The variation of acidity and ion concentration of snowmelt water in light and heavy snow year

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This paper describes the effect of snow pack on acidity and main ion concentration of snowmelt water in the temperate snow area. In order to understand the variation of snow water quality of snowfall, snow pack and snowmelt, snow monitoring and chemical measurement were conducted in light snow year from December 2008 to March 2009 and heavy snow year from December 2009 to March 2010 at Tohkamachi experiment station, Japan. Sampling interval of snowfall, snow pack and snowmelt are one day, ten days and one day, individually, and the measured parameters were acidity (pH), electric conductivity (EC) and the ion concentration of Cl-, SO4²-, NO3⁻, Na⁺ and Mg²⁺.

As a result, maximum snow depth in light snow year and heavy snow year were 83 cm and 251 cm, individually, and mean acidity of snowfall was higher than that of snowmelt water. However, the acidity of snow pack and snowmelt water decrease after intensive rainfall and snowmelt during winter since they prevent the chemical matter from depositing in the snowpack layer. This result indicates that the occurrence frequency of high acidity of snowmelt in little snow year is more than that in heavy snow year. Moreover, observational result suggested that the calcium carbonate, which is main component of Asian soil from Eurasia continent, contained in the snow particle also decrease the high acidity of snowfall and snow pack.