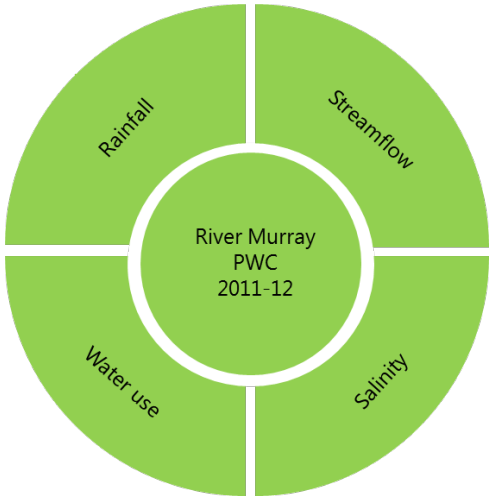
River Murray PWC

Surface water status report

2011–12

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

2011–12 Summary



The River Murray Prescribed Watercourse (PWC) has been assigned a green status for 2011–12:

No adverse trends indicating a stable or improving situation

This hydrological status for 2011–12 is supported by:

- Above average rainfall
- above average streamflow
- steady to freshening salinity
- negligible water use compared to annual streamflow.

This status report provides a snapshot of the surface water resources in the River Murray PWC for the financial year 2011–12. 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 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)

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 have 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. Data from 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 at all analysis sites in 2011–12.

Flow to South Australia is calculated based on the station River Murray D/S Rufus River (A4260200) and the flow in Mullaroo Creek (A4140211); the calculated flow is reported as the 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 above average at all analysis sites in 2011–12.

Long-term gauging stations selected for analysis of salinity trends include; Morgan (A4260554), Murray Bridge (A4261003) and the average of sites representing Lakes Alexandrina (A4261004, A4260574, A4261032, A4261133, A4261156 and A4261158) and Albert (A4261057, A4261153 and A4261155) (Figure 1). Salinity was steady to freshening in 2011–12 when compared to the range of salinity for the previous year.

Water use was negligible in 2011–12 when expressed as a percentage of the total available streamflow in 2011–12.

