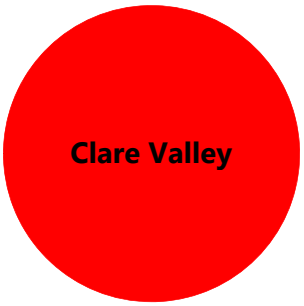
Clare Valley Prescribed Water Resources Area

2018 Surface water status report

Government of South Australia
Department for Environment and Water

2018 Status summary
Clare Valley PWRA



The Clare Valley at a whole PWRA scale is assigned a ***red*** surface water status for 2018, with streamflow being much lower than the average observed for the region.

Red status means that the total annual streamflow was below the 25th percentile[1] of the period of data availability.

The status presented is based on the combined streamflow recorded at the Wakefield, Hutt and Hill Rivers gauging stations. The percentile range of all three stations used to inform the status can be seen in Figure 6.

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	Clare (Calcannia) rainfall station (M021075) Reporting period: 1970–71 to 2017–18, in line with streamflow data availability
Annual total [2]	439 mm This was 106 mm below the average annual rainfall of 546 mm (1970–71 to 2016–17).
Monthly rainfall summary	In August and December 2017, as well as May 2018, the Clare rainfall station recorded higher than the average monthly rainfall. Lower than average conditions were recorded in the autumn months of 2018. The rainfall trends observed at the Clare rainfall station are consistent with the nearby Watervale rainfall station (M021054).
Spatial distribution	Spatial distribution of rainfall across the region over the past five years indicates a similar spatial rainfall pattern to the average annual rainfall (1900–2018), although the higher rainfall band 600-700 mm covers a smaller area in the central zone of the Prescribed Water Resources Area (PWRA). The spatial distribution of rainfall during 2017–18 indicates a decrease in the total rainfall across the Clare PWRA when compared with the 5-year average (2013–14 to 2017–18) and average annual rainfall patterns. Parts of the southern and eastern PWRA experienced a total annual rainfall between 300-400 mm.
Rainfall trend	Long-term trend – Annual rainfall recorded at the Clare rainfall station is stable. Short-term trend – A decreasing rainfall trend was observed over the past 5 years primarily in response to lower than average rainfall experienced in 2014–16 and 2017–18.

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

Streamflow

Figures 2 and 6

Streamflow gauging stations	Wakefield River (A5060500) gauging station is located at the downstream outlet of the PWRA. Hill River (A5070500) and Hutt River (A5070501) gauging stations are located outside the Clare Valley PWRA but provide representative data for the region and are used to inform the regional streamflow status. Streamflow data availability: 1970–71 to 2017–18
Annual total[2]	in 2017–18, all gauging stations showed recorded streamflow below the average annual streamflow. The flow record for the Hill (A5070500) and Hutt (A5070501) Rivers provide representation of the hydrology for the whole upstream catchment area, some of which is located outside the PWRA.

	Average annual streamflow (1970–71 to 2017–18) (ML)	2017–18 Streamflow (ML)	Percentile rank
Wakefield River	7846	1862	36th
Hill River	3977	445	11th
Hutt River	6169	493	11th

Monthly streamflow summary	Drier than average flows were recorded in all months at the three representative gauging stations. There was minimal or no flow recorded at the Hill and Hutt River gauging stations between November 2017 and June 2018. In comparison, flow was recorded in all months on the Wakefield River.
Streamflow trend	Long-term trend – Annual streamflow volume recorded at the Wakefield River gauging station indicates a declining long-term trend, with similar trends being observed at both the Hill and Hutt River gauging stations. Short-term trend – The last five years of streamflow on the Hutt and Wakefield River indicate an increasing trend primarily 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): 1043 ML (compared to 1615 ML in 2016–17) Non-licensed water demand (stock and domestic): 675 ML (non metered and estimated at 30% of dam capacity) Imported water: 717 ML (compared to 309 ML in 2016–17). The Clare Valley Water Supply Scheme (WSS) brings treated water from the River Murray for municipal water supply and irrigation of high value crops (e.g. wine grapes).
Resorce volume[2]	Total resource volume: 3844 ML: • Streamflow calculated for the Clare Valley PWRA from the streamflow records in the region: 2126 ML • Surface water extraction (licensed and non-licensed): 1718 ML. Surface water extraction was approximately 45% of the total resource volume (compared to 4% in 2016–17). The average for 2006–2018 was 34%.

