CLIMATE COUNCIL

EARLIER, MORE FREQUENT, MORE DANGEROUS: BUSHFIRES IN NEW SOUTH WALES

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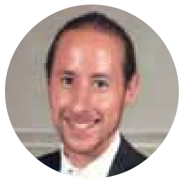
Professor Lesley Hughes
Climate Councillor



Dr David Alexander
Researcher,
Climate Council

Contents

Key Findings

1

Bushfires in New South Wales have become more frequent and dangerous due to climate change.

- Since the 1970s, increasing hot days and heatwaves have increased extreme fire weather across large parts of New South Wales.
- Declining cool season rainfall has had a significant impact on increasing bushfire risk. Since the mid-1990s, southeast Australia has experienced a 15% decline in late autumn and early winter rainfall and a 25% decline in average rainfall in April and May.
- The fire season in southeast Australia has lengthened, reducing opportunities for fuel reduction burning and increasing the resource needs of firefighting services.

2

The 2017/2018 bushfire season mirrors the long-term trend to increased bushfire risk due to climate change.

- Hot, dry conditions have a major influence on bushfires. The 2017 winter in New South Wales was hot and dry, and was followed by an unprecedented hot and dry September. It was the first time on record that any location in the state exceeded 40°C in September.
- 'Above normal' fire potential is expected for much of eastern New South Wales during the 2017–18 bushfire season, on the back of warm, dry June-September weather.
- The New South Wales Rural Fire Service brought forward the start of the bushfire danger season by one month in nine eastern local government areas.

3

Bushfires have a major negative impact on public health, the economy and the environment in New South Wales.

- Bushfire smoke can seriously affect human health because it contains respiratory irritants, as well as inflammatory and cancer causing chemicals. The elderly, infants and those with chronic heart or lung diseases are at highest risk. Increasing frequency and severity of bushfire conditions will thus have a flow-on effect to negative health outcomes.
- Bushfire costs in New South Wales are likely to more than double by mid-century to over $100 million per year. These estimates are conservative, because they do not factor in climate change.
- Increasing fire frequency is affecting freshwater resources, many plants and animals, and has ongoing implications for ecosystem health.

4

In the future, New South Wales is very likely to experience an increased number of days with dangerous fire weather.

- Fire severity and intensity is expected to increase substantially in coming decades, especially in those regions currently most affected by bushfires.
- The increasing length of the fire season is reducing the window of opportunity for hazard reduction at the same time as the need for hazard reduction is becoming greater.
- Increased resources for emergency services and fire management agencies will be required as fire risk increases.
- As bushfires seasons increasingly overlap in both Hemispheres, sharing resources, for example firefighting personnel or fire bombers, will become increasingly impractical.
- Communities, emergency services and health services must keep preparing for a future with increasingly higher bushfire risk.
- Tackling climate change through reducing pollution from fossil fuel burning in New South Wales and Australia is critical.

1. Introduction

On the back of Australia's record-breaking warm and dry winter, particularly in the north and east of the country, dangerous bushfire weather has already been experienced across much of New South Wales. As a result, fire bans have been in place on many occasions, particularly during the extreme heat in September where more than 90 bushfires broke out on the 23rd, including one that blocked the Hume Highway between Canberra and Sydney.

Residents of New South Wales have often experienced the serious consequences of bushfires. In 2013, bushfires in January and October burnt 768,000 hectares of land and destroyed 279 homes. Tragically, two people lost their lives and damages were conservatively estimated to be more than $180 million.

The New South Wales population has always lived with fire and its consequences, but climate change – driven by the burning of coal, oil and gas – is worsening dangerous fire weather across the state. Long-term global warming, now about 1°C above pre-industrial levels, is increasing temperatures across the Australian continent. At the same time, a decline in cool season rainfall is contributing to an increased likelihood of more dangerous bushfire conditions by drying fuel. Bushfire weather is becoming harsher.

We must think seriously about how to prepare for, and cope with, increasing bushfire risk under a hotter climate. This report begins by describing the bushfire risk this coming spring and summer in New South Wales, before outlining the link between bushfires and climate change. We consider how bushfire weather is intensifying in the state, and what this means for the immediate future. We explore the impacts of fire on people, property, water supply, biodiversity and the economy, before identifying the future implications of bushfires for New South Wales fire managers, planners and emergency services.

This report provides an update to the previous Climate Council report on bushfire risk in New South Wales and the Australian Capital Territory.

Dry, warm conditions have led to a dangerous bushfire season ahead.

