

# Landscape Fuel Moisture Forecasting for Bushfire Risk Assessment

## Research Fact Sheet

Forests, Fire and Regions Group invests in an *Emergency Risk Management Research* agreement with the Bushfire and Natural Hazards CRC that delivers critical science research to support policy and operational practices. This project '*Landscape Fuel Moisture Forecasting for Bushfire Risk Assessment*' is part of this work and commenced in June 2017. It is due to be completed by March 2019.

### The Project

Accurate and timely information about the status of fuel moisture across landscapes will improve bushfire prediction and is a critical component underpinning bushfire prediction and modelling. This is delivered through the tool Phoenix Rapidfire which is used both operationally and for strategic planning in Victoria, New South Wales, Tasmania, South Australia and Queensland.

The *Landscape Fuel Moisture Forecasting for Risk Assessment* (LFMF) project will provide more precise and accurate data on fuel moisture to support strategic bushfire management and planning. This will better equip fire agencies to inform communities about short and long-term risk and guide activities to minimise the risk of major bushfires to people, infrastructure, economic activity and ecosystems.

The LFMF project will link satellite imagery estimates of forest fuel moisture with field-based intelligence to provide more dynamic, up-to-date and accurate estimates of actual and predicted moisture conditions.

The project will provide a system with a range of metrics to predict landscape fuel moisture, representing the best available science in Australia and potentially internationally.

### Project outputs

The project will provide DELWP with:

- a report describing the methods for predicting landscape fuel moisture
- a web-based tool for the prediction of landscape fuel moisture across multiple metrics
- a technical report with the algorithms, source code and documentation
- a final report outlining the evaluation and opportunities for improvement.

The LFMF project will provide training and technology transfer to DELWP through training workshops.

Tools for downloading the data will allow for both the projects development and inputs to be incorporated into bushfire risk modelling and be used as operational and strategic applications. While adjustments to these models may be required, the capacity to provide appropriate data will ensure DELWP is prepared for model improvements.

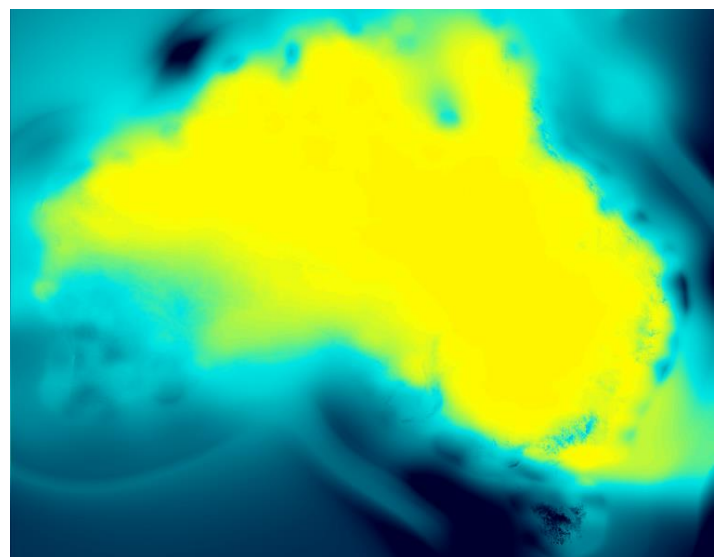


Figure 1 - Landscape Fuel Moisture Condition October 28, 2016

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## Policy and Operational Implications

This work will enable the Department of Environment, Land, Water and Planning (DELWP) to improve the quality (accuracy and currency) of landscape-level fuel moisture information in Australia. In addition, it will deliver near real-time and forecasted landscape fuel moisture maps and information products, which will directly improve Victoria's capacity to manage bushfire risk across a range of activities including; prevention, preparedness and response.

## The research Team

The project is being managed by the Bushfire and Natural Hazards CRC and the research carried out by a team from the University of Melbourne (UM) including: Dr Trent Penman, Dr Gary Sheridan, Anthony Rawlins, Dr Jane Cawson, Dr Thomas Duff and Dr Petter Nyman. The research team are also in collaboration with experts and fellow researchers in Landscape Fuel Moisture from across Australia and internationally.

## Project status (August 2018)

An End-User workshop was held in July 2017 (**Image 1**) to determine what information is currently used operationally to assess fuel moisture across the landscape. Staff from DELWP, CFA and Emergency Management Victoria provided valuable insight into the process.



**Image 1** - End user workshop, July 2017  
**Photo:** Trent Penman

The group also provided design guidelines for the webpage to ensure we captured the functional elements required for fire management staff.

A model-developers workshop was conducted in October 2017. Fuel moisture modellers gathered for a two-day workshop to assess the range of available models. In this workshop, strengths and weaknesses of current approaches were identified and a framework for assessing new models in the future were developed. A research paper outlining the findings of the workshop is currently in preparation.

A prototype website and its supporting cloud framework is under development (**Figure 2**) and the first model has been implemented in this system.



**Figure 2** - Prototype of website under development

The website development process is testing a range of software that will enable the processing and storage of data across Victoria and potentially Australia. These data will enable not only contemporary assessment of fuel moisture, but historic analysis of changes over time.