



HEALTHY RIVERS TO  
REEF PARTNERSHIP  
MACKAY-WHITSUNDAY-ISAAC

# THE MACKAY – WHITSUNDAY – ISAAC 2022 REPORT CARD

Reporting on waterway health data collected between July 2021 and June 2022



Pentecost Island - Photo by Jodi Lorroway

## ACKNOWLEDGEMENT OF COUNTRY

The Partnership acknowledges the continuing land and sea country management of the Traditional Owner groups within the Mackay-Whitsunday-Isaac region and Great Barrier Reef whose rich cultures, heritage values, enduring connections, and shared efforts protect the land and Reef for future generations.



# ABOUT THE REPORT CARD

This Report Card assesses the condition of waterways in the Mackay-Whitsunday-Isaac (MWI) region based on data collected between July 2021 and June 2022.

We assess the condition of freshwater, estuary, and marine environments, and include human dimensions such as cultural heritage value, litter pressures, and urban water management.

By understanding how climate, population, development, and land use affect our waterways at a regional level, we can inform management responses and actions tailored to our local area. We aim to improve or maintain ecological health, while also supporting the important industries and social systems that rely on our waterways.



## page 4 WHITSUNDAY COASTAL REGION

## page 6 MACKAY REGION

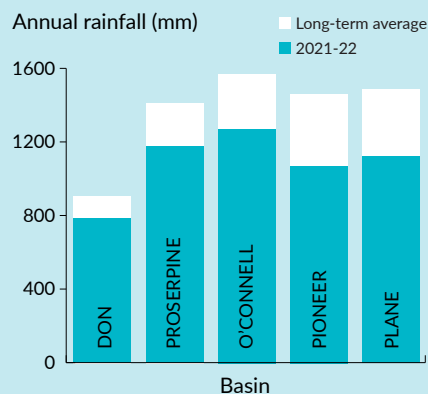
## page 8 MACKAY & ISAAC COASTAL REGION

- Key
- Freshwater grade
  - Estuary grade
  - Marine grade

## CLIMATE

Regional rainfall is often a key driver of Report Card results as it influences the amount of flow in rivers and estuaries, and runoff into the marine environment. In 2021-22, annual rainfall was lower than the long-term average throughout the MWI region, and rainfall events were less intense. However there were periods of unseasonably high rainfall, with August 2021 and May 2022 recording 'above average' and 'very much above average' rainfall across all basins.

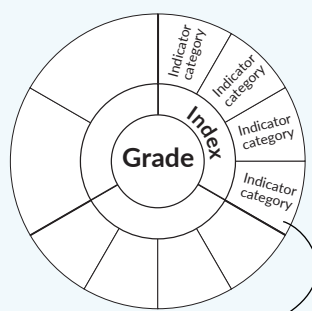
A marine heatwave in early 2022 resulted in the fourth mass bleaching event on the Great Barrier Reef since 2016, however ecosystems in the MWI region were less heavily impacted and were observed to be resilient with coral recovery occurring across most of our marine zones. With lingering impacts of Tropical Cyclone Debbie in 2017 still evident in coral communities across the region, the increased occurrence of bleaching events is a concern for coral reef recovery.



## WHAT GOES INTO A GRADE?

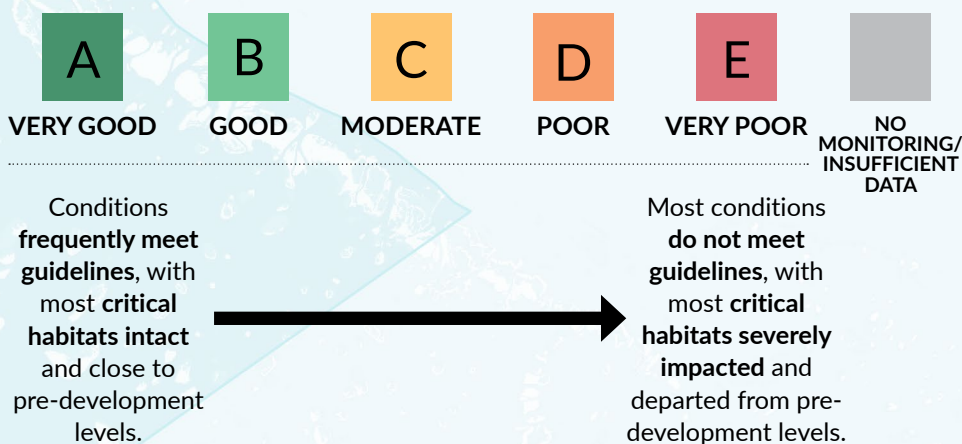
To arrive at a grade, indicators are selected based on the environment type (freshwater, estuary, inshore, and offshore marine) and external influences specific to our region. Each indicator is given a score, and these scores are averaged into a final grade that ranges from A (Very Good) to E (Very Poor).

