

AUSTRALIAN SEASONAL BUSHFIRE OUTLOOK: JUNE - AUGUST 2021

OVERVIEW

The influence of La Niña on Australia's climate has resulted in a wet spring, summer and early autumn for much of the country. With longer-term climate drivers now neutral, weather will be more heavily influenced by local drivers in each state or territory. Some southern parts of South Australia, south west New South Wales and western Victoria have largely missed out on recent rainfall and are yet to see good autumn falls. The climate outlook through until the end of winter suggests above average rainfall is likely over much of the country except the south west.

Winter coincides with the dry season in northern Queensland, the Northern Territory and northern Western Australia, marking the start of the bushfire season. While the *Australian Seasonal Bushfire Outlook: June - August 2021* covers all states and territories, it is especially relevant to northern Australia.

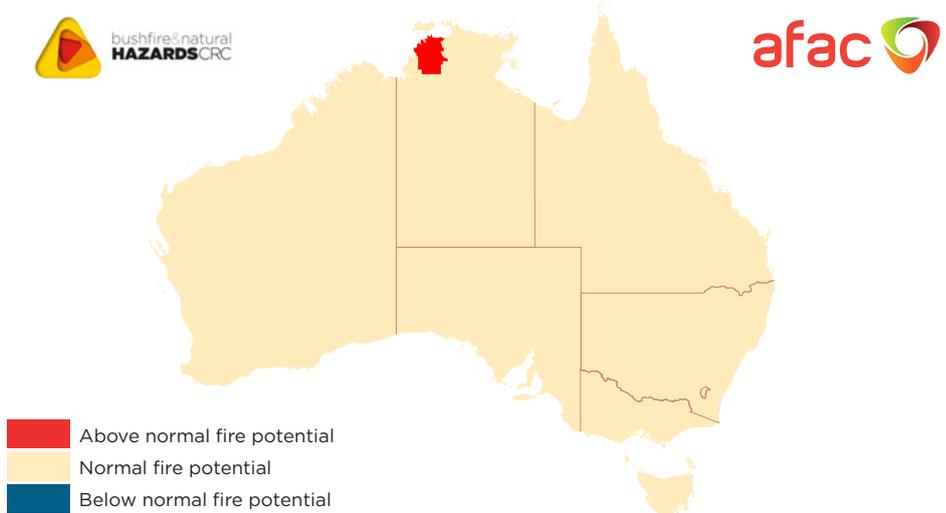
The Northern Territory received above average rainfall during the wet season and is now seeing significant vegetation growth and grass curing, resulting in above normal fire potential in some northern areas from July onwards.

Normal bushfire potential for this time of year is expected for the rest of Australia.

While recent and expected rain across the country helps improve soil and vegetation moisture, it also contributes to vegetation growth. Combined with warmer than average

DEFINITION

Fire potential: The chance of a bushfire or number of fires occurring of such size, complexity or other impact 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 1:** AUSTRALIAN SEASONAL BUSHFIRE OUTLOOK: JUNE - AUGUST 2021. AREAS ARE BASED ON THE INTERIM BIOGEOGRAPHIC REGIONALISATION FOR AUSTRALIA AND OTHER GEOGRAPHICAL FEATURES.

temperatures being predicted for most areas, this can increase the likelihood of grass fires when the weather warms. These conditions will be monitored locally throughout winter.

In southern Australia, prescribed burning during winter is an important tool to reduce future bushfire risk. In many areas, prescribed burning opportunities may continue under appropriate weather conditions and with enough local resources.

The *Australian Seasonal Bushfire Outlook: June - August 2021* was developed by the Bushfire and Natural Hazards CRC, AFAC, the Bureau of Meteorology, Queensland Fire and Emergency Services, the NSW 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.

