applied sciences

MDPI

Supplementary Materials

Factors Influencing Changes of the Initial Stable Water Isotopes Composition in the Seasonal Snowpack of the South of Western Siberia, Russia

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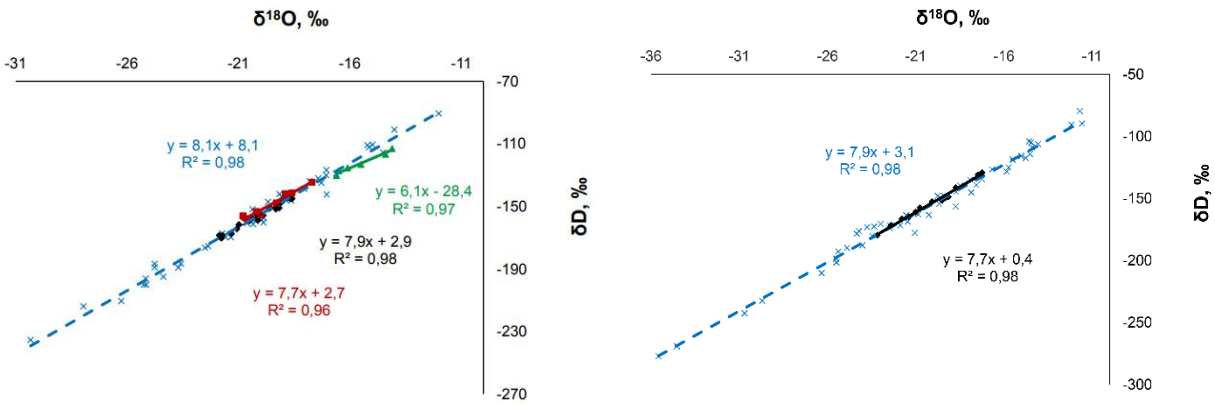
(**a**) (**b**)

Figure S1. Sampling site on the roof of the building of the Institute for Water and Environmental Problems of the Siberian Branch of the Russian Academy of Sciences (IWEP SB RAS) (a) Snowfall's event-based collecting; (b) getting the snow layers from a plastic barrel (experiment No.1).



(**a**) (**b**)

Figure S2. Local meteoric water lines (LMWL) for winter (a) 2019–2020 and (b) 2020–2021. Blue – event-based precipitation, black – snowpack (bulk), green - bottom layer of the snowpack on a non-frozen soil, red - bottom layer of the snowpack on a frozen soil.

Table S1. The statistical estimates of LMWL for snowpack and snowfall samples getting in Altai region in winter 2019-2020 and 2020-2021 (Ordinary least squares regression (OLSR) was applied)

Sample type	Number of samples	LMWL[1]
Event-based snowfalls (2019-2020)	47	$\delta D = (8.1\pm 0.15) \times \delta^{18}O + (8.1\pm 3.1)$ (R^2=0,98)
Snowpack (2019-2020)	14	$\delta D = (7.9\pm 0.3) \times \delta^{18}O + (2.9\pm 3.4)$ (R^2=0,98)
Snowpack on the frozen soil (2019-2020)	8	$\delta D = (7.7\pm 0.6) \times \delta^{18}O + (2.7\pm 12)$ (R^2=0,96)
Snowpack on the unfrozen soil (2019-2020)	6	$\delta D = (6.1\pm 0.5) \times \delta^{18}O -(28\pm 7.7)$ (R^2=0,97)
Event-based snowfalls (2020-2021)	50	$\delta D= (7.9\pm 0.14) \times \delta^{18}O + (3.1\pm 2.3)$ (R^2=0,98)
Snowpack (2020-2021)	14	$\delta D = (7.7\pm 0.3) \times \delta^{18}O + (0.4\pm 5.7)$ (R^2=0,98)

[1] Local meteoric water line

Table S2. The daily average air temperature and difference between day and night air temperatures during the formation of layers of the snowpack (Experiment No 1 and No 2)

Layer number	time interval	number of samples (days)	mean of the daily average air temperature± SDOM[1], °C	Mean of difference between day and night air temperatures± SDOM[1], °C
winter 2019–2020 (number of layers according to Fig.3)				
11	20.02-03.03.2020	13	-7.3 ± 2.4	5.6± 0.7(max=9)
10	06.02-19.02.2020	14	-3.4 ± 2.1	9.2± 1(max=15)
9	21.01-05.02.2020	16	-11.0 ± 2.9	9.1± 1(max=17)
8	10.01-20.01.2020	11	-12.9 ± 1.3	6.6± 1.5(max=13)
7	24.12.2019-09.01.2020	17	-11.0 ± 2.0	6.4±0.8(max=8)
6	17.12-23.12.2019	7	-7.4 ± 1.6	5.8± 0.8(max=10)
5	10.12-16.12.2019	7	-7.3 ± 1.2	5.1±1.1(max=12)
4	03.12-09.12.2019	7	-3.9 ± 1.7	5.5±1.6(max=9)
3	26.11-02.12.2019	7	-15 ± 1.9	5.4±1(max=9)
2	20.11-25.11.2019	6	-13 ± 2.4	6.2± 0.4(max=7)
1	14.11-19.11.2019	6	-7 ± 3.0	9.6±2.1(max=15)
winter 2020–2021 (number of layers according to Fig.4)				
9	01.03-17.03.2021	18	-7.3 ± 1	14± 2 (max=30)
8	17.02-28.02.2021	12	-14.8 ± 1.9	10 ± 2 (max=19)
7	27.01-16.02.2021	21	-12.2 ± 1.8	8.7 ± 1(max=15)
6	21.01-26.01.2021	6	-15.1 ± 3.8	10.3 ± 1.5(max=16)
5	11.01-20.01.2021	10	-16.9 ± 1.9	9.4± 1.1(max=15)
4	26.12.2020-10.01.2021	16	-26.1 ± 2.4	7.8±0.7(max=12)
3	12.12-25.12.2020	14	-10.1 ± 0.9	5.3±1.4(max=9)
2	24.11-11.12.2020	18	-13.2 ± 1.3	7.3±0.7(max=13)
1	12.11-23.11.2020	12	-8.1 ± 2.6	5.4± 0.7(max=10)

[1] SDOM - standard deviation of the mean