Clare Valley Prescribed Water Resources Area

2016 Surface water status report

Government of South Australia
Department of Environment, Water and Natural Resources

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This document is available online at www.waterconnect.sa.gov.au/Systems/GSR/Pages

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

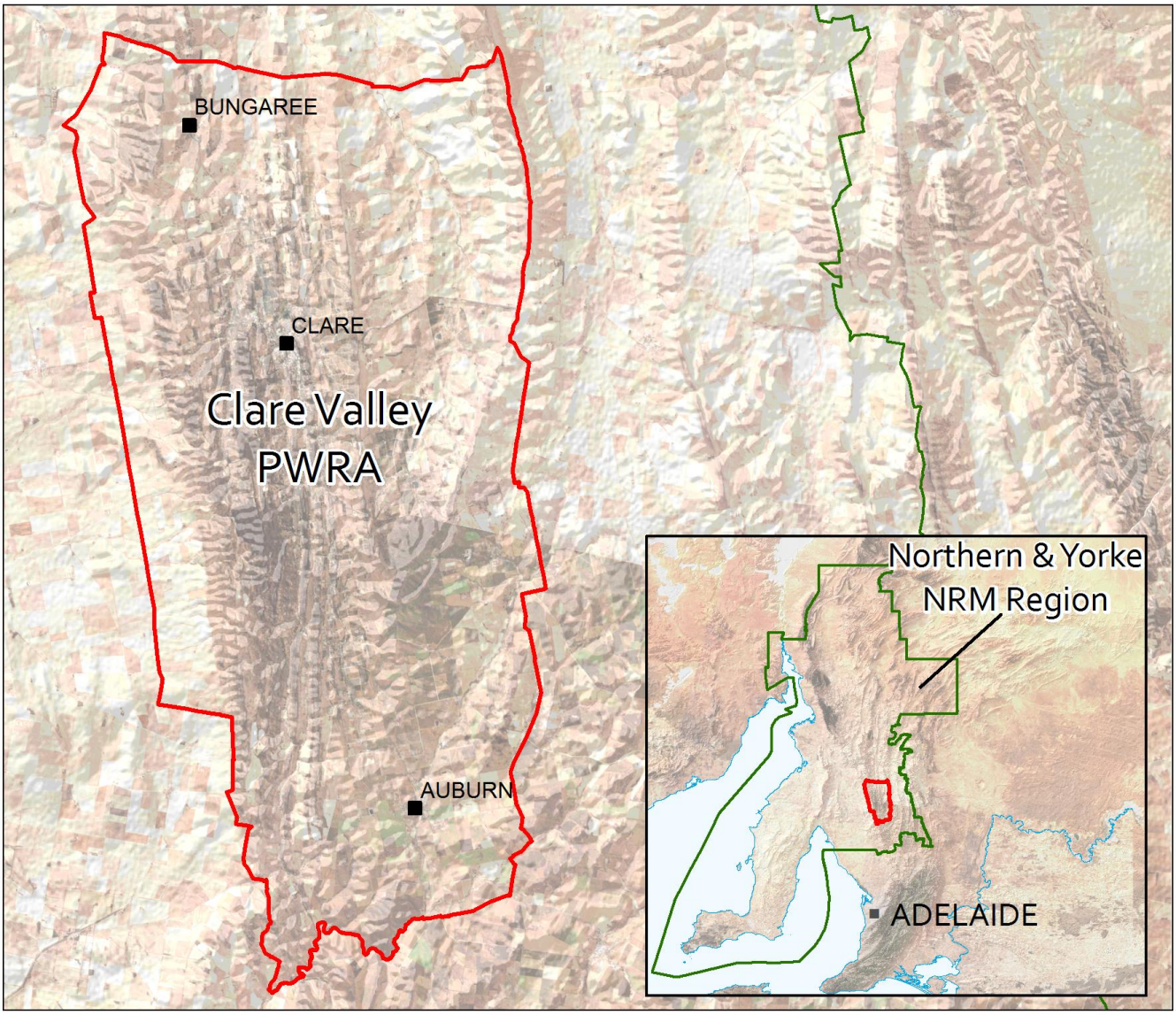
For further details about the *Clare Valley PWRA*, please see the *Water Allocation Plan* for the Clare Valley PWRA on the Natural Resources Northern and Yorke website

Gridded rainfall data was sourced from the Bureau of Meteorology (BoM). Station rainfall data was sourced from the Scientific Information for Land Owners database (SILO) and is Patched Point Data. Further information on SILO climate data is available at: http://www.longpaddock.qld.gov.au/silo/index.html

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

To view descriptions for all status symbols, please visit WaterConnect

CLARE VALLEY PWRA



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) developed by the Northern and Yorke Natural Resources Management Board and adopted in 2009, seeks to provide for 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.

