

Victorian Annual Water Outlook

December 2021 to November 2022



Acknowledgement

We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.



Acknowledgements

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Cover image: Craig Moodie

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Ministerial foreword

Victoria is well prepared to meet urban and rural water needs over the coming summer and autumn.

Spring rainfall and predictions of wetter conditions this summer put most water supplies in a good position heading into 2022.

Storage levels in Melbourne are 15 per cent higher compared to last year with desalination order contributing 7 per cent to Melbourne's water storages. The wetter-than-average outlook means that we don't expect water restrictions for any Victorian city or town.

Melbourne's water supplies have been bolstered by wet conditions over winter and spring, which strengthens Victoria's buffer against drought provided by water from the Victorian Desalination Project.

In rural areas, seasonal determinations have reached 100 per cent for High Reliability Water Shares in the northern and southern Victorian systems, and licence holders can expect limited or no restrictions. Conditions in Gippsland have improved for the second consecutive season after several years of drought. However, after another year of significantly below average rainfall, the Mallee will need sustained rainfall for local farms and communities to fully recover.

Over recent decades, we have seen warmer and drier seasonal conditions in Victoria. While individual seasons or years may see high rainfall, the longer-term trend of warmer and drier conditions is expected to continue.

Because of this trend, the Victorian Government continues to work with water corporations to ensure we have secure water supplies across the state to meet the challenges of climate change and population growth.

We are putting plans in place to secure our short- and long-term water needs. Water corporations regularly consult and engage with communities about the best ways to use our water resources. As part of this planning, water corporations each provide an annual water outlook to keep the community informed about the status of water supplies and expected demand and

supply projections. The Victorian Annual Water Outlook presents a state-wide summary on what to expect in the next 12 months, including the impact of short-term climate trends on water sources.

While water supplies are secure for the year ahead in Melbourne and regional towns, our changing climate and population growth means we need to continue to use our existing water resources wisely and make the most of diverse sources of water, such as desalination, recycled water and stormwater harvesting.

The Victorian Government continues to work with rural water corporations to deliver infrastructure projects that upgrade water delivery systems, save water and build resilience in our communities. In 2020-21 we successfully completed three major projects - the Mitiamo and District Reticulated Water Supply Project, Macalister Irrigation District MID2030 Phase 1B and Bacchus Marsh Irrigation District Modernisation. These projects will improve water security, boost productivity, and provide significant regional community benefit.

As always, demand management has a big part to play. Victorians should be proud of their water conservation efforts. Permanent Water Saving Rules are in place across the state, and we continue to promote water efficiency through Target 155 in Melbourne and Target Your Water Use in regional Victoria. While more rainfall is expected in the coming months, continuing to be smart about our household, business and on-farm water use puts us in a better position for drier times. Smart water use helps secure our water supplies and allows more water to be used to support the economy and create greener and more liveable communities now and for the future.



Hon Lisa Neville MP
Minister for Water



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Introduction

The aim of the Victorian Annual Water Outlook (the Outlook) is to keep Victorians informed about the state's water supplies for the coming year. It also outlines the contingency plans to manage any water shortages that may arise. The Outlook is a compilation of the annual water outlooks prepared by all 18 Victorian urban and rural water corporations for the 12-month period from December 2021 through to November 2022.

Due to the highly variable nature of Victoria's climate, 'average', 'dry' and 'worst on record' scenario climate modelling is used to identify potential water security risks and understand the vulnerabilities of each system. The individual water corporations' annual water outlooks present this information and report on the current condition of each water supply system, predict future water availability where possible, and outline strategies to meet customer demand. Each water corporation makes its annual water outlook available on its website.

The Outlook takes this information and provides a state-wide overview of the conditions that can be expected this coming year. It considers the seasonal conditions already experienced in 2021 and the short- and long-range forecasts into 2022. The Outlook also summarises environmental water security across the state.

Note: Data provided within this report was correct as at 30 November 2021 or at the date specified.

Craig Moodie



Snapshot for 2022



CLIMATE OUTLOOK

- Above average rainfall and warmer temperatures are predicted for Victoria for the 2021-22 summer.
- Winter rainfall was average for most of Victoria, however, wetter conditions across much of the State this spring has resulted in better water security than this time last year.



MELBOURNE

- Melbourne will not face water restrictions during the 2021-22 summer and water storages are 15% higher than in November 2020.
- Melbourne's water supplies have been boosted by wet conditions over winter and spring, but major storages retain sufficient airspace to capture additional inflows.
- While water supplies are secure, we need to continue to closely manage supply and demand to adapt to a changing climate and significant future population growth.
- In collaboration with the water industry, we have been working to ensure we have a range of water sources to boost supplies if needed over the longer term. This includes recycled water and the desalination plant.
- Melbourne continues to work towards reaching a usage target of 155 litres per person, per day.





ENVIRONMENT

- Catchments in the state’s west, central and northern regions are expected to have moderate to high reserves of water for the environment in 2022 and 2023. Environmental water reserves in western Victoria will remain low.
- If conditions are average to wet, environmental watering in many systems will aim to increase the recruitment of native aquatic plants and animals, and improve the condition of ecosystems to help them withstand the next dry period.



RURAL

- For regulated systems, seasonal determinations have reached 100 per cent High Reliability Water Shares (HRWS) in northern and southern Victorian systems. Seasonal allocations for the Wimmera-Glenelg system are not expected to reach 100%, but no restrictions for stock and domestic pipeline customers are expected.
- With the Bureau of Meteorology (BOM) predicting a wetter than average 2021-22 summer, licence holders in unregulated systems will have access to water in line with their licence conditions, with few streams on bans or restrictions this summer.
- Wetter conditions across winter and spring in 2021 have allowed groundwater levels to remain stable or even increase. Most groundwater licence holders will not be affected by restrictions in 2022.

REGIONAL URBAN

- With wetter conditions expected, urban water restrictions will not be required for any regional city or town.
- Total storage levels across regional Victoria’s major water storages are 25% higher than in November 2020.
- Some parts of Gippsland remain comparatively dry following recent years of drought. A return to dry conditions could result in low-level water restrictions in East Gippsland.



Key messages


Urban water



Wetter than average conditions are predicted for the 2021–22 summer. Based on this, water restrictions are not expected in any urban city or town.

Even though we expect wetter than average conditions this summer, water corporations always plan for different climate scenarios to make sure we are prepared. Below are the plans in place in the unlikely event of dry and worst on record climate scenarios.

ALL WATER CORPORATIONS

 Under an **average climate scenario**, no water restrictions are expected for the next 12 months for any of the water corporations

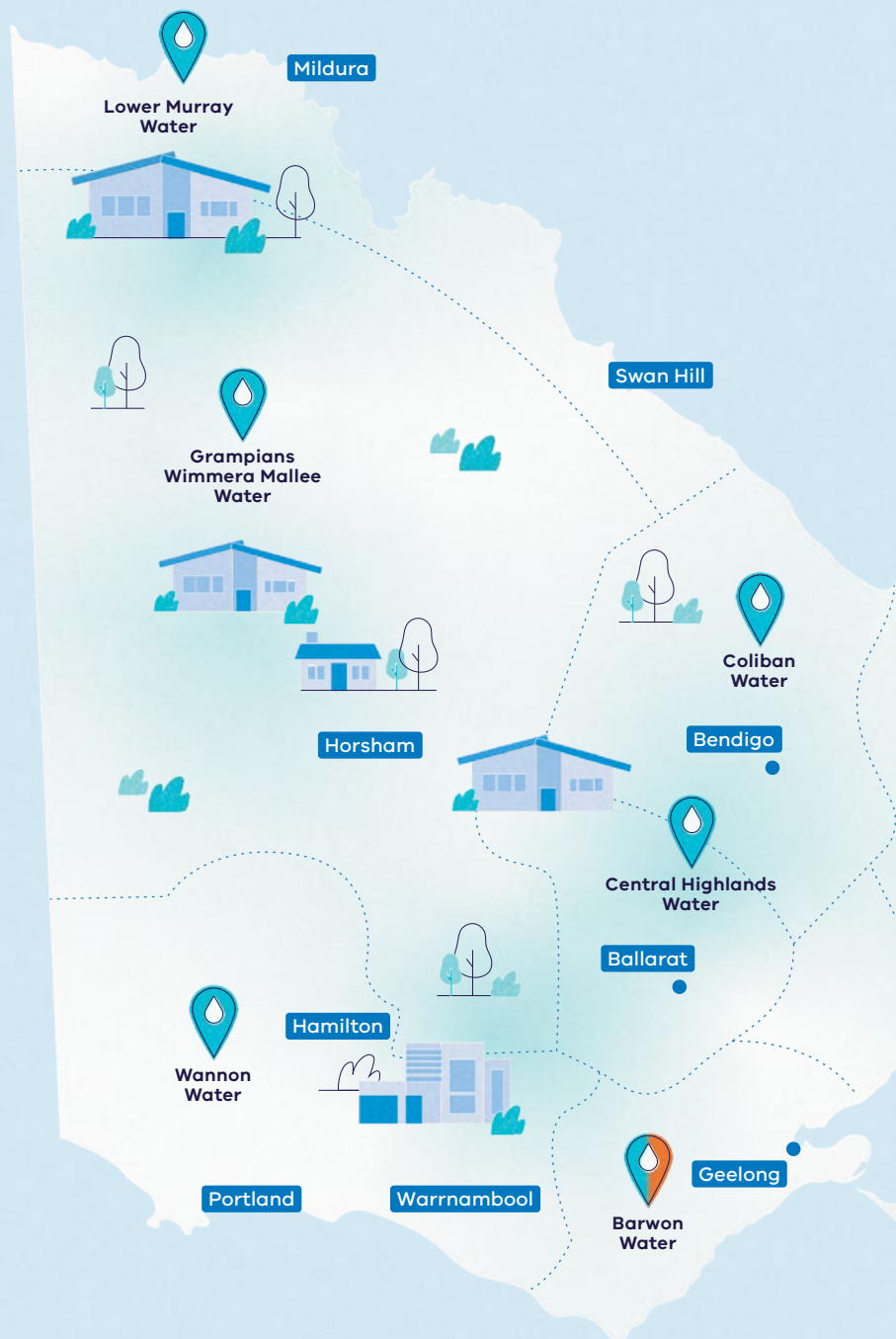
CLIMATE SCENARIOS EXPLAINED

A climate scenario is a plausible and possible representation of the future climate.


