SES

EDITION 3

State Emergency Management Plan

Storm Sub-plan

VICTORIA
State Government

Acknowledgment of Traditional Owners

The Victoria State Emergency Service respectfully acknowledges the Traditional Owners of the land and waters. We pay our respects to Elders past, present and emerging, and are committed to working with Aboriginal and Torres Strait Islander communities to achieve a shared vision of safer and more resilient communities.

Authority

This plan has been approved by the **State Crisis and Resilience Council (SCRC)** as a sub-plan to the State Emergency Management Plan.

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Inquiry into the 2022 Flood Event in Victoria

This **State Emergency Management Plan (SEMP) Storm Sub-Plan Edition 3** *(this plan)* replaces the **SEMP Storm Sub-Plan Edition 2** published in 2022. This plan considers the Parliamentary Inquiry into the 2022 flood event in Victoria (Final Report 2024), particularly the timeline for addressing the recommendations made therein.

Published in June 2025, this plan acknowledges the need for relevant agencies and departments to have sufficient time to develop and implement any necessary procedures and processes related to these recommendations. Consequently, this plan emphasises the importance of flexibility in future reviews to integrate the outcomes of these recommendations as required, ensuring continued adaptability however, this plan also includes provision of current and accurate information relating to operational response in a complex and multi-hazard environment that has impacted Victoria since the previous version published in March 2022.

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1. Introduction

1.1 Readiness and response triggers summary

Sections 1.1 and 1.2 serve as quick reference tables, providing easy and direct access to key information to support efficient response to storm emergencies. Their purpose is to guide the reader directly to the relevant sections without the need to review the entire plan.

Table 1 is a high-level summary that outlines the major risk factors for storm emergency events in Victoria and is designed as a quick reference guide to support an efficient response.

Readiness Levels (RL) three (3) to five (5) are levels where there is an increased likelihood that response will require multi-agency involvement to supplement control agency resources to manage, mitigate and control a potential major emergency and/or its consequences.

Readiness Levels are described in a five-level scale. Refer to section 3.6.1 for more detail.

Table 1

Readiness/ Response level	Category	Characteristics of a storm event, incident, or emergency	Multi-agency response requirement	Outlined within this plan	Relevant links or documents
1	No severe weather or severe thunderstorm warning.	Possibility of: Average winds (up to 60 km/hr) with wind gusts (up to 90 km/hr) Rainfall Hail (<2cm)	Nil – Considered Agency Business as usual	**Section 3.6.1 Readiness** Page 23 **Section 3.6.2 Normal agency arrangements** Page 23	External SEMP Emergency Management Severe Weather Intelligence Briefing (SWIB) on Emergency Management Common Operating Picture (EM-COP) Internal VICSES Operations Management Manual (OMM)
2	Thunderstorms possible / thunderstorms possible for 4 or more weather districts Severe Weather event	Possibility of: Average winds (up to 60 km/hr) with wind gusts (90 to 100 km/hr) Heavy rainfall Hail (<3cm) Flash flooding	Nil – Considered Agency Business as usual	**Section 3.6.1 Readiness** Page 23 **Section 3.6.2 Normal agency arrangements** Page 23	External SEMP Emergency Management SWIB on EM- COP Internal OMM
Line of control					
3	Severe thunderstorms likely for majority of state. Sever Weather event.	Possibility of: Average winds (60 - 80 km/hr) with wind gusts (101-115 km/hr) Heavy rainfall Hail (3-5cm) Flash flooding	Multi-unit response with increasing multi-agency response. Impacts / consequences of requests for assistance warrants activation	Section 3.6.3 Concept of operations - Multi-agency Response Page 24	External • Joint Standard Operating Procedure (JSOP) 02.03 • SEMP Emergency Management SWIB on EM- COP Internal OMM

4	Severe thunderstorms likely for majority/whole of state Anticipated significant weather event.	Likelihood of: Average winds (60 - 80 km/hr) - with wind gusts (101-115 km/hr) Heavy rainfall Hail (3-5cm) Flash flooding Possibility of: Average winds (80+ km/hr) with wind gusts (115+ km/hr) Intense rainfall Giant hail (5cm+) Flash flooding Tornado Microburst	Multi-unit response with multi-agency support and high level of multi-agency resources utilised. Impacts / consequences of requests for assistance warrants activation. Incident Management Teams (IMTs) established to manage incidents. For these levels, the SRC exercises control in accordance with the SEMP.	**Section 3.6.3 Concept of operations - Multi-agency Response** Page 24	**External** • Bureau of Meteorology (the Bureau) Warnings • JSOP 02.03 • SEMP **Emergency Management** SWIB on EM- COP **Internal** OMM
5	Severe thunderstorms likely for majority/whole of state. Anticipated significant extreme weather event.	Likelihood of: • Average winds (80+ km/hr) with wind gusts (115+ km/hr) • Intense rainfall • Giant hail (5cm+) • Flash flooding • Tornado	Multi-unit response and high level of multi-agency response activity with significant impacts across municipalities. Impacts / consequences of requests for assistance warrant activation IMTs established to manage incidents. For these levels, the SRC exercises control in accordance with the SEMP.	**Section 3.6.3 Concept of operations - Multi-agency Response** Page 24	**External** • BOM Warnings • JSOP 02.03 • SEMP **Emergency Management** SWIB on EM- COP **Internal** OMM

1.2 Response process summary

Table 2 outlines a high-level summary of the first steps required from the onset of a storm event. This section is a quick reference guide to support an efficient response.

Table 2

Step number	Process	Summary	Where this step is outlined within this plan
1	Monitoring and Forecasting	Mitigation activities related to forecasting and warning for storm.	Section 3.4.1 Public Information and Warnings for storm emergencies Pages 18 - 22
2	Notification	Agency and community notifications	Section 3.4.2 VICSES Public Information and warnings for storm Page 21
3	Readiness	Preparedness indicators and Triggers	Section 3.5 Preparedness Page 22 Section 3.6.1 Readiness Page 23 3.6.2 Normal agency arrangements Page 23
4	Response	Concept of operations and response and relief considerations	3.6 Response (including relief) - Sections 3.6.3 through to Section 3.6.14 Pages 23 - 29
5	Recovery	Transition to recovery and agency roles and responsibilities across the recovery environments including recovery coordination	Section 3.7 Pages 30 - 32

1.3 Purpose and objective

Purpose

This plan outlines the Victorian arrangements for managing storm events across all emergency management phases.

The plan's purpose is to provide sources of information and to outline the arrangements for ensuring an integrated and coordinated approach to the state's management of storm events, and to reduce the impact and consequences of these events on the community, infrastructure, and services.

Objective

In alignment with the SEMP, this plan contextualises the current arrangements, roles and responsibilities for storm mitigation, preparedness, response (including relief) and recovery.

1.4 Scope

Storms, in the context of this plan, include windstorms, dust storms, tornadoes, snowstorms, coastal hazards, including high tides, storm tides and damaging surf, and blizzards, as well as severe thunderstorms including hailstorms and heavy rain leading to flash flooding.

This plan acknowledges that concurrent emergencies and consequences often accompany a storm event, including epidemic thunderstorm asthma and disruptions to electricity, telecommunications, transport and water services.

The scope of this plan includes:

- A description of potential risks and consequences of storms to the social, built, economic, and natural environments.
- The policy and programs in place to mitigate these risks before, during, and after a storm event.
- The positions with accountability and the agencies responsible for managing specific strategies.
- The multi-agency management arrangements at the national, state, regional and local levels.
- Links to sources of information where the reader can obtain further detail.

This sub-plan makes references to the SEMP where necessary to avoid duplicating content. It does not include detail about the operational activities of individual agencies.

1.5 Authorising environment and activation

Authorisation

The *Emergency Management Act 2013 (EM Act)* requires the **Emergency Management Commissioner (EMC)** to arrange for the preparation of a SEMP. The SEMP allows for an integrated, coordinated, and comprehensive approach to emergency management at the state level. It contains provisions for the mitigation of, response (including relief) to, and recovery from emergencies (before, during and after), and specifies the roles and responsibilities of agencies in relation to emergency management.

Under the EM Act, storms (or other natural events), are defined as a Class 1 emergency. A Class 1 emergency is a major fire or any other major emergency where either the **Country Fire Authority (CFA)**, **Fire Rescue Victoria (FRV)** or **Victoria State Emergency Service (VICSES)** is the control agency.

The EM Act defines a major emergency as an event which:

- (a) is a large or complex emergency (however caused), which –

  i. Has potential to cause or is causing loss of life and extensive damage to property, infrastructure or the environment; or

  ii. Has the potential to have, or is having significant adverse consequences for the Victorian community or a part of the Victorian community; or

  iii. Requires the involvement of two or more agencies to respond to the emergency; or
- (b) a Class 1 emergency.
- (c) a Class 2 emergency.

This plan is a Sub-plan of the SEMP and aligns with the SEMP and was prepared with regard to the Guidelines for Preparing State, Regional and Municipal Emergency Management Plans (The Guidelines). SCRC approved this plan on 27 June 2025.

This plan was published and took effect from the 30 June 2025.

The following legislation, while not exhaustive, is the principal legislation for storms in Victoria:

- Emergency Management Acts 1986 and 2013 (EM Act)
- Victoria State Emergency Service Act 2005
- Essential Services Act 1958
- Planning and Environment Act 1989
- Aboriginal Heritage Act 2006
- Local Government Act 2020.
- Meteorology Act 1955 (Commonwealth)
- Marine Safety Act 2010

VICSES, on behalf of the EMC, coordinated the development of this plan in conjunction with stakeholders including, but not limited to:

- **Ambulance Victoria (AV)**
- Australian Red Cross
- Bureau of Meteorology (The Bureau)
- **Catchment Management Authorities (CMA)**
- Country Fire Authority (CFA)
- **Department of Education (DE)**
- **Department of Energy, Environment and Climate Action (DEECA)**
- **Department of Government Services (DGS) (including Local Government Victoria)**
- **Department of Health (DH)**
- Department of Families, Fairness and Housing (DFFH)
- **Department of Jobs, Skills, Industry and Regions (DJSIR)**
- **Department of Transport and Planning (DTP)**
- **Emergency Management Victoria (EMV)**
- **Emergency Recovery Victoria (ERV)**
- **Triple Zero (000) Victoria (TZV)**
- **Environment Protection Authority (EPA)**
- Fire Rescue Victoria (FRV)
- **Life Saving Victoria (LSV)**
- **Municipal Association of Victoria (MAV)**
- **Parks Victoria (PV)**
- **Victoria Police (VICPOL)**
- **WorkSafe Victoria**

Activation of the plan

The arrangements in this plan apply on a continuing basis and do not require activation.

1.6 Exercise, evaluation and review

Exercise and Evaluation

This sub-plan will be exercised within 12 months of publication and evaluated every three years from the date of publication. The exercise will be evaluated and, where improvements to the emergency management arrangements in this plan are required, the plan will be amended, and a revised version issued.

Exercises will be conducted in accordance with the Australian Institute for Disaster Resilience (AIDR) Managing Exercises Handbook, available at knowledge.aidr.org.au/resources/handbook-managing-exercises/.

Review

This plan will then be reviewed and updated at least every three years, with consideration given to earlier revisions as required to ensure the plan provides for a current, integrated, coordinated, and comprehensive approach to storm emergencies, and consideration of potential escalation of climate-related hazards. Earlier reviews may be triggered by this plan being applied in a major emergency or exercise or following a substantial change to relevant legislation or arrangements, including the SEMP.

1.7 Audience and linkages

Audience

This plan recognises that for emergency management and supporting communities to be safer and more resilient it is a shared responsibility of all Victorians, not just the emergency management sector.

The audience for this plan comprises the Victorian Government and agencies within the emergency management sector, including business, industry, councils and community with a significant role in the mitigation of, response to, and recovery from storms.

This plan should be read in conjunction with the SEMP.

