



Australian Government

National Emergency Management Agency

2024-2025 Higher Risk Weather Season

**National Preparedness Summit**

# Exercise Scenario



## HRWS Scenario 2024-25: Instructions for use

- This information has been developed for the National Emergency Management Agency (NEMA) High Risk Weather Season (HRWS) Preparedness Summit 2024 Scenario Exercise and is not an official observation, forecast, or warning. The content here represents intelligence that would normally be sourced from the Bureau of Meteorology– it has been developed here to create a plausible narrative to be considered by relevant groups within the HRWS Scenario Exercise.
- This data should not be used for any other purpose than the intended communication of the 2024 HRWS Scenario Exercise, without consultation with the Bureau of Meteorology.
- The content has been based on the current long-range forecast and real weather events to ensure the scenario is relevant and realistic but should not be considered a forecast of likely events. The severity of some events is high and designed to stress test the capacity and capability of response.
- It has been designed to enable NEMA to emphasise different components of the scenario
- The narrative extends from September 2024 to February 2025
- Three one-day 'snapshots' from key points within the season will be highlighted, with warning layers (e.g flood, heatwave, bushfire, tropical cyclone) developed for display on the NJCOP
- This year's Summit will focus on applying Crisis Appreciation and Strategic Planning (CASP) to the scenario



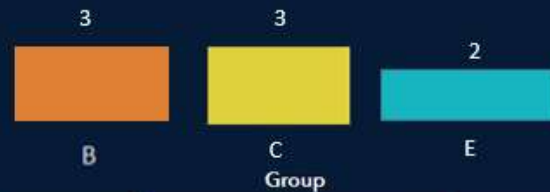


## Group A Incidents

0

## Group A Incidents

There are no active Group A incidents



Counts by Group Incident Count More Information

## Incident Summary

- Severe Weather Warning 21/11/2024 12:31pm  
South East, Qld.  
[Bureau of Meteorology](#)
- Severe Weather Warning 21/11/2024 12:31pm  
South East, Qld.  
[Bureau of Meteorology](#)
- Flood - Watch and Act 21/11/2024 1:17am  
Greater Sydney Region and Coastal NSW.  
[NSW State Emergency Service](#)
- Heatwave - Advice 21/11/2024 13:12pm  
Central Western Australia, WA  
[Bureau of Meteorology](#)
- Heatwave - Advice 21/11/2024 12:12pm  
SE South Australia - Port Augusta to Gippsland, SA and Vic.  
[Bureau of Meteorology](#)
- Bushfire - Watch and Act 21/11/2024 1:17am  
Greater Sydney Region and Coastal NSW

All Incidents Bushfires Floods Tropical Weather





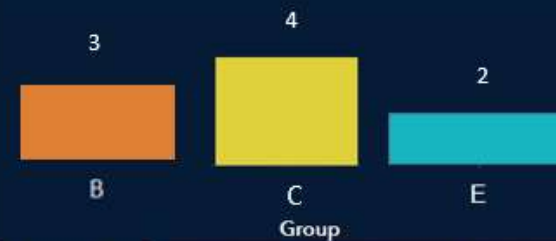
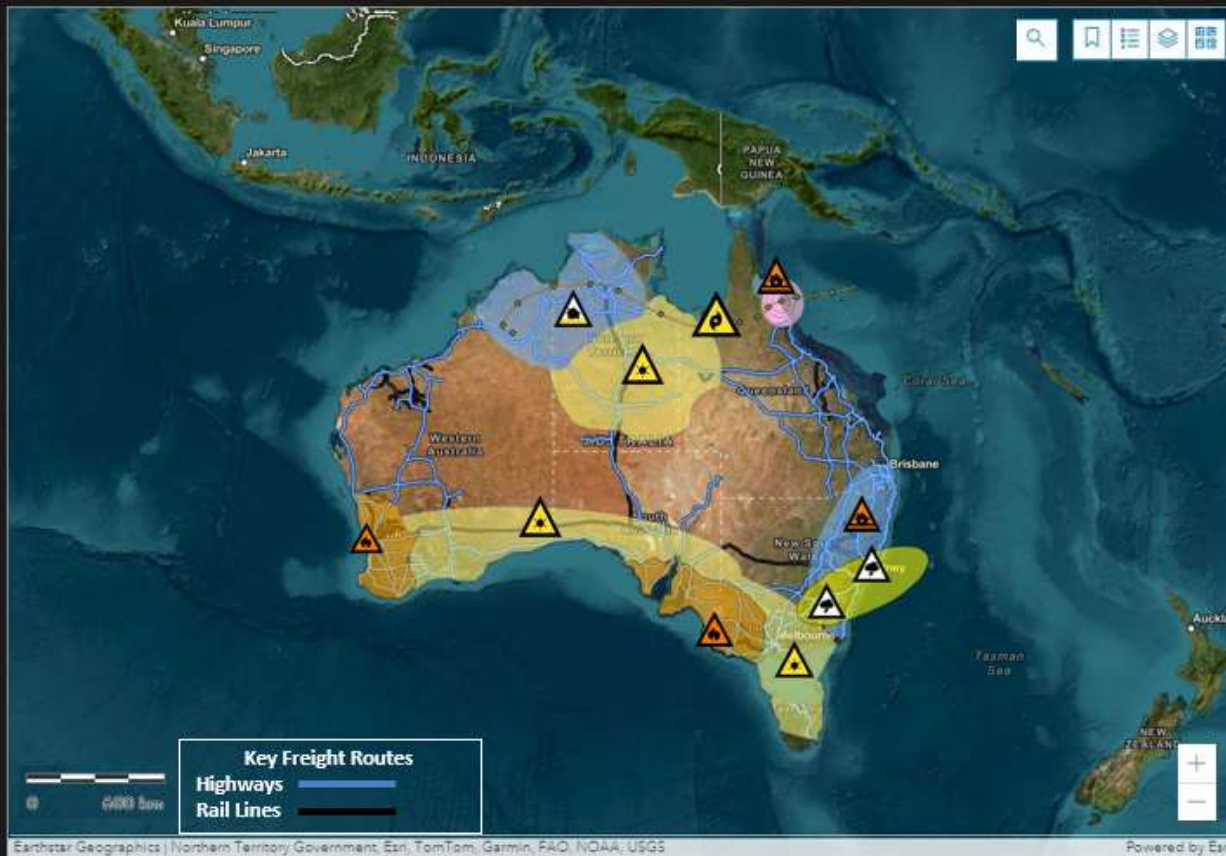
## Group A Incidents

1

## Group A Incidents



Tropical Cyclone Warning 25/12/2024 1:31am  
Far North Queensland to Darwin  
[Bureau of Meteorology](#)

[Counts by Group](#) [Incident Count](#) [More Information](#)

## Incident Summary



Severe Weather Warning 25/12/2024 11:09pm  
Canberra, ACT.  
[Bureau of Meteorology](#)



Severe Weather Warning 25/12/2024 13:14pm  
Greater Sydney Region, NSW  
[Bureau of Meteorology](#)



Flood - Watch and Act 23/12/2024 2:23am  
East Coast Region and Coastal NSW.  
[NSW State Emergency Service](#)



Heatwave - Advice 23/12/2024 16:55pm  
South Australia, WA/SA/VIC  
[Bureau of Meteorology](#)



Heatwave - Advice 24/12/2024 10:29am  
Central Australia, NT and Western QLD.  
[Bureau of Meteorology](#)



Bushfire - Watch and Act 23/12/2024 14:17pm  
South East SA and Western VIC

[All Incidents](#) [Bushfires](#) [Floods](#) [Tropical Weather](#)



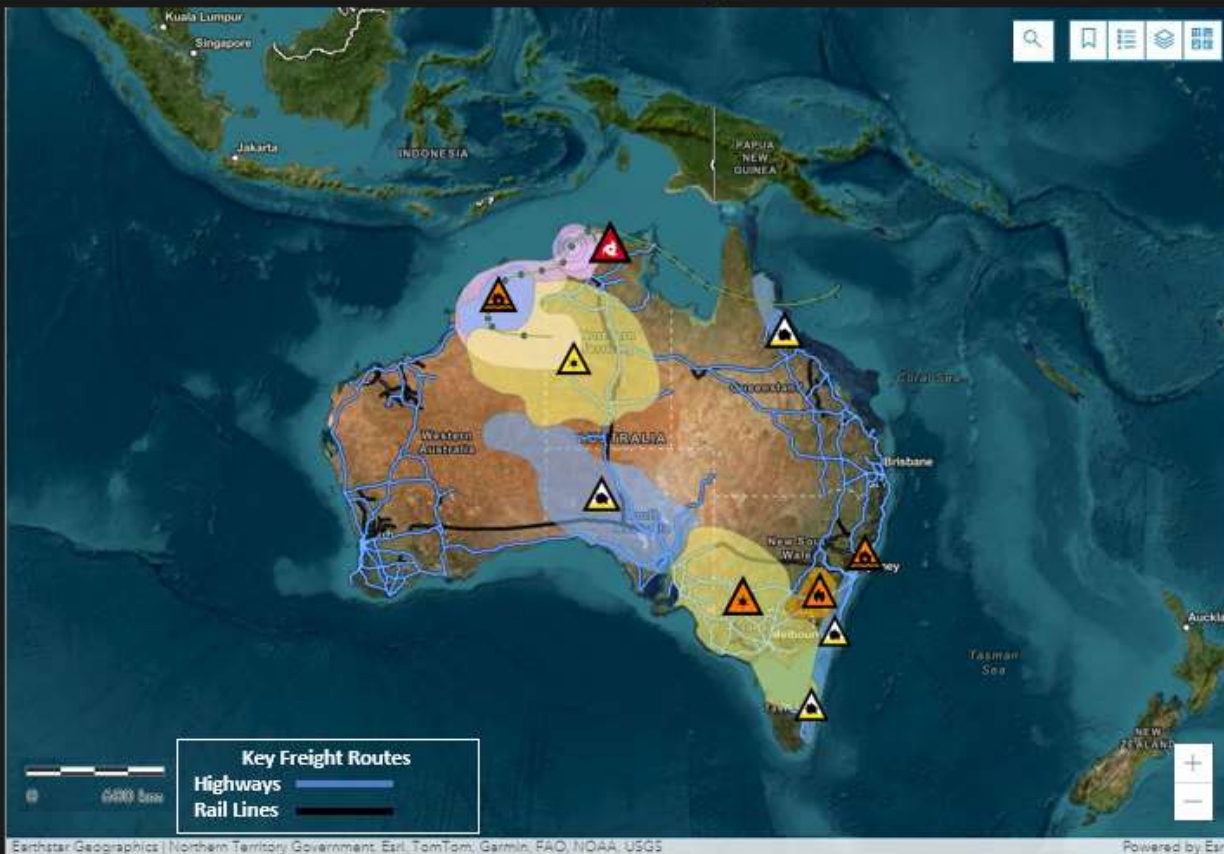
## Group A Incidents

1

## Group A Incidents



Severe Tropical Cyclone Warning 24/02/2025 4:24am  
Darwin, NT to Northern WA  
[Bureau of Meteorology](#)



4



B

4



C

2



D

Group

Counts by Group

Incident Count

More Information

## Incident Summary



Flood - Advice 23/02/2025 17:45pm  
Far North East, QLD.  
[Bureau of Meteorology](#)



Flood - Watch and Act 22/02/2025 15:31pm  
South East, Qld.  
[Bureau of Meteorology](#)



Flood - Watch and Act 21/02/2024 12:59am  
Fitzroy River, WA.  
[NSW State Emergency Service](#)



Heatwave - Advice 23/02/2025 21:19pm  
Central Western Australia, WA  
[Bureau of Meteorology](#)



Heatwave - Watch and Act 24/02/2025 15:37pm  
SE South Australia - Port Augusta to Gippsland, SA and Vic.  
[Bureau of Meteorology](#)



Bushfire - Watch and Act 24/02/2025 10:17am  
Canberra, ACT and Southern Highlands

All Incidents

Bushfires

Floods

Tropical Weather



# National Map: September - November 2024

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**September - November**  
**WA/NT/Interior**  
Several prolonged extreme heatwaves. northern WA / NT / interior. Temperatures >40 sustained for over a week at times. Severe heat stress in indigenous communities. Blackouts, impacts to industry.

**3-25 October**  
**Darwin NT, Clermont QLD, Alice Springs NT**  
Fire weather conditions become **EXTREME to CATASTROPHIC** and fires ignite impacting key roads / industry / communities. An outbreak of fires also occurs near Hughenden / Moranbah / Clermont (QLD) and across Central West to North West. Fire weather conditions become **EXTREME to CATASTROPHIC** & fires ignite in Alice Springs impacting key roads/ communities / civil unrest

**22-24 November**  
**SE QLD**  
Severe storm like those seen in Dec 2023 occurs, with damaging winds, flash flooding. Transmission lines are damaged, power outages, and humidity/ heatwave during recovery causes heat stress

**26-27 September**  
**NSW & ACT**  
Heavy rain causes flooding in large parts of inland NSW and Canberra. Forbes, Condobolin, Ivanhoe, Broken Hill, Menindee see several rescues and evacuations, road closures.

**21 November**  
**ACT**  
Severe storm with large hail impacts **Canberra**.

**16-20 November**  
**Newcastle, Hawkesbury-Nepean & Illawarra NSW**  
A slow-moving east coast low brings extremely high multi-day rainfall and strong winds to much of the eastern seaboard from Forster to Mallacoota with severe impacts in Newcastle, Hawkesbury-Nepean and Illawarra coinciding with spring tide.

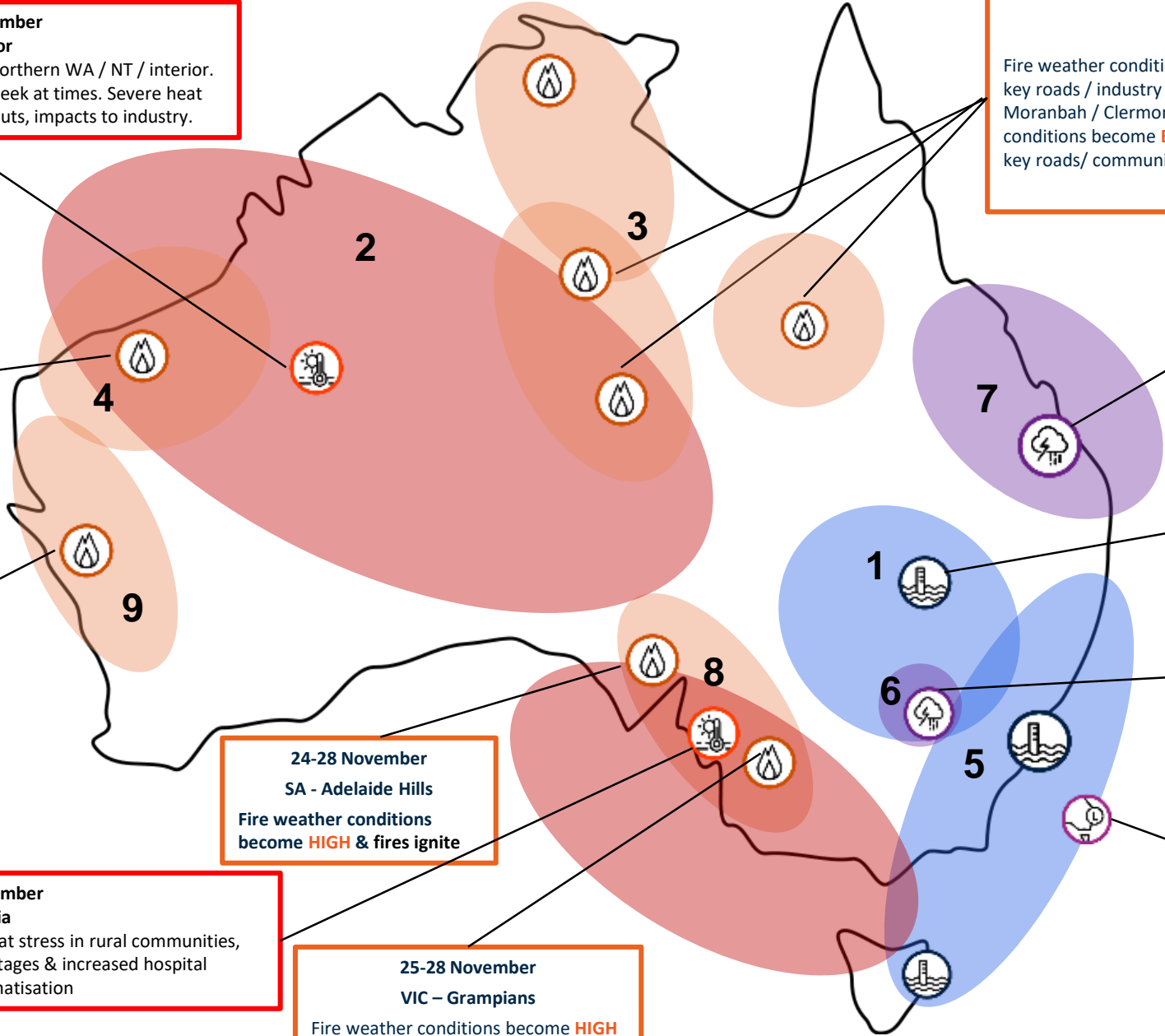
**24-28 November**  
**SA - Adelaide Hills**  
Fire weather conditions become **HIGH** & fires ignite

**25-28 November**  
**VIC – Grampians**  
Fire weather conditions become **HIGH** & fires ignite threatening Horsham

**25 October**  
**WA – Pilbara Port Hedland / Karratha**  
Fire weather conditions become **EXTREME** and fires ignite closing the hwy / impacting industry

**30 November**  
**WA - Geraldton**  
Fire weather conditions become **EXTREME** in central-west WA, favourable burning conditions due to long-term rainfall deficiencies and recent heat

**Mid-late November**  
**SE Australia**  
Early season heatwaves causing severe heat stress in rural communities, further dries landscape. Several power outages & increased hospital admissions due to early season non-acclimatisation



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## 26-27 September: Heavy rainfall causes inland flooding NSW, SA and ACT

### Weather

A north-west cloud band brings prolonged rainfall and embedded thunderstorms across much of inland NSW and SA, with extensive flooding along Lachlan and Darling Rivers due to saturated soils and full rivers/creeks. Flash flooding due to high intensity rainfall occurs in several locations including Broken Hill, Forbes and Canberra CBD.

### Locations impacted

Broad area including extending from Flinders Ranges through parts of western central NSW to the ACT. Further flooding anticipated over coming days downstream.

### Energy and infrastructure

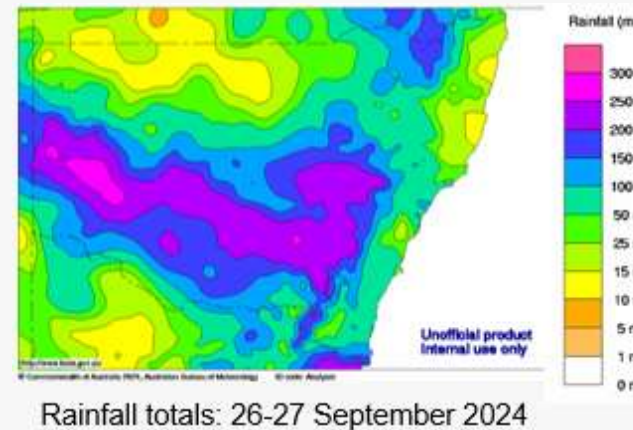
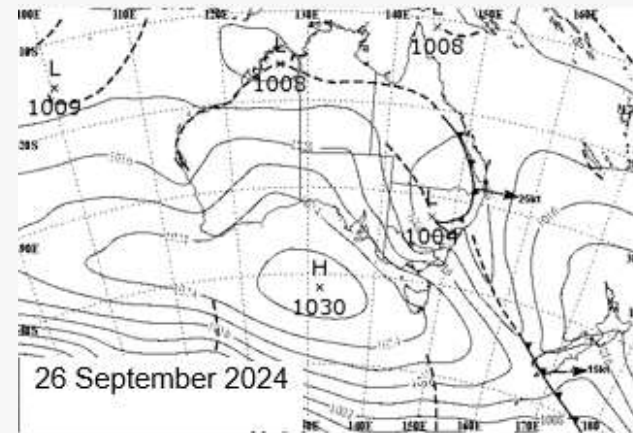
- Barrier Hwy closed west of Broken Hill with severe flood damage to the road, blocking link to SA.
- Canberra's CBD inundated, public transport suspended, homes flooded particularly in northern suburbs. Over 700 requests for assistance. Blackouts in parts of the CBD. Many tourists impacted due to school holidays / Floriade.

