Barossa Prescribed Water Resources Area

2018 Surface water status report

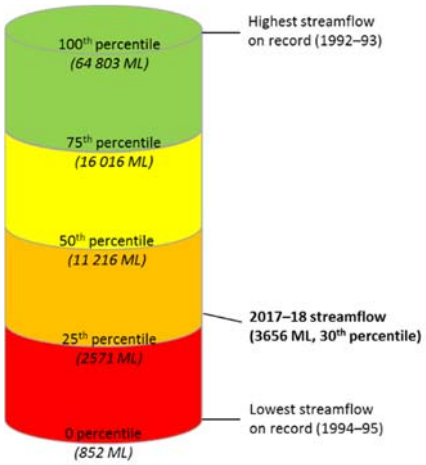
Government of South Australia
Department for Environment and Water

2018 Status summary
Barossa PWRA

The Barossa at a whole PWRA scale is assigned an ***orange*** surface water status for 2018, with streamflow being lower than the average observed for the region.

Orange status means that the total annual streamflow was between the 25th and 50th percentile[1] for the period of data availability.

The status presented is based on the streamflow recorded at the main gauging station located at Yaldara.



This status report does not seek to evaluate the sustainable limits of the resource. Nor does it make any recommendations on management or monitoring of the resource. These actions are important, but occur through separate processes such as prescription and water allocation planning.

[1] The nth percentile of a set of data is the value at which n% of the data is below it. For example, if the 75th percentile annual flow is 100 ML, 75% of the years on record had annual flow of less than 100 ML. Median streamflow: 50% of the records were above this value and 50% below.

Rainfall

Figures 1 and 5

Rainfall station	Angaston rainfall station (M023300) Reporting period: 1977–78 to 2017–18, in line with streamflow data availability
Annual total[2]	465 mm This was 54 mm lower than the average annual rainfall of 518 mm (1977–78 to 2017–18). Neighbouring rainfall stations at Tanunda (M023318) and Williamstown (M023752) recorded 475 mm and 559 mm respectively for the 2017–18 period, which are lower than the annual averages for these locations.
Monthly rainfall summary	In August 2017, Angaston rainfall station recorded almost double the average monthly rainfall (114 mm compared to 67 mm). In July 2017 and November 2017, there was above-average monthly rainfall. Drier than average conditions were recorded in September and October 2017 as well as in December 2017 to June 2018.
Spatial distribution	Rainfall in 2017–18 was lower in the southern part of the PWRA when compared to the five year average (2013–14 to 2017–18) and average annual rainfall patterns. The long-term average annual rainfall shows the higher rainfall band (600–700 mm) extending north to the Tanunda Creek catchment, contracting south over the five-year and 2017–18 periods.
Rainfall trend	Long-term trend – Annual rainfall volumes recorded at the Angaston rainfall station are stable. Short-term trend – The last five years of rainfall have shown a decline.

[2] For the water-use year 1 July 2017 to 30 June 2018

Streamflow

Figures 2 and 6

Streamflow gauging stations	Three stations on the North Para River: Mt McKenzie (A5050533), Penrice (A5050517) and Yaldara (A5050502); One station on the Tanunda Creek: Bethany (A5050535) Streamflow data availability: 1977–78 to 2017–18
Annual total[2]	In 2017–18, all gauging stations showed recorded streamflow below the average annual streamflow.

	Average annual streamflow (1977–78 to 2017–18) (ML)	2017–18 Streamflow (ML)	Percentile rank
Mt McKenzie	1754	606	48th
Penrice	4626	1063	30th
Yaldara	12 821	3656	30th
Tanunda Creek	1873	567	36th

Monthly streamflow summary	All months in 2017–18 were drier than average at the Yaldara streamflow gauging station with no flow recorded between February and May 2018. The gauging stations at Mt McKenzie, Penrice and Tanunda Creek also experienced minimal or no streamflow between January and June 2018.
Streamflow trend	Long-term trend – Annual streamflow volume recorded at Yaldara gauging station (1977–78 to 2017–18) indicates a declining long-term trend, with similar trends being observed at both Penrice and Mt McKenzie gauging stations. Short-term trend – The last five years of streamflow indicate an increasing trend due to much higher-than-average rainfall in 2016–17.

