SEASONAL BUSHFIRE OUTLOOK

afac

Spring 2022

- **Above normal fire potential** (red)
- **Normal fire potential** (tan)
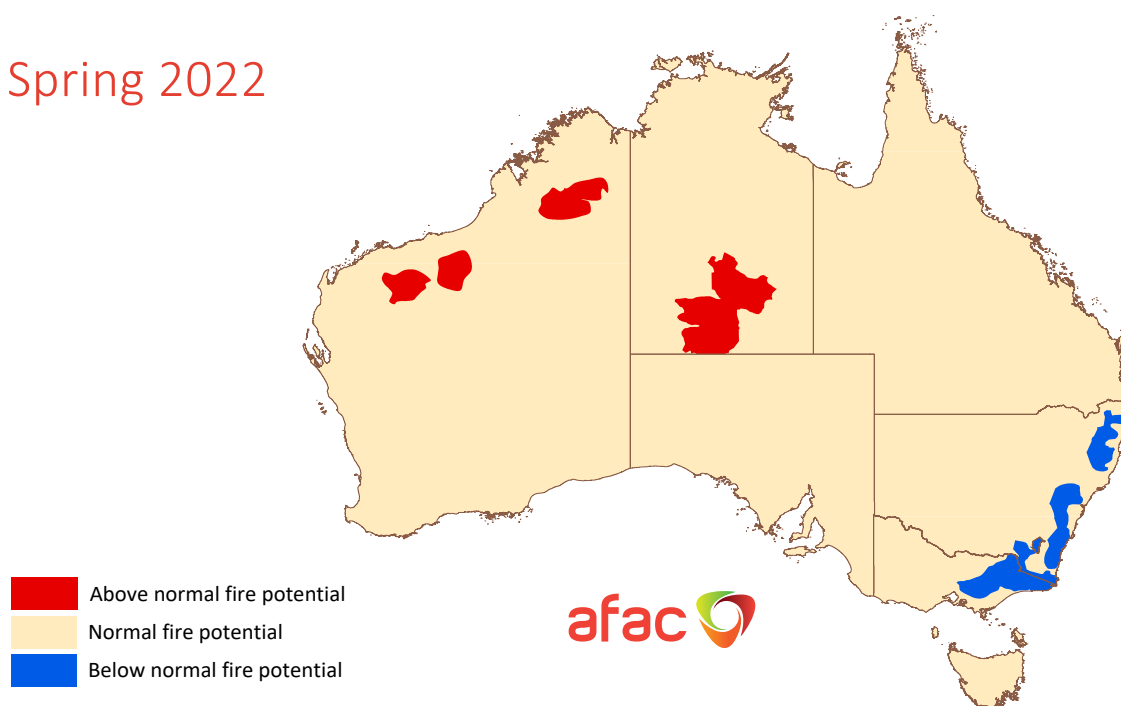- **Below normal fire potential** (blue)

Figure 1 Seasonal Bushfire Outlook Spring 2022. Areas are based on the interim biogeographic regionalisation for Australia and other geographical features.

Fire potential definition: The chance of a bushfire or number of fires occurring of such size, complexity or other impact that requires resources (from both a preemptive 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.

Overview

Much of Australia has experienced above average winter rainfall and this is expected to persist for many regions throughout spring, contributing to varied levels of fire potential across the country.

Parts of Central Australia and northern WA show **above normal fire potential** due to higher than average vegetation fuel loads following significant rainfalls. These fuel loads are either fully cured or expected to cure with predicted warmer and drier seasonal conditions.

Areas across Victoria, NSW and the ACT show **below normal fire potential** due to recent and persisting rainfall expected through spring, as well as low fuel loads in regions recovering from the 2019-20 bushfire season.

While most of Australia shows **normal fire potential** during the spring outlook period, anyone living and working in these areas needs to be vigilant. Destructive and deadly fires can still occur during normal bushfire seasons across Australia.

For the first time, the Seasonal Bushfire Outlook is utilising model guidance using the new Australian Fire Danger Rating System (AFDRS).

