Marne Saunders Prescribed Water Resources Area

2018–19 surface water and groundwater status overview

Marne Saunders PWRA	Fractured rock aquifers	
	Murray Group Limestone	
	Surface water	

LEGEND

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

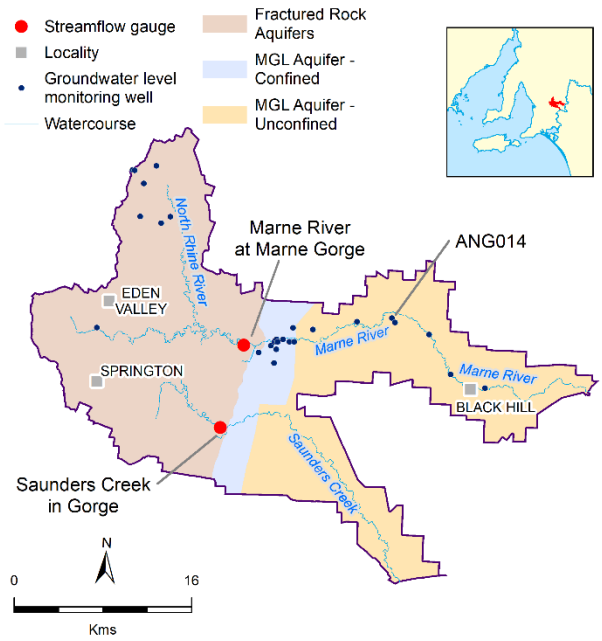
Regional context

The Marne Saunders PWRA relies on both surface water and groundwater resources which are managed under a Water Allocation Plan (WAP) adopted in 2010.

The PWRA is located in the Murray-Darling Basin. It is characterised by undulating hills and valleys with high rainfall to the west while the east is largely defined by flat plains with localised hills and rocky outcrops with very low rainfall.

The main watercourses within the PWRA are the ephemeral Marne River and Saunders Creek, which have their headwaters in the Mount Lofty Ranges.

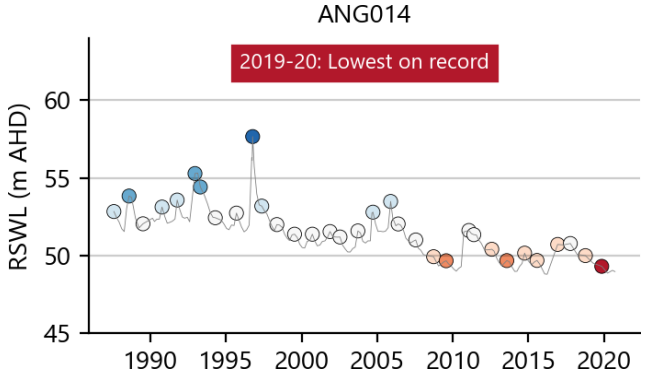
Groundwater is located in two types of aquifer, the fractured rock aquifers found in the hills area and the sedimentary Murray Group Limestone aquifers found in the Murray Plains.



Groundwater level

75% of monitoring wells recorded 'lowest-on-record' groundwater levels

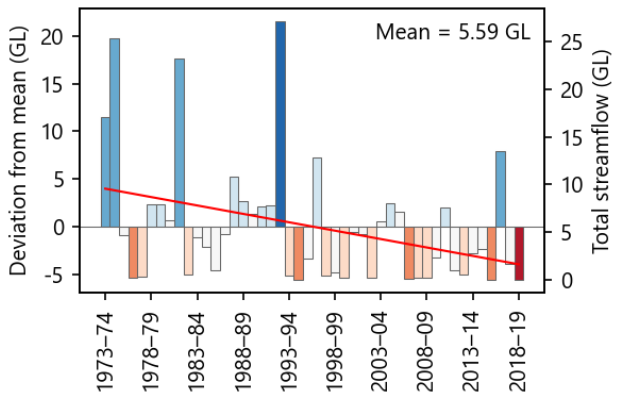
- Water levels in the two aquifer systems (fractured rock and Murray Group Limestone) range from 'below average' to 'lowest on record' compared to their historic levels
- Water levels in 2018–19 in 12 (75%) of the 16 monitoring wells were 'lowest-on-record' when compared to historic levels
- Three wells were 'below average' and one well was 'very much below average'
- The figure below shows long-term water levels at a monitoring well on the Marne River.