[2] For the water-use year 1 July 2017 to 30 June 2018

Water extraction

Figure 3

Surface water extraction[2]	Licensed surface water sources (dams and watercourses): 1423 ML (compared to 1413 ML in 2016–17) Non-licensed water demand (stock and domestic): 1100 ML (non-metered and estimated at 30% of dam capacity) Imported water: 10 500 ML (9228 ML Barossa Infrastructure Limited (BIL) Scheme and 1272 ML SA Water). River Murray water is transferred to the Prescribed Water Resources Area (PWRA) for irrigation by the BIL Scheme, and for SA Water's reticulated water supply.
Resource volume[2]	Total resource volume: 6179 ML: • 3656 ML Streamflow recorded at Yaldara gauging station • 2523 ML Surface water extraction (licensed and non-licensed). Surface water extraction was approximately 41% of the total resource volume in 2017–18 (compared to 8% in 2016–17). The average for 2004–5 to 2017–18 was 34%.

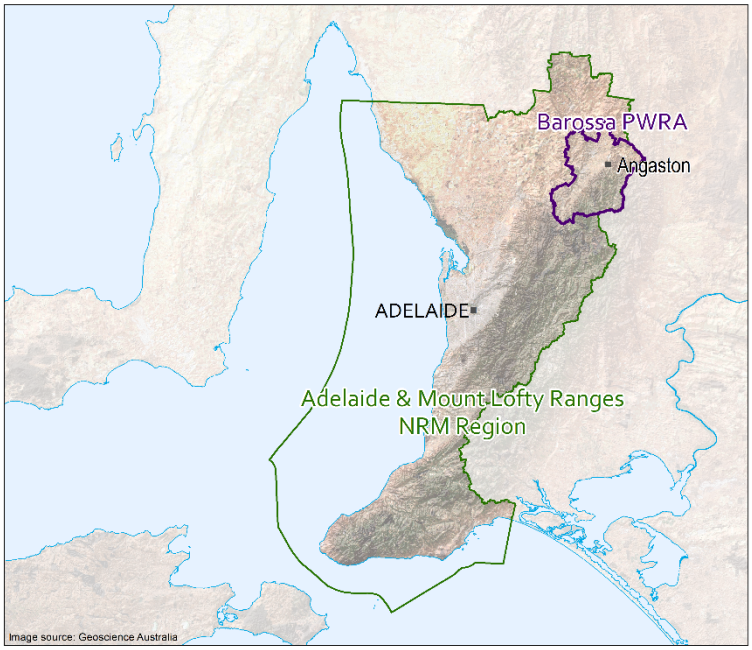
Surface water salinity

Figure 4.

Salinity monitoring	Yaldara gauging station (A5050502) – data available from 1994 Tanunda Creek gauging station (A5050535) – data available from 1994
General observations	Salinity increases during sustained summer events while decreasing throughout the winter months as a result of higher dilution capacity as flow volumes increase. Data further downstream are typically of higher salinity as the salt inputs accumulate.
Salinity: 2017–18 water-use year[2]	Highest salinity recorded at Yaldara: 3932 mg/L Highest salinity recorded at Tanunda Creek: 1538 mg/L
Salinity: 1994–95 to 2017–18	Salinity levels in the North Para River are generally greater than 1000 mg/L, increasing further down the catchment. Salinity levels at Yaldara exceeded 2500 mg/L (median 2082 mg/L) for approximately a third of the salinity data period. Salinity levels at Tanunda Creek were lower, less than 1000 mg/L (median 590 mg/L) for 81% of the data period.

[2] For the water-use year 1 July 2017 to 30 June 2018

Regional setting



The Barossa PWRA is located approximately 60 km north-east of Adelaide. Surface water, watercourses and groundwater resources in the PWRA have been prescribed under South Australia's Natural Resources Management Act 2004. A water allocation plan (WAP) was adopted in 2009 to provide for sustainable management of these water resources.

The Barossa PWRA is situated in the north of the Adelaide and Mount Lofty Ranges Natural Resources Management (NRM) Region, and is characterised by rolling hills and valleys, extending into localised flat plains in the north-west of the region. The North Para River is the region's main watercourse and flows south to north in the eastern-side of the PWRA between Mt McKenzie and Penrice streamflow gauging stations. The river then heads in a south-westerly direction between Penrice and Yaldara streamflow gauging stations. Major tributaries include Tanunda and Jacobs Creeks. All streams are ephemeral and feature seasonal disconnected permanent pools, fed predominantly by groundwater.