Average: based on average climate experienced since 1975

Dry: based on the driest tenth per centile (ten per cent) of climate experienced since 1975

Worst on record: similar to the extremely dry conditions experienced during the peak of the Millennium Drought in 2006–07. Note that according to water corporation modelling, a worst on record scenario is not expected for any system over the outlook period.




Barwon Water

 **Worst on record**

Apollo Bay, Skenes Creek, Marengo, Lorne: Stage 1 water restrictions could be considered by February 2022.

Actions to mitigate risk include leak reduction and targeted residential and non-residential water efficiency programs.

Goulburn Valley Water


 **Dry**

Pyalong: Any shortfall will be met through water carting.

 **Worst on record**

Marysville, Buxton and Mansfield: Water restrictions are possible at the end of summer.

North East Water


 **Worst on record**

Corryong: Stage 2 water restrictions could be considered in February 2022.


Myrtleford: Stage 2 water restrictions could be considered in April 2022.

Water markets and demand management programs will be used to mitigate risk.

East Gippsland Water

 **Dry**


Mitchell River system (including Bairnsdale, Paynesville, Lakes Entrance): Stage 2 water restrictions could be considered in February 2022.

 **Worst on record**

Mitchell River system (including Bairnsdale, Paynesville, Lakes Entrance): Stage 4 water restrictions could be considered in February 2022.



Melbourne (Melbourne Water, Greater Western Water, Yarra Valley Water, South East Water)


 No water restrictions are expected for the next 12 months.

Despite secure supply for 2021-22, greater climate variability and population growth will impact long term supply and demand for water.

Over the last year Melburnians changed their water use as a result of working and schooling from home. Average water use in 2020-21 was 159 litres per person per day, up from 157 litres in 2019-20.

Melbourne continues to work towards Target 155.

South Gippsland Water

 **Worst on record**

Fish Creek: Stage 1 water restrictions could be considered in January 2022.

Toora, Welshpool, Port Welshpool, Port Franklin, Barry Beach: Stage 1 water restrictions could be considered in February 2022.

Leongatha, Koonwarra: Stage 1 water restrictions may be considered in August 2022.

Actions to mitigate risk include reduction of leaks and wastage, and demand management programs.

Note: only three or six-month outlooks have been provided for some systems.

Key messages

Rural water



GRAMPIANS WIMMERA MALLEE WATER

Rural pipeline customers remain secure for the next 12 months.

LOWER MURRAY WATER

Rural customers will have enough allocation to meet their irrigation and stock and domestic demand.

COLIBAN WATER

Coliban rural water users will have access to their full licence volume.



GREATER MELBOURNE REGION UNREGULATED WATERWAY DIVERSIONS

Wetter than average conditions across the summer to winter period, followed by average conditions in the spring, meant that there were no diversion bans or restrictions in most systems. Melbourne Water's unregulated waterway customers should not expect extended periods of diversion bans and restrictions in the 2021-22 summer irrigation period.

GOULBURN-MURRAY WATER

REGULATED SYSTEMS

Seasonal determinations as at 18 November 2021

Murray:

100% HRWS / 0% LRWS

Campaspe:

100% HRWS / 0% LRWS

Goulburn and Loddon:

100% HRWS / 0% LRWS

Broken:

100% HRWS / 100% LRWS

Bullarook:

100% HRWS / 100% LRWS

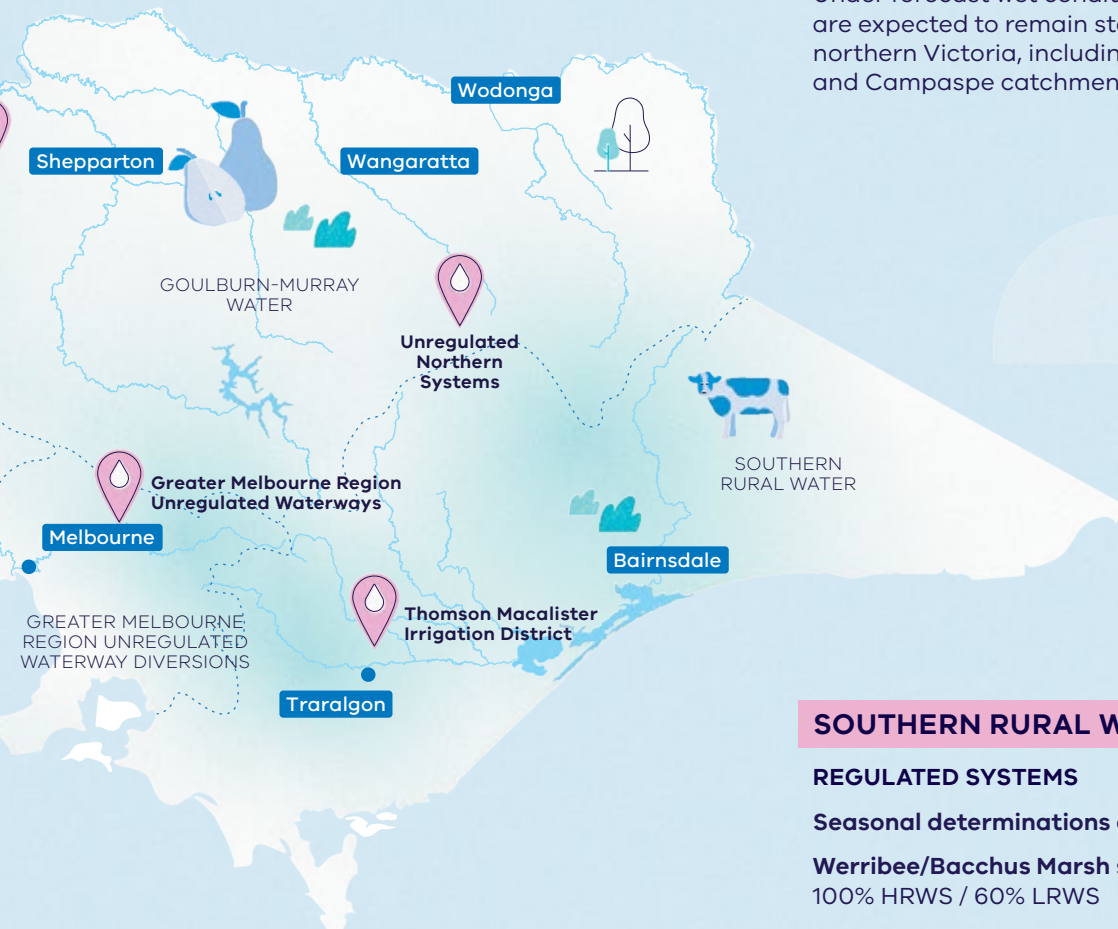
Reserves for 2022/23 are being established in the Murray, Goulburn, Loddon and Campaspe systems. If the forecast wet conditions occur, this will allow GMW to issue an opening seasonal allocation to water shareholders on 1 July 2022.

UNREGULATED SYSTEMS

Under forecast wet conditions, licence holders on unregulated waterways should not expect larger rivers and streams to be placed on diversion bans or restrictions. However smaller tributary streams may experience some restrictions.

GROUNDWATER

Under forecast wet conditions, groundwater levels are expected to remain stable or increase across northern Victoria, including recovery in the Loddon and Campaspe catchments.



SOUTHERN RURAL WATER

REGULATED SYSTEMS

Seasonal determinations as at 18 November 2021

Werribee/Bacchus Marsh system:

100% HRWS / 60% LRWS

Thomson-Macalister system:

100% HRWS / 0% LRWS

Customers have also had access to spill entitlement.

UNREGULATED SYSTEMS

Where bans or restrictions are typically applied over the summer period, they are likely to come into effect later this season, or not at all.

Key messages

Environmental water



This map does not include all the possible environmental watering that may occur over the outlook period. For more information on other activities across Victoria, please visit www.vewh.vic.gov.au.

NORTHERN REGION

Murray River

Coordinated release in the Murray River to provide spring floodplain inundation at Barmah Forest, boost foodweb productivity in the main river channel and support the movement and breeding of native fish. Some of this water will be re-used at downstream sites in Victoria, New South Wales and South Australia.

Goulburn River

A spring fresh*, timed to complement a natural flow event, was delivered to trigger spawning of golden perch and promote recovery of vegetation along the banks. Waterway managers will aim to maintain flows below 1,000 ML per day for at least six weeks after the fresh to allow native vegetation to germinate and establish before consumptive water use increases over summer.

Hattah Lakes and Lindsay, Mulcra and Wallpolla islands

Successive dry years mean that many wetlands on the lower Murray River floodplain are thirsty. Natural high flows in spring 2021 have watered some wetlands at Nyah and Vinifera forests and Wallpolla Island. Environmental water is being pumped to other sites across Lindsay and Mulcra islands and the Hattah Lakes that have missed out on these natural fills. Watering these floodplain

habitats aims to stimulate growth of aquatic vegetation, improve the condition of fringing river red gums and black box and provide feeding and breeding habitat for a range of waterbirds.

Loddon system

Environmental water in the Loddon system is being used to support native fish outcomes within the river channel and water important wetlands. Key wetland watering actions include filling Lake Meran in spring and Lake Boort in autumn. These will be the first time these wetlands have filled since natural floods in 2016.

