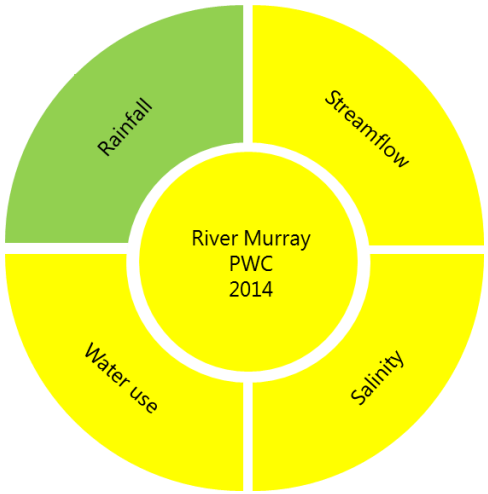
River Murray PWC

Surface water status report

2014

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

2014 Summary



The River Murray Prescribed Watercourse (PWC) has been assigned a yellow status for 2014:

Adverse trends, indicating low risk to the resource in the short-term

This hydrological status for 2014 is supported by:

- above average rainfall across 3 of 3 rainfall analysis sites (sites are located in South Australia)
- below average streamflow at 2 of 2 streamflow analysis sites
- variable salinity at 4 of 4 salinity analysis sites
- change from negligible to low water use when compared to annual streamflow (this is a regulated system).

This status report provides a snapshot of the surface water resources in the River Murray PWC for the financial year 2013–14. Surface water status reports are limited to reporting on the hydrological status of the PWC. Available data on climate, streamflow, salinity and water use is summarised and compared with recent and long-term data to provide an indication of the hydrological status of its water resources. Each element is discussed with reference to recent or more long-term trends where, if at all, they are present in the data. These status reports seek to support informed policy-development and management decisions by resource managers and those responsible for, or reliant on, the water resources. Status of the prescribed resource for the previous years is shown below.

2010–11 Status (green)	2011–12 Status (green)	2012–13 Status (green)	2014 Status (yellow)

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.

The River Murray PWC extends from South Australia's eastern border to Lake Alexandrina and Lake Albert (Lower Lakes) (Figure 1). Surface water (including within watercourses) in the PWC has been prescribed under South Australia's *Natural Resources Management Act 2004*. A Water Allocation Plan (WAP) was developed by the South Australian Murray–Darling Basin Natural Resources Management Board in 2009, which seeks to provide for sustainable management of water resources.

Status symbols

No adverse trends, indicating a stable or improving situation (green)

Trends are either stable (no significant change), or have improved over the reporting period, indicating that there is insignificant risk of impact to the beneficial use of the resource.

Adverse trends, indicating low risk to the resource in the short-term (1 to 3 years) (yellow)

Observed adverse trends are gradual and if continued, are unlikely to lead to a change in the current beneficial uses of the surface water resource in the short-term.

Adverse trends, indicating medium risk to the resource eventuating in the short-term (amber)

Observed adverse trends are significant and if continued, moderately likely to lead to a change in the current beneficial uses of the surface water resource in the short-term.

Adverse trends, indicating high risk to the resource within the short-term (red)

Trends indicate degradation of the resource is occurring. Degradation will very likely result in a change in the beneficial use (e.g. reduced ability to access surface water entitlements and/or decline in the condition of environmental assets).

Unclear (grey)

Trends are unable to be determined due to a lack of adequate information on which to base a sound judgement of status.

Data from the same stations summarised in previous reports are used in analysis, for comparison of annual trends. Three long-term meteorological stations were selected for analysis of rainfall trends: Overland Corner (M024012), Murray Bridge (M024521) and Meningie (M024518) (Figure 1). Rainfall was above average across all analysis sites in 2013–14.

Flow to South Australia is calculated based on both the River Murray D/S Rufus River (A4260200) and the Mullaroo Creek (A4140211) stations; the calculated flow is reported as the virtual site Flow to South Australia (A4261001) (Figure 1). Streamflow at the barrages has been calculated based on the number of gates open at stations A4260526 (Mundoo Barrage), A4260570 (Boundary Creek Barrage), A4260571 (Ewe Island Barrage), A4261005 (Goolwa Barrage) and A4261006 (Tauwitchere Barrage). Streamflow was below average at all analysis sites in 2013–14.