2. Bushfire Outlook 2017/2018

JUNE-SEPTEMBER CLIMATE RECORDS

Many heat and low rainfall records were broken in New South Wales from June to September in 2017 (Figure 1). As a result, the hot, dry conditions have set the scene for a dangerous bushfire season ahead. Here are a selection of records and weather details for this period (BoM 2017a):

June:

- 38 records in regional towns across the state were broken for the driest June on record.
- New South Wales had its driest June since 2002.

July:

- 35 records were broken for the hottest July temperature on record at a number of locations across New South Wales, including Sydney which set a record high of 26.5°C.
- Statewide rainfall for July was about 70% below the long-term July average.

August:

- Rainfall was 44% below average.
- Maximum temperatures were 1.17°C above average across New South Wales.

September:

- The average maximum temperature was more than 2°C above average for the state.
- Sydney had the driest start to spring since observations began in 1858, with Observatory Hill recording only 0.2 mm.
- Wanaaring in regional New South Wales set a new state September record of 41.4°C. No locations in the state had previously exceeded 40°C in this month.
- New South Wales broke 61 records for low rainfall and 76 high temperature records.
- Some parts of New South Wales experienced temperatures 16°C above average on September 23, the state's overall warmest September day on record.

Data from the Bureau of Meteorology's climate summary archives, available at: http://www.bom.gov.au/climate/current/statement_archives.shtml. More records can also be found in BoM's Special Climate Statement on the September extreme heat: http://www.bom.gov.au/climate/current/statements/scs62.pdf.

Figure 1: Sunset in Sydney. Hotter than average days, including Sydney's hottest July day marked a warm and dry winter in the city and across New South Wales.

SEASONAL OUTLOOK

Fortunately, maximum temperatures appear set to be average or below average across much of New South Wales through to January, according to the latest (12 October) climate outlook from the Bureau of Meteorology (BoM 2017b). Rainfall is likely to be average or slightly above average, particularly in the far southeast of the state. However, the exceptionally dry and warm conditions that persisted through winter has led to above normal fire potential predicted for many areas, including Sydney, Newcastle, Armidale, Port Macquarie, Jindabyne, Batemans Bay, Tamworth and Orange, as well as the Australian Capital Territory (Bushfire and Natural Hazards CRC 2017; Figure 2).

The climate models also indicate that the El Niño Southern Oscillation (ENSO) – a large-scale climate pattern that can either bring dry (El Niño) or wet (La Niña) conditions to the east of the country – will be neutral for the remainder of the year (BoM 2017b). In El Niño years, bushfire risk is typically elevated in eastern Australia due to drier than normal conditions. The neutral ENSO conditions mean that the fire conditions projected for this spring and summer are even more unusual.

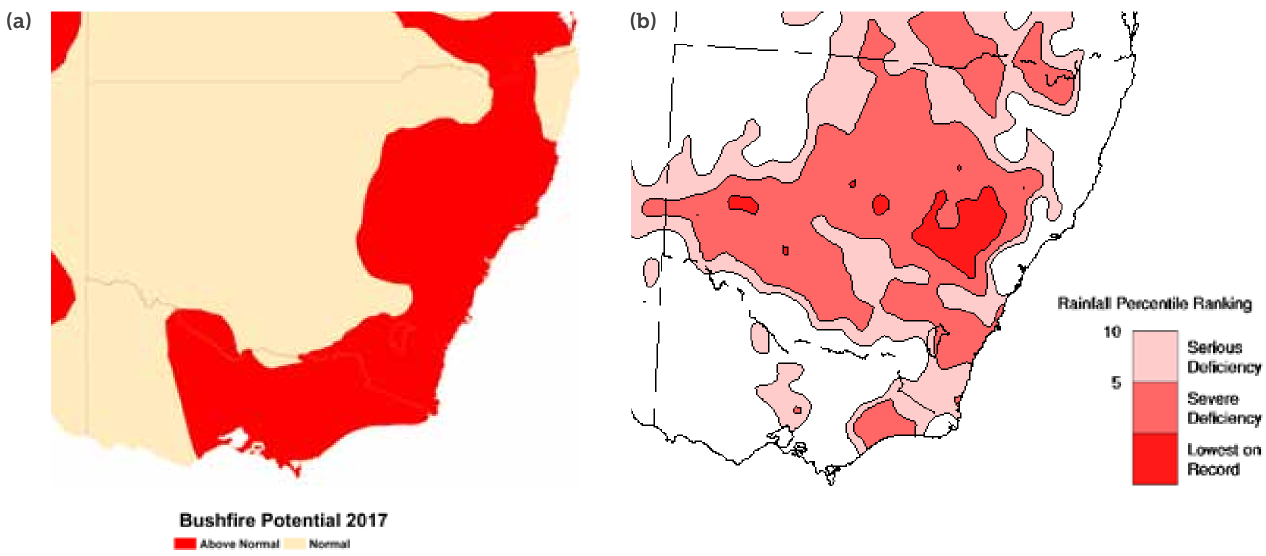


Figure 2(a): Bushfire outlook for the 2017/2018 bushfire season. Magenta areas show above normal bushfire potential. New South Wales has above normal fire potential in the east of the state. **(b)** Rainfall deficiencies for the June to September period. **Sources:** Bushfire and Natural Hazards CRC 2017; BoM 2017c.

