

Water Quality in Cleveland Bay

Cleveland Bay is a shallow and naturally turbid* bay with most of it having a depth of less than 10 metres. Natural turbidity is caused by wind and wave action stirring up the seabed of Cleveland Bay, which is called “resuspension”. Resuspension occurs all year round in Cleveland Bay, causing the water to look brown and muddy.

During an event resuspension and turbid zones will start at the shallowest areas first, being the beaches, then extend to the whole of bay if the wind and waves continue for lengths of time.

During heavy rain, cyclones or other significant weather events, sand and fine sediments are washed into Cleveland Bay from the Ross River, Ross Creek, and Alligator Creek (which drains a mangrove and mud flat area of coast) and through coastal drift from Burdekin River and southern bays, depending on the size of the event.

Increased urbanisation of Townsville and sand mining in the upper part of the Ross River also contributes to the amount of sediment being washed into Cleveland Bay.

**turbid = cloudy, opaque or thick with suspended matter*



Sediment flows into Cleveland Bay from Ross River



Wind and wave action make the waters of Cleveland Bay muddy on a normal windy day outside the Townsville Port



Wind and wave action cause resuspension of sediments – indicated by the cloudy area around the coastline



How often is Cleveland Bay turbid?

Historical records show that turbidity occurs on average 220 days of the year for water depths up to 5 metres due to wind and current resuspension. This means that the shallow areas of Cleveland Bay are naturally turbid for about two thirds of the year.



Above: Less turbid waters in the sheltered area of the port



How does turbidity affect flora in Cleveland Bay?

Increased turbidity in water decreases the amount of light that can penetrate below the surface. Light penetration is important for the health of ocean plants (like seagrass) and algae that live on some corals to make food (photosynthesis).

To monitor the health of seagrasses, Port of Townsville commissions an annual Seagrass Health Survey in Cleveland Bay which is carried out by James Cook University's Centre for Tropical Water & Aquatic Ecosystem Research (TropWATER).

The 2016 Seagrass Survey results for Townsville showed that seagrass in Cleveland Bay:

- Ranked "good" or "very good" for area and species composition indicators in most monitoring meadows;
- Increased in total area for the fifth consecutive year;
- Had lower biomass scores than last year due to a range of climatic conditions;
- Are in satisfactory overall condition.

You can view the full report on our website.



Does dredging affect turbidity in Cleveland Bay?

Port of Townsville carries out maintenance dredging of the channels every 12 months to remove sand and finer soils that built up due to natural processes (resuspension). Maintenance

dredging of the sea channels takes about four weeks.

Maintenance dredging is required to keep the channels between the port and ocean at an acceptable depth for ships to be able to safely access the port.

Our monitoring and research shows that turbidity created by dredging activities takes approximately 45 minutes to return to normal levels, and plumes travel up to 300 metres before settling. Typical distances between the Sea Channel and Magnetic Island are between 1.3kms and 3kms.



How is water quality in Cleveland Bay monitored?

Port of Townsville has several water quality monitoring programs that measure sediment, turbidity and light availability in Cleveland Bay and a number of sensitive receptor sites (spots that are home to corals and seagrasses) around Magnetic Island.

Sediment monitoring is carried at 240 monitoring locations and water turbidity is monitored at five locations.

Additional monitoring buoys are being installed in late 2017 in Cleveland Bay which use modern telemetry technology to send real-time information- this means live data will be streamed to a website for the public.

More information about our water quality monitoring can be found on our website.

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