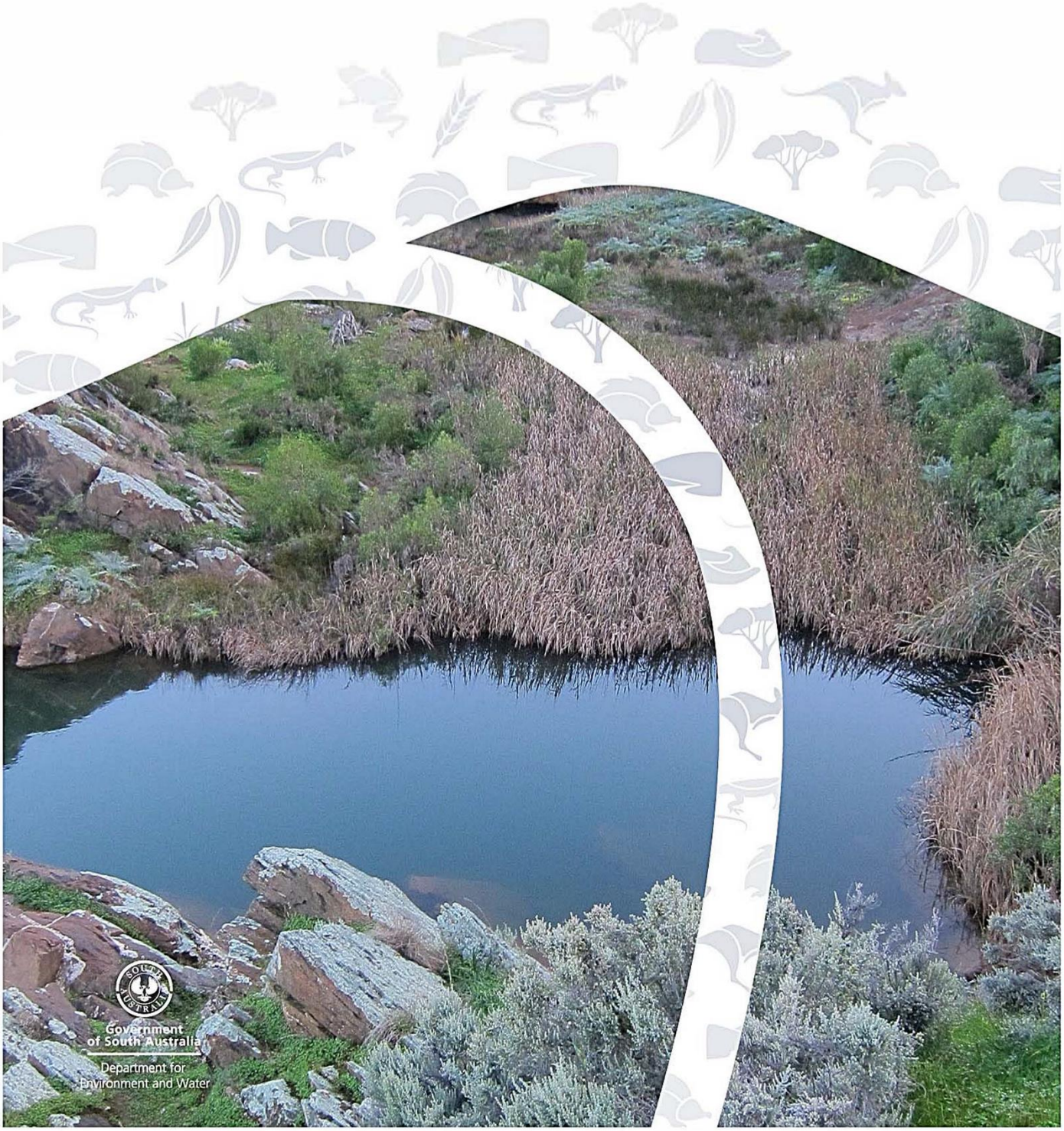
Clare Valley Prescribed Water Resources Area

2017 Surface water status report



Department for Environment and Water
GPO Box 1047, Adelaide SA 5001

Telephone	National	(08) 8463 6946
	International	+61 8 8463 6946
Fax	National	(08) 8463 6999
	International	+61 8 8463 6999
Website	www.environment.sa.gov.au	

ISBN 978-1-925805-32-1

Preferred way to cite this publication

DEW, 2018, *Clare PWRA 2017 surface water status report*, Government of South Australia, Department for Environment and Water, Adelaide.

