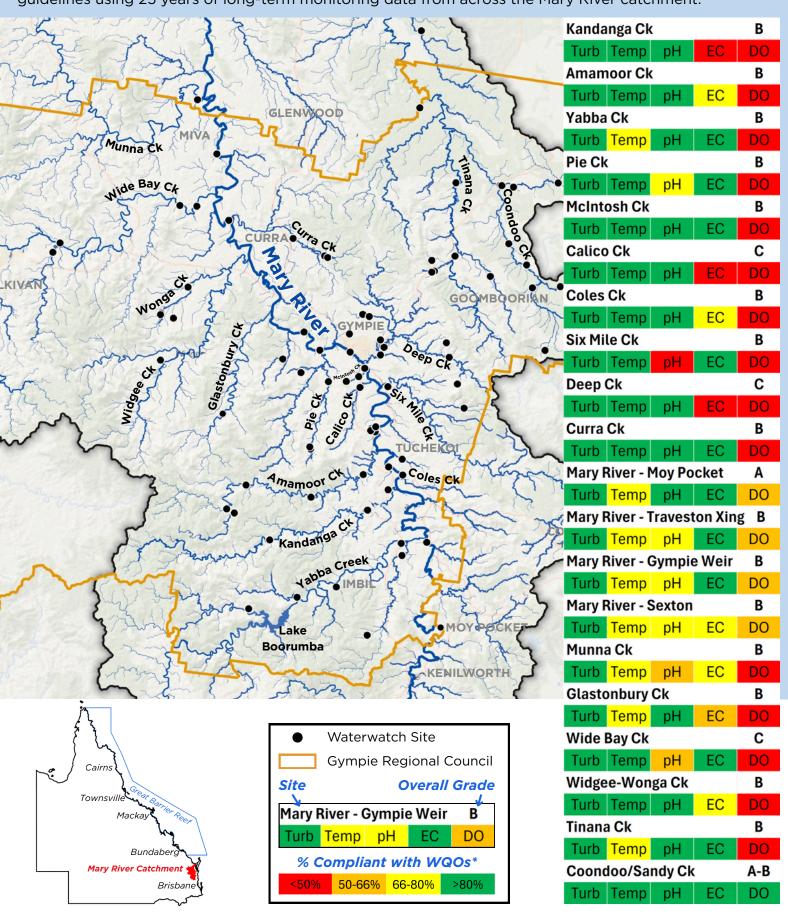
Gympie Region

Water Quality Report Card Summary 2018 - 2025



Between 2018 and 2025, 57 trained citizen scientists sampled 85 sites across the Gympie Regional Council area on Kabi Kabi and Butchulla Country. Volunteers monitor turbidity (turb), temperature (temp), pH, electrical conductivity (EC) (salinity) and dissolved oxygen (DO) each month. Some have been monitoring for more than 20 years, providing long-term data that would not otherwise exist. Without this committed volunteer effort we would not have access to all the valuable water quality information we have today.

All results were compared to Queensland Water Quality Objectives* and locally developed temperature guidelines using 25 years of long-term monitoring data from across the Mary River catchment.



Weather & Streamflow

Weather and streamflow can greatly influence water chemistry

From 2018 to 2021 the Mary River catchment endured prolonged drought, cease-to-flow events and rising salinity, which by 2020 prevented Mary River cod from spawning and required strategic Borumba Dam releases to support downstream reaches. Late 2021 rains offered brief relief before early 2022 brought one of the catchment's largest floods on record. Conditions then flipped again, with 2023 becoming one of the driest years recorded, followed by more regular rain in early 2024 and minor December flooding that washed out Mary River Turtle nests. In 2025 the extremes have continued, with Cyclone Alfred and major rain events in March-April causing significant flooding in Tiaro and the eastern tributaries.

Results

Turbidity (Turb)

The Mary River and most Gympie region creeks typically have clear water with low turbidity under normal flow conditions. Tinana and Six Mile Creeks are naturally tea-coloured from tannins but also remain low in turbidity. During floods, however, several tributaries such as Kandanga, Amamoor and Eel Creeks deliver elevated fine-sediment loads due to their geology and soil types. Once mobilised, this sediment can travel long distances before settling in the Great Sandy Strait near Hervey Bay.

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A general rule is the Mary River has a slightly alkaline pH, the tributaries on the western side of the river are alkaline (pH 8) and the tributaries on the eastern side of the river are acidic (pH 6). Some tributaries in the Toolara Forest are naturally acidic, with pH of 3 to 4. High pH results can be recorded in the afternoon, which indicates poorer water quality. Stable pH results without much variation throughout the day indicate good water quality, eg. Six Mile and Upper Widgee Creek.