THE FIRE SEASON SO FAR

Warm, dry weather over winter has led to an early start to the 2017 bushfire season (Figure 3; Boer et al. 2017). The New South Wales Rural Fire Service brought forward the start of the bushfire danger season to 1 September in nine eastern local government areas, one month earlier than usual due to the prevailing dry conditions (NSW RFS 2017). During the peak of the extreme heat on September 23, more than 90 bushfires were reported across the state, with 12 total fire bans in effect (BoM 2017d). Fire danger weather also exceeded extreme levels at many sites across the rest of Australia from 22–27 September, with the highest values in inland areas (BoM 2017d).

Figure 3: A hazard reduction burn being conducted by the New South Wales Rural Fire Service. With the bushfire season starting early, there is less opportunity to perform such preventative burns.

3. The Climate Change Influence on Bushfires

A fire needs to be started (ignition), it needs something to burn (fuel), and it needs conditions that are conducive to its spread (appropriate weather). Climate change, primarily driven by the burning of fossil fuels – coal, oil and gas – can affect all of these factors in both straightforward and more complex ways.

The role of climate change in ignition is likely to be relatively small compared to its impact on fuel and weather, but may still be significant. Lightning accounts for ~27% of the ignitions in the Sydney region (Bradstock 2008) and the incidence of lightning is sensitive to weather conditions, including temperature. One modelling study has predicted that lightning strikes in the US could increase 12±5% for every degree of global warming, and as much as 50% over the coming century (Romps et al. 2014). Climate change can also affect fuel. For example, a lack of rainfall can dry out the soil and vegetation, making existing fuel more combustible. Dead vegetation can dry to a critical threshold to sustain severe fires in a matter of a few weeks (Nolan et al. 2016). The 2013 October bushfires in the Blue Mountains provide a good example (e.g. Figure 4). These bushfires were preceded by the warmest September on record for the state, the warmest 12 months on record for Australia, and below average rainfall in forested areas, leading to very dry fuels (Bushfire CRC 2013).

But whilst climate change can affect ignition and fuel, it is weather that is the most important factor affecting the spread, size and severity of bushfires (Penman et al. 2014; Price et al. 2015; Price et al. 2016). Increasing greenhouse gas emissions from the burning of fossil fuels, are increasing the amount of heat in the atmosphere. In turn, the frequency and severity of very hot days are increasing and this is driving up the likelihood of fire danger weather. The latest Intergovernmental Panel on Climate Change (IPCC) report concluded with high confidence that climate change is increasing the number of days with very high and extreme fire weather, particularly in southern Australia (IPCC 2014).

Since the 1970s, there has been an increase in extreme fire weather and a lengthening of the fire season across large parts of Australia, particularly in southern and eastern regions, due to increases in extreme hot days and drying (CSIRO and BoM 2016). Since the mid-1990s, southeast Australia has also experienced a 15% decline in late autumn and early winter rainfall, and a 25% decline in average rainfall in April and May (CSIRO and BoM 2014).

There has been an increase in extreme fire weather in the southeast of Australia over the last 40 years.

Figure 4: Firefighters using a monitor (high-capacity water gun) while fighting a fire at Mt. Riverview in the Blue Mountains in October 2013.

Burning coal, oil and gas is increasing bushfire risk.

The influence of hotter, drier weather conditions on the likelihood of bushfire spread is captured by changes in the Forest Fire Danger Index (FFDI), an indicator of dangerous fire weather. Analysis of changes in the FFDI (1973–2010) since the 1970s has shown that extreme fire weather has increased significantly at 16 of 38 weather stations across Australia, with the majority of these stations concentrated in Australia's southeast, with none of the stations recording a significant decrease (Clarke et al. 2013). These changes have been most marked in spring, indicating a lengthening fire season across southern Australia, with fire weather extending into October and March. The lengthening fire season means that opportunities for fuel reduction burning are decreasing (Matthews et al. 2012; Ximenes et al. 2017).