### Industry and environment

- Widespread impacts to agriculture, stock and fodder losses, damage to crops and infrastructure.
- Interruptions to supply chains due to road closures, particularly Adelaide-Broken Hill

### Services

- SES inundated in ACT with rescues and evacuations
- Evacuation shelters established for those whose homes were flooded
- Several communities in western NSW / eastern SA isolated, requiring ADF assistance to air drop food and essential supplies



**Looking to the future:** a warmer atmosphere can hold more moisture, meaning rain events are becoming more intense

### Quick Numbers: Weather observations

Rainfall	(mm) over 48hrs
- Broken Hill Airport	223
- Condobolin Airport	218
- Forbes	198
- Ivanhoe	212
- Canberra Airport	182 (89mm in 2hrs)
River levels	m (above AHD)
- Menindee	8.9
- Condobolin	6.2
- Forbes	11.2
- Cowra	12.8
- Bathurst	5.1

### Quick Numbers: NSW-ACT regions

Total population	93,000
- Fatalities	2
- People displaced	360
Residential dwellings	50,000
- Damaged	5,000
- Destroyed	980
- Reconstruction value	\$1 billion

## NEMA Scenario Consequences: 26-27 September. Heavy rainfall causes inland flooding. NSW / SA / ACT

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"> <li>Flash flooding in Canberra extends to Commonwealth park resulting in Floriade being washed away.</li> <li>Two children were playing in a storm water drain when the storm arrives, both are swept away by flash flooding and drown.</li> <li>Blackouts extend across Canberra, and public transport is brought to a standstill with extensive cancellations and delays in services. Canberra Airport is closed.</li> <li>ACT SES have received over 700 requests for assistance and conducted multiple flood rescues for people caught in flood waters. 16 dwellings are damaged by flooding, and an additional five are destroyed.</li> <li>Parts of Canberra Hospital become flooded.</li> <li>In NSW, wheat, barley, canola and chickpea crops are destroyed by the rain, with multiple regions also experiencing damage to harvest equipment and packing sheds. Cattle and sheep around Forbes perish.</li> <li>The Barrier Highway, west of Broken Hill, is flooded, blocking the main supply link to SA. Other critical supply routes throughout western NSW are washed out or flooded. The Broken Hill rail line is flooded in multiple places, with large extents of rail tracks damaged or washed away.</li> <li>Flash flooding in Forbes and Broken Hills results in damage to over 80 homes and businesses.</li> <li>The Royal Flying Doctor Service (RFDS) Broken Hill base is flooded and critical maintenance equipment is destroyed or damaged.</li> <li>In Silverton, the Mad Max museum is damaged by the rainfall.</li> </ul>	<ul style="list-style-type: none"> <li>Blackouts and impacts of public transport disruptions leads to mass traffic jams resulting in a number of car accidents.</li> <li>Canberra Hospital cancels all non-urgent procedures.</li> <li>Broken Hill is isolated by flooding, leading to supply shortages of food, fuel and medicines.</li> <li>Multiple communities in western NSW and eastern SA are isolated, with food and fuel stocks running critically low.</li> <li>The ADF is required to conduct air drops of dry goods to these isolated communities.</li> <li>Crops that were successfully harvested before the rainfall, and livestock are unable to get to market. Undamaged citrus crops from the Riverina begin to spoil before they get to market.</li> <li>The RFDS is operating at limited capacity as they are unable to operate flights out of Broken Hill . The condition of multiple runway sites is unknown or known to have been damaged by flooding.</li> <li>Stagnant flood waters lead to the spread of Ross River virus and Japanese encephalitis throughout the impacted region.</li> <li>Tourism in western NSW is significantly impacted, with tourists unable to travel due to road closures. Many accommodation providers have to cancel bookings due to damage to their facilities.</li> <li>Mental health of farmers impacted due to additional stress and pressure from a failed crop whilst already experiencing economic stress in a high cost of living environment.</li> </ul>	<ul style="list-style-type: none"> <li>The ACT economy is impacted by the loss of significant tourism revenue.</li> <li>There is a shortage of skilled labour due to the large number of buildings requiring repair following the flooding.</li> <li>Significant delays for non-urgent medical procedures are experienced for patients in the ACT.</li> <li>Crop and livestock loss, combined with goods unable to get to market have resulted in noticeable shortages in citrus, leading to dramatic price increases.</li> <li>Manufactures of products containing wheat, barley, canola and chickpeas begin to experience shortages of these crops, leading to supply disruption and price increases.</li> <li>Supply routes resume to Broken Hill and surrounds, but shortages remain due to load limitations on surrounding roads and rail while repairs take place.</li> <li>Preventable deaths occur in remote Australia due to critical healthcare provided by the RFDS unable to be conducted due to strain on the service.</li> <li>Multiple cases of Ross River virus and Japanese encephalitis are detected in the Broken Hill area. One death has occurred from Japanese encephalitis</li> <li>The economy of western NSW is impacted by the loss of significant tourism revenue, with many accommodation and tourism service providers needing to undertake significant repairs before reopening.</li> <li>Repairs to road, rail and critical infrastructure are prioritised, resulting in trade shortages in the western NSW region.</li> </ul>



# 3-6 October: Bushfires

## NT and QLD

### Weather

A high-pressure system over SE Aust directs a dry, fresh SE'ly flow across the western Top End. With a dry start to the wet season, vegetation was fully cured and ripe for fire activity on this EXTREME FW day. Widespread fire activity develops at multiple locations around the Greater Darwin region. A few days later (5-6 Oct) a cold front/trough moved into the southern NT generating gusty, dry northerly winds and CATASTROPHIC fire danger ratings. Fire activity, mainly on the northern and western outskirts of Alice Springs and adjacent West MacDonnell Ranges blocks roads and impacts several communities.

On the 4th a west to northwesterly flow develops across central QLD leading to EXT fire danger. Fires ignite to the NW of Clermont and fresh, dry winds rapidly lead to out-of-control fires which directly impact the town.

### Locations impacted

Darwin, Alice Springs, Clermont

### Energy and infrastructure

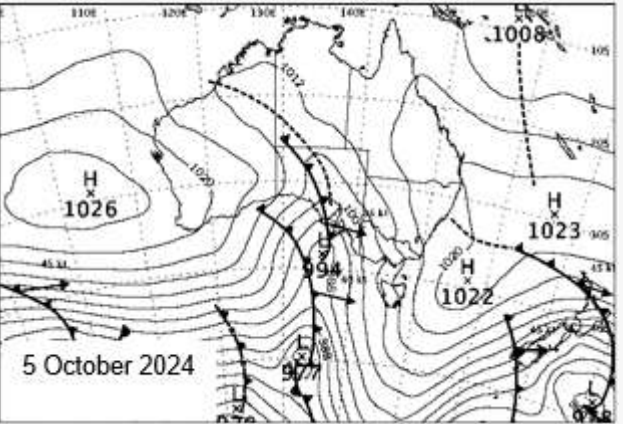
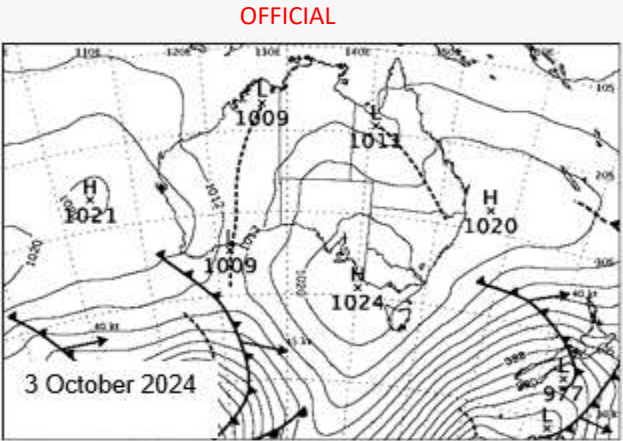
- Burnt trees contacting powerlines lead to blackouts which persist in some areas for over 2 weeks (Darwin & Alice)
- Houses and businesses destroyed in all 3 towns
- Darwin & Clermont airport runways closed due to smoke/damage

### Industry and environment

- Thick smoke affects Darwin & Alice Springs residents, causes traffic routes to be closed
- Larapinta walking trail closed with signage/shelter damage
- Pastoral properties damaged near Alice Springs & Clermont – fences destroyed; livestock lost, widespread damage to agricultural infrastructure
- Dozens of businesses and tourism operators affected, inc. Clermont Coal Mine

### Services

- Health services and evacuation centres overwhelmed



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Looking to the future: fire seasons will become longer, with more frequent dangerous fire weather days

### Quick Numbers: Weather observations

<b>Max FBI</b> <ul style="list-style-type: none"><li>• Darwin Airport</li><li>• Alice Springs Airport</li><li>• Clermont AP</li></ul>	67 EXT 146 CAT 74 EXT
<b>Max wind gust</b> <ul style="list-style-type: none"><li>• Darwin Airport</li><li>• Alice Springs Airport</li><li>• Clermont AP</li></ul>	<b>Km/h</b> 71 88 69
<b>Max temp</b> <ul style="list-style-type: none"><li>• Darwin Airport</li><li>• Alice Springs Airport</li><li>• Clermont AP</li></ul>	<b>°C</b> 35.7 39.1 40.9

### Quick Numbers: NT / Alice Springs

<b>Total population</b>	140,000
<ul style="list-style-type: none"><li>- Fatalities</li><li>- People displaced</li></ul>	1 4,367
<b>Residential dwellings</b>	60,000
<ul style="list-style-type: none"><li>- Damaged</li><li>- Destroyed</li><li>- Reconstruction value</li></ul>	235 529 \$900 million

# NEMA Scenario Consequences: 3-6 October. Bushfires. NT and QLD

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"><li>• Fires on the outskirts of Alice Springs lead to property losses in the suburbs of Larapinta and Stuart, business are also damaged in impacted suburbs. At least 400 properties have been destroyed.</li><li>• Alice Springs Desert Park is evacuated and cannot be saved. The historic Telegraph Station Reserve is also damaged. Pine Gap is heavily damaged.</li><li>• The Larapinta walking trail is closed, with 15 walkers needing to be evacuated from remote campsites along the trail. One hiker is found deceased at one of the trail camps, three remain missing. Trail markers and camp infrastructure is damaged, and in some locations completely destroyed.</li><li>• Westerly winds fan the fire closer to town and heavy smoke affects the township. The smoke results in an increase in respiratory related admissions to health services. The hospital and health clinics quickly become overwhelmed with patients.</li><li>• In Darwin, fires start in the Howards Spring area leading to home losses, and forcing the evacuation of the Darwin Correctional Centre. At least 120 properties have been destroyed, with an additional 230 damaged. Business on the outskirts of Howard Springs are also damaged. Palmerston Regional Hospital begins diverting patients to other hospitals in case they too need to evacuate.</li><li>• Heavy smoke in Darwin prompts the airport runway to close to all non-essential aircraft. This leads to multiple flight cancellations. The smoke results in an increase in respiratory related admissions to health services. Additionally, the smoke sets off smoke alarms across the city – including in hospitals – resulting in repeated call outs for the fire brigade.</li><li>• In both Alice Springs and Darwin, the fire damages pastoral properties with fences and agricultural infrastructure destroyed and livestock lost.</li><li>• A significant number of fruit farms on the outskirts of Darwin are severely damaged including mango, avocado, banana and pumpkin crops. Packing infrastructure damaged or destroyed.</li><li>• Fire threatens homes on the edge of Clermont, and smoke causes operations to cease at the Clermont coal mine, with workers accommodation being evacuated.</li></ul>	<ul style="list-style-type: none"><li>• Burnt trees around Alice Springs and Darwin continue to fall on power lines resulting in ongoing black outs for two weeks.</li><li>• Telephone communications towers that weren't destroyed by the fire in Alice Springs are now unreliable due to blackouts. This results in some residents unable to contact emergency services.</li><li>• Alice Springs Hospital is reliant on backup generators to ensure consistent power supply.</li><li>• The Stuart Highway to the north of Alice Springs continues to be shut off due to persistent fire behaviour, blocking the townships northern supply route. Ongoing highway closures result in disrupted supply of fuel and perishable food goods.</li><li>• Social cohesion in Alice Springs and Darwin is disrupted. An emergency curfew is put in place in Alice Springs to curb violence and crime rates. The curfew is met with anger resulting in violent confrontations with police.</li><li>• Parts of the Larapinta trail are closed for the foreseeable future, with some closures expected to remain in place for the 2025 hiking season.</li><li>• Cost rise for avocados, mangoes and bananas across Australia.</li><li>• Fire restricts the use of the Gregory Highway near Clermont, with smoke reducing visibility on nearby roads.</li></ul>	<ul style="list-style-type: none"><li>• Blackouts in Alice Springs and Darwin cause significant food spoilage in residential communities and in impacted businesses.</li><li>• Ongoing supply chain disruptions result in an increase in the cost of fuel and perishable food goods in Alice Springs and surrounding towns. Difficulty in procuring fresh fruit and vegetables at affordable prices leads to some early indicators of malnutrition in children in First Nations communities.</li><li>• Destruction and damage of housing in Alice Springs leads to increased rates of homelessness, increasing pressure on support services and other households.</li><li>• Early indicators show school attendance in impacted areas are down, with school results trending down compared to the year before. School children indicate they are stressed and upset from the bushfires.</li><li>• The economy of Alice Springs is impacted by the loss of significant tourism and expat revenue, with many accommodation and tourism service providers experiencing cancellations due to closure of the Larapinta Trail and high crime rates.</li><li>• Ongoing bushfire activity near the Gregory Highway leads to supply chain disruptions into Clermont.</li></ul>

# 16-20 November: East Coast Low NSW, VIC and TAS

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## Weather

A severe east coast low, fueled by warm SSTs off east coast, tracks slowly down the NSW coast to Victoria, bringing strong winds and extremely heavy rainfall. Coincides with spring tides on 17 Nov causing widespread coastal damage.

## Locations impacted

Newcastle / Hunter Valley / Greater Sydney / Hawkesbury-Nepean /  
Mallacoota / Launceston

## Energy and infrastructure

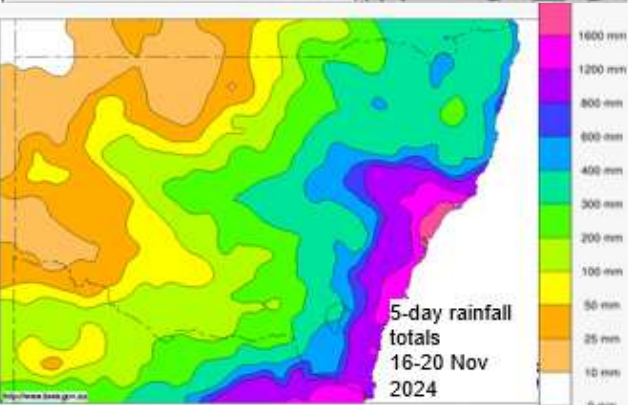
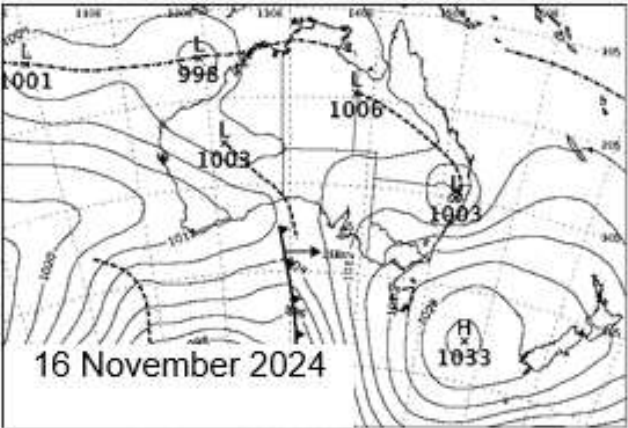
- Blackouts persist in some areas for over 2 weeks
- Many roads and bridges lost – major supply chain interruptions
- Newcastle airport / RAAF Williamtown runway closed
- Water contamination – Eraring coal ash dam spill causes a major environmental disaster
- Levees breached in Launceston and residences flooded

## Industry and environment

- Livestock lost, widespread damage to agricultural infrastructure from catastrophic flooding
- Vineyards in the Tamar Valley and vineyards and mining operations in the Hunter Valley are severely affected
- Over 500 000 businesses affected
- Flood-driven algal blooms in rivers causing health crisis and mass fish kills
- Major landslides along Illawarra
- Launceston sewerage treatment plants are overwhelmed and spill effluent.

