



“Gheorghe Asachi” Technical University of Iasi, Romania



SNOW EVAPORATION CHARACTERISTICS RELATED TO MELTING PERIOD IN A FORESTED CONTINUOUS PERMAFROST REGION

Youwei Lin, Tiji Cai *, Cunyong Ju

College of Forestry, Northeast Forestry University, Harbin 150040, China

Abstract

In cold, high-latitude regions, snow evaporation can significantly influence the snow water equivalent and thus change the regional water balance in early spring. In order to explore how the snowfall event and environmental factors affected the snow evaporation rate in the northern Daxing'an Mountains in China. From the snow melting period of March 2016 to April 2018, the eddy covariance method was used to explore the relationship between environmental factors and snow evaporation. The results showed that the air temperature played a more important role than net radiation in snow evaporation. The snow evaporation rates obviously increased after snowfall events during the snow ablation period, but the increments were different in different years. Throughout the observation period, the maximum snow evaporation was $0.448 \text{ mm} \cdot \text{d}^{-1}$ and occurred in the snow ablation period of 2016. However, the following processes induced an abrupt increase of snow evaporation rate: heavy snowfall events resulting from temporary warm air temperatures. Our results can be used to improve snowmelt models, and the corresponding routines in climate models, as well as can contribute to the development of more efficient practices of water resources utilization.

Key words: air temperature, eddy covariance, permafrost, snowfall, snow evaporation

Received: October, 2019; Revised final: February, 2020; Accepted: March, 2020; Published in final edited form: March, 2020

* Author to whom all correspondence should be addressed: e-mail: caitijiu1963@163.com; Phone: +0451-82191821