4. Impacts of Bushfires

In New South Wales, bushfires have a very wide range of human and environmental impacts, including loss of life and severe health effects, damage to property, devastation of communities and effects on water and natural ecosystems (Figure 5).

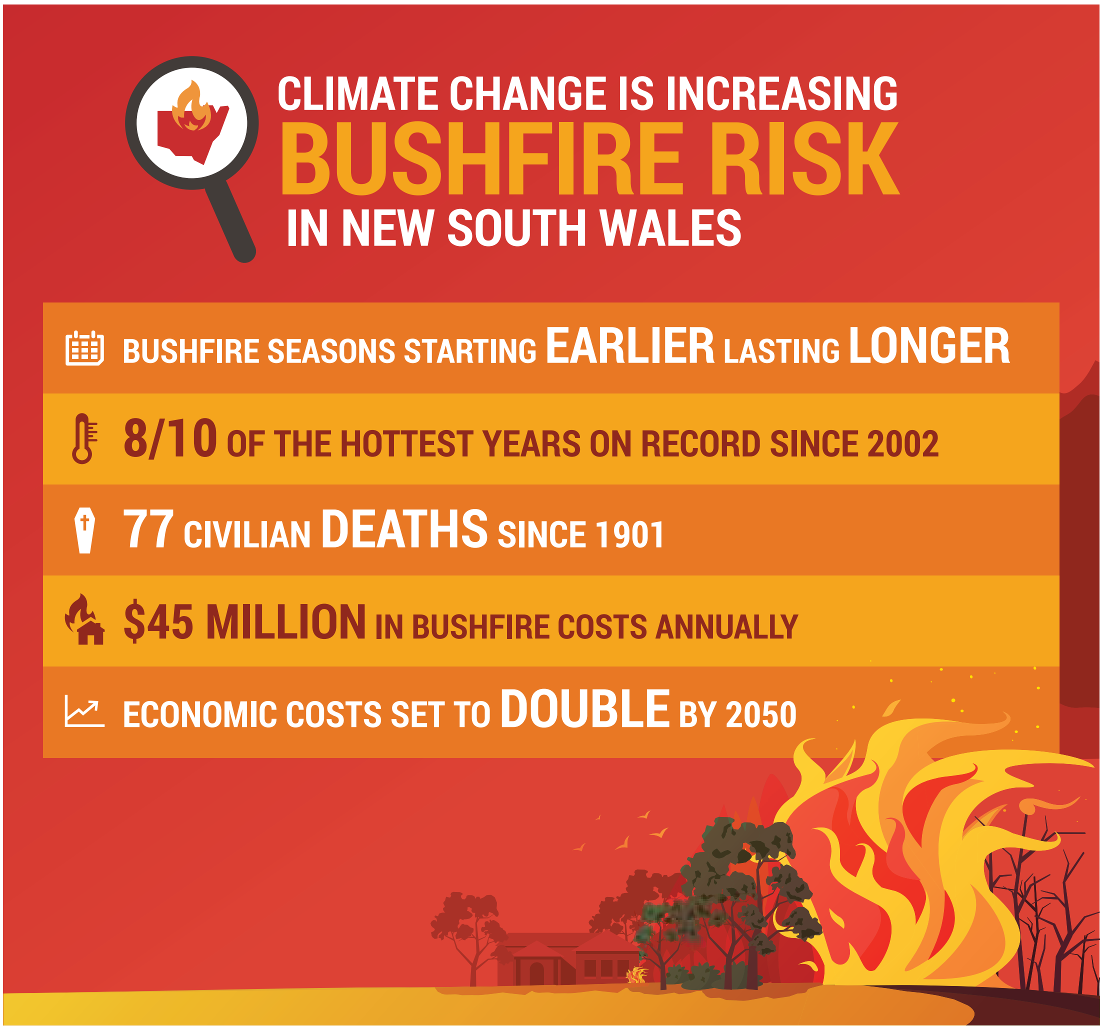


Figure 5: Climate change is increasing the bushfire risk in New South Wales.

4.1 Health Impacts

Large populations in New South Wales are at risk from the health impacts of bushfires, which have contributed to physical and mental illness as well as death. Communities in New South Wales are particularly vulnerable because many people live close to highly flammable native vegetation, such as eucalyptus trees (Chen and McAneney 2010; Handmer et al. 2012; Price and Bradstock 2013). Tragically, there have been 77 known civilian fatalities in New South Wales between 1901 and 2011 (Blanchi et al. 2014).

