

BREAKNECK SPEED: SUMMER OF CLIMATE WHIPLASH

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Published by the Climate Council of Australia Limited.

ISBN: 978-1-923329-25-6 (ebook)

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Reviewers:

Professor David Karoly, Climate Councillor and Dr Linden Ashcroft, Climate Council Fellow.

Acknowledgments:

Climate Council acknowledges the contributors including Izzy Lyndon-James for infographics. Graphic design by Sarah Graham (Spade and Arrow) and Tim Allan (Made Visual).

The Climate Council acknowledges the Traditional Owners of the lands on which we live, meet and work. We wish to pay our respects to Elders, past and present, and recognise the continuous connection of Aboriginal and Torres Strait Islander peoples to land, sea and sky. We acknowledge the ongoing leadership of First Nations people here and worldwide in protecting Country, and securing a safe and liveable climate for us all.



Dr Martin Rice
Research Director



Dr Andrew Watkins
Climate Councillor



Greg Mullins AO, AFSM
Climate Councillor



Sean O'Rourke
Director,
Emergency Leaders for Climate Action



Jacqui Street
Media Manager



Dinah Arndt
Head of Strategic Communications



Dr Kate Charlesworth
Climate Councillor

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 info@climatecouncil.org.au

 climatecouncil.org.au

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Key findings

1 This summer Australia's climate flipped between extremes at accelerating speed - a phenomenon scientists call climate whiplash.

- › Victorian communities were flung from catastrophic fire warnings to flash flooding within a week then back to extreme heat only 10 days later.
- › Western Queensland communities received their average annual rainfall in the first five weeks of the year.
- › In Western Australia, after 45°C heat the Eyre Highway was closed due to fires ignited by dry lightning, only to be cut off again two days later by floodwaters.
- › Large areas of Australia swung from extreme heat and less than 20% of typical rainfall to more than 400% of average rainfall within weeks.

2 Climate pollution is now overpowering natural climate cycles like El Niño and La Niña.

- › Typically, a La Niña event in the Pacific Ocean is associated with wetter, cooler conditions over large parts of Australia. But 2025 was still Australia's 4th hottest year on record and January 2026 our 4th hottest January.
- › Six consecutive days in January saw at least one Australian location reach 49°C or higher, while Port Augusta, SA, became the most southerly place on Earth to record 50°C.
- › The shift in extreme heat is stark in places like Mildura, which reached 45°C just six times between 1946–1999 versus 27 times since 2000.
- › The January 2026 heatwave broke Victoria's all-time maximum temperature record, even without strong, hot northerly winds that are normally associated with our hottest days such as Black Saturday 2009. The key difference: 17 more years of coal, oil and gas pollution creating a hotter baseline climate.
- › This summer Victoria experienced catastrophic fire danger, with fires destroying 451 homes, and scorching 450,000 hectares of land. Australia now experiences 56% more extreme fire weather days than 40 years ago, and our fire seasons last nearly a month longer in some locations.

3 Record ocean heat is intensifying rainfall, floods and tropical cyclones with compounding damage across regions.

- › 2025 and 2024 were the two warmest years on record for Australian ocean temperatures. Hotter oceans fuel tropical cyclones and heavy rainfall.
- › Parts of the northern Great Barrier Reef experienced coral bleaching again in early 2026 - only the second time this has occurred during La Niña conditions.
- › Towns in north-west Queensland - Burketown, Normanton, Cloncurry and Julia Creek - recorded their highest December rainfall (450-500mm) triggering flooding that killed or displaced an estimated 100,000 head of livestock.
- › Dangerous flash flooding is increasing across the continent. For every 1°C of warming, extreme rainfall in Australia can increase by 7–28% for hourly or short duration downpours.

4 Australians are paying a high price for failure to reign in climate pollution as disasters become more frequent, damaging and expensive.

- › Annual disaster costs per Australian have risen 222% since the 1980s.
- › Between 2020 and 2024 insurance payments averaged \$4.5 billion per year, more than double the 30-year average of \$2.1 billion.
- › Insurance premiums are up 51% in five years impacting on all households even if they aren't directly affected by fire, floods or storms.
- › Councils are struggling to fund repairs because of worsening, consecutive disasters. The NSW MidCoast council has applied for state and federal disaster recovery funding 16 times since 2019, with \$232 million in flood damage in 2025 alone.

5 Australia must deeply cut climate pollution, and prepare every Australian for worsening disasters.

- › Without far deeper and faster cuts to climate pollution, the extreme heat, flash flooding and catastrophic fire danger experienced this summer will continue to worsen in the years ahead.
- › Every new coal and gas project approval locks in more pollution and increases the risk of more frequent and damaging disasters.
- › At the same time, governments must strengthen our ability to cope with worsening extremes by:
 - better resourcing for fire and emergency services;
 - helping households prepare for and recover from future disasters;
 - regularly updating the National Climate Risk Assessment and fully funding a revised National Adaptation Plan; and
 - stopping development in dangerous places, and relocating homes where risks are unacceptably high and unavoidable.

Introduction

On 9 January 2026, the fire danger across Victoria was the worst experienced since Black Summer in 2019-20, with Catastrophic and Extreme fire conditions forecast across the region. Record-breaking heat and flash drought fuelled a major bushfire crisis of more than 200 fires. Some so ferocious they produced their own weather systems, ultimately destroying around 1,590 structures, including 451 homes.



The Otways in Victoria epitomised the 2025/26 summer of breakneck climate whiplash. Some residents of Wye River on Victoria's Great Ocean Road evacuated under catastrophic fire danger warnings. A week later, the same community watched floodwaters carry cars out to sea after record-breaking rainfall.

This is not a one-off. It is climate whiplash.

Across Australia this summer, communities were flung from one extreme weather event to another. In north-west Queensland, record daily rainfall for December was followed by Tropical Cyclone Koji making landfall on 11 January, bringing heavy rainfall to already saturated soils and hitting graziers hard. More than 100,000 head of livestock were dead or missing. Meanwhile, for six consecutive days in late January, at least one place in Australia recorded a temperature of 49°C or higher. Port Augusta became the most southerly point on Earth to reach 50°C, and extreme heat in southeastern Australia spread to southern parts of Queensland.

These events are being fuelled by climate pollution, and they are getting worse.

It can be hard for many Australians to fully grasp how drastically our weather patterns are changing. Our understanding of what's possible - let alone what's "normal" has shifted, so it pays to look closely at the trend. Over more than half a century (1946-99) Mildura only reached 45°C six times. In just half that time (since 2000) Mildura has sweltered through 45°C days a shocking 27 times. Mildura recorded six days over 45°C in our climate whiplash summer alone.

The baseline has shifted. So when extremes now strike, they strike from a hotter, more dangerous starting point.

Climate pollution from burning coal, oil and gas is overheating our atmosphere and oceans, loading the dice toward more intense heat, heavier rainfall, flash drought and more dangerous fire weather. The influence of this pollution is now overtaking natural climate drivers (like El Niño and La Niña). So even during a La Niña - that typically means cooler and wetter weather over Australia - 2025 was Australia's fourth warmest year on record, and January 2026 was among the hottest on record globally. Climate pollution is rewriting the rule book for Australian summers.

This report makes clear that there are significant and rapidly increasing costs to continued climate pollution. Insurance premiums have risen 51% in five years as insurers grapple with consecutive, compounding disasters. Initial insurance losses due to the January Victorian fires are estimated to be as high as \$786 million. Any expansion of coal and gas projects will deepen these risks. Every approval pushes Australia further toward more frequent, more severe and more costly climate disasters — a price that Australian families cannot afford to keep paying.



Image 1 (top): Destroyed historic Ruffy church and home after fires razed the town during catastrophic fire weather on 9 January 2026.

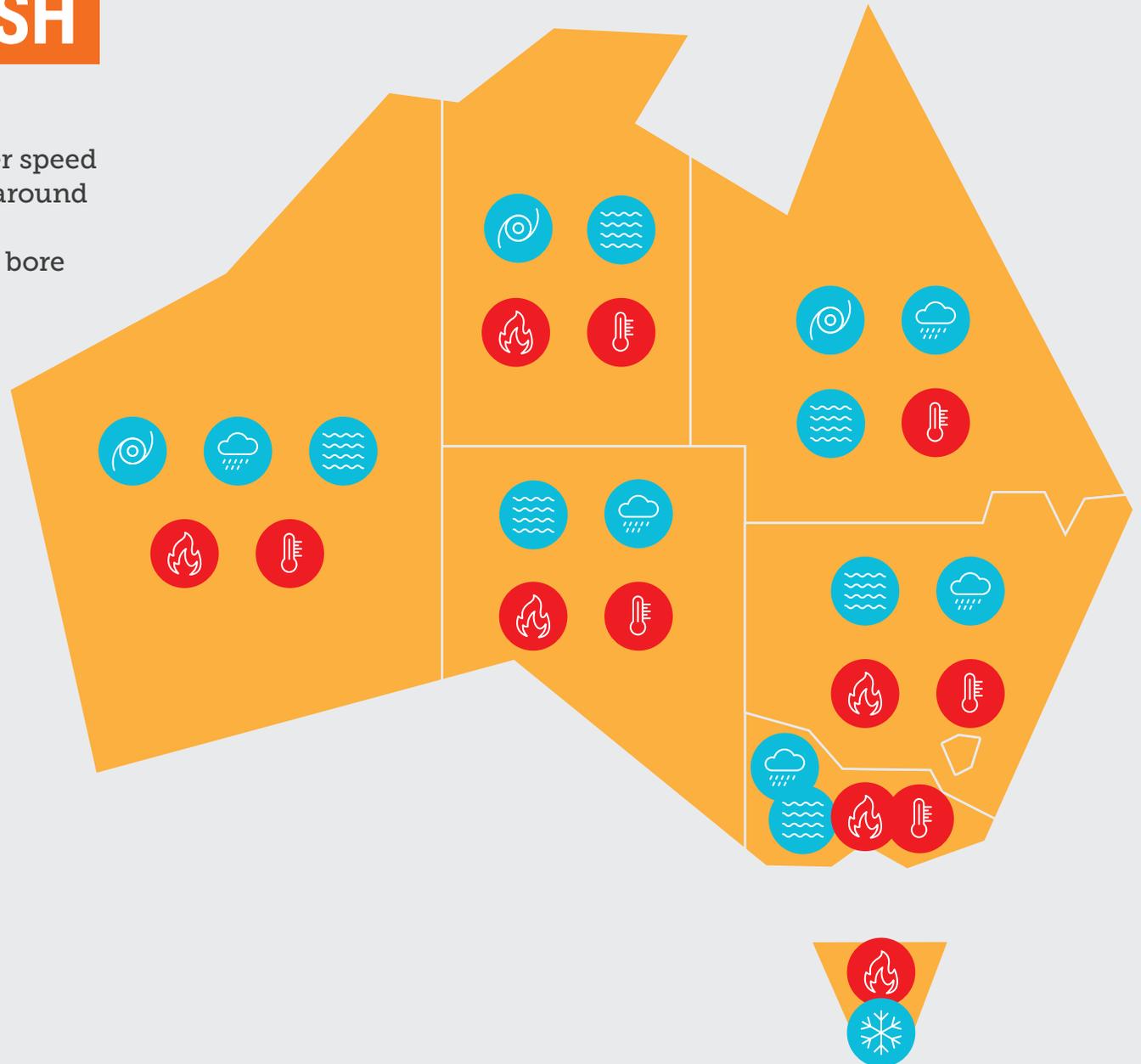
Image 2 (bottom): Residents and travellers in low-lying streets of Winton were voluntarily evacuated to other parts of the town in early January 2026.



SUMMER 2025/26

CLIMATE WHIPLASH

This summer was characterised by the sheer speed of change from one extreme to another, all around Australia. Communities, farming, business, infrastructure and the natural environment bore the brunt of climate whiplash.



Icons on the map represent different types of extreme weather events that occurred over the summer*

- | | |
|--|--|
|  Fires |  Extreme heat |
|  Tropical cyclone |  Heavy rainfall |
|  Flooding |  Snowfall |

*Note the icon placement is not site specific.

WESTERN AUSTRALIA

Heat, fires and drought

-  5 homes destroyed and 2 lives lost during fires (Nov-Dec)
-  +100 fires in one week over Christmas/New year
-  Record 2 days of 49°C - Onslow (7 Jan) and Shark Bay (20 Jan)
-  Fire closed Eyre Highway severing main link between Perth and eastern states (26 Jan)
-  Flash drought (Jan-Feb)

Heavy rainfall and floods

-  After fires closed Eyre Highway, ex-tropical cyclone *Launa* brought +4X Eucla's average Jan rainfall in 2 days (27-28 Jan), cutting vital east-west supply link again

SOUTH AUSTRALIA

Extreme heat, fires and drought

-  Multiple fires, 1 firefighter death and 2 homes lost (Nov-Feb)
-  50°C at Port Augusta is most southerly 50°C ever recorded on Earth (26 Jan)
-  Record number of consecutive days +45°C: Coober Pedy and Roxby Downs (7 days) (Jan)
-  Marree no rainfall and 5 consecutive days +48°C (Jan)
-  Flash drought (Jan-Feb)

Heavy rainfall and floods

-  Parts of SA received equivalent of average annual rainfall in 1 month (Feb)
-  Floods closed roads and cut off supply routes of population centres (Feb)
-  1 week after record-breaking heat and no rain, Marree had 68 mm of rain in 2 days (10X average Feb total)

NORTHERN TERRITORY

Extreme heat and fires

-  Over 46 million hectares burnt across the Tropical Savannas of Australia in 2025 including the NT
-  Severe heatwave in southern NT (Jan)

Tropical cyclones and floods

-  Severe Tropical Cyclone Fina impacted western Top End of the NT (15 - 26 Nov)
-  Severe Tropical Cyclone Mitchell began as a tropical low over the NT, producing significant inland flooding (29 Jan - 10 Feb)
-  Alice Springs flash flooding (12 Feb)

VICTORIA

Heat, fires and drought

-  Catastrophic and extreme fire weather conditions, and major fires destroyed around 1,590 structures including 451 homes, 1 life lost, 450,000 ha burnt (Dec-Feb)
-  Pyro-cumulonimbus (fire storm) events caused dry lightning that ignited fires (9 Jan)
-  Record-breaking heat and flash drought fuelled a major bushfire crisis with more than 200 fires (9 Jan)
-  New Victorian max temp record 48.9°C at Walpeup and Hopetoun (27 Jan)
-  1/3 Victoria highest January temp on record (27 Jan)
-  Heatwave and fires in Otways, 10 days after flash flooding
-  Flash drought Jan-Feb

Heavy rainfall and floods

-  Flash flooding in Otways (Mount Cowley 180 mm in 6hrs) – days after out of control fires in region
-  Mildura flash floods 148.8 mm of rain (1-2 Mar) almost equal to the total rainfall for 2025 (159.7 mm)

TASMANIA

Fires

-  Around 30 bushfires on East coast, 21 homes and shacks and 15 other buildings lost in Dolphin Sands and near St Helens (4-10 Dec)

Snowfall

-  3X snowfall events (Dec-Feb)

QUEENSLAND

Extreme heat and fires

-  Over 46 million hectares burnt across northern Australia including the Gulf Country (Oct - Dec)
-  Record 4 consecutive days +45°C at Cunnamulla (Jan)
-  Extreme heat in southern Queensland (Jan)

Tropical cyclones, heavy rainfall and floods

-  Three major flood events (Dec - Feb)
-  Rainfall +300 mm in Gulf country, flooding and isolation of communities (late Dec)
-  Tropical cyclone Koji flooded parts of northwestern Queensland +2 weeks (Jan)
-  Large parts of inland Queensland received average annual rainfall in first 5 weeks of 2026
-  Mt Isa recorded 399.2 mm for Feb, smashing previous record (282.5 mm) set in 1930
-  Tropical Low caused widespread flooding in Queensland, cutting road and rail links to Darwin and Perth

NEW SOUTH WALES

Extreme heat and fires

-  Fire at Koolewong near Gosford destroyed 16 homes, temps in the 40s, very low humidity and strong winds (6 Dec)
-  Fire at Bulahdelah north of Newcastle destroyed 4 homes, 1 firefighter was killed (7 Dec)
-  Record number of consecutive days +45°C: Pooncarie and Ivanhoe (6 days) (Jan)

Heavy rainfall and floods

-  Parts of north-west NSW recorded their highest rainfall on record (Feb)
-  Tibooburra received 273 mm (Feb) 10X average rainfall
-  Torrential downpours and flash floods in Sydney's northern suburbs (17 Jan)

1.

Climate whiplash
is wreaking havoc
on our summers



Image 3: Helicopter flies over the Deep Creek National Park (South Australia) fire in February.

Climate whiplash describes the rapid change between opposing weather or climate extremes like catastrophic fire conditions to flash flooding. The sudden change from one extreme to the other causes more harm than the individual events alone, affecting sectors as diverse as agriculture, infrastructure, biodiversity and human health. Climate whiplash is becoming more frequent and severe in a much warmer and energetic climate, fuelled by record high global pollution from coal, oil and gas ([Tan et al. 2023](#); [Treppiedi et al. 2024](#); [McCabe 2025](#)).

We are now at a point where these events [climate disasters] are occurring at a speed and with a force that we have never seen before."

Monique Barbut, Minister for Ecological Transition, France ([The Guardian 2026a](#)).

Climate whiplash events have become more extreme and more frequent across the globe in recent years ([Swain et al. 2025](#)). This increasing oscillation in extremes can be attributed, in most cases, to a more volatile climate caused by climate pollution.

On shorter timescales, whiplash events are increasingly considered to be compound events (several hazards combining to produce greater impacts), such as 'flash drought' where increased heat causes the landscape to dry much faster than lack of rainfall alone, followed by fires. This may then be followed by severe thunderstorms with intense rainfall due to greater atmospheric moisture boosted by higher evaporation due to climate change. In some cases, hard packed dry soils are less able to soak up these heavy rains, leading to flash flooding.

CLIMATE WHIPLASH EXAMPLES FROM AROUND THE GLOBE

NORTH-CENTRAL USA

Jan 2020–Jan 2021
wet to dry

Impacts: flooding, crop loss, hydropower loss, wildfire

NORTHERN & CENTRAL EUROPE

Jan 2018–Jan 2019
wet to dry

Impacts: flooding, extreme heat, crop loss

IRAN, PAKISTAN & EASTERN ARABIAN PENINSULA

May 2022–Aug 2022
dry to wet

Impacts: flooding, landslides, infrastructure damage

PACIFIC SOUTHWEST

Oct 2022–Oct 2023
dry to wet

Impacts: wildfire, flooding, landslides

SOUTHERN CHINA

Jun 2022–Sep 2022
wet to dry

Impacts: crop loss, hydropower loss

CENTRAL AMERICA

Nov 2019–Nov 2020
dry to wet

Impacts: flooding, landslides, crop loss, human displacement

SOUTHERN CHILE & ARGENTINA

Dec 2016–Dec 2017
dry to wet

Impacts: wildfire, flooding, landslides

WEST AFRICA

Jun 2020–Sep 2020
dry to wet

Impacts: flooding, human displacement, disease outbreak

EAST AFRICA

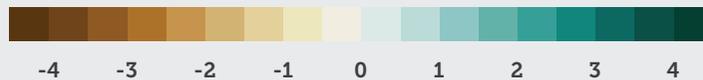
Sep 2023–Dec 2023
dry to wet

Impacts: crop and livestock loss, food shortages, flooding

SOUTHEAST AUSTRALIA

Dec 2019–Dec 2020
dry to wet

Impacts: wildfire, flooding



Standardised Precipitation Evapotranspiration Index (SPEI)*

*The SPEI is designed to take into account both precipitation and potential evapotranspiration in determining drought ([UCAR 2026](#)).

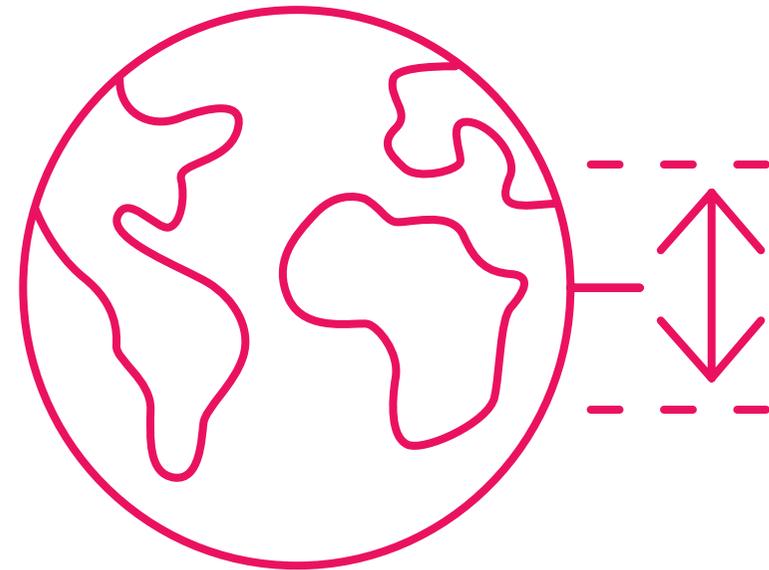
One of the key causes of climate whiplash events is shifts and changes in the weather patterns driven by changes in the difference between the temperatures in the tropics and at the poles.

The tropics near Australia are expanding at about 60km per year ([Lucas et al. 2013](#)), pushing weather systems further south, while at the same time, 'polar amplification' means temperatures in Antarctica are warming at a greater rate than the global average ([Smith et al. 2019](#)).

Both of these changes are primarily caused by increased climate pollution in the lower part of the atmosphere (the troposphere) trapping more heat, although changes in stratospheric ozone also play some role.

These changes to the tropics and poles means the temperature gradient from the high to low latitudes is decreasing. This decrease in turn causes a change in the speed of our weather systems: they are now generally slowing as they move west to east, and can draw cold air from further south or warm air from further north as the jetstream (winds at high altitude) that guides our weather systems gets more 'wavy'. The same thing is happening in the Northern Hemisphere, e.g. a winter snowstorms swept across large parts of the US in January 2026 leaving a million people without power and killing at least 50 people ([BBC Science Focus 2026](#)). During Black Summer relentless bouts of Severe, Extreme and Catastrophic fire danger was worsened by slower transit of high pressure systems across Australia ([Binskin et al. 2020](#)).

Figure 1 (opposite): Global examples of climate whiplash. Adapted from [Swain et al. 2025](#).



Climate pollution is a major driver of the expansion of the tropics, pushing weather systems further south.

2.

Summer 2025/26:
from one extreme
to another



Images 4 (top) and 5 (bottom): Victoria experienced climate whiplash in January 2026 with flips from one climate extreme to another.

Australia's summers have always been the peak of our severe weather season, which historically lasted from October through to April. But our summer weather and climate have been changing. So much so that the Bureau of Meteorology (BoM) and National Emergency Management Agency (NEMA) no longer call October to April the *Severe Weather Season*. They have changed its name to the *Higher Risk Weather Season* (see [NEMA 2025](#)) in recognition that any time of the year can now give us extreme weather as our climate is increasingly supercharged by fossil fuels.

Climate drivers that historically gave us dry or wet summers – such as El Niño and La Niña events – are no longer the dominant players that change the odds for different types of weather. Climate pollution from coal, oil and gas is now supercharging the seasonal impacts from our traditional climate drivers, and even overtaking their influence.

A supercharged climate from the burning of coal, oil and gas is now a dominant driver of different types of weather over summer.



Image 6: A boat is battered against rocks at Airlie Beach during ex-Tropical Cyclone Koji in January 2026.

2.1 Climate drivers under a changing climate

In late November 2025, the BoM declared that La Niña was underway in the tropical Pacific Ocean. This followed the weak 2024-25 La Niña, which had ended in March 2025, and the triple dip La Niña in 2020-2023 ([BoM 2026a](#)).

Typically La Niña causes temperatures to cool globally and over Australia. For eastern Australia, December to March rainfall during La Niña years is 20% higher than the long-term average, with coastal areas experiencing more severe flooding during La Niña summers ([BoM 2016](#)).

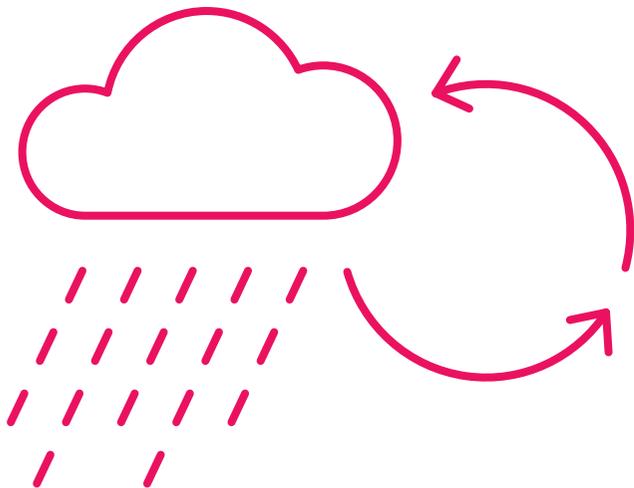
But despite starting *and* ending in a La Niña event that should have cooled things down, 2025 was one of the three warmest years on record for the globe ([WMO 2026](#)), and was Australia's 4th warmest year since records began in 1910 ([BoM 2026b](#)). This heat during a supposedly cooling La Niña has continued into the new year, with January 2026 Australia's 4th warmest January on record ([BoM 2026c](#)), and globally the 5th warmest ([Copernicus 2026](#)).

Summer 2025/26 was Australia's 8th hottest on record, hotter than all summers in the 20th Century except for 1997/98, which was 0.01°C warmer. Such a small difference means the summer temperatures were statistically identical, despite 1997/98 being the strongest El Niño of the 20th Century, while 2025/26 was a weak La Niña. Temperatures were only identical because of 28 years of global warming caused by increasing climate pollution.

"The year 2025 started and ended with a cooling La Niña and yet it was still one of the warmest years on record globally because of the accumulation of heat-trapping greenhouse gases in our atmosphere. High land and ocean temperatures helped fuel extreme weather – heatwaves, heavy rainfall and intense tropical cyclones"

Secretary-General Celeste Saulo, United Nations World Meteorological Organization ([WMO 2026](#)).

