

Lower Darling River – water quality and flow release update – 11 April 2024

Multiple agencies are monitoring water quality at Menindee and the lower Darling River to minimise the risk of further fish death events. This update provides a summary of information up to 11 April 2024.

There have been no further reports of fish deaths in the Darling River weir pool near Menindee. Despite detailed investigations and sample analysis, no single factor has been identified as the cause of the fish deaths that began in February 2024. Government agencies are continuing to pursue investigations into the cause, with further water quality, toxicology analysis and sampling of sediments undertaken.

Water quality monitoring is showing water temperatures are decreasing and dissolved oxygen levels in the Darling River at Menindee have increased and are remaining above the critical thresholds for fish health. In addition to the release of water from Lake Pamamaroo, the cooler water temperatures have provided an opportunity for dissolved oxygen levels to recover.

In response to the improved dissolved oxygen results, the volumes of water being released from lakes Pamamaroo and Menindee were adjusted this week to help preserve the water resource stored in the upper lakes. Discharge from Lake Pamamaroo was decreased from 500 ML/day to 300 ML/day, while Lake Menindee was increased from 50 ML/day to 100 ML/day to maintain a total of 400 ML/day at Weir 32. Ongoing monitoring will continue to inform operations to mitigate potential fish deaths.

To report any incidents of dead fish, fish struggling or starting to gasp at the water surface, or crayfish exiting the water, please call the NSW Department of Primary Industries Fisheries' Fishers Watch Phonenumber 1800 043 536 or fill in a fish kill protocol and report form (including a photo) at: <https://www.dpi.nsw.gov.au/fishing/habitat/threats/fish-kills-2019-2020/info-sheet> or <https://www.dpi.nsw.gov.au/fishing/compliance/report-illegal-activity> using the 'dead or dying fish' check box.

Vertical profile water quality monitoring – Darling River at Menindee

As the surface water of the river is heated by the sun, the water at the bottom of the deeper pools is often not warmed to the same temperature. During the summer months this can result in a difference in temperature between surface and bottom waters which is known as thermal stratification. This can lead to other water quality issues such as increased algal blooms on the surface and, nearer the riverbed, low dissolved oxygen. When the thermal stratification breaks down, this water near the riverbed with low dissolved oxygen is mixed through the whole water column where it can impact on fish health.

Monitoring in the weir pool at Menindee township shows that on the morning of 1 April there was thermal stratification between 3.0 and 4.2 metres. Cooler air temperatures since then have resulted in a steady decline in water temperature, with thermal stratification breaking down each morning and mixing of water through the water column. (Figure 1).

