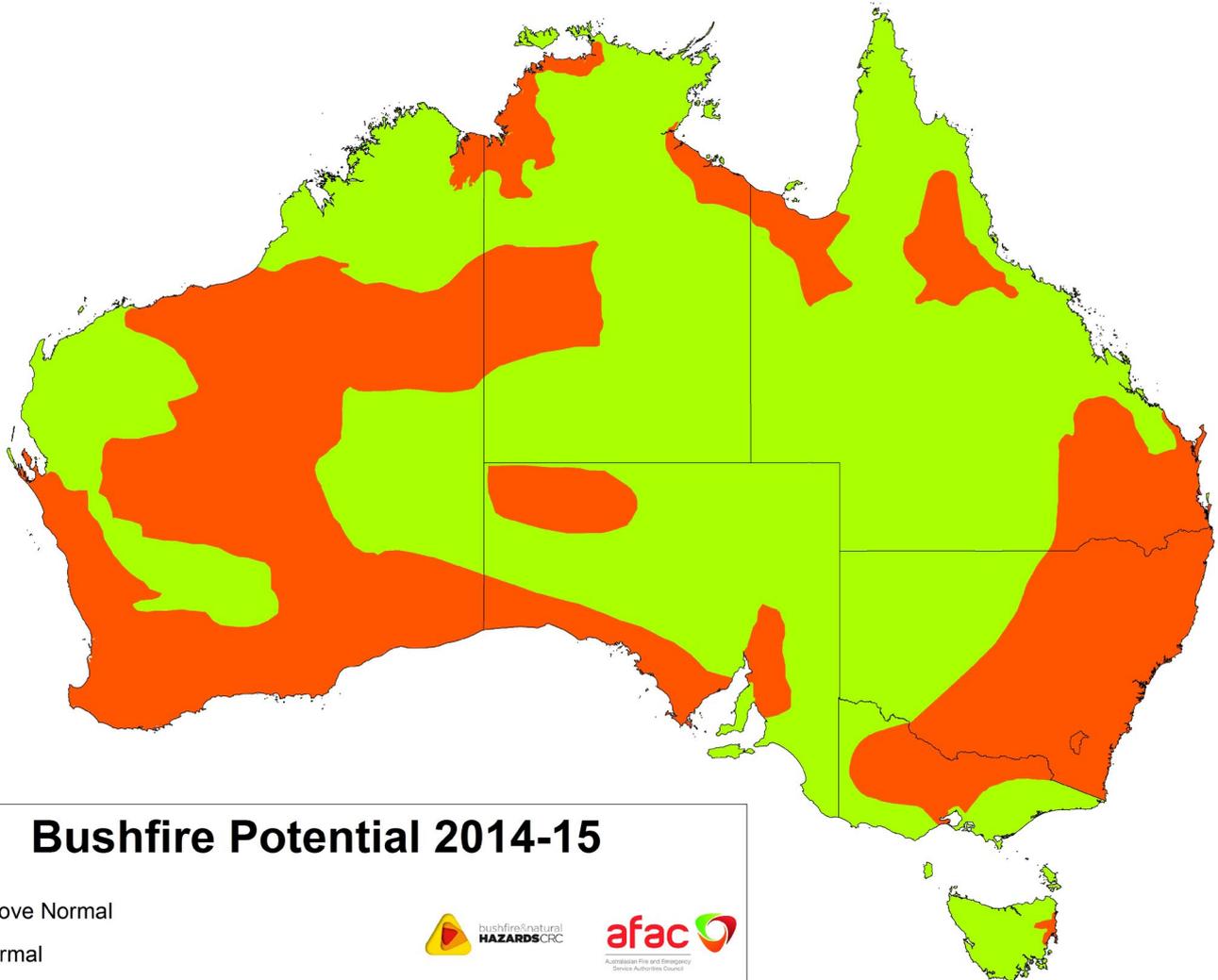


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TOPICS IN THIS EDITION | FIRE WEATHER | FUEL MANAGEMENT

SOUTHERN AUSTRALIA SEASONAL BUSHFIRE OUTLOOK 2014-15



OVERVIEW

The *Southern Australia Seasonal Bushfire Outlook* is used by fire authorities to make strategic decisions on resource planning and prescribed fire management for the upcoming fire season. The outlook is decided at an annual workshop convened by the Bushfire and Natural Hazards CRC and the Australasian Fire and Emergency Service Authorities Council (AFAC).

