

Bellevue



Eyre Peninsula Groundwater Dependent Ecosystems monitoring site
2018 Report Card



The **Bellevue** Groundwater Dependent Ecosystems monitoring site is situated eight kilometres north-east of Bramfield, on the Birdseye Highway. The site includes a seasonal (ephemeral) wetland and a remnant patch (approximately 17 ha) of Red gum (*Eucalyptus camaldulensis*) Woodland. Amongst the Red gum overstorey and midstorey grows Native apricot (*Pittosporum* sp.) and sheoak (*Allocasuarina* spp.). The understory is predominately intact and includes Flax-lily (*Dianella* spp.). Around the wetland proper is an extensive zone of Honey-myrtle (*Melaleuca* sp.).

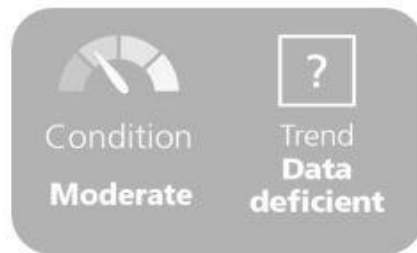
Bellevue is a Control Site, as it is outside of the zone of influence of any current or known historic licensed extraction.

There is extraction of water for stock and domestic purposes for which a water licence is not necessary. This extraction is assumed to be low compared to extraction for licensed consumptive purposes at other sites.

Red gum condition

Tree condition monitoring was undertaken in 2016 and repeated in 2018. In 2016 the average Red gum Condition Index (RCI) score was 0.53. In 2018 the average RCI score was 0.46, showing a 7% decline in Red gum condition over this period. A two year

dataset while good, is much too short to determine any long-term trend in condition.



Adult Red gums assessed as in 'moderate' condition, during the 2016 GDE monitoring at Bellevue.



Bellevue site map. Note: yellow dots represent 50 surveyed trees.



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Climate assessment

Statistical analysis of air temperature, rainfall and groundwater depth indicates that this change in condition is likely due to the effects of climate variability. Average annual maximum air temperature at Elliston has increased by 1.6 degrees Celsius between 1962 and 2018.

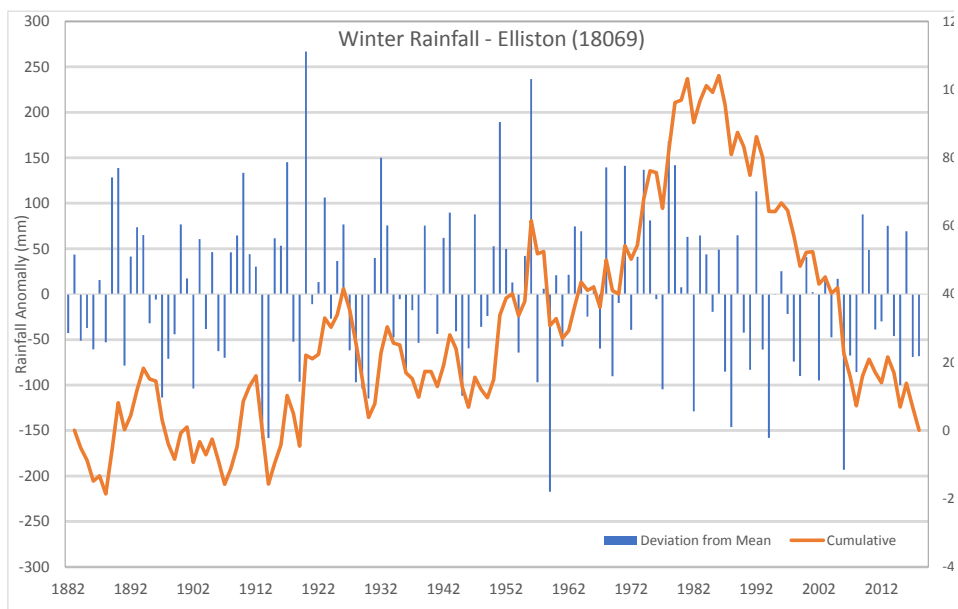
Graphs on the right show:

- The rainfall trend amounts are in decline since 1986 including from 2016 to 2018. It should be pointed out that we would rather have rainfall data from closer to the site but Elliston (17km away) was the closest rainfall station with an appropriate dataset. It must also be noted that it is thought that intense rainfall events maybe more important to Red gum health than changes in annual rainfall. This concept will need further data analysis into the future.
- Groundwater levels have seen a slight decline (up to 0.15m) at some wells from 2016 to 2018.

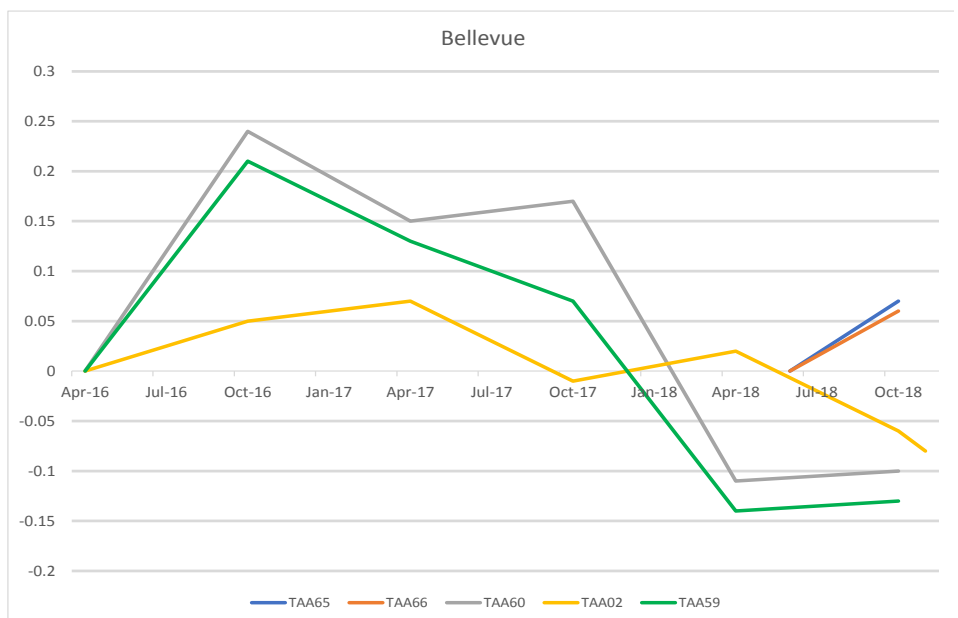
Monitoring into the future

Tree condition monitoring will continue on a yearly basis. As time goes on more data will identify a trend if there is one. In addition to more data, new monitoring infrastructure was installed at Bellevue in 2019 to improve the site specific accuracy of data collection. Additions include:

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



Graph 1 Winter rainfall from 1882 – 2017.



Graph 2 Change in groundwater levels at five wells, from 2016 to 2018.
(Note: all measurements are in metres)

For more information

Access the full report 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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