It is becoming clearer every year that the amount of heat now trapped in the ocean and atmosphere is overriding the natural variability of the past. This is loading the dice for even more erratic climate extremes.



2.2 Climate whiplash hit Australians hard and fast this summer

From November 2025 to January 2026, communities bore the brunt of climate whiplash. Over large parts of Western Australia, South Australia, Victoria and Tasmania the weather flipped from cool and wet conditions to record breaking heat, flash drought and extreme to catastrophic fire danger across multiple states in southern Australia. While in Northern Australia, the region experienced extensive fires and extreme heat, record breaking rainfall and major flooding. It was a great acceleration from one extreme to another, symptomatic of the climate supercharged by excess heat and energy from record high pollution from coal, oil and gas.

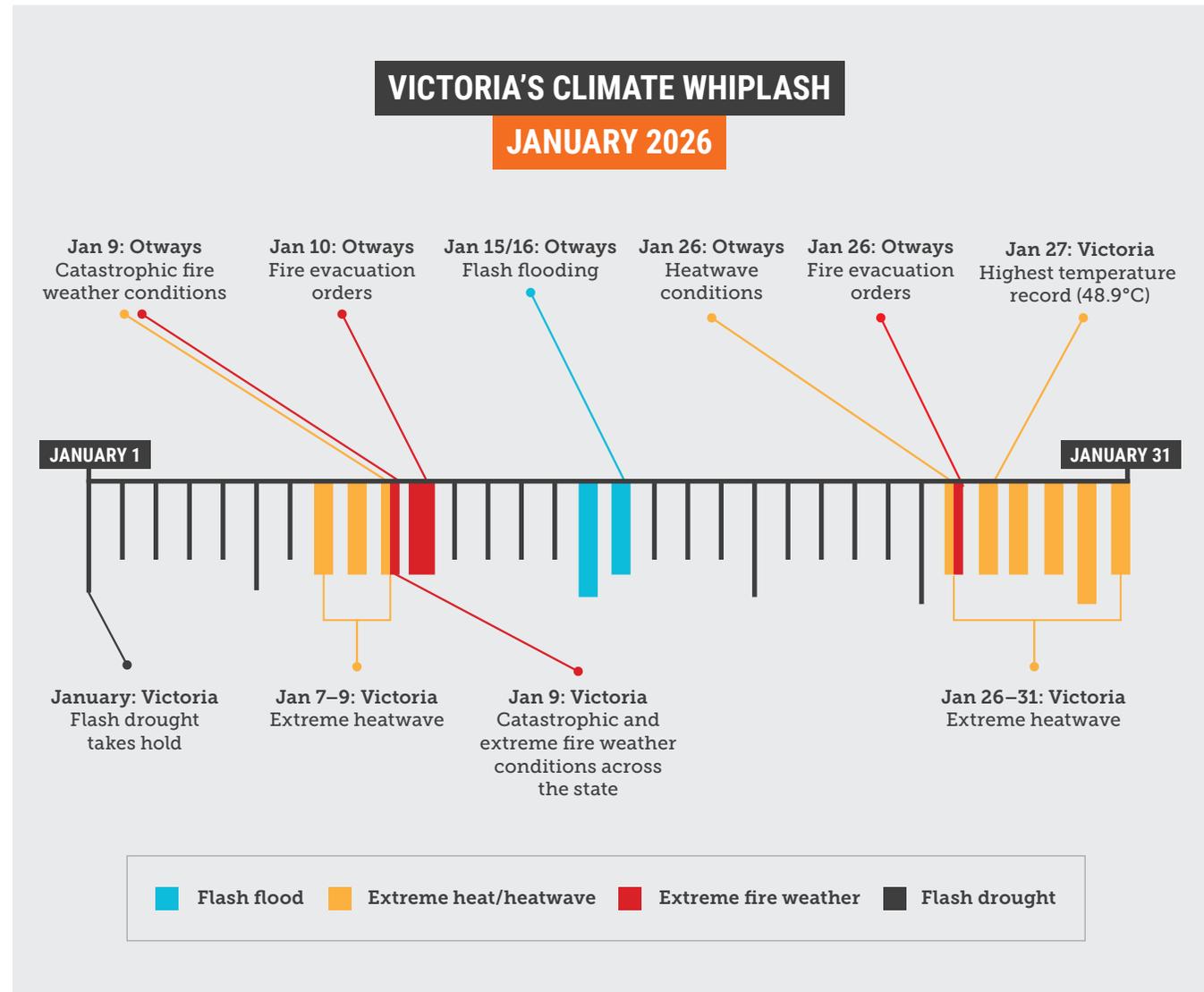


Figure 2: Climate whiplash summer timeline for Victoria, January 2026.

VICTORIA

Perhaps the most prominent example of summer 2025/26 climate whiplash was when areas near Lorne close to the Victorian Otway Ranges switched from smoke and fire during a heatwave in early January, to evacuations and property damage due to highly localised and near stationary thunderstorms and flash flooding on 15 January, then evacuations again due to a resurgence in the heat and fire in late January.

The weather station at Mt Cowley, inland from Lorne, set a new record for highest January daily rainfall with 186.2mm on 16 January, which is over three times its average rainfall for January ([BoM 2026d](#)), sending torrents of water towards the sea, with dangerous flash flooding at summer holiday locations along the Surf Coast such as Wye River along the Great Ocean Road. More evacuation warnings were issued, just 10 days later in late January, but this time for fire rather than flood with the onset of a new heatwave.

Following a summer of record-breaking heat and bone dry conditions, Mildura experienced flash flooding with 148.8 mm of rain 1-2 March, just shy of Mildura's total rainfall for 2025 (159.7 mm) ([BoM 2026e](#)). The State Emergency Service received more than 100 calls for flood assistance in the Mildura area, and flash flooding delayed the grape harvest ([ABC 2026a](#)).

Communities in the Victorian Otways were hurled from smoke and fire to flash flooding and back to heat and fire all in January.

17:38 Fri. 27 Feb

VicEmergency



VicEmergency 17:37
Flood at Hamilton St, Gisborne in your watch zone: Emergency Alerts 



VicEmergency 17:37
Storm at Central, East Gippsland, Mallee, South West, North Central, ... 



VicEmergency 17:37
Flood at AitkenSt, Gisborne in your watch zone: Emergency Alerts 



VicEmergency 17:35
Bushfire at Macedon in your watch zone: Emergency Alerts 

Figure 3: Climate whiplash in action. VicEmergency¹ issued severe weather warnings for the Macedon Ranges in Central Victoria on Friday, 27 February 2026. Alerts were issued only minutes apart for various locations kilometres from each other including from flash flooding, storms and bushfires.

¹ VicEmergency is a centralised website for Victorians to find emergency information and warnings.



Image 7 (left) and 8 (right): The Otway Ranges and Surf Coast in Victoria bore the brunt of a summer of climate whiplash, with a quick succession of flash flooding and then fire evacuation alerts for the communities.

BOX 1: BREAKOUT: WHY ARE DOWNPOURS SO INTENSE?

Global climate pollution is causing a long-term warming trend and changes in our weather patterns which is having a profound effect on the water cycle. For every degree of global warming, the Earth's atmosphere can hold about 7% more moisture. This has increased the average amount of moisture over Australia during our summers (Figure 4).

While you may think this would make things more humid and sticky, some weather systems will concentrate that extra moisture into smaller areas, producing much more intense rainfall (see Section 4).

This means that when it does rain, even in normally dry areas, there can be more rain from the same types of events than ever before.

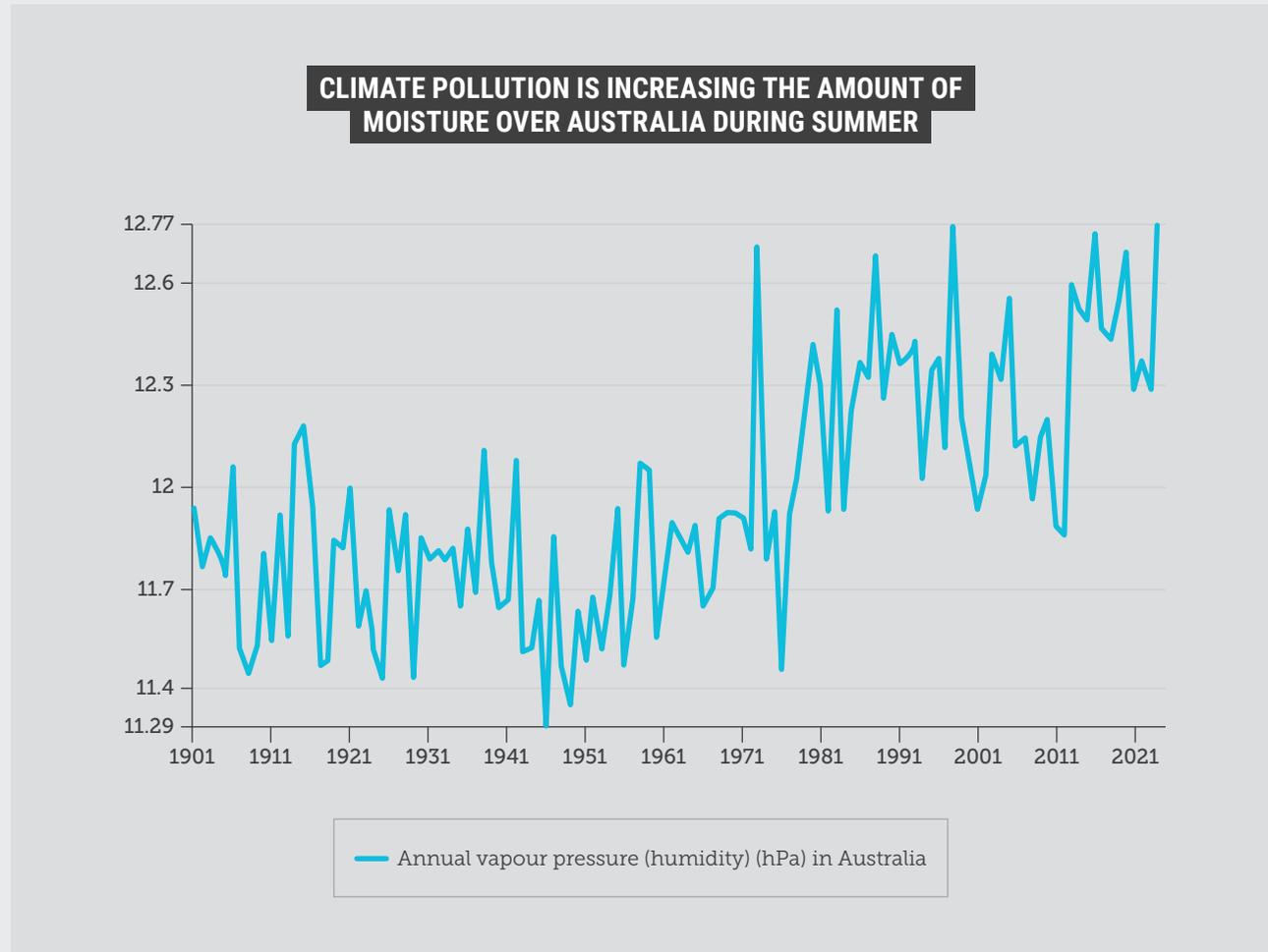


Figure 4: Increase of humidity in Australia in summer (1901-2024). Source: Adapted from [NCAS & CRU-UEA 2026](#).

ON NOTICE: HALF OF AUSTRALIA WAS ON FLOOD WATCH AT THE END OF SUMMER 2025/26

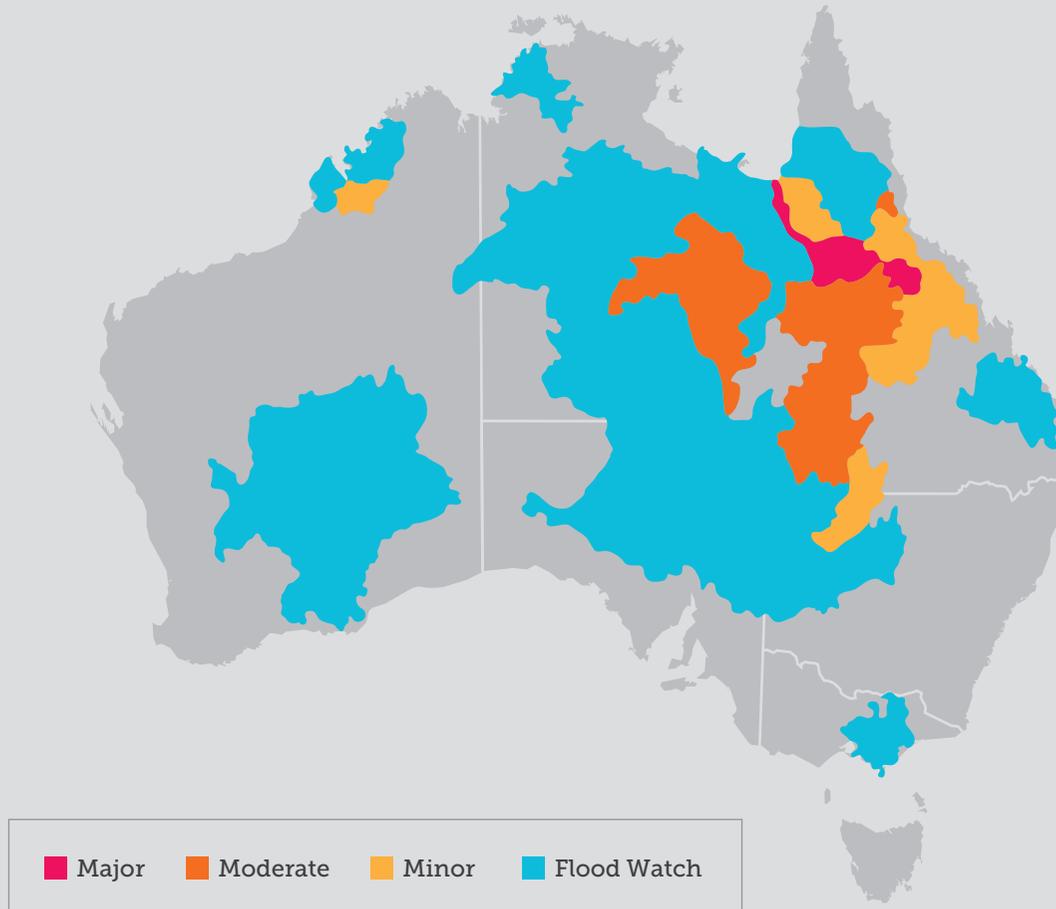


Figure 5: At the end of summer 2025/26 flood watches had been issued across nearly half the continent. Source: Adapted from [ABC 2026b](#).

QUEENSLAND

In the last week of December 2025, an intense low pressure system brought heavy rainfall to parts of the Northern Territory and western Queensland. Parts of north-western Queensland had their highest daily rainfall on record for December, and for some areas their all time record daily rainfall. Rainfall exceeded 300 mm for the event in the Gulf country leading to flooding and isolation of some communities with the closure of many roads.

This was followed by Tropical Cyclone Koji, which crossed the Queensland coast on 11 January before tracking slowly westwards across inland Queensland towards the Northern Territory. Heavy rainfall onto the already saturated soils resulted in flooding that covered some parts of northwestern Queensland for over two weeks, and revived memories of the region's widespread losses and devastation in the 2019 event.

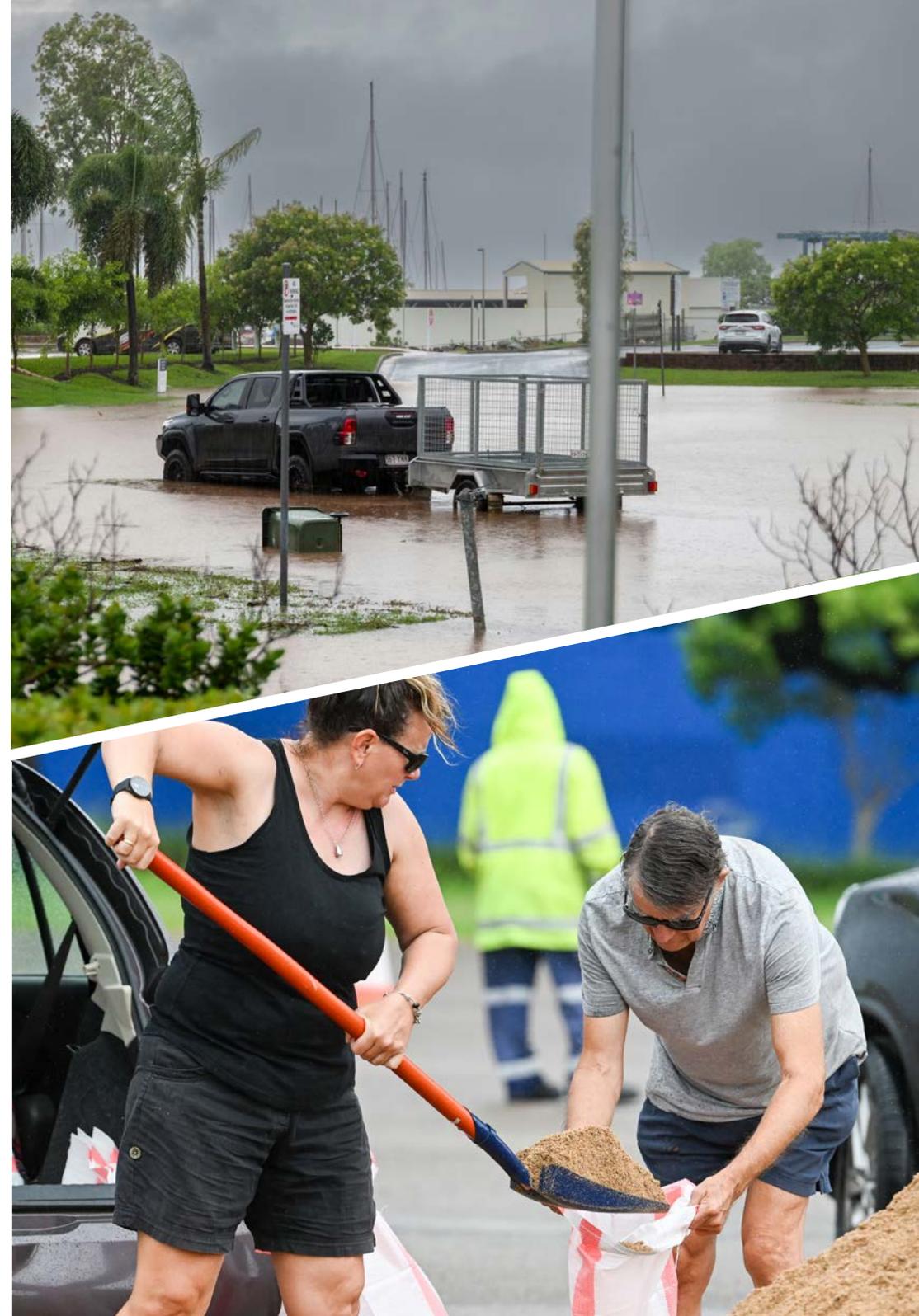
Large parts of inland Queensland had received their average annual rainfall in just the first five weeks of the year.

Parts of northern coastal Queensland were drenched by more than 200 millimetres of rain in less than 24 hours on 1-2 March 2026. Some areas of western Qld recorded around 100 mm of rainfall in the week ending 2 March, adding to the already wet landscape. At time of writing, there are fears that some communities of western Queensland face the prospect of being cut off for weeks by slow-moving floodwaters ([ABC 2026c](#)).

"Many of these rivers will probably remain in some kind of flood until the middle of this year at least."

Felim Hanniffy, Senior Meteorologist at Bureau of Meteorology ([ABC 2026c](#)).

Image 9 (top): Flooding in Airlie Beach during ex-Tropical Cyclone Koji, 11 January.
Image 10 (bottom): Local residents fill sandbags in preparation for severe weather in Townsville, 10 January.



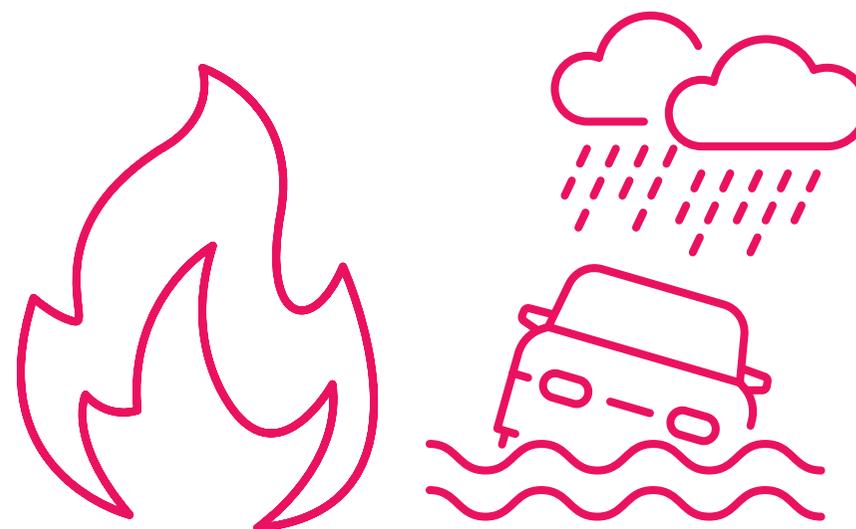
WESTERN AUSTRALIA

In Western Australia, after temperatures as high as 45°C, the Eyre Highway was closed on 26 January as a fire near Caiguna started by dry lightning severed the main link between Perth and the eastern states ([ABC 2026d](#)). This was immediately followed on 27-28 January, by ex-tropical cyclone *Launa*, which brought more than four times Eucla's average January rainfall in just two days, once again cutting the vital east-west supply link, but this time due to flood, not fire ([BoM 2026f](#)).

Transport and supply chains were identified in the National Climate Risk Assessment ([Australian Climate Service 2025](#)) as highly vulnerable to climate change. Fire, heat, flood and drought can all cause the road surface or its natural bases to expand and contract, and ultimately cause cracking and deterioration ([Seligman 2025](#)). For major hubs, including Darwin, Perth, and Cairns, road transport is critical to supply communities, some of which can be cut off for months due to road deterioration. Infrastructure damages like these are only expected to worsen because of our failure to drive down climate pollution fast enough.

For much of the tropical north, both near the coast and inland, tropical cyclones can cause rapid flooding, extreme winds and coastal erosion (see Section 4, [NESP 2019](#)). Coastal impacts from tropical cyclones will increase in the future, due to rising seas levels and increases in wind strength resulting in damaging erosion events. Rainfall is also likely to produce greater flooding near river mouths as extreme water levels increase during storm surge events.

Western Australia went from extreme heat and fire risk to flooding rains within 48 hours.



NORTHERN TERRITORY

Extensive fires occurred across the Gulf country and inland Northern Territory between October and early December, which is the hottest time of the year for the tropical north ([NAFI 2026](#)). The dry season in the north saw around 46 million hectares burnt - the largest area burned since 2012 ([Fisher 2026](#)).

Leading into the tropical wet season, October 2025 was the Northern Territory's hottest October on record ([BoM 2026g](#)), with maximum temperatures +2.9°C hotter than average, and almost 6°C degrees hotter than its coldest October in 1945. The December rains as the northern monsoon arrived led to an abrupt relative cooling, with December only +0.1°C above normal.

January brought not only extremes of temperature to central Australia, with multiple days well above 40°C at Alice Springs ([BoM 2026h](#)), but also several periods of intense rainfall.

The normally dry Todd River catchment experienced thunderstorms and intense rainfall on three occasions in early February 2026, with dangerous flash flooding impacting Alice Springs and surrounding areas on 12 February ([ABC 2026e](#); [Figure 6](#)).

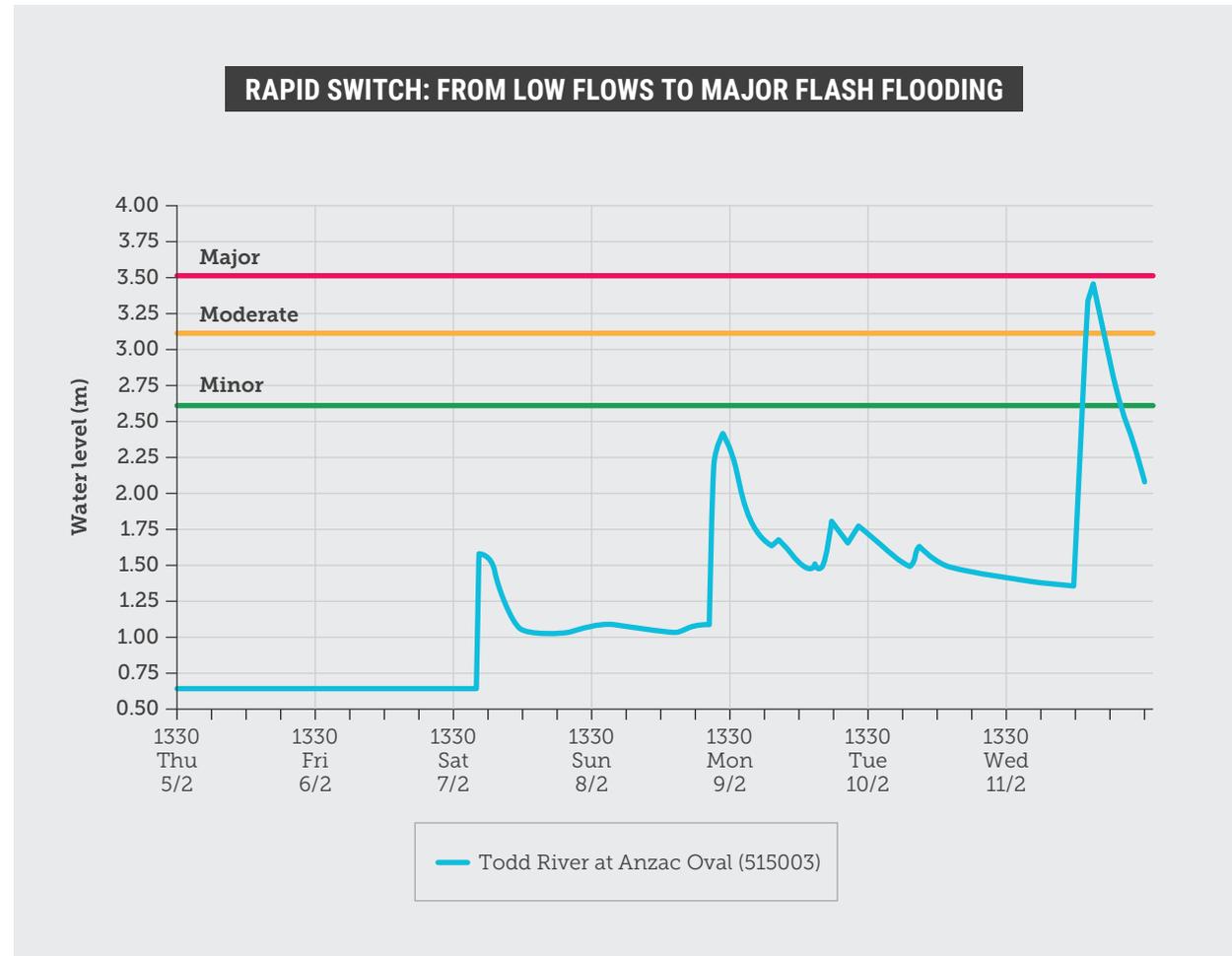


Figure 6: Top panel: Bureau of Meteorology river height measurement for Todd River, Alice Springs for the week starting 5 February. The far right blue line spike shows a rapid switch from minor flooding to major as flash flooding reached major flood level on 12 February 2026. Adapted from [BoM 2026i](#).