Gunbower Forest

Gunbower Forest would naturally flood during wet conditions such as have been experienced in spring 2021. The controlled releases from upstream storages such as Hume Dam partially increased flow in the Murray River and some of that water flowed into permanent wetlands within Gunbower Forest. However, other parts of the forest that would naturally be inundated during these conditions remained dry; environmental water will be used to water some of those areas in autumn 2022.



***Freshes** are short-duration flow events that submerge the lower parts of the river channel. They are important for plants that grow low on the banks and provide opportunities for fish and other animals to move more easily along the river.

WESTERN REGION

Wimmera system

Deliver low flows and freshes over summer and autumn to maintain pools and increase flowing habitat for native fish and platypus.

Glenelg River

Deliver low flows and freshes over summer and autumn to protect the environmental gains made through watering actions in recent years.

GIPPSLAND REGION

Thomson River

Freshes will be provided in autumn and spring to trigger migration and spawning of native fish species (such as Australian grayling) that need to move between the river and sea during different stages of their life cycle.

Latrobe River

Delivery to internationally important wetlands: Sale Common, Dowd Morass and Heart Morass. West Gippsland Catchment Management Authority is working in partnership with the Gunaikurnai Land and Waters Aboriginal Corporation to improve environmental water delivery paths through Dowd Morass to improve environmental outcomes.

Snowy River

Environmental flows have increased opportunities for canoeing and kayaking on the Snowy River.



CENTRAL REGION

Yarra system

Under average-wet climatic conditions, many of the Yarra's floodplain billabongs would have naturally filled, however river regulation and modifications to natural flow paths mean they are often drier than natural. While Bolin Bolin Billabong and Yering Backswamp filled naturally in spring 2021, environmental water was required to partially fill Annulus Billabong, located on the Yarra River floodplain near Heidelberg.

The watering action was planned and delivered in conjunction with the Wurundjeri Woi-Wurrung Cultural Heritage Aboriginal Corporation.

Moorabool River

Provide minimum low flows through summer and autumn to maintain habitat for native fish, waterbugs and platypus. An autumn fresh is also planned to trigger migration and spawning of Australian grayling and help populations recover from past dry periods.

Lower Barwon wetlands

Supporting a partial drawdown at Reedy Lake and Hospital Swamps over summer and early autumn 2022 to expose mudflats on the edge of the wetlands, followed by a fill in late autumn/winter 2022, is expected to result in enhanced ecological productivity and processes that rely on wetting and drying cycles. Under a wet scenario, drawdowns may not be possible, especially if there are multiple high-flow events in the Barwon River during summer and autumn.

Climatic conditions

Temperature and rainfall influence water use. We tend to use more water in summer when it is hotter and drier (for example for gardens and pools), than in winter when it is wetter and colder. Water corporations are continually monitoring storage conditions and use. They forecast demand using short-term seven-day forecasts and the BoM's seasonal climate outlooks, updated weekly.

Recent conditions

Varied rainfall and temperatures across the state in 2021.

Last summer was slightly cooler and wetter than average for most of Victoria, with the exception being the warmer and drier conditions experienced in the north-west. Autumn brought below average rainfall to the majority of the state, with only Gippsland receiving higher than average rainfall. In winter, rainfall was about average for Victoria, although conditions were wetter in west Gippsland, and temperatures were above average in most of the state. Heavy rainfall in the state's east continued into spring, and above average rainfall was also recorded in central and south-west Victoria, however conditions were again dry in the north-west.

December to February outlook:

The BoM seasonal outlook prepared for summer 2021-22 indicates that average temperatures are likely to vary significantly across the state, with the chance of exceeding average maximum temperatures over the next three months ranging from 70-75% in western Victoria to 25-30% in east Gippsland (**Figure 1**). Victoria is likely to be wetter than average this summer, with a 50-70% chance of exceeding average rainfall (**Figure 2**).

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FIGURE 1. Chance of exceeding median maximum temperature for December 2021 to February 2022

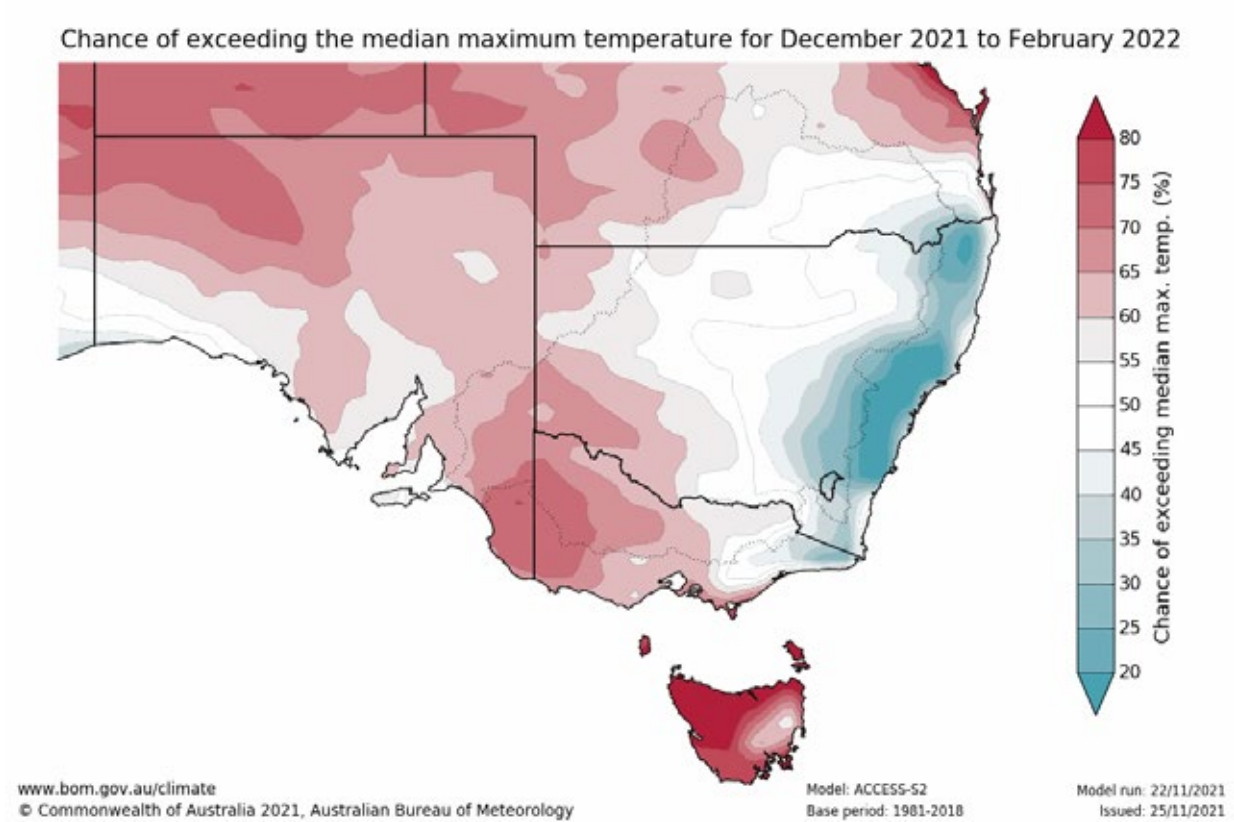
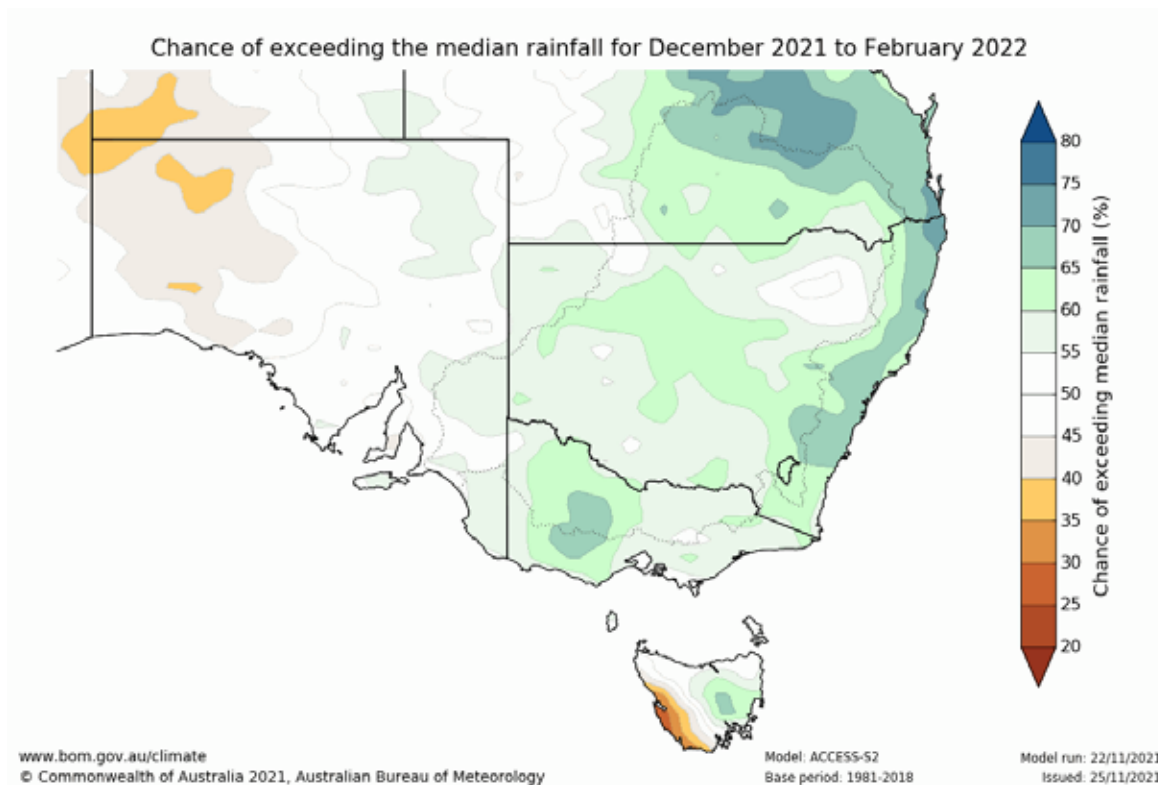


FIGURE 2. Chance of exceeding median rainfall for December 2021 to February 2022



Current climate and streamflow in the longer-term context

Victoria's climate and streamflow is highly variable, but within this variability we have experienced a warming and drying trend over recent decades.

