Morambro Creek and Nyroca Channel Prescribed Watercourses and Morambro Creek Prescribed Surface Water Area

2017 Surface water status report

Government of South Australia

Department for Environment and Water

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ISBN 978-1-925805-35-2

Preferred way to cite this publication

DEW, 2018, *Morambro Creek and Nyroca Channel PWCs and Morambro Creek PSWA 2017 surface water status report*, Government of South Australia, Department for Environment and Water, Adelaide.

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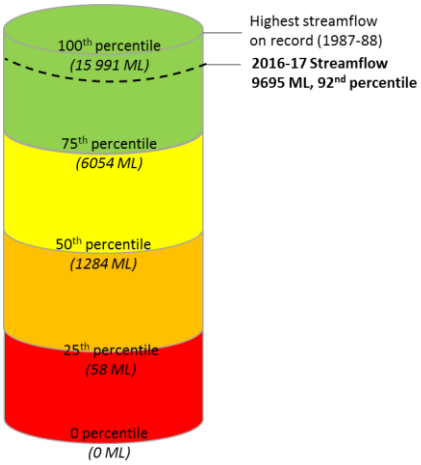
2017 Status summary
Morambro Creek and Nyroca Channel Prescribed Watercourses and Morambro Creek Prescribed Surface Water Area

The Morambro Creek and Nyroca Channel Prescribed Watercourses (PWC) and Morambro Creek Prescribed Surface Water Area (PSWA), referred to collectively as the Prescribed Area (PA). This status is determined for Morambro Creek at a whole of prescribed area scale.

Morambro Creek at a whole of prescribed area 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 streamflow recorded at the Morambro Creek gauging station.



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 4

Rainfall station	Frances rainfall station (M026007) located on the eastern-edge of the region Average annual rainfall period: Reporting period: 1979/80-2016/17, in line with streamflow data availability
Annual total [2]	720 mm 204 mm above the average annual rainfall of 516 mm (1889/90-2016/17) 2016/17 annual rainfall was the 2nd highest of the past 38 years at the Frances rainfall station
Monthly rainfall summary	November 2016 and February and June 2017 had below average rainfall, while the remaining months recorded above the monthly average Rainfall between July and October 2016 accounted for almost 60% of the annual rainfall for 2016/17 September recorded over 2 times the average monthly rainfall (135 mm compared to 57 mm)
Spatial distribution	The spatial variability of rainfall for 2016/17 indicates that above average rainfall was observed across the entire PA when compared to both the annual average rainfall and the 5-yearly average rainfall Spatial analysis shows that average rainfall for the past five years is lower than average annual rainfall across the majority of the region
Rainfall trend	Long-term trend - Annual rainfall volumes recorded at the Frances rainfall station indicate a decreasing long-term trend. Short-term trend - The last five years of rainfall indicate an increasing trend as a result of the high rainfall experienced in 2016/17

Streamflow

Figure 2 and 3

Streamflow gauging stations	Morambro Creek gauging station (A2390531) at Bordertown-Naracoorte Road Bridge is the sole streamflow gauging station located within the PA Streamflow data availability: 1979/80-2016/17 Streamflow was historically recorded at Cockatoo Lake, 15km downstream of Morambro Creek gauging station, but this site has been decommissioned. Data from this site is not presented in this report
Annual total [2]	The Morambro Creek gauging station annual streamflow = 9695 ML, significantly higher than the average annual streamflow of 3256 ML Total volume reported is an underestimation, as there is a period of missing data between mid-March and end-June 2017. Percentile ranking: 92nd

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

Monthly streamflow summary	Historically, the majority of streamflow in the Morambro Creek PA occurs between June and October and typically accounts for over 90% of the total annual flow in any given year Streamflow between September and October 2016 accounted for 98% of the flow in 2016/17 September was 4-times the average monthly total (3795 ML compared to 941 ML) Morambro Creek is an ephemeral system and flows are not typically recorded between December and May
Streamflow trend	Long-term trend - Annual streamflow volumes recorded at the Morambro Creek gauging station (1979/80-2016/17) indicate a declining long-term trend This declining trend correlates with predominantly below average rainfall recorded in the Morambro Creek PA since 1997 Short-term trend - The last five years of streamflow indicate an increasing trend as a result of the high rainfall experienced in 2016/17

