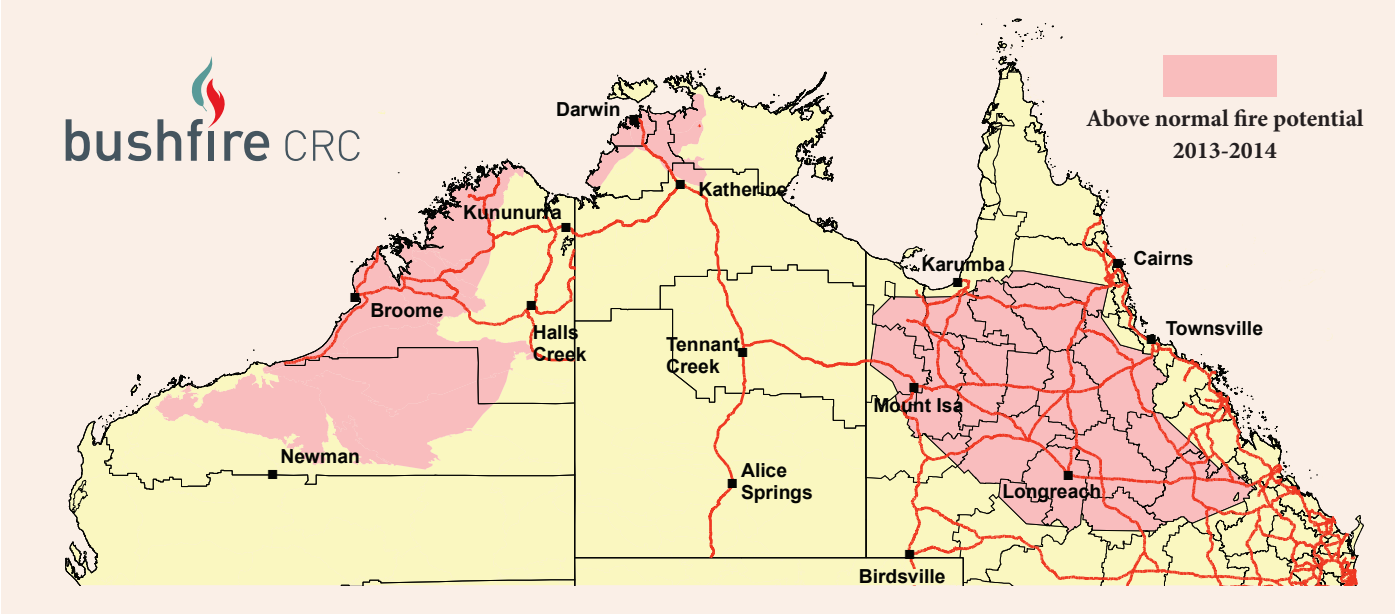
Background briefings on emerging issues for fire managers from AFAC and Bushfire CRC.

FIRE NOTE

ISSUE 113 JULY 2013

NORTHERN AUSTRALIA SEASONAL BUSHFIRE OUTLOOK 2013



The annual *Northern Australia Seasonal Bushfire Outlook* provides information to assist fire authorities in making strategic decisions such as resource planning and prescribed fire management to reduce the negative impacts of bushfire.

A *Seasonal Bushfire Outlook* for southern Australia will be distributed in early September, and will include an update on the northern fire season.

Bushfire potential depends on many factors. In northern Australia, conditions are determined by the nature of the previous wet season. The volume, location and timing of rainfall are critically important when estimating fuel volumes and growth. They also affect the timing of the drying of the fuel.

The climate outlook for the next few months is also a crucial factor. Of particular interest are the future tendencies of Pacific sea surface temperature associated with the El Niño-Southern Oscillation, a major climate driver over Australia. Other less quantifiable factors, such as the distribution and readiness of firefighting resources, are also considered.

Members of the Northern Australian Fire Managers' Group Forum, chaired by Bushfire CRC Deputy CEO Richard Thornton, met in Darwin in June at Charles Darwin University. During the two-day proceedings the Forum discussed the seasonal outlook for the imminent fire season, enabling the production of this *Fire Note*. All other presentations from the Forum are available on the Bushfire CRC website. Forum attendees included representatives of the Bureau of Meteorology, Bushfires NT, the NT Fire and Rescue Service, the WA Department of Fire and Emergency Services, the WA Department of Parks and Wildlife, CSIRO, Charles Darwin University, the Australasian Fire and Emergency Service Authorities Council, Parks Australia, Queensland Fire and Rescue Service and Queensland Parks and Wildlife Service.