All of our results undergo a rigorous review process with regional and national experts. You can read more about how the grades are calculated by reading our methods and results reports on our [website](#).



One or more related indicators are combined to produce an indicator category

## GRADES



### SOUTHERN INSHORE MONITORING PROGRAM

The Southern Inshore Monitoring Program has been providing data on water quality, coral and seagrass since 2017. Prior to 2017, there was no information for this zone, and the program was established to fill a vital gap in waterway health reporting. We thank Dalrymple Bay Coal Terminal Pty Ltd and Dalrymple Bay Infrastructure for their continued support of this valuable monitoring program. Read our feature on page 11 or visit our [website](#).

## WHERE DOES OUR DATA COME FROM?

We use the best available science and integrate a range of Reef-wide and regional monitoring programs from governments, research organisations, and citizen science groups.

We draw on information from existing and partnership-funded monitoring programs, which vary in their data collection cycles. Most of the data used in this Report Card is collected annually, however there are some data sets that are only collected every three to four years depending on what's appropriate for the indicator. In these cases, we assess conditions based on when the data was last collected. Find out more by reading our methods and results reports on our [website](#).

[CHECK OUT OUR REPORT CARD FAQs](#)

# WHITSUNDAY COASTAL REGION

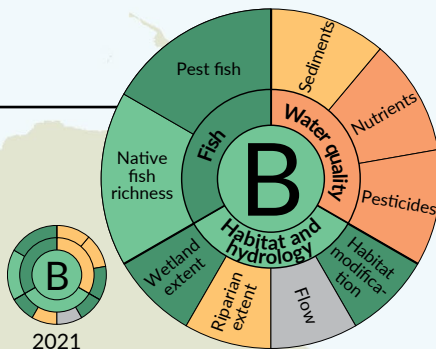
The Whitsunday Coastal Region covers freshwater sites and estuaries within the **Don** and **Proserpine** basins, as well as the **Northern** and **Whitsunday Inshore Marine Zones**, stretching from Cape Upstart through to Cape Conway.

Waterways in the **Don Basin** flow for short periods in the wet season from November to April, but remain dry for most of the year. In dry years, this restricts water sampling, which may impact scores. Land use in this basin is predominantly agriculture and horticulture.

Waterways in the **Proserpine Basin** usually flow year-round. It has a larger urban footprint, with tourism a key focus in Airlie Beach, and the town of Proserpine servicing rural agriculture.

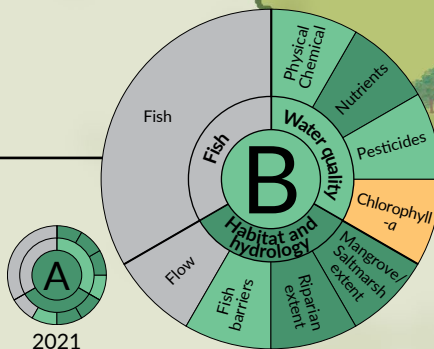
## DON BASIN FRESHWATER

- The Don River experienced an extremely dry year which meant sampling was restricted to only three times over the reporting year.
- Pesticide grade declined due to concentrations of metsulfuron-methyl, a chemical generally used to control weeds.



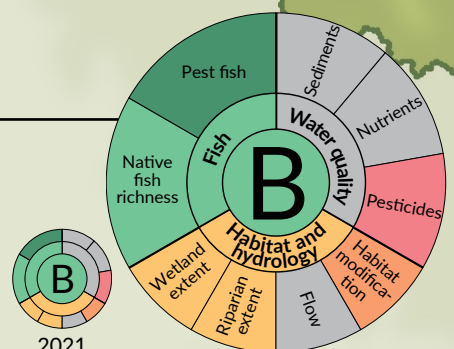
## GREGORY RIVER ESTUARY

- Overall grade declined from 'very good' to 'good' due to minor score decreases for all water quality indicators.
- Gregory River is the only estuary in the MWI region to receive a 'very good' grade for nutrients.



