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AUSTRALIAN SEASONAL BUSHFIRE OUTLOOK: MARCH - MAY 2021

OVERVIEW

The influence of La Niña on Australia's climate has had a pronounced effect on fire potential. Spring and summer have seen average to above average rainfall across much of the country, with the exceptions of south east Queensland, south west Tasmania and parts southern Western Australia.

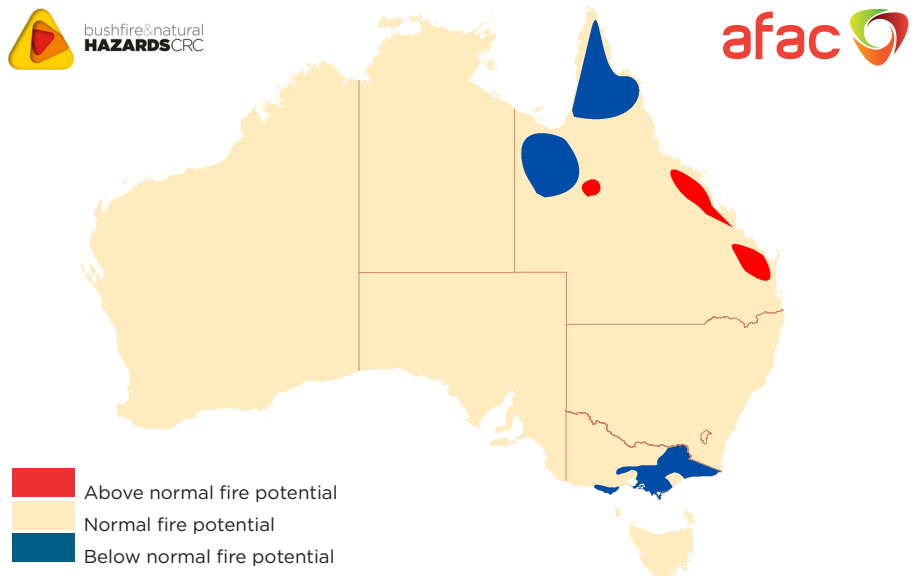
For autumn, below normal fire potential can be expected in parts of Victoria and far northern Queensland due to wet conditions and damp vegetation and soils. In contrast, dry conditions mean that parts of central and southern Queensland inland from the coast have been assessed as above normal fire potential.

Elsewhere, where the rain has fallen in southern Australia, the risk of grass and crop fires continues into autumn due to strong vegetation growth. These types of fires are fast moving and spread rapidly during strong winds.

Prescribed burning during this *Outlook* period is an important tool to reduce bushfire risk. In many areas, prescribed burning opportunities may arise under appropriate weather conditions and with enough local resources.

The *Australian Seasonal Bushfire Outlook: March - May 2021* covers all states and territories. 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.

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



▲ **Figure 1:** AUSTRALIAN SEASONAL BUSHFIRE OUTLOOK: MARCH - MAY 2021. AREAS ARE BASED ON THE INTERIM BIOGEOGRAPHIC REGIONALISATION FOR AUSTRALIA AND OTHER GEOGRAPHICAL FEATURES.

rainfall over these regions. It is important to remember that areas designated as normal or below normal fire potential may experience fire - normal or below normal risk does not mean there is no risk.

The *Australian Seasonal Bushfire Outlook: March - May 2021* 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

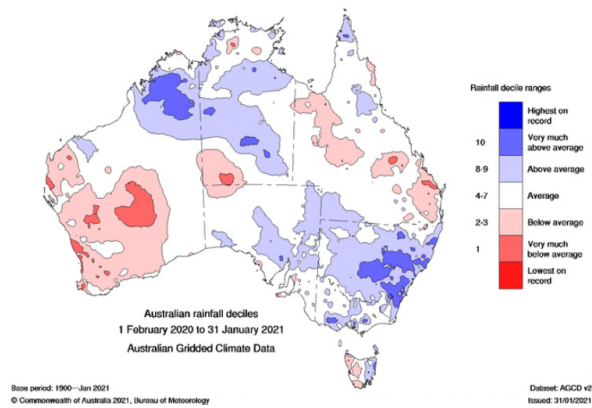
Biodiversity, Conservation and Attractions Western Australia, and Bushfires NT.