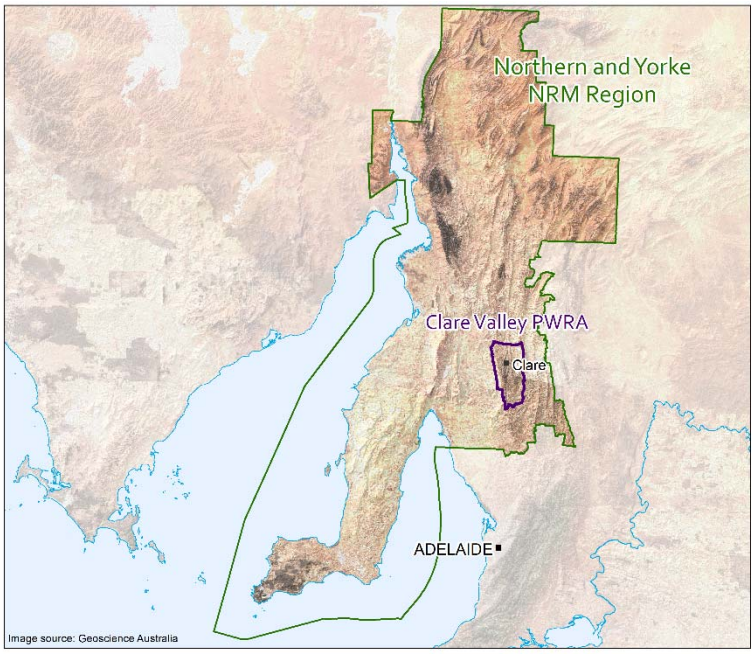
Surface water salinity

Figure 4

Salinity monitoring	Skillogalee Creek gauging station (A5061008) – data available from 2005 Wakefield River gauging station (A5060500) – data available from 2005
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.
Salinity: 2017–18 water-use year[2]	Highest salinity recorded at Skillogalee Creek: 2303 mg/L Highest salinity recorded at Wakefield River: 4792 mg/L
Salinity: 2005–06 to 2017–18	Skillogalee Creek: 92% of salinity data is less than 2500 mg/L. Wakefield River was comparably more saline with 72% of salinity values between 2500-4000 mg/L. Salinity levels peaked in the Wakefield River during the millennium drought in early 2008, the result of many years of below average streamflow. The 5-year moving averages show an overall stable trend in salinity at Skillogalee Creek and Wakefield River.

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

Regional setting



The Clare Valley PWRA is located approximately 100 km north 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) adopted in 2009 provides for the sustainable management of these water resources.

The topography, characterised by hills and valleys, essentially divides the area into a northern half, comprising part of the Broughton River catchment that drains to Spencer Gulf near Port Pirie and a southern half, comprising part of the Wakefield River catchment that drains to Gulf St Vincent near Port Wakefield. The main watercourses that drain to the north are the ephemeral Hill and Hutt Rivers, while Wakefield River is the main ephemeral watercourse draining to the south. Many permanent pools, primarily sustained by groundwater, occur along these ephemeral watercourses.

Surface water resources are highly dependent on rainfall, with trends in streamflow and salinity primarily climate driven, i.e. below-average winter rainfall results in a reduction in annual streamflow volumes. Below-average summer rainfall can also result in increased irrigation extractions, and these two elements can cause salinities to increase by reducing the amount of streamflow available to dilute salts. Conversely, increased rainfall results in increased streamflow volumes and decreased irrigation extractions, and as a result salinities may stabilise or decline.