Linkages and hyperlinks

This plan refers to a range of existing resources relating to storms, including documents and websites. This plan does not seek to duplicate the information contained in these resources and instead provides links to where the reader can obtain further information.

Readers may require a log-in to access more operational or sensitive information, such as for documents saved on the EM-COP.

Documents or resources that are referred to frequently throughout this plan (such as the SEMP) are not hyperlinked in each instance.

All hyperlinks were accurate at the time of publication, and the currency of the linked content remains the responsibility of the host agency.

Acronyms

A range of existing resources relating to storms, including documents and websites provide various acronym lists and attachments, for this plan the first use of an acronym is fully described, bolded and then the acronym is enclosed in brackets for that point on the only the acronym is used.

For example: **State Emergency Management Plan (SEMP)**

Linking to secondary consequences

Secondary consequences for storms can be complex and compounding. The arrangements for managing consequences of storm are contained in relevant SEMP Sub-Plans, or agency specific plans, including, but not limited to:

- SEMP Flood Sub-Plan
- SEMP Tsunami Sub-Plan
- SEMP Health Emergencies Sub-Plan
- SEMP Bushfire Sub-Plan
- SEMP Energy Sub-Plan
- SEMP Bushfire Sub-Plan
- SEMP Public Transport Disruption Sub-Plan
- SEMP Maritime Emergencies (non-search and rescue) Sub-Plan
- State Landslide Hazard Plan

Where necessary, VICSES has prepared Regional and Municipal Storm Emergency Plans in alignment with the Minister's Guidelines for Preparing State, Regional and Municipal Emergency Management Plans. These plans can be found on the VICSES website.

In the case of a concurrent emergency (for example, human health pandemic or an energy disruption), the arrangements detailed in this plan may need to be adjusted as required.

2. The emergency context

2.1 Risks

This plan addresses storms in the context of severe weather events, including severe thunderstorms and the emergencies and consequences that often accompany them such as epidemic thunderstorm asthma and disruptions to essential services. Broad definitions of the various phenomena covered under this plan are:

- **Flash flooding:** flash floods are characterized by their short duration and rapid rise in water levels, often occurring within a few hours of heavy rainfall. They are typically caused by intense, localized rainfall, such as from thunderstorms, where the ground and drainage systems cannot absorb or cope with the heavy downpour.
- **Hailstorms:** a hailstorm is a thunderstorm that produces hail, which is solid precipitation in the form of balls or pieces of ice, with hailstone diameters ranging from 5 mm to over 100 mm (10 cm) which occurs within thunderstorms that have strong updrafts (rising air).
- **Windstorms:** damaging winds are defined as sustained winds of gale force (63 km/h) or more or wind gusts of 90 km/h or more and are classified in this plan as windstorms.
- **Tornadoes:** a tornado is a violently rotating column of air that extends from a cloud to touch the ground, often associated with swirling clouds of debris or a funnel-shaped cloud. To be classified as a tornado, the rotating column must be in contact with the ground and the parent cloud at the same time. A tornado is usually associated with:
  - swirling clouds of debris or dust near the ground
  - a funnel-shaped cloud that extends down from the base of the parent cloud.
- **Snowstorms:** a 'snowstorm' is a broad term for a winter weather event characterized by a significant amount of snow falling over a given area, ranging from light flurries to heavy snowfalls that accumulate several inches or even feet of snow.
- **Blizzards:** are conditions are defined as strong winds in conjunction with blowing or falling snow with an expected reduction in horizontal visibility to less than 200 metres.
- **Storm tide:** refers to the total elevated water level at the coast during a storm. Storm tide combines the predicted tide with the storm 'surge'. The storm surge component is due to effects of low atmospheric pressure, wind and waves associated with the storm system. Storm tide events result in temporary flooding across coastal and estuarine floodplains, sometimes for kilometres inland.
- **Damaging surf:** refers to periods of extreme wave heights and wave energy that may damage and erode coastal assets, landforms and access. This may often coincide with storm tide and wave effects at the coast may increase flooding extents.
- **Epidemic thunderstorm asthma (ETSA):** is an outbreak of asthma symptoms that occurs when a large number of people develop asthma symptoms over a short period of time, triggered by a combination of high grass pollen levels and a specific type of thunderstorm.

**DH is the control agency for Epidemic Thunderstorm Asthma*

Severe weather events affecting land-based communities are generally divided into two broad categories:

- Severe thunderstorm events.
- Severe weather events not directly associated with severe thunderstorms, tropical cyclones or bushfires.

Severe thunderstorms

In Australia, a severe thunderstorm is defined by the Bureau as one that produces any of the following:

- Hailstones with a diameter of 2cm or more.
- Wind gusts of 90km/h or greater.
- Heavy rainfall leading to flash flooding.
- Tornados.

The types of hazardous phenomena from severe weather include land gales and squalls, heavy rain leading to flash flooding, and blizzards and epidemic thunderstorm asthma.

Severe weather

Typical weather patterns that can cause severe weather include:

- Recently decayed tropical cyclones moving into southern regions and sometimes interacting with cold fronts.
- East coast lows: Deep low-pressure systems that can form in the Tasman Sea and affect the Gippsland coast.
- Vigorous squally cold fronts.
- Strong pressure gradients, often due to cold fronts, causing land gales - particularly in exposed alpine regions.
- Distant tropical cyclones or deep southern low-pressure systems that can produce ocean swells that reach the Australian shores causing dangerous surf.
- Locally intense rainfall, particularly in susceptible areas that can cause flash flooding.

Criteria for a Severe Weather Warnings include:

- Damaging and/or destructive winds sustained winds of gale force (63 km/h) or more or wind gusts of 90 km/h or more).
- Heavy rain that may lead to flash flooding.
- Abnormally high tides expected to exceed highest astronomical tide.
- Damaging surf expected to cause dangerous conditions on the coast.
- Widespread blizzards in alpine areas.

Further information regarding weather and weather warnings is provided at the Bureau's Weather Knowledge Centre.

The most frequent types of severe weather events that are not directly related to thunderstorms are windstorms (land gale force winds), associated with the passage of a cold front or intense low-pressure systems across Victoria.

Non-thunderstorm severe weather events are mostly a winter-spring phenomenon in Victoria, also associated with unusually frequent low-pressure systems and fronts. However, some major events have occurred in the warmer half of the year as systems of tropical origin extend or move south.

A blizzard is a violent and very cold wind which is loaded with snow, some of which has been raised from snow covered ground. It does not have to be snowing to have blizzard conditions, and the winds should be at least gale force (average 63km/h or more). Blizzards are confined to alpine areas in Victoria and mainly occur during the winter and early spring months but can also occur in autumn.

2.2 Damage and disruption

Damage and disruption caused by storms in Victoria vary, but may include:

- **Agriculture** – loss of and damage to livestock, broadacre crops, horticultural produce, tree crops, fodder and agricultural infrastructure
- **Built infrastructure damage** – loss of essential services and/or key community infrastructure including roads bridges, dams, marinas, ports and essential services (water, gas, communications, and electricity) to homes, businesses and recreational assets.
- **Cultural and heritage** – loss of or damage to Aboriginal places and objects and/or culturally significant artifacts, places or buildings and other historic heritage listed sites.
- **Displacement or isolation** – relocation or disconnection of community members from temporary or permanent housing, including caravan parks and campgrounds.
- **Economic** – disruption and closures to local businesses and manufacturing activities resulting in loss of income/employment and financial losses and impacts to agricultural production and tourism.
  - Long term economic impact - Potential disruption and suspension of business operations due to emergencies can lead to revenue losses, with disproportionate impacts on regional economies that heavily rely on these sectors (for example, negatively affecting regional Victoria's poultry sector or covid-19 affecting the tourism and hospitality industry). The business impacts can also translate into long-term job and skills losses and result in domestic and international trade restrictions, leading to far-reaching effects on the Victorian economy.
- **Education** – disruptions to or closure of education facilities as a result of damage to facilities, essential service disruptions, community impact, and access issues. School bus transportation may also be affected by road infrastructure damage and closures.
- **Energy (electricity and gas)** – Damage to electricity and gas assets (such as coal mines, gas plants, infrastructure feeding power stations and gas supplies, electricity transmission and distribution lines and gas pipelines) can impact the ability to maintain core services. This may impact on critical infrastructure and/or infrastructure reliant on electricity and gas such as telecommunications, water supply, transport, business and retail services, and health.
- **Environment** – temporary and potentially long-term degradation of natural ecosystems and amenities. Dams, including those storing mine tailings and wastes such as dairy effluent can discharge into receiving waters. Sewerage systems can be overwhelmed by stormwater ingress, flooding into receiving waters through emergency relief structures, threatening environmental and human health.
- **Environmental health, Human health and health services (including pre-hospital)** – Potential impacts relating to the environment, human health, and the health system may occur due to storms, including:
  - The potential for injuries, mental health, injuries and death.
  - Contamination and disruption to built or natural environments that can increase the risks to public health, including elevated vector-borne diseases, impacts on drinking water quality, and mould.
  - Overwhelming of emergency and health services.
  - Impact on health services facilities reducing function, capability and capacity.
  - Dams, including those storing mine tailings and wastes such as dairy effluent, can be discharged into the receiving waters. Sewerage systems can be overwhelmed by stormwater ingress, flooding into receiving waters through emergency relief structures and threatening environmental and human health.
  - The compounding nature of access issues and delays will negatively affect human health, including reduced access to ambulances and other emergency services and mobility and access to health services staff.

Storms can overwhelm emergency services with compounding storm events (for example, windstorm events – Trees down and warnings for epidemic thunderstorm asthma). Road closures result in reduced access for ambulances and other emergency services, in addition to an inability for health staff to access work premises.

There may be a requirement for rescue agencies to assist ambulances in accessing patients.

Health services could be affected by service outages or capacity reduction, such as energy and telecommunications likely to be operating at a reduced capacity. There could be a significant decrease in ambulance services within the affected area due to road access issues and staff availability. Power outages could cause additional impacts, such as food safety and carbon monoxide hazards from generators.

Further potential human health impacts include:

- Waterborne diseases (due to floodwaters mixing with sewage, contaminants, and debris)
- Respiratory infections (in overcrowded shelters/evacuation centres) such as legionella due to electricity failures impacting cooling towers.
- Gastrointestinal illnesses (due to disrupted water and sanitation systems)
- Vector-borne diseases (stagnant water after floods creates breeding sites for mosquitos and other vectors)
- Skin/soft tissue infections (wounds exposed to contaminated floodwater or injuries sustained during clean up).

- **Food and grocery supply continuity** – potential of isolation and reduced access and/or loss/spoilage of products due to refrigeration and transport issues. Damage to supermarkets, distribution centres and supporting infrastructure can lead to temporary supermarket closures and deprive communities from essential food supplies. This could be exacerbated where towns and communities are isolated due to damage to critical transport infrastructure, reducing opportunities to resupply, and creating conditions for consumers to panic buy. Power outages may also cause refrigeration and storage failures, resulting in loss of perishable food items.
- **Public order and community safety** – overwhelming of local road infrastructure, and loss of services such as food, water, sanitation, and telecommunications resulting in community safety risks such as panic buying, looting, public demonstrations, civil unrest, disorderly conduct due to discontent.
- **Public telecommunications** – disruption or loss of telecommunication services including network and internet outages, resulting from damage to infrastructure, loss of power or overwhelming of services. Power lines supplying mobile phone and radio towers at high points can be damaged, along with access for repair and back-up power sources. May also impact on provision of health, emergency, transport services, water and sanitation services, and communities' ability to communicate with each other, Emergency Triple Zero, other essential services (i.e. banking, etc).
- **Road and transport access** – restricted access to or closure of major roads, rail lines and/or ports due to infrastructure damage results in delays or cancellations of services. Loss of access to regional mobile phone and radio towers can mean that back-up power is difficult to reinstate.
- **Water supply** - storms can cause significant damage to above ground water infrastructure such as tanks, pump stations, electrical cabinets and monitoring and control equipment. This can also result in drinking water contamination. Falling trees cause damage to below ground water mains (e.g. water mains are pulled up and burst with tree roots).
- **Wastewater** – flash flooding from storms can generate a significant volume of infiltration of sewerage and grey water systems. High rainfall and increased volume of flash floodwater can overwhelm sewerage systems causing spills to waterways, floodwater and the environment. Where floodwater volume exceeds the capacity of the treatment plants, lower quality effluent (partially or untreated wastewater) may be released to waterways, floodwater and the environment. Wastewater can contain biological hazards, chemical pollutants and debris. Storms can also cause significant damage to above ground sewerage infrastructure such as pump stations, electrical cabinets and monitoring and control equipment. When sewerage systems are overwhelmed maintenance hole lids can also become dislodged under floodwater, creating a physical safety risk.