## PROSERPINE BASIN FRESHWATER

- Water quality is not currently reported in this basin. We'd love to hear from potential partners about ways to fill this data gap.





## GRADES

**A**

VERY GOOD

**B**

GOOD

**C**

MODERATE

**D**

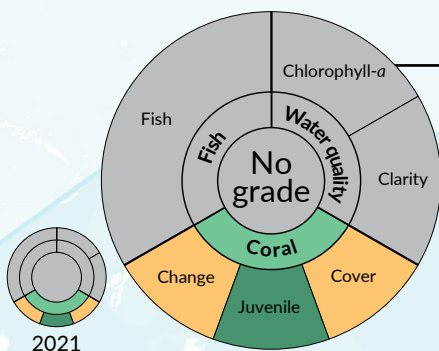
POOR

**E**

VERY POOR

 NO MONITORING/  
INSUFFICIENT DATA

## OFFSHORE MARINE



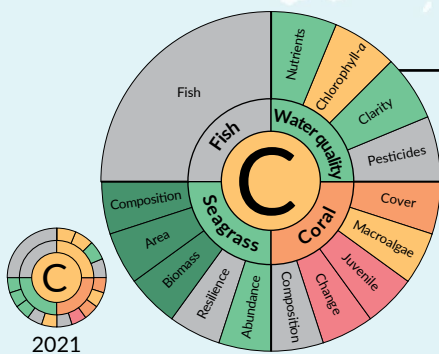
### OFFSHORE MARINE

- This zone does not have an overall grade, as the dashboard we used to report offshore marine water quality was decommissioned in early 2021. We are working with our technical advisory group to identify new data sources to be included in future reporting years.

### CITIZEN SCIENCE FISH

In 2021, the Regional Report Card Partnerships commissioned a study into the validity of citizen science programs and use of this data in our reporting. The study found that the current data collected was not suitable for annual fish assessments, however there is exciting potential to strengthen these programs for future inclusion in regional Report Cards.

## NORTHERN INSHORE MARINE



### NORTHERN INSHORE MARINE

- The only inshore zone to record an improvement in water quality grade this year, improving from 'moderate' to 'good'.
- Coral remained 'poor', while juvenile recruitment changed from 'poor' to 'very poor'.
- Seagrass scored 'good' for the third consecutive year, showing continued improvement since Cyclone Debbie in 2017.

[Read more about the context and causes of water quality decline in the Whitsunday region in our report here.](#)



### WHITSUNDAY INSHORE MARINE

#### GREGORY RIVER ESTUARY

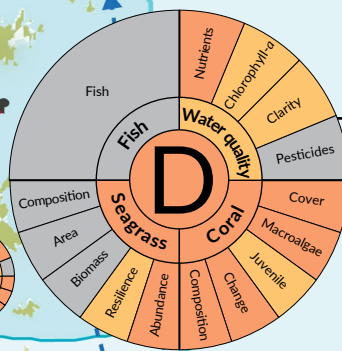
#### PROSERPINE BASIN

#### Airlie Beach

#### Proserpine

#### Cape Conway

Proserpine River influence  
O'Connell River influence



## WHITSUNDAY INSHORE MARINE

- Scores continue to improve for the second year in a row, although the overall grade remains 'poor'.
- Water clarity improved from 'poor' to 'moderate', with scores improving at all monitored sites.
- Seagrass grades in the Whitsunday Inshore Marine Zone have been poor for four consecutive years, however improvement was seen at Lindeman Island and Hideaway Bay.

# MACKAY REGION

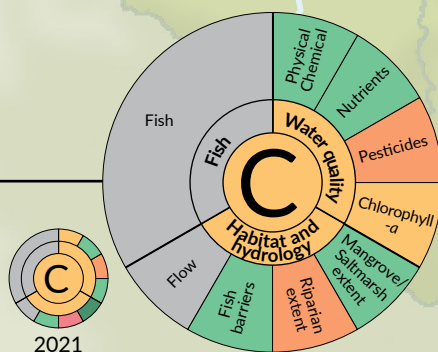
The Mackay region includes freshwater environments and estuaries in the **O'Connell** and **Pioneer** basins. The **Central Inshore Marine Zone** stretches from Cape Conway to Cape Palmerston.

