

Eastern Mount Lofty Ranges Prescribed Water Resources Area Fractured rock aquifers

2018 Groundwater level and salinity status
report



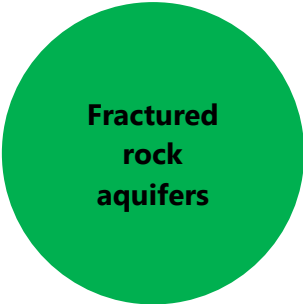
**Government
of South Australia**

Department for
Environment and Water

2018 Status summary

Eastern Mount Lofty Ranges PWRA

Fractured rock aquifers



Fractured rock aquifers

The fractured rock aquifers (FRAs) of the Eastern Mount Lofty Ranges (EMLR) Prescribed Water Resources Area (PWRA) have been assigned a **green** status for 2018 because positive trends have been observed over the past five years.

The status is based on five-year trends: over the period 2014–18, 93% of wells show rising groundwater levels and all wells show decreasing or stable salinities.

The status is based on five-year trends. To view the *Eastern Mount Lofty Ranges PWRA groundwater level and salinity status report 2011*, which includes long-term trends in rainfall, groundwater levels and salinity, please visit the [Water Resource Assessments](#) page on WaterConnect. To download the full record of groundwater level and salinity data for the Eastern Mount Lofty Ranges PWRA, please visit the *Groundwater Data* page on [WaterConnect](#).

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

See Figures 1, 2 and 3

Rainfall station	Mount Barker Bureau of Meteorology (BoM) rainfall station, number 23733, is located near the township of Mount Barker in the central western part of the EMLR PWRA.
Annual total ¹	829 mm 42 mm (5%) greater than the five-year average of 787 mm 70 mm (9%) greater than the long-term (1900–2018) average of 759 mm
Rainfall station	Ashbourne BoM rainfall station, number 23701, is located south of the township of Ashbourne in the south-western part of the EMLR PWRA.
Annual total ¹	644 mm 34 mm (5%) less than the five-year average of 678 mm 36 mm (5%) less than the long-term (1900–2018) average of 680 mm

¹ For the water-use year 1 July 2017 to 30 June 2018

Groundwater extraction

Allocated volume ^{1,2}	31 835 ML (all aquifers of the EMLR PWRA)
Licensed groundwater extractions ^{1,3}	3173 ML (fractured rock aquifer)

Groundwater level

See Figure 4

Five-year trend: 2014–18	24 out of 27 wells (89%) show a rising trend, at rates of 0.01–1.5 m/y (median of 0.14 m/y) 1 well (4%) shows a stable trend 2 wells (7%) show a declining trend, at rates of 0.15 and 0.47 m/y
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Groundwater salinity

See Figures 5 and 6

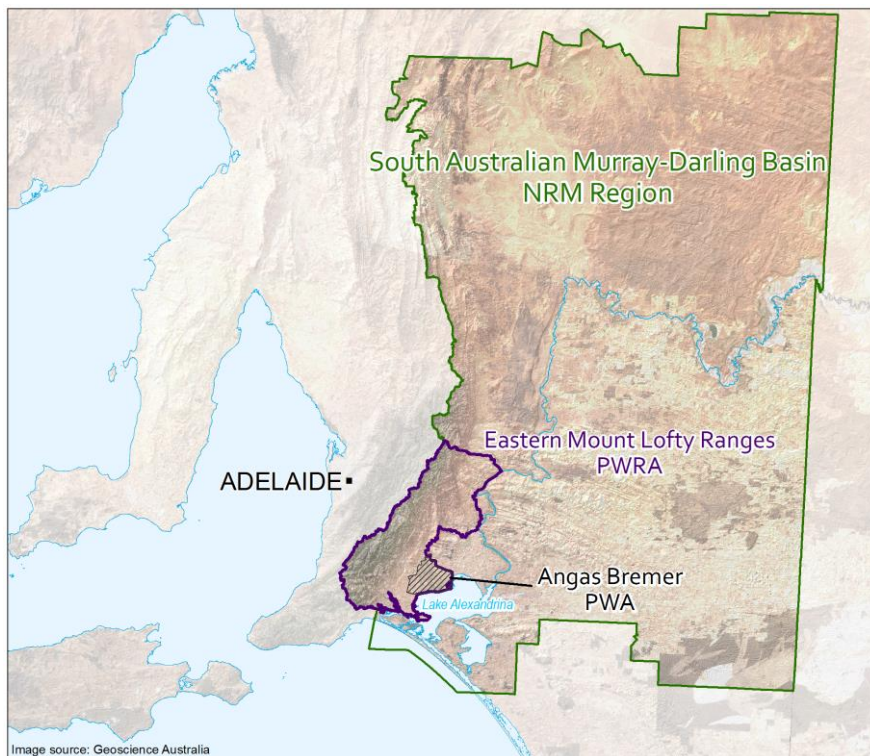
2018 salinity	177–5851 mg/L (259 wells; median of 1384 mg/L)
Five-year trend: 2014–18	1 out of 6 wells (17%) shows a decreasing trend, at a rate of 46 mg/L/y 5 wells (83%) show stable salinities
Citizen science	Since 2014, irrigators in the EMLR PWRA have submitted groundwater samples that DEW have tested for salinity concentration. Data that have been validated are augmenting the existing DEW monitoring network. ⁴