Surface water resources are highly dependent on rainfall, with trends in streamflow and salinity primarily climate driven, i.e. lower than average winter rainfall will result in reduced annual streamflow volumes. Below-average summer rainfall can also result in increased irrigation extractions. These two elements can cause salinities to increase by reducing the amount of streamflow available to dilute salts. Conversely, higher rainfall will result in increased surface water availability and decreased irrigation extractions, with potential decline or stabilisation of salinity.

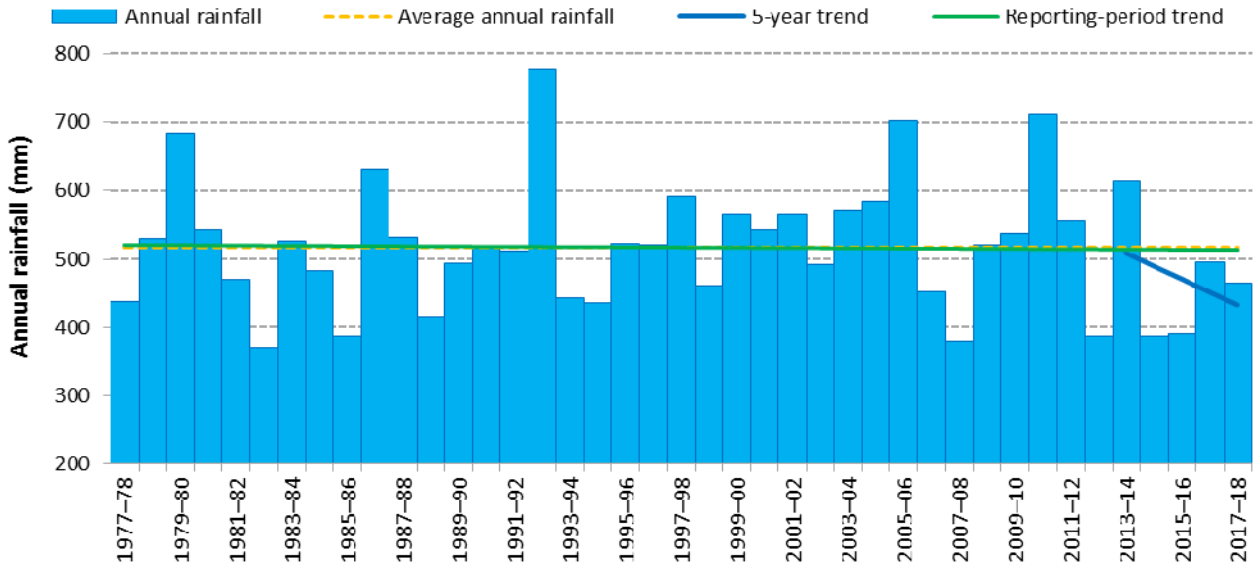


Figure 1. Annual rainfall for 1977–78 to 2017–18 at the Angaston rainfall station (M023300)