Bushfire smoke can seriously affect health because it contains respiratory irritants as well as inflammatory and cancer-causing chemicals (Figure 6). Smoke can be transported in the atmosphere many kilometres from the fire front, affecting air quality and exposing large populations to its impacts (Bernstein and Rice 2013; Rea et al. 2016). The estimated annual health costs of bushfire smoke in Sydney are also high, at $8.2 million per annum (2011$) (Deloitte Access Economics 2014). Smoke events, whether from hazard reduction burning or wildfire, are associated with increased ambulance callouts and emergency admissions, with immediate impacts on people with respiratory conditions, and lagged impacts on people with heart conditions (Johnston et al. 2014; Haikerwal et al. 2015; Salimi et al. 2017). The impacts of bushfire smoke in the community are also uneven, with the elderly, infants and those with pre-existing heart or lung diseases at higher risk (Morgan et al. 2010; Liu et al. 2015).

In addition to physical health impacts, the trauma and stress of experiencing a bushfire can also increase depression, anxiety, and other mental health issues, both in the immediate aftermath of the trauma and for months or years afterwards (McFarlane and Raphael 1984; Sim 2002; Whittaker et al. 2012). Following the 2013 Blue Mountains bushfires, mental health charity 'Beyond Blue' collaborated with the Australian Red Cross to develop resources to assist bushfire victims experiencing increases in depression and anxiety (Beyond Blue 2013a; 2013b) and over 100 households requested wellbeing assistance from Red Cross volunteers (Red Cross 2013).

Figure 6: Bushfire smoke from the Blue Mountains blankets Sydney in 2013.

4.2 Economic Impacts

The economic cost of bushfires – including loss of life, livelihoods, property damage and emergency services responses – is very high. The total economic cost of bushfires in Australia, a measure that includes insured losses as well as broader social costs, is estimated to be approximately $375 million per year (2011$), a figure expected to reach $800 million by 2050 (Deloitte Access Economics 2014).

The annual economic costs of bushfires in New South Wales is estimated to average $45 million per annum (2011$) and by about mid-century these costs could more than double (Deloitte Access Economics 2014). These estimates take into account increases in the number of households, growth in the value of housing stock, population growth, and increasing infrastructure density. However, they do not incorporate increased bushfire incident rates due to climate change and are therefore likely to be conservative. The full economic cost of the health impacts of bushfires are also poorly quantified (Bowman and Johnston 2014).

New South Wales has already experienced a significant increase in extreme fire weather since the 1970s, and bushfires occurring in New South Wales from 1970–2013 have contributed to at least 40 deaths, the destruction of nearly 800 properties and affected over 14 million hectares of land. Indirect costs, such as impacts on local tourism industries can also be significant. For example, a month after the 2013 Blue Mountains bushfires, tourism operators estimated losses of nearly $30 million due to declines in visitors and cancellations alone (ABC 2013), in addition to the more than $180 million worth of insured losses (ICA 2016; Figure 7).

Figure 7: Home destroyed in Yellow Rock, during the October 2013 Blue Mountains fires.

4.3 Environmental Impacts

Fire can affect the quality and quantity of water in catchments and have significant impacts on ecosystems. Large-scale high intensity fires that remove vegetation expose topsoils to erosion and increased runoff after subsequent rainfall (Leigh et al. 2015; Zhou et al. 2015). This can increase sediment and nutrient concentrations in nearby waterways, potentially making water supplies unfit for human consumption (Smith et al. 2011; IPCC 2014). Fires in the Sydney region in 2002 affected the Woronora pumping station and water filtration plants, resulting in a community alert to boil drinking water (WRF 2013).

Fire is a regular occurrence in many Australian ecosystems, and many species have evolved strategies over millions of years to not only withstand fire, but to benefit from it (Crisp et al. 2011; Bowman et al. 2012). Particular fire regimes (especially specific combinations of fire frequency and intensity) can favour some species and disadvantage others. If fires are too frequent, plant species can become vulnerable to local extinction if the adult plants are killed and the supply of seeds in the soil declines (Enright et al. 2015; Fairman et al. 2016).

Animals are also affected by bushfires, especially those restricted to localised habitats and those that cannot move quickly, and/or reproduce slowly. These species may be particularly at risk from intense, large-scale fires that occur at short intervals. Tree-dwelling mammals such as gliders and koalas (Chia et al. 2015) and amphibians (Potvin et al. 2017), are particularly vulnerable. Deliberate fuel reduction burning can also destroy habitats if not managed properly. For example, in the Shoalhaven region of New South Wales, the threatened eastern bristlebird and the glossy black cockatoo face the potential destruction of their habitats which overlap with areas of bushland targeted in hazard reduction burning (Whelan et al. 2009; Figure 8). By removing sheltering habitat, fire can also increase the vulnerability of native animals to introduced predators such as foxes and cats (Hradsky et al. 2017).