Download this document at www.waterconnect.sa.gov.au

2017 Status summary
Clare Valley PWRA

The Clare Valley at a whole PWRA scale is assigned a ***green*** surface water status for 2017, a wet year, with streamflow being much higher than the average observed for the region.

Green status means that the total annual streamflow was above the 75th 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 less than this value. 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.

Rainfall

Figure 1 and 5

Rainfall station	Clare (Calcannia) rainfall station (M021075), located approximately 9 km north of Clare Reporting period: 1970/71-2016/17, in line with streamflow data availability
Annual total [2]	708 mm 157 mm above the average annual rainfall of 551 mm (1889/90-2016/17)
Monthly rainfall summary	July, September, December 2016, January, February and April 2017 all received higher than the average monthly rainfall. September to November rainfall accounted for approximately 40% of the total annual rainfall during 2016/17. September recorded almost 3 times the average monthly rainfall (188 mm compared to 65 mm) Drier than average conditions were recorded in the autumn months of 2017 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 rainfall pattern to the average annual rainfall. The spatial distribution of rainfall during 2016/17 indicates an increase in the total rainfall across the Clare PWRA when compared with the 5-year average and average annual rainfall patterns Parts of the central and southern area of the PWRA experienced a total annual rainfall over 800 mm
Rainfall trend	Long-term trend - Annual rainfall volumes recorded at the Clare (Calcannia) rainfall station are stable Short-term trend - An increasing rainfall trend was observed over the past 5 years, primarily in response to the high rainfall in 2016/17

[2] For the water-use year 1 July 2016 to 30 June 2017

Streamflow

Figure 2 and 6

Streamflow gauging stations	Wakefield River (A5060500) gauging station (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 records for the region and are used to inform the regional streamflow status. Streamflow data availability: 1970/71-2016/17
Annual total [2]	All gauging stations analysed recorded streamflow above the average annual streamflow in 2016/17, with the Wakefield River (A5060500) station recording the highest flow on record. The flow record for the Hill (A5070500) and Hutt (A5070501) Rivers are representative of the entire catchment upstream of the gauging station, some of which is located outside the PWRA

	2016/17 streamflow (ML)	Average annual streamflow (1977-2016) (ML)	Percentile Rank
Wakefield River	55 692	6936	100th
Hill River	10 803	3905	87th
Hutt River	33 248	5704	98th

Monthly streamflow summary	Large streamflow in September and October 2016 due to higher rainfall conditions. September experienced flows almost 7 times the average monthly total and October 3 times larger. In comparison, lower than average streamflow was experienced between November 2016 and June 2017
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 Wakefield River indicate an increasing trend as a result of the high rainfall experienced in 2016/17

Water use

Figure 3

Surface-water use data[2]	Licensed surface water sources (dams and watercourses): 1615 ML (compared to 1056 ML in 2015/16). Non-licensed water demand (stock and domestic): 675 ML (non metered and estimated at 30% of dam capacity) Imported water: 309 ML. The Clare Valley Water Supply Scheme brings treated water from the River Murray for municipal water supply and irrigation of high value crops (e.g. wine grapes)
Resource Volume[2]	Total resource volume: 80 147 ML • Streamflow calculated for the Clare Valley PWRA from the streamflow records in the region: 78 000 ML. • Surface water extraction (licensed + non-licensed): 2290 ML. Surface water extraction was approximately 4% of the total resource volume (compared to 62% in 2015/16)