Image 11: Roads were cut off by fast flowing flood water in mid-February 2026, leaving people stuck on either side of the Todd River in Alice Springs.

SOUTH AUSTRALIA

Satellite imagery shows that Kati Thanda - Lake Eyre went from partially full in mid 2025, to empty and baked dry by early summer, to partially full once again in February 2026. Typically flood waters travel from up to 1,500 km away over several weeks from the channel country of southwest Queensland rather than from local rains.

In January 2026, Marree, near the southern shores of Kati Thanda - Lake Eyre in South Australia had no rainfall at all and five consecutive days over 48°C ([BoM 2026j](#)). This is the first time anywhere in Australia has had five such days, one of which was a new Marree record of 49.8°C. In stark contrast, and just a week after the heatwave, February 2026 brought a day of only 24.3°C and a two-day rain event that brought 68 mm ([BoM 2026k](#)), ten times Marree's normal February monthly rainfall ([BoM 2026l](#)). In late February the second burst of tropical rainfall reached Marree, with eight consecutive days of rainfall (the most consecutive days of summer rain on record for Marree), bringing the monthly rainfall total to 116 mm. Subsequent flooding and road degradation led to all access roads to Marree being closed, cutting the town off from land transport supply chains ([Government of South Australia 2026](#)).

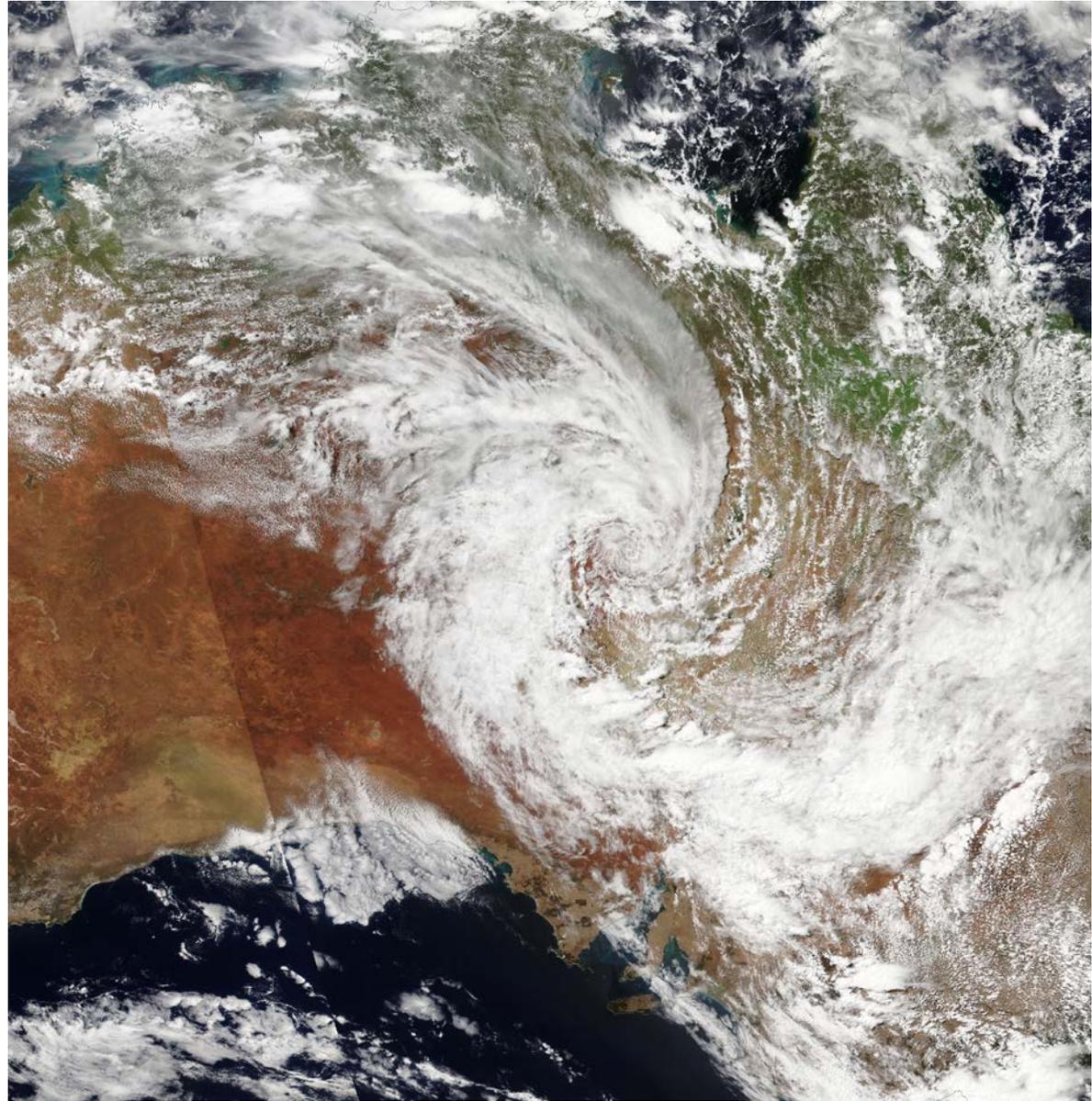


Image 12: Satellite image of Tropical Low 26U over central Australia on 24 February 2026, drawing in high amounts of tropical moisture, bringing record breaking rainfall and flooding to areas already severely impacted by summer floods. Source: [NASA 2026](#).

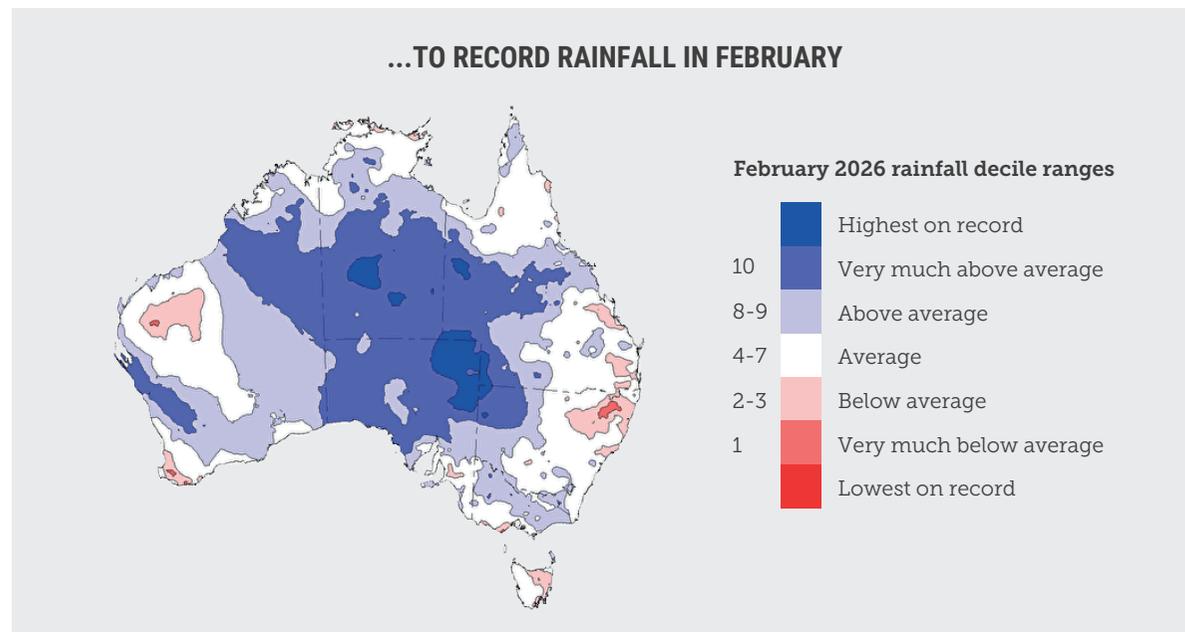
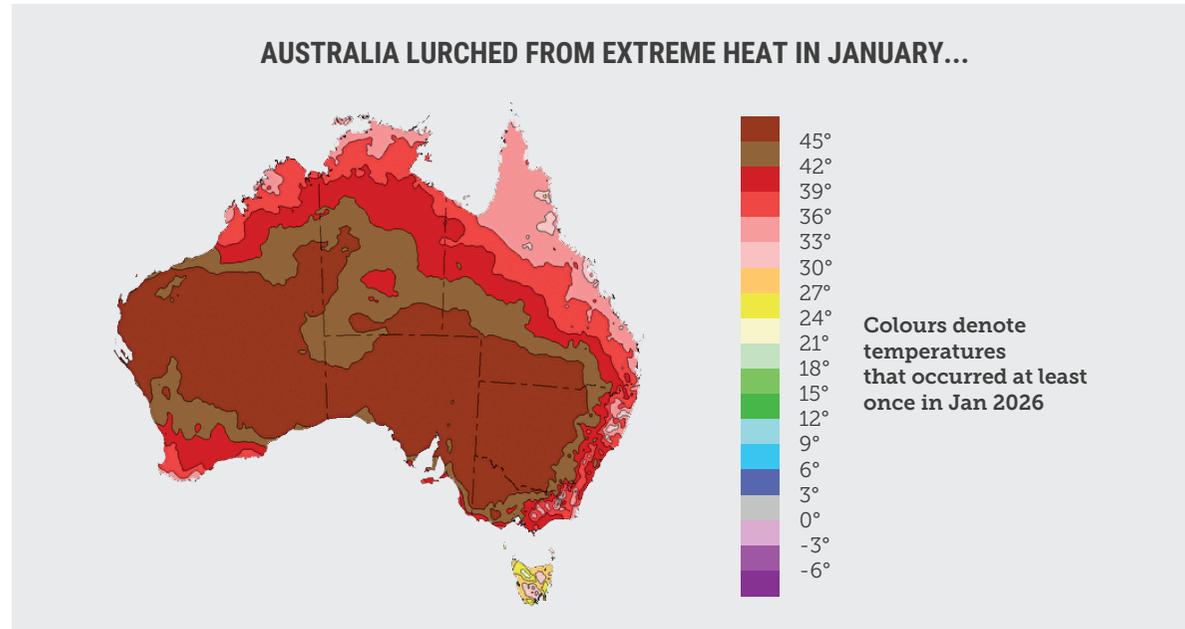
Tropical lows do not need to develop into tropical cyclones to cause major damage and disruption, especially now given the added moisture they carry due to climate pollution.

In the last week of February, Tropical Low 26U (the 26th tropical low of the season, U meaning it developed in Australia) drifted over central Australia and remained stationary for several days. This resulted in very large areas of central Australia receiving more than four times their normal February rainfall, setting new rainfall records in some areas. Mt Isa (Qld) recorded 399.2 mm for the month, smashing its old record of 282.5 mm set in 1930. As a result, riverine and flash flooding in ephemeral rivers and streams led to isolation of a number of communities ([NT News 2026](#)), and road and rail links to both Darwin and Perth being cut ([ABC 2026f](#)).

Some of these areas had received little to no rainfall at all for the summer, until the February rains brought one to two times their annual rainfall in just four weeks. Minor to major riverine and flash flooding occurred across Queensland, parts of the Northern Territory, much of South Australia, western New South Wales and Victoria.

Large areas of central and southern Australia deluged by more than a year's worth of rainfall in February were the same as had experienced extreme and record heatwaves in January.

Figure 7: (top) Maximum temperature recorded during January 2026 ([BoM 2026m](#)). Brown areas denote temperatures above 45°C at least once in the month (bottom) rainfall deciles for February 2026 ([BoM 2026n](#)). Dark blue areas denote highest February rainfall on record.



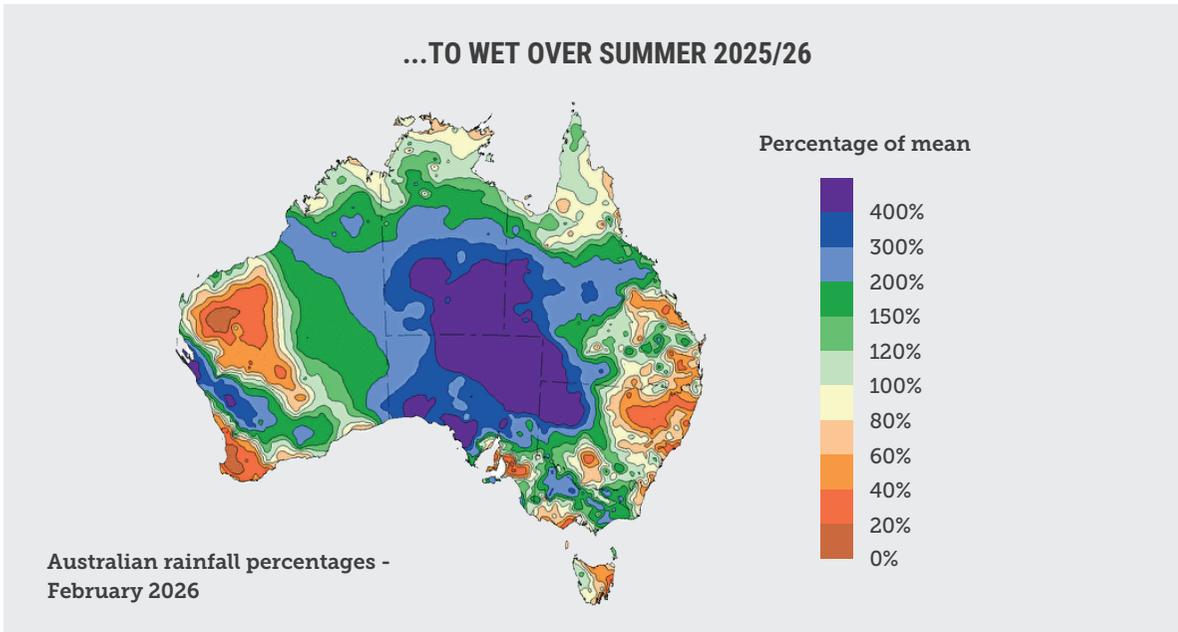
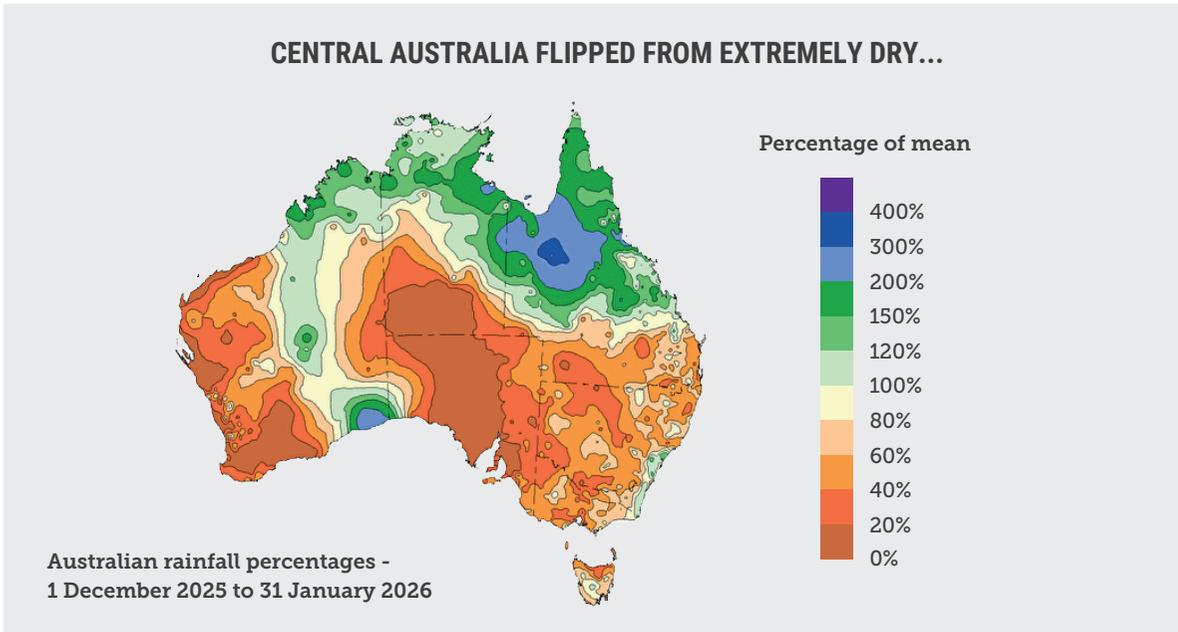


Figure 8: Percentage of normal rainfall for December - January 2025/26 (top) ([BoM 2026o](#)) and February 2026 (bottom) ([BoM 2026p](#)). Large areas of the Northern Territory, South Australia, New South Wales and Queensland rapidly shifted from less than 20% of normal rainfall and extreme heat, to over 400% of normal rainfall.

NEW SOUTH WALES

NSW also experienced climate whiplash with out-of-control bushfires on the NSW Central Coast destroying 20 homes in January, followed by torrential downpours of up to 150 mm over a 24-hour period in parched northern Sydney suburbs on 17 January, requiring urgent evacuation of a caravan park at Narrabeen and residents in Manly to be placed on standby for evacuation. In February 2026, some locations in north-west NSW recorded their highest rainfall on record for that month ([BoM 2026g](#)). For example, Tibooburra received 273 mm for the month, over 10 times its average rainfall for February ([BoM 2026r](#)).

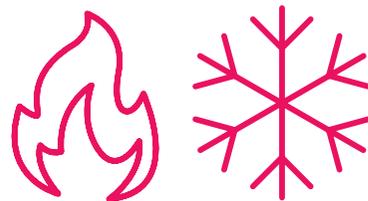


TASMANIA

In the south, Tasmania started summer with almost 30 bushfires between 4 and 10 December 2025, which destroyed 21 homes and shacks and 15 other buildings in Dolphin Sands and near St Helens. The fires were fanned by strong west to northwest winds, with Hobart recording its windiest day (98 km/h) of the summer ([BoM 2026s](#)).

Firefighters noted that strong winds rather than heat are causing more and earlier summer fires in Tasmania as the climate changes ([ABC 2026g](#); see Section 3).

In stark contrast, only three weeks later, at least one location in Tasmania recorded snowfall every day between the 23rd and 26th of December, including snow as low as 700m on Christmas day with even a dusting on Kunanyi - Mt Wellington overlooking Hobart ([News.com 2025](#)). A further two snowfalls occurred in Tasmania in January and February.



2.3 Extremes in temperature

When we talk about climate whiplash it's natural to think of the big swings from wet to dry, or hot to cold. But whiplash also has a sting in the tail. In climate terms, the tail refers to the extremes — those weather events that are right at the limits, or beyond, of what we have observed in the past.

The frequency of record extremes, beyond what we have experienced before, will continue to increase as the world continues to warm due to climate pollution.

The summer of 2025/26 saw record maximum temperatures in many areas of Australia, even though natural climate drivers like La Niña were not favourable for these kinds of extremes. Australia experienced its eighth warmest summer on record (1.10°C above the 1961–1990 average for summer) ([BoM 2026t](#)).

The heatwave of late January 2026 brought six days in a row where at least one location in Australia recorded 49°C or higher, and a total of eight readings that would have been in the former top 10 hottest January days on record for Australia prior to the event.



Image 13: The sun sets over Point Cooke Marine Sanctuary amid ongoing heatwave conditions in Victoria January 2026.

Maximum temperatures day by day during the heatwave were:

- › 24 Jan 48.2 Tarcoola (SA)
- › 25 Jan 48.5 Oodnadatta (SA)
- › 26 Jan 49.5 Ceduna (SA)
- › 27 Jan 49.7 Pooncarie (NSW)
- › 28 Jan 49.2 Wanaaring (NSW)
- › 29 Jan 50.0 Andamooka (SA)
- › 30 Jan 50.0 Port Augusta (SA)
- › 31 Jan 49.1 Fowlers Gap (NSW)

There were also two days with temperatures above 49°C earlier in January 2026:

- › 7 Jan 49.0 Onslow (WA)
- › 20 Jan 49.2 Shark Bay (WA)

A record number of consecutive days above 45°C were observed at stations in South Australia, New South Wales, and southern Queensland, including:

- › Coober Pedy Airport (SA) 7 days
- › Roxby Downs (Olympic Dam Aerodrome) (SA) 7 days
- › Pooncarie Mail Agency (NSW) 6 days
- › Ivanhoe Airport AWS (NSW) 6 days
- › Cunnamulla Post Office (Qld) 4 days.

Port Augusta set a world record for the most southerly 50°C ever measured on Earth.

On 26 January, the average temperature for the entire state of South Australia exceeded 45°C (45.7°C): South Australia's second hottest day on record.

The temperature of 50°C at Port Augusta was the most southerly 50°C ever measured on Earth. Likewise Renmark (49.6°C) and Longerenong (48.1°C) were also world records for hottest temperatures recorded so far south.

In Victoria, the peak of the heatwave was on 27 January, with a state-wide average temperature of 42.5°C. Weather patterns across Australia had some similarity to those preceding Black Saturday (7 February 2009) ([BoM 2019a](#)), with a trough extending across the country from the Pilbara to the SA/Vic border, a front in the Great Australian Bight, and a high pressure system in the Tasman Sea. It's a pattern known to generate temperature extremes ([Parker and Barnes 2026](#)).

The extreme heat of Black Saturday came at the end of the Millennium Drought, with ferocious winds from central Australia racing over baked soil ([ABC 2026h](#)).

However, despite a La Niña event, January 2026 saw a new Victorian record of 48.9°C recorded at both Walpeup and Hopetoun, eclipsing the 48.8°C at Hopetoun on Black Saturday in 2009. In total, almost one third of Victoria had its highest January temperature on record on 27 January 2026 ([BoM 2026u](#)).

The biggest difference between 2009 and 2026 is an additional 17 years of climate pollution - Kennaook - Cape Grim, Tasmania: 384ppm Feb 2009, 423ppm Dec 2025 ([CSIRO 2026](#)) - causing more global warming (Figure 9).

While February of 2009 was 0.04/0.62°C warmer than the 1991-2020 mean temperature for Australia/ Victoria, January 2026 was 1.2/1.6°C warmer.

"In 2009 temperatures like 49 or 50 seemed unimaginable without the ferocious northerly winds we had on Black Saturday to squeeze out every last bit of hot air down from central Australia, and there is nothing especially unusual about the weather pattern this week behind the heatwave. What has very much changed since 2009 is the global climate in which this heatwave takes place. ... As the planet continues to warm, each new heatwave will be just that little bit more intense than the last."

Dr Adam Morgan (ex-BoM weather forecaster), [ABC-TV News weather forecast](#), Presented live on 26 January 2026.

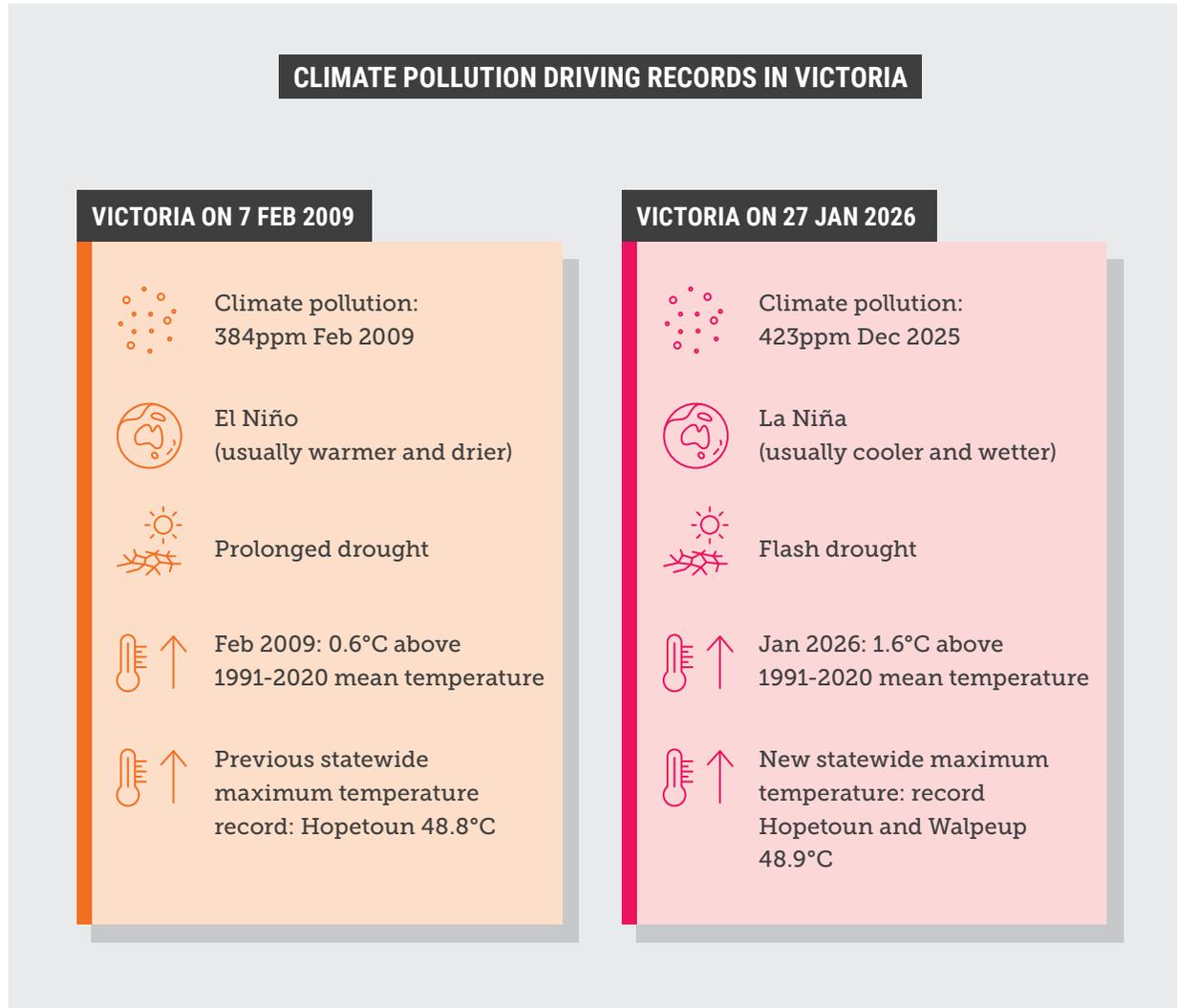


Figure 9: Climate change is rewriting the rule book. January 2026 weather patterns across Australia had some similarity to those of Black Saturday (7 February 2009) but increased climate pollution over the years tipped the scale to record breaking levels of extreme heat in Victoria, despite a La Niña event, contrasting to hot, dry El Niño conditions in February 2009.

