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Effect of Snow Hydrology in the Forest Environment

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Editorial

Any complete snow hydrology treatment in the forest environment truly should encompass the full area of snow hydrology, involving the revision and update of the mammoth study "Snow Hydrology" by the U.S. Army Corp of Engineers. This endeavour, of course, exceeds both the willingness of the writer and his skills. There have to be some boundary requirements. This article has been created for one of the seminar series of the I.H.D. For a mixed and – if we can tell – hard public, people with notable technical expertise in one or more hydrological fields are frequently included, which represent part of the topic allocated to the speaker and those who may just start their hydrological professions. These situations put contradictory requirements and limitations on allowable treatment, and this document was developed for this purpose.

Considering that hydrology includes two primary terrestrial phases, one land phase and one channel phase, this subject is obvious almost only from the land phase. Although this may frustrate some engineers who deal only with the water in channels, it is essential in the daily thinking of the forest hydrology that, as part of his water management responsibility, spends most of his work time with the water in the land phase.

Therefore, this research deals solely with forest ecosystem snow hydrology. In this approach, it overlooks the impacts of topography and not only channels hydrology, which is a very important parameter as shown by previous works. The general nature of the forest landscape cannot be entirely ignored, even if the particular local ecology is accorded major importance. Even on the plane, the landscape is not homogenous; it comprises, as Miller underlined, of a three-dimensional mosaic. This mosaic may be seen as a thorough puzzle in which the geography, soil, local climate, and history dictate size, shape and depth of the pieces. The ruggedness of the surface and the 'porosity' stand differ between these components of this jigsaw puzzle, borders and edges, canopy density variations and advective heat transfers.

In the particular ecosystem, apart from the total landscape, we have not yet come to a proper knowledge of the snow hydrology. Knowledge of snow hydrology in the landscape will develop via better understanding of the snow hydrology processes within ecosystems. Need leaf forests dominate much of the Northern Hemisphere's alpine and boreal areas, where snowmelt is the most significant annual hydrological event. During winter, the retention of leaves by evergreen needle tree species reduces the accumulation of snow through losses of canopy interception and dramatically alters energy exchanges for snow.

However, the forest cover is sometimes discontinuous, with clearings of different sizes that can vary significantly in snow accumulation and melting characteristics. As such, forest snowmelt management will profit from an effective forecast for snow build up and melting in both open and forest situations. Forest cover varies according to its snowfall impacts, with reduction in nearly even accumulations in Finnish temperate woods from 30% seen in cold Canadian and Russian mountains and in boreal forests.

While several processes are suggested to explain decreasing snow accumulations in forests, the key element in limiting forest snow loss has been the sublimation of canopy snow Founded that the canopy sublimation might cause an enhanced exposure of captured snow to the upper atmosphere to lose 30 to 45% of yearly snowfall in Western Canadian. The canopy sublimation loss estimate thus

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