² Allocated volume does not include rollover, carry over or recharge allocations

³ Total licensed extractions are subject to change as extraction data have not yet been verified in full; installation of water meters by licensed users is still in progress across the EMLR PWRA – see [More information](#)

⁴ The salinity data collected from irrigation wells can be viewed at [Groundwater Data](#) or via [WaterConnect](#)

Regional setting



The EMLR PWRA lies within the South Australian Murray-Darling Basin Natural Resources Management Region and is located about 50 km east of Adelaide. It is a regional-scale resource for which groundwater, surface water and watercourse water are prescribed under South Australia's *Natural Resources Management Act 2004* and a water allocation plan provides for their sustainable management. The Angas Bremer Prescribed Wells Area is located within the boundaries of the EMLR PWRA and a stand-alone groundwater level and salinity status report has been prepared for this area (please visit the *Water Resource Assessments* page on [WaterConnect](#)).

The EMLR PWRA is characterised by fractured rock and sedimentary aquifers that are of varying age, water quality and yields. The FRAs, where groundwater is stored and moves through joints and fractures in the basement rocks, form the ranges that occur in the west of the PWRA. Sedimentary aquifers, where groundwater flows through the pore spaces within the sediments, occur in the valleys and plains to the east. Recharge to these aquifers occurs directly from local rainfall that percolates down to the water table through the soil profile. Where the sedimentary aquifers are confined, recharge occurs indirectly by throughflow from adjacent aquifers. Separate groundwater level and salinity status reports have been prepared on the sedimentary aquifers of the EMLR PWRA. These reports can be found on the *Water Resource Assessments* page of [WaterConnect](#).

The FRAs in the EMLR PWRA are the focus of this report. They comprise four geological units: the Barossa Complex, the Adelaidean sedimentary rocks, the Normanville Group and the Kanmantoo Group. Generally, the Adelaidean sedimentary rocks show greater rates of recharge, higher yields and lower salinities. The watertable generally follows the topography, with groundwater flowing from higher points in the landscape towards lower areas, where it typically discharges into rivers and streams or sedimentary aquifers in the valleys below. The regional flow direction within the FRAs is from north-west to south-east.

Trends in groundwater level and salinity within the FRAs of the EMLR are primarily climate driven: below-average rainfall can result in a reduction in recharge to the aquifer. Below-average summer rainfall can also result in increased extractions for irrigation, and both these elements can cause the groundwater levels to decline, and salinities to increase. Conversely, above-average rainfall may result in increased recharge and decreases in irrigation extractions, which can cause groundwater levels to rise and salinities to stabilise or decrease.