The **O'Connell Basin** has small rural populations dotted throughout the catchment, supporting the primary industries of grazing, irrigated cropping, and forestry production. It receives the highest annual average rainfall of all the basins.

The city of Mackay in the **Pioneer Basin** is the most populous centre in the MWI region and is largely supported by agriculture, mining, and construction. Due to more intensive land use in this area, contaminants from urban runoff, nutrients from fertilisers, and pesticides can be an issue. Water diversions for irrigation and man-made changes to the natural environment such as weirs can affect fish migration and life cycles.

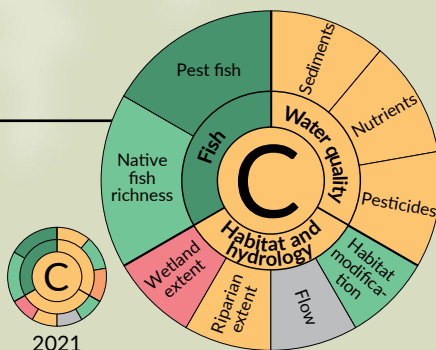
## O'CONNELL RIVER ESTUARY

- Pesticide scores improved, although the overall grade remains 'poor'.
- Updated habitat and hydrology data resulted in grade changes for both mangrove and riparian extent indicators.
- Water quality is often a problem here due to lake-like characteristics and low flow. It has scored 'moderate' every year since the report card's inception.



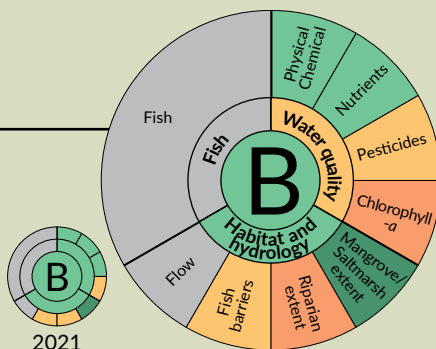
## O'CONNELL BASIN FRESHWATER

- Water quality remains moderate for the sixth consecutive year.
- Nutrients scores declined, while pesticide scores improved.



## MURRAY AND ST HELENS CREEK ESTUARY

- Overall grade remains 'good' for the fourth consecutive year, despite declines in some water quality indicators including chlorophyll-a and pesticides.
- Interestingly, there was an increase in the aerial extent of mangrove and saltmarsh vegetation, which may be due to sediment depositing in nearshore environments and providing conditions for mangroves to colonise.



### FRESHWATER FISH

The fish index scores are based on species composition, not fish health. [Read more on our website.](#)





## GRADES

**A**

VERY GOOD

**B**

GOOD

**C**

MODERATE

**D**

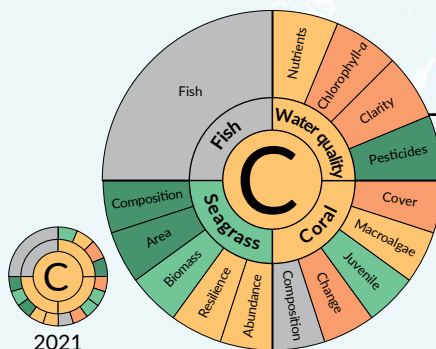
POOR

**E**

VERY POOR

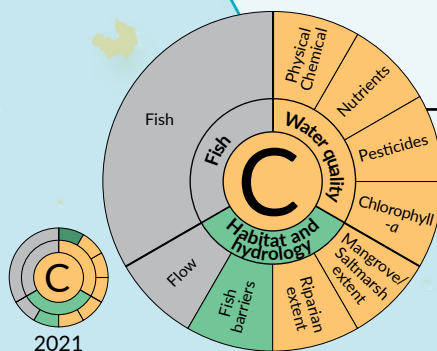
 NO MONITORING/  
INSUFFICIENT DATA

## CENTRAL INSHORE MARINE



- Improvement in seagrass grade was driven in part by the inclusion of a new meadow offshore from Mackay Harbour, where surveys have shown a general increasing trend across all seagrass indicators since monitoring began in 2017.
- Coral grade remained moderate, however notable changes included a decline in juvenile recruitment at Slade Island, an improvement in coral cover change score at Round Top Island, and an increase in juvenile recruitment at Victor Island.

