



Australian Government
National Emergency Management Agency

Australian Institute for
Disaster Resilience



2023-24

Major Incidents Report

An overview of major incidents that have involved the fire and emergency services sector from July 2023 to June 2024.

The Australian Institute for Disaster Resilience (AIDR) is the National Institute for disaster risk reduction and resilience. We collaborate across sectors to strengthen the resilience of Australian communities to disasters.

AIDR creates, grows, and supports a range of networks; provides opportunities for learning, development, and innovation; shares knowledge and resources to enable informed decision making and action; and facilitates thought leadership through national conversations.

AIDR is a consortium managed by AFAC and supported by its partners: the Australian Government National Emergency Management Agency (NEMA) and Australian Red Cross.

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Cover image: Barkly Fire Complex, Northern Territory.
Image: NSW RFS

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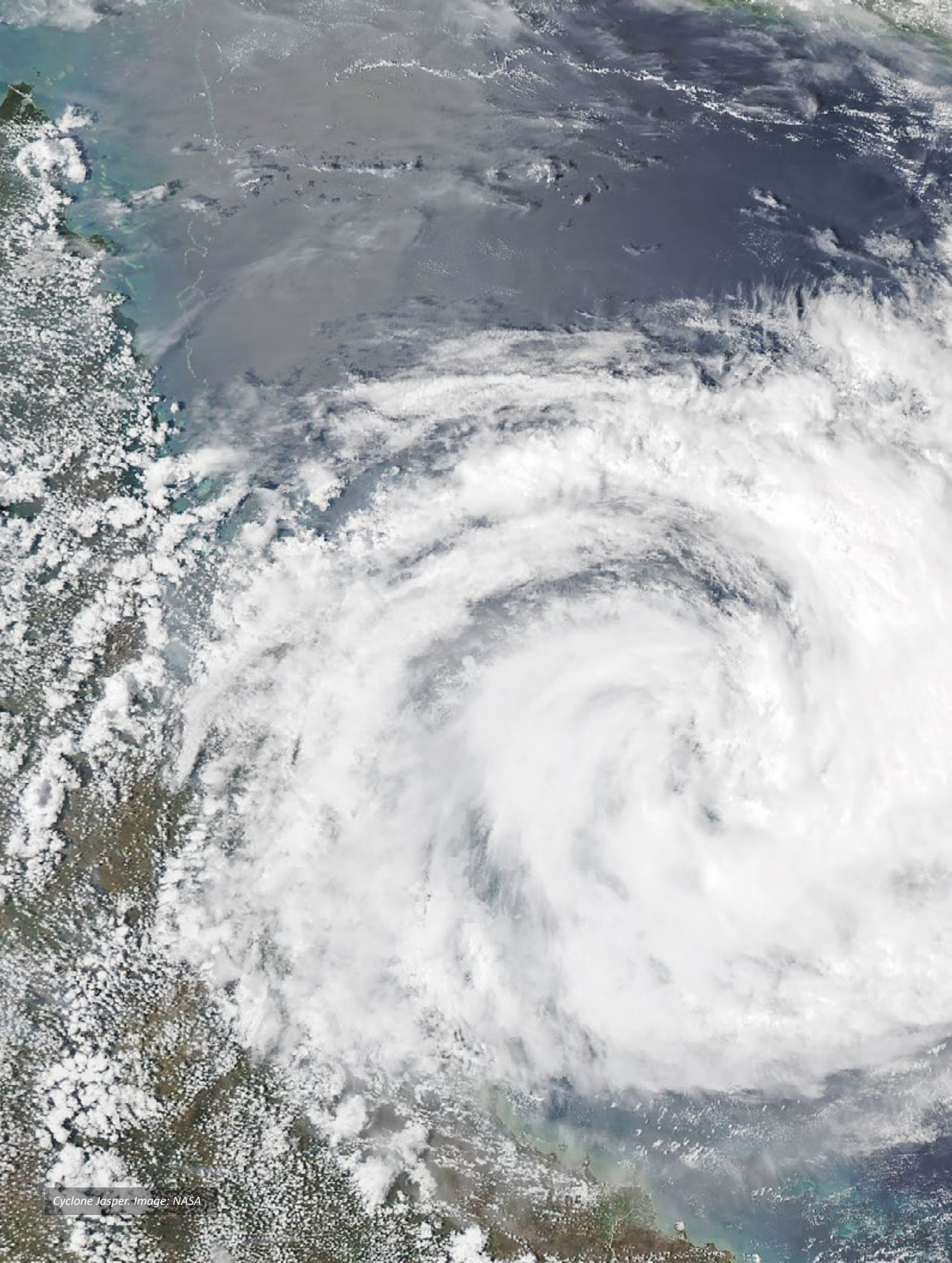
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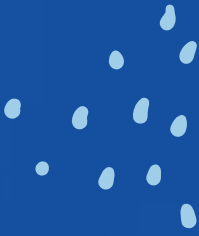
*The Australian Institute for Disaster Resilience
acknowledges the Traditional Owners of Country
throughout Australia and recognises their continuing
connection to land, waters, and culture.
We pay our respects to Elders past and present.*

Aboriginal and Torres Strait Islander people are advised that this report
may contain images of people who may have since passed away.





Cyclone Jasper. Image: NASA



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Executive summary

This eighth Major Incidents Report provides an annual record of major incidents that have been identified as significant by the emergency management sector during the 2023–24 financial year. This report identifies 30 major incidents, with 5 case studies selected for in-depth discussion.

Context

The period July 2023 to June 2024 was a year of weather records, extremes and contrasts. Temperatures in Australia were above average for most of the country except for parts of the Northern Territory, and warmest on record for much of Western Australia and coastal New South Wales. The national mean temperature was 1.31°C above the 1961–1990 average, the second-warmest July to June period on record since 1910–11, whilst the July to December 2023 period was the warmest on record, at 1.69°C above average.

Rainfall in Australia for July 2023 to June 2024 was above average to very much above average for most of northern Australia and inland areas of New South Wales (highest 10% of all years since 1900–01). Rainfall was very much below average (lowest 10% of all years since 1900–01) for much of the western half of Western Australia, agricultural areas of South Australia,

much of Victoria, and Tasmania. August to October 2023 was Australia's driest 3-month period on record for all months since 1900, with September the second-driest month on record (for all months since 1900). January 2024 was Australia's ninth-wettest January on record, and March 2024 the third-wettest March on record.

National overview

In addition to the large bushfire events in northern and central Australia, Western Australia and Queensland heatwaves, and intense storm events across the nation, Australia faced several technological crises. These included a cyber-attack on the national ports system and failure of supply of a national communications supplier. Health and biosecurity challenges declined in the 2023–24 period, though there was an increase in heatwaves particularly in the west. The Communicable Disease Incidents of National Significance (CDINS) activation for COVID-19 was stood down in October 2023.

This report identifies 30 major incidents for 2023–24. Of these, 8 were bushfires in 6 jurisdictions. The 5 storm and 4 cyclone major incidents were often associated with flash floods, floods, landslide or power and communication outages. Other notable challenges included extensive heat waves in Western Australia,

	Bushfire	Flood	Storm	Cyclone	Geological	Health	Technological	Structure fire	Conflict	Transport
International	1			1	1				1	
National						1	2			
Australian Capital Territory										
New South Wales	2	2	1					1		
Northern Territory	1	1		1						
Queensland	1		1	2						
South Australia										1
Tasmania	1									
Victoria	2		3							
Western Australia	1	1				1				
Total	9	4	5	4	1	2	2	1	1	1

Table 1 Major incidents included in the 2023/24 Major Incidents Report by state and hazard

Australia's first structure fire fatalities from a lithium-ion battery fire, technology failures, repatriations from a conflict zone and the challenge of a complex and remote transport incident involving hazardous materials.

The AFAC National Resource Sharing Centre (NRSC) was active for 5 bushfire, 2 storm, 1 flood events and supported the extensive 119-day Canadian wildfire deployment of 746 Australian and New Zealand personnel. In addition, Australian Defence Force (ADF) resources responded with general and specialist capabilities during 3 cyclone events and the Barkly Fire Complex in northern Australia.

Internationally, Australia provided support to cyclone-impacted Vanuatu, the Papua New Guinea Enga Province landslide incident, and continued with extended wildfire support to Canada. Australia activated AUSRECEPLAN in response to the Hamas-Israel conflict, to aid with domestic reception of Australians and approved foreign nationals arriving in Australia on Australian Government assisted flights.

Joint state/territory and Australian Government funded Disaster Recovery Funding Arrangements (DRFA) recovery assistance was activated in response to 71 events across Australia in 2023-24. This is an increase from 38 in 2022-23. Funding was made available to 207 of Australia's 539 local government areas. Of the 71 events, 5 were activated for extraordinary assistance (Category C and D) under the DRFA, demonstrating the severity of these events. A total of \$269.81 million has been committed in extraordinary assistance for these events, in addition to significant support provided under Categories A and B of the DRFA. The Australian Government also provided over \$80 million directly to disaster affected individuals and families through the Australian Government Disaster Recovery Payment (AGDRP) and Disaster Recovery Allowance (DRA).

Case studies

South West Region bushfires (Queensland)

The bushfire season was active in Queensland from July to November 2023, with significant early season fires in the Western Downs and South East Queensland following a significant build-up of fuel during the preceding years of wet conditions during 2020-23. Other areas of the state were slower to transition from these wet conditions, however, by October 2023, fires were experienced across the state with significant fire activity experienced in all areas. During this time, approximately 1,700 bushfire warnings were issued throughout Queensland. This case study looks at the cumulative effect of consecutive intense bushfire seasons in the South West Region and the lessons learned over the 2022-23 and 2023-24 bushfire seasons.

Barkly Fire Complex (Northern Territory)

Northern Australia, including the Northern Territory, experienced one of its biggest known bushfire seasons with more than 84 million hectares burnt.¹ The fires were exacerbated by a grass fuel load generated by recent wet seasons. During 2023, over 42 million hectares were burnt in the Northern Territory. The scale and continuity of these fire events placed great stress on the Northern Territory bushfire

management system which had them draw on the resources of the entire Northern Territory Government, land managers, pastoralists, community volunteers, Bushfires NT volunteers, the Department of Defence, Northern Territory Police Force and strike teams from South Australia and New South Wales. The case study of the 2.8 million hectare Barkly Fire Complex, that burned from 29 August to 18 October 2023, explores how remoteness, size of the active fire, weather, fuel loads and fuel type, lack of mitigation, lack of available support, logistics, fatigue management, communication challenges with the fire ground, and other fires of significance across the Northern Territory impacted the fire response.

South East Queensland severe storms, rainfall and heatwave (Queensland)

This case study explores the storms, flood and heatwave that struck South East Queensland over the Christmas and New Year period of December 2023. Daily intense storms hit 8 separate local governments across South East Queensland, with destructive winds, intense heat and humidity, a tornado and flooding. Tragically 7 people lost their lives, communities were isolated, power and communications were disrupted, and homes and property damaged.

Heatwave (Western Australia)

During the 2023-24 summer season, the State Hazard Plan for Heatwave was activated on 3 occasions. A further 7 significant heat events triggered public messaging from the Western Australia Department of Health, as Hazard Management Agency, to mitigate heat-related health risks. The 10 events that occurred from mid-November 2023 to mid-February 2024 impacted a large geographical area of Western Australia and a significant proportion of the state's population. On one occasion, an estimated 70 per cent (1.8 million people) of the population was affected while on another occasion, the event occurred concurrent with major power outages across the Goldfields and Wheatbelt regions.

Catastrophic Fire Danger and subsequent impacts (Victoria)

On 13 February 2024, Victoria experienced a combination of concurrent emergencies, with significant fires, severe thunderstorms and damaging winds resulting in major impacts across Victoria. Significant disruption occurred to water services, telecommunications and the electricity transmission and distribution network. Following the event, a comprehensive relief and recovery program was launched with over \$168 million in funding, providing immediate relief, temporary housing, and clean-up assistance to impacted communities. This event highlighted the importance of comprehensive and effective coordination when managing multiple complex emergency events, with lessons management activities contributing to ongoing continuous improvement for the emergency management sector, through identifying good practices to sustain and opportunities for improvement.

1. <https://theconversation.com/vastly-bigger-than-the-black-summer-84-million-hectares-of-northern-australia-burned-in-2023-227996>

Acronyms

ABC	Australian Broadcasting Corporation
ADF	Australian Defence Force
AGDRP	Australian Government Disaster Recovery Payment
AIDR	Australian Institute for Disaster Resilience
AUSASSISTPLAN	Australian Government Overseas Assistance Plan
AUSRECPLAN	Australian Government Plan for the Reception of Australian Citizens and Approved Foreign Nationals Evacuated from Overseas
CDINS	Communicable Disease Incidents of National Significance plan
CFA	Country Fire Authority
COMDISPLAN	Australian Government Disaster Response Plan
COVID-19	Coronavirus Disease
DART	Disaster Assistance Response Team
DFAT	Australian Government Department of Foreign Affairs and Trade
DFES	Department of Fire and Emergency Services
DRFA	Disaster Recovery Funding Arrangements
ENSO	El Niño–Southern Oscillation
FFMV	Forest Fire Management Victoria
FRANZ	France Australia New Zealand
IMT	Incident Management Team
IOD	Indian Ocean Dipole

LAT	Large Air Tanker
LGA	Local Government Area
NAFC	National Aerial Firefighting Centre
NCM	National Coordination Mechanism
NEMA	National Emergency Management Agency
NLAT	National Large Air Tanker
NRSC	National Resource Sharing Centre
NSR	National Situation Room
NSW RFS	New South Wales Rural Fire Service
NTFRS	Northern Territory Fire and Rescue Services
RAAF	Royal Australian Air Force
RFA	Request For Assistance
RFR	Register.Find.Reunite
SAM	Southern Annular Mode
SCC	State Control Centre
SEAT	Single Engine Air Tanker
SOI	Southern Oscillation Index
TC	Tropical Cyclone
NSW SES	New South Wales State Emergency Service
VIC SES	Victoria State Emergency Service

Foreword

The Major Incidents Report provides an annual record of those incidents that the emergency management sector views as significant from a national perspective. This edition, the eighth Major Incidents Report, has been commissioned by the National Emergency Management Agency (NEMA) and published by the Australian Institute for Disaster Resilience (AIDR).

The 30 incidents included in this report, and the 5 case studies in particular, bring into focus the increase in consecutive, concurrent and compounding disasters and the resulting complexity for emergency response.

The uncharacteristic weather patterns and the impacts of supply chain and critical infrastructure disruption that emerged in this year's report demonstrate the importance of the continued investment being made in exercising, lessons management and capability development. This commitment to improvement, along with the maturity of forums like the National Coordination Mechanism, are vital to meeting future challenges.

On behalf of the Australian Government, NEMA has continued to invest significantly in developing additional capacity and capabilities to support collective emergency management efforts, such as the national emergency management stockpile. Initiatives like this will augment the emergency management system, safeguarding it into the future.

I would like to recognise that these incidents can have direct and long-term impact on individuals, communities and society. I acknowledge those who have lost loved ones, homes, businesses and

livelihoods in disasters across Australia and overseas.

My sincere thanks to our emergency workers, front line service providers, volunteers, and community members; your service is unparalleled, and our support to you and all those impacted by disaster must be as well.

I would also like to acknowledge the continuing contribution of AIDR, in the development of this report on behalf of NEMA, and the input of steering committee members jurisdiction emergency management organisations and the Australian Government. Your efforts add to our collective ability to improve across the emergency management continuum.

Joe Buffone PSM

Deputy Coordinator-General,
Emergency Management and Response Group,
National Emergency Management Agency



1. Introduction

Across Australia, people, the economy, societal function, essential services and the environment are affected by significant incidents that disrupt how people go about their lives. Disasters can be complex in nature, cascade from one to the next, compound on top of each other and run consecutively, leaving little time for communities or those that support them to recover. These events run across yearly boundaries. The recovery time frames for many events should be measured in years to decades.²

Disasters are systemic in nature. Communities and systems of society experience disaster scenarios under the influence of climate change, international political tensions and malicious and deliberate threats on technological systems. As these systems of society rapidly evolve, they in themselves create new risks and challenges.

This year's report compiles 30 incidents across Australia during the 2023–24 financial year. These were selected by a steering committee of state and territory emergency services organisations, the National Emergency Management Agency, and the Bureau of Meteorology (the Bureau). The criteria used to select the incidents include significance at a state or territory

or national level, the level of damage or disruption caused, community sentiment and interest, and uniqueness.

These incidents across Australia were characterised by, among other things, their complexity, the uncharacteristic weather patterns that disrupted disaster 'seasons', and the rise of technology-based incidents. Complex incidents combining storms, fires, heatwaves and power outages were experienced in southwest Western Australia, South East Queensland and Victoria. Extended fire seasons saw overlaps between the Top End and central Australian fire seasons, major fires in Tasmania in September, and extensive and large fire events across central and northern Australia as fuel growth responded to wetter than normal conditions, cyclone and flood events from previous years. Summer flooding on the Nullarbor Plain cut the essential east-west supply chain of the Trans-Australian Railway for 3 weeks.

2023–24 saw mass outage of communication networks disrupting business, society and emergency services, a cyber-attack on the national ports system and the first fatalities from a structure fire initiated by a lithium-ion battery runaway fire.

2. Gibbs L, Molyneux R, Harms L, Gallagher H C, Block K, Richardson J, Brandenburg V, O'Donnell M, Kellett C, Quinn P, Kosta L, Brady K, Ireton G, MacDougall C, Bryant R. 10 Years Beyond Bushfires Report 2020. University of Melbourne, Melbourne, Australia



Darling St, Balmain - Ashfield-Leichhardt Unit. Image: NSW SES

At an international level, 2023–24 saw the continuation of Australian and New Zealand firefighting support to Canada, a Disaster Assistance Response Team (DART) deployment to the Papua New Guinea landslide, support to the Government of Vanuatu's response to Severe Tropical Cyclone Lola, and emergency evacuation and repatriation as a result of the Hamas-Israel conflict.

Disasters and disruptions provide an opportunity to learn. Lessons management has become a central part of how the system can learn from disasters.³ Learning lessons contributes to Priority 1 of the *National Disaster Risk Reduction Framework*, 'Understanding Risk', and to the specific outcome of 'An effective and connected disaster risk reduction knowledge system that provides a solid foundation for action' in the Second National Action Plan. This report selects 5 case studies for in-depth discussion. Distilling the causes and sharing experiences of what contributed to each disaster, providing evidence, or unpacking what happened, all provide important opportunities to learn so that measures can be taken to reduce the consequences of future incidents.⁴

Common themes emerged:

- increasing energy in storm events, and extremes in temperature and rainfall
- interaction between trans-seasonal rainfall, vegetation growth and fire scale in semi-arid environments
- disruption to traditional weather-driven hazard seasons that saw an extension to bushfire seasons in southwestern Western Australia, central Australia, western Queensland and Tasmania, and summer flooding of the Nullarbor Plain

- vulnerability of lifelines to disruption, and the risk posed to interconnected critical infrastructure systems
- value of interstate support of specialised resources
- increase in complex, including remote, incidents bringing increasing challenges for response and relief activities.

This year's major incidents highlighted the consequences of vulnerable and exposed essential infrastructure, particularly in remote and outback Australia, the challenge of sustaining response activities in remote locations, the coordination and collaboration required to respond to complex, cascading and concurrent incidents, and the continuous activity undertaken by jurisdictions.

The report describes incidents that are, by their nature, stressful and potentially traumatic. Descriptions and images may trigger stress reactions for those that have lived through the events, as well as those that have helped respond to and recover from these events. We recommend that readers be aware of this and use strategies that work for them to help manage any distress that may arise. There is a range of help available, including resources available on Australian Red Cross' website.⁵

The report is the result of multi-agency, nationwide collaboration and AIDR would like to sincerely thank those who provided and reviewed written and visual content.

3. Australian Institute for Disaster Resilience (2019) *Lessons Management*.

4. National Resilience Taskforce (2019) *Profiling Australia's Vulnerability: The interconnected causes and cascading effects of systemic disaster risk*.

5. www.redcross.org.au/emergencies



Barkly Fire Complex. Image: NSW RFS

2. Timeline of major incidents 2023–24

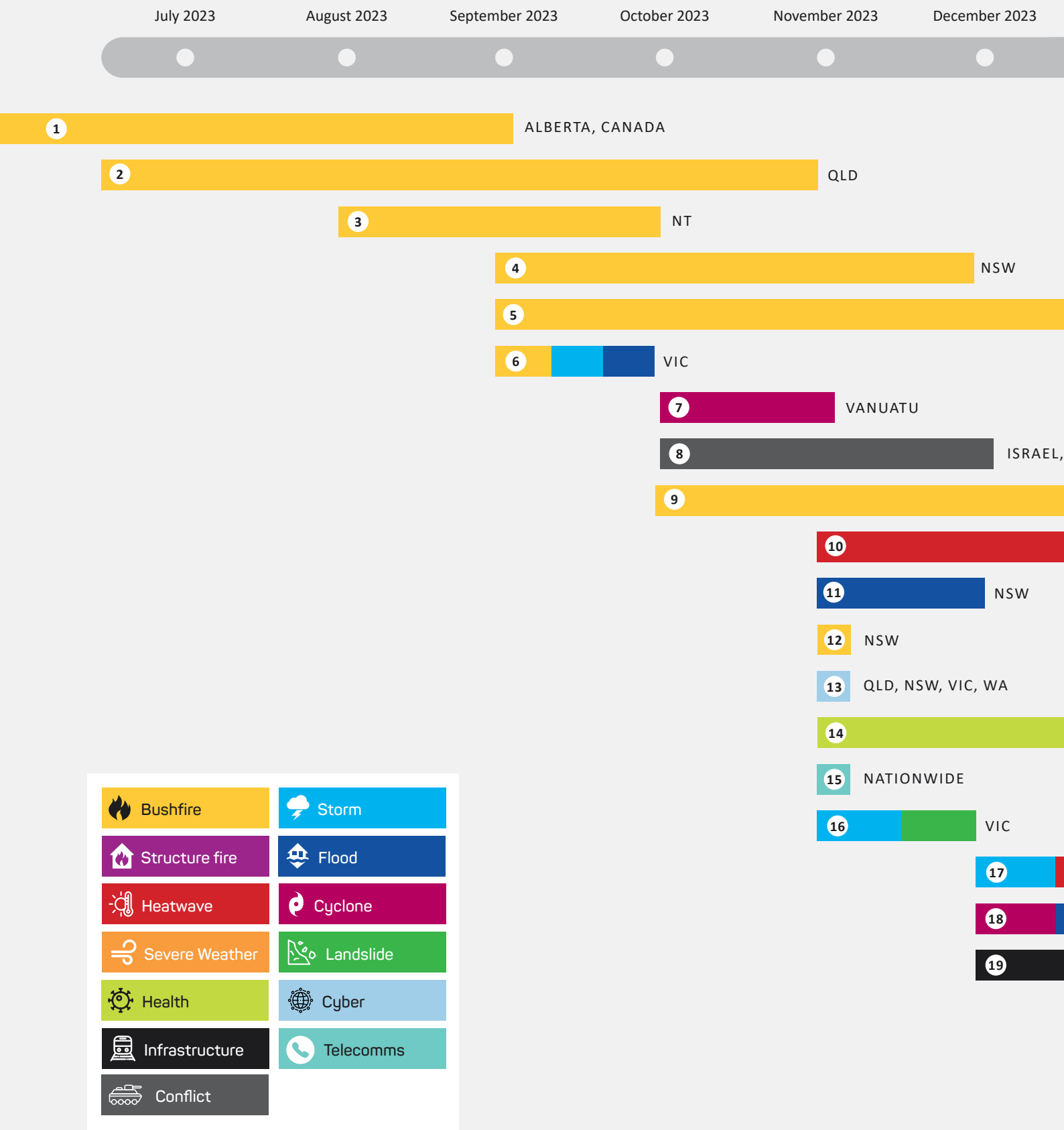


Figure 1: Timeline of major incidents 2023–24. A summary of all 32 major incidents 2023–24 is on page 19.
*Positioning of numbers is approximate

January 2024

February 2024

March 2024

April 2024

May 2024

June 2024



TAS

OCCUPIED PALESTINIAN TERRITORIES



WA



WA



NATIONWIDE



NSW



NSW



QLD



NT



QLD



SA



NSW



NT



PAPUA NEW GUINEA



VIC



WA



VIC



VIC

3. Climate and weather overview

3.1 Climate drivers

3.1.1 Summary

Temperatures in Australia for July 2023 to June 2024 were above average for most of the country except for parts of the Northern Territory, and warmest on record for much of Western Australia and coastal New South Wales (Figure 2).