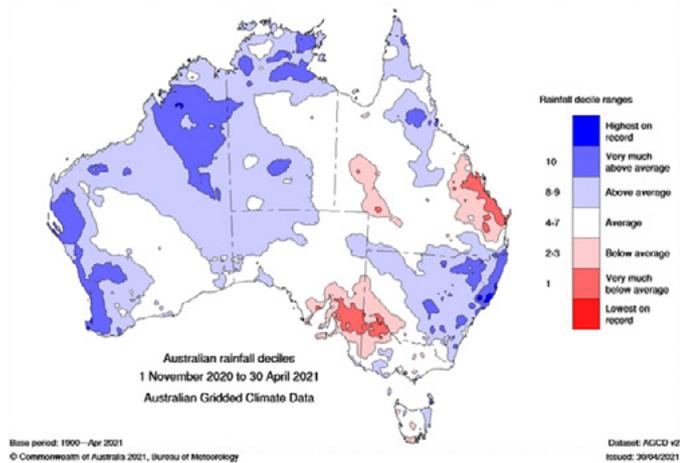
OUTLOOK - WINTER 2021

Fire management is a year-round process, and the *Outlook* reflects the priorities in each state and territory for the coming

months given the expected climate conditions. It 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. Of particular interest are the tendencies of major drivers of Australia's climate, which are now assessed as neutral, meaning neither La Niña or El Niño. Other less quantifiable factors, such as the distribution and readiness of firefighting resources, are also considered.

Fire potential can vary greatly, even at the smaller scale, between bordering states and territories. Each state and territory's assessment takes into account different land use types (such as agriculture, forestry, public land) and vegetation types (forests, grasslands, deserts). This in turn is influenced by different forecasts for temperature and rainfall over these regions. It is important to remember that, although normal bushfire potential is expected for most of Australia, areas designated as normal may still experience bushfire - normal risk does not mean there is no risk.

For future updates on fire potential during winter 2021, visit your rural fire agency website.



▲ **Figure 2:** RAINFALL DECILES NOVEMBER 2020 TO APRIL 2021.

RECENT CONDITIONS

Seasonal fire conditions are a function of fuel (vegetation) amount and dryness, and recent rainfall and temperatures. The past six months from November 2020 to April 2021 (see Figure 2, above) saw above average rainfall for many areas across Australia, with much of the north of the country seeing increased wet season rains and increased vegetation growth. However, there were a few notable exceptions, with the central coast of Queensland and an area of south east South Australia extending into western Victoria and south west New South Wales all experiencing below average rainfall for the six-month period. May to date (26 May) has seen above average rainfall in parts of south west Western Australia and eastern Victoria into south eastern New South Wales.

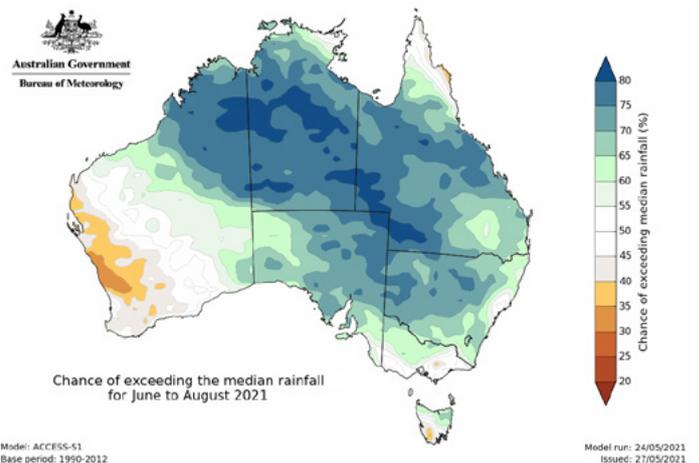
Australia's recent climate has been affected by La Niña, which developed during September 2020 and decayed in March 2021. La Niña events typically increase the likelihood of above average rainfall across much of Australia during spring, and across much of eastern Australia during summer and early autumn. The 2020/21 La Niña did indeed help deliver northern Australia's wettest wet season (October to April) since 2016/17, and nationally it was the coolest such period since the La Niña of 2011/12. North west Western Australia was affected by several tropical lows, with one bringing heavy rains in the Kimberley and east Pilbara areas in January. Another resulted in parts of the western Gascoyne having its wettest February on record, along with extensive flooding. During March, moderate to heavy rainfall across the Kimberley extending into western and southern Northern Territory also brought flooding to the region. In the east, rainfall in Queensland was largely restricted to northern areas and the Cape

York Peninsula, as the weather patterns were less favourable for rain further south.

The long-term warming trend means that above average temperatures now dominate most years, and recent months have generally followed this pattern, despite the cooling influence of the La Niña. The national average maximum and minimum temperatures were 0.55°C and 0.63°C higher than the long-term (1961–1990) averages for October to April, ranking 23rd and 15th warmest of 112 years of records – much lower than recent periods without La Niña influence.

