

AUSTRALIAN SEASONAL BUSHFIRE OUTLOOK: DECEMBER 2020 – FEBRUARY 2021

OVERVIEW

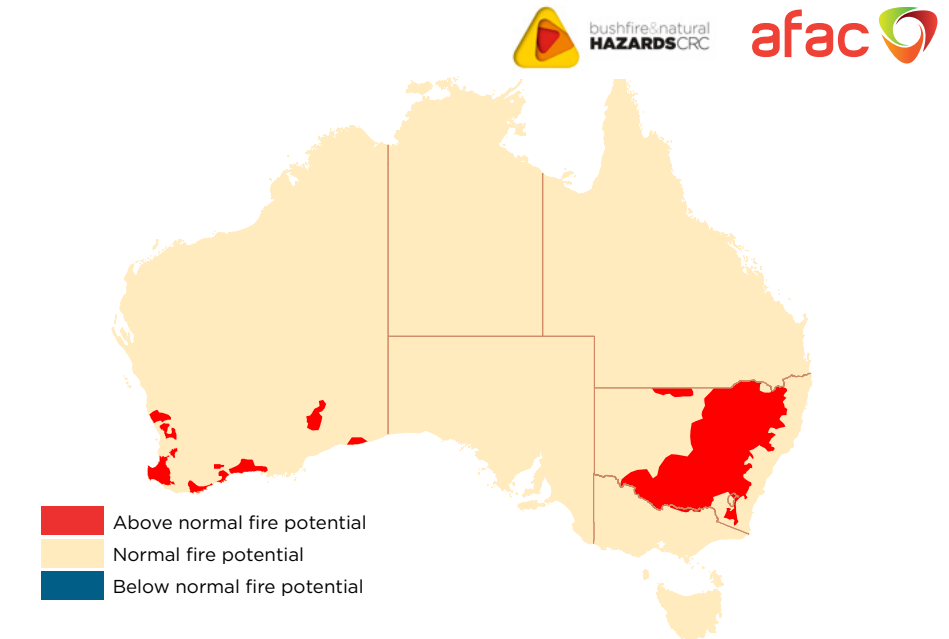
Australia's climate is now under the influence of La Niña, and as a result the landscape and weather conditions continue to be vastly different to the previous two years. The year to date has seen average to above average rainfall across much of the south east and north west of the country. This rainfall continued through spring, resulting in prolific grass growth in south eastern and central areas. Grass and crop fires are the main concern in these locations for the summer months as the growth dries out in the warmer weather. Grass and crop fires are fast moving and can spread rapidly when fanned by strong winds.

These conditions mean that large parts of New South Wales west of the Great Dividing Range face above normal fire conditions, as well as grassland areas of the ACT and into north eastern Victoria. Western Australia has largely missed out on the rainfall in 2020 and conditions are very dry, with parts of the south and south west coasts expecting above normal fire conditions through summer.

Although large parts of the east coast were affected by bushfires last season, and wetter than average conditions are expected over this summer, normal fire conditions are still expected for much of these forested areas due to the long-term dryness that still persists and the significant amount of area that was not burnt.

The *Australian Seasonal Bushfire Outlook: December 2020 – February 2021* 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.

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



▲ **Figure 1:** AUSTRALIAN SEASONAL BUSHFIRE OUTLOOK: DECEMBER 2020 – FEBRUARY 2021. AREAS ARE BASED ON THE INTERIM BIOGEOGRAPHIC REGIONALISATION FOR AUSTRALIA AND OTHER GEOGRAPHICAL FEATURES.

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.

The *Australian Seasonal Bushfire Outlook: December 2020 – February 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.