Water use

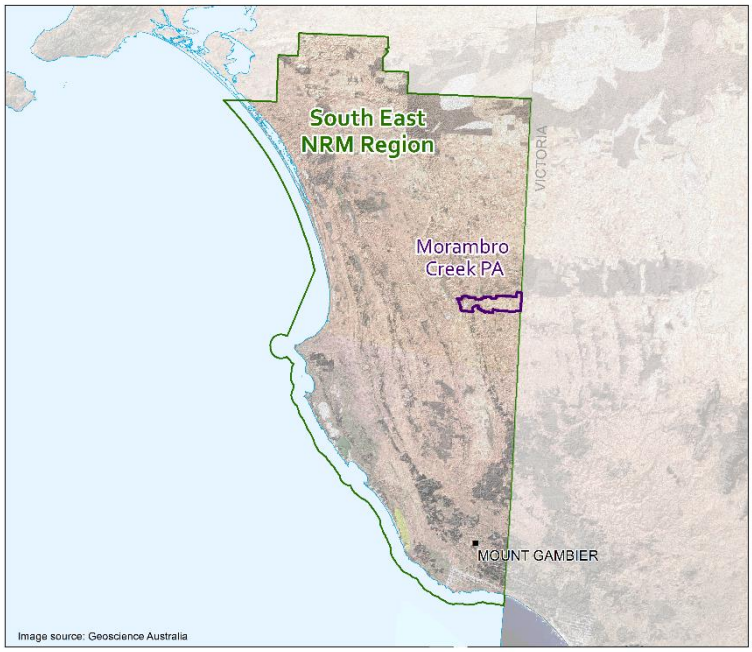
Surface-water licences	Low reliability of streamflow in Morambro Creek has meant there has been no systematic development of the surface water resource Licensees are limited to a rate of take once specific flow thresholds are reached Currently there are 4 licences to take and/or divert water within the PA
Surface-water use data [2]	Flow was recorded in Morambro Creek in 2016/17 and this enabled extraction for irrigation. Actual usage from licensed surface water sources: 270 ML (76% of the allocated volume of 354 ML)
Resource Volume [2]	Total resource volume therefore 9965 ML: • Streamflow recorded at the Morambro Creek gauging station: 9695 ML. • Surface water extraction (actual use): 270 ML. Surface water extraction was approximately 3% of the total resource volume

Surface water salinity

Salinity monitoring	Morambro Creek gauging station (A2390531) – data available from 2007
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. Due to the ephemeral nature of Morambro Creek, at times no streamflow is recorded (and therefore salinity) when the stream is dry.
Salinity – 2016/17 water-use year	Highest salinity recorded at Morambro Creek: 174 mg/L Higher than average streamflow was recorded in the Morambro Creek in 2016/17 and therefore salinity data was recorded. However, there is a period of missing data between mid-March and the end of June 2016
Salinity – 2006/7–2016/17	The majority of the record is less than 250 mg/L, indicating a very fresh section of watercourse. Note that the data record has not been represented graphically as the ephemerality of the system has led to an interrupted record.

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

Regional setting



The Morambro Creek and Nyroca Channel Prescribed Watercourses (PWC) and Morambro Creek Prescribed Surface Water Area (PSWA), referred to collectively as the Prescribed Area (PA), is located approximately 280 km south-east of Adelaide, with its eastern boundary along the Victoria border and covering an area of 225 km^2.

Surface water and watercourses in the PA have been prescribed under South Australia's *Water Resources Act 1997*. A water allocation plan (WAP) adopted in 2006 provides for sustainable management of these water resources.

The topography of the PA is predominantly characterised by flat plains with slight variations in elevation occurring in the western most section. The main watercourse within the PA is the Morambro Creek, an ephemeral system with headwaters originating in the Wimmera region of western Victoria, travelling east – west through the PA, before terminating in Cockatoo Lake. From here, a spillway allows water to enter the Nyroca Channel, flowing for approximately 30 km in a north-westerly direction before discharging into the Marcollat watercourse.

The status of surface water resources in the Morambro Creek PA is highly dependent on rainfall, with trends in streamflow and salinity primarily climate driven.