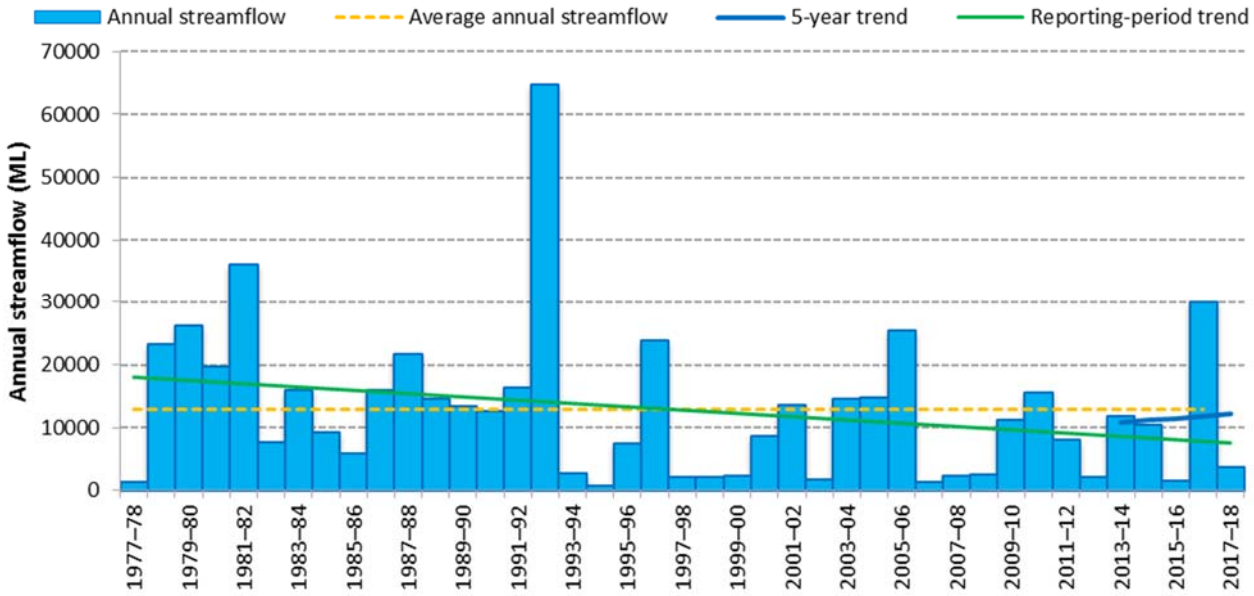


Figure 2. Annual streamflow for 1977–78 to 2017–18 at the Yaldara gauging station (A5050502)