2016 Status

The Clare Valley at a whole PWRA scale is assigned a ***red*** surface water status for 2016 based on the status of total streamflow recorded at the Hill, Hutt and Wakefield River gauging stations:

'Annual streamflow was below the 25th percentile (%ile) of the period of record'

The percentile range of all three streamflow gauging stations used to inform 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.

Rainfall

The Clare (Calcannia) rainfall station (M021075) is located 9 km north of the township of Clare and is representative of the regional rainfall in the Clare PWRA (Figure 5). Annual rainfall totalled 517 mm during the 2015/16 water-use year, 38 mm below the long-term average (Figure 1).

Total annual rainfall was greater than the previous year, with November and January receiving approximately double the long-term average monthly rainfall. The region also received higher than average rainfall during March, May and June, accounting for approximately 40% of the total annual rainfall during the 2015/16 period. The rainfall trends observed at the Clare rainfall station are consistent with the nearby Watervale rainfall station (M021054).

Spatial distribution of rainfall over the past five years (Figure 5-2) show higher variability occurring in the southern and central parts of the region, with the 5-year average generally less than the long-term average (Figure 5-1). The spatial distribution of rainfall across the PWRA during 2015/16 (Figure 5-3) is consistent of with the long term pattern. However, a slight contraction in the proportion of the region receiving more than 600 mm/year rainfall is evident, while a reduction in annual rainfall along the eastern and western boundaries of the PWRA can be observed during this period.

Streamflow

The Wakefield River gauging station is the primary streamflow record for the Clare Valley PWRA, and is located at the bottom of the PWRA. This station has a large contributing catchment, much of which is outside the PWRA boundary. Streamflow gauging stations on the Hill and Hutt Rivers are located outside the Clare Valley PWRA but provide representative data records for the region and are also used to inform regional streamflow status (Figure 6). All gauging stations analysed within the PWRA recorded streamflow below the long-term average in 2015/16, with data for the individual catchments presented in Table 1.

Table 1: Clare Valley PWRA streamflow statistics

	Wakefield River	Hill River	Hutt River
2015/16 streamflow (ML)	1446	206	719
Long-term average streamflow (ML)	7058	3988	5815
Percentile Rank (%ile)	24th	2nd	20th

Streamflow during the 2015/16 period was lower than the previous water year across the PWRA despite experiencing higher rainfall conditions. Above average rainfall during autumn (2013/14) generated a large streamflow response at the beginning of 2014/15, which accounted for the majority of flow during the period of analysis. By comparison, below average winter rainfall resulted in lower than average streamflow during the beginning of the 2015/16 water-use year.

Water use

Surface water use in the Clare Valley PWRA includes allocated volumes for licensed extractions from dams and watercourses that are metered, estimated demand from non-licensed activities (generally stock and domestic dams), and metered data from the Clare Valley Water Supply Scheme. The latter brings treated water from the River Murray by SA Water for the purpose of municipal water supply and for irrigation of high value crops, including wine grapes. During 2015/16 this volume totalled 633 ML. Water use from licensed surface water sources totalled 1,056 ML in 2015/16.

Existing stock and domestic dams are not managed through the Clare Valley WAP, therefore an estimate is used to report on non-licensed water demand. Estimated non-licensed water demand is 675 ML and this volume equates to approximately 30% of the existing stock and domestic dam capacity. Recorded streamflow for the Clare Valley PWRA in 2015/16 was around 1850 ML (scaled to the PWRA), with approximately 1731 ML (sum of licensed and non-licensed extraction) recorded or estimated as being extracted.

The total resource capacity for the 2015/16 water-use year (excluding evaporation from farm dams) is estimated to be 3579 ML (1848 plus 1731 ML), with estimated 48% extracted for use (Figure 3).

Salinity

The Skillogalee Creek and Wakefield River gauging stations provide a good indication of salinity (Figure 4). Salinity increases during sustained summer events, while decreasing throughout the winter months as a result of higher diluting flow levels.

In the Skillogalee Creek, 90% of salinity data is less than 2500 mg/L, while the Wakefield River is comparably more saline with 72% of between 2500–4000 mg/L. Salinities 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 steady trend in salinity at Skillogalee Creek and Wakefield River (Figure 4).