## CENTRAL INSHORE MARINE



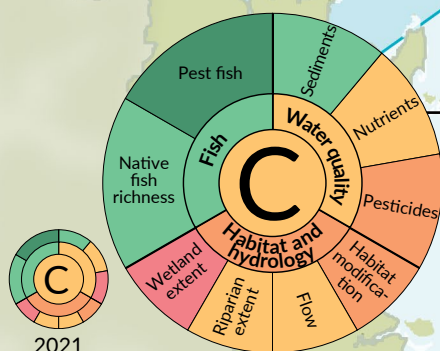
## VINES CREEK ESTUARY

- Overall water quality remained 'moderate' despite a decline in the physical-chemical indicators from 'very good' to 'moderate'. This decrease may be related to the timing of sampling in relation to rainfall events.

## VINES CREEK

Mackay

## PIONEER BASIN FRESHWATER



- Overall basin score improved, but the grade remained moderate.
- Nutrients, pesticides and flow indicator scores all improved.
- The only basin to score within the recommended guidelines for sediment, scoring 'good' for the fourth consecutive year.

## FLOW

The flow indicator was designed to tell us how human activities (such as water extraction or damming) influence streamflow. However, the current tool has limitations in prolonged periods of low or no flow, and some basins lack sufficient data. For these reasons, flow scores are only reported for the Pioneer and Plane Basin this year. Our technical advisory group is working to progress this indicator, so if you are interested in funding improved flow reporting please get in touch.

# MACKAY & ISAAC COASTAL REGION

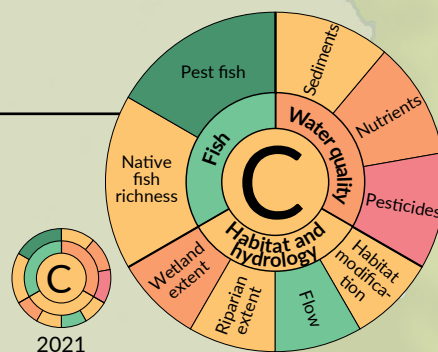
The **Plane Basin** stretches along the coast of the southern Mackay and Isaac regions, with freshwater and estuaries flowing into both the **Southern** and **Central Inshore Marine Zones**.

The **Southern Inshore Marine Zone** is also influenced by runoff from the Broadsound region south of the Plane Basin, with aerial imagery showing water from this area repeatedly tracking north, and then out to sea in line with Cape Palmerston.

The **Plane Basin** is unique in that it encompasses several smaller waterways, rather than one or two larger rivers like the other basins. Major land uses include sugarcane in the north of the basin and grazing in the south.

## PLANE BASIN FRESHWATER

- Minor improvement in pesticides, however the grade remained 'very poor'.
- Sandy Creek within the Plane Basin is the only site to record its highest nitrogen concentrations during the dry season.
- Flow scores are 'good' for the second year in a row.



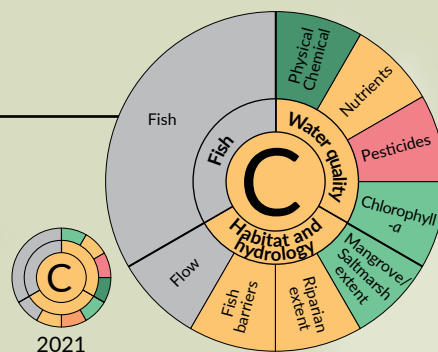
### WHAT ABOUT FISH?

There are currently no monitoring programs for estuarine fish in our region. Given the high social, cultural, and economic value fishing has within our community, this is a great opportunity for potential partners to come on board and help support a pilot program. Please contact us if you are interested in being involved.



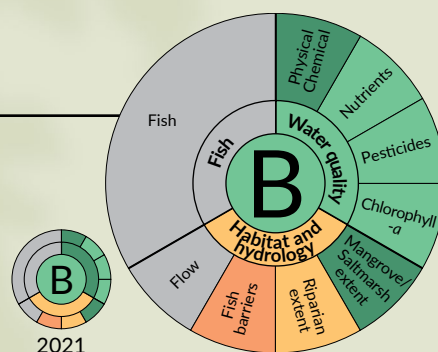
## SANDY CREEK ESTUARY

- Nutrients remained moderate despite improvements in both nitrogen and phosphorus scores.
- Chlorophyll-a scored 'good' or higher for a fifth year in a row.



## PLANE CREEK ESTUARY

- Plane Creek Estuary has scored 'good' for the sixth year in a row.



