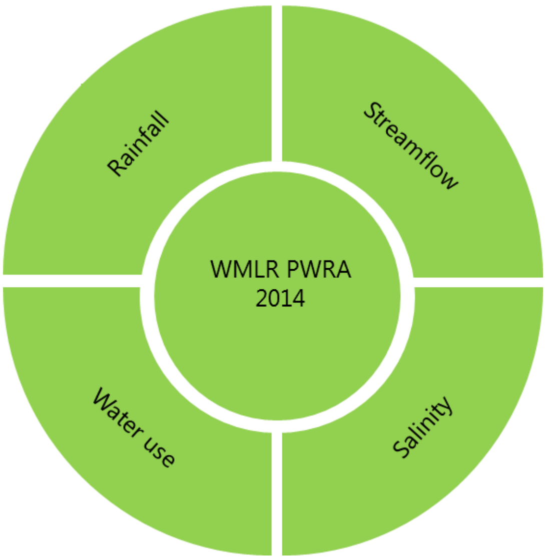
Western Mount Lofty Ranges PWRA

Surface water status report

2014

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

2014 Summary



The Western Mount Lofty Ranges Prescribed Water Resources Area (PWRA) has been assigned a green status for 2014:

No adverse trends, indicating a stable or improving situation

This hydrological status for 2014, which is based at a whole prescribed area scale (and does not consider local scale impacts), is supported by:

- above average rainfall at 7 of 7 rainfall analysis sites
- above average streamflow at 7 of 8 streamflow analysis sites
- steady salinity at 4 salinity analysis sites
- high water use compared to resource capacity considered over the entire PWRA and not at a local scale (very high use in 2012-13).

This annual status report provides a snapshot of the surface water resources in the Western Mount Lofty Ranges (WMLR) PWRA for the financial year 2013–14. Surface water status reports are limited to reporting on the hydrological status of the PWRA on an annual basis and at a whole prescribed area scale. 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.

2012–13 Status (yellow)	2014 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 such as prescription and water allocation planning.

The WMLR PWRA is located approximately 10 km east of Adelaide (Figure 1). Surface water (including within watercourses) and groundwater resources in the PWRA have been prescribed under South Australia's *Natural Resources Management Act 2004*. A Water Allocation Plan (WAP) was developed by the Adelaide and Mount Lofty Ranges Natural Resources Management Board in 2013, which seeks to provide for sustainable management of water resources.

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.

Seven long-term meteorological stations were selected for analysis of rainfall trends: Uraidla (M023750), Parawa (M023761), Cudlee Creek (M023731), Mount Bold (M023734), Mount Pleasant (M023737), Yankalilla (M023754) and Port Elliot (M023742) (Figure 1). Rainfall was above average at all analysis sites in 2013–14. The late spring/early summer months of October to December and the autumn months of March to May recorded below average rainfall for the second consecutive year across the majority of stations analysed. This is the third consecutive year of above average rainfall in June across all stations analysed.

Eight long-term gauging stations were selected for analysis of streamflow trends: Torrens River (A5040512), Sixth Creek (A5040523), Kersbrook Creek (A5040525), Scott Creek (A5030502), Baker Gully (A5030503), Myponga River (A5020502), Inman River (A5010503) and Yankalilla River (A5011006) (Figure 1). Streamflow was above average at 7 of 8 analysis sites in 2013–14. A number of stations have recorded below average streamflow the past two years during the spring, summer and autumn months of September to April.

Four short-term gauging stations were selected for analysis of salinity trends: Torrens River d/s Hollands Creek (A5041003), Onkaparinga River u/s Hahndorf Dissipater (A5031001), Inman River u/s sewage treatment works (A5010503) and Yankalilla River d/s Blackfellows Creek (A5011006) (Figure 1). Salinity was steady in 2013–14 when compared to the previous year.

Water use was high in 2013-14 when expressed as a percentage of the total available streamflow in 2013–14.