## Services

- Health services overwhelmed / hospitals flooded



Looking to the future: a warmer atmosphere can hold more moisture, meaning rain events are becoming more intense

## Quick Numbers: Weather observations

Winds	Kph / kts
• Newcastle Nobbys	180 / 97
• Sydney airport	177 / 95
Rainfall (5-day accumulation)	mm
• Newcastle Nobbys	1544
• Williamtown	1623
• Sydney Obs Hill	1320
• Mallacoota	1231
Water levels (tide and storm surge)	m above AHD
• Sydney	1.8
• Eden	1.9

## Quick Numbers: NSW-Vic coastal regions

Total population	4 million
- Fatalities	5
- People displaced	2,500
Residential dwellings	1.9 million
- Damaged	845
- Destroyed	495
- Reconstruction value	\$6 billion



# NEMA Scenario Consequences: 16-20 November: East Coast Low. NSW, VIC and TAS

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"><li>Major flooding occurs along the Hawkesbury–Nepean and Georges River, with flood levels comparable to the March 2022 flooding. Over 980 homes in this area have been inundated with flood waters.</li><li>The Shoalhaven River at Nowra reaches a major flood level, with 1,455 homes experiencing flooding above the floor boards.</li><li>The Princes Highway is closed in multiple places due to landslides or sink holes emerging in the road surface. Significant road and bridge damage occurs across NSW. Rail networks are also impacted.</li><li>Livestock perishes in flood waters, and turf crops in the Hawkesbury Nepean region are destroyed. Significant flooding of agricultural infrastructure including sheds containing fertiliser and chemicals. Two farmers were swept away by flood waters as they attempted to move livestock to higher ground.</li><li>Significant damage to the Eraring Coal Fired Power Station is experienced, with the ash dam spilling and contaminating local water ways. The power station is damaged, and unable to produce power. Other power infrastructure is significantly damaged, leading to substantial blackouts.</li><li>Flash flooding near Murrumbidgee causes landslides and flooding across the road, effectively isolating the town. Multiple flood rescues occur along the road into the town.</li><li>Hospitals in Sydney, Newcastle, Bega and Wollongong are inundated, with many additional hospitals sustaining damage from the rainfall. Multiple hospitals cancel non urgent procedures to cope with the damage.</li><li>Large groups of campers become isolated along the south coast, with a large number of Schoolies participants also becoming isolated. A group of five school leavers become stuck in flood waters and drown.</li><li>High rainfall causes the Launceston levees to breach, flooding residential neighborhoods, roads and businesses.</li></ul>	<ul style="list-style-type: none"><li>Vineyards and mining operations are severely affected in Hunter Valley, impacting the amount of goods that can be exported and subsequent revenue.</li><li>Vineyards in the Tamar Valley are severely affected, impacting the amount of wine that can be produced and subsequent revenue.</li><li>Flood-driven algal blooms in rivers causing health crises and mass fish kills.</li><li>Flood-driven toxic algal blooms impact wild shellfish in north east TAS causing people who have eaten them to seek medical treatment placing further pressure on the health system.</li><li>Ongoing power outages impact the ability for tourists with electric vehicles to recharge and evacuate from flood impacted areas. Service stations are also unable to operate.</li><li>Significant amounts of top soil is washed away, resulting in reduced crop yields in following years.</li><li>Crops that were successfully harvested before the rainfall, and livestock are unable to get to market.</li><li>Stagnant flood waters lead to the spread of Ross River virus and Japanese encephalitis throughout the impacted regions of NSW and VIC.</li><li>Mental health of farmers impacted due to additional stress and pressure from a failed crop whilst already experiencing economic stress in a high cost of living environment.</li><li>Mental health of residents in the Hawkesbury–Nepean and Murrumbidgee is impacted due to the ongoing trauma from responding to multiple disasters in short succession.</li><li>In Launceston, increased water turbidity impacts water filtration capacity, resulting in boil water notices being issued. Sewerage treatment plants are overwhelmed, resulting in spilled effluent.</li></ul>	<ul style="list-style-type: none"><li>Significant delays for non-urgent medical procedures are experienced for patients in NSW</li><li>Stranded tourists start to complain about lack of access to shelter, food, clean water and information. Tensions in evacuation shelters run high as locals feel that tourists should have left earlier.</li><li>People eat contaminated food that has been in contact with floodwaters leading to illness and increased hospitalization which places pressure on the health system.</li><li>Crop and livestock loss, combined with goods unable to get to market have resulted in noticeable shortages in fresh fruit and vegetables, leading to dramatic price increases.</li><li>Manufactures of products containing goods from the Hunter begin to experience shortages of these crops, leading to supply disruption and price increases.</li><li>Supply routes resume to Murrumbidgee but shortages remain due to load limitations on surrounding roads while repairs take place.</li><li>Multiple cases of Ross River virus and Japanese encephalitis are detected in Nowra. One death has occurred from Japanese encephalitis</li><li>The economy of NSW is impacted by the loss of significant tourism revenue, with many accommodation and tourism service providers needing to undertake significant repairs before reopening.</li><li>Repairs to road, rail and critical infrastructure are prioritised, resulting in trade shortages in the South Coast of NSW.</li><li>Rates of domestic violence increase, and schools record high absence rates in the Hawkesbury–Nepean, Murrumbidgee and Launceston regions.</li><li>Impacted areas in and around Launceston experience substantial decrease in tourism. This has a substantial economic impact to these areas, and many businesses that are forced to close, struggle to reopen.</li></ul>

# 22-24 November: Severe storm outbreak QLD

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### Weather

Weather conditions become favourable for widespread severe thunderstorms over south-east & central Queensland during late November. Severe thunderstorms impact an area which extends from the Capricornia District to the far south-east of the state. Hazardous weather includes large and giant hail, intense/heavy rainfall and flash flooding and destructive/damaging wind gusts. The focus area is Sunshine Coast south to NSW border on 22-23 Nov, contracting to Capricornia region on 24th.

### Locations impacted

Eastern QLD, inc. Rockhampton, Bundaberg, Gympie, Sunshine Coast, Brisbane metro, Gold Coast

### Energy and infrastructure

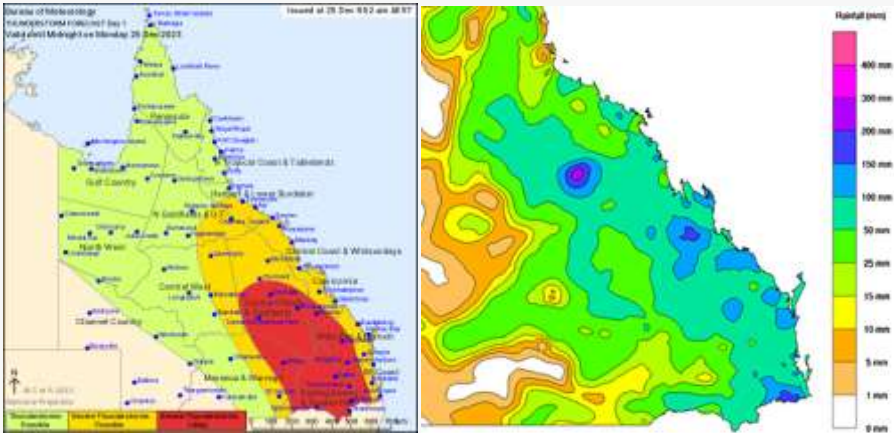
- High winds bring down transmission lines near Gympie on 22nd, while damaged trees cause outages around Gold Coast on 23rd.
- Blackouts persist across Sunshine Coast for several days; power outages also at Gold Coast, Brisbane and Gladstone
- Flash flooding causes severe disruption inc. traffic chaos, creeks breaking banks
- Brisbane and Sunshine Coast Airports closed due flash flooding
- Drinking water contamination– residents required to boil water

### Industry and environment

- Destructive winds cause widespread damage to power lines, infrastructure and commercial and residential properties across the region
- Hundreds of businesses affected

### Services

- Flooded roads and persistent storm activity (wind/lightning/rain) hinders Emergency Service response



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Looking to the future: a warmer atmosphere supports more intense rainfall

### Quick Numbers: Weather observations

#### Winds

- Gympie
- Gold Coast Seaway
- Gladstone

#### Kph / kt

137 / 74  
117 / 63  
105 / 57

#### Rainfall (short-term)

- Gympie
- Brisbane
- Gold Coast
- Gladstone

#### mm

88 (1 hour)  
164 (2 hours)  
64 (1 hour)  
202 (6 hours)

#### Hail size (maximum observed)

- Gympie
- Brisbane suburbs
- Gold Coast

#### cm

12  
8  
6

### Quick Numbers:

#### Total population

3.8 million

- Fatalities
- People displaced

6  
300

#### Residential dwellings

1.5 million

- Damaged
- Destroyed
- Reconstruction value

454  
127  
\$98 million

# NEMA Scenario Consequences: 22-24 November: Severe storm outbreak. QLD

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"><li>• Destructive winds result in widespread fallen trees, with at least 12 homes destroyed by fallen trees. A further 45 are damaged. Three people are killed by falling trees.</li><li>• Livestock perishes in flood waters, and sugarcane and vegetable crops in the Bundaberg region are destroyed. Large quantities of zucchini, squash, cucumber, capsicum, and bean crops are unable to be harvested due to flooding and spoil. Significant flooding of agricultural infrastructure including sheds containing fertiliser and chemicals. One farmer is killed by a lightning strike.</li><li>• High winds bring down the transmission lines near Gympie, resulting in 30,000 customers being without power. Damage to transmission lines near the Gold Coast result in over 250,000 customers being without power.</li><li>• Power is disrupted to key water treatment plants, resulting in boil water notices being issued.</li><li>• Significant stormwater flows result in some sewerage treatment plants overflowing and releasing effluent.</li><li>• Flash flooding closes Brisbane and Sunshine Coast airport. The Port of Brisbane is closed due to strong winds impacting crane operations.</li><li>• Giant hail damages approx. 23,000 cars.</li><li>• A rum distillery in Bundaberg is flooded, resulting in significant stock losses and subsequent shortages.</li></ul>	<ul style="list-style-type: none"><li>• Ongoing hazardous conditions, including flooded roads, prevent emergency services from reaching those requiring assistance. Two people die waiting for an ambulance to arrive.</li><li>• Flood-driven algal blooms in rivers causing health crisis and mass fish kills.</li><li>• Ongoing power outages impact the ability business to re open, and damage stock.</li><li>• Significant amounts of top soil is washed away, resulting in reduced crop yields in following years.</li><li>• Crops that were successfully harvested before the rainfall, and livestock are unable to get to market.</li><li>• Stagnant flood waters lead to the spread of Ross River virus and Japanese encephalitis, throughout the impacted region.</li><li>• Mental health of farmers impacted due to additional stress and pressure from a failed crop in conjunction with economic stress in a high cost of living environment.</li><li>• Significant delays in insurance assessments are experienced.</li></ul>	<ul style="list-style-type: none"><li>• Stranded tourists start to complain about lack of access to shelter, food, clean water and information. Tensions in evacuation shelters run high as locals feel that tourists should have left earlier.</li><li>• Evacuation centres are not appropriately fitted with accessibility or ambulant facilities which leads to further distress and tension.</li><li>• Black outs continues to impact response early recovery, health centres and hospitals running at limited capacity.</li><li>• Increased transmission of waterborne diseases in the area.</li><li>• People eat contaminated food that has been in contact with floodwaters leading to illness.</li><li>• Crop and livestock loss, combined with goods unable to get to market have resulted in noticeable shortages in fruits and vegetables, leading to dramatic price -increases across Australia.</li><li>• The economy of the Gold Coast is impacted by the loss of significant tourism revenue, with many accommodation and tourism service providers needing to undertake significant repairs before reopening.</li><li>• Rates of domestic violence increase, and schools record high absence rates in the Bundaberg and Gympie regions.</li></ul>



# 22-28 November: Early season heatwave

## WA, SA, VIC, NSW, and ACT

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### Weather

A fresh, dry north-easterly flow leads to hot conditions over much of southern WA during 22-24 November. Severe to Intense Heatwave Warnings are issued for a region extending from around Geraldton to the far south of the state.

By the 25th a hot, northerly flow affects much of SA with inland locations experiencing record temps. On the 26th Adelaide breaks it's Nov daily record, with SE SA remaining hot until the 27th.

Vic and southern NSW see Heatwave conditions from the 26th to the 28th. Melbourne also exceeds its November max temp record on the 27th.

Southern NSW and subsequently Canberra also get very close to highest-on-record max temps between the 26th and 28th.

Some of the above locations have their first Total Fire Ban for the year along with non-severe, but widespread fire activity. More significant fire activity was observed in inland and forested locations (e.g. Grampians (Vic), Adelaide Hills – see separate slides)

### Locations impacted

Perth, Adelaide, Melbourne, Canberra

### Energy and infrastructure

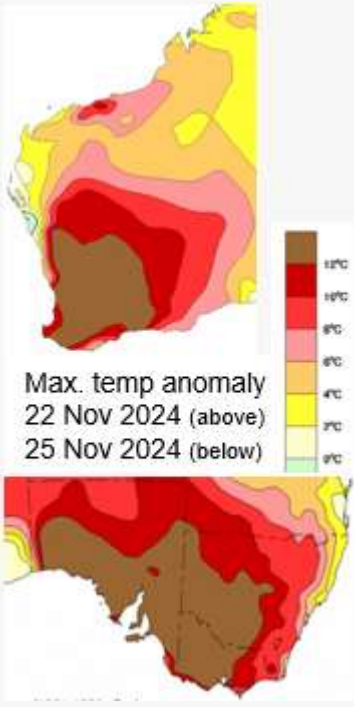
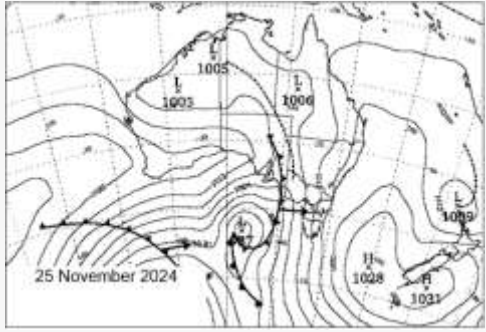
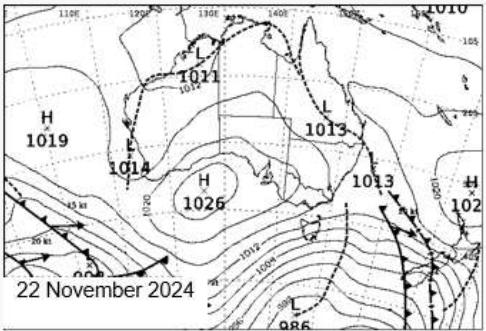
- Multiple blackouts across SE Aust due to excessive energy demand

### Industry and environment

- High number of grass fires across SE SA and southern VIC
- High number of surf rescues and drownings due to large numbers at beaches

### Services

- Hospitals overwhelmed with near-record number of admissions



Looking to the future: extreme heat events will become more frequent, last longer, and reach higher temperatures

### Quick Numbers: Weather observations

Max temps (consecutive days)	°C
• Perth (22-23/11)	39, 41
• Adelaide (25-27/11)	41, 44, 36
• Melbourne (26-28/11)	36, 41, 36
• Canberra (27-28/11)	39, 38
Max FBI	
• Perth	46 HIGH
• Adelaide	67 EXT
• Melbourne	48 HIGH
• Canberra	43 HIGH

### Quick Numbers:

Total population	8.8 million
- Fatalities	45
- People displaced	230
Residential dwellings	
- Damaged	19
- Destroyed	3
- Reconstruction value	\$98 million

## NEMA Scenario Consequences: 22-28 November: Early season heatwave. WA, SA, VIC, NSW, and ACT

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"> <li>• Total Fire Ban in place in many areas impacted by the heatwave, with communities fearful of fires breaking out. Construction and landscaping activities that may create sparks are banned. Pre bushfire season hazard reduction burns cannot take place.</li> <li>• High number of grass fires break out across south east South Australia and southern Victoria, threatening rural towns and farming infrastructure.</li> <li>• South East Australia suffers from multiple blackouts due to excessive energy demand. Load shedding is required in Canberra, Wagga Wagga and Albury-Wodonga.</li> <li>• Assistive technology for high-risk cohorts fails leading to increased fatalities in remote areas of WA, VIC and NSW.</li> <li>• Large crowds gather at beaches and rivers across heat impacted areas to escape the heat, resulting in traffic and waterway congestion.</li> <li>• There are more fatalities across Victoria due to drowning.</li> <li>• High temperatures cause severe heat stress in rural communities with farmers expressing concern for livestock access to water and no access to shade.</li> <li>• The drying of the landscape in south east Australia continues, threatening crops and the feed for livestock.</li> <li>• High winds, combined with high grass pollen counts lead to multiple thunderstorm asthma events in Victoria, NSW and the ACT resulting in two fatalities.</li> </ul>	<ul style="list-style-type: none"> <li>• Cuts to power and air-conditioning lead to an increase heat stress admissions at health centres and hospitals</li> <li>• Ambulance service cannot keep up with demand due to heat related illness and respiratory issues relating to thunderstorm asthma events. Ramping occurs in multiple locations.</li> <li>• Beaches across the impacted areas record high numbers of surf rescues, overwhelming surf life saving resources.</li> <li>• Damage to crops and livestock is experienced, with fruit crops spoiling and large numbers of poultry, goats, sheep and cattle perishing due to heat stress.</li> <li>• Businesses experiencing power outages are unable to operate due to inoperable tills and appliances. Some industries are unable to operate due to the heat, including the building industry.</li> <li>• Mass deaths of birds and bats are recorded in Victoria due to heat stress.</li> <li>• Grass fires burning in grassland around Canberra impact air quality.</li> </ul>	<ul style="list-style-type: none"> <li>• Dead livestock decompose rapidly due to the heat, resulting in biohazard issues for farms.</li> <li>• Ramping and delays in accessing healthcare result in a number of preventable deaths.</li> <li>• Rates of domestic violence increase, and schools record high absence rates.</li> <li>• Canberra airport closed due to lingering smoke in the area.</li> <li>• Concerns for water security arise in rural communities, with farmers hesitant to plant future crops due to hesitations that rainfall wont come.</li> </ul>

# 24-28 November: Fires Adelaide Hills SA

## Weather

Strong northerlies ahead of a trough and front cause extreme heat across eastern SA and into NSW and Victoria. Temperatures exceed 41°C in Adelaide, with lightening in pre-frontal trough triggering a line of fires in Para Wirra Conservation Park, quickly spreading south/south-east as the winds intensify. A second outbreak of grass fires occurs north of Naracoorte. Little rain eventuates with the front, with extreme heat returning in the subsequent days.

## Locations impacted

Adelaide Hills, Mt Torrens, Lenswood, Hahndorf, Echunga  
Naracoorte

## Energy and infrastructure

- NSW-SA interconnector / transmission lines threatened by fires

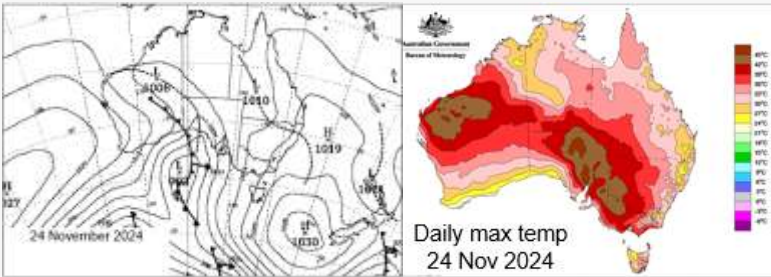
## Industry and environment

- Vineyards impacted from infrastructure damage and potential smoke taint
- Many animals perish in fires

## Services

- Evacuation centers set up in several communities

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Looking to the future: fire seasons will become longer, with more frequent dangerous fire weather days

Quick Numbers: Weather observations	
Max FBI • Adelaide	FDR 87 EXT
Max wind gusts • Adelaide	Kt / kmh 45 / 85
Max temp • Adelaide	°C 43.3
Rainfall well below average during 2024 to date. High fuel loads in many areas with vegetation drying in recent heat	

Quick Numbers: Adelaide Hills, SA	
Total population	29,900
- Fatalities - People displaced	4 263
Residential dwellings	
- Damaged - Destroyed - Reconstruction value	4,570 235 \$980 million



# NEMA Scenario Consequences: 24-28 November: Fires. Adelaide Hills SA

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"><li>• Fires in the Adelaide Hills result in destruction of 235 homes and additional damage to 4,570 homes. The evacuation centre in Hahndorf quickly reaches capacity following the evacuation of the local caravan park. The evacuation centres do not cater for companion animals so there are a number of cohorts who refuse to leave their homes despite imminent danger.</li><li>• Fires quickly spread and reach a number of orchards, destroying cherry and stone fruit crops. At one orchard, 12 seasonal workers become trapped by the fire, with 4 of them dying from smoke inhalation.</li><li>• Some wheat crops are destroyed by the fires, with harvest machinery also destroyed at a number of locations.</li><li>• Packing sheds and other farm machinery and infrastructure is damaged or ruined.</li><li>• The energy grid is struggling to cope with the energy demand caused by the heatwave. Rolling blackouts impact Adelaide</li><li>• The SA–Vic electricity connector is severely damaged. There is also damage to the NSW–SA interconnector with machinery destroyed and workers unable to access construction sites.</li><li>• Heavy smoke from the fires impacts Adelaide, resulting in an increase in respiratory related admissions to health services. The smoke also taints grapes in surrounding vineyards.</li><li>• Ongoing heatwave conditions result in an increase in heat related admissions to health services.</li></ul>	<ul style="list-style-type: none"><li>• Smoke taint impacts over 90% of the Adelaide Hills grape crop, resulting in no 2025 Adelaide Hills vintage.</li><li>• Destruction of cherry and stone fruit crops leads to shortages and price rises. Crops that aren't destroyed by fire are unable to be picked in time, resulting in spoilage and lost revenue.</li><li>• Damage to the SA-VIC electricity connector is difficult to fix due to supply chain shortages of essential materials. Blackouts persist over the coming weeks.</li><li>• Some locations, including Hahndorf and Lenswood have an unstable electricity supply due to infrastructure damage. Businesses that weren't damaged in the fire are now unable to operate if they are reliant off steady power supply.</li><li>• Mental health of farmers and vineyard operators impacted due to additional stress and pressure from a failed crop whilst already experiencing economic stress in a high cost of living environment.</li></ul>	<ul style="list-style-type: none"><li>• Farmers are unable to get crops to markets either due to heat or smoke damage or because the fire destroyed the crop, leading to a lack of export revenue.</li><li>• Nationwide increase in the price of cherry and stone fruit crops due to shortages.</li><li>• Nearby waterways become polluted due to ash run off.</li><li>• Fire affected farm land is stripped of its topsoil, resulting in subsequent poor crop yields.</li><li>• A rise in the number of police call outs for domestic and family violence incidents in bushfire impacted towns.</li></ul>

# 25-28 November: Heatwave and fires Grampians VIC

## Weather

Hot and dry conditions in southern Australia prompt early season bushfires in Victoria. A Total Fire Ban was issued for 25 Nov, with HIGH to EXT Fire Danger ratings across much of western Vic. Strong winds increase fire risk in dry areas and fires break out in Horsham. Smoke and embers are carried towards the Grampians where a major fire is started. Towns around and south of the main Grampians fire were impacted, including Halls Gap and Ararat.