Mean temperature distribution

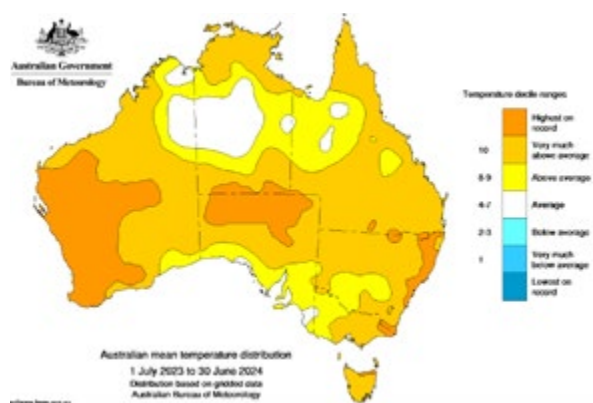


Figure 2. For July 2023 to June 2024, the Australian mean temperature distribution relative to all years since 1910.

Image: Bureau of Meteorology

The national mean temperature from July 2023 to June 2024 was 1.31°C above the 1961–1990 average, the second-warmest July to June period on record since 1910–11.

July to December 2023 was the warmest such period on record, at 1.69°C above average.

Rainfall in Australia for July 2023 to June 2024 was above average to very much above average (highest 10 per cent of all years since 1900–01) for most of northern Australia and inland areas of New South Wales (Figure 3).

Rainfall was very much below average (lowest 10 per cent of all years since 1900–01) for much of the western half of Western Australia, agricultural areas of South Australia, much of Victoria, and Tasmania.

August to October 2023 was Australia's driest 3-month period on record for all months since 1900, with September the second-driest month on record (for all months since 1900).

January 2024 was Australia's ninth-wettest January on record, and March 2024 the third-wettest March on record.

Total rainfall distribution

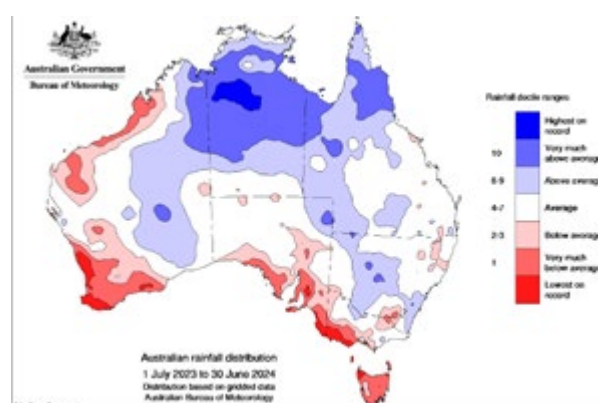


Figure 3. Total rainfall distribution relative to all years since 1900.

Image: Bureau of Meteorology

3.1.2 Climate conditions⁶

Underlying Australia's climate from July 2023 to June 2024 were record-warm global sea surface temperatures (SSTs) (Figure 4). For the Australian region overall, SSTs for July 2023 to June 2024 were the warmest on record for all years since 1900–01, 0.73°C above the 1961–1990 average (Figure 4).

An El Niño phase of the El Niño–Southern Oscillation (ENSO) developed in the tropical Pacific over winter and early spring 2023. El Niño was considered to be active from September 2023.

At the same time, a positive Indian Ocean Dipole (IOD) was developing. The positive IOD became active in late August 2023, and reached its peak strength, based on SSTs, in early October. Its peak strength was the second strongest on record, after 2019.

El Niño continued to strengthen in the ocean until November and December 2023, but atmospheric indicators remained relatively weak throughout the event. The positive IOD slowly weakened over this period.

In December 2023 and January 2024, the Southern Annular Mode (SAM) was active over Australia's southern regions. A relatively large and long-lasting Antarctic ozone hole in 2023 supported a strong polar vortex, which in turn supported a positive phase of SAM, with a poleward shift of mid-latitude westerlies.

The positive IOD was relatively long-lived and ended in late January 2024. At this time there was an active phase of the Madden-Julian Oscillation (MJO) in the Australian tropical region. This coincided with the onset of the monsoon over northern Australia.

6. Further information: Australia's climate drivers can be found at the Bureau of Meteorology's Climate Watch www.bom.gov.au/climate/enso

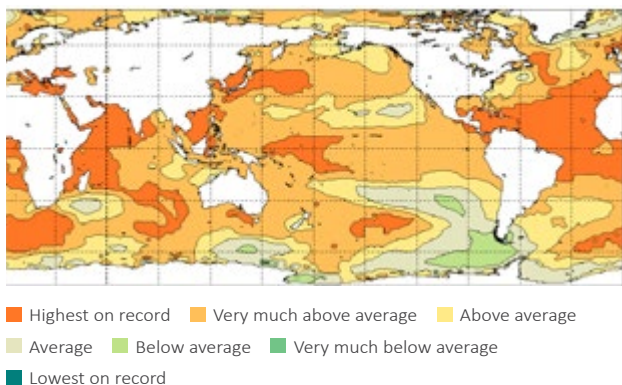


Figure 4. Global SST distribution for July 2023 to June 2024 relative to all year since 1900–01.

Images: Bureau of Meteorology

ENSO became inactive (returned to neutral) in the tropical Pacific Ocean in March 2024, although its atmospheric indicators had been neutral since December 2023. March and April 2024 saw further MJO activity in the Australian tropical region, with periods of monsoon bursts and tropical cyclone development.

There were some signs of a positive IOD developing in March and April 2024, but these returned to neutral (inactive) by early May 2024. The SAM was in a positive phase at times during the April to June 2024 period.

3.1.3 Global warming impacts

Australia's climate is increasingly affected by global warming. State of the Climate 2022⁷ has documented the following impacts:

- Australia's climate has warmed by an average of $1.50 \pm 0.23^\circ\text{C}$ between 1910 and 2023.
- SSTs in the Australian region have warmed by an average of 1.05°C since 1900.
- There has been an increase in extreme fire weather, and a longer fire season, across large parts of the country since the 1950s.

September 2023 mean horizontal wind speed

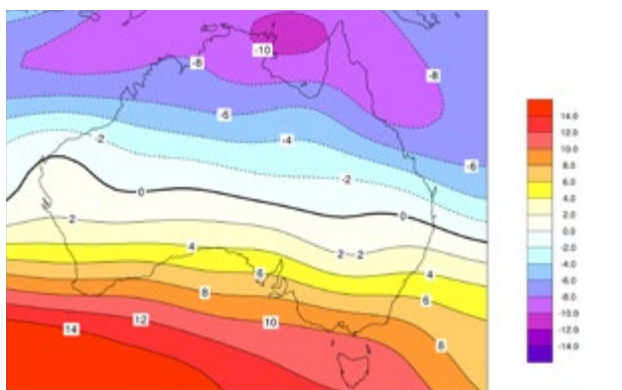


Figure 5. Horizontal wind speed at about 1.5 km above sea level for the September 2023 monthly mean.

Image: Bureau of Meteorology

- Heavy rainfall events are becoming more intense, as a warmer atmosphere can hold more water vapour than a cooler atmosphere.
- Increased atmospheric moisture can also provide more energy for some processes that generate extreme rainfall events, such as severe storms and tropical cyclones.
- There has been a decline of around 15 per cent in April to October rainfall in the southwest of Australia since 1970, and around 10 per cent in the southeast since the late 1990s.
- The declining trend in southwestern and southeastern Australian April to October rainfall is associated with a trend towards higher surface atmospheric pressure in the region and a shift in large-scale weather patterns, more highs, fewer lows and a reduction in the number of cold fronts that produce rainfall.

3.2 High impact weather events

Fire weather in northern Australia

During September and October 2023, conditions across northern and eastern Australia were generally dry and warm. Easterly winds were stronger than average across northern Australia, particularly during September. Figures 5 and 6 demonstrate negative horizontal wind anomalies over northern Australia indicating that the easterly winds were stronger than usual in September. These winds strongly influenced fire behaviour on the Barkly Fire Complex, explored in Case Study 2.

There was hot and dry weather across Queensland in the last week of October. Maximum temperatures in the south of the state were more than 8°C above the 1961–1990 October monthly average for several days, reaching more than 10°C above average on 25 and 31 October in some areas. The fire danger rating reached Extreme on 31 October in southeast Queensland and northeast New South Wales. For October overall, fire weather conditions, measured as Forest Fire Danger Index (FFDI) were very much above average (highest 10 per cent of all Octobers since 1950) for much of Queensland, reaching highest on record for parts of the Wide Bay and Burnett and the Central West of the state. Figure 7 demonstrates

7. www.bom.gov.au/state-of-the-climate/

September 2023 anomaly horizontal wind speed

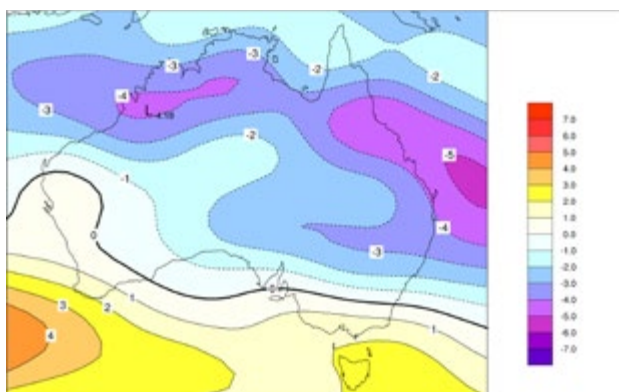


Figure 6. Horizontal wind speed at about 1.5 km above sea level for the September 2023 anomaly relative to the 1981–2010 average.

Image: Bureau of Meteorology

the accumulated daily FFDI distribution for October 2023 in Queensland relative to all Octobers since 1950. FFDI allows for comparison of fire weather conditions against historical data. The impacts of these weather conditions are explored Case Study 1.

Heatwaves and fire weather in south-west Western Australia

November 2023 saw persistent high pressure systems in the Australian Bight, consistent with the development of a positive SAM phase. This combined with a near stationary low pressure off the Western Australia coast to direct heat from the interior of the continent over southwest Western Australia (Figure 7). Within Figure 8, the red "L" and "H" respectively denote the centre of the low pressure trough off the west coast of Western Australia and a large high pressure system to the south. Together, these directed hot air from the interior of the continent over southwest Western Australia, indicated by the black arrows. More closely spaced contour lines on

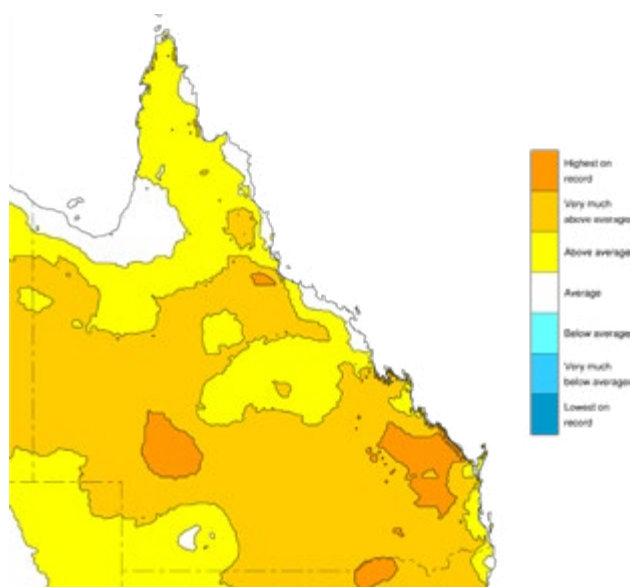


Figure 7. Accumulated daily Forest Fire Danger Index (FFDI) distribution for October 2023 for Queensland relative to all Octobers since 1950.

Image: Bureau of Meteorology

21 November indicate the presence of stronger winds, resulting in more intense heatwave and fire weather conditions.

The heat was unusually prolonged; Perth set a November record of 10 consecutive days with temperatures equal or above 30°C, with observations starting in 1897. Many other stations also set November records for consecutive days above a temperature threshold. On 21 and 22 November, the hot conditions combined with strong winds resulted in Extreme to Catastrophic fire danger ratings (Figure 9).

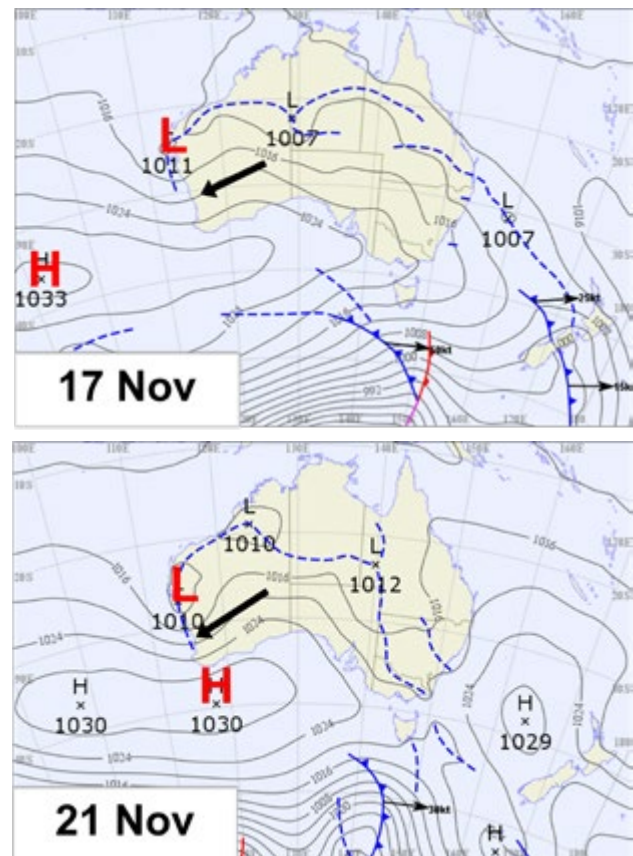


Figure 8. Bureau of Meteorology mean sea level pressure (MSLP) analyses for 0800 AWST 17 (top) and 21 November 2023 (bottom).

Image: Bureau of Meteorology



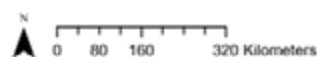
Figure 9. Map of highest Fire Danger Rating (FDR) from the Australian Fire Danger Rating System (AFDRS) models during November 2023.

Image: Bureau of Meteorology

FBI/FDR Nov 2023

■ Catastrophic ■ Extreme ■ High ■ Moderate
■ No Rating ■ Australia Land Boundary

The map shows the highest Fire Behaviour Index (FBI) or Fire Danger Rating (FDR) from the new AFDRS models during November 2023. The map further shows the weather stations in Western Australia and their FBI/FDR rating during the month of November.



Monsoon activity, Tropical Cyclones Lincoln and Megan

A tropical low that developed in the Gulf of Carpentaria on 14 February 2024 briefly reached tropical cyclone intensity and was named Tropical Cyclone Lincoln on 16 February. Tropical Cyclone Lincoln made landfall that afternoon in the remote Northern Territory between Port McArthur and the Queensland border, and rapidly weakened to a tropical low. Ex-Tropical Cyclone Lincoln tracked southwest across central Northern Territory and reached the Kimberley coast in Western Australia on 20 February. The system was associated with widespread heavy rainfall along its path (Figure 10), with daily rainfall totals of 50 to 100 mm, and locally up to 200 mm. The heavy rain fell on ground already saturated by monsoonal rain and ex-Tropical Cyclone Kiriya. See Incident Number 23 on page 27 for details on the impact.

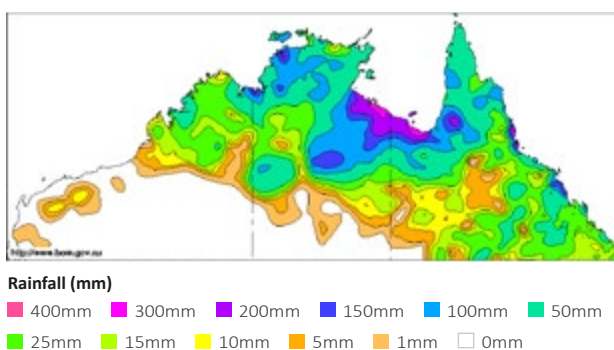


Figure 10. Total rainfall for the week ending 19 February 2024.

Image: Bureau of Meteorology

In the second week of March 2024, a near-stationary low pressure trough across central and eastern Western Australia interacted with tropical moisture that was advected from the Timor Sea, resulting in frequent showers, heavy rain and thunderstorms. Rainfall over the 4-day was 2 to 5 times the monthly average (20 to 30 mm). Eyre, on the Nullarbor, recorded 325.4 mm during this period, exceeding its annual average rainfall of 314.3 mm.

Severe Tropical Cyclone Megan formed as a tropical low near the Tiwi Islands on 13 March, and reached tropical cyclone intensity on 16 March in the Gulf of Carpentaria east of Groote Eylandt. Groote Eylandt Airport recorded 680.4 mm in 2 days, an annual record for the site.

Severe Tropical Cyclone Megan crossed the southwestern Gulf of Carpentaria coast, about 45 km southeast of Port McArthur, as a Category 3 cyclone on the afternoon of 18 March. Borroloola Airport and McArthur River Mine Airport had daily rainfall totals (to 9am on 19 March) of 256.6 mm and 274.4 mm respectively, their highest daily rainfall for any month. The McArthur River at Borroloola reached major flood levels, and on 22 March peaked at 14.98 metres, exceeding the previous record peak level of 14.96 metres in 2001. See Incident Number 28, on page 29 for further details on the impact.

Hot and dry across southern Australia

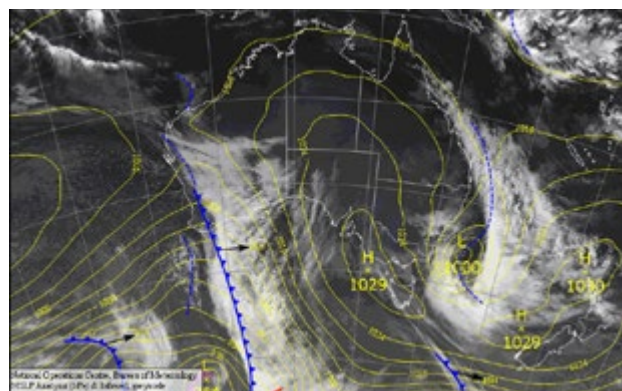
March to June 2024 was dominated by a succession of slow-moving high pressure systems in the Great Australian Bight, resulting in hot and dry conditions across southern Australia.

Between 8 and 11 March, a low to severe intensity heatwave was over the southeast, with heatwave and fire weather warnings issued by the Bureau. South Australia had its warmest March on record (since 1910), and for Victoria it was the seventh-driest March on record (since 1900). May saw southwest Western Australia have prolonged periods of warm weather, with synoptic patterns similar to November 2023 and February 2024, and many monthly temperature records were set for February to June 2024. Rainfall was very much below average (lowest 10 per cent of periods since 1900) for parts of southwest Western Australia and southern South Australia, and much of Tasmania, with some areas experiencing their lowest rainfall on record.

Successive low pressure systems off the east coast

For eastern Australia, especially coastal New South Wales, slow moving, high pressure systems in the Australian Bight favours outbreaks of cold air from the south and onshore easterly flow, bringing heavy rain. Low pressure systems brought heavy rain to coastal New South Wales 4 times between April and June 2024, on 5–6 April, 5–6 May, 1–2 June and 6–7 June (Figure 11). On each occasion, widespread daily rainfall totals of 50 to 100 mm, and locally up to 200 mm, were recorded across Sydney, the Illawarra, Central Coast, the Hunter and the South Coast. Several rivers reached Moderate flood levels at times, with the Hawkesbury River flooding for the seventh time in 4 years. See Incident Number 29, on page 29 for further details on the impact.

9am AEST 2 June 2024



9am AEST 7 June 2024

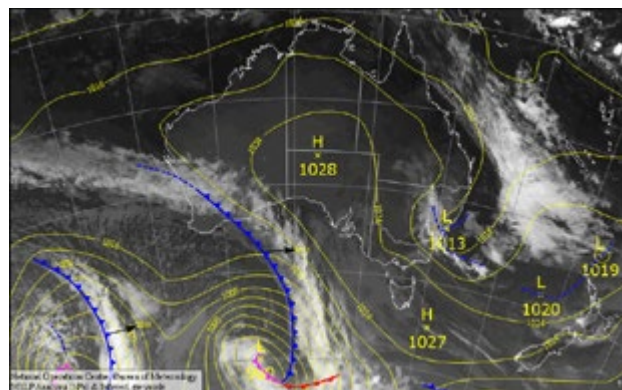


Figure 11. MSLP and Satellite IR imagery for 9am AEST 2 June 2024 (top) and 9am AEST 7 June 2024 (bottom).

Images: Bureau of Meteorology

4. National overview

The 2023–24 financial year continued to present significant disaster challenges for Australia. This national overview presents the key activities taken at a national and nationwide level to prepare for and support states and territories, and by extension, the individuals and local communities at risk or affected. International support that was requested and provided is also outlined in this section.

4.1 National plan activations

Australia has a range of national plans that cover specific situations where Australian Government assistance or leadership is required. The following plans were activated/maintained in 2023–24:

- Australian Government Disaster Response Plan (COMDISPLAN)
- Australian Government Plan for the Reception of Australian Citizens and Approved Foreign Nationals Evacuated from Overseas (AUSRECEPLAN)
- Australian Government Overseas Assistance Plan (AUSASSISTPLAN)
- Emergency Response Plan for Communicable Disease Incidents of National Significance (CDINS).

Australian Government Disaster Response Plan (COMDISPLAN)

COMDISPLAN is the plan for the provision of Australian Government non-financial assistance to Australian states and territories in an emergency or disaster. COMDISPLAN was activated 10 times in 2023–24 for the following events:

- Northern Territory (Barkly Fire Complex) bushfires – 9 September to 25 September 2023
- Bushfires and flooding across New South Wales and Victoria – 3 October to 6 October 2023
- Bushfires in Western Downs, Darling Downs and Gladstone, Queensland – 27 October to 23 November 2023
- Northern Territory bushfires (planning and logistics assistance and impact assessment assistance) – 5 November 2023 to 7 February 2024
- Bushfires across Western Australia – 23 November 2023 to 12 January 2024
- Tropical Cyclone Jasper, ex-Tropical Cyclone Kirrily – 8 December 2023 to 26 February 2024

- Severe weather across southeast Australia – 8 January to 16 January 2024
- Severe weather across southeast Australia – 27 February to 6 March 2024
- Ex-Tropical Cyclone Megan – 17 February to 25 March 2024
- Severe weather across eastern Australia – 5 April to 9 April 2024

A total of 23 requests for non-financial assistance were received by NEMA and tasked to various Australian Government agencies and contracted capabilities, including:

- Australian Defence Force
- Department of Finance
- National Emergency Management Stockpile
- Disaster Relief Australia

The Joint Interagency Crisis Coordination Team was activated 5 times for domestic incidents for a total of 250 calendar days, often responding to concurrent incidents.