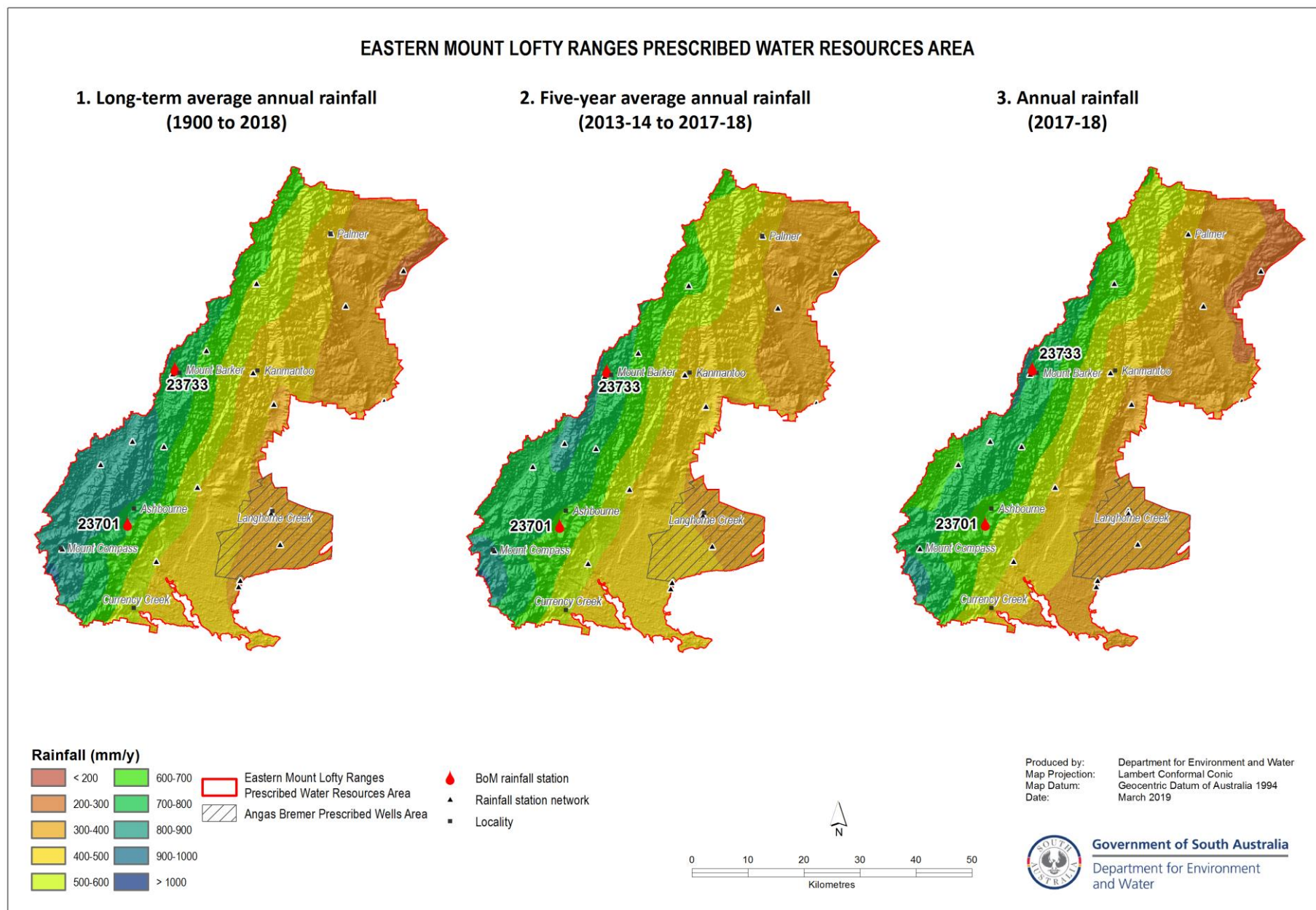


Figure 1. Spatial distribution of (1) long-term and (2) five-year average annual rainfall, and (3) annual rainfall⁵

⁵ Data sources: SILO interpolated point and gridded datasets available at <https://legacy.longpaddock.qld.gov.au/silo/> – see [More information](#)