Streamflow

Streamflow was lowest on record for the 2 principal gauging stations in the PWRA

- Two principal streamflow gauging stations operational in the Marne Saunders PWRA recorded the 'lowest streamflow on record' during 2018–19 (Marne River data presented below)
- The Marne River streamflow gauging station has not recorded any streamflow since November 2017. 8 ML of flow was recorded in the Saunders Creek in 2018–19
- Long-term data shows a declining trend in streamflow.

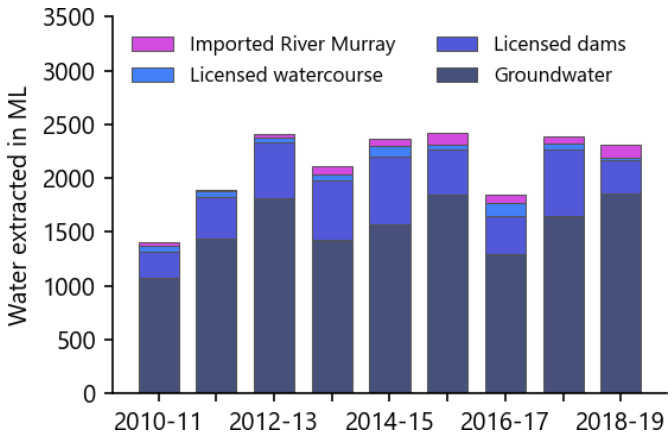


Marne Saunders PWRA 2018–19 surface water and groundwater status overview

Water use

Water use in 2018–19 was 2803 ML with 1860 ML of this total extracted from groundwater, 830 ML from surface water sources (licensed and non-licensed) and 113 ML imported from the River Murray

- Water sources include watercourses, farm dams, groundwater and imported water from the River Murray for municipal water supply and irrigation.



Salinity

The majority of monitored wells showed stable or decreasing five-year trends in groundwater salinity

- No salinity values were recorded in the Marne River due to insufficient flow in 2018–19
- Peak levels reached 6075 mg/L in the Saunders Creek in 2018–19, despite limited streamflow being recorded
- The majority of irrigation wells with salinity data show stable or decreasing salinities over the period 2015–19 (more than 80% of wells in each aquifer)
- In 2019, groundwater salinities in the Murray Group Limestone aquifer ranged from 1121 and 2989 mg/L, with a median of 1766 mg/L
- Groundwater salinities in the fractured rock aquifers varied widely from 450 to 6302 mg/L, with a median of 2227 mg/L.

Climate-driven trends in water resources

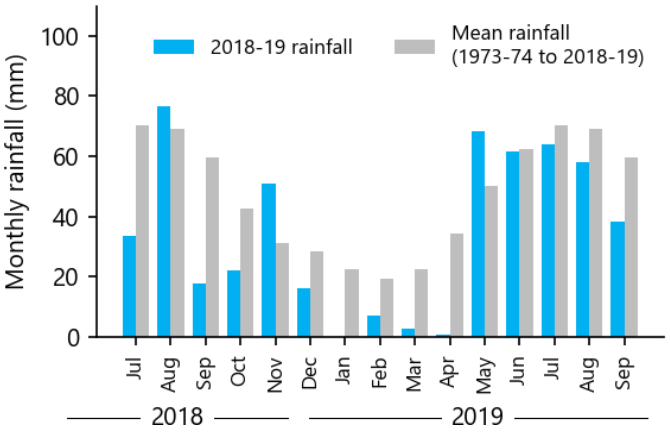
Climate is one of the primary drivers of trends in the local water resources. Surface water and groundwater resources in the Marne Saunders PWRA are highly dependent on rainfall.

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. Together 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, which can cause groundwater levels to increase

Rainfall was 'lower than average' for 2018–19

- Rainfall typically ranges from 280 mm on the Murray Plains at the eastern boundary of the PWRA to 800 mm in the higher elevations at the western boundary
- Rainfall across the region was 'lower than average' in 2018–19. Long-term data trends indicate a decline in rainfall
- Rainfall at Keyneton was 357 mm in 2018–19, 30% below average, while rainfall at Cambrai was 204 mm, 29% below average. This pattern was consistently observed across the PWRA
- 'Lower-than-average' conditions were observed in early winter and spring 2018 and very dry conditions in summer 2018–19
- The figure below shows monthly rainfall at Keyneton.



More Information

This fact sheet is a high level summary of information provided in the 2018-19 Water Resources Assessment for the Marne Saunders 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