Eastern Mount Lofty Ranges Prescribed Water Resources Area

2018–19 surface water and groundwater status overview

Angas Bremer PWA	Murray Group Limestone		
EMLR PWRA	Fractured rock aquifers		
	Murray Group Limestone	Currency	
	Permian sand	Finniss	
		Tookayerta	
	Surface water (Angas & Bremer)		
	Surface water (Finniss & Currency)		

LEGEND

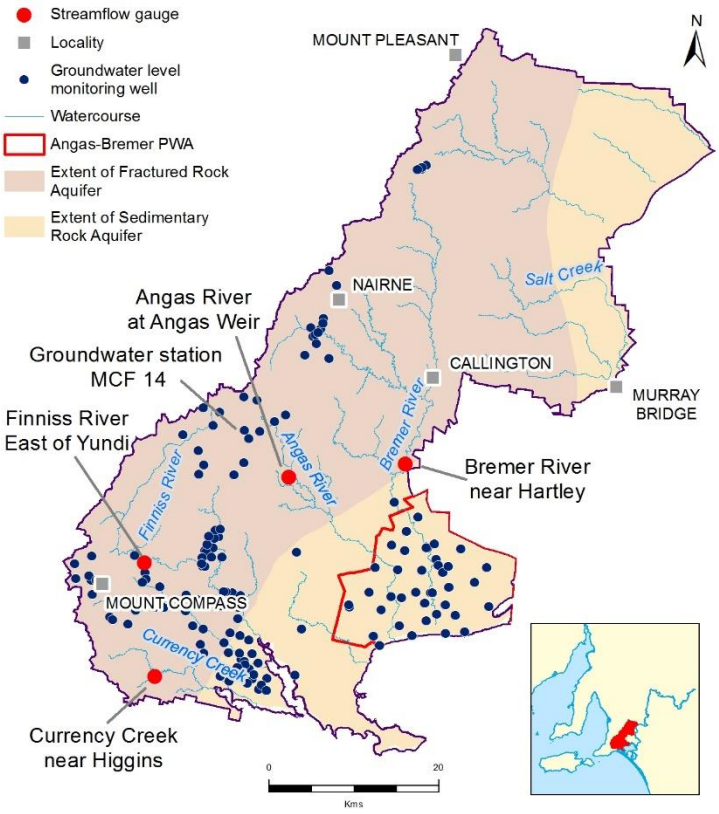
- Highest on record
- Very much above average
- Above average
- Average
- Below average
- Very much below average
- Lowest on record
- Long-term trend

Regional context

The Eastern Mount Lofty Ranges (EMLR) PWRA relies on both surface water and groundwater resources which are managed under a Water Allocation Plan (WAP) adopted in 2013. The PWRA lies within the Murray-Darling Basin and includes the Angas-Bremer Prescribed Wells Area (PWA).

The EMLR PWRA contains a number of different groundwater resources: fractured rock aquifers form the main resources in the Mount Lofty Ranges; the Permian Sand aquifer in valleys in the Tookayerta Creek and Finniss River catchments, and the Murray Group Limestone aquifer in the Murray Basin near Currency and Langhorne Creek.

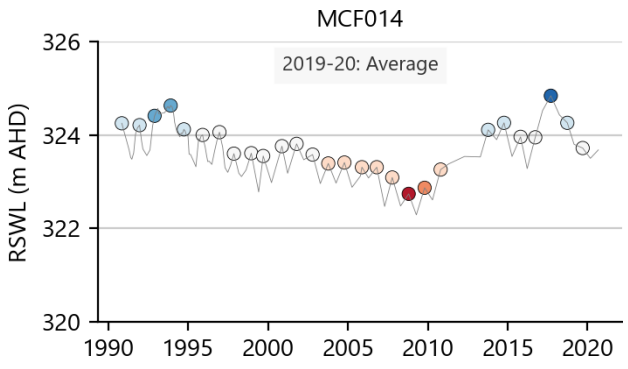
Eleven of the sixteen surface water catchments in the PWRA have watercourses that drain from the eastern slopes of the Mount Lofty Ranges to the River Murray and Lake Alexandrina, with the Bremer, Angas and Finniss Rivers being the largest watercourses.



Groundwater level

Recovered water levels in 2019 were 'average' in 45% of monitoring wells, compared to their historic record

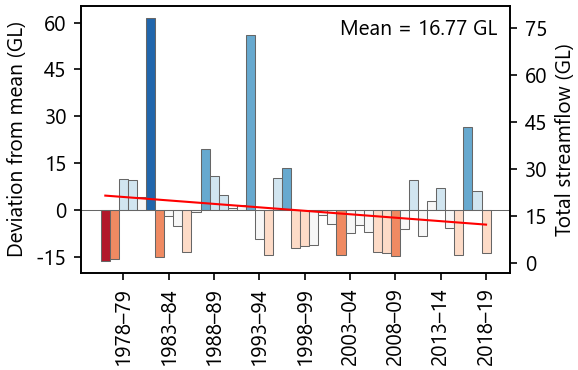
- In the Murray Group Limestone aquifer, water levels were at or above their average level in all monitoring wells
- In the fractured rock aquifers, groundwater levels showed variable trends, with average levels in 64% of wells
- Similarly, monitoring wells in the Permian Sand aquifer in the Tookayerta and Finniss catchments showed varying trends in groundwater level
- The figure below shows long-term changes in groundwater level near Macclesfield, with declines during drought years.