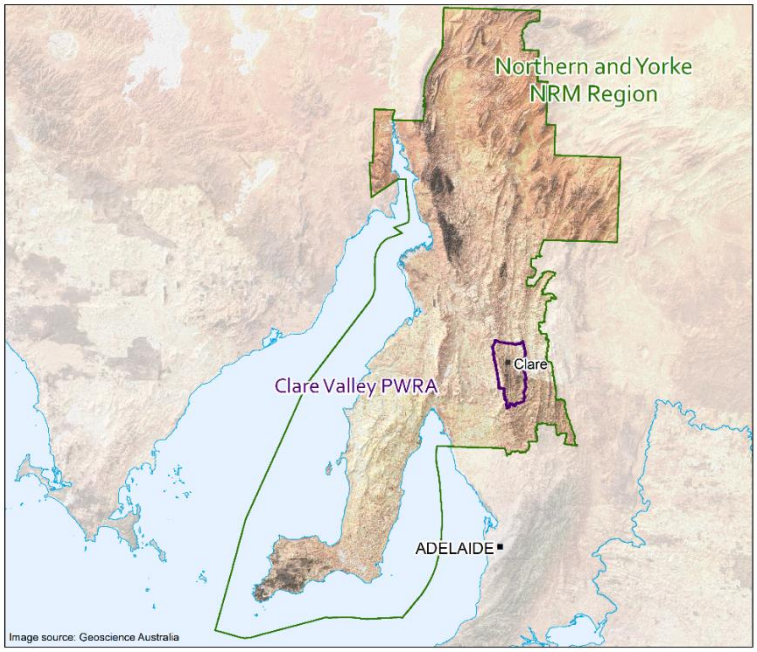
Surface water salinity

Figure 4

Salinity monitoring	Skillogalee Creek (A5061008) and Wakefield River (A5060500) gauging stations
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 – 2016/17 water-use year[2]	Highest salinity recorded at Skillogalee Creek: 2559 mg/L Highest salinity recorded at Wakefield River 5112 mg/L
Salinity - 2005/06–2016/17	Skillogalee Creek: 92% of salinity data is less than 2500 mg/L Wakefield River is 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 2016 to 30 June 2017

Regional setting



The Clare Valley Prescribed Water Resources Area (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, decreased irrigation extractions and salinities may stabilise or decline.

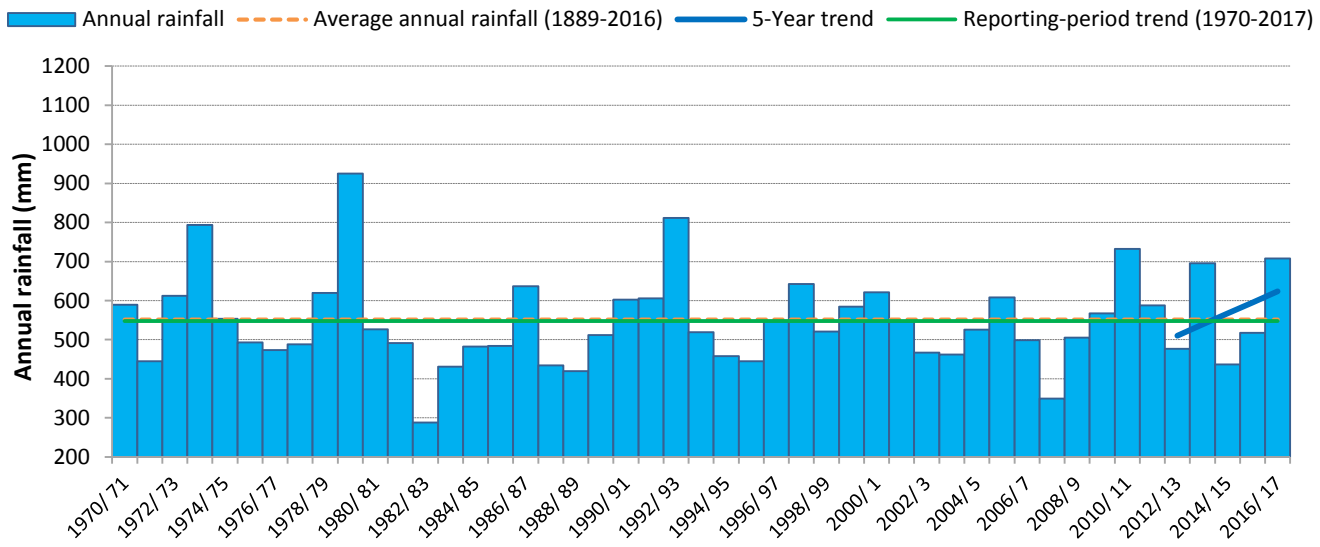


Figure 1. Annual rainfall (mm) for 1970/71–2016/17 at Clare (Calcannia) rainfall station (M021075)