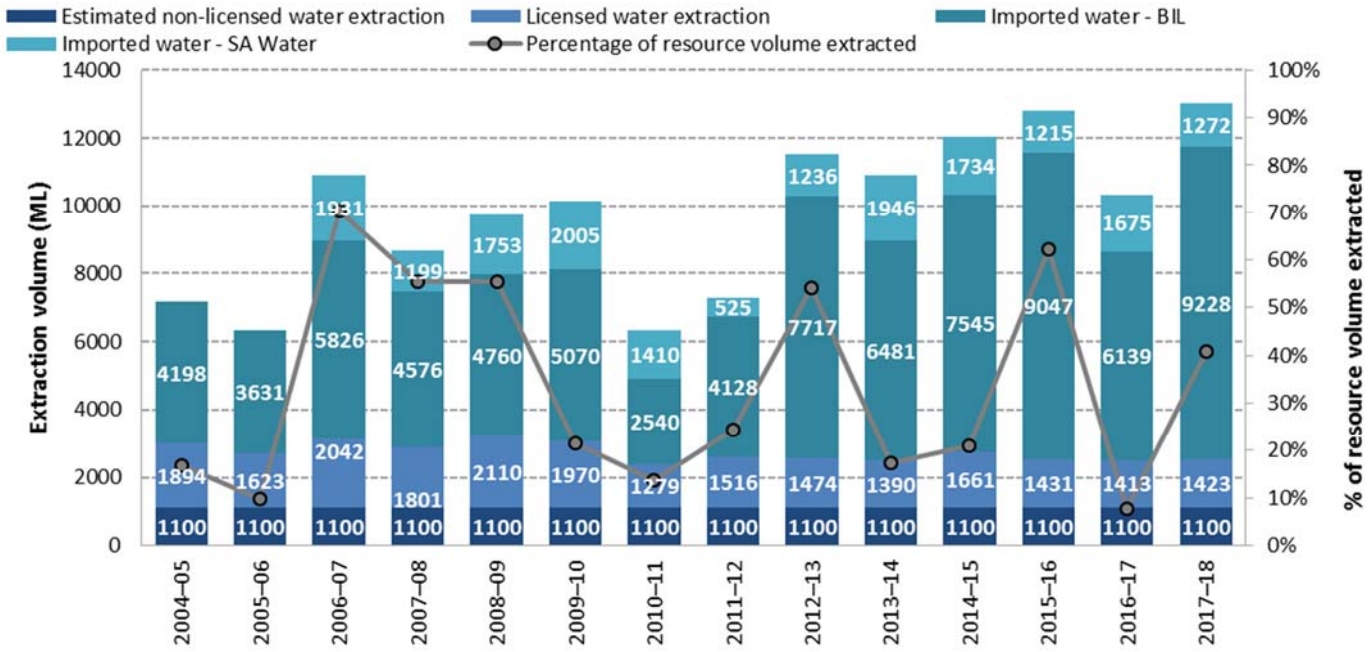


Figure 3. Surface water extraction for 2004–05 to 2017–18 for the Barossa PWRA

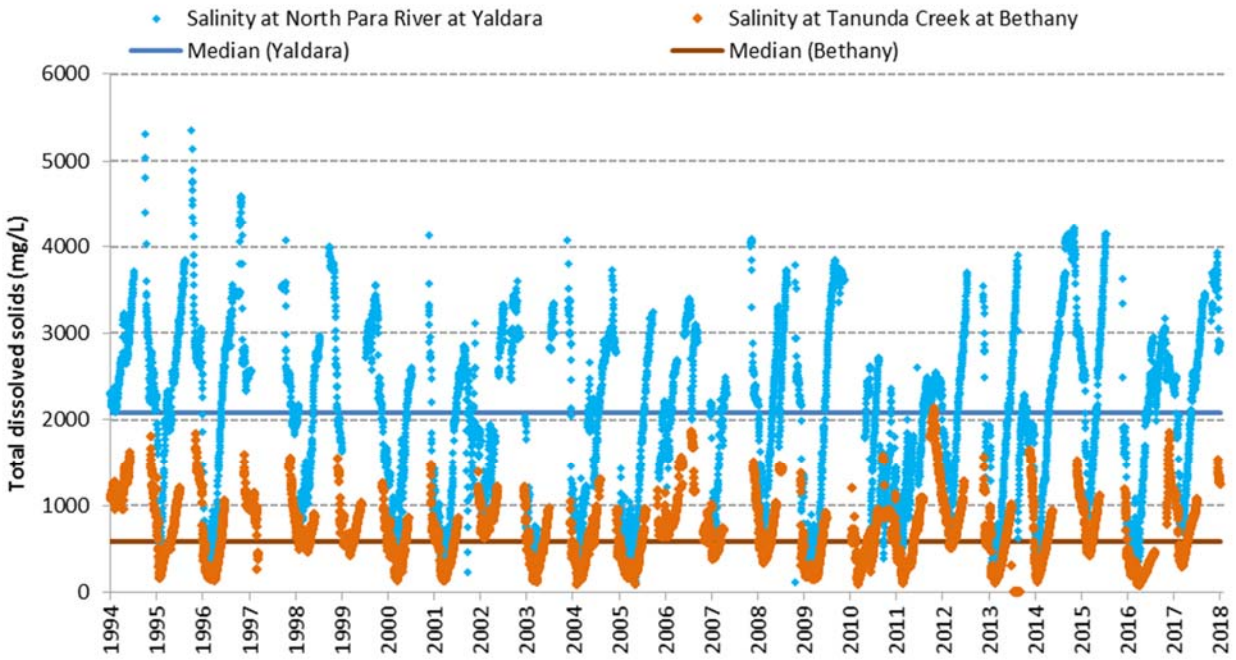


Figure 4. Salinity data for 1994 to 2018 at the Yaldara (A5050502) gauging station on the North Para River, and at the Bethany gauging station (A5050535) on the Tanunda Creek