ANTECEDENT CONDITIONS

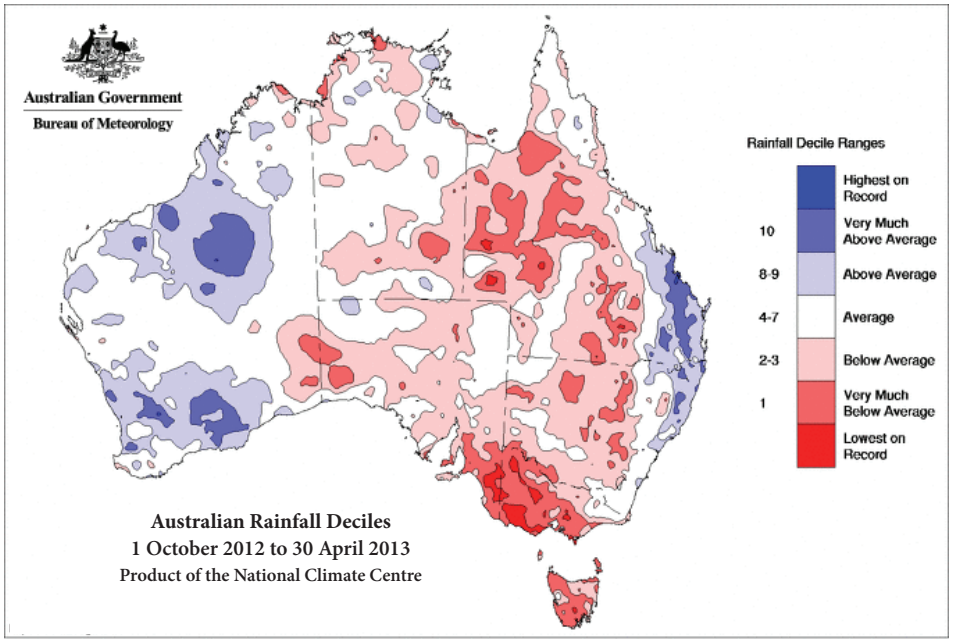
The 2012-2013 wet season saw neutral ENSO conditions (neither La Niña nor El Niño) in the Pacific, along with generally warmer than average sea surface temperatures in the eastern Indian Ocean. With the major climate drivers in a neutral phase and generally not producing wet or dry conditions over northern Australia, the Madden-Julian Oscillation, a shorter-term driver, was one of the main contributors towards wet season variability.

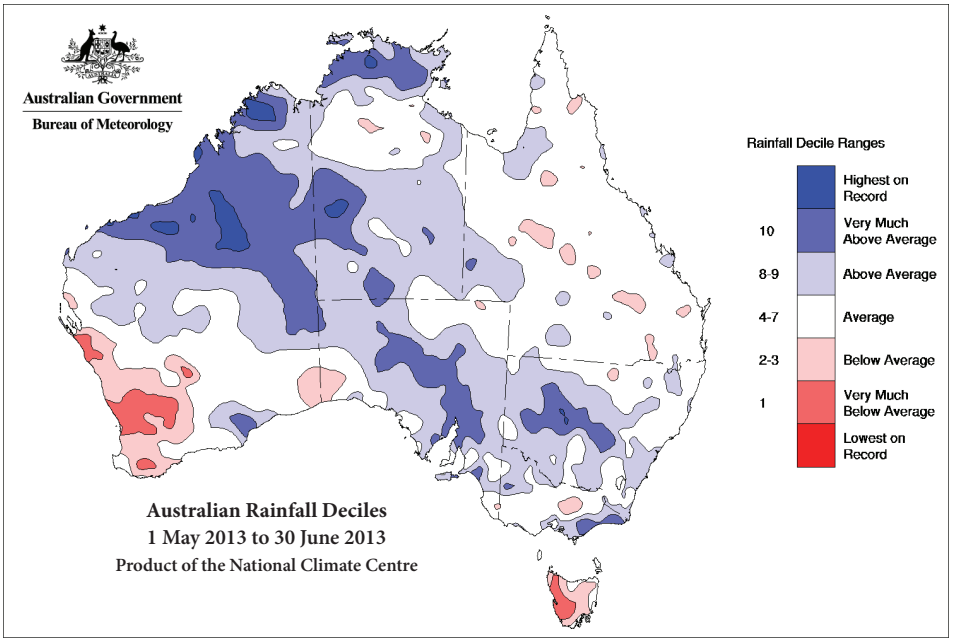
The pattern of rainfall across northern Australia in the 2012-2013 wet season came in short intense bursts of active monsoon periods, followed by prolonged (3-4 weeks) break periods where "build-up" like conditions dominated – high humidity, isolated afternoon thunderstorms and bright sunny days. By the end of February, most of the Northern Territory, Queensland and northern Western Australia had experienced below average rainfall for the five months of the season. The two

