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Temporal variation in acidity and ion concentration of snowmelt water in light and heavy snow years

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Abstract This paper describes the temporal variation in chemical components of snowfall and snowmelt in a temperate snowy area. We conducted snowfall and snowmelt water sampling and their water quality analysis in light and heavy snow years at the Tohkamachi experiment station, Japan. We compared the behaviour of acidity and ion concentration of snowmelt water in response to annual snow conditions. Our results show that the mean acidity of snowfall is slightly higher than that of snowmelt. More acidic melt water flows out of the snowpack into the ground when snowmelt is generated on the surface and meltwater reaches the bottom of the snowpack. Comparisons between the two years revealed that although the snowpack has higher capacity for storing chemical components with increase of snowdepth, the stored chemical components gradually flow out of the snowpack with melt water caused by the heat flux from soil.

Key words snowmelt; temperate snow area; annual snow condition; pH; electric conductivity; yellow sand