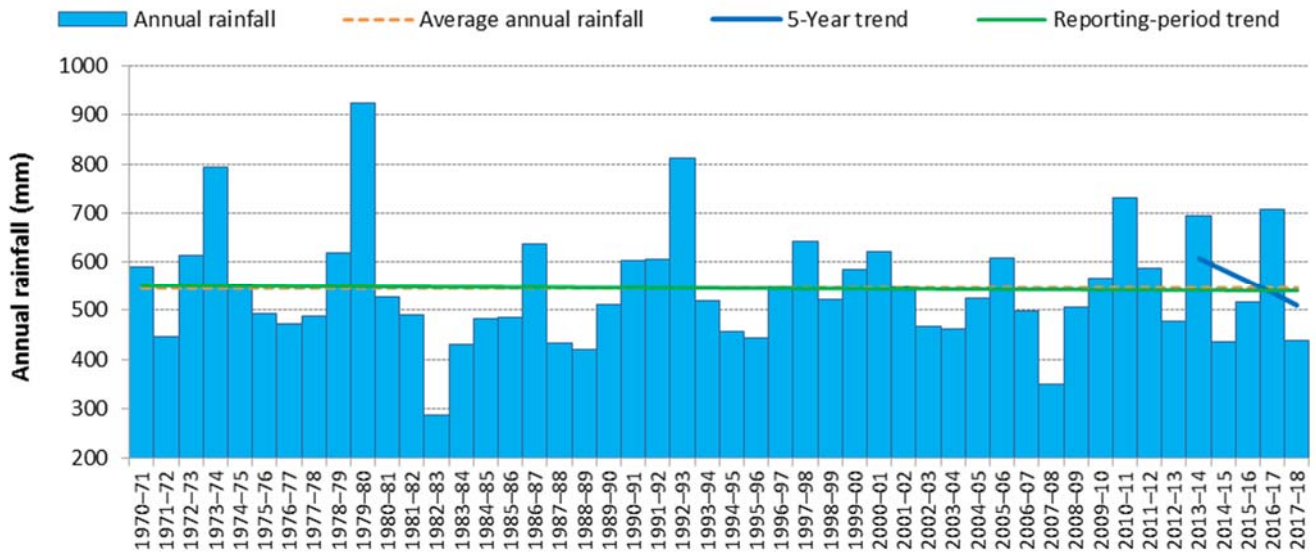


Figure 1. Annual rainfall for 1970–71 to 2017–18 at Clare (Calcannia) rainfall station (M021075)

