HAZARD **NOTE**

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**TOPICS IN THIS EDITION** | FIRE IMPACTS | FIRE SEVERITY | FIRE WEATHER

# AUSTRALIAN SEASONAL BUSHFIRE OUTLOOK: SEPTEMBER – NOVEMBER 2020

## OVERVIEW

The 2020/21 fire season will be driven by vastly different climate drivers than the previous two fire seasons. With a La Niña ALERT now active, large areas of eastern and northern Australia are expecting wetter than average conditions through spring. Despite the wetter climate signals, parts of Queensland face above normal fire potential in the south east and central coast, extending to the north.

While these wetter conditions in eastern Australia will help in the short-term, they may lead to an increase in the risk of fast running fires in grasslands and cropping areas over summer. These conditions will be monitored closely over the coming months.

In contrast to the wetter conditions for the east, dry conditions persist in Western Australia, with above normal fire potential continuing to be expected in parts of the north.

The *Australian Seasonal Bushfire Outlook: September - November 2020* covers all states and territories. 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.

The *Australian Seasonal Bushfire Outlook: September - November 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.

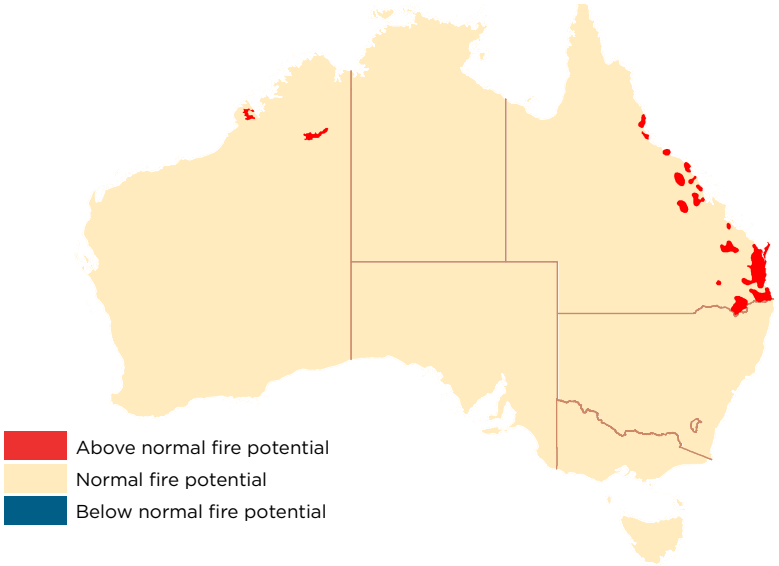



**Figure 1:** AUSTRALIAN SEASONAL BUSHFIRE OUTLOOK: SEPTEMBER – NOVEMBER 2020. AREAS ARE BASED ON THE INTERIM BIOGEOGRAPHIC REGIONALISATION FOR AUSTRALIA AND OTHER GEOGRAPHICAL FEATURES.

## OUTLOOK – SPRING 2020

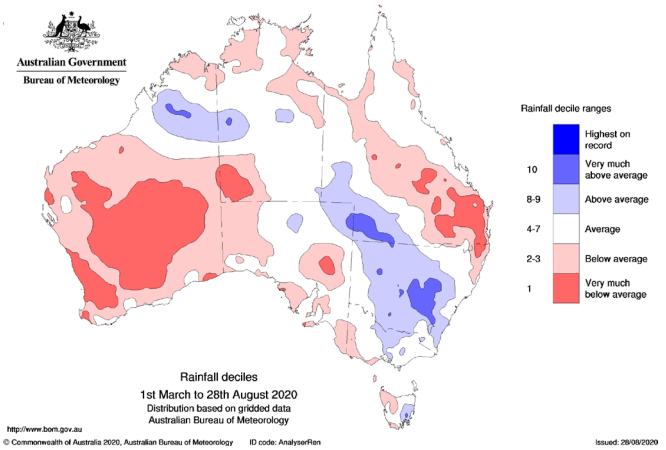
Fire management is a year-round process, and bushfire potential depends on many factors. The volume, location and timing of rainfall are critically important when estimating vegetation (fuel) volumes and growth. The climate outlook for the next few months is also a crucial factor. Of particular interest are the future tendencies of Pacific sea surface temperature associated with the El Niño-Southern Oscillation, as well as the Indian Ocean Dipole, major climate drivers over Australia. Other less quantifiable factors, such as the distribution and readiness of firefighting resources, are also considered.