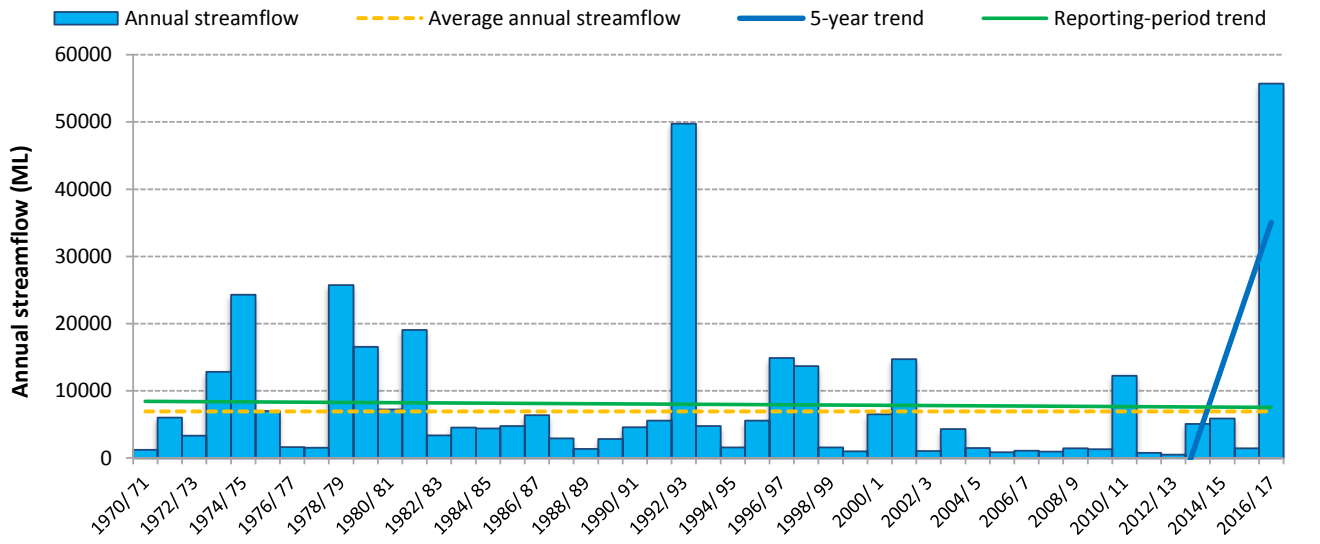


Figure 2. Annual streamflow (ML) for1970/71–2016/17 at Wakefield River gauging station (A5060500)

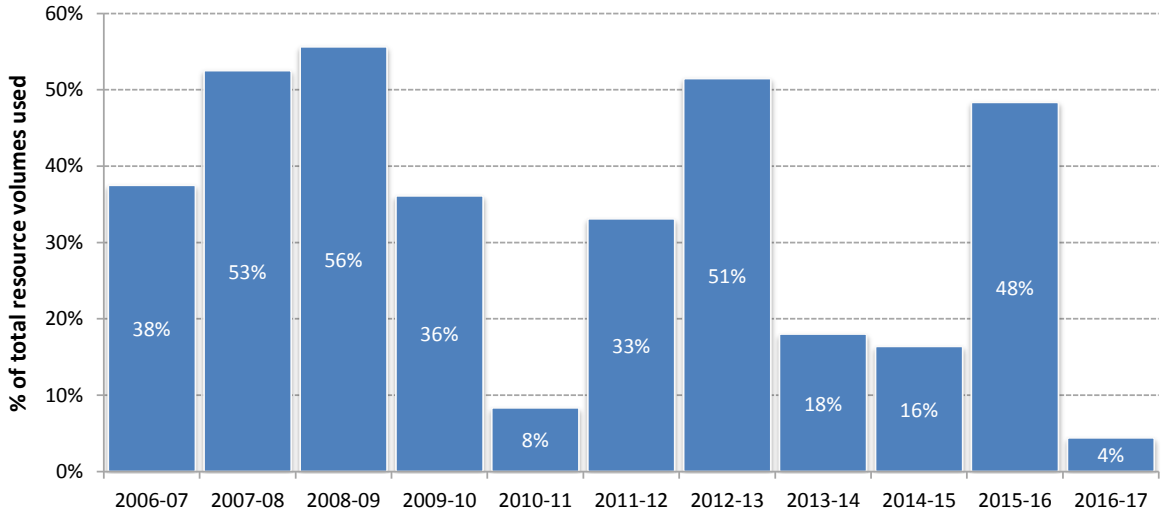


Figure 3. Surface water use as a percentage of total resource volume available for 2006/07–2016/17 for the Clare Valley PWRA