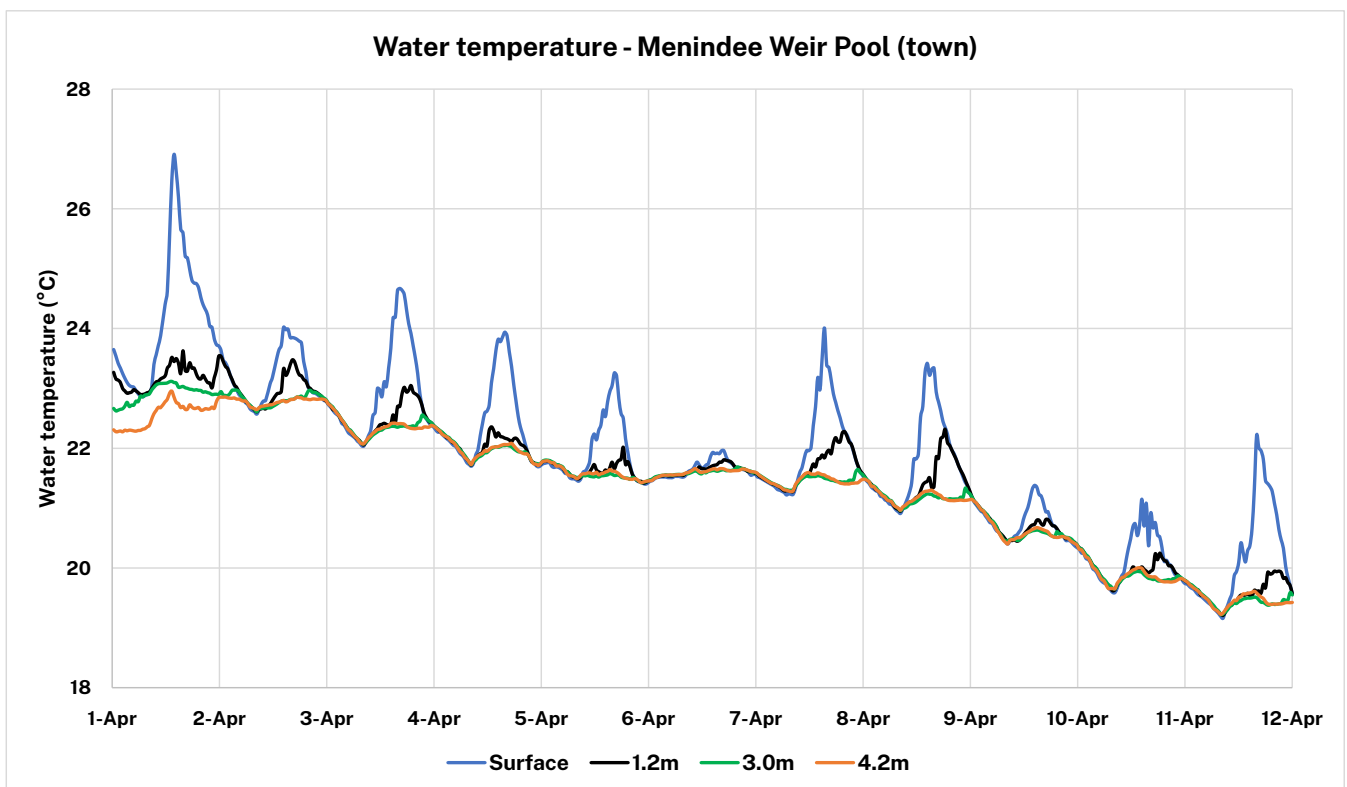


Figure 1: Water temperature (°C) continuous monitoring in the Darling River downstream of Menindee

Dissolved oxygen results from the weir pool at Menindee township show that at the start of April, dissolved oxygen was not being mixed through the water column. Dissolved oxygen nearer the water surface was above the safe level for fish health of 4 mg/L. At a depth of 4.2 metres, dissolved oxygen had decreased to below 2 mg/L (Figure 2). As a general guide, native fish and other large

aquatic organisms require at least 2 mg/L of dissolved oxygen to survive but may begin to suffer if levels are below 4 to 5 mg/L for prolonged periods.

With the drop in water temperature and the regular break down in thermal stratification, dissolved oxygen was being mixed through the water column each morning, resulting in oxygen levels remaining above 4 mg/L, and continuing to improve.

In addition to the release of oxygenated water from Lake Pamamaroo, water temperatures have been slowly falling as air temperatures cool. The amount of dissolved oxygen water can hold increases with decreasing water temperature. The process of bacteria breaking down organic material in the river slows down as water temperature decreases, which uses up less oxygen. The combination of these two processes is providing an opportunity for dissolved oxygen levels to recover.

In response to the improved dissolved oxygen results, discharge from Lake Pamamaroo has been decreased and discharge from Lake Menindee increased to maintain a total of 400 ML/day at Weir 32. NSW and Commonwealth agencies will continue to work together and monitor dissolved oxygen levels in this area and advise the best operational measures to mitigate risks to aquatic life as much as possible. This can involve adjusting the timing, size and location of releases from the lakes into the lower Darling River to maintain the quality of the water in the river. Releases from both Lake Pamamaroo and Lake Menindee will continue to be managed to minimise the risk of further hypoxia-related fish deaths in the Darling River at Menindee.

