

An analysis of historical cease-to-flow and low-flow events in the Barwon–Darling system

Some people have suggested that the Barwon–Darling river system never used to run dry and that increased development and water extraction has led to frequent cease-to-flow periods. This fact sheet looks at what evidence exists to support this.

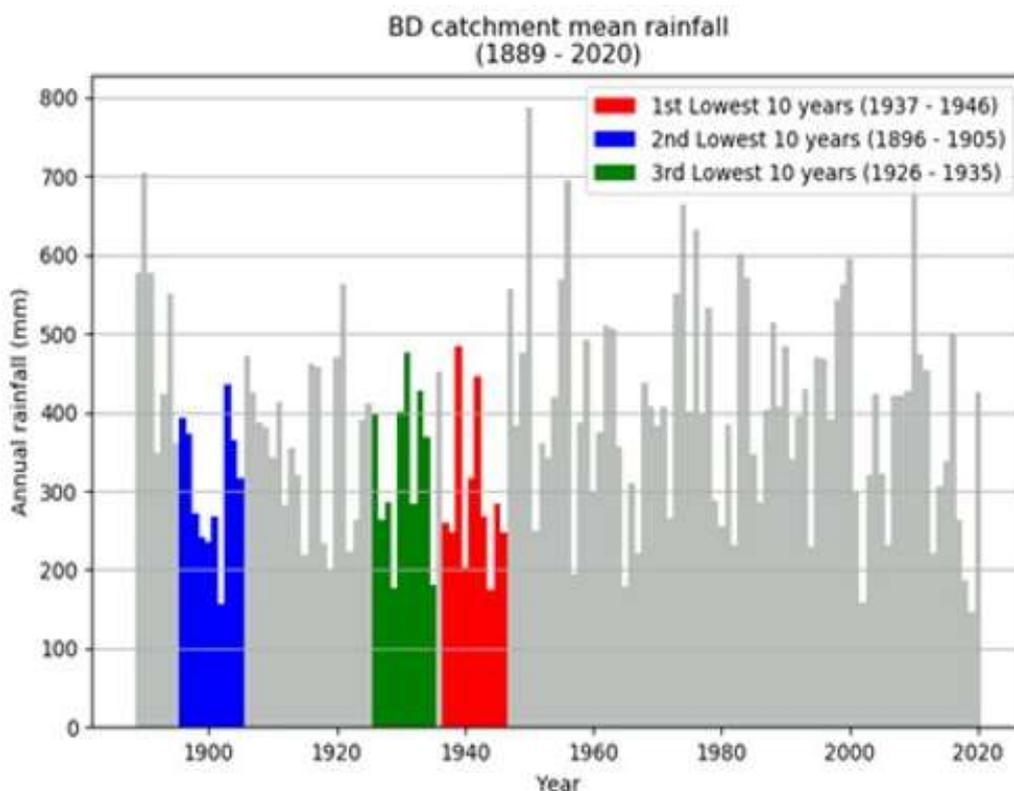
Wet and dry climate periods

Western NSW cycles between wet and dry periods:

- The 1900s to the 1950s were comparatively dry.
- The 1950s to the 1990s were comparatively wet.
- Since the millennium drought, Western NSW has been returning to drier conditions.

The driest 10-year and 5-year rainfall periods in the Barwon–Darling catchment all occurred in the dry periods (Figure 1 and Figure 2).

