SPATIAL VARIATION IN FUEL MOISTURE:
MEASURING AND MODELLING LOCAL EFFECTS

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THE MOISTURE CONTENT OF DEAD FUELS HAS A LARGE IMPACT ON FIRE RISK AND BEHAVIOUR. THIS PROJECT IS USING FIELD MEASUREMENTS AND PROCESS-BASED MODELS TO DEVELOP IMPROVED FUEL MOISTURE PRODUCTS FOR FIRE MANAGERS. RECENT WORK HAS SHOWN STRONG LINKS BETWEEN VEGETATION CLASSES AND MOISTURE. FUTURE WORK WILL REFINE THIS MODELLING TO PROVIDE PREDICTIONS AT A RANGE OF SCALES.

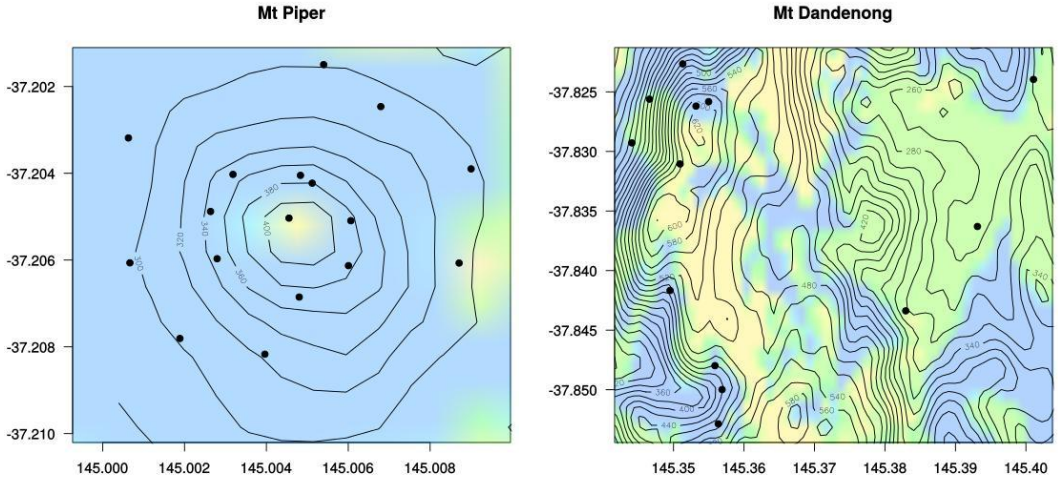

Figure 1. Fuel moisture sampling points (black points) at Mt Piper (left) and Mt Dandenong (right), Victoria. The sites differ in both complexity of topography (black contour lines) and range of vegetation types (NVIS classes, shaded)

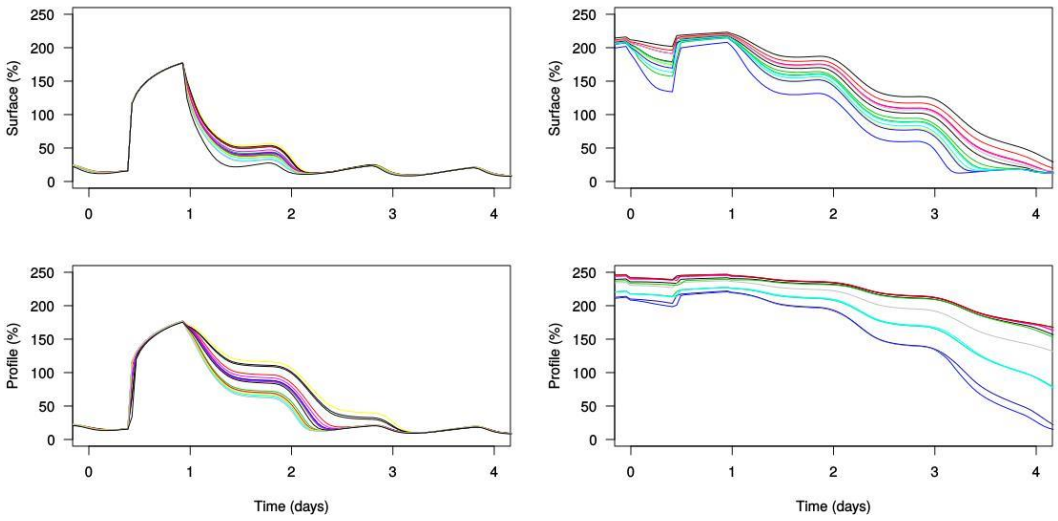

Figure 2. Modelled fuel moisture curves at Mt Piper (left) and Mt Dandenong (right), Victoria. Variation in surface moisture (top) was determined by local weather and solar radiation while variation in profile moisture (bottom) was driven by weather and fuel load. Each curve is a sampling point. From uniform conditions after rain (day 1) the more complex vegetation and topography at Mt Dandenong produced large differences in drying rates than at Mt Piper.

Measurements of fuel moisture, forest and fuel structure were made at 5 sites in Victoria from February, 2013 to April, 2014. Two of the sites are shown in Figure 1.

A process-based model of fuel moisture has been used to reconstruct observations and examine the sensitivity of wetting drying to factors such as canopy cover and litter fuel depth. Figure 2 shows that while wetting is often uniform drying varies widely. Differences in micro-climate that are large enough to affect vegetation type (shading in Figure 1) produce the largest differences in fuel moisture.

End User Statement (Jan Radic, DEPI):

Assessing fuel moisture over large areas of dissected forest is needed for assessment of fire danger, bushfire control, and burn planning. However, this is difficult using traditional approaches such as field based sampling. A landscape level overview of current and predicted fuel moisture would be a valuable planning input,