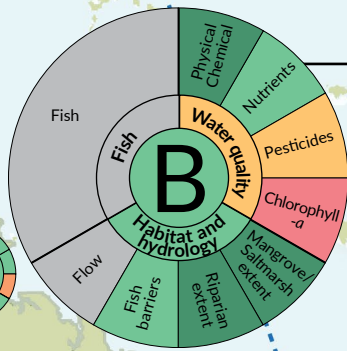
COLLABORATE WITH US!



## GRADES

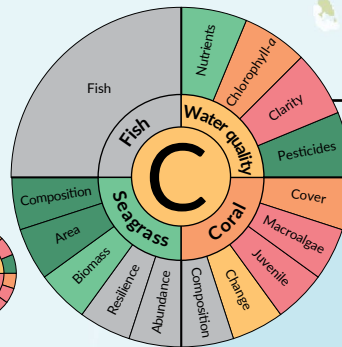


### ROCKY DAM CREEK ESTUARY



- Water quality changed from 'good' to 'moderate' with declines in chlorophyll-a and pesticide grades.
- Mangrove saltmarsh improved from 'good' to 'very good'.

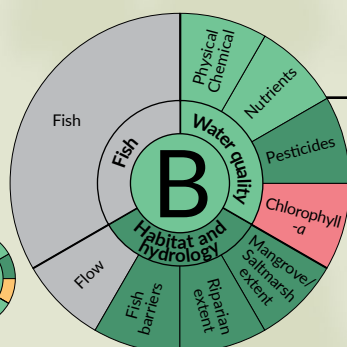
### SOUTHERN INSHORE MARINE



- Coral scores indicate recovery from the 2022 heatwave, with hard coral cover increasing at four of the five reefs since the previous year.
- Excitingly, seagrass condition is reported for the second time, improving from 'moderate' to 'good'. All seagrass indicators met recommended guidelines in all three monitored meadows.
- Strong tidal flow and silty shallows in this area lead to consistently low water clarity scores, remaining 'very poor' for five consecutive years.

The Southern Inshore Marine Zone grades are based on data collected through monitoring funded by Dalrymple Bay Coal Terminal Pty Ltd and Dalrymple Bay Infrastructure. Read more on page 11 or on our [website](#).

### CARMILA CREEK ESTUARY



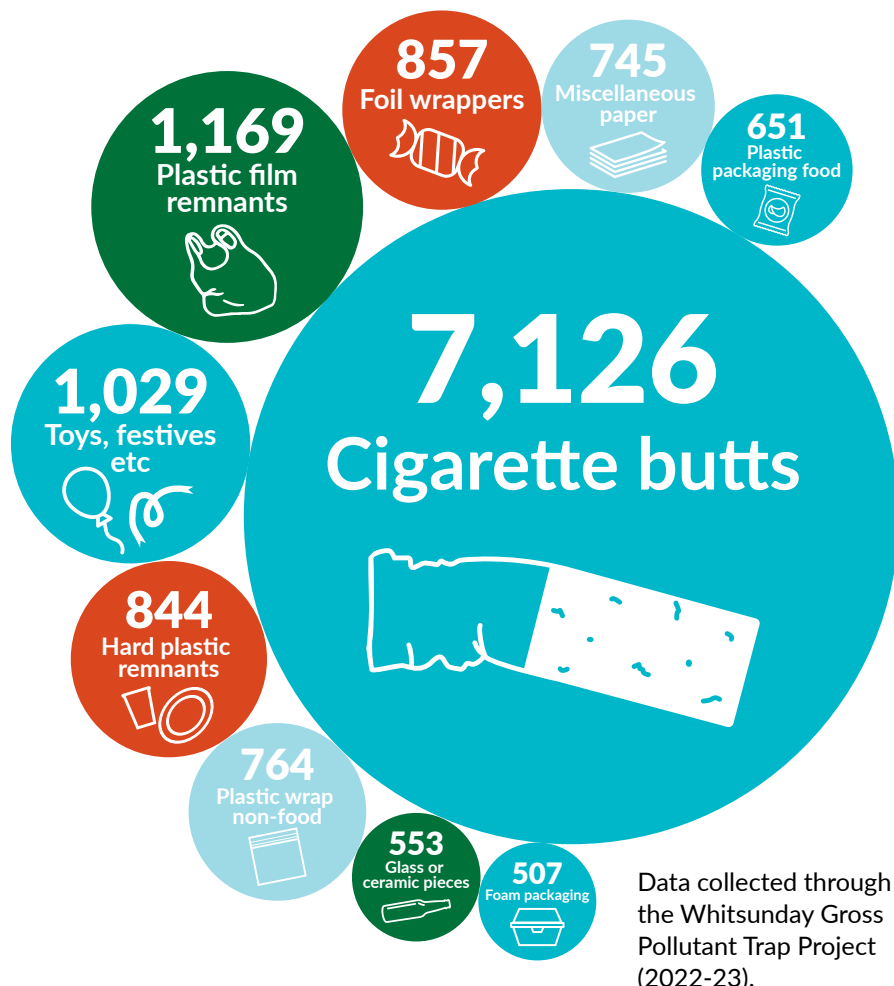
- The overall estuary grade declined from 'very good' to 'good' primarily due to changes in Chlorophyll-a. This indicator declined from 'poor' to 'very poor' – the largest score decrease out of all the estuaries.
- Overall water quality is 'good' for the fourth year in a row.