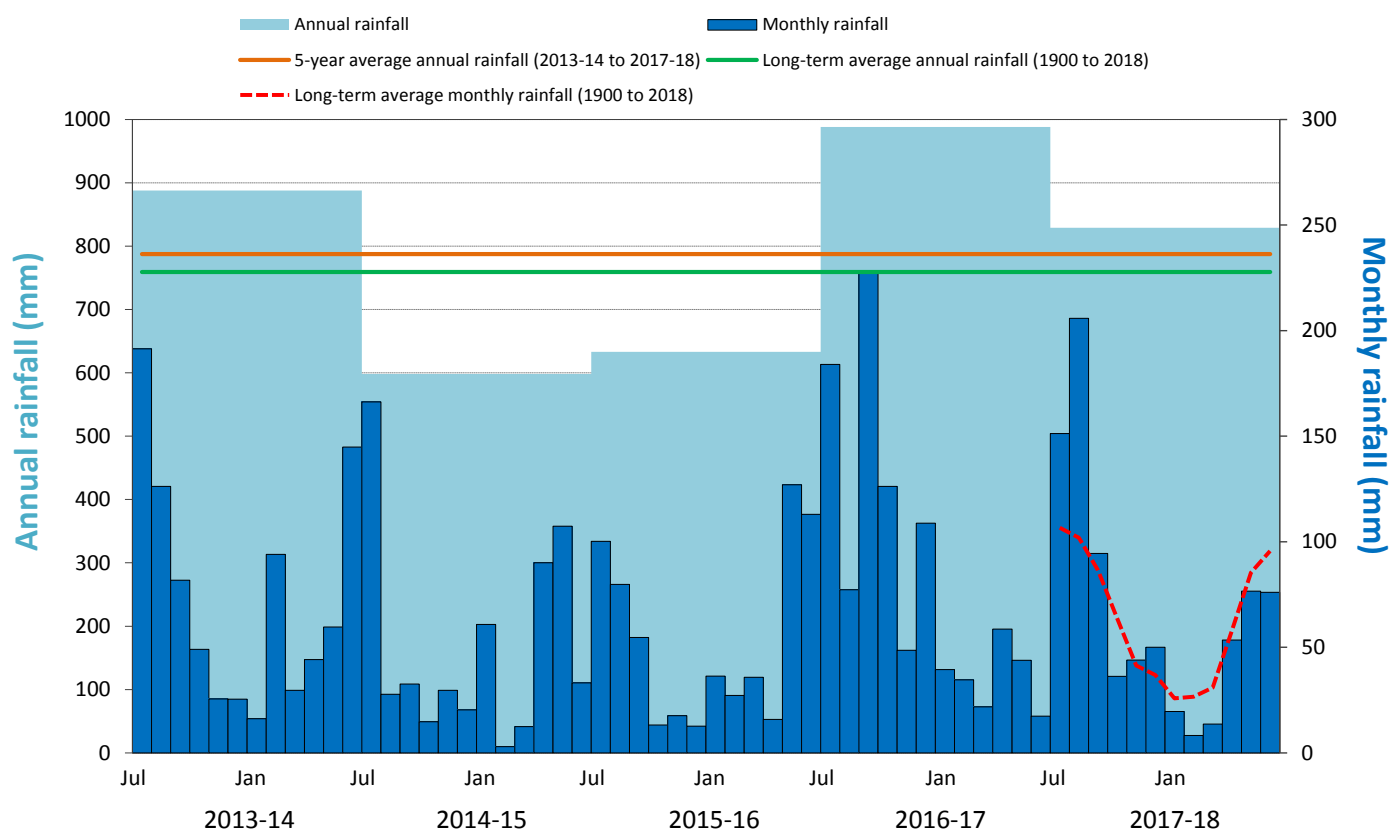


Figure 2. Annual and monthly rainfall for the past five water-use years recorded at Mount Barker (BoM Station 23733)⁶

