

Marne Saunders Prescribed Water Resources Area

2019–20 surface water and groundwater status overview



Marne Saunders PWRA	Fractured rock aquifers	○
	Murray Group Limestone	●
	Surface water	●

LEGEND

● Highest on record	○ Below average
● Very much above average	○ Very much below average
○ Above average	● Lowest on record
○ Average	— 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 high rainfall in the hills and valleys of the ranges to the west, while the east is largely defined by gently undulating plains with rocky outcrops and very low rainfall.

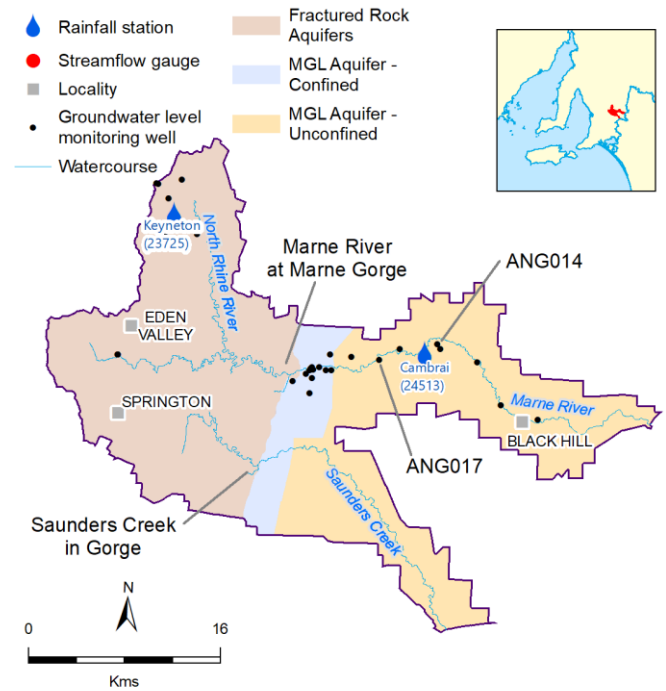
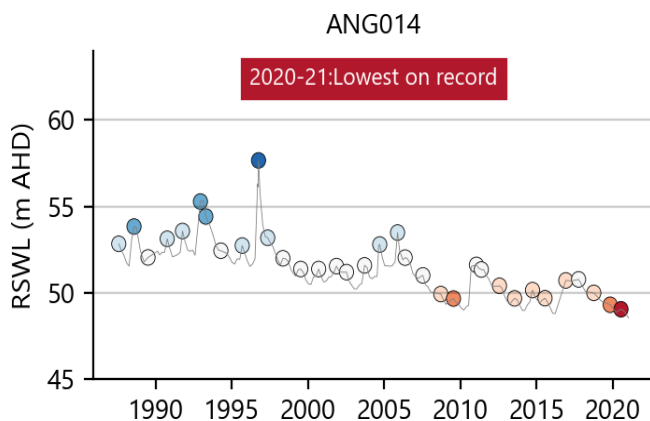
The main watercourses within the PWRA are the ephemeral Marne River and Saunders Creek, which have their headwaters in the Mount Lofty Ranges.

Groundwater is located in two types of aquifer: fractured rock aquifers found in the ranges to the west and the sedimentary Murray Group Limestone aquifers occurring beneath the Murray plains.

Groundwater level

56% of monitoring wells show 'Lowest on record' groundwater levels

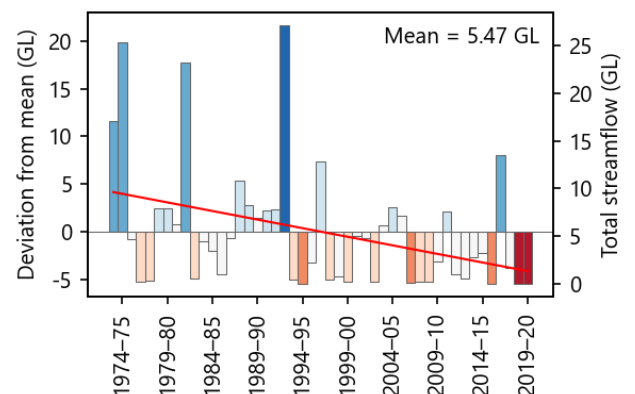
- Water levels in the fractured rock and Murray Group Limestone aquifers are classified from 'Below average' to 'Lowest on record' compared to their historical record.
- 56% of the monitoring wells (9 of 16) show lowest water levels on record in 2019–20, when compared to their respective historical record.
- Five-year trends in water level indicate that the majority of monitoring wells (92%) are declining.
- The figure below shows long-term groundwater levels at a monitoring well located near the Marne River (see map).