OUTLOOK - AUTUMN 2021

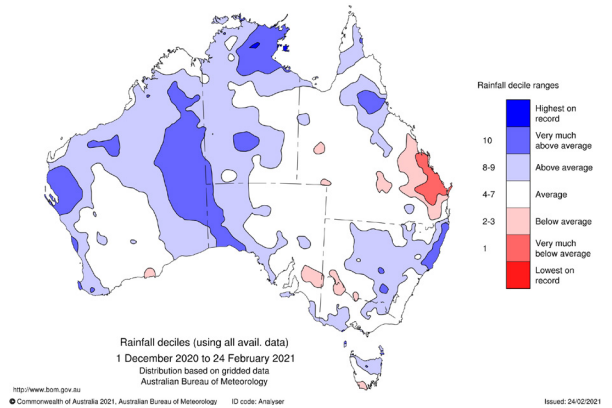
Bushfire potential depends on many factors. The volume, location and timing of rainfall are critically important when estimating vegetation (fuel) volumes and growth. The climate outlook for the next few months is also a crucial factor. Of particular interest are the future tendencies of Pacific sea 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.

DEFINITION

Fire potential: The chance of a fire 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 2: RAINFALL DECILES FEBRUARY 2020 TO JANUARY 2021.



▲ Figure 3: RAINFALL DECILES DECEMBER 2020 TO 24 FEBRUARY 2021.

Although La Niña has reached its peak, it is still expected to influence Australia's climate into autumn, with above average rainfall likely over much of the country.

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

RECENT CONDITIONS

Seasonal fire conditions are a function of fuel (vegetation) amount and dryness, and recent rainfall and temperature patterns. Australia's climate in spring and summer 2020/21 has been markedly different to 2019. Since February 2020, rainfall has generally been average to above average across much of the south east and north west of the country (see Figure 2, above). Rainfall during summer 2020/21 was above average across parts of the south east, central, north and west of the country (see Figure 3, above right). In contrast, 2019 was Australia's warmest and driest year on record.

La Niña has been underway in the tropical Pacific since September 2020 but is expected to return to neutral (neither El Niño nor La Niña) in autumn. 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. Above average rainfall since August 2020 over some areas of eastern Australia has eased rainfall deficiencies. However, south west and southern Western Australia, and some of the southern agricultural areas of South Australia, have received near- to below-average rainfall in the last 12 months. As a result, south west WA continues to experience long-term rainfall deficiencies.

The long-term warming trend means that above-average temperatures now dominate most years, and recent months have generally followed this pattern, despite La Niña. Spring 2020 was the warmest spring

nationally on record. However, December 2020 and January 2021 were only slightly warmer than average, with above average rainfall, especially in December (Australia's third wettest December on record), keeping daytime temperatures cooler.

Rainfall so far in spring and summer 2020/21 has eased the fire risk for large parts of eastern Australia, however southern South Australia and south west WA have generally seen drier and warmer conditions in recent months. Areas such as south west WA have seen reduced rainfall over the multi-year timescale and did not see the extended average to above average rainfall that some regions in eastern Australia saw in 2020. More rainfall is needed across many areas to fully recover from the extreme dry of spring and summer 2019/20.

The tendency towards fire seasons with more frequently elevated fire dangers and for elevated fire danger to occur earlier and later in the season is a clear trend in Australia's climate, reflecting reduced and/or less reliable cool season (April to October) rainfall in southern parts and rising temperatures. 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 WA. For more details on the changes being observed, see the recently updated [State of the Climate 2020 report from the Bureau of Meteorology and CSIRO](#).

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.