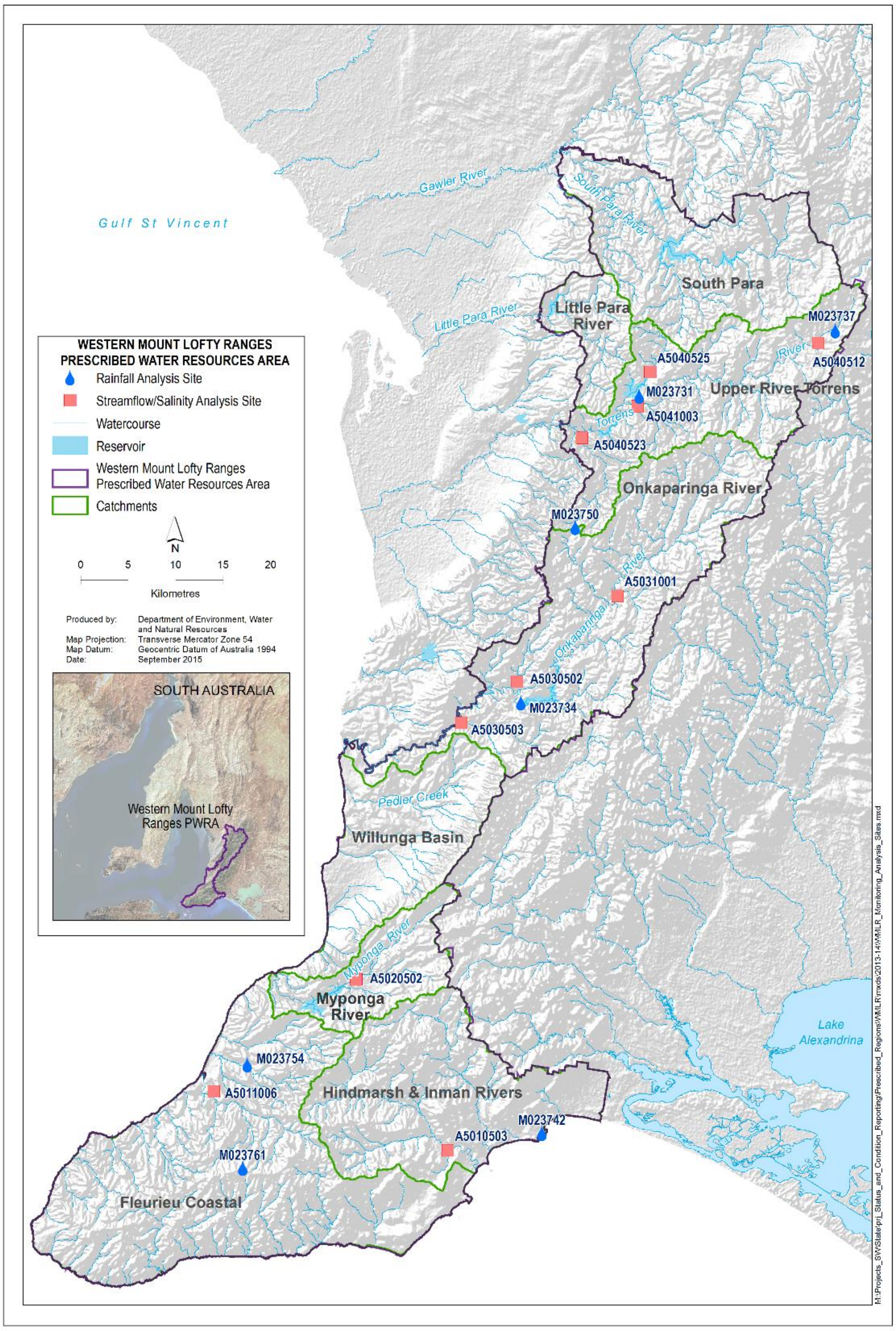


Figure 1. Monitoring analysis sites as used in the Western Mount Lofty Ranges PWRA Surface water status report

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 rainfall variation across the region	Above average rainfall at Mount Bold and Port Elliot after below average rainfall the previous year. Above average rainfall at Uraidla, Parawa, Cudlee Creek, Mount Pleasant and Yankalilla after two years of below average rainfall.