Both the El Niño-Southern Oscillation and the Indian Ocean Dipole are expected to influence the weather, and therefore fire conditions, during spring. In the Pacific, a La Niña ALERT was issued in mid-August by the Bureau of Meteorology. La Niña typically sees above average spring and summer rainfall over much of eastern and northern Australia. A negative Indian Ocean Dipole may develop during spring, which would further increase the likelihood of wetter conditions in eastern Australia.

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

## DEFINITION

**Fire potential:** The chance of a fire or number of fires 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. Fire potential depends on many factors including weather and climate, fuel abundance and availability, recent fire history and firefighting resources available in an area.




▲ **Figure 2:** RAINFALL DECILES 1 MARCH TO 28 AUGUST.

## RECENT CONDITIONS

Seasonal fire conditions are a function of fuel (vegetation) amount and state, and seasonal weather conditions. 2019 was warmest and driest year on record for Australia, with many records set. To date, 2020 has seen a shift away from these drier conditions to closer to average rainfall patterns for large parts of the country. However, the last six months has seen drier than average conditions over central and south east Queensland and parts of southern Australia, including large parts of Western Australia (see Figure 2, above).

Rainfall deficiencies over large parts of drought affected New South Wales and Victoria have reduced significantly compared to this time last year, and soil moisture has returned to average in many areas. However, multiple years of below average rainfall means that much of the northern Murray–Darling Basin, eastern South Australia and south west Western Australia require a much longer period of above average rainfall for the wider environment to fully recover. For instance, while water levels in storages across the northern Murray Darling Basin have increased in recent months, they remain at only 21% of their capacity.

Despite above average rainfall across large parts of the country since the start of the year, June and July were largely drier than average nationally, especially in the south west. In contrast, some regions such as the south coast of New South Wales have recorded above average rainfall, largely from the impact of multiple coastal lows.

South west and southern Western Australia is notable in that it has seen much drier than average conditions in autumn and winter – normally the wettest time of year for these regions. These regions have seen an increase in the area in drought this winter.

The long-term warming trend means that above average temperatures now occur in most years, and recent months have 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).

To date, 2020 has continued to bring warmer than average conditions for much of the north and west of Australia. Western Australia recorded its second warmest July on record in 2020, second only to July 2019, while June 2020 was warmest on record. High temperatures add to the impact of reduced rainfall by increasing evaporation. Cooler than average conditions have been experienced around large parts of the south east away from mainland eastern coastal areas.

The combined very hot and dry conditions of 2019 saw Australia experience one of its most devasting southern fire seasons in 2019/20. Rainfall so far in 2020 has eased the fire risk for large parts of eastern Australia, however southern South Australia and Western Australia have seen drier and warmer conditions persist this year. More rainfall is needed across many areas to fully recover from the extreme season of 2019/20.

## CLIMATE OUTLOOK

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

The climate influences 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* was raised to La Niña WATCH in late June, then to La Niña ALERT in mid-August. This means there is now around a 70% chance of La Niña forming in 2020, roughly triple the normal likelihood. La Niña typically sees above average spring and summer rainfall over much of eastern and northern Australia. Combined with warmer than average waters 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.

Furthermore, half of the models surveyed by the Bureau indicate a negative Indian Ocean Dipole may develop during spring. A negative Indian Ocean Dipole would act to further increase the likelihood of wetter than average conditions across eastern Australia.