Launching on 1 September 2022, The AFDRS improves the science that sits behind fire danger rating modelling.

A better understanding of how different fuel types burn and improvements in technology means we can more accurately predict the risk faced by communities on any given day.

About the Outlook

Fire management is a year-round process. The Seasonal 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 and vegetation types. This is influenced by different forecasts for temperature and rainfall over these regions.

This Seasonal Outlook was developed by AFAC, the Bureau of Meteorology (BOM), 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, SA Country Fire Service, Department of Fire and Emergency Services and Department of Biodiversity, Conservation and Attractions WA, and Bushfires NT.

AFAC is the National Council for fire and emergency services, supporting the sector to create safer, more resilient communities. AFAC drives national consistency through collaboration, innovation and partnerships. It delivers enhanced capability by developing doctrine and supporting operations.
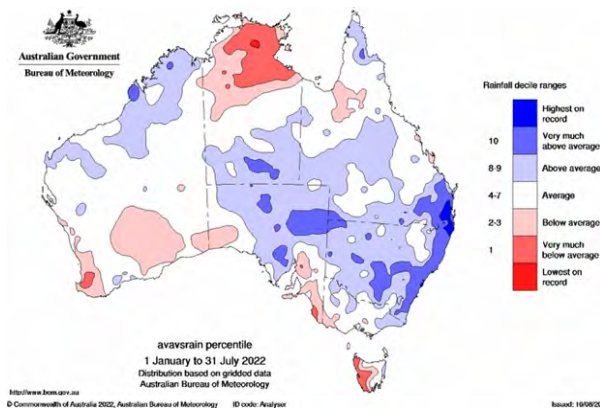
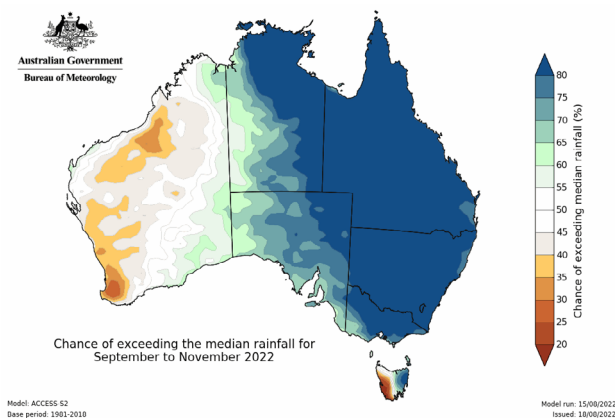*Figure 2 1January 2022 - 31 July 2022 rainfall deciles*
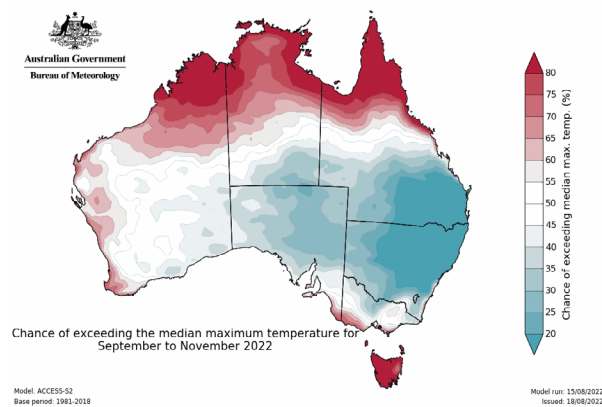

Figure 3 September - November 2022 rainfall outlook

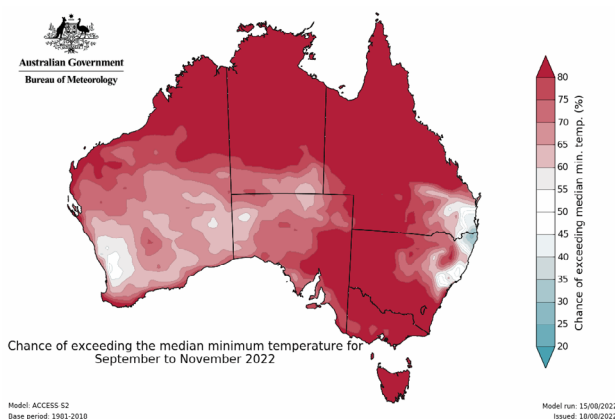*Figure 4 September - November 2022 maximum temperature outlook*

