

Water quality summary for the Macquarie–Castlereagh surface water resource plan area (SW11)

Water quality technical reports provide an overview of the water quality condition for each water resource area in the Murray–Darling Basin.

Purpose

The *Murray–Darling Basin Plan* (2012) requires all basin water resource areas to have a water quality management plan. Water quality technical reports for each area provide specialised background information to support the plans.

The Water Quality Technical Report for the Macquarie–Castlereagh surface water resource plan area gives an overview of the water quality condition. The report also outlines the factors influencing water quality in the region. This includes the likely causes of water quality degradation.

Water quality targets

The report compares water quality data to Basin Plan water quality targets. These targets support environmental, social, cultural and economic benefits in the Murray–Darling Basin and help identify risks to aquatic ecosystems, recreational and irrigation use.

Future monitoring of progress towards the targets will assess the success of management actions taken to address water quality decline.

Water quality parameters

The report looks at water quality parameters listed in the Basin Plan that represent general water quality condition. These parameters are most likely to demonstrate change over time from management actions. They include:

- turbidity and suspended sediment
- nutrients
- dissolved oxygen
- pH
- water temperature and thermal pollution
- salinity
- harmful algal blooms
- toxicants
- pathogens.

Methods

The water quality data used in the report comes from 15 routine water quality monitoring stations within the Macquarie–Castlereagh surface water resource plan area.

We have developed a water quality index (WaQI) to communicate and report water quality condition. It combines data from a range of parameters to a common score and rating.

Water quality summary

Water quality technical report for water resource plans



For New South Wales, the WaQI uses parameters such as total nitrogen, total phosphorus, turbidity, dissolved oxygen and pH. Where data is available, it also considers temperature, salinity and blue-green algae.

The outcome provides a number between 1 and 100 categorised according to the following water quality rating:



Results

We used data collected between 2010 and 2015 to calculate index results for a range of sites in the Macquarie–Castlereagh surface water resource plan area. Results are shown in Figure 1. The Water Quality Technical Report for the Macquarie–Castlereagh surface water resource plan area has further details.

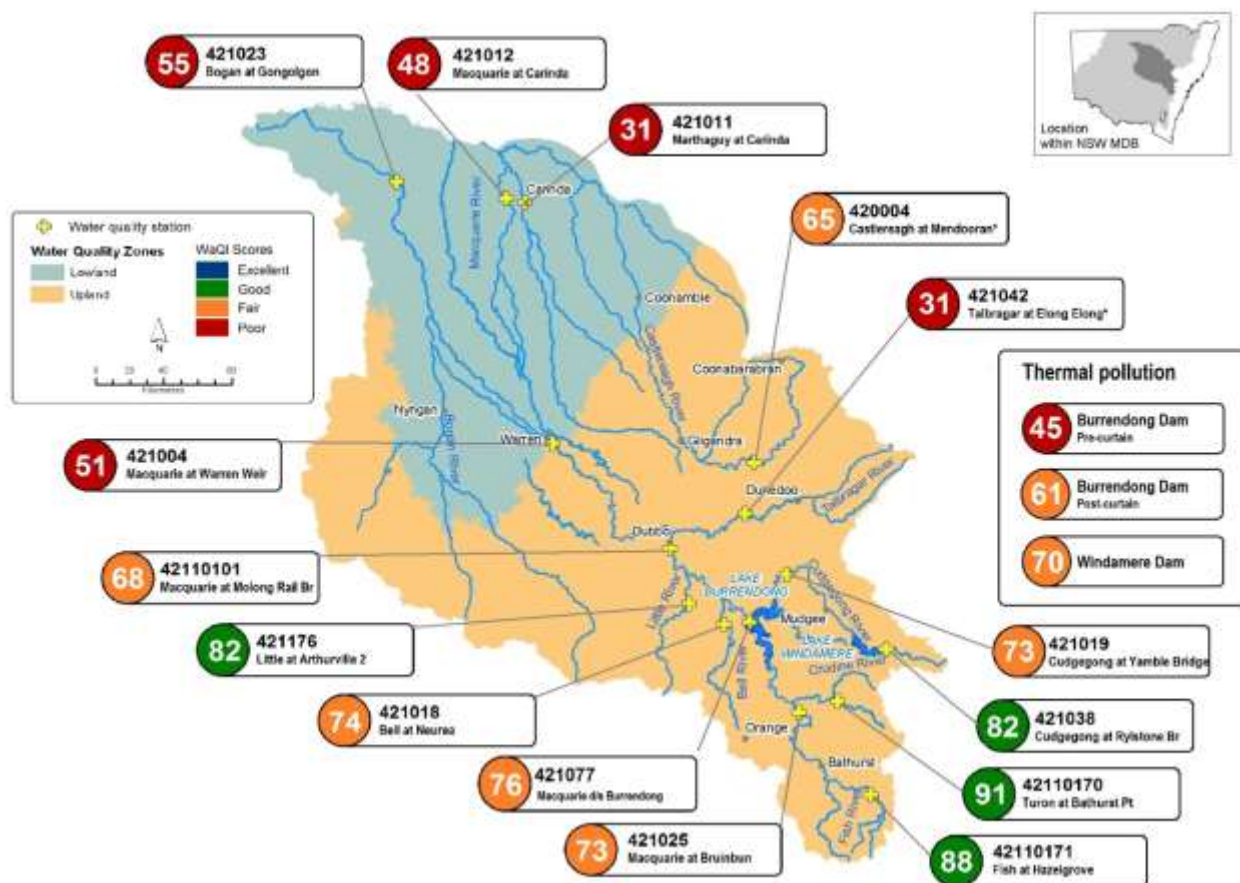


Figure 1 Water Quality Index Scores for the Macquarie–Castlereagh surface water resource plan area

Water quality issues within the Macquarie–Castlereagh catchment result from a combination of factors. These include changes to natural flow regimes, catchment conditions and land use. Table 1 lists the major water quality issues in the Macquarie–Castlereagh catchment.

Table 1. Summary of major issues and causes of water quality degradation

Issue	Location	Potential Causes
Harmful algal blooms	uplands	Stratification and warm water temperatures in Windamere, Burrendong and Ben Chifley Dams, nutrient inputs to dams.
Dissolved oxygen and pH outside of normal ranges	uplands, midlands, lowlands	Reduced flow and increased low flow and cease-to-flow periods disrupting dissolved oxygen dynamics and increasing eutrophication.
Increased nutrients and turbidity	uplands, midlands, lowlands	Stream bank and riparian condition, grazing and cropping practices, carp and feral species. In the lowlands, increased sediment and nutrient input associated with erosion.
Salinity	midlands	Salt inputs from naturally saline catchments
Toxicants and pesticides	midlands, lowlands	Pesticide use in cropping areas.
Disruption to organic carbon cycling	midlands, lowlands	Reduced freshes and high flows, disruption of longitudinal connectivity by Windamere and Burrendong Dams.
Thermal pollution	midlands	Cold water released from Burrendong Dam in summer and Windamere Dam during bulk water transfers.

More information

Please see the full report for further information on the water quality condition and discussion of results. It can be accessed [here](#).

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