# Understanding the Impacts of Climate Change on Fire Weather Variables

**SAFER TOGETHER**

In 2015, the Victorian Government released *Safer Together*, setting out the future direction for emergency sector-wide bushfire management in Victoria. Under it's 'Better knowledge = better decisions' priority, a number of research projects have been established through the *Bushfire Risk Management Research* agreement with the Bushfire and Natural Hazards CRC. This project '*Understanding the impacts of climate change on fire weather variables*' is one of these and is being led on behalf of the sector by the Department of Environment, Land, Water and Planning (DELWP). The project commenced in November 2018 and is due to be completed by June 2019.

## The Project

Australia has been described as one of the most vulnerable developed countries to climate change, and already experiences a significant climate variability, including exposure to extremes in rainfall, winds and drought.

Predicting the likelihood and/or severity of bushfires with a high degree of confidence is critical for Victorian bushfire management agencies. Climate change induced alterations to burn windows for planned burns, season lengths, extreme events and fire behaviour, are of significant concern for fire managers. In particular, a detailed and spatially continuous understanding of how climate change will impact fuel availability and fire weather variables such as temperature, precipitation, wind speed and relative humidity, does not currently exist.

The *Understanding the impacts of climate change on fire weather variables* project will provide fire managers access to locally-relevant projections of future climate changes, as well as access to more granular interpreted changes to fire weather variables.
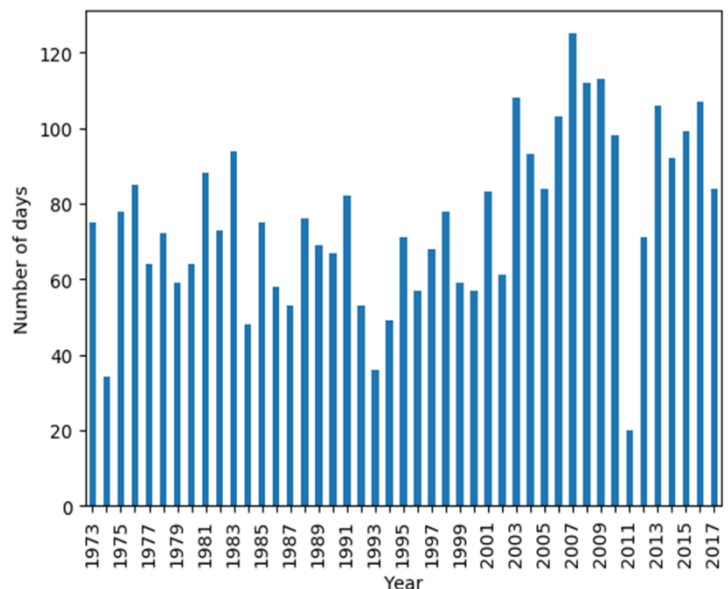
## Research Fact Sheet

This will increase understanding of the implications for local fire weather conditions and provide guidance on the capital and operational resources that may be needed to facilitate the implementation of policies and measures.

## Project Outputs

To address the identified critical knowledge need, the project team undertook a business needs analysis – first, a baseline of current practices, and then identifying and documenting future needs for knowledge, models and data, to help the sector better understand the projected impacts of climate change on fire weather variables.

The project included:

1. detailed stakeholder consultation strategy, including milestones and key decision points for progression of the project

2. briefs and presentations to key stakeholders at Decision Point forums regarding the ongoing findings of the review

3. final presentation to key stakeholders

4. final report on findings, and a

5. seminar to the wider sector.



**Figure 1:** Number of days each year (July to June) that 10% of Victoria reaches an FFDI greater than 25 from 1972-73 to 2016-17

**Source:** Harris et al. (2019) Victorian fire weather trends and variability. Proceedings for the 6th International Fire Behavior and Fuels Conference

bushfire&natural HAZARDS CRC

DRI Desert Research Institute

MONASH University

VICTORIA State Government

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## Policy and Operational Implications

By reviewing the impacts of climate change on fire weather variables in Victoria, bushfire management agencies will understand how this knowledge informs risk decision making, and have an evidence base for the longer-term objective- the preparation of a series of datasets that enable exploration of fire weather under different climate change scenarios.

## The Research Team

The project is being managed by the Bushfire and Natural Hazards CRC, led by Dr Timothy Brown from the Desert Research Institute (Nevada, USA) in partnership with Dr Graham Mills and Dr Scott Clark (Monash University) and Dr Sarah Harris from the CFA.