In comparison to historical conditions, we are already experiencing trends toward:

- Higher temperatures and more hot days;
- Reductions in rainfall in late autumn and winter;
- In some locations, increases in rainfall during the warmer months and during extreme, short-duration rainfall events; and,
- In many catchments, a shift in the streamflow response to rainfall, with less streamflow generated for the same amount of rain.

The rainfall decline in late autumn and winter is linked to changes in atmospheric circulation, and some of the change can be attributed to global warming. During the cooler time of the year we have been getting less rainfall from low pressure systems and frontal systems, and in the northern part of Victoria more rainfall during the warmer months from thunderstorms.

The cause of the reduction in streamflow response to rainfall is not yet fully known and is the subject of continuing research.

Over the long-term, we can expect:

- The rainfall reductions in winter to persist;
- Possible increases in summer rainfall;
- Increases in potential evapotranspiration due to higher temperature and lower relative humidity;
- Reductions in streamflow because of less rainfall and higher potential evapotranspiration; and
- The streamflow response to rainfall to no longer remain the same, and generally decline.

Even if there is an increase in summer rainfall, it is unlikely to offset the streamflow impact from rainfall reductions in winter because most of the runoff in Victorian catchments occurs over winter and spring. In the warmer months, catchments are drier and more rainfall soaks into the ground, is used by vegetation or evaporates.

Victoria's climate will continue to be variable with wet years and dry years, against a background drying trend. With a hotter future and projections of declining water availability, we can expect more frequent and severe droughts.

The Victorian Government is investing in further research to better understand how Victoria's climate is changing and the water resource implications, through the Victorian Water and Climate Initiative. More information on the observed changes and longer-term future climate and water projections can be found at:

<https://www.water.vic.gov.au/vicwaci>.

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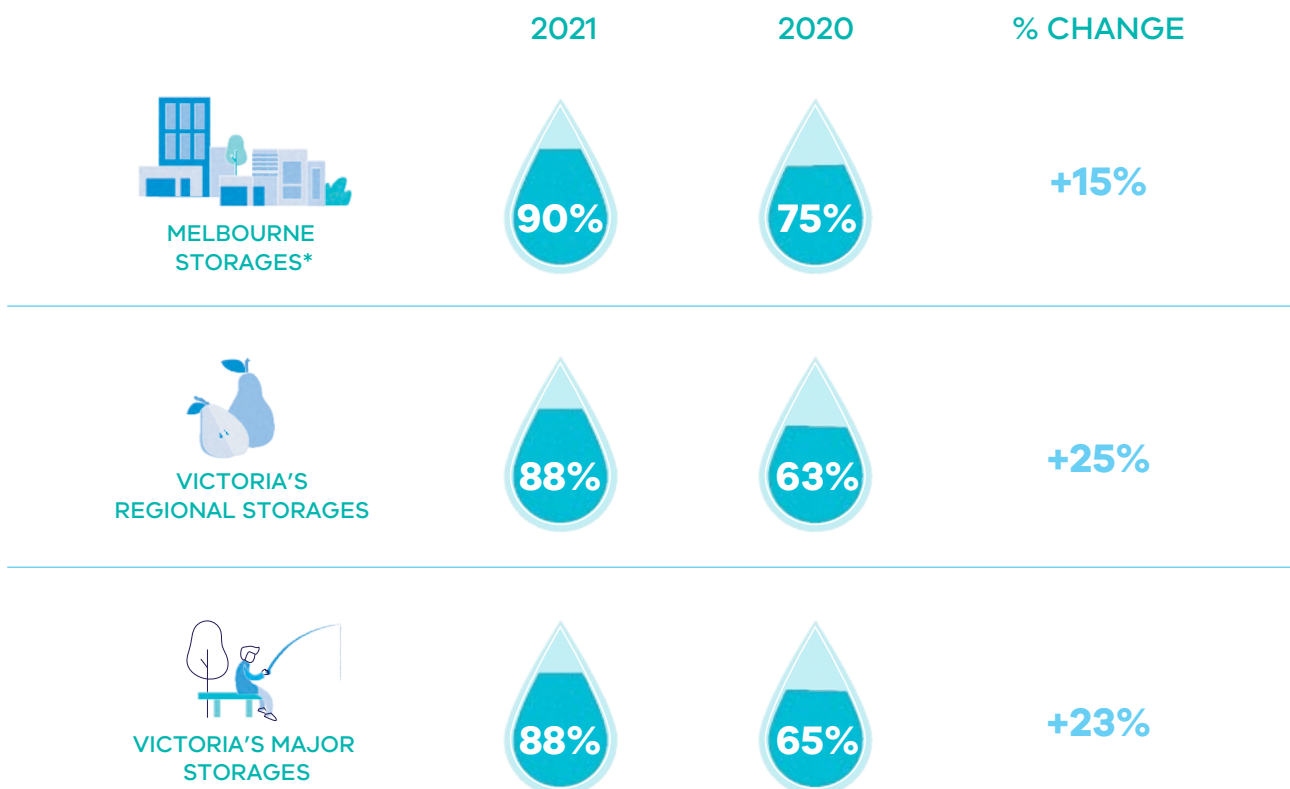
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Current state of Victoria's water storages

Rainfall in 2021 was higher than in 2020, resulting in increases across most major storages. **Figure 3** shows the state of Victorian storages as at 29 November 2021 in comparison to the previous two years.

DID YOU KNOW

Permanent Water Saving Rules are always in place throughout the state to ensure we use water wisely, even when water restrictions do not apply.



* Desalination water orders have contributed around 7% to Melbourne water storages from 1 December 2020 to 29 November 2021.

FIGURE 3. The state of Victorian storages at 29 November 2021, 2020 and 2019.



* The Victorian share of the Murray storages are updated monthly. Volumes for Murray storages are from 31 October.
 # Desalination water orders have contributed around 7% to Melbourne water storages from 1 December 2020 to 29 November 2021.

Water systems across the state are diverse and many factors influence why some are more vulnerable to drought than others. Factors include:

- Climatic conditions,
- Physical characteristics of water systems themselves, including reservoir capacity and availability of water for irrigation,
- Whether there is a drought reserve,
- Flexibility of local demand, including pressure by large industrial or commercial water customers,
- Whether there is the option for additional or alternative supplies.

Some parts of the state may be reliant on smaller water systems with lower storage that either have less than 12 months’ supply or a supply direct from a river or stream. These parts of the state are more susceptible to drought and dry conditions.



Urban water supplies



Under predicted wet and average conditions, no water restrictions are expected.



Under a dry climate scenario, Stage 2 water restrictions are possible for 18 towns¹



Under a worst on record climate scenario, water restrictions are possible for 36 towns²

Individual urban water corporations assess water supplies on a system-by-system basis, to determine the best ways to manage supply and demand to ensure secure supply for cities and towns. Implementation of water restrictions is only one of a range of possible responses that water corporations may use to help cope with potential water shortages. Specific to each system, other responses may include behaviour change campaigns, use of

standby water sources, water carting and water trading.

Table 1 contains details for these towns, current water system levels, their outlook for the summer and autumn and the short-term measures available to help affected communities and improve supply security.

TABLE 1. Victorian towns and potential water restrictions in outlook period

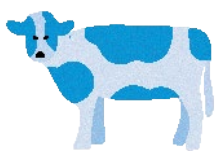
Water corporation	Water system	Towns supplied	Storage levels ³	Water restriction level	Other mitigation measures
AVERAGE CLIMATE SCENARIO⁴					
No water restrictions are expected under an average climate scenario. Note that wetter than average to average conditions are predicted for the Outlook period.					
UNDER A DRY CLIMATE SCENARIO⁴					
Water Corporation	Water System	Towns Supplied	Storage levels as at 29 November	Current condition, outlook and risks	Mitigation actions
East Gippsland Water	Mitchell River	Bairnsdale, Wy Yung and Lucknow, Lindenow, Paynesville, Raymond Island, Metung, Tambo Bluff, Lakes Entrance, Lake Tyers, Lake Tyers Beach and Kalimna, Nowa Nowa, Nicholson, Johnsonville, Swan Reach, Bruthen, Sarsfield	88%	Stage 2 water restrictions are possible from February 2022. Good rainfall was received in the past 12 months however longer-term deficits remain after four years of drought.	Planning underway for an additional raw water storage at Woodglen to provide a buffer during periods of low flow and reduce likelihood of future restrictions.
UNDER A WORST ON RECORD SCENARIO					
Worst on record conditions are not expected to occur this year. However, if they were to occur, urban water corporations have identified restrictions may be required in up to 36 towns. The annual water outlooks for these systems will be updated accordingly and urban water corporations will implement their Drought Preparedness Plans to minimise the effect of any water restrictions.					

¹ Based on the driest tenth per centile (ten per cent) of climate experienced since 1975.

² A worst on record scenario would happen if conditions are similar to the extremely dry conditions that occurred during the peak of the Millennium Drought in 2006-07. This scenario is not expected in the Outlook period of 2021-22.

³ Storage levels as at 30 November 2021.