Figure 8: A glossy black cockatoo in New South Wales. This threatened bird species, as well as the threatened eastern bristlebird, face potential destruction of their habitats because their habitats overlap with areas of bushland targeted for hazard reduction burning.

5. Future Projections of Bushfires

A number of studies on future fire activity all point in the same direction – weather conditions conducive to fire in the southeast of the continent, including New South Wales, are becoming increasingly frequent (Table 1). For example, FFDI values are expected to increase substantially by the end of the century (e.g. Clarke et al. 2011; CSIRO and BoM 2015; Clarke et al. 2016). Additionally, the number of severe fire weather days and severe fires is predicted to increase (CSIRO and BoM 2015; Zhu et al. 2015).

Future changes in the ENSO phenomenon are also likely to have an influence on fire activity. There is a strong positive relationship between El Niño events and fire weather conditions in southeast and central Australia (Williams and Karoly 1999; Verdon et al. 2004; Lucas 2005) and between El Niño events and actual fire activity (Harris et al. 2013). It is likely that climate change is, and will continue to, influence ENSO behaviour, increasing extreme El-Niño events (e.g. 1982/83, 1997/98, 2015/16) (Power et al. 2013; Cai et al. 2014). Such a change would, in turn, increase the incidence of extreme heat and drought (e.g. Figure 9), and thus potentially increase fire activity in eastern Australia.

Figure 9: Dry conditions in summer 2014 in central New South Wales. Recent projections show that by the mid-to-late 21st century, increases in El Niño-driven drying in the western Pacific Ocean may increase the incidence of heat and drought, potentially increasing fire activity in eastern Australia, including New South Wales.

Bushfire weather is expected to become even more dangerous.

Table 1: Summary of projections from modelling studies aimed at projecting changes in fire risk in southeast Australia.

Study	Projections
Beer and Williams (1995)	Increase in FFDI with doubling of atmospheric carbon dioxide, commonly >10% across most of continent, especially in the southeast, with a few small areas showing decreases.
Williams et al. (2001)	General trend towards decreasing frequency of low and moderate fire danger rating days, but an increasing frequency of very high and in some cases extreme fire danger days.
Hennessy (2007)	Potential increase of very high and extreme FFDI days in the range of 4–25% by 2020 and 15–70% by 2050.
Lucas et al. (2007)	Increases in annual FFDI of up to 30% by 2050 over historical levels in southeast Australia and up to a trebling in the number of days per year where the uppermost values of the index are exceeded. The largest changes are projected to occur in the arid and semi-arid interior of New South Wales and northern Victoria.
Hasson et al. (2009)	Projected potential frequency of extreme events to increase from around 1 event every 2 years during the late 20th century to around 1 event per year in the middle of the 21st century, and to around 1 to 2 events per year by the end of the 21st century.
Clarke et al. (2011)	In the southeast, FFDI is projected to increase strongly by end of the 21st century, with the fire season extending in length and starting earlier.
Matthews et al. (2012)	A warming and drying climate is projected to produce drier, more flammable fuel, and to increase rate of fire spread.
CSIRO and BoM (2015)	Projections of warming and drying in southern and eastern Australia will lead to increases in FFDI and a greater number of days with severe fire danger. In a business as usual scenario (worst case, driest scenario), severe fire days increase by up to 160-190% by 2090.
Zhu et al. (2015)	Projections of increased average daily FFDI in 2060–2079 compared to baseline period of 1990–2009 with spring being the season with greatest increases and western New South Wales proportionally more affected. Also project more frequent severe fires (FFDI 50–74).
Clarke et al. (2016)	Changes in climate and atmospheric CO_2 are projected to increase fuel load. FFDI projections are variable depending on which climate scenario is used in modelling but overall projections are for increasing fuel load and fire weather in spring in both forested and grassland areas by the latter half of this century.

6. Implications of Increasing Fire Activity

The population of New South Wales is expected to grow from 7.7 million people (as of March 2016) to 9.9 million people by 2036 (NSW Department of Planning and Environment 2017). The steady urban encroachment into bushland, along with increasing fire danger weather, present significant and growing challenges for New South Wales. This challenge is exemplified in greater Sydney, a region considered to be one of the most bushfire-prone areas in Australia and home to a quarter of Australia's population. All areas on the periphery of Sydney are considered at risk from bushfires (Price et al. 2015), with the risk highest for those homes closest to bushland. In 2005, 190,000 homes in Sydney were estimated to be within 80m of a bushland boundary (Chen 2005).