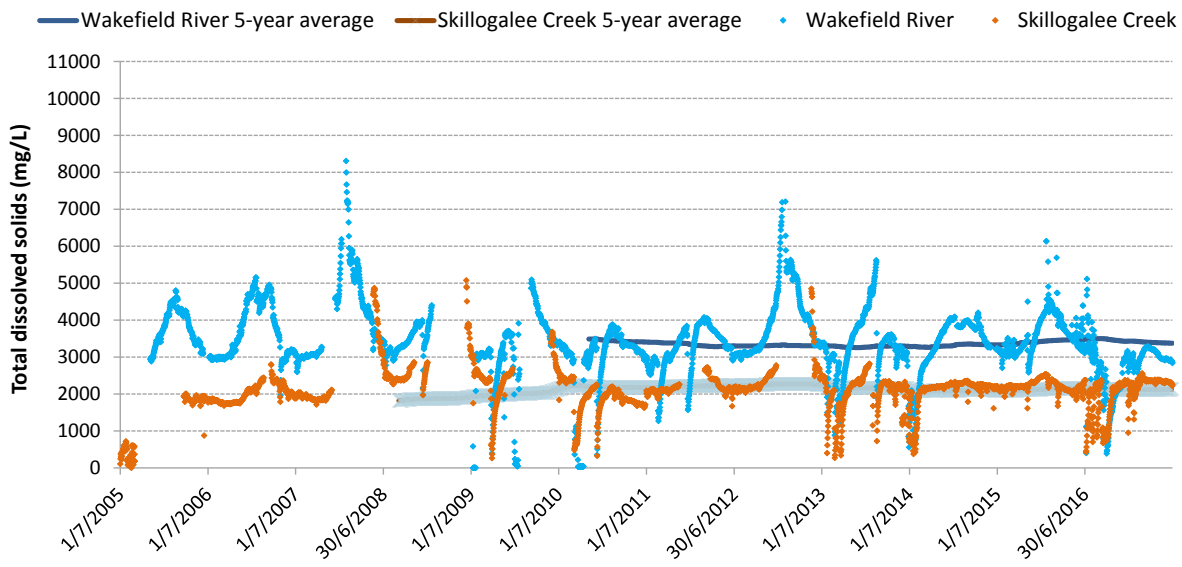


Figure 4. Salinity data (TDS mg/L) for 2005/06–2016/17 at the Wakefield River (A5060500) and Skillogalee Creek (A5061008) gauging stations

