

Response of the Coorong- Macroinvertebrates

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 was the largest flood event since the late 1950s. The floodwater reduced salinities in the South Lagoon which enabled a recolonisation by macroinvertebrates in 2023. The flood had a negative impact on macroinvertebrates in the Murray Mouth area, but there was evidence of a beginning recovery.

PROJECT AIM:

To assess the impact of the 2022-2023 flood in the River Murray on the macroinvertebrate community in the Coorong.

HIGHLIGHTS

- As floodwaters reduced salinities in the South Lagoon below the tolerance threshold for most macroinvertebrates, recolonization occurred. Species of snails, bivalves and bristleworms were found for the first time for decades in sediments of the South Lagoon.
- Macroinvertebrate species richness and abundance were highest in the North Lagoon, providing the source for colonization of the South Lagoon.
- The flood caused an impact in the Murray Mouth, but the macroinvertebrate communities started to recover quickly. This resilience was enabled by the improved flow and water management over the last decade which had enabled the increased populations in the North Lagoon.
- The shifts in distribution and abundance after the flood affected the food availability for fish and shorebirds.



This project is part of the South Australian Government's *Healthy Coorong, Healthy Basin* Program, which is jointly funded by the Australian and South Australian Governments. The Goyder Institute for Water Research is a collaborative partnership of the South Australian Government through the Department for Environment and Water, CSIRO, Flinders University, the University of Adelaide and the University of South Australia. Published November 2024.

KEY FINDINGS

To assess the effect of the flood on macroinvertebrates, two surveys were carried out, about seven and ten months after the flood peak passed through the estuary. Samples were taken from sediments on either side of the Coorong lagoons and from sediments in the channel, sieved through 0.5 mm mesh and preserved for identification and counts in the laboratory. Sediment samples for nutrients were taken at the same time.

The flood caused a decrease in macroinvertebrates in the Murray Mouth region, possibly from smothering by sediment deposited by the floods. The inflow of freshwater lowered salinities throughout the Coorong and reduced salinities below a threshold for macroinvertebrates, which previously inhibited their presence in the South Lagoon. Yet with a reduction in flow, salinities started to increase again in late 2023.

The flood enabled a recolonization of the South Lagoon, where bivalves, snails and worms started to establish at sites in the northern section of the lagoon. Their abundances increased after further high flow in spring 2023. The population sizes of several species of bivalves and bristleworms increased to numbers not previously seen in long-term monitoring in the North and South Lagoon.

Recolonisation of the Murray Mouth by macroinvertebrates commenced within the study period, showing a faster recovery than following the 2010-2011 flood. A decade of continuous flow and higher flow volumes in recent years improved the resilience of macroinvertebrate populations in the Coorong.