There is increasing interest in how adaptation to an increasingly bushfire-prone world may reduce vulnerability. Current government initiatives centre on planning and regulations; building designs to reduce flammability; burying powerlines in high risk areas and retrofitting electricity systems; fuel management; fire detection and suppression; improved early warning systems; and community education (Preston et al. 2009; Buxton et al. 2011; O'Neill and Handmer 2012; King et al. 2013).

Retrofitting to reduce fire vulnerability, however, is expensive for households and cost may be a significant disincentive (Penman et al. 2017). The practice of prescribed burning, where fires are lit in cool weather to reduce the volume of fuel, can be particularly challenging. For example, during 2012–13, the largest ever hazard reduction burn was conducted in New South Wales, with 330 burns carried out across 206,000 ha of national parks (NSW Government 2014). Fire managers are constantly faced with balancing the need to reduce risk to life and property whilst simultaneously conserving biodiversity and environmental amenity, and controlling air pollution near urban areas (Penman et al. 2011; Williams and Bowman 2012; Altangerel and Kull 2013; Ximenes et al. 2015; Williamson et al. 2016; Holland et al. 2017). As noted above, the increasing length of the fire season is reducing the window of opportunity for hazard reduction at the same time that the need for hazard reduction is becoming greater. Ongoing climate changes is also affecting the ability of households to prepare. For example, the dry conditions prior to the 2013 fires in the Blue Mountains meant that many households that relied on dams and water tanks had limited water available to prepare their properties (Wilkinson and Eriksen 2015).

Lengthening of the fire season reduces the opportunity for hazard reduction burns.

Figure 10: Country Fire Authority firefighters in the foreground with Elvis in the background – the Erickson Air-Crane fire bomber – dumping of water to assist firefighters battling a blaze in Australia's southeast. Specialised firefighting aircraft like this are loaned for the bushfire seasons in both the Northern and Southern Hemispheres each year. Such aircraft are expensive to operate.

Australia's fire and emergency services agencies have recognised the implications of climate change for bushfire risk and firefighting resources for some time (AFAC 2010). During the past decade, state fire agencies have increasingly needed to share suppression resources domestically during peak demand periods. As climate change increases the severity of bushfire danger weather in New South Wales and increases the fire season length, firefighting services will be less able to rely on help from interstate and across the world as fires occur simultaneously (see Box 1 for implications of the recent California wildfires). This is a major challenge. Substantially increased resources for fire suppression and control will be required. Most importantly, a significant increase in the number of career and volunteer firefighters will be needed.

BOX 1: DEVASTATING CALIFORNIA WILDFIRES: The Climate Change Influence

While wildfires (referred to as bushfires in Australia) are a common occurrence in California, October 2017 has seen some of the worst fires in the State's history, with 40 deaths and many missing, 5,700 homes and businesses destroyed, and 100,000 people evacuated at the time of publication (The Guardian 2017). The fires spread rapidly to urban areas due to strong winds, which followed months of record-high temperatures and heavy winter rainfall (which was not enough to break the prolonged drought but did provide more fuel) (Scientific American 2017; Figure 11). Generally, the risk of wildfires in California is increasing due to increasing extreme heat and drought, driven by climate change (Yoon et al. 2014; Climate Signals 2017).

'Attribution' studies, which quantify the probability that a particular extreme weather event was made more likely because of climate change, reveal the impact of climate change on worsening fire weather and the length of fire seasons in California. For example, a recent study on wildfires in the western United States (US) by Abatzoglou and Williams (2016), has linked climate change to producing more than half of the dryness (fuel aridity) of forests since the 1970s, a doubling of the forest fire area since the mid-1980s, and an increase in the length of the fire season. Model simulations by Barbero et al. (2015) show that the risk of very large fires is likely to increase sixfold by mid-century in some parts of the western US, including California.

Increasing fire season length and increasing frequency of large fires in the US is likely to add pressure to both Australia and the US firefighting resources. For a number of years now, the two countries have shared firefighting resources, enabling states to request additional personnel and equipment at short notice (NIFC 2002). As fire seasons in the two hemispheres increasingly overlap, such arrangements may become increasingly impractical (Handmer et al. 2012). In particular, longer fire seasons have implications for the availability and costs of firefighting equipment, such as the Elvis fire bomber, leased from agencies in the Northern Hemisphere (Figure 10).

Figure 11: Destruction left by wildfires in Santa Rosa, California, October 2017.

