

Response of the Coorong – Water Quality

The following technical report associated with the [Murray-Darling Basin 2022-23 flood environmental response in the Coorong](#) research program is available at [Reports – Goyder Institute](#).

The 2022-2023 flood in the River Murray was the second largest on record, only surpassed by the 1956 flood. Floodwaters decreased salinity and nutrients in the North and South Lagoon from late 2022 and throughout 2023. The floodwaters around the Murray Mouth were turbid and high in total nutrients, which is common for floodwaters draining a catchment high in agricultural productivity.

PROJECT AIM:

To assess the impact of the 2022-2023 flood in the River Murray on the water quality of the Coorong.

HIGHLIGHTS

- Average water levels over the barrages increased a hundred-fold during the flood period (compared to average years) and remained high throughout most of 2023.
- Salinity decreased substantially in both the North and South Lagoon of the Coorong. Sites decreased at different rates depending on their distance from the River Murray Mouth. During the flood period, salinity was below 60 g/L in the South Lagoon for the first time since 1998. Salinity began to increase from 2024 in the Coorong, particularly in the South Lagoon.
- Total phosphorus was low (0.1 mg/l) during the flood and high flow period except for the sites closest to the Murray Mouth (0.15 mg/L).
- South Lagoon was less turbid during the flood and high flow period than in the pre-flood period. Turbidity was high in the flood waters near the Murray Mouth. Low turbidity allows aquatic plant to more easily establish.



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[First Nations Acknowledgement](#)

KEY FINDINGS

The official duration of the flood (i.e. defined as >100,000 ML/day flow at the SA Border) was from 15 November 2022 to 26 January 2023, although high flows (defined as >40 000 ML/day flow at the SA Border) persisted for longer.

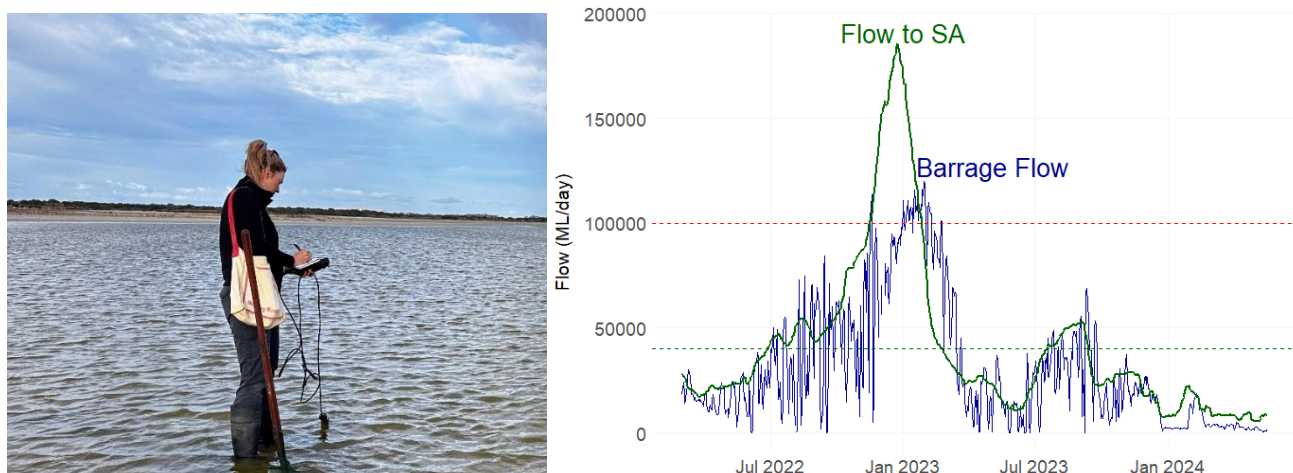


Figure 1: Water sampling in the Coorong (left). Flow to SA over the border (ML/day) and flow over the barrages (ML/day)(right) from July 2022 to Jan 2024.

The increased flows decreased salinity at all sites. Salinity remained relatively low throughout 2023. Salinity was lower than 60g/L in both lagoons in response to the flood. Salinity below 60 g/L has been shown to be beneficial for burrowing macroinvertebrates, fish and plant species.

Floodwaters had higher concentrations of nitrogen and phosphorus near the Murray Mouth.

However, the total nitrogen, total phosphorus and filtrable reactive phosphorus decreased across the South and North Lagoons of the Coorong in response to the flood waters.

Nutrient concentrations were much lower during the flood than the peak of the Millennium Drought. Surface waters around the marginal areas along the North and South Lagoon also showed a similar trend of lower nutrients.

Turbidity was higher around the Murray Mouth during the flood and subsequent high flow period. The turbidity in the floodwaters can be seen in Sentinel-2 imagery from January 2023 (Figure 3).

While the turbidity near the Murray Mouth was high, turbidity in the rest of the Coorong, particularly the South Lagoon, was lower during the flood than the pre flood period. The flood and high flow period lowered salinity, flushed nutrients and decreased turbidity in the Coorong. These conditions provided ideal habitat for macroinvertebrates, aquatic plants and fish.