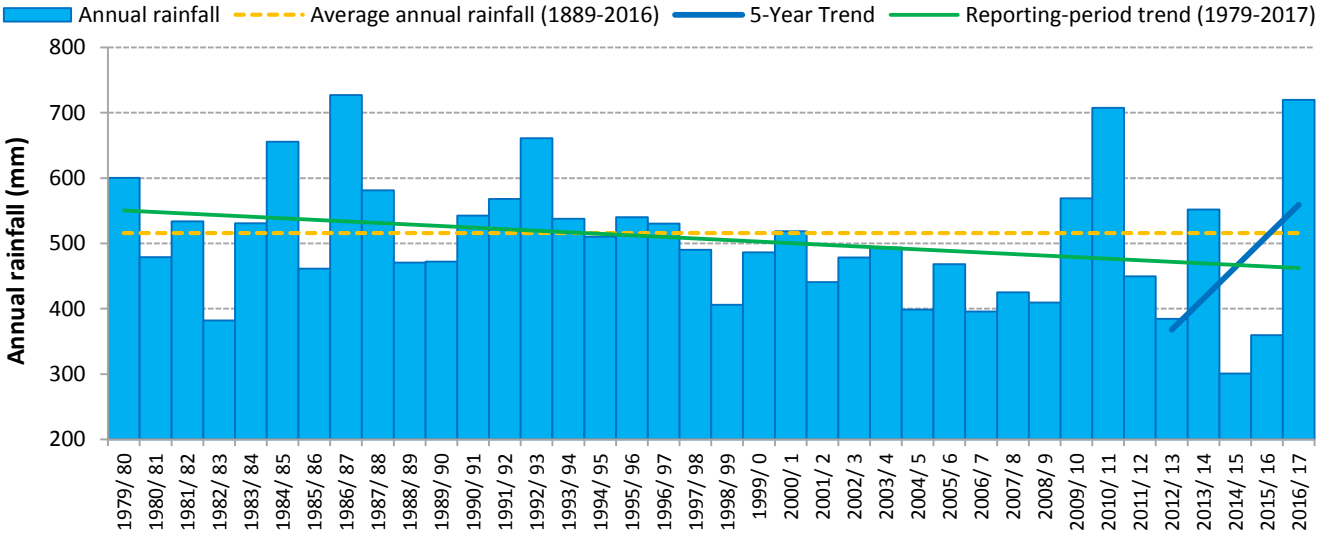


Figure 1. Annual rainfall (mm) for 1979/80–2016/17 at Frances rainfall station (M026007)

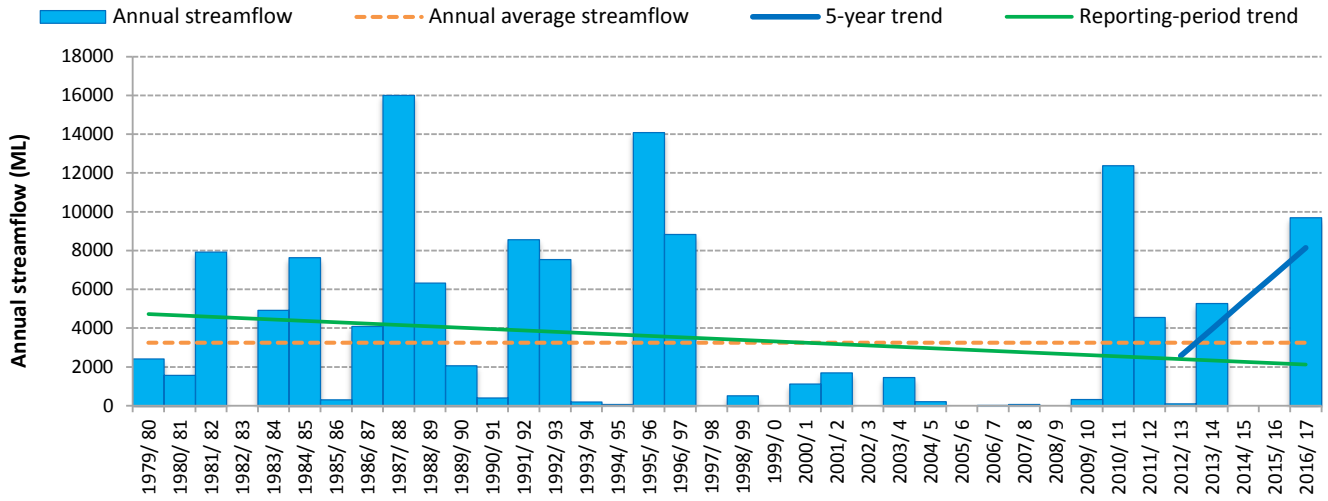


Figure 2. Annual streamflow (ML) for 1979/80–2016/17 at Morambro Creek gauging station (A2390531)