The fire is in largely inaccessible areas and burns out of control for more than 48 hours. Smoke and embers at the Halls Gap tourist town lead to closure of businesses and evacuation of tourists. Embers generate further fire activity at Ararat with severe disruption and damage to houses to nearby farms.

## Locations impacted

Grampians, Horsham, Ararat

## Energy and infrastructure

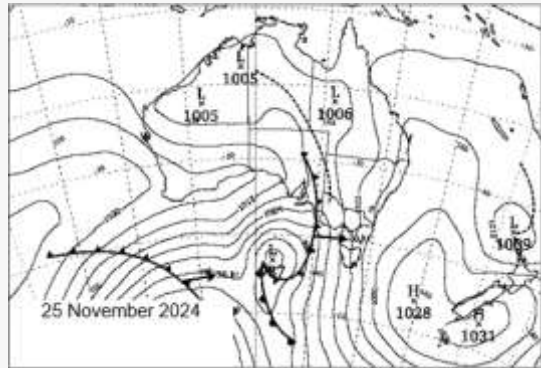
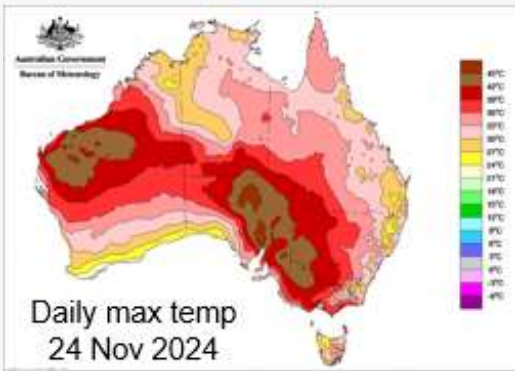
- Power outages relating to excessive energy demands (broader Vic region)
- Strong winds and fire damage lead to fallen power lines and widespread and power outages up to 2 days

## Industry and environment

- 270 homes destroyed
- 5,800 ha burnt area

## Services

Health services strained by heat stressed people due to early season non-acclimatization. Evacuation centres unprepared for scale of emergency



Looking to the future: fire seasons will lengthen; early season heatwaves become more frequent

Quick Numbers: Weather observations	
Max FBI • Horsham	FDR 74 EXT
Max wind gusts • Horsham	Kts / kmh 45 / 85
Max FBI • Horsham	°C 42.0
Rainfall well below average during 2024 to date. High fuel loads in many areas with vegetation drying in recent heat	

Quick Numbers: Grampians / Horsham, VIC	
Total population	62,000
- Fatalities	3
- People displaced	160
Residential dwellings	29,849
- Damaged	705
- Destroyed	12
- Reconstruction value	\$202 million

# NEMA Scenario Consequences: 25-28 November: Heatwave and fires. Grampians VIC

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"><li>• 12 homes are destroyed as the fire approaches Horsham, with an additional 705 damaged or significantly impacted by smoke.</li><li>• One firefighter is killed by a falling tree. Two farmers die from heart attacks whilst trying to protect their properties.</li><li>• Fires quickly spread to farmland and destroy legume and grain crops.</li><li>• Some hay crops are destroyed by the fires, with harvest machinery also destroyed at a number of locations.</li><li>• Packing sheds and other farm machinery/infrastructure is damaged or ruined.</li><li>• Transmission poles are burnt in the fire, cutting off power to Horsham and rural properties.</li><li>• Heavy smoke from the fires impacts Horsham, resulting in an increase in respiratory related admissions to health services. The runway at Horsham Airport has to be closed due to the smoke, preventing RFDS planes from taking off.</li><li>• Ongoing heatwave conditions result in an increase in heat related admissions to health services.</li></ul>	<ul style="list-style-type: none"><li>• Damage to transmission lines is difficult to fix due to ongoing fire activity and strong winds. Blackouts persist over the coming weeks.</li><li>• Delays in surviving crops getting to market due to harvesting delays and damage to roads.</li><li>• Some locations in Horsham have an unstable electricity supply due to infrastructure damage. Businesses that weren't damaged in the fire are now unable to operate if they are reliant off steady power supply.</li><li>• Mental health of farmers impacted due to additional stress and pressure from a failed crop whilst already experiencing economic stress in a high cost of living environment.</li></ul>	<ul style="list-style-type: none"><li>• Farmers are unable to get crops to markets either due to heat or smoke damage or because the fire destroyed the crop, leading to a lack of export revenue.</li><li>• Nearby waterways become polluted due to ash run offs.</li><li>• Fire affected farm land is stripped of its topsoil, resulting in subsequent poor crop yields.</li><li>• A rise in the number of police call outs for domestic and family violence incidents in bushfire impacted towns.</li></ul>



# 30 November: Bushfires

## Geraldton, WA

### Weather

An inland trough is located close to the WA coast, leading to enhanced, dry easterly winds across WA's Central West region. Record daily maximum temperatures are observed across the district, and Geraldton experiences EXTREME fire danger. Multiple grassfires develop inland, and driven by the strong winds encroach rapidly upon parts of the town. Several houses are impacted along with road closures leading to closures of businesses and the Geraldton Port. Fires also affect pastoral land inland of the town, leading to livestock losses and burnt pasture. A large fire front develops east of Geraldton airport

Fires continue until late on 1 December when a cooler, humid airmass reaches the region.

### Locations impacted

Geraldton and surrounds

### Energy and infrastructure

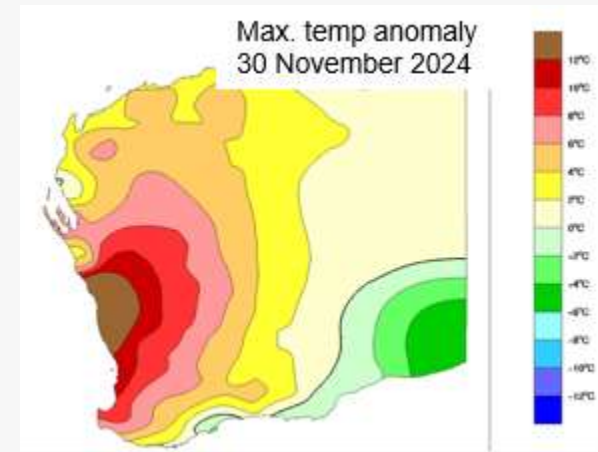
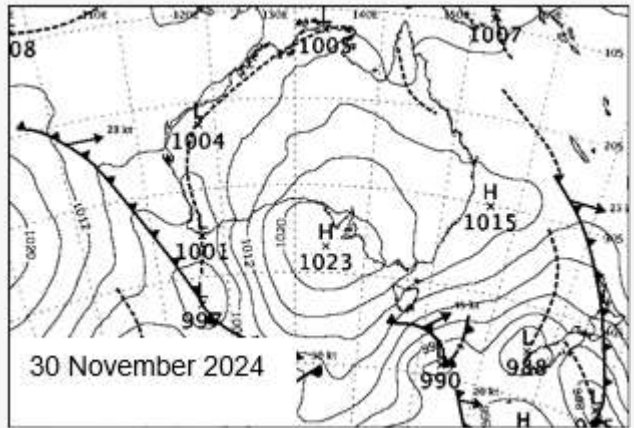
- 12,700ha burnt area
- No.1 route/highway closed both north and south of Geraldton due to smoke and blowing embers
- Airport forced to shut down for several days due to smoke/embers

### Industry and environment

- Multiple Geraldton & regional businesses affected with Port closure
- Extensive damage to pastoral properties and livestock losses

### Services

- Evacuation sites overwhelmed



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Looking to the future: fire seasons will lengthen; early season heatwaves become more frequent

### Quick Numbers: Weather observations

Max FBI <ul style="list-style-type: none"><li>• Geraldton</li></ul>	94 EXT
Max wind gust <ul style="list-style-type: none"><li>• Geraldton</li></ul>	Km/h 84
Max temp <ul style="list-style-type: none"><li>• Geraldton</li></ul>	°C 43.5

### Quick Numbers: Geraldton, WA

Total population	38,595
<ul style="list-style-type: none"><li>- Fatalities</li><li>- People displaced</li></ul>	 0 463
Residential dwellings	17,000
<ul style="list-style-type: none"><li>- Damaged</li><li>- Destroyed</li><li>- Reconstruction value</li></ul>	 458 184 \$28 million

# NEMA Scenario Consequences: 30 November: Bushfires. Geraldton WA

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"><li>• The bushfire burns over 12,000 ha, and damages properties on the outskirts of Geraldton, and on surrounding farms. At least 184 homes or buildings are destroyed by the fire.</li><li>• Pastoral properties experience significant livestock losses, with large numbers of cattle being killed or needing to be euthanised due to injuries.</li><li>• The Geraldton airport is closed due to heavy smoke and ongoing ember presence. Geraldton port is also closed due to smoke, impacting visibility and rendering the site unsafe for workers.</li><li>• Businesses reliant on Port operations are impacted, with ships being diverted until further notice.</li><li>• The Brand and North West Coast highways are both closed due to fire conditions, essentially isolating Geraldton for periods.</li><li>• Evacuation sites become overwhelmed quickly, with large numbers of people evacuating with large animals such as horses.</li></ul>	<ul style="list-style-type: none"><li>• Air quality impacted due to smoke, increased respiratory issues for local residents and increased hospital admissions.</li><li>• Farming infrastructure losses including extensive damage to fences and farming machinery. Food supplies for livestock lost or damaged.</li><li>• Port closure causes disruption of grain and iron ore exports.</li><li>• Airport closure leaves passengers stranded, increasing pressure on local supplies.</li><li>• Road closures cause long detours, impacting trucks heading north.</li><li>• Online disinformation campaigns spread rumours that the fires were deliberately lit fires, causing tensions in the evacuation centres and amongst residents.</li></ul>	<ul style="list-style-type: none"><li>• Fear of asbestos contamination from burnt building slow down recovery work in the area.</li><li>• Long term economic downturn due to reduced agricultural productivity for farmers in the region impacted by the fires.</li><li>• Increased difficulty in getting feed for livestock that survived the fires. Farmers stuck with dealing with live stock carcasses.</li><li>• Port struggles to deal backlog of ships in the port and arriving vessels bunching, causing more delays and longer wait times.</li><li>• Airport infrastructure damaged by the fire results in longer term closure of the airport.</li></ul>

# National Map: December 2024

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26-30 December

WA

**Flooding and community isolation caused by the ex-Tropical Cyclone.**

- Widespread flash flooding across the Kimberly
- Great Northern Highway cut with local communities isolated
- Saturates regional catchments including Fitzroy River

30-31 December

NT

Heatwave affects the region with still in recovery from the Tropical Cyclone. Heat also impacts Alice Springs.

2-4 December

SW WA

Fire weather conditions become **EXTREME** in south-west WA & fires ignite. Multi-day fire causes major disruption and structural damage.

4-7 December

SA/VIC

Fire weather conditions become **EXTREME** in Southeast SA, VIC. Fire near Spalding / Clare and along Eyre Peninsula (SA) & Otways (Vic)

Early December

SA/VIC/TAS

Heatwave dries landscape. Major heat health event at Meredith music festival. Power outages. Affecting Melbourne / Western Sydney/Hobart

18-30 December

QLD/NT/WA

**Severe Tropical Cyclone Rae forms in the Coral Sea.** Category 4 landfall near Port Douglas. Category 3 landfall near Nhulunbuy. Elcho Island affected. Prolonged power outage across Arnhem Land and impacts Tiwi Islands. Category 4 landfall at Darwin Christmas day

10-15 December

QLD

**Ex-Tropical Cyclone Peter passes close to the SE QLD coast.** As Ex-TC, turns towards QLD coast and slowly tracks south generating very heavy rainfall and flooding from Sunshine Coast to NSW Northern Rivers

26 December

Sydney NSW

**Severe storm in Sydney** with tornado, flash flooding and severe impacts, potential fatalities. Storm comes while still in recovery from ECL.

25 December

ACT & inland NSW

**Severe storm** with large hail, flash flooding, damaging winds. Severe impacts, power outages due fallen trees

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# 2-4 December: Heatwave and fires South-west WA

## Weather

A fresh, dry north-easterly flow leads to hot conditions over much of SW WA during 2 December. A Severe Heatwave Warning as well as a Total Fire Ban were issued for 2 Dec, with EXTREME Fire Danger ratings.

Deliberate fires are ignited on the western edge of Blackwood State Forest, east of Margaret River. The fires in this region rapidly build and become out-of-control during 2 Dec. Easterly winds push the fires towards coastal, residential areas including Witchcliffe and the Margaret River township.

Smoke and embers cause multiple flare-ups along the near-coastal strip, causing widespread disruptions, and the closure of the main north-south route in the region (Bussell Hwy). As the fires approach the peri-urban areas, power poles are burned, and widespread blackouts ensue.

Weather conditions are equally as volatile on the 3rd and little progress is made suppressing the main fire around the urban townships.

A coastal trough moves onshore during 4 Dec increasing humidity, reducing wind speed and temperature and decreasing fire weather. This enables fire fighters to bring the blaze under control

## Locations impacted

Witchcliffe, Margaret River, Blackwood State Forest

## Energy and infrastructure

- 7 fatalities; 687 homes destroyed
- 11,700ha burnt area
- Transmission poles burnt and damaged leading to widespread local power outages.
- Bussell Hwy. closed due to smoke and blowing embers

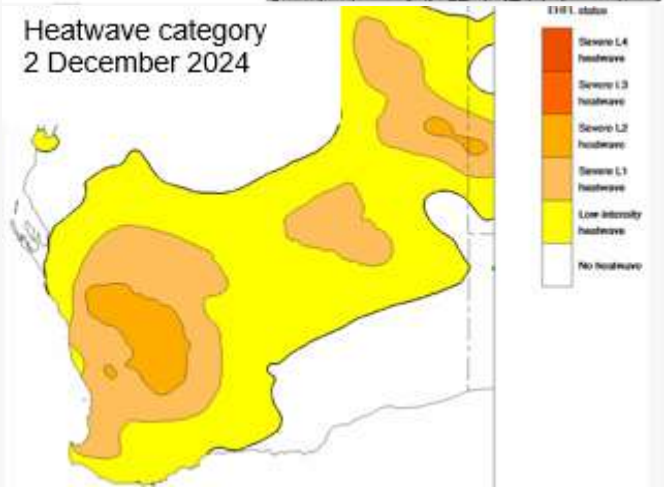
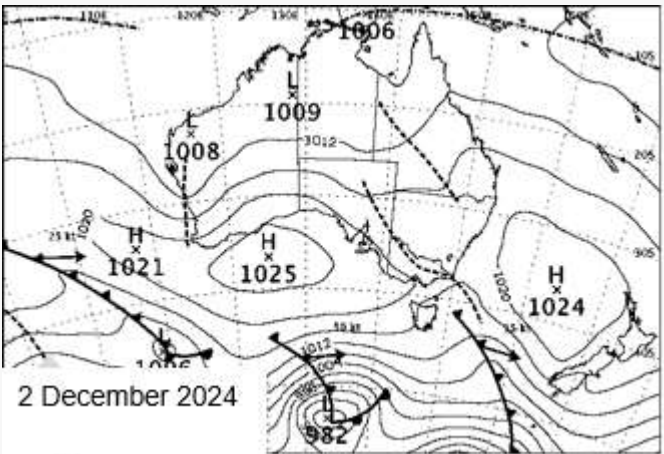
## Industry and environment

- Over 4000 businesses affected

## Services

- Evacuation sites overwhelmed

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Looking to the future: fire seasons will lengthen; early season heatwaves become more frequent

Quick Numbers: Weather observations	
Max FBI <ul style="list-style-type: none"><li>• Witchcliffe</li><li>• Bridgetown</li></ul>	87 EXT 94 EXT
Max wind gust <ul style="list-style-type: none"><li>• Witchcliffe</li><li>• Bridgetown</li></ul>	Km/h 81 86
Max temp <ul style="list-style-type: none"><li>• Bridgetown</li><li>• Manjimup</li></ul>	°C 41.3 42.1

Quick Numbers: South-west WA	
Total population	7,500
<ul style="list-style-type: none"><li>- Fatalities</li><li>- People displaced</li></ul>	7 370
Residential dwellings	9,300
<ul style="list-style-type: none"><li>- Damaged</li><li>- Destroyed</li><li>- Reconstruction value</li></ul>	687 459 \$112 million

# NEMA Scenario Consequences: 2-4 December: Heatwave and fires. South-West WA

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"><li>• A deliberately lit fire burns out of control in the vicinity of Margaret River, with winds pushing the fire towards the Margaret River Township and Witchcliffe where a total of 687 homes are destroyed by the fire. An additional 90 structures, such as sheds, are destroyed.</li><li>• 3 firefighters are killed in a car crash on their way to the fire front. 2 farmer dies whilst trying to protect their properties. 2 people die trying to evacuate.</li><li>• The bushfire burns a total area of 11,700ha including through nearby national parks.</li><li>• Transmission poles burnt and damaged leading to widespread local power outages.</li><li>• Bussell Highway is closed due to smoke and blowing embers, causing traffic congestions and major delays.</li><li>• Over 4,000 local businesses are affected by the fires, some business owners refuse to evacuate, trying to protect their livelihood.</li><li>• Evacuation sites are quickly overwhelmed, misinformation spreads on social media that some people are being turned away from evacuation centers.</li><li>• Fires impacts the Margaret River vineyards as grapes ripen before harvest</li></ul>	<ul style="list-style-type: none"><li>• Lack of power impacts peoples ability to cool down, increasing heat stress admissions at health centres and hospitals.</li><li>• Extensive use of air conditioners puts stress on the power grid in areas unaffected, resulting in rolling blackouts.</li><li>• Bushfire smoke sparks surges in hospital admissions.</li><li>• Margaret River vineyards are impacted by smoke and fires, damaging vines and grapes as they ripen.</li><li>• Mass livestock loss from heat stress and fires. Grazing land and dairy infrastructure burnt.</li><li>• Large group of hikers on the Cape to Cape Track are impacted by the heatwave and smoke from the fires and need evacuation.</li><li>• The Bussell Hwy closure causes traffic and supply chain disruptions. A car accident on one of the evacuation route causes a major traffic jam as the fire front approaches.</li><li>• Tensions in evacuation centres rises as they struggle to deal with influx of nearby residents, reports of assault and looting in one of the centres causes panic and unrest.</li><li>• Ten Mile Brook dam water quality is impacted by ash and increased water turbidity. Boil water notices are issued.</li></ul>	<ul style="list-style-type: none"><li>• Loss of feed crops result in farmers needing to source additional feed, increasing the financial pressure on farmers.</li><li>• Damage to dairy infrastructure, combined with rolling blackouts, impacts milk production, further impacting local farming income.</li><li>• Carcasses from animals start to rot posing major biohazard risk.</li><li>• The 2025 wine vintage from the Margret River is destroyed due to smoke taint.</li><li>• The economy in the Margaret River region is impacted by the loss of significant tourism revenue, with many accommodation and tourism service providers needing to undertake significant repairs before reopening.</li><li>• Large amounts of ash wash into the Margaret River, resulting in lasting water quality issues. Water treatment processes become more difficult and costly, prompting the need for water conservation notices to be issued.</li></ul>

# 4-7 December: Heatwave and fires

## SA, VIC and TAS

### Weather

A slow-moving high in the Tasman Sea generates a fresh, dry northerly flow which leads to hot conditions over much of Australia's south-east from 4-7 December. Severe to Intense Heatwave Warnings as well as Total Fire Bans were issued during the period, with widespread EXTREME to CATASTROPHIC Fire Danger ratings.