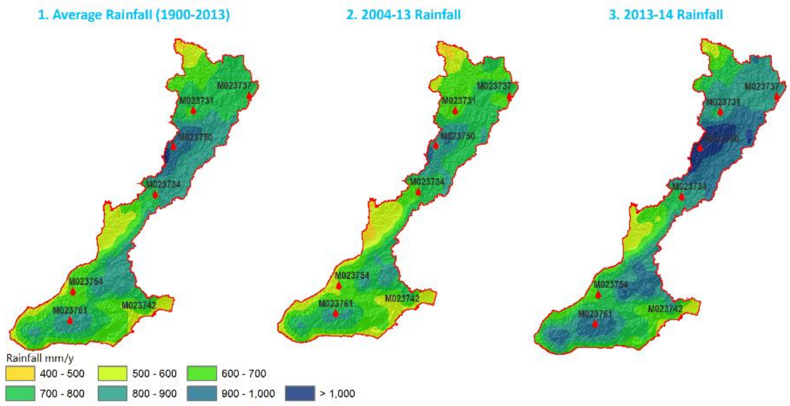


Figure 2. Annual rainfall distributions for the WMLR PWRA

Rainfall is highly variable, ranging from over 1000 millimetres (mm) in the central part of the PWRA around the township of Uraidla to less than 500 mm in the north of the South Para catchment and parts of the Fleurieu Coastal catchments (Figure 2). The three panels of Figure 2 indicate that rainfall was higher across the entire PWRA for the year 2013–14 (Panel 3) in comparison to the long–term and short-term averages (Panels 1 and 2).

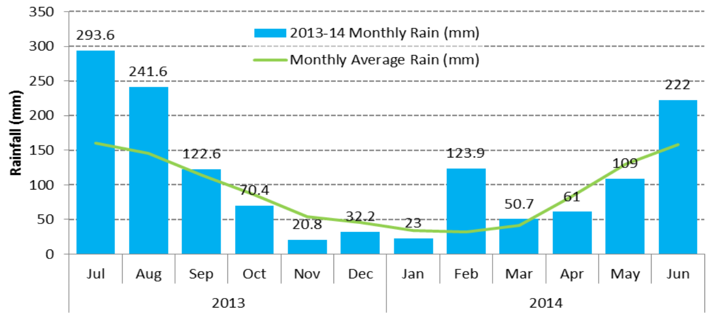


Figure 3. Monthly rainfalls at Uraidla (M023750)

Uraidla Bureau of Meteorology (BoM) rainfall station received an above average rainfall of 1371 mm in 2013–14 in comparison to its long-term average of 1085 mm (Figure 3). Above average rainfall was experienced predominantly in the late summer and all winter months across 2013–14. The months of October to January and April and May all received below average rainfall.

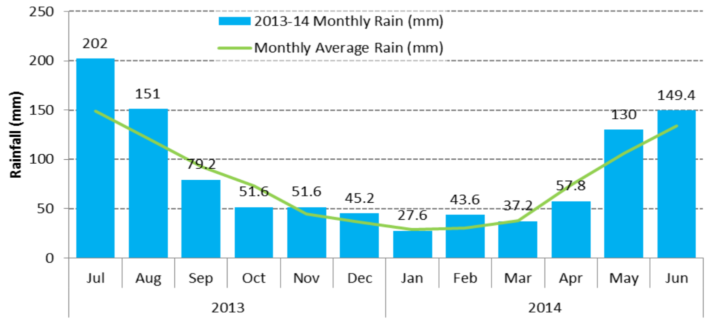


Figure 4. Monthly rainfalls at Parawa (M023761)

Parawa BoM rainfall station received an above average rainfall of 1026 mm in 2013–14 in comparison to its long-term average of 929 mm (Figure 4). Above average rainfall was experienced in 7 months across 2013–14, with above average rainfall predominantly in the summer and winter months.

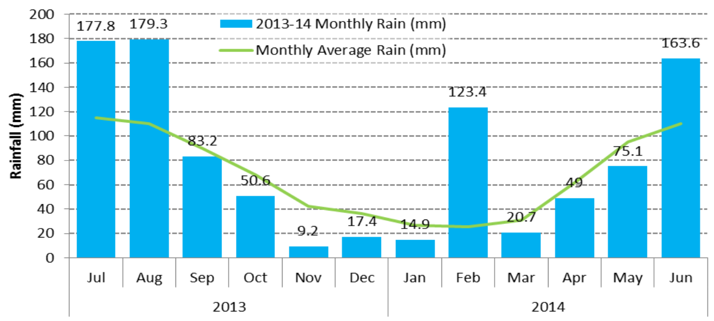


Figure 5. Monthly rainfalls at Cudlee Creek (M023731)

Cudlee Creek BoM rainfall station received an above average rainfall of 964 mm in 2013–14 in comparison to its long-term average of 811 mm (Figure 5). Well above average rainfall was experienced in July and February across 2013–14. The spring and summer months of September to January and also the autumn months of March to May all received below average rainfall.