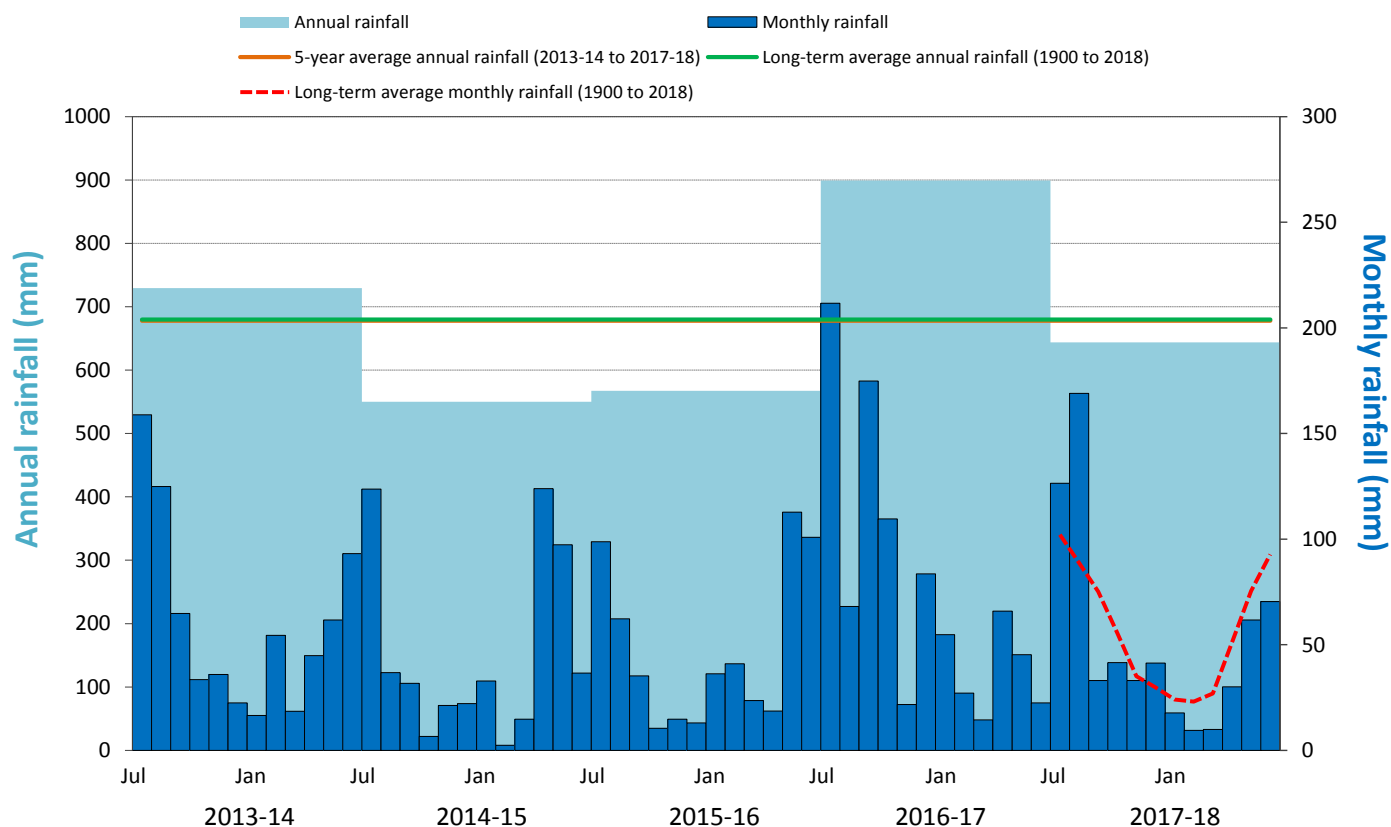