Australian Government Overseas Assistance Plan (AUSASSISTPLAN)

AUSASSISTPLAN details the process for the provision of emergency Australian Government-led physical assistance to overseas countries. AUSASSISTPLAN was activated once in 2023–24 for the following event:

- Incident Management Support and aerial scanning to Papua New Guinea in response to a landslide in Enga Province.

Australian Government Plan for the Reception of Australian Citizens and Approved Foreign Nationals Evacuated from Overseas (AUSRECEPLAN)

AUSRECEPLAN details the process for the safe repatriation of Australians, their immediate dependents and approved foreign nationals following an Australian Government led evacuation in response to an overseas disaster or adverse security situation.

AUSRECEPLAN was activated once in 2023–24 for repatriation and reception in response to the Hamas-Israel conflict.



Figure 12. A member of Australia's Disaster Assistance Response Team using drones to map the incident site, providing local authorities crucial information to support affected communities.

Image: Queensland Fire Department

Emergency Response Plan for Communicable Disease Incidents of National Significance (CDINS)

The CDINS Plan describes the context within which the Australian Government Department of Health and Aged Care and state and territory health departments will function during any national communicable disease related emergency.

The activation of this plan was maintained once for 2023-24 for COVID-19 (first declared 22 January 2020, ceased 20 October 2023).

4.2 National Coordination Mechanism

The National Coordination Mechanism (NCM) met on 80 occasions during 2023-24 to ensure shared situational awareness, rapid problem definition and effective national consequence management in response to a range of hazards. This included supporting potential and emerging crises and preparedness activities including space weather events, avian influenza, offshore conflict, cyber incidents, telecommunication outages, and severe weather. In particular, the NCM supported the 2023 Higher Risk Weather Season Preparedness Program and the delivery of the national space weather exercise, Exercise Aurora, in May 2024.

4.3 Department of Defence

During 2023-24, Defence responded to requests for Australian Government assistance under COMDISPLAN. Defence's support contributed to emergency response, relief, evacuation and general recovery efforts across the country. Northern Australian cyclones and flood situations associated with Tropical Cyclones Kirrily, Jasper and Megan led to the commitment of Defence capabilities.

Defence's major domestic contributions during the higher risk weather season were:

- In September 2023, Defence provided engineering support including heavy equipment and engineering support to protect critical infrastructure from fire in the area of Barkly and Tenant Creek.
- In December 2023, Defence provided aviation, marine and light engineering support to the community of Wujal Wujal and northern Queensland region as a result of Tropical Cyclone Jasper. This was the first deployment of the semi-rigid temporary shelter, Humanihut and Defence provided marine support for this deployment.
- In January 2024, Defence provided planning staff and rotary wing aircraft support to the response effort for Tropical Cyclone Kirrily in Northern Australia.
- Support to the Northern Territory Government was provided in response to Tropical Cyclone Megan in February 2024, which had a large commitment of Defence aviation capabilities at the outset of the task. As the situation developed, Defence assisted with the evacuation of medically vulnerable persons from Borroloola and provided logistic support with transportation of critical goods to isolated communities in the region.

4.4 National resource sharing arrangements

The AFAC National Resource Sharing Centre (NRSC) facilitated both national and international resource sharing during 2023-24. July to September was occupied by the Canadian wildfire deployment, which saw 746 Australian and New Zealand personnel deployed to assist wildfire suppression activities (from May to September 2023). After being activated for 119 consecutive days to support the international deployment, just 2 days later the NRSC was operational again to support the Northern Territory bushfire response.

Following the Northern Territory deployment, the NRSC activated to facilitate resource sharing for another 5 bushfire events, 2 storm events and one flood event. Across these 9 interstate deployments, 1,649 personnel and 194 equipment assets were shared between jurisdictions, including 53 personnel from New Zealand who were deployed to support the Queensland bushfire response in November and December 2023.

Between July 2023 and June 2024, incident management team (IMT) and crew personnel were the most requested resources. The remaining resources were deployed to flood and storm events in Queensland and New South Wales. This year, all interstate resource requests were able to be fulfilled.

During the severe weather season, the National Large Airtanker (NLAT) was requested twice to South Australia and on 5 occasions to Western Australia. Figure 13.

4.5 Relief and recovery

Joint state/territory and Australian Government funded Disaster Recovery Funding Arrangements (DRFA) recovery assistance was activated in response to 58 events across Australia in 2023-24. The most being in New South Wales (23) and Queensland (13).

Of the 58 events, 5 were activated for extraordinary assistance (Category C and D) under the DRFA. A total of \$269.81 million has been committed in extraordinary assistance for these events, in addition to significant support provided under Categories A and B of the DRFA.

Funding was made available to 201 of Australia's 539 local government areas for a range of recovery measures, including emergency assistance for impacted individuals and families, support for councils for clean-up activities and to restore or replace damaged essential public assets. Extraordinary assistance was also made available in the most severely impacted local government areas in the form of additional community and mental health support, support to restore damaged sport and recreational facilities and recovery grants for primary producers, small businesses and non-profit organisations.

The Australian Government also provided over \$80 million directly to disaster affected individuals and families through the Australian Government Disaster Recovery Payment (AGDRP) and Disaster Recovery Allowance (DRA):

- The AGDRP is a non-means tested payment of \$1,000 for eligible adults and \$400 for eligible children which is

available to people whose homes or major assets have been lost or directly damaged, people who have been seriously injured or are an immediate family member of someone who has lost their life. The AGDRP was made available for 5 events in 18 unique local government areas.

- The DRA is a short-term income support payment to assist individuals who have experienced a loss of income as a direct result of the flood. The DRA was made available for 3 events across 14 unique local government areas.

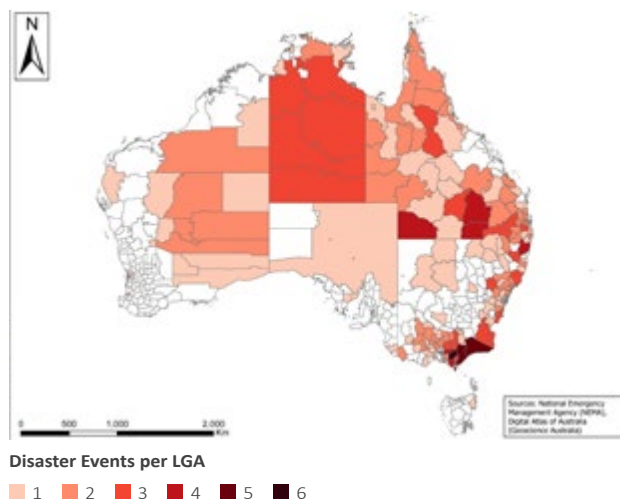


Figure 14. 2023 – 24 map Disaster Recovery Funding Arrangements Activations by LGA across the country.

Image: NEMA



Figure 13. A National Large Air Tanker was redeployed to Western Australia to support its fire response in a difficult fire season. Image: NAFC

4.6 Provision of international support

Support for wildfires in Canada from Australian and New Zealand firefighters occurred from May to September 2023 with resourcing arrangements activated and supported by the NRSC. This operation was the largest and longest deployment of Australasian resources internationally, since the commencement of international support between the 4 nations of Canada, the United States, Australia, and New Zealand.

The landslide in Enga Province in Papua New Guinea saw the Department of Foreign Affairs and Trade (DFAT) and NEMA coordinate an international Disaster Assistance Response Team (DART) deployment to support local emergency services in their response.

Severe Tropical Cyclone Lola affected Vanuatu's northern and central islands on 24 and 25 October saw the RAAF deploy aerial reconnaissance and deliver Australian-provided humanitarian relief supplies to Port Vila in support of the Government of Vanuatu's response and provide priority emergency assistance in affected areas.

The Australian Government responded to the Hamas-Israel conflict through the activation of AUSRECEPLAN from 17 October to 30 November 2023. The activation provided Australian Government assistance for domestic reception of Australians and approved foreign nationals arriving in Australia on Australian Government assisted flights.



Figure 15. Australia and New Zealand fire fighters supported Canada with its longest ever international deployment of 173 days Image: ABC News

5. Map of major incidents 2023–24

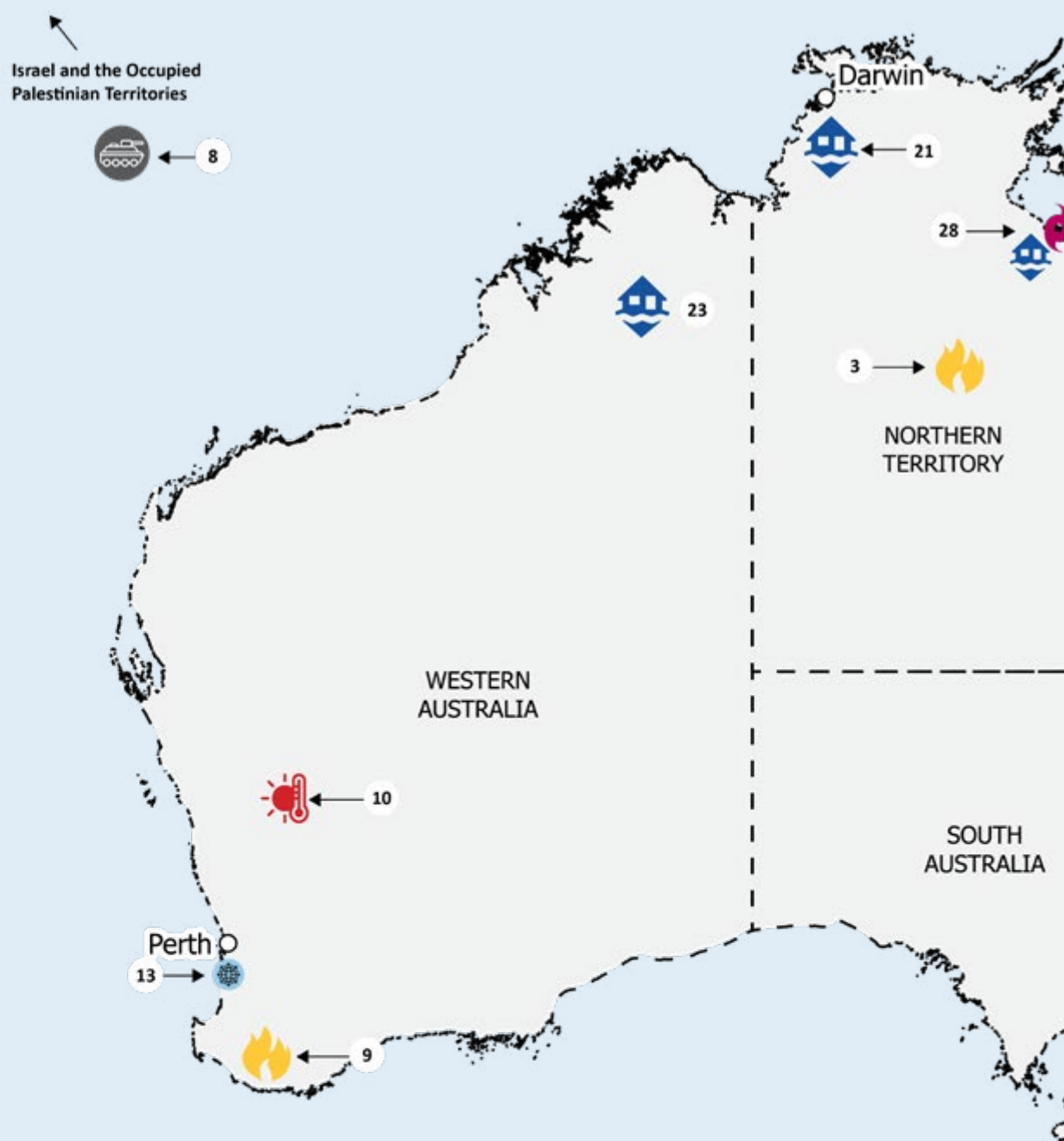
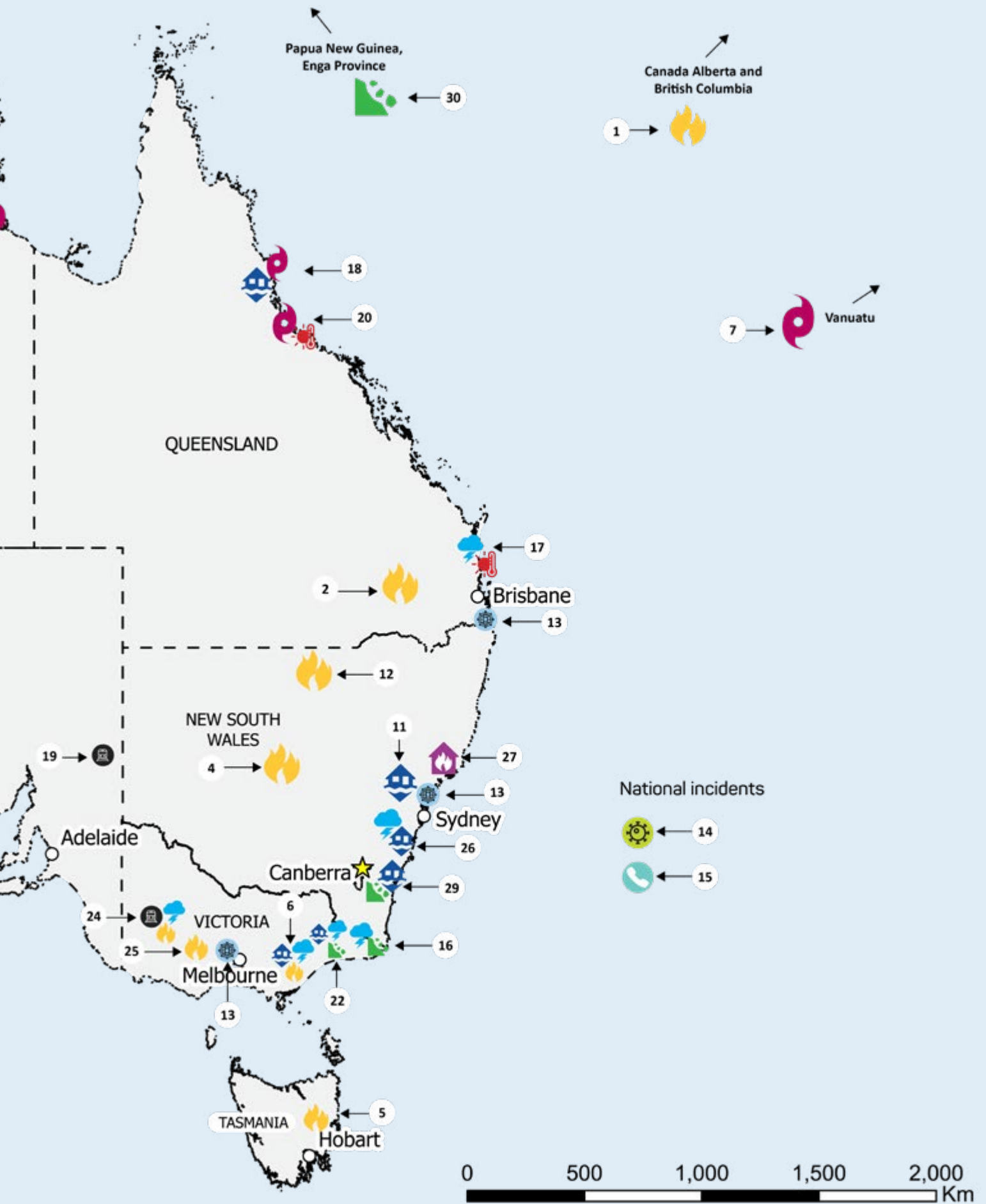




Figure 16. Map of major incidents 2023–24.



**Locations of symbols are approximate*

6. Summary of major incidents 2023–24

The following are 30 incidents that were identified by emergency services for their scale, duration, community impact, media coverage and/or unique operational challenges. They represent a snapshot of the major incident that individuals, communities, agencies and governments had to respond to over the course of the year.

No.	Date	Incident	Location	Jurisdiction and agency
1	May 2023 – September 2023	Canadian wildfires- international deployment	Alberta and British Columbia, Canada	National Emergency Management Agency
	A series of major wildfires affected every Province of Canada from May. The AFAC NRSC coordinated the deployment of Australasian personnel to assist wildfire suppression activities in British Columbia and Alberta, Canada. A formal request for assistance was received from the Canadian Interagency Forest Fire Centre on 17 May. On 26 May, 221 personnel were deployed from all Australian jurisdictions and NZ to Canada. Shortly after, Canada requested a further 179 personnel across Australia and NZ, followed by a further request for an additional 14-person IMT. Australasian resources were then utilised on a continuous basis from this period until 11 September, resulting in a total of 746 personnel deployed. Spread across 3 contingents, the Australasian personnel included arduous firefighting crews, IMTs and specialist roles including supervision and aviation management. Fire, land management and state emergency management organisations representing all jurisdictions across Australia and New Zealand contributed to the deployment. This operation was the largest and longest deployment of Australasian resources internationally, since the commencement of international support between the 4 nations of Canada, the United States, Australia, and New Zealand.			
2	June 2023 – November 2023	South West Region bushfires	South West Region, Western Downs and Tara	Queensland Fire Department
	See Case Study 1			
3	August 2023 – October 2023	Barkly Fire Complex	Barkly Region and Tennant Creek.	Bushfires NT
	See Case Study 2			
4	September 2023 – November 2023	Extensive spring fire season	South Coast, Bega Valley, Bathurst, Hunter Valley and North Coast	New South Wales Rural Fire Service
	New South Wales experienced a widespread spring bushfire season. Throughout this operational period there were over 65 concurrent incidents, 8 Section 44 declarations, 500 personnel active, and 28 heavy plant and over 40 aircraft operating across New South Wales simultaneously. These incidents saw extensive school closures, property losses, personnel injury, and fatalities. The Tenterfield area was affected by over 60 new fire ignitions following an electrical storm in the afternoon in late October. The AFAC NRSC was utilised to support aviation and specialist positions throughout a protracted period of fire activity (26 October – 9 November). Register.Find.Reunite (RFR) was activated with 244 registrations and 3 inquiries taken.			

No.	Date	Incident	Location	Jurisdiction and agency
5	September 2023 – April 2024	Extended fire season	East Coast (Flinders Island and Coles Bay) and Central Highlands (Bradys Lake area)	Tasmanian Fire Service



The AFAC Seasonal Bushfire Outlook for Spring and Summer 2023-24 suggested above-average fire potential across areas in the central, east and northeast areas of Tasmania. This modelling did predict accurate outcomes, with fires occurring unusually early on the Tasmanian east coast at Coles Bay in September and Dolphin Sands in November with little overnight reduction in intensity. The season risk also extended beyond normal end time ranges, with a particular focus on low rainfall effects on the eastern half of the state and the resulting low soil dryness. This risk was mitigated to some extent with an extension of NAFC contracted aircraft for a period up to 6 weeks which assisted with a policy of rapid, heavily weighted direct attack.

Major fires

Coles Bay – The Coles Bay fire started unusually early in the Tasmanian bushfire season on 19 September and burnt approximately 1,284 hectares of national park and 650 hectares of private land. It was contained after a significant strategic burning operation was carried out on 24 September. The fire threatened homes on the Freycinet Peninsular and burnt some private structures as well as Tasmania Parks and Wildlife Service infrastructure, and power infrastructure. The fire destroyed some environmental assets at Friendly Beaches and threatened other high value environmental assets on the peninsular, which includes the Freycinet National Park and Wineglass Bay. The fire caused long term damage to the amenity of the Friendly Beaches area which is a popular local campground. The event temporarily restricted access to towns in the area for approximately 24 hours because of fallen trees and powerlines. This displaced children at the local school and blocked access to the peninsula overnight.

This 5,454 hectare complex of 5 fires occurred in the central highlands, Brady's Lake area. After its initial start on the 21 February in Sustainable Timbers Tasmania tenure land, the fire crossed Parks and Wildlife and private tenure over the next few days. A level 3 multi-agency IMT was appointed to manage the incident at the southern regional operations centre. Risks identified included emergency service radio tower sites, the Lake Echo power station (Dee Lagoon), Lake Echo canals, pipeline and transmission lines, Wild Cattle Hill Windfarm, forest assets, Aboriginal heritage sites and highly erodible soils. The fire took significant runs on subsequent high fire danger days placing enormous pressure on any established boundaries, and active firefighting was regularly suspended to prioritise public warnings and firefighter safety. The fire was considered contained and downgraded from level 3 IMT management on the 5 March and returned to local control.

No.	Date	Incident	Location	Jurisdiction and agency
6	September 2023 – October 2023	Concurrent bushfire, severe storm, flash flooding	Gippsland	Victoria State Emergency Service, Department of Energy, Environment and Climate Action, Victoria



In the period between 30 September to 13 October, Victoria experienced dramatic changes in weather that led to an initial outbreak of bushfires in East Gippsland, followed by a low-pressure system that brought strong winds, thunderstorms and rainfall, leading to a range of minor to major flooding in the East Gippsland and northeast catchments. In the lead up to the fires occurring in Gippsland, the region had experienced one of the driest winters on record.

On 1 October, fires took hold in Rawson, Briagolong, and Loch Sport within a few hours of each other. Crews were able to hold the Rawson fire; however, the fires in Briagolong and Loch Sport resulted in impacts to those communities.

The Briagolong fire started in the vicinity of Duffy Road (approx. 30 km northwest of Bairnsdale) resulting from an escaped private property burn off. The fire burnt for 30 days in steep terrain, driven by strong winds, and required significant resources, plant, and equipment to suppress. The impact of the fire resulted in the loss of one residential property, 3 cabins and 1,100 hectares of forest plantation. The fire was contained to 12,504 hectares in size before heavy rainfall impacted the region.

The Loch Sport fire (25 km southwest of Bairnsdale) resulted from a suspected escaped campfire. The fire was in difficult swampy terrain and was driven by strong gusty winds. Victoria Police, supported by emergency service personnel including FFMV and the Country Fire Authority (CFA), encouraged Loch Sport residents to leave prior to an expected day of extreme fire weather. The fire did reach the western edge of town as predicted, isolating the town for approximately 36 hours. Significant fuel management works over previous seasons had reduced the fuel loads adjacent to Loch Sport which aided successful suppression operations. CFA strike teams and FFMV crews worked hard to protect the community, resulting in no residential assets being lost. The fire was contained 5 days later and impacted 3,420 hectares.

The Rawson fire (south of the Rawson township) resulted from a private property burn off. Suppression of the fire was difficult due to strong winds, erratic fire behaviour and steep terrain. The fire burnt for 4 days and impacted 198 hectares. No assets were lost. Walhalla Road was closed and campers from local campgrounds were evacuated.

Between 3 and 4 October, strong winds, thunderstorms and heavy rain led to flash and riverine flooding through to early Thursday. Following the rainfall, major flooding occurred in East Gippsland and the northeast of Victoria. The Mitchell River at Bairnsdale peaked around the major flood level (6.51 m) with Victoria State Emergency Service (VIC SES) crews rescuing 2 males from a car washed away in flood waters near Bairnsdale. Additionally, police and VIC SES responded to a report of a male drowning in the Tyers River on 7 October. While community members recovered the male, rescue crews were unable to revive him.