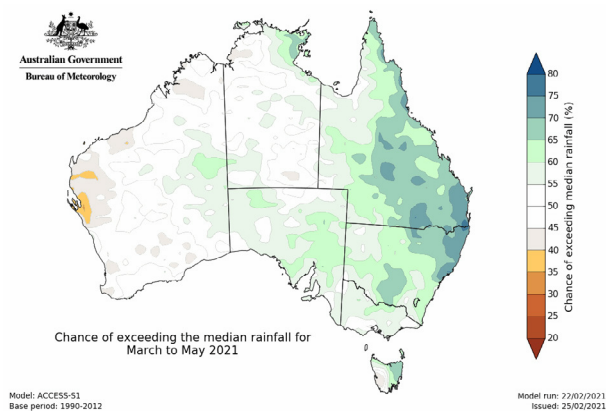
The climate influences of 2020/21 are very different to those that led to the extreme dry conditions in 2019. A La Niña event has been active in the tropical Pacific Ocean

since September 2020. La Niña typically results in above average spring, summer and early autumn rainfall over much of eastern and northern Australia. Combined with other drivers that enhance rainfall, including warmer than average waters to the north and west of Australia, parts of eastern Australia are expected to experience wetter than average conditions during autumn.

The rainfall outlook for March to May (Figure 4, page 3) shows that wetter than average conditions are likely for eastern parts of Queensland, New South Wales and Tasmania, with roughly an equal chance of wetter or drier conditions elsewhere. Historical outlook accuracy for March to May is high across much of Australia, but generally moderate to low around far south west WA, near the New South Wales–Queensland border and parts of south east NSW.

Average maximum temperatures for March to May are likely to be above average for Tasmania, parts of northern Australia and near-coastal parts of WA and Victoria. There is no shift towards either above or below average temperatures for the remainder of the country (Figure 5, page 4). Average minimum temperatures for the same period are very likely to be above the long-term average across much of the country (Figure 6, page 4). Historical accuracy for March to May maximum temperature outlooks is high to very high across the north of Australia. Elsewhere it is moderate, apart from much of SA and inland southern WA, where it is low. Historical minimum temperature outlook accuracy is moderate to high across much of northern Australia, SA and the south east, including Tasmania, and low across much of southern Queensland and WA.

The tropical cyclone season, which officially started in November 2020 and runs until the end of April 2021, has to date been relatively subdued, though there have been



▲ **Figure 4:** CHANCE OF EXCEEDING THE MEDIAN RAINFALL FOR MARCH TO MAY 2021.

a number of tropical lows that have brought rainfall to some parts of northern Australia. However, March is historically the most active month for tropical cyclone occurrence across the Australian region. While this may increase the chance of rainfall across northern Australia, including inland regions, areas 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

Recent rainfall, particularly across northern Queensland continues to improve fire risk conditions. With the continued rainfall in the northern parts of the state, an increase in growth in biomass is expected and is likely to lead to lower than normal fire potential.

Lower than normal rainfall over the coastal areas from Rockhampton to south of Townsville may increase fire potential through March to early April. Conditions are likely to return to normal by May.

For this autumn outlook period, fire potential across most of Queensland is expected to return to normal or below normal conditions. The exception to this is some areas of the interior, to west and central coastal areas, with above normal fire potential expected. Fire mitigation activities may be challenging and affected by the positive moisture outlook throughout Queensland. These activities will be dependent upon local weather conditions.

NEW SOUTH WALES

The expected increase to grass fuel loads across the central west of the state

eventuated during the last outlook period. Although a number of hot and dry periods occurred over summer, more recently the usual pattern of curing or drying of the grass that normally causes fire danger to increase has been interrupted by the frequency and amount of rain.

This rain has also led to continued growth. Although the rainfall outlook for the coming months suggests higher than average rainfall is possible for much of the state, depending on local conditions these high grass fuel loads may pose a risk during autumn.

The rainfall outlook, in combination with warmer than average minimum temperatures outlooks, may extend growing conditions for grassland areas. This could lead to higher fuel loads heading into next fire season and poses a particular risk to an early start to next season in grassland areas especially if frosts occur during winter as this could result in high fuel loads more susceptible to fire.