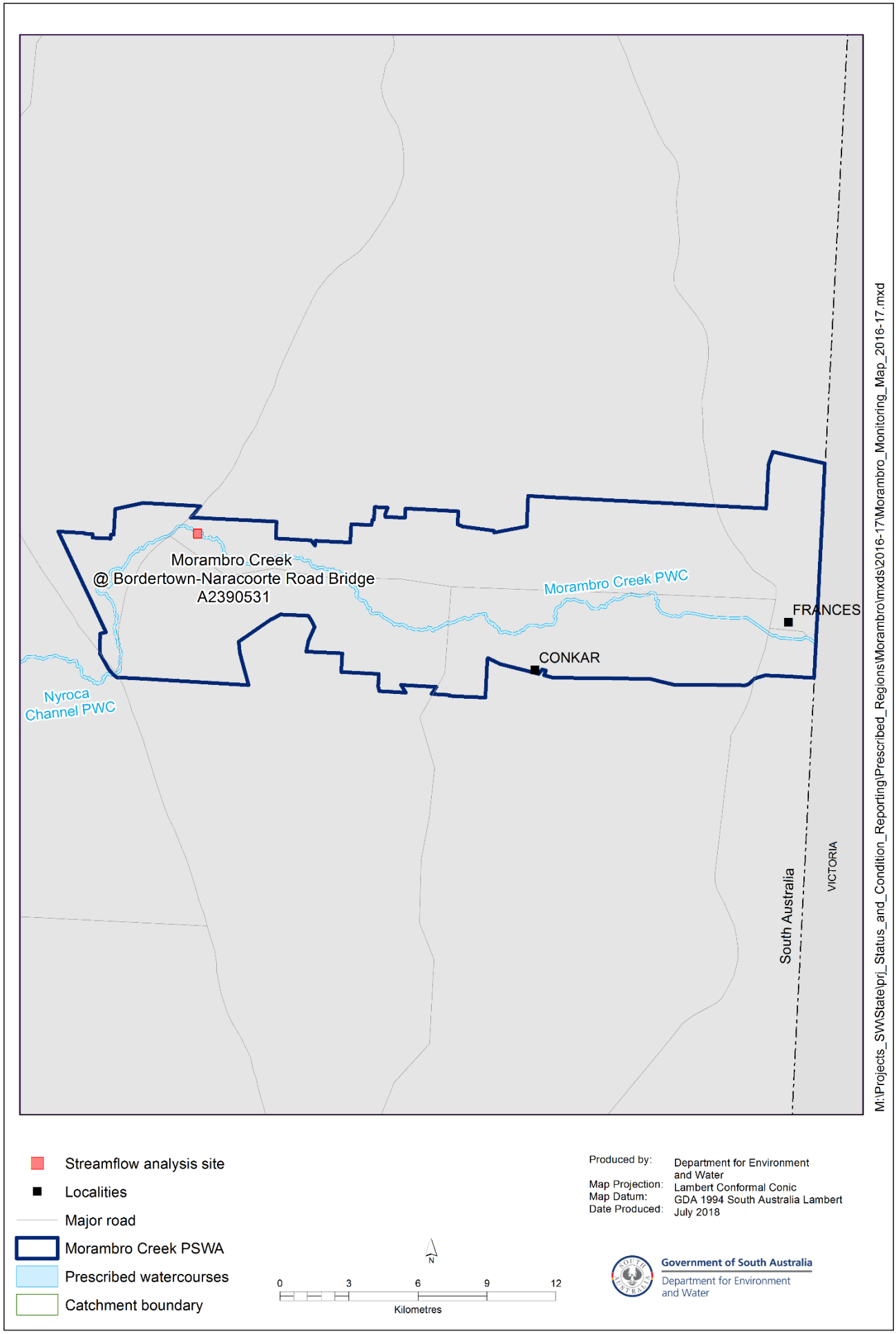


Figure 3. Streamflow gauging station in the Morambro Creek PSWA

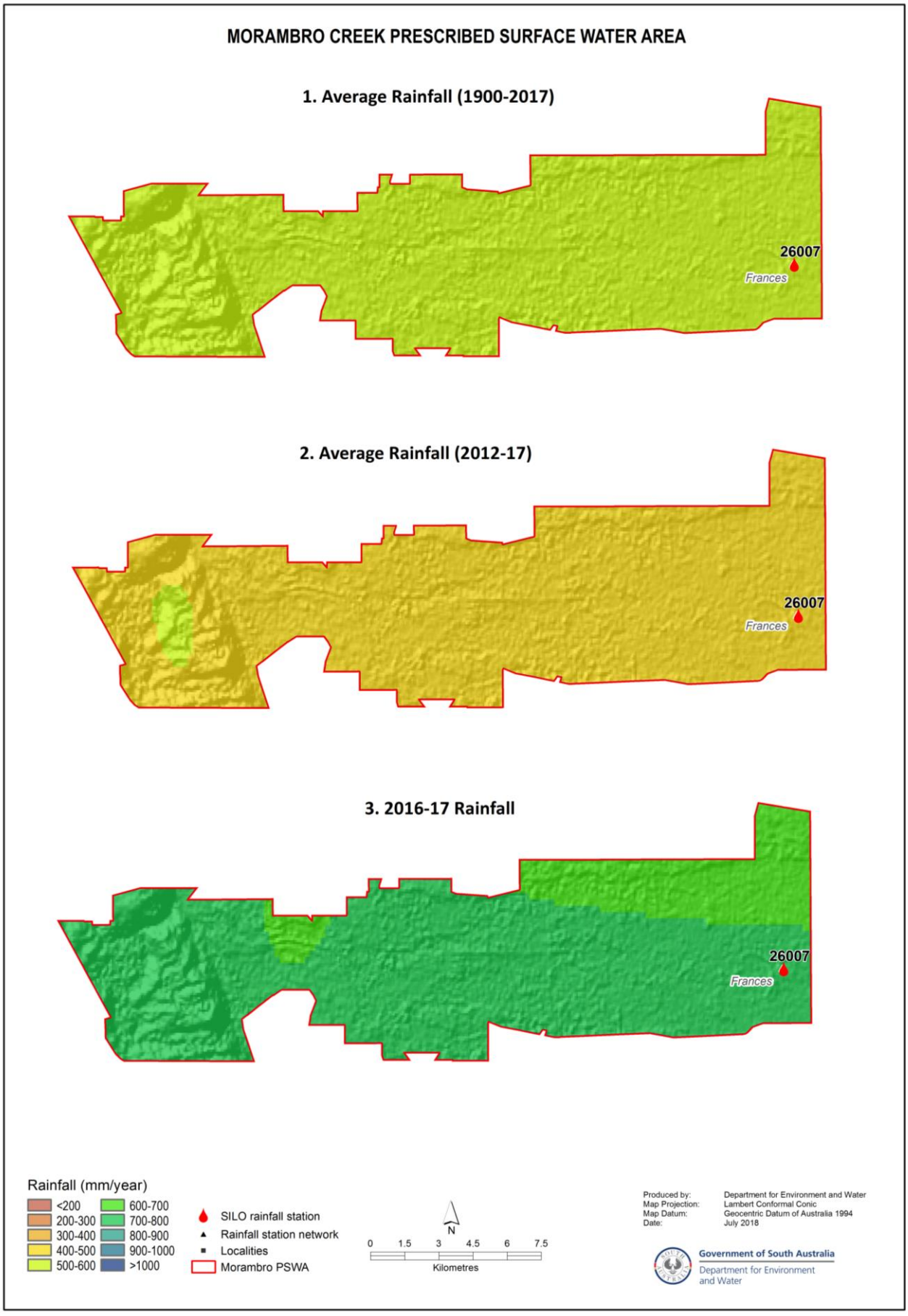


Figure 4. (1) Annual average rainfall (2) five-year average annual rainfall and (3) annual rainfall for 2016/17 in the Morambro Creek PSWA[3]

[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/)*

More information

The status of the Morambro Creek PA was determined by expressing the annual Morambro Creek streamflow for 2016/17 as a percentile of the total annual streamflow for the period (1979/80–2016/17).

The 2016/17 streamflow was ranked as the 92nd percentile or 4th largest flow in the 38 years of streamflow data. This is based on the recorded streamflow of 9695 ML, (which includes a period of missing data between mid-March and the end of June 2016).

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 *Morambro Creek and Nyroca Channel PWCs and Morambro Creek PSWA 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 *Morambro Creek and Nyroca Channel PWCs and Morambro Creek PSWA*, please see the *Water Allocation Plan* for the *Morambro Creek and Nyroca Channel Prescribed Watercourses including Cockatoo Lake and the Prescribed Surface Water Area* on the Natural Resources South East website.

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