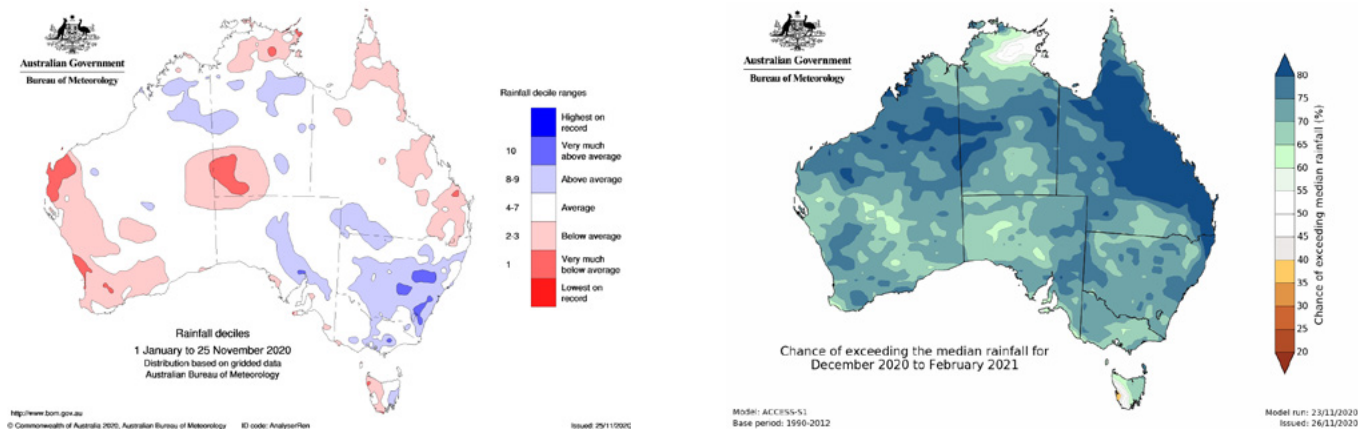
OUTLOOK – SUMMER 2020/21

Fire management is a year-round process, and bushfire potential depends on many factors. The volume, location and timing

DEFINITION

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

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



▲ **Figure 2:** RAINFALL DECILES 1 JANUARY TO 25 NOVEMBER 2020.

▲ **Figure 3:** CHANCE OF EXCEEDING THE MEDIAN RAINFALL FOR DECEMBER 2020 TO FEBRUARY 2021.

Australia. Other less quantifiable factors, such as the distribution and readiness of firefighting resources, are also considered.

With La Niña climate conditions reached in mid-September, the rainfall outlook through to the end of summer suggests above average rainfall is likely over much of the country. However, these months are a drier time of the year for much of southern Australia. Some southern parts of South Australia and Western Australia have largely missed out on recent rainfall and are very dry.

For future updates on fire potential during summer 2020/21, visit your rural fire agency website.

RECENT CONDITIONS

Seasonal fire conditions are a function of fuel (vegetation) amount and dryness, and seasonal weather conditions. Australia's weather and climate in 2020 has been markedly different to 2019. In 2020, rainfall has been average to above average across much of the south east and north west of the country (see Figure 2, above), whereas 2019 was Australia's warmest and driest year on record.

A La Niña is now well established in the tropical Pacific and is likely to persist until at least the end of summer, potentially peaking in December or January. 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. Above average rainfall since August 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 not received above average rainfall. As a result, south west Western Australia has seen an increase in the area in drought over recent months.

Satellite monitoring of vegetation health suggests some areas that have experienced above average rainfall in recent months are now observing a significant increase in grass vegetation growth. This includes large areas of New South Wales to the west of the ranges, parts of western Victoria, and south east South Australia. A period of dry weather in summer can rapidly dry out this type of vegetation, creating fuel for grass fires.

The long-term warming trend means that above average temperatures now dominate most years, and recent months have generally followed this pattern. September 2020 was Australia's second warmest September since national records began in 1910. Preliminary data indicates that November 2020 may also be one of the warmest November's on record. High temperatures add to the impact of reduced rainfall by increasing evaporation. Despite high temperatures in the north and west of the country lifting the national average, cooler than average days have been experienced across large parts of inland south east Australia.