Background information

The status of the Clare Valley PWRA was determined by expressing the combined annual streamflow for 2015/2016 from three gauging stations (Wakefield, Hutt and Hill Rivers) as a percentile of the total combined annual streamflow for the period (1970/71 to 2015/16).

The total 2015/16 streamflow from the combined gauging stations (2371 ML) represents the 16th percentile, i.e. only 16% of the long-term historic annual streamflow totals were less than the streamflow observed in 2015/16.

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

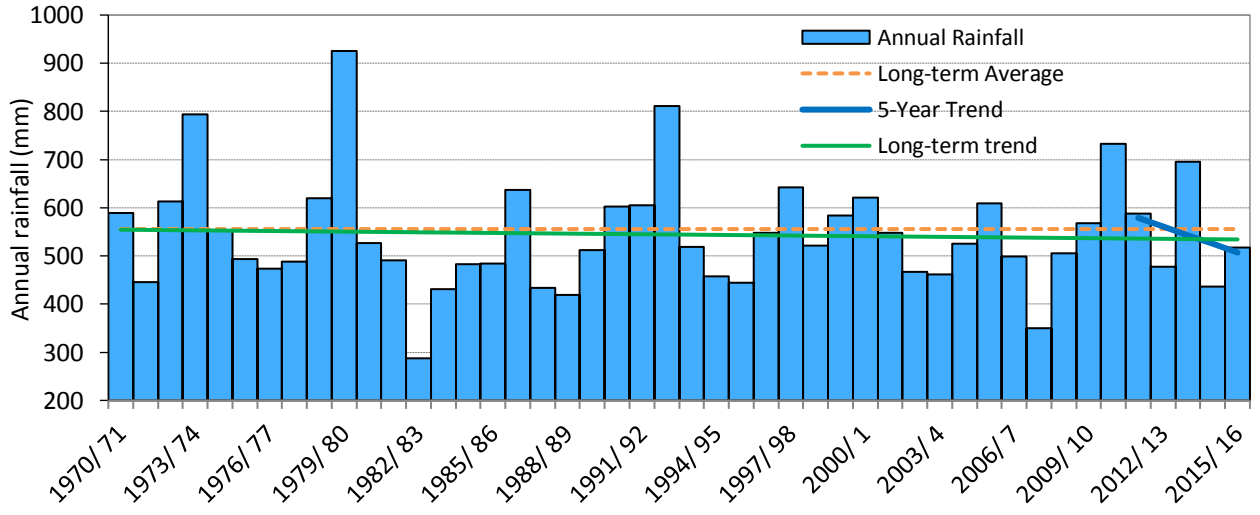


Figure 1. Annual rainfall (mm) for the 1970/71 to 2015/16 water-use years (July–June), the long-term trend and long-term average annual rainfall, and the short-term trend for the past five-years recorded at Clare (Calcannia) rainfall station (M021075)