Between 3 and 13 October, VIC SES crews responded to 1,165 requests for assistance, mostly relating to trees down, flooding and building damage and most significantly 11 water rescue events, highlighting the dangers of people entering flood waters.

The event highlighted the complexity in responding to concurrent emergencies within the same response footprint, and the benefits of multidisciplinary IMT personnel able to adjust to additional hazards in the landscape.

7	October 2023 – November 2023	Cyclone Lola – damage assessment and aid	Vanuatu	National Emergency Management Agency
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Severe Tropical Cyclone Lola impacted Vanuatu's northern and central islands on 24 and 25 October. It was the third cyclone in 8 months to affect Vanuatu and was the earliest ever Category 5 cyclone in the Southern Hemisphere. The Australian Government coordinated closely with France and New Zealand under the FRANZ arrangement for disaster relief to support the Government of Vanuatu's response and provide priority emergency assistance in affected areas. This included aerial damage assessments that assisted the Government of Vanuatu to understand the impact of the cyclone. On 26 October, the ADF deployed a Royal Australian Air Force (RAAF) C-27J Spartan aircraft to support this request. RAAF aircraft also delivered Australian-provided humanitarian relief supplies to Port Vila on 29 and 30 October. Australia provided an initial \$800,000 package to support the Government of Vanuatu's response. This provided a range of shelter, water purification supplies and other essential humanitarian items for impacted communities, in line with the Government of Vanuatu's priorities.

No.	Date	Incident	Location	Jurisdiction and agency
8	October 2023 – December 2023	War - Hamas-Israel conflict	Israel and the Occupied Palestinian Territories	National Emergency Management Agency



Following the outbreak of the Hamas-Israel conflict, AUSRECEPLAN was activated from 17 October to 30 November to facilitate Australian Government assistance for the domestic reception of Australians and approved Foreign Nationals returning to Australia on Australian Government assisted flights. The New South Wales, Victorian, South Australian and Western Australian governments, together with the Australian Federal Police, Department of Home Affairs, Australian Border Force, Department of Health and Aged Care and Services Australia, established reception points within Sydney, Melbourne, Adelaide and Perth airports to provide support and services to returning persons. A total of 9 repatriation flights arrived in Australia during 17 October and 26 November and a National Emergency Management Agency (NEMA) Liaison Officer met each flight. NEMA convened 10 NCM meetings with Australian Government and jurisdictional stakeholders to ensure collective situational awareness.

9	October 2023 – April 2024	Extended southern bushfire season	Midwest, Wheatbelt and the South West	Department of Fire and Emergency Services
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The 2023-24 bushfire season was a very busy period for the Department of Fire and Emergency Services (DFES) and its emergency services partners in Western Australia. While there were consistent Level 1 and Level 2 incidents throughout the bushfire season, no Level 3 bushfire incidents occurred. There were many incidents during the October and November period, which resulted in the southern bushfire high threat season being brought forward into November and extended through to April.

Weather experienced throughout the early part of the season included lightning strikes, resulting in many bushfire ignitions in the northern parts of the state. There were consistent incidents in the metropolitan and surrounding areas throughout the period.

While no incidents reached Level 3, resourcing was under pressure due to the requirement to run incidents. Predicted weather conditions throughout the season triggered DFES to undertake further preparedness actions more frequently, due to the positive outcomes from previous seasons where this took place. This provides an avenue for regions to respond early to the predicted weather and proactively prepare for the potential ramifications.

10	November 2023 – February 2024	Repeat heatwave incidents	West Coast, including Kimberly, Pilbara, Gascoyne, Murchison, Goldfields, Wheatbelt and southwest Western Australia, including Perth	Western Australia Department of Health
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See Case Study 4









11	November 2023 – December 2023	Extensive flooding	Hunter region to South Coast region	New South Wales State Emergency Service
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At the end of November, a broad low-pressure system formed over southern inland New South Wales and moved slowly towards the southeast. A second low pressure centre developed on the North Coast and travelled towards the South Coast. As a result of the weather systems, there were isolated heavy showers and thunderstorms. Some thunderstorms were severe, with associated strong winds. The weather system was short lived, with response activities concluded by 3 December.

Damage from the weather systems was widespread, from the Victorian border to the Hunter region. The New South Wales State Emergency Service recorded 1,537 incidents, including 15 flood rescue activations. Most of the flood rescues were on the South Coast. Lake Conjola had 40 homes impacted by flooding. Severe rain in Deniliquin resulted in flash flooding with 57 incidents recorded and a multi-agency response. In total, 347 properties were damaged in the impact areas, with 310 experiencing inundations from flood waters. 43 properties were assessed as not inhabitable and 1 was destroyed.

Power outages were experienced on the South Coast between Batemans Bay and Eden. Batemans Bay also experienced a Telstra outage which impacted the 3G, 4G and 5G networks.

No.	Date	Incident	Location	Jurisdiction and agency
12	November 2023	Hudson bushfire	Hudson, Walgett and Lightening Ridge	New South Wales Rural Fire Service
	The Hudson fire burnt 27,894 hectares and was a complex incident in the remote and rugged Opal fields of northwest New South Wales. One firefighter died, 24 properties were destroyed, and 20 properties damaged. The fire had a large impact on Grawin opal fields with mine shafts posing a significant risk to firefighting crews. Extremely high temperatures with low humidity created difficult challenges for crews.			
13	November 2023	Cyber attack	Brisbane, Sydney, Melbourne, Fremantle	National Emergency Management Agency
	On 10 November, major port cargo and logistics operator DP World Australia shut down its networks to contain a major data breach, which restricted port operations in Sydney, Melbourne, Brisbane and Fremantle and disrupted national supply chains across many industry sectors. NEMA supported the Department of Home Affairs by convening 3 NCM meetings with stakeholders across Australian, state and territory governments and many industry sectors to manage the consequences of the data breach and the impacts on freight and logistics. DP World Australia was able to clear the freight backlog by 20 November by working closely with all stakeholders.			
14	November 2023 – June 2024	COVID-19 JN.1 variant outbreak	All states and territories	National Emergency Management Agency
	The COVID-19 JN.1 variant was first reported in Australia in October and rapidly became the dominant circulating variant in Australia following a similar trend globally. While there is currently evidence to suggest the JN.1 variant leads to increased transmission, there is no evidence that it is associated with more severe disease. An increase in COVID-19 case notifications was observed in December and may be explained by the highly transmissible JN.1 variant, holiday-related population mixing, and some likely waning of hybrid immunity. Following this small increase in December, COVID-19 case notifications began to decrease from January, before increasing again from late April.			
15	November 2023	Telecommunication outage	All states and territories	National Emergency Management Agency
	On 8 November, Optus experienced a service outage which impacted communities and telecommunications services across Australia. NEMA co-chaired an NCM meeting with the Department of Home Affairs and the Department of Infrastructure, Transport, Regional Development, Communications and the Arts to ensure shared situational awareness of the outage across Australian Government and state and territory agencies. This meeting ensured common understanding of critical impacts, and highlighted interdependencies and redundancies in the national telecommunication network. A second NCM meeting was held with telecommunications providers and key Australian Government agencies which identified lessons from the outage to enable future improvement.			
16	November 2023 – December 2023	Severe storms and landslide	Swan Hill, Melbourne, Gippsland and Mallacoota	Victoria State Emergency Service
 	<p>On 28 November, the Bureau issued a Severe Weather Warning for damaging winds and heavy rainfall for several parts of Victoria. Subsequently the Bureau recorded significant wind gusts on 29 and 30 November, including gusts up to 100 km/h in the Victorian Alps and more than 80 km/h in elevated parts of the state. Rain gauges recorded significant rainfall of between 50 mm to 150 mm in parts of East Gippsland, with Reeves Knob recording 199.2 mm over 29 and 30 November and just over 200 mm during 1 and 3 December.</p> <p>Following the heavy rainfall, landslide occurred on the Mallacoota Genoa Road near Mallacoota, blocking traffic along the Gipsy Point turn off, which restricted access in and out of Mallacoota. Swan Hill also recorded over 90 mm of rain in 7 hours, leading to children from St Marys Primary School in Swan Hill being asked to stay home due to roads that were inundated by flooding. The rainfall in Swan Hill had an Annual Exceedance Potential (AEP) of 1-2%.</p> <p>By 30 November, VIC SES received 811 requests for assistance. The majority were for trees down, most of which occurred in eastern metro areas.</p>			
17	December 2023 – January 2024	Severe storms, rainfall, and heatwave	Southern Queensland, Gympie to Gold Coast	Queensland Police Service
 	See Case Study 3			

No.	Date	Incident	Location	Jurisdiction and agency
18	December 2023 – January 2024	Tropical Cyclone Jasper and associated flooding	North Queensland Coast, Cape York Peninsula and Cairns	Queensland Police Service



A tropical low formed in the Solomon Sea on 2 December and developed into a Category 1 system as Tropical Cyclone Jasper on 5 December. The system intensified to a Category 5 before making landfall in the evening on 13 December as a Category 2 on Queensland's north tropical coast near the community of Wujal Wujal, 120 km northwest of Cairns.

The Queensland disaster management arrangements stood up coordination centres and readied staff for deployment from early December. Preparedness activities commenced, including community messaging and support to vulnerable communities, homeless persons and those needing critical health care. Particular focus was given to those living in housing constructed pre-1982 and evacuation plans were considered prior to the event.

The Bureau started issuing hourly tropical cyclone warnings from 13 December. Before the cyclone made landfall, 14,500 customers were without power. Once Jasper had crossed the coast at 8:00pm on 13 December, 40,000 customers were without power (20% of the population in that area) with crews mobilised into the area in preparation for restoration activities. The cyclone weakened to a tropical low around midnight on 13 December as it moved inland and stalled over the southern Cape York Peninsula for several days. The tropical low produced significant rainfall with 5-day totals from 13 to 18 December exceeding 2000 mm in some locations. Significant daily rainfall totals between 500-600 mm occurred on 13 December in the vicinity of Wujal Wujal when Jasper made landfall. Higher daily rainfall totals between 700-800 mm occurred on 18 December along the North Tropical Coast with Black Mountain recording the highest at 975 mm. This was the highest 24-hour total ever reliably measured in Australia (previous record 960 mm at Bellenden Ker in January 1979). The heavy rainfall occurred in saturated river catchments resulting in significant and widespread impacts including flooding, mass evacuation of communities, landslides and road closures. Access to the region was hampered due to significant flooding, closing the Cairns airport 17-18 December.

These cascading, compounding events resulted in large-scale isolation, and significant impacts to agriculture, animal welfare, small business and tourism. 18 of Queensland's 77 local government areas were activated for this event for a range of disaster assistance through the joint state/territory and Australian Government DRFA to address the immediate and long-term impacts from these events.

19	December 2023 – January 2024	Transport incident	Bindarra	South Australia Police
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The Barrier Highway was blocked following a collision between a truck and freight train at an active level crossing in the Bindarra area on 31 December. The impact caused the driver's carriage to catch fire and several carriages to derail. 2 train drivers lost their lives in the incident. Some carriages carried hazardous materials, but they were able to be contained. The scene was attended by emergency services, and the highway was reopened on 2 January.

No.	Date	Incident	Location	Jurisdiction and agency
20	January 2024 – February 2024	Tropical Cyclone Kirrily and associated flooding with heatwave	Queensland coast, inland northeast Queensland and western Queensland	Queensland Police Service



A tropical low formed in the central Coral Sea on 17 January and developed into Tropical Cyclone Kirrily on 24 January. Gales with damaging wind gusts to 120 km/h developed about the Whitsunday Islands and extended to mainland communities between Townsville and St Lawrence overnight. Community messaging was issued across the state, recommending people ensure their emergency kits were stocked and urging tourists to reconsider their plans. Tropical Cyclone Kirrily crossed the Queensland coast as a Category 1 system just north of Townsville around 10:00pm on 25 January. Once the cyclone made landfall, road access was impacted in parts of the state due to severe weather events. Significant power outages occurred across the state, primarily in the north, with over 66,000 power outages reported. The system quickly weakened below tropical cyclone intensity and slowly travelled across central and western Queensland from 26 to 31 January, whilst producing daily moderate to heavy rainfall totals up to 100 mm with isolated falls greater than 200 mm. Water supply and sewerage plants were monitored closely, and Emergency Action Plans for several dams were activated due to rising water levels. The QLD State Emergency Service completed 681 tasks and agency support requests state-wide between 5:00pm, 24 January and 7:00am 28 January.

Over 29-30 January, more than 300 mm of rain fell across southeast Queensland, causing severe and widespread flash flooding. On 1 February, the low moved north and reached the southern Gulf of Carpentaria and generated strong wind gusts of 102 km/h at Mornington Island, the equal highest wind gust ever recorded at the site. 13 swift-water rescues were conducted in the Moreton Bay suburbs of Bray Park and Brendale where houses were inundated. From 4 February, Ex-Tropical Cyclone Kirrily began to interact with an upper trough to the southwest. Towns as far afield as Kynuna in McKinlay and Warra in the Western Downs were evacuated ahead of floodwaters. As Ex-Tropical Cyclone Kirrily moved over the tropical coast and then inland across Queensland it led to heavy falls, as well as widespread flooding for western Queensland. As floodwaters spread steadily across thousands of hectares in Queensland's Channel Country, roads were cut, rail networks were affected, and flooding was widespread.

Tropical Cyclone Kirrily was a very significant event, with the effects felt from Mornington Island and Burke in the far northwest to Moreton Bay, Ipswich and Southern Downs in the southeast. In total, 41 of Queensland's 77 local government areas were eligible for a range of disaster assistance through the joint state/territory and Australian Government DRFA to address the immediate and long-term impacts from these events. RFR was activated and operated by Australian Red Cross, with 163 registrations taken, and 3 enquiries.

21	January 2024 – February 2024	Tropical Low O3U and flooding	Gregory district, Pigeon Hole, Kalkarindji, Yarralin, Timber Creek and Dagaragu	Northern Territory Fire and Emergency Services
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Tropical low O3U formed in the southern Joseph Bonaparte Gulf in mid-January near the southwest Top End or northeast Kimberley coasts.

Tropical low O3U brought high rainfall to the northwestern part of the Northern Territory. Tipperary received 1021 mm in January 2024, its wettest month on record, including 124 mm on 16 January 2024. Port Keats Airport, at Wadeye, received 1051.2 mm in January 2024, also its wettest month on record, including 334.8 mm on 15 January 2024, its wettest day on record.

Flooding associated with tropical low O3U resulted in residents from Pigeon Hole and Dagaragu being evacuated whilst other communities and out stations became isolated. The flooding closed and damaged major highways and many secondary roads, as well as the main north-south rail line, as it passed across the Northern Territory during late January.

No.	Date	Incident	Location	Jurisdiction and agency
22	January 2024	Extended severe storm period with associated flooding, drinking water contamination, and landslip	Mid and northern Victoria, East Gippsland, Dandenong and southeast Melbourne	Victoria State Emergency Service



The Bureau provided advice that from Tuesday 2 January 2024, severe thunderstorms were likely to occur in multiple weather districts across Victoria with severe thunderstorms likely to produce heavy rainfall that may lead to flash flooding, localised large hail and damaging winds. Predictions indicated north western, north central and north eastern parts of the state were likely to be impacted on Tuesday, with effects extending into Gippsland on Wednesday. In preparation, Regional Operations Centres and standby IMTs were put in place for these areas.

From around 7 January, the most affected catchments were the Goulburn-Broken Catchment and Campaspe Catchment, straddling the boundary of the VIC SES East (Primarily Hume) and West (primarily Loddon Mallee) Regions. By the second week of January, the Bureau advised that it had been the wettest first 9 days of January on record. Between 7 and 9 January, several locations around central Victoria received 48-hour rainfall totals of between 135 mm to 184 mm.

These weather events led to a mix of flash-flooding in towns such as Wedderburn on 2 January, through to riverine flooding in the Goulburn-Broken Catchment affecting Yea, Shepparton and Seymour, and in the Campaspe Catchment affecting Rochester. Additionally, flash-flooding in the Bendigo Creek Catchment affected Goornong north of Bendigo. More than 150 properties were assessed as being affected by flood water with some experiencing over floor inundation. This led to relief centres opening in the worst affected communities such as Yea, Seymour and Echuca (for Rochester). RFR was activated and operated by Australian Red Cross, with 17 registrations taken.

A landslide occurred at Mount Dandenong Tourist Road in Ferny Creek on Tuesday 9 January, 40 metres wide and 70 metres long, requiring closure of the road. VIC SES established an IMT at the Ferntree Gully Incident Control Centre to manage the response and consequences.

During the 19-day period, VIC SES units received 4,668 requests for assistance (RFAs), peaking on 8 January with 1,345 RFAs. In total, VIC SES received 78 events for Inland Water Rescue. The most common events relating to flooding (1,086 RFAs), trees down (1,710 RFAs) and building damage (643 RFAs). The response was multi-agency in nature with personnel from numerous agencies supporting state, regional and incident control centres and undertaking tasking in the field.

No.	Date	Incident	Location	Jurisdiction and agency
23	January 2024 – April 2024	Kimberley flooding and intense wet season	East and central Kimberley, Fitzroy Crossing, Tanami, Sturt Creek	Department of Fire and Emergency Services WA



The 2023-24 wet season commenced later than usual, with large areas of the Kimberley experiencing prolonged heatwave conditions and extreme dryness. This resulted in significant soil aridity, particularly in the central and western regions, and low riverine flows. These dry conditions persisted in parts of the Kimberley, with Broome receiving only 51.6 mm of rainfall for the entire season, 88% below its summer average, making it the lowest summer rainfall on record. In contrast, parts of the east and central Kimberley recorded their highest rainfall totals in 23 years.

The first tropical system cell to affect the region was tropical low 03U, which passed through the southeastern Kimberley in late January 2024, bringing significant rainfall to the Sturt Creek catchment. Reports from manual rain-gauge recordings indicated up to 300 mm of rain over 48 hours, equivalent to between two-thirds and three-quarters of the area's annual rainfall total. This led to substantial catchment saturation, riverine rises across the Sturt Creek, and flash flooding in the east Kimberley.

Tropical low 03U caused the closure of the Great Northern Highway (National Highway 1) at Bluebush Bridge near Fitzroy Crossing and the Victoria Highway in the Northern Territory, isolating the towns of Wyndham, Kununurra and Halls Creek, along with several remote communities in the east Kimberley. The Gibb River Road, which connects various communities in the central Kimberley, was also closed at this time.

By the end of January, the Kimberley Regional Duty Coordinator received the first request for resupply, due to isolation caused by road closures. The region received 48 requests for resupply for food and fuel via aircraft over this period.

On 19-21 February, Ex-Tropical Cyclone Lincoln crossed the Kimberley, bringing intense and heavy rainfall across the Sturt, Ord, and some tributaries of the Fitzroy River. Flash flooding caused minor infrastructure impacts and road closures across the region, with moderate riverine flooding observed in these catchments.

The Sturt Creek catchment received significant rainfall from Ex-Tropical Cyclone Lincoln (up to 200 mm in 24 hours) across an area already saturated by the rainfall from tropical low 03U in late January 2024 and normal wet season rain. Anecdotal reports from pastoralists at Sturt Creek Station and Ruby Plains indicated the Sturt Creek was at its highest levels in recent memory.

March continued to see enhanced tropical conditions, increasing thunderstorm activity across the Kimberley. Widespread rainfall totals of 50-100 mm were recorded weekly, with some areas between Halls Creek and Wyndham receiving 100-300 mm, leading to increased river flows, flash flooding and road closures. The Victoria Highway in the Northern Territory, a major access route into Western Australia, closed again due to flooding which impacted industry in and out of the state.

Throughout April, the Sturt Creek catchment continued to receive significant rainfall, resulting in sustained overland and riverine flooding. By this point in the season, the Tanami Road crossing of Sturt Creek near Billiluna had been inundated since 24 January, isolating communities such as Balgo, Mulan, and Kundat Djaru (Ringer Soak) for over 85 days.

By the end of April, the flooding which was impacting the roads had started to recede seeing access into all communities by 30 April which put an end to community resupply activities.

24	February 2024 – March 2024	Catastrophic fire danger and severe storms with associated electrical disruption	Grampians region, central region (including Melbourne) and Gippsland	Emergency Management Victoria
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See Case Study 5

No.	Date	Incident	Location	Jurisdiction and agency
25	February 2024	Bayindeen-Rocky Road bushfire	Ballarat region, Mount Cole	Department of Energy, Environment and Climate Action, Victoria



Weather conditions leading up to 22 February were significant, with Victoria experiencing a long, hot dry spell and severe weather forecast, with Total Fire Bans in place across 6 districts. Hot, dry weather, strong, gusty winds and an elevated C-Haines ahead of a significant wind change meant Extreme Fire Danger conditions were forecast. Additionally, there were 2 recently contained fires of significance in the Grampians National Park and adjoining areas that required a heavy resource commitment.

At approximately 10:30am, Bayindeen-Rocky Rd fire was first reported to FFMV crews.

The initial fire was reported as being located at the junction of private property and the Buangor State Park, with a rapidly building smoke column under the influence of a strong north/north-easterly wind pushing toward a steep uphill run to Mt Buangor. Rapid first attack crews were dispatched from FFMV and CFA, supported initially by 3 Single Engine Air Tankers (SEAT) and 2 Type 1 fire-bombing helicopters that had been locally prepositioned. Soon after, 3 Large Airtankers (LAT) from Avalon were dispatched (the additional LAT was on loan from New South Wales and prepositioned at the Avalon Airbase).

Driven by the severe weather, producing pyro-convective fire behaviour and long-distance spotting, the fire grew to 21,664 hectares with significant resources and aircraft deployed, including night fire bombing and reconnaissance operations. A large number of spot fires ahead of the main fire threatened nearby communities. A significant burning-out operation was undertaken by FFMV crews ahead of Catastrophic Fire Danger conditions forecast for 28 February. New South Wales deployed 120 firefighters to assist Victorian firefighters amid Extreme – bordering Catastrophic – conditions. The combined efforts were critical in maintaining control lines and containing breaches. The fire burnt for 7 days before being declared contained on 29 February. The cause of the fire was not apparent, and a follow-up investigation was required.

During the fire, 6 residential properties were lost, power, communications (mobile and radio) and 2 water treatment plants were compromised, the Western Highway closed, and rail services suspended. Agricultural losses were limited. The Beaufort Hospital was evacuated, and nursing home residents relocated, whilst several schools were closed. Approximately 140 people from the State Park and State Forest were also evacuated.

26	February 2024	Severe storms and flash flooding	Sydney region	New South Wales State Emergency Service
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An inland trough generated severe thunderstorms and showers over widespread parts of New South Wales on 19 February. The severe thunderstorms impacted Sydney from midday before moving north. Heavy rainfall impacted parts of the Hunter and Sydney, resulting in 665 incidents recorded by NSW SES. Flash flooding occurred in many parts of Sydney. In response, 15 flood rescues were undertaken across Sydney and 23 in-water flood rescue teams were activated, with the majority of rescues undertaken for people trapped in vehicles by floodwater.

During the storms, the Sydney region recorded around 75,000 lightning strikes within 3 hours. This resulted in 4 people being struck by lightning while seeking shelter under a tree at Sydney's Royal Botanic Gardens. They were taken to hospital in serious but stable conditions, with injuries from burns and cardiac symptoms. Lightning strikes also caused 3 house fires and several tree fires across Sydney.

The weather resulted in disruption to transport for rail and road networks. Flights from Sydney Airport were delayed due to the storm as well as lightning damage to the tarmac. It was reported that over 16,000 homes across the northern parts of Sydney lost power because of the storms.