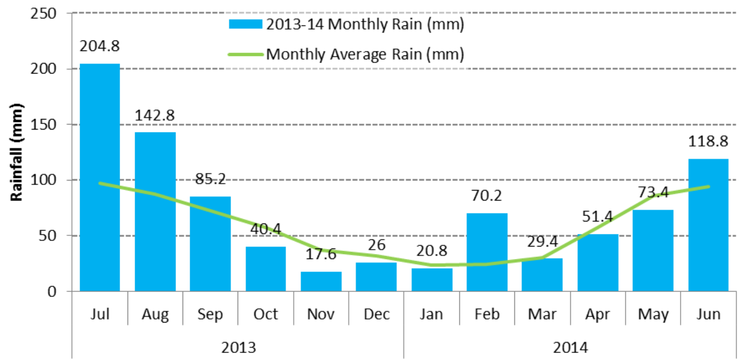


Figure 6. Monthly rainfalls at Mount Bold (M023734)

Mount Bold BoM rainfall station received an above average rainfall of 881 mm in 2013–14 in comparison to its long-term average of 699 mm (Figure 6). Above average rainfall was experienced in five months across 2013–14, predominantly the winter months. The months of October to January and March to May all received below average rainfall.

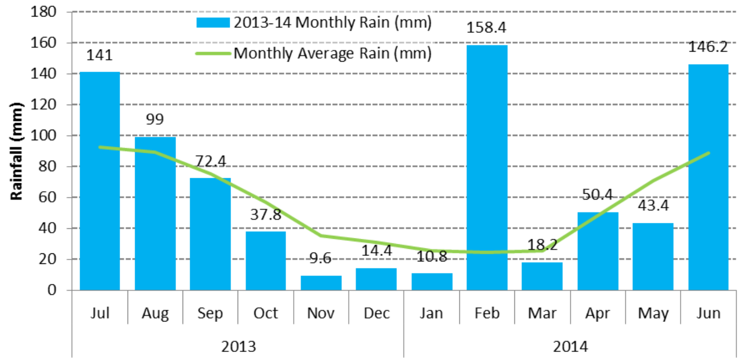


Figure 7. Monthly rainfalls at Mount Pleasant (M023737)

Mount Pleasant BoM rainfall station received an above average rainfall of 802 mm in 2013–14 in comparison to its long-term average of 664 mm (Figure 7). Above average rainfall was experienced predominantly in the winter and late summer months across 2013–14. February received more than six times the monthly average rainfall. The months of September to January all received below average rainfall

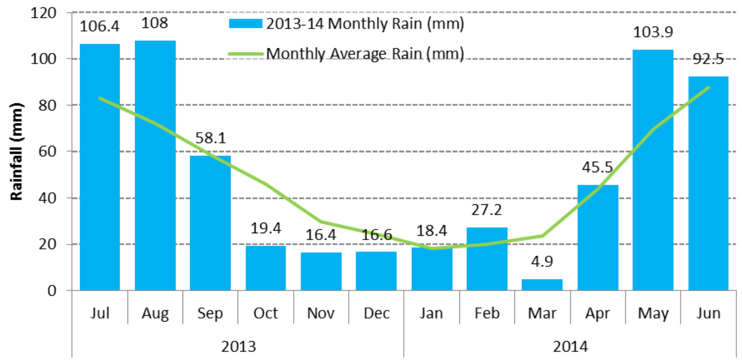


Figure 8. Monthly rainfalls at Yankalilla (M023754)

Yankalilla BoM rainfall station received an above average rainfall of 617 mm in 2013–14 in comparison to its long-term average of 577 mm (Figure 8). Above average rainfall was experienced in 7 months across 2013–14. Well above average rainfall was received in the late autumn and all winter months. The months of September to December and also March all received below average rainfall.

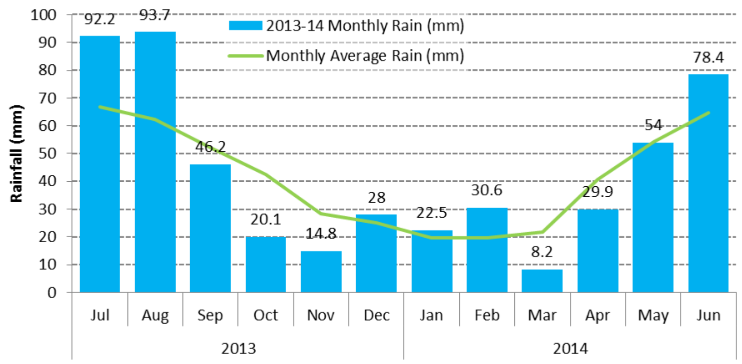


Figure 9. Monthly rainfalls at Port Elliot (M023742)

Port Elliot BoM rainfall station received an above average rainfall of 519 mm in 2013–14 in comparison to its long-term average of 498 mm (Figure 9). Above average rainfall was experienced in 6 months across 2013–14. As was observed across all previous rainfall analysis sites, the late summer month of February and all winter months received well above average rainfall. Conversely, the late spring months of October and November across all previous sites received below average rainfall.