Whilst the fire outlook on the balance of the forecast appears normal, there is a need to monitor for unusual weather events (particularly windy conditions) that occasionally present during this period.

Traditionally in NSW the period March to May sees a shift from the fire danger period to a focus on hazard reduction burning. Conditions for the current outlook period appear variable, with soil moisture conditions for large areas in the eastern half of the state area wetter than average.

The grassland fuel state reflects this situation with reports of grass growth and low levels of curing (green grass). As conditions allow, NSW fire and land management agencies will undertake hazard reduction burning.

ACT

Due to the influence of La Niña, good rainfall has been received across the ACT during summer. The forecast return to neutral

El Niño–Southern Oscillation conditions (neither El Niño nor La Niña) is expected to bring near average rainfall and daytime temperatures during March to May, however above average minimum temperatures are expected. Normal fire potential for autumn is expected as a result of these conditions.

Given the return to neutral climate conditions, fire agencies and land managers will undertake prescribed burning when conditions allow. Given the amount of recent rainfall, grassland areas are likely to allow for prescribed burning sooner than forest areas. ACT residents can monitor prescribed burns that are being planned and undertaken through either the ACT Emergency Services Agency and ACT Parks and Conservation Service websites or Fires Near Me App.

VICTORIA

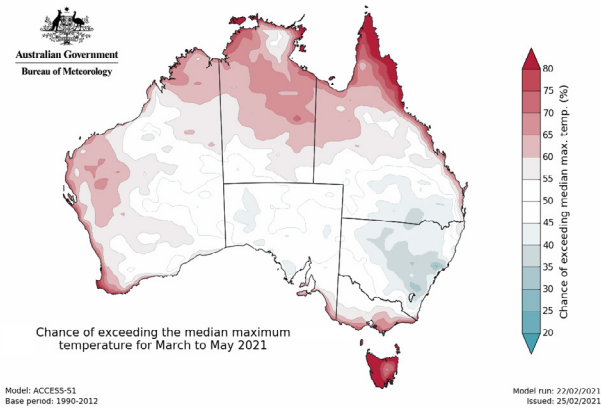
Above average rainfall has occurred over much of Victoria during summer and daily maximum temperatures were below average across the south, but average across the north of the state. These conditions led to reduced fire activity in both grasslands and forests, with a cumulative area burnt of 6,800 ha to date compared to the 10 year annual average burnt per year of 252,026 ha.

These conditions and the climate outlook indicate lower bushfire potential for many parts of Victoria than is normal during autumn. Below normal fire potential is expected in wet forests and many foothill forests due to higher than normal soil moisture levels limiting the flammability of vegetation (fuels). These soil moisture levels will likely persist due to no strong changes to drier conditions.

Opportunities for planned burning may be currently limited in foothill forests due to high soil moisture levels. However drier forests, woodlands, heathlands and grassy woodlands may be more receptive to planned burning compared to previous seasons. A return to drier patterns would see planned burning opportunities in foothill forests open up. Warmer than average nights during autumn may also expand windows for planned burning. District staff and planned burn teams will monitor fuel conditions to safely and effectively conduct planned burn operations.

TASMANIA

The influence of La Niña during spring and summer has seen above normal rainfall across northern Tasmania, and below normal bushfire activity across the state. The south west was consistently drier than normal from July 2020 to January 2021 but large amounts of rain during February have returned the soil dryness



▲ **Figure 5:** CHANCE OF EXCEEDING THE MEDIAN MAXIMUM TEMPERATURE FOR MARCH TO MAY 2021.