Long-term gauging stations selected for analysis of salinity trends include: Morgan (A4260554), Murray Bridge (A4261003/ A4261126) and sites representing Lakes Alexandrina and Albert (Figure 1). Salinity was variable in 2013–14 when compared to the range of salinity for the previous year.

Water use in the Murray–Darling Basin is determined by a cap on diversions and transition to sustainable diversion limits. For the purpose of this assessment, water use was low in 2013–14 when expressed as a percentage of the total available streamflow in 2013–14.

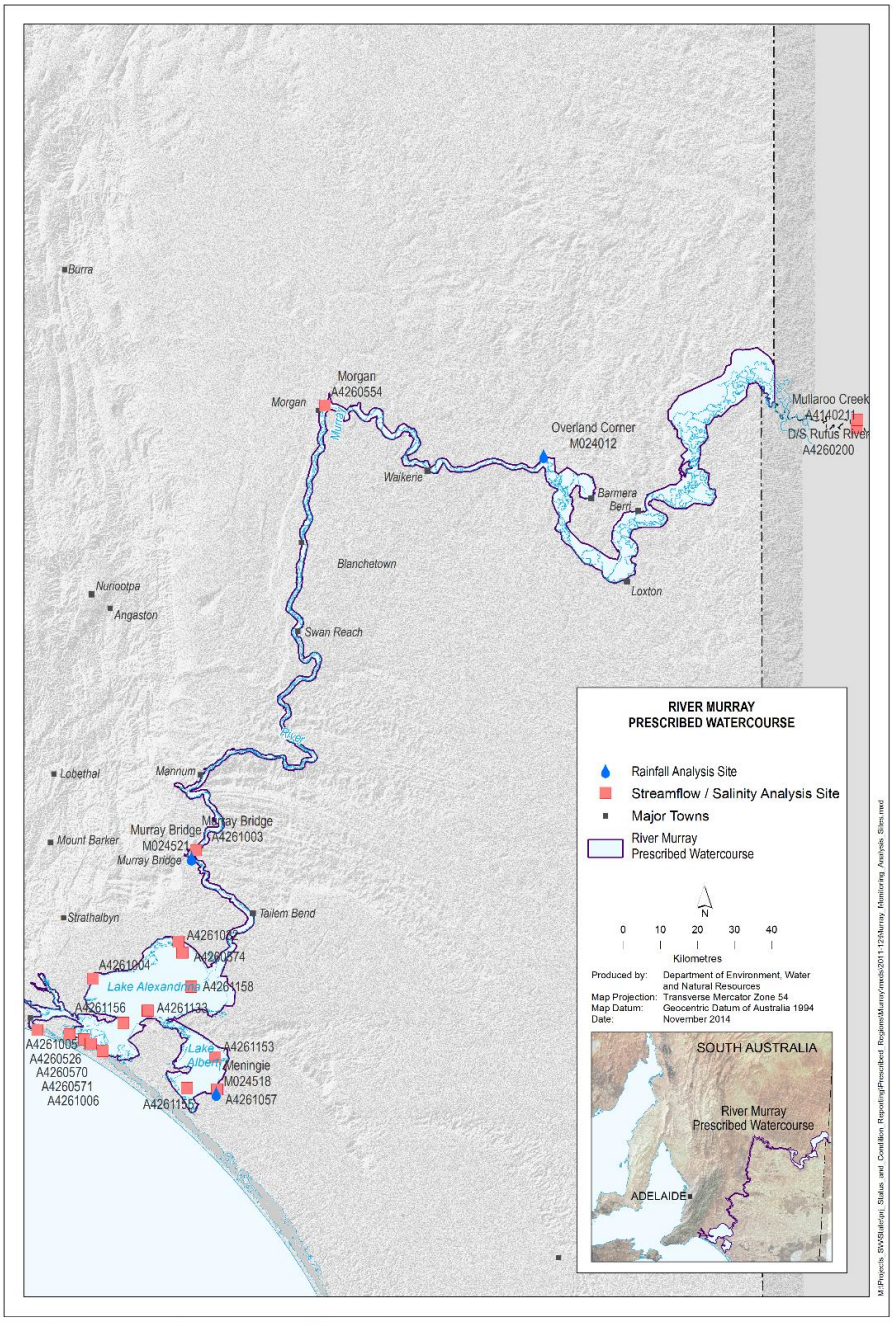


Figure 1. Monitoring analysis sites as used in the River Murray PWC Surface water status report