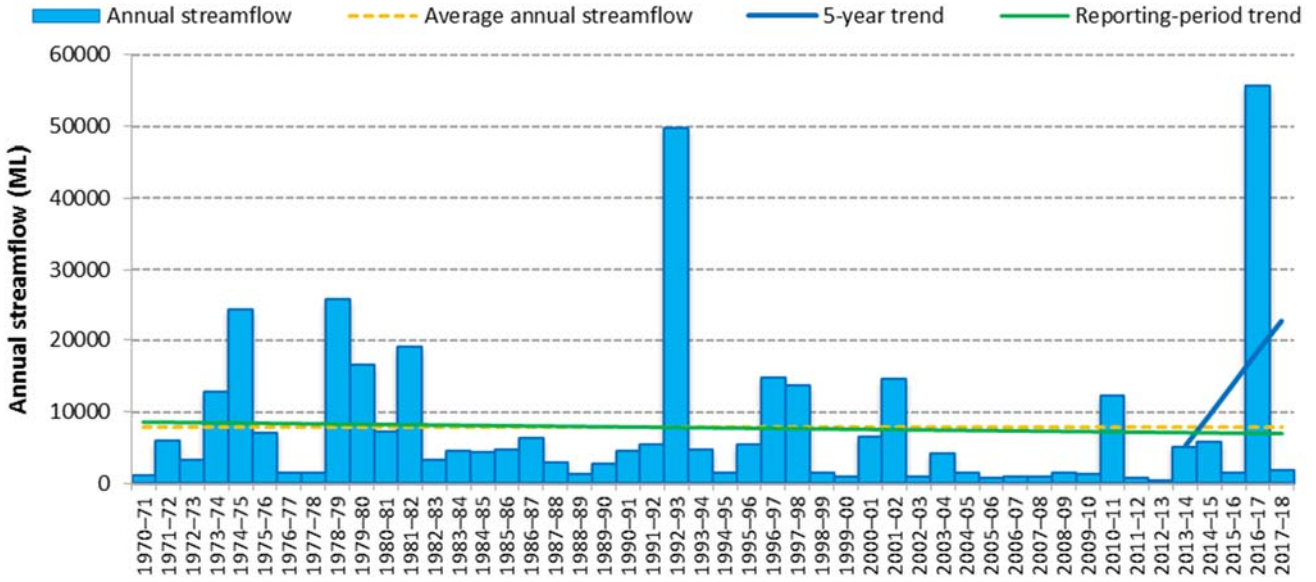


Figure 2. Annual streamflow for 1970–71 to 2017–18 at Wakefield River gauging station (A5060500)

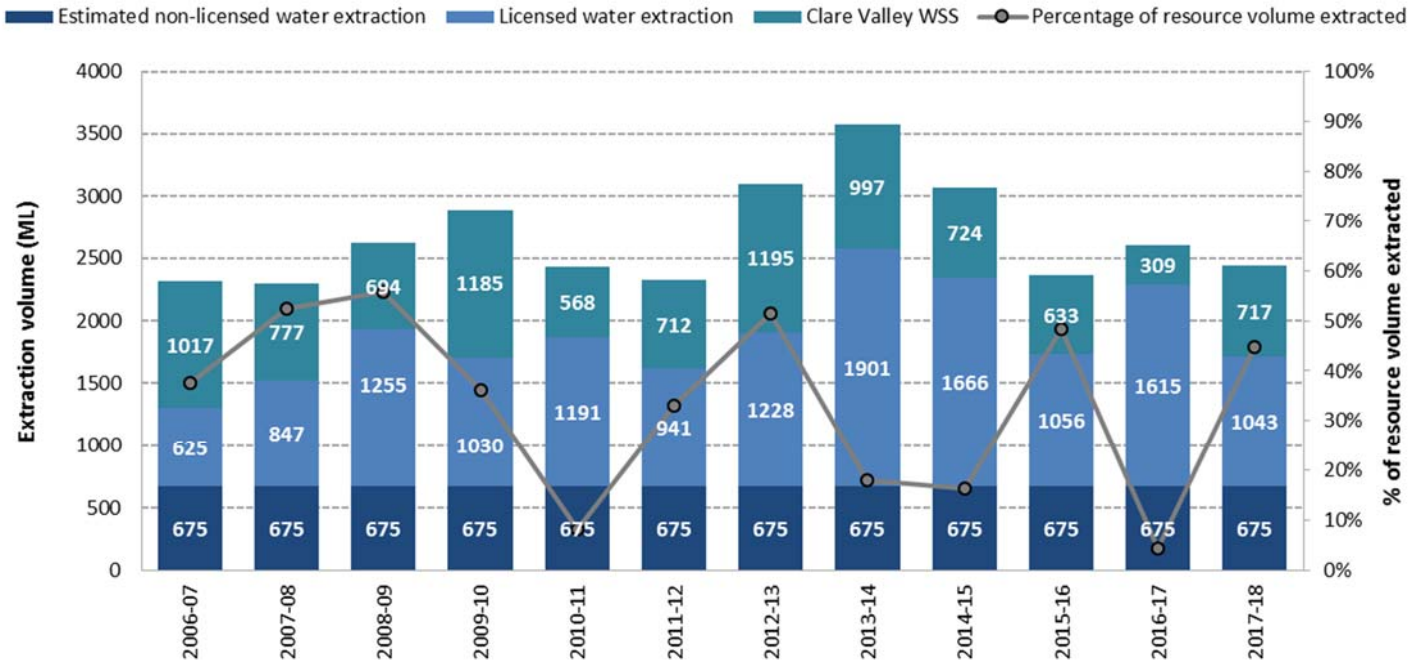


Figure 3. Surface water extraction for 2006–07 to 2017–18 for the Clare Valley PWRA