At the 2014 workshop in Hobart in August, the outlook was assessed and a range of broad climate factors were considered.

Australia is predicted to experience a trend towards an increasing number of bad fire weather days in its southern and eastern states with fire seasons that begin earlier and last longer than in earlier decades (*Be Prepared: Climate Change and the Australia Bushfire Threat*, Climate Council 2013).

As benign fire seasons are predicted to become the exception, the concept of an

average or normal fire season becomes less meaningful as historical long-term averages are surpassed by fire seasons that are regularly above average in either duration, area burnt or in the total number of fires. Costs to the community for firefighting and damage are already steadily rising.

Fire severity across southern Australia has been consistently worse than the long term averages would suggest. This is partly driven by an increase in temperatures as well as an increased dryness of soils and vegetation.

DEFINITIONS

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

In assessing the bushfire potential for any given year, it is important to take into account not only the amount of rainfall in the immediately preceding months but the long-term rainfall deficit across southern Australia.

Leading into this year, many areas have consistently received below average annual rainfall over successive years. The effect of this has been a cumulative reduction in soil moisture levels and increasingly dry forests and grasslands.

In addition to these long-term trends, other climate drivers, such as the El Niño-Southern Oscillation and the Indian Ocean Dipole, can further increase the severity and duration of the fire seasons.

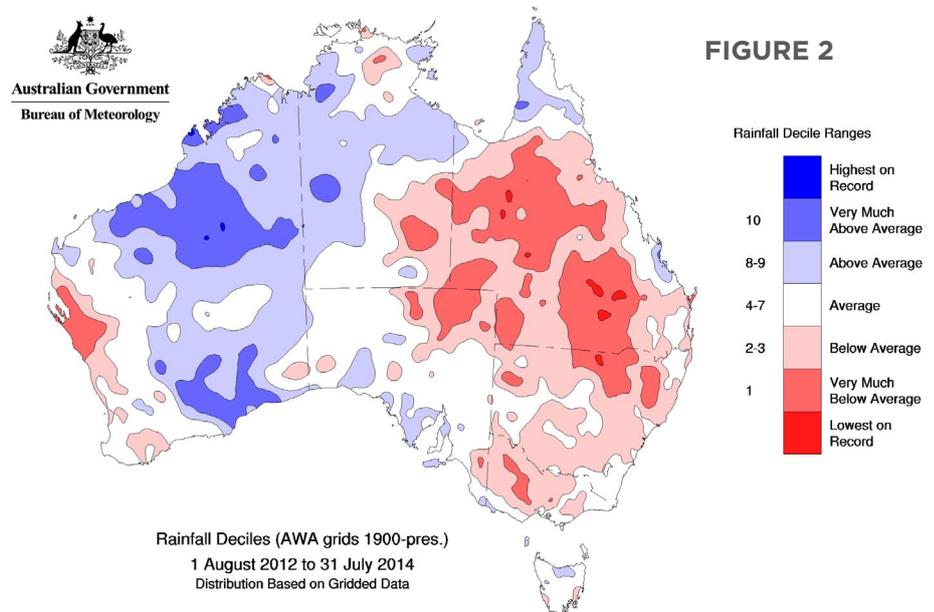
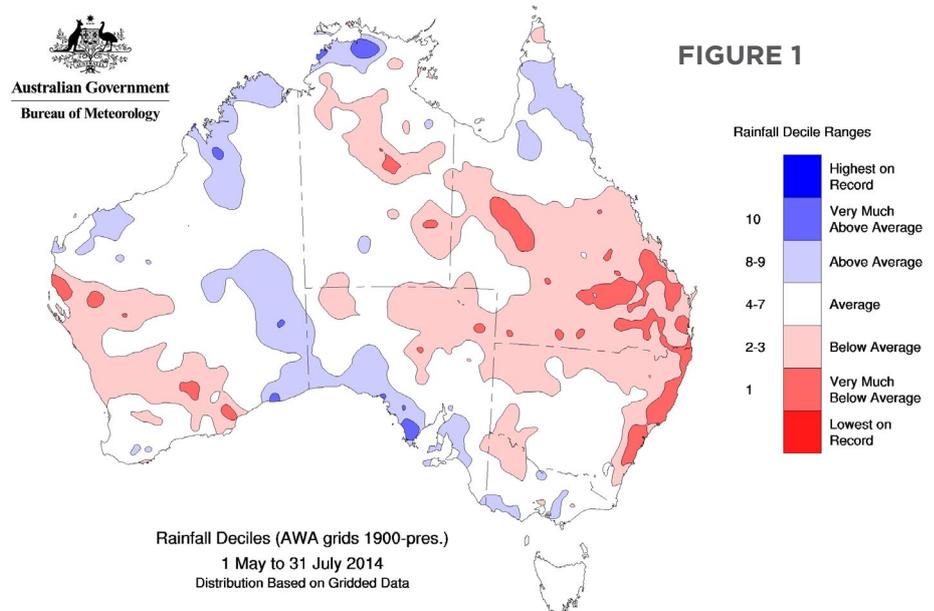
Such impacts are challenging the limited resources of the fire and land management agencies and have created the situation where each fire season is demanding both in economic and human costs.