Rainfall so far in 2020 has eased the fire risk for 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 dry of 2019/20.

The tendency for fire seasons to become more intense and for fire danger to occur earlier in the season is a clear trend in Australia's climate, reflecting reduced and/or less reliable cool season (April to October) rainfall and rising temperatures. Fire season 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 recently updated [State of the Climate 2020 report from the Bureau of Meteorology and CSIRO](#).

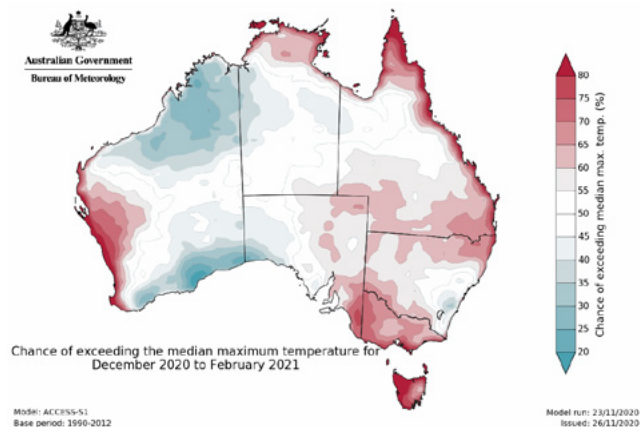
CLIMATE OUTLOOK

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 are very different to those that led to the extreme dry conditions in 2019. A La Niña event is currently active in the tropical Pacific Ocean. La Niña typically results in above average spring and summer rainfall over much of eastern and northern Australia. Combined with other drivers that enhance rainfall, including warmer than average waters to the north of Australia and a positive Southern Annular Mode that is forecast to persist until late 2020, much of Australia is expected to see wetter than average conditions over summer.

The rainfall outlook for December to February (Figure 3, above) shows that wetter than average conditions are very likely for nearly all of Australia except western Tasmania, where there is an increased chance of drier than average conditions. Historical outlook accuracy for December to February is very high across much of Australia, but generally moderate to low around central and southern parts of the Northern Territory and the Queensland border, and some parts of north eastern New South Wales.

Average maximum temperatures for December to February are likely to be higher than the long-term average for Victoria, Tasmania, the far west of WA, the northern coastlines of NT and Queensland, parts of eastern SA, southern Queensland, and western NSW. However, the average maximum temperature is likely to be below the long-term average for south coast WA,



▲ **Figure 4:** CHANCE OF EXCEEDING THE MEDIAN MAXIMUM TEMPERATURE FOR DECEMBER 2020 TO FEBRUARY 2021.

north east WA, and north west NT. (Figure 4, above). Elsewhere, temperatures are likely to be close to the long-term average. Average minimum temperature for the same period is very likely to be above the long-term average across Australia (Figure 5, above right). Historical accuracy for December to February maximum temperature outlooks is moderate to high across all of Australia except the NT. Historical minimum temperature outlook accuracy is moderate to high across much of Australia, very high in Victoria and Tasmania, and low around central NT and 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 Queensland, the NT and WA due to the influence of La Niña. While this may increase the chance of rainfall, 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 south eastern Queensland, has seen an improvement in fire risk conditions. Despite this recent rain, large parts of the state are carrying very low to average grass fuel loads relative to long-term records. Long-term rainfall deficits still persist across large parts of the state and significant additional rainfall is needed to overcome this underlying sub soil dryness.