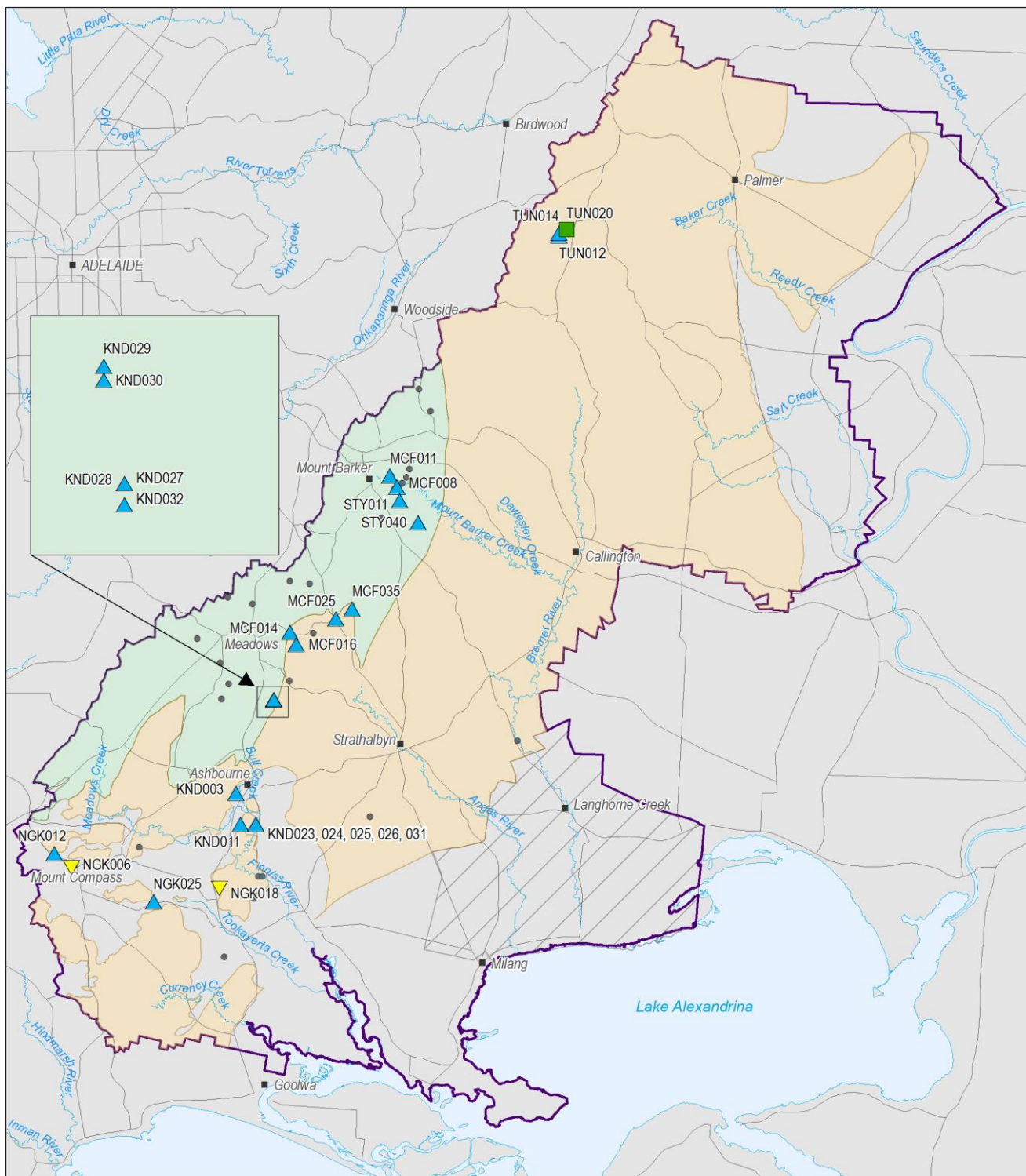