## Project Status (June 2019)

A stakeholder workshop was held in March, with approximately 20 attendees representing cross-sector and cross-government interests in climate change. The workshop highlighted the value in having a climate model projection dataset that includes fire weather variables, and identified numerous potential uses, to inform risk-based decision making.

Analyses and testing of climate models and statistical methods has been completed, with an end user workshop held in June to present findings and recommendations. A final report is in draft with the project due for completion in June 2019.
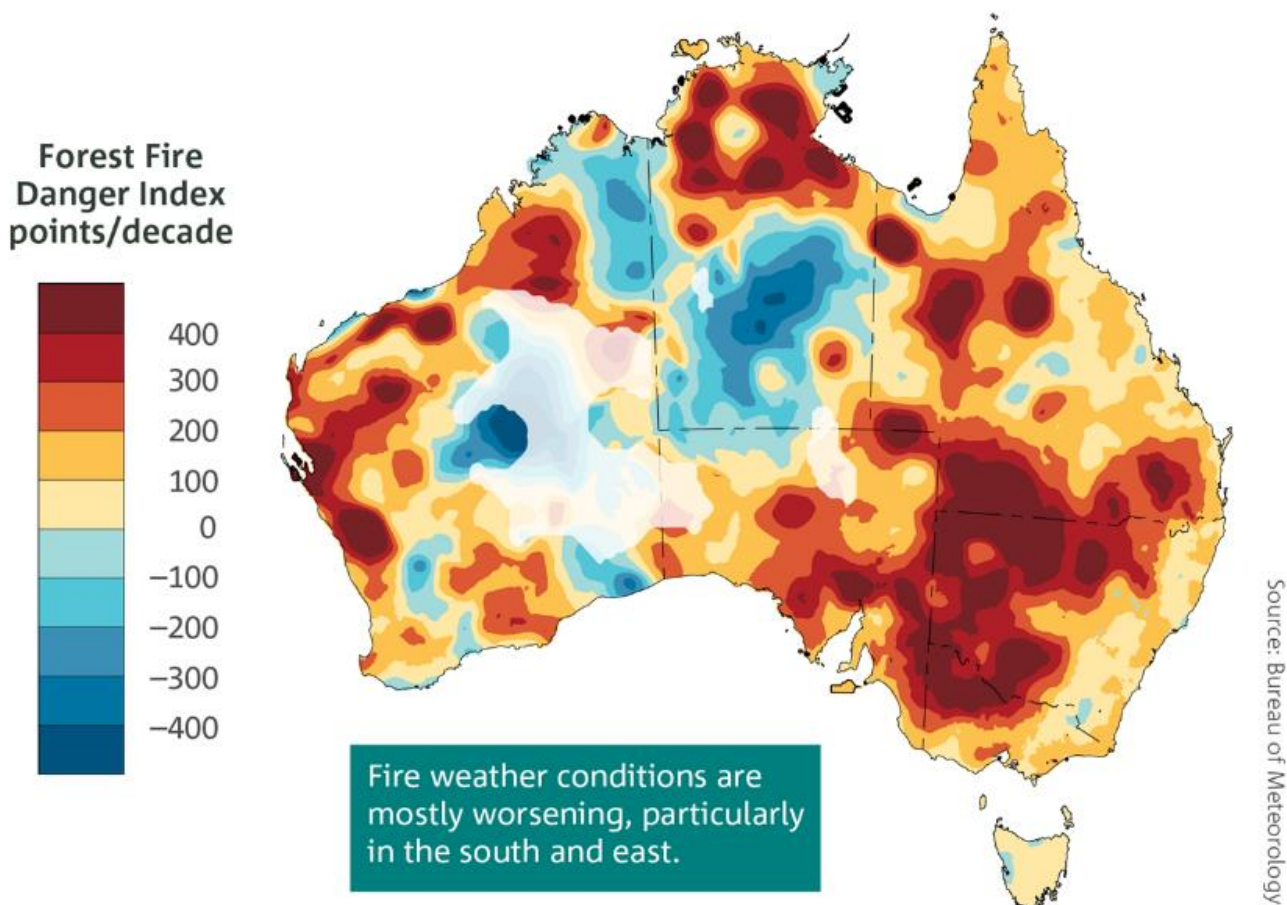


**Figure 2:** Trends from 1978 to 2017 in the annual (July to June) sum of the daily Forest Fire Danger Index— an indicator of the severity of fire weather conditions.

**Source:** http://www.bom.gov.au/state-of-the-climate/australias-changing-climate.shtml