Streamflow

Status	Degree of confidence	Comments on recent historical context
Above average streamflow at 7 of 8 streamflow analysis sites	High: data derived from long-term gauging stations	Average streamflow at Scott Creek after two years of below average streamflow. Above average streamflow after two years of below average streamflow at Mount Pleasant, Sixth Creek, Kersbrook Creek, Scott Creek and Myponga River. Second consecutive year of above average streamflow at Inman River and Yankalilla River and fourth consecutive year of above average streamflow at Baker Gully.

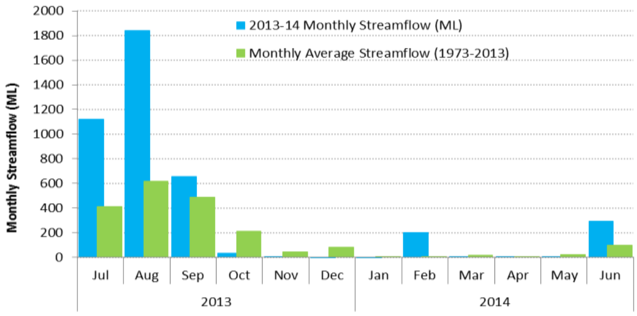


Figure 10. Monthly streamflow at Torrens River (A5040512)

Torrens River at Mount Pleasant (A5040512) experienced an above average annual streamflow of 4169 megalitres (ML) for 2013–14 (107% higher than the 2009 ML long-term average). The monthly breakdown of streamflow for 2013-14 (Figure 10) highlights that five months received above average streamflow, with the late winter months of July and August receiving well above the monthly average streamflow. No streamflow was recorded in December or January.

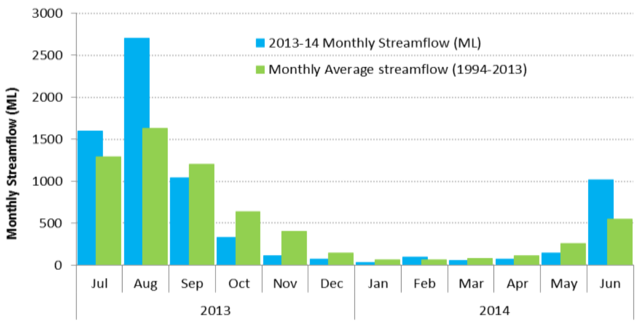


Figure 11. Monthly streamflow at Sixth Creek (A5040523)

Sixth Creek at Castambul (A5040523) experienced an above average annual streamflow of 7253 ML for 2013–14 (13% higher than the 6436 ML long-term average). The monthly breakdown of streamflow for 2013-14 (Figure 11), highlights the winter months of June to August received well above the monthly average streamflow. 73% of the total streamflow was received during the winter months.

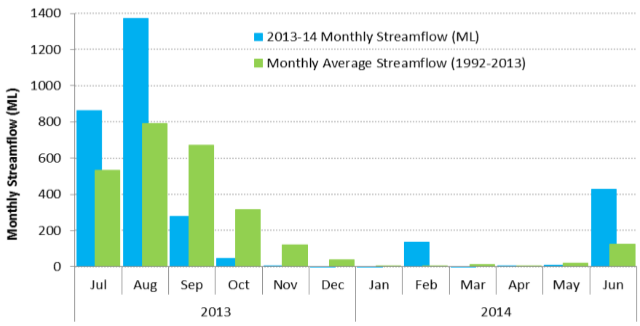


Figure 12. Monthly streamflow at Kersbrook Creek (A5040525)

Kersbrook Creek u/s Millbrook Reservoir (A5040525) experienced an above average annual streamflow of 3133 ML for 2013–14 (19% higher than the 2637 ML long-term average). The monthly breakdown of streamflow for 2013-14 (Figure 12) highlights that four months received above the monthly average streamflow, the majority received in the winter months and February. No streamflow was recorded in December, January or March.