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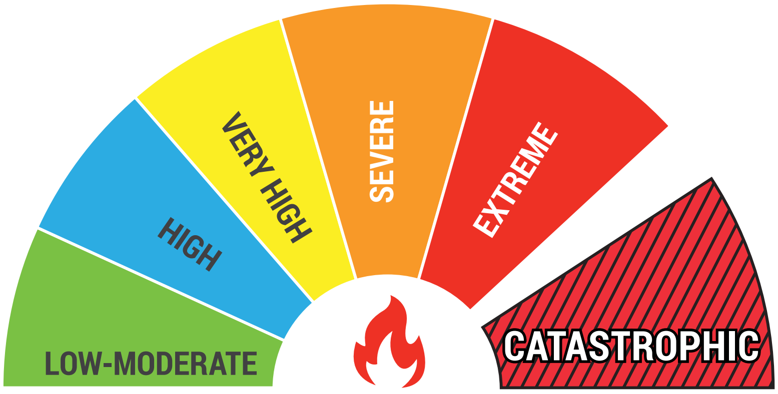
Fire Danger Rating



FIRE DANGER RATING	ACTION
CATASTROPHIC Fires in these conditions are uncontrollable, unpredictable, and fast moving. People in the path of fire will very likely be killed, and it is highly likely that a very great number of properties will be damaged.	**LEAVE EARLY—DO NOT STAY** Keep up to date with the situation.
EXTREME Fires in these conditions are uncontrollable, unpredictable, and fast moving. People in the path of the fire may die, and it is likely that many properties will be destroyed.	**LEAVE EARLY.** Only stay and defend if your house has been built specifically to withstand bushfires, and if you are physically able, and your property has been prepared to the very highest level. Keep up to date with the situation.
SEVERE Fires in these conditions will be uncontrollable and will move quickly. There is a chance that lives will be lost, and that property will be destroyed.	**IF YOU PLAN TO LEAVE, LEAVE EARLY.** If you plan to stay and defend property, only do so if your property is well prepared and you are able. Keep up to date with the situation.
VERY HIGH Conditions in which fires are likely to be difficult to control. Property may be damaged or destroyed but it is unlikely that there will be any loss of life.	Monitor the situation, and be prepared to implement your bushfire survival plan.
HIGH Conditions in which fires can most likely be controlled, with loss of life unlikely and damage to property to be limited.	Know your bushfire survival plan, and monitor the situation.
LOW TO MODERATE Fires in these conditions can most likely be easily controlled, with little risk to life or property.	Ensure you have a bushfire survival plan, know where to access up-to-date information.

Source: NSW Rural Fire Service 2017.
Accessed at: https://www.rfs.nsw.gov.au/plan-and-prepare/fire-danger-ratings

Preparing for a Bushfire in NSW

IN AN EMERGENCY, CALL TRIPLE ZERO (106 FOR PEOPLE WITH A HEARING OR SPEECH IMPAIRMENT)

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What can I do to prepare for a bushfire?

INFORM YOURSELF

The NSW Rural Fire Service has the resources available to help you prepare for a bushfire. Use these resources to inform yourself and your family.

ASSESS YOUR LEVEL OF RISK

Take advantage of the great resources available to assess your risk levels to fires. Visit: **http://www.rfs.nsw.gov.au/plan-and-prepare**.

MAKE A BUSHFIRE SURVIVAL PLAN

Even if your household is not at high risk from bushfire (such as suburbs over 1 km from bushland), you should still educate yourself about bushfires, and take steps to protect yourself and your property. Access the bushfire ready self assessment tool: **www.rfs.nsw.gov.au/plan-and-prepare**.

PREPARE YOUR PROPERTY

Regardless of whether you decide to leave early or to stay and actively defend, you need to prepare your property for bushfires. An important consideration is retrofitting older houses to bring them in alignment with current building codes for fire risk and assessing the flammability of your garden. Use this Fire Ready Kit to help recognise exactly what you need to do to prepare your property: **www.rfs.nsw.gov.au/plan-and-prepare**.

PREPARE YOURSELF AND YOUR FAMILY

Preparation is not only about the physical steps you take to prepare – for example, preparing your house and making a bushfire survival plan. Preparing yourself and your family also involves considering your physical, mental and emotional preparedness for a bushfire and its effects. Take the time to talk to your family and to thoroughly prepare yourself on all levels.

Key Links

NSW RFS
www.rfs.nsw.gov.au
1800 679 737

Bushfire Survival Plan App:
www.rfs.nsw.gov.au/plan-and-prepare/bush-fire-survival-plan
(Available for iOS and Android)

Fire Watch Map
myfirewatch.landgate.wa.gov.au

CLIMATE COUNCIL

NB: Information correct as of 18/10/17

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