

Coulta

Eyre Peninsula Groundwater Dependent Ecosystems monitoring site

2020 Report Card



Summary

Type of site: Control site for Wanilla
Status: **Green**, improving trends in the short term (2016 to 2020).
 Improvement in condition (2020) likely due to early and consistent rainfall.



Red Gums:



Condition
Very good



Trend
Improving
Short term
(2016 to 2020)



Trend
More data required
Long term

Ground water levels:



Trend
Declining
Short term
(2016 to 2020)

Climate: Above average maximum summer temperatures and decline in winter rainfall and recharge events.

This Report Card should be read in conjunction with the Overview, which provides information about Groundwater Dependent Ecosystem (GDE) monitoring and summary information for all monitored GDE sites.

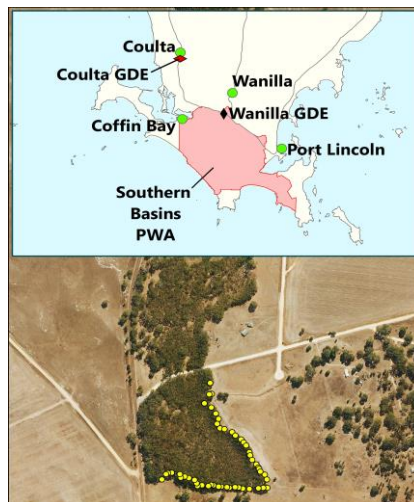


Adult Red Gum at Coulta assessed as 'very good' condition in Oct 2020.

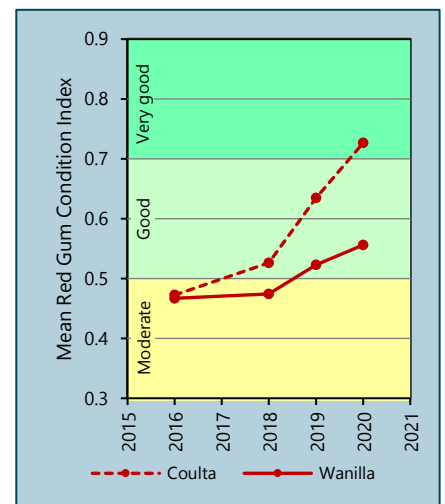
The **Coulta** Groundwater Dependent Ecosystems monitoring site is situated three kilometres south of Coulta, on the Flinders Highway. The site includes a remnant patch (approximately 17 ha) of Red Gum (*Eucalyptus camaldulensis*) Woodland. The understorey is dominated by native and introduced grasses.

Coulta is a control GDE Site, and is monitored to assess the impact of factors other than licensed extraction (e.g. climate) on GDE condition. It is located outside the zone of influence of any current or known historic licensed extraction.

While there is unlicensed extraction of water for stock and domestic purposes, this is assumed to be low compared to extraction for licensed consumptive purposes at other sites, and there is a low likelihood of it having any impact on the GDE.



Coulta site map (yellow dots represent 50 surveyed trees)



Graph 1 Change in Red Gum Condition Index at Coulta (control site for Wanilla) and Wanilla from 2016 to 2020

Red Gum condition

Tree condition monitoring is carried out in late October to early November. First completed in 2016, monitoring has been repeated annually since 2018. In 2016 the average Red Gum Condition Index (RCI) score was 0.47. There has been a steady improvement in condition since then, with condition in 2020 being very good (average RCI score of 0.72). This shows a 25% improvement in Red Gum condition since 2016. The dataset is, however, too short to enable determination of any long term trends. The higher RCI measured in 2020 can be attributed to high levels of tip growth observed in the trees.



Groundwater and climate assessment

Although an improvement in Red Gum condition was evident in 2020, there is a declining trend in groundwater levels at Couлта (Graph 2). Groundwater levels at Couлта fluctuate seasonally, but the minimum groundwater level in 2020 was approximately 13 cm below the minimum groundwater level in 2019.

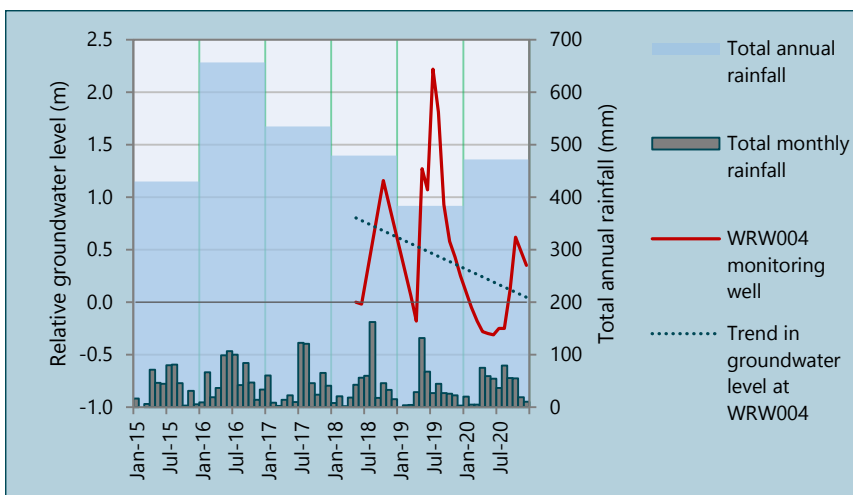
Couлта is located outside the zone of influence of licensed extraction, thus the decline in groundwater can be attributed to factors other than licensed extraction, specifically reduced recharge, and increasing temperature.