For a summary of significant storms that affected Victoria from 2008 until 2024 see ***APPENDIX 1***.

2.3 Consequences of Storms

The direct impacts and consequences may occur across a relatively small geographic area for severe thunderstorms, through to large geographic areas for windstorms. The indirect impacts and consequences can extend to areas considerably beyond the directly affected areas. This reflects that disruption of critical infrastructure and/or services at specific locations can have flow on impacts to other locations/regions. For details on the arrangements for managing the consequences of storms see section 3.7.

Storms, including hail, results in an annual average economic loss of $310m across Victoria. The June 2021 storm event gave rise to 26,000 insurance claims, totaling $230m.

As storms can occur anywhere across Victoria, all Victorians and visitors have exposure to storms. Likewise, all built assets and infrastructure have an exposure to storm related impacts.

2.4 Climate change and storms in Victoria

Research by the Bureau and others suggests that:

Short duration events produced by thunderstorms could potentially increase in intensity by about 15 per cent per degree of global warming in Australia

Research by the Bureau has found that the number of low-pressure systems across Victoria is decreasing in winter, and the average rainfall from each low or front is decreasing too. The number of thunderstorm days and thunderstorm related rainfall has increased in some regions in the warmer half of the year.

Intense, short duration rainfall events in Victoria are becoming more frequent and more intense, particularly in the warm season. Research by the Bureau and others suggests that short duration (such as, hourly) events produced by thunderstorms could potentially increase in intensity by about 15 per cent per degree of global warming in Australia. This increases both the likelihood of severe weather-related floods, and the severity of these floods when they happen.

In urban areas flood risk is likely to increase as roads, paving and buildings prevent the water being absorbed. The resulting flash flooding caused by heavy, short-duration rainfalls may negatively affect urban areas and infrastructure and disrupt essential water and wastewater services. Across Australia, rainfall intensities of long-duration events (24 hours and over) are expected to increase by 8% per degree of global warming (Wasko et al., 2024). This is expected to increase the severity of large-scale flooding beyond just flash flooding.

In coastal areas, an increase in mean sea level has, and will continue to contribute to a significant increase in the risks associated with coastal erosion and flooding.

As explained in Victoria's Climate Science Report 2024:

Higher global temperatures are increasing the frequency and severity of extreme weather…higher temperatures increase the amount of atmospheric moisture available to generate storms.

This means that storms may be more intense in future.

3. Managing storm emergencies

3.1 Emergency management priorities

The State Emergency Management Priorities that are outlined in the SEMP guide all decisions before, during, and after any emergency, and apply to all aspects of this plan. The priorities are:

- Protection and preservation of life and relief of suffering is paramount. This includes:
  - Safety of emergency response personnel.
  - Safety of community members including those most at-risk in emergencies, residents and visitors or tourists.
  - Issuing of community information and community warnings detailing incident information that is timely, relevant, and tailored to assist community members to make informed decisions about their safety.
- Protection of critical infrastructure and community assets that support community resilience and community assets that support community resilience.
- Protection of residential property as a place of primary residence.
- Protection of assets supporting individual livelihoods and economic production that supports individual and community financial sustainability.
- Protection of environmental and conservation assets that considers the cultural, biodiversity, and social values of the environment.

3.2 Shared responsibilities

The SEMP recognises that emergency management is the shared responsibility of all Victorians, not just the emergency management sector. Individuals, communities, organisations, businesses, all levels of government and the not-for-profit sector all have a role to play in planning for, responding to and recovering from emergencies.

Storm events can happen anytime and, as with all hazards, cannot be fully mitigated from potential impacts on the community. As such, shared responsibility is further explained in the National Strategy for Disaster Resilience, developed by the former Council of Australian Governments (now known as National Cabinet) and is available at: knowledge.aidr.org.au/resources/national-strategy-for-disaster-resilience. This strategy provides high-level guidance on disaster management to agencies with a role in emergency management. Foremost in the strategy is the principle of all of society taking responsibility for preparing for disasters. Examples in the context of storm include:

- Individuals being aware of their storm risk, undertaking preparedness activities (such as developing a home emergency plan and emergency kit with food/water etc), and following advice from emergency services when responding to warnings
- Regional and Municipal emergency management committees, and communities undertaking risk assessment activities, including storm discussion, and ensuring consideration within emergency management planning, intelligence, and land use planning.
- Industry and businesses planning for the risk of disruption, and ensuring arrangements are in place to maintain critical services and assist communities.
- Government agencies undertaking:
  - Risk assessments to gain an appreciation of storm risk – for example, Victoria Emergency Risk Assessment (VERA) activities.
  - Engagement with communities regarding storm risk.
  - Work with communities to plan the management of storm risk.
  - Provision of emergency information and storm warnings.
  - Effective and well-coordinated response during a storm event.
  - Identify and support those most at risk during a storm event.
  - Activities to help communities recover and learn following a storm event and build their resilience to future events.

In Victoria, Emergency Management Victoria (EMV) has led the development of the Community Resilience Framework for Emergency Management, it defines community resilience as "the capacity to survive, adapt and thrive no matter what kind of chronic stresses and acute shocks they experience".

The VICSES Strategic Plan 2023 – 2027 outlines key outcomes and measurable priorities in partnering with communities, government, other agencies, and business to provide timely and effective emergency management services, building community preparedness, disaster resilience and contributing to risk prevention.

Community preparedness material for emergencies can also be found via the VICSES website, Plan and Stay Safe, including information in other languages. Localised community engagement activities include Culturally and Linguistically Diverse (CALD) programs and initiatives.

3.3 Roles and responsibilities

The SEMP details the roles and responsibilities for storms including the following list of key roles.

State Crisis and Resilience Council

The State Crisis and Resilience Council (SCRC) is the peak crisis and emergency management body to the Victorian Government and provides advice to ministers and relevant cabinet sub-committees. It is responsible for the development and implementation of whole of government emergency management policy and strategy. It does not make operational or tactical decisions.

Emergency Management Commissioner

Under the *EM Act 2013*, the **Emergency Management Commissioner (EMC)** has legislated management responsibilities across major emergencies. These include response coordination, ensuring effective control arrangements are established, and ensuring effective coordination of consequences.

Victoria State Emergency Service

VICSES is identified as the control agency for Class 1 Natural Event Emergencies including earthquakes, floods, storms, landslides and tsunamis.

Specifically related to the storm hazard, the following activities listed expand on those outlined in the VICSES agency role statement in the SEMP, with VICSES taking accountability for:

- The strategic and operational planning for response.
- Provision of public information and warnings, including the provision of public safety advice to the community.
- Providing advice to the state response controller and regional controllers on appropriate structures and initial operational activities in response to a storm.
- Supporting Victoria Police in undertaking their responsibilities with evacuations.
- Rescue of persons in partnership with other rescue agencies.
- Protection of critical community infrastructure from further damage.

**DH is the control agency for Epidemic Thunderstorm Asthma*

Supporting agency roles and responsibilities

A range of government and non-government agencies/organisations have the skills, expertise, and/or resources to support storm emergency response, relief, and recovery.

Refer to the SEMP agency role statements for a list of roles that support agencies may undertake across all the emergency management phases related to storm.

Emergency Management Teams

At the state level, the **State Emergency Management Team (SEMT)** and at the regional level, **Regional Emergency Management Teams (REMT)** will be activated to coordinate initial intelligence relating to impact and consequence. This will occur ahead of **Incident Control Centres (ICCs)** and **Incident Emergency Management Teams (IEMTs)** being established to manage the response, including any initial relief requirements. These Emergency Management Teams (EMT) should be based on consequence management and consider the National Emergency Management Agency Framework and connectivity to the National Coordination Mechanism.

More detailed information on EMTs is outlined in the SEMP.

Emergency Management Planning Committees

Emergency Management Planning Committees operate at the state, regional and municipal tiers to guide mitigation and preparedness activities.

For more detailed information on emergency management planning committees, refer to the SEMP.

3.4 Mitigation

Mitigation activities for storm includes, but is not limited to:

- Key infrastructure compliance to engineering standards (Infrastructure standards/regulations).
- Drainage systems (drainage standards and strategy).
- Vegetation planning and management.
- Building compliance to engineering standards (planning and building standards/regulations).
- Risk management planning for historic heritage sites on the Victorian Heritage Register and Heritage Inventory.

For detailed information on the roles and responsibilities for mitigation activities, refer to the SEMP.

The following two sub-sections describe mitigation activities related to forecasting and warning for storms.

3.4.1 Public Information and Warnings for storm emergencies

Forecasting and Warning Services for Victoria

Under the Commonwealth Meteorology Act 1955, The Bureau of Meteorology has the function to provide the Australian community with weather information. It also has the function to issue warnings for weather conditions likely to endanger life or property. In support of this, the Bureau provides services to VICSES in support of its control agency roles including storm.

The Victorian Emergency Operations Handbook broadly outlines the Bureau's activities and the interactions between it and VICSES in the issuing of public information and warnings to the community in relation to events where storms are occurring or there is potential for storms.

Service Levels

Specific details of the Bureau's service delivery in relation to storm events, including relevant forecasts, warnings, notifications and briefings, are outlined in the Thunderstorms and Severe Weather Service Level Specification.This document outline the following key products issued by the Bureau that support VICSES in issuing public information and warnings to the community.

Forecast and Warning Products

Severe Weather Intelligence Briefing (SWIB)

This is a five-day outlook produced by the Bureau three times a week for severe weather events involving significant rain, hail, and wind, but excluding severe thunderstorms. The SWIB is available on EM-COP and is used to guide readiness and activation. See section 3.6.1 for details.

Weather Outlook Teleconferences

The Bureau will conduct a 'Weather Outlook Teleconference' three times a week, with the purpose of briefing VICSES on the five-to-six-day weather outlook, based on the SWIB, and where relevant, the 'Thunderstorm Chart'. If significant weather is predicted, VICSES will implement the notification processes as detailed in Section 3.4.2.

Thunderstorm Forecast Chart

The Bureau develops and issues a Thunderstorm Forecast daily. This forecast provides a description of the areas which may be affected by thunderstorms and severe thunderstorms for the remainder of the current day. This forecast assists VICSES with readiness level assessment for the current day. The Day 1 Thunderstorm Forecast may be updated throughout the day should a change in forecast be observed.

The thunderstorm forecast includes a map with areas representing "Thunderstorms Possible" (green), which is defined as a 10% to 30% probability of lightning within 10 km of a point, "Severe Thunderstorms Possible" (yellow), defined as "If a thunderstorm occurs, the probability of it being severe is 10% to 30% within 10 km of a point", and "Severe Thunderstorms Likely" (red), defined as " If a thunderstorm occurs, the probability of it being severe is ⇢ 30% within 10 km of a point".

Details on possible hazards, timing and other useful information are included in the text section following the map.

Although the duty meteorologist will do their best to predict areas where severe thunderstorms are likely, they may develop outside of the 'Severe Thunderstorm Likely' area delineated on the Forecast Chart.

Should severe thunderstorms occur outside of the forecast area, Severe Thunderstorm Warnings will be issued as required. The Day 1 forecast will not generally be updated under these circumstances.
The Day 1 Thunderstorm Forecast is available on EM-COP.