DEFINITIONS

Bushfire potential: The chance of a fire or number of fires occurring of such size, complexity or other impact (such as biodiversity or global emissions) which requires resources (from both a pre-emptive management and suppression capability) beyond the area in which it or they originate. Fire potential depends on many factors including weather and climate, fuel abundance and availability, recent fire history and firefighting resources available in an area.

Rainfall decile: A decile is a statistical technique that ranks sorted observations into 10 equal groups. A decile rainfall map will show whether the rainfall is above average, average or below average for the chosen time period and area.





exceptions to the below average total rainfall were the south east Queensland coast (including the Capricornia Coast) where ex-Tropical Cyclone Oswald caused major flooding in late January, and the Pilbara and interior regions of WA, which saw heavy rainfall from the landfall of Tropical Cyclone Rusty in February. These two short-lived heavy-rainfall events were exceptions within the generally suppressed rainfall patterns experienced over the rest of the wet season up to the beginning of March.

In March and April, tropical northern Australia (north of 18°S) generally received above average rainfall. The Top End of the NT saw heavy rainfall over the Easter long weekend as a tropical low pressure system moved along the north coast and then stalled over the Joseph Bonaparte Gulf. Despite this wet March and April, northern Australia ended the wet season with generally average to below average rainfall totals, especially in northern and western Queensland. The short bursts of wet weather followed by long exposure to sunshine that characterised the 2012-2013 wet season was ideal for vegetation growth.

Several rainfall events in May and June have resulted in the 2013 dry season in northern WA and the NT starting wetter than average. On 24 May, the Top End received heavy rainfall as the moist tropical air was lifted ahead of a southerly wind surge. The highest daily rainfall total from the event was 101.4 mm at Batchelor. Also in May, four north west cloudband events brought very-much-above average rainfall across the Pilbara and Alice Springs districts, with monthly rainfall totals in excess of 50 mm. Some locations saw their wettest May on record. Alice Springs Airport measured 42.6 mm in May, more than double the long-term average and its wettest May in nine years. In June, another north west cloudband brought record high rainfall totals across the western Kimberley and Pilbara. Broome set a June daily rainfall record with 146.4 mm on 6 June. June rainfall totals were near average for the rest of northern Australia.

CLIMATE OUTLOOK

The tropical Pacific has remained ENSO-neutral since mid-2012. International climate models surveyed by the Bureau of Meteorology suggest ENSO-neutral is most likely to continue over the coming season. This is usually associated with no significant trend towards a wetter or drier winter and spring (the late dry season). However, the possibility of a weak La Niña forming in the coming months cannot be completely ruled out; this would increase the odds of above average rainfall across northern and eastern Australia.

