

For 37 years the Australian Institute of Marine Science has surveyed the condition of numerous reefs across the Great Barrier Reef (the Reef). This program, called the [Long-Term Monitoring Program](#) (LTMP), is an essential resource for governments and agencies involved in the management and protection of the Reef.

Researchers use hard coral cover as an indicator of the condition of each reef. The LTMP also estimates crown-of-thorns starfish populations, coral bleaching levels and fish numbers.

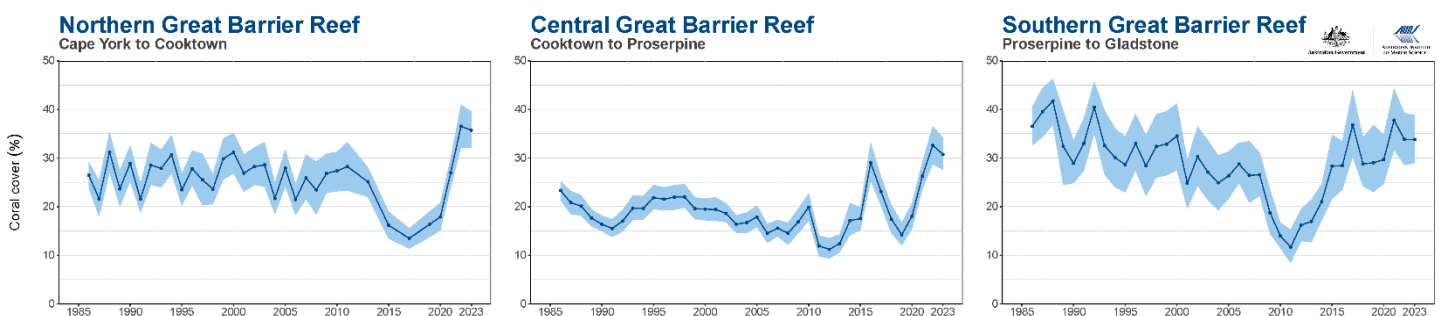
Each year, results on hard coral cover are published as an annual summary. This report provides information on the status and condition of reefs across the Northern, Central, and Southern Great Barrier Reef. More detailed data is collected, analysed and published by the program in other ways.

The 2022/2023 annual summary report is now available. For this report, the perimeters of 111 reefs were surveyed between August 2022 and May 2023. Survey reefs are primarily on the mid to outer shelf of the Reef.

Overall findings

Pause in recent coral recovery across the Great Barrier Reef

Regional hard coral cover across the Great Barrier Reef remains at similar levels to those recorded in 2022, with each region experiencing just small decreases in the average hard coral cover. Coral recovery continued on many reefs within each region, however this was offset by coral loss on others, caused by the impacts of the 2022 mass coral bleaching event, crown-of-thorns starfish predation, a cyclone and coral disease, particularly in the Southern Great Barrier Reef. The results indicate the recent widespread recovery in the Northern and Central regions of the Great Barrier Reef has paused.



Regional trends in the percentage of hard coral cover on the Northern, Central and Southern Great Barrier Reef from manta tow surveys by the AIMS Long-Term Monitoring Program up to the 2022/23 survey year.

Percentage of hard coral cover was variable across the Reef:

- 1 reef had 0-10% coral cover
- 49 reefs had 10-30% coral cover
- 43 reefs had 30-50% coral cover
- 18 reefs had 50-75% coral cover
- No reefs had more than 75% coral cover

Background – coral cover in recent years

Since 2018, hard coral cover had been increasing in both the Northern and Central Great Barrier Reef after almost a decade of disturbances including cyclones, predatory crown-of-thorns starfish outbreaks, and the back-to-back mass bleaching events of 2016 and 2017 all of which caused widespread mortality.

This recovery was primarily, but not exclusively, driven by fast-growing but vulnerable branching and plate corals (*Acropora*). It continued despite a mass bleaching event in 2020, showing bleaching events do not always lead to widespread mortality. In 2022, hard coral cover in both regions had reached the highest level in 36 years of monitoring.