## TRAPS IDENTIFY TOP LITTER ITEMS

As part of the Whitsunday Gross Pollutant Trap Project, we worked with Whitsunday Regional Council to install 15 litter traps in stormwater drains across the Whitsundays including Proserpine, Cannonvale and Airlie Beach. Throughout 2022 and early 2023, the contents of these traps were collected every eight weeks and with the help of volunteers, we sorted and entered the findings into the Australian Marine Debris Initiative (AMDI) Database.

Data from the Whitsunday Gross Pollutant Trap Project shows that the number one litter item found heading into our waterways was cigarette butts with more than 7,000 pieces intercepted. Using this information, we are working with our partner, Tangaroa Blue Foundation and local venues to install dedicated butt bins along with educational signage.

The Whitsunday Gross Pollutant Trap Project received funding support from the Queensland Government's Community Sustainability Action grant program.



## URBAN WATER STEWARDSHIP

The Urban Water Stewardship Framework assesses how regional councils manage urban water across the Great Barrier Reef region.

The grade shown here is based on the latest grade available within this reporting period, relating to assessments undertaken in 2020-21 with the Mackay, Whitsunday and Isaac regional councils (assessments completed in 2022-23 will be shown in next year's Report Card). The MWI region was rated C for overall management practice level.

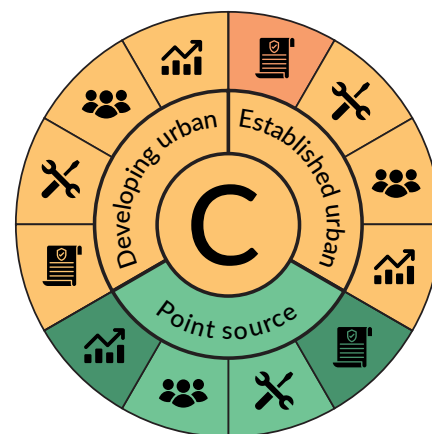


Photo: Gemma Armstrong





Seagrass beds in the Southern Inshore Marine Zone. Photo: TropWater, James Cook University

Ricci Churchill (Dalrymple Bay Coal Terminal Pty Ltd) and Tim Ffrost (Dalrymple Bay Infrastructure).

## SOUTHERN INSHORE MARINE ZONE REPORT CARD TIMELINE

- 2014-2017** No data available. Finding a funding source becomes Partnership priority.
- 2017** Southern Inshore Monitoring Program starts with funding from DBCT P/L.
- 2018** Water quality scores included in the Report Card for the first time.
- 2019** Coral and pesticides scores reported for the first time. Project now funded by DBCT P/L and DBI.
- 2022** Seagrass scores included in the Report Card for the first time.

## SOUTHERN INSHORE DATA GATHERS MOMENTUM

The Partnership-led Southern Inshore Monitoring Program is now well-established with water quality, coral and seagrass indicators assessed across multiple years.

Thanks to the ongoing support of Dalrymple Bay Coal Terminal Pty Ltd (DBCT P/L) and Dalrymple Bay Infrastructure (DBI), data is now available for the Southern Inshore zone, which historically has been a critical missing piece of the regional waterway health puzzle. Prior to 2017, there was no information for this zone.