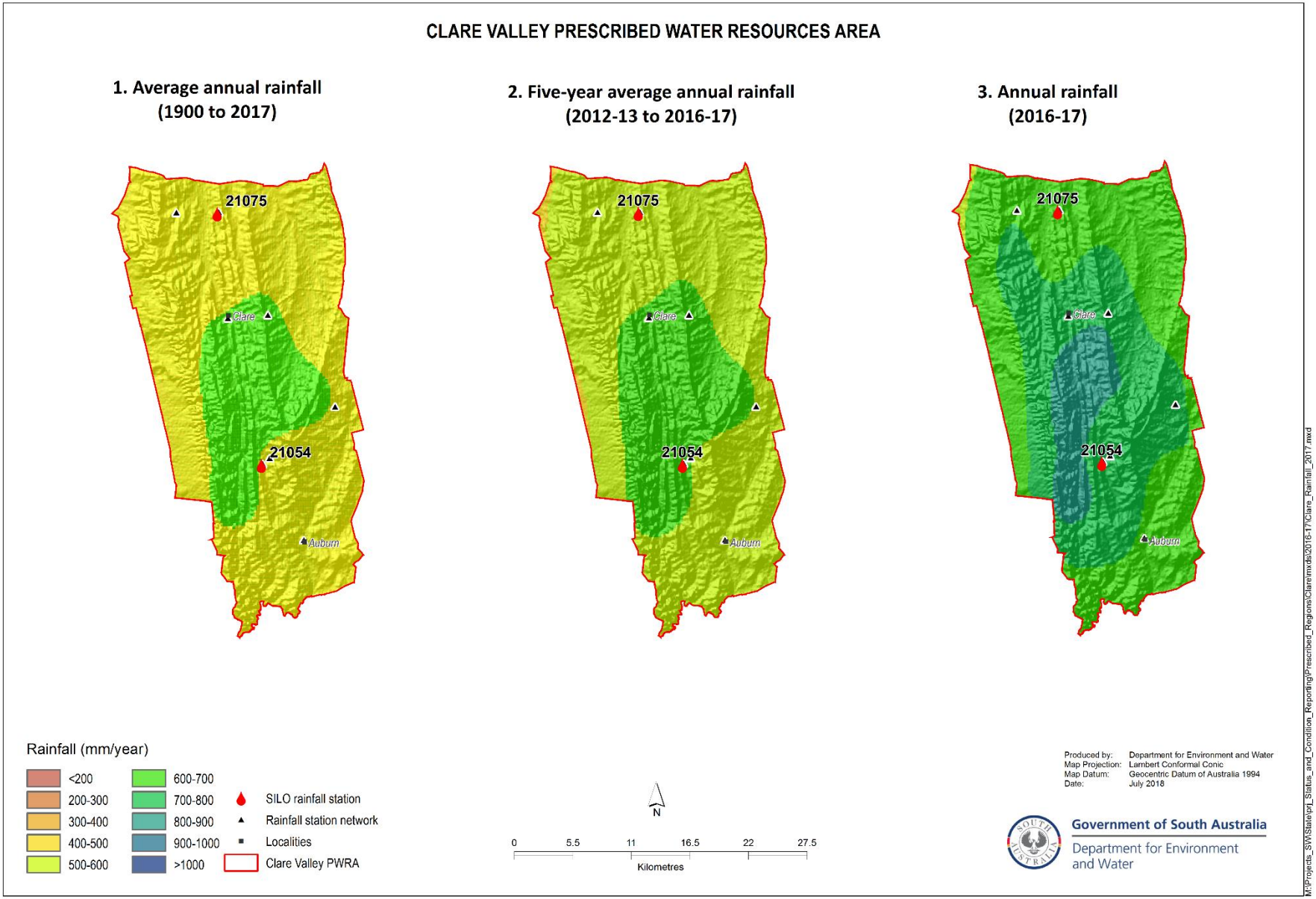


Figure 5. (1) Average annual rainfall (1900–2017) (2) five-year average annual rainfall and (3) annual rainfall for the 2016/17 in the Clare Valley PWRA[3]

[3] Data sources: SILO Patched Point Dataset https://legacy.longpaddock.qld.gov.au/silo/ and BoM Australian Water Availability Project (http://www.bom.gov.au/jsp/awap/)