⁴ Based on average climate experienced since 1975



Rural water supplies



The 2020–21 water year began with very dry conditions and low seasonal determinations, Murray high-reliability water share (HRWS) holders received an 8 per cent seasonal determination and Goulburn and Loddon water HRWS holders received a 35 per cent seasonal determination. Despite this very dry start, conditions improved over winter, and October 2020 saw widespread average and above average rainfall in northern Victoria. This replenished streamflow and provided inflows into storages, particularly in the Goulburn and Broken catchments. The recovery in the Broken system was significant and the storage went from 21.1 per cent on 1 April 2020 to the dam spilling on 8 October 2020, and the BoM issued a flood watch for the Broken catchment.

By 16 November 2020, seasonal determinations had increased to 100 per cent for HRWS for the Campaspe, Goulburn and Loddon systems. Murray system customers had to wait longer and were issued 100 per cent for HRWS by 15 February 2021. The Broken and Bullarook systems received seasonal determinations of 100 per cent for HRWS and 100 per cent for low-reliability water shares (LRWS) in October 2020 and September 2020 respectively.

The 2021–22 water year opened with seasonal determinations across all systems between 5 per cent (Broken) and 40 per cent (Bullarook). Goulburn and Loddon systems received opening seasonal determinations of 33 per cent for HRWS and the Murray system received an opening seasonal determination of 21 per cent for HRWS.

Above average rainfall in the Goulburn, Murray and Darling catchments in winter of 2021 provided significant inflows into reservoirs. Lake Eildon started the water year sitting at 58 per cent full and is now 87 per cent full (as at 28 November). Murray system storages Lake Hume and Dartmouth Reservoir started the water year at 57 per cent and 66 per cent full and are now 99 per cent and 86 per cent full respectively. The Murray-Darling Basin Authority have been making controlled releases from Lake Hume to manage airspace since August 2021, so far Victorian Murray system users have spilled 35 per cent of any

water carried over in spillable water accounts. The Menindee Lakes storage scheme play an important role in the operations of the Murray system. In March 2021 the Menindee Lakes dropped as low as 300 GL, however heavy rain in February and March and again in July and September generated significant flow in the Darling River and the Menindee Lakes are exceeding 100 per cent full supply level.

From 15 October all systems had received seasonal determinations of 100 per cent for HRWS (see **Figure 4**) and the Broken and Bullarook systems had both received seasonal determinations of 100 per cent for LRWS as well. Goulburn-Murray Water (GMW) has established early system reserves for the Goulburn and Murray systems and is now building reserves for seasonal determinations in 2022–23, once GMW is confident that it can make seasonal determinations of 100 per cent HRWS for the Murray, Goulburn, Campaspe or Loddon systems in 2022–23 it will then direct future resource improvements to making a seasonal determination for LRWS in that system.

The Broken, Bullarook and Ovens systems are annual systems and water availability next year will depend on seasonal conditions and inflows closer to the start of 2022–23.

Water users that access water from unregulated rivers, streams and creeks only have access to licenced water when streamflows reach the minimum flow requirements specified in management plans. In northern Victoria, these are managed and monitored by GMW. As at 29 November 2021, there were 5 streams on bans or restrictions compared to 8 streams on bans or restrictions at the same time in 2020. The outlook for streamflow is for close to median conditions in December.

With a wet outlook for summer, it is likely that the larger streams in northern Victoria will not experience restrictions, while smaller tributary streams may experience some restrictions over the summer period. If the forecast rainfall is not received, then more restrictions are likely.

The majority of groundwater licence holders have access to 100 per cent of their entitlement, except for zones of the Lower Campaspe Valley Water Supply Protection Area (WSPA) that have a 75 per cent allocation for 2021–22, and zones in the Katunga WSPA that have a 70 per cent allocation for 2021–22.

Groundwater recovery and drawdown levels in northern Victoria are dependent on rainfall recharge and groundwater extraction. In 2021–22, average to above average rainfall conditions will not drive high demands and groundwater levels are expected to remain stable or improve.

LOWER MURRAY DELIVERY RISKS

There is always a possibility of not being able to deliver enough water held in the River Murray System dams to users in the Murray downstream of Barmah at the time they want it.

This can occur either when demand spikes and there is not enough time to release more water from dams (a delivery shortfall), or when the physical channel capacity of the rivers limits the amount of water that can be delivered (a system shortfall). The Murray-Darling Basin Authority (MDBA) operates the river on behalf of the River Murray states (Victoria, New South Wales and South Australia) and actively manages the system to avoid shortfalls. However, there can always be unforeseen circumstances that may arise. If required, the MDBA will announce a shortfall in the lower Murray, and states will ration demand between water users in the affected reach.

MDBA's *River Murray System Annual Operating Outlook* for 2021-22 (published in July 2021) advised that the risk of a system shortfall this year is very low. This is largely due to the high storage volumes in Lake Victoria and the availability of water in Menindee Lakes. The Outlook also states that a system shortfall is less likely to occur this year in scenarios where Menindee Lakes continues to be available to the MDBA for Murray resources through to June 2022. More recently, high winter and spring rainfall in the Menindee Lakes catchment are expected to generate more inflows to Menindee Lakes making it increasingly likely the lakes are available to the MDBA for the full water year.

The risk of a delivery shortfall exists every year and is more likely during an extended heatwave. This is because it takes about three weeks for water released from Hume Dam to get to Mildura, so releases are made well before a heatwave is forecast or water users decide to increase their take. River operators have a good understanding about typical water use in the Murray, and draw on mid-river storages and weir pools where they can to meet spikes in demand and mitigate delivery shortfalls. When there is spare capacity in Lake Victoria, river operators can also accommodate demand spikes by releasing surplus water from Hume and capturing it in Lake Victoria.

The risk of a Murray shortfall is monitored by the MDBA throughout the year. The MDBA's Annual Operating Outlook for the River Murray System in 2021-22 sets out how the system will be operated, including to avoid a shortfall, under a range of different inflow conditions. During summer and autumn, the MDBA will report on emerging system and delivery shortfall risk in its River Murray Weekly Report.

Mallee Catchment
Management Authority

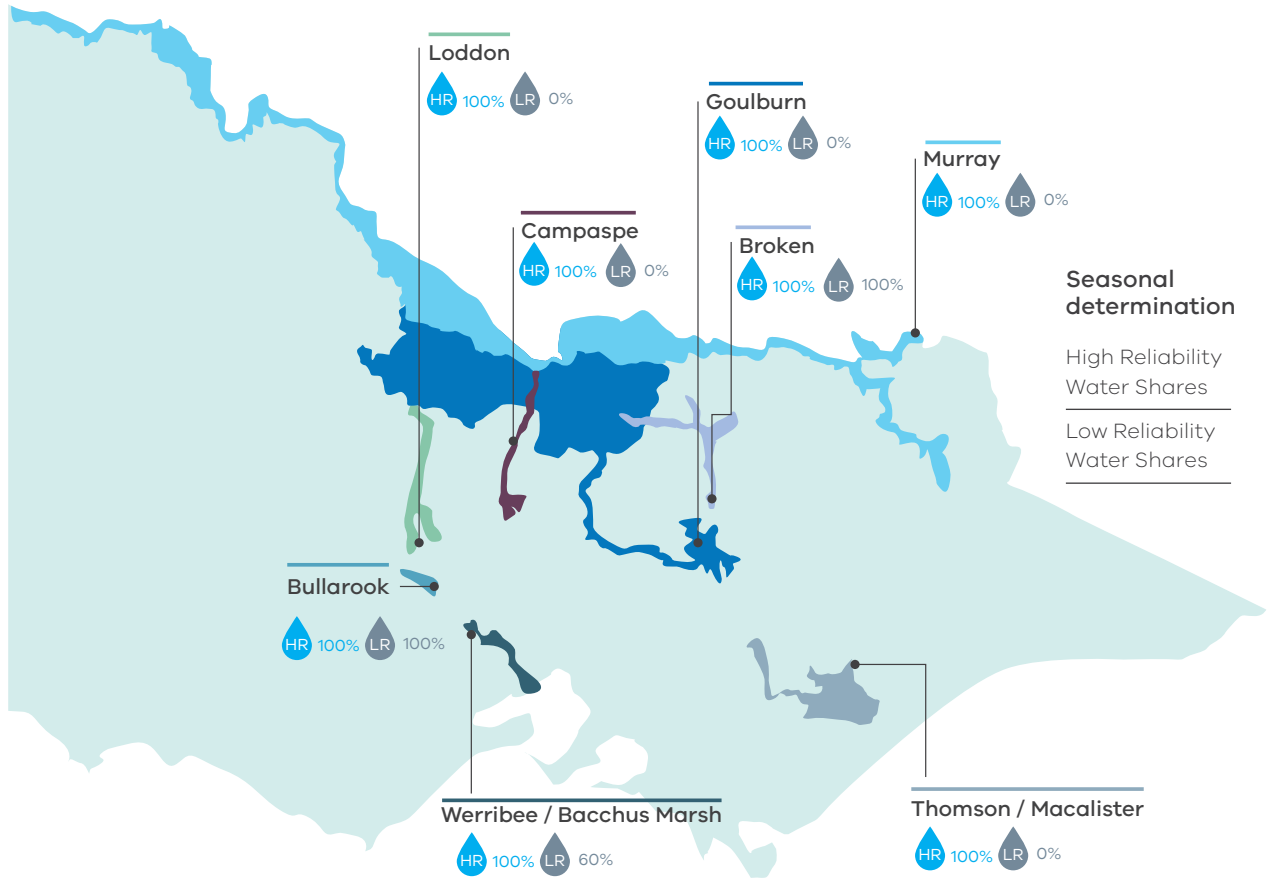
Water shares explained...

A water share is an ongoing entitlement to a share of water available in a water system. The volume of a water share is defined as the maximum amount of allocation that can be made against it each year.