The page 1 map reveals the bushfire outlook for southern Australia through to 2015. This map has been combined with the outlook for the northern Australia bushfire season, which was released at the beginning of the northern fire season in July, to show the areas of fire potential for all of Australia in 2014-15 (see *Hazard Note 001*, July 2014).

BUSHFIRE POTENTIAL

Fire season potential depends on several factors. The volume, location and timing of rainfall in the period leading up to the fire season are critically important for estimating fuel loads and dryness. The temperature and rainfall outlooks for the next few months are crucial factors for fire behaviour.

Of particular importance are the future tendencies of Pacific sea surface temperatures associated with the El Niño-Southern Oscillation, a major driver of climate over much of Australia.



Other factors, such as the distribution of firefighting resources, previous fire activity and the amount of prescribed burning, are also considered in the analysis of fire potential.

The Southern Seasonal Bushfire Assessment Workshop was hosted by the Tasmania Fire Service in Hobart on 21 August. The workshop, supported by the Bushfire and Natural Hazards CRC and AFAC, brought together fire and land managers, climatologists and meteorologists to evaluate the upcoming season for the southern part of Australia.

The group discussed the weather, landscape conditions and cross-border implications leading into summer and determined areas that had the potential for a fire season that was above normal, normal or below normal.

Attendees included representatives of the Bushfire and Natural Hazards CRC, AFAC, the Bureau of Meteorology, Emergency Management Australia, Tasmania Fire Service, the Australian Capital Territory Emergency Service Agency, the New South Wales Rural Fire Service, South Australia's Country Fire Service, Victoria's Country Fire Authority and Department of Environment and Primary Industries, and Western Australia's Department of Parks and Wildlife and the Department of Fire and Emergency Services.

The *Southern Australia Seasonal Bushfire Outlook* and the earlier *Northern Australia Seasonal Bushfire Outlook* provide information to assist fire authorities in making strategic resource and planning decisions leading into the fire season.

