



Darwin Harbour Water Quality 2022

Water quality at a glance

In 2022, water quality in Darwin Harbour was good overall. Myrmidon Creek received a C grade rating, whereas Buffalo Creek received a poor rating due to treated wastewater inflow from the Leanyer-Sanderson wastewater treatment plant. Notwithstanding these localised impacts the water quality of Darwin Harbour and its estuarine reaches remain in good condition. Changes in grades largely reflect natural variability typically found in this dynamic estuary.

Overall 2022 Grade **B**



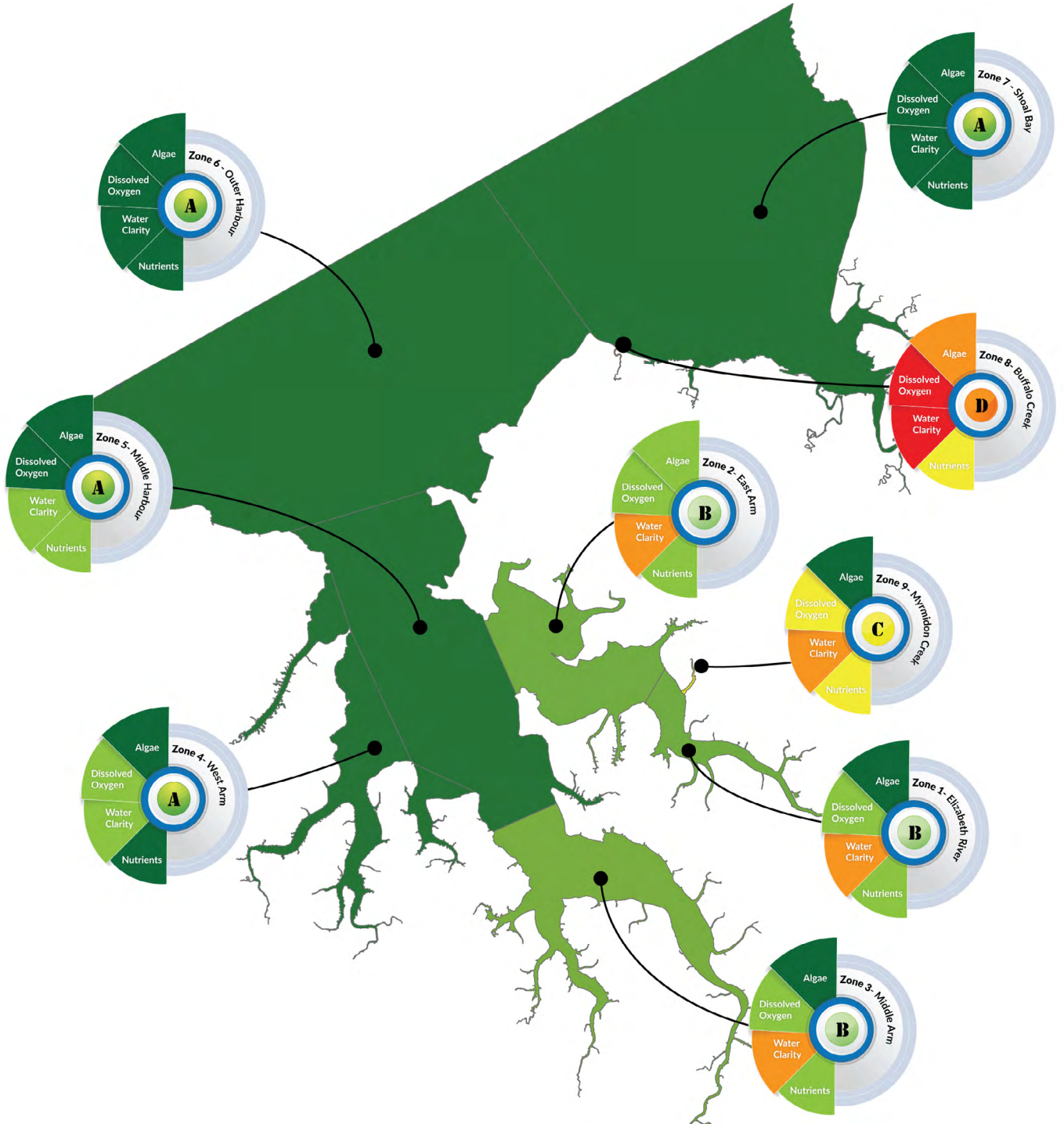
WATER QUALITY GRADES

- A** Very good water quality.
- B** Good water quality.
- C** Satisfactory water quality.
- D** Poor water quality.
- E** Very poor water quality.

Water Quality Index

Water Quality Index (WQI) is a single number which can be calculated easily and used to provide an overall description of the quality of water. It provides a methodology to summarise the quality of water using a single value and a corresponding scale.

The WQI across the 9 reporting zones has again highlighted that water quality is good to very good across the marine-estuarine sampling domain. However, the condition of the tidal creeks such as Buffalo Creek require further attention.



Four indicators of Algae, Nutrients, Dissolved Oxygen and Water clarity are combined into an overall Water Quality Index which is presented for each of the nine reporting zones.