Scott Creek at Scott Bottom (A5030502) experienced an around average annual streamflow of 3466 ML for 2013–14 (4% lower than the 3606 ML long-term average). The monthly breakdown of streamflow for 2013-14 (Figure 13) highlights that July, August and March were the months to receive above average streamflow.

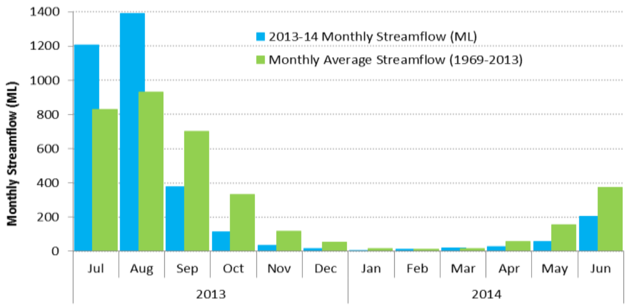


Figure 13. Monthly streamflow at Scott Creek (A5030502)

Baker Gully 4.5km WNW Kangarilla (A5030503) experienced an above average annual streamflow of 9036 ML for 2013-14 (123% higher than the 4051 ML long-term average). The monthly breakdown of streamflow for 2013-14 (Figure 14) highlights that nine months received above average streamflow, predominantly the winter and early spring months. November, January and March all received below average streamflow.

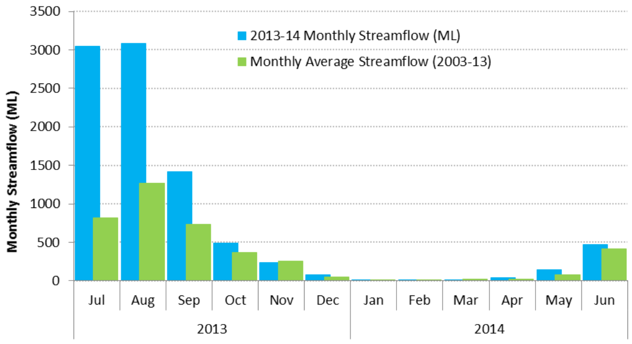


Figure 14. Monthly streamflow at Baker Gully (A5030503)

Myponga River u/s dam and road bridge (A5020502) experienced an above average annual streamflow of 9387 ML for 2013–14 (43% higher than the 6554 ML long-term average). The monthly breakdown of streamflow for 2013-14 (Figure 15) highlights that July to September and May were the months to receive above average streamflow.

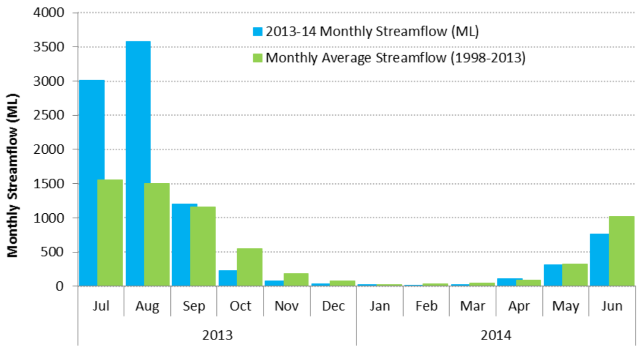


Figure 15. Monthly streamflow at Myponga River (A5020502)

Inman River u/s sewage treatment works (A5010503) experienced an above average annual streamflow of 14 166 ML for 2013–14 (90% higher than the 7445 ML long-term average). The monthly breakdown of streamflow for 2013-14 (Figure 16) highlights that six months received above average streamflow, predominantly in the late winter and early spring months. 91% of the total streamflow was received between July and September.

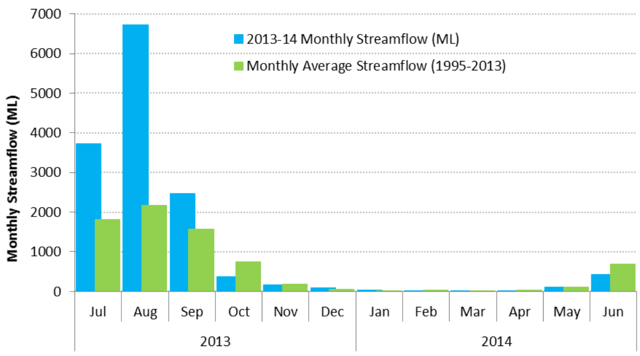


Figure 16. Monthly streamflow at Inman River (A5010503)