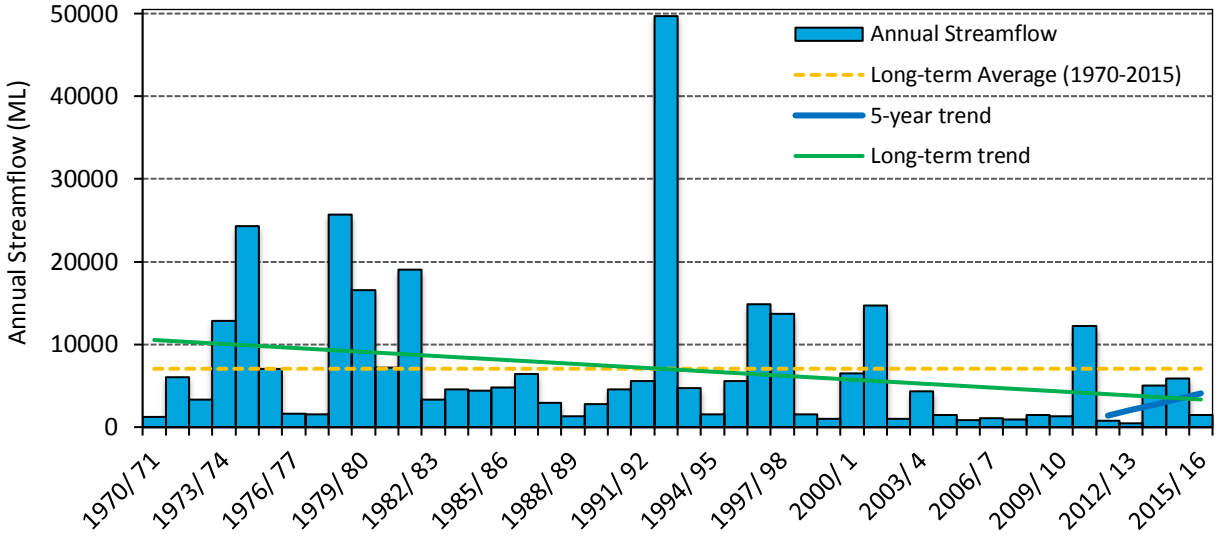


Figure 2. Annual streamflow (ML) for the 1970/71 to 2015/16 water-use years (July–June), the long-term trend and long-term average annual streamflow, and the short-term trend for the past five-years recorded at Hill River gauging station (A5070500)

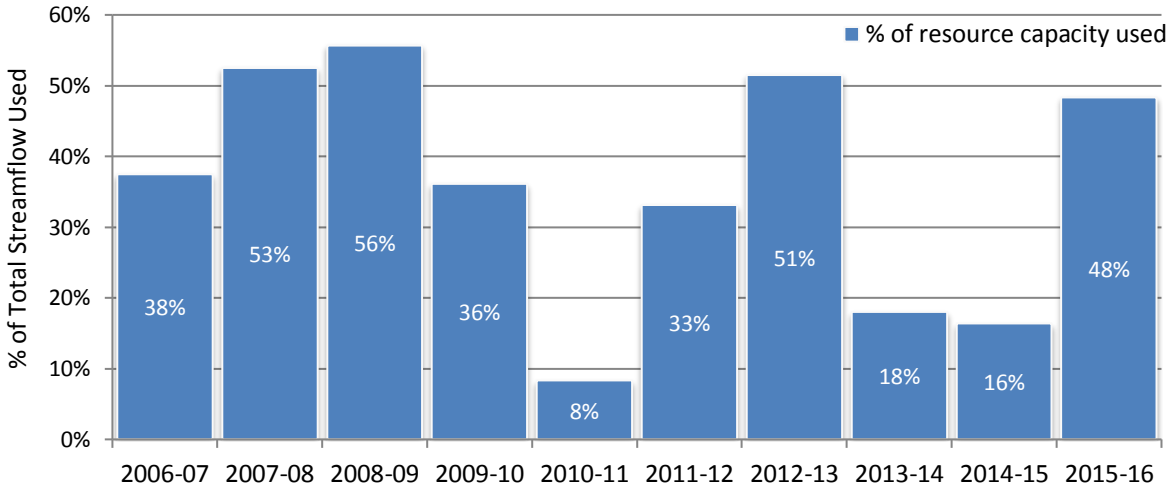


Figure 3. Surface water use as a percentage of total resource capacity available for the 2006/07 to 2015/16 water-use years for the Clare Valley PWRA