As detailed below, graphs on the right show climatic factors possibly contributing to groundwater decline, but also improvement in Red Gum condition:

- Total annual rainfall increased from 384 mm in 2019 to 472 mm in 2020 (Graph 2), but remained 46 mm below the long term¹ mean annual rainfall.
- In 2020 there was no month with high total rainfall (Graph 2), as can generally be seen in the long term record¹. In addition, the maximum daily rainfall was 34% less than the long term¹ mean. The combination of these two factors, while not a direct measure of rainfall intensity and duration, are an indication that rainfall in 2020 was lower than average intensity and duration.
- Temperatures remained hotter than usual, with the monthly average of the daily maximum temperature for the summer months (November to March) 0.4°C above the long term¹ mean (Graph 3).

Rainfall intensity and duration, and not just volume, are important for groundwater recharge. Although total annual rainfall increased, it was probably of lower intensity and duration. This, combined with an increase in maximum summer temperatures, could result in water being available in the upper soil profile, but NOT infiltrating deeper to contribute to groundwater recharge. The increased water in the upper soil profile would be immediately available to the Red Gums, likely resulting in improved tree condition despite a decline in groundwater levels.

¹All long term averages are for the period 1 Jan 1899 to 31 Dec 2020.

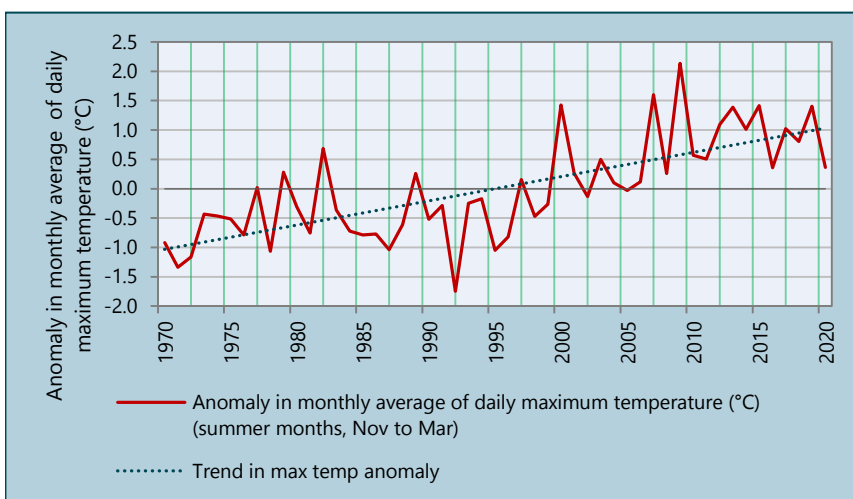


Graph 2 Total annual and total monthly rainfall^{^^}, and change in groundwater level^{**} at one monitoring well WRW004

Notes:

^{^^}Rainfall data for 2016 to 2018 is obtained from the Bureau of Meteorology station, Couлта (number 18019). Rainfall data for 2019 and 2020 is site specific data obtained from the rainfall gauge installed at the Couлта GDE site.

^{**}The groundwater levels shown for monitoring well WRW004 are relative to the groundwater level at the start of the monitoring period, which is shown as zero.



Graph 3 Anomaly in monthly average of daily maximum temperature[^] for summer months (November to March) from 1970 to 2020

Note:

[^] This is the difference between the mean monthly averages of the daily maximum temperature for November to March in any one year and the long term¹ mean of the same parameter. Maximum daily temperature is measured at the Bureau of Meteorology station, Couлта (number 18019).

Monitoring into the future

Tree condition monitoring will continue on a yearly basis. As time goes on, more data will allow for the identification of any long term trends in the GDE condition.

New monitoring infrastructure was installed at Couлта in 2019 to improve the site specific accuracy of data collection. Additions include:

- two monitoring wells;
- a water level data-logger at one well; and
- a rain gauge to measure rainfall intensity and amount.

For more information

Access the full report on assessment of Red Gum condition in 2018 [here](#):

Muller K. L., N.J. Souter and Australian Water Technology (2019). *Eyre Peninsula Groundwater Dependent Ecosystem Data Analysis: Red Gum tree condition data (five sites)*. A report for Natural Resources Eyre Peninsula, Department for Environment and Water, Port Lincoln, South Australia.

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