The changes in heatwaves and their extremes over time is most stark at places such as Mildura (Victoria), which only reached 45°C a total of six times between when the airport recording site opened in 1946 until 1999 (54 years). Mildura has reached 45°C a further 27 times since 2000 (26 years) (Figure 10).

Closer to the coast, even Melbourne has undergone changes in its extremes. In summer 2025-26, Melbourne recorded a top temperature of 42.9°C. Melbourne has experienced 11 days of at least 42.9°C since 2000. This already equals the number of days it recorded 42.9°C or more during the entire previous century from 1900-1999 (Figure 10).

EXTREME HEAT RECORDED IN MILDURA

Mildura only **reached 45°C a total of 6 times** between when the airport recording site opened in 1946 until 1999 (54 years).



Mildura has reached **45°C a further 27 times** since 2000 (26 years).

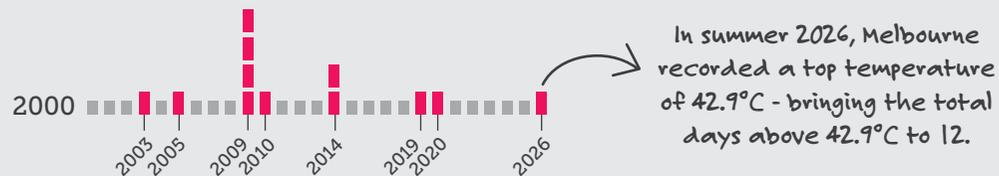


EXTREME HEAT RECORDED IN MELBOURNE

Melbourne recorded at least 42.9°C (its hottest temperature of summer 2025-26) **11 times last century** (1900-1999).



Melbourne had experienced **11 days of at least 42.9°C** from 2000 to 2025 - already equal to the number of days above 42.9°C for the previous century.



The influence of climate pollution on increasingly severe and damaging extreme weather has been demonstrated more clearly through the development of climate attribution science, where models are used to examine how much more likely extreme weather events were as a result of climate change (see, for example, [Union of Concerned Scientists 2025](#)). Already some formal attribution studies have been conducted on the heat in the 2025/26 summer (see [World Weather Attribution 2026](#)). The heatwave from 5-10 January impacted Western Australia, South Australia, Victoria, New South Wales and Tasmania before crossing the Tasman Sea to New Zealand.

Attribution studies suggest that the 3-day daily maximum temperatures from 7-9 January 2026 were made 1.6°C hotter due to climate change, with similar events about five times more likely to occur now than without global warming. The authors also noted that “this is likely an underestimate” ([World Weather Attribution 2026](#)). They also noted that La Niña lowered the 3-day maximum temperatures of the heatwave by about 0.3-0.5°C, meaning without it, temperatures above 50°C may have been experienced at a number of locations.

Figure 10: Extreme heat becoming more frequent in Mildura and Melbourne in a climate supercharged by fossil fuels.

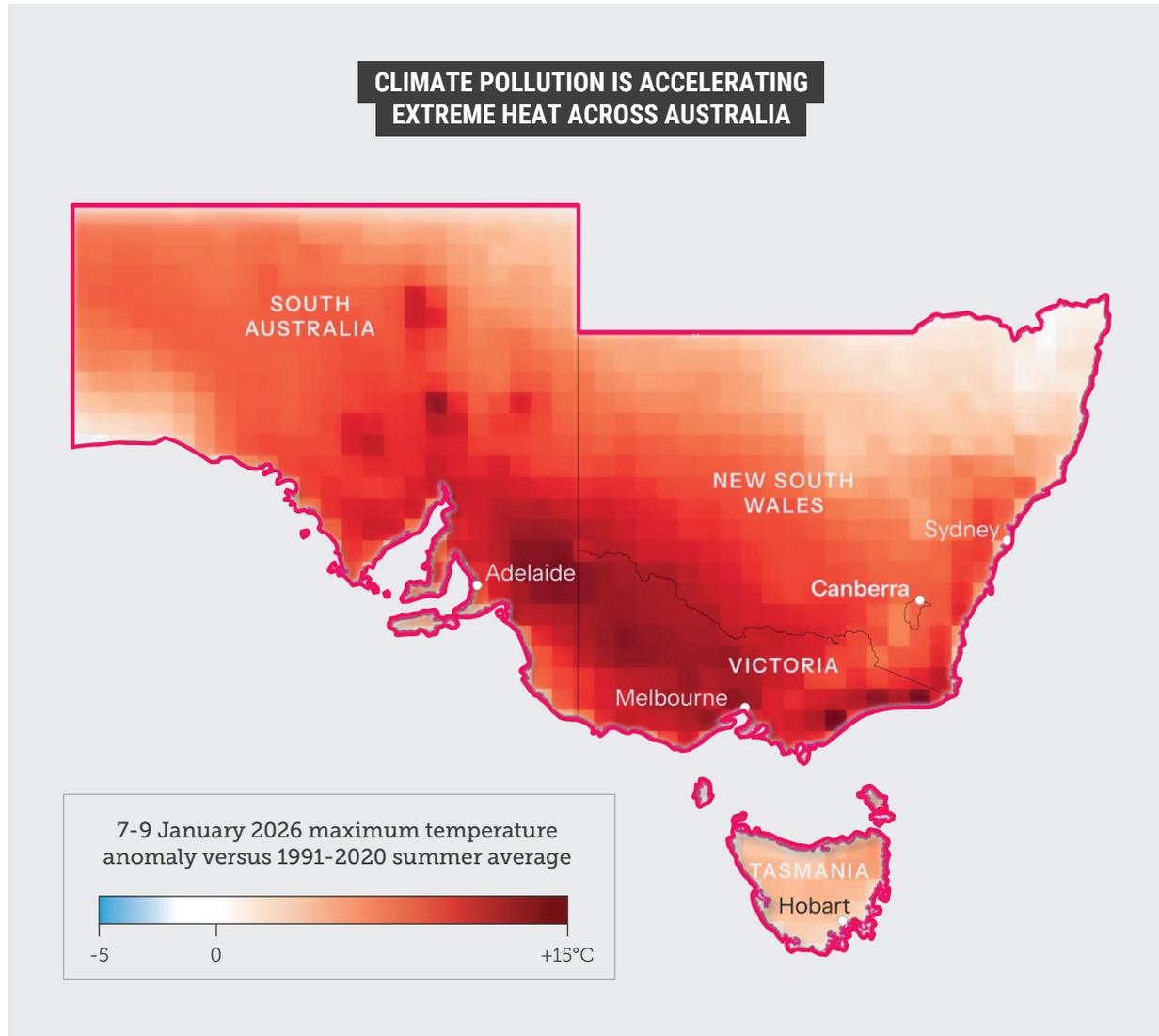


Figure 11: A severe to extreme heatwave exacerbated by climate pollution baked southern Australia in early January in the lead up to catastrophic fire conditions. Source: Adapted from [World Weather Attribution 2026](#).

The early January heatwave (Figure 11) again highlighted that we are increasingly crossing thresholds that are atypical, and hence increasingly difficult for natural systems to adapt to.

In South Australia, Victoria and NSW, grey headed flying fox colonies suffered losses in the thousands as temperatures persisted above the 42°C threshold considered dangerous for colonies ([The Guardian 2026b](#)). These are the species critical for pollination of our tall flowering gums.

Overall, despite the cooling impacts of the ongoing La Niña and flooding in Queensland and central Australia, January 2026 was Australia's 4th warmest January on record, and hotter than any January prior to 2013.

2.4 Shifting baselines: how extreme heat became common

Australia, on average, has warmed by 1.59°C since national records began in 1910, with most warming occurring since 1950. Every decade since 1950 has been warmer than preceding decades, and 14 of Australia's 15 warmest years on record have occurred in the 21st century ([BoM 2026b](#)).

In Australia, the annual number of hot days (above 35°C) and very hot days (above 40°C) has also increased strongly over most areas since 1950. Heatwaves are also lasting longer, reaching higher maximum temperatures and occurring more frequently over many regions of Australia ([CSIRO and BoM 2024](#)).

Hot days and heatwaves pose significant risks to human health. This is not only due to heat-related illness (dehydration, heat exhaustion, heat stroke etc) but also increased risks for people with existing disease such as heart and kidney disease and diabetes. Heatwaves are also associated with increased risk of mental health exacerbations and violence ([Harris et al. 2025](#)). Babies and young children, pregnant women and the elderly are most at risk from extreme heat. In the third trimester of pregnancy, there's a strong link between extreme hot temperatures and the risk of pre-term birth ([Li 2024](#)).

Thermal environment is one of the most important factors affecting human sleep, and extreme heat is associated with poor sleep, lower productivity and lower work performance ([WHO 2024](#)). Heatwaves are associated with increased ambulance callouts and emergency department visits, placing greater

strain on our hospitals. Advances in attribution science mean that scientists and health researchers can now calculate that, globally, more than half of heatwave-related deaths are attributable to human-induced climate change ([Hundessa et al. 2025](#)).

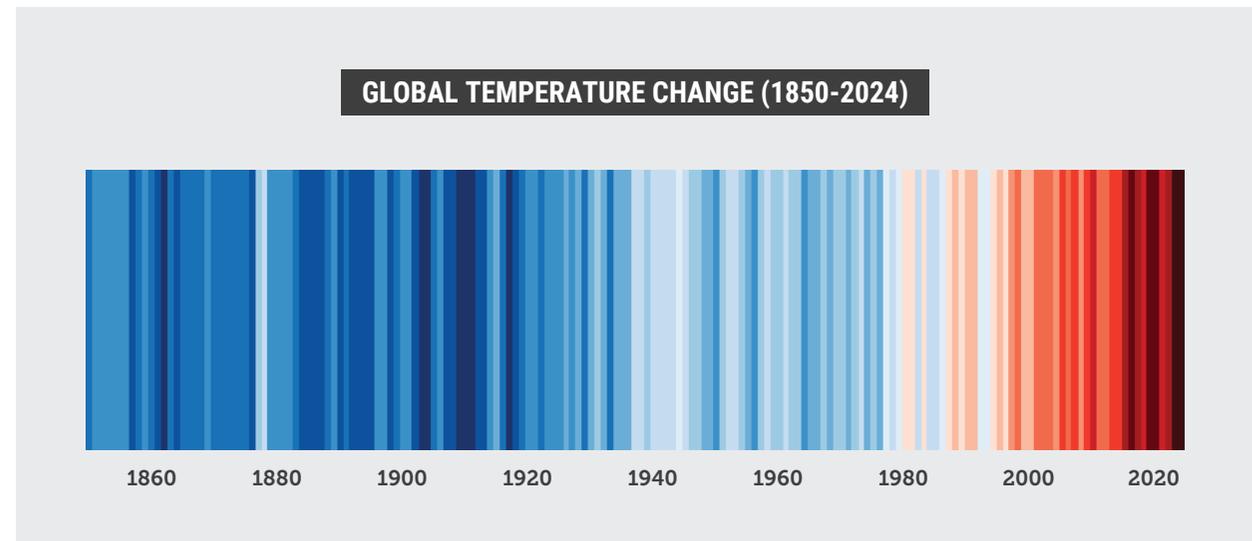


Figure 12: Increases in global average temperature shown using 'stripes' of colour for each year. The blue shades indicate cooler temperatures and red shades represent warmer temperatures. Red colours (warmer temperatures) have been dominant more recently, illustrating the rise in global average temperatures (1850-2024). Graphics and lead scientist: Ed Hawkins, NCAS, UoR. Data: Berkeley Earth & ERA5-Land, NOAA, UK Met Office, MeteoSwiss, DWD, SMHI, UoR & ZAMG.

Heatwaves have always been a part of life in Australia's summers. But climate pollution from coal, oil and gas is making heatwaves far more common and more intense. In today's climate, extreme heatwaves return every five years, compared to once every 25 years during pre-industrialisation (Figure 13).

For many parts of the world, the most severe local heatwave seasons have occurred in the past twenty years, in line with increasing climate pollution from the extraction and burning of fossil fuels. This includes southern Australia, where the worst heatwave seasons have been the summer of 2008–09, when the Black Saturday bushfires occurred, 2014, 2019/–20 (Black Summer) and now in 2026.

Long-term heatwave trends across the planet would not have been possible in the absence of climate pollution (Government of Victoria 2025). The two-week heatwave in Victoria prior to the Black Saturday bushfires in February 2009 was 3°C warmer than it would have been without climate change (Abhik et al. 2023), the hottest week of the 2019–2020 Black Summer was 1–2°C hotter and around 10 times more likely than if it had occurred a century before, while the early January 2026 heatwave was around five times more likely than without climate pollution ([World Weather Attribution 2026](#)).

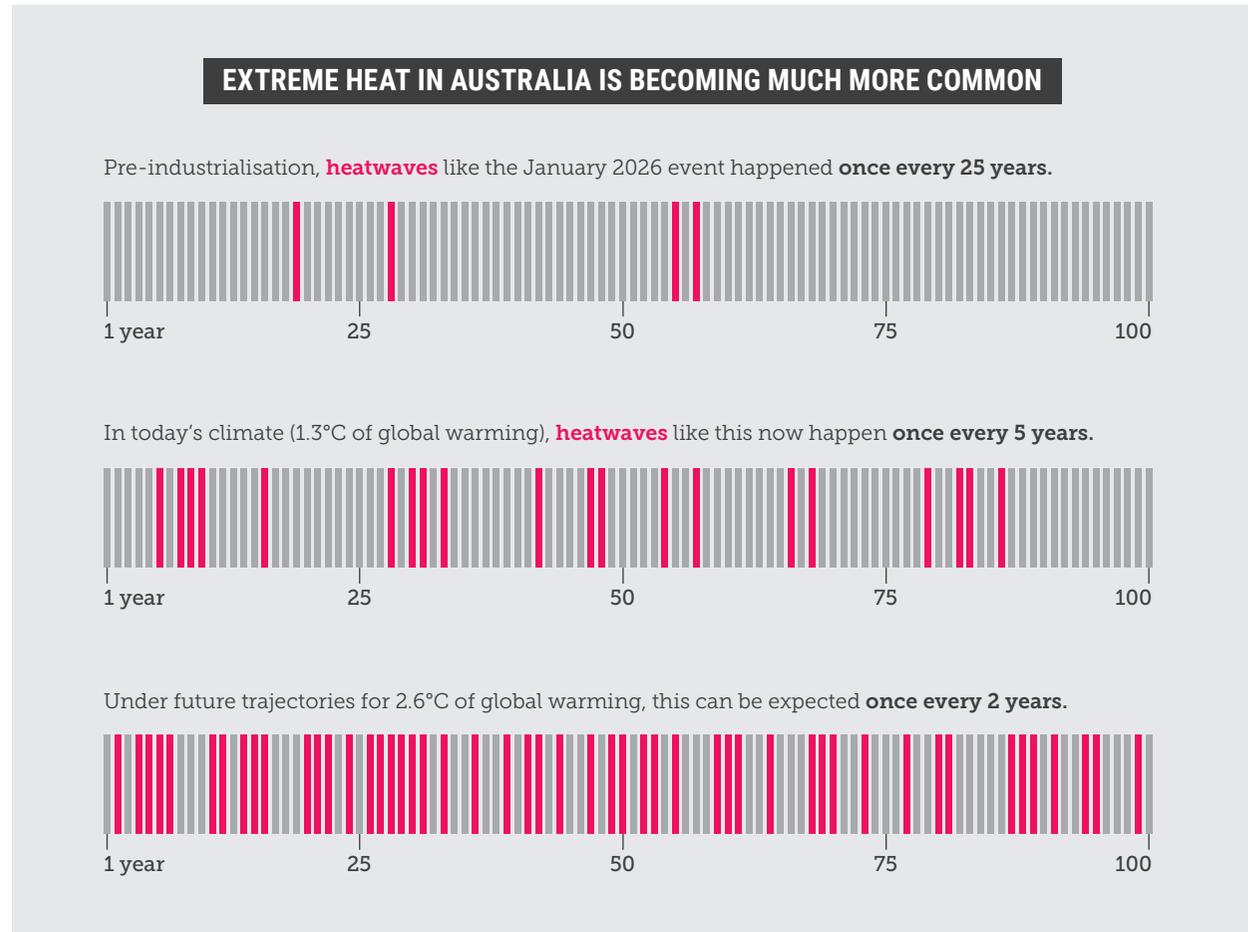


Figure 13: The extreme heat Australia just experienced is no longer rare. Source: Data from [Clarke et al. 2026](#), adapted from [ABC 2026i](#).

BOX 2: ANATOMY OF A HEATWAVE

Heatwave conditions are affected by a number of physical processes that cause prolonged periods of excessive heat (Figure 14).

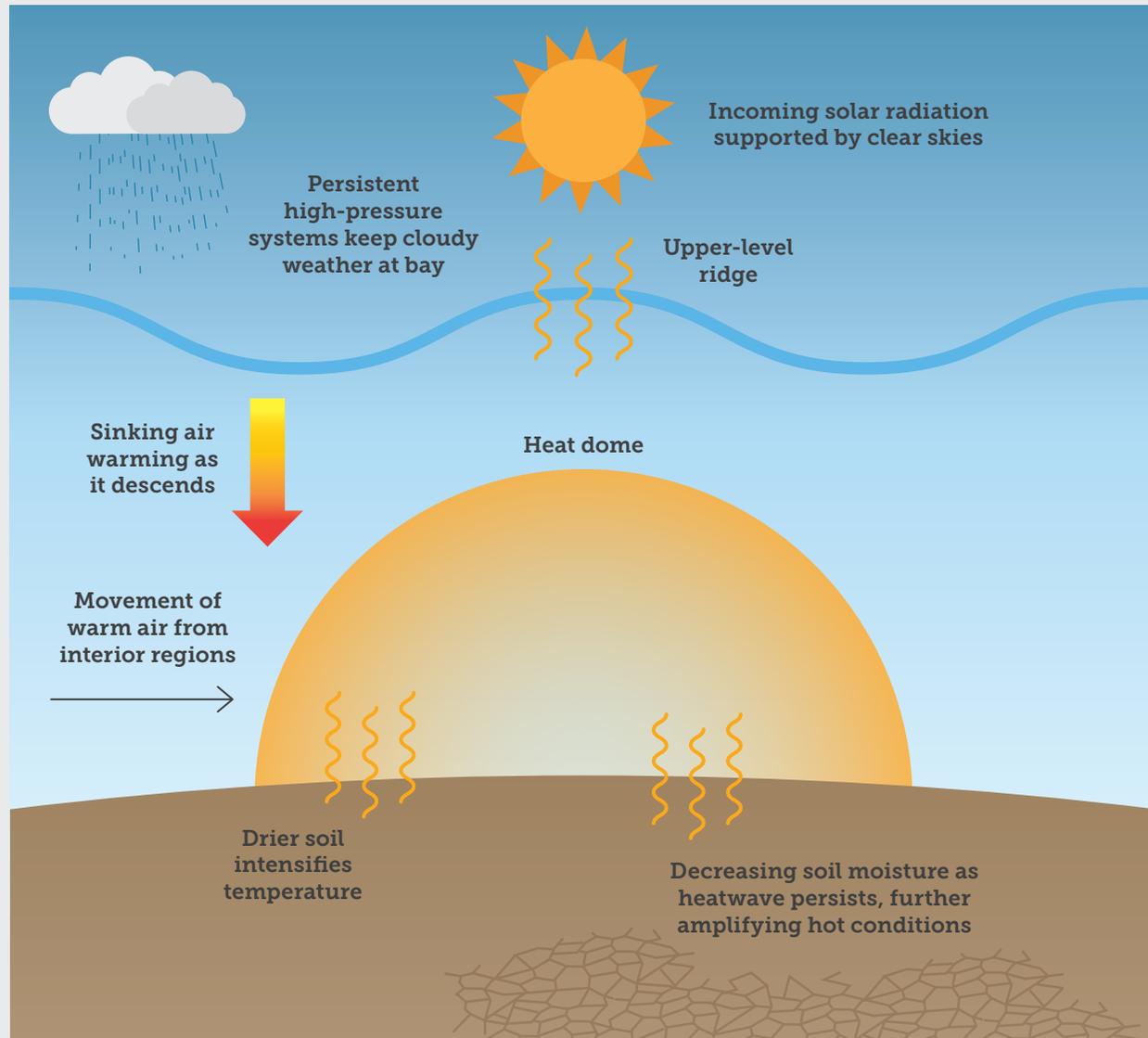


Figure 14: Physical mechanisms, and their interactions, that contribute to the development of heatwave conditions in Victoria. The heat dome represents the hot conditions within the bounds of the high-pressure systems. Source: Adapted from Sarah Perkins-Kirkpatrick for VCSR24 ([Government of Victoria 2024](#)).

2.5 Flash drought: how parts of Australia dried rapidly

While spring was a mixed bag in terms of rainfall for southern Australia, it showed a pattern typical of a northwards shift in weather systems, called a negative Southern Annular Mode (BoM 2019b). More westerly winds over Australia than normal brought average to drier than average conditions to NSW, but average-to-wetter than average to places adjacent to the Southern Ocean, including western Tasmania, parts of Victoria, South Australia and southwest Western Australia.

December and January brought rapid changes, with drier than average conditions for much of the southern half of Australia, despite the onset of La

Niña. Parts of southern Australia experienced only one significant rain event in the last two months of the year and virtually no rainfall in January. Coupled with extreme temperatures, low humidity and in some places wind, the landscape dried very quickly in January.

One measure of flash drought is the “Evaporative Stress Index”. In November 2025, large parts of Victoria were not in stress with ESI positive values up to 2. This flipped in January 2026 to most of the state being in high evaporative stress with ESI negative values as low as -2 (see Figure 15).

BOX 3: WHAT IS FLASH DROUGHT?

Flash drought refers to a rapid onset of landscape dryness, beyond what may be expected from lack of rainfall alone. It occurs when there is above normal evaporation, often associated with heatwaves in Australia.

Climate pollution has caused flash droughts to intensify (Devanand et al. 2024) and to increase in 74% of Earth’s regions over the past sixty years (Yuan et al. 2023). Unlike the traditional understanding of droughts, flash droughts emerge and escalate within weeks or months, causing major harm to agriculture, economies, and ecosystems if not detected early (Hadjimichael 2022).

Long term trends (1975-2018) show flash drought has been increasing in intensity and duration in eastern and southern Australia during winter and spring, and in Victoria and Tasmania during summer ([Nguyen et al. 2020](#)).



Image 14: Very low lake levels at Lake Hume in Victoria, 6 January 2026.

