005/01/05		35	492 ± 2	2.22 ± 0.009	215	10
2005	1	2005/01/05 - 2005/02/02		28	1129 ± 4	2.77 ± 0.011	407	118
	2	2005/02/02 - 2005/03/01		27	483 ± 2	2.60 ± 0.011	193	101
	3	2005/03/01 - 2005/04/01		31	243 ± 1	1.31 ± 0.008	186	42
	4	2005/04/01 - 2005/05/02		31	229 ± 1	3.27 ± 0.017	70	0
	5	2005/05/02 - 2005/06/01		30	152 ± 1	1.85 ± 0.013	82	0
	6	2005/06/01 - 2005/07/01		30	157 ± 1	1.44 ± 0.009	109	0
	7	2005/07/01 - 2005/08/01		31	128 ± 1	0.38 ± 0.003	337	0
	8	2005/08/01 - 2005/09/01		31	141 ± 1	0.74 ± 0.005	191	0
	9	2005/09/01 - 2005/10/03		32	75 ± 1	0.62 ± 0.006	120	0
	10	2005/10/03 - 2005/11/01		29	213 ± 1	1.66 ± 0.011	129	0
	11	2005/11/01 - 2005/12/01		30	601 ± 3	3.00 ± 0.013	201	0
	12	2005/12/01 - 2005/12/28		27	1051 ± 5	1.78 ± 0.007	745	156
2006	1	2005/12/28 - 2006/02/01		35	631 ± 2	3.22 ± 0.012	157	87
	2	2006/02/01 - 2006/03/02		29	112 ± 1	0.60 ± 0.005	181	37
	3	2006/03/02 - 2006/04/04		33	493 ± 2	2.44 ± 0.008	202	42
	4	2006/04/04 - 2006/05/01		27	228 ± 1	1.99 ± 0.013	118	0
	5	2006/05/01 - 2006/06/01		31	282 ± 1	1.71 ± 0.008	165	0
	6	2006/06/01 - 2006/07/03		32	121 ± 1	2.25 ± 0.015	54	0
	7	2006/07/03 - 2006/08/01		29	228 ± 2	0.37 ± 0.003	633	0
	8	2006/08/01 - 2006/09/01		31	59 ± 1	1.30 ± 0.015	44	0
	9	2006/09/01 - 2006/10/02		31	172 ± 1	0.68 ± 0.005	253	0
	10	2006/10/02 - 2006/11/01		30	117 ± 1	1.87 ± 0.014	63	0
	11	2006/11/01 - 2006/12/01		30	410 ± 2	2.72 ± 0.012	151	0
	12	2006/12/01 - 2007/01/04		34	523 ± 3	2.71 ± 0.011	193	11
2007	1	2007/01/04 - 2007/02/01		28	591 ± 2	4.11 ± 0.018	144	3
	2	2007/02/01 - 2007/03/02		29	297 ± 3	2.06 ± 0.023	139	9
	3	2007/03/02 - 2007/04/02		31	624 ± 2	3.55 ± 0.013	181	26
	4	2007/04/02 - 2007/05/07		35	327 ± 1	3.10 ± 0.014	87	0
	5	2007/05/07 - 2007/06/05		29	225 ± 1	2.29 ± 0.013	105	0
	6	2007/06/05 - 2007/07/02		27	151 ± 1	0.65 ± 0.005	268	0
	7	2007/07/02 - 2007/08/07		36	152 ± 1	0.78 ± 0.005	162	0
	8	2007/08/07 - 2007/09/04		28	87 ± 1	0.65 ± 0.006	159	0
	9	2007/09/04 - 2007/10/01		27	107 ± 1	1.18 ± 0.011	94	0
	10	2007/10/01 - 2007/11/07		37	218 ± 1	1.54 ± 0.009	119	0
	11	2007/11/07 - 2007/12/03		26	501 ± 3	3.01 ± 0.014	205	0
	12	2007/12/03 - 2008/01/07		35	1206 ± 3	2.99 ± 0.008	369	21
2008	1	2008/01/07 - 2008/02/04		28	421 ± 2	4.11 ± 0.020	102	40
	2	2008/02/04 - 2008/03/03		28	609 ± 3	3.15 ± 0.013	214	96
	3	2008/03/03 - 2008/04/04		32	467 ± 2	2.99 ± 0.012	142	6