Rainfall

Status	Degree of confidence	Comments on recent historical context
Above average rainfall across all rainfall analysis sites (sites are located in South Australia)	High: good coverage of rainfall stations representing the rainfall variation across the region	Above average rainfall across all rainfall analysis sites in South Australia in 2013–14 after average or below average rainfall the previous year

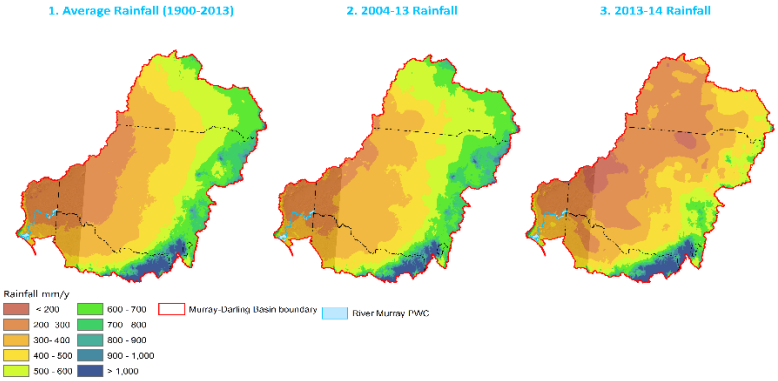


Figure 2. Annual rainfall distributions for the Murray–Darling Basin

Rainfall in the River Murray PWC typically varies from 250 millimetres (mm) at the border to over 450 mm around the Lower Lakes (Figure 2). The three panels of Figure 2 indicate that rainfall was around average or above in the South Australian portion of the Murray-Darling Basin (MDB) and largely below average upstream of South Australia for the year 2013-14 (panel 3) in comparison to the long-term and short-term averages (panels 1 and 2).

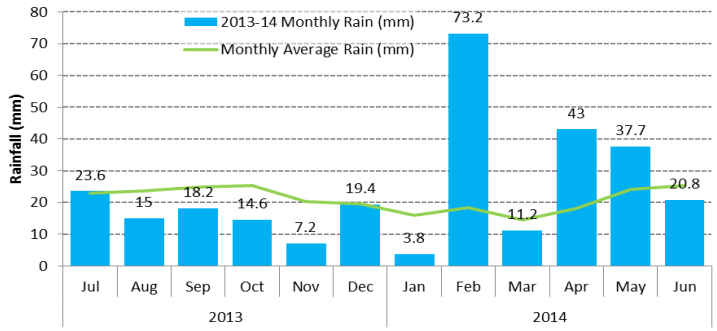


Figure 3. Monthly rainfalls at Overland Corner (M024012)

Overland Corner Bureau of Meteorology (BoM) rainfall station received an above average rainfall of 288 mm in 2013–14 in comparison to its long-term average of 253 mm (Figure 3). Above average rainfall was experienced in 4 months across 2013–14, but the months of August to January all received well below the monthly average rainfall.

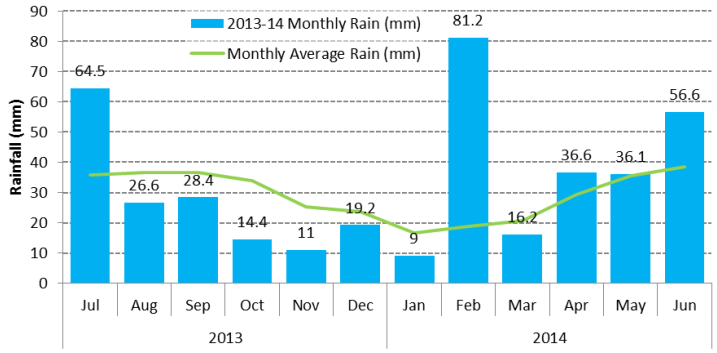


Figure 4. Monthly rainfalls at Murray Bridge (M024521)

Murray Bridge BoM rainfall station received an above average rainfall of 400 mm in 2013–14 in comparison to its long-term average of 351 mm (Figure 4). Above average rainfall was experienced in 5 months across 2013–14. The months of August to January, like that at Overland Corner, all received well below average rainfall in contrast to February, which received more than 4 times the monthly average rainfall.