The data gathering is set to continue with renewed commitment from DBCT P/L and DBI to fund the program for an additional three years, from FY24 to FY26.

The continued monitoring of this zone has so far already contributed to an increased understanding of local waterway conditions and natural variabilities.

In the first five years of monitoring, seagrass in the Southern Inshore Marine Zone appears to have a high degree of variability, with biomass hotspots shifting around the meadow from year-to-year. Given the abundance of feeding trails frequently observed during monitoring, it is likely that this variation is due to feeding patterns of dugongs and turtles.

Similarly, this zone scores consistently low on water clarity, which is a key factor in coral health and recovery. Through this monitoring program, there is evidence to support that these low scores are a natural feature of the zone's strong tidal currents. As the data set funded by DBCT P/L and DBI grows, the more we can continue to learn about water quality in this region.

DBCT P/L Manager of Safety, Risk and Environment, Ricci Churchill said DBCT P/L was eager to build on the success of the monitoring program to date and further understand how local ecosystems are responding to changing pressures.

"To effectively look after our waterways and the environment around us, we first must understand what is happening in the local area. The Southern Inshore Monitoring Program provides us with the data needed to keep an eye on the health of the marine environment and inform management actions if necessary.

"As a founding member of the Healthy Rivers to Reef Partnership, we are proud to have established this monitoring program and continue to support it in partnership with DBI. It shows what can be possible through the Partnership and by investing in your local community."

Healthy Rivers to Reef Partnership Chair Julie Boyd said the Southern Inshore Monitoring Program was a key example of what could be achieved through the Partnership.

"One of our aims is to continually improve our understanding of regional waterway conditions by developing and investing in new monitoring programs and with the support of DBCT P/L and DBI we have done exactly that.

"The fact that this monitoring program continues to be supported demonstrates the value it brings to the Report Card and to our understanding of regional waterway conditions more broadly.

"We are very grateful to DBCT P/L and DBI for their ongoing support and we look forward to working with them over the next phase of the monitoring program."

A number of report cards are produced in relation to the environmental condition of the Great Barrier Reef, including this one, with different purposes and coverage.

The **Reef Water Quality Report Card**, jointly produced by the Queensland and Australian governments, focuses on tracking towards the **Reef 2050 Water Quality Improvement Plan** targets ([www.reefplan.qld.gov.au](http://www.reefplan.qld.gov.au)). The regional report cards form an important part of this framework by providing an annual snapshot of ecosystem health and water quality conditions of local waterways.



## ABOUT US

Launched in 2014, the MWI Healthy Rivers to Reef Partnership has a shared vision of healthy rivers and Reef contributing to a prosperous region. The Partnership is a collaboration between community, Traditional Owners, farmers and fishers, industry, science, tourism, and government who recognise that more can be achieved by working together.

## JOIN US

Is your organisation interested in becoming a partner? Contact us to find out how you can help build and shape our community's understanding of waterway health and how we respond.

Your support could help fund monitoring programs to fill data gaps and ensure the Report Card continues to be an effective tool for regional waterway management.

## WHAT'S NEXT?

The 2022 Report Card marks nine years of waterway health reporting for the MWI region. As we approach the release of our 10th report card in 2024, we are building towards exploring regional waterway trends over our 10-year data set.

## ACKNOWLEDGEMENTS

The Partnership acknowledges the extensive input into the science behind the report card from the Regional Report Card Technical Working Group, the Reef 2050 Plan Independent Science Panel, and our data providers and collaborators, including: Australian Government, Australian Institute of Marine Science, Bureau of Meteorology, Commonwealth Scientific and Industrial Research Organisation, Central Queensland University, Queensland Government, the Great Barrier Reef Marine Park Authority, James Cook University, The University of Queensland, University of New South Wales, North Queensland Bulk Ports, Reef Check Australia, Seagrass Watch, Australian Marine Debris Initiative.



Australian Government



Queensland Government



CANEGROWERS  
MACKAY



## CONTACT INFORMATION

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[www.healthyriverstoreef.org.au](http://www.healthyriverstoreef.org.au)



MWHR2RP

Want to hear more about waterway health?  
Sign up for our newsletter at:  
[www.healthyriverstoreef.org.au/contact](http://www.healthyriverstoreef.org.au/contact)

This report card is printed on recycled paper.  
Published July 2023.

Design and layout: Kate Hodge (Hodge Environmental)