The current La Niña conditions favour above average rainfall across much of

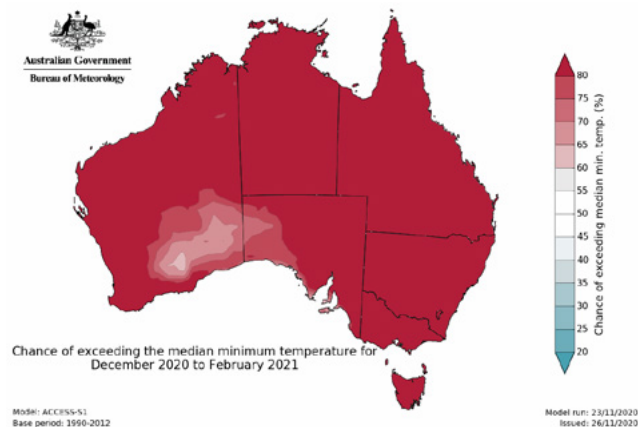
Queensland. This rainfall is likely to trigger good grass growth, particularly along coastal areas. The forecast rainfall and maximum temperatures indicate that it will be unlikely that this new grass growth will cure off during summer. This has resulted in an assessment of normal fire risk, however the grass fire risk will continue to be monitored over the coming months.

NEW SOUTH WALES

With a La Niña underway in the tropical Pacific, the summer rainfall outlook appears favourable for above average rain for much of NSW.

The fire outlook for forested areas that were not affected by last season's fires remains at a normal level for this fire season. Like most seasons, there is always a risk that if fires occur, particularly around the interface of high population centres of Sydney, Illawarra and the Hunter, they could quickly impact on houses and infrastructure. In these areas there is a need to monitor for escalation to fire danger associated with prolonged heatwaves that can occur during La Niña years as a result of more heat being retained in the atmosphere.

The rain received through spring has resulted in prolific grass growth west of the Great Dividing Range. These ideal growing conditions for cropping and grassland areas are expected to continue in coming months with the combination of above average rainfall and warmer than average minimum temperatures forecast. This growth has already increased the grass and crop fuel loads, and this is expected to continue throughout summer. Reports of lower stocking levels after the drought means that reduction of fuel loads by grazing may not be as high as what would normally be expected. The risk for this period will be dependent on grass curing or drying rates.



▲ **Figure 5:** CHANCE OF EXCEEDING THE MEDIAN MINIMUM TEMPERATURE FOR DECEMBER 2020 TO FEBRUARY 2021.

For the majority of areas, this is expected to be highest from mid to late summer. Hot and windy days will increase the fire risk and this will continue to 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 fires hotter, more dangerous, and harder to put out. As a result, above normal fire potential is expected for the predominantly grassland areas on and west of the Divide. In these areas, there is a high risk of high intensity grass fires that could impact communities this season.

ACT

The ACT has received significant rainfall in recent months which has resulted in vigorous grass growth. While abundant in amount, this grass is currently seeding and is predominately uncured and too damp to burn in a high-risk way. This is expected to change over summer, as while November and December is the normal time for annual grasses to set seed and then die-off, this season may instead see a second round of flowering, increasing the growth and therefore grass fire risk once the grass dries. As a result, there is above normal risk of fires in these grassland areas and this will be closely monitored by the ACT Emergency Service Agency.

Due to the amount of rain received, forest vegetation is too damp to support fast running or large bushfires. It is expected that these conditions will continue for some time. Should drying conditions emerge during the coming months in these forested areas, the community will be advised by the ACT Emergency Services Agency.

ACT residents need to review their bushfire plans with a particular focus on grass fire risk, and to manage grasses near their property to prevent potential impacts

of fast-running grass fires. It is important to clear around fences. Rural residents are advised to place and maintain strategic breaks to check fire runs. Fire services and land managers will also be implementing plans to further mitigate that risk.

VICTORIA

Victoria experienced below average rainfall for most of the state during winter except for East Gippsland, which received above average rain. Spring has resulted in average rainfall for most of the state, with areas of above average rainfall in the west and south west. As a result, the entire state is currently experiencing average to above average soil moisture conditions.

With the outlook for summer indicating above-average rainfall across Victoria due to the influence of La Niña, it is likely this soil moisture will persist in many areas and will lead to normal fire potential across the state, with the exception of the far north east.

With significant grass growth, 2020/21 has potential to be more of a grass fire-dominated season. There is some potential for above normal grass fire potential in north east border areas, due to the heavy grass and crop fuels prior to harvest.

