



Australian Government  
Bureau of Meteorology



# Better water resources forecasts for Melbourne

The Bureau of Meteorology’s seasonal streamflow forecasts provide Melbourne Water with improved information to aid water resource management for Melbourne. These forecasts indicate the likely volume of catchment inflows into the city’s major water supply reservoirs for the next three months.

Collaboration between the two organisations has led to the continued development of seasonal streamflow forecasts for Melbourne Water, offered insight for the Bureau on how the forecasts can support decision-making within the water industry, and enabled better communication on forecast performance.

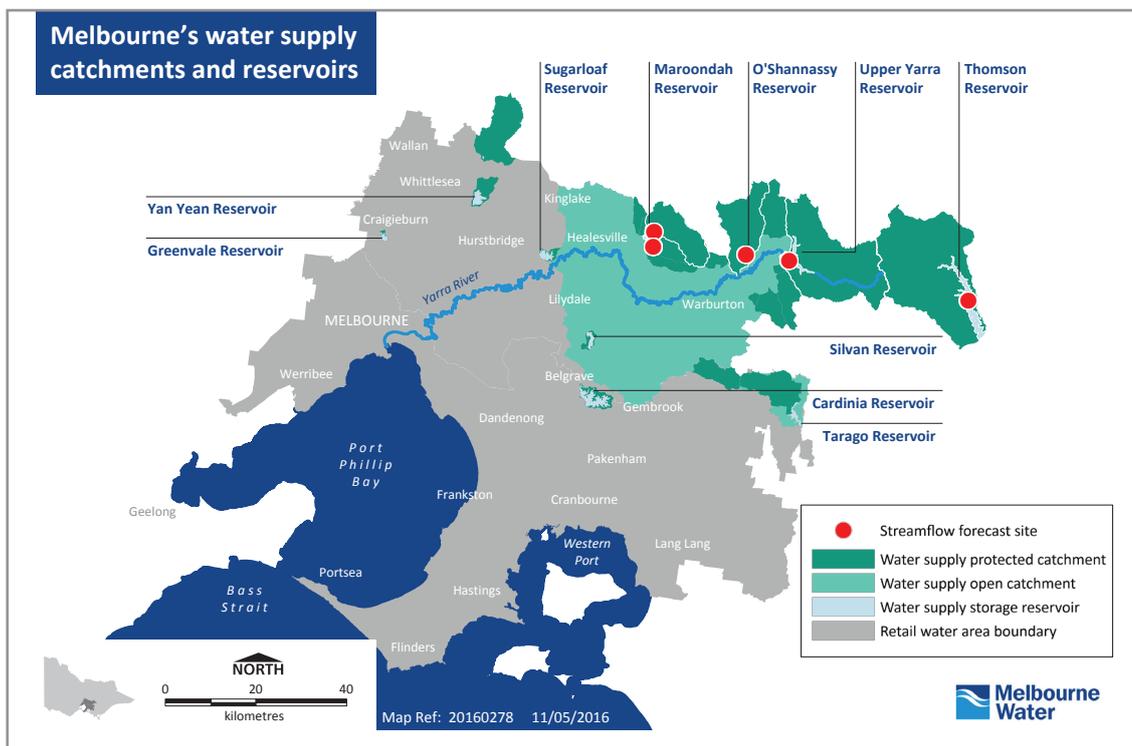
## Forecasting to improve Melbourne’s water resource management

Severity of the 1997–2009 Millennium Drought—combined with projected impacts due to a changing and variable climate, population growth and urban development—posed challenges to Melbourne’s water resource management. So in 2010, the Bureau started working with Melbourne Water to improve seasonal streamflow forecasts to aid water management.

## Testing the forecast accuracy

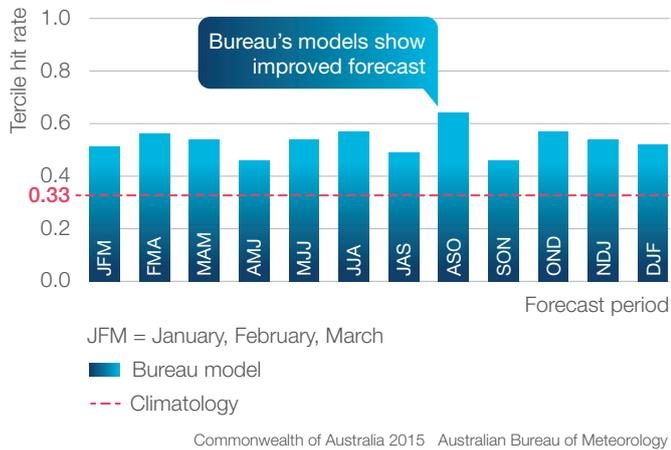
Together, the Bureau and Melbourne Water evaluated the accuracy of monthly forecasts at five major inflow locations for Melbourne’s four major reservoirs—Maroondah, O’Shannassy, Upper Yarra and Thomson—comparing the Bureau’s forecasting model output to the use of historical streamflow records (or climatology) for forecasting inflows for each location and season.