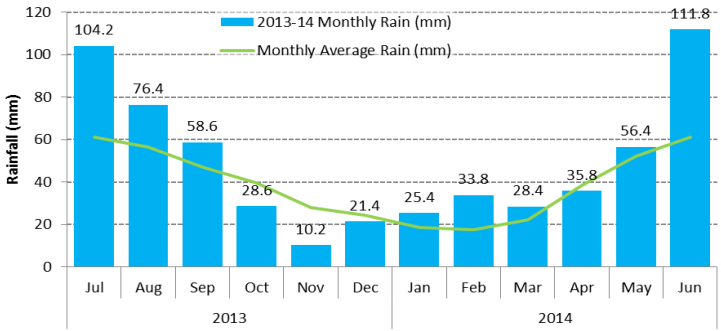


Figure 5. Monthly rainfalls at Meningie (M024518)

Meningie BoM rainfall station received an above average rainfall of 591 mm in 2013–14 in comparison to its long-term average of 467 mm (Figure 5). Above average rainfall was experienced in 8 months across 2013–14. The months of October to December all received below average rainfall.

Streamflow

Status	Degree of confidence	Comments on recent historical context
Below average streamflow at all streamflow analysis sites	High: data derived from long-term gauging stations	Below average streamflow after 3 years of above average streamflow

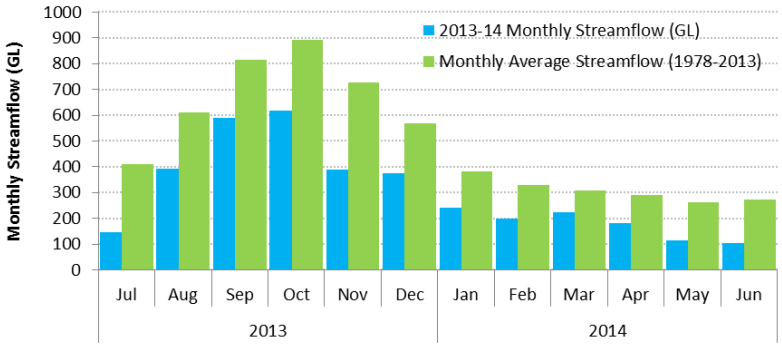


Figure 6. Monthly streamflow to South Australia

A below average annual streamflow of 3569 gigalitres (GL) flowed to South Australia for 2013-14 (39% lower than the 5867 GL long-term average). The monthly breakdown of streamflow for 2013–14 (Figure 6) highlights that all months received below average streamflow. This can be attributed to the below average rainfall conditions in the south-east and northern headwater catchments of the MDB.

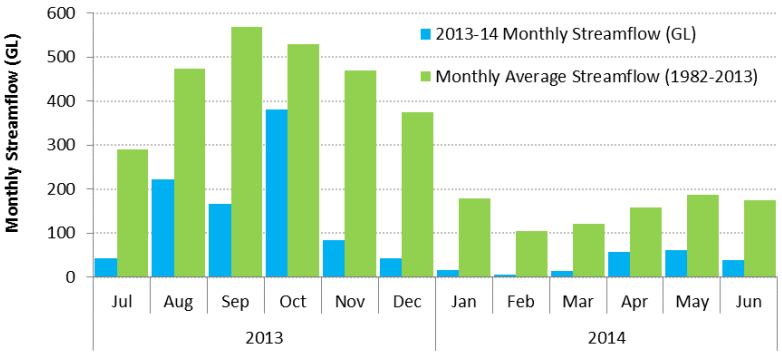


Figure 7. Monthly streamflow at the barrages

Flow at the barrages experienced a below average annual streamflow of 1125 GL for 2013–14 (69% lower than the 3631 GL long-term average). The monthly breakdown of streamflow for 2013–14 (Figure 7), highlights that all months received below average streamflow. The months of November to June each received less than 100 GL total streamflow, well below their monthly averages. Less than 60 GL/month (approximately 2 GL/day) occurred between December and April.