27	February 2024 – March 2024	Lithium-ion battery structure fire	Teralba	Fire and Rescue New South Wales
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At approximately 4:00am on 29 February, residents in a townhouse at Teralba, New South Wales were fitting a plastic cowl that protected the battery of an electric trail bike. A screw punctured 1 cell of the 72V 12000W battery, causing it to go into thermal runaway. Flames erupted out of the battery, forcing the 2 residents working on the bike to retreat outside. The fire intensified at an extremely fast rate, trapping a woman on the ground floor and a woman on the second floor. Firefighters arrived 8 minutes after the fire started. The fire caused by the failing battery resulted in serious damage to the structure and 2 fatalities. These are the first reported fatalities from a lithium-ion battery fire in Australia and are part of rapidly accelerating incident trend which has seen a 67% increase in battery fire incidents in New South Wales from 2022 to 2023.

No.	Date	Incident	Location	Jurisdiction and agency
28	March 2024 – April 2024	Cyclone Megan and associated flooding	Gulf of Carpentaria	Northern Territory Fire and Emergency Services



Severe Tropical Cyclone Megan formed as a tropical low (09U) on 13 March, near the Tiwi Islands north of Darwin, and moved eastwards close to the Top End coast, which resulted in heavy rain and flooding to communities along the coast. The low entered the Gulf of Carpentaria on 15 March strengthened to tropical cyclone level on 16 March and caused widespread damage to Groote Eylandt as it passed.

Severe Tropical Cyclone Megan then moved slowly to the south/southwest, crossing the southwestern Gulf of Carpentaria coast, about 45 km southeast of Port McArthur, as a Category 3 cyclone on the afternoon of 18 March. Megan quickly weakened as it moved inland and was downgraded to a tropical low overnight from 18 to 19 March.

Very intense rainfall and flooding was caused by the slow movement, with Groote Eylandt Airport recording a two-day rainfall total of 680 mm and Borroloola recorded a two-day rainfall total of 370 mm. A record major flood level was recorded in the McArthur River on 22 March. Flooding forced the evacuation of 359 residents from Borroloola, with assistance from the Australian Defence Force.

Flooding associated with ex-Tropical Cyclone Megan damaged major highways and several secondary roads along its path across the Northern Territory during late March.

29	April 2024	Flooding and landslips	Multiple regions including Hawkesbury-Nepean, Blue Mountains, Sydney region and the Illawarra	New South Wales State Emergency Service
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A coastal trough and low-pressure system affected eastern parts of New South Wales at the beginning of April 2024. The weather system brought heavy and locally intense rainfall over a 3-day period which resulted in flooding in several locations along the coast. Flooding also occurred in several areas in Sydney resulting in evacuation orders being issued along parts of the Georges and Hawkesbury-Nepean Rivers. Both Warragamba and Woronora Dams spilled during this event.

NSW SES responded to 5,516 incidents, including 203 flood rescue activations, predominately in Sydney and the southeast of the state. There were 565 warning products issued to impacted communities during the event.

As a result of the impacts, Natural Disaster Declarations were issued for Blue Mountains, Camden, Hawkesbury, Kiama, Liverpool, Penrith, Shellharbour, Shoalhaven, Sutherland, Upper Lachlan, Wingecarribee, Wollondilly and Wollongong local government areas.

A significant landslide on Megalong Road, Megalong occurred on 5 April, completely blocking the road. The Blue Mountains Council worked with emergency services to establish a temporary route to evacuate approximately 200 visitors trapped in the area. Council established pedestrian access to the area within a week, however, the access was initially restricted to residents and employees of the valley and essential services, each morning and afternoon. It was initially estimated that it would take up to 3 months to restore full access to the area. Blue Mountains Council coordinated the delivery of essential food, fuel and animal supplies to the community. The road opened to light vehicle traffic on 19 April.

A landslide on Lawrence Hargrave Drive in the Illawarra resulted in the road between Coalcliff and Clifton being closed in both directions for approximately 24 hours. There were other minor landslides causing road disruptions in several locations. Rail services were significantly disrupted in numerous locations due to flooding of tracks. Power outages were reported in multiple locations around the state.

In total, 413 damage assessments were undertaken, showing 110 properties damaged, including 52 inundated and 30 deemed not habitable.

30	May 2024 – June 2024	Enga landslide – deployment of DART team and aid	Enga Province, Papua New Guinea	National Emergency Management Agency
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Following a landslide in Enga Province in the north of Papua New Guinea on 24 May 2024, Australia provided an initial \$2.5 million in humanitarian assistance, including relief supplies for up to 750 households, funding for partners, and activated AUSASSISTPLAN to provide physical assistance to the Papua New Guinea government. Between 28 May and 6 June 2024, a 16-person DART, consisting of Queensland Fire and Emergency Services, Department of Foreign Affairs and Trade, NEMA and staff from DFAT's Humanitarian Logistics Capability. The DART provided specialist response planning and coordination surge support to the Papua New Guinea Government and local first responders, technical advice and assessment of the land slippage using drone technology, and assistance with constructing temporary shelters provided by the Australian Government. On 2 June 2024, the New South Wales Rural Fire Service undertook aerial multispectral scanning activities of the landslide site.

7. Major incidents 2023–24 case studies

The following case studies have been selected by state and territory emergency services organisations.

CASE STUDY 1 | QUEENSLAND

South West Region
bushfires

CASE STUDY 2 | NORTHERN TERRITORY

Barkly Fire Complex

CASE STUDY 3 | QUEENSLAND

Severe storms and rainfall

CASE STUDY 4 | WESTERN AUSTRALIA

Heatwave

CASE STUDY 5 | VICTORIA

Catastrophic fire danger
and subsequent impacts

South West Region bushfires

Bushfires in Queensland typically occur in less densely populated areas however, Queensland's recent bushfire seasons, which have been unpredictable in both timing and duration, have shown that bushfire is a major hazard for the state, with the potential to significantly impact Queensland's economy, environment, and communities. The bushfires experienced in the South West Region, particularly from December 2022 to March 2023, and again from July 2023 to February 2024, clearly demonstrate this. Insights captured from successive bushfire seasons, focusing on the South West Region, have been examined to determine what lessons we have learned over time.

Queensland's 2022-23 State Disaster Risk Report identified significantly higher temperatures for all seasons and lower winter rainfall as significant long-term impacts in southwest Queensland. The South West Region received a hazard ranking of 1 (highest risk) for riverine flooding and a hazard ranking of 2 (second highest risk ranking) for bushfire, establishing the link between higher fuel loads and bushfire risk.



Figure 17. Locality map of South West Region Fires.

Image: NEMA

Seasonal conditions

Historically, the bushfire season in Queensland commences in the north of the state in August and concludes in December of each year. Increasingly, climate influence of weather patterns and fuel loads means bushfire seasons are becoming more unpredictable in terms of scale, frequency and complexity.

The 2023-24 bushfire season officially commenced on 1 August 2023. The average rainfall for the months prior and during the bushfire season reflected a significant drop in average rainfall from a monthly average of 73.2 mm in July 2023, to a monthly average of 19.2 mm in October 2023. Consequently, Queensland Fire Department (formerly Queensland Fire and Emergency Services) had already responded to over 5,000 bushfires between January and September 2023. This was more than double when compared to the same period in 2022. Bushfire activity initially began in southern Queensland and was highly active from July to November 2023.

The AFAC Seasonal Bushfire Outlook for Spring 2023 highlighted the potential for the bushfire season to be much more active than in recent years. Reduced seasonal rainfall, low root zone soil moisture levels and elevated evaporation rates across inland parts of the Capricornia, Wide Bay-Burnett and the Southeast Coastal forecast areas, and in widespread parts of the Western Downs, Southern Downs and Granite Belt, combined to produce above average fire potential for the spring bushfire season (Figure 18).

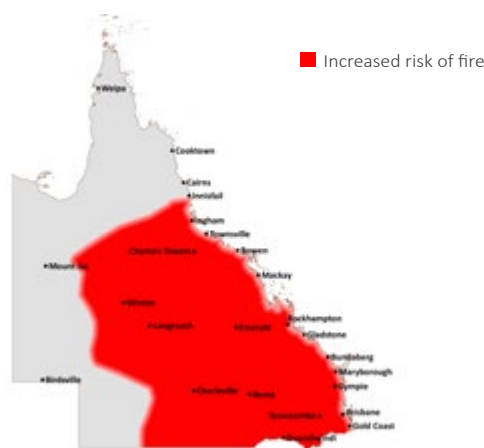


Figure 18. AFAC Seasonal Bushfire Outlook for Queensland, Spring 2023.

Image: AFAC

By summer 2023-24, the AFAC Seasonal Bushfire Outlook forecast a continuation of the intense late spring fire conditions into the summer months.

Regional Profile

The South West Region is the second largest geographical region of Queensland at 426,000 square kilometres. There are 11 local government areas within the region, including Toowoomba,

Maranoa, Western Downs, Southern Downs, and Goondiwindi. These 5 regional areas were predominantly impacted by bushfires during the 2023-24 bushfire season in Queensland. Although Western Downs local government area was primarily impacted during the 2022-23 bushfire season, the Southern Downs, Goondiwindi, and Toowoomba regional areas also experienced heightened bushfire activity, however were not activated for DRFA during the 2022-23 bushfire season.

What happened

On 6 September 2023, significant fire activity commenced across southern Queensland necessitating sustained support within the region, requiring the Regional Operations Centre and several Incident Control Centres to be activated.

The season was very active from July to November 2023, with significant early season fires in the Western Downs and southeast Queensland following a significant build-up of fuel during the preceding years under La Niña climate influences. Other areas of the state were slower to transition from these wet conditions, however by October 2023, fires were experienced across the state with significant fire activity experienced in all areas. During the 2023-24 bushfire season, approximately 1,700 bushfire warnings were issued throughout Queensland. Of these, 551 (32 per cent) were issued for the South West Region.

How did we respond

A bushfire in Tara was first reported on 15 October and by 23 October, was starting to threaten homes. Flames were reported to be up to 20 metres above the tree canopy. By 24 October, the situation deteriorated and the Western Downs Regional Council (WDRC) was reporting challenges with communications (Figure 19). Local communities were being accommodated in the local evacuation centre and by 25 October, approximately 200 people had sought refuge at evacuation centres in Tara and surrounding towns.

By late October, fatigue had become an issue for firefighters and further resources were requested from interstate and New Zealand to support fatigued crews. Subsequently, from 6 to 28 November, 53 personnel from Fire and Emergency New Zealand, 579 personnel from Emergency Management Victoria, 11 personnel from ACT Emergency Services Agency and 7 personnel from the AFAC National Resource Sharing Centre were deployed to support response efforts in both the South West Region and Central Region within Queensland.

On 28 October, the WDRC reported that 280 residents had been evacuated and more than 30 homes had been destroyed. At that stage, more than 11,000 hectares in the Tara region had been impacted over a 4-day period.

Authorities issued 3 emergency evacuation alerts between midnight and 2:00am on 28 October, for residents around Tara, Wieambilla, and The Gums. On 30 October, firefighters were responding to around 70 bushfires in the region. On 31 October, the Wallangarra bushfire forced the closure of the New England Highway between Wallangarra and Pyramids Road. Joint operations between Queensland and New South Wales to fight fires on both sides of the border were effectively carried out by coordinating efforts and sharing resources.

During the season, air operations provided significant support, with over 22,000 drops, totalling over 40 million litres of suppressant and fire retardant, from the beginning of September. On 31 October, the town of Wallangarra was saved following a massive firefighting effort including a large aerial tanker and other water bombing aircraft. During the season, there was a total of 676 dispatches and 3,104 hours flown, including both crewed and uncrewed operations.

By 11 November, 3 significant bushfires were burning simultaneously in the Tara region. Widespread rain in late 2023 and early 2024 eased conditions leading to the cessation of the operational period on 1 February (see Figure 20 and Figure 21).

	Start date	End date	Duration	Fire location/s	Local government area	Hectares burnt
1	6 September 2023	15 September 2023	9 days	Kumbarilla State Forest, Cecil Plains	Toowoomba	7,734
2	3 October 2023	18 November 2023	46 days	Carnarvon National Park	Maranoa	427,368*
3	23 October 2023	06 November 2023	14 days	Tara, Darling Downs, Millmerran	Western Downs	21,038
4	28 October 2023	08 November 2023	11 days	Wallangarra, Dalveen, Granite Belt	Southern Downs	21,187
5	31 December 2023	07 January 2024	7 days	Beebo	Goondiwindi	8,881

Figure 20. Significant fires in the South Western District in the 23/24 bushfire season.

* Within the Carnarvon National Park fire, approximately 193,136 hectares burnt in the South West Region and 234,232 hectares burnt in the Central Region.

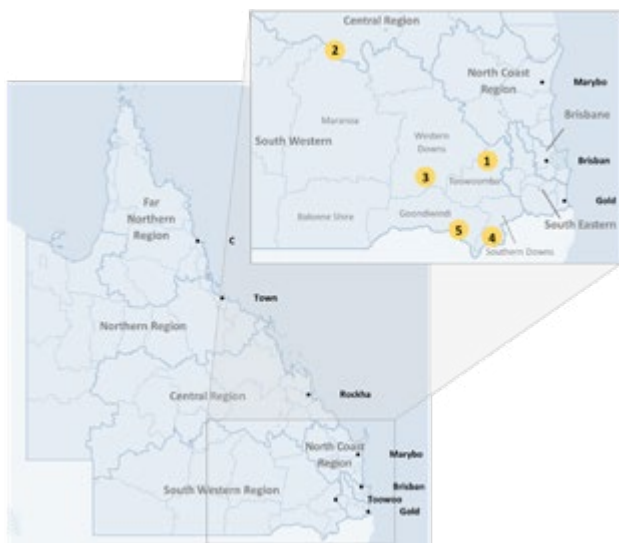


Figure 21. Location of the 5 significant fires of the South West and Central Regions.

Image: Queensland Fire Department

Impact and consequence

During the season, from 6 September 2023 to 7 January 2024, 251,976 hectares were burnt in the South West Region, 21,187 hectares of which were burnt in Western Downs, compared with approximately 90,000 hectares for South West Region in the previous season. The total number of vegetation fires was over 700, as well as nearly 100 vegetation fires with exposure that threatened life, property, or livestock.

Communities in these regions are saturated with advice and information about preparing for bushfire and monitoring local conditions. However, the rapid onset and dynamic nature of bushfires resulted in tragedy. Two lives were lost in Tara during the season in the South West Region. The first death occurred on 24 October, when a man died while trying to protect his property. The second death occurred on 25 October, when a woman died after suffering a medical episode while attempting to evacuate.

Communications and warnings were paramount in this bushfire season to keep the community informed and reduce the threat to their lives. A total of 2,580 Triple Zero calls were logged in the South West Region during the period. Overall, 551 bushfire warnings were issued including 239 advice warnings, 205 watch and act warnings, 107 emergency warnings. Of these, 103 'Leave Immediately' warnings were issued for Tara, Kogan, Cypress Gardens, Millmerran Downs, Wutul, East Cooyar, Dunmore, Wieambilla, Goranba, Weranga, Millmerran Woods, Halliford, Moonie, The Gums, Montrose North, Dalveen, The Glen, Cherry Gully, Silverwood, The Pines. Additionally, one 'Seek Shelter Immediately' warning was issued for Wallangarra. There were 42 Emergency Alert campaigns, compared with 6 campaigns during the previous season within the affected areas within the South West Region. In total, approximately 1,000 people registered as evacuees within the region.

Direct response from firefighters saved many assets. In response to the bushfires, 1,275 personnel were deployed to the South West Region and 845 appliances involved in over 5,000 responses. Five injuries were sustained by firefighters in the region that were classified as notifiable to Workplace Health and Safety Queensland.

In assessing the impact from the bushfires, 726 damage assessments were undertaken compared with 119 damage assessments in Western Downs during the previous bushfire season. Over 130 structures were destroyed during the season, including 63 houses, compared to 30 structures the previous season within the region. This repeat, chronic fire season has added to the cumulative impacts and consequences to the communities of southwest Queensland (Figure 22).

South West Region bushfires, event scale

6 September 2023 – 7 January 2024

	>700 vegetation fires <100 vegetation fires with exposure		726 damage assessments 130 structures destroyed including 63 houses destroyed
	251,976 hectares burnt		676 aircraft dispatches 43 individual aircraft used
	1,275 personnel deployed		2,911 hours flown
	845 appliances were involved in <5,000 responses		2,580 triple zero calls logged
	42 emergency alert campaigns 85,509 text/voice messages sent		551 bushfire community warnings issued in the region across the season

Figure 22. Event scale of South West Region bushfires, 6 September 2023 - 7 January 2024.

Relief and recovery

Initial recovery assistance was jointly funded by the Australian and Queensland governments and included almost \$660,000 in Personal Hardship Assistance. More than \$12 million was subsequently jointly funded by the Australian and Queensland governments to support the mid-to-long-term recovery and resilience needs of affected communities. Initiatives included:

- \$6.24 million Community Health and Wellbeing Package
- \$2.2 million Mental Health Package
- \$1.87 million Agricultural Industry Recovery and Resilience Officers
- \$1.5 million Rural Landholders Recovery Grants Program

DRFA were activated for 17 local government areas impacted from 8 September to 7 November 2023 by the southern Queensland bushfires including Toowoomba, Maranoa, Western Downs, Southern Downs, and Goondiwindi regions. The Pines and Toowoomba communities were also eligible for DRFA from 19 November to 1 December 2023 in response to a bushfire at Condamine.

Rural Fire Service Queensland was able to establish a Bushfire Recovery Project team to take on the role of managing a range of bushfire recovery operations. The small team focused on 7 key areas of recovery including:

- People – staff, volunteers, contractors and community
- Environmental – fire line remediation
- Lessons – debriefs and community meetings
- Accounting and records – submissions for grants, contractor engagement, and payment of accounts
- Identifying community resilience and mitigation programs
- Infrastructure – incident control centres, command vehicles, and air operations
- Rural Fire Brigades – equipment management and volunteer management.

Resilience

Following on from the South West Region bushfires, and in light of some weather forecasts indicating a return to higher rainfalls in the region in the future, on 22 May 2024, Toowoomba Regional Council hosted a multi-agency evacuation exercise, which tested disaster management capability in the event of major flood event necessitating mass evacuation in the region (Figure 23).



Figure 23. Toowoomba hosts 'home on the range' exercise to boost community resilience after the 2023-24 bushfire season.

Image: Toowoomba Regional Council

What did we observe?

In 2018, the former Queensland Fire and Emergency Services developed and implemented a robust lessons methodology, aligned to the Observations, Insights, Lessons Identified, Lessons Learned (OILL) model documented in the Australian Institute for Disaster Resilience (AIDR) Lessons Management Handbook.

Following the most recent bushfire season, a longitudinal assessment of insights from debriefs conducted since 2018 was undertaken. Thematic analysis of these insights supports applied lessons as an enabler for improvements and resilience in response activities. This is illustrated by insights reflecting a clear shift in focus, over time, from siloed response activities towards proactive collaboration demonstrated by an increase in proliferation in observations relating to pre-season agency collaboration, community engagement, and mitigation, rather than just response phase observations. This may indicate that, increasingly, all phases of prevention, preparedness, response, and recovery are considered critical drivers to the effective management of bushfire. Over time, observations generally reflected an increasing appetite amongst debrief participants to implement regular and collaborative exercising and workshopping during low tempo periods, which the South West Region proactively undertake with key partner agencies such as Queensland Parks and Wildlife Service.

More broadly, comparative analysis of historical observations shows improvements being embedded in the capture and sharing of information and intelligence, the application and utilisation of air operations support, and engagement protocols for and tracking of interstate and international

resources. There has been a clear evolution of operational information and intelligence sharing, with an increase in positive observations captured in recent years. Since the 2018-19 season, significant work has been undertaken to review operational doctrine and this is evidenced by an absence of observations relating to operational doctrine from the most recent season. Increasingly, observations have been received highlighting how Queensland's Rural Fire Brigades and Area Fire Management Groups can be more effectively and proactively engaged and utilised.

Some capabilities, activities and inputs have been and will continue to be consistently identified as areas for improvement. These include training, command and control functions, transfer of control, resourcing, and situational awareness during response activities, and these areas continue to evolve and improve. For example, the refinement and enhanced dispatch of aircraft to enable faster response for bushfires in high-risk areas.

It is important to note that with the increasingly dynamic nature of bushfires, combined with technological, organisational, and operational changes over time, keeping pace with technology on the fireground is an increasingly common topic in lessons activities. Advances in mapping and radio technology are both areas where effective and collaborative stakeholder partnerships are becoming critical during response operations.

It is evident that meaningful improvements have been made within Queensland Fire Department, that over time will reinforce the value of maintaining an agile lessons program within emergency management organisations.

Barkly Fire Complex

What happened in 2023 was an extraordinary fire season for the Northern Territory, with 903 wildfire incidents recorded compared with 472 in 2022, and for the first time, all areas within the Northern Territory were under fire danger declarations. The AFAC Bushfire Seasonal Outlook for June to August 2023 forecast an increased risk of wildfire throughout Central Australia and the Barkly region following several years of rainfall in typically dry, arid regions, resulting in growth of above-average grass and mid-story fuel loads. This was a rare crossover of the Top End savannah and the Central Australia spinifex country fire seasons. By the end of the 2023 fire season, more than 42 million hectares of land had been burnt across the Northern Territory.

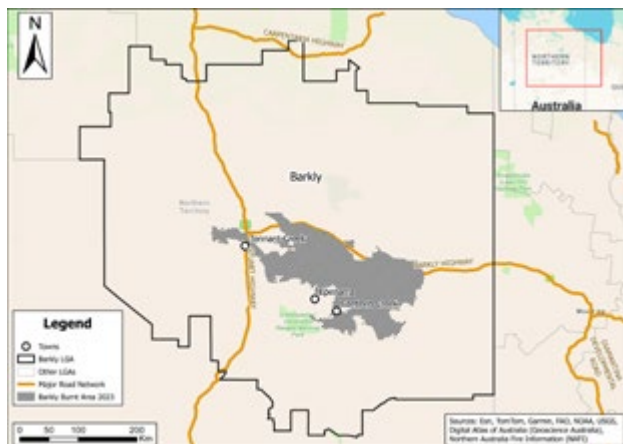


Figure 23. Locality Map for Barkly Fire Complex.

Image: NEMA

By late October 2023 there were 43 going fires across the Northern Territory affecting almost every major transport route. There were up to 10 large fires impacting or threatening multiple properties and communities and being actively managed by Bushfires NT. Over the 8-week period the fire threatened 3 communities: Epenarra, with a population of 170, Tennant Creek, a regional centre with 3,000 people and Canteen Creek, with a population of 147. During this period, the fire continued to threaten smaller outstations and communities around the Barkly region, disrupt transport and primary production activities, and threaten critical infrastructure.

Significant fire weather affected the Barkly region, with 123 fire incidents. The Barkly Fire Complex incident originated when 2

of these wildfires merged in early September 2023 (Figure 24). It was a significant fire event by both Northern Territory and Australian standards, having burnt an estimated 2.8 million hectares over a period of 8 weeks from 29 August to 23 October 2023, and impacting on conservation areas, Aboriginal Land Trusts, pastoral stations, and local communities.



Figure 24. Two large bushfires converged on the 5th of September to create the Barkly Fire Complex.

Image: Bushfires NT

There were numerous challenges responding to this event which include the remoteness, size of the active fire, weather, fuel loads and fuel type, lack of mitigation, lack of available support, logistics, fatigue management, poor communication from the fire ground, and other fires of significance across the Northern Territory impacting on the availability of resources and support.