Figure 3. Annual and monthly rainfall for the past five water-use years recorded at Ashbourne (BoM Station 23701)

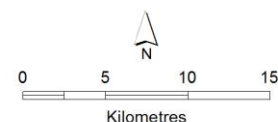
⁶ Data source: SILO Patched Point Dataset, available <https://legacy.longpaddock.qld.gov.au/silo/> – see [More information](#)



2018 water level status

- ▲ Groundwater level is above the historical minimum and has a rising trend
- Groundwater level is above the historical minimum and is stable
- ▼ Groundwater level is above the historical minimum but has a declining trend
- ▲ Groundwater level is the lowest on record but has a rising trend
- Groundwater level is the lowest on record but is stable
- ▼ Groundwater level is the lowest on record and has a declining trend

- Current monitoring well, insufficient data available
- Locality
- Road
- Watercourse
- ▭ Angas Bremer Prescribed Wells Area
- ▭ Kanmantoo Group Underground Water Management Zone
- ▭ Adelaide Group Underground Water Management Zone
- ▭ Eastern Mount Lofty Ranges Prescribed Water Resources Area

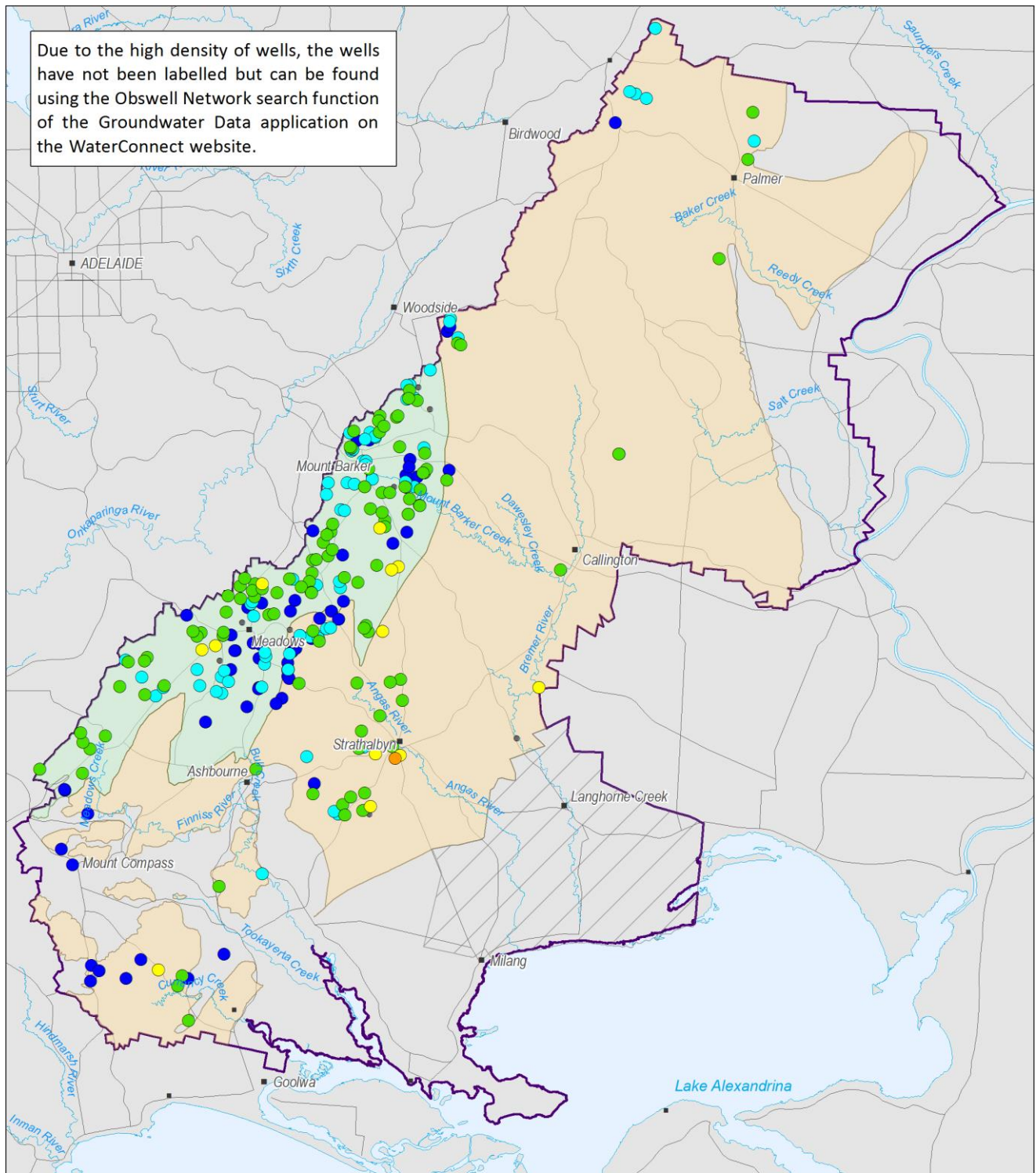


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 Date: March 2019



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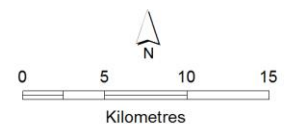
Figure 4. Five-year trends (2014–18) in groundwater levels: fractured rock aquifers



2018 salinity (mg/L)

- < 1000
- 1000 - 1500
- 1500 - 3000
- 3000 - 5000
- 5000 - 8000
- > 8000
- Current monitoring well, insufficient data available
- Locality

- Watercourse
- Road
- ▨ Angas Bremer Prescribed Wells Area
- Kanmantoo Group Underground Water Management Zone
- Adelaidean Group Underground Water Management Zone
- Eastern Mount Lofty Ranges Prescribed Water Resources Area