The rainfall outlook for September to November (Figure 3, page 3) shows wetter than average conditions are very likely for most of the eastern two-thirds of mainland Australia, while conditions are likely to be drier than average around the Kimberley and Pilbara regions of Western Australia, as well as south western Tasmania. Most of the remainder of the country has roughly equal chances of wetter or drier than average conditions. Historical outlook accuracy for September to November is very high across much of Australia, but generally moderate to low around the Western Australia and Northern Territory border.

Maximum temperatures during September to November are very likely to be warmer than average across the northern tropics and most of Tasmania, while cooler than average conditions are likely over most of New South Wales and South Australia, southern Queensland, northern Victoria and the south east coast of Western Australia (Figure 4, page 3). Elsewhere, temperatures are closer to average. Minimum temperatures (not shown) are very likely to be warmer than average across the eastern two-thirds of Australia, while the outlook is for closer to average temperatures towards south western Western Australia. Historical accuracy for September to November maximum temperatures is high across all of Australia. Minimum temperature accuracy is moderate to high across much of Australia, very high in Victoria and Tasmania, and low around central parts of Queensland.

The tropical cyclone season, which typically starts in November, is likely to be more active this season than in recent years for both Queensland and Western Australia due to the influence of La Niña. While this may increase the chance of rainfall, areas

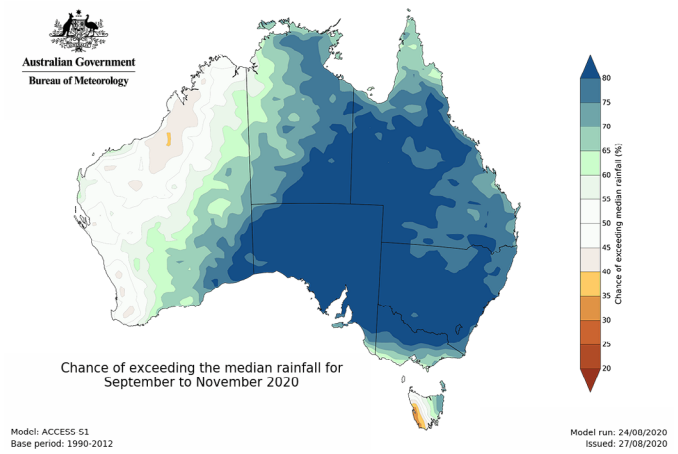



**Figure 3:** CHANCE OF EXCEEDING THE MEDIAN RAINFALL FOR SEPTEMBER TO NOVEMBER 2020.

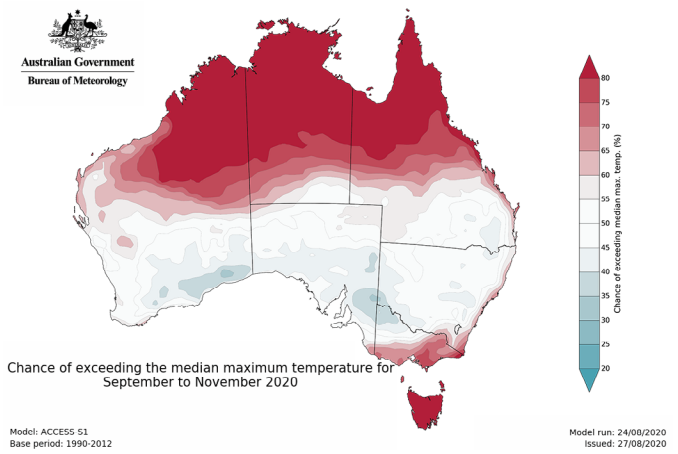



**Figure 4:** CHANCE OF EXCEEDING THE MEDIAN MAXIMUM TEMPERATURE FOR SEPTEMBER TO NOVEMBER 2020.

of increased wind could potentially interact with any fires in the south of the country.

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

### QUEENSLAND

The major climate drivers are favouring a wetter than normal spring across most of Queensland. If this rainfall eventuates there is potential for the bushfire season to be milder than the previous two seasons. However, if widespread rain does not eventuate, above normal bushfire potential in forested areas in South East Queensland and some central coast areas extending north is likely.