Salinity

Status	Degree of confidence	Comments on recent historical context
Variable	High: data derived from long-term salinity monitoring	Peak salinities in 2013–14 were higher at Morgan and Murray Bridge compared to 2012–13. Salinity continued to gradually freshen in Lake Albert and was steady in Lake Alexandrina

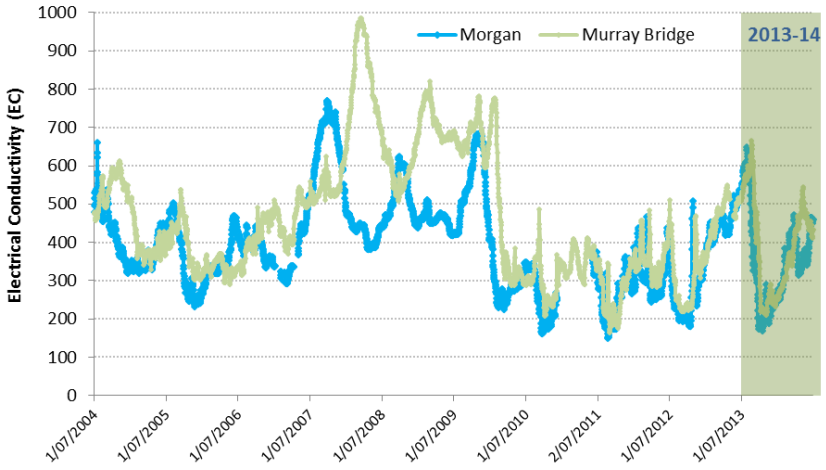


Figure 8. Salinity data at Morgan and Murray Bridge from 1997–2014

Salinity levels of less than 800 EC (µs/cm) at Morgan and less than 830 EC (µs/cm) at Murray Bridge for 95% of the time are set in the Basin Plan. Salinity at Morgan (A4260554) and Murray Bridge (A4261003/A4261126) was increasing at the start of 2013-14 as a result of low streamflow to South Australia. Prior to 2010–11, salinity levels at Morgan and Murray Bridge were higher due to lower streamflows in the River Murray. From 2003 to 2014, salinity at Morgan has not exceeded 800 EC. Over the same period, salinity at Murray Bridge has exceeded 830 EC for one event of ninety-three days in 2008 (2.52% of total days).

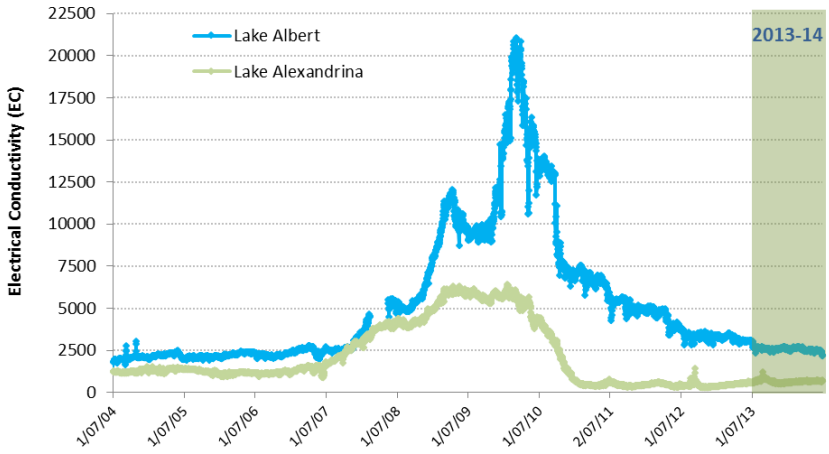


Figure 9. Salinity data at Lakes Alexandrina and Albert from 2002–14

The Basin Plan includes a salinity target for Milang (Lake Alexandrina) of less than 1000 EC 95% of the time. This can be compared to a calculated Lake Alexandrina salinity of less than 1000 EC 36% of the time from 2004–14 (largely due to the drought period). A maximum salinity of 1206 EC and an average salinity of 670 EC was recorded across 2013–14 for Lake Alexandrina. Salinity exceeded 1000 EC for one event of two days in August of 2013–14. Although salinity levels remain higher than the long-term average in Lake Albert, salinity freshened slightly due to lake level manipulation to export some salt from Lake Albert through the Narrows to Lake Alexandrina, and then to sea through the Murray Mouth. A maximum salinity of 3054 EC (on 1st July) and an average salinity of 2580 EC was recorded across 2013–14 for Lake Albert.