ANTECEDENT CONDITIONS

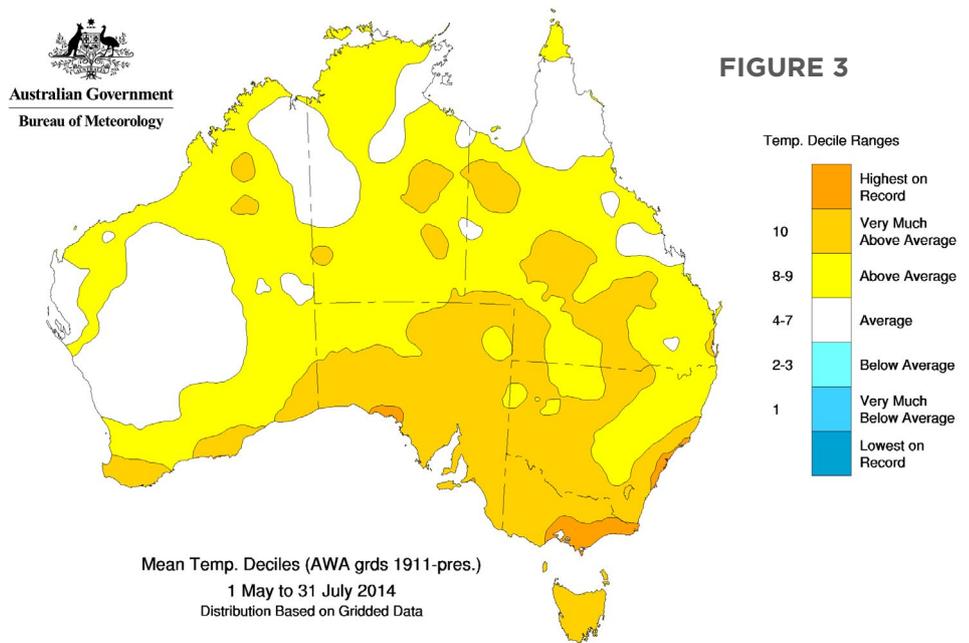
Rainfall since May has tended to be below average across most of Queensland, northern and eastern New South Wales, northern South Australia and much of south west Western Australia (figure 1, page 2). A particularly dry August has affected most parts of southern Australia, meaning that the extent of deficiencies will substantially expand beyond those evident at the end of July across Victoria, southern South Australia and Tasmania. On time scales of 12 to 24 months (figure 2, page 2), below-average rainfall has dominated almost the entirety of eastern Australia as well as the south western areas of Australia, meaning that long-term substantial deficits persist in these areas. The underlying dry conditions mean that any surface moisture will quickly decline with warmer temperatures and reduced rainfall over summer.

2013 was Australia's warmest year since comparable records began in 1910, and persistent warm conditions have continued to affect Australia during 2014 (figure 3, above). These above average temperatures have been a feature across almost the whole country, and particularly affected the eastern states in 2014, including the major eastern capital cities. This combination of underlying rainfall deficits, with persistently above average temperatures and near El Niño conditions in the Pacific, means that the antecedent conditions favour an early and above normal fire season in many areas.

SEASONAL CLIMATE OUTLOOK

The past few months have seen near El Niño conditions in the Pacific, with a negative Indian Ocean Dipole (IOD); a highly unusual combination. The consensus of model forecasts from various international centres suggests that the coming months are likely to see the IOD return to neutral values. The outlook for the El Niño remains somewhat uncertain, with above average temperatures likely to continue across much of the tropical Pacific Ocean. Conditions approaching El Niño or weak El Niño conditions are the most likely scenarios.

With the El Niño-Southern Oscillation still not making the shift into El Niño territory just yet and the negative IOD returning to neutral, the seasonal climate outlook for September to November does not show a strong bias toward below average or above average rainfall over most of southern Australia. The main exception is southern NSW and



central Victoria, where a dry season is most likely (figure 4, page 4).