A fire is accidentally ignited on 4 Dec. in the Mt Lofty Ranges, north of Spalding. It quickly builds and heads in a southerly direction, reaching Clare later that day. The fires continue to build and become out-of-control between the 4th and 6th Dec. Separate fires develop on the Eyre Peninsula near Cummins.

On 5 Dec, small fires which started in the Otway Ranges on the 4th grow rapidly, north of Apollo Bay. Smoke and embers start to affect the township and region causing multiple fires that surround the town and lead to closure of the Great Ocean Road on both sides of Apollo Bay.

While some minor fire activity is observed in TAS, there are no major outbreaks during this period. However, heatwave conditions contribute to high admission rates to local hospitals; likewise for metro Adelaide and Melbourne.

The fires in both SA and VIC lead to downing of burnt power poles and widespread blackouts ensue.

Weather conditions improve for TAS early on the 6th but remain volatile across SE SA and much of VIC until later on the 6th (SA) and during the 7th (VIC); fires remain out-of-control until this time in SA and VIC.

### Locations impacted

Clare Valley, Otway Ranges (Apollo Bay), Hobart

### Energy and infrastructure

- 6 fatalities; 480 homes destroyed
- 247,000ha burnt area
- Transmission poles burnt and damaged leading to widespread power outages.
- Great Ocean Road closed due to smoke and blowing embers

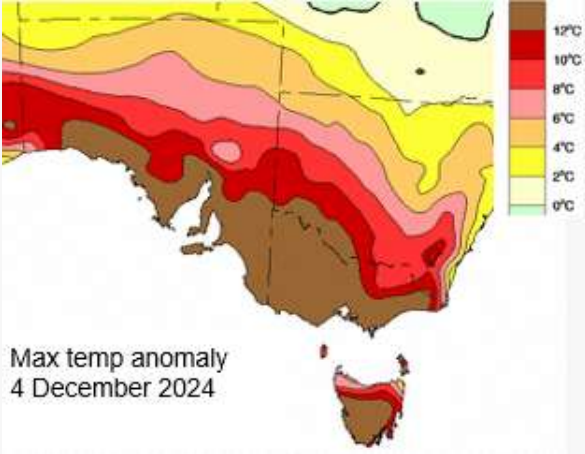
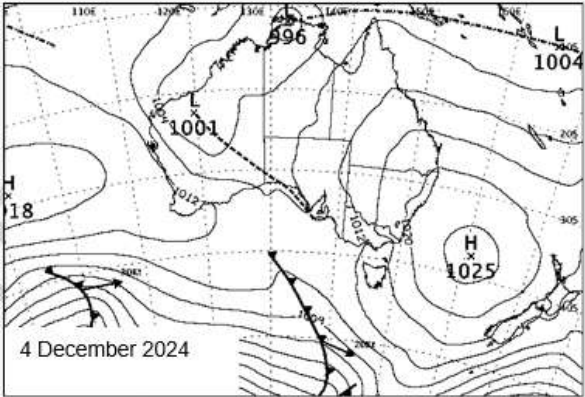
### Industry and environment

- Thousands of businesses affected

### Services

- Evacuation sites/regional hospitals overwhelmed

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Looking to the future: fire seasons will lengthen; early season heatwaves become more frequent

### Quick Numbers: Weather observations

<b>Max FBI</b> <ul style="list-style-type: none"><li>• Adelaide</li><li>• Melbourne</li><li>• Hobart</li></ul>	114 CAT 107 CAT 129 CAT
<b>Max wind gust</b> <ul style="list-style-type: none"><li>• Adelaide</li><li>• Melbourne</li><li>• Hobart</li></ul>	<b>Km/h</b> 106 101 127
<b>Max temp</b> <ul style="list-style-type: none"><li>• Adelaide</li><li>• Melbourne</li><li>• Hobart</li></ul>	<b>°C</b> 45.6 44.9 40.8

### Quick Numbers:

<b>Total population</b>	211,000
<ul style="list-style-type: none"><li>- Fatalities</li><li>- People displaced</li></ul>	6 300
<b>Residential dwellings</b>	
<ul style="list-style-type: none"><li>- Damaged</li><li>- Destroyed</li><li>- Reconstruction value</li></ul>	1,000 480 \$115 million



# NEMA Scenario Consequences: 4-7 December: Heatwave and fires. SA, VIC and TAS

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"> <li>• Total Fire Ban in place in many areas impacted by the heatwave</li> <li>• 480 homes are destroyed around the Apollo Bay area, with an unknown amount damaged.</li> <li>• 2 people die whilst trying to protect their home. There is 1 fatality due to heatstroke.</li> <li>• A total of 247,000ha of land burnt in Tasmania, Victoria and South Australia.</li> <li>• Transmission poles burnt and damaged leading to widespread power outages in Victoria and South Australia</li> <li>• The Great Ocean Road is closed due to smoke and blowing embers, with social media reports indicating that firestorm chasers continue to drive along the road.</li> <li>• Hikers along the Great Ocean Walk need to be rescued.</li> <li>• Large crowds gather at beaches and rivers across heat impacted areas to escape the heat, resulting in traffic and waterway congestion.</li> <li>• High temperatures cause severe heat stress in rural communities with farmers expressing concern for livestock access to water and no access to shade.</li> <li>• The drying of the landscape in south east Australia continues, threatening crops and the feed for livestock.</li> <li>• Some wheat crops are destroyed by the fires, with harvest machinery also destroyed at a number of locations.</li> <li>• The energy grid is struggling to cope with the energy demand caused by the heatwave and damaged transmission lines. Rolling blackouts impact Adelaide and Geelong.</li> </ul>	<ul style="list-style-type: none"> <li>• Cuts to power and air-conditioning lead to an increase heat stress admissions at health centres and hospitals</li> <li>• Ambulance services cannot keep up with demand due to heat related illnesses. Ramping occurs in multiple locations. Hospitals in Hobart near capacity and a Code Brown is declared.</li> <li>• Beaches across the impacted areas record high numbers of surf rescues, overwhelming surf life saving resources. There is 3 fatalities related to drowning in unsafe waterways.</li> <li>• Damage to crops and livestock is experienced, with fruit crops spoiling and large numbers of poultry, goats, sheep and cattle perishing due to heat stress.</li> <li>• Businesses experiencing power outages are unable to operate due to inoperable tills and appliances. Some industries are unable to operate due to the heat, including the building industry.</li> <li>• Firefighters and volunteers are fatigued.</li> </ul>	<ul style="list-style-type: none"> <li>• Tourist season ends early after much of the infrastructure in the Great Ocean Road area is damaged, impacting local outfitters and tour operators.</li> <li>• Increased mental health pressures on community.</li> <li>• Businesses forced to close during peak season are impacted by loss of significant revenue.</li> <li>• Housing stress in the Apollo Bay area is exacerbated by the loss and damage to homes, increasing tensions with owners of short term rentals and locals.</li> <li>• Dead livestock decompose rapidly due to the heat, resulting in biohazard issues for farms.</li> <li>• Ramping and delays in accessing healthcare result in a number of preventable deaths.</li> <li>• Concerns for water security arise in rural communities, with farmers hesitant to plant future crops due to hesitations that rainfall won't come.</li> </ul>

# 10-15 December: Tropical Cyclone Peter QLD and NSW

## Weather

Tropical cyclone Peter develops in the Coral Sea and peaks at Cat 3 intensity over open waters. It weakens to below TC intensity and takes a westerly turn towards the south-east QLD coast. It then slowly tracks south as an ex-TC, closely paralleling the coast. Due to the slow movement of the system, rainfall totals are extremely high, leading to widespread major flooding. Storm surges also affect several exposed stretches of coast, particularly along the Sunshine coast and around Coolangatta, near the NSW border.

## Locations impacted

South-east QLD; Northern Rivers District, NSW

## Energy and infrastructure

- Blackouts persist in Brisbane metro for several days; power outages also at Gold Coast and Northern Rivers sites
- M1 cut at multiple sites between Noosa and NSW border
- Brisbane airport flooded
- Drinking water contamination– residents required to boil water

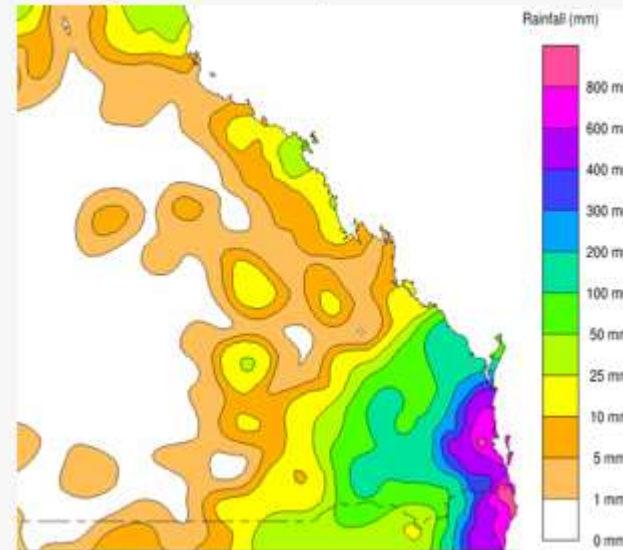
## Industry and environment

- Severe flooding causes widespread damage to infrastructure and commercial and residential properties across Greater Brisbane region and parts of Sunshine Coast
- Silting at mouth of Tallebudgera Creek – severe flooding of commercial and residential properties Gold Coast
- Thousands of businesses affected
- Coastal flooding between Noosa Heads and Coolangatta as 2-3m storm surge affects coast
- Widespread coastal erosion- mainland and offshore islands

## Services

- Evacuation sites overwhelmed

7-day rainfall totals, 12-18 December



**Looking to the future:** fewer tropical cyclones in general, but a greater proportion are likely to be severe

## Quick Numbers: Weather observations

### Rainfall (event totals)

	mm
• Brisbane	675
• Tewantin	594
• Gold Coast	637
• Coolangatta	689
• Lismore	453

### Water levels (tide and storm surge)

	m above AHD
• Noosa Heads	4.6m
• Coolangatta	3.7m

## Quick Numbers: Sunshine Coast

<b>Total population</b>	3.1 million
- Fatalities	4
- People displaced	14,000
<b>Residential dwellings</b>	1.3 million
- Damaged	4,950
- Destroyed	1,876
- Reconstruction value	\$2.1 billion

# NEMA Scenario Consequences: 10-15 December: Tropical Cyclone Peter. QLD and NSW

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"> <li>• Blackouts persist in Brisbane metro for several days; power outages also at Gold Coast and Northern Rivers sites.</li> <li>• M1 cut at multiple sites between Noosa and NSW border disrupting travel and evacuation routes.</li> <li>• Brisbane airport is damaged, and the runway is closed due to flood damage. Aircraft hangers are damaged, with many remaining aircraft in the airport sustaining damage from wind debris or heavy rainfall.</li> <li>• Flooding causes drinking water contamination– residents are required to boil water.</li> <li>• Mass evacuations of tourists from the Sunshine Coast area causing increased road congestion and increasing pressure on fuel supplies.</li> <li>• Severe flooding causes widespread damage to infrastructure and commercial and residential properties across Greater Brisbane region and parts of Sunshine Coast.</li> <li>• Silting at mouth of Tallebudgera Creek results in severe flooding of commercial and residential properties Gold Coast.</li> <li>• Coastal flooding between Noosa Heads and Coolangatta as 2-3m storm surge affects coast.</li> <li>• Widespread coastal erosion- mainland and offshore islands.</li> <li>• Evacuation centres are at capacity and there is a significant number of tourists in the area for the Christmas period which places immense pressure on available accommodation options.</li> </ul>	<ul style="list-style-type: none"> <li>• Australia Zoo suffers major flooding. The extent of damage is unknown, with the possibility that a number of animals escaped from damaged enclosures, including fresh water and salt water crocodiles.</li> <li>• Heavy rain causes multiple major landslips in the Sunshine coast region, blocking local roads and impacting houses.</li> <li>• Flooding impacts the Rocky Point Sugar Mill in the Woongoolba</li> <li>• Sugar cane farmers who were impacted by severe storms in November have been hit again, damaging farm machines and buildings.</li> <li>• Large storm surges and coastal erosion have impacted the evacuation on K'gari Moreton Island and Minjerribah (Stradbroke Island), leaving holidays makers stranded on the islands.</li> <li>• Ports and airport closures and major detours are causing bottlenecks for freight, limiting fuel, medical and fresh food supplies.</li> <li>• Evacuation centres over capacity are turning away stranded tourists, leaving them without shelter and limited transport options.</li> <li>• Major flooding around the Brisbane airport as increased the spread of exotic mosquitos carrying potential life threatening viruses.</li> <li>• A large number of cattle and other livestock have been washed away by severe flooding.</li> <li>• Construction sites for the Brisbane Metro have been flooded causing major damage, The Gabba has been damaged, ending the cricket season.</li> </ul>	<ul style="list-style-type: none"> <li>• Stranded tourists start to complain about lack of access to shelter, food, clean water and information, tensions in evacuation shelters run high as locals feel that tourists should have left earlier.</li> <li>• Black outs continues to impact response early recovery, health centres and hospitals running at limited capacity.</li> <li>• Increased transmission of water-borne diseases in the area. People eat contaminated food that has been in contact with floodwaters leading to illness. Hospitals are overwhelmed with the number of people presenting for serious food poisoning.</li> <li>• Roads that are open become blocked with people evacuating, resulting in frustrated people and increased supply chain disruptions.</li> <li>• Disinformation about crocodiles in Brisbane spreads quickly, bringing into question official messaging about how to safely move in flood affected areas.</li> <li>• Large scale loss of sand from beaches and damage to tourist infrastructure causes mass Christmas cancelations.</li> <li>• Widespread disaster overwhelms volunteers' base – emergency services not coping.</li> </ul>



# 18-30 December: Tropical Cyclone Rae

## NT, WA and QLD

### Weather

A tropical cyclone develops in the Coral Sea and strengthens to Cat 4 before making first landfall near Port Douglas. It then tracks across the Gulf and makes a 2nd crossing near Nhulunbuy at Cat 3. It then continues westwards across the northern NT coast. It takes a southerly turn towards Darwin and makes landfall on the city as a Category 4 severe TC overnight/morning of 24-25 December. Destructive winds and storm surge (landfall near time of local high tides) cause widespread damage and disruption. After weakening to a tropical depression, it moves into WA where it generates heavy rainfall (saturating parts of the Fitzroy R. catchment).

### Locations impacted

North Tropical Coast, QLD; Nhulunbuy, Elcho Island, Tiwi Islands, Darwin, Kimberley region

### Energy and infrastructure

- Blackouts persist in Darwin metro for several weeks; power outages also at Elcho Island and Nhulunbuy (Gove)
- Community isolation across FNQ, NW NT and Kimberley region
- Great Northern Highway cut at several locations between Katherine and Fitzroy Crossing. Many roads and bridges lost – major supply chain interruptions.
- Flash flooding with isolated Moderate to Major flooding in NTC
- Darwin airport damaged and runway closed
- Drinking water contamination– residents required to boil water

### Industry and environment

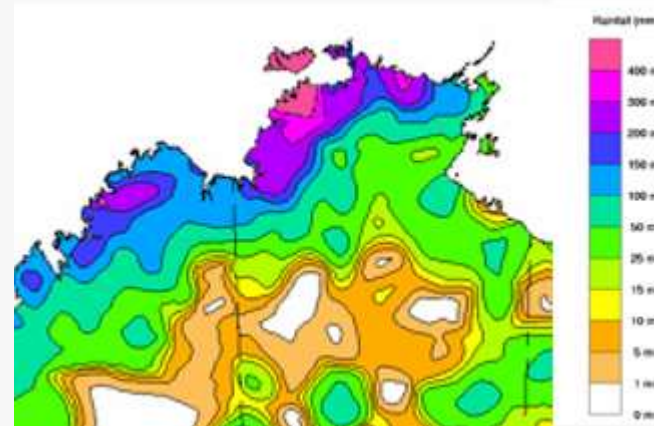
- Kimberley region: Livestock lost, damage to agricultural infrastructure from flooding and strong winds
- Hundreds of businesses affected
- Coastal erosion (Darwin N beaches; northern Kimberley coast)

### Services

- Evacuation sites overwhelmed



7-day rainfall totals, 23-29 December 2024



**Looking to the future:** fewer tropical cyclones in general, but a greater proportion are likely to be severe

### Quick Numbers: Weather observations

#### Winds

- Low Isles
- Darwin Airport
- Ngayawili (Elcho Island)

#### Kph / kts

147 / 79  
241 / 130  
170 / 90

#### Rainfall (event totals)

- Daintree Village
- Darwin AP
- Wadeye (Port Keats)
- Mt Elizabeth

#### mm

375  
494  
276  
387

#### Water levels (tide and storm surge)

- Darwin Harbour
- Darwin – northern beaches

#### m above AHD

9.2m  
8.3m

### Quick Numbers: Darwin

#### Total population

204,493

- Fatalities
- People displaced

3  
3,600

#### Residential dwellings

76,018

- Damaged
- Destroyed
- Reconstruction value

3,144  
546  
\$1.3 billion

# NEMA Scenario Consequences: 18-30 December: Tropical Cyclone Rae. NT, WA and QLD

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"> <li>As the cyclone makes landfall in Port Douglas, flash flooding and wind damage causes significant impacts to properties, including those rebuilding after last years TC Jasper. At least 1,400 properties are damaged. Power outages are extensive across Douglas Shire.</li> <li>In the broader Douglas Shire, multiple landslides occur, destroying the recently rebuilt Cape Tribulation Road and the Bloomfield Track.</li> <li>Destructive winds down transmission lines and trees across the Darwin CBD. Winds also destroy over 5,000 sheds in the area, with 300 homes sustaining severe damage. At least 459 dwellings have been completely destroyed. Multiple churches, including the Cathedral are damaged, and commemorations for the 50<sup>th</sup> anniversary of Cyclone Tracy are cancelled. Elcho Island and Nhulunbuy (Gove) experience significant destruction too.</li> <li>Darwin airport is damaged, and the runway is closed due to flood damage. Aircraft hangers are damaged, with many remaining aircraft in the airport sustaining damage from wind debris or heavy rainfall. Port of Darwin also sustains damage, with a number of cargo cranes destroyed by the winds and other port infrastructure damaged by the storm surge</li> <li>Crops that weren't destroyed in the October bushfires are damaged, with significant loss of banana and mango crops experienced.</li> <li>As the now ex-TC moves towards WA, extensive rainfall floods the Great Northern Highway in multiple places, isolating nearby towns. Flooding also results in large losses in livestock in the Kimberly region, with losses exceeding \$100 million. Agricultural infrastructure including sheds and machinery are damaged by winds and flooding.</li> <li>Fitzroy Crossing is isolated by flood waters, with the Fitzroy River flooding. The Fitzroy Crossing bridge is undamaged, but linking roads are flooded and damaged.</li> <li>Low lying areas of Fitzroy crossing are flooded.</li> <li>Heatwave conditions in Alice Springs place significant pressure on energy supply, resulting in rolling blackouts.</li> </ul>	<ul style="list-style-type: none"> <li>Road closures in Douglas Shire isolate a number of communities including Cape Tribulation and Degarra. Critical supply routes for Port Douglas are closed for a number of days impacting food and fuel resupply.</li> <li>Landslide related debris increase water turbidity, impacting drinking water supply. Conserve water notices are issued for the Douglas Shire. Residents are advised to boil water before consumption.</li> <li>Ongoing blackouts in Darwin, Elcho Island and Nhulunbuy lead to food spoilage and ongoing communications outages. Hot, humid conditions exacerbates food spoilage issues and creates ideal environments for spread of water and mosquito borne diseases.</li> <li>Significant distress in Darwin, especially elderly people due to the cyclone making landfall on the 50<sup>th</sup> anniversary of Cyclone Tracy.</li> <li>Resupply of essential goods in Darwin is slowed due to damage on roads and the port, resulting in price increases in fresh food and fuel.</li> <li>Isolated communities in the NT and Kimberly region run out of food and fuel supplies due to prolonged flooding.</li> <li>Health services in Alice Springs become overwhelmed with heat related presentations.</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing water restrictions in Douglas shire, preventing washouts of flooded homes</li> <li>Black outs continues to impact response early recovery, health centres and hospitals running at limited capacity.</li> <li>Increased transmission of water-borne diseases in the area.</li> <li>People eat contaminated food that has been in contact with floodwaters leading to illness. Or spoiled food</li> <li>Ongoing flooding in residential areas of Darwin lead to large numbers of crocodile sightings and panic in the community.</li> <li>Increase in DV, increase in mental health related presentations to health services.</li> <li>Widespread disaster overwhelms volunteers' base – emergency services struggle to cope.</li> </ul>

# 25 December: Severe thunderstorm ACT

## Weather

An inland trough through NSW combined with upper-level moisture and hot temperatures triggers the development of a line of thunderstorms between Wagga Wagga and Dubbo. In the afternoon, the trough has moved eastwards towards Bathurst and the ACT with thunderstorms in step.