A Day 2 Thunderstorm Forecast is also issued, valid for the following 24 hours. Content is the same as the Day 1 forecast. It will be usually issued by midday, but this time may vary depending on the weather situation. The Day 2 Thunderstorm Forecast is available on EM-COP.

Bureau Warnings to the Public

When the Bureau issue or update a public Severe Weather Warning or Severe Thunderstorm Warning, the Bureau will inform VICSES State Command. VICSES State Command then assesses the requirement to issue a community notification.

Bureau Severe Weather Warnings

Severe Weather Warnings may be issued for potentially hazardous or dangerous weather that is not solely related to severe thunderstorms, tropical cyclones or bushfires. Severe Weather Warning areas are based on one or more weather forecast districts and/or parts of weather forecast districts.

Severe Weather Warnings provide advice of the potential for Damaging/Destructive wind gusts, Large/Giant Hailstones, Heavy/Intense Rainfall that may lead to flash flooding, and Blizzard.

Severe Weather Warnings will aim to be issued 24 to 36 hours ahead of the expected onset of severe weather conditions. Depending on forecast confidence and the level of threat, Severe Weather Warnings may be issued with shorter lead times.

Once a Severe Weather Warning is issued, routine updates will be issued at least every six hours until the threat has passed. Once the threat of severe weather has passed, the Severe Weather Warning will be cancelled.

Bureau Severe Thunderstorm Warnings

A Severe Thunderstorm Warning is issued whenever there is sufficient meteorological evidence to suggest that severe thunderstorm development is likely, or when a severe thunderstorm has been directly reported or observed.

Thunderstorms Warnings will be issued when there is an expectation that thunderstorms may produce the following phenomena:

- Large hail – 2 cm in diameter or greater
- Damaging wind gusts – 90 km/h or greater
- Heavy rainfall that may lead to flash flooding.

Thunderstorms are classified as 'very dangerous' when they produce one or more of these severe phenomena:

- Giant hail – 5 cm in diameter or greater
- Destructive winds gusts – 125 km/h or greater
- Tornadoes
- Intense rainfall that may lead to dangerous and life-threatening flash flooding

The Bureau issues two types of Severe Thunderstorm Warnings that alert the public and others:

Regional Severe Thunderstorm Warnings

Regional Severe Thunderstorm Warnings highlight broad areas where severe thunderstorms are occurring or may occur in the next 3 hours. They are valid for a three-hour period but may be updated more frequently during rapidly evolving situations.

Regional Severe Thunderstorm Warnings are issued for the entire State, with weather forecast districts under threat detailed. A graphical representation of the threat area is also included.

If severe thunderstorms develop within an area that is already described by a Severe Weather Warning, a separate Severe Thunderstorm Warning will only be issued if a hazard other than those already included in the Severe Weather Warning is occurring or expected to occur.

Detailed Severe Thunderstorm Warnings

The Bureau will issue a Detailed Severe Thunderstorm Warning for the greater Melbourne area. They provide time and location-specific information about the severe thunderstorm threat.

Detailed Severe Thunderstorm Warnings are issued when one or more severe thunderstorms are detected in the Greater Melbourne area, or an existing thunderstorm is forecast to become severe within the next 60 minutes.

Detailed Severe Thunderstorm Warnings are valid for 30 or 60 minutes from the issuance time and will be updated routinely every 30 to 60 minutes or as required.

Detailed Severe Thunderstorm Warnings depict and describe individual severe thunderstorm cells, and the likely area of impact.

A very dangerous thunderstorm label will be included to identify thunderstorms which may produce high end phenomena.

Agency notifications

VICSES and the Bureau work in close partnership to ensure the timely notification of severe weather events in Victoria. VICSES implements a detailed notification process for severe weather events which is documented in the VICSES Standard Operating Procedures and in relevant emergency management sector including JSOP 03.16 - Significant Event Notification to the EMC.

The Bureau will provide all Severe Weather Warnings and Severe Thunderstorm Warnings directly to VICSES State Command. Irrespective of issuing a warning, the Bureau should attempt to contact VICSES State Command whenever severe weather is imminent or has been observed.

When a Severe Thunderstorm Warning is upgraded to include the term 'This thunderstorm is very dangerous', the Bureau should contact VICSES State Command and include this information and a statement to contact the Bureau urgently regarding the warning.

3.4.2 VICSES Public Information and Warnings for Storm

Issuing of public information and warnings for severe weather and storm occurs in accordance with the principles outlined in the SEMP and the Victorian Warning Arrangements. These documents provide overall guidance on the expectations around the issuing of public information and warnings and relevant definitions. This includes outlining the need for timely, relevant, tailored and accessible warnings and public information, which is delivered across a range of channels, including but not limited to:

- VicEmergency website and app
- Social media
- Doorknocks
- Community meetings
- Radio
- TV
- Mobile and landline phones.

Warnings Systems and doctrine

Table 3 outlines VICSES doctrine for issuing warnings related to storms.

The key warnings systems that VICSES uses in Victoria for issuing of storm warnings are:

- Emergency Alert
- EMCOP Public Publisher.

Table 3

Hazard	EMCOP Business Rules document location	VICSES Standard Operating Procedure
Severe Weather and Thunderstorm	EMCOP – Library – IMT Toolbox – IMTTB – Public Information – EMCOP Business Rules – Severe Weather and Thunderstorm Business Rules	VICSES Intranet – Assets and Operations – Operational Doctrine - SOP008 Severe Weather Notification and Activation
Coastal Hazards		
Flash Flood	EMCOP – Library – IMT Toolbox – IMTTB – Public Information – EMCOP Business Rules – Flash Flood Business Rules	VICSES Intranet – Assets and Operations – Operational Doctrine - SOP008 Severe Weather Notification and Activation

The severe weather and thunderstorm business rules also refer to hazards associated with severe weather phenomena, including flash flooding and thunderstorm asthma. In the case of rain events the severe weather and thunderstorm business rules prompt consideration of whether flash flood messaging is required in conjunction with or in place of severe weather public information and warnings.

The issuing of severe weather warning products by the bureau incorporates coastal hazard warnings for dangerous surf and abnormally high tides. While the issuing of public information and warnings for coastal hazards falls within the severe weather and thunderstorm business rules and this sub-plan consideration also needs to be given to the flood sub-plan and associated business rules due to the potential impacts i.e. flooding of coastal areas.

The severe weather and thunderstorm business rules also contain prompts that should be followed around the issuing of thunderstorm asthma messaging based on Department of Health triggers.
The business rules clearly outline who is responsible for warning for each of the hazards, or related phenomena.

3.5 Preparedness

Preparing for storm events includes developing arrangements to ensure that the state can efficiently mobilise and deploy the resources and services it needs to respond.

Preparedness activities include:

- Identifying and assessing the risk.
- Developing policy, arrangements, and plans.
- Ensuring adequate resources, systems, and processes are in place.
- Training response personnel and educating stakeholders and potentially affected industries and communities.
- Maintaining and developing expertise, including through local knowledge (see section 3.6.5)
- Conducting exercises.
- Evaluating preparedness and response activities.
- Ensuring the necessary relationships, formal and informal mechanisms are in place across government and industry to support community outcomes.

The risk management approach aligns with the SEMP and outcomes and objectives of the Sendai Framework for Disaster Risk Reduction 2015–2030 and the National Disaster Risk Reduction Framework. At the state level, EMV is responsible for development and implementation of the state-level Victorian Emergency Risk Assessment process and publication of the Emergency Risks in Victoria report.

Regional storm emergency planning

REMP sub-plans are prepared with regards to the Guidelines; Where the REMP, or REMP Sub-Plans or relevant complementary plans (including operational plans) are not sufficient to address the local risk of storms, identified through the REMP risk assessment process, a REMP Storm Sub-Plan may be required as determined by the Control Agency or the REMPC with agreement from the Control Agency. REMP Storm Sub-Plans are prepared by the relevant Control Agency on behalf of, and in collaboration with, the REMPC.

Based on storm risk and the requirement for multiagency response for storm events across Victoria, as the Control Agency responsible for storm, VICSES will prepare a Storm Sub-plan on behalf of, and in collaboration with, all Victorian REMPCs.

Municipal storm emergency planning

MEMP sub-plans are prepared with regard to the Guidelines; Where the MEMP, or MEMP Sub-Plans or relevant complementary plans (including operational plans) are not sufficient to address the local risk of storms, identified through the MEMP risk assessment process, a MEMP Storm Sub-Plan may be required as determined by the Control Agency or the MEMPC with agreement from the Control Agency. MEMP Storm Sub-Plans are prepared by the relevant Control Agency on behalf of, and in collaboration with, the MEMPC.

Based on storm risk and the requirement for multiagency response for storm events across Victoria, as the Control Agency responsible for storm, VICSES will prepare a Storm Sub-plan on behalf of, and in collaboration with, all Victorian MEMPCs.

Community preparedness

Outcome 2 of the VICSES Strategic Plan 2023 – 2027, 'We connect better to communities, enhancing their preparedness for emergency weather events', indicates key and measurable priorities in partnering with communities, government, other agencies, and business to provide timely and effective emergency management services, building community preparedness, disaster resilience and contributing to risk prevention.

Community preparedness material for storm can also be found via the VICSES website.

3.6 Response (including relief)

3.6.1 Readiness

Either the Bureau's Regional Forecasting Centre or the SCC Weather Service will provide advice to VICSES of a pending severe weather event. The Severe Weather Intelligence Briefing provides guidance on readiness and activations. See Section 3.4.1 for details for the Bureau's forecasting and warning services.

VICSES State Command and VICSES Regional Command will then use this intelligence to determine the Readiness Level in line with JSOP2.03 Incident Management Team Readiness Arrangements and the VICSES Readiness and Activation Levels.

Readiness Levels are described in a five (5) level scale:

- Levels one (1) and two (2) are within VICSES internal command and control arrangements.
- Levels three (3) to five (5) will require a multi-agency response to manage, mitigate and control the hazards and/or its consequences.

3.6.2 Normal Agency Arrangements

In line with Schedule 1, Table 2 under JSOP 02.03 readiness levels 1 and 2 are within VICSES internal command and control arrangements. For VICSES, readiness levels 1 and 2 are classified as business as usual or normal agency arrangements.

Supporting agencies and organisations will have various operational management structures and systems for the management of their command and control responsibilities to define what is classified as an emergency for the consequences of storms and what is classified as normal agency arrangements. This information is contained in the relevant SEMP Sub-plan where necessary or is otherwise documented in the internal documentation of those agencies and organisations.

Concurrent and consequential emergencies

For emergencies that are occurring at the same time or result as a consequence of storms that fit within VICSES Readiness Levels 1 and 2, the same concepts apply for the responsible control agency.
The OOM outlines the expected command and control structures, and activities that VICSES shall undertake in preparation for readiness levels one (1) and (2). The audience of the VICSES OMM is VICSES Members.

3.6.3 Concept of Operations Multi-agency Response

Readiness level three (3), four (4) and five (5)

Readiness Levels 3, 4 and 5 are where there is an increased likelihood that response will require multi-agency involvement to supplement control agency resources to manage, mitigate and control a potential major emergency and/or its consequences.

Schedule 1, Table 2 of JSOP2.03 Incident Management Team Readiness Arrangements outlines the process to establish IMTs to manage incidents.

Support agencies may be requested to provide EMLOs into IMTs at these levels or seek to have EMLOs positioned for intelligence and connection purposes. When these requests are received or made, each agency is to consider their own operational environment, arrangements, resourcing and requirements in providing personnel to support these requests or determining alternative support methods if necessary.

For these readiness levels, the SRC exercises control in accordance with the SEMP, including working with State Controllers for Class 2 emergencies (where appointed) for concurrent incidents. Refer to SEMP for guidance on concept of operations when the SRC exercises control.