Water Quality Guidelines used in this	Waterway
summary	•
1. Mary River and major	Mary River, Six Mile,
tributaries	Amamoor, Kandanga, Yabba
	and Tinana Creeks
2. Western Mary	Wide Bay, Widgee,
catchments	Glastonbury and Munna
	Creeks
3. Eastern Mary	Coondoo, Sandy, Yards, Big
catchments (Tannin	Sandy and Toolara Forest
stained)	Creeks

Electrical Conductivity (EC)

Several Gympie region creeks—such as Calico, Traveston, Deep and Wide Bay—show high salinity, especially during drought when flows drop or cease. In contrast, the Mary River through Gympie generally maintains low salinity due to reliable flow, though levels can rise in the Miva district during low-flow periods. The Western Mary sub-catchments also tend to have higher salinity than most other tributaries in the region.

Dissolved Oxygen (DO)

Mary River sites from Moy Pocket to Miva recorded the highest compliance with DO guidelines, largely due to consistent riverflow. In contrast, most major creeks were non-compliant, reflecting intermittent flows during drought and dry seasons, as well as warm temperatures that drive algal growth and cause DO to fluctuate through the day. Some creeks in good condition record naturally low DO levels e.g. Coondoo Creek.

Temperature (Temp)

The shaded rainforest creeks tend to have cooler water temperatures (18-20 degrees) which provides better water quality for fish and other species. The more open water bodies eg. Yabba Creek near Imbil with less shade from riparian vegetation are consistently much warmer (23-24 degrees) which stimulates algal growth.



Above: Coondoo Creek tannin stained waters, March 2018

Endangered Mary River cod

The endangered Mary River Cod prefer cooler water shaded by riparian rainforest. The better condition riparian rainforest the more likely that Mary River Cod will be found. The cod need stable water quality parameters eg. stable dissolved oxygen and temperatures, with no wild fluctuations during the day and night. They also need cool water to trigger them to spawn in Spring. In 2023 and 2024 a catchment wide survey was undertaken. In the Gympie region 38 sites were surveyed, at only 5 of these sites were cod recorded.

Water Testing Parameters Explained

Electrical Conductivity (EC)

EC is a measure of water's ability to conduct electricity. The EC value is derived from the amount of dissolved salt content in the water. As dissolved salt increases, so does the EC. Influences include geology, river flow, inflow of ground water into the stream and rising salt in the water table. During higher flow, the concentration of dissolved salts in the water reduces, resulting in decreased salinity, and lower EC.

Dissolved Oxygen (DO)

DO is the amount of oxygen that is dissolved in the water and is essential for all aquatic life. Fish are adapted to natural fluctuating oxygen availability; however, when DO falls below 80% saturation, fish survival is compromised.

DO is influenced by:

- temperature (warmer water holds less DO)
- streamflow and agitation through riffles (less agitation leads to lower DO)
- salinity (more saline water holds less DO)
- turbidity (more turbid water holds less DO)
- plant photosynthesis (day time = increased DO)
- plant respiration (night time = decreased DO)

Turbidity (Turb)

Turbidity is the measure of suspended sediments within the water. It is measured using the penetration of light through a liquid to approximate the level of suspended sediments. Turbidity is effectively a rapid approximation of Total Suspended Solids.

Temperature (Temp)

Temperature affects water quality by changing how much oxygen the water can hold, how quickly chemical and biological processes happen, and how easily substances dissolve. Warm water holds less oxygen and speeds everything up, while cooler water slows things down, making temperature a key factor in overall water health.

pH Acidity/Alkalinity

pH is a measure of acidity or alkalinity and is measured on a scale of 1 to 14. A pH of 7 is considered neutral, above 7 is alkaline and below 7 is acidic. During the night plants respire, releasing carbon dioxide into the water which increases acidity (lowers pH) compared to day time when photosynthesising plants take carbon dioxide from the water, which increases alkalinity. Sites with high levels of aquatic plant growth would be expected to fluctuate from more acidic pH in the morning to more alkaline in the later afternoon. pH is also influenced by catchment geology.

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We thank the Traditional Owners from Jinibara, Kabi Kabi, Waka Waka and Butchulla Country for their involvement and ongoing care for Country

For more information





MRCCC www.mrccc.org.au admin@mrccc.org.au (07) 5482 4766