As the trough approaches the ACT multiple thunderstorm cells rapidly intensify between Brindabella and Crookwell bringing damaging, locally destructive winds and large hail to the area. Two large cells with destructive winds and large hail pass through Canberra CBD and Goulburn. Widespread uprooting of trees and local wind damage to buildings occur, impacting powerlines and road access. Severe thunderstorms remain in the area for several hours into the evening hampering immediate clean up.

## Locations impacted

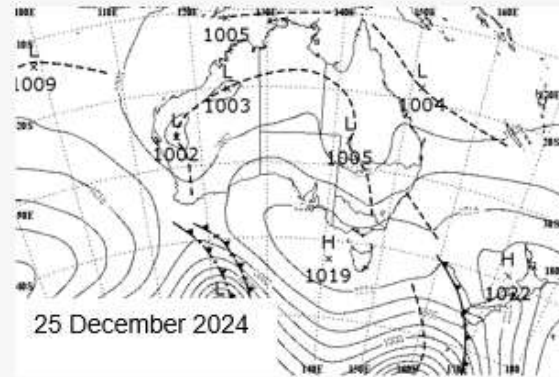
Canberra, Goulburn

## Energy

- Damage to powerlines from uprooted trees and broken tree limbs leading to widespread local power outages affecting 50,000 people

## Infrastructure

- Transport impacts with trees and debris closing multiple local roads and car crashed causing closures to the Tuggeranong Parkway
- Damage to 15,000 homes from wind and hail
- 7,284 homes are destroyed
- 60,500 people are displaced
- Hail damage to exposed vehicles
- Canberra airport/runway closed due to storms in the area



**Looking to the future:** a warmer atmosphere supports higher intensity rainfall associated with thunderstorms

## Quick Numbers: Weather observations

### Max wind gust

- Canberra Airport
- Goulburn

**Km/h**

130  
125

### Hail Size

- Canberra
- Goulburn

**cm**

3  
4

### Rainfall Rate

- Canberra
- Goulburn

**mm/h**

45  
36

## Quick Numbers:

### Total population

391,502

- Fatalities

2

- People displaced

60,500

### Residential dwellings

166,681

- Damaged

15,000

- Destroyed

7,284

- Reconstruction value

\$300 million



# NEMA Scenario Consequences: 25 December: Severe thunderstorm. ACT

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"> <li>In the ACT, significant property damage occurs including instances of fallen trees on homes and vehicles, localised flooding, roof skylights destroyed by hail and roofs collapsing under the weight of water.</li> <li>The ACT SES have received over 9,000 requests for assistance and conducted multiple flood rescues for people caught in flood waters. 15,000 dwellings are damaged by fallen trees, hail or roof collapse, 7,284 dwellings were destroyed.</li> <li>Multiple national institutions experience significant hail damage, with the skylights at Parliament House damaged and leaking due to the hail and drainage overflow.</li> <li>Multiple parks and nature reserves across the ACT experience significant numbers of fallen trees and damage to playground equipment. 2 people are killed when a tree falls onto their parked car.</li> <li>At the peak of the storm 210,000 customers are without power due to extensive damage to power lines in the ACT. Three days after the storm, that number reduces to 5,000.</li> <li>Cars parked outside experience significant hail damage, with over 75,000 vehicles damaged.</li> <li>In Goulburn, 50 dwellings are damaged by fallen trees, hail or roof collapse. The NSW SES receive 400 requests for assistance from the Goulburn region. 800 customers are without power in the region due to damage to power lines.</li> <li>The Hume Highway is flooded and closed in multiple places, with Lake George overflowing onto parts of the Federal Highway. Both highways sustain damage from the flooding, with multiple sinkholes emerging.</li> <li>The wind farm near Bungendore experiences hail damage to turbine blades, resulting in power generation ceasing whilst inspections are underway.</li> </ul>	<ul style="list-style-type: none"> <li>A number of Australian Government offices are significantly damaged and it is estimated individuals will not be able to renter until the 15<sup>th</sup> of January at the earliest.</li> <li>Ongoing power outages results in significant food spoilage as people are unable to refrigerate perishable food.</li> <li>Charitable food pantries are overwhelmed with people seeking goods.</li> <li>Business, including large shopping centres are unable to open for Boxing Day sales due to ongoing power outages.</li> <li>Trades shortages are experienced in the ACT and Goulburn region due to the large number of buildings requiring repair following the storms. The shortages are exacerbated by a significant percentage of tradespeople being out of the ACT during the holiday period.</li> <li>Road closures and load limitations on highways results in some supply shortages of food and fuel into the ACT.</li> <li>Mental health of impacted areas deteriorates due to the compounding trauma of the storm, delays in repairs and the stress of the holiday period.</li> <li>Significant delays in insurance assessments are experienced.</li> <li>Stagnant flood waters lead to the spread of Ross River virus and Japanese encephalitis.</li> </ul>	<ul style="list-style-type: none"> <li>A rise in the number of police call outs for domestic and family violence incidents.</li> <li>Extra garbage collection is required in areas with prolonged power outages</li> <li>ACT Health records a significant rise in food poisoning related illnesses in the days following the storm, this is attributed to Christmas leftovers being stored incorrectly due to the lack of electricity in places.</li> <li>The ACT economy is impacted by the loss of significant tourism revenue, with many accommodation and tourism service providers needing to undertake significant repairs before reopening.</li> <li>Shortages in new and used vehicles are experienced due to the number of vehicles written off by insurance companies. The price of used vehicles increases.</li> </ul>

# 26 December: Severe thunderstorm NSW

## Weather

The weather system that caused severe thunderstorms in Canberra moved further east and during the 26th generated widespread thunderstorm activity across parts of Sydney metropolitan area. The moist onshore flow, assisted by an intense upper-level low produced widespread thunderstorm activity. While there were isolated instances of damaging winds and large hail, the primary hazard was predominantly intense rainfall. Some parts of the Sydney region had more than a month's rainfall in the space of a few hours. In addition, a destructive tornado with gusts in excess of 150 km/h hits Bondi Junction, including its main shopping precinct.

Sydney's northern suburbs, including the northern beaches, were particularly hard hit. Flash flooding impacted many suburbs and severely disrupted Boxing Day activities in the CBD. Local creeks in Sydney's southwest caused Georges River to rapidly rise, stranding hundreds of vehicles; similar impacts along parts of the Parramatta River. More generally, traffic disruption was severe with holiday makers experiencing flooded arterial routes north and south of the city.

## Locations impacted

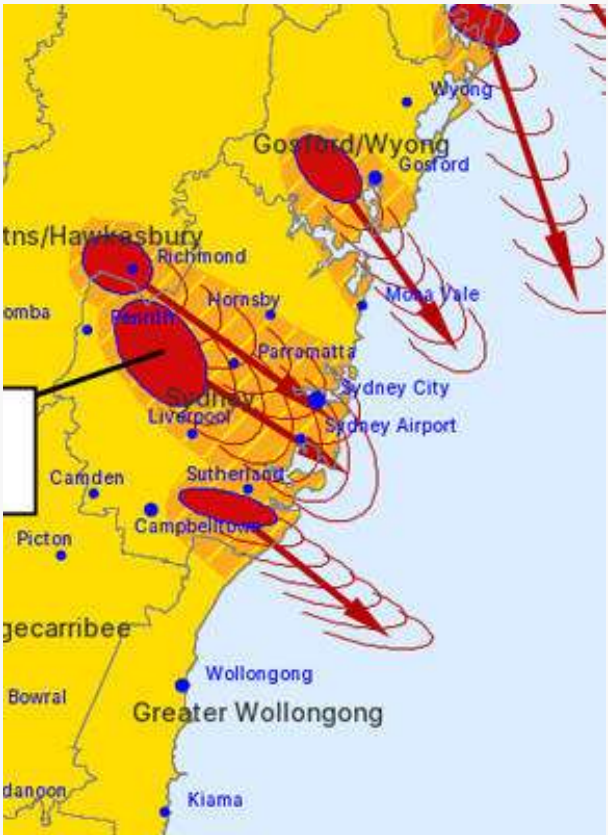
Sydney metro

## Energy

- Isolated damage to powerlines from uprooted trees and broken tree limbs leading to local power outages affecting 30,000 people

## Infrastructure

- Major transport impacts due to widespread flash flooding and roads cut off and damaged
- Rapid creek rises and isolated instances of rapidly-occurring riverine flooding stranded thousands of vehicles; multiple submerged cars and SES rescues required
- Disruption to 10,000+ of businesses who had to cease trading on Boxing Day
- Shopping Centre at Bondi Junction badly damaged; hundreds of people injured due to broken glass and flying debris



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Looking to the future: a warmer atmosphere can hold more moisture, meaning storms are becoming more intense

### Quick Numbers: Weather observations

#### Rainfall (daily)

- Hornsby
- Parramatta
- Sydney Airport
- Bankstown

mm  
278  
196  
223  
247

#### Rainfall Rate (maximum)

- Hornsby
- Parramatta
- Sydney Airport
- Bankstown

mm/h  
98  
83  
78  
89

### Quick Numbers: Greater Sydney

#### Total population

5.2 million

- Fatalities
- People displaced

4  
3,807

#### Residential dwellings

2 million

- Damaged
- Destroyed
- Reconstruction value

23,000  
247  
\$1.9 billion

# NEMA Scenario Consequences: 26 December: Severe thunderstorm. NSW

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"> <li>Flash flooding occurs across Sydney, with multiple suburbs experiencing damage to property, and isolating roads around the Georges and Parramatta rivers. Multiple shopping centres including Bondi Junction, Westfield Sydney and the QVB sustain flooding on ground and basement floors. The M5 tunnel floods.</li> <li>Major highways and roads sustain damage from the flooding, with multiple sinkholes emerging. Sydney Trains cease operations in areas due to flooding.</li> <li>Hail causes significant damage to parked cars across the city, with a number of Sydney to Hobart yachts sustaining hail damage. Over 89,000 cars are damaged by the hail, with the SES receiving a number of call outs for hail or rain damage to roofs.</li> <li>Destructive wind gusts in the Bondi area result in 235 roofs being blown off buildings, and large numbers of uprooted trees and broken tree limbs. 2 separate fallen trees fall onto cars, killing 3 people. Thousands of homes are damaged by downed trees or branches.</li> <li>Windows at the Bondi Junction shopping centre shatter during the tornado, with workers preparing for Boxing Day sales badly injured by broke glass or other flying debris.</li> <li>Damaged power lines lead to power outages across the city. 1 person is killed after being electrocuted by downed power lines.</li> <li>NSW SES receives over 12,000 requests for assistance in a 30 minute time period, however most crews are unable to be deployed due to ongoing dangerous conditions.</li> </ul>	<ul style="list-style-type: none"> <li>Sydney harbour is filled with heavy amounts of pollution and flood debris, with the Cruising Yacht Club of Australia announcing the postponement of the start of the Sydney to Hobart Yacht race due to unsafe harbour conditions and extensive damage sustained by a majority of yachts planning to compete in the race.</li> <li>Most shopping centres are unable to open on Boxing Day either due to damage to the centre, or inability for staff to safely travel to the centres. These closures equate to over \$1 billion in lost revenue.</li> <li>Ongoing power outages results in significant food spoilage as people are unable to refrigerate perishable food.</li> <li>Charitable food pantries are overwhelmed with people seeking goods.</li> <li>Mental health of impacted areas deteriorates due to the compounding trauma of the storm, delays in repairs and the stress of the holiday period.</li> <li>Some areas are effectively isolated, with limited open roads to conduct resupply, and most public transport disrupted.</li> <li>Significant delays in insurance assessments are experienced.</li> <li>Stagnant flood waters lead to the spread of Ross River virus and Japanese encephalitis.</li> <li>Trades shortages are experienced due to the large number of buildings requiring repair following the storms. The shortages are exacerbated by a significant percentage of tradespeople being out of the Sydney region during the holiday period.</li> </ul>	<ul style="list-style-type: none"> <li>Algal blooms form in Sydney Harbour and surrounding beaches including Bondi, forcing their closure.</li> <li>A rise in the number of police call outs for domestic and family violence incidents.</li> <li>Extra garbage collection is required in areas with prolonged power outages</li> <li>NSW Health records a significant rise in food poisoning related illnesses in the days following the storm, this is attributed to Christmas leftovers being stored incorrectly due to the lack of electricity in places.</li> <li>The NSW economy is impacted by the loss of significant tourism revenue, with many accommodation and tourism service providers needing to undertake significant repairs before reopening.</li> <li>Increase in cost of living pressures in casual staff unable to work due to shopping centre closures.</li> <li>Shortages in new and used vehicles are experienced due to the number of vehicles written off by insurance companies. The price of used vehicles increases.</li> </ul>



# National Map: January – February 2025

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28 February  
NT  
Extreme heat in northern NT following Tropical Cyclone Tara. Continuing blackouts.

25 February  
NT  
Severe storm moves through Katherine. Heavy rainfall and Flash flooding. Tornado brings down trees, power outages. Houses and businesses severely damaged.

1-3 January  
WA  
Fire weather conditions become **EXTREME (to CATASTROPHIC)** in south-west WA. Fire ignites near and impacts Perth Hills with fire storm/tornado developing.

2 January  
VIC  
High intensity rainfall and large hail from a line of severe storms causes flash flooding and widespread road and property damage.

6 February  
TAS  
Heatwave coincides with fire weather conditions becoming **CATASTROPHIC** west of Hobart. Fires in several parts of western Tas and old forest growths. Northwestern communities impacted

18 February – 2 March  
QLD/NT/WA/SA  
Severe Tropical Cyclone Tara forms in the Coral Sea. It reaches a category 4 system before making landfall near Wujal Wujal. Tornado & prolonged power outage across Katherine. Flooding at Fitzroy Crossing. Major disruptions to SA road and rail network due to rain from remnant low.

24 January – 3 February  
QLD/NSW/VIC/TAS  
Tropical Cyclone Sebastian forms in the Gulf of Carpentaria. Category 2 system at landfall. Tracks south as ex-TC. Widespread flooding to QLD, NSW and Vic.

18-19 January  
NSW  
Extreme heat impacts much of NSW west of the Divide, drying landscape that flooded in spring. Tamworth music festival particularly impacted with power outages and increased hospital admissions.

25 February  
ACT  
Fire weather conditions become **EXTREME** in ACT. Fire ignites in Bullen Range Nature Reserve and threatens southern Canberra suburbs.

24 Feb – 1 March  
SA/VIC/NSW/ACT  
Extreme heat leads to increased ambulance call outs. Electrical transmission failures. Basslink cut due to peak operating temperature.

2-3 February  
TAS  
Ex-TC Sebastian impacts NE TAS. Heavy rainfall and flash flooding. Houses and businesses severely damaged.

EXERCISE NOT  
FORECAST

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# 1-3 January: Perth Hills bushfire WA

## Weather

A strong, slow-moving high-pressure system south of WA directs dry, fresh easterly winds over the Greater Perth region. A Total Fire Ban is issued for 1 Jan, with EXTREME Fire Danger ratings.

Strong winds caused trees to contact power lines on the outskirts of Gooseberry Hill, leading to several fire ignitions. Easterly winds pushed fires towards residential areas. Accidental ignitions also led to fire activity in Kalamunda and Helena Valley. The separate fires all grow rapidly and remain out-of-control until a change in weather conditions allowed effective suppression measures on 4 Jan.

The coastal trough which increased humidity and coincided with reduced wind speeds, temperatures and dangerous fire weather, initially provided conditions which initiated a pyro-cumulonimbus (fire-induced thunderstorm cloud) and subsequent fire tornado in the Gooseberry Hill area.

