

RESEARCH SEMINAR SERIES

Snow response to changing forest cover after mountain pine beetle

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Abstract: Many communities throughout BC rely on water supplied by snow, which is affected by the weather, landscape, vegetation and the processes that link these variables. Given the widespread devastation caused by mountain pine beetle (MPB), recent studies have begun to examine the effects of partial and/or complete forest cover loss on snow processes. Since MPB attack in 2005, forest cover and snow have been monitored in an attacked pine stand, a mixed species stand and a clearcut northwest of Kamloops. Attacked trees turned from green to red by 2007, and significant canopy needle loss occurred in 2009. This increased canopy transmittance and snow surface litter cover, changing both the energy reaching the snow surface and snow surface reflectivity. In 2009, litter accumulation at the snow surface in the pine stand was approximately three times greater than in previous years, and over double that in the mixed stand. By 2011, attacked trees had turned grey and litter accumulation was only one third of that in the mixed stand. April 1 snow water equivalent (SWE) was highly variable between years, but overall was ~30% lower in the pine stand and ~40% lower in the mixed stand than in the clearcut. While we have yet to observe significant changes in SWE in response to needle loss, average ablation rates were significantly lower in both the pine and mixed species stands than in the clearcut. Ablation rate differences between the pine stand and the clearcut decreased with increasing needle loss, which likely represents the combined effect of increased canopy transmittance and decreased snow surface reflectivity. The exception was 2010, which had the lowest SWE and fastest snowpack depletion. The major driver of snow accumulation and ablation was the weather, with the largest differences between both forested stands and the clearcut occurring in the low-snow year of 2010. In the high snow year of 2011, the mixed canopy had a significantly greater effect on snow reaching the ground and on ablation rates than the pine canopy. This study highlights the complex interactions between ecohydrologic processes influencing snow response to changing forest cover, as well as the difficulty in transferring research results between study sites given local weather conditions.

Bio: Rita Winkler is a Professional Forester with a Ph.D. in forest hydrology. She has 30 years of experience in the southern interior working for government, as an independent consultant and as an instructor at Thompson Rivers University. Her work focuses on understanding hydrologic processes in forested watersheds and the effects of forest land-use on water supplies.

When: Tuesday, November 1, 2011. 1:30 pm to 2:30 pm

Location: Kamloops: Juniper Room, Thompson-Okanagan Regional Office

Conference call: 1-877-353-9184 **Conference ID:** 7190434

Common meeting rooms have been reserved in the following locations:

Victoria: Room 502, 727 Fisgard Street

Prince George: Heritage Room, Northern Interior Regional Office, 1011 4th Ave.

Smithers: Driftwood Room, Skeena-Stikine Forest District Office

Nanaimo: Birch Room at 2100 Labieux Rd.

Williams Lake: Williams Lake Room, Williams Lake Forestry Centre

PowerPoint presentation will be available at http://www.for.gov.bc.ca/hre/research_seminars on the day of the presentation.

For further information, please contact Ken Soneff at: Ken.Soneff@gov.bc.ca or 250-828-4164.