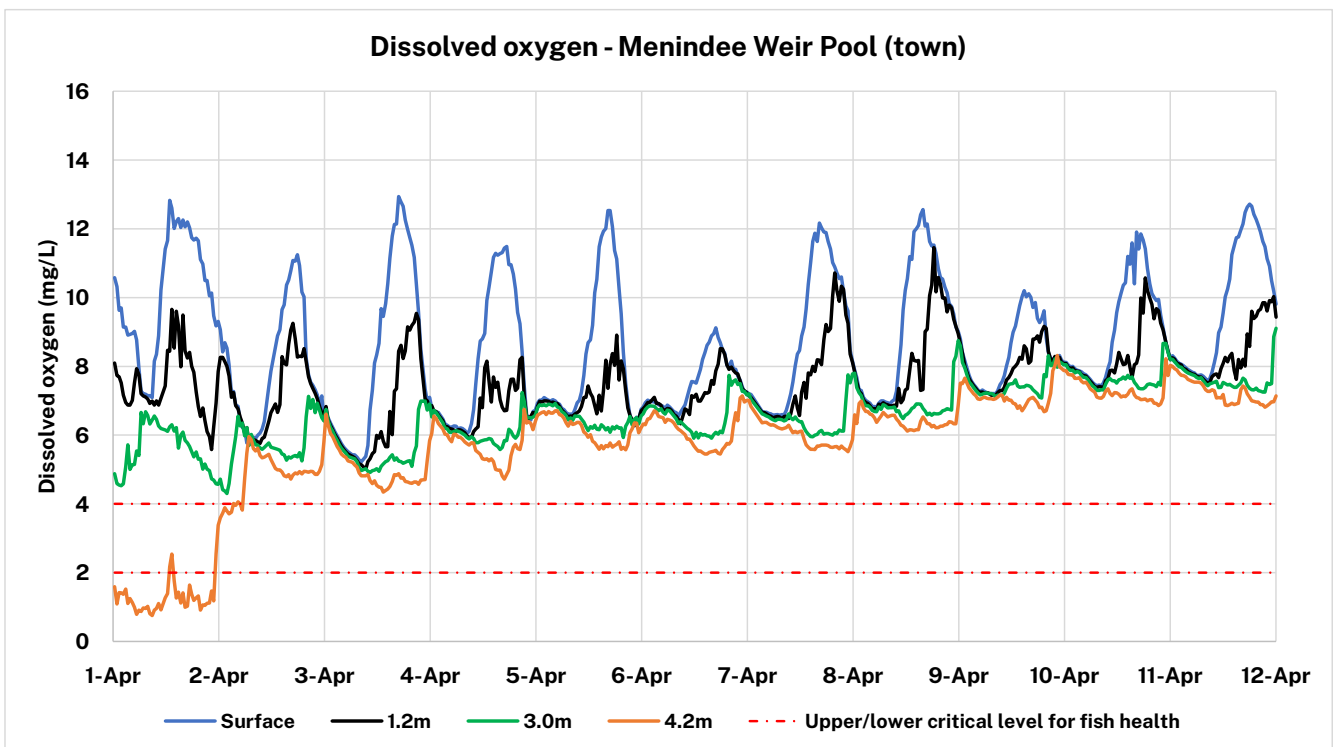


Figure 2: Dissolved oxygen (mg/L) continuous monitoring in the Darling River at Menindee

Fish death summary

In the past week to 11 April there have been no reports of dead Golden Perch in the Darling River at Menindee. Since the fish deaths started on 10 February, Golden Perch continued to die in small numbers, bringing the total number of fish affected into the low thousands.

Large numbers of Bony Herring and Carp remain in the reach of Darling River between Main Weir and Menindee Creek (Weir 32 weir pool). There remains a risk of further fish deaths in the Menindee area as fish (particularly Bony Herring) may be in poor condition from previous low oxygen conditions, limited food supply and may be more susceptible at reduced flow rates.

What is being done?

Flow releases into the lower Darling

In response to the improving water quality in the Darling River at Menindee, the discharge from Lake Pamamaroo has been decreased to 300 ML/day to preserve the water resource in the upper lakes. Discharge from Lake Menindee has been increased to 100 ML/day to maintain a flow of 400 ML/day at Weir 32 to meet the environmental water requirements for the lower Darling River.

Discharge from Menindee Lakes in April cannot be reduced below the minimum flow target of 300 ML/day, as required under the WaterNSW Works Approval. Ongoing monitoring will continue to inform operations to mitigate potential fish deaths.