Figure 1. Lowest 10-year droughts in the Barwon–Darling historical record

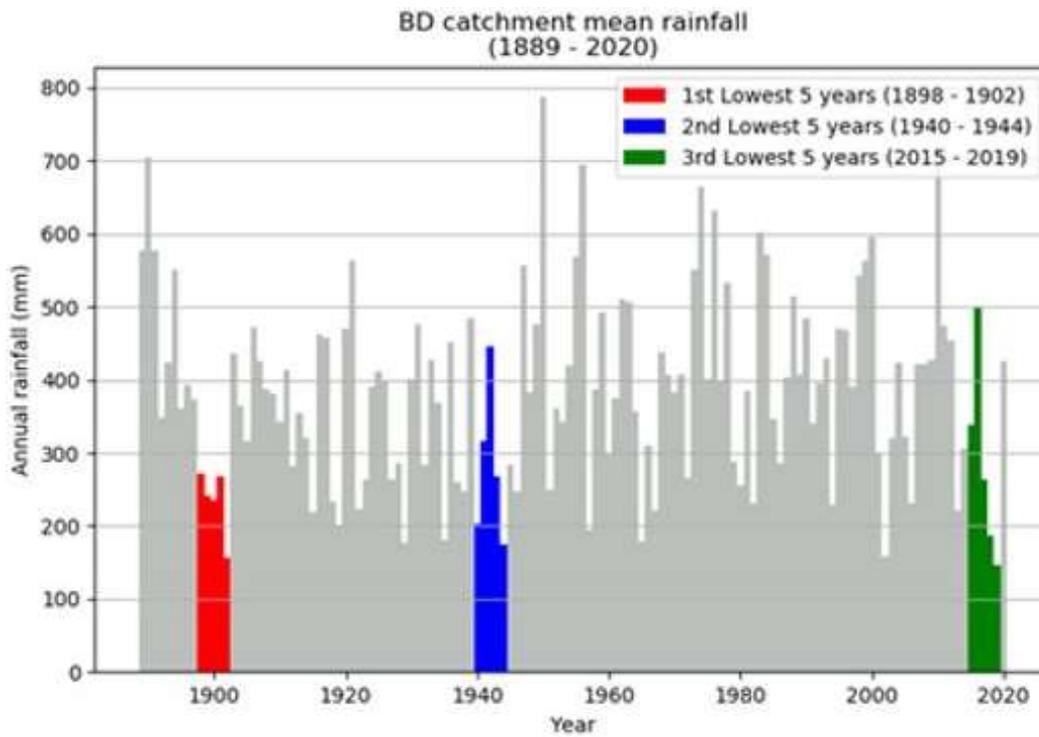


Cease-to-flow and low-flow events in the Barwon–Darling River



Healthy Floodplains Program

Figure 2. Lowest 5-year droughts in the Barwon–Darling historical record



Cease-to-flow and low-flow events in the Barwon–Darling River

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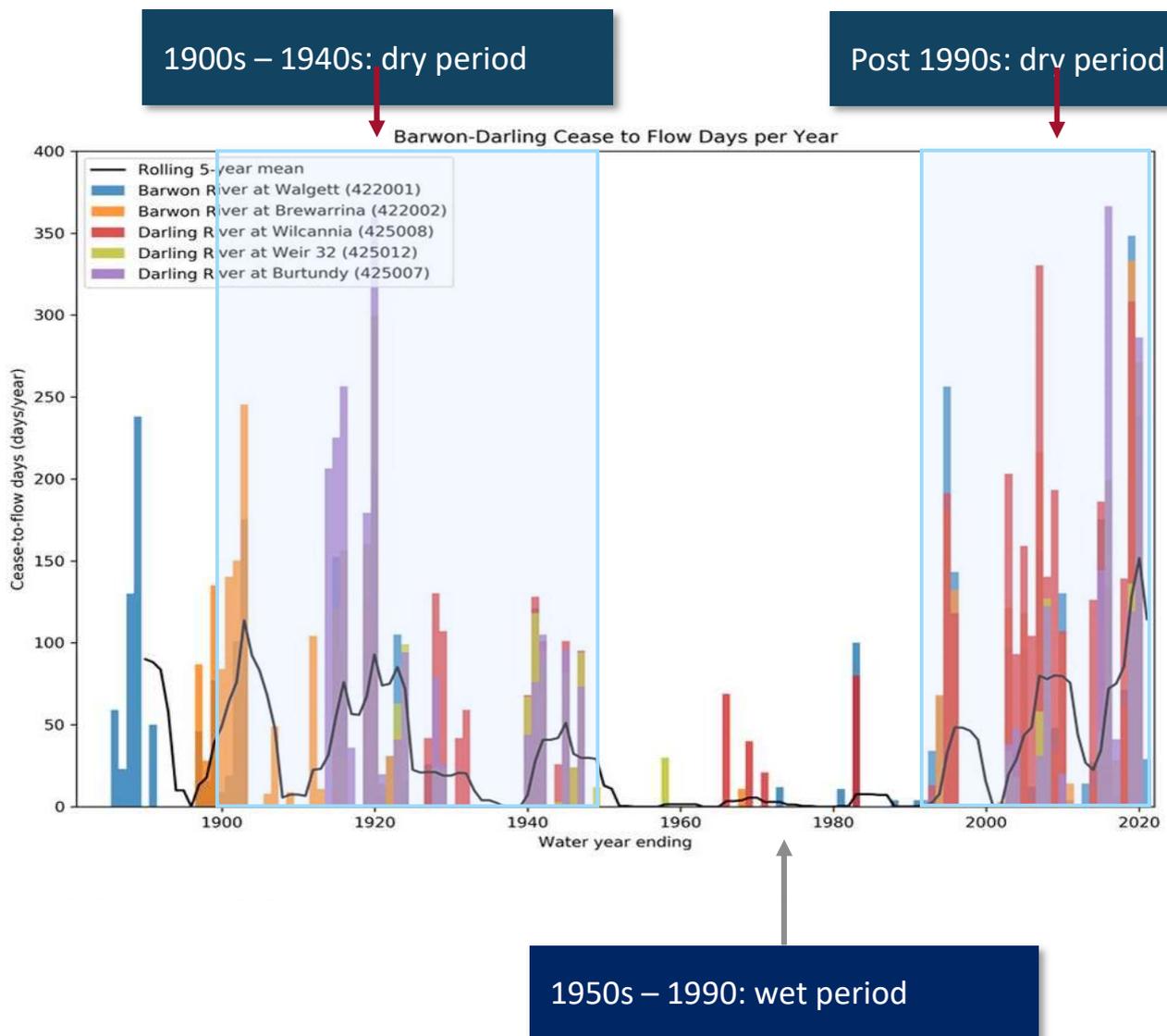
The river has stopped flowing naturally from time to time

The Barwon–Darling river has stopped flowing from time to time and often the cease-to-flow periods have correlated with dry periods in the climate.

There is a similar pattern for low flows in the Barwon–Darling.

A constantly flowing river is not normal for the region. The river stopped flowing for extended periods even before there were large dams and significant agricultural water use upstream (Figure 3).

Figure 3. Barwon-Darling cease-to-flow days at Walgett, Brewarrina, Wilcannia, Menindee and Burtundy in the historical record