	4	2008/04/04 - 2008/05/07		33	213 ± 1	1.70 ± 0.009	114	0
	5	2008/05/07 - 2008/06/02		26	131 ± 1	0.89 ± 0.008	182	0
	6	2008/06/02 - 2008/07/01		29	209 ± 1	1.50 ± 0.009	140	0
	7	2008/07/01 - 2008/08/05		35	151 ± 1	0.95 ± 0.006	141	0
	8	2008/08/05 - 2008/09/02		28	136 ± 1	1.17 ± 0.009	129	0
	9	2008/09/02 - 2008/10/03		31	166 ± 1	1.13 ± 0.007	142	0
	10	2008/10/03 - 2008/11/04		32	247 ± 1	2.10 ± 0.010	125	0
	11	2008/11/04 - 2008/12/01		27	578 ± 2	2.28 ± 0.011	253	4
	12	2008/12/01 - 2009/01/05		35	669 ± 2	2.85 ± 0.009	234	34
2009	1	2009/01/05 - 2009/02/02		28	815 ± 3	2.96 ± 0.011	275	90
	2	2009/02/02 - 2009/03/02		28	401 ± 2	3.09 ± 0.016	130	12

Sampling information					^{7}Be deposition	^{7}Be concentration	Precipitation	Snowfall
Year	Month	Period		Days	(Bq/m^{2})	(Bq/L)	(mm)	(mm)
	3	2009/03/02 -	2009/04/06	35	550 ± 2	2.56 ± 0.009	184	3
	4	2009/04/06 -	2009/05/08	32	297 ± 2	3.18 ± 0.016	105	0
	5	2009/05/08 -	2009/06/02	25	212 ± 1	2.40 ± 0.016	88	0
	6	2009/06/02 -	2009/07/06	34	173 ± 1	1.07 ± 0.006	142	0
	7	2009/07/06 -	2009/08/03	28	302 ± 2	1.24 ± 0.006	287	0
	8	2009/08/03 -	2009/09/02	30	108 ± 1	0.92 ± 0.008	114	0
	9	2009/09/02 -	2009/10/01	29	183 ± 1	2.54 ± 0.016	74	0
	10	2009/10/01 -	2009/11/02	32	208 ± 1	1.45 ± 0.008	144	0
	11	2009/11/02 -	2009/12/01	29	348 ± 2	2.39 ± 0.011	146	0
	12	2009/12/01 -	2010/01/04	34	1369 ± 4	4.03 ± 0.010	340	62
2010	1	2010/01/04 -	2010/02/01	28	853 ± 3	3.03 ± 0.011	282	93
	2	2010/02/01 -	2010/03/02	29	590 ± 2	2.41 ± 0.010	237	53
	3	2010/03/02 -	2010/04/05	34	416 ± 2	1.83 ± 0.008	207	8
	4	2010/04/05 -	2010/05/07	32	265 ± 1	1.83 ± 0.009	163	0
	5	2010/05/07 -	2010/06/02	26	170 ± 1	0.95 ± 0.007	172	0
	6	2010/06/02 -	2010/07/05	33	171 ± 1	0.76 ± 0.004	205	0
	7	2010/07/05 -	2010/08/02	28	82 ± 1	0.71 ± 0.007	131	0
	8	2010/08/02 -	2010/09/07	36	73 ± 1	0.78 ± 0.006	78	0
	9	2010/09/07 -	2010/10/05	28	262 ± 1	0.72 ± 0.004	391	0
	10	2010/10/05 -	2010/11/02	28	247 ± 1	1.21 ± 0.007	226	0
	11	2010/11/02 -	2010/12/01	29	622 ± 2	4.35 ± 0.016	148	0
	12	2010/12/01 -	2011/01/05	35	1245 ± 4	2.91 ± 0.007	429	81
2011	1	2011/01/05 -	2011/02/08	34	1613 ± 4	3.64 ± 0.009	365	216
	2	2011/02/08 -	2011/03/01	21	185 ± 1	1.72 ± 0.015	139	21
	3	2011/03/01 -	2011/04/04	34	485 ± 3	3.42 ± 0.018	129	37
	4	2011/04/04 -	2011/05/09	35	350 ± 2	2.04 ± 0.009	152	0
	5	2011/05/09 -	2011/06/01	23	203 ± 2	0.61 ± 0.005	435	0