The Bureau’s model produced better forecasts than the information previously available. For each outlook, the number of times the forecast matched what was observed (also called the ‘tercile hit rate’) was substantially higher using the Bureau’s model, than using historical streamflow records.



Forecasts support Melbourne Water planning

Top image: Maroondah reservoir



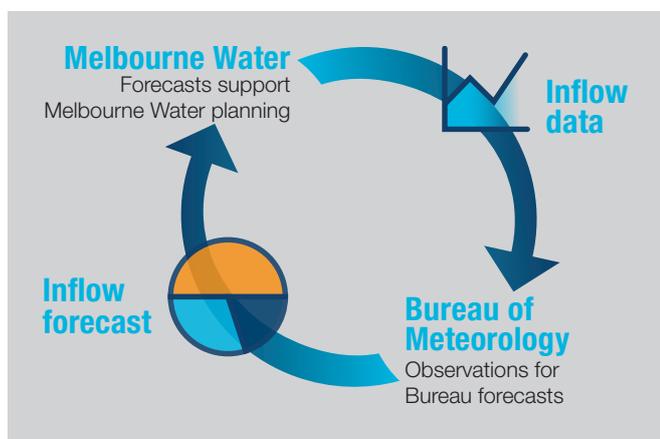
Tercile hit rate represents the number of times the forecast matched what was observed for the total inflow to the Thomson Reservoir (1950–2010). The dotted red line represents the chance (0.33 or one in three) of a correct forecast (of either low, near-median, or high flows) when using only historical data. The blue bars show the forecast was correct more often when using the Bureau’s forecasts.

### Improved forecasts

The Bureau and Melbourne Water now work together to deliver forecasts at the five major inflow locations in the Melbourne water supply network.

At the beginning of each month, Melbourne Water provides net inflow data from the previous month at each location. The Bureau feeds the inflow data into its forecast model and issues a seasonal forecast for each location via a public website.

The Bureau also provides additional information to demonstrate how often a forecast matches the observed streamflows, giving Melbourne Water and other industry users valuable guidance on forecast performance at different times of the year. This has enhanced understanding of the forecasts and increased adoption across the industry.



### About Melbourne Water

As the wholesale supplier of Melbourne’s drinking water, Melbourne Water is responsible for managing the catchments, treating water and transferring it to their customers—primarily City West Water, South East Water and Yarra Valley Water, as well as Barwon Water, Gippsland Water, South Gippsland Water, Western Water and Westernport Water. The customers then supply water to individual homes and businesses, serving a metropolitan and regional population of over 4 million. Melbourne Water also stores and releases water on behalf of the Victorian Environmental Water Holder for environmental uses and Southern Rural Water for irrigation purposes. In addition, Melbourne Water treats and supplies recycled water, removes and treats most of Melbourne’s sewage, and manages waterways and major drainage systems in the Port Phillip and Westernport region.

Melbourne Water uses the Bureau’s seasonal streamflow forecasts:

- to aid water supply planning and operations and manage environmental water resources; and
- as an input in developing the annual *Water Outlook for Melbourne*, which guides water security management and drought response planning (see [www.melbournewater.com.au](http://www.melbournewater.com.au)).

### Seasonal streamflow forecasting service

#### What are seasonal streamflow forecasts?

Forecasts issued monthly by the Bureau showing how much water is expected to flow into selected streams and catchments over the next three months. They are presented as probabilities—that is the likelihood or chance of a given volume of water flowing into a stream, based on recent climate and catchment conditions.

#### Why are they important?

Australian streamflows are among the most variable in the world. Streamflow forecasts are vital in helping water managers and users make informed decisions. For example, they help water managers decide which water source to use or whether environmental flows should be allocated.

#### What areas do the forecasts cover?

They presently cover 140 locations across Australia, increasing from just 21 locations when the service was launched in 2010.

**FIND OUT MORE**

To learn more about the Bureau’s seasonal streamflow forecasts, visit [www.bom.gov.au/water/ssf](http://www.bom.gov.au/water/ssf) or email [water\\_ssf@bom.gov.au](mailto:water_ssf@bom.gov.au).

Melbourne Water: [www.melbournewater.com.au](http://www.melbournewater.com.au), email [enquiry@melbournewater.com.au](mailto:enquiry@melbournewater.com.au) or call 131 722.