While the above average rainfall and relatively cooler weather have eased fire risk for some areas, this has also meant increased vegetation growth across the north. Additionally, the central coast of Queensland and south east South Australia, extending into north west Victoria and south west New South Wales have all largely missed out on the above average falls, with below average to very much below average rainfall for these areas. This may require further attention in coming months, should rainfall deficiencies persist.

The tendency for fire seasons to have elevated fire dangers more frequently, and for elevated fire danger to occur earlier and later in the season is a clear trend in Australia's climate. This reflects rising temperatures and reduced and/or less reliable cool season (April to October) rainfall in southern parts of the country. Fire season length and severity is increasing across much of Australia, as measured by annual (July to June) indices of the Forest Fire Danger Index, with increases tending to be greatest across inland eastern Australia and coastal Western Australia. For more details on the changes observed, see the [State of the Climate 2020 report from the Bureau of Meteorology and CSIRO](#).



▲ **Figure 3:** CHANCE OF EXCEEDING THE MEDIAN RAINFALL FOR JUNE TO AUGUST 2021.

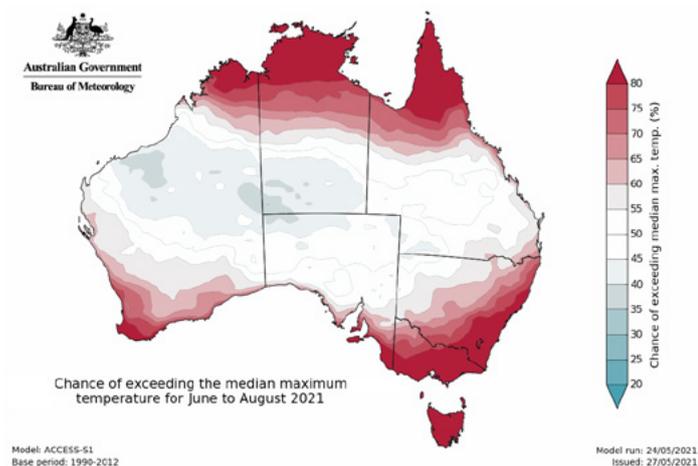
CLIMATE OUTLOOK

The Bureau of Meteorology's climate outlooks are based on the physics of the oceans, atmosphere, land and ice. They implicitly include all current climate drivers, including long-term trends.

The El Niño-Southern Oscillation is neutral, with model forecasts suggesting that this situation is likely to continue for the winter months. The Indian Ocean Dipole is currently also neutral. Climate model outlooks suggest the Indian Ocean Dipole is most likely to remain neutral during the first half of winter. Two of the five models indicate negative Indian Ocean Dipole thresholds may be reached during winter or spring. The accuracy of Indian Ocean Dipole forecasts made during autumn is generally lower than at other times of the year, but improves in winter. A negative Indian Ocean Dipole increases the chances of above average winter-spring rainfall for much of southern Australia. Above average Indian Ocean sea surface temperature patterns outside of the Indian Ocean Dipole region may also be providing conditions more conducive for rainfall across some parts of Australia.

The rainfall outlook for June to August (see Figure 3, above) shows that a wetter than average winter is likely for most of Australia except western and southern Western Australia, the Cape York Peninsula and parts of south east Australia, where there are roughly equal chances of a wetter or drier than average winter. Some western parts of Western Australia are likely to have a drier winter. Historical outlook accuracy for June to August is moderate to high across much of Australia, but generally moderate to low around the Gulf of Carpentaria and south east Australia.

Average maximum temperatures for winter are likely to be above average for



▲ **Figure 4:** CHANCE OF EXCEEDING THE MEDIAN MAXIMUM TEMPERATURE FOR JUNE TO AUGUST 2021.

the northern tropics, south west Western Australia, south east South Australia, east coastal Queensland, eastern and southern New South Wales, Victoria, and Tasmania (see Figure 4, above). Average minimum temperatures for the same period are very likely to be above the long-term average across most of Australia (see Figure 5, above). Historical accuracy for winter maximum temperature outlooks is high to very high across the northern tropics and the southern half of the country.