While managing these incidents, Bushfires NT, an agency of about 40 people, was experiencing extreme levels of staff fatigue. Breakdowns of firefighting plant and equipment in remote areas, where spare parts and replacement equipment is difficult to access, was a constant challenge (Figure 25). Assistance was sought from other Northern Territory Government agencies to provide qualified medium to long term secondment of staff to support incident management team (IMT) operations in all roles.

Why did it happen?

For northern Australia, the 2022–23 wet season (October 2022 to April 2023) was the sixth-wettest on record since 1900–01. The start of July 2023 saw widespread rainfall in the Northern Territory's Barkly Tableland, with totals of 25 to 50 mm and up to 100 mm locally. This is unusual for the dry season, where average monthly rainfall in the region is less than 5 mm.



Figure 25. Grader constructing a firebreak to use as a containment line.
Image: Bushfires NT

Extended periods of rainfall during the dry season promoted vegetation growth across northern Australia.

As noted in Chapter 3.2, during September and October 2023, conditions across northern and eastern Australia were generally dry and warm. Easterly winds were stronger than average across northern Australia, particularly during September.

In the lead up to August, fire agencies in the Northern Territory had forecast an increased risk of wildfire throughout most of Central Australia including the Tanami Desert and Barkly region (Figure 26). Conditions in the lead up to the event were like those experienced in previous above normal fire seasons. The previous 2 years of rainfall had caused spinifex and shorter-lived grass fuels to develop and connect across great distances. Conditions were drying out, with reduced rainfall and higher than average minimum and maximum temperatures.

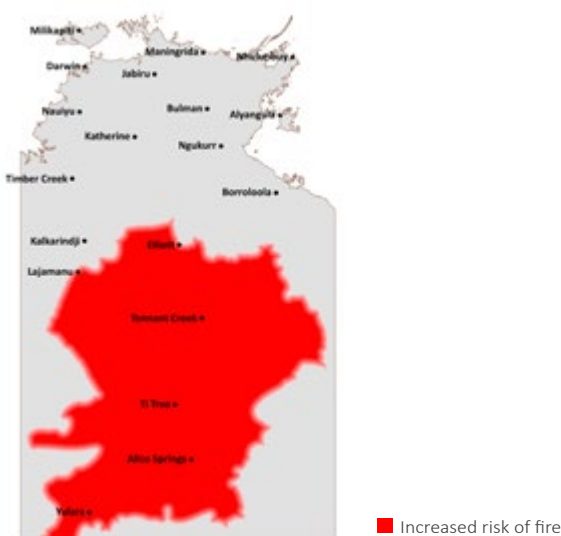


Figure 26. AFAC Seasonal Bushfire Outlook for Spring 2023.
Image: AFAC

In response, an extensive planning and preparedness approach was undertaken by Bushfires NT and Northern Territory Fire and Rescue Services (NTFRS).

How did we respond?

At the time of the Barkly Fire Complex, fire agencies were already stretched with resourcing commitments in other, higher populated regions. Moving resources to the Barkly region was a difficult balance between ensuring enough firefighting capacity remained in all regions.

In the Northern Territory, fire response is the responsibility of the land holder. Principally in the Barkly region this is pastoralists. Livestock is the lead industry for the region, with an estimated 1 million head of cattle on various pastoral leases (Figure 27).



Figure 27. Barkly Region centred on Tennant Creek with Aboriginal land trusts and pastoral leases map.
Image: Bushfires NT

Bushfires NT took control of the Barkly Fire Complex from pastoralists on 5 September 2023. On 12 September, a formal emergency situation was declared for the Barkly Fire Complex when the wind conditions changed and pushed a 200 km fire front towards the town of Tennant Creek. The emergency situation declaration was important because Tennant Creek, the smallest volunteer brigade in the Northern Territory, did not have enough firefighting or emergency management capacity to manage

the situation locally. During the following 6-week period, Bushfires NT, NTFRS and other government agencies, pastoralists, land managers and community partners responded to fire. The fire was impacting major transport routes and threatening several remote Aboriginal communities and outstations including the Barkly Highway, Canteen Creek and Epenarra. The response effort spanned from August to October 2023 and scaled to a Level 3 emergency response. These response activities highlight that the bushfire response arrangements in the Northern Territory are heavily reliant on partnerships in government and the private sector.

In support of the emergency response, significant resources were deployed to the Barkly region from other Northern Territory Government agencies, in addition to 2 South Australian Country Fire Service strike teams comprising 132 firefighters, a paramedic, quick response vehicles, light and medium attack



Figure 28. IMT briefing Tennant Creek.

Image: Bushfires NT

trucks over 2 rotations. Half of these vehicles remained in the Northern Territory for New South Wales Rural Fire Service (NSW RFS) volunteers to use when they were also deployed to assist. These resources and personnel were coordinated through the AFAC National Resource Sharing Centre. NSW RFS also provided the use of their Citation jet with line scanning capabilities and fire behaviour analysts. In addition, the Department of Defence provided a blade team from Darwin, bringing both air and on ground resources to support the increasing fire threat, and provide relief to the fatigued workforce.

In a first for the Northern Territory, water bombers were despatched and utilised alongside other aerial assets to protect Tennant Creek, Canteen Creek, Barkly pastoral leases, and Alice Springs. Logistics to support the aircraft needed to be established. In support, the Department of Infrastructure, Planning and Logistics deployed public messaging boards for the Barkly Highway and engaged earthmoving contractors to undertake earth breaks on crown land around Tennant Creek and Tennant Creek Station. Pastoralists and landholders provided what local machinery could be found until further machinery could be trucked in. The Department of Education maintained liaison with schools on the potential fire threat. The Northern Territory Police Force conducted patrols of the Barkly Highway and provided Air Wing resources to conduct surveillance of the fireground and assist with crew deployment from Darwin to Tennant Creek.

Despite the deployment of additional staff and volunteers to the Barkly region, containment proved difficult to achieve due to the strength of the wind, difficulty in locating heavy plant equipment, back burning operations struggling against the strong winds, and the 2-hour distance to get to the fire ground and patrol once there.

By mid-September, Bushfires NT was facing significant impacts with staff and volunteer fatigue and a decision to initiate a withdrawal from active management of the fire was made as it was not a threat to communities at that time. A new response was initiated to assist community members and landholders install containment lines and protect the Canteen Creek community should a threat re-emerge.



Figure 29. Smoke and fire hazard across the Barkly Highway.

Image: NSW RFS

Tactical backburning was a major tool for firefighters. Given the scale of the fire, at least 2 of these back burns were greater than 200 kms long.

When a 75 km breakout on Epenarra Station threatened Tennant Creek, a large back burn of 200 km was successfully undertaken in advance of a significant wind change and the forecast catastrophic fire weather. The aim of this back burn was to strengthen containment lines and prevent the fire from travelling west through Tennant Creek Station and the Tennant Creek township.

On 10 October, Bushfires NT contacted the Northern Territory Cattlemen's Association to convene a meeting with surrounding pastoralists to discuss the encroaching fire and agree on a combined plan of attack (Figure 30).



Figure 30. Rate of spread map used in discussion with pastoralists.

Image: Bushfires NT

The plan was to establish a 120 km graded break from the Barkly Highway to the top of Elkedra Station. Once the breaks were installed, a 255 km back burning operation commenced, utilising station managers, staff, contractors, Bushfires NT staff and volunteers, aviation assets and a deployment of volunteers and staff from NSW RFS (Figure 31). The Barkly Highway was closed for 3 days. On 23 October 2023, 57 days after the initial report, the Barkly Fire Complex, had covered 2.8 million hectares, was declared safe and finally recorded as extinguished.

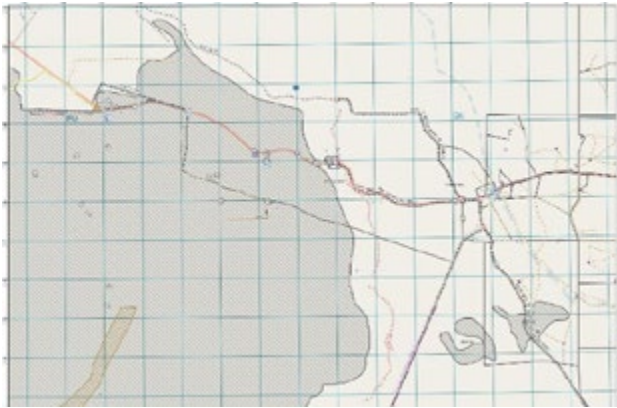


Figure 31. Map of final planned containment line.

Image: Bushfires NT

See Appendix 1 on page 53 for a detailed timeline of the incident.

Impact and consequences

During the incident, there was a sustained risk to life and property over multiple areas. The Barkly region is dotted with remote Indigenous communities, cattle stations with various outstations, mining lease infrastructure and major trade routes, roads and critical infrastructure corridors (Figure 32).

The Barkly Highway was closed for a total of 8 days with some intermittent closures during periods of high fire behaviour close to the road. Transport companies were working around impacts to road access, with freight and perishable groceries from Brisbane and Townsville diverted to be delivered from Adelaide instead.

Communication between responders across the remote Barkly region was exacerbated by the loss of a telecommunications repeater tower which remained inoperable for 3 days. The lack of regular and routine maintenance around tower locations throughout the Barkly increased the risk to infrastructure and consumed valuable resources during the height of the fire.

What did we observe?

The emergency declaration brought a great benefit to resolve the risk to Tennant Creek. A slower, better planned withdrawal of support when the declaration finished could have delivered a timelier outcome to contain this fire and lessen the ongoing risk to communities, primary producers, and users of the highway infrastructure.

The IMT was hampered during the event through under-resourcing in key functional areas. The experience of the planning team for fire response was not where it needed to be for landscape fire management. Late deployment of a suitable management team to Tennant Creek lost the opportunity to commence containment work with more favourable weather conditions. The over-willingness amongst firefighters to fight the fire and the sheer size and remoteness of the fire in the first few weeks led to long shifts that exceeded the fatigue management guidelines; this had the potential to lead to considerable organisational liability.

The importance of logistics and how we need to improve our logistics capacity and capability to better support operations in remote locations over a large geographical area. The reality was, in the early part of the response firefighting staff were fatigued by the time they reached the fire ground.

The generosity of other jurisdictions, including NEMA, to provide support with equipment, strike teams, fire behaviour analysts, line scanners and strategic planning capability was phenomenal. The network and support received through AFAC Members during these times cannot be underestimated and the willingness of volunteers to deploy to remote locations and undertake arduous work was paramount to the success of the operation.



Figure 32. Backburning on community access road. Image: NSW RFS

Severe storms and rainfall

Queensland historically experiences its highest severe weather risks from November to April for all hazard types. By December 2023, most of the state had already been impacted by a number of disaster events, from severe bushfires in southern and northern Queensland to Tropical Cyclone Jasper and associated flooding across the north.

In December 2023 alone, a series of thunderstorms impacted South East Queensland, from Gympie and Maryborough, through to the Scenic Rim and Gold Coast regions. These thunderstorms brought giant hail (up to 15 cm in diameter), gusty winds exceeding 85 km/h and heavy rainfall, with daily falls at times above 100 mm. A severe thunderstorm impacted Brisbane and Ipswich across 15 and 16 December, with wind gusts reaching 169 km/h at the Archerfield Airport, up from the previous record of 143 km/h. Severe thunderstorms also brought giant hail, well in excess of 5 cm, to Gatton on 23 December and Burpengary, Dayboro, Morayfield and Narangba on 24 December. Severe heatwave conditions and stifling humidity, with temperatures reaching into the high 30s, continued periodically across the state throughout December 2023 and January 2024 (Figure 33).



Figure 33. Locality Map of Severe Storms and Rainfall events.

Image: NEMA

What happened

On 25 December a severe thunderstorm system producing damaging to locally destructive wind gusts impacted the Gold Coast and Scenic Rim, resulting in a 3-4 km wide and 30-50 km long area of damage.

How did we respond?

Severe thunderstorms escalated quickly across the state from 4:00pm. The Bureau issued severe thunderstorm warnings for the Gold Coast, Logan and Scenic Rim that included 'very dangerous thunderstorm' escalations for giant hail and destructive wind gusts from 7:56pm and 8:40pm respectively. Subsequent warnings were then issued approximately every 17 minutes until cancelled at 10:19pm. Twenty-two thunderstorm warnings were issued during this period; 5 warnings were issued at 'Very Dangerous' level including the requested use of the Standard Emergency Warning Signal (SEWS) at 9:06pm, the highest possible warning for a thunderstorm, only issued when there is potential for loss of life, and likely to result in a significant, destructive event (Figure 34).



Figure 34. Thunderstorm pathways Source BOM Image produced by the Bureau of Meteorology.

Image: Bureau of Meteorology

At 9:48pm, the Bureau advised that the main cells had moved off the coast of the Gold Coast, however shower activity continued through the evening. Severe thunderstorm warnings were cancelled at 10:19pm following 22 hours and 19 minutes of active severe thunderstorm warnings for the day. Over 126,000

customers were reported without power throughout South East Queensland with restoration hampered by fallen powerlines, trees and other debris across roads. By 10:15pm, 221 State Emergency Service (SES) jobs were received from Gold Coast, Logan City and Scenic Rim areas including multiple trees into houses and reports of a large tree falling, causing partial collapse of a house in Tamborine Mountain. Emergency Services noted they were coordinating possibly hundreds more tasks that had not yet been entered into dispatch systems (Figure 35).

The strongest wind gust was recorded at 106 km/h by a Bureau station at the Gold Coast Seaway. There was evidence of stronger winds, including damaged infrastructure and property along parts of these areas.

On 26 December, severe thunderstorm warnings were again issued for damaging winds, large hail and heavy rainfall for an area extending from Mackay to the New South Wales border. Thunderstorm warnings were escalated to include Very Dangerous Thunderstorms for locally destructive winds and giant hailstones about the western Wide Bay & Burnett, southern Central Highlands & Coalfields and northern Darling Downs & Granite Belt at 4:21pm. The number of SES requests for assistance rose to 468. Support was requested from additional crews in surrounding areas and from New South Wales and Victoria through the AFAC NRSC (Figure 36).

Severe thunderstorms contracted from the southeast coast at 7:45pm and severe thunderstorm warnings were cancelled at 2:18am the following morning after 12 hours and 59 minutes of active severe thunderstorm warnings for the day. A total of 22 detailed severe thunderstorm warnings were issued, updated approximately every 19 minutes.

Around 122,000 customers were still without power. It was later found that more than 1,000 power lines were brought down during the storm. An Emergency Alert was issued in Scenic Rim reminding people to stay away from fallen power lines. These incidents and their consequences were exacerbated by the ongoing extreme heat as South East Queensland experienced 22 days of heatwave conditions between 29 November 2023 and 1 January 2024.



Figure 35. Storms destroyed homes on Christmas Day.
Image: ABC News

Field crews prioritised power restoration across affected areas, however, isolated pockets were without power for several days severely hampering the community's ability to request assistance and receive public messaging. Power restoration was a priority for vulnerable community members with high humidity and temperatures expected to reach into the high 30s on 28 December, 8 degrees higher than the December average. Agencies worked to source alternative accommodation for those with health conditions and those susceptible to heatwave, and provide heat health messaging.

Localised flooding was also impacting communities, as the Logan River at Beaudesert was reportedly at 8.32 m by 8:00pm with major flooding due to recent heavy rainfall in the catchment and was expected to reach around 8.7 m in the morning. Further rises were possible with thunderstorms predicted that evening.

On 29 December, there were very warm conditions in South East Queensland as Brisbane recorded a temperature of 38.3°C. Power had now been restored to more than 100,000 homes and businesses, close to 80 per cent restoration of the overall number of customers affected.

The wild weather continued into the new year as thunderstorms developed in areas north of Brisbane, with reports of flash flooding, large hail and damaging winds. The highest daily rainfall total recorded to 9:00am on 31 December was 127.6 mm at Beerburrum. Many locations in South East Queensland recorded their highest December daily minimum temperature (above 26°C) at this time.

Impacts and consequences

Tragically, 7 people lost their lives during these severe storm events, 3 men due to a boat capsizing in Moreton Bay, 2 women drowned in a stormwater drain in Gympie, a child was also lost in a stormwater drain in Brisbane, and a woman struck by a falling tree on the Gold Coast. A small number of people were also treated for injuries related to these events.

The impact on the second largest populated area in Queensland was exacerbated due to the traditional shut down period for services across the Christmas and New Year period. Local



Figure 36. SES teams were deployed from across the country to support the storm relief effort.
Image: ABC News

councils instigated clean-up operations with local resources, supported by neighbouring councils, state agencies, volunteers and commercial providers. The move to recovery was rapid due to the sudden onset and short duration of the storm event. Pop up recovery hubs were established in affected areas by 30 December, when they were accessible.

Relief and recovery

A RFA was submitted to the Australian Government on 30 December 2023, which resulted in Disaster Relief Australia dispatching 50 personnel on 4 January 2024, who continued to work in the impacted areas until 17 January. Clean up included the removal of fallen trees and vegetation debris, stabilisation of damaged trees and structures, clearing debris from roadways and restoring access to private and public buildings.

In total, 8 South East Queensland local government areas – Banana, Brisbane, Gold Coast, Logan, Murweh, Moreton Bay, Redland, and Scenic Rim – were activated for severe

storms from 24 December 2023 to 3 January 2024 for a range of disaster assistance through the joint state/territory and Australian Government DRFA to address the immediate and long-term impacts.

What did we observe

On 18 April 2024, the Minister for Police and Community Safety, the Honourable Mark Ryan MP, tasked the Queensland Office of the Inspector-General of Emergency Management (IGEM) to undertake a review of the 2023–24 severe weather season. The review will include the severe storms, tropical cyclones, tropical lows, flooding, and bushfires that occurred across Queensland between 1 October 2023 and 30 April 2024. The final report is due in September 2024.



Darling St, Balmain - Ashfield-Leichhardt Unit. Image: NSW SES



Darling St, Balmain - Ashfield-Leichhardt Unit. Image: NSW SES

Heatwave

In Western Australia the event of Heatwave is prescribed as a hazard under the Emergency Management Regulations 2006 (WA). The Hazard Management Agency (HMA) for the hazard of Heatwave is the Chief Executive Officer of the Department of Health, with the role of managing disasters or significant events delegated to the State Health Coordinator (SHC).

The State Hazard Plan for Heatwave (the Plan) is activated at the highest level of threat – extreme – and not for severe heatwaves. During the 2023-24 season the Plan was activated on 3 occasions, with a further 7 significant heat events that triggered public messaging from the HMA to mitigate heat-related health risks. The 10 events that occurred from mid-

November 2023 to mid-February 2024 impacted a large geographical area of Western Australia and a significant proportion of the state's population. On one occasion, an estimated 70 per cent (1.8 million people) of the population was affected while on another occasion, the event occurred with major power outages across the Goldfields and Wheatbelt regions which impacted people's ability to enact mitigation procedures and health advice (for example, use mains powered cooling appliances).

Against a background of one of the most challenging summers in recent years, this case study outlines, from the state-level perspective, the last activation of the Plan for the 2023-24 season.

What happened

In February 2024, there were 3 low to severe intensity heatwaves in Western Australia. As in November 2023, they were generally associated with a stationary deep trough off the west coast combined with high pressure systems in the Great Australian Bight. Daytime temperatures in the southwest of the state were frequently 8 to 14°C above the February average. Temperatures peaked on 18 February (Figure 37) and 19 February, with a number of stations having their highest temperatures for February or for any month. Carnarvon reached 49.9°C on 18 February, and Shark Bay 49.8°C, respectively the equal eighth and equal tenth highest temperatures ever recorded in Australia. Emu Creek in the Pilbara had 4 consecutive days (17–20 February) of at least 48°C, an Australian record. Perth had 7 days in February of at least 40°C, exceeding the previous record of 4 such days. The hot, dry and windy conditions caused elevated fire dangers across much of southern and central Western Australia, with the fire danger rating level reaching Extreme in some areas.

On 5 February 2024 the regular bi-weekly briefing by the Bureau discussed an extended period of hot weather commencing 8 February. Subsequent forecasts showed a large geographic area, ranging from the Albany coast in the south to Broome in the north, to be impacted by severe heatwave.

The triggers for activating the Plan occur when the Bureau is forecasting extreme heatwave (that is, Excess Heat Factor ≥ 3). In this case, the previous forecast of 5 February did not anticipate this occurrence. However, the HMA noted that the severe heatwave forecast covered a large portion of the state's population, therefore increasing the assessed risk. The impact was also forecast to include the southwest of the state, where people are less accustomed to extreme heat, even towards the end of the summer.



Figure 37. Locality Map of Heatwave event.

Image: NEMA

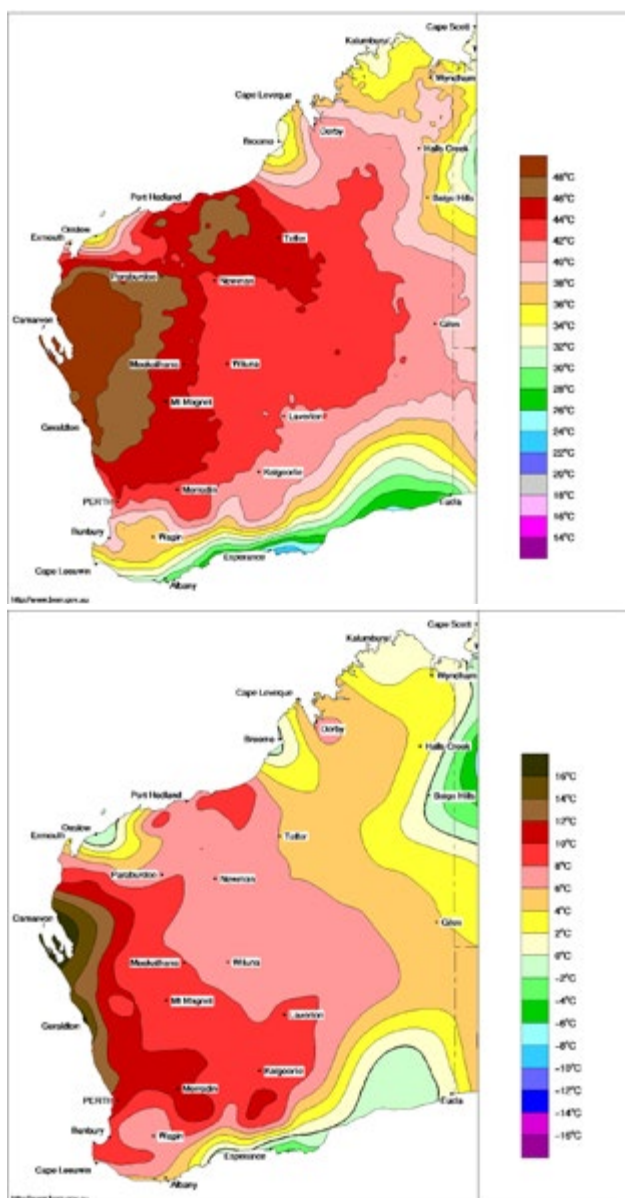


Figure 38. Western Australia daily maximum temperature (°C) for 18 February 2024 (top) and anomaly relative to the 1961–1990 February average (bottom).

Image: Bureau of Meteorology

On 5 February, the HMA advised its communications team and the regional health service provider (WA Country Health Service or WACHS) that response arrangements could be activated later in the week. At a minimum, it was anticipated that community messaging would be disseminated via EmergencyWA, the state-wide platform that provides information about a wide variety of hazards, including heatwave. Specific advice to metropolitan health service providers was not considered necessary on 5 February due to existing messaging through mass media and the proximity to health services in the metropolitan area compared to regional areas.

