HAZARD NOTE

bushfire&natural HAZARDSCRC

ISSUE 75 JULY 2020
TOPICS IN THIS EDITION | FIRE IMPACTS | FIRE SEVERITY | FIRE WEATHER

AUSTRALIAN SEASONAL BUSHFIRE OUTLOOK: JULY 2020

bushfire&natural HAZARDSCRC afac

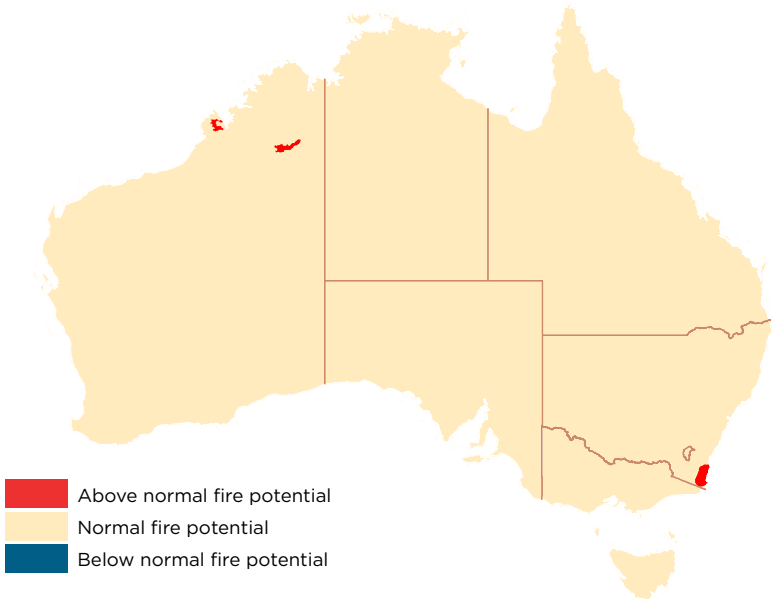
OVERVIEW

The winter period coincides with the dry season in northern Australia, and sees this part of the country enter its fire season. The *Australian Seasonal Bushfire Outlook: July 2020* covers all states and territories for the period of July until September, but is particularly relevant to the areas now in their fire season, or due to begin their fire season in the coming months – Queensland, the Northern Territory and northern Western Australia.

In Western Australia, rainfall from tropical cyclones has led to above normal fire conditions in parts of the Kimberley. For Queensland, normal fire potential is expected, however there is a risk of grass fires due to good grass growth in some areas. Normal fire potential is forecast for the Northern Territory. Given the long-term dry conditions in the area, the south coast of New South Wales has above normal fire potential for the time of year for areas that did not burn during the 2019/20 season.

Elsewhere across the country, normal fire potential is expected for the time of year. With a La Niña WATCH current, most states and territories are watching the grass fire risk for coming months, as increased rainfall could see this risk increase when the weather warms. It is important to remember that areas designated as normal fire potential may experience fire. Normal risk does not mean there is no risk.

The *Australian Seasonal Bushfire Outlook: July 2020* is developed by the Bushfire and Natural Hazards CRC, AFAC, the Bureau of Meteorology, Queensland Fire and Emergency Services, the New South Wales Rural Fire Service, ACT Emergency Services Agency, ACT Parks and Conservation Service, Country Fire Authority, Department of Environment, Land, Water and Planning Victoria, Tasmania Fire Service, Country Fire Service, Department of Fire and Emergency Services and Department of Biodiversity, Conservation and Attractions Western Australia, and Bushfires NT.



▲ Figure 1: AUSTRALIAN SEASONAL BUSHFIRE OUTLOOK JULY 2020. AREAS ARE BASED ON THE INTERIM BIOGEOGRAPHIC REGIONALISATION FOR AUSTRALIA AND OTHER GEOGRAPHICAL FEATURES.

OUTLOOK – WINTER 2020

Fire management is a year-round process, and bushfire potential depends on many factors. For northern Australia, where the fire season occurs at this time of year, conditions are determined by the nature of the previous wet season. The volume, location and timing of rainfall are critically important when estimating vegetation (fuel) volumes and growth. The climate outlook for the next few months is also a crucial factor.

The *Australian Seasonal Bushfire Outlook: July 2020* covers all states and territories through to September 2020. It reflects the priorities in each state and territory for the coming months given the expected climate conditions, and 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.