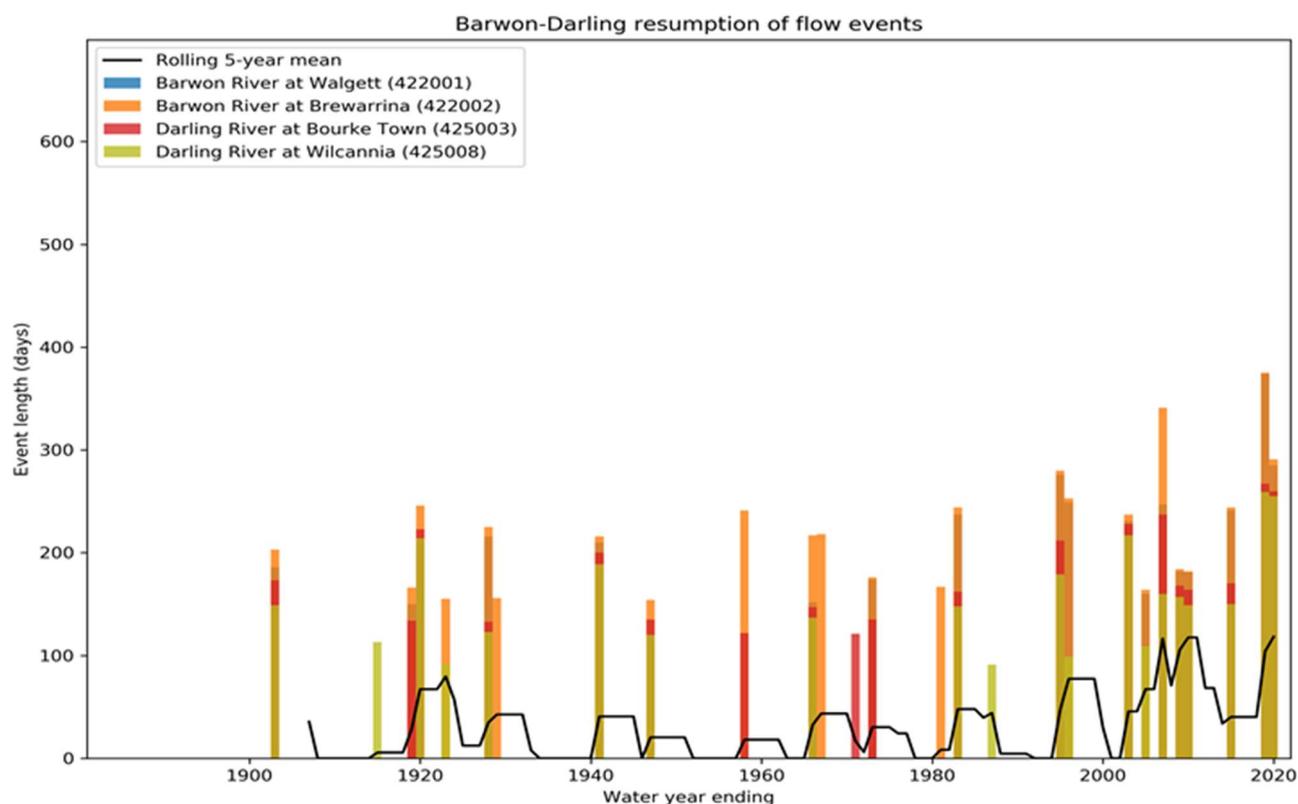


Frequency of cease-to-flow and low-flow periods

Low-flow periods are normal in the region. However, extended periods of low- and no-flow periods place significant stress on communities and the environment, which rely on flows from the river.

There has been a step change and an increase in the frequency of extended low-flow periods over the last 20 to 30 years. Figure 4 shows the extended low-flow days at 4 gauges in the Barwon–Darling system.

Figure 4. Extended low-flow events at Walgett, Brewarrina, Bourke and Wilcannia in the historical record



Cause of extended low- and no-flow periods

It is difficult to be definitive about the role and impacts of climate change, water management rules and development in the frequency and extent of cease-to-flow and low-flow events. However, indications are that the increasing cease-to-flow events are predominately due to changing climate.

For low flows, the climate is still having an effect, but development is also a significant contributor. The Murray–Darling Basin Authority undertook some research in 2018 that found that climate change and variability appear to be a significant factor to flows at Bourke, but development and regulation also influence flows across the Northern Basin.¹

Extended low- and no-flow periods are likely to be caused by a combination of the natural climate as well as development.

¹ *Hydrologic assessment of flow changes in the Northern Basin* (October 2018) Murray Darling Basin Authority. Canberra

Climate change may increase the number of low-flow and cease-to-flow periods

Our new climate modelling suggests that:

- extreme droughts have occurred in our long-term past
- under a worst case, dry climate change scenario there may be significant decline in long-term water availability on average
- there may be more instances when the northern valleys do not connect with the Barwon–Darling (see Table 1).

Table 1. How often there is no flow at Walgett on average, i.e. no connection between the Namoi River and Barwon–Darling system

Source data	Frequency of no flows
Historical data (last 130 years)	20% of the time on average
Long-term historical climate projections	Similar to historical data on average
Dry climate change scenario	40% of the time on average

Climate change presents connectivity challenges through declines in the frequency and extent of flow events from the tributaries into the Barwon–Darling River.

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