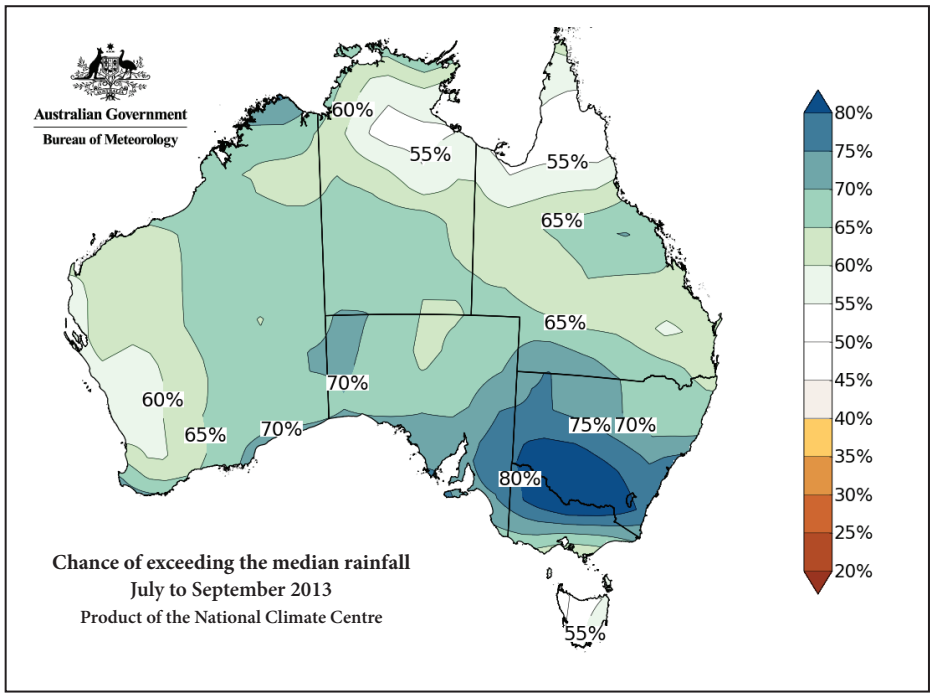
A negative Indian Ocean Dipole (IOD) event is favoured to develop during the dry season and continue until October or November 2013. A negative IOD increases the chances of above normal humidity levels and rainfall over north western and central Australia during the dry season due to an increase in cloudband events. However, five of the last six years that had both a negative IOD and

a neutral ENSO saw below average early wet season rainfall; 2005 was the exception to this.

Warmer than normal sea surface temperatures currently surround northern Australia. Warmer ocean temperatures can provide more moisture to the atmosphere, which in favourable weather conditions (for example, interactions with fronts or north west cloudbands) may result in increased rainfall. This is reflected in the current rainfall outlook covering the remainder of the northern dry season, with most of Australia expecting above normal rainfall. The area surrounding the Gulf of Carpentaria has an equal chance of above and below average rainfall this season.

The temperature outlook for Australia favours warmer than average maximum and minimum temperatures for the remainder of the dry season along the north coast. This is most likely driven by the warmer than average sea surface temperatures that currently surround northern Australia.

Central and southern Queensland, the southern NT and WA's southern interior can expect an increased chance of below average maximum temperatures this season.



Chance of exceeding the median rainfall
July to September 2013
Product of the National Climate Centre

REGIONAL SUMMARIES

NORTHERN TERRITORY

Overview

In the Top End, a significant amount of late season rain, averaging 200 mm, has complicated mitigation efforts, with some of the rains falling after initial fuel hazard reduction burns commenced. This resulted in later efforts being less effective. An additional broad scale aerial incendiary run has partially addressed this, but the real effectiveness is yet to be tested. In addition, ground access into much of this area is still difficult due to wet country. The Wadeye area has once again had little early season mitigation works primarily because of access and limited resources. The Douglas Daly region is starting to see the effects of gamba grass, which cures later than native species. The Darwin peri-urban area also has gamba grass related effects, including increased fuel loading and a considerable reduction in the number of grazing cattle, as well as a later curing period due to the late rain. Accordingly, this area is assessed as above average fire potential.

The Gulf region experienced a relatively poor wet season with little rain, so the effective mitigation program by staff and landholders has led to average fire potential. The Victoria River Downs region is also considered to be of average fire potential, with only isolated pockets of high fuel after mitigation efforts. The Sturt Plateau area south of Katherine is currently well grazed and fuel is being managed, resulting in average fire potential.

The extensive fires in Central Australia during 2011 and into 2012 have reduced the fire potential across the majority of the southern NT, especially in the Tanami and Simpson deserts. The developing mitigation capacity on the APY lands is continuing to increase and limit the fire potential on this estate and neighbouring areas. The fuel loadings across the Barkly region have been adjusted down to four tonnes per hectare and the remaining southern regions, including Alice Springs, adjusted down to three tonnes per hectare on average.

With the rainfall received to date, current land use regimes, and mitigation programs and activities undertaken, the prognosis is for average fire potential for the remainder of the Territory. It must be recognised that significant fire activity will still occur, and in some cases this will cause significant impacts and potential losses of property, earning capacity, and environmental values.