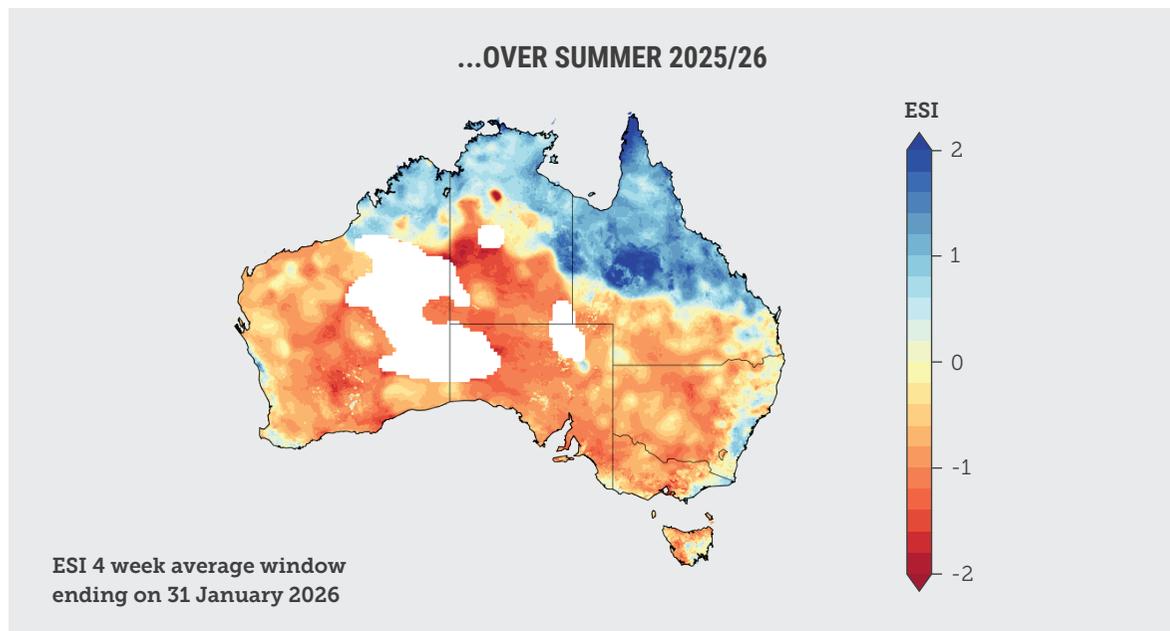
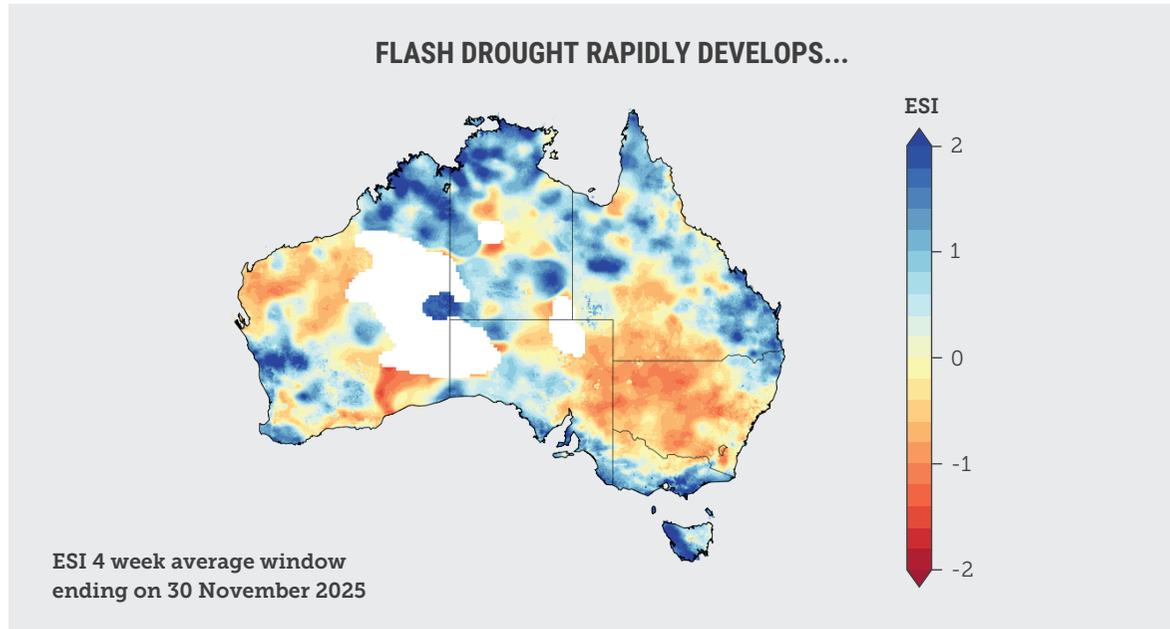


Figure 15: Rapid drying out of landscape in southern Australia as a flash drought takes hold over summer 2025/26. Adapted from Bureau of Meteorology's rainfall deficiencies and water availability summaries, see [BoM 2026v](#).

Flash drought develops quickly, priming conditions for heatwaves and dangerous bushfires and can impact farming and the natural environment.

Another measure of flash drought is soil moisture levels. Figure 16 indicates a period of 'flash drought' began across parts of southern Australia in January, with a peak in the second week of February.

The January-February 2026 flash drought resulted in rapid curing of grasslands and ultimately fires when high winds and in some places dry lightning occurred at the end of the heatwave on 9 January (BoM 2026w). In Victoria, fires occurred at Longwood, Skipton, Harcourt, Natimuk, and Gellibrand (Otways) during catastrophic to extreme fire weather conditions. By the end of January, 451 homes and more than 1,000 other buildings were reported destroyed by fire in Victoria and nearly 450,000 hectares were burnt (personal communication, Fire Rescue Victoria 2026).

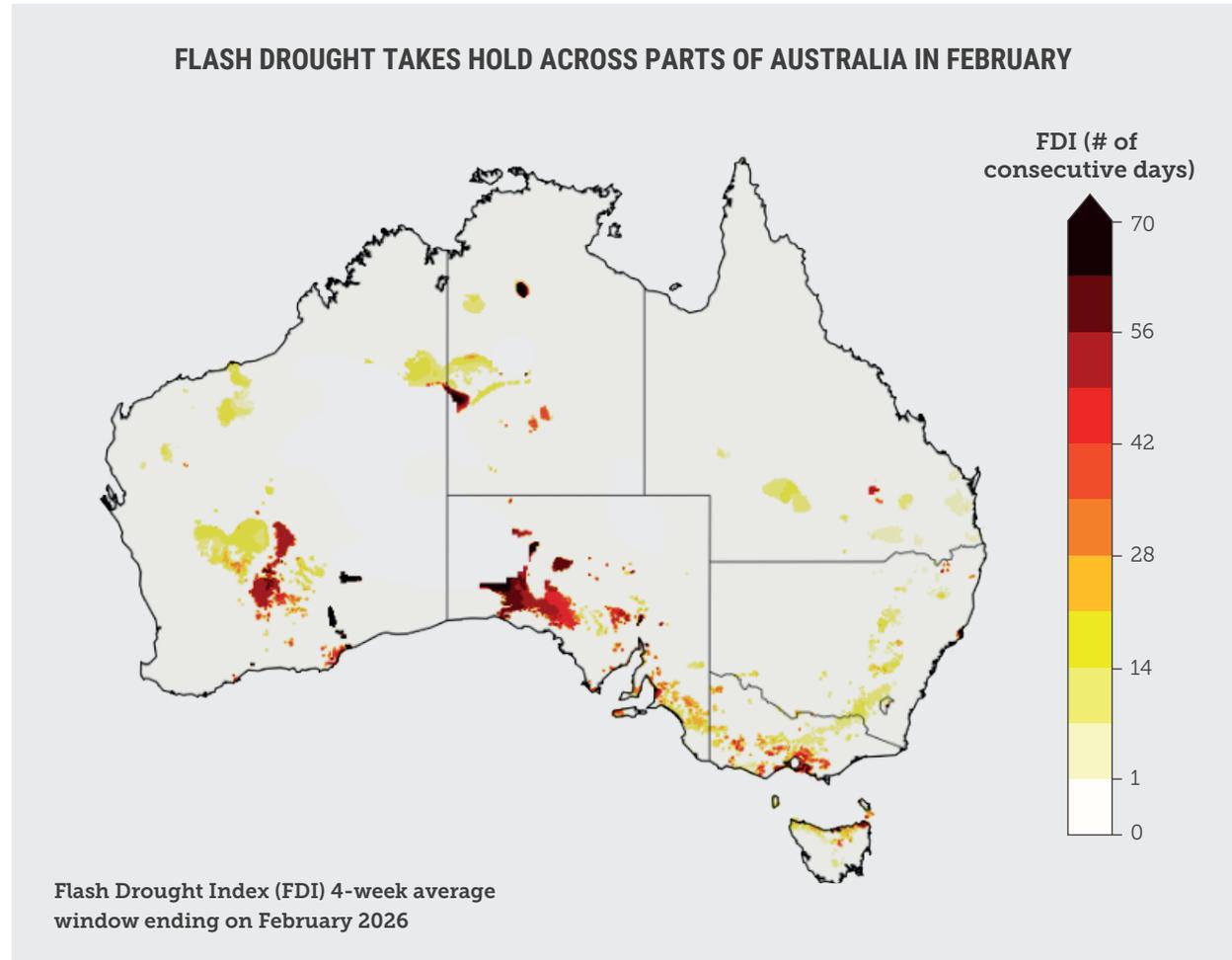


Figure 16: Flash Drought Index (FDI) for the 4 weeks ending 15 February 2026. Orange and red areas indicate areas of flash drought. Adapted from [NACP 2026](#).

3.

Australia's bushfire weather is becoming more dangerous



Image 15: Deep Creek National Park fire in South Australia in February 2026.

Climate pollution is turbo-charging Australian fire conditions, making fires more frequent, costly, intense - and less predictable. From 2000–2023 the frequency of extreme bushfires and their radiative power—a measure of fire intensity— increased 2.2 times and 2.3 times respectively, across major fireprone areas in the world, including southern Australia (Cunningham et al. 2024).

Since the 1950s large parts of Australia have seen increases in serious fire weather and longer fire seasons (CSIRO and BoM 2024). Bushfires are becoming more frequent than would occur naturally, giving native vegetation, wildlife, and communities little time to recover in between events (Lidenmayer and Taylor 2020).

“...we have a very unstable climate now... we just have to accept the fact that with a very unstable climate, a fire situation, you can go from zero to 100 in hours. And you’ve got to think about what that means, because that means that you might be having to activate a bushfire plan very quickly, not in days, in hours”

Professor David Bowman, [ABC Radio Canberra 2025](#).

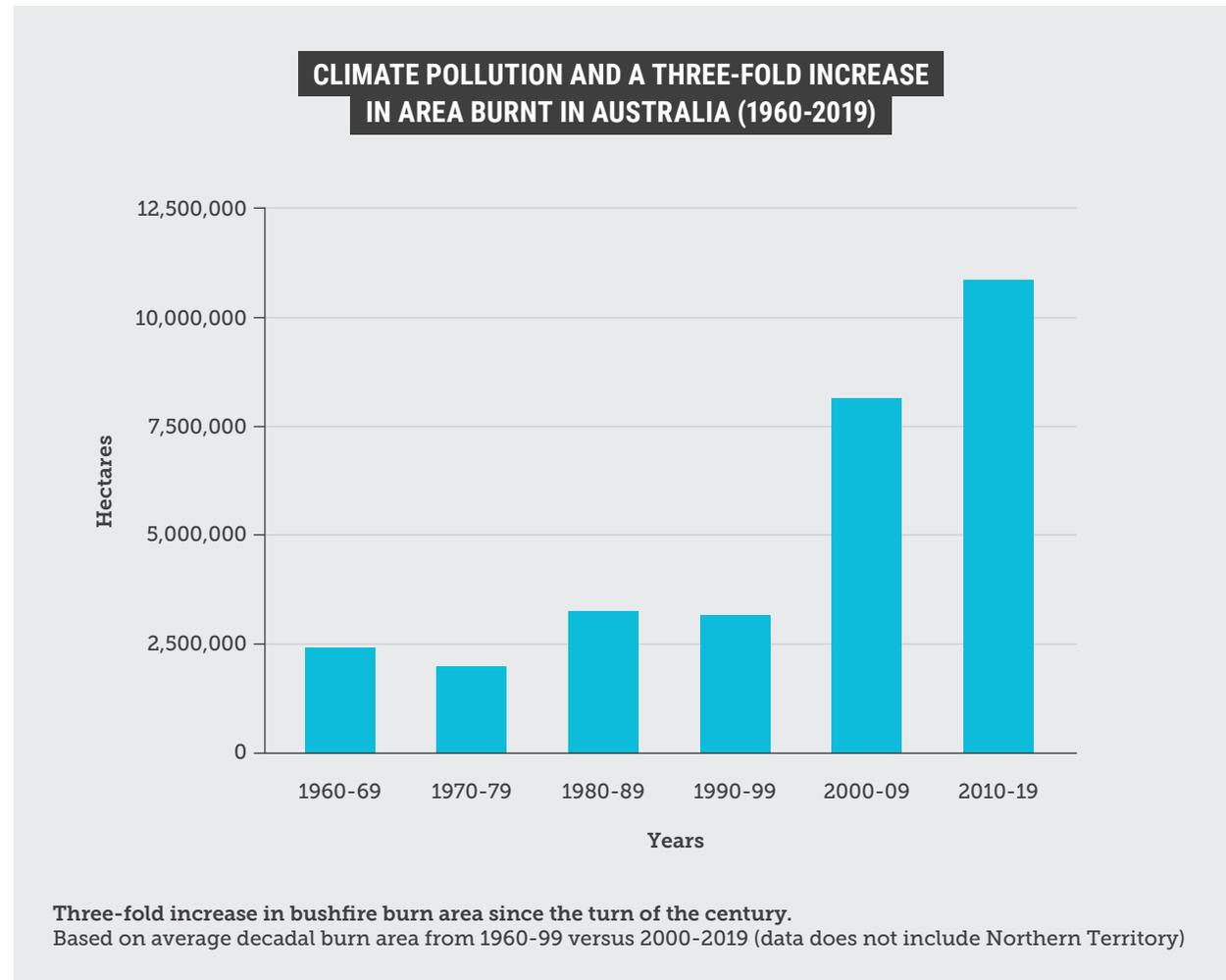


Figure 17: In the hotter fossil fuel-driven climate, there has been a three-fold increase in area burned by bushfire in Australia between 1960 and 2019. Source: Data from [Canadell et al 2021](#).

Australian fire seasons are now 20% longer than 40 years ago, lasting an extra 27 days.

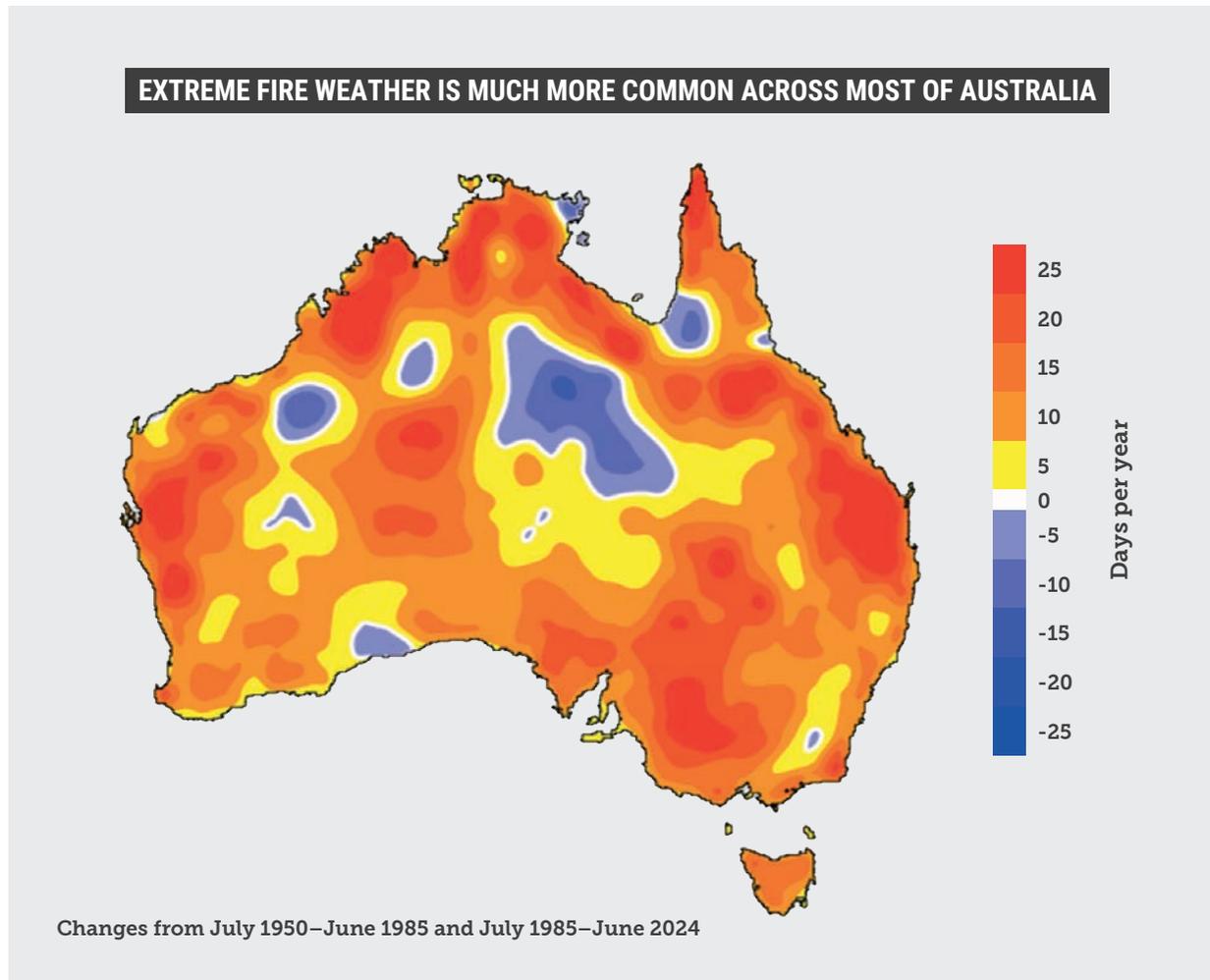


Figure 18: Climate change has already made weather conditions more dangerous for fires. Long-term change in the average number of days per year that have FFDI 90th percentile. This is shown for the change from the period July 1950–June 1985 to the period July 1985–June 2024. Source: Adapted from [Dowdy 2020](#).

Extreme fire weather days in Australia have increased by 56% over the past 40 years.

RAINFALL AND RAPID VEGETATION GROWTH

Wet periods can be like a double-edged sword for fire services and land management agencies. On one hand, rain keeps vegetation wet and reduces the likelihood of a fire taking hold or spreading. On the other hand, it can result in prolific growth that ultimately increases fire risk.

Wet weather and wet vegetation also limits hazard reduction burning, which historically has been the most effective large-scale fire mitigation tool used by fire and land management agencies. Studies have found that climate change will continue to affect windows of suitable weather conditions for prescribed burning / hazard reduction ([Di Virgillio et al, 2020](#)). When wet weather inevitably gives way to hot, dry conditions, light grasses and immature shrubs can die and dry out, leaving more available fire fuel. In parts of Victoria, antecedent rainfall led to prolific growth and high fuel loads, then dryness and heat through Spring and early Summer 2025/26 created flash drought conditions, priming the landscape for major fires.

EXTREME HEAT AND FIRES

The most direct link between bushfires and climate change comes from the long-term trend towards a hotter climate. Climate pollution is now making hot days hotter, and heatwaves longer and more frequent ([Perkins-Kirkpatrick and Lewis 2020](#); [Reddy Perkins-Kirkpatrick and Sharples 2021](#)).

A heatwave heats up the landscape ([Bowman 2026](#)), and as vegetation dries out, it provides a lot of combustible fuel available to burn ([Collins et al. 2022](#)). Landscape fires are often discussed in terms of loads, but the energy released when fuels burn determine fire intensity, speed at which fires spread, the distance burning embers can blow ahead and start new fires, how difficult fires are to control, and how much damage they can cause. During a heatwave, vegetation that would burn moderately on cooler days and be easy to extinguish can ignite and burn intensely, defying control efforts ([Bowman 2026](#)).

Extreme heat conditions preceded Australia's most deadly bushfire, the Black Saturday bushfire in 2009. Victoria experienced one of its most severe heatwaves in January 2009, with Melbourne exceeding 43°C for three consecutive days; the first time on record. This extreme heat dried out flammable vegetation across the state. When the Black Saturday fires raged upper on 7 February, temperatures climbed into the mid-40s and Melbourne had its hottest day on record at the time ([BoM 2019a](#)). Extreme heat combined with a long-term lack of rain, which was reinforced by very dry weeks leading up to the Black Saturday. Melbourne had seen no rain for 35 days, equalling its second-longest dry spell on record ([BoM 2019a](#)).

The 2009 Black Saturday bushfires in Victoria prompted fire services to add a new category of fire danger, "Catastrophic", reflecting the increasingly common instances of weather conditions exceeding the theoretical maximum fire danger index of 100. This is because weather conditions have become hotter and drier on the worst fire weather days over recent decades ([Australian Academy of Science 2021](#)). Because of changing climate conditions a new Australian Fire Danger Rating System has been developed because the Forest Fire Danger Rating System used for decades was no longer fit for purpose and was under-calculating extremes.

Australia is getting hotter and drier on the worst fire weather days.

FIRE STORMS

Very intense fires during Extreme and Catastrophic fire weather can produce convection columns up to 10-13 kilometres in height, reaching the stratosphere. Convection columns may then link with very strong upper-level winds and very dry air, drawing it down to the surface where it can worsen already-intense fires.

In certain conditions of atmospheric instability, cumulonimbus (storm) clouds can form intense smoke plumes, with very little moisture present. Fire-generated storms (pyro-cumulonimbus) may then generate downbursts, storm cells can collapse sending wind squalls in every direction carrying embers, and lightning can start new fires up to 100 km away (Dowdy et al. 2017). There may be little or no rain associated with these fire storms (Figure 19).

There were approximately 60 pyroconvective events recorded nationally from 1978 to 2018, but during the record heat of Black Summer they became common, with up to 45 events recorded in just six months (Dowdy et al. 2017). Professor David Bowman described this unprecedented situation to the Royal Commission into National Natural Disaster Arrangements as, rather than a black swan event, a “flock of black swans” (Binskin et al, 2020).

This underlines one of the most alarming impacts of a warming atmosphere on fire behaviour, because these once-rare events make firefighting virtually impossible, with saving lives becoming the only consideration. Firefighting aircraft cannot safely fly in such conditions.

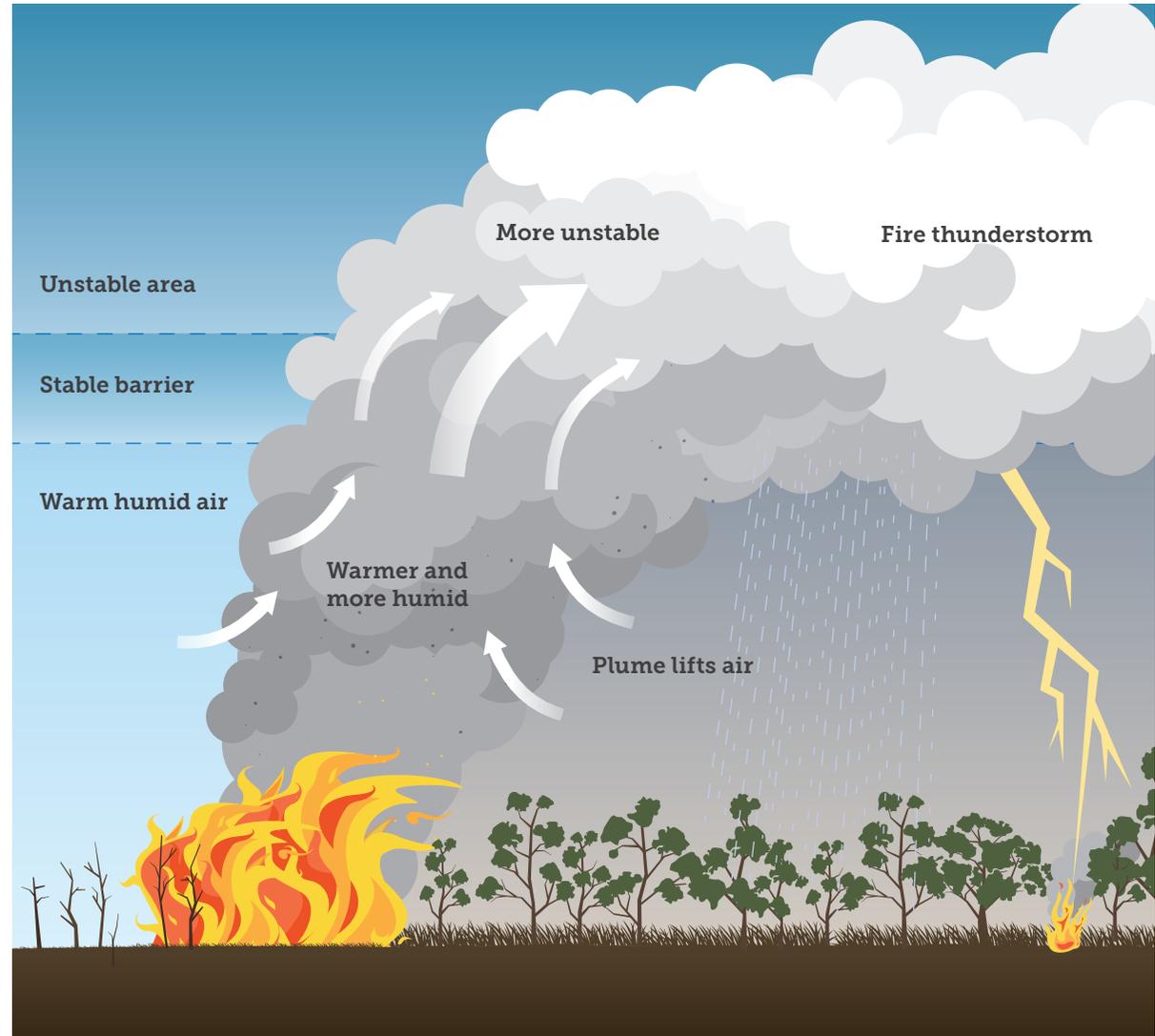


Figure 19: Pyro-cumulonimbus cloud development. Source: Adapted from BoM 2020 ([ELCA and Climate Council 2023](#)).

From 1979 to 2016 south-eastern Australia has experienced an increase in conditions conducive to formation of fire-generated thunderstorms. Risks have increased during the spring and summer due to decreases in atmospheric stability and humidity alongside more severe fire weather conditions (Owens & O’Kane 2020). Climate change will continue to amplify these conditions and could lead to more fire-generated extreme weather over longer fire seasons (Sharpley 2020). This fear was borne out on 9 January this year in Victoria as fires, such as the Walwa Fire, spawned pyro-cumulonimbus (see Australian Pyro-cumulonimbus database McRae 2025 for examples).