Streamflow

Streamflow was 'very much below average' for 3 out of the 4 gauging stations

- Three of the four representative streamflow gauging stations operational in the EMLR PWRA recorded 'very much below average' streamflow during 2018–19. The Bremer River recorded 'below average' streamflow (data presented below)
- Long-term data trends show a decline in streamflow.



EMLR PWRA 2018–19 surface water and groundwater status overview

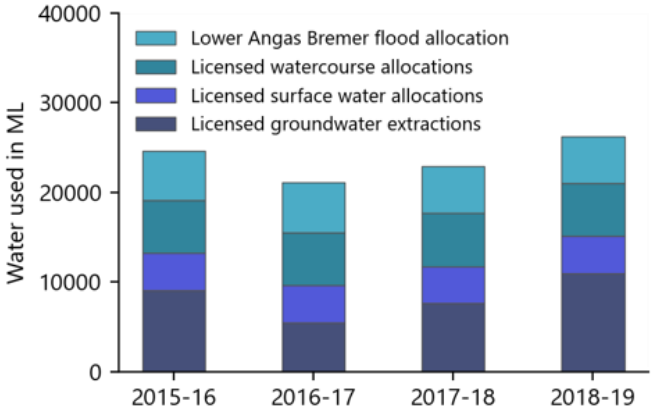
Water use

Water use in 2018–19 was 32 910 ML which is the highest use since 2015–16

- 32 910 ML accounts for metered groundwater use and total surface water allocations given usage is not metered
- Consumptive water use includes a variety of licensed purposes (irrigation, industrial, intensive animal production, environmental and recreational uses) and non-licensed uses such as stock and domestic and plantation forestry. Water is sourced through pumping and diversions from watercourses and aquifers and interception and storage by farm dams
- Water use was high due to irrigation demand; this is likely to be due to the lower-than-average summer rainfall.

10 928 ML was extracted from groundwater aquifers

- Groundwater extraction in Angas-Bremer PWA increased by 89% to 1530 ML following two years of low extraction, however extraction volumes are still much lower than during the Millennium drought due to improved access to water from the River Murray.



Salinity

Surface water salinity in 2018–19 remained within historical ranges. The majority of wells (73%) showed a stable groundwater salinity trend

- In general, the wetter southern catchments show lower salinities than the drier northern catchments
- Salinity levels were variable on the Bremer River but remained within the historical ranges, with peak levels reaching 2077 mg/L
- Peak surface water salinity levels on the Finniss River reached 1314 mg/L
- The majority of irrigation wells with salinity data show stable salinities between 2015–19. Wells in the Permian Sand aquifer in the Tookayerta and Finniss catchments show the most variability in salinity trends, but remain very fresh with a median salinity in 2019 of 232 mg/L
- Groundwater salinity is also highly variable in the fractured rock aquifers. In 2019, salinity ranged between 492 mg/L and 3200 mg/L, with a median of 1393 mg/L.

Climate-driven trends in water resources

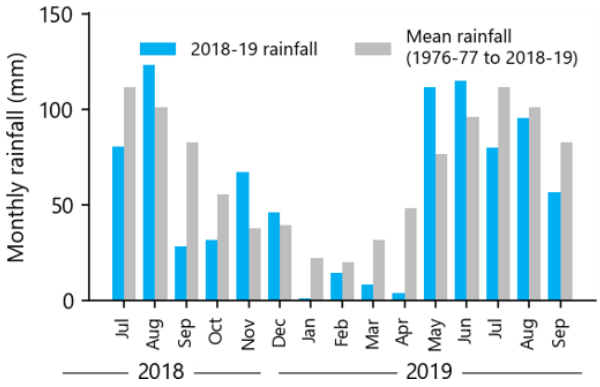
Climate is one of the primary drivers of trends in the local water resources. Surface water and groundwater resources in the EMLR PWRA are highly dependent on rainfall.

Below-average winter rainfall results in a reduction in annual streamflow volumes. Below-average summer rainfall can increase the need for irrigation and therefore lead to higher water extraction. This can in turn lead to an increase in salinity. Conversely, increased rainfall results in increased surface water availability, decreased irrigation extractions, with potential decline or stabilisation of salinity.

Below-average rainfall also results in reduced recharge to shallow aquifers. This coupled with increased water extractions can cause groundwater levels to decline even in deeper confined aquifers. Conversely, higher than average rainfall can cause increased recharge and lower irrigation extraction, resulting in potential groundwater level increase.

Rainfall was lower than average for 2018–19

- Rainfall typically ranges from 500 to 1000 mm in the eastern Mount Lofty Ranges and from less than 300 mm to 500 mm on the Murray Plains
- Rainfall at Mount Barker measured 630 mm, which was lower than the average of 726 mm (see below)
- Rainfall at Langhorne Creek measured 304 mm and was also lower than average
- In May 2019, both stations recorded greater than the average monthly rainfall. Below average conditions were experienced in winter and spring 2018 as well as summer 2018–19
- Long-term data trends indicate a decline in rainfall.



More Information

This fact sheet is a high level summary of information provided in the 2018-19 Water Resources Assessment for the EMLR PWRA.Full details of the assessment can be found at: https://www.waterconnect.sa.gov.au

Government of South Australia
Department for Environment and Water