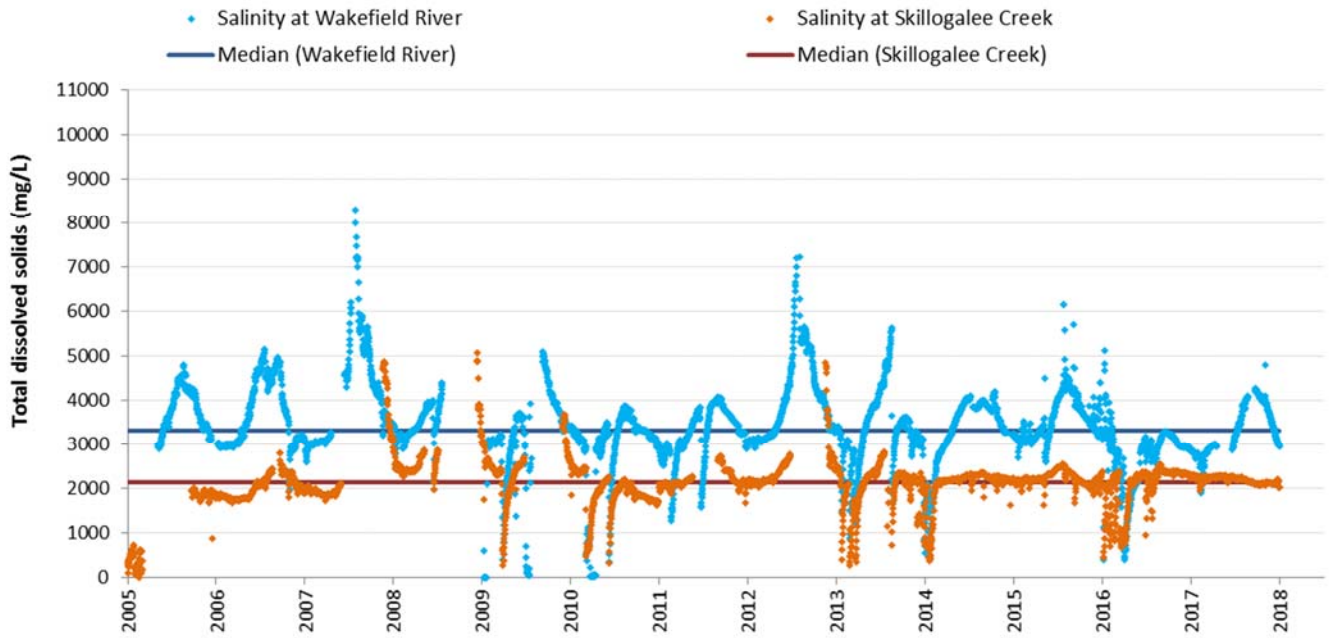


Figure 4. Salinity data for 2005 to 2018 at the Wakefield River (A5060500) and Skillogalee Creek (A5061008) gauging stations