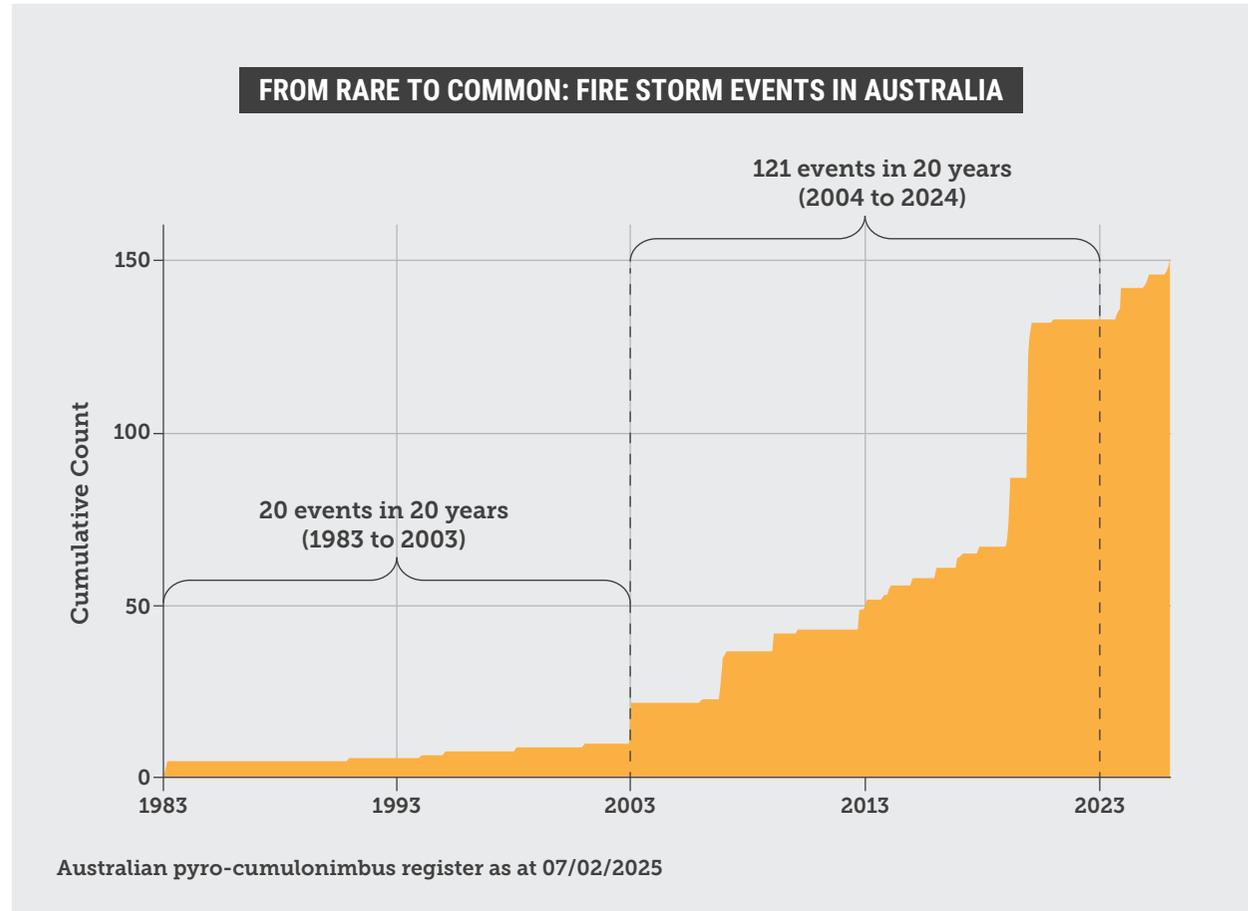


Figure 20: Climate pollution is causing an exponential increase in the occurrence of pyro-cumulonimbus events in a hotter, more volatile climate. Adapted from McRae 2025.

3.1 Fires are harder to predict in a more volatile climate

The 2025/2026 Summer Bushfire Outlook² released in November 2025 predicted “average” conditions in most parts of Australia, with above average risks in parts of NSW, Victoria, and Western Australia ([AFAC 2025](#); Figure 21). It detailed particular concerns for parts of southern and western Victoria due to significant drying and high fuel loads caused by earlier rains. Modelling indicated no significant shift towards wetter or drier than average conditions east of the Great Dividing Range. A La Niña event suggested the likelihood of periods with above-average rainfall. These conclusions were entirely reasonable with assumptions based on historical experience and precedent.

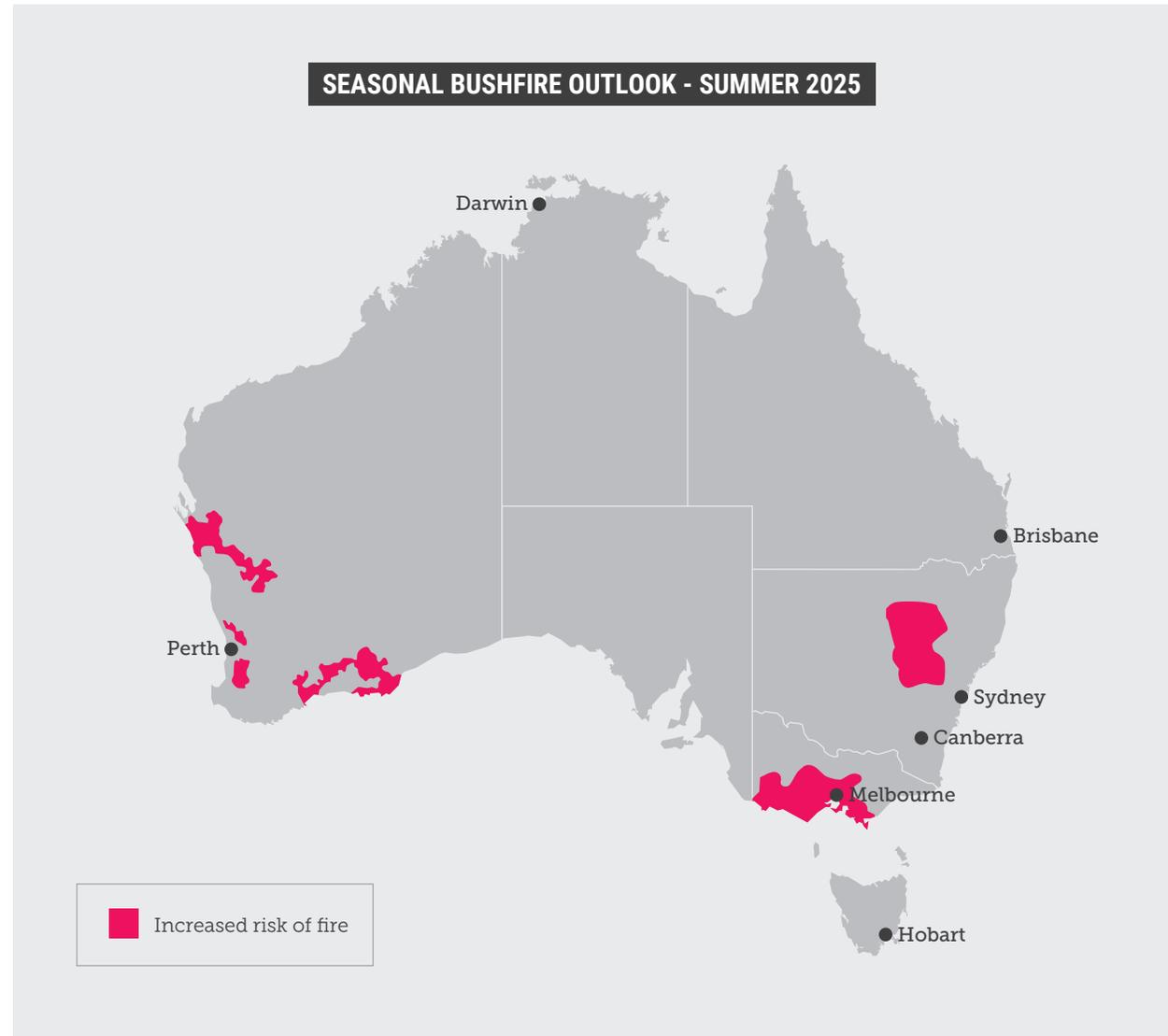


Figure 21: 2025/26 Summer Bushfire Outlook issued on 27 November 2025 by the peak council for fire and emergency services in Australia, AFAC. Adapted from [AFAC 2025](#).

² The peak council for fire and emergency services in Australia, AFAC, works closely with the Bureau of Meteorology (BoM) and fire agencies in each State and Territory to produce seasonal bushfire outlooks. The outlooks consider preceding weather conditions including precipitation, expected seasonal weather, and fuel loads and dryness.

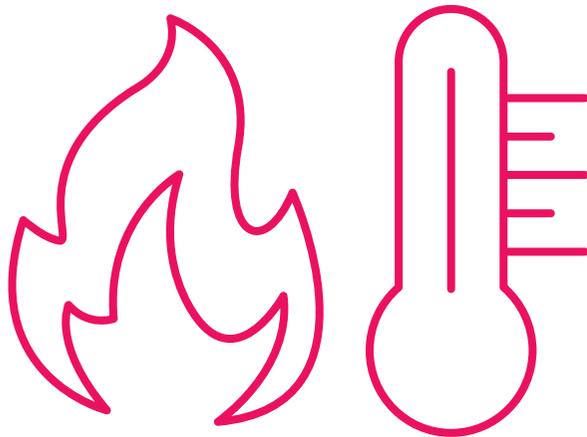
But in September 2025 a rare event known as Sudden Stratospheric Warming (SSW) occurred and temperatures high above Antarctica increased by more than 30°C in one week. This event drove a change in the Southern Annular Mode that had profound implications for Australian fire weather.

SSW is very rare in the Southern Hemisphere, with only two major SSW events recorded in the past 60 years – one in 2002 and the other in 2019, both coinciding with or preceding some of the most devastating bushfires in Australia’s history, including the Canberra firestorm of January 2003 and widespread fires in alpine areas of Victoria and NSW, then Australia’s worst ever bushfires, the Black Summer of 2019 / 2020 ([ABC 2025](#)).

The 2025 SSW weakened the polar vortex that holds a tight band of strong westerly winds around Antarctica. This enabled the winds to reach the Australian continent, to push away moist maritime air that would otherwise have moderated fire weather, and drove hot, dry air from the interior to the east coast.

These surface conditions associated with the SSW also likely intensified the onset of flash drought (see Section 2) in many parts of South Australia and Victoria, and parts of New South Wales. Then from late 2025 a series of heatwaves resulted in multiple days of Extreme and sometimes Catastrophic fire danger across multiple states, further drying out the landscape and rapidly exacerbating soil and fuel dryness.

The predicted “average” fire season turned into one that ultimately destroyed 1,653 structures (1,590 in Victoria) and left several people dead. The conclusions drawn in the Summer Bushfire Outlook were entirely reasonable but highlight how climate whiplash makes forecasting and preparation by fire agencies increasingly difficult.



3.2 Victoria's worst fire season since Black Summer

Australia's peak body for fire and emergency services (AFAC) had already highlighted parts of Victoria as being vulnerable to major fires, particularly in the event of Extreme or Catastrophic fire weather given the parched nature of much of the landscape (AFAC, 2026). The Country Fire Authority and Victorian Premier had warned of the likelihood of major fires and damage from late in 2025. Flash drought and relentless heatwaves made major fires almost inevitable. All that was needed was ignitions, and lightning strikes, made more likely by climate change, provided this last ingredient on multiple occasions.



Image 16: Local resident Daryl Otzen at his burnt out property that was destroyed in the Longwood fire in Ruffey, 11 January 2026.

Victorians experienced fires from December, but an approaching heatwave from 7-9 January resulted in widespread Extreme and Catastrophic fire weather warnings. On 8 January firefighters were already busy across the state, when dry lightning storms in the evening sparked thousands of lightning strikes and dozens of new ignitions. Many of the new outbreaks were in inaccessible areas and there was no way to bring them under control before a particularly testing day for Victorians on 9 January.

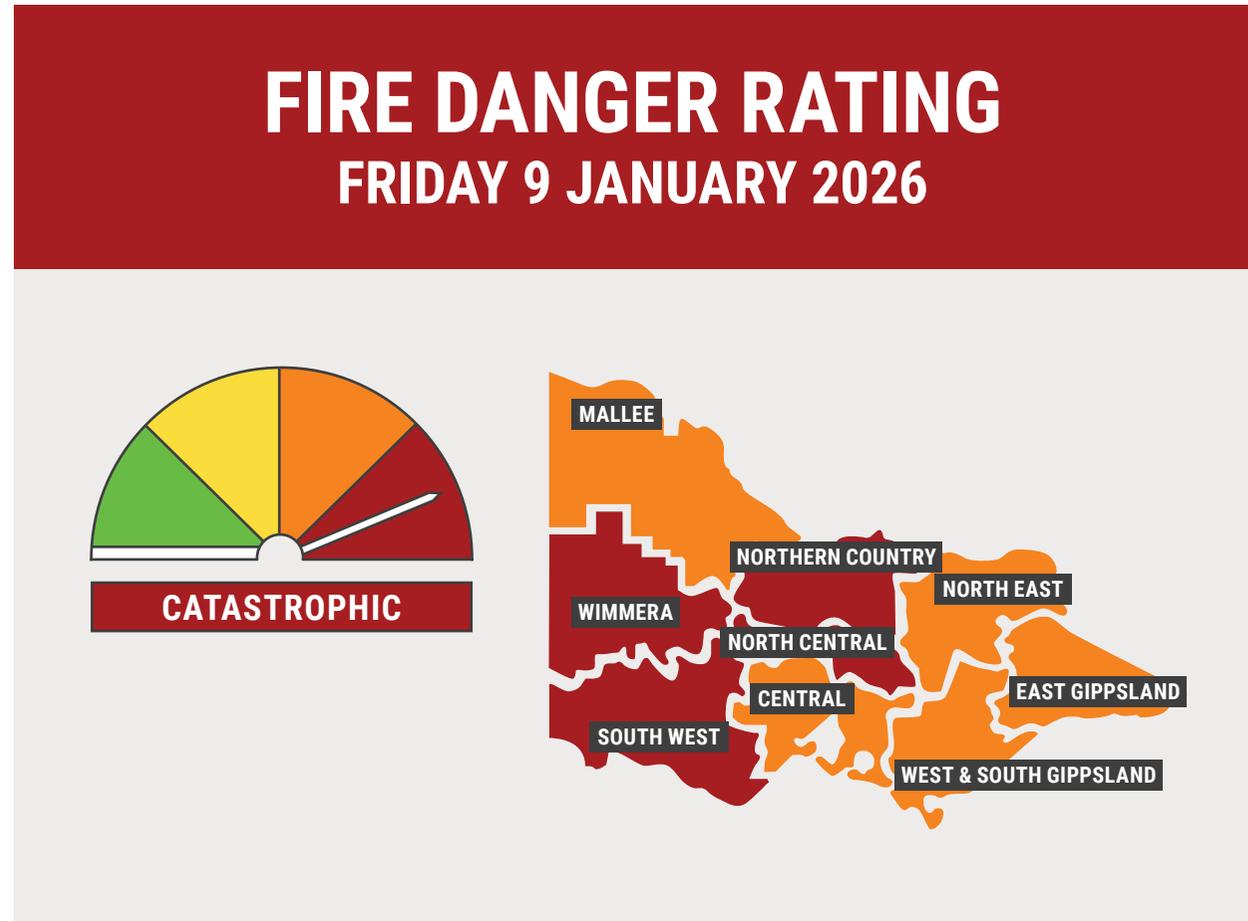


Figure 22: Catastrophic and Extreme fire weather warnings in Victoria midday 9 January 2026. Source: Adapted from VIC EMERGENCY 2026.

Ultimately 9 January resulted in the worst fires since Black Saturday 2009, with more homes lost in Victoria than in the 2019/20 Black Summer fires. Temperatures reached the mid 40s in many parts of the state, with single digit relative humidity and wind gusts over 100 kph in some areas. A strong south-westerly wind change later turned long fire flanks, in some cases tens of kilometres long, into intense fire fronts, overwhelming firefighting efforts.

According to Victorian authorities 1,590 structures including 451 homes, farm sheds, schools and shops destroyed (Fire Rescue Victoria, 2026). Every home in the small township of Ruffy near Longwood burned, with only the fire station and community centre left standing. A local farmer lost his life as he tried to seek safety.

On 9 January around 200 separate fires were recorded. The biggest fires that cumulatively burned more than 400,000ha were at Longwood, Walwa, Harcourt, Skipton, Gellibrand (the Otways), and Natimuk.

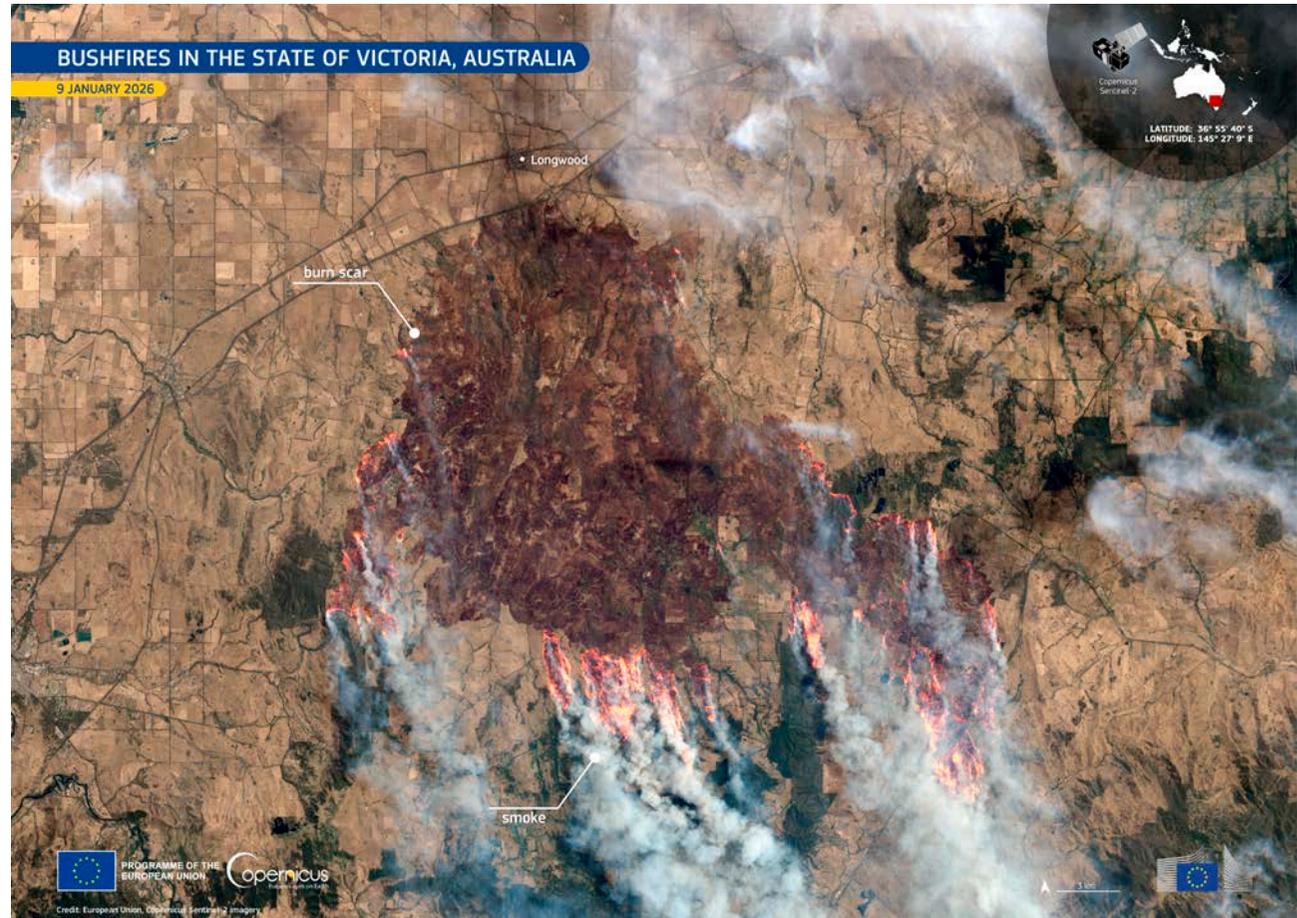


Figure 23: The Longwood bushfire on 9 January, 2026. Source: European Union, Copernicus Sentinel-2 imagery. The blaze burned through nearly 140,000 hectares of land in north east Victoria.

THE WINDOWS BETWEEN VICTORIA'S WORST FIRES ARE SHRINKING

Historically, Victoria has experienced extreme fire weather and major fires causing significant losses roughly once every 40 years (1851, 1898, 1939, 1983). The Black Saturday fires on 7 February 2009 caused the largest loss of life in history (173 killed) and destroyed thousands of buildings. Black Saturday happened just 26 years after the previous major fires in 1983, but statistically could have been an outlier. Then just 10 years later the Black Summer fires in 2019 / 2020 destroyed around 400 homes in Victoria. The January 2026 fires, six years after Black Summer, will now also rank amongst Victoria's worst.

It has been established that the increasing frequency of extreme weather conditions leading to the most damaging fires is a feature of climate change in action ([Di Virgilliuo et al. 2020](#); [Abram et al. 2021](#); [CSIRO and BoM 2024](#)).

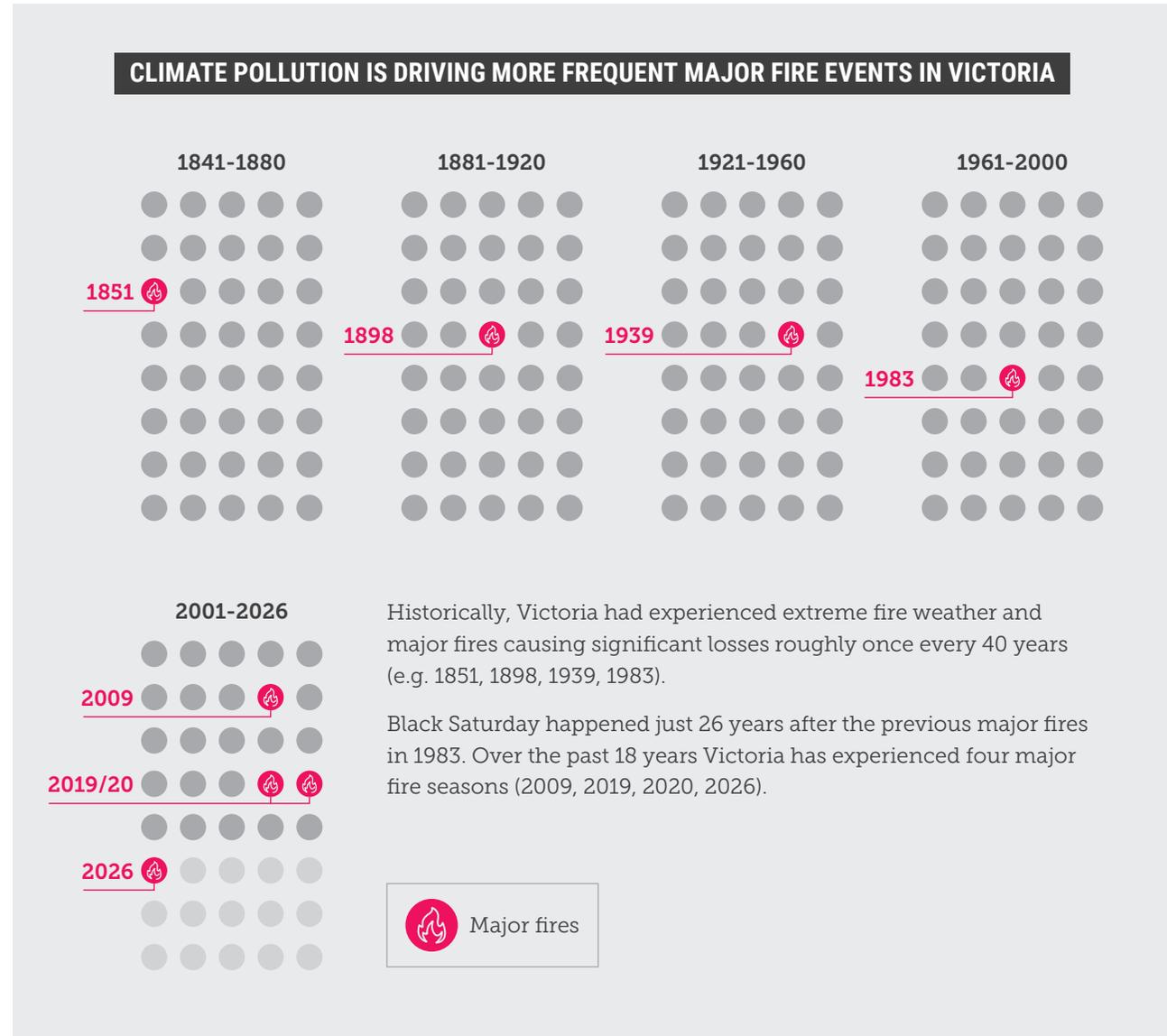
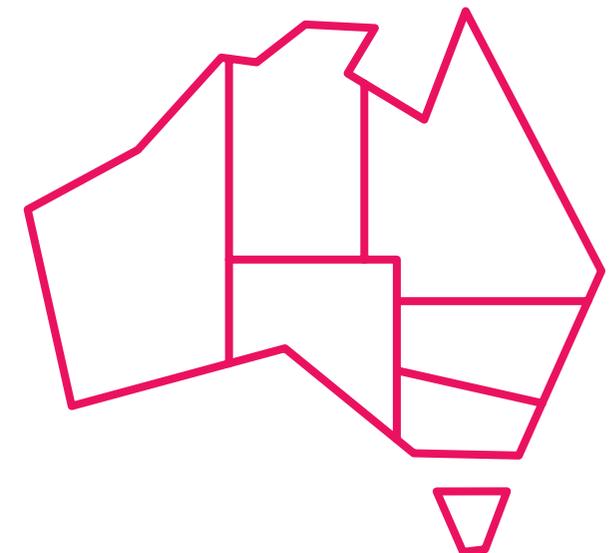


Figure 24: Window is shrinking between the most destructive fires in Victoria.

3.3 Summary of fire impacts of other states

<p>Tasmania</p>	<ul style="list-style-type: none"> > Between 4 and 10 December 21 homes and shacks and 15 other buildings were lost in Dolphin Sands and near St Helens. > Strong southerly then westerly winds in spring and early summer dried out forests in the east and then fanned uncontrolled fires. > Very strong winds grounded firefighting aircraft at one stage. > Temperatures were not particularly high, but very strong winds were enough to make fires uncontrollable
<p>New South Wales</p>	<ul style="list-style-type: none"> > Coastal NSW was forecast to have average fire risk, with increased risk in Central NSW however relentless drying and bouts of strong, dry, westerly winds and heatwaves primed larger areas of NSW for major fires > 6 December fire at Koolewong near Gosford destroyed 16 homes with temperatures in the 40s, very low humidity and strong winds > 7 December fire at Bulahdelah north of Newcastle destroyed 4 homes and a National Parks and Wildlife Service firefighter was killed by a falling tree.
<p>Western Australia</p>	<ul style="list-style-type: none"> > Up to five homes destroyed by multiple fires in northwestern and southwestern WA from November to February. > 1 December a grader driver was over-run by fire and died, > 17 December a farmhand assisting with firefighting efforts died when a tree fell on his vehicle. > Over one week in the Christmas / New Year period WA firefighters dealt with more than 100 fires stoked by heatwave conditions and strong winds (DFES 2026).
<p>South Australia</p>	<ul style="list-style-type: none"> > Firefighters battled multiple fires from November 2025 as periodic heatwaves cured vegetation. > 23 November a firefighter was killed while fighting a fire in the Pinkawillinie Conservation Area. > 23 January two homes were destroyed by a fire near Tooperang. > 1 February the Deep Creek fire broke out in the southeast and burned out of control until 12 February. Due to the size (4,592 hectares burned) (CFS 2026) and potential impacts of this fire, South Australia sought help from hundreds of interstate firefighters.
<p>Northern Territory and Queensland</p>	<ul style="list-style-type: none"> > October- December saw extensive fires across Queensland’s Gulf country and inland Northern Territory with around 46 million hectares burnt - the largest area burned since 2012 (Fisher 2026; NAFI 2026).



