ELEVATED FIRE DANGER CONDITIONS ASSOCIATED WITH FOEHN-LIKE WINDS IN EASTERN VICTORIA

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Background
Foehn winds are strong, dry and warm winds that result from the effects that mountains have on the atmosphere. Air that is forced to rise over a mountain barrier can become drier and warmer through orographic precipitation and latent heat release during condensation. Further warming can take place due to compression as the air descends in the lee of the mountain barrier. Alternatively, when lower level air is blocked by a mountain barrier, drier air from above can flow down the lee side of the mountain barrier where it gains strength and is warmed by adiabatic compression.

Consequently, foehn winds can lead to elevated fire danger conditions. The Santa Ana winds of Southern California are an example of foehn winds that are associated with severe fires (e.g. the Cedar Fire, 2003). The extent to which foehn-like conditions affect fire danger in Australia is an open problem.

29th May 2007: A Case Study
Conditions resembling a foehn occurrence were observed in eastern Victoria on the 29th of May 2007. Characteristics of this event were:
• Elevated temperature, lower relative humidity (figure 1a) and increased wind speed downwind from the mountains
• Subsequent increase in the fire danger index downwind of the mountains (figure 1b)

Conclusions
The analyses suggest that the elevated fire conditions on the 29th of May 2007 were due to a foehn-like event caused by blocking of lower level air to the northwest of the ranges. Further work on these foehn-like occurrences will enhance understanding of fire weather and assessments of bushfire risk in regions prone to these conditions.