The VICSES Operations Management Manual (OMM) outlines the expected command and control structures, and activities to be undertaken by VICSES in preparation for Readiness Levels 3, 4 and 5.

SRC readiness, response, and relief considerations

Where conditions for readiness level 3 or above are likely to be met or are met, the VICSES SAC will notify the SRC who will notify other control agencies, and rostered Regional/Zone Controllers to assure the following considerations are made:

- Establishing a suitable control structure for management of the risk/incident.
  - Confirming agencies at all tiers are activated and appropriate arrangements are in place and have adequate resources in place to fulfil their responsibilities and are planning for sustainment and surge capacity, including identification of need for inter-state assistance.
  - Confirming agencies with call taking responsibilities, including TZV, have resources in place and back up.

    Note: this is of particular importance for storm events as these can generate a large volume of calls to 132 500 and 000, necessitating significant increase in call taking capacity
- Confirming positioning of relevant rescue resources (for example, land based swift water rescue) and command as required.

  Note: this is of particular importance during storm and severe weather events that produce flash flooding.
- Providing consistent emergency warnings and information to the community.
- Implementation of evacuation and emergency relief plans.
- Identifying the likely consequences of the event and any interdependencies that may affect planning.
- Confirming agencies have adequate resources in place to fulfil their responsibilities and are planning for sustainment and surge capacity, including identification of need for inter-state assistance.
- Identifying mass gatherings and large public events that maybe at-risk, and arrangements to ensure the safety of individuals attending.
- Positioning of emergency management liaison officers from key support agencies to the SCC and RCCs, where appropriate.
- Ensure that arrangements are in place for initial impact assessment data to be collected and then incorporated into the operational response.
- Arranging for regular meetings of the state, regional and incident emergency management teams.
- Providing whole-of-government situation reports to relevant government ministers.

3.6.4 Cross jurisdictional arrangements

The cross jurisdictional arrangements to support operational response to storm events are underpinned by national and inter-state agreements, including:

- **Arrangement for Interstate Assistance (AIA)** which provides the national governing arrangements for deployments and support through the **National Resource Sharing Centre (NRSC)**.
- Inter-state MoU between VICSES and South Australia **State Emergency Service (SES)** and New South Wales SES respectively, which detail arrangements for cross jurisdictional response.
- Local arrangements are also detailed in VICSES regional plans.

To ensure that interstate resources are able to efficiently operate in Victoria, there are the following considerations that the SRC should ensure are addressed by the **Interstate and International Liaison Unit (IILU)** when making a request and preparing deployment plans.

- Any identified differences in other operating practices are identified and a process is agreed and documented as to how interstate crews will be able to undertake the expected functions given the identified differences.

Some of the key considerations when establishing cross jurisdictional arrangements that are relevant to storm response include:

- Coordination and negotiation for resource requests when additional support is required by the Australian Defence Force.
- Use of the national warning platform, Emergency Alert, to provide urgent information to community members above and beyond state warning platforms (such as VicEmergency).
- Establishment of offline communication (such as radio networks).
- Consideration of supporting state deploying **Jurisdictional Liaison Officer (JLO)** in support of their assets/ members

3.6.5 Local knowledge

The community and other organisations can provide valuable local knowledge about incidents and how they may evolve. This information is commonly referred to as local knowledge.

It is essential that communications pathways are created and maintained to ensure appropriate local knowledge can be captured before, during and after incidents.

As an incident escalates from local control to a larger incident management structure, it is essential that local knowledge capability is retained within the overall structure. A Joint Standard Operating Procedure - JSOP 02.04 Local Knowledge, is designed to maximise the safety of incident response personnel and the safety of the community by integrating local knowledge into incident management teams.

Further to this, VICSES has created a statewide network of local field observers who provide real-time information and images from the field to the Intelligence Section in IMTs to support situational awareness and intelligence verification. VICSES has adopted the Snap, Send, Solve app to improve communication from field observers to IMTs. Field Observer data is directly available in the EM-COP situation map via the data button (Observations/Snap Send Solve).

The VICSES RDO is responsible for the activation of Field Observers - refer to SOP073 Field Observer for role information and activation process. The VICSES RDO will give consideration to incorporating people with relevant local knowledge into relevant roles within an IMT. SOP073 can be found EM-COP.

VICSES has developed a Local Knowledge Policy which outlines key strategies for incorporating local knowledge into the management of emergency events and is available to VICSES members via its intranet (Sharepoint). Others who require a copy should request it through VICSES command.

3.6.6 Impact assessment

Undertaking an impact assessment provides all decision makers with relevant information regarding the nature and extent of the hazard, and any potential consequences during and after the emergency to ensure efficient, timely and appropriate support for communities.

The regional (or zone) controller is responsible, with the regional control team agencies, for initiating and managing **Initial Impact Assessments (IIAs)**.

The EMC is responsible for ensuring the coordination, collection, collation and reporting of incident data and impact assessment processes as required. All agencies have a responsibility to assist the EMC with the impact assessment process, as per the SEMP and the relevant impact assessment guidelines available on EM-COP. The data from impact assessments (including **Secondary Impact Assessments (SIAs)**) is used to identify where to focus early recovery activities. Multi-agency Impact Assessment Guidelines can be found on:

- Library - IMT Toolbox - Incident Control - Impact Assessment.

FRV is the response agency identified in the SEMP to assist with IIA, however in some circumstances IIAs may be done by other response agencies. To expedient collection of information, the Incident Controller may task any response agency to assist by having its personnel collect relevant information. VICSES provide its impact assessment data through its **Requests For Assistance (RFAs)**.

In the initial phase of response, IIA may involve:

- Aerial reconnaissance of the affected area.
- Individual agencies reporting on community impacts within communities where they have a presence.
- The SCC Intelligence and Public Information Cells monitoring media channels and community sentiment through the likes of social media.

To enable emergency relief and early recovery activities to commence, IIA is utilised to capture the nature and scale of the storm's impact during the initial 48 hours of an emergency. It identifies impacts on people, community infrastructure, and the economic, natural, and built environments.

An IIA typically begins in the first 24-48 hours of an emergency event and is focused on the collation of immediate impact data. An IIA is a preliminary assessment generally from visual inspection undertaken by response agencies, assisting in determining the scale and impact of the storm emergency on people, community infrastructure, and the economic, natural, and built environments. It assists with prioritisation of immediate needs of individuals and communities, requirements of SIAs.

3.6.7 Restricting access

- To ensure public safety, it may be necessary to restrict access to affected areas. Victoria Police and relevant land managers will coordinate the restriction of access to these areas as directed by the Incident Controller.
- Traffic management will be conducted in accordance with the JSOP for Traffic Management at Major Emergencies (JSOP 03.10).
- The IC who has overall responsibility for incident control is required to consult with Victoria Police and where possible, the responsible road authority to develop, implement and monitor a Traffic Management Plan.

3.6.8 Evacuation and relocation

AIDR's Evacuation Planning Handbook defines evacuation as:

> *A risk management strategy that may be used to mitigate the effects of an emergency on a community. It involves the movement of people to a safer location and their return. For an evacuation to be effective, it must be appropriately planned and implemented.*

Evacuation is a scalable activity, in that it may be applied to individuals, a house, a street, a large facility (such as a school or hospital), a suburb, a town or a large area of the state.

The Incident Controller is responsible for making a decision in consultation with Victoria Police as to whether evacuation is a safe option for communities and individuals. In making this decision the Incident Controller may seek advice from other agencies or communities, as detailed in JSOP 03.12 – Planned Evacuation for Major Emergencies.

3.6.9 Emergency works

Emergency works, in this Sub-plan, are defined as works undertaken using powers as outlined in the VICSES Act 2005 (Section 32AB)

The VICSES Act 2005, Part 3, Section 32AB, provides the power to enter land or premises with or without the consent of the occupier of the land or premises, if a service member reasonably believes that entry is urgently required to protect life or property in the course of responding to or preparing for, a flood, earthquake, storm, or when undertaking a rescue.

VICSES SOP035 'Entering land or premises during operations' sets out the procedure to be followed when exercising these powers.

3.6.10 Safety of responders during severe weather

In the response phase of a severe weather event, the conditions may be extreme enough to make it unsafe for emergency personnel to work in the field. Consequently, at the state level, the SRC may need to consider issuing a Red Flag warning or remind RCs and ICs to be alert to the need to issue one. A Red Flag Warning should be issued when there is, or is predicted to be, a significant risk to safety due to changed circumstances and must be issued in accordance with JSOP 03.11 - Red Flag Warning.

A recent example of a severe weather event that warranted issuing of red flag warnings, was the evening of 9 June 2021, when destructive winds led to the issuing of red flag warnings. An insight from that event identified that the issuer of the red flag warnings needs to ensure the warning is clear on what actions it expects responders to take and how to acknowledge the warning.

3.6.11 Restoration of services

Storms can disrupt energy, communications, water (potable and waste), agriculture/dairy industries, and transport services.

Refer to SEMP Roles and Responsibilities for details on restoration of services resulting from storm in various settings.

Refer to SEMP for details of coordination arrangements related to restoration of services.

3.6.12 Health response

The **SEMP Health Emergencies Sub-plan (HESP)** outlines the arrangements for coordinating the health response to emergencies. The HESP outlines the arrangements in place for directing health resources.

The State Health Commander AV is responsible for directing the pre-hospital response in an emergency. The Department of Health's State Health Agency Commander and State Health Coordinator are responsible for directing health resources. These roles are represented on the SEMT.

For a storm event, the DH has a support function to minimise the health impacts on individuals, communities, public health and the health system. DH works with many partners including the control agency for energy emergencies DEECA, DFFH, Victoria Police, Red Cross and hospitals to support life support customers during prolonged power outages.

During and after storm events, Ambulance Victoria is likely to require access to impacted and potentially isolated areas for people who require urgent medical assistance. This may be as a result of storm related injuries or illnesses, or urgent requests for an ambulance for unrelated pre-hospital emergencies. To facilitate a response, AV may require VICSES to.

- provide advice on safe access/egress to patients;
- support AV and rescue agencies in determining safe access to or retrieval of patients; or
- provide advice and alternate arrangements on managing those requests for assistance (for example, via altered call taking and/or dispatch arrangements in the impacted area or altered rescue arrangements).

Storms have the potential to affect electricity supplies across the state, and in some instances lead to widespread and prolonged power outages affecting many people. Some of the most at risk people during such outages are customers on life support, including customers dependent on ventilators or other medical devices, and rely on electricity for medical reasons. The Department of Health works with many partners to facilitate support for these groups during widespread and prolonged power outages, in recognition of their unique risk to this type of event.

The Department of Health also administers Victoria's safe drinking water regulatory framework. The framework requires water businesses to have emergency management arrangements and procedures for dealing with an incident, event, or emergency that may adversely affect the quality or safety of drinking water or result in water being supplied that poses a risk to human health. The Department of Health is also the control agency for drinking water contamination.

In response to mass fatalities, Victoria Police will manage the disaster victim identification process and will administer the handling and investigation of deceased persons and their subsequent removal on behalf of the state coroner (Refer to SEMP Roles and Responsibilities – Table 10: Lead Response Support Agencies).

Epidemic thunderstorm asthma

Since the November 2016 epidemic thunderstorm asthma event, the department has worked closely with a wide range of stakeholders to develop and implement a comprehensive Epidemic Thunderstorm Asthma Program to minimise the impact that any future events may have on the community and the Victorian health system. In part, the program includes:

- A public health campaign to raise awareness of thunderstorm asthma, which helps the community prepare for the grass pollen season and improve asthma and hay fever management.
- A Victorian epidemic thunderstorm asthma risk forecasting system, which operates between 1 October and 31 December and combines the forecasting of a certain type of thunderstorm and forecasting of grass pollen levels across Victoria.

- Increased planning and response activities carried out by AV in conjunction with the DH and Triple Zero Victoria.
- Increased monitoring during escalated events by response agencies.
- Resources and training for health professionals – including expert clinical guidelines to identify and manage those at increased risk.
- A close to real-time Health Emergency Monitoring System, ensuring quick recognition and better management of a surge in demand on our health services.
- Revised State Health Emergency Response Arrangements designed to improve planning, communication and working with health services during emergencies, to better meet community health needs.