3.4 Climate change supercharged the 2025/2026 bushfire season

Climate change worsens most of the key factors contributing to fire risk, fire size and intensity, and associated fire losses. Increased dry lightning storms also result in increased ignitions. The sudden change in weather conditions caused by the 2025 Sudden Stratospheric Warming over Antarctica significantly changed the assumed trajectory of the fire season given the early signals for wetter than average conditions in many areas.

On a macro scale it is well established that the burning of coal, oil and gas has warmed the planet not only resulting in increasing temperatures, but also changed rainfall patterns, sudden swings from wet to dry, increased evaporation that relentlessly dries out vegetation, stronger wind velocities, longer fire danger seasons, more days of High fire danger and above (most years), and atmospheric instability that can make extreme fire behaviour such as fire tornadoes and pyroconvective storms more likely ([Binskin et al., 2020](#); [Abram et al., 2021](#)).

The most significant impacts of climate change on worsening bushfire conditions are briefly explained in Appendix.



Image 17: Firetrucks traverse across a burned landscape, attending the Lismore grassfire in Victoria in January 2026.

4.

Floods and tropical cyclones: the other side of climate whiplash



Image 18: A man wades through flooded streets in Airlie Beach during ex-Tropical Cyclone Koji in January 2026.

Floods and tropical cyclones have long been part of life for many people in Australia, but climate pollution is supercharging conditions, so that when tropical cyclones now form they do so in a world that is warmer, wetter, and more energetic than before. This means tropical cyclones can be more intense on average³ when they occur and may dump more rain for worse flood impacts. Some studies also suggest they could retain their strength for longer, and move more slowly – meaning they linger over a given area and cause more damage.

Riding upon higher sea levels, tropical cyclones can drive even more dangerous storm surges and coastal flooding.

4.1 Hotter seas power more intense storms

Climate change means the world's oceans are absorbing vast amounts of excess heat, with devastating consequences that are now unfolding.

Water has a much higher heat capacity than air. Heating a cubic metre of sea water by 1°C uses around three thousand times the energy it takes to heat a cubic metre of air. The ocean's immense capacity to absorb and store heat means that the vast majority of the excess heat in our climate system from climate pollution - around 93 percent - has been absorbed by the ocean (IPCC 2019). The observed rate of ocean warming has increased dramatically in recent decades, more than doubling since the mid-1990s (IPCC 2019, [Cheng et al. 2023](#)).

Today, we are putting more than 10 zetajoules of extra heat energy into the ocean each year. That's the equivalent energy of five Hiroshima bomb explosions every second ([Cheng et al. 2022](#), [Cheng et al. 2023](#)). Put another way, it's enough energy to boil all the water in Sydney Harbour every eight minutes ([Climate Council 2023a](#)).

The equivalent of five Hiroshima nuclear bomb explosions worth of excess heat from climate pollution is being absorbed by our oceans every second.

³ The intensity of a cyclone refers to the speed of the wind and size of the wind affected area.

Australia's average sea surface temperatures have warmed by 1.16 °C between 1900 and 2025, and 10 of the top 11 warmest years on record have occurred since 2010 (BoM 2026b; Figure 25).

Sea surface temperatures around Australia's coast were record warm in 2025, and 0.93°C above the 1961–1990 average. 2025 broke the previous record of 0.90°C above average in 2024. This helps cyclones to form, which typically need water temperatures of 26.5°C or more (BoM 2026b). Rising ocean surface temperatures and a warmer, wetter atmosphere means more energy for tropical cyclones to draw on once they have formed. It is likely that tropical cyclones will become more intense with climate change in terms of maximum wind speed and the amount of rainfall they produce (IPCC 2023; Australian Climate Service 2025). When combined with rising sea levels, storm surges from tropical cyclones will create greater coastal erosion and inundation of coastal communities (Australian Climate Service 2025). Post-event heatwaves and flooding can also compound the direct impacts of tropical cyclones, leading to far greater losses.

Two consecutive years of record sea surface temperatures in the Australian region increased the amount of moisture available to fuel heavy rainfall events and influence the frequency and severity of flooding events, like major flooding that occurred in northern and central Australia during summer 2025/26 (BoM 2026b; see Section 2).

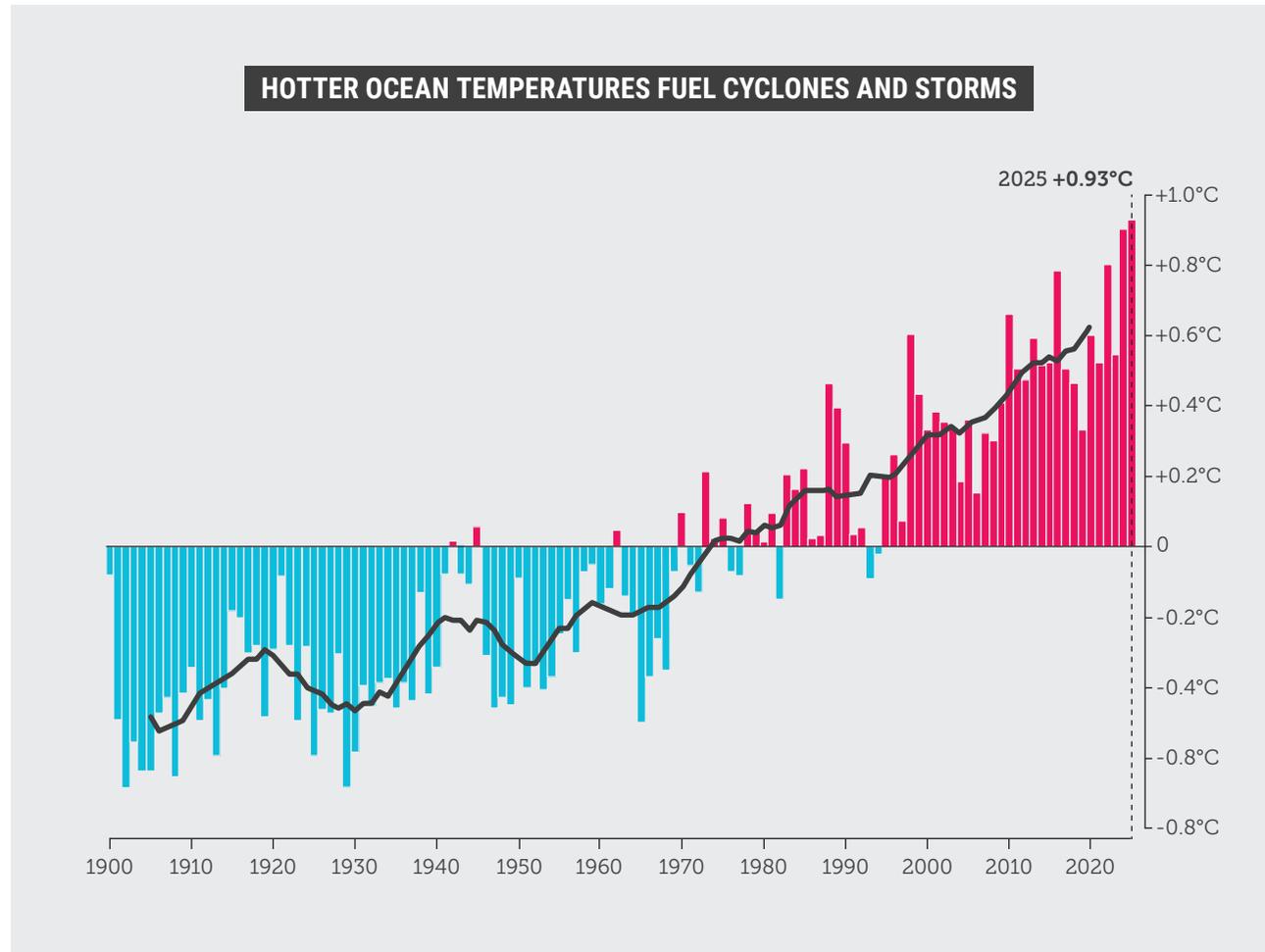


Figure 25: Australia's sea surface temperature anomaly (1900-2025). Source: Adapted from BoM 2026b.

Ten of Australia's top 11 warmest years on record for ocean temperatures have occurred since 2010.

4.2 Tropical cyclones are dumping more rain

Communities can be badly impacted by storms when they're at cyclone intensity, but also afterwards as they become tropical lows. In January 2026, Tropical Cyclone Koji brought record-breaking floods that inundated homes, displaced families, and deeply impacted primary producers and small and family businesses in

Queensland. Graziers lost over 100,000 head of livestock and vast paddocks were transformed into an inland sea. Entire road networks were severed, leaving communities stranded and vulnerable ([QRA 2026](#); Section 5).



Image 19: Communities in Winton, Queensland badly impacted by flooding in January 2026.

BOX 4: HOW IS CLIMATE WORSENING EXTREME RAINFALL EVENTS?

Climate change is affecting our hydrological (water) cycle, which refers to the way water moves about our planet. Generally speaking, wet areas are getting wetter and dry areas are getting drier.

We are also experiencing more of our rain in the form of short, intense downpours, which leads to a greater risk of floods. These events occur because a warmer atmosphere holds more moisture and more energy to fuel storms.

In Australia, the latest research shows for every degree of global warming, we will experience about 7–28% more rain for hourly or shorter duration extreme rainfall events, and 2–15% more rain for daily or longer duration extreme rainfall events (Wasko et al. 2024).

4.3 Tropical cyclones: a multi-layered threat for Australian communities

Tropical cyclones are among the most destructive of extreme weather events. In addition to causing loss of life, property damage, flooding, storm surges and coastal erosion as mentioned above, cyclones can also impact:

- › Human health, e.g. including drowning, falls and injuries, skin infections from contaminated water, respiratory issues from mould exposure and mosquito-borne infections such as Ross River virus and Murray Valley encephalitis.
- › Reduced agricultural production, e.g. loss of livestock, farm infrastructure and road access.
- › Critical infrastructure, e.g. energy and communication networks, roads and seaports.
- › The natural environment (e.g. polluting waterways and soils, eroding coastlines and threatening ecosystems like the Great Barrier Reef and Ningaloo Reef).

Compound tropical cyclone hazards, such as combined wind and heavy rainfall, can exacerbate these impacts. While the most extreme winds tend to be confined to coastal zones, creating very large waves and storm surges, prolonged heavy rain and flooding can impact communities well inland from where the cyclone landfall occurs, similar to Tropical Cyclone Koji in January 2026 impacting inland Queensland communities.

Studies have shown that in the aftermath of severe storms, survivors demonstrated a 15% increased risk in the onset of depression after the storm event. Emotional stress can undermine the resilience of individuals and communities, placing further physical, emotional and financial burdens onto recovery efforts ([Martin 2015](#)).

Heatwaves and high humidity in the wake of an event may further increase mortality, particularly if power supplies are lost. For example, low-intensity to severe heatwave conditions impacted western regions of Western Australia, south of the tropical activity associated with Tropical Cyclone Mitchell in February 2026.

Our weather is now more chaotic, unpredictable and dangerous due to climate pollution, which presents challenges for us all.



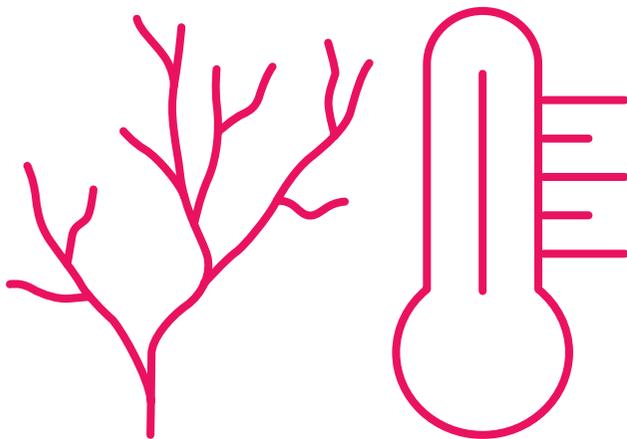
4.4 Coral reefs under threat

As the world's oceans heat up to record levels from excess energy from climate pollution, marine heatwaves are becoming more intense and frequent. The Great Barrier Reef (GBR) is already under immense pressure, devastated by eight mass bleaching events since 1998 ([AIMS 2026](#)). For the first time both the GBR and Ningaloo Reef bleached concurrently over summer 2024/25. Coral reefs are also under threat from ocean acidification. Ocean acidification reduces the concentration of carbonate in seawater, which makes it more difficult for organisms like corals, mussels, oysters and some plankton to form shells and skeletons ([Fitzer 2019](#)). This means that corals which bleach but don't die will take longer to recover, putting them at greater risk from more frequent bleaching events.

Tropical cyclones bring both risks and benefits for coral reefs. Winds, cloud and rain associated with tropical cyclones can cool sea surface temperatures. For example, the southern section of the GBR was spared from mass bleaching in 2016 because of late summer cooling of ocean temperatures from ex-Tropical Cyclones Winston and Tatiana ([GBRMPA 2016](#)). Whereas, on the downside, climate change could result in more intense tropical cyclones hitting the Australian coast, which will in turn increase the risk of physical damage to reefs.

In 2011, Tropical Cyclone Yasi passed over large tracts of the GBR. Coral damage was reported across an area of approximately 89,000 km² of the Great Barrier Reef Marine Park. In total 15% of the park sustained some damage and 6% was severely damaged ([GBRMPA 2011](#)). The ecological impact of this severe tropical cyclone is likely to be evident for several decades.

Summer 2025/26 ended with reports of coral bleaching in some parts of the northern Great Barrier Reef, the result of several weeks of sea surface temperatures more than 1°C warmer than normal. Bleaching during a La Niña period is uncommon, with the only widescale La Niña bleaching event on the GBR occurring in 2021-22. As of late February 2026, the northern Great Barrier Reef remained under coral bleaching Alert Level 1 with some areas at Alert Level 2 ([NOAA 2026](#)), noting that the peak period for bleaching in Australian waters is February/March ([GBRMPA 2026](#)). The Bureau of Meteorology indicated around a 60% chance of a marine heatwave over the northern GBR for March 2026 ([BoM 2026x](#)).



5.

What climate whiplash is costing Australians

Climate pollution is fuelling more frequent and intense disasters that are hitting communities repeatedly, straining household budgets, harming our health, costing our farming communities millions, lifting all our insurance premiums and putting many councils on the backfoot as they have to continually repair damaged roads and community assets.

Image 20: A man shades himself from the heat with a fan in Melbourne during a heatwave in late January 2026.



5.1 The costs of climate disasters are growing - and hitting Australian households hard

Over the last few decades Australian households have faced growing costs from extreme weather events. In the 1980s the average annual economic loss for disasters was estimated to be \$60 per person. From 2020 to 2024 this had risen to \$193 per person - a 222% increase ([ICA 2025](#)). Insured losses per person have also increased steeply - by 474% ([ICA 2025](#)). The steepest disaster cost increases occurred in the decade beginning from 2010 (see Figure 26).

In the five years to 2024 average insurance payouts for extreme weather losses per year were \$4.5 billion - well above the 30 year average of \$2.1 billion ([ICA 2024](#)). At the same time, Australian homeowners have seen their insurance premiums increase year on year due to the growing climate risks they face and the costs of repair following disasters. Home insurance costs for Australian households have increased by 51% over the last five years ([ABC 2026j](#)). The costs are greatest for those hit repeatedly by disaster, including flood-prone areas in Brisbane's west and Sydney's bushfire prone Blue Mountains ([ABC 2026j](#)).

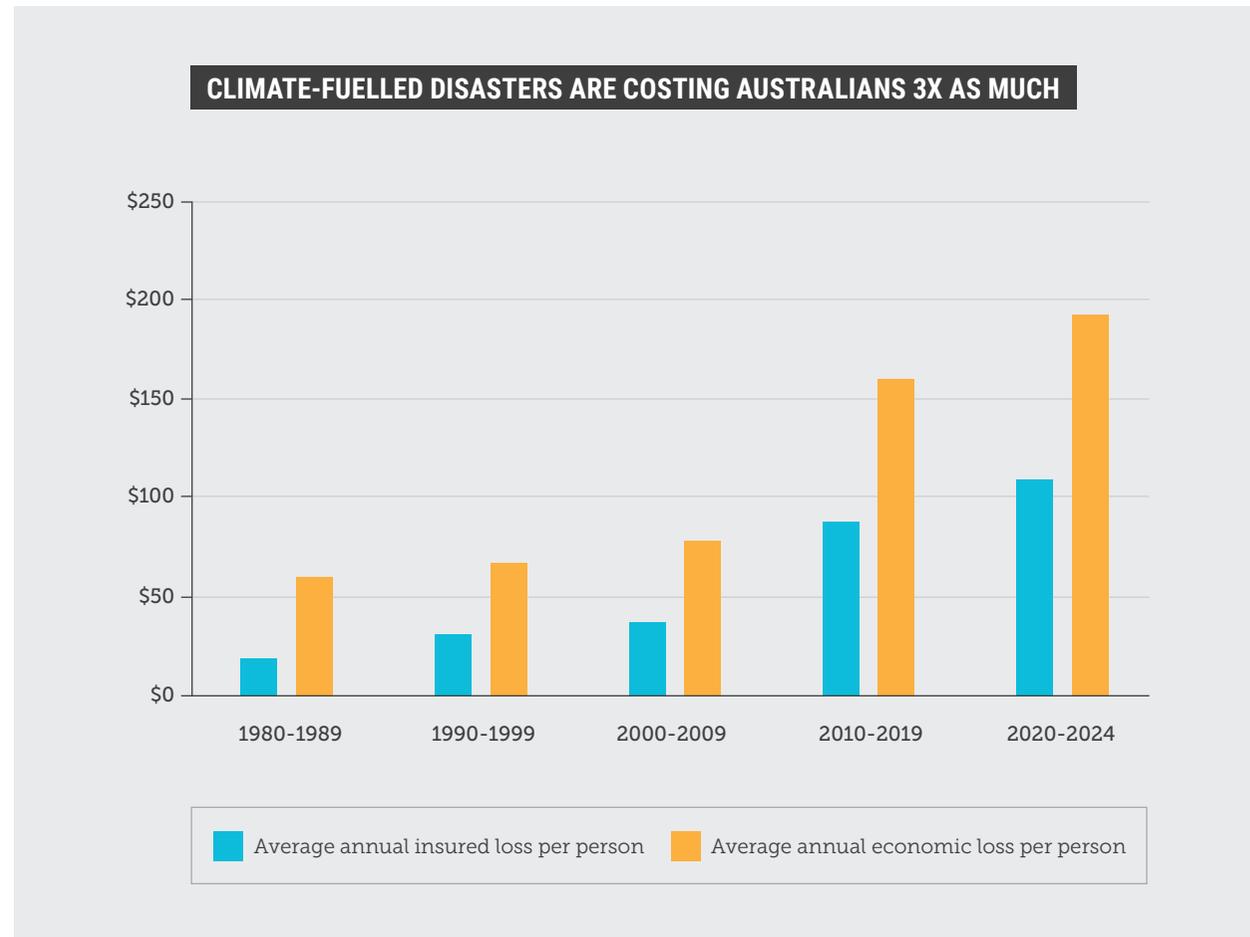


Figure 26: Skyrocketing disaster costs for Australians (US dollars adjusted for inflation). Data from [ICA 2025](#).

5.2 Australians have been hit by back to back disasters since the 2019/20 Black Summer bushfires

From the 2019/20 Black Summer bushfires onwards, Australians have been hard hit by consecutive, concurrent and compounding climate disasters, from deadly heatwaves to destructive fires, then record-breaking floods (see BoM's Special Climate Statements). The overwhelming majority (84%) of Australians report having been directly affected by at least one climate-fuelled disasters since 2019, including:

- › heatwaves (71%)
- › floods (45%)
- › bushfires (43%)
- › droughts (37%)
- › destructive storms (35%) and
- › landslides (8%) (see Climate Council 2024a).

Sadly, many Australians have experienced these disasters more than once in recent years. More than half (53%) experienced multiple heatwaves, one in four (23%) reported more than one flooding event and one in five (19%) had been through more than one bushfire (Climate Council 2024a).

These disasters aren't experienced equally, with Queenslanders in particular more likely to report experiencing one or more floods (70%), heatwaves (86%) and/or cyclones and/or destructive storms (57%) compared to other states and territories. Residents of both QLD (53%) and NSW (46%) were

also more likely to have reported living through one or more droughts compared to their counterparts in other states and territories (Climate Council 2024a).

If the 2019/20 Black Summer bushfires are a guide to the health and environmental impacts of the largest fires, we can expect the 2026 Victorian fires to also be costly. Thirty three people died as a direct result of the Black Summer bushfires, and 80% of Australia's population were exposed to dangerous air pollution from bushfire smoke, contributing to 445 further deaths ([Johnston et al 2022](#)). Counting deaths from bushfire smoke can take months so the full health impacts of Victoria's January 2026 fires are not yet available.

The wildlife impacts of this summer's extreme events are also being tallied. Conservationists have concerns that a plant, the southern shepherd's purse, may be extinct after the Harcourt fire and

Victoria's endangered eastern bristlebirds and dingoes have lost significant chunks of their habitats (The Guardian 2026). Six years ago the Black Summer fires were responsible for the deaths or displacement of an estimated three billion animals ([WWF-Australia 2020](#)).

The bushfires wiped up to \$4.6 billion off Australia's Gross Domestic Product (GDP) - equivalent to a 1.8% reduction in GDP among bushfire affected regions - and led to \$2.4 billion in insurance losses (Suncorp 2022). Australian farmers and tourism operators were hit hard - with costs to their businesses estimated to be as high as \$4-5 billion and \$2.8 respectively (Reiner et al. 2024; [WWF-Australia 2021](#)).

The majority of Australians (84%) have been directly impacted by climate-fuelled disasters since the Black Summer fires of 2019/20.

BOX 5: CLIMATE DRIVEN FLOODS ARE ENDANGERING OUR HOMES, AND RISKING OUR BIGGEST ASSET: THE HOME

In Australia, one in six Australian homes (just over 2 million) are flood-prone. Of these, at least 70% have experienced a reduction in value due to flood risk. Homes exposed to flood risk are collectively worth \$42.2 billion less than they would have been in the absence of flood risk. The bulk of these properties are in Queensland, where flood risk has cost homeowners \$19 billion as at April, 2025. The Gold Coast ranks highest within the state, with a collective \$4.5 billion in value foregone across the region. NSW follows closely behind, with more than \$14 billion foregone in flood-related value (Climate Council and PropTrack 2025).

The first half of 2025 saw a return of back to back climate pollution-fuelled disasters, including Tropical Cyclone Alfred and major floods in Queensland and New South Wales, costing the Australian economy \$2.2 billion (CCA 2025). These events caused extensive damage and disruption to the lives of people in their paths.



Image 21: Many homes across Brisbane experienced flood damage during the great deluge of 2022.

5.3 Climate-fuelled disasters are hitting regions hard, and repeatedly

5.3.1 Flood and storm impacted regions faced fast moving and intense fires in NSW

Many regions impacted by fire in New South Wales were already recovering from past bushfires, storms and floods. Following the Bulahdelah fire in December 2025, the MidCoast council required additional disaster recovery funding assistance from the state and commonwealth governments. Since 2019, the council has required this disaster assistance 16 times - essentially twice a year ([NEMA 2026](#)). In May 2025, record breaking floods hit the town of Taree which sits less than an hour north of Bulahdelah, rendering at least 608 homes uninhabitable due to flood damage ([Risk Frontiers 2025](#)).

5.3.2 Victoria's fire scarred communities count the costs of multiple disasters

The bushfires that burned through large parts of Victoria in January 2026 hit communities that have been battered by climate fuelled disasters repeatedly in recent years. The Longwood fire covered parts of the Mitchell and Murrindindi local government areas which experienced significant flooding in 2022, and have seen destructive storms in the years since (NEMA 2026). From 2019 onwards, these areas have required government disaster recovery funding support 10 and 12 times respectively.⁴ The Colac Otway local government area which was impacted by the Gellibrand fire has also required disaster recovery funding support eight times from 2019 onwards ([NEMA 2026](#)), and symptomatic of a summer of climate whiplash over summer 2025/26, communities in the region bore the brunt of flash floods at Wye River and then back to heatwaves and bushfires.

The full impact of the Victorian fires is still being tallied and most likely won't be known until after the findings of an Inquiry into the state's devastating bushfire season. However, initial insurance losses due to the fires are estimated to be as high as \$786 million ([PERILS 2026](#)).

5.3.3 Queensland's most disaster impacted local government areas hit by flood waters

Over half (60%) of the local government areas in Queensland have needed disaster recovery funding support in response to ongoing flooding from the North Queensland Monsoon and ex-Tropical Cyclone Koji since December 2025 ([Department of Home Affairs 2026](#)). By 30 December parts of northwest Queensland had recorded close to their total average annual rainfall in a week (ABC 2025). Further rainfall from a tropical low in late January triggered evacuations in North Queensland in Einasleigh and along the Gilbert River (ABC 2026k). Some of the local government areas hit by flood waters are among Queensland's most disaster impacted - including Barcoo, Carpentaria and Cook ([ELCA and Climate Council 2024](#); [Department of Home Affairs 2026](#)).

⁴ Not including disaster assistance for the 2024 earthquake that hit communities in the Murrindindi local government area in 2024.