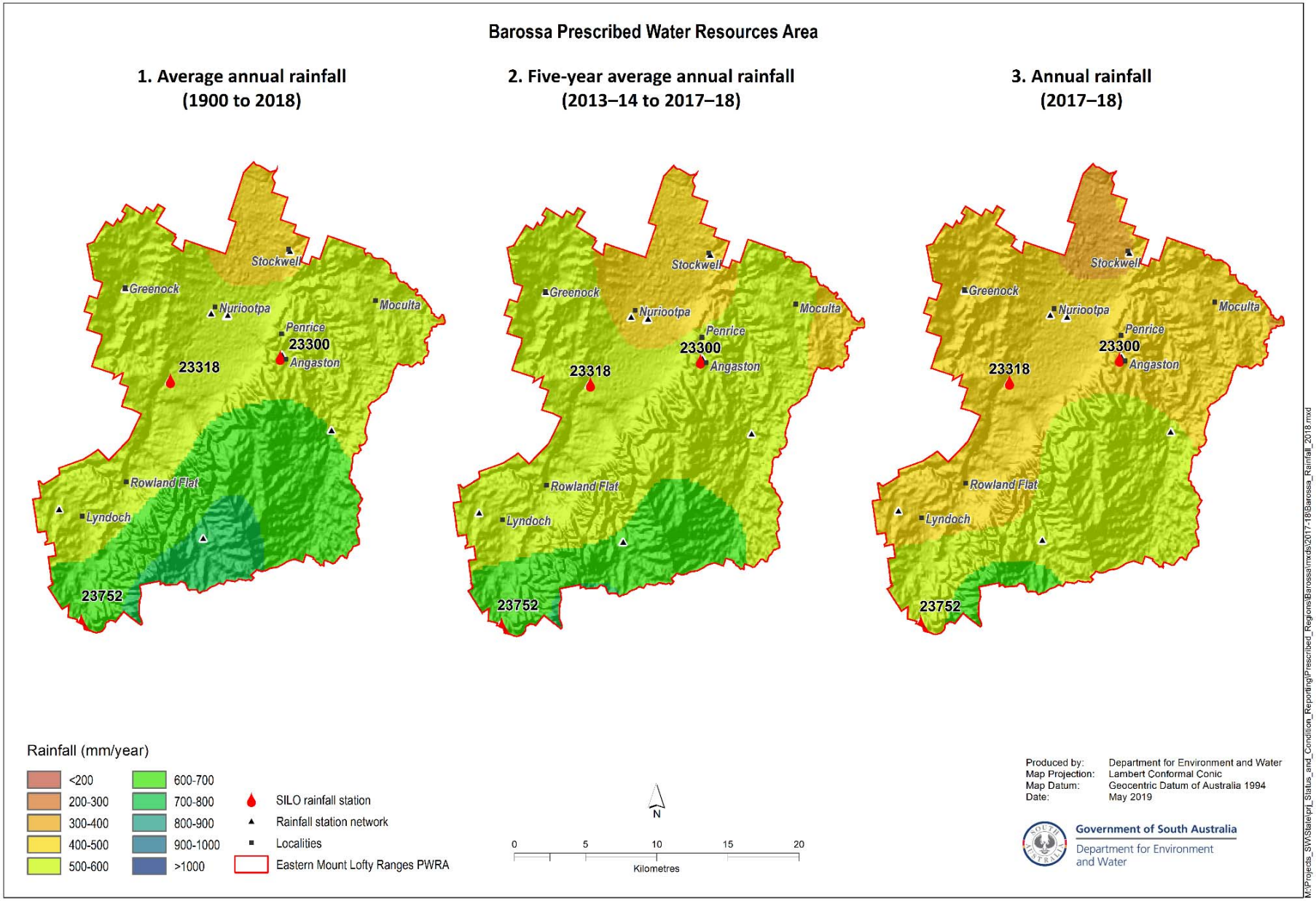


Figure 5. (1) Average annual rainfall (2) five-year average annual rainfall and (3) annual rainfall for 2017–18 in the Barossa PWRA[3]

[3] Data sources: SILO interpolated point and gridded datasets, available at https://legacy.longpaddock.qld.gov.au/silo/