The outlook for temperatures in spring shows that above average temperatures are most likely across southern and eastern Australia (figure 5, page 4). Historically, El Niño has brought more frequent hot days to south eastern Australia. It is not clear whether this will occur this season. However, even without the effects of an El Niño, there will be hot days during the coming fire weather season.

REGIONAL SUMMARIES

ACT

While the ACT does not have a strong signal for the severity of the coming summer, there are several reasons for expecting above normal fire potential. These include:

- Strong grass growth into early winter.
- Forecast for above average temperatures into summer.
- A reduction in rainfall in recent months, with heavy rains falling only in adjacent central areas of NSW.

NEW SOUTH WALES

Much of NSW experienced well below average rainfall in the three months leading up to August. Temperatures have also been above average or very much above average for all of this time. This has resulted in significant drying of the heavy fuels in the forests. Reduced rainfall has also resulted in reduced growth and lower grass fuel loads through much of the west of the state.

The next three months are forecast to have average rainfall over much of the state except the southern border areas, which

are forecast to have reduced rainfall. The temperatures are forecast to remain above average for much of the state. Under these conditions the drying trend will continue and it is expected to result in above normal fire activity for the coastal table lands and central slopes of the state while the risk of significant fire in the west of the state will be normal.

WESTERN AUSTRALIA

In Western Australia, the Wheatbelt region has below average grass fuel loads as a result of average and below average rainfall totals across the region.

In the South West reduced rainfall, a long term deficit in the soil moisture and high fuel loads has led to above normal fire potential.

Conversely, across the Mid West and Desert, it is the high fuel loads as a consequence of above average rainfall totals that warrant the expectation of an above normal fire season. Rainfalls in the area has led to high fuel loads. The higher rainfall across the Nullarbor, east of the Fraser Range, has also led to an above normal fire potential.

SOUTH AUSTRALIA

In South Australia the outlook conditions indicate the most likely scenario is for near normal fire potential across southern agricultural areas of the state, with parts of the North West Pastoral, West Coast, Eastern Eyre Peninsula, Lower Eyre Peninsula, Flinders and Mid North districts likely to be above normal fire potential.

All these areas of above normal fire potential have had above average rainfall in the period leading up to the fire season, resulting in above average fuel loads. The

North West Pastoral and Flinders regions also have abundant fuel loads that have been building up from previous seasons.

The area adjacent to the Northern Territory border (north of the APY Lands) has normal fire potential, in line with the normal potential indicated by the Northern Territory.

A normal to above normal fire potential may see the need for firefighting resources over a longer period of time, together with a longer time for mop-up post fires. The districts where there is potential for above average activity may pose resourcing issues during this fire season, should above level of activity be experienced.

QUEENSLAND

The overview for the state is that generally grass fire potential is reduced as a result of the drought. Forest fuels continue to dry out, making more of the fine fuels available for the upcoming fire season.

