

Message from the Minister

The Territory's natural environment is one of our greatest assets and it's crucial that we continue to preserve and protect it for the benefit and enjoyment of future generations.

Our beautiful Darwin Harbour and its surrounds are home to a diverse range of flora, fauna and marine life and play an integral role in our unique outdoors lifestyle and our economy.

It's pleasing that the 2016 Darwin Harbour Report Card confirms that the Harbour remains in great shape.

But we can't afford to be complacent. We need to continue to carefully monitor and manage the way we interact with the Harbour to ensure its ongoing health, while ensuring that Territoryans can continue to enjoy what it has to offer in terms of recreational activity and economic opportunities.

We are doing this by ensuring decisions about the management of the Harbour are based on science, and that new developments undergo a robust environmental assessment process.

This will allow us to better focus our protection efforts, while also generating jobs in research, innovative practice and emerging environment-based industries.

The community will also play a key role in decision-making through the reinstatement of the Darwin Harbour Advisory Committee which will include diverse representation.

The 2016 Darwin Harbour Report Card provides an assessment of water quality across nine key regions and acknowledges that the harbour's water is in good condition but identifies a need for improvement in some areas.

Community input through the Darwin Harbour Advisory Committee will be critical in achieving these improvements, its first task will be developing a community led, integrated, management plan to conserve the Harbour's vital mangrove habitats.

The Department of Environment and Natural Resources will continue to monitor the health of the Harbour on an ongoing basis. Advice and input from the department as well as other scientific experts and from the community will ensure integrity and transparency in environmental decision-making and ensure the Harbour is preserved for the benefit of future generations.

The Hon. Lauren Moss MLA
Minister for Environment and Natural Resources

Integrated monitoring and management are vital to keeping check on our harbour and conserving important environmental assets such as mangroves.

The Report Card

Each region in the harbour was assessed for water quality from May 1, 2016 to October 30, 2016, and assigned a grade against four key water quality health indicators. These indicators are explained below.

Water clarity

The plants in Darwin Harbour need light to photosynthesize and grow. Microscopic algae live in the water, whilst other plants, such as seagrasses, live on the mudflats and seabed. Stormwater and dredging can reduce water clarity and plant growth.

Dissolved oxygen

Oxygen dissolved in the water is essential for fish and other animals to survive. The amount of oxygen in the water can be reduced by water pollution.

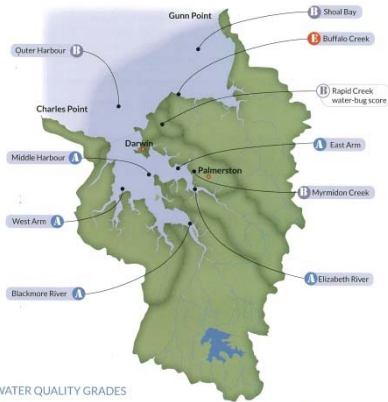
Nutrients

Nitrogen and phosphorus are nutrients required for algae to grow. However, high nutrient concentrations can increase the amount of algae, resulting in algal blooms which affect the broader environment.

Algae

These are microscopic plants that may appear as specks in the water or as a scum floating on the surface. Algae are an important part of the ecosystem in the harbour, but excessive amounts have a detrimental effect on the waterway.

The Health of the Harbour



WATER QUALITY GRADES

- 1 Excellent water quality. All four water quality indicators meet desired levels.
- 2 Very good water quality. Three water quality indicators meet desired levels.
- 3 Good water quality. Two water quality indicators meet desired levels.
- 4 Poor water quality. Only one water quality indicator meets desired levels.
- 5 Very poor water quality. No water quality indicators meet desired levels.

- ✓ No aquatic pests were found in Darwin Harbour for 2016.
- ✓ The beaches were suitable for swimming over the 2016 dry season.
- ✓ Overall the water quality of Darwin Harbour is in very good condition.

Metals in Darwin Harbour mangrove muds



Mangrove community in Shoal Bay, Darwin Harbour.

Mangroves dominate the coastal fringe of Darwin Harbour. They are important habitats that support a large range of plants and animals, from birds, right through to the tiny marine critters that live in the muddy sediments.

Metal levels in the mangrove muds are naturally quite low. However, stormwater from the catchment area adds slightly to these levels, so it is important that levels be monitored on an ongoing basis.

For example, when it rains, water runs over galvanised house roofs, picking up tiny amounts of zinc. As this stormwater drains into the harbour, some of this metal will find its way into the mangrove sediment.

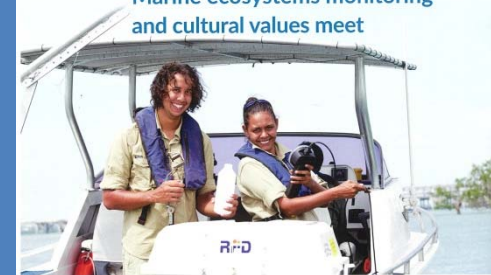
Similarly, tiny amounts of lead, cadmium and copper are also washed into the harbour from the stormwater system. Careful monitoring provides an early warning mechanism, which will alert us should the levels of these metals in the mangroves become a concern.

A recent INPEX-led Ichthyology (LNG) Project funded study undertaken by Charles Darwin University (CDU) researchers examined the way in which these metals are stored in the mangrove sediments, and the broader factors that influence the health of the harbour.

The study found that some sediments around populated areas of the catchment had higher metal concentrations than those in less populous locations. However even these higher levels fell well within national guidelines.

This research will be used to develop Darwin Harbour's first comprehensive sediment quality monitoring program, enabling more effective management of the harbour.

Marine ecosystems monitoring and cultural values meet



The Darwin Harbour Marine Ranger Program was established in 2013.

This program brings Larrakia traditional owners together with technical experts and representatives of government departments. The indigenous rangers work with these agencies to monitor the wellbeing of the harbour, and conduct the research projects which gather the evidence to allow us to protect the harbour's resources.

The program has a strong focus on developing the skills of the rangers in marine ecosystem monitoring. These rangers played a pivotal role in Department of Land Resource Management programs in 2014-2015 as they worked closely with staff undertaking water quality and sediment sampling, and a range of other marine monitoring projects.

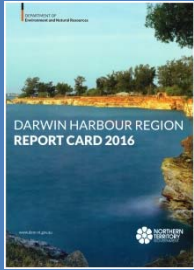
Rangers use electronic equipment to assess the health of the harbour's waters. This is critical to the welfare of marine plants and animals, including the shellfish which are harvested by the local Larrakia people.

This program has resulted in four young Indigenous people working in jobs which will prepare them for an exciting future. They receive training in field and laboratory skills, and work towards gaining the coxswains certificate which will permit them to pilot a vessel.

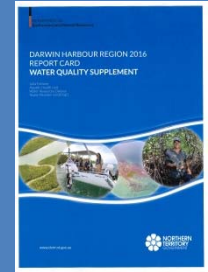
The program also offers project partners the opportunity to learn about Larrakia cultural values and knowledge. This exchange builds opportunities to combine western science with Indigenous cultural knowledge, in a way that benefits all parties to the arrangement.

Darwin Harbour Region report card

- Harbour huge, macro-tidal, seasonal extremes, variable WQ, difficult to summarise
- Low levels of WQ impact/natural condition
- Future indicators; seagrass, mangroves, sediments
- Include pressures



Darwin Harbour Region report card



- Little publicity - one advertisement, sometimes picked up by the media
- Initiated development of a website, akin to Fitzroy River and others
- What mistakes should we avoid?