	6	2011/06/01 -	2011/07/04	33	156 ± 1	1.79 ± 0.011	79	0
	7	2011/07/04 -	2011/08/01	28	161 ± 1	0.90 ± 0.007	199	0
	8	2011/08/01 -	2011/09/06	36	172 ± 1	0.61 ± 0.004	244	0
	9	2011/09/06 -	2011/10/03	27	130 ± 1	0.51 ± 0.004	301	0
	10	2011/10/03 -	2011/11/08	36	198 ± 1	1.30 ± 0.007	123	0
	11	2011/11/08 -	2011/12/05	27	487 ± 3	2.59 ± 0.013	209	0
	12	2011/12/05 -	2012/01/10	36	955 ± 3	2.87 ± 0.008	323	33
2012	1	2012/01/10 -	2012/02/06	27	745 ± 3	2.79 ± 0.012	267	141
	2	2012/02/06 -	2012/03/06	29	371 ± 2	1.90 ± 0.009	196	72
	3	2012/03/06 -	2012/04/02	27	318 ± 2	2.01 ± 0.011	187	1
	4	2012/04/02 -	2012/05/07	35	236 ± 1	2.16 ± 0.010	91	0
	5	2012/05/07 -	2012/06/05	29	162 ± 1	2.17 ± 0.014	80	0
	6	2012/06/05 -	2012/07/03	28	99 ± 1	0.57 ± 0.005	191	0
	7	2012/07/03 -	2012/08/06	34	133 ± 1	0.59 ± 0.004	199	0
	8	2012/08/06 -	2012/09/04	29	90 ± 1	0.91 ± 0.007	112	0
	9	2012/09/04 -	2012/10/02	28	298 ± 1	0.87 ± 0.004	342	0
	10	2012/10/02 -	2012/11/05	34	287 ± 1	1.60 ± 0.007	164	0
	11	2012/11/05 -	2012/12/03	28	543 ± 3	2.05 ± 0.010	302	0
	12	2012/12/03 -	2013/01/04	32	879 ± 4	2.86 ± 0.010	336	74
2013	1	2013/01/04 -	2013/02/04	31	945 ± 3	3.64 ± 0.012	210	58
	2	2013/02/04 -	2013/03/04	28	491 ± 2	2.73 ± 0.012	180	74
	3	2013/03/04 -	2013/04/03	30	141 ± 1	2.32 ± 0.018	63	0
	4	2013/04/03 -	2013/05/01	28	363 ± 2	2.32 ± 0.013	168	0
	5	2013/05/01 -	2013/06/03	33	94 ± 1	1.34 ± 0.009	70	0
	6	2013/06/03 -	2013/07/01	28	131 ± 1	0.83 ± 0.007	158	0
	7	2013/07/01 -	2013/08/01	31	390 ± 2	0.99 ± 0.005	396	0
	8	2013/08/01 -	2013/09/02	32	123 ± 1	0.54 ± 0.003	234	0
	9	2013/09/02 -	2013/10/01	29	144 ± 1	0.39 ± 0.003	354	0
	10	2013/10/01 -	2013/11/01	31	205 ± 1	1.00 ± 0.006	205	0
	11	2013/11/01 -	2013/12/02	31	754 ± 3	2.33 ± 0.008	324	0
	12	2013/12/02 -	2014/01/05	34	796 ± 3	2.89 ± 0.010	284	18

Sampling information					^{7}Be deposition	^{7}Be concentration	Precipitation	Snowfall
Year	Month	Period		Days	(Bq/m^{2})	(Bq/L)	(mm)	(mm)
2014	1	2014/01/05 -	2014/02/03	29	460 ± 2	3.46 ± 0.017	128	47
	2	2014/02/03 -	2014/03/03	28	133 ± 1	1.94 ± 0.014	69	35
	3	2014/03/03 -	2014/04/01	29	337 ± 2	1.33 ± 0.008	252	20
	4	2014/04/01 -	2014/05/01	30	172 ± 1	1.58 ± 0.010	109	0
	5	2014/05/01 -	2014/06/02	32	220 ± 1	2.29 ± 0.011	96	0
	6	2014/06/02 -	2014/07/01	29	162 ± 1	1.44 ± 0.009	113	0
	7	2014/07/01 -	2014/08/01	31	129 ± 1	0.61 ± 0.004	213	0
	8	2014/08/01 -	2014/09/01	31	161 ± 1	0.49 ± 0.003	330	0