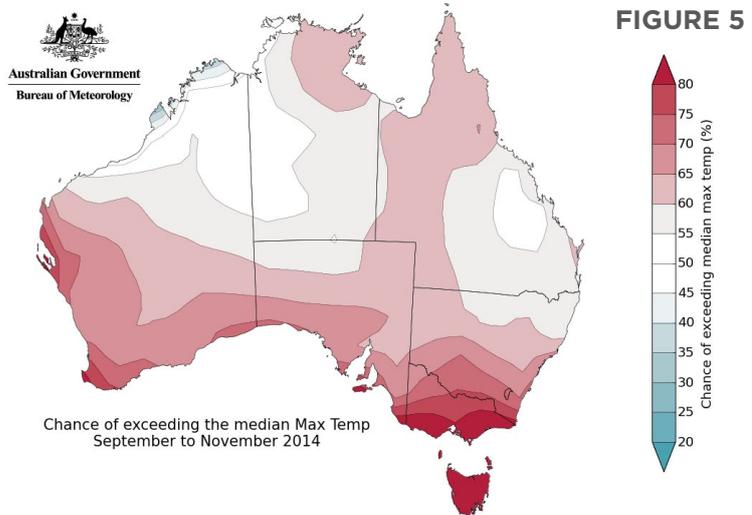
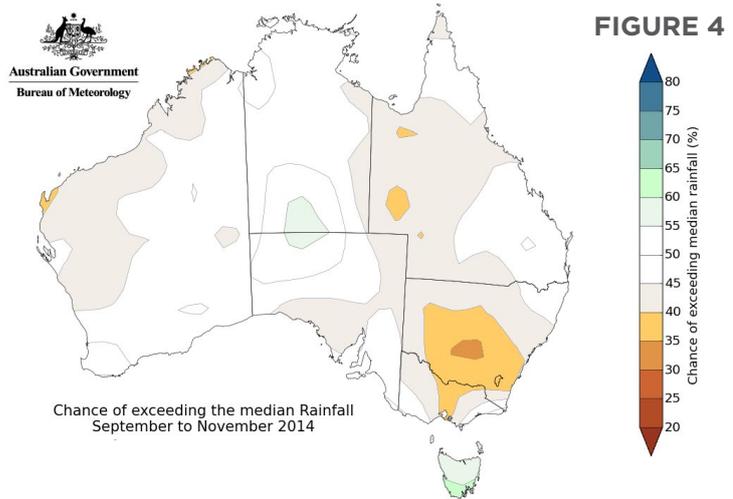
Recent wet seasons have failed to deliver widespread rains resulting in significantly reduced rainfall particularly in inland areas. More than 75 percent of Queensland is now drought declared. Rainfall from tropical cyclones was patchy and as a result the pasture growth is varied across the state.

In general, grassland fuel loads are significantly less than the average and curing across much of the state is ahead of the same time last year.

Above normal fire potential has been assessed for much of south east Queensland, from Bundaberg south west to Gayndah, north west to Biloela, south to Miles, across to Roma and down the Carnarvon Highway to the NSW border.

TASMANIA

Overall, normal fire season potential is expected over most of the state and on the Bass Strait Islands in the period to the end of December. There is above normal potential in the central part of the east coast between Swansea and St Helens and extending around Fingal. The south of the state is relatively moist, including the Derwent Valley and the Southern Midlands. Forest fires are expected to be relatively normal up to December in the eastern half of the state. while forest fire



activity in the west will be suppressed. Similarly, moorland and scrub fuels are expected to be relatively normal while grassland fire activity will be low during spring and early summer.

VICTORIA

A preliminary investigation of factors affecting the fire season outlook for 2014-15 point to an above normal season in many areas of central, north and western Victoria. Key factors are an overall rainfall deficit coupled with the potential for an earlier start to the season.

Areas with long-term rainfall deficits run from the west of Melbourne to the central Wimmera and also north through central Victoria into the Mallee. Another band exists extending

from the north east of Melbourne to the northern slopes of the Great Dividing Range.

Shorter term deficits are emerging in a broad band across much of the state's north, extending south to the northern rises of the Great Dividing Range. Similar deficits are emerging in coastal and southern Victoria, though the exact pattern in these areas is not yet clear.

Climatic signals indicate a likely return to warm conditions in spring. There is no strong signal on rainfall, and agencies will be closely monitoring rainfall amounts across the state.

Widespread above average rainfall conditions are not likely, but even in the event they occur, Victoria may still expect, given the antecedent conditions, a fire season slightly more active than 2013-14.

The Bushfire and Natural Hazards CRC is a national research centre funded by the Australian Government in the Cooperative Research Centre (CRC) Program. It was formed in 2013 in partnership with the fire, land and emergency service management agencies in Australia and New Zealand for an eight year program to undertake end-user focused research.

Hazard Notes are prepared from available research at the time of publication to encourage discussion and debate. The contents of the Hazard Notes do not necessarily represent the views, policies, practices or positions of any of the individual agencies or organisations who are stakeholders of the Bushfire and Natural Hazards CRC.

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