



## Fact Sheet

# Water Quality Monitoring

Why we monitor, what we monitor and where the information goes.

**Water is the world's most valuable resource, from freshwater systems to coastal waters and estuaries.**

Water quality monitoring is an essential part of keeping the planet healthy and sustainable, and is carried out across the globe to gauge how land-based activities impact water systems.

In Cape York, water monitoring is carried out to measure any changes to water quality during flows and how they affect the Great Barrier Reef (GBR).



## What we look for

Sediments and nutrients in the water are produced naturally in a landscape. But because of land use change and inputs from human activities, the concentration of sediments and nutrients can increase to harmful levels becoming pollutants.

- Fine sediment consists of silt, clay, and sand particles broken down through weathering and erosion. They are moved by flowing water on floodplains, riverbeds and in estuaries. They mostly impact shallow seagrass and coral reefs on the inner GBR lagoon. Too much of it can prevent photosynthesis, affect reproduction, disrupt coral growth and increase susceptibility to coral disease. Higher than normal fine sediment in water indicates severe erosion upstream and loss of valuable productive topsoil that agricultural industries depend on to grow crops or pasture for livestock consumption.
- Nutrients in water are dominated by nitrogen and phosphorus. Levels that are too high upset the balance of natural ecosystems: algae can become dominant and displace coral. High levels can also increase susceptibility to bleaching and some coral disease. High amounts of dissolved inorganic nitrogen also produce algal blooms in freshwater ecosystems which can deplete dissolved oxygen causing fish kills, dead zones and ecosystem collapse.
- Pesticides are used to control pests, weeds, insect infestation and diseases. They can have toxic effects. Pesticide residues especially herbicides, are often found in streams, estuaries, coastal waters, inshore reefs and seagrass bed.



Scan the QR code to access data from the Laura River Autosampler

## Measuring up

- **Particulate nutrients** are bound to sediments the main forms are particulate nitrogen (PN) and particulate phosphorus (PP).
- **Dissolved organic nutrients** in waterways come from organic matter. It is present in soil and waterways in compounds like amino acids and urea.
- **Dissolved inorganic nitrogen** plant available forms of nitrogen (large amounts of this are put into our landscape in the form of fertiliser).
- **Pesticides** includes herbicides, insecticides and fungicides.

## Testing times

- Information comes from auto-sampling stations scattered across waterways in reef catchments and from teams of people taking manual samples.
- Sampling is done in high flow events (when it rains a lot and our river heights change significantly) and during low or base-flow conditions.
- The autosampler recently installed on the Laura River does the leg work for us, capturing these rapid rises and falls in river height (see QR code for graph)

## Where the information goes

Information is fed into the Paddock to Reef Integrated Monitoring, Modelling and Reporting Program (Paddock to Reef program) which is supported by both the Queensland and Australian governments.

- Sample data goes into the Great Barrier Reef Catchment Loads Monitoring Program, which helps to track long-term trends in water quality entering the inshore waters of the Great Barrier Reef from catchments.
- This is then used to build the Reef Water Quality Report Card.
- Because sampling is labour intensive, even with auto-sampler stations, it is not possible to monitor everywhere. So the data is used to validate and calibrate water quality models.
- These models track our progress towards targets in the Reef Water Quality Improvement Plan (Reef 2050 WQIP).
- Models are used to help us understand long-term trends in water quality. Year to year there can be a lot of variation in rainfall and run-off. This kind of variability can make it hard to see any trends.
- Models help us to estimate how changes in land management produce water quality benefits, rather than waiting decades to see a trend.
- In the last Reef Water Quality Report Card (2020 results) the Cape York Region progressed to a 12.2% reduction in sediment and 14.6% reduction in particulate nitrogen.

## Resources

Visit [www.reefplan.qld.gov.au](http://www.reefplan.qld.gov.au) to access:

- Reef 2050 Water Quality Improvement Plan 2017–2022
- Paddock to Reef Integrated Monitoring, Modelling and Reporting Program 2017-2022 Summary



Australian Government Queensland Government