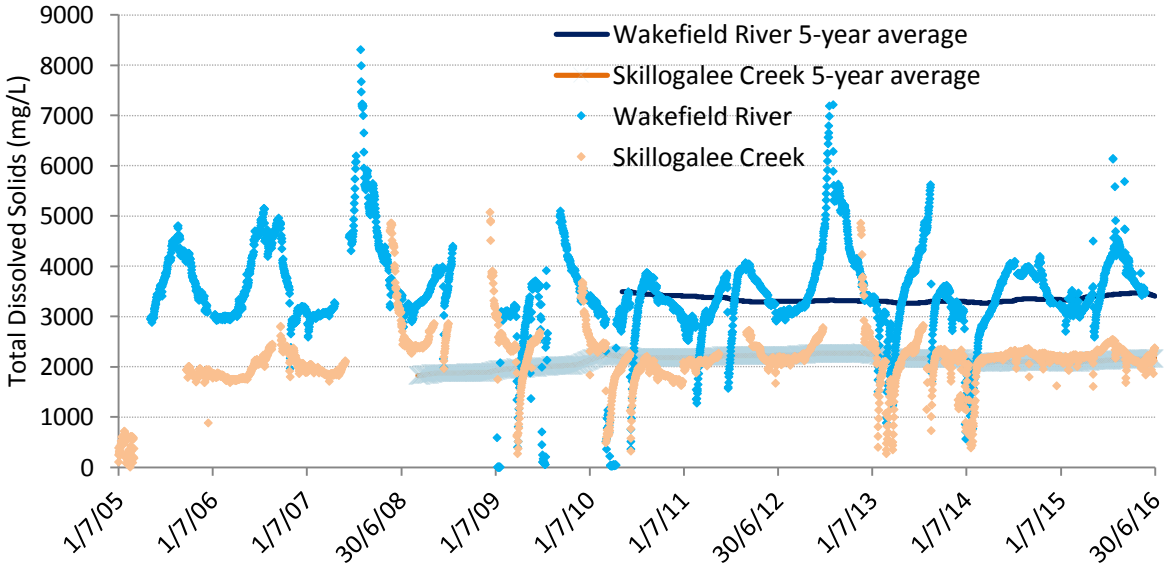


Figure 4. Salinity data (TDS mg/L) for the 2005/06 to 2015/16 water use years at Wakefield River (A5060500) and Skillogalee Creek (A5061008) gauging stations

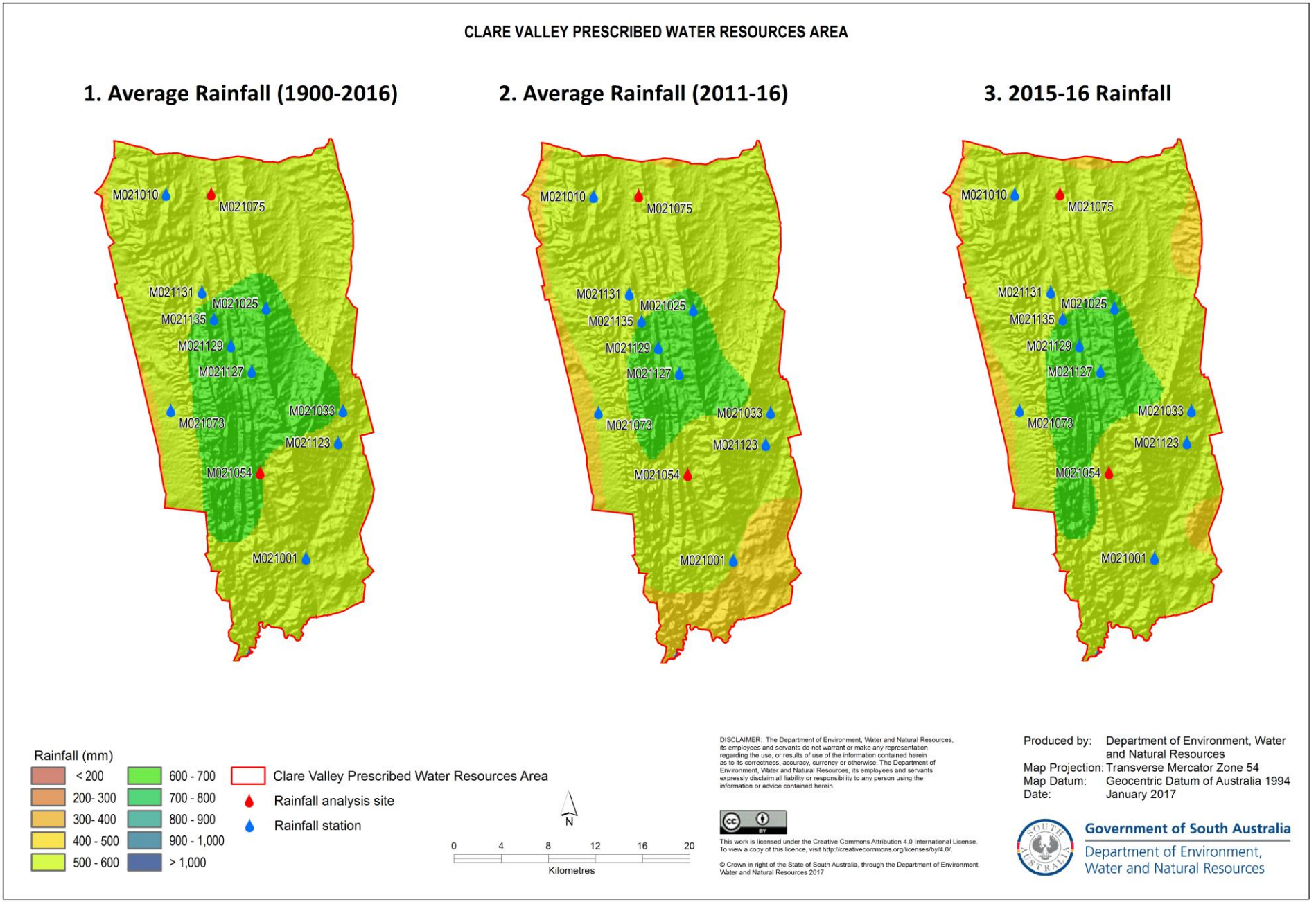


Figure 5. (1) Long-term and (2) five-year average annual rainfall and (3) annual rainfall for the 2015/16 water-use year in the Clare Valley PWRA