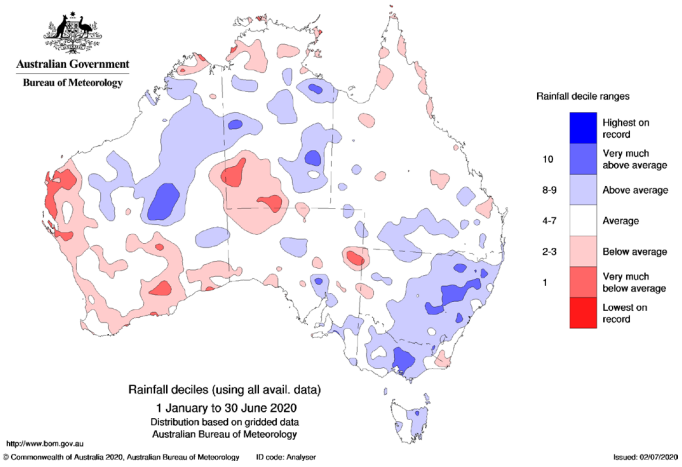
Across the country, autumn presented an opportunity to conduct prescribed burning where appropriate weather conditions allowed. In some states and territories, this will continue through winter when possible.

DEFINITION

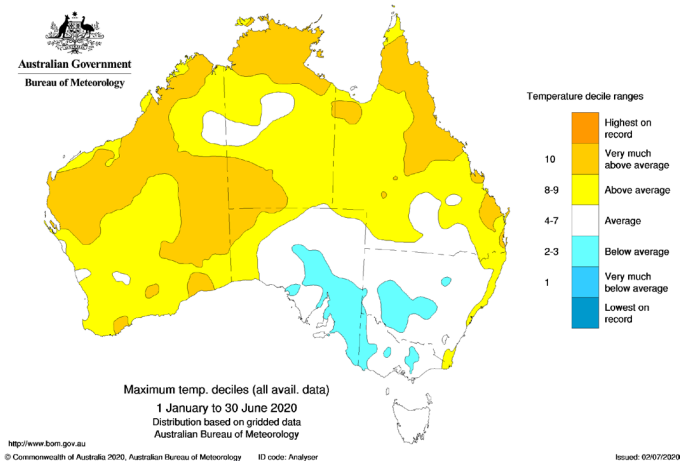
Bushfire potential: The chance of a bushfire or number of bushfires occurring of such size, complexity or other impact (such as biodiversity or global emissions) that requires resources (from both a pre-emptive management and suppression capability) beyond the area in which it or they originate. Bushfire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

RECENT CONDITIONS

Seasonal fire conditions are a function of fuel (vegetation) amount and state, and seasonal



▲ Figure 2: RAINFALL DECILES FOR JANUARY TO JUNE 2020.



▲ Figure 3: TEMPERATURE DECILES FOR JANUARY TO JUNE 2020.

weather conditions. 2019 was the warmest and driest year on record for Australia, with many records set. However, the first half of 2020 has seen a shift to more normal rain patterns for a number of areas. This start to the year has been wetter than in the previous two years, and contrasts with prolonged drought in some, but not all, locations, over that period.

January to June 2020 saw more normal rain patterns return to much of southern and eastern Australia (Figure 2, above), with a number of tropical incursions bringing rainfall to drought-affected parts of eastern Australia. This rainfall has eased short-term deficiencies in many areas, especially in the south east of the country. However, years of below average rainfall means that water storages remain low—especially in the northern Murray-Darling Basin—and many months of above average rainfall is needed for the wider environment to fully recover. In the last three months, some areas such as east of the Great Dividing Range, have seen drier than average conditions. A positive Southern Annular Mode through late May and June has resulted in below average rainfall over much of the country, especially in south west Western Australia, adding to rainfall deficiencies in this area.

Some areas of the country did not see any widespread relief from long-term dry conditions. This includes south west Western Australia, which despite seeing some above average rainfall in February, has seen drier than average conditions in autumn and early winter, a wetter period of the year climatologically. Additionally, the northern wet season (October 2019 to April 2020) saw low rainfall across parts of northern Australia, and much of the south. This is the second successive dry wet season, with 2018/19 also below average. Some factors contributing to the drier conditions seen in the 2019/20 wet season included a late monsoon onset in January, three weeks later than average in the Northern Territory, and below average tropical low/cyclone activity. In addition, a strong positive Indian Ocean Dipole was in place until the end of 2019, likely helping to suppress the start of the northern wet season.

The long-term warming trend means that above average temperatures now tend to occur in most years, and recent months have generally followed this pattern. The exception to this was May 2020, which saw the first cooler than average month nationally since October 2016. Temperatures in Australia for 2019 were the warmest in 110 years of record (1.52 °C above the 1961–1990 average, see Annual Climate Statement 2019, Bureau of Meteorology). Early 2020 has continued to see warmer days for much of the north and west. High temperatures add to the impact of reduced rainfall by increasing evaporation.

