

essentialfacts

Living with drought

What is drought?

Drought is a prolonged, abnormally dry period when there is not enough water to meet normal or expected needs. It may include reduced water storage volumes and flows to reservoirs, and higher demand for water caused by hot weather.

Drought causes environmental and economic damage, often resulting in loss of vegetation and soil erosion, reduced water quality, and increased risks of bushfires and duststorms as well as crop and stock losses.



Drought may last a few months or many years. Its impact depends on the amount of water in storage from previous years' rainfall.

Drought is a natural part of Australia's highly variable climate. It is not a case of whether drought will occur, but when. This is why Melbourne Water and other metropolitan water agencies plan to manage drought.

Melbourne is in its tenth consecutive year of drought.

Where our water comes from

Melbourne is one of only about five cities in the world that has protected catchments.

Most of the city's water comes from these uninhabited catchments high up in the Yarra Ranges. The catchments, which cover more than 157,000 hectares of national parks or State forests, are closed to human activity to protect water quality and public health.

The forests catch, hold and filter rainwater as it flows across land into streams and then reservoirs. Deep soils and shaded understorey enable reliable streamflow, which helps accumulate water for storages. These storages provide security of supply during drought.

Melbourne's water supply system is based on the principle that it is better to start with the highest quality source water than having to treat it to reach required standards.

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Our variable rainfall

Rainfall varies significantly across Australia in its severity and frequency. Melbourne has more rainy days than Sydney but its average annual rainfall (655 millimetres) is about 40% less than Sydney's (1107 millimetres).

Even across Melbourne, rainfall varies considerably, with averages for the past 20 years ranging from 827 millimetres in the east at Mitcham to 542 millimetres in the west at Keilor.

Rainfall also varies significantly from year to year. For example, Clayton received 1029 millimetres in 1993 and only 486 millimetres in 1997.

Melbourne Water is planning to manage expected reductions in rainfall caused by climate change.

The El Niño effect

The known main cause of drought in Australia is El Niño. El Niño – the extensive warming of the central and eastern Pacific Ocean that leads to a major shift in weather patterns across the Pacific – is often experienced as drought affecting large parts of eastern and northern Australia.

The 1982/83 Ash Wednesday bushfires were largely due to drought conditions caused by the El Niño effect. The most recent El Niño event was 2002/03. The El Niño phenomenon affects run-off in catchments serving all major water supply systems in eastern Australia. Weather researchers watch closely for signs of developing El Niño events to warn of impending drought. Not all droughts occur in El Niño years or can be predicted this way.

A dry history

Traditionally new reservoirs were built to meet increasing demand for water, spurred on by population growth, dry spells and the inevitable drought. The last and largest of Melbourne's water storages, the Thomson Reservoir (pictured) was completed in 1984.



Since the 1960s, water restrictions have been introduced in dry years.

In the severe drought of 1967/68, restrictions on fixed sprinklers and hoses, washing cars and filling swimming pools were introduced. People used buckets to water their gardens.

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Following the drought of 1972/73 water restrictions were formalised. The Melbourne and Metropolitan Board of Works (Melbourne Water's predecessor) and the State Rivers and Water Supply Commission produced an eight-stage set of restrictions at the end of 1975, later simplified to four stages for the metropolitan area).

The 1982/83 drought affected most of eastern Australia, and triggered the Ash Wednesday bushfires, which destroyed 13,000 hectares of water supply catchments.

In Melbourne, Stage 6 restrictions were introduced in February 1983. Watering gardens with hand-held hoses was only allowed for two hours in the evening on alternate days.

On March 1 2005, permanent water saving rules were introduced for all Melbourne households -

Protecting rivers and creeks

An important part of operating the water supply system is to maintain environmental flows in the rivers below all of Melbourne Water's on-stream reservoirs and weirs. During drought conditions, Melbourne Water is not permitted to pump water from the Yarra into Sugarloaf Reservoir, and restrictions may be placed on businesses, known as diverters, that draw water from the Yarra and lower Maribyrnong rivers.

