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The second generation United States Forest Service fire behaviour model (abstract only)

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ABSTRACT

A comprehensive series of laboratory fires are being burned in the wind tunnel at the Intermountain Fire Sciences Laboratory in Missoula, MT. Together with field data from experimental and wildfires, information from these fires will be used to formulate and test the US Forest Services second generation fire behaviour model which is currently being developed.

The fuels used in the laboratory fires are excelsior (wood shavings), pine needles, and 6 mm diameter sticks. Most fires are in homogenous fuel beds, but a series of fires have been burned in mixed excelsior and sticks, to compare fire behaviour in mixed fuel with behaviour in component fuels.

In conjunction with Dick Rothermel of the US Forest Service, Ted Catchpole and I are developing a firespread model based on radiative and convective heat transfer from the flame to the unburned fuel. Each fire is instrumented with thermocouples, pitot tubes and radiometers to measure the factors influencing fire behaviour. Currently the model appears to predict fire spread well if these factors are known. In order to construct a predictive model it remains to model these factors in terms of fuel and environmental factors that can be measured just prior to a hazard reduction burn or wildfire.

I will talk about progress on the model to date, the experimental results obtained so far, and about preliminary attempts to test current flame structure models which are needed to describe the heat source.