On 6 February the Bureau advised severe heatwave conditions were developing in the Gascoyne that were expected to increase in intensity and area toward the end of the week. The HMA

was already prepared for a media conference to be held on 8 February, and community messaging was modified for use in the event of a power outage during the heatwave.

On 7 February pockets of extreme heatwave were clearly distinguishable on the forecast maps for the 3 days starting 8 February (Figure 39). An in-depth analysis of the forecast identified 5 health regions plus the Perth metropolitan area that were likely to be impacted:

- Kimberley – Pocket of extreme heatwave forecast for Roebuck Plains
- Midwest – Severe forecast for Gascoyne coast including larger centres/tourist locations of Kalbarri, Geraldton and Carnarvon. Small extreme pocket forecast along North West Coastal Highway between Carnarvon and Coral Bay
- Wheatbelt – severe forecast for multiple towns including Narrogin
- South West – severe forecast for multiple towns including Collie, Harvey, Manjimup, Pemberton, Bridgetown and Boyup Brook
- Great Southern – severe forecast for multiple towns Katanning, Gnowangerup, Jerramungup and Mt Barker
- Perth Metropolitan – severe forecast for much of population.

In addition to the analysis of the forecast, the following issues were also considered:

- Extreme heatwave forecast areas included 2 major traffic routes (between Broome and Derby and between Carnarvon and Coral Bay – a total of 460 km)
- Major sporting event in Busselton (more than 4,000 participants expected, plus spectators)

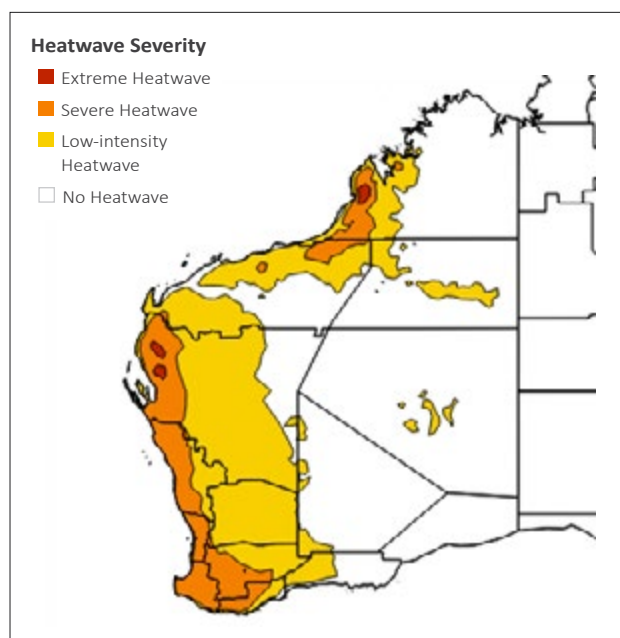


Figure 39. On 7 February pockets of extreme heatwave were clearly distinguishable on the forecast maps for the 3 days starting 8 February, issued on 7 February 2024.

Image: Bureau of Meteorology



Heatwave in Perth at sunset Image: ABC News

- Large-scale outdoor events in the Perth metropolitan area including a music festival and Chinese New Year celebrations, and an unknown number of private gatherings (and related travel) marking the Chinese New Year
- Potential impacts (and duration) from the heat event on the power grid and electricity supply
- Ability of the health system to surge due to the large area of impact and potentially affected healthcare staff.

On 7 February the SHC made the decision to declare a Level 1 incident, effective 8:00am on 8 February due to:

- Major highways impacted by 2 areas of extreme heatwave
- Severe heatwave covering a large portion of the populated area of the state forecast until 9 February (before contracting on 10 February)
- Uncertainty on impact (level, intensity and duration) on the power grid and electricity supply with potential to affect large geographical areas and 70 per cent of the state's population.

How did we respond?

The Level 1 incident declaration, effective 8 February, prompted the stand-up of state and regional emergency operations centres, activation of state and regional plans, media activities, public messaging and the appointment of metropolitan and regional incident controllers.

External agencies with specific roles and responsibilities in relation to heatwave were advised of the declaration on 8 February. Information provided to agencies related to the EmergencyWA alerts, the nature of the incident and the emergency management arrangements that had been put in

place. Agencies were also referred to HMA-approved heatwave information on the HealthyWA website that is freely available for use as required by organisations and members of the public.

Internal health system stakeholders were also advised of the incident declaration and tasked to monitor and report heat related presentations to hospital as well as critical infrastructure issues.

Two Australian Warning System advice level messages were issued on 8 February via the EmergencyWA platform – one message for the Kimberley emergency management district, and one for the combined area of the Midwest-Gascoyne, Wheatbelt, Great Southern, South West and Perth metropolitan area emergency management districts. The call to action on both messages was 'stay informed' and included specific text regarding the extreme forecast areas for travellers north from Carnarvon and east from Broome.

An All-Hazards Liaison Group meeting was held at 9:00am on 9 February to ensure any increased health risks or other issues were identified and responded to. The Bureau provided a briefing to the meeting. There were no particular issues of note raised by agencies.

A situation report was issued to external and internal stakeholders at 12:00pm on 9 February. Health services were requested to activate their heat plans and to continue to monitor and report heat-related presentations to hospitals.

During the afternoon of 9 February, the SHC decided to retain current EmergencyWA alerts at advice level and maintain the Level 1 incident activation for another 24 hours. Monitoring of impacts and public messaging was maintained. The state emergency operations centre continued to support the flow of information between the SHC, incident controllers and health service providers.

On 10 February the severe and extreme heatwave forecast areas were easing and the Bureau cancelled the warning for the Kimberley District, with severe heatwave conditions also expected to ease over southern districts, including Perth, from 10 February. On 11 February the HMA updated the EmergencyWA advice level alerts to reflect current conditions and heat health concerns:

- travellers between Broome and Derby- 'stay informed', extreme heatwave active over the Great Northern Highway. The highway was targeted on the EmergencyWA map via the use of the heatwave icon only (no polygon).
- the Western Gascoyne- 'monitor conditions', extreme heatwave remains over some parts. The EmergencyWA map included a polygon to continue to show a significant area of impact.
- parts of the Midwest, Wheatbelt, Great Southern, South West and metropolitan area- 'stay informed', conditions expected to ease but be aware of residual effect of heat and high daytime temperatures.

On 12 February a remaining extreme heatwave area covered largely unpopulated areas of Western Australia. The severe heatwave conditions in the southwest of the state had peaked and were contracting north of Perth, and the area of previous

concern in the Kimberley (covering the major highway) had been downgraded to severe. The SHC made the decision to stand down the Level 1 incident. Accordingly, the emergency operations centres and incident controllers were stood down, a final situation report was issued, and state and regional plans returned to Standby. EmergencyWA alerts were also adjusted by:

- removing the alert over the southwest of the state
- changing the alerts in the Midwest-Gascoyne and Kimberley to 'threat is reduced', with those alerts to be removed the following day on 13 February
- daily monitoring by duty officers returned to business as usual.

Impacts and consequences

While an increased number of heat-related presentations to hospitals were recorded, no significant impact to health or health care infrastructure was reported during the incident.

Agencies with roles and responsibilities under the Plan did not report any issues of concern, including energy supply and distribution.

The HMA's post-season review is yet to be completed.

What did we observe?

Multiple incident controllers were appointed although only one incident was formally declared. While noting the regional incident controllers acted in some ways as operational area managers, some of their actions, such as approving regional communications, were characteristic of incident controllers. The benefits and efficiency of using multiple incident controllers will be analysed for appropriateness, by the HMA, during the post-season review.

The need to translate the information between the Bureau's forecast areas, WACHS health regions (upon which the regional emergency management structure is based) and the state's emergency management districts not only slowed the analysis, interpretation and actioning of information, but also, on occasion, allowed for confusion and misinterpretation to occur. For example, forecasts were provided as per the Bureau's forecast areas. These were then translated to health regions to analyse which regions were impacted, then translated again to emergency management districts for messaging on the EmergencyWA platform. Clear preparatory work to guide staff around areas of divergence is recommended.

One agency with roles and responsibilities under the Plan reported that, when considering the messaging from the Bureau, EmergencyWA and the HMA, it was difficult to clearly identify the incident area. More broadly, informal feedback relating to confusion between the Bureau messaging and HMA actions and messaging has been noted by the HMA. Messaging from the Bureau and the HMA, and how they do and should interact, will be considered during the post-season review and in the context of related work underway by the National Heatwave Advisory Group.

These actions will address potential for confusion and misinterpretations, and also strengthen transparency of the HMA's decision-making.

2023-24 was the second season Western Australia used the Australian Warning System for heatwaves and, as HMA experience builds, messaging continues to become more agile and targeted. For example, with the benefit of hindsight, there has been some reflection within the HMA (to be fully considered during the post-season review) that messaging could have changed from Advice level to Watch and Act level during this incident, particularly for travellers in the extreme heatwave forecast areas.

This incident, and other heat events during the summer, reinforced the view that managing these events, even with the benefit of a forecast, is more resource-intensive than may be initially expected. A recommendation to other jurisdictions is to ensure good availability of staff during the high-threat season, and consideration of a dedicated resource for the duration of a heat event to provide continuity in planning and operations.

Catastrophic fire danger and subsequent impacts

What happened

On 13 February 2024, Victoria experienced a combination of concurrent emergencies, with significant fires, severe thunderstorms and damaging winds resulting in major impacts across Victoria, including significant disruption to water services, telecommunications and the electricity transmission and distribution network. The situation saw the first issue of a Catastrophic fire danger rating for the Wimmera region, and the first Catastrophic declaration in Victoria since the 2019-20 fire season. This cool change brought strong winds that would impact fire behaviour and cause significant damage in the Central region, causing a spike in VIC SES RFAs, mass power outages, and the destruction of critical infrastructure.



Figure 40. Locality Map for Catastrophic Fire danger.

Image: NEMA

Weather

A high-pressure system over the Tasman Sea extended a ridge over eastern Victoria whilst a trough deepened over western parts on 12 February. By 13 February, a cold front that had developed to the southwest of the state, combined with the trough and crossed Victoria during the afternoon and evening. (Figure 41).

February was tracking drier than average in terms of rainfall, and the synoptic pattern in the lead up to and including the morning of 13 February resulted in hot, dry, and windy conditions with parts of the state experiencing low intensity heatwave conditions on 10 and 11 February.

On the morning of 13 February northerly winds became strong and gusty and the thunderstorms that developed over most



Figure 41. Maximum wind gusts (km/h) in Victoria on 13 February 2024 (midnight to midnight). White borders indicate that the gust was a monthly record for February.

Image: Bureau of Meteorology

western and central parts were elevated and dry in nature. By the afternoon, thunderstorms had developed in a linear feature across the state along the front, extending from northwest to southeast and increasing in severity and rainfall amount. A few weather stations across the state recorded some of their strongest wind gusts for the month of February and of all time, associated with these northerly winds and thunderstorms. This includes Mount Gellibrand recording 130 km/hr at 11:35am, a record for February, and Yarram Airport recording 126 km/hr at 5:06pm, the highest on record.

Readiness

Hot and windy conditions were forecast for the Wimmera, Mallee and Northern Country on 13 February, with temperatures up to 40°C and gusty winds.

Isolated showers and gusty thunderstorms were forecast for northern, central and eastern parts of the state during the afternoon and evening. Severe thunderstorms eventuated over central districts, including in the Melbourne area, with damaging winds.

A Catastrophic fire danger rating was declared for the Wimmera district on 13 February. An Extreme fire danger rating was declared for the Mallee, Central and Northern Country districts on 13 February. A Total Fire Ban was declared in 6 districts: Wimmera, Mallee, Northern Country, Central, South West and North Central. The cause of the increased fire danger rating was a result of high temperatures and dry fuels and strong, gusty northerly winds in the Wimmera, Mallee, and Northern Country, followed by a south/south-westerly cool wind change, which was forecast to cross the state in the mid-afternoon.

Due to concurrent emergency events, activation levels at the State Control Centre (SCC) between the period of 13–17 February were as follows:

- Escalation to Tier 3 (Red) for a Class 1 (natural hazard) Emergency, commencing from 7:00am on 13 February
- Class 2 (other hazard) Emergency begins, causing overlap and a concurrent event, keeping the SCC at Tier 3 (Red) until 8:00pm on 17 February
- From 6:00am on 17 February, a reduction in activation levels occurred: de-escalating to Tier 2 (Orange) for Class 1 and Class 2 Emergencies during the day, and further de-escalating to Tier 1 (Blue) overnight, from 7:00pm to 7:00am.

How did we respond

The SCC was subsequently concurrently activated to Tier 2 (Orange) for Class 2 Emergencies on 13 February because of a statewide energy emergency.

By the end of the day, there had been 3 major bushfires across the state, 2 of which were in the Grampians National Park (Figure 43). The severe thunderstorms had also caused major damage in Geelong, Bendigo, the Dandenongs, outer eastern and southeastern suburbs of Melbourne and South Gippsland.

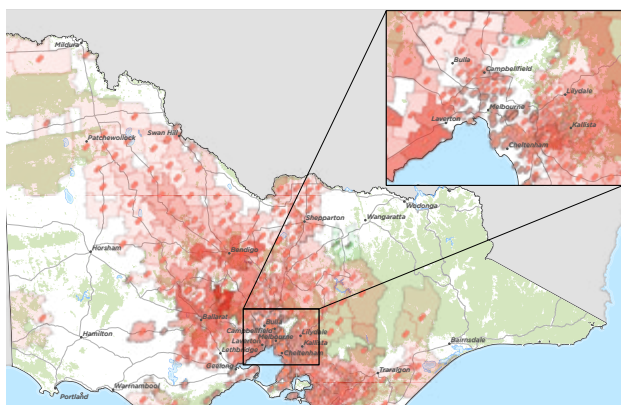


Figure 42. Statewide power outage overview map as at 4:52pm 13 February 2024.

Image: EMV



Figure 43. Statewide view of bushfires as at 5:00pm on 13 February 2024.

Image: EMV

The storms led to 6,800 RFAs to the VIC SES (Figure 44). The most severe impact being in the Mirboo North and Thorpdale communities, which included a fatality from airborne debris.

RFR was activated, operated by Australian Red Cross, with 769 registrations taken and 6 enquiries made.

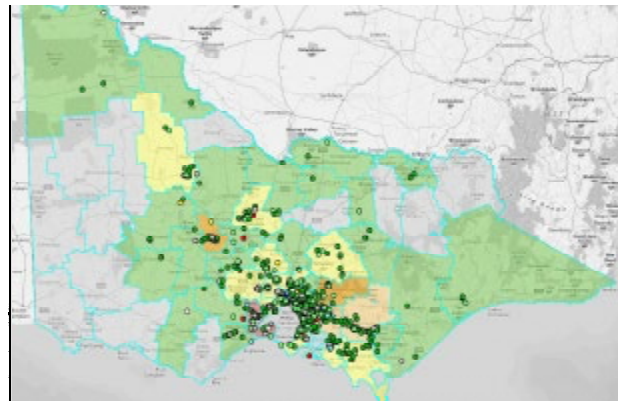


Figure 44. Statewide view of 6,800 requests for VIC SES assistance.

Image: EMV

Relief and recovery

Funding of over \$168 million was committed to address the relief and recovery needs, and support communities impacted by the storms and fires. A range of relief and recovery activities were implemented which included:

- Recovery Support Program
- Clean-up
- Council support
- Temporary Accommodation Program
- Personal Hardship Assistance Program (emergency relief payments and re-establishment assistance payments)
- Prolonged power outage payments

Immediate relief assistance was delivered. 192 emergency relief payments, totalling \$242,240, were provided in 5 local government areas – Pyrenees, Ararat, Golden Plains, Northern Grampians, and Hepburn – as of 4 March 2024. Re-establishment assistance payments were also made available to eligible households.

The Prolonged Power Outage Payment scheme, jointly funded by the Australian and Victorian governments under the DRFA, provided financial relief to 3,500 residential and 240 businesses who were without power for 7 or more cumulative days due to the large-scale and prolonged power outages resulting from the significant damage sustained to Victoria's electricity transmission and distribution network. The scheme allowed payments of \$1,920 per week for households and up to \$2,927 per week for affected small businesses for up to 3 weeks. As of May 2024, a total of \$7.5 million in Prolonged Power Outage Payment payments have been administered by AusNet Services to residents and businesses.

The Emergency Recovery Hotline was established to support impacted individuals seeking assistance. As of 31 May 2024, 6,900 calls had been made to the hotline. Common themes include the need for psychosocial support, information on

available relief and recovery programs, safety/emergency plans, and telecommunications issues. The number of people experiencing psychological distress with complex circumstances/needs resulted in call durations of an average 40-60 minutes.

The Recovery Support Program provides trauma-informed services to navigate people through their recovery. Over 2,400 households have accessed support through the Recovery Support Program. The program takes a continuum approach designed to be tailored to the resident's needs and providing information on how to access mental health and wellbeing, legal, business, and financial advice, as well as one-off support payments offered through the state and Australian governments.

The Clean-Up Program, funded through the DRFA, is delivering bushfire and storm clean-up support through hazardous tree removal and demolition of storm and bushfire damaged homes and ensures a focus on uninsured and underinsured residential properties. Street debris removal works, including green waste

and building waste, were also completed. Green waste micro sites were established in impacted communities to efficiently process green waste, where possible, in the community. A total of 697 registrations – 194 for bushfire and 503 for storm – affected properties have been received.

As communities rebuild and heal from the compounding impact of multiple emergency events, the focus remains on medium to longer-term recovery. Sector partners are working to strengthen recovery coordination arrangements and ensure that the recovery needs of impacted communities are being met. This involves a focus on monitoring recovery progress- providing evidence-based advice into government on where recovery is going well and where it is being challenged. The second is a system-level focus, working across the sector to drive continuous improvement to achieve relief and recovery outcomes into the future. In terms of preparing for future events, operational readiness both ahead of, and during, the forthcoming high risk weather season remains firmly in sight.

Lessons management activities

Victoria has a mature lessons management approach to ensure lessons are identified and learned. The Victorian emergency management sector lessons management framework (the EM-LEARN Framework) informs continuous improvement before, during and after emergencies and has been in place since 2015.

During the 2023-24 higher risk weather season, the SCC State Lessons and Evaluation (SLE) Function captures more than 3,000 observations and more than 200 insights relating to operational activity from observing meetings, conducting debriefs, observations submitted directly into EM-Share, Real Time Monitoring and Evaluation (RTM&E) deployments and an After Action Review (AAR).

The RTM&E deployments included:

- January 2024: Loddon Mallee Region Flood Event focused on response.
- February 2024: Concurrent Class 1 and Class 2 Emergencies focused on relief and recovery arrangements (Figure 45).

A Network Outage Review is investigating the response to the 13 February 2024 storms that damaged 12,000 km of powerlines and poles across the state's electricity distribution businesses, causing power outages that impacted more than 530,000 homes and businesses.

To complement this review, the Emergency Management Commissioner oversaw an AAR into SCC operations, particularly the interaction between telecommunications and energy state command during the telecommunications and energy issues experienced from 13 February 2024. This AAR has identified 48 insights from a total of 540 observations, which were derived from an RTM&E deployment.

Learnings captured during operational activity are analysed for insights and are shared with appropriate personnel, teams, and agencies to ensure they can be used to inform real time change.



Figure 45. EMV Real time monitoring team collated information on the concurrent storm fire and power outage emergency incidents.

Image: EMV

Impact and consequences

Impacts – fire

The Mt. Stapylton and Bellfield fires, both caused by lightning strikes, burnt a combined 6,418 hectares. The Mt. Stapylton fire spread easterly following the cool change and threatened the community of Dadswells Bridge where one home was destroyed and resulted in the closure of the Western Highway for several days.

The Bellfield fire spread easterly following the cool change. Unfortunately, the fire could not be contained before it reached the nearby township of Pomonal, where a total of 45 residential and one commercial property were destroyed (Figure 46). The third bushfire started in Staffordshire Reef, some 23 km southwest of Ballarat. Crews managed to control this fire with much greater ease due to effective backburning and favourable weather conditions in the area.

In the 48 hours following activation, 250 fires were reported across Victoria. Of these, 3 grass/bush fires in the Grampians region became significant. This represents one of the busiest fire days since the Black Summer bushfires. The Mt Stapylton and Bellfield fires were successfully held during following spikes in fire danger.

Impacts – storm

Significant storm activity occurred causing fires to ignite due to dry lightning in the Grampians region. A severe thunderstorm then developed with damaging winds and large hailstones across other parts of the state with the Geelong and Bendigo

areas seeing the first impacts. The cells that affected the west of the state then built in momentum as they crossed Port Phillip Bay. This caused major storm damage in the eastern and southeastern suburbs of Melbourne. The fast-moving storms kept their intensity as they crossed West and South Gippsland later in the evening, seeing major damage in the more rural locations such as Mirboo North and Thorpdale.

During the storms, winds gusted to well over 100 km/h with peaks recorded at Yarram of 126 km/h, 115 km/h at Fawkner Beacon and 106 km/h at Frankston. Winds brought down trees and powerlines, damaging roofs and buildings. There were also a considerable number of roads affected by fallen trees, and a large-scale power outage from local powerlines down and the collapse of 6 major transmission towers at Anakie.

The storms led to 37 homes becoming uninhabitable. Sadly, at the height of the storm, a 50-year-old farmer died in Mirboo North after possibly being struck by flying debris.

'I was the Deputy Operations Officer in the field, supporting the operational response into Mirboo North. The impact of the storm had disrupted every element of community. The devastation to the built environment left the town and its community with limited infrastructure affecting power, water and communication lines. Community members were in an emotionally distressed and traumatised state, but their small town and country spirit was an inspiration, as they quickly banded together to start the clean-up and start the recovery journey.'

— Cameron Rothnie VIC SES



Figure 46. The Bellfield fire swept through the neighbouring community of Pomonal. Image: EMV?

As the control agency for storm, VIC SES led a multi-agency response from a combination of regional operations centres and the incident control centre at Warragul while at the same time supporting fire agencies in response to the bushfires. Storm operations ran for approximately 12 days.

Region	RFAs
Southern Metro	2,186
Eastern Metro	1,730
North West Metro	590
Gippsland	1,077
Loddon Mallee	443
Hume	334
Barwon Southwest	269
Grampians	157
TOTAL RFAs	6,796

Table 2. Requests for action by region.

Impacts - energy

As forecast by the Bureau, a significant thunderstorm crossed Victoria on the morning of 13 February 2024. In addition to heavy rainfall, wind gusts exceeded 110 km/h in non-alpine areas and were as high as 122 km/h in the Central weather district near Anakie.

The damaging winds impacted Victoria’s electricity transmission and distribution network (Figure 47). A major energy emergency was declared as per the trigger in the State Emergency Management Plan (SEMP) Energy Sub Plan early with the emergency comprising of:

- At peak, over 531,000 customers to lose power, however it is anticipated total customers who lost power to be greater than 1 million.
- Damage to 6 high voltage transmission towers near Anakie due to high winds causing the failure of the Moorabool to Sydenham 500 kilovolt transmission lines and a trip of all 4 generation units at Loy Yang A, resulting in the loss of 2,210 megawatts of generation capacity.
- The Australian Energy Market Operator responded by load shedding 90,000 customers for a short period of time in the afternoon of 13 February to secure electricity supplies.

The significant damage to the electricity distribution network resulted in about 12,000 km of lines affected and 1,100 powerlines down.



Figure 47. Storms destroyed critical power infrastructure. Image: AAP

Of the estimated 531,000 customers without power at the peak of the storm, 400,000 customers were restored to power within the first 24 hours. After 72 hours, 30,000 customers remained without power, while 3,170 customers would continue to be without power for more than one week, with the last 5 customers being restored 11 days after the storm event.