Surface water use

Status	Degree of confidence	Comments on recent historical context
Change from negligible to low water use when compared to annual streamflow	High: data derived from long-term water use monitoring	Water use compared to annual streamflow increased in 2013–14 in comparison to 2012–13 (522 GL; 7% of total streamflow)

In 2013–14 total use (diversions) from the River Murray PWC was 443 GL, lower than the 522 GL diverted in 2012–13. The diversions for 2013–14 comprised of:

- 42.1 GL for metropolitan Adelaide and associated country areas
- 35.4 GL for country towns
- 15.6 GL for the Lower Murray swamps (including Environmental Land Management Allocation)
- 349.8 GL for all other purposes (metered and non-metered consumption).

The distribution of water use across the PWC from 2004–14 is shown in Figure 10.

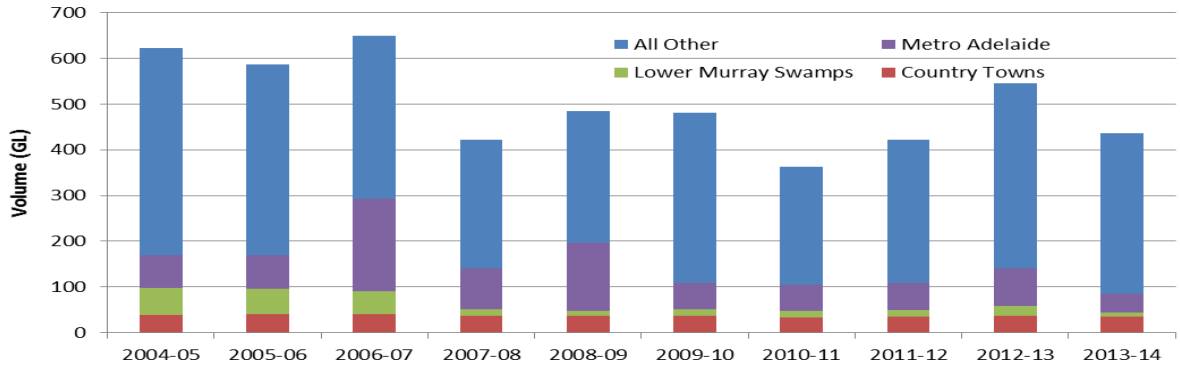


Figure 10. Surface water diversions from the River Murray PWC from 2004–14

Recorded streamflow for the PWC in 2013–14 was approximately 3569 GL (Flow to South Australia), with approximately 443 GL (excluding environmental water) recorded as being diverted from the PWC. As such it is estimated that 12% was extracted for use (7% in 2012–13).

Water use in the MDB is determined by a cap on diversions and transition to sustainable diversion limits. For the purpose of this assessment and based on the consistent approach to assess water use across all prescribed surface water resources, the PWC has been assigned a use rating of 2 (Low use) for 2013–14.

Table 1. Use rating system

Rating	% of resource capacity used in current year	Description
1	0 – 10 %	Negligible use
2	11 – 20 %	Low use
3	21 – 30 %	Moderate use
4	31 – 40 %	High use
5	41 – 50 %	Very high use
6	Greater than 50 %	Extremely high use

Department of Environment, Water and Natural Resources

25 Grenfell Street, Adelaide

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	

Disclaimer

ISBN 978-1-925369-24-3

Preferred way to cite this publication

DEWNR 2015, *River Murray PWC Surface water status report 2014,* Government of South Australia, through Department of Environment, Water and Natural Resources, Adelaide.

This Surface water status report is available online at http://www.waterconnect.sa.gov.au

To view the *River Murray PWC Surface water status report 2010–11*, which includes background information on location, rainfall, streamflow, salinity, water use and relevant water dependent ecosystems, please visit the Water Resource Assessments page on WaterConnect.

For further details about the River Murray PWC please see the *Water Allocation Plan for the River Murray PWC* on the Natural Resources South Australian Murray–Darling Basin website.

Gridded rainfall data was sourced from the Bureau of Meteorology (BoM). Station rainfall data was sourced from 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.

Page left blank intentionally.

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