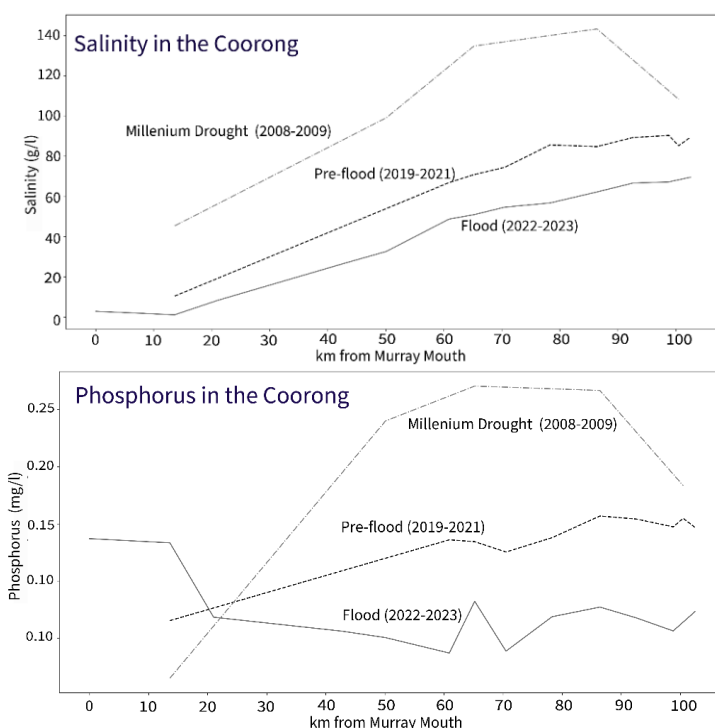
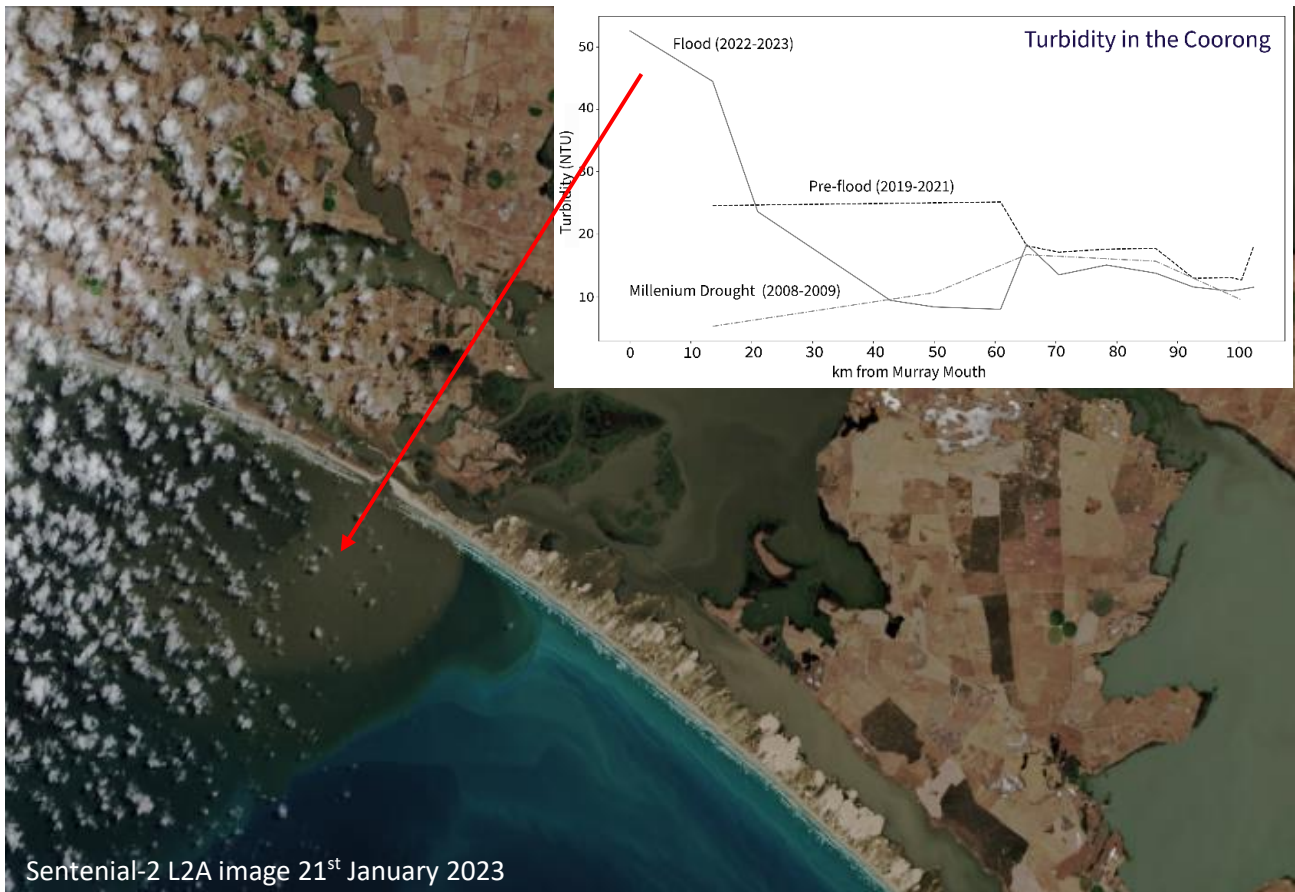


Figure 2: (Top) Salinity and (Bottom) total phosphorus in the Coorong surface water during the peak of drought, pre flood period and flood and high flow period.



Sentinel-2 L2A image 21st January 2023

Figure 3: Image showing turbidity plume during the flood. Graph compares turbidity in the Coorong surface water during the peak of the drought (2008-2009), pre-flood period (2019-2020) and flood and high flow period (2022-2023) as a distance from the Murray Mouth.

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This project was completed from August 2023 - March 2024.