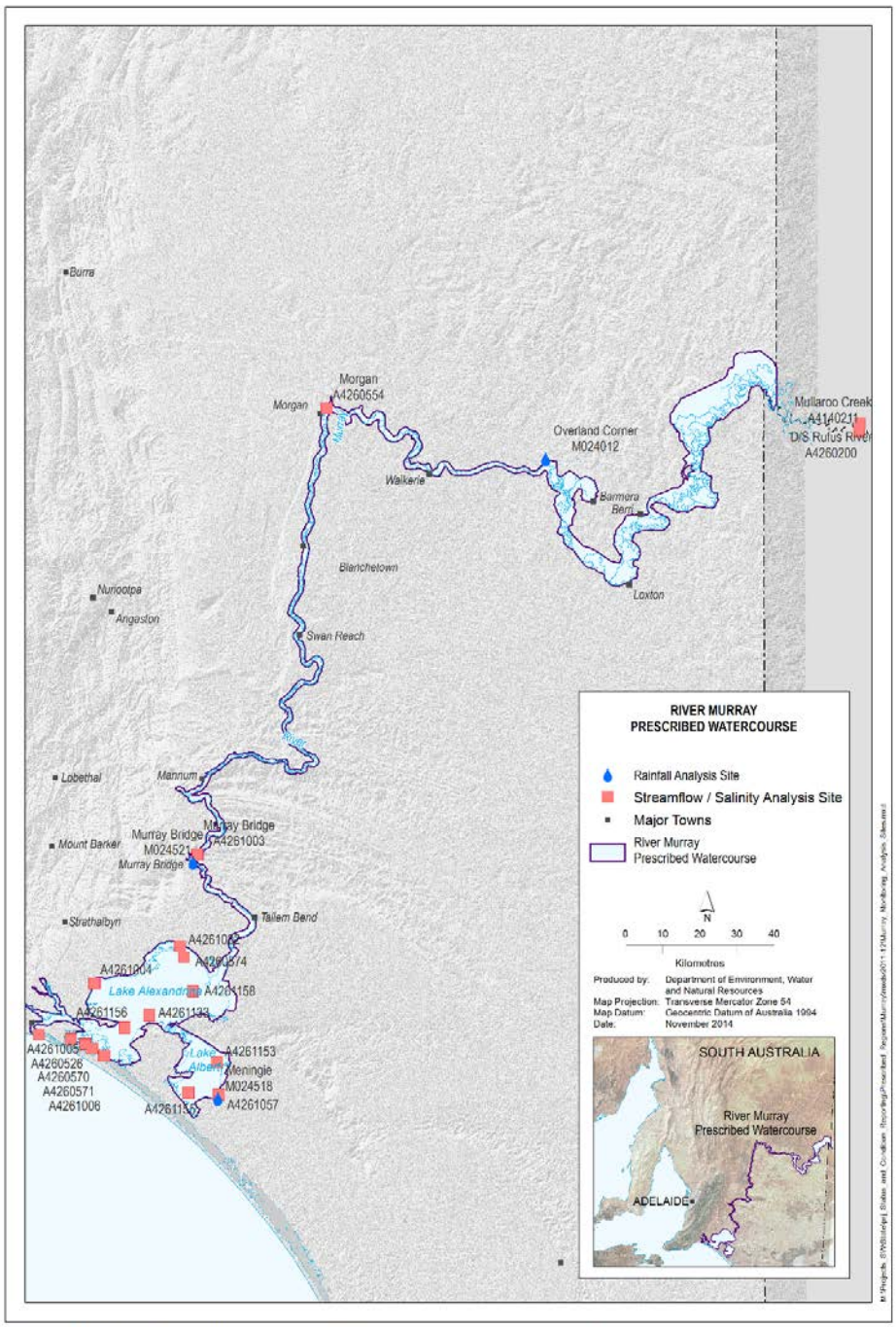


Figure 1. Monitoring analysis sites as used in the River Murray PWC Surface water status report

Rainfall

Status	Degree of confidence	Comments on recent historical context
Above average rainfall at all rainfall analysis sites	High: good coverage of rainfall stations representing the spatial rainfall variation across the region	Third year of above average rainfall at Overland Corner and Murray Bridge and fourth year of above average rainfall at Meningie meteorological stations

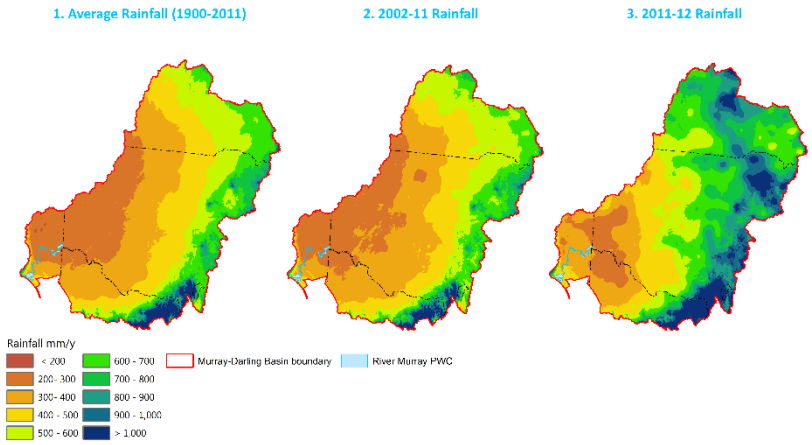


Figure 2. Annual rainfall distributions for the Murray–Darling Basin

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 above average across the majority of the surrounding area for the year 2011–12 (panel 3) in comparison to the long–term and short–term averages (panels 1 and 2).

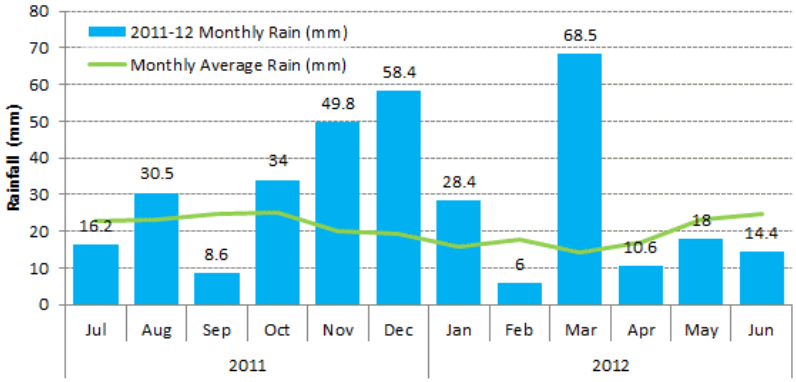


Figure 3. Monthly rainfalls at Overland Corner (M024012)

The Overland Corner Bureau of Meteorology (BoM) rainfall station received an above average rainfall of 343 mm in 2011–12 in comparison to its long-term average of 248 mm (Figure 3). Above average rainfall was experienced predominantly in the late spring and summer months across 2011–12 with November, December and March receiving well above the monthly average rainfall.