	9	2014/09/01 -	2014/10/01	30	39 ± 0.5	0.49 ± 0.006	79	0
	10	2014/10/01 -	2014/11/04	34	321 ± 2	1.55 ± 0.007	207	0
	11	2014/11/04 -	2014/12/01	27	500 ± 2	2.90 ± 0.015	173	0
	12	2014/12/01 -	2015/01/05	35	1370 ± 4	2.11 ± 0.005	649	126
2015	1	2015/01/05 -	2015/02/02	28	664 ± 2	2.60 ± 0.009	256	31
	2	2015/02/02 -	2015/03/02	28	524 ± 2	2.29 ± 0.011	229	57
	3	2015/03/02 -	2015/04/01	30	455 ± 2	2.60 ± 0.011	175	15
	4	2015/04/01 -	2015/05/01	30	241 ± 2	1.24 ± 0.009	195	0
	5	2015/05/01 -	2015/06/01	31	118 ± 1	1.35 ± 0.010	87	0
	6	2015/06/01 -	2015/07/01	30	204 ± 1	1.31 ± 0.007	156	0
	7	2015/07/01 -	2015/08/03	33	60 ± 1	0.42 ± 0.004	141	0
	8	2015/08/03 -	2015/09/01	29	150 ± 1	1.27 ± 0.010	118	0
	9	2015/09/01 -	2015/10/01	30	208 ± 1	0.92 ± 0.005	227	0
	10	2015/10/01 -	2015/11/02	32	156 ± 1	1.66 ± 0.012	94	0
	11	2015/11/02 -	2015/12/01	29	378 ± 2	1.76 ± 0.008	215	0
	12	2015/12/01 -	2016/01/04	34	652 ± 2	2.26 ± 0.008	289	0
2016	1	2016/01/04 -	2016/02/01	28	943 ± 3	3.23 ± 0.011	292	86
	2	2016/02/01 -	2016/03/01	29	537 ± 2	2.68 ± 0.012	200	44
	3	2016/03/01 -	2016/04/01	31	125 ± 1	1.95 ± 0.018	64	9
	4	2016/04/01 -	2016/05/02	31	130 ± 1	0.85 ± 0.007	173	0
	5	2016/05/02 -	2016/06/01	30	118 ± 1	1.26 ± 0.011	81	0
	6	2016/06/01 -	2016/07/01	30	10 ± 0.3	0.07 ± 0.002	153	0
	7	2016/07/01 -	2016/08/01	31	118 ± 1	1.17 ± 0.008	101	0
	8	2016/08/01 -	2016/09/01	31	157 ± 1	1.09 ± 0.006	143	0
	9	2016/09/01 -	2016/10/03	32	164 ± 1	0.62 ± 0.004	264	0
	10	2016/10/03 -	2016/11/01	29	156 ± 1	0.97 ± 0.008	160	0
	11	2016/11/01 -	2016/12/01	30	487 ± 2	3.06 ± 0.014	159	0
	12	2016/12/01 -	2017/01/04	34	643 ± 2	2.99 ± 0.009	215	5
2017	1	2017/01/04 -	2017/02/01	28	1010 ± 3	4.19 ± 0.014	241	63
	2	2017/02/01 -	2017/03/01	28	578 ± 2	2.65 ± 0.011	219	56
	3	2017/03/01 -	2017/04/03	33	246 ± 1	2.43 ± 0.013	101	12
	4	2017/04/03 -	2017/05/01	28	185 ± 1	1.38 ± 0.010	167	0
	5	2017/05/01 -	2017/06/01	31	156 ± 1	2.06 ± 0.015	59	0
	6	2017/06/01 -	2017/07/03	32	183 ± 1	1.77 ± 0.010	104	0
	7	2017/07/03 -	2017/08/01	29	168 ± 1	0.74 ± 0.006	227	0
	8	2017/08/01 -	2017/09/01	31	94 ± 1	0.46 ± 0.004	206	0
	9	2017/09/01 -	2017/10/02	31	128 ± 1	0.60 ± 0.004	215	0
	10	2017/10/02 -	2017/11/01	30	365 ± 2	1.15 ± 0.006	318	0
	11	2017/11/01 -	2017/12/01	30	908 ± 3	3.22 ± 0.011	282	0
	12	2017/12/01 -	2018/01/04	34	1036 ± 3	3.17 ± 0.008	375	26
2018	1	2018/01/04 -	2018/02/01	28	1367 ± 4	3.59 ± 0.013	312	181