Figure 5 September - November 2022 minimum temperature outlook

Recent conditions

Seasonal fire conditions depend on many factors such as the amount and type of fuel (vegetation) and how dry that fuel is. These factors are in turn influenced by recent rainfall, temperatures and soil moisture. It has been wet over much of the north and east of Australia, with above average rainfall between May and July this year. Some areas in eastern Queensland have received record rainfall totals that were unusual for the northern dry season. During the same period, central Australia received close to average rainfall while much of southern Australia and the far Top End of the NT saw below average rainfall. January to July rainfall (Figure 2) saw below average rainfall in northern parts of the NT, southern WA, western Tasmania and southeast SA into western Victoria.

Australia's recent climate has been influenced by the 2021-2022 La Niña, and warm waters to the north of Australia, which have contributed to increased rainfall over parts of northern and eastern Australia. A negative Indian Ocean Dipole (IOD) event became established in late July 2022, contributing to the above average rainfall seen in northwest WA. The Southern Annular Mode (SAM) index was neutral to positive during July, which, while positive, has influenced the drier conditions in the far southwest and parts of the southeast of the country.

Long-range forecasts

The BOM's long range forecasts are based on global models of the oceans, atmosphere, land, and ice. These models implicitly include physics that captures the influence of all climate drivers, including long term trends.

The rainfall outlook for September to November (Figure 3) shows western Tasmania and parts of WA along the west coast and between the eastern Pilbara and western Kimberley inland of the coast are likely to receive below median rainfall, while above median rainfall is likely for the eastern half of the country. For the northern NT, north and eastern Queensland, and southeast NSW, there is also an increased chance for rainfall totals being amongst the wettest 20 per cent of seasons for this time of year. Historical accuracy for spring rainfall outlooks is moderate to high for most of Australia, tending to low to very low for much of the western half of WA.

Maximum temperatures during spring (Figure 4) are likely to be above median for northern Australia, Tasmania, the west coast of WA and the southern coast of Victoria and southeast NSW, with an increased chance of temperatures being amongst the hottest 20 per cent of seasons for this time of year in northern Australia and Tasmania. For central and eastern Australia, maximum temperatures are likely to be below median. For minimum temperatures (Figure 5), most of the country is likely to be warmer than average, except for the northern half of the NSW coast and southeast Queensland. Historical accuracy for spring maximum temperatures is high to very high for most of Australia. Accuracy for minimum temperatures is mostly moderate to high, tending to very high in the far southeast.

Updates to climate forecasts, including forecasts of monthly, fortnightly and weekly outlooks and the outlook for the IOD and El Niño–Southern Oscillation (ENSO) will continue to be published at www.bom.gov.au/climate/ahead.

Climate drivers

A negative IOD event developed during early winter 2022, and all models indicate that this event is likely to persist into late spring. A persistent negative IOD increases the chance of above average winter to spring rainfall for much of Australia, as well as warmer days and nights for northern Australia.

ENSO conditions are currently at La Niña ALERT with a 70 per cent chance of La Niña reforming later in 2022. La Niña increases the chance of above average winter to spring rainfall across northern and eastern parts of Australia, and a wetter start to the northern wet season.

The Antarctic polar vortex is predicted to be stronger than usual, which typically increases the likelihood of a positive SAM in the spring and early summer months. Positive SAM in winter and early spring has a drying influence for parts of southwest and southeast Australia, while also increasing the likelihood of above normal rainfall in eastern NSW, far eastern Victoria, and parts of southern Queensland.