Flows from Lake Cawndilla into the Great Darling Anabranch

Commonwealth environmental water is being used to maintain a flow releases of 400 ML/day from Lake Cawndilla to the Great Darling Anabranch. The flow is continuing to deliver environmental benefits by maintaining connectivity through the Great Darling Anabranch, which facilitates the dispersal of native fish, predominantly Golden Perch. The flows are also benefitting vegetation, waterbirds, bush birds, aquatic bugs, frogs, yabbies and other animals that live on the floodplain.

Blue-green algae

WaterNSW undertake routine blue green algae monitoring in Menindee Lakes and in the Darling River. Alert warnings are declared where algal cell numbers exceed the triggers identified in the Guidelines for Managing Risk in Recreational Waters (NHMRC 2008).

The most recent results indicate a red alert warning for recreational use in Lake Wetherell, Lake Tandure, Lake Pamamaroo, Copi Hollow and Lake Menindee. There are also multiple red alert warnings in the Darling River, including downstream of the Main Weir, Menindee pumping station, Weir 32, Tolarno, Pooncarie, Burtundy, Ellerslie, Tapio and Pamona (in the Wentworth weir pool) and

the Great Darling Anabranch at Silver City Highway. Algal numbers at other sites in the Menindee Lakes area are remaining in the amber alert range for recreational use ([Algae Alerts NSW map - WaterNSW](#)). When a red alert warning is in place, people should avoid recreational activities that brings them into contact with the water and drinking untreated water. At the amber alert warning level, blue-green algae may be multiplying in numbers but remains suitable for recreational use. The water may have a green tinge and musty or organic odour.

The water should be considered unsuitable for potable use and alternative supplies or prior treatment of raw water for domestic purposes should be considered. The water may also be unsuitable for stock watering. Water users should use caution and avoid water where signs of blue-green algae are present.

Darling-Baaka flood recovery program

The Darling-Baaka flood recovery program is a comprehensive river health monitoring program that extends the NSW Government's incident response to the floods and fish kill disasters that occurred in early 2023.

The program is coordinated by the Environment Protection Authority as the lead agency for the NSW Environmental Services Functional Area. It will be delivered until June 2025, extending on the incident response sampling already undertaken this year.

Through the River Health Project, Department of Climate Change, Energy, the Environment and Water – Biodiversity, Conservation and Science have installed 4 telemetered loggers which collect real-time data on water quality in the project area. You can access the real time data online via [Dashboard - Darling Barka River Health Program \(tago.run\)](#)

Weather outlook

Refer to the [Bureau of Meteorology website](#) for the latest forecasts.

Additional information

To notify the NSW Department of Climate Change, Energy, the Environment and Water of potential blackwater events email: waterqualitydata@dpie.nsw.gov.au

To view community updates issued, visit [Community updates and frequently asked questions | Water \(nsw.gov.au\)](#)

To report dead fish, fish struggling or gasping at the water surface, or crayfish leaving the water please call the NSW DPI Fisheries Phoneline 1800 043 536 or fill in a fish kill protocol and report form at: <https://www.dpi.nsw.gov.au/fishing/habitat/threats/fish-kills-2019-2020/info-sheet>

Information on recent fish deaths is available at: [Fish kills in NSW](#). When reporting, please include the name of the river/waterbody, location and date of your observation and provide photographs. If possible, please also record what species are affected and an estimate of number of each species observed.

Monitoring data from the monitoring buoys installed by the NSW Department of Climate Change, Energy, the Environment and Water for the Darling-Baaka flood recovery program is available online via [Dashboard - Darling Barka River Health Program \(tago.run\)](#).

Monitoring data from the monitoring buoys installed by WaterNSW and operational updates are available on their Water Insights web page ([WaterInsights - WaterNSW](#)).

Further information on blackwater events can be found at the NSW Department of Climate Change, Energy, the Environment and Water website at: <https://water.dpie.nsw.gov.au/our-work/allocations-availability/drought-and-floods/hypoxic-blackwater>

Additional information is also available on the Murray-Darling Basin Authority website at: <https://www.mdba.gov.au/publications/mdba-reports/water-management-101-factsheets>

Water quality data collected after the fish deaths at Menindee is available on the Environment Protection Authority web page at: <https://www.epa.nsw.gov.au/working-together/community-engagement/updates-on-issues/menindee-fish-kill>

To report suspected algal blooms see the [WaterNSW website](#).