The combined very hot and dry conditions saw Australia experience one of its most devasting southern fire seasons in 2019/20. The rainfall in early 2020 has eased the fire risk for most of eastern Australia, however, South Australia and Western Australia have seen drier conditions persist into winter.

The tendency for fire seasons to become more intense and fire danger to occur earlier is a clear trend in Australia's climate, reflecting reduced and/or less reliable cool season rainfall and rising temperatures (see State of the Climate 2018, CSIRO and Bureau of Meteorology). Fire season severity is increasing across much of Australia as measured by annual (July to June) indices of the Forest Fire Danger Index, with the increases tending to be greatest in inland eastern Australia and coastal Western Australia.

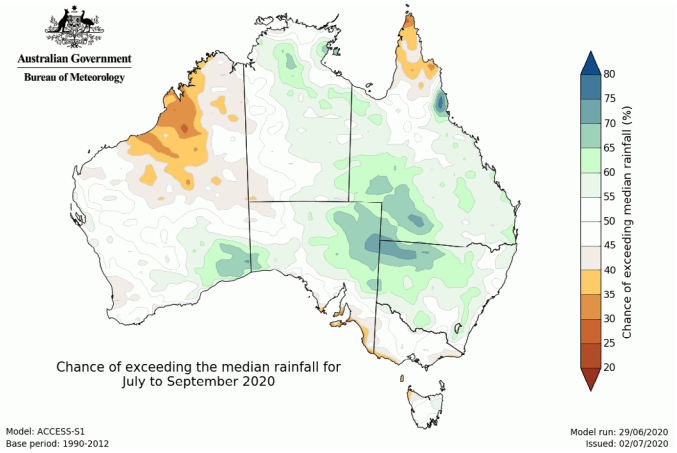
CLIMATE OUTLOOK

Climate outlooks are influenced by active climate drivers, together with other factors including long-term trends.

The influences of the climate in 2020 are very different to those that led to the extreme dry conditions in 2019. Both the El Niño-Southern Oscillation (ENSO) and the Indian Ocean Dipole are currently neutral. However, the Bureau of Meteorology's *ENSO Outlook* has shifted to La Niña WATCH. This means there is around a 50% chance of La Niña forming in 2020, roughly double the normal likelihood. La Niña typically sees above average rainfall over much of Australia. Combined with warmer than average water in the eastern Indian Ocean, this is helping to increase the likelihood of wetter than average conditions across the eastern two-thirds of Australia in the coming months.

The rainfall outlook for July to September (Figure 4, page 3) shows an above average likelihood of wetter than average conditions for parts of central and eastern Australia, extending from north eastern South Australia through New South Wales, as well as central parts of the Queensland coast. Most of the remainder of the country has roughly equal chances of wetter or drier than average conditions, but drier than average for parts of the north west and Cape York Peninsula. Historical outlook accuracy for July to September is very high across much of Australia, but generally moderate to low for western Western Australia, northern Queensland, and in the south east of the country.

Maximum and minimum temperatures during July to September are very likely to be warmer than average across most of Australia (Figure 4 and Figure 5, page 4). Historical accuracy for July to September maximum temperatures is moderate to high across most of Australia, but low in the central Northern Territory to western Queensland. Minimum



▲ Figure 4: CHANCE OF EXCEEDING THE MEDIAN RAINFALL FOR JULY TO SEPTEMBER 2020.

temperature accuracy is moderate to high for much of Australia—very high for northern Australia and north east New South Wales, but low to very low for much of central and southern Western Australia.

While the outlook is favouring good rainfall for the coming months, recent low rainfall in May and June mean a close watch will be kept on where the rainfall does and does not fall leading into the 2020/21 southern fire season.

Updates to climate forecasts, including forecasts of monthly, fortnightly and weekly outlooks and the outlook for the Indian Ocean Dipole and the El Niño-Southern Oscillation will continue to be published at www.bom.gov.au/climate/ahead.

REGIONAL SUMMARIES

WESTERN AUSTRALIA

As noted in April's *Australian Seasonal Bushfire Outlook*, rainfall from Tropical Cyclones *Blake* (early January), *Damien* (early February) and *Esther* (mid February) has resulted in above average root zone soil moisture content for most of the Kimberley and parts of the East Pilbara. Good vegetation growth for tropical grasses and spinifex is visible across the landscape, suggesting potential increases in fuel loads and a delay in grass curing. Planned burning and grazing have been undertaken in these areas, and despite a delayed start to the dry season, the Dampierland, Central Kimberley and Ord Victoria Plain bioregions have been identified as having above normal fire potential due to higher than normal fuel loads.