Historically, forest fire activity in eastern Australia is lower during a La Niña or negative IOD years. However, regions that see above average rainfall leading to increased grass vegetation growth can subsequently see an increase in grassfire risk during short periods of warmer and drier conditions within the season.

Higher values of the SAM can mean areas of southern Australia with western facing coastlines, such as southwest WA and western Tasmania, generally don't benefit from the additional La Niña/IOD moisture, and may experience drier conditions and therefore elevated fire danger.

The tendency for fire seasons to have elevated fire dangers more frequently, and for elevated fire danger to appear earlier and later in the season, is an observed trend in Australia's climate. This reflects reduced and/or less reliable cool season (April–October) rainfall in southern parts of the country and rising temperatures. Year-to-year variability can reduce the impact of the long-term trends in increased severity and length of fire seasons, as currently observed in eastern Australia.

Fire season length and severity is increasing across much of Australia as shown by fire weather indices such as the annual (July–June) indices of the Forest Fire Danger Index (FFDI). Annual values of the highest 10% of FFDI values show increases tending to be greatest across inland eastern Australia and coastal WA (State of the Climate 2020).

Jurisdictional summaries

New South Wales

Persistent above average rainfall across much of NSW has resulted in unusually high fuel loads in grasslands and shrublands. Soil moisture is high and with the chance of exceeding median rainfall high for much of the state, good growing conditions are likely to continue for both cropping and grassland areas. Good winter rainfall has also led to high cropping yields, resulting in very high fuel loads in cropping areas.

Grass and shrubland fuels respond quickly to periods of low rainfall and high temperatures. Given the high fuel loads, and despite the forecast of wetter than average conditions, there are likely to be periods of elevated fire danger in grassland and cropping areas, particularly in the northwest and southwest during the spring forecast period.

It should also be noted that if the above median forecast rainfall does not eventuate, these high grass fuel loads will pose an above normal grass fire risk during the period.

Wet conditions have also assisted the recovery of areas burnt in the 2019-20 season but these areas are expected to remain at below normal fire potential due to reduced fuel loads and high fuel moisture. Despite the wetter conditions, normal fire potential is predicted in other forested areas due to high fuel loads.

In summary, NSW is expecting predominantly normal fire potential over the outlook period with the exception of areas burnt in the 2019-20 season, though it is likely that the onset of the fire danger period in the north of the state will be delayed due to the wetter conditions.

Leading into the Seasonal Bushfire Outlook for summer, we will be closely monitoring climate and fuel state. If the current climate drivers break down and result in a drier outlook, very high grass fuel loads could result in larger and more intense fires in NSW.

ACT

The ACT received average rainfall for much of winter and a very wet start to August with more than a month's average rainfall received in one day. With a negative IOD underway and looking to persist through spring, above average rainfall is likely for this outlook period. Maximum (daytime) temperatures are forecast to be around average and minimum (overnight) temperatures are forecast to be above average throughout the period. Given the very wet start to August across the ACT and the outlook for above average rainfall throughout spring, below normal fire potential is expected for ACT during spring. Should the expected above average rainfall not be received, then we would expect to see normal fire potential for grasslands in the ACT during spring.

Fire agencies and land managers will continue to undertake prescribed burning when conditions allow throughout spring. 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

To date, winter rainfall has been variable across Victoria, with June experiencing wetter conditions in southern areas, while July has been mostly drier than average. Rainfall in June was sufficient to offset drier than average conditions in west Gippsland in autumn.

Across Victoria's eastern and northeast ranges, above average rainfall over the last 12 months, in conjunction with an above average rainfall outlook, suggests a below average fire danger outlook in these areas. Some recent drying is evident across the eastern ranges but is expected to be offset by an above average rainfall expected in spring. Burnt areas from the 2018-19 and 2019-20 seasons are included as part of the below normal assessment in eastern Victoria.

Parts of southwest Victoria have experienced below average rainfall in recent months, which may lead to some forests being drier than normal. Longer term drying is also notable in some parts of the Wimmera. Rainfall over this area is expected to remain average until late spring. Combined with higher than average temperatures, forests in these areas may need to be monitored throughout spring for signs of increased flammability.

