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## Evaluation of snowfall interception of boreal forest and sublimation profile

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**Introduction** Snowfall interception by canopy is an important factor for the variation of snow water equivalent (SWE) of snowy forest watershed. Intercepted snow stays on canopy from several days to a few months, a part of which eventually evaporates back to atmosphere or falls down to ground. The fallen snow from the canopy becomes a part of snowpack on the ground, and the sublimated snow becomes a loss to precipitation. Therefore, it is important to estimate the amount evaporation loss of the intercepted snow. This research aims to evaluate the interception loss by measuring the snow water equivalent inside and outside a boreal forest and discusses on the seasonal variation of the interception coefficient, and their relationship with canopy density and atmospheric conditions.

**Observation site and method** The observation was carried out at a mixed forest of coniferous and broad leaf trees and a birch forest in the Uryu Research forest of Northern Biosphere Field Research Center, Hokkaido University from November 2007 to March 2008. The SWE of inside and outside of forest, canopy sky view factor (SVF), profiles of sublimation from a block of ice are observed with meteorological terms by boundary layer tower. A snow survey was carried by setting a 5 meter grid in a plot of 50 m x 100 m in the mixed forest, and line measurement of 50 m with 1m interval at the open site. Sublimation profiles ice was measured by measuring the weight change of a block of ice, which hung at several heights on the tower.

**Discussion and results** The difference in SWE of inside and outside of forest is small at the Birch forest site through the observation period and at the Mixed forest site, it was small in early winter but became larger towards the end of the observation period. The average interception loss is 14.4% for Mixed forest and 7.8% for Birch forest.

The SWE inside the Mixed forest increased with sky view factor (SVF), and the interception fraction is closely related to the canopy density. The SVF within the zenith angles less than 60 degree is better assessed the above result than the SVF within the zenith angle less than 10 degree, therefore, the SWE is related to the canopy density not just above canopies but with wider area.

The profiles of evaporation from ice blocks showed larger rate with height for the period longer than 1 week. This is mainly due to the wind and specific humidity profiles. This result must be concerned in snowfall interception models.

**Keywords:** Interception loss, boreal forest, snow water equivalent