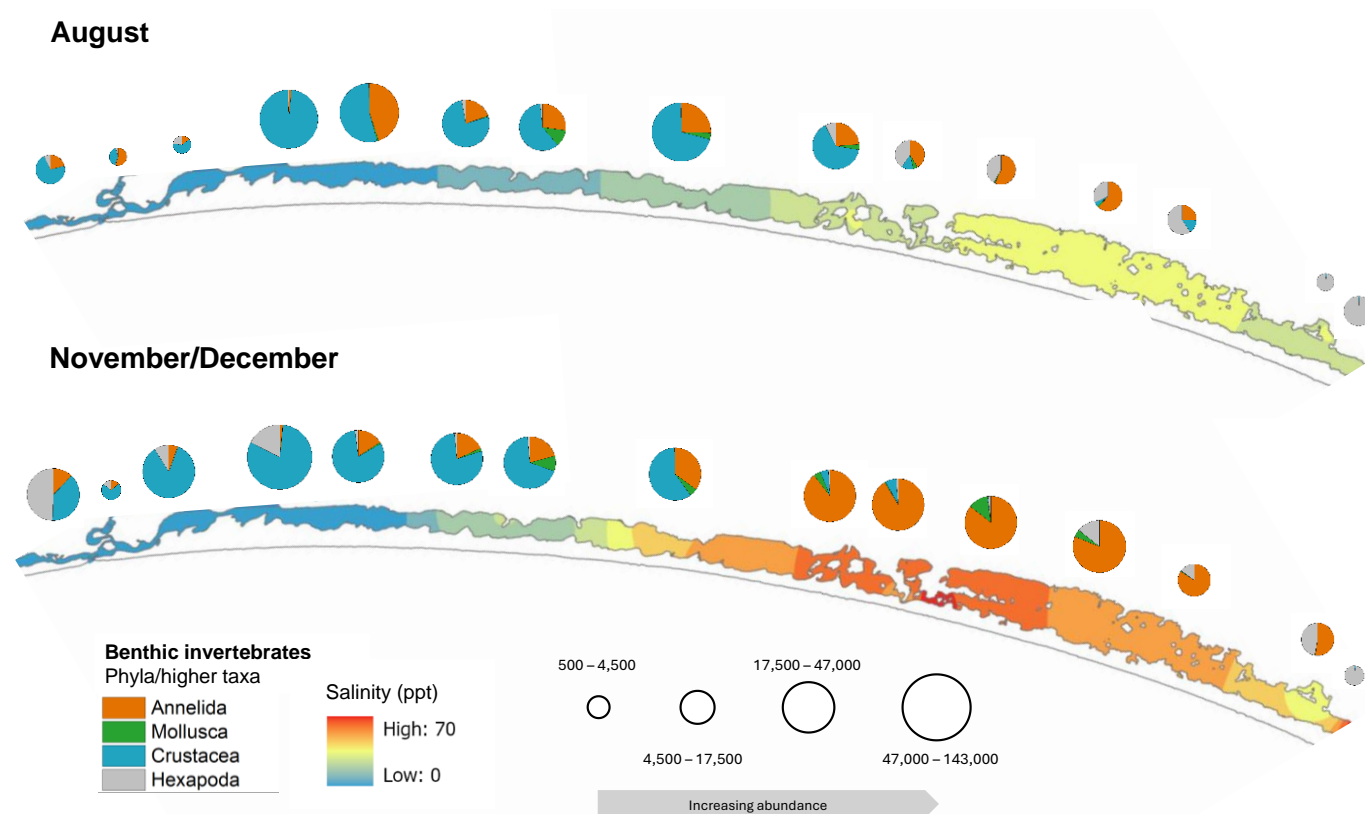


Figure 1: Macroinvertebrate abundance increase in the Coorong lagoons enabled by the flood. The pie chart sizes reflect the number of individuals per m², and colours indicate the abundance of main groups of macroinvertebrates. The colours for the water from the Murray Mouth region into the South Lagoon show the salinities at the sampling months in 2023



Figure 2: (from left to right): Sediment deposited on to mudflats in the Murray Mouth; burrows from worms bio-irrigating the sediments in the North Lagoon; the mussel *Spisula trigonella* which increased in abundance following the flood; the snail *Salinator fragilis* on mudflats near Parnka Point.

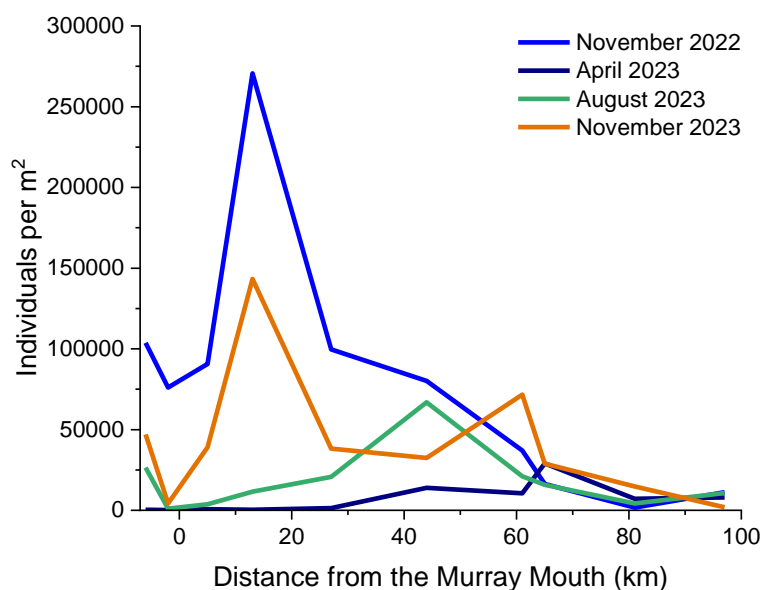


Figure 3: Sampling for macroinvertebrates and changes in average abundances at long-term monitoring sites before (November 2022), and after the flood in 2023.

PROJECT TEAM: University of Adelaide: Luke Mosley, Michelle Waycott, Emily Leyden, Brett Thomas; Flinders University: Sabine Dittmann; PIRSA-SARDI: Qifeng Ye, Jason Nicol; Goyder Institute: Bryony Cotterell, Alec Rolston.

REFERENCE: Sabine Dittmann

CONTACT: E enquiries@goyderinstitute.org

This project was completed from August 2023 - March 2024.