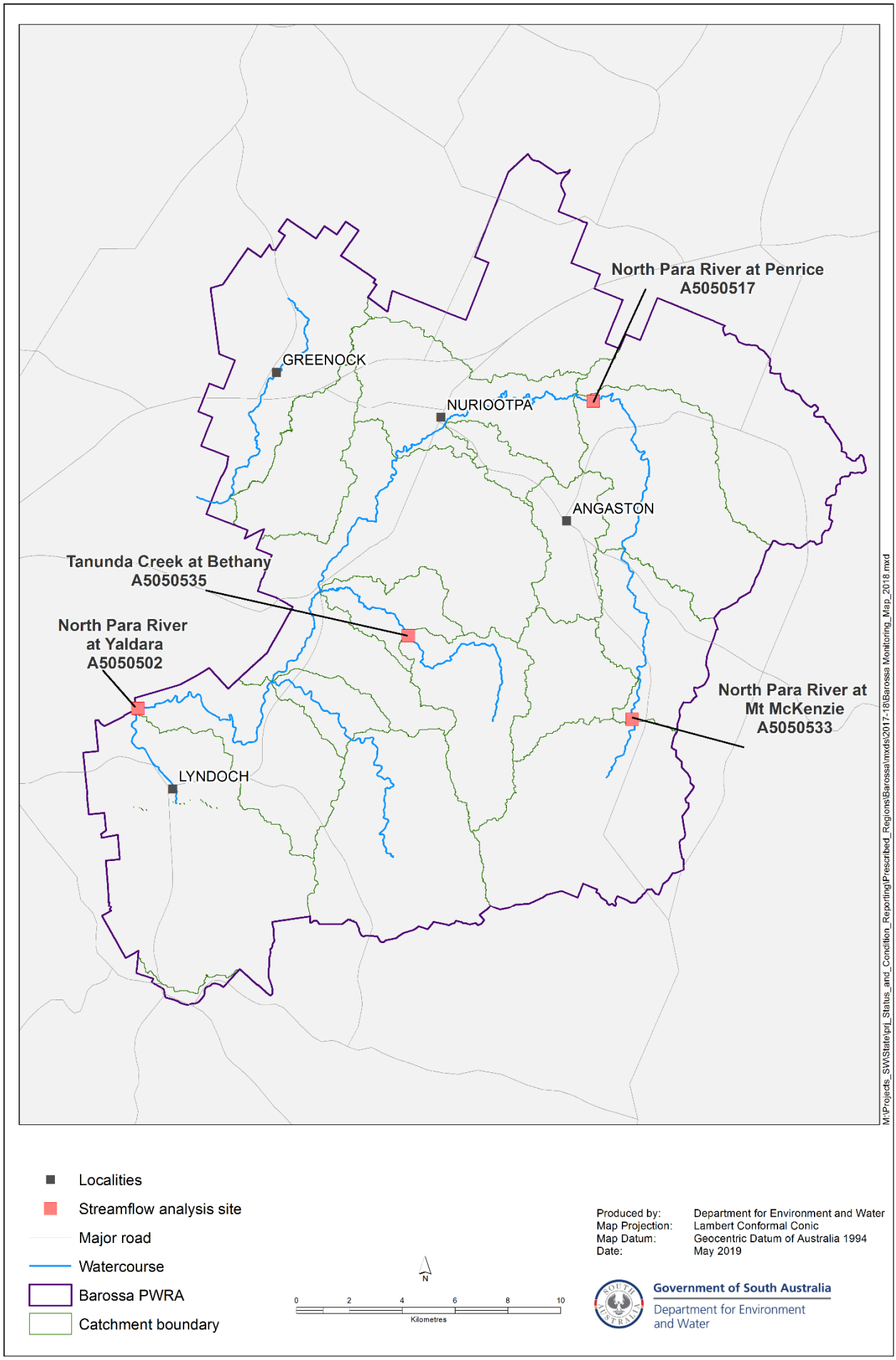


Figure 6. Streamflow gauging stations in the Barossa PWRA

More information

The status of the Barossa was determined by expressing the annual Yaldara streamflow for 2017–18 as a percentile of the total annual streamflow for the period (1977–78 to 2017–18).

The total 2017–18 streamflow from the Yaldara gauging station (3656 ML) represents the 30th percentile, i.e. 30% of the annual streamflow totals in the record since 1977–78 were less than the streamflow observed in 2017–18.

To view descriptions for all status symbols, and to review the full historical record of the gauging stations (streamflow and salinity), please visit the *Water Resource Assessments* page at http://www.waterconnect.sa.gov.au.

Further information may be found among the Frequently Asked Questions on the *Water Resource Assessments* page of www.waterconnect.sa.gov.au.

Rainfall data used in this report are sourced from the SILO interpolated point and gridded datasets, which are calculated from Bureau of Meteorology daily and monthly rainfall measurements and are available online at https://legacy.longpaddock.qld.gov.au/silo/.

To view the *Barossa PWRA Surface water status report 2010–11*, which includes background information on rainfall, streamflow, salinity, water extraction and relevant water-dependent ecosystems, please visit the *Water Resource Assessments* page on http://www.waterconnect.sa.gov.au.

Streamflow and salinity data are available via Water Connect at http://www.waterconnect.sa.gov.au.

For further details about the *Barossa PWRA*, please see the *Water Allocation Plan* for the Barossa PWRA on the Natural Resources Adelaide and Mount Lofty Ranges site at https://www.naturalresources.sa.gov.au/adelaidemtloftyranges/water/water-planning/water-allocation-planning/barossa.

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