Power outages affected telecommunications, water treatment plants, health facilities, schools, supermarkets, dairies, and food distribution centres, as well as businesses and households.

Impacts - water

Due to the initial loss of power, communities also faced loss of power to water treatment, pumping and sewage plants and the 3 communities of Mirboo North, Morwell and Pomonal required distribution of bottled water (either due to loss of pressure or contaminated water).

Impacts - telecommunications

The mass power outages that occurred on 13 February also heavily impacted telecommunication services for all major providers. Given the length of the power outages, the battery backups at mobile towers and exchanges were depleted, and the number of impacted sites increased throughout 14 February.

At the peak there were 640 mobile towers, 250,000 NBN customers and 4,477 fixed line customers impacted. Due to mass telecommunication outages, many communities across the state could not or had great difficulty in contacting Triple Zero as the event was occurring.

Mirboo North was amongst the worst hit by the storm, with trees down, roofs ripped off, roads closed, and water utilities impacted. As a result, the town progressively lost NBN, mobile and fixed line telecommunications services. Mirboo North residents have described how the loss of all mobile and broadband telecommunications, and with that the ability to communicate within and outside the community, was one of the worst consequences of the storms.

To support the restoration of telecommunications services a working group was established to expedite the restoration of services through facilitating information sharing between the energy sector and telecommunications carriers.

To enable people to stay connected, at some relief centres, satellite community Wi-Fi services were established that provided connectivity when mobile and NBN wasn't working. For example, at the Cockatoo community complex there were 847 Wi-Fi sessions and 172.3 GB of data downloaded in the week of 13 February.

By 7:00am on 17 February, no communities were identified as being without any public telecommunications and only 31 mobile towers remained impacted without power. Telecommunications networks were back to business as usual by 23 February.

What did we observe

Areas to sustain

- Continuing to maintain high levels of collaboration and support between SCC functions and emergency management agencies.
- The strong level of understanding around command and control arrangements and the role of IMTs.
- Continuing to ensure the smooth transition between emergency management phases (preparedness, response (including relief) and recovery) – particularly the transition to recovery process.

Areas to improve

- The understanding and clarification of emergency management roles and responsibilities.
- Ensuring that there is consistent and effective intelligence and information sharing, including the use of correct terminology and timely and coordinated public information and messaging.
- Identifying additional opportunities for further engagement and collaboration between emergency management agencies.
- Identifying and implementing opportunities to streamline operational meetings, working groups and committees.

Appendix 1

TIMELINE OF THE BARKLY FIRE COMPLEX

On **28 August 2023**, a report of a fire was received by Bushfires NT of a fire burning west of the Barkly Homestead along the Barkly Highway, east of Tennant Creek. The fire was burning in vacant Crown Land with the source of ignition later identified as resulting from a blown tire.

Neighbouring station staff initially attended the fire and undertook backburning along the Barkly Highway to prevent the fire spreading onto the other side of the highway.

On **4 September**, a second fire was reported, resulting from an escaped cooking fire, northeast of Epenarra community. Neighbouring landholders utilised graders and staff to strengthen breaks to reduce the impact on their properties, before requesting support from Bushfires NT.

On **5 September** Epenarra Station strengthened firebreaks in advance of the fire moving south approximately 30 km from the Epenarra community, (population 170). Communications to the community were limited as the Telstra infrastructure was out of action. The local school was using satellite communication to stay connected with its department. Epenarra Station requested assistance and Bushfires NT volunteers from Tennant Creek (over 200 km away) and 2 Bushfires NT staff from Alice Springs (over 500 km away) were deployed.

A neighbouring station flew the fire line and advised Bushfires NT that there was a 10 km fire front moving through turpentine bushes, some of the breaks were holding, but there were spot overs occurring. The concern was if the fire continued to jump it would further impact the station, community and into the Davenport Ranges National Park. The Bureau's Incident Weather Forecast issued at 9:56am on 8 September indicated: Significant wind changes and uncertainties. Fresh to strong south-easterly winds to 40-50 km/h and gusts up to 60-70 km/h possible between 10:00am and 3:00pm, then easing slightly but remaining fresh and gusty for the remainder of the afternoon and into the overnight period. Assessments at this time were that the fire would continue without impacting the Epenarra community, however, Canteen Creek Community (population 147) was the next community in the path of the fire.

Fire Weather Forecast issued at 5:00am on 8 September had Barkly North Fire Danger Rating (FDR) forecast of CAT 100 and Barkly South FDR forecast of EXT 68. It was possible that with the change of wind direction, the flank of the fire would become the fire front and head towards the Tennant Creek township, the largest town in the Barkly with a population over 3,000.

Bushfires NT briefed the Tennant Creek Local Emergency Committee, providing a modelling of the weather forecasting and the potential impact on the Canteen Creek community the following day, and the southeast of the Barkly Highway by 8

September 2023. Police from a nearby community of Ali Curung undertook a patrol to Epenarra and Canteen Creek to undertake visual assessments and ensure preparedness and mitigation strategies were in place.

Bushfires NT formally took control of the Barkly Fire Complex on **5 September** due to the complexity, size, resources required and potential impacts of the fire.

Bushfires NT issued public information advising a large fire burning along the Barkly Highway had merged with the Epenarra fire, creating one large fire.

The manager of 2 large pastoral stations north of the fire monitored the fire on the Barkly Highway, committing 2 staff and a grader to try and prevent the fire crossing the highway onto an Aboriginal Land Trust. Pastoral properties in the region were carrying more stock than usual as a result of a temporary ban on live stock exports.

There was a considerable risk that following the expected wind increase and change from east northeast on **8 September**, the fire could push towards 2 large cattle stations which at that time were collectively carrying over 80,000 head of cattle.

Bushfires NT also worked with the station neighbouring Tennant Creek to strengthen firebreaks on their eastern boundary using a combination of earthmoving equipment, on ground back burning and aerial incendiaries.

A sizeable portion of the vegetation around Tennant Creek is Turpentine (Acacia) and spinifex. All the fire breaks around the town and nearby communities had not been maintained for years.

By **9 September**, the first strike teams from South Australia had been deployed to assist the Northern Territory. Additional resources including Bushfires NT and NT Fire and Rescue staff and volunteers were deployed to Tennant Creek, in addition to 2 helicopters and 3 single engine air tractors (SEATS) and water bombers with a 3,000-litre capacity. A Defence Assistance to the Civil Community request for the Australian Defence Force Blade Team to assist with asset protection around Tennant Creek Township was submitted. Multiple heavy machinery assets from across the Northern Territory were deployed to Tennant Creek to support fire break and asset protection.

A large backburn of approximately 200 km was undertaken in advance of the significant wind change and the forecast FDR of catastrophic (100) for 10 September. The backburn aimed to strengthen containment and prevent the fire travelling west through Tennant Creek Station and the Tennant Creek township. Rural landholders across the Northern Territory were urged to make their own fire preparations, as resources were stretched and it was highly likely that Bushfires NT could not assist with every new fire.

At the time of the Barkly fires, an estimated 1 million head of cattle were being carried on various pastoral leases in the Barkly region. Traffic control was put in place on the Barkly Highway, and east and west bound cattle trucks were diverted along the Sandover Highway, north of Alice Springs.

A fully loaded semi-trailer of cotton was heading east and attempted to pass along the Barkly Highway but was impacted by fire. Fortunately, fire units in the area were able to douse the cotton and extinguish the fire with the assistance of a helicopter overhead fanning the flames away from the truck.

The Department of Education issued a direction cancelling all students and staff highway travel for excursions between Alice Springs and Elliott for the next 7 days.

By **12 September** there were 32 wildfires across the Northern Territory. Fire bans were declared for the Barkly North and Barkly South Fire Weather Forecast areas, and more were anticipated for extreme fire weather in the Barkly for several days. The Territory Emergency Management Council met 2 to 3 times a day for the next 3 days.

The Territory Emergency Management Council recommended to the Minister of Police, Fire and Emergency Services that the response to the Barkly fires necessitated a declaration of an Emergency Situation. This was declared on **12 September** and revoked on **15 September**. At this time, the Northern Territory Police took control of the event with Bushfires NT continuing to manage the fire operations.

In conjunction with the Barkly Mayor, the Northern Territory Police coordinated a public meeting at the Tennant Creek Civic Centre to provide information to the community on the fires across the Barkly region.

By **20 September**, the fire in the southeast corner had taken a 7 km run to the south overnight. The fire was spotting in front of itself. At that stage, containment lines were not complete due to the terrain and lack of machinery to the north. Catastrophic fire danger ratings and extreme fire weather forecasts were predicted for the Barkly North, with an east-south-east wind change and enhanced fire behaviour due to a deeply unstable atmosphere.

Resourcing was proving difficult. Aerial resources and contractors were due to leave, machinery did not turn up as scheduled so

lines were unable to be installed. There was limited support in the Tennant Creek IMT.

On **21 September** daytime temperatures reached 38°C daytime temperatures and a fire ban had been declared for the Barkly North and Barkly South Fire Weather Forecast areas, including Tennant Creek. South easterly winds, with the fire edge backing to the west, saw the fire travel 4 km in 24 hours in a slow but steady progression. Machinery crews continued working on the control line between Canteen Creek and Elkedra Station, a line that was critical in protecting the communities if the wind change pushed the fire to the southwest. Catastrophic and extreme fire weather was forecast again for the Barkly North for the following day. The fire was still active to the east of Canteen Creek and along the northeast corner near the Barkly Highway.

On **22 September** machinery cutting a break to the south from Canteen Creek experienced problems due to the very sandy terrain and graders getting bogged. The fire continued to the east and south without containment lines in place. The active fire edge on the west side of the fire was now 21 km from Canteen Creek. The sandy terrain continued to make containment with machinery difficult along the 89 km active fire front. The South Australia Country Fire Service strike teams were working on foot working on a 30 km stretch of active fire on the west and southwest edge of the fire ground until the fire behaviour became too intense. Aerial ignition was assessed at that time as not viable under the presiding weather conditions and with limited to no ground resources.

Fire bans were declared for the Barkly North Fire Weather Forecast Area on **23 September**.

A fire ban had been declared for the Barkly North on **27 September** with extreme fire behaviour, winds of 20-30 km/h and gusts up to 45 km/h. The fire broke the containment line approximately 7 km south of Canteen Creek. A Watch and Act and an emergency SMS alert was issued advising residents to shelter in place. Defensive back burning was undertaken to provide protection to the community. Ground and aerial assets continued to work in and around the community, putting out spot overs close to the new planned containment line. Machinery continued to strengthen a containment line to the southwest of the community (Figure 48).



Figure 48. Breach of containment lines and path of water bombers over Canteen Creek.

Image: Bushfires NT

By **29 September** there were 23 wildfires across the Northern Territory that Bushfires NT was monitoring, responding, or coordinating responses to. Several of them were extremely large. Canteen Creek was deemed safe as there was considerably less active fire edge, and the back burning was successful around most of the community. A decision was made to withdraw resources from Canteen Creek with significant threats elsewhere in the Northern Territory, although the fire continued in the east and west sections. It was unlikely that the fire would be extinguished entirely and was likely to continue to burn through the inaccessible landscape in the Davenport National Park until it eventually exhausted its fuel load or reached the Stuart Highway.

On **30 September**, a demobilisation plan was activated relocating ICC resources to Alice Springs from Tennant Creek. The ICC was also suffering from fatigue, necessitating a conscious shift to commit resources to other priorities and leaving a small capability to remain in Tennant Creek.

On **1 October**, a spot fire was identified from satellite monitoring north of the Barkly Highway. Bushfires NT assisted landholders where possible while managing the fire on the Highway. Rolling road closures were necessary for several days. A second cotton truck was impacted by fire and able to be contained using handheld fire extinguishers. The truck driver elected to continue travelling to Queensland rather than unloading to ensure the fire was out. It is unknown if the bales suffered any significant damage.

On **10 October**, Bushfires NT contacted the Northern Territory Cattleman's Association to convene a meeting with surrounding pastoralists to discuss the encroaching backing fire and agree on a combined plan of attack.

On **13 October**, a final plan was agreed to between Bushfires NT and adjoining pastoralists to undertake a final push to control

the fire along the Barkly Highway and surrounding pastoral land. The final phase of the response utilised station managers, staff, Bushfires NT and NTFRS staff and volunteers, aviation assets and a strike team from NSW RFS.

On **14 October**, a Fire Spotter aircraft commenced in Tennant Creek, tasked with aerial mapping, intelligence gathering and the transportation of mission critical staff and resources.

By **15 October**, Northern Territory roads were heavily impacted by fires, with most major transport routes affected. The Barkly Highway was closed up to 3 days to keep road users safe and undertake strategic back burning to allow containment of the fire.

On **16 October**, the Barkly Highway remained closed but was expected to reopen the next day following an assessment of the highway. The back burn on the northern side of the Barkly Highway had been completed and ground crews with aerial support were making good progress on back burning to complete the burn to the south to join into burnt ground (Figure 50).

On **17 October**, crews commenced mop up and aviation confirmed the fire remained contained.

The Barkly Highway was re-opened on **18 October**, crews began to depart and return to their home bases. Bushfires NT continued to monitor the fireground which was handed back to the landowners. An assessment of the fireground confirmed containment was achieved for 100 per cent of the fire, some 2.8 million hectares (Figure 49).

The Northern Territory Government, landowners and Tennant Creek community came together to combat the Barkley Complex fire. The community donations were generous, and support of the frontline workers was phenomenal.

On **23 October**, the Barkly Fire Complex was declared safe and finally recorded as out.

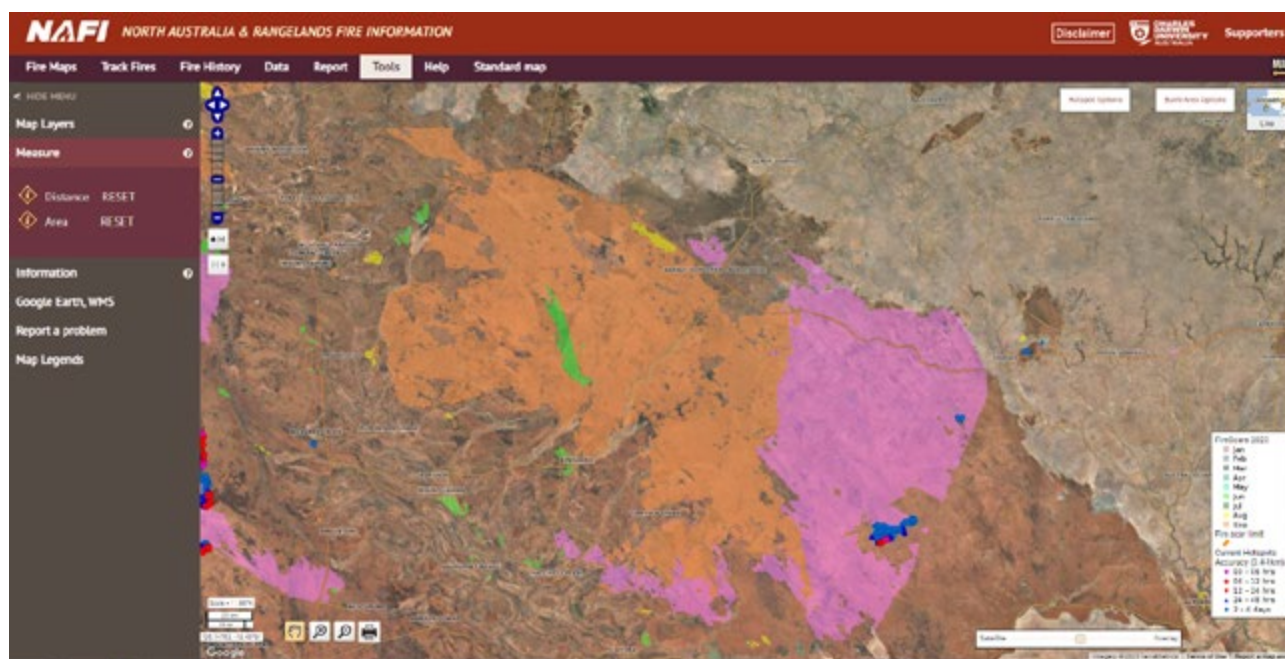


Figure 49. NAFI fire scars - October 2023 with the larger pink scar showing the final back burn.

Image: Bushfires NT

The next day brought devastating news. On **24 October**, an illegally lit fire south of Kuraya outstation on the Warumungu Aboriginal Land Trust to the east of Tennant Creek was reported.

Multiple new ignitions were detected to the north of the Sandover Highway burning through Annitowa Station towards the contained Barkly fire. Pastoralists responded to the new fire. Landholders and Bushfires NT staff responded overnight to contain what was known as the Kuraya fire, which flared up again the following day. Predictions saw the fire moving westward into Tennant Creek (Figure 50). Catastrophic fire weather was predicted for the Barkly North and extreme for Barkly South and expected to continue for several days.

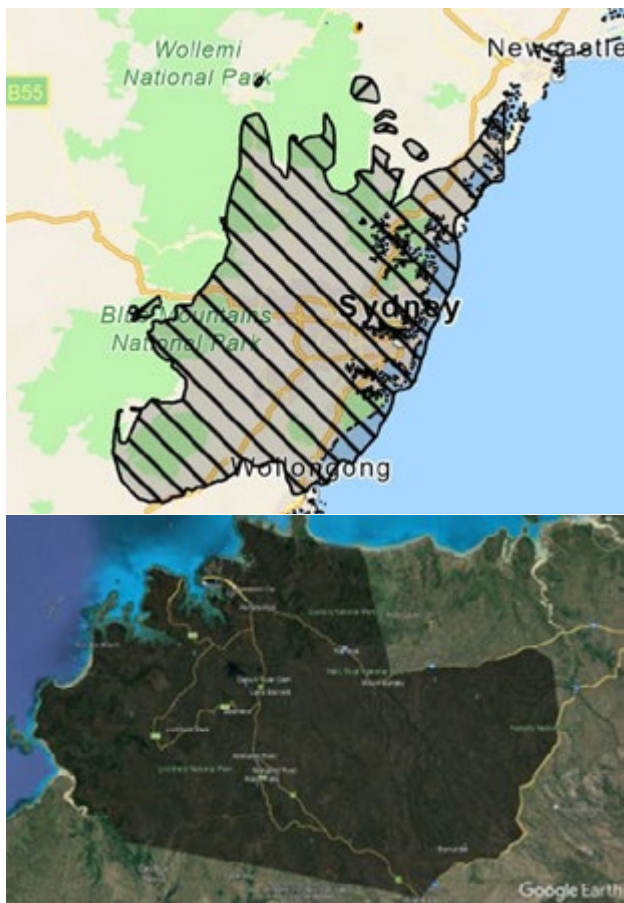


Figure 50. Barkly Fire Complex 2.8 million hectare fire scar compared to the area of Sydney NSW (top) and the Top End NT (bottom).

Image: Bushfires NT

By **25 October**, a new fire ignition on the west side of the Gosse River quickly spread to be on the boundary of Tennant Creek within 24 hours, triggering a multi-agency response as the protection of Tennant Creek became crucial. Tennant Creek residents were advised to start preparing their properties.

The Local Emergency Committee (LEC) was stood up in Tennant Creek with NTFRS taking operational control of the fire due to its potential impact on the Tennant Creek township. Bushfires NT provided support with on ground and aerial assets (a fixed wing bomber and helicopter) transferred to Tennant Creek, and

additional staff deployed from Darwin and Alice Springs. The Tennant Creek township was at risk from the head fire, and Three Ways Roadhouse and Homelands to the south from flanking fires.

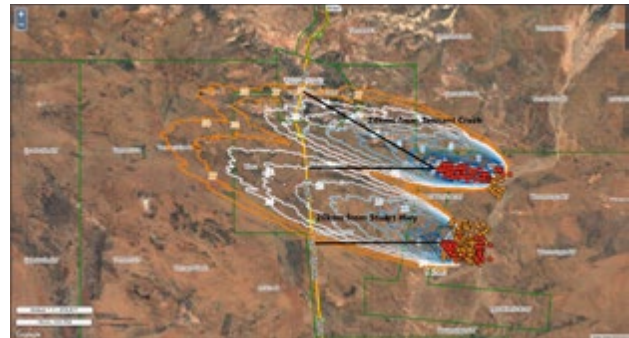


Figure 51. Predicted rate of spread shows threat to Tennant Creek.

Image: Bushfires NT

Fire was impacting the Stuart Highway and saw it closed. Fire on the southeast of the township threatened 5 communities northeast of Tennant Creek and pastoral properties to the north of Tennant Creek. Heavy machinery were deployed, and the rail operators were advised that fire was impacting the rail line north of Tennant Creek.

The threat advice level on **27 October** was raised to a Watch and Act and the Stuart Highway was closed to all traffic.

By **29 October**, the fire activity to the east and south of Tennant Creek has been contained, however the fire continued north between Tennant Creek to Three Ways and travelling consistently in a north-westerly direction towards Phillip Creek Station. The landholders continued to combat the fire with support from Bushfires NT.

The Kuraya fire was declared safe and finally recorded as out on **3 November**. Once again, the Northern Territory Government and Tennant Creek community came together to manage these fires.

Appendix 2

STEERING COMMITTEE

The production of the Major Incidents Report is guided by a Steering Committee convened by the Australian Institute for Disaster Resilience and selected by the Commissioners and Chief Officers Strategic Committee.

Steering Committee Membership 2023–24

Mr John Richardson (Chair)	Australian Institute for Disaster Resilience
Dr Isabel Cornes (Secretariat)	Australian Institute for Disaster Resilience
Mr Darryl Glover Writer	Darryl Glover Planning
Assistant Coordinator-General David Long	National Emergency Management Agency
Mr Frank Tyler	National Resource Sharing Centre
Mr Robert Kilpatrick	ACT Emergency Service
Assistant Commissioner Kelly Quandt and Assistant Commissioner Viki Campbell	NSW Rural Fire Service
Superintendent Trent Lawrence	Fire + Rescue NSW
Deputy Commissioner Daniel Austin	NSW State Emergency Service
Acting Deputy Director Ian Carlton	NT Emergency Service
Superintendent Greg Moore	NSW Police Service
Ms Collene Bremner	Bushfires NT
Ms Jane Zsombok	Queensland Police
Commander Dave O'Shannessy	SA State Emergency Service
Senior Sergeant First Class Russell Dippy	SA Police
Ms Lisa Jackson	Emergency Management Victoria
Mr John Chatfield	VIC State Emergency Service
A/Chief Superintendent David Gill and Ms Gemma McLachlan	Department of Fire and Emergency Services WA
Mr David Sayce	Forest Fire Management
Commander Steve Morgan	Fire Rescue Victoria
Assistant Chief Fire Officer Paul Carrigg	Country Fire Authority
District Officer John Holloway	Tasmania Fire Service
Ms Anita Ransome	Queensland Fire Department

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Amanda Aridi and Deb Shaddock	Australian Red Cross
Lee Dagleish	Emergency Management Victoria
Gerabeth Abbott	Victoria State Emergency Service,
Heather Stuart	NSW State Emergency Service
Laura Wythes	NSW Rural Fire Service
Jennifer Deveraux and Margarita Towers	Bushfires NT
Dr Tudor Condreanu and Kathryn Hart	Department of Health WA
Sergeant James (Ned) Niederer	SA Police
District Officer Matt Thomas, Superintendent Leon Gardiner and Superintendent Damian Pumphery	Department of Fire and Emergency Services (WA)
Becky Cooper	Queensland Fire Department



Australian Government
National Emergency Management Agency