Water shares are classed by their reliability, which is defined by how often full season allocations are expected to be available. In Victoria there are two types, **high-reliability water shares (HRWS)** and **low-reliability water share (LRWS)**.

Allocations are made to HRWS before LRWS. When HRWS have reached 100 per cent allocation and existing commitments are satisfied, only then will allocation for LRWS be considered.

FIGURE 4. Seasonal determinations in Victorian declared systems as at 18 November 2021

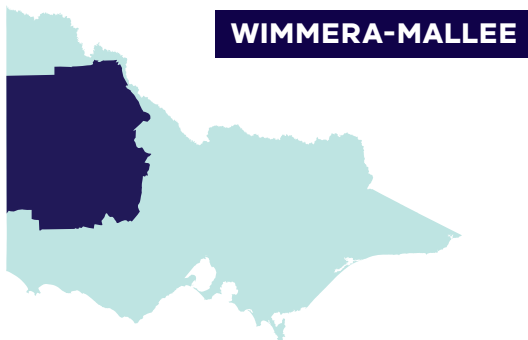


1 Water year – 1 July to 30 June

2 Water shares can be high or low-reliability. Seasonal determinations are made to high-reliability water shares before low-reliability shares.



Craig Moodie



The 2020-21 water year was again dry, with inflows to the Wimmera-Glenelg headworks under 50% of the historic average. At the end of 2020-21, allocations only reached 57% for pipeline customers, however, the system reserve was sufficient to meet forecasting operating water requirements for the 2021-22 season and make carryover available to entitlement holders. Rainfall across Grampians reservoir catchment for the 2021-22 season so far has been about average, with above average rainfall recorded in early winter, followed by below average rainfall for most of spring. Despite this, inflows to reservoirs are tracking well below average due largely to dry soil conditions limiting the runoff generated from rainfall events. Storages are now holding 241,620 ML of water equivalent to being 43.1% full, which is 3.4%, or 19.1 GL, more than the same time last year (as at 24 November 2021).

As at 5 November 2021, Grampians-Wimmera Mallee Water (as storage manager for the Wimmera-Mallee system) made allocations of 57 per cent against the Wimmera-Mallee Pipeline product and 1 per cent against the Glenelg compensation flow. No allocation was made against the recreation entitlement, wetlands entitlement or Commonwealth environmental entitlement. However, some recreation lakes received water from other entitlements. Supplies for rural water customers from the Wimmera-Mallee Pipeline and Northern-Mallee Pipeline are secure this season.

Groundwater supplies remain relatively unaffected by recent conditions. There are sufficient volumes of water available to meet demands, with the exception of Neuarpuir Zone 1 which remains on restrictions as part of a long-term management plan.

Irrigation diversion triggers have been satisfied for both the Wimmera and Avoca Rivers, so water may be extracted for irrigation and commercial uses subject to licence conditions and local management rules.



There are two irrigation districts in south-western Victoria – Werribee and Bacchus Marsh – both of which are supplied from the Werribee and Lerderderg catchments via the Werribee system. Strong rainfall and inflows to Pykes Creek and Melton Reservoir in the 2020-21 season meant that both storages opened the 2021-22 season at 100% capacity. This allowed Southern Rural Water (SRW) to make opening seasonal determinations for Werribee and Bacchus Marsh of 95 per cent HRWS. This meant that water users carried over 11.4 GL of allocation equivalent to 70 per cent of the total entitlement. After continued good rain in the catchments to start the season, seasonal determinations reached 100 per cent HRWS and 60 per cent LRWS on 18 November.

The Rosslynne Reservoir in the neighbouring Maribyrnong catchment has recovered to 65% capacity, compared to 27% at the same time last year, due to above average rainfall in the previous 12 months.

Rainfall across the western region has been above average for winter and early spring and has seen major streams, and the Barwon, Leigh, Glenelg, Wannon and Hopkins rivers and Mount Emu Creek experiencing bank full and over bank flows through much of the rainfall season and into spring. On farm storages have filled and are overflowing, and many aquifers will have been able to recharge. This allows for streams that have good baseflows from groundwater to remain high through early summer and could allow for unregulated licence holders to divert water without restrictions. Diversion rosters and restrictions are unlikely for major river basins in the far south-west based on current flows and the forecast wet conditions, however they are likely to continue for the Gellibrand and Curdies rivers similar to the 2020-21 season.

Groundwater levels in the western areas are generally showing a stable or increasing trend with most groundwater levels normal for this time of year. The exception is the shallow Deutgam aquifer in Werribee South, where licence holders have been restricted to 50 per cent of licence volume to protect the aquifer. This is the same as this time last year.



Conditions in Gippsland have been wet for the second consecutive season, after three years of drought stretching from 2017 to 2020. Rainfall in Gippsland in winter and spring has been the strongest in Victoria relative to average rainfall, meaning that all eastern Victorian rivers are flowing at higher rates than twelve months ago. This has allowed high seasonal determinations for water shares and fewer unregulated licence holders on diversion rosters, bans and restrictions.

The Thomson and Macalister irrigation districts are situated in central Gippsland, and the primary source of water is Lake Glenmaggie, supplemented by water held in a 'drought reserve' in the Thomson Reservoir. The opening seasonal determination for the 2021-22 water year for Thomson and Macalister water shareholders was 100 per cent HRWS. High inflows into the catchment in winter allowed SRW to announce the availability of spill entitlement in September and this remains available as at 18 November. This means that water used from the beginning of the irrigation season is classified as spill entitlement and allocation against HRWS are reset to 100 per cent. The next seasonal determination announcement will be at the end of the potential spill period on 15 December 2021.

As at 29 November 2021, Blue Rock Reservoir (in the Latrobe system) is 100 per cent full. Under the forecast medium to high streamflows, Blue Rock Reservoir is likely to hold or slightly decline over summer and quickly refill with winter/autumn rains. Blue Rock Reservoir has filled in seven of the last ten years.

The outlook is indicating a high chance of exceeding median rainfall over the next three months. At this stage, it appears unlikely that any diversion restrictions will be required for unregulated streams in early summer, and only limited diversion restrictions might apply during the latter part of summer and early autumn.

The Mitchell River is the most significant of the systems in the east of the state. Following strong rainfall over the past 12 months, the Mitchell River catchment has somewhat recovered from three years of drought from 2017 to 2020 to reach a position where restrictions for unregulated licence holders are now unlikely, possibly applying late in the season if dry conditions return.

South and central Gippsland rivers have been flowing well so far this irrigation season and, given the wet outlook, diversion restrictions for licence holders on unregulated streams are unlikely to be required.

Groundwater systems throughout Gippsland do not have any restrictions on extractions by licence holders and are well placed to meet unrestricted demand.



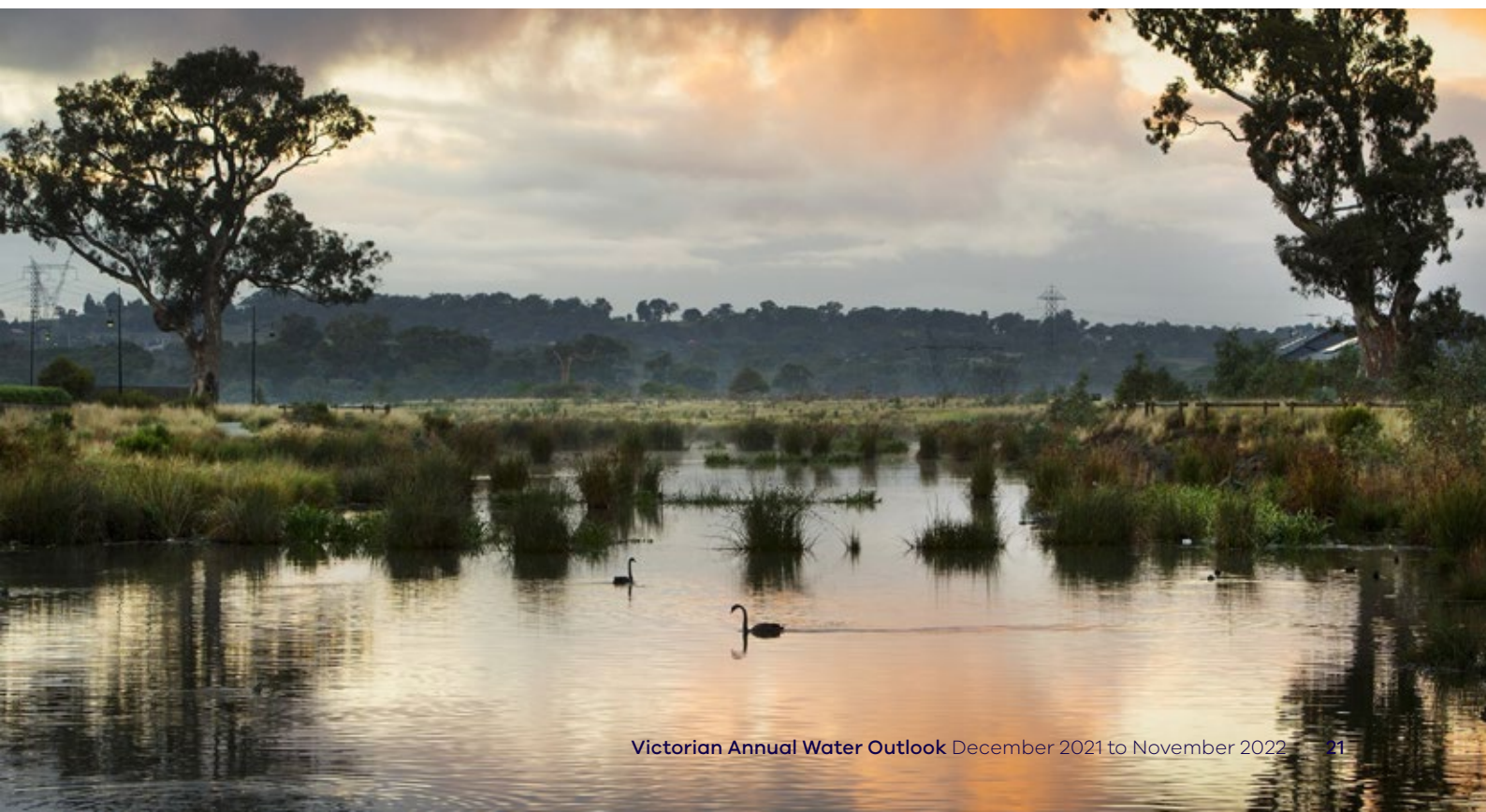
The Yarra Valley region experienced wetter than average conditions across the 2021 summer to winter period, followed by average conditions in the spring, which has meant that most unregulated systems have seen no diversion bans or restrictions. Based on the average to above average rain conditions to date, near-median to high flows and above average rainfall predicted in the coming summer months, licence holders are not expected to face extended periods of bans or restrictions for the summer irrigation period, if at all. Areas reliant on dams for irrigation water, such as Yarra Glen and Dixons Creek, are in a good position with most off-stream dams full.