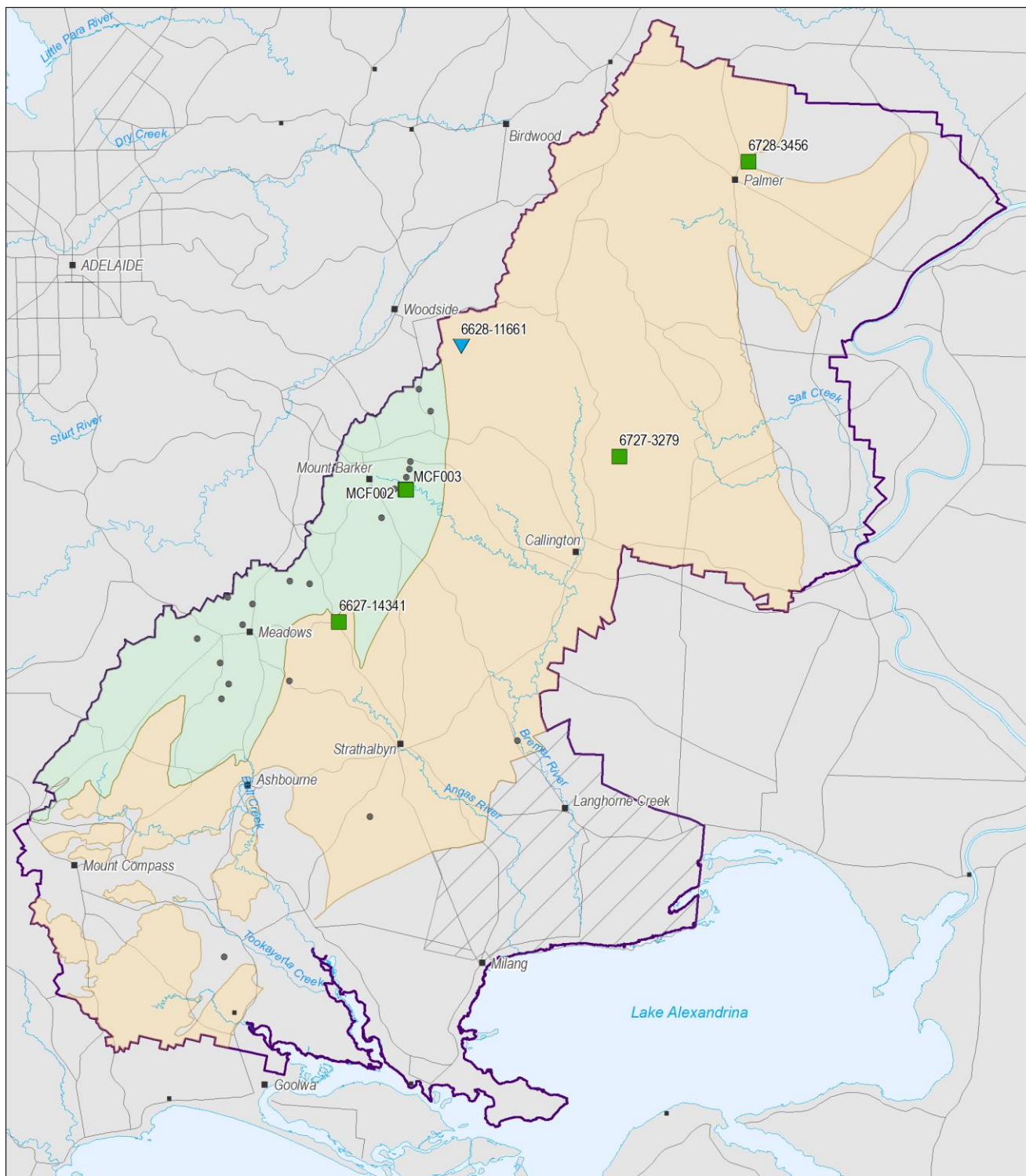


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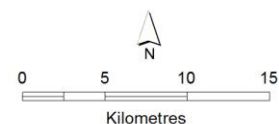
Figure 5. 2018 groundwater salinities: fractured rock aquifers



2018 salinity status

- ▴ Decreasing salinity trend
- Stable salinity
- ▴ Increasing salinity trend
- Current monitoring well, insufficient data available
- Locality

- Watercourse
- Road
- ▭ Angas Bremer Prescribed Wells Area
- ▭ Kanmantoo Group Underground Water Management Zone
- ▭ Adelaidean Group Underground Water Management Zone
- ▭ Eastern Mount Lofty Ranges Prescribed Water Resources Area



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Figure 6. Five-year trends (2014–18) in groundwater salinities: fractured rock aquifers

More information

To determine the status of the fractured rock aquifers for 2018, the trends in groundwater levels and salinities over the past five years (2014 to 2018, inclusive) were analysed, in contrast to the year-to-year assessments that have been used in *Groundwater level and salinity status reports* published prior to 2015. Please visit the [Frequently Asked Questions](#) on the *Water Resource Assessments* page on WaterConnect for more detail on the current method of evaluating the status of groundwater resources.

To view descriptions for all status symbols please visit the *Water Resource Assessments* page on [WaterConnect](#).

For additional information related to monitoring wells nomenclature, please refer to the *Wells Details* page on [WaterConnect](#).

The licensed groundwater extraction for the 2017–18 water-use year is based on the best data available as of February 2019 and could be subject to change, as some extraction volumes may be in the process of being verified and installation of water meters is still in progress across the EMLR PWRA.

For information completeness and consistency across all the groundwater and salinity status reports, the legend on each map herein shows the full range of water level and salinity status that could possibly be reported. However, the measured data that appear on each map may not span this full range.

Rainfall data used in this report are sourced from the SILO interpolated point and gridded datasets, which are calculated from BoM daily and monthly rainfall measurements and are available online at <https://legacy.longpaddock.qld.gov.au/silo/>.

To view the *Eastern Mount Lofty Ranges PWRA groundwater level and salinity status report 2011*, which includes background information on hydrogeology, rainfall and relevant groundwater-dependent ecosystems, please visit [WaterConnect](#). To view all past published *Groundwater level and salinity status reports*, please visit the [Water Resource Assessments](#) page on WaterConnect.

To download groundwater level and salinity data from monitoring wells within the Eastern Mount Lofty Ranges PWRA, please visit the *Groundwater Data* page under the Data Systems tab on [WaterConnect](#).

For further details about the Eastern Mount Lofty Ranges PWRA, please see the *Water Allocation Plan for the Eastern Mount Lofty Ranges* on the Natural Resources South Australian Murray-Darling Basin [website](#).

Units of Measurement

mm	millimetre
ML	megalitre
m/y	metres per year
mg/L	milligrams per litre
mg/L/y	milligrams per litre per year
mm/y	millimetres per year

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