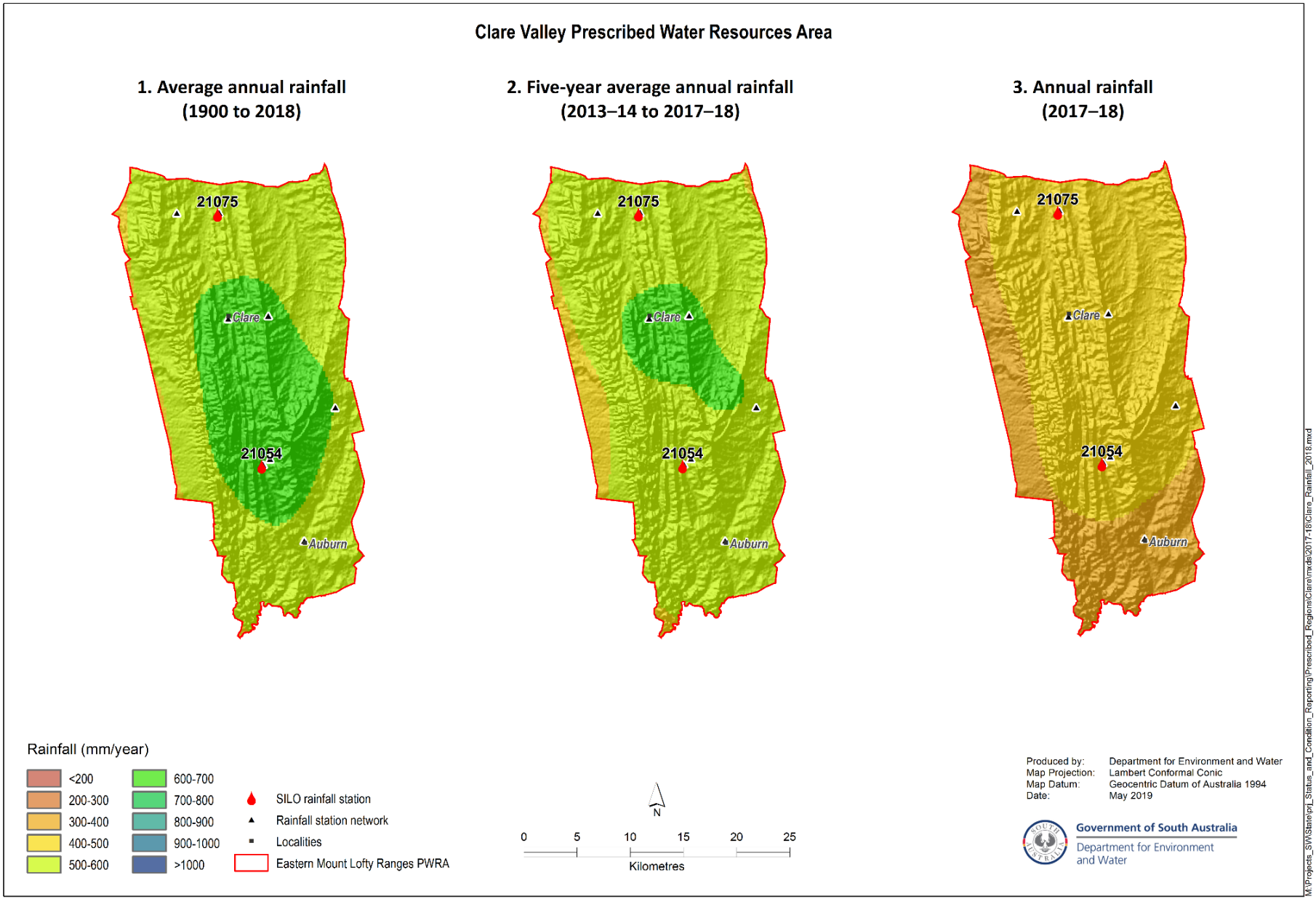


Figure 5. (1) Average annual rainfall (2) five-year average annual rainfall and (3) annual rainfall for 2017–18 in the Clare Valley PWRA[3]