3.6.13 Animal welfare

Storm events may result in significant displacement or other welfare issues for livestock, companion animals and wildlife.

The SEMP Roles and Responsibilities defines DEECA as the control agency for the welfare of livestock, companion animals and wildlife arising from a declared emergency.

3.6.14 Relief

Emergency relief involves the provision of essential needs to individuals, families, and communities during and in the immediate aftermath of an emergency. The relief needs of individuals, families, and communities will be complex and specific to each incident. However, there are several overarching relief priorities for storm emergencies which are:

- Provision of need-based assistance for the immediate health and wellbeing of individuals and communities.
- Planned and timely access to restore critical infrastructure (including transport infrastructure, power, water, and telecommunications).
- Planned and timely return of communities to storm affected areas to minimise further physical and psychological harm.
- Provision of timely, relevant, and tailored relief information to assist community members to make informed decisions.
- Effective and efficient state, region/incident and local relief coordination arrangements.

Refer to the SEMP for the relief responsibilities of the incident controller, regional controller and the SRC.

Relief coordination operates at both the tier and functional activity levels and in line with the SEMP Roles and Responsibilities. Tier level coordination is as follows:

- Local – Councils are responsible for coordinating relief at a local level.
- Regional – ERV will coordinate relief arrangements at the regional level.
- State – ERV will coordinate relief arrangements at the state level.

Several agencies, government departments, and non-government organisations have responsibility for coordinating or providing direct assistance to individuals, families, and communities or indirect assistance through the resupply of essential goods or services to communities isolated in an emergency. State leads are identified in the SEMP Relief Services and Co-ordination table.

Debris removal and safety mitigation activities

Whilst the SEMP Roles and Responsibilities define longer term clean-up in recovery, storms in various settings will require a level of clean-up in the response and relief phase to ensure the safety of personal and the community. Some of these activities may include:

- Debris removal
- Access and egress management
- Temporary road infrastructure mitigations
- Hazardous tree assessment/management
- Hazardous power line assessment/management
- Disconnection of energy supply (e.g. solar, gas)

Refer to SEMP Roles and Responsibilities for details on debris removal and clean up resulting from storms in various settings.

3.7 Recovery

Under the EM Act 2013, the EMC is responsible for the coordination of consequence management and coordinating recovery for major emergencies and can delegate this responsibility to relevant agencies. In line with the SEMP Roles and Responsibilities, recovery coordination operates at both the tier and functional activity levels. Tier level coordination is as follows:

- State and regional recovery coordination: ERV, partnering with all levels of government, business and not-for-profit organisations and responsible to deliver recovery programs and services (including community services).
- Municipal recovery coordination: Councils are responsible for recovery information for community and the coordination of community recovery services.

3.7.1 Transition to recovery

The SEMP specifies the arrangements for the coordinated planning and management of transition from response to recovery in Victoria.

Transition to recovery may occur on a municipality-by-municipality basis, with the support of ERV, while response may be still occurring in other municipalities.

The response function will continue at least until the following conditions are met:

- All rescues have been accomplished.
- All injured have been attended to.
- Displaced people have been provided with shelter, and essential services.
- Impacts to community assets and infrastructure are at repair and/or rebuilding phase (noting this may mean significant levels of disruption may still be present within the community).

Incident controllers, regional controllers, ERV recovery coordinators and municipal recovery managers at the relevant tiers, should collaboratively develop transition plans. These plans should identify appropriate and agreed resources, both prior to and post transition.

The community must receive continuous services during the transition.

An important component is communications appears seamless during transition. Recovery messaging should be integrated with response information as early as possible to facilitate a smooth transition to recovery, alongside other components required for effective transition to recovery.

Key concepts guiding transition include:

- Coordination of transition from response (including relief) to recovery, in partnership with the lead recovery agency, and in consultation with other agencies affected by the transition.
- Seamless transition of information, concise and household specific impact data, and consequence planning.
- Continuity of emergency management for individuals and community.
- Integration of recovery within the IMT – supporting knowledge management into recovery.

Transition from response to recovery is not always a clearly defined step. For a storm that affected a large areas or multiple areas, there may be a legitimate need to instigate recovery in some areas while the response phase is still in operation. This is a phased transition to recovery. The teams at the relevant incident, regional and state tiers should agree on the timing and phasing of the transition, the activities required and who is responsible.

3.7.2 Agency roles and responsibilities across the recovery environments

In Victoria, four recovery environments are used as a framework within which recovery can be planned, reported, monitored and evaluated. These are: social; natural; economic; and built. These environments can be adapted to meet the needs of people and community affected. This includes the inclusion of Aboriginal Culture and Healing.

Social

The social environment considers the direct and indirect effects emergencies may have on the health and wellbeing of individuals, families and communities. This environment is primarily concerned with safety, security and shelter, health and psychosocial wellbeing. The DFFH is the **Recovery Coordinating Agency (RecCA)** for housing and accommodation and psychosocial support, and **Recovery Lead Agency (RecLA)** for a number of activities in areas such as psychosocial support, family violence, certain forms of financial assistance and accommodation. The DH is the RecCA for health and medical assistance, and the RecLA for activities in areas such as mental health and wellbeing, access to health services and public health accommodation standards advice.

Natural

The natural environment considers the effects emergencies may have on a healthy and functioning environment, which underpins the economy and society. Components of the natural environment include air and water quality, land degradation and contamination, loss and damage of plant and wildlife and impacts to national parks and cultural and heritage sites.

Activities in this environment look to support the vitality of biodiversity through prioritisation of threatened species and native vegetation, and the restoration of natural habitats. Natural resources are safeguarded through activity that supports sustainable use of land, water and energy resources.

Environmental recovery also looks to restore the productive and accessible amenity of parks and forests for recreation and nature-based tourism.

DEECA is the RecCA for the recovery activities for natural environment, public land and inland waters, and wildlife and threatened ecosystems and species.

Economic

The economic environment considers the direct and indirect effects an event may have on businesses, primary producers and the broader economy.

Activities in this environment focus on how businesses and local economies can survive in the short-term and thrive in the long-term. Building on existing economic strengths and opportunities with a focus on tourism, primary producers, small businesses, medium and large business, industry and sectors is critical. This environment also captures opportunities for strategic investment in regional infrastructure to boost economic recovery and future development.

DEECA (through Agriculture Victoria) is the RecCA for recovery activities relating to agriculture and the RecLA for a range of activities that support primary producers. DJSIR is the RecCA for recovery activities relating to economy and businesses, and the RecLA for a number of activities that support economic recovery such as identifying economic impacts and consequences, implementing financial assistance and providing knowledge and skills for workforces and businesses.

Built

The built environment considers the effects emergencies may have on critical infrastructure including essential services, commercial and industrial facilities, public buildings and assets and housing.

Activities in this environment seek to address loss in the built environment and to restore critical infrastructure safely and quickly. Some of the desired outcomes are to ensure utilities and transport routes are restored and resilient, and public infrastructure is relevant and of a high quality. Activities could include factoring in Victoria's future climate when rebuilding damaged infrastructure.

DEECA is the RecCA for energy services and reticulated water and wastewater services. DGS is the RecCA for public telecommunications.

DTP has obligations as both a RecLA and **Recovery Support Agency (RecSA)** for recovery activities relating to transport infrastructure and services, as well as providing guidance on planning, building, land-use and historic heritage.

Aboriginal culture and healing

For Aboriginal people, relationships to Country, culture and community are not only interconnected, but intrinsically linked and enmeshed with identity. Aboriginal people may therefore be uniquely impacted by emergencies. It is critical to recognise that any impact is compounded by, and cannot be detached from, trauma incurred due to longstanding social dislocation and upheaval as a direct result of past policies of governments at all levels.

It is also very important to recognise the unique strengths and resilience of Aboriginal communities through the protective factors provided by culture, Country and community in healing from the trauma of emergencies. Activities in this environment support the recognition of culture and knowledge, physical and mental health and wellbeing, engagement with education, respect for land practices, connection to land, water, and wildlife, and strengthened representation in workforce.

While this environment is not listed among the others in the SEMP, it is used in recovery governance at different levels to coordinate these activities. ERV is also accountable in the SEMP for coordinating state and regional recovery, including recovery support for Aboriginal Culture and Healing, ensuring coordination efforts align with the State Government's commitment to advancing Aboriginal self-determination.

ERV works closely with Aboriginal communities to maximise opportunities for operating under the Victorian Aboriginal Affairs Framework 2018-23 and the Self Determination Reform Framework to ensure Aboriginal individuals, families, communities, businesses and Traditional Owner groups are supported to self-determine appropriate relief and recovery responses. This self-determination provides the ability for indigenous people to freely pursue their economic, social and cultural development following emergencies or natural disasters that have impacted them and their communities.

3.7.3 Coordination

Recovery activities, in accordance with the SEMP, begin immediately and continue beyond the need for relief activities, and therefore should be considered during response. As such, high levels of understanding and cooperation are required between response and recovery organisations at each operational tier (state, regional, municipal) and each recovery environment and activity. Response and recovery activities may need to be managed concurrently in some areas impacted by a storm.

As highlighted in 3.7.1, coordination is a key element for the transition to recovery to ensure roles, responsibilities and messaging is clear and consistent.

Appendix

Appendix 1

Recent history of damaging storms in Victoria 2008 – 2024

Date	Event	Location	Details
25 August - 2 September 2024	Severe weather and damaging winds	Statewide	Victoria experienced multiple severe thunderstorms across the state on 25 August 2024 affecting Loddon Mallee, Hume, and parts of Metro Regions. ■ Observed damage to trees in the Yabba South area of Hume Region could be related to the passing of a supercell thunderstorm in the area. ■ On the 25 August, recorded wind gusts of 150 km/h at Mt Buller just prior to 6:00pm resulted in the issuing of a Watch and Act Message issued via VicEmergency. ■ Flash flooding was confirmed in Bendigo, with a Watch and Act Message issued via VicEmergency just before 4:00pm. ■ Power outages were observed across the state due to thunderstorm damage, with just over 20,000 customers across the state impacted. ■ Following these thunderstorms, Victoria experienced multiple strong cold fronts from Tuesday 27 August up to and including Thursday 5 September with the strongest cold front crossing Victoria during the early hours of Monday 2 September. ■ This cold front saw a large portion of Victoria lashed with Damaging to Destructive winds as well as Coastal Hazard warnings for abnormally high tides and damaging surf along a majority of the Victoria coastline. This weather phenomenon resulted in winds that resembled those of a Category 2 cyclone. ■ On Wednesday 28 August, Victoria experienced a deep, complex low-pressure system. This cold front generated strong winds, especially in the alpine and coastal regions. Some of the top recorded wind gusts include: • 154 km/h at Wilsons Prom • 131 km/h at Mount Gellibrand • 100 km/h at Melbourne Airport ■ Significant power outages were observed across the state due to storm damage, with more than 180,000 customers impacted at the peak on 2 September Monday morning. ■ Between Sunday, 25 August, and Monday, 5 September, VICSES responded to just over 10,000 RFAs, primarily due to fallen trees and building damage. Just over half of these RFAs were received on Monday, 2 September alone.
13 February 2024 – 29 February 2024	Thunderstorms and damaging winds	Statewide	■ On February 13, 2024, Victoria experienced a catastrophic storm event that damaged 12,000 km of powerlines and poles across the state's electricity distribution businesses, causing power outages that impacted more than 535,000 homes and businesses. ■ With the storm came damaging and destructive winds and heavy rainfall impacting large parts of Victoria, including wind gusts of: • 130km/h at Mount Gellibrand • 122km/h at Avalon Airport • 106km/h at Frankston Beach and St Kilda Harbour • 102km/h at Melbourne Airport • 91km/h at Moorabbin Airport ■ During this event VICSES attended 6,768 incidents, with 6,108 of these incidents directly related to storm impacts.