Streamflow management plans are being established for rivers and creeks in the Yarra catchment under State Environment Protection Policy and the Victorian River Health Strategy. We bring together all stakeholders in a working group to develop a blueprint that balances demands on the water resource and provides for a sustainable future for the waterway.



Preparing for drought

Melbourne's storages are designed to maintain supplies through droughts. Water is stored in wetter years and used to supply Melbourne in drier years.

Drought security in the Melbourne system depends on storage levels, water demand and streamflow into the storages.

Thomson Reservoir, the largest of Melbourne's storages, holds about 60% of Melbourne's total system storage capacity and provides the drought "reserve". However, because of its size, it can take a number of years to reach capacity.

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Melbourne Water monitors storage levels, streamflow, catchment conditions and climate outlooks as part of the Melbourne metropolitan water industry's drought response plan, which covers issues such as water supply restrictions.

Contingencies are also in place to increase supply and reduce demand if extreme drought conditions continue for long periods.

Restrictions

Melbourne Water provides the metropolitan retail water companies with information including updates on consumption, rainfall, streamflow, catchment conditions and storage levels, which allows advance warning of the need to impose water restrictions in times of drought.

In addition to the permanent water saving rules introduced across Victoria in 2005, there are four stages of water restrictions.

Restriction stages are triggered when the amount of water in our storages falls to certain levels. These trigger points vary according to the time of the year - the trigger points are higher in summer when demand is higher.

Melbourne is currently under Stage 3 restrictions (for details see www.ourwater.vic.gov.au). The storage level trigger for moving to Stage 4 restrictions is 29.3%. Daily storage level updates are found on the Melbourne Water homepage.

Towards a sustainable future

We have to adapt better to our climate and protect our river flows and bays by making our water supplies go further. Building new dams is not environmentally or financially sustainable.

Several strategies have been developed to ensure Melbourne has sufficient water supplies to meet future needs. Melbourne Water played the leading role in developing the Victorian Government's Water Resources Strategy, which is a long-term framework for managing Melbourne's water.

The Victorian Government's Central Region Sustainable Water Strategy, which sets out actions to protect rivers and provide security of water supply to 2055, emphasises conservation and efficiency, and alternative water sources, such as re-use and recycling, aquifers, desalination, stormwater, and augmenting and interconnecting existing supply systems.

The strategy will provide 400,000 megalitres of water for urban and industrial supply, and 66,000 megalitres of water for environmental flows. The strategy does not support building new dams.

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Climate change

Climate change is expected to reduce rainfall over southern Australia and produce more dry spells in the future. However, there is a great deal of uncertainty throughout the world about the potential impacts of climate change.

Melbourne Water commissioned the CSIRO to undertake a study on the implications of potential climate change for Melbourne's water resources.

The study, *Implications of Potential Climate Change for Melbourne's Water Resources*, found that Melbourne could face a reduction in total water supply system yield ranging from 4% to 15% by 2020 (mid range 8%) and from 10% to 40% (mid range 20%) by 2050.

Working partnerships

The more people appreciate the value of water, the more likely they are to conserve it. Melbourne Water's education programs, industry and community partnerships, and water conservation initiatives across all levels of government are essential in helping to establish sustainable water management practices, and manage drought.

Useful links and other sources

Melbourne Water - melbournewater.com.au/drought

Victorian Government's Department of Sustainability and Environment - www.dse.vic.gov.au

Water conservation – melbournewater.com.au/conservewater, www.savewater.com.au

Victorian Government's Water Resources Strategy - www.watersmart.vic.gov.au

Bureau of Meteorology - www.bom.gov.au

Climate change and the greenhouse effect www.marine.csiro.au www.dar.csiro.au
www.greenhouse.gov.au

Our Water Our Future – www.ourwater.vic.gov.au