Geophysical Research Abstracts
Vol. 18, EGU2016-10775, 2016
EGU General Assembly 2016


# New approaches to predicting surface fuel moisture in south east Australian forests

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The capacity to predict of the moisture content (FMC) of fine surface fuels in mountainous south east Australian forests has improved dramatically in recent years due to the convergence of several new technologies, including i) improved process-based account-keeping type FMC models, ii) improved understanding and representation of topographic effects (aspect, drainage position, elevation) on surface fuel and soil moisture, iii) improved methods for downscaling weather variables (eg. rainfall/throughfall, short-wave radiation) using digital elevation models and airborne LIDaR, and, iv) new in-situ sensor technologies (fuelsticks, capacitance sensors, Ibuttons) for continuously monitoring surface fuels and within-litter micro-climate conditions, generating datasets of unprecedented temporal resolution and continuity for model development and testing under real field conditions across a broad range of forests, landscapes and climates. In this study the combined improvements in predictive capacity were quantified by comparing the field FMC observations with predictions from traditional, widely used operational FMC models, and with two new process-based models, including improved spatial parameterisation provided by the new technologies outlined above. The results are interpreted in the context of planned-burning decision making and outcomes, and bushfire modelling and management. The initial results showed that the new approaches to FMC prediction offered substantial improvements over the traditional methods and could be reasonably implemented at operational scales.