Date	Event	Location	Details
2 January 2024 – 20 January 2024	Tropical severe thunderstorm	Statewide	■ VICSES responded to 4,097 incidents, of which 612 were for building damage, 1,260 for flood, and 1,692 for trees down.
24 December 2023 – 27 December 2023	Flash flooding, heavy rain and thunderstorms	North-West, Central and Eastern Victoria	■ Daily rainfall totals of 50 to 100 mm were recorded in the 24 hours to 9 am between the 25 and 27 December across parts of Victoria with minor to moderate flooding across catchments in north-western, central and eastern Victoria. ■ Several locations across the state recorded their highest December daily rainfall total during this period. Dunolly reported its highest ever daily rainfall on record, receiving 96mm of rain in 24 hours. ■ VICSES attended 1,284 incidents, including 856 for storm and 323 for flood.
29 November 2023 – 6 December 2023	Severe Weather	North-East Victoria	■ A Severe Weather Warning for damaging winds and heavy rainfall was issued for several parts of Victoria on 28 November 2023. ■ Significant wind gusts were recorded on 29 and 30 November across the High Country ■ Swan Hill received 90mm of rain in a short period of time. ■ VICSES responded to 1,214 RFAs, including 804 for trees down.
3 October 2023 – 13 October 2023	Severe Weather	Statewide	■ On 5 October damaging winds and heavy rainfall impacted parts of Victoria, including wind gusts of 106km/h at Wilsons Promontory Lighthouse and significant rainfalls totals at Mount Hotham (198.8mm), Fall Creek (208.2mm), Halls Gap (203mm). ■ In the 24 hours to 9 am on the 4th, many stations in Victoria had their highest October daily rainfall on record. ■ Heavy rainfall led to flash flooding and widespread minor and moderate riverine flooding across north-eastern and eastern Victoria. ■ During this event VICSES attended 1,015 RFAs, including 606 for storm-related incidents.
7- 8 September 2023	Destructive winds and dangerous surf	Statewide	■ Severe winds affected broad areas of south-east Australia on 7 and 8 September, as a strong cold front and low-pressure trough crossed southern and south-eastern Australia. ■ Maximum daily wind gusts greater than 100 km were recorded across elevated and coastal areas of Victoria. ■ Wind gusts of 109km an hour was recorded at Port Fairy and 106km an hour recorded at Warrnambool. ■ Victoria and New South Wales recorded their highest daily wind gust on record for September. ■ There were reports of swells of more than 9 meters at Port Fairy (Victoria) and 8 meters at Portland (Victoria). ■ A total of 24,000 community members were without power and VICSES received 1,314 RFAs during this period with 675 of these across the Barwon Southwest Region and 413 across Metro Regions.
April 2023	Strong winds, Thunderstorms	Statewide	■ On 15 April, a cold front moved eastwards across southern Australia drawing moisture from ex-Tropical Cyclone Ilsa. This brought widespread heavy rain, strong winds and thunderstorms to southern and inland Western Australia, southern Northern Territory and South Australia, Victoria, Tasmania and New South Wales. ■ In the 24 hours to 9 am on the 14 and 15 April large parts of Victoria, Tasmania and New South Wales received 20 to 40 mm in the 24 hours to 9 am on the 16 April. ■ From 15 April – 16 April, VICSES received 281 RFA's were. Largely pertaining to building damage and trees down.

Date	Event	Location	Details
18 September 2022	Tornado	Taylors Hill	■ On 18 September, a small tornado impacted the Taylors Hill area. ■ VICSES received 28 RFAs, mostly building damage with tiles and roofing requiring tarping.
August 2022	Damaging winds, thunderstorms, heavy rainfall	Central, Gippsland	■ A series of cold fronts and low-pressure troughs swept across southern and south-eastern Australia at the start of August as a deep and complex low-pressure system passed to the south of the country. Periods of damaging winds, thunderstorms, heavy rainfall and generally cool conditions resulted with flood warnings issued for catchments across inland New South Wales, Victoria, and north-eastern Tasmania. ■ A complex low-pressure system crossing the Great Australian Bight extended cold fronts over south-east Australia during 11 and 12 August. The low developed into a Tasman Low, bringing strong winds and heavy rain to the south-east and localised reports of hail in metropolitan Melbourne. ■ The Tasman Low stalled in Bass Strait on the 13th and 14th, bringing multi-day rainfall totals of 50 to 100 mm over much of Tasmania and Gippsland in Victoria. A number of sites set daily rainfall records for August during this period. ■ VICSES approximately received, 500 Requests for Assistance during this period, 75% relating to trees down.
June 2022	Flash flooding	North-East Victoria	■ In the 24 hours to 9 am on 6 June, totals of 60 to 80 mm were recorded in north-eastern Victoria, with minor flood warnings issued for the King River.
1 February 2022	Heavy rainfall and damaging winds	North-East Victoria	■ A large storm cell developed rapidly over the Northeast, with the most intense area tracking from Benalla to Tallangatta. Rainfall totals received include 47mm at Bobinawarrah, 40mm at Rosewhite, and 31mm at Rocky Point. ■ VICSES received 113 RFAs, mostly for trees down.
26 January 2022 – 30 January 2022	Severe thunderstorms, heavy rain and flash flooding	Statewide	■ From mid-January, the remnants of ex-Tropical Cyclone Tiffany brought heavy rain to central Australia as it moved south, forming a complex low-pressure system. Widespread moderate to heavy rainfall caused ponding, overland flow, and rises in local creeks, which impacted local transport networks and necessitated lengthy detours on some transport routes. In western and central Victoria, there were further storms, heavy rain, flash flooding, and large hail on the 26th and 27th, with widespread loss of power ■ Mildura was impacted by a flash flood event with local falls of up to 110mm, including 72mm in 1.5 hours. ■ Geelong received 40mm rain in 40 minutes, causing flash flooding of the Geelong CBD and surrounding suburbs. ■ Damaging and local destructive winds in western parts of state led to building damage and trees down. Edenhope recorded 93km/h winds and 26mm of rainfall in 30 minutes. Horsham recorded 129km/h winds and rainfall of 29mm in a short period. ■ Severe Thunderstorm Warnings for heavy rainfall, and very dangerous thunderstorms warning for Gisborne and Woodend were released, with Malmsbury recording 56.2mm of rainfall in 60 minutes, and Springhill-Tylden recording 23mm of rainfall in 30 minutes. ■ VICSES responded to just over 2300 RFA's.

Date	Event	Location	Details
5 January 2022 – 7 January 2022	Severe Thunderstorms & Flash flooding	Ballarat, Portland, Western & Central Victoria	■ Severe thunderstorms on 6 January brought large hail and heavy rain to parts of Victoria around Ballarat, damaging potato and other crops. ■ Creswick and surrounds experienced a flash flooding event, with 53mm rain upstream, 110mm in Invermay and Creswick areas, and 120-200mm north of Ballarat. 88 RFAs were recorded for the Creswick area within three hours, including three rescue persons trapped. This was estimated to be a 1-in-50-year event. Within the Ballarat area, 206 RFAs were received, mainly for building damage. ■ An excess of 1,600 RFAs were received across the state during this event, largely for building damage and flooding. Central received 882 RFAs, East 137 RFAs, Mid-West 339 RFAs, North-East 105 RFAs, North-West 35 RFAs, and South-West Region received 192 RFAs. ■ Significant storm cells formed near Colac and the Otways, and a large thunderstorm cell near Portland resulted in many RFAs due to heavy rain and hail.
19 December 2021 – 20 December 2021	Windstorms	Statewide	■ Severe winds affected broad areas of eastern Australia on 19 December as a cold front crossed south-eastern Australia, with gusts over 100 km/h recorded at a number of locations in Victoria, New South Wales, and Tasmania. ■ Destructive winds were observed about Victoria's ranges, with gusts of 135km/h recorded on Mt Buller and 124km/h on Mt Hotham. ■ Gusts of 115km/h recorded at Fawkner Beacon and 102km/h at St Kilda. ■ 919 RFAs were received across the state, with over 70% relating to trees down. Central Region (624 RFAs) and North-East Region (186 RFAs) were most heavily impacted.
28 October 2021 – 8 November 2021	Severe weather, heavy wind gusts and flash flooding	Statewide	■ Intense rainfall on Thursday 28 October led to flash flooding in the Mid-West and North-West Regions, with three flash flood warnings released for St Arnaud, Inglewood/Charlton, and Castlemaine associated with the severe weather warning. ■ A strong front brough wind, rain and hail which initially impacted the west of the state, with additional fronts following, impacting south-west Victoria and metropolitan Melbourne areas. Due to event timing and conditions, thunderstorm asthma was an item of potential concern. ■ Early on 29 October, wind gusts in excess of 100km/hr and heavy rainfalls led to widespread damage across the South-West Region and metropolitan Melbourne areas. Wind gusts of 143km/hr were recorded at Mt William, 146km/hr at Wilsons Promontory, and 119km/hr at Melbourne Airport. ■ Widespread power outages and disruption to telecommunications was experienced across the state with 526,000 properties without power from 8:30am, 29 October. ■ Of the 9,897 RFAs received during this event, 7,685 RFAs were received for Central Region, 662 RFAs for East Region, 526 RFAs for Mid-West Region, 578 RFAs for South-West Region, 303 RFAs for North-West Region and 129 RFAs for North-East.

Date	Event	Location	Details
29 September 2021 – 6 October 2021	Windstorms and flash flooding	Statewide	■ Rainfall in the east lead to minor to moderate flooding to the Thompson, Latrobe, and Traralgon creek systems. ■ Heavy rainfall/thunderstorm on the 3 October caused flash flooding in St Arnaud, forcing residents to leave their houses. ■ 3 to 4cm of hail was reported at Nagambie (north of Melbourne) on the 6 October, associated with a severe thunderstorm. ■ 147 RFAs were received in this area in a 40-hour window, mostly for flash flooding. ■ Within the VICSES Central Region, isolated storm cells brought intense rainfall and localised flash flooding. The Broadmeadows area recorded 46mm of rainfall in 45 minutes. ■ A total of 832 RFAs were received state-wide, with Central Region receiving 511 RFAs and East Region receiving 172 RFAs.
3 September 2021 – 9 September 2021	Severe weather	Statewide	■ Rainfall in the east lead to minor to moderate flooding to the Thompson, Latrobe, and Traralgon creek systems. ■ Within the Greater Melbourne area, isolated storm cells brought intense rainfall and localised flash flooding. 46mm of rainfall in 45 minutes in the Broadmeadows area. ■ VICSES received over 700 RFAs, with 370 in its Central Region, 140 in the East Region, and 90 in the North-East Region, largely for trees down on roads and property, building damage and flooding.
9 June 2021 – 11 June 2021	Severe weather, windstorms and flash flooding	Statewide	■ Victoria experienced a weather event, part of a low-pressure system, that moved across Southeast Australia during the week commencing Monday 7 June 2021. ■ On Wednesday 9 June, Victoria faced damaging to destructive winds with wind gusts exceeding 125km/h and 100mm of rain in the 24 hours on the 10th and 11th leading to flooding in low-lying areas that affected central and eastern parts of the state overnight. ■ Moderate to major storm warnings were issued on the 10th and 11th of June for the Latrobe River at Thoms Bridge, the Tanjil River at Tanjil Junction, along the Thomson River near Sale, along parts of the Macalister and Morwell Rivers, and for the Yarra River at Yarra Glen. ■ The Traralgon Creek caused major flooding in Traralgon. Following a series of earlier warnings, at 10am on Thursday 10 June 2021, an 'Evacuate Now' warning was issued for the vicinity of Traralgon and subsequently Traralgon Creek, which continued until Friday 11 June 2021. ■ The scale of storm impacts was significant, with 3.3 million hectares across the state impacted, which included approximately 1.97 million hectares of public land. ■ The storm and associated flooding impacted the Yallourn mine in the Latrobe Valley, which supplies more than a fifth of Victoria's electricity needs. ■ More than 330,000 homes and businesses in Victoria were affected by power outages as the strong sustained winds with gusts exceeding 100 km/h, brought down trees and powerlines. 2100km+ of state managed roads were closed due to flooding and due to downed trees and power lines. ■ VICSES responded to more than 10,000 requests during the period 8 June to 8 July 2021; 9300 of these within the first week. Requests for assistance received were mostly for fallen trees, building damage and storms.