Outlook

There is one area identified as above average for fire potential in the NT. The north west Top End, extending around the greater Darwin peri-urban area and into the Vernon and Arafura Fire Control Regions, has had a continued trend of increasing density and range of gamba grass. The ineffectual management of this single species of weed has been largely responsible for an increase in average fuel loadings within this area from between 4.5 and 6 tonnes per hectare to between 9 and 11 tonnes per hectare; even exceeding this in some smaller areas.

QUEENSLAND

Overview

Queensland's bushfire season is primarily influenced by long-term and seasonal short-term climate conditions and the relationship the climate has on vegetation. Climate conditions have generally been moderate in recent months with a variance effect on rainfall across most of Queensland.

In late January 2013, the severe weather event associated with ex-Tropical Cyclone Oswald affected most central and southern coastal and inland coastal centres. Significant rainfall over catchment areas culminated in the flooding of major rivers, which produced considerable damage to land production industries, public infrastructure and the loss of many residences and businesses within the affected communities.

Despite this catastrophic weather event in late January, early February saw below average rainfall over most of the north Queensland coastal and inland areas with the exception of the lower Capricornia, Curtis, Wide Bay-Burnett and South East Coast weather districts.

The prolific growth in pastures over north Queensland in recent years has slowed generally during 2013 due to below average rainfall during autumn and winter.

Rainfall outlook from July to September 2013

indicates more than a 60% probability of above normal rainfall across most of coastal and inland parts during the period. The outlook also indicates warmer than average daytime maximum temperatures for north Queensland but cooler daytime minimum temperatures for inland and south western parts of Queensland. Winter frosts are expected with average minimum temperatures over most inland centres.

Current grassland fuel levels throughout Queensland are assessed as average to abundant and continuous. Soil profiles are dryer than average over most northern coastal areas with exceptional dry soil conditions inland. The current grass fire risk over inland areas is assessed as above average. Forest areas with average to high fine fuel loads, are assessed to have an above average fire risk.

Early start to season

A slightly early start to the fire season is anticipated due to high fuel loads, especially in the inland savannah landscapes that have not burnt in recent years. This prediction may well also apply for inland and far inland areas south of the savanna to the New South Wales/South Australia border.

There may be a slight extension of the fire season based on a late arrival of the northern monsoon season.

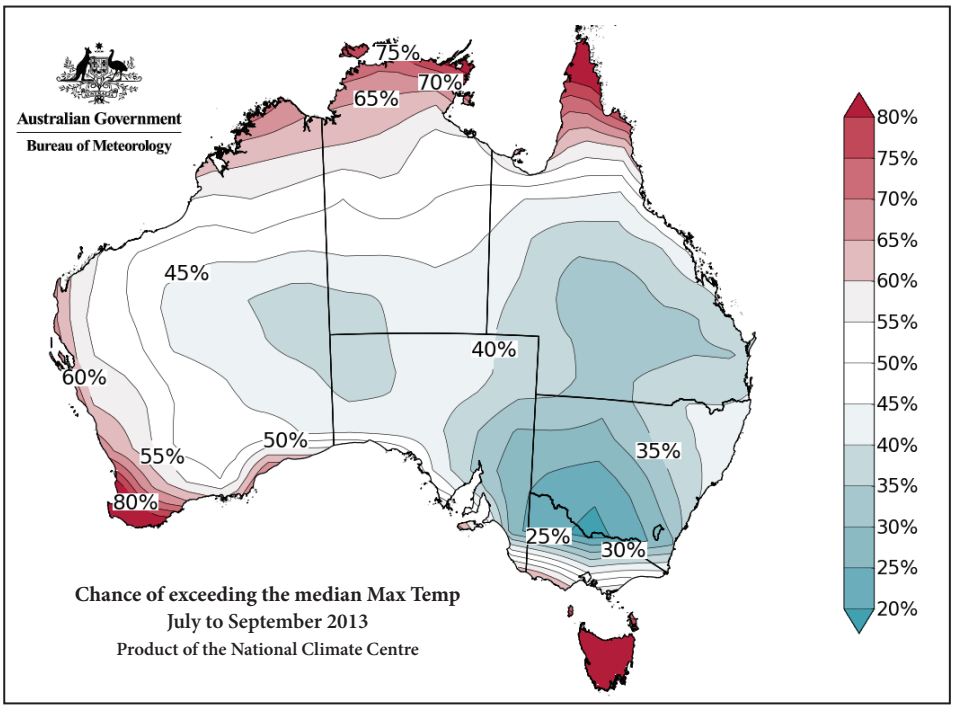
Grass fires in coastal areas where there is prolific growth may produce high flame heights and high intensity fires with a high forward rate of spread. Fast running, high intensity grass fires can be expected over most of the state, with concerns for larger fires in some rural areas due to the abundance and continuity of the grassland sward.