Seasonal conditions in Victoria were favourable for the start of the 2022-23 winter cropping season and this may result in extra growth of grass and crop fuels through most areas in Spring. It may result in an increase in fire potential later in spring, as curing advances.

Drier conditions may provide sufficient fuel availability to promote early opportunities for spring burning in the Wimmera and southwest Victoria, but wetter conditions are expected to limit fuel availability and spring burning windows across the east of the state.

Tasmania

A very dry July has reduced soil moisture and catchment storages across much of Tasmania. Sub-surface moisture levels in the southwest of Tasmania are being closely monitored as continuing rainfall deficits will greatly increase the range of bushfire fuels available in summer (including peats). Late winter rains will be important to determine the timing for the spring burning season and the outlook for summer, however spring 2022 is expected to have normal bushfire potential.

South Australia

SA recorded the fifth driest July on record, with significant rainfall deficits throughout the state. However, above average rain across some southern districts during June, and regular rain so far this August, mean overall winter rainfall should end up closer to average. Forecasts also support wetter than average conditions developing through spring due to a negative IOD, and the potential of a third La Niña event.

This puts SA in a favourable, but still somewhat unclear position, of waiting to see what level of risk develops for late spring and summer, based on how much rain occurs during the critical months ahead.

If the forecasts eventuate as expected, then the state's fire risk may be moderated and a slightly later start to the season may occur. However, if the dry conditions observed during July were to redevelop, then SA could see the fire season start in the north of the state in early spring and see the fire risk steadily increase elsewhere.

This wait-and-see approach means that residents across SA must take advantage of conditions where possible to prepare their plans and properties in order to cope with increased risk in case the rainfall predictions do not occur. This outlook may also see impacts on prescribed burning operations as a potentially wetter forecast may create unsuitable burning conditions.

Queensland

The continued mild and wet conditions across Queensland in 2022, including the significantly above average rainfalls across most of the state, have resulted in a mild start to the bushfire season. The declared formation of an negative IOD has increased the likelihood of above average spring rainfall over large parts of Queensland.

Above average sea surface temperatures to the north of Australia combined with the slightly cooler than average sea surface temperatures likely to persist in the central tropical Pacific and warmer ocean temperatures in the western tropical Pacific may result in above average winter rainfall for eastern Australia.

Although La Niña returned to neutral in early winter and most models are indicating neutral conditions during winter, the ENSO outlook is showing a 70 per cent chance of a return to La Niña during spring with a high likelihood of above average rain across Queensland during the spring period.

The forecast temperatures continue to predict most of the state experiencing above average minimum temperatures and above average maximum temperatures for northern Queensland down to Mackay. The remainder of the state below Mackay will experience average to below average maximum temperatures for the spring period.

The relative root zone soil moisture map shows most of the state has average to above average available water, except the savannah region and far southwest corner of the state.

The forecast conditions and root zone soil moisture balances across the state will continue to promote grass fuel loads and increase the potential fire risks.

Western Australia

For northern parts of WA, planned burning activities have now ceased and the bushfire season has begun. Higher than average non-woody vegetation fuel loads such as fully cured grasses, together with predicted warmer and drier seasonal conditions, have resulted in above normal fire potential for parts of Dampierland, Central Kimberley, Ord Victoria Plain, the Great Sandy Desert, and bioregions further south, such as the Pilbara, and Gascoyne.

Throughout the forecast period, normal fire potential is expected for the remainder of the state. However, the western parts of the South West Land Division are experiencing below to very much below average root zone soil moisture, increasing the probability of early onset of southern fire season should rainfall deficits continue into spring. Furthermore, the September to November climate outlook

is showing that median to below median rainfalls across the Jarrah Forest bioregion can be expected. Together with the forecast high chance of exceeding median maximum and minimum temperatures and existing rainfall deficiency, root zone soil moisture is expected to remain below average. Therefore, planned burning activities in these areas need to consider the potential for lower fuel moisture

Northern Territory

The spring period is the time of greatest fire potential in northern savanna, wildfire in the landscape is common, fuels are fully cured and periods of severe fire weather are expected to occur.