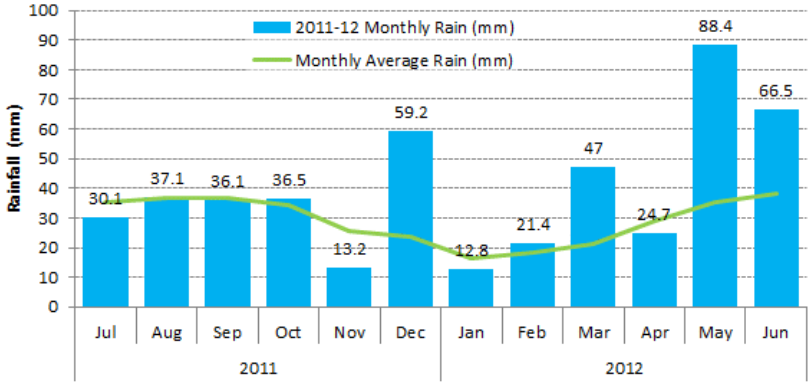


Figure 4. Monthly rainfalls at Murray Bridge (M024521)

The Murray Bridge BoM rainfall station received an above average rainfall of 473 mm in 2011–12 in comparison to its long-term average of 351 mm (Figure 4). Above average rainfall was experienced in 8 months across 2011–12. December, March and May all received more than double the monthly average rainfall.

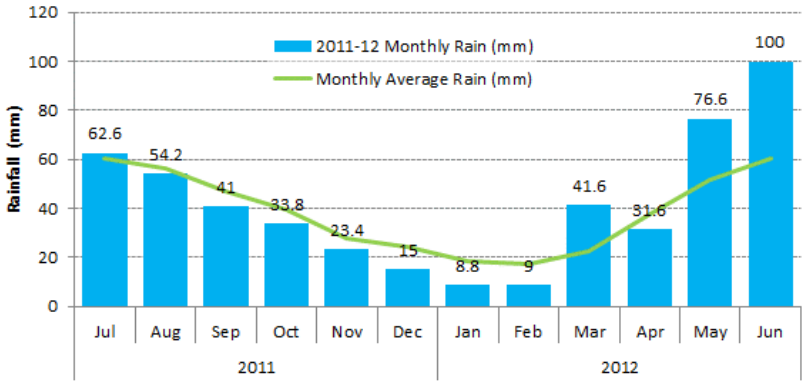


Figure 5. Monthly rainfalls at Meningie (M024518)

The Meningie BoM rainfall station received an above average rainfall of 498 mm in 2011–12 in comparison to its long-term average of 463 mm (Figure 5). Above average rainfall was experienced predominantly in the autumn and winter months across 2011–12. The months of August to February all received below average rainfall.

Streamflow

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

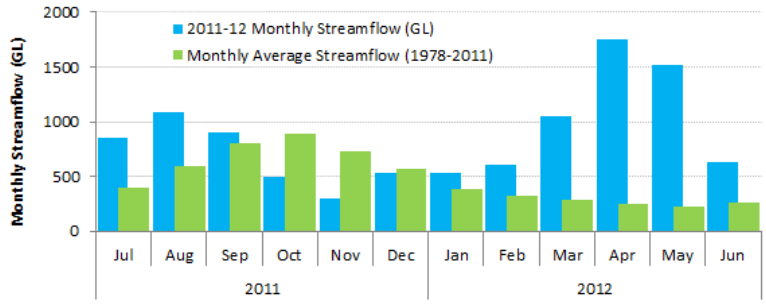


Figure 6. Monthly streamflow to South Australia

An above average annual streamflow of 10 248 gigalitres (GL) flowed to South Australia for 2011–12 (79% higher than the 5726 GL long-term average). The monthly breakdown of streamflow for 2011–12 (Figure 6) highlights that 9 months received above average streamflow. April and May received more than 5 times the monthly average streamflow.