The South East, bounded by Rockhampton to the NSW border south of Cunnumulla, and extending to the coast, has seen significantly below average rainfall over the past 12 to 24 months. As a result, most of this area is experiencing significant drought. Twelve-month rainfall deficiencies have also persisted along much of the state's east coast.

August has seen above average rainfall in some coastal areas between Mackay and Cairns, and from Maryborough to the NSW border. However significant rainfall is still needed to return these areas to average conditions.

Across the remainder of the state very large areas have very low to no grass cover relative to long-term records. With a La Niña ALERT current, Queensland is likely to experience above median rainfall during the outlook period. As a result it is very unlikely this will translate into an elevated grass fire risk before December. Therefore, with around 60% of the state comprising grass and woodland with grassy understory fuels, normal fire potential has been assessed.

### NEW SOUTH WALES

Large parts of NSW have experienced welcome rain over the last six months, reducing soil moisture deficits for much of the state. However, long-term rainfall deficiencies are still significant in the north and west. In particular, dry sub soil conditions on the northern ranges are of concern. These areas are being monitored closely.

With a La Niña ALERT current, the rainfall outlook appears favourable for much of the state. Whilst the bushfire outlook on the balance of the forecast is normal for NSW for the outlook period, there is a need to monitor for escalation to fire danger associated with windy weather events that can often present during this period. These windy conditions can be a risk regardless of the temperature where grass has been cured by frosts.

The grass fire risk will continue to be monitored on and west of the Divide over coming months. Recent and forecast rain, combined with warmer than average minimum temperatures, may provide ideal growing conditions for cropping and grassland areas. This spring growth has the potential to increase grass and crop fuel loads as it dries through summer, and this will be monitored closely.

Higher grass fuel loads can increase fire danger by increasing the intensity of grass fires. All other factors being equal, this increase of the intensity makes the grass fires hotter, more dangerous and harder to extinguish.

Where weather permits, NSW fire and land management agencies will continue to undertake hazard reduction activities in the coming months.

### ACT

In early August the ACT received sufficient rainfall to remove the residual drought that was posing a raised forest fire threat for the coming fire season. As a result of this rain, and the expectation of further rainfall in spring with a La Niña ALERT current, it is anticipated that forest flammability will remain low over the coming months. The effect of the rains on grass fire risk may not become clear until the end of spring or early summer. These conditions will be monitored over the coming months. For the outlook period, normal fire conditions are expected.

The ACT Emergency Services Agency (ESA) advises that rural residents, and those on the urban edge of Canberra, need to review their bushfire preparedness plans and prepare their property with a focus on potential impacts from fast moving grass fires over summer. Further advice will be provided to the community by ESA as the spring grass growth concludes. Government agencies will continue to implement plans to mitigate grass fire risks.

### VICTORIA

The above average rainfall experienced during winter has substantially reduced the risk of campaign bushfires in Victoria's east for the outlook period. Elsewhere, much of Victoria has experienced average to below average rainfall during winter. Parts of the Mallee, Wimmera and Far South West are drier than normal, however the current climatic signals indicate that there is a high chance of above median rainfall across Victoria during spring. The strength of this signal is higher north of the Divide compared to the south of the Divide.

As a result, greater uncertainty exists for the bushfire outlook in western Victoria. It is possible that occurrences of hot,

dry periods may be enough to offset the wetter signal associated with possible La Niña conditions during spring.

Overall, the influence of a possible La Niña is expected to reduce the risk of prolonged fire activity across most of Victoria, leading to an assessment of normal fire potential for the outlook period for the entire state. Short duration fires in grasslands and drier forests/woodlands are still likely to occur by late spring, depending on fire weather conditions and grassland curing.

## TASMANIA

After a dry start to winter, the eastern half of Tasmania now has high moisture levels and the Soil Dryness Index is close to zero. Follow up rains during spring will provide valuable moisture recharge for lower soil levels and increased fuel moisture in coarse and heavy fuels. Forested areas are very wet and will take time to become available as fuel. It is anticipated that the start of the fire season will be delayed on the east coast and in the south east.

