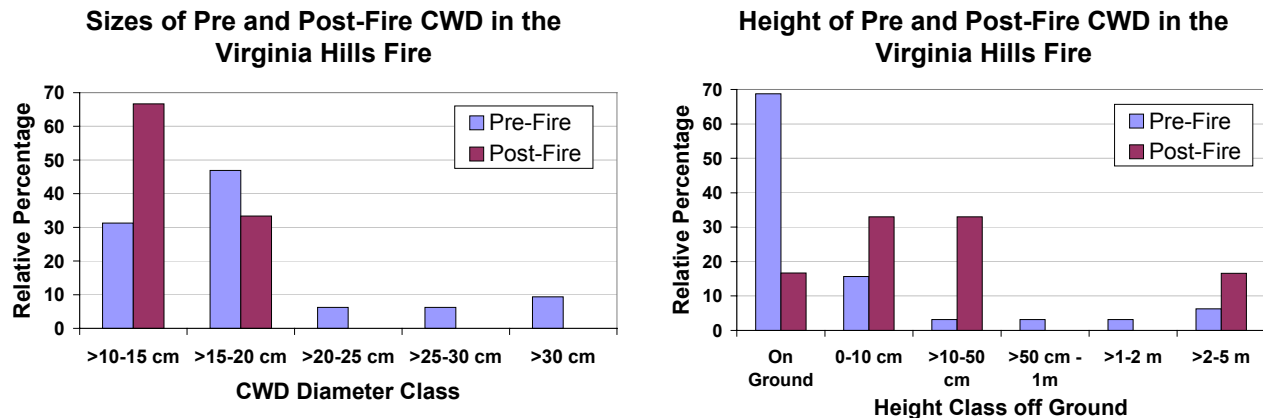


How Do Wildfires Generate Coarse Woody Debris?

Over time. In the Dogrib Fire of 2001, only 8% of the (downed) coarse woody debris (CWD) was created within two years of the fire, and 16% of the existing CWD was created within three years of the Virginia Hills fire of 2001. Given that wildfires in west-central Alberta historically kill an average of 62% of the trees within a given disturbance event (ND Quicknotes #18 & 22), these CWD percentages represent only a fraction of the trees killed by the fires. In other words, for these fires, *there was no obvious large post-fire "pulse" of CWD recruitment.*

Furthermore, the CWD generated after the Virginia Hills fire is likely to be small and suspended off the ground. Pre-fire CWD ranged from 10-35 cm in diameter, but the CWD generated by the Virginia Hills fire was all less than 20 cm in diameter. Also, almost 70% of the CWD existing before the Virginia Hills fires was touching the ground, compared to only 17% of the CWD created from the fire itself.



One interpretation of these findings is that the consumption of the root systems by fire, combined with the physical power of the fire, was insufficient to de-stabilize anything other than the smallest trees killed by the fires. And, after 2-3 years, each fire area has already experienced a range of seasonal (wind, ice and snow) storm conditions. Thus, it is reasonable to presume that the only reason for a pulse of new CWD at this point is a storm event of unusual severity.

It is important to keep in mind that the data for these results come from only two wildfires. The single most important message from the FMF ND research is that natural levels of variation in wildfire patterns are universal. However, even if these two fires represent one extreme, they still provide considerable insight. For example, there is an obvious difference between (standing) dead trees, and (downed) woody debris. Clearly, not all wildfires create large pulses of CWD. And even for those that may do so, the prominence of elevated CWD identified here is telling. Since decay rates of dead wood are directly related to contact with the ground, most of the large dead wood generated from these two wildfires will require extended periods to fully decompose.

Perhaps the focus on CWD alone is ill advised. Based on these findings, it is possible to identify at least three different physical forms of dead wood created from fires; 1) *standing dead*, as specialized habitat (e.g., cavity nesting birds), 2) *downed aerial*, as specialized habitat (e.g. small mammals), and 3) true *downed woody debris* as both specialized habitat and a soil nutrient source. Clearly, wildfires produce all three types of dead wood, although likely in different proportions, and over different periods of time.

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