5.4 Disaster hit councils are struggling to make ends meet

These back-to-back disasters have decimated council budgets - making it difficult for council to repair damaged community assets. In 2022/23 MidCoast council north of Newcastle in New South Wales had a net operating budget deficit of over \$45 million due to recurring climate disaster impacts ([SMH 2024](#)). The 2025 floods that hit the region left the council with a \$232 million damage bill for road repair alone ([Mid North Coaster 2025](#)). Other NSW councils that have experienced successive disasters in recent years also recorded significant deficits in 2022/23 - including Lismore, Clarence Valley, Upper Hunter, Wingecarribee and Shoalhaven ([SMH 2024](#)).

In Victoria, councils hit with climate fuelled disasters are experiencing similar issues. Council budgets are being smashed due to urgent repair work following disasters and rising insurance premiums in their wake. Following the 2022 floods, the City of Greater Shepparton was hit with insurance premium increases - including a 25% hike in one year. At the same time coverage for flood damage dropped from \$20 million to \$2 million ([Parliament of Victoria 2024](#)).

With back to back disasters and climate whiplash - councils will find it more and more difficult to fund essential repair work, let alone invest in programs and infrastructure to better protect their communities from future climate impacts.

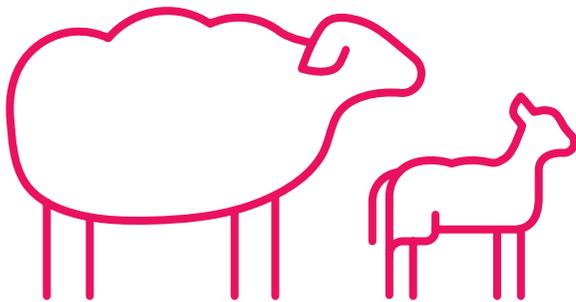


Image 22: People recover camping gear from the shoreline after flash flooding near Wye River in Victoria on 16 January 2026.

5.5 Farmers across the nation counting the costs of floods and fires

The Victorian fires of summer 2025/26 have been a disaster for the state's primary producers. An estimated 150,443 hectares of farmland was burned by the fires - essentially a third of the total burn area across the state. Farmers lost 45,593 livestock to the fires - costing over \$20 million⁵ ([Agriculture Victoria 2026](#); ABC 2026m). This excludes the costs of replacing agricultural assets damaged or destroyed by the fires. Many farmers have been flung between disasters in the past four years, with Mitchell, Murrindindi and Strathbogie local government areas impacted by recent fires as well as the 2022 floods that caused estimated agricultural damages of \$108 million ([Deloitte 2023](#)).

The impacts of the heavy rains and flooding that hit communities across north Queensland in December 2025 and January 2026 are still being assessed - but it is clear that primary producers bear significant costs in the short term, including damage to equipment, stock losses, and damaged roads and supply chains, even if longer term it brings about better feed. In the north-west there have been 68,000 stock losses, with the final number expected to exceed 100,000 ([ABC 2026n](#)). Some businesses face millions of dollars worth of repairs. Primary producers in 13 local government areas have been offered additional disaster recovery funding support, however many have likely been hit by disasters before (Department of Home Affairs 2026). The Etheridge local government area has required additional disaster recovery support 12 times from 2019 onwards. Eight of these disasters have been flood related ([NEMA 2026](#)). The currently flood impacted local government areas of Carpentaria and Cook have now experienced eight and seven flood disasters during the last seven years ([NEMA 2026](#)).



⁵ Livestock losses and farmland burned as of 11 February 2026. Estimated economic cost as of 31 January 2026.

6.

Accelerating climate risk beyond our capacity to cope

We are now in a new era of fast developing and compounding climate disasters driven by pollution from coal, oil and gas. This is pushing disaster and emergency management to the limit. Authorities are periodically being overwhelmed by off the chart disasters, and emergency services simply do not have the capacity and resources to cope with multiple back-to-back, consecutive disasters. As Northern and Southern Hemisphere seasons expand and increasingly overlap, international resource-sharing becomes more difficult—reducing the capacity to surge support during major events.

Image 23: Firefighter at the Longwood fire in Victoria, January 2026.



6.1 Health and emergency systems under strain

Climate pollution has pushed us into a new era of increasingly severe and frequent disaster threats. Our emergency management, response and recovery arrangements, which were set up to cope with a much tamer environment in the 1990s, fall short of what is needed today. Without major changes, they will certainly not be able to handle worsening threats as global warming escalates.

This is already evident in several recent disasters:

- › The hot and dry conditions across Australia in 2019 that drove bushfires of a duration, size, scale and level of destructiveness never before experienced or predicted ([Binskin et al 2020](#)). Overwhelmed fire services were unable to share sufficient firefighting resources across borders because for the first time there were simultaneous major fires across all national jurisdictions ([Binskin et al 2020](#)).
- › The Black Summer bushfire smoke killed 445 people, affected 80% of Australia's population and caused an estimated \$2 billion in healthcare costs ([Johnston et al. 2020](#)). Canberra Hospital was inundated with bushfire smoke, causing failure of some equipment and placing staff and patients at risk.

- › Floods in Lismore in early 2022 exceeded the historic flood peak by around 2 metres, resulting in many previously 'safe' homes being inundated. There was extensive flooding and damage to Lismore Base Hospital and other health services in the town. Emergency services scrambled to cope with the number of rescues required, ultimately having to rely on assistance from spontaneous community volunteers (Fuller & O'Kane 2022).

- › In November 2022, the Lachlan river in NSW rose fast causing a major flood emergency in Forbes and Eugowra. One-in-five residents had to be rescued from rising flood waters in Eugowra on 14 November 2022 (ABC 2022c), and on 15 November around 1,000 people in NSW town of Forbes were told to evacuate before expected major flooding (SBS 2022).

Against a background of more frequent, consecutive and compounding climate disasters, governments are being called upon to coordinate long-term recovery operations to re-establish devastated communities. This work is difficult, expensive, and easily set back by a subsequent disaster. For instance, following the 2019/20 Black Summer Bushfires many areas were hit by flooding rains in March 2021 ([AIDR 2021](#)). On the NSW South Coast, many people made homeless by the fires were living in tents and caravans

(The Canberra Times 2022b), and their temporary accommodation was flooded. Soon after this, the COVID-19 pandemic hit, and Australia, like other countries, scrambled to set up effective responses ([AIDR 2021](#)).

Those in the disaster and emergency management sector know without a doubt that we have entered a new era of escalating disaster threats, where the next impact often lands while communities are still reeling from the last. Our emergency management, response and recovery arrangements are not currently equipped to handle this. It is sobering to note that the supercharged-climate disasters which periodically overwhelm governments and emergency services, and the resulting devastation for communities, are occurring in a world that is 1.3°C warmer on average than pre-industrial times. However, we are on a trajectory for more than 2°C of warming by this century based on existing international emissions reduction commitments ([UNEP 2025](#)). This equates to a barely survivable future and impacts to which it will be impossible to adapt, unless we act quickly.

6.2 Accelerating climate risk in Australia

The Australian Government's national climate risk assessment (Australian Climate Service 2025) paints a bleak picture of the worst risks that Australia faces, from extreme heat, to flooding and drought, into the future. And if we don't do more to cut climate pollution, the assessment warns that:

- › Climate change will disrupt our very way of life. *"Changes in Australia's climate will not occur gradually or smoothly. Reaching potential climate and ecological tipping points is very likely to result in abrupt changes"* (p.10).
- › Communities will be slammed in many, severe ways. *"It is likely we will experience more compounding, cascading and concurrent hazards"*, like heavy flooding after a tropical cyclone, or bushfires and increased air pollution after extreme heatwaves (p. 10).

The report finds that the extreme weather events of today are likely to resemble the average experience of Australians in the future if we don't drastically cut climate pollution and faster (p.22). All Australians will be at greater risk, with the most significant and rapidly escalating risks identified for Queenslanders, Tasmanians, and those in New South Wales and the ACT (p.26). With sea levels rising around Australia, and more frequent extreme events increasing, the risk of inundation and damage to coastal infrastructure and communities in low-lying areas are a major

risk, including in major cities and external territories (p.22). If populations remained static, then that puts 597,000 more people at direct risk of coastal hazards by 2030. Those living in remote communities are vulnerable today because of limited telecommunications and weak supply chains (p.22). In the future, climate impacts could exacerbate this vulnerability, doubling freight costs for some regional areas in Queensland, Western Australia, and the Northern Territory (p.51).

Aboriginal and Torres Strait Islander Peoples are already experiencing the adverse impacts of climate change, which exacerbate existing health and social disparities. Displacement from Country due to climate change can have severe health and wellbeing consequences, including increased homelessness and weakening of family and social connections, identity, and belonging. Other climate risks to the health and wellbeing of Aboriginal and Torres Strait Islander peoples may be driven by reduced air quality, extreme heat, flooding, interrupted health services, and energy insecurity (p. 34).

The federal government should legislate mandatory five-year updates to the National Climate Risk Assessment and the Adaptation Plan with mid-point updates on progress. This will ensure national disaster preparedness keeps pace with escalating climate risks and is grounded in the best available science.



The National Climate Risk Assessment finds that the extreme weather events of today are likely to resemble the average experience of Australians in the future if we don't deeply and rapidly cut climate pollution.

HOW BAD WILL CLIMATE CHANGE BECOME?



Quadruple the time spent in heatwaves

The average number of severe and extreme heatwave days per year across Australia would:

- **Double** at 2°C of warming
- **Quadruple** at 3°C of warming



Deaths due to extreme heat could quintuple

Heat-related deaths could increase dramatically (under a 3°C scenario):

- Sydney: 440% more deaths
- Melbourne: 260% more deaths
- Perth: 300% more deaths
- Launceston: 140% more deaths
- Darwin: 420% more deaths
- Townsville: 330% more deaths



Millions more Australians at risk of coastal flooding

Sea-level rise could reach one metre, leading to:

- **18 times more coastal flooding**, from an average of about 15 days per year in different coastal locations to around 272 days per year under a 3°C scenario.
- **Doubling the number of Australians exposed to coastal hazards** to 1.5 million by 2050, and exposing 3 million people by 2090.



\$135+ billion drag on productivity

Exposure to heat would harm worker productivity, **reducing overall economic output by \$135-423 billion by 2036.**

Agriculture, construction, manufacturing and mining would be the worst hit, **losing the equivalent of 700,000 additional days of work every year by 2061** under a 3°C scenario.



Marine heatwaves for half the year

Marine heatwave duration would increase dramatically, which would have catastrophic consequences for coral reefs:

- **Quintuple** to 95 days at 2°C of warming
- **Increase ten-fold** to 179 days at 3°C of warming



Property values could take a half-trillion dollar hit

Losses to property values could increase to:

- 2050: \$611 billion
- 2090: \$770 billion



Our bill for climate-driven disasters seven times bigger

Average Australian Government **disaster recover could be almost seven times higher** by 2090 under a 3°C scenario.

Figure 27: Escalating climate risk and impacts on Australia. Source: Adapted from Australian Climate Service 2025.

7.

Our summer
of high speed
climate whiplash



Image 24: Aerial drone view of bushfire damage, 23 January 2026.

The rapid swings between disasters from December 2025 to the end of February 2026 confirmed the confronting new climate reality in Australia.

Communities were flung from extreme fire danger to flash flooding within days. Record heat struck during what would typically be a cooling La Niña. Temperatures in the stratosphere above Antarctica suddenly shot up by 30°C, then stoked fire weather in eastern Australia. Fire seasons intensified under weather patterns that used to arrive only once in a generation. Oceans at record temperatures fuelled destructive tropical cyclones and heavy rainfall events.

This was climate whiplash playing out at breakneck speed

There is now so much heat and energy in our atmosphere and oceans that it is overriding natural climate drivers like El Niño and La Niña. The La Niña's cooling influence could not contain flash drought, record heat and shocking fires this

past summer. Similarly, an El Niño summer in 2023-24 saw major flooding events, in what should have been hotter, drier conditions ([Climate Council 2024b](#)).

Climate change is now the dominant influence on our weather systems

The consequences are profound. Emergency services are stretched by back-to-back disasters. Farmers face mounting losses from both fire and flood. Councils struggle to repair roads and community assets before the next disaster hits. Animals and plants are being pushed to the brink of survival. Insurance bills are rising across the country.

Communities are paying the price for climate damage, because companies and governments in Australia and around the world have made active choices to keep polluting, by approving more and more coal, oil and gas extraction. Decades of these policies have locked in more extreme weather events in the future.

Our choices today will define how safe or dangerous the world becomes as our children grow up.

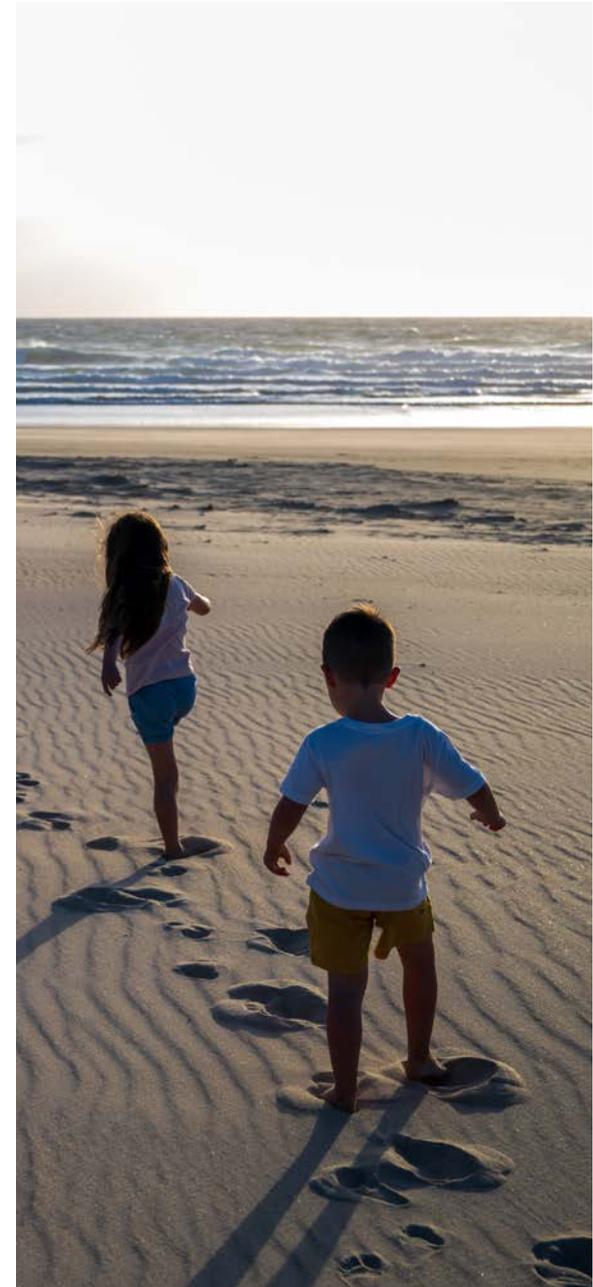


Image 25: Children walking along the sand at Coolum Beach, Sunshine Coast Region, Queensland.

The collective steps we take now to cut climate pollution as far and as fast as possible will determine how severe future climate impacts become

Climate whiplash is becoming a defining feature of Australian summers because of past failures to tackle the root cause of the problem: rising climate pollution. We can limit escalating climate risk by rapidly and deeply reducing climate pollution from coal, oil and gas, while transitioning to a clean, healthy and vibrant Australia powered by renewables and storage.

We can still limit the severity of future floods, fires and destructive storms that our children and grandchildren will experience, but we must act this decade. We must build a clean economy and industries so we can cut climate pollution deeply by 2030 (Climate Council 2023b, 2024b, IPCC 2021).

Achieving meaningful reductions in greenhouse gas emissions to avert the worst climate outcomes starts with an immediate end to all new or expanded coal, oil and gas project approvals at both state and federal levels.

A significant near-term opportunity for the federal government to accelerate domestic climate pollution reductions is to strengthen the Safeguard Mechanism — the policy that sets pollution limits for Australia's largest industrial facilities. Strengthening the mechanism will help ensure it delivers genuine reductions in climate pollution, aligns with the upper end of Australia's new 2035 climate target, and requires the country's largest polluters to contribute their fair share.

Inefficient taxpayer-funded subsidies that are supporting continued fossil fuel production and use — including Government funding that enables or accelerates exploration, the construction of gas pipelines and power stations, new coal mines, and the diesel fuel tax credits scheme — must also be urgently phased out. These funds should instead be redirected to initiatives that support Australia's national climate targets and help communities prepare for increasingly severe climate-fuelled disasters.

Australians need more support to adapt to and prepare for back to back disasters

While we cut climate pollution, we must help communities across the nation - particularly those hardest hit by climate change - to adapt to and prepare for future climate fuelled disasters. The return on early action is \$1 spent in adaptation has a \$3 to \$20 benefit post-climate disaster (The Actuaries Institute 2025). Federal, state and territory governments must continue to scale up efforts to protect people and communities, to make them more resilient, and able to recover quickly after multiple impacts.

Lock in regular climate risk updates

The National Climate Risk Assessment was an important first step in recognising the scale of future climate impacts and the Australian Government's role in preparing communities for them, and the National Adaptation Plan now needs to be revised on the basis of the assessment. They cannot be one-off exercises. Communities facing

back-to-back disasters need access to reliable, up-to-date scientific risk information — and all tiers of governments need current data to plan effectively (CCA 2025). Australia needs a clearly stated, funded plan to adapt to what is coming our way, rather than the current adaptation framework that lacks detail.

The federal government should legislate mandatory five-year updates to both the National Climate Risk Assessment and the Adaptation Plan with mid-point updates on progress. This will ensure national disaster preparedness keeps pace with escalating climate risks and is grounded in the best available science.

Greater investment in household resilience nationwide

More than half (55%) of Australia's housing stock was built before modern building standards were introduced, including homes in some of our most disaster prone regions (Parida et al. 2025).

The 2025/26 bushfire season underscored this reality. A pilot assessment by the Resilient Building Council and Castlemaine Institute (CI) of 140 households in Victoria's Mount Alexander Shire found every home faced some level of bushfire risk — and 90% received a 1-Star Bushfire Resilience Rating - a very poor level of bushfire resilience (RBC and CI 2025).

Plans to expand the project across Central Victoria to assess up to 70,000 homes and support householders to make their homes more energy and disaster resilient are a great step toward

limiting the impact of future fires. Similarly the initial investment the Australian Government made in The Resilient Building Council's Bushfire Resilience Rating app has already helped homeowners identify improvements to their homes to better protect them from fire (RBC 2024). However, more investment in household resilience for homes facing significant bushfire risks is needed - as the recent Victorian bushfire season has shown.

Both the New South Wales and Queensland governments have state-based household resilience programs that are co-funded by the Australian government specifically targeting areas at high risk of floods and tropical cyclones ([NSW Reconstruction Authority 2025](#), [Queensland Government 2024](#)). These should be built upon to develop a national household resilience program spanning all hazards co-funded and coordinated with state and territory governments. This could include:

- › A strong focus on households at greatest risk of climate impacts and vulnerability to them
- › More accessible and user friendly climate risk information made available for households and prospective home buyers to understand the impacts of climate change on their properties and actions to improve resilience
- › Embedding climate risk into planning and zoning reforms to prevent development in locations at high-risk of disaster

- › Funding for at-risk households to improve resilience through retrofits, and where the risks are too great, property buy-backs ([ELCA and Climate Council 2024](#), [Productivity Commission 2025](#)).

Plan for relocation where severe risks are unavoidable

The National Climate Risk Assessment makes clear that some rural, remote and coastal communities may become effectively uninhabitable due to extreme heat, worsening fires, floods and sea-level rise ([Australian Climate Service 2025](#)). Repeated disasters combined with declining essential services may push some communities beyond what adaptation can achieve ([Australian Climate Service 2025](#)).

In these cases, planned relocation will be the safest and most responsible option.

The National Adaptation Plan acknowledges this need. It lists as a future priority that "strategies will be needed to manage displacement and relocation of people" and a "specific policy need around the relocation of whole communities" due to climate impacts (DCCEEW 2025). The federal government must commit to this by developing a national policy framework for managed relocation, working in partnership with states and territory governments and affected communities.

Boosting fire and emergency management services capability

Since 2019, concurrent, consecutive and compounding disasters have left communities reeling - and throughout it all state and territory fire and emergency services have responded to each disaster and supported recovery efforts.

More frequent and severe disasters are stretching the capacity of our first responders. During heatwave events, demand for health services - ambulance call outs, visits to GPs and emergency rooms spike. The 2019/20 Black Summer bushfires saw many firefighting personnel engaged for longer periods - in some cases leading to exhaustion and a significant mental health toll, not to mention the impact on earnings of volunteers sometimes fighting fires for weeks and months. Worse can be expected in future. More frequent disasters combined with growing numbers of people living in high-risk places will continue to increase demand for emergency services support.

While federal, state and territory governments have boosted investment in fire and emergency services - including expanding aerial firefighting capability - the rising toll of more frequent disasters means that more investment is needed. Australian federal, state and territory governments must invest heavily in disaster risk reduction and community resilience, including hazard reduction, local disaster planning, education, evacuation centres, building and planning standards, while ensuring that emergency services are properly resourced.

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Image 1: AAP Image/Michael Currie, 'Destroyed historic Ruffy church and home'

Image 2: Holly Brodie, 'Children wander through flooded Winton streets'

Image 3: SA Country Fire Service, 'Helicopter flies over Deep Creek National Park fire'

Image 4: CFA, 'Longwood fire smoke covers the sky'

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Image 6: Ingrid Hendriksen, 'Boats at Airlie Beach takes damage from ex-Tropical Cyclone Koji in January 2026'

Image 7: AAP Image/Michael Currie, 'Cars destroyed and abandoned at Cumberland River Caravan park after flash flooding near Wye River'

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Image 14: iStock/Chris Gordon, 'Late afternoon sun on reflection lake and red dirt'

Image 15: SA Country Fire Service, 'Aerial view of Deep Creek National Park fire'

Image 16: AAP/James Ross, 'Local resident Daryl Otzen at his burnt out property that was destroyed in the Longwood fire in Ruffy'

Image 17: CFA, '2026 Summer fires, Lismore fire'

Image 18: Ingrid Hendriksen, 'A man wades through flooded streets in Airlie Beach during ex-Tropical Cyclone Koji'

Image 19: Teagan Peacock, 'Floods in Winton Queensland in January 2026'

Image 20: AAP Image/Michael Currie, 'A man shades himself from the heat with a fan in Melbourne, Tuesday, January 27, 2026'

Image 21: Unsplash/Grace Koo, 'Heavy storms cause Brisbane River to overflow which flooded nearby suburbs including Brisbane City, West End, Toowong and St Lucia on 28 February 2022'

Image 22: AAP Image/Michael Currie, 'People recover camping gear from the shoreline after flash flooding near the Wye River, Victoria, January 16, 2026'

Image 23: Alex Zucco, 'Firefighter at the Longwood fire in Victoria, January 2026'

Image 24: iStock/theartofocan, 'Top-down aerial drone view of burnt remain after a bushfire passes through an Australian regional town'

Image 25: iStock/EyeEm Mobile GmbH, 'Rear view of kids on beach walking towards sunrise'

Appendix

Serious fire seasons and bad fire weather days more frequent

For the purposes of this report, “serious fire season” is defined as one where there are multiple large, out of control bush or grass fires over a period of weeks and months that result in Watch and Act and Emergency Warning alerts, and / or significant loss of life and / or property. Using this definition, Victoria, Western Australia, South Australia, NSW and Tasmania all experienced a serious fire season in summer 2025/26.

Together with an increase in the length of fire seasons, an increase in the frequency / return period of the worst fire weather has been linked to climate change (Abram et al, 2021). As noted in Section 3, over more than a century ago Victoria’s most destructive fire seasons happened roughly 40 years apart. Since 1983 major property losses have occurred in 2009, 2019/2020, and 2026.

The NSW Blue Mountains is a particularly fire-prone environment and throughout the 20th century fire weather conditions that resulted in the largest, most damaging fires, happened about once every decade. Major fires resulting in significant property loss or large areas burned impacted the Blue Mountains in 1936, 1944, 1957, 1968, 1977 and 1994. The frequency of serious seasons since then has about doubled, with major fires in 2001/02, 2006, 2013, and 2019/20, with significant

implications for communities, government, and the fire and emergency services (Mullins, 2021). It also raises ecological concerns as explained by the NSW Bushfire Research Hub to the NSW Bushfire Inquiry, with the landscape having adapted over millennia to certain “fire regimes” including timing, frequency and intensity of burning (Owens & O’Kane, 2020).

Together with the increase in frequency of serious fire seasons, the average number of days each year where the Fire Behaviour Index (FBI) is High, Extreme or Catastrophic (formerly Fire Danger Index (FDI) of Very High, Severe, Extreme and Catastrophic) has markedly increased (Binskin et al, 2020).

A hotter world means increasing community impacts

Following the deadly fires in Victoria on Black Saturday 2009, the resulting Royal Commission criticised fire services for not providing earlier warning to communities (Teague et al, 2010). However on a day of temperatures approaching 50°C, storm force winds, and pyroconvective storms, it was almost impossible to get a grip on the rapidly evolving situation where spot fires were igniting tens of kilometres downwind and lightning from pyroconvective storms probably started dozens of new fires even further away.

The subsequent Black Summer fires in 2019/20 that saw more than 3,100 homes and around 6,000 other buildings destroyed reinforced that on the worst days now, the most prudent thing that authorities can do is call for mass evacuations the day before catastrophic fire weather arrives. The new category of Catastrophic was introduced following Black Saturday and signalled acknowledgement by fire services of worsening climate-driven fire conditions.

On New Year’s Eve 2019, when about 1,000 buildings were destroyed in southeastern NSW and eastern Victoria, there were relatively few deaths. Some attribute this to the early decision by the NSW Premier to order a mass evacuation from holiday towns the day before the firestorm (Mullins, 2021). People trapped by fires in Mallacoota, Victoria, had to be evacuated by the Royal Australian Navy.

On days of Catastrophic fire weather fires move faster, burn more intensely, generate spot fires many kilometres downwind, can generate fire storms and tornadoes, and can cause firefighting aircraft to be grounded. Climate change has transformed firefighters’ already difficult, dangerous jobs into something frightening and sometimes deadly.

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