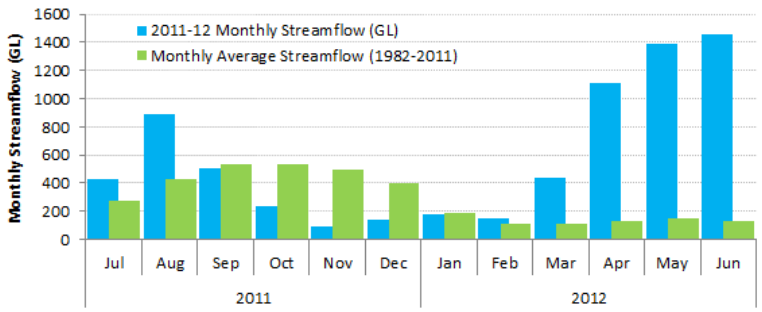


Figure 7. Monthly streamflow at the barrages

Flow at the barrages experienced an above average annual streamflow of 7008 GL for 2011–12 (101% higher than the 3482 GL long-term average). The monthly breakdown of streamflow for 2011–12 (Figure 7), highlights that 7 months received above average streamflow. The months of April to June received streamflow at the barrages that was more than 7 times the monthly average streamflow.

Salinity

Status	Degree of confidence	Comments on recent historical context
Steady to freshening	High: Data derived from long-term salinity monitoring	Salinity trends show the high range of salinity in 2011–12 being comparable to or less than 2010–11

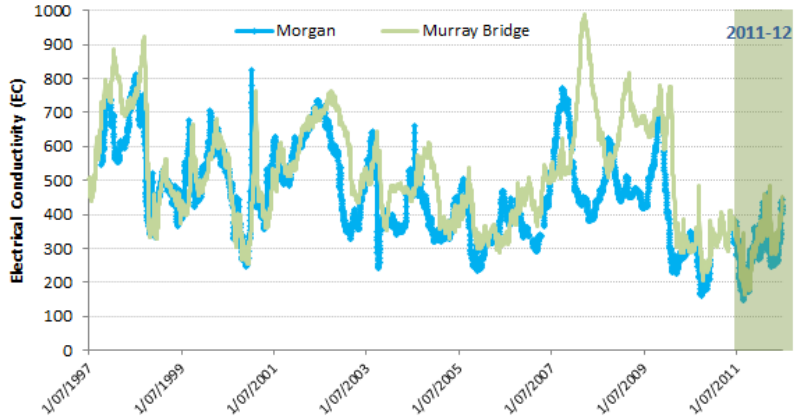


Figure 8. Salinity data at Morgan and Murray Bridge from 1997–2012

Target 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) was steady in 2011–12 as a result of above average streamflow to South Australia, with the high range of salinity below 500 EC. Prior to 2010–11, salinity levels at Morgan and Murray Bridge were higher due to lower streamflows in the River Murray. From 2002 to 2012, 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 (2.55% of total days).

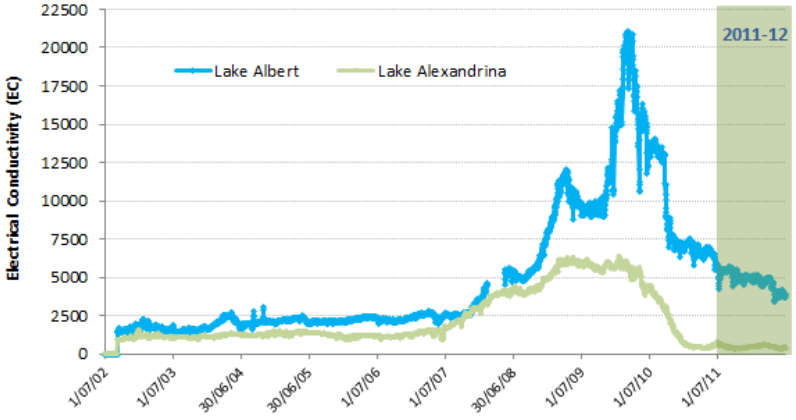


Figure 9. Salinity data at Lakes Alexandrina and Albert from 2002–2012

Although salinity levels remain high in Lake Albert, salinity is freshening due to increased streamflow that have allowed some salt to be exported from Lake Albert through the Narrows to Lake Alexandrina, which is then washed to sea through the Murray Mouth. 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 the calculated Lake Alexandria salinity that was less than 1000 EC 18% of the time from 2002–12. A maximum salinity of 660 EC and an average salinity of 465 EC was recorded across 2011–12 for Lake Alexandrina.