Bushfire risk in the eastern parts of the state – particularly in areas that burnt last season – has reduced, thereby reducing the risk of prolonged fires. Elsewhere in the state, shorter-duration fires are still likely to occur in drier forests and woodland/heath fuels on hotter and windier days.

TASMANIA

Planned burning is now underway in all areas with suitable vegetation, while annual grasslands are still growing strongly. Tasmania has been assessed as normal fire potential for the outlook period. Above average rainfall in the eastern half of the state has provided significant moisture recharge in the east and south east. In the west, below normal rainfall has been received, resulting in a slowly increasing area of moisture deficit. It should be noted that even reduced rain is still a

significant amount of rain in a historically wet area. With the current climate drivers, it is likely this somewhat unusual rainfall pattern will persist and possibly intensify. Therefore, eastern Tasmania may have a quiet fire season, while the fire potential in the south west may increase in late summer due to the availability of peat soils, moist scrubs and forests to burn.

SOUTH AUSTRALIA

The benefits of the early spring rainfall, which has resulted in increased grass fuel growth in many areas, has now been offset by the return of warm and dry weather across South Australia. Despite this, the current Soil Dryness Index figures are below the five year average at the majority of monitoring sites, which is an improved position compared to the previous fire season. The current outlook for SA includes the potential for above average rainfall in broad areas over the next three months, however much of this is reliant on the influence of La Niña, which typically has less of an effect on SA. Average summer rainfall in SA is historically low, so above average rainfall, if it eventuates, may not be enough to bring substantial relief to the fire season. Recent fires across the state highlight that the very real risk of fire remains, particularly grass fires, with dangerous conditions and fires observed on the Eyre Peninsula, Yorke Peninsula, Murraylands and in the Riverlands. An elevated risk of thunderstorm and dry lightning has also been observed, which could increase the number of fires experienced during the rest of the fire season. As a result of the recent conditions and increased risks associated with thunderstorms, SA can expect a normal fire season. Normal fire seasons in SA are still characterised by dozens of high risk fire days. The fire threat is still substantial and significant fires have occurred under similar conditions.

WESTERN AUSTRALIA

Southern parts of Western Australia have been experiencing dry conditions for a number of years, and winter rain has not sufficiently improved the soil moisture content

in the root zone this year. This has increased the fire potential to above normal for parts of the Nullarbor and Eucla bioregions. In addition, although planned burning and past bushfires have reduced fuel loads across some forested areas of the South West, there are still areas of forest and shrubland vegetation that have experienced a prolonged rainfall deficit and are carrying significant surface fuel loads with relatively low fuel moisture contents. Moving into summer, parts of the Swan Coastal Plain, Avon Wheatbelt, Jarrah Forest, Warren, Mallee and Esperance Plains bioregions have been identified as having above normal fire potential.

The wet season is now underway in the north, with wetter than average conditions expected for the coming months, resulting in normal fire potential.

NORTHERN TERRITORY

Curing rates in the Darwin Coastal, Pine Creek, Tiwi Cobourg and Daly Basin regions have been reduced as a result of earlier than normal and relatively widespread rainfall in the north west Top End. This has reduced the ongoing bushfire risk in these areas. Areas of the Victoria Bonaparte, Sturt Plateau and Gulf regions continue to have low soil moisture and fully cured surface fuels, resulting in continuing bushfire risk in those regions. With the predicted wetter conditions for the coming months, normal fire potential has been assessed for the whole of the Top End.

For central Australian regions, the fire danger period will commence in mid-December, with surface fuels fully cured. There are some areas throughout central Australia that have experienced a prolonged rainfall deficit and are carrying less than normal surface fuel loads. Minimal landscape scale planned burning has occurred during the past 12 months, with many pastoral enterprises destocking and securing remaining grassy vegetation for pastoral production. All bioregions in central Australia have been identified as having normal bushfire potential through to February 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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