During spring pasture growth is likely to be significant in the Midlands, South East and East Coast districts. These areas have been assessed as normal fire potential for the outlook period, but will be monitored closely.

The western half of Tasmania has closer to normal moisture conditions for winter. With a La Niña ALERT current, the far south west may become significantly drier than normal, which can occur during a La Niña. This area will be monitored closely and has been assessed as normal fire potential for the outlook period.

## SOUTH AUSTRALIA

South Australia has experienced the third driest June and July on record, and as a result prolonged moisture deficits persist.

While the La Niña ALERT that is now active indicates that the forecast models favour wetter than average conditions for spring across South Australia, historically La Niña has had less of an impact on increased rain for southern South Australia than for the east coast. A number of variables have to line up for these wetter conditions to occur in southern South Australia. Increased rainfall for the state is more often influenced by a negative Indian Ocean Dipole, and while climate models indicate this may occur, the signals would only support wetter conditions for a brief period in early spring, rather than an indication of prolonged wetter conditions. Spring rainfall could also encourage grass growth which may raise fuel loads in areas where they are currently reduced. The current rainfall outlook is unlikely to overcome the current soil dryness and long-term rainfall deficiencies. The Fire Danger Season may start later than the previous two seasons, however any benefits from spring rain will quickly be marginalised once warmer weather occurs. In addition, spring rainfall is often accompanied by thunderstorm activity which could see an increase in lightning and new ignitions occurring.

Western South Australia (including much of the Eyre Peninsula), the Flinders Ranges, and the Riverland are currently experiencing drought-like conditions which is likely to limit grass and crop growth. These regions will be monitored closely, especially in areas of native vegetation and scrub, which could present challenges later. Without good rainfall during spring, this pattern of potentially reduced grass fire risk and elevated scrub and forest fire risk is likely to persist over much of the state come summer.

## WESTERN AUSTRALIA

The climate outlook indicates normal weather conditions for Western Australia from August through October, with the possibility of below-normal rainfall in parts of the South West Land Division. Seasonal rainfall deficiencies have continued, which is preventing the recovery of root zone soil moisture in much of the eastern Wheatbelt and the eastern South Coast and leading to persistent moisture stress in woody vegetation. Despite overall below normal rainfall, recent rain has helped, leading to an assessment of normal fire potential for the outlook period.

In contrast, some areas in northern WA are experiencing higher moisture content in the root zone in comparison to this time last year, and this is reflected in the lower seasonal grassland curing for some areas of the Kimberley and Pilbara regions. These conditions have delayed the onset of the northern WA bushfire season. For the start of the late dry season, higher than normal fuel loads continue to persist for parts of the Dampierland, Central Kimberley and Ord Victoria bioregions, resulting in a continued assessment of above normal fire potential for these areas as per July's *Australian Seasonal Bushfire Outlook*.

## NORTHERN TERRITORY

Wet season rainfall totals in most areas across the Northern Territory were well below average for 2019/20, and as a result many areas are now experiencing drier soil moisture and earlier vegetation curing. As noted in the *Australian Seasonal Bushfire Outlook: July* 2020, the Fire Danger Period for the northern half of the Territory was declared earlier than normal. In some areas of the savanna region, vegetative fuel loads remain lower than average. Planned burning in the north was predominately limited to strategic corridors, carbon burning projects, and fine scale properties. For the top half of the Territory, the duration and extent of the fire weather to date has been slightly less than what was experienced in the 2019 fire season, with the western Top End experiencing higher than average humidity during August. The Bureau of Meteorology's weather modelling indicates a negative Indian Ocean Dipole is possible in coming months. This may increase the chances of an early onset to the wet season and the possibility of exceeding October and November median rainfall. A review of fire season activity to date, completed fire mitigation and overall fuel loads indicates normal fire potential for all regions of the Territory for the outlook period.

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.

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