Surface water use

Status	Degree of confidence	Comments on recent historical context
Negligible use compared to annual streamflow	High: data derived from long–term water use monitoring	Water use increased in 2011–12 in comparison to use reported in 2010–11 (362 GL; 2% of total streamflow)

In 2011–12 total use (diversions) from the River Murray PWC was 421 GL, higher than the 362 GL diverted in 2010–11. The diversions for 2011-12 comprised of:

- 59 GL for Metropolitan Adelaide and Associated Country Areas
- 35.7 GL for Country Towns
- 13.1 GL for the Lower Murray Swamps (including Environmental Land Management Allocation)
- 313.4 GL for All Other Purposes (metered and non-metered consumption).

The annual distribution of water use across the PWC is shown in Figure 10.

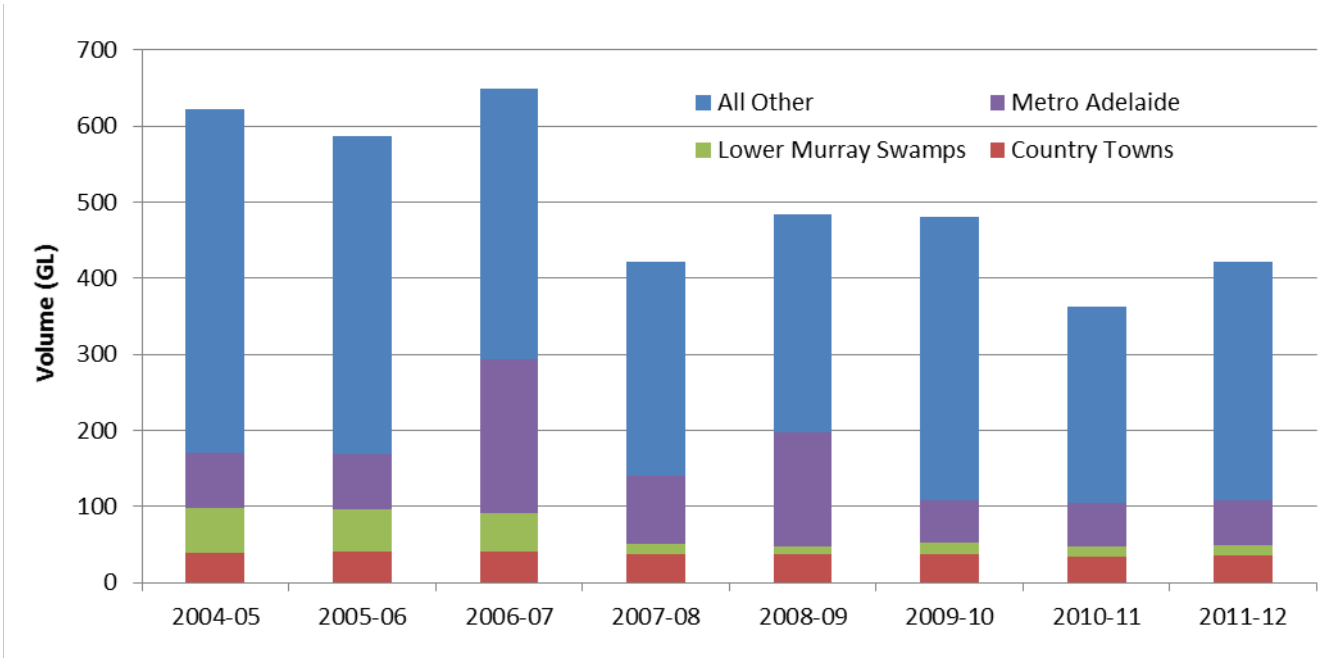


Figure 10. Surface water diversions from the River Murray PWC from 2004–12

Recorded streamflow for the PWC in 2011–12 was approximately 10 248 GL, with approximately 421 GL (excluding environmental water) recorded as being diverted from the PWC. As such it is estimated that 4% was extracted for use (2% in 2010–11). The PWC has been assigned a use rating of 1 (Negligible use) when compared to annual streamflow for 2011–12.

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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.

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