Soil moisture has decreased across the southern half of Western Australia compared to monthly averages. Woody vegetation in the south western third of the state continues to experience long-term soil moisture deficits, increasing their relative flammability. However, the climate outlook suggests cooler and wetter weather conditions in the coming months, and this should restore root-zone soil moisture, resulting in normal fire potential for this part of the state over the outlook period.

NORTHERN TERRITORY

Wet season rainfall totals in most areas across the Northern Territory were well below average for 2019/20. Two areas were exceptions - the Arnhem East and Gregory North West Fire Weather Forecast Areas - which both received average rainfall. For most of the Northern Territory, it was the second consecutive wet season of below average rainfall. Apart from these two areas, grassy vegetation (fuels) are all but cured. Prescribed burning in the north went ahead as planned, however as a result of the well below average wet season rain, fuel mitigation was limited to strategic corridors and fine scale properties. The Fire Danger Period has been declared earlier because of the drier than usual conditions including grassy fuel curing, and covers the northern half of the Northern Territory. To date, fire season activity, fire mitigation efforts and fuel loads suggest normal fire potential for all regions through to September. Weather modelling by the Bureau of Meteorology suggest that there is an increased chance of an earlier start to the northern Australia wet season.

QUEENSLAND

Late summer rainfall has triggered increased grass growth through parts of Queensland. This growth is in contrast to that seen across areas that were heavily affected by drought in recent seasons. Reduced livestock stocking rates have increased the likelihood that these grass fuel loads may be carried over into the start of the fire season in some areas.

Forested areas, particularly in south east Queensland, remained dry through May due to below average rainfall. Relative soil moisture levels in these areas have now largely returned to normal. There is however significant long-term underlying soil dryness across much of southern Queensland.

The climate outlook through to October is supporting above average rainfall across most of the eastern half of Australia.

As a result, Queensland is expecting a different fire season to what has been experienced in the last two years. There is normal fire potential for the state, however if the projected above average rainfall does not eventuate in coming months, forested areas may become readily available due to the long-term underlying dryness. Areas carrying significant grass fuel loads may see an increased risk of grass fires, particularly during the start of the season, though projected rainfall and warmer temperatures may also lead to rapid greening up of these areas in late winter and early spring.

NEW SOUTH WALES

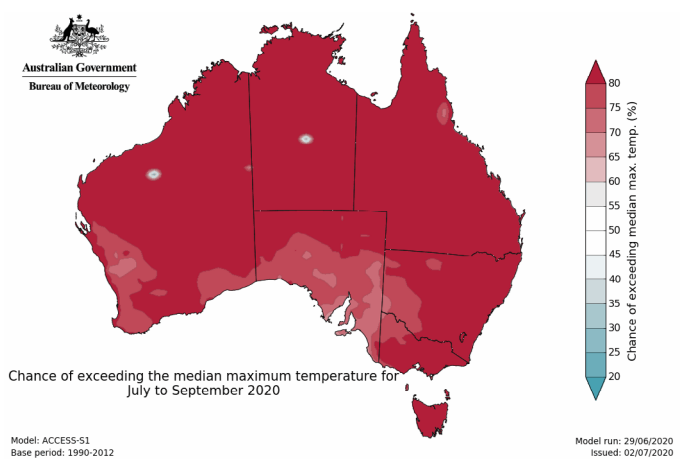
Large parts of NSW west of the Great Dividing Range have experienced welcome rain since March, which has increased soil moisture in these areas. However, long-term rainfall deficiencies remain right across the state. In particular, dry sub soil conditions on the northern ranges, far north coast and south coast are of concern. These areas are being monitored closely.

Due to ongoing dry conditions and a reduced chance of above median rainfall, above normal fire potential is expected for the south coast for this time of year in areas unburnt after last season's fires. However, should a significant rain event, which has been forecast for mid-July, affect the south coast, this is likely to decrease the fire potential for the outlook period.

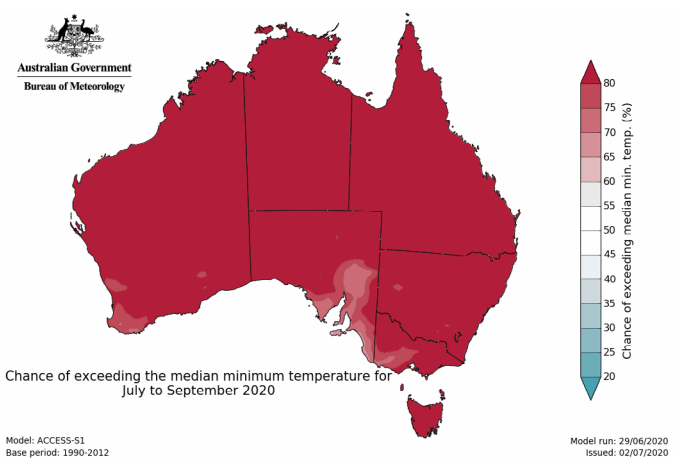
In spite of dry conditions, normal fire potential is expected for the northern ranges and far north coast due to an increased chance of above median rainfall in these areas.