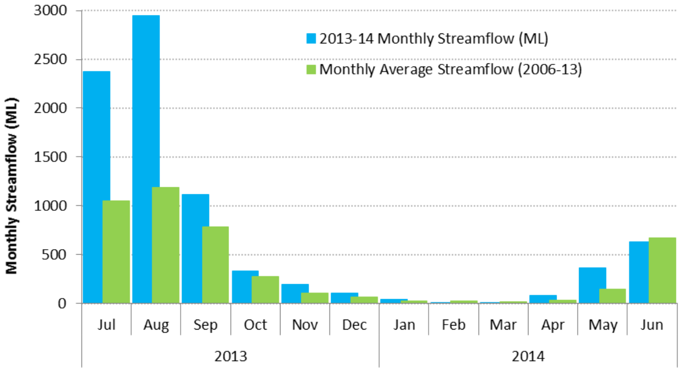


Figure 17. Monthly streamflow at Yankalilla River (A5011006)

Yankalilla River d/s Blackfellows Creek (A5011006) experienced an above average annual streamflow of 8228 ML for 2013–14 (88% higher than the 4386 ML long-term average). The monthly breakdown of streamflow for 2013-14 (Figure 17) highlights that July to January and April and May were the months to receive above average streamflow. Like was observed across all previous streamflow analysis sites, the months of July and August received the majority of the total streamflow.

Salinity

Status	Degree of confidence	Comments on recent historical context
Steady	Fair: data is derived from short-term monitoring stations	Stations show the high range of salinity being comparable to 2012–13

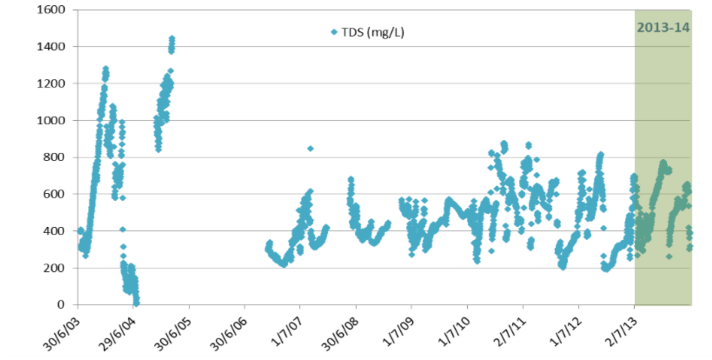


Figure 18. Salinity at Torrens River (A5041003) from 2003–14

Of the total record for Torrens River d/s Hollands Creek, 95% was recorded as <1000 mg/L and 5% of the record was between 1000-2500 mg/L. The salinity range in 2013-14 is slightly lower compared to the previous year and lower than the high range of salinity recorded around 2004-05.

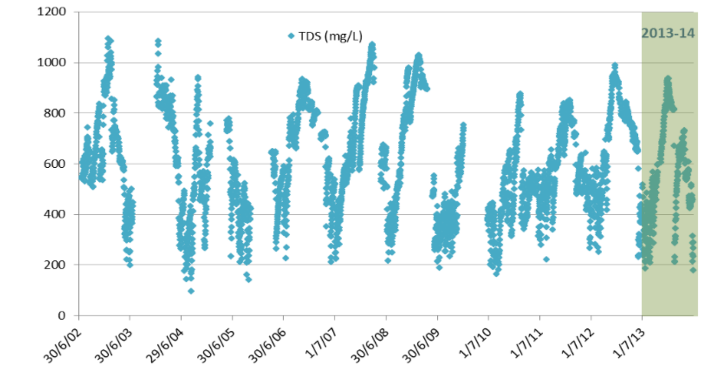


Figure 19. Salinity at Onkaparinga River (A5031001) from 2002–14

Of the total record for Onkaparinga River u/s Hahndorf Dissipater, 98% was recorded as <1000 mg/L and 2% of the record was between 1000-2500 mg/L. The salinity range in 2013-14 is slightly lower compared to the previous year and lower than the high range of salinity recorded around 2002-03.