Elsewhere, accuracy is low. Historical minimum temperature outlook accuracy is moderate to high across most of Australia, but moderate to low across south east and south west Australia. The long-term warming trend continues to provide a background influence on outlooks.

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

In northern Western Australia, with the exception of Dampierland and part of the Great Sandy Desert, most bioregions have continued to receive above average rainfall. This is reflected in the current high root zone moisture content, as well as relatively low grass curing levels across the landscape for this time of year. The preceding weather conditions and later than average grass curing have resulted in normal fire potential for northern regions of the state for this outlook period.

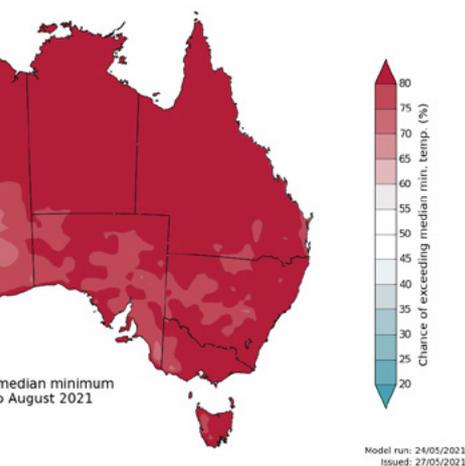
Several ex-tropical systems and strong early season cold fronts have resulted in

above average root zone soil moisture in many areas, particularly the Jarrah Forest and Warren, and parts of the Avon Wheatbelt, Mallee and Esperance bioregions, alleviating stress in live woody vegetation and providing good conditions for planned burning activities. In contrast, the Nullarbor, Hampton and part of Great Victoria Desert bioregions remain dry. However, with average rainfall predicted for early winter, fire potential in these areas is also expected to be normal.

NORTHERN TERRITORY

The Northern Territory, which has just come out of its wet season, has experienced above average rainfall in the past six months. The area spanning from the top of the Victoria Bonaparte through to the Daly Basin, as well as areas of the Gulf Uplands to Pine Creek bioregions, has received the highest rainfall on record. The wetter than average season has left widespread vegetation (fuel) growth with steadily increasing grass curing.

The El Niño–Southern Oscillation is now neutral and the dry season has settled in, making current conditions favourable for planned burning. Since late April, land managers have been utilising this opportunity, with aerial and ground burning operations well underway across the Top End. However, some areas, particularly around the Darwin Coastal bioregion, are expected to retain root zone soil moisture over the early dry season (May and June). With challenges to mitigate fuel in the peri-urban interface, fire potential is expected to be above normal during the late dry season (July to October) in the eastern reaches of the Pine Creek region and central Darwin Coastal bioregions. This area encompasses the Northern Fire Protection Zone, including the Darwin, Batchelor, Adelaide River and Pine Creek Emergency Response Areas.



▲ **Figure 5:** CHANCE OF EXCEEDING THE MEDIAN MINIMUM TEMPERATURE FOR JUNE TO AUGUST 2021.

Further south, the greater Katherine region, extending down to Newcastle Waters along the Stuart Highway, are watch points for fire activity. The same applies to the southern extent of the Gulf Fall Uplands bioregion, east of the Tablelands Highway. In central Australia, there is ongoing opportunity for prescribed burning over the coming months, with normal fire potential assessed in these regions.

QUEENSLAND

Most of Queensland has experienced mild and wet conditions for the first six months of 2021. This will likely see long-term rainfall deficits reduced through most of the state, except coastal and inland areas between Rockhampton and the Wide Bay area, leading into the winter period. The outlook for rainfall for winter is average for the far north and Cape York Peninsula areas and above average across the remainder of the state. These conditions have resulted in an assessment of normal fire potential for the entire state.

With the El Niño–Southern Oscillation neutral and expected to remain inactive for winter, Queensland's climate is expected to be influenced by local drivers. The temperature outlook shows average maximum temperatures in the central to south west inland areas, with above average temperatures across the remainder of the state. Increased minimum temperatures are forecast for the entire state.

The observed weather conditions, together with the indication of milder conditions and the increased chances of above average rainfall in many areas, indicate a slower start to the fire season. Conditions will be favourable for continued grass growth, increasing the fuel loads in grassland areas. The potential for frosts in the south western inland areas in the

coming months may lead to localised curing of grassland and the possibility of high intensity grass fires during the fire season. Underlying drought conditions may generate an early onset of grass fires in the South Burnett region in June, progressing into the western area between Maryborough and Gympie into early July.