## Locations impacted

Gooseberry Hill, Helena Valley, Kalamunda

## Energy and infrastructure

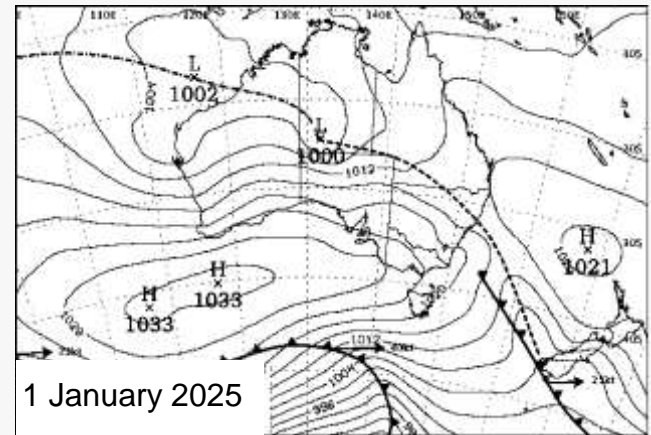
- More than 1,509 homes destroyed
- 6,500ha burnt area
- Transmission poles burnt and damaged leading to widespread local power outages.
- Perth airport/runway closed due to smoke and blowing embers

## Industry and environment

- Hundreds of businesses affected

## Services

- Health services and hospitals overwhelmed with high admissions



Looking to the future: fire seasons will become longer, with more frequent dangerous fire weather days

## Quick Numbers: Weather observations

### Max FBI

- Bickley 87 EXT
- Gooseberry Hill 79 EXT

### Max wind gust

- Bickley 81 Km/h
- Gooseberry Hill 78

### Max temp

- Bickley 34.7 °C
- Gooseberry Hill 33.9

## Quick Numbers: Greater Perth

Total population 73,964

- Fatalities 5
- People displaced 12,500

Residential dwellings 28,545

- Damaged 3,689
- Destroyed 1,509
- Reconstruction value \$500 million

# NEMA Scenario Consequences: 1-3 January: Bushfire. Perth Hills WA

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"><li>• 1,509 homes are destroyed in the Perth hills, as the fire moves through residential areas.</li><li>• 6,500ha of land is burnt in the peri-urban and residential areas surrounding Perth, blanketing the city in smoke.</li><li>• Transmission poles are burnt and damaged by the bushfire, leading to widespread local power outages in the suburbs closest to the fire.</li><li>• Hundreds of businesses are affected by the fire and smoke. Many have to close for extended periods.</li><li>• Health services and hospitals overwhelmed, hospital see a large increase in patients.</li><li>• Perth airport/runway closed due to smoke and blowing embers, flights that are scheduled to land are diverted and flights taking off are grounded. Passengers stuck at the airport become increasingly agitated</li><li>• As strong easterly fan flames towards residential areas, more people are required to evacuate, resulting in traffic jams and panic.</li><li>• As a fire tornado passes through Gooseberry Hill, 2 people die from heart attacks, and 3 firefighters die after becoming trapped in the path of the tornado.</li></ul>	<ul style="list-style-type: none"><li>• Damage to transmission lines is difficult to fix due to ongoing fire activity and strong winds. Blackouts persist over the coming weeks.</li><li>• Some locations in vicinity to the fires have an unstable electricity supply due to infrastructure damage. Businesses that weren't damaged in the fire are now unable to operate if they are reliant off steady power supply.</li><li>• Apple and stone fruit orchards in the Kalamunda area are impacted by smoke and fire.</li><li>• Some equipment at Perth Airport is damaged by fire.</li><li>• Bushfire smoke sparks surges in greater Perth hospital admissions.</li><li>• Shortage of medical supplies and services (staff fatigue and facilities overwhelmed) limits peoples access to medical attention for heat and smoke exposure in the areas closed to the bushfire</li><li>• Significant food spoilage occurs in areas with ongoing power outages, extra garbage collection is required.</li><li>• Outdoor infrastructure in national park is severely damaged including the norther terminal of the Bibbulman Track.</li><li>• Fires impact local schools.</li></ul>	<ul style="list-style-type: none"><li>• Significant delays in insurance assessments are experienced.</li><li>• Perth airport takes longer to become operational after the damage to equipment, mass flight delays and cancelations are experienced.</li><li>• Blackouts continue to impact recovery and reconstruction. Reliance on generators increases community tensions as due to inequitable access.</li><li>• A rise in the number of police call outs for domestic and family violence incidents in bushfire impacted towns.</li><li>• Start of the school year for some local children is postponed due to damaged schools.</li><li>• Critically endangered Baudin's black cockatoo loses large amounts of habitat in the area. Less and less birds are spotted.</li></ul>



## 2-3 February: Flooding TAS

### Weather

Ex-TC Sebastian brings flooding to NE Tasmania locations, including Launceston. The remnant low-pressure system tracks south through the Tasman Sea before stalling just east of Tasmania. Record 2-day rainfall totals on relatively wet soils leads to widespread flash and riverine flooding. Major flooding occurs in the North & South Esk, Meander and Macquarie River basins, with river heights exceeding the 1969 marks. Locations with record river level heights include Fingal, Longford, Launceston (levees breached) and Deloraine.

### Locations impacted

North-east and northern TAS

### Energy and infrastructure

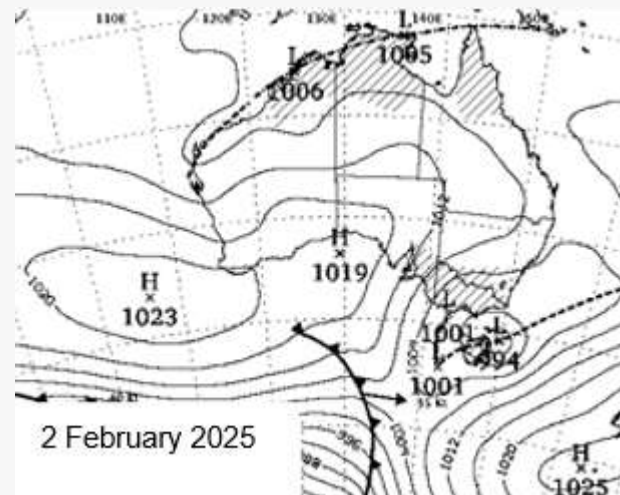
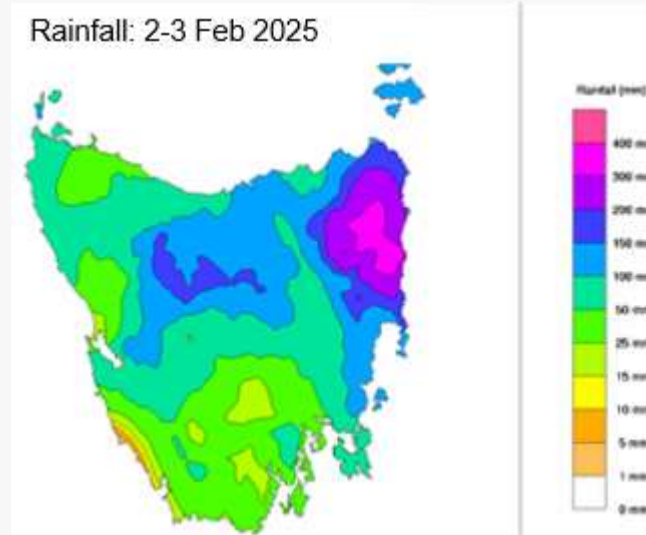
- Launceston levee breached
- Evacuations, road closures, bridge and property damage.
- North-South and Fingal railway lines severely damaged

### Industry and environment

- Flash flooding in St Helens – businesses closed

### Services

- Evacuation sites overcrowded



**Looking to the future:** a warmer atmosphere supports more intense rainfall

### Quick Numbers: Weather observations

#### Rainfall (2-day totals)

	mm
• Gray	465
• Fingal	411
• Launceston	148
• Scottsdale	168

#### River levels

	m above AHD
• Fingal	8.74
• Longford	7.35
• Trevallyn Pond (Launceston)	132.4
• Nunamara	5.6
• Deloraine	3.2
• Cressy Pumps	5.1

### Quick Numbers: North-east TAS

<b>Total population</b>	72,615
-------------------------	--------

- Fatalities	3
- People displaced	2,500

<b>Residential dwellings</b>	32,834
------------------------------	--------

- Damaged	1,869
- Destroyed	607
- Reconstruction value	\$190 million

# NEMA Scenario Consequences: 2-3 January: Flooding. TAS

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"><li>• High rainfall causes the Launceston levees to breach, flooding residential neighborhoods, roads and businesses.</li><li>• Over 1,000 homes in Fingal, Longford, Launceston and Deloraine are flooded.</li><li>• Mass evacuations take place in the north west of Tasmania. Late evacuees experience large number of road closures and some are unable to get to evacuation shelters.</li><li>• Two people die whilst driving through floodwaters.</li><li>• Bridges and rail infrastructure are damaged by the flooding and heavy rainfalls, with roads also flooded with sinkholes and potholes emerging. The North-South and Fingal railway lines are severely damaged.</li><li>• The flooding has caused major damage to local, with significant damage done to the Cataract Gorge Reserve.</li><li>• Flash flooding through St Helens impacts businesses still in recovery from the 2024 flash flooding, and the wharf sustains substantial damage.</li><li>• Launceston Airport is damaged, and the runway is closed due to flood damage. Aircraft hangers are damaged, with many remaining aircraft in the airport sustaining damage from wind debris or heavy rainfall</li><li>• Evacuation sites are overcrowded and underprepared. Large numbers of tourists are at evacuation sites. Sandbag supplies are also running low.</li><li>• Livestock are washed away in flood waters, with apple and pea crops destroyed.</li></ul>	<ul style="list-style-type: none"><li>• Saturated soils result in delays in timber harvesting, and surviving fruit crops are slow to be harvested, increasing risk of spoilage.</li><li>• Launceston experiences a shortage of medical supplies and services, with staff and supplies unable to get to the hospital.</li><li>• Shortage of medical supplies and services (staff fatigue and facilities overwhelmed) limits peoples access to medical attention</li><li>• Increased water turbidity impacts water filtration capacity, resulting in boil water notices being issued. Sewerage treatment plants are overwhelmed, resulting in spilled effluent.</li><li>• Damage to the Tasman Highway in St Helens leads to bottle necks of tourists and locals trying to leave flood impacted areas.</li><li>• Businesses closed in Launceston, Deloraine and St Helens.</li><li>• Flights out of Launceston canceled or grounded, disrupting travel.</li></ul>	<ul style="list-style-type: none"><li>• Stranded tourists start to complain about lack of access to shelter, food, clean water and information, tensions in evacuation shelters run high as locals feel that tourists should have left earlier.</li><li>• Mental health of impacted areas deteriorates due to the compounding trauma of the storm, and delays in recovery.</li><li>• Impacted areas experience substantial decrease in tourism. This has a substantial economic impact to these areas, and many businesses that are forced to close, struggle to reopen.</li><li>• Large scale flood clean up in Launceston impacted by ongoing industrial action and skilled labor shortages.</li><li>• Fatigue of emergency services limits ability to respond to subsequent events.</li></ul>

# 6 February: Heatwave and bushfires TAS

## Weather

Following several weeks of dry and generally warm conditions across western Tasmania, fresh to strong, hot northerly winds produce extreme heat and low humidity across much of the state on 6 Feb. These conditions cause fire danger ratings to spike with EXTREME to CATASTROPHIC fire weather observed.

Accidental fire ignitions around Zeehan rapidly develop into a major fire that tracks towards both the Strahan and Queenstown regions. Separate ignitions occur at the northern edge of the Franklin-Gordon NP in inaccessible terrain. The NP fire continues for more than 2 weeks before a significant rainfall event douses the flames.

Weather conditions ease sufficiently that the fires around Zeehan to Strahan are able to be controlled by 8 Feb.

## Locations impacted

Zeehan, Strahan, Queenstown, Franklin-Gordon NP

## Energy and infrastructure

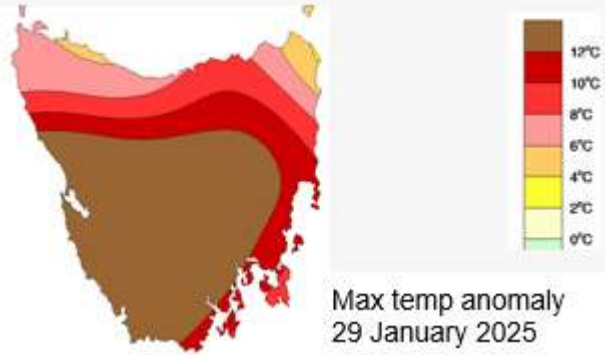
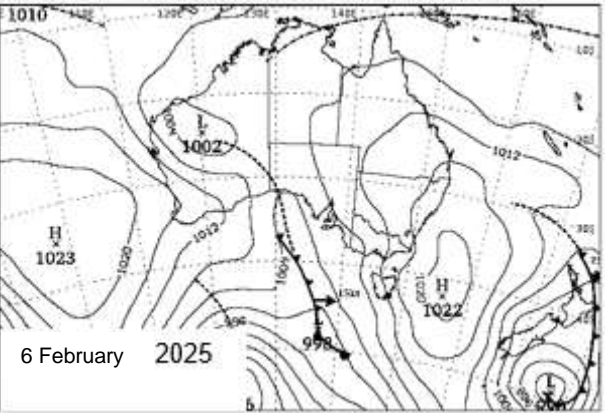
- 165 homes destroyed
- 37,000ha burnt area
- Transmission poles burnt and damaged leading to widespread local power outages
- Local roads closed for extended periods

## Industry and environment

- Fires in inaccessible parts of National Park damage sections of old-growth forest
- Multiple business affected

## Services

- Health services overwhelmed/Evacuation sites unprepared



Looking to the future: more dangerous fire weather days are likely across south-east Australia

Quick Numbers: Weather observations	
Max FBI <ul style="list-style-type: none"><li>• Strahan</li><li>• Hobart</li></ul>	107 CAT 64 EXT
Max wind gust <ul style="list-style-type: none"><li>• Strahan</li><li>• Hobart</li></ul>	Km/h 91 68
Max temp <ul style="list-style-type: none"><li>• Strahan</li><li>• Hobart</li></ul>	°C 37.8 33.9

Quick Numbers: TAS	
Total population	5,130
<ul style="list-style-type: none"><li>- Fatalities</li><li>- People displaced</li></ul>	4 897
Residential dwellings	3,595
<ul style="list-style-type: none"><li>- Damaged</li><li>- Destroyed</li><li>- Reconstruction value</li></ul>	457 165 \$40 million



# NEMA Scenario Consequences: 6 February: Heatwave and bushfires. TAS

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"> <li>• 165 homes destroyed are destroyed in Queenstown and Zeehan, with multiple injuries reported to volunteers firefighters. 4 people die after being caught in the fire.</li> <li>• 37,000ha of area is burnt in by the fires, including areas of the National Parks.</li> <li>• Hydro Tasmania communications infrastructure is burnt by the fire.</li> <li>• Transmission poles are burnt and damaged during the fires, leading to widespread power outages across the state.</li> <li>• Fires in inaccessible parts of National Park damage sections of old-growth forest burn for weeks, impacting Huon Pines.</li> <li>• Tourism reliant businesses along the West Coast are significantly impacted. Mountain bike trails in Queenstown are destroyed.</li> <li>• Health services in the area are overwhelmed due to heat and smoke.</li> <li>• Evacuation sites are unprepared for the influx of people and companion animals.</li> <li>• Timber plantations are severely impacted by the fire. Mature plantations ready for harvest are destroyed.</li> <li>• Mining operations are put on hold due to fire and smoke.</li> <li>• Communication infrastructure impacted, including mobile towers and repeaters, the local communities struggle with receiving accurate and timely warnings and information for trusted sources.</li> <li>• Water and sewage infrastructure is impacted by fires, locals are asked to boil water and limit usage.</li> <li>• There are an unknown number of bushwalkers stranded in National Parks, with at least 10 stranded near the base of Federation Peak</li> </ul>	<ul style="list-style-type: none"> <li>• Cuts to power and air-conditioning lead to an increase heat stress admissions at health centres and hospitals</li> <li>• Ambulance service cannot keep up with demand due to heat related illness. Ramping occurs in multiple locations. Hospitals in Hobart near capacity and a Code Brown is declared.</li> <li>• Medical facilities in fire impacted areas reach capacity, and are rapidly running out of supplies for burns and smoke inhalation treatment.</li> <li>• Hydro Tasmania is unable to send communications to a significant number of dams, limiting power generation capacity. Workers are unable to fix equipment due to ongoing dangerous fire conditions and difficulty accessing sites.</li> <li>• Aquaculture in Macquarie Harbor is impacted by polluted run off from the fires.</li> <li>• Emergency services resources are diverted to searching National Parks to rescue isolated hikers.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in DV, increase in mental health related presentations to health services.</li> <li>• Businesses forced to close during peak season feel the long term impact.</li> <li>• Tourist season ends early after much of the infrastructure is damaged, impacting local outfitters and tour operators.</li> <li>• Mass fish die off in salmon farms impact price of salmon, large amount of dead fish impacts water quality and native sea life.</li> <li>• Large scale loss of timber in plantations have multi year impacts for the timber industry and local economies.</li> <li>• Loss of World Heritage listed old growth forest has lasting impacts on biodiversity in the region.</li> <li>• Road reconstructions is delayed frustrating locals. Long detours are expected for the foreseeable future</li> <li>• Rebuilding of homes takes longer than expected, due to limited access, shortage in construction materials and labour.</li> </ul>

# 18 February – 2 March: Tropical Cyclone Tara

## QLD, NT and WA

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### Weather

Severe TC Tara makes landfall near Wujal Wujal, 20 Feb, as a Category 4 system. Tara weakens to below-TC strength as it traverses Cape York Peninsula but produces near gales at Karumba and gales at Burketown – along with heavy rainfall. Widespread heavy rainfall impacts areas of northern QLD. The ex-TC then tracks towards the base of the NT Top End, producing a violent tornado near Katherine. Heavy rainfall also affects parts of the NT, before the system tracks into the Kimberley region. It slows down in this region, generating very heavy rainfall over the near-saturated Fitzroy R. catchment. Major flooding ensues across the northern Kimberley.

### Locations impacted

Wujal Wujal / Cairns / Mornington Island / Burketown /Katherine / Kununurra / Fitzroy Crossing

### Energy and infrastructure

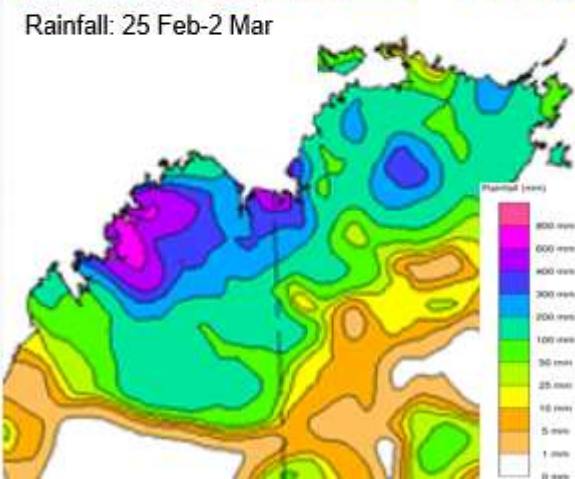
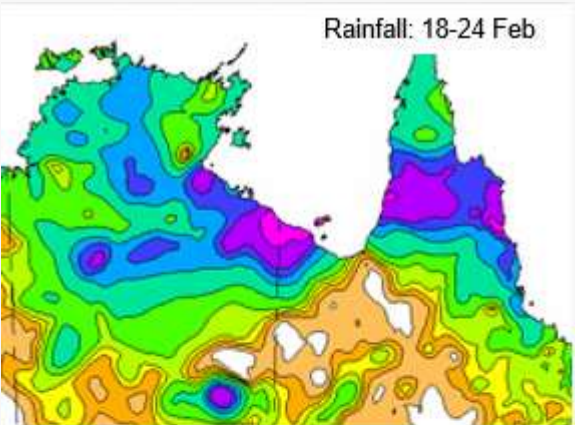
- Transmission lines cut inland of Wujal Wujal, affecting coastal towns of NTC (inc. Cairns); Katherine lines also damaged from severe storms. Blackouts persist in some areas for over 2 weeks hampered by heatwave conditions.
- Katherine EF3 tornado causes widespread building, infrastructure and vegetation damage
- Many roads, bridges and rail lost or flooded – major supply chain interruptions. Widespread community isolation.

### Industry and environment

- Livestock lost, widespread damage to agricultural infrastructure from catastrophic flooding and wind damage
- Impacts to mining industry in Kimberly and Northern Australia as Great Northern Highway cut.

### Services

- Health services/evacuation centres overwhelmed / hospitals flooded.