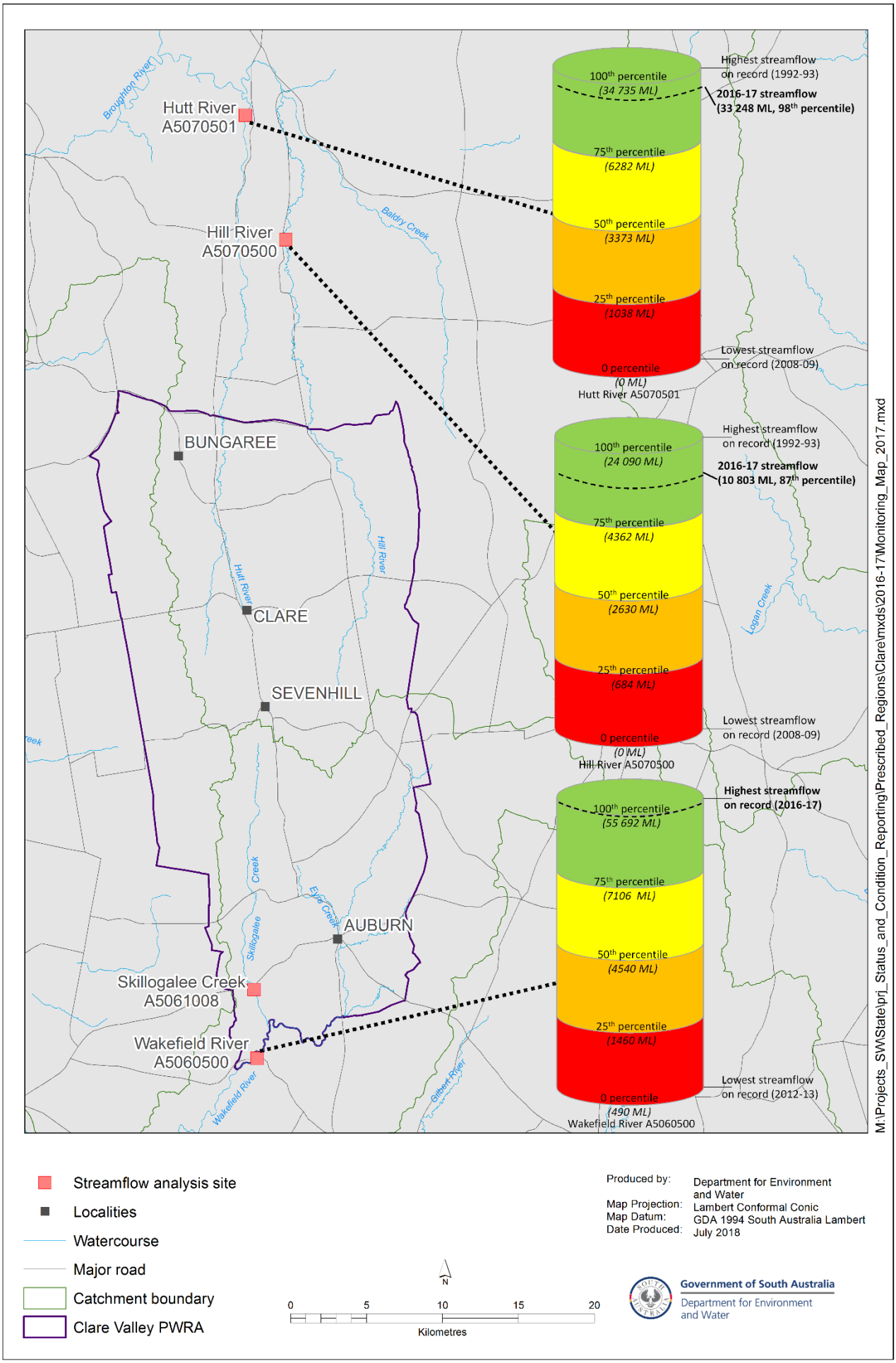


Figure 6. Streamflow gauging stations and streamflow percentiles in the Clare Valley PWRA

More information

The status of the Clare Valley PWRA was determined by expressing the combined annual streamflow for 2016/2017 from three gauging stations (Wakefield, Hutt and Hill Rivers) as a percentile of the total combined annual streamflow for the period (1970/71–2016/17).

The total 2016/17 streamflow from the combined gauging stations (99 743 ML) represents the 98th percentile, i.e. 98% of the annual streamflow totals were less than the streamflow observed in 2016/17.

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 on WaterConnect.

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 is sourced from the SILO Patched Point Dataset, which uses original Bureau of Meteorology daily rainfall measurements and is available online at https://legacy.longpaddock.qld.gov.au/silo/. Rainfall maps have been compiled using daily gridded data produced by the BoM Australian Water Availability Project (http://www.bom.gov.au/jsp/awap/).

To view the *Clare Valley PWRA Surface water status report 2010–11*, which includes background information on rainfall, streamflow, salinity, water use and relevant water-dependent ecosystems, please visit the *Water Resource Assessments* page on WaterConnect

Streamflow and salinity data are available via WaterConnect: 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 website.

Government of South Australia

Department for Environment and Water

Published 2018 | FIS 94502
www.environment.sa.gov.au