NEW SOUTH WALES

Leading into winter, long-term rainfall deficits have been reduced across most of NSW, with autumn being wetter than average for much of the state. As a result of preceding conditions, subsequent fuel state and the climate outlook, normal fire potential has been assessed for winter. Previous seasons' conditions, as well as rainfall and temperature outlooks for winter, are important early indicators for the start of the upcoming fire season and its potential.

With neutral El Niño–Southern Oscillation conditions and an inactive El Niño–Southern Oscillation outlook forecast, the climate outlook for winter in NSW is likely to be more influenced by local drivers. The rainfall outlook for the coming months suggests an increased chance of above average rainfall west of the ranges, while average rainfall is likely along parts of the east coast. The temperature outlook is for increased maximum and minimum temperatures for much of the state. It is likely that the east coast and ranges will see above average maximum temperatures.

With these conditions, hazard reduction burning may be able to continue during winter, particularly towards the latter half, when weather conditions allow. West of the ranges, warmer than average nights may mean less frosts. Wetter than average soil moisture through the central west, combined with higher chances of above average rainfall, will likely result in continued favourable conditions for grass and winter crop growth. This situation would create higher fuel levels and, in the event of fires during the fire season, higher intensity grass and crop fires in these areas.

ACT

Winter conditions are expected to bring near average rainfall for the ACT, due to the neutral El Niño–Southern Oscillation conditions (neither El Niño nor La Niña), along with most other climate drivers being neutral. Above average minimum and maximum temperatures are also forecast, resulting in normal fire potential in all areas throughout winter.

Neutral climate conditions will allow fire agencies and land managers to continue prescribed burning over the coming months when conditions allow.

The rainfall received in May means that grassland areas are likely to allow for prescribed burning sooner than forest areas. Residents in the ACT can monitor planned prescribed burns through either the ACT Emergency Services Agency and ACT Parks and Conservation Service websites, or through the Fires Near Me app.

VICTORIA

Autumn rainfall was varied across Victoria, with March and May seeing wetter conditions in central and eastern areas, while April was dry. These conditions, combined with the already-high levels of underlying vegetation moisture, resulted in significantly reduced levels of bushfire activity for autumn, while enabling an earlier start to the planned burning season. Winter will see Victoria transitioning into a low-risk period for bushfires for this time of year, resulting in an assessment of normal bushfire potential across the state.

In the west and north, as well as the north east foothills, soil moisture is currently drier than average. The climate outlook suggests average or near average rainfall is expected across most of the state, which may contribute to a reduction of bushfire risk in Victoria next fire season. However, in parts of the east, the outlook indicates a chance of drier conditions (below average rainfall and above average maximum temperatures). This will be closely monitored during the winter months.

Planned burning may be able to continue in some drier forest types in the north and west of the state. District staff and planned burn teams will monitor fuel conditions to conduct planned burn operations safely and effectively.

SOUTH AUSTRALIA

Much of South Australia remains drier than average, without any significant rain occurring in the last few months across most agricultural and southern areas. This has resulted in parts of the state recording rainfall deciles that are very much below average. However, the current winter outlook indicates the potential for above average rainfall, which may help reduce the existing short-term soil moisture deficits ahead of the next fire season. This increased likelihood of exceeding the average winter rainfall across South Australia means that normal fire potential is expected across the state over the coming months. However, if South Australia does not receive good winter rainfall, the chances of bushfires during the 2021/22 fire danger season may increase. Agencies will continue to conduct prescribed burns where conditions allow, noting that the local conditions through the winter period are typically not conducive to this occurring.

TASMANIA

The widescale renewal of soil moisture during summer has now slowed, as reflected in the reduced Soil Dryness Index in the east of Tasmania, with mostly average levels observed elsewhere. Recent conditions have been dry and the early winter period is expected to contribute only average rainfalls. Winter temperatures are likely to be above average, noting that there were both unusually high and low temperatures in April. Conditions are likely to slowly dry during the outlook period, which may allow an early commencement to the spring planned burning season. As a result of these predictions, Tasmania is expecting normal fire potential 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.

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

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