Woodlands may have simular fire behaviour with a grassy understorey; however, rates of spread may be slightly less.

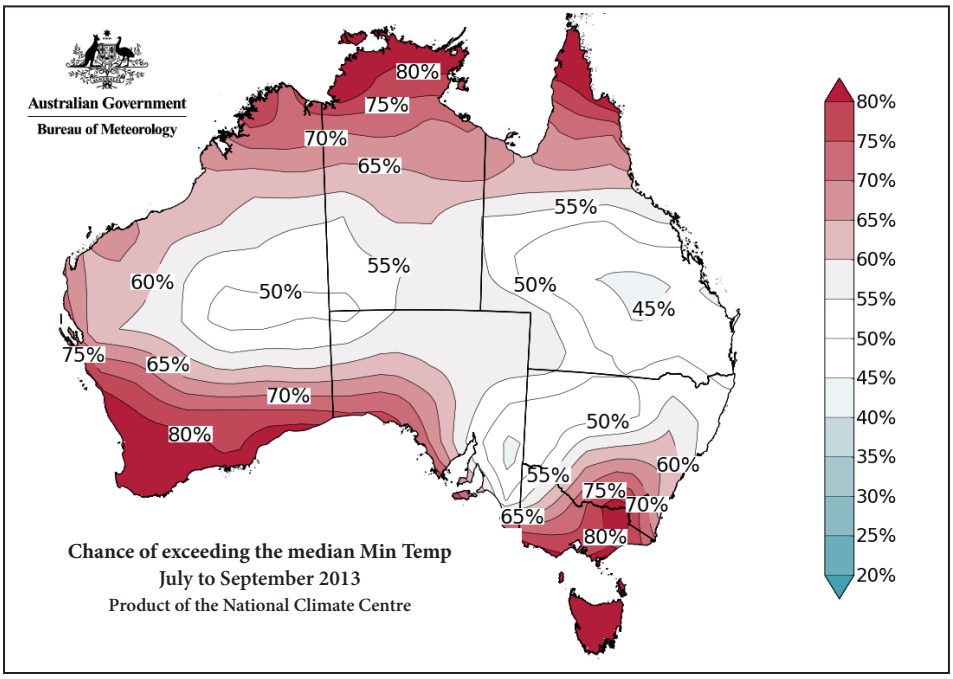
Forest fires are expected, but with moderate intensities early in the bushfire season. The intensity may increase later in the season, especially if the season is prolonged. This will be due to the drying moisture profile within the forest soils and an increase of fine forest fuels available, coupled with warmer temperatures and the influence of dry north westery to south westerly winds.

WESTERN AUSTRALIA

There is an above average bushfire potential in the central region of northern Western Australia. The areas to the east and west of the central zone are of average fire potential.



Chance of exceeding the median Max Temp
July to September 2013
Product of the National Climate Centre



Chance of exceeding the median Min Temp
July to September 2013
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Kimberley

The Kimberley area has been subject to high rainfall in recent months and this will result in significant and widespread grass growth across the region. This assessment is mindful of the increased prescribed burning planned across the region, but the rainfall and consequent regrowth fuel loads are significant.

Pilbara

Rainfall across the Pilbara has been average or above average in recent months. As a result of this rainfall pattern, there is above average bushfire potential in the central region. The outlook potential is for basically an average season on the western and eastern side of the central zone.

Fire Note is published jointly by the Bushfire Cooperative Research Centre (Bushfire CRC) and the Australasian Fire and Emergency Service Authorities Council (AFAC).

Bushfire Cooperative Research Centre
Level 5/340 Albert Street, East
Melbourne VIC 3002
Telephone: 03 9412 9600
www.bushfirecrc.com

Australasian Fire and Emergency Service Authorities Council
Level 5/340 Albert Street, East
Melbourne VIC 3002
Telephone: 03 9418 2388
www.afac.com.au