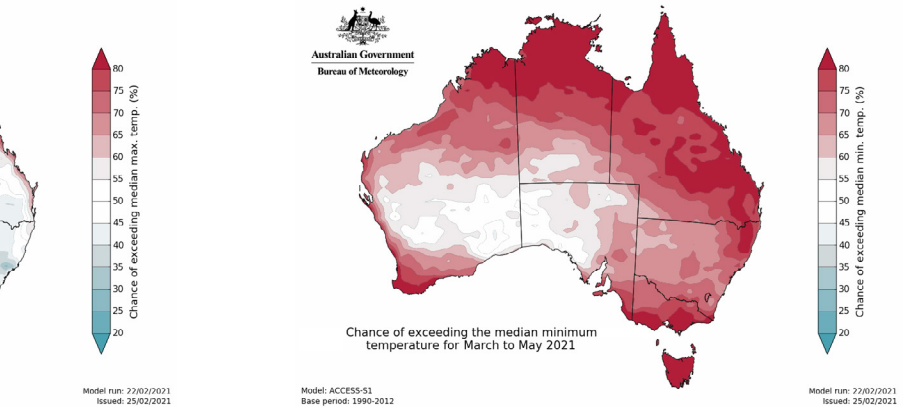
index to normal across large areas. Grassland curing is proceeding across the state, with most areas now over 80% cured. These conditions mean that there is little likelihood of sufficient drying occurring to allow landscape scale fires during autumn, although the grass fire risk remains in areas where the pasture has not been harvested or grazed. Normal fire potential is expected across the state for the outlook period. Conditions for planned burning during autumn are very promising, with planned burning projected to start in March.

SOUTH AUSTRALIA

Whilst some parts of South Australia have received above average rainfall so far this bushfire season, this rainfall has not been widespread or significant enough to negate a sustained risk of fire for most of the state. Furthermore, long-term rainfall deficiencies persist across most of the state, adding to the overall threat.

This risk is in line with conditions typically experienced during autumn and is characterised by short periods of heightened fire danger at regular intervals that can support intense fire behaviour. Such spikes in fire danger created the conditions experienced during summer at the Blackford fire at Lucindale and the Cherry Gardens fire in the Adelaide Hills.

While the current climate forecast indicates an increased chance of exceeding



▲ **Figure 6:** CHANCE OF EXCEEDING THE MEDIAN MINIMUM TEMPERATURE FOR MARCH TO MAY 2021.

the median rainfall over the coming months, early autumn is a nevertheless a climatologically dry time of year for SA. Until sufficient rainfall is broadly received, which typically will not occur until later in autumn, this risk will persist and an extension to the dates of the fire season in some fire ban districts may be required. This potentially extended fire season would be fairly typical of recent years and as such normal fire potential has been assessed for autumn.

WESTERN AUSTRALIA

Northern Western Australia has received a good amount of summer rainfall and this is reflected in the above average soil moisture content of the root zone. Consequently, soil moisture may cause a delay in planned burning activities for the Victoria Bonaparte, Ord Victoria Plain, Central Kimberley, Northern Kimberley and Dampierland bioregions.

Summer 2020/21 saw WA affected by a number of severe bushfires in the south of the state. However the south west received significant rainfall along the west coast from a tropical low in early February which has elevated soil and live woody vegetation moisture contents, particularly for the Geraldton sandplains, Swan Coastal Plain, Jarrah Forest and Warren bioregions. This above average summer rainfall, together with a neutral climate outlook,

has resulted in an expectation of normal fire potential for the outlook period.

NORTHERN TERRITORY

With an active monsoon, root zone soil moisture is above average for most of the northern Top End including the Arnhem Coast, Darwin Coastal, Gulf Fall and Uplands, Gulf Coastal and Tiwi Coburg regions. As a result, grass fuel growth continues with increasing moisture content. Above average soil moisture levels extend through most of the central belt from the Sturt Plateau to the Tanami, Great Sandy Desert, Burt Plain, Davenport Murchison and MacDonnell Ranges regions and grass fuel curing has been marginally lowered as a result. While La Niña has passed its peak, rainfall is forecast to persist into the early dry season for parts of the Top End. Normal fire potential has been assessed for the whole of the Top End. Planned burning activities may be challenging until late May due to increased soil moisture levels and lower than average curing.

For central Australian regions, the fire danger period commenced in mid-December 2020 and was revoked on 29 January 2021 following widespread rain. This rain increased soil and fuel moisture content levels which reduced the fire risk. All regions in central Australia have been identified as having normal fire potential through to May 2021.

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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