Winter and spring rainfall across the Dandenong Creek catchment has remained steady and is consistent with the wetter conditions of last year. Stream flows in the Dandenong Creek systems have remained similar to last year. Above-average flows have been observed in Mile Creek, Monbulk Creek and Eumemmerring Creek systems. The forecast rainfall across the catchment makes restrictions unlikely in this catchment.

The Werribee and Maribyrnong catchments have had above-average rainfall for the first nine months of 2021. The season is developing similar to summer 2020-21 where restrictions were not imposed on the Maribyrnong system. The Turitable Creek and Willimigongong Creek are usually subject to a total ban in the summer months though neither system had bans imposed last year. With above-average rainfall predicted for the 2021-22 summer these systems may avoid bans again this year, but conditions in these systems can be quick to change.

Rainfall across the Tarago/Bunyip catchment remained above average during winter 2021. With the rainfall forecast again expected to be above average for summer the river system should be well placed to meet consumptive demands through the coming irrigation season.

Photographer: David Hannah. Courtesy Melbourne Water





Environmental water supplies

'Water for the environment' is water managed to protect and maintain rivers, wetlands and lakes, and the native species that rely on them. It is critical in keeping waterways – and the life within and around them – healthy. Environmental flows also support activities like recreation, tourism, timber production and beekeeping, and help maintain cultural connections and values as well as social wellbeing.

The Victorian Environmental Water Holder (VEWH) holds water entitlements and receives water allocations that can be used for environmental purposes. The VEWH and its partner waterway managers consider a range of possible climate and water availability scenarios to determine environmental watering actions under different conditions. The VEWH's annual seasonal watering plan identifies the scope of the environmental watering activities that could occur in waterways across Victoria under different climate scenarios. The plan can be accessed at www.vewh.vic.gov.au.

In northern Victoria, the VEWH works with the Commonwealth Environmental Water Office, the Murray Darling Basin Authority as well as New South Wales and South Australian governments to prioritise how and where water is used, and to ensure use of water is coordinated to optimise the condition of connected waterways in the southern Murray-Darling Basin.

Climatic conditions and water availability in the Gippsland, central and northern regions of Victoria have been close to, or above the long-term average during the first half of 2021-22. Many systems in the central and Gippsland regions have experienced spills at major storages. The Latrobe River experienced low-moderate flooding and the Murray River has had long periods of unregulated high flow. In the western region, the Wimmera and Glenelg rivers have received some good natural flows, but the volumes held in water supply storages in the western region remain low.

Environmental watering actions delivered so far this year have aligned with catchment conditions, primarily aiming to increase habitat and food in rivers and wetlands to help populations of native plants and animals recover from dry conditions during 2018 to early 2020. Water for the environment was delivered to Hattah Lakes and the Lindsay and Mulcra islands in the northern region during spring 2021. Natural high flows in spring inundated parts of the floodplain at Nyah and Vinifera forests and Wallpolla Island, which may cause planned autumn watering actions to be amended. Low water allocations continue to limit the scope of environmental watering in western Victoria and therefore the watering actions in the Wimmera and Glenelg rivers will primarily aim to maintain habitats for native fish, platypus, and aquatic plants during summer and autumn.

A La Nina event has now developed for the 2021-22 summer, increasing the likelihood of wetter than average conditions in south-eastern Australia.

Wet conditions are likely to cause high flows or floods in some rivers and might fill some floodplain wetlands. These natural events support important ecological processes and are critical to the health and persistence of many native plants and animals that live in Victoria's waterways. Environmental water may be used to supplement natural high flow events (e.g. to extend the duration of a wetland inundation to help nesting waterbirds successfully raise their chicks) or may be saved for later use if not needed at the time. Subject to entitlement conditions, unused environmental water can be carried over to support environmental flows in subsequent years. The ability to carry water over between years is critical to help maintain waterway health in drier periods.

The VEWH may consider buying or selling water for the environment where it is important for meeting an environmental objective. The VEWH's annual *Water Allocation Trading Strategy* describes the trading activity that the VEWH may undertake during 2021-22: www.vewh.vic.gov.au/watering-program/trading.

Securing our water supplies

To manage the impact of population growth and climate change, we need to stay focused on both water supply and demand.

The Victorian Water Grid

Victoria's water grid works much like the State's road network by connecting water sources for urban, rural, environmental, recreational and Traditional Owner use via an infrastructure network, and natural elements like rivers. The water grid includes the following elements:

- Capture, production and storage infrastructure (including dams, reservoirs, weirs, irrigation districts, groundwater extraction locations and the Victorian Desalination Plant)
- Delivery infrastructure (including channels, pipes, pumps and the natural waterways used to deliver water)
- Arrangements by which water can be purchased and sold through the water markets, and allocated through the water entitlement framework.

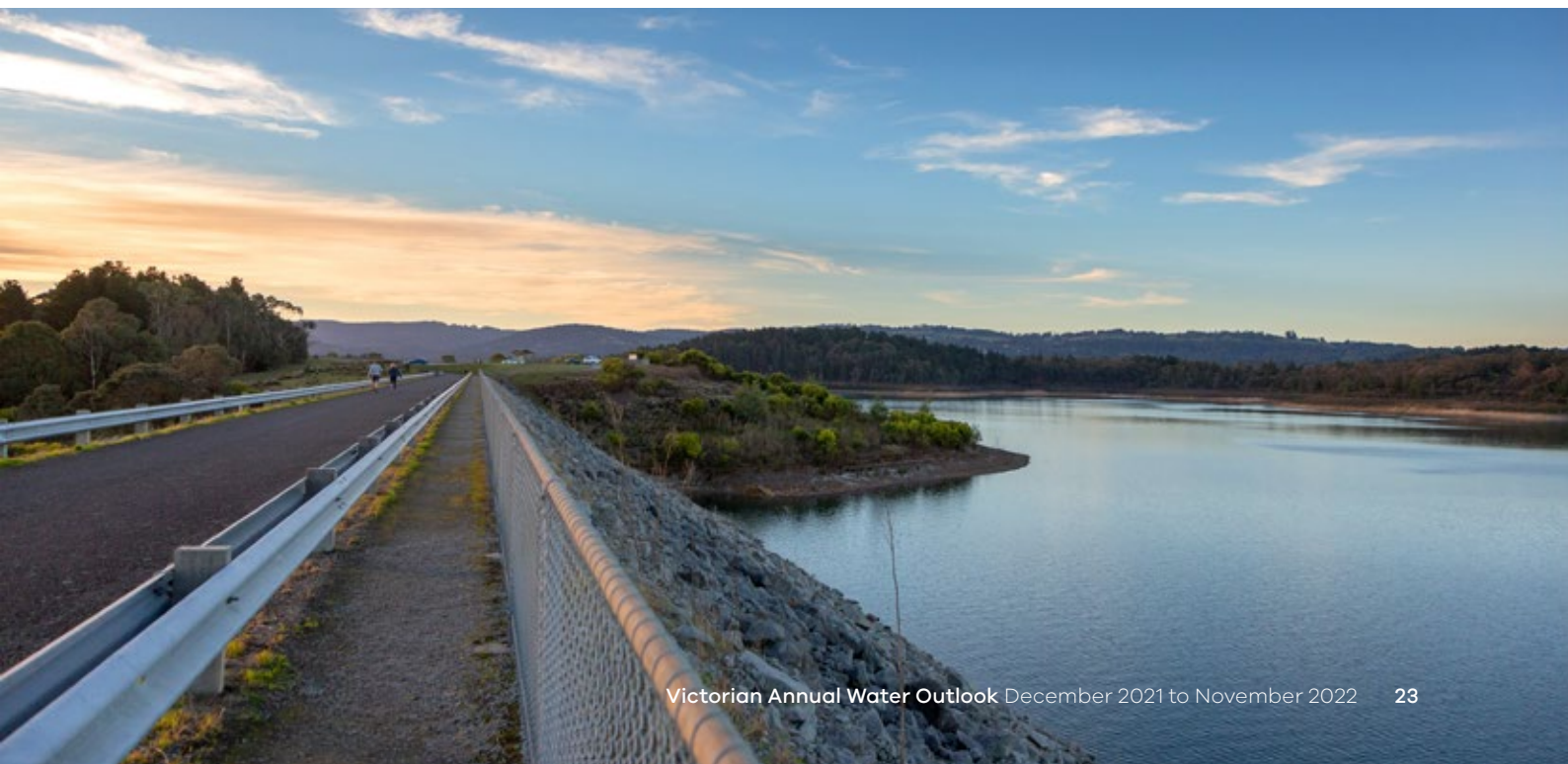
The Water Grid Partnership was established in late 2018 to oversee the grid and realise opportunities to maximise community benefit, water affordability and water security across the state. The partnership consists of water corporations, catchment management authorities and the VEWH, and integrates perspectives from the broader water industry.