With a La Niña WATCH current, the rainfall outlook appears favourable for much of the state. Whilst the bushfire outlook on the balance of the forecast is normal for most of NSW for the winter period, there is a need to monitor for unusual weather events (particularly windy conditions) that occasionally present during this period.

The grass fire risk will continue to be monitored west of the Divide over coming months. Recent and forecast rain, combined with warmer than average temperatures, may provide ideal growing conditions for grassland areas. Whilst this is potentially good news, this spring growth has the potential to increase



▲ Figure 5: CHANCE OF EXCEEDING THE MEDIAN MAXIMUM TEMPERATURE FOR JULY TO SEPTEMBER 2020.



▲ Figure 6: CHANCE OF EXCEEDING THE MEDIAN MINIMUM TEMPERATURE FOR JULY TO SEPTEMBER 2020.

grassland fuel loads as it dries through summer.

Since April, fire management in NSW has focused on hazard reduction. Where weather permits, NSW fire and land management agencies will continue to undertake hazard reduction burning in the coming months.

ACT

With some useful rain over autumn, the ACT has had some relief from the ongoing severe drought. Bushfire risk managers will be monitoring conditions over winter and spring to see how the bushfire risk develops ahead of the next fire season. At present the landscape is damp and there is minimal bushfire risk, which is normal for winter. Bushfire risk mitigation actions, under the ACT Government's Strategic Bushfire Management Plan, continue. Community members need to continue to keep their property bushfire safe, and should take the opportunity over winter to review their bushfire survival plans.

VICTORIA

Throughout autumn large parts of Victoria have seen above average rainfall, with the exception of East Gippsland. As a result, there are still areas in Gippsland with unburnt vegetation – particularly in the north, west and along coastal strips. These areas have experienced three years of drought. In the last two seasons, the fire danger period in East Gippsland has commenced earlier than usual and it is anticipated that an early season start is likely for the coming season given the dry conditions. If this drying trend continues in East Gippsland, it is possible that fires in the scale of a thousand hectares may develop under prolonged warm and windy conditions in late winter or early spring. For the remainder of the state, normal fire conditions are expected during winter.

With the increased rainfall, there are good prospects for spring pasture and crop growth in the north and west of the state. A La Niña WATCH is current, and if a La Niña eventuates there is a higher than normal chance of above average rainfall during spring. As a result, fire risk in pastoral and agricultural areas will be monitored closely come spring. Planned burning activity in Victoria is typically reduced during winter due to unsuitable weather conditions.

SOUTH AUSTRALIA

South Australia has experienced average rainfall since March, with exceptions being parts of the south east and north east, which have seen slightly above average rainfall, and the APY Lands in the north west, which has experienced below average rainfall. Variability associated with the path of significant weather systems has meant soil dryness seen across observation points is extremely variable. For example, in the Flinders and Mount Lofty Ranges, soils are very wet, whilst in the Riverland and parts of the Eyre Peninsular, soils are quite dry.

In partnership with the Department of Environment and Water, prescribed burning has been undertaken where conditions have allowed, however opportunities in the foreseeable future will be limited due to fuel conditions, with vegetation currently too wet to burn.

There is low potential for fire activity across South Australia for the winter period, which is considered normal for the time of year. The current climate outlook shows an increased chance of above normal rainfall through to September, which may increase fuel loads in grassland and cropping areas into spring.

TASMANIA

Autumn rains significantly eased moisture deficits in the northern and eastern parts of the state, while good progress was made with planned burning until the program was ended by early winter rain. Planning is underway to take advantage of suitable weather windows during late winter and early spring for further planned burning and other bushfire mitigation. Deep soil moisture levels are still low in the eastern half of the state but will be improved with further rain. Fire threat levels are normally low in Tasmania until spring unless there are significant drought conditions, and as a result, normal fire potential is expected for this winter.

The Bushfire and Natural Hazards CRC is a national research centre funded by the Australian Government Cooperative Research Centre Program. It was formed in 2013 for an eight-year program to undertake end-user focused research for Australia and New Zealand.