The recent winter period began with high humidity and unseasonal rainfall until July, when strong southeasterly surges dominated subsequent weather with periods of severe fire weather resulting. The fire danger period was declared for areas north of Elliot on 27 June to 30 November 2022. The NT's first 24 hour fire ban period for the season was declared on 15 August 2022.

In the northern savanna, extensive prescribed burning operations were completed in rural and remote areas. However, the Sturt plateau bioregion has large areas of continuous fuel, and targets were not met in some urban and peri-urban areas. As a result, this residual risk is of concern through the remainder of the late dry season.

In the Top End, weather conditions supporting higher than normal fire risk are expected during August and continuing into September but high humidity and early rainfall is forecast towards the end of this outlook period, reducing fire risk. Extensive early dry season savanna burning was completed in May to June through western and central Arnhem Land further reducing risk in those areas.

The broader Katherine region remains very dry and retains much fuel during this period. Above average temperatures and windy periods will add to fire danger, particularly early in the spring, and substantial rain is not forecast. Fuel reduction and fire scars from recent years have reduced the risk of large fires over much of the Gulf and VRD regions.

Normal bushfire potential is expected for northern savanna areas, while noting the potential for localised areas of high fire risk, including urban and rural areas of greater Darwin, where mitigation or response capacity is reduced.

Central Australia is drying after significant rains over summer and the resulting onset of growth has increased fuel load and continuity. Areas without fire scars from recent years have accumulated sufficient fuels for large fires to form, most notably in bioregions around Alice Springs. Good opportunities for prescribed burning will present when favourable conditions prevail, more commonly early in the period. Adverse fire conditions will become increasingly frequent as the season progresses.

The majority of central Australia's seasonal fire potential for the spring period is forecast to be normal, for the Alice Springs region an above normal fire potential is forecast including parts of the Macdonnell Ranges, Burt Plain and Finke bioregions.

Introducing the new Australian Fire Danger Rating System

For the first time, the Seasonal Bushfire Outlook is utilising model guidance using the new Australian Fire Danger Rating System (AFDRS).

Launching on 1 September 2022, The AFDRS improves the science that sits behind fire danger rating modelling. A better understanding of how different fuel types burn and improvements in technology means we can more accurately predict the risk faced by communities on any given day.

The new AFDRS replaces the previous system that was largely based on science more than 60 years old. New technology and research have greatly improved our ability to accurately predict fire behaviour and the potential threat to the community. The AFDRS calculates fire danger at a finer geographic scale than ever before, so more specific and relevant information can be provided.

The AFDRS uses the latest scientific understanding about weather, fuel and how fire behaves in different types of vegetation to improve the reliability of fire danger forecasts. This strengthens the ability of those working in emergency services to be better prepared, make improved decisions, and provide better advice to the community.

Long range forecasts of temperature, precipitation, humidity, soil moisture and wind speed are used as inputs for the AFDRS fire behaviour models for major fuel types across the Australian landscape. These long-range outlooks allow Australian fire agencies to undertake a more objective, data-driven process to assess long range risks.

The AFDRS is designed to be updatable so that the system can take advantage of improving science, data and information into the future.

The way fire danger ratings are communicated has been improved and simplified, to make it easier for Australians to make decisions to stay safe on days of fire danger risk. Across the country, fire and emergency services are applying nationally consistent colours, signs and terminology. This means that wherever you go in Australia, and whatever the season or fuels you're surrounded with, you can understand the level of threat and what you need to do to stay safe. The key benefit is a more prepared and resilient community resulting in a reduction in loss of life, property, and human harm.

The AFDRS is a project of national significance, developed collaboratively by all states and territories and the Australian Government. More information about the AFDRS is available online at www.afac.com.au/initiative/afdrs