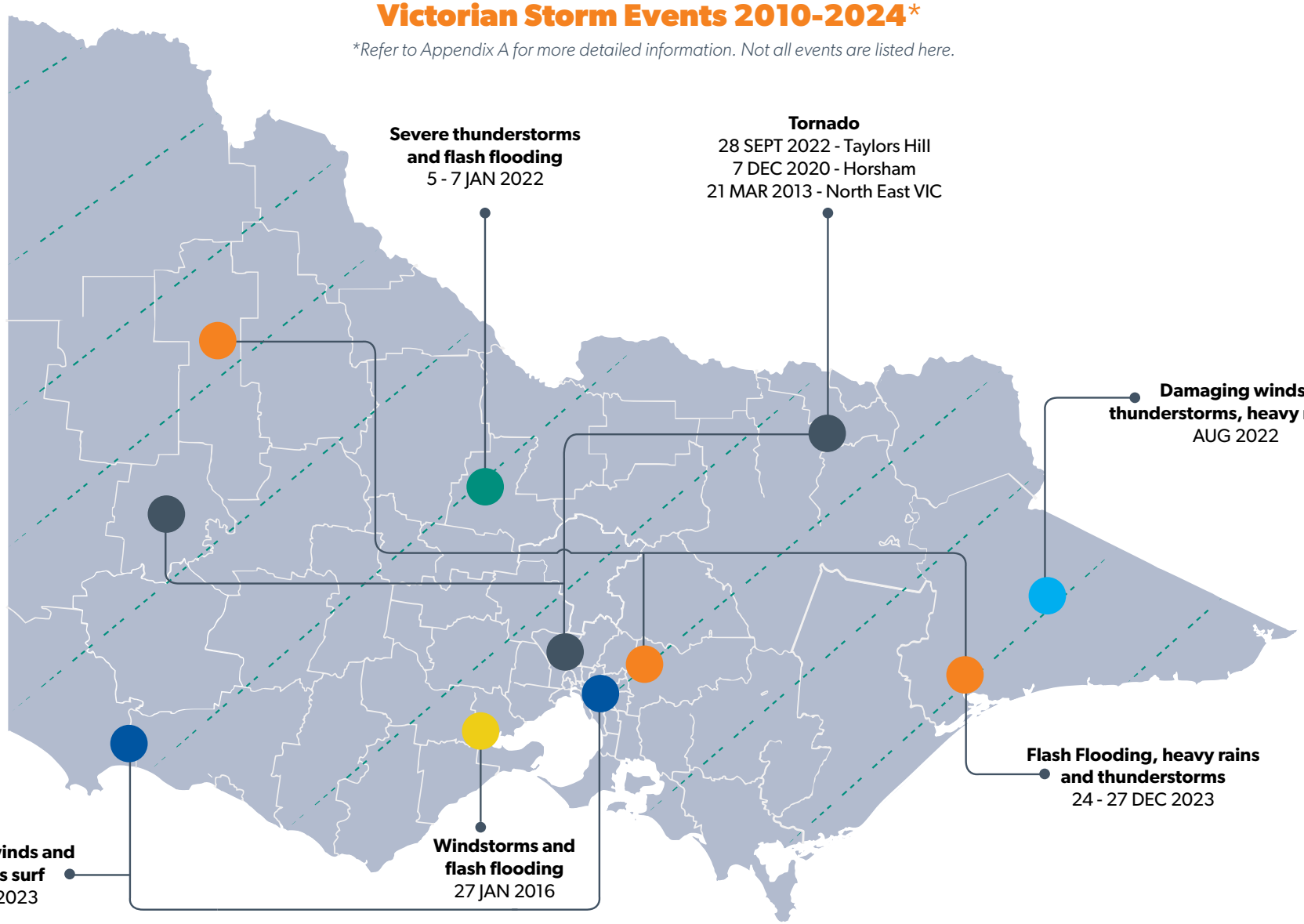
Date	Event	Location	Details
7 December 2020	Tornado	Horsham	■ An Enhanced Fujita (EF) scale 1 tornado (with peak gusts of 138-178 km/h) was reported at Horsham in western Victoria on the 7th of December. ■ Strong winds downed trees, damaged roofs and windows, scattering debris across roads, and cut the power supply to many houses.
January 2020	Severe thunderstorms and flash flooding	Statewide	■ Severe thunderstorms in the afternoon on the 15th of January brought heavy rainfall, flash flooding and damaging winds to central Victoria and parts of Melbourne. ■ Severe thunderstorms developed again on the 19th of January over central and eastern Victoria, bringing heavy rainfall and giant hail (up to 5.5cm in diameter in Glen Iris, in the southeast of Greater Melbourne). ■ Widespread rainfall on the 20th and the 22nd helped reduce the number of uncontained bushfires in the state's east. ■ Strong northerly winds brought dust from northwest Victoria to the southern parts of the state – it came down with rain, and coated surfaces with a layer of dust and coloured the Yarra River brown. ■ High temperatures and humidity fuelled thunderstorms that developed on the 31st of January over southwestern Victoria, generating strong winds. The strongest wind gust in the state this January of 146 km/h, was recorded at Fawkner Beacon on the 31st. ■ Strong winds associated with a thunderstorm which developed near Colac in the afternoon of the 31st led to several transmission towers being knocked to the ground.
21 November 2016	Epidemic thunderstorm asthma	Statewide	■ A severe thunderstorm impacted the Mallee, South-West Region, Wimmera, Northern Country, Geelong and Melbourne with damaging winds, heavy rainfall and large hailstones. ■ ESTA received a moderate surge in calls, answering 532 calls. However, the storm passed quickly, and BOM stated the storm was unremarkable. ■ From 6pm that night, ESTA experienced an increase in calls numbering at 510 calls within an hour to 7pm. During the 12 hours to 6am on 22nd November 2016, 2,332 calls were received requesting Ambulance Victoria to attend for a medical emergency. ■ From 7pm on the 12th of November 2016, hospital emergency departments experienced unprecedented demand, estimated by some hospitals to be an increase of 50%, particularly in Melbourne's west and north. This continued into the 22nd of November 2016 and resulted in the deaths of 9 people. ■ Ambulance Victoria and health services across Victoria were significantly challenged by unprecedented demand across greater Melbourne and Geelong for time-critical calls for people with asthma. In the 30 hours from 6 p.m., there were almost 3,500 extra asthma presentations to public emergency departments, almost 500 extra asthma admissions, and 30 ICU admissions. In the following two days, there were an estimated 10,000 extra GP presentations for asthma in greater Melbourne. The coroner found 10 deaths were attributable to this event.

Date	Event	Location	Details
27 January 2016	Windstorms and flash flooding	Geelong and North-Western suburbs	■ Severe thunderstorms impacted the Geelong area with isolated heavy rainfall, high winds, hail, and flash flooding. ■ Rainfall at Avalon and was determined to be a one-in-100-year event, with 72mm falling in a short period of time and rain at Geelong, a one in 50-year event. ■ Flash flooding required significant multi-agency response at incident, region, and state levels. ■ VICSES and CFA responded to more than 350 RFAs during the afternoon of Wednesday 27 January and morning of Thursday 28 January. ■ Eighteen people were rescued from their cars, while a man was struck by lightning in Highton. Significantly, no lives were lost. ■ The storm caused significant damage to over 300 properties, including impact to 213 residences, 18 schools, 5 early learning centres, and 74 council-owned buildings. ■ The storm damaged essential assets, including road, drains, and other infrastructure. It also led to outages of the mobile phone and electricity networks. ■ A total of 35 residential properties were designated as uninhabitable due to storm damage
25 September – 1 October 2013	Windstorms	Statewide	■ A series of strong windstorms affected most parts of Victoria for several days. ■ Gusts of up to 142 km/h were recorded, putting the strength of the storms into the range of Category 1 tropical cyclones. ■ VICSES received over 3,600 calls for assistance. ■ Apart from fallen trees damaging cars and houses, power outages affected many thousands of premises.
21 March 2013	Tornadoes	North-East Victoria	■ At least 20 people were injured and taken to hospital, with two in a critical condition, after two tornadoes with wind gusts between 180 and 250 km/h cut a path of destruction across Victoria's north-east. ■ VICSES received 150 calls for assistance when the tornadoes hit the towns of Yarrawonga, Mulwala, Bundalong, Rutherglen and Euroa, causing damage to properties, businesses and infrastructure.
25 December 2011	Hailstorms and tornadoes	Western suburbs	■ Thousands of homes were damaged when thunderstorms swept across Melbourne, bringing flash flooding and hail. ■ Over a seven-hour period up to five long-lived supercells (very severe long lasting thunderstorm cells) moved eastwards across Melbourne. ■ The northern suburbs of Eltham, Broadmeadows, and Keilor were among the worst hit. There were reports of two tornadoes in Fiskville and Melton - in some place's cars were upended. ■ VICSES received more than 4200 RFAs, and insurance payments exceeded $700 million.
28 September 2011	Electrical and thunderstorms	Statewide	■ Thunderstorms and heavy rain occurred across Victoria. Melbourne recorded its wettest September day with more than 48 mm of rain falling in the city in the 24 hours. ■ Electrical storms disrupted flights and public transport and left tens of thousands of homes without power. ■ Hail caused significant crop damage in the Mildura area. ■ The Tolmie weather station recorded the highest record of 101mm in a day.

Date	Event	Location	Details
4 February 2011	Flash flooding and damaging winds	South-eastern suburbs Statewide	■ Severe thunderstorms developed over Victoria as a result of the tropical moisture associated with Tropical Cyclone Anthony and ex Tropical Cyclone Yasi, extending from central Australia, through Mildura, Melbourne, and on to north-eastern Tasmania. ■ The extremely high humidity levels resulted in record daily and multi-day rainfall totals to areas of north-east and south-east Victoria. ■ A damaging microburst caused damage west of Melbourne at Laverton, with wind speed strengthened from calm to 131km per hour in six minutes, causing damage to vegetation and structures within an area of approximately one square kilometre. ■ VICSES received more than 6000 requests for assistance (RFAs).
2 April 2008	Dust storm	Western Victoria	■ Severe thunderstorms developed to the northwest of the Melbourne bringing isolated severe wind gusts. ■ Flash flooding was widespread, and hailstones measuring 2-10cm caused damage to homes and buildings mainly in the Knox area. ■ VICSES received 7,500 requests for assistance (RFA). insurance claims exceeded $1 billion. ■ Historically, the only comparable report of such large hail in Melbourne was from 14 November 1901 when "an egg-shaped mass of ice (was) picked up in Victoria Parade (that) had dimensions 7 cm x 4.5 cm x 4 cm."

Victorian Storm Events 2010-2024*

*Refer to Appendix A for more detailed information. Not all events are listed here.



= Statewide storm event
AUG - SEPT 2024

- Victoria experienced multiple severe thunderstorms across the state on 25 August 2024 affecting Loddon Mallee,Hume, and parts of Metro Regions.
- Following these thunderstorms, Victoria experienced multiple strong cold fronts from Tuesday 27 August up to and including Thursday 5 September with the strongest cold front crossing Victoria during the early hours of Monday 2 September.
- This cold front saw a large portion of Victoria lashed with Damaging to Destructive winds as well as Coastal Hazard warnings for abnormally high tides and damaging surf along a majority of the Victoria coast line. This weather phenomenon resulted in winds that resembled those of a Category 2 cyclone.