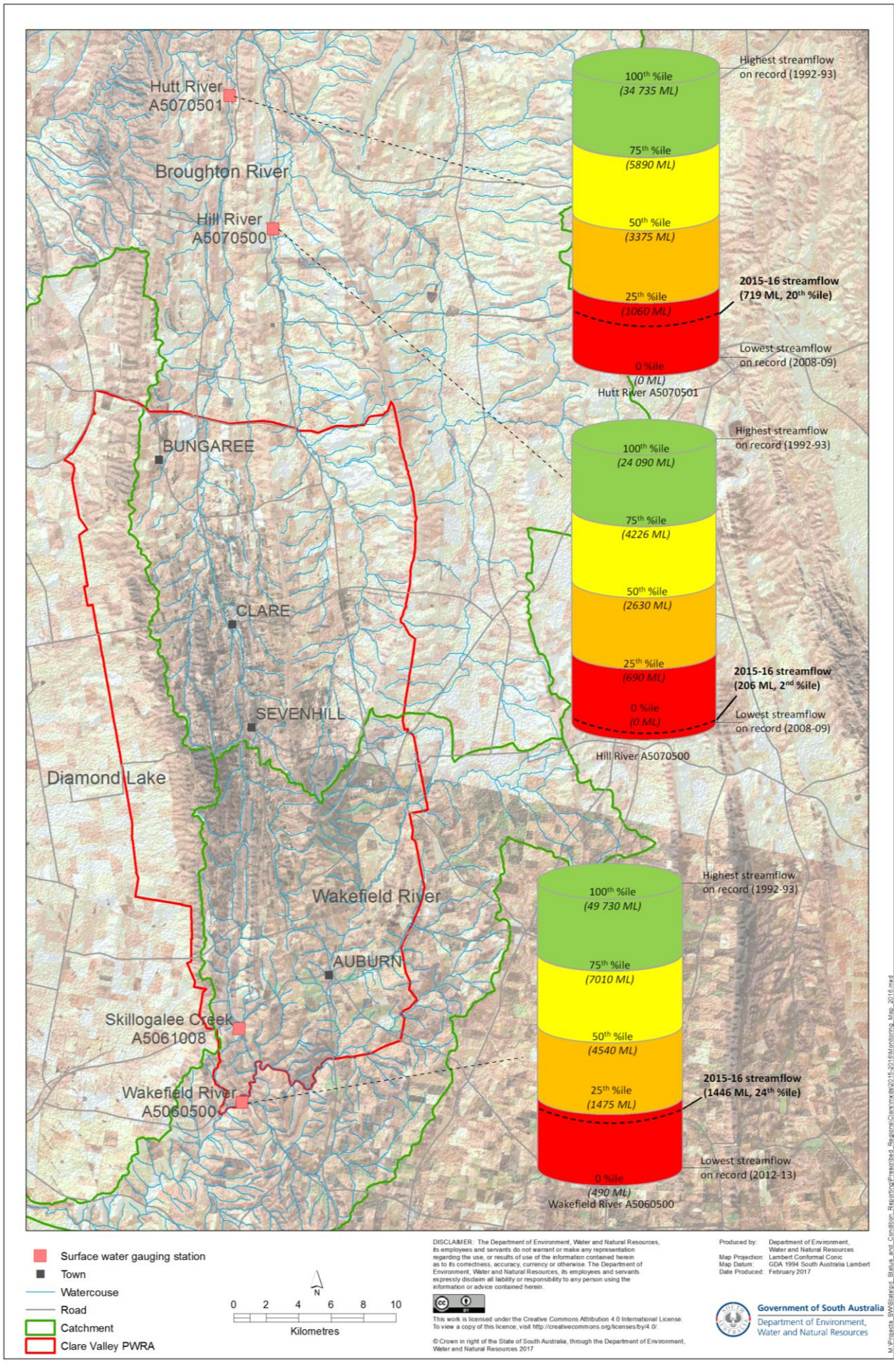


Figure 6. Surface water gauging stations and streamflow percentiles in the Clare Valley PWRA

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