Looking to the future: fewer tropical cyclones in general, but a greater proportion are likely to be severe

Quick Numbers: Weather observations	
Wind gust (maximum)	Kph / kts
• Low Isles	264 / 142
• Cairns AP	139 / 75
• Burketown Airport	106 / 57
• Katherine town (tornado)	260 / 140 (est.)
Rainfall (event totals)	mm
• Cairns	675
• Karumba	343
• Burketown Airport	274
• Kununurra AP	396
• Mt Elizabeth	487
River levels (maximum height)	m above AHD
• Fitzroy Crossing	14.2m

Quick Numbers: FNQ / Fitzroy Crossing	
Total population	84,773
- Fatalities	4
- People displaced	990
Residential dwellings	37,924
- Damaged	1,879
- Destroyed	467
- Reconstruction value	\$600 million

# NEMA Scenario Consequences: 18 February – 2 March: Tropical Cyclone Tara. QLD, NT and WA

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"> <li>As the cyclone makes landfall near Wujal Wujal, flash flooding and wind damage causes significant impacts to properties, including those rebuilding after last years TC Jasper. At least 125 properties are damaged. Power outages are extensive across the area.</li> <li>In the broader Douglas Shire, multiple landslides occur, destroying Cape Tribulation Road and the Bloomfield Track, just days after they reopened.</li> <li>Destructive winds down transmission lines and trees near Burketown and Karumba, with 1,500 homes sustaining severe damage.</li> <li>As the now ex-TC tracks through the NT, the violent tornado that formed near Katherine results in significant power outages, and damaging RAAF Base Tindal. Damage to the airbase impacts construction works, and a number of hangers and base equipment is damaged.</li> <li>4 people are killed in Katherine by falling trees or flying debris.</li> <li>As the ex-TC moves towards WA, extensive rainfall floods the Great Northern Highway again in multiple places, isolating nearby towns. Flooding also results in large losses in livestock in the Kimberly region, with losses exceeding \$200 million. Agricultural infrastructure including sheds and machinery are damaged by winds and flooding. Combined with the impacts of TC Rae, losses now exceed a total of \$300 million</li> <li>Fitzroy Crossing is again isolated by flood waters, with the Fitzroy River flooding. The Fitzroy Crossing bridge is closed, with damage done to the road surfaces.</li> <li>Areas of Fitzroy crossing are flooded with 250 properties sustaining damage in the floods.</li> </ul>	<ul style="list-style-type: none"> <li>Road closures in Douglas Shire isolate a number of communities including Cape Tribulation and Degarra. Critical supply routes for Wujal Wujal are closed for a number of weeks impacting food and fuel resupply.</li> <li>Landslide related debris increase water turbidity, impacting drinking water supply. Conserve water notices are issued for the Douglas Shire. Residents are advised to boil water before consumption.</li> <li>Hot, humid conditions creates ideal environments for spread of water and mosquito borne diseases.</li> <li>Significant distress in disaster impacted communities due to being impacted by multiple cyclones in short succession. .</li> <li>Isolated communities in the NT and Kimberly region run out of food and fuel supplies due to prolonged flooding.</li> <li>The Australian Defence Force is required to do a number of airdrops to isolated communities.</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing water restrictions in Douglas shire, preventing washouts of flooded homes</li> <li>Black outs continues to impact response early recovery, health centres and hospitals running at limited capacity.</li> <li>Increased transmission of water-borne diseases in the area.</li> <li>People eat contaminated food that has been in contact with floodwaters leading to illness. Or spoiled food</li> <li>Ongoing flooding in residential areas of Darwin lead to large numbers of crocodile sightings and panic in the community.</li> <li>Increase in DV, increase in mental health related presentations to health services.</li> <li>Widespread disaster overwhelms volunteers' base – emergency services not coping.</li> </ul>



## 24 February – 1 March: Heatwave VIC, NSW, ACT, and SA

### Weather

A blocking high in the Tasman Sea, in conjunction with the low over northern Australia directs hot northerly winds through VIC, NSW, ACT, and SA. Maximum temperatures across the four states and territories increases into the low to high 40s for several consecutive days. Many locations observe their highest daily maximum temperatures on record.

The heatwave peaks on the 26<sup>th</sup> as cloud from the north-west spreads to the south, bringing overnight cloud cover to southern NSW, ACT and VIC preventing significant cooling. Overnight minimum temperatures remain in the mid 20s.

A low across southern Australia slips to the south of VIC on the 27<sup>th</sup> bringing a lack of significant cool relief. Widespread heatwave conditions continue for several more days as maximum temperatures drop only slightly to low to mid 40s.

### Locations impacted

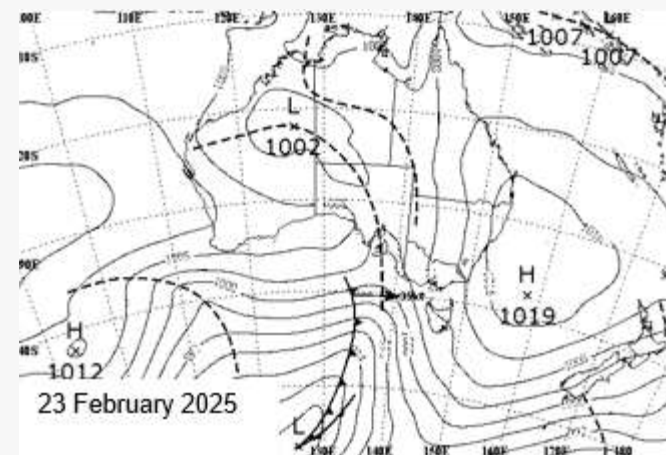
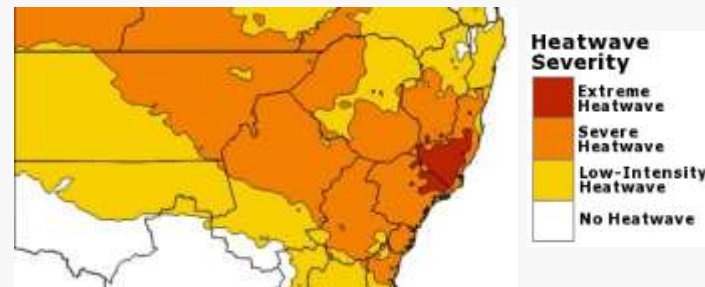
Sydney, Dubbo, Canberra, Mildura, Melbourne, and Adelaide

### Energy and infrastructure

- Increasing demand on power networks
- Basslink cut due to peak operating temperature

### Services

- Health services stretched / increase in hospital admissions due to prolonged warm overnight temperatures



**Looking to the future:** extreme heat events will become more frequent, last longer, and reach higher temperatures

### Quick Numbers: Weather observations

#### Hottest Maximum Temperature

	°C
• Sydney	42.4
• Dubbo	43.8
• Canberra	41.9
• Mildura	44.8
• Melbourne	43.1
• Adelaide	44.2

#### Warmest Minimum Temperature

	°C
• Sydney	27.2
• Dubbo	30.8
• Canberra	26.3
• Mildura	29.5
• Melbourne	28.4
• Adelaide	28.3

### Quick Numbers:

#### Total population

	10 million
- Fatalities	13
- People displaced	-

#### Residential dwellings

	4 million
- Damaged	-
- Destroyed	-
- Reconstruction value	\$6 million

# NEMA Scenario Consequences: 24 February – 1 March: Heatwave. VIC, NSW, ACT, and SA

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"><li>• Total Fire Ban in place in many areas impacted by the heatwave, with communities fearful of fires breaking out. Construction and landscaping activities that may create sparks are banned. Pre bushfire season hazard reduction burns cannot take place.</li><li>• Large crowds gather at beaches and rivers across heat impacted areas to escape the heat, resulting in traffic and waterway congestion.</li><li>• High temperatures cause severe heat stress in rural communities with farmers expressing concern for livestock access to water and no access to shade.</li><li>• Demand on the power network causes rolling blackouts. Basslink reaches maximum operating temperature on the Victorian side, with Basslink switched off until heatwave conditions ease.</li><li>• Transport delays are experienced across the country as train lines buckle due to the heat and tarmac melts along many critical supply routes.</li><li>• The urban heat island effect impacts the Melbourne CBD, with local councils forced to open pools for free and identify alternate strategies for getting people into air-conditioning.</li><li>• Multiple deaths to heat stress are reported, including one homeless person found in Canberra CBD</li></ul>	<ul style="list-style-type: none"><li>• Cuts to power and air-conditioning lead to an increase heat stress admissions at health centres and hospitals. Basslink outages results in load shedding in Tasmania.</li><li>• Ambulance service cannot keep up with demand due to heat related illness. Ramping occurs in multiple locations. A Code Brown is declared in Melbourne.</li><li>• Beaches across the impacted areas record high numbers of surf rescues, overwhelming surf life saving resources. 4 people drown at the beach. An additional 8 people drown in inland waterways across the country.</li><li>• Damage to crops and livestock is experienced, with fruit crops spoiling and large numbers of poultry, goats, sheep and cattle perishing due to heat stress.</li><li>• Businesses experiencing power outages are unable to operate due to inoperable tills and appliances. Some industries are unable to operate due to the heat, including the building industry.</li><li>• Mass deaths of birds and bats are recorded in Victoria due to heat stress.</li></ul>	<ul style="list-style-type: none"><li>• Dead livestock decompose rapidly due to the heat, resulting in biohazard issues for farms.</li><li>• Ramping and delays in accessing healthcare result in a number of preventable deaths.</li><li>• Rates of domestic violence increase, and schools record high absence rates.</li><li>• Concerns for water security arise in rural communities, with farmers hesitant to plant future crops due to hesitations that rainfall wont come.</li><li>• Significant delays for non-urgent medical procedures are experienced for patients in the ACT and Dubbo.</li><li>• Blackouts in Mildura cause significant food spoilage in residential communities and in impacted businesses.</li><li>• Citrus trees in Mildura are severely impacted by the heatwave. The winter Naval orange crop in the Murray Valley is impacted.</li></ul>

# 25 February: Bushfire ACT

## Weather

A strong, slow-moving high-pressure system in Tasman sea directs, fresh northwesterly winds over the Canberra region. Heatwave conditions in the days leading up to the event has rapidly dried grasslands. A Total Fire Ban is issued for 25 Feb, with EXTREME Fire Danger ratings.

A trough moves over the ACT changing winds to more westerly with developing dry thunderstorms and during the afternoon, multiple lightning induced fires ignite in the Bullen Range Nature Reserve. These fires rapidly take hold and due to the nearby trough, a pyro-cumulonimbus (fire-induced thunderstorm cloud) develops causing erratic bushfire behavior. Fire impacts nearby powerlines and some eastward suburbs of the ACT.

Fire conditions remain elevated (HIGH – EXTREME) as heatwave conditions continue for another week, with several fires continuing to burn across the ACT.

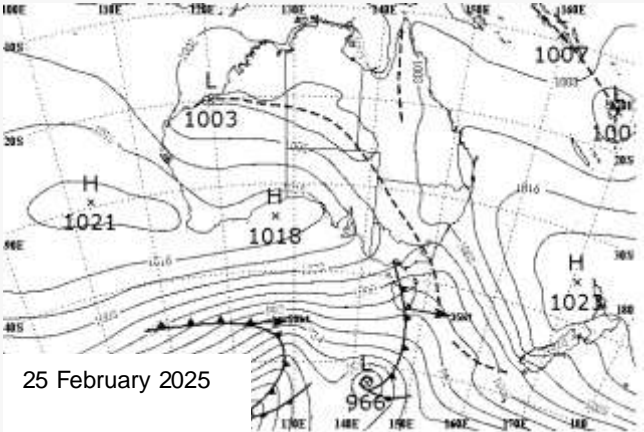
Residents start to panic at the sight of smoke as the fire threatens the Canberra Equestrian Centre in Chapman.

## Locations impacted

Tuggeranong, Kambah, Chapman

## Energy and infrastructure

- 15 homes destroyed
- 1500ha burnt area
- Transmission poles burnt and damaged leading to widespread local power outages
- Water quality in the Murrumbidgee river is affected by ash and sediment



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Looking to the future: more dangerous fire weather days likely across south-east Aust

## Quick Numbers: Weather observations

<b>Max FBI</b> <ul style="list-style-type: none"><li>• Canberra</li></ul>	88 EXT
<b>Max wind gust</b> <ul style="list-style-type: none"><li>• Canberra</li></ul>	Km/h 82
<b>Max temp</b> <ul style="list-style-type: none"><li>• Canberra</li></ul>	°C 41.9

## Quick Numbers:

<b>Total population</b>	19,011
<ul style="list-style-type: none"><li>- Fatalities</li><li>- People displaced</li></ul>	2 4,300
<b>Residential dwellings</b>	7,467
<ul style="list-style-type: none"><li>- Damaged</li><li>- Destroyed</li><li>- Reconstruction value</li></ul>	260 15 \$200 million

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# NEMA Scenario Consequences: 25 February: Bushfire. ACT

First Order Consequences	Second Order Consequences	Third Order Consequences
<ul style="list-style-type: none"><li>• Suburbs in Canberra close to the fire front including Chapman, Duffy, Rivett and Fisher are evacuated.</li><li>• 15 homes in the suburbs of Chapman, Duffy, Rivett and Fisher are destroyed, many more are damaged by ember attacks, smoke and high winds. 2 people die whilst protecting their properties.</li><li>• Bushfire smoke limits visibility on the road, multiple car accidents caused by distracted drivers are reported.</li><li>• People travel to locations in Tuggeranong to view the fire front across the Murrumbidgee river, blocking roads and causing disruption to local residents.</li><li>• Windy conditions bring down numerous trees around Canberra, damaging houses in Tuggeranong and Kambah.</li><li>• Transmission poles burnt and damaged leading to widespread local power outages. Volunteers receive a large volume of calls for help.</li><li>• Pyro-cumulonimbus develops causing erratic bushfire behavior, making the fire hard to control. The fire jumps multiple containment lines before hitting the suburbs.</li><li>• Schools are evacuated across the south of Canberra.</li></ul>	<ul style="list-style-type: none"><li>• Cuts to power and air-conditioning lead to an increase heat stress and smoke related admissions to health centres and hospitals.</li><li>• Damage to crops and livestock is experienced, with fruit crops spoiling and large numbers of poultry, goats, sheep and cattle perishing due to heat stress.</li><li>• Businesses experiencing power outages are unable to operate due to inoperable tills and appliances.</li><li>• Canberra Hospital is reliant on backup generators to ensure consistent power supply. .</li><li>• Water quality in the Murrumbidgee and Cotter rivers is impacted by ash and sediment, placing strain on Canberra's water filtration system.</li></ul>	<ul style="list-style-type: none"><li>• Increased mental health pressures on community.</li><li>• A rise in the number of police call outs for domestic and family violence incidents in bushfire impacted suburbs.</li><li>• Significant delays in insurance assessments are experienced due to compounding crisis events in the ACT.</li></ul>

# National Disability Insurance Agency: Event impacts and Consequences

Event	Impacts	Consequences
Blackouts, power outages, rolling blackouts	<ul style="list-style-type: none"> <li>Assistive technology unable to be used</li> <li>Failure of critical medical and disability related equipment</li> <li>Anxiety created by uncertainty</li> <li>Inability for providers to provide support to people with disability (PWD)</li> </ul>	<ul style="list-style-type: none"> <li>Inability to make and receive critical communications (incorrect situational awareness or up to date safety instructions)</li> <li>Risk to life-threatening conditions and equipment failure restricting ability to safely evacuate (may result in death/injury for PWD and/or carers)</li> <li>PWD not receiving critical supports (may result in increased pressure on health care system/hospitals)</li> </ul>
Transport disruptions/road closures Mass evacuation impacted by road closures Transport delays as train lines buckle	<ul style="list-style-type: none"> <li>Physical closure of roads and rail due to weather events</li> <li>Evacuation due to weather events has caused panic/requirement for mass evacuation causing blockages and delays</li> </ul>	<ul style="list-style-type: none"> <li>People with disability and providers of support cannot travel to receive and deliver supports</li> <li>Potential for disability transport i.e. disability taxi to have reduced or no availability</li> <li>General transport, trains/bus/taxi/uber not available</li> </ul>
Community isolation	<ul style="list-style-type: none"> <li>That weather events have created an inability to travel to or receive supports</li> <li>That weather events have created an environment of isolation</li> </ul>	<ul style="list-style-type: none"> <li>People with disability and providers of support cannot travel to receive and deliver supports</li> <li>Isolation reducing connectiveness with support provision and contributing to mental health</li> </ul>
Unreliability of telecommunications	<ul style="list-style-type: none"> <li>That weather events have created an inability communicate effectively on telecommunications</li> </ul>	<ul style="list-style-type: none"> <li>People with disability cannot receive support or seek assistance as required for their disability</li> <li>That unreliability of communication, or effective accessible communication, leads to isolation and may contribute to a deterioration in mental health</li> <li>That the needs of PwD may not be met, creating a potential for hospitalisation or other intervention</li> </ul>
Community unrest Inaccurate information communicated around cause of the event, causing tension in residents and evacuation centres	<ul style="list-style-type: none"> <li>That community unrest has created an unsafe environment for those on community</li> <li>That community unrest has created an unsafe environment for those visiting/support delivery to community</li> </ul>	<ul style="list-style-type: none"> <li>People with disability cannot receive support or seek assistance as required for their disability due to safety or cultural barriers (.i.e. sorry business)</li> <li>People with disability/support providers cannot travel to or from the community to receive/deliver supports</li> </ul>
Multiple deaths due to heat stress	<ul style="list-style-type: none"> <li>PWD are at increased risk, limitations of support workers to engage with PWD will contribute to this risk if they have no access to informal supports</li> <li>Increased pressure on families and carers to provide support to PWD whilst also under environmental stress and responding to the crisis</li> </ul>	<ul style="list-style-type: none"> <li>Increased pressure on health system/hospitals for PWD with no informal supports</li> <li>Risk of illness or death due to inability to receive visits from support workers</li> <li>Family members and carers may be overwhelmed and unable to continue to provide support</li> <li>Accessible communications do not adequately provide relevant health and safety advice to PWD</li> </ul>

# National Disability Insurance Agency: Event impacts and Consequences

Event	Impacts	Consequences
Evacuation centres Overwhelmed and misinformation spreading that people are being turned away Stranded tourists cause tensions in evacuation centres Evacuation sites are unprepared for people and companion animals	<ul style="list-style-type: none"> <li>The evacuation centres are at capacity</li> <li>The evacuation centres are overwhelmed by visitors causing logistical issues for resources and housing</li> <li>The evacuation centres are not appropriately fitted with accessibility or ambulant facilities</li> <li>The evacuation centres will not cater for care/companion animals to support people with disability</li> </ul>	<ul style="list-style-type: none"> <li>That there is no safe (including ambulant restrooms) place for PwD to be provided emergency accommodation suitable for their needs</li> <li>That there is not ability to provide support services within the emergency environment</li> <li>An increased need for formal intervention for PwD is required.</li> <li>That everyday support including assistive technology and support animals will not be 'able' to be utilised or allowed into the evacuation environment. This may be via lack of utilities or access to other AT or their assistance animals</li> </ul>
Increased mental health issues	<ul style="list-style-type: none"> <li>Anxiety and uncertainty can exasperate mental health issues, impacting behaviours and decision making</li> <li>Families and carers of PWD may experience their own mental health issues during a crisis, impacting the support they can provide a PWD during times of crisis</li> </ul>	<ul style="list-style-type: none"> <li>Increased needs for formal interventions outside of usual arrangements putting further increased pressure on hospitals and mental health care</li> </ul>
Increased hospital admissions due to smoke-related respiratory conditions and heat-related issues	<ul style="list-style-type: none"> <li>Some PWD are more susceptible to respiratory health issues</li> <li>Challenges with accessible communications during crisis may impact the ability for PWD to receive health warnings about smoke and heat</li> </ul>	<ul style="list-style-type: none"> <li>Increased medical attention required when there has been limited self-care during crisis</li> <li>Potential media coverage of negligence when health warnings have not been effectively received by PWD</li> </ul>
Emergency services continue to be overwhelmed	<ul style="list-style-type: none"> <li>Vulnerable people checks unable to be facilitated putting PWD at risk during a crisis event</li> <li>Limited resources (including equipment) may not be available to safely evacuate PWD</li> </ul>	<ul style="list-style-type: none"> <li>Death or injury to PWD as sufficiently equipped personal are not available or able to complete vulnerable people checks based on up-to-date data</li> <li>Risk of safety to emergency services personal due to not having sufficient resources to effectively respond to PWD</li> </ul>
Critical supplies and supports are compromised Shortage of medical supplies and services Shortage of medical staff to supply services, limiting access to medical attention Isolated communities run out of food and fuel supplies	<ul style="list-style-type: none"> <li>PWD do not have access to the consumables required for their disability and associated medical issues</li> <li>Suitably qualified personal are not available or able to provide supports to PWD due to many environmental reasons i.e. road closures, community isolation, increased risk of recurring incidents</li> <li>Nutritional needs are not able to be met specific to disability type due to supply chain issues or the ability to get supplies to isolated communities</li> </ul>	<ul style="list-style-type: none"> <li>Potential neglect and deterioration of the health and welfare of PWD due to inability to access basic needs, increasing risk of hospitalisation and other complications</li> <li>PWD receiving supports from unqualified personal</li> </ul>