	2	2018/02/01 -	2018/03/01	28	772 ± 3	2.70 ± 0.012	286	197
	3	2018/03/01 -	2018/04/02	32	253 ± 1	1.36 ± 0.007	187	0
	4	2018/04/02 -	2018/05/01	29	232 ± 2	1.27 ± 0.008	219	0
	5	2018/05/01 -	2018/06/01	31	308 ± 1	1.02 ± 0.006	244	0
	6	2018/06/01 -	2018/07/02	31	76 ± 1	0.85 ± 0.008	89	0
	7	2018/07/02 -	2018/08/01	30	76 ± 1	0.29 ± 0.004	258	0
	8	2018/08/01 -	2018/09/03	33	26 ± 0.4	0.25 ± 0.004	102	0
	9	2018/09/03 -	2018/10/01	28	344 ± 2	0.65 ± 0.004	527	0
	10	2018/10/01 -	2018/11/01	31	229 ± 1	2.59 ± 0.013	89	0

Sampling information					^{7}Be deposition	^{7}Be concentration	Precipitation	Snowfall
Year	Month	Period		Days	(Bq/m^{2})	(Bq/L)	(mm)	(mm)
	11	2018/11/01 -	2018/12/03	32	316 ± 2	4.03 ± 0.019	78	0
	12	2018/12/03 -	2019/01/04	32	793 ± 3	3.04 ± 0.010	261	19
2019	1	2019/01/04 -	2019/02/01	28	906 ± 3	5.87 ± 0.021	154	20
	2	2019/02/01 -	2019/03/01	28	270 ± 1	3.45 ± 0.019	78	3
	3	2019/03/01 -	2019/04/01	31	456 ± 2	3.74 ± 0.015	122	3
	4	2019/04/01 -	2019/05/07	36	230 ± 1	1.69 ± 0.006	136	0
	5	2019/05/07 -	2019/06/03	27	120 ± 1	1.36 ± 0.012	88	0
	6	2019/06/03 -	2019/07/01	28	388 ± 2	1.64 ± 0.008	237	0
	7	2019/07/01 -	2019/08/01	31	227 ± 1	1.20 ± 0.007	189	0
	8	2019/08/01 -	2019/09/02	32	102 ± 1	0.52 ± 0.005	195	0
	9	2019/09/02 -	2019/10/01	29	81 ± 1	1.26 ± 0.012	64	0
	10	2019/10/01 -	2019/11/01	31	277 ± 1	1.16 ± 0.006	240	0
	11	2019/11/01 -	2019/12/02	31	293 ± 1	3.76 ± 0.018	78	0
	12	2019/12/02 -	2020/01/06	35	835 ± 3	3.94 ± 0.010	212	0
2020	1	2020/01/06 -	2020/02/03	28	678 ± 2	2.65 ± 0.010	256	0
	2	2020/02/03 -	2020/03/02	28	458 ± 2	3.18 ± 0.015	144	8
	3	2020/03/02 -	2020/04/01	30	428 ± 2	2.79 ± 0.012	154	0
	4	2020/04/01 -	2020/05/07	36	417 ± 2	2.81 ± 0.009	148	0
	5	2020/05/07 -	2020/06/01	25	166 ± 1	1.84 ± 0.016	90	0
	6	2020/06/01 -	2020/07/01	30	278 ± 2	0.93 ± 0.005	298	0
	7	2020/07/01 -	2020/08/03	33	297 ± 2	0.83 ± 0.004	360	0
	8	2020/08/03 -	2020/09/01	29	74 ± 1	0.58 ± 0.006	126	0
	9	2020/09/01 -	2020/10/01	30	252 ± 1	0.95 ± 0.005	264	0
	10	2020/10/01 -	2020/11/02	32	195 ± 1	2.06 ± 0.012	95	0
	11	2020/11/02 -	2020/12/01	29	327 ± 2	2.18 ± 0.011	150	0
	12	2020/12/01 -	2021/01/04	34	1409 ± 4	3.58 ± 0.008	394	46
2021	1	2021/01/04 -	2021/02/01	28	1010 ± 3	2.70 ± 0.009	374	146
	2	2021/02/01 -	2021/03/01	28	835 ± 3	3.87 ± 0.014	216	51
	3	2021/03/01 -	2021/04/01	31	325 ± 2	2.08 ± 0.010	157	0