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

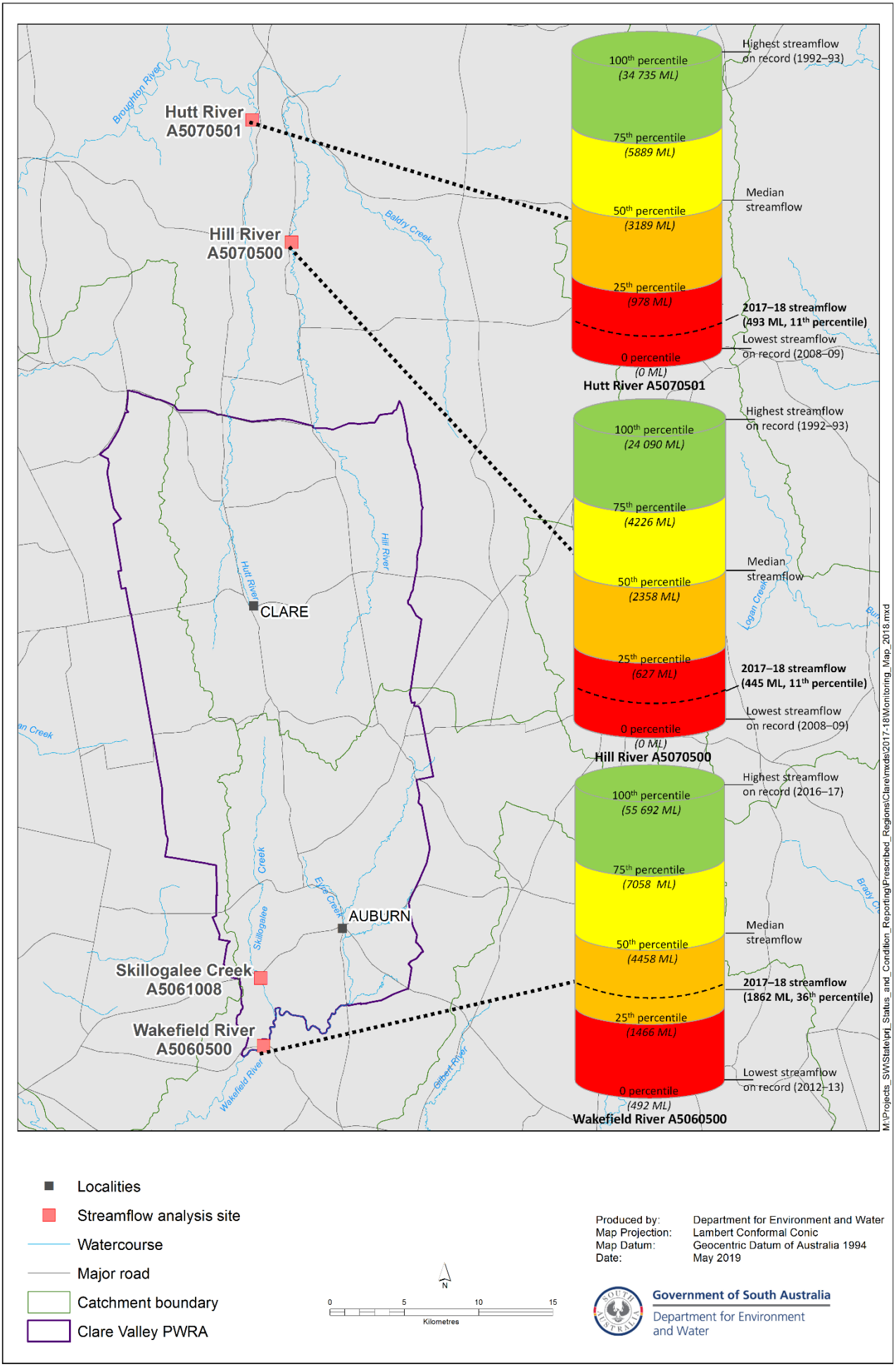


Figure 6. Streamflow gauging stations and streamflow percentiles in the Clare Valley PWRA

More information

The status of the Clare Valley PWRA was determined by expressing the combined annual streamflow for 2017–18 from three gauging stations (Wakefield, Hutt and Hill Rivers) as a percentile of the total combined annual streamflow for the period (1970–71 to 2017–18).

The total 2017–18 streamflow from the combined gauging stations (2799 ML) represents the 21st percentile, i.e. 21% of the annual streamflow totals 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 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 *Clare Valley 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 www.waterconnect.sa.gov.au.

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

For further details about the *Clare Valley PWRA*, please see the *Water Allocation Plan* for the Clare Valley PWRA on the Natural Resources Northern and Yorke site at https://www.naturalresources.sa.gov.au/northernandyorke/home.

Published by the Department for Environment and Water.
Government of South Australia
July 2019

Head Office
Level 7
81-95 Waymouth St
ADELAIDE SA 5000

Telephone +61 (8) 8463 6946
Facsimile +61 (8) 8463 6999

ABN 36702093234
ISBN 978-1-925805-60-4

Report prepared by:
Department for Environment and Water
Water Science and Monitoring Branch
Strategy, Science and Corporate Services Directorate

www.environment.sa.gov.au

Preferred way to cite this publication

DEW, 2019, *Clare Valley Prescribed Water Resources Area 2018 surface water status report*, Government of South Australia, Department for Environment and Water, Adelaide.

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