Algae
(Chlorophyll-a)



NP Nutrients (Nitrogen and Phosphorus)



DO Dissolved Oxygen

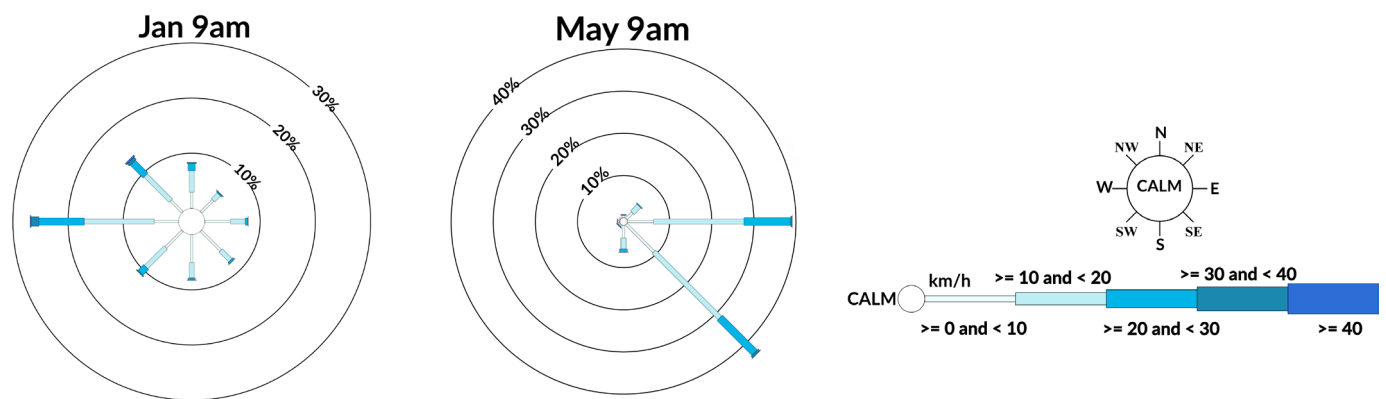


Water Clarity
(Turbidity)

Water Quality Status - 2022

Annually the water quality of the harbour is assessed against the guidelines of the Darwin Harbour Water Quality Objectives. Nine zones represent different physical environments in the harbour, which feature diverse marine life and habitats such as seagrass beds, coral reefs and mangroves. Water quality data is collected by the Aquatic Group of the Department of Environment, Parks and Water Security and was supplemented by monitoring data from Power and Water Corporation in 2022. Stakeholders work together in the region and continue to look for ways to integrate data and information to report on the health of Darwin Harbour.

Each reporting zone in the harbour was assessed in 2022 and assigned a grade against four key water quality health indicators. These are algae, water clarity, dissolved oxygen and nutrients. The grades reflect no major long-term change for reporting zones since 2012. For the reporting year of 2022 the zones of Middle Arm, East Arm, Elizabeth River and Myrmidon Creek have lower water quality grades. Often these changes are associated with natural variation rather than any human induced change. Wind driven turbidity influences water clarity during the dry season and frequently explains lower scores for water clarity.



Wind rose plots indicate typical wind speed and direction for wet season (Jan) and dry season (May) in 2022. Wind direction is predominantly south to south easterly during sampling campaigns (May-July). Winds can be strong resulting in rough seas in coastal waters acting with tide to resuspend sediments.

Current issues for Darwin Harbour water quality



















High nutrient loads from wastewater, urban and industrial run-off can cause excessive growth of algae, lower dissolved oxygen levels and reduce water clarity. The water quality of estuaries subject to these pressures can become degraded and in concert with limited tidal flushing, particularly in smaller tidal creeks, hypoxia can occur. Although much of the harbour is in very good condition impacts are discernable in some locations.

Areas for further investigation

Buffalo Creek and entrance to Shoal Bay: Water quality was again poor in 2022, as a result of high nutrient discharge from the Leanyer Sanderson Wastewater Treatment Plant. Water quality and sediments immediately downstream of the discharge are impacted. The small tidal creek is also subject to increasing diffuse loads and stormwater from nearby urban areas. Ongoing infrastructure and operational improvements to improve discharge quality are being undertaken by the Power and Water Corporation.

To help us monitor impacts a long-term 'Pressure' monitoring program as part of the Integrated Marine Monitoring and Research Program commenced in 2020. This program evaluates trends and interactions between pollutant loads entering the harbour including those from intensive land uses and point source discharges. For more information see: <https://depws.nt.gov.au/water/water-management/darwin-harbour/darwin-harbour-integrated-marine-monitoring-and-research-program>.

Darwin Harbour water quality - reporting zone grade trend

Zone	1	2	3	4	5	6	7	8	9
	Elizabeth Estuary	East Arm	Middle Arm	West Arm	Middle Harbour	Outer Harbour	Shoal Bay	Buffalo Creek	Myrmidon Creek
2022 Grade	B	B	B	A	A	A	A	D	C
Change since 2021									
Long term trend*									

*Long-term trend since 2012 reporting year.

Symbols indicate change since last annual reporting period and long-term grade trend.



The full summary of data collected in 2022 can be found at www.depws.nt.gov.au/reportcards