Streamflow

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

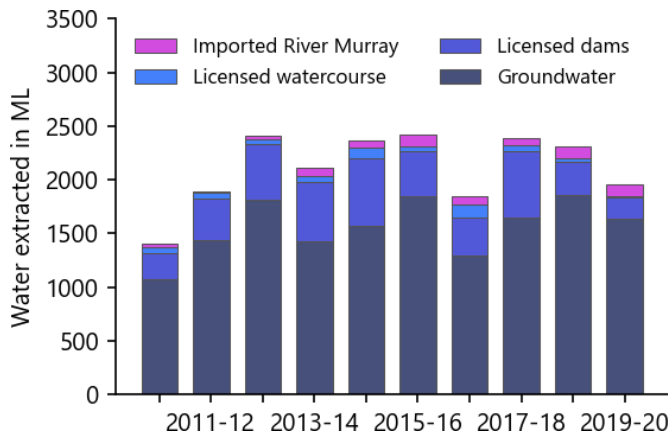
- Two principal streamflow gauging stations operational in the Marne Saunders PWRA recorded the below-average streamflow during 2019–20 (Marne River data presented below).
- The Marne River streamflow gauging station has not recorded any streamflow since November 2017. 10 ML of flow was recorded in the Saunders Creek in 2019–20.
- The data show a long-term declining trend in streamflow.



Water use

Water use in 2019–20 was 2454 ML with 1632 ML of this total extracted from groundwater, 822 ML from surface water sources (209 ML from licensed take and 496 ML of estimated demand from non-licensed sources) and 117 ML imported from the River Murray

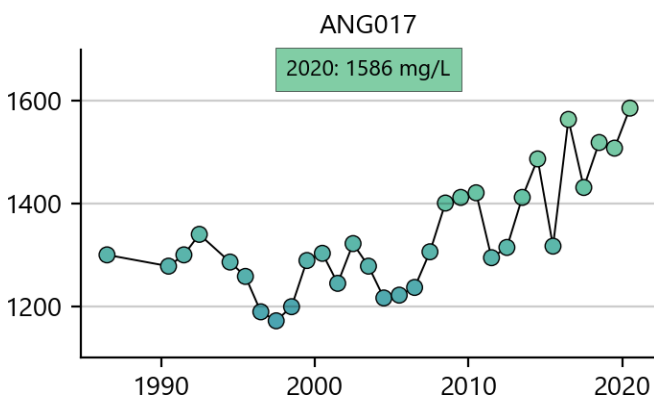
- Water sources include watercourses, farm dams, groundwater and imported water from the River Murray for municipal water supply and irrigation.



Salinity

In 2020, groundwater salinity from 76 wells ranged from 465 to 7387 mg/L with a median of 1810 mg/L

- Eight-year salinity trends in the fractured rock aquifers are decreasing in most wells (66%). The change in salinity over the eight-year period varies from a decrease of 6.34% per year to an increase of 1.04% per year, with a median rate of 0.27% decrease per year.
- Eight-year salinity trends in the Murray Group Limestone aquifer vary from a decrease of 5.99% per year to an increase of 7.93% per year, with a median rate of 0.02% increase per year.
- The figure below shows increases in salinity over the past 30 years at a monitoring well located east of Cambrai.



- No salinity values were recorded in the Marne River or Saunders Creek due to insufficient flow in 2019–20.

Climate-driven trends in water resources

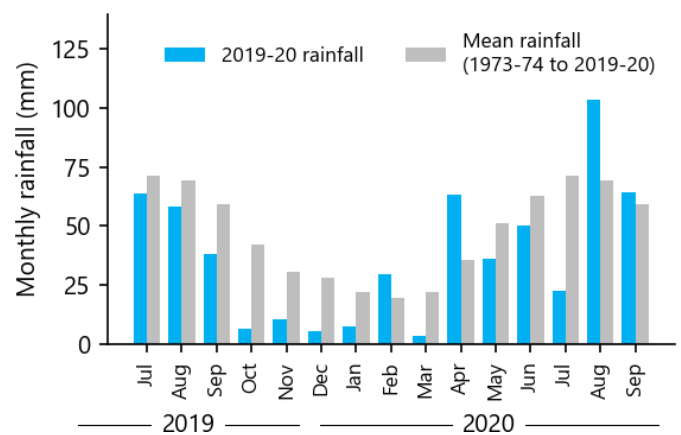
Climate is one of the main drivers of trends in the local water resources. Surface water and groundwater resources in the Marne Saunders PWRA are highly dependent on rainfall.

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, above-average rainfall can cause increased recharge and lower irrigation extraction, which can cause groundwater levels to increase.

Rainfall was below-average for 2019–20

- Rainfall typically ranges from 280 mm/y on the Murray Plains at the eastern boundary of the PWRA to 800 mm/y across the higher elevations at the western boundary.
- Rainfall across the region was below-average in 2019–20.
- Rainfall at Keyneton was 373 mm in 2019–20, 27% below-average, while rainfall at Cambrai was 192 mm, 33% below average. This pattern was consistently observed across the PWRA (data for Keyneton presented below).
- Below-average rainfall was observed throughout 2019–20 with very dry conditions experienced in the spring and summer of 2019–20.
- Long-term data trends indicate declining rainfall (1973–20).



More Information

This fact sheet is a high level summary of information provided in the 2019–20 Water Resources Assessment for the Marne Saunders PWRA. Full details of the assessment can be found at: <https://www.waterconnect.sa.gov.au/>