The second Biennial Statement was released in May 2021 and is a snapshot of Victoria's current and emerging water security position. The Statement is a series of online interactive dashboards that visualise Victoria's water resources so readers can engage and interact with the information most relevant to them.

The release of the Statement meets *Water for Victoria* (2016) Action 9.1 and celebrates some of the successes of the water sector in the last two years, including the completion of major infrastructure projects and the work of the Water Grid Partnership.

You can [explore the Biennial Statement here](#).

Asanka Brendon Ratnayake



Desalination Plant

The Victorian Desalination Plant is an integral part of our drinking water supplies to Melbourne and surrounding regions through the water grid and plays an important part in long term water security and planning. Better use of our water grid means Melbourne's storages must also be ready to provide for new regional allocations to other towns. The water grid connects the Desalination Plant to many regional towns, including Geelong, Sunbury, Melton, Cowes, Wonthaggi, Korumburra, Poowong, Loch and Nyora.

Since 2016-17, the Victorian Desalination Project has delivered 394 GL of water to the Melbourne system. Melbourne's storages would be 21.8 per cent lower without the water provided by the Victorian Desalination Project.

Water efficiency measures in urban areas

The urban water corporations are working collaboratively with DELWP on a program of initiatives for residential and non-residential customers, including the:



Target 155 water efficiency program helping metropolitan Melbournians to target 155 litres of water per person per day – <https://www.water.vic.gov.au/liveable/using-water-wisely/t155>



Target Your Water Use regional water efficiency program focusing on efficient water use for each region – <https://www.water.vic.gov.au/liveable/using-water-wisely/target-your-water-use>



Schools Water Efficiency Program enabling schools to track their water usage using data loggers to help identify leaks, faulty appliances and inefficient water practices – <https://www.water.vic.gov.au/liveable/water-education>

Community Rebate and Housing Retrofit programs helping vulnerable and hardship customers and not-for-profit housing organisations to reduce water use and bills.

Smart Water Advice providing water utilities, customers and councils with a range of educational, interactive water saving resources – www.smartwatermark.org/Victoria

Public spaces (Urban water security planning)

Each urban water corporation produced an Urban Water Strategy in 2017. They identify the best mix of measures to provide water services in towns and cities now and into the future. These strategies include Drought Preparedness Plans that set out how the water corporation will respond to water shortages if they arise. The strategies are updated every five years. Urban water corporations are currently preparing their next Urban Water Strategies, due in early 2022.

As part of those strategies, water corporations continue to engage with councils and other public open space managers to identify and assess which important liveability assets would be impacted under water restrictions and the extent to which they should be exempt from these restrictions. These include sporting facilities, public gardens, and street trees. Urban water corporations also consult with customers regarding important community assets that might require water to be made available during water shortages.

Rural water supplies

Rural water infrastructure is vital to support agriculture and its future growth. Successive governments have invested in modernising irrigation districts with a focus on reducing the amount of water required to operate the irrigation systems and increase the value of agricultural production. Governments have also partnered with communities to build modern stock and domestic supply systems in drier parts of the state that traditionally rely on rainfall or groundwater.

The Victorian Government, the Commonwealth Government, water corporations and local communities have invested in a number of important water infrastructure projects that increase water security and improve drought resilience for our regional communities. In 2020-21, four of these projects have been completed. The most significant of these is the Connections Project, the largest irrigation modernisation project in Australian history, which has now completed works to achieve 429 GL of water savings to be shared between the environment, irrigators and the Melbourne water retailers. This world-leading delivery system will support the sustainable future of productive agriculture in the Goulburn-Murray Irrigation District (GMID) for generations to come.

REMEMBER

Permanent Water Saving Rules are always in place.

See **What are Permanent Water Saving Rules?** on page 26 for the full list of rules to help guide your water use.



Connections Project

The other three projects that reached practical completion includes the Mitiamo and District Reticulated Water Supply Project, Macalister Irrigation District Phase 1B project and Werribee and Bacchus Marsh Irrigation District Modernisation. These projects will improve water security, boost productivity, and provide significant regional community benefit

Currently, there are four major water infrastructure projects well underway. This includes the innovative \$116.3 million Western Irrigation Network (WIN) which is a major new recycled water irrigation scheme for the Parwan-Balliang agricultural district to the west of Melbourne.

Victoria has successfully put forward projects for funding under the recently established National Water Grid Fund to deliver projects that will improve the reliability and security of water for regional communities and agriculture and primary industry sectors. Two new capital projects have been funded, including the \$11 million Bellarine Recycled Water for Agriculture Project which will provide high quality, fit-for-purpose recycled water for high value agriculture and horticulture on the Bellarine Peninsula, and the \$21 million Werribee Irrigation District Modernisation Stages 4 & 5 which will complete the replacement of a manual, dilapidated, and inefficient channel-based irrigation network with a modern, automated pipeline across the Werribee Irrigation District. An additional six business case projects have been funded across the State.

In addition, Victoria secured \$20 million of National Water Grid Funding to deliver nine small-scale construction projects across Victoria to contribute to delivering secure, affordable and reliable water.

Collectively, these projects are expected to deliver up to 100 jobs during construction and secure over 125 ongoing jobs, provide 900 megalitres in additional water storage capacity, 1700 megalitres per annum increased water availability and an increase of an estimated 664 hectares of additional irrigable land.

Climate change will increase the need for existing infrastructure to be more efficient. In 2018, the Victorian Government released Victoria's Northern Water Infrastructure Prospectus (the Prospectus),⁵ which identified five projects in northern Victoria that could improve irrigation supply infrastructure that are expected to have neutral or positive outcomes and could recover water for the environment.

A key project included in the Prospectus, the GMW Water Efficiency Project, had been successful in securing \$177.5 million in Commonwealth funding in March 2021, following a positive socio-economic assessment that included public consultation. This project is now underway with modernisation of the irrigation supply system occurring in targeted GMID locations. The project is targeted to complete in 2024 and achieve 15.9 GL of water savings from off-farm works.

The feasibility of developing irrigated agriculture in central Gippsland was explored through a SRW-led Southern Victoria Irrigation Development Feasibility Study, with its **findings now available on SRW's website**. The findings of this study are informing the development of the Central and Gippsland Region Sustainable Water Strategy.

⁵ https://www.water.vic.gov.au/_data/assets/pdf_file/0028/395830/Victorias-Northern-Water-Infrastructure-Prospectus-Continuing-to-deliver-the-Basin-Plan.pdf



Craig Moodie

What are Permanent Water Saving Rules?

They are a set of common-sense rules to help Victorians use water wisely. They are always in place and only replaced if water restrictions are enforced. Breaking these rules could result in penalties.

Hand-held hose	Water from a hand-held hose must not be used for any purpose unless the hose is: <ul style="list-style-type: none"> • Fitted with a trigger nozzle; and • Leak-free.
Residential or commercial gardens and lawns	Can be watered with <ul style="list-style-type: none"> • A hand-held hose, bucket or watering can at any time; and • A watering system between the hours of 6PM – 10AM on any day.
Public gardens and lawns and playing surfaces	Can be watered with: <ul style="list-style-type: none"> • A hand-held hose, bucket or watering can at any time; • A watering system fitted with a rain or soil moisture sensor between the hours of 6PM – 10AM on any day; and • In accordance with an approved Water Use Plan.
Fountains and water features	Water can only be used for fountains or water features that recirculate water.
Cleaning of hard surfaces (includes driveways, paths, concrete, tiles, timber decking)	High-pressure water cleaning devices, a hand-held hose or bucket only can be used for: <ul style="list-style-type: none"> • Cleaning as a result of an accident, fire, health hazard, safety hazard or other emergency; • Staining to the surface has developed (limited to once a season).
Exemptions	Each Victorian urban water corporation can grant exemptions in special circumstances.

Permanent water saving rules do not apply to recycled, reclaimed, rain or grey water use.

Further information

More information about sustainable water management and how we manage in dry conditions can be found at:

Department of Environment, Land, Water and Planning – www.water.vic.gov.au

More information about your local conditions and how water corporations manage in dry conditions can be found at:

Barwon Water – www.barwonwater.vic.gov.au

Central Highlands Water – www.chw.net.au

Coliban Water – www.coliban.com.au

East Gippsland Water – www.egwater.vic.gov.au

Gippsland Water – www.gippswater.com.au

Goulburn-Murray Water – www.g-mwater.com.au

Goulburn Valley Water – www.gvwater.vic.gov.au

Grampian Wimmera Mallee Water – www.gwmwater.org.au

Greater Western Water – www.gww.com.au

Lower Murray Water – www.lmw.vic.gov.au

Melbourne Water – www.melbournewater.com.au

North East Water – www.newater.com.au

South East Water – www.southeastwater.com.au

South Gippsland Water – www.sgwater.com.au

Southern Rural Water – www.srw.com.au

Wannon Water – www.wannonwater.com.au

Westernport Water – www.westernportwater.com.au

Yarra Valley Water – www.yvw.com.au

More information about environmental water can be found at:

Victorian Environmental Water Holder – www.vewh.vic.gov.au

DID YOU KNOW

You can save up to \$100 a year on water and energy bills by switching from a 3-star to a 4-star showerhead.

More information about forecast rainfall and temperatures can be found at:

Australian Bureau of Meteorology – www.bom.gov.au/climate/ahead

More information about using water efficiently can be found at:

Smart Water Advice – www.smartwatermark.org/Victoria/

More information on water restrictions can be found at:

<https://www.water.vic.gov.au/liveable/using-water-wisely/advice-and-rules>

