Influence of Snow Capture by Forest Canopy for a Seasonal Snowpack in the Adirondack Mountains, NY

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ABSTRACT

During the winters in Upstate New York, seasonal snow is often captured by tree canopies that delay snow from depositing on the surface and affect the rate at which the snow melts in the snowpack. Tree canopies often shade the snowpack slowing sublimation and melting rates if most of the snowpack is covered by trees. Differential melting of the snowpack occurs if the snowpack receives uneven amounts of sunlight from forested areas that have a mix of open and closed canopies. Quantifying the effect of canopy interception of snow is difficult because many snow study sites are focused on open areas and/or fields where instruments, satellites, and manual measurements are more accessible. We focus on the Arbutus Lake watershed, located within the Huntington Wildlife Forest (HWF) in the central Adirondack Mountains of New York, USA. The Arbutus Lake watershed is heavily forested with a mix of conifer and deciduous trees. For our study, we use traditional snow depth/SWE transect methods collected on a biweekly timeframe to quantify how snow depth (SD) and snow water equivalent (SWE) vary between three canopy types: heavily coniferous, heavily deciduous, and an entire open canopy field. We examine the spatiotemporal dynamics of the snowpack under different energy budgets and relate it to midwinter melt events. Preliminary results show a distinct change in SD and SWE values in our snowpack depending on whether it is beneath a closed or open canopy type. Additional results show that SD and SWE values differ depending on whether there has been a recent snowstorm or after a long period of melt.

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