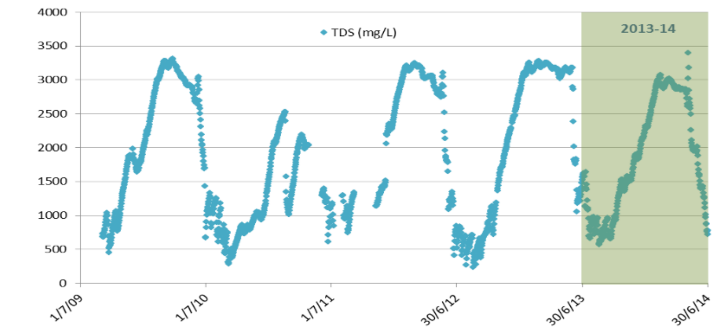


Figure 20. Salinity at Inman River (A5010503) from 2009–14

Of the total record for Inman River u/s sewage treatment works, 24% was recorded as <1000 mg/L, 41% of the record was between 1000-2500 mg/L and 35% between 2500-4000 mg/L. The salinity range in 2013-14 is slightly higher compared to the previous year.

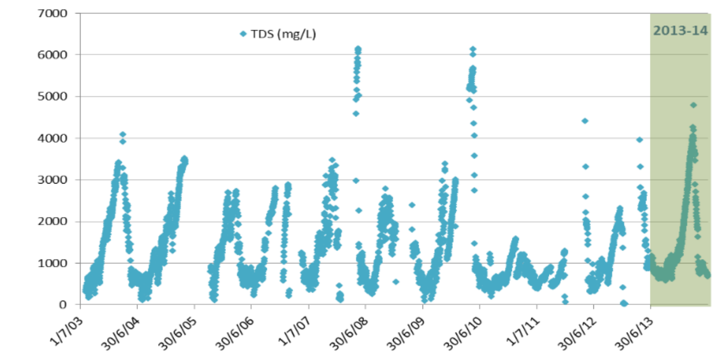


Figure 21. Salinity at Yankalilla River (A5011006) from 2003–14

Of the total record for Yankalilla River d/s Blackfellows Creek, 52% was recorded as <1000 mg/L, 38% of the record was between 1000–2500 mg/L, 9% between 2500–4000 mg/L and 2% was >4000 mg/L. The salinity range in 2013–14 is slightly higher compared to the previous year and lower than the high salinity levels recorded around 2007–08.

Surface water use

Status	Degree of confidence	Comments on recent historical context
High use compared to annual streamflow	Fair: licensed water use is based on estimates as roll-out of water licenses is being finalised	Water use as a % of annual streamflow has decreased during 2013–14

This section includes a description and estimates of surface water use at a whole prescribed area scale. As such, this may not represent the spatial variability of water use across the WMLR PWRA. Surface water use is summarised by estimated non-licensed demand, licensed surface water demand, SA Water licensed extractions, and plantation forestry (Table 1).

Table 1. Summary of surface water use in the WMLR PWRA

WMLR PWRA surface water use (ML)	Estimated non-licensed water demand	4956
	Licensed surface water demand	15 147
	SA Water licensed extractions (public water supply)*	66 099
	Plantation forestry	17 413
Total water extractions (ML)		**103 615**

*SA Water licensed extractions data provided by SA Water

In order to determine the impact of water use, a comparison of estimated water use and resource capacity is provided below.

Water use for the WMLR PWRA in 2013-14 was estimated to be 103 615 ML. The resource capacity of the PWRA as stated in the WMLR PWRA WAP is 286 000 ML and is adjusted to remove the impacts of farm dams and plantation forestry. To make the resource capacity more relevant to the 2013-14 reporting year, it has been scaled. This was achieved by taking into account the streamflow recorded in 2013-14 and the long–term resource capacity of surface water management zones upstream of the gauging stations, as outlined in the WMLR PWRA WAP. As a result, the total scaled resource capacity for the WMLR PWRA is equal to 328 813 ML, higher than the long-term average resource capacity. In 2013-14 it is estimated that 32% of the scaled resource capacity was used (49% in 2012-13). In terms of the rating system described by Table 2, the WMLR PWRA has been assigned a use rating of 4 (high use) for 2013-14. The assessed 'high use' rating is based at a whole prescribed area scale.

Table 2. 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

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ISBN 978-1-925369-59-5

Preferred way to cite this publication

DEWNR 2016, *Western Mount Lofty Ranges PWRA 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 *Western Mount Lofty Ranges PWRA Surface water status report 2012–13*, 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 Western Mount Lofty Ranges PWRA please see the *Water Allocation Plan for the Western Mount Lofty Ranges PWRA* on the Natural Resources Adelaide and Mount Lofty Ranges 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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