The Southern region has generally had higher coral cover than the Northern or Central regions but it has also been the most dynamic over the 37-years of monitoring. A rapid and substantial increase in hard coral cover occurred from a historic low in 2011 to 2017; however, ongoing outbreaks of crown-of-thorns starfish have continued to stymie growth in coral cover in the Southern region in all but one year since 2019.

In the summer of 2022, the Great Barrier Reef experienced a marine heatwave resulting in the fourth mass bleaching event on the Great Barrier Reef since 2016 and the first to occur in a typically cooler La Niña year. The severity of bleaching was variable among reefs. Overall, it was less intense than the 2016 and 2017 events. Its longer-term impacts were assessed in the 2023 LTMP survey season and are summarised at the end of this 2023 Quick Look.

What do our findings mean for the Great Barrier Reef?

Our latest surveys found an overall pause in coral cover growth in 2023, with most reefs showing very little change, and those reefs recording growth offset by those recording decline. Overall, the percentage of hard coral cover declined slightly in all three regions.

The Reef saw record high spring temperatures in 2022, but conditions were mild over the 2023 summer. No cyclones entered the marine park, and a monsoon trough kept sea temperatures mild during the Summer. Low bleaching was recorded.

The effects from the 2022 bleaching event, the fourth in seven years, caused some coral loss on some reefs. It is likely that those corals which survived bleaching have been affected by reduced growth and reproduction.

Additionally, in the Northern reef there was coral loss from crown-of-thorns starfish and Tropical Cyclone Tiffany (in January 2022); while in Southern reef, continued crown-of-thorns starfish outbreaks and coral disease combined with the impacts of coral bleaching to keep hard coral cover at a similar level to last year.

Our 2023 survey results show that even mass bleaching events considered not severe, can be enough to pause regional increases in coral cover when coupled with other pressures faced by the Great Barrier Reef.

Climate change remains the greatest threat to the Reef. Its consequences, particularly more frequent and more severe marine heatwaves, will lead to shortened windows of recovery. Recent gains, while encouraging, can be lost in a short amount of time.

Northern Great Barrier Reef – from Cape York to Cooktown

- 38 reefs were surveyed.
- Average hard coral cover across the region was estimated at 35.7%, down slightly from 36.5% in 2022 (the previous historical high for average coral cover). The region had, until last year, experienced continual coral cover increases from the most recent low point of 13%, recorded in 2017. A summary of recent disturbances and changes in coral cover is available in the report.

Coral cover varied substantially among reefs. Five reefs had between 50% and 75%. The remaining reefs were between 10% and 50%. Some places have experienced little recovery from the 2016/17 bleaching events.

An assessment of the longer-term impact of the 2022 mass bleaching is available below.

No reefs had outbreak levels of crown-of-thorns starfish. However, there were low numbers of individuals which contributed to coral mortality in the region. The [Crown-of-thorns Starfish Control Program](#) is active in this region.

Tropical Cyclone Tiffany crossed the Northern Great Barrier Reef in January 2022 and likely contributed to coral loss. This cyclone occurred between the two latest surveys, and its impacts are included in this report.

Low coral bleaching (less than 10% of corals) was observed on 29 of the 38 reefs this year. These reefs were surveyed before the height of summer.

Central Great Barrier Reef – from Cooktown to Proserpine

- 42 reefs were surveyed.
- Average hard coral cover was estimated at 30.8%, a slight decrease from 32.6% in 2022, which was an historic high for the LTMP in this region. The most recent average low coral cover was 14% in 2019. A summary of recent disturbances and changes in coral cover is available in the report.

Coral cover varied among reefs. Just over half the surveyed reefs had coral cover between 10% and 30%. Five reefs had between 50% and 75% coral cover.

An assessment of the longer-term impact of the 2022 mass bleaching is available below.

No crown-of-thorns starfish outbreaks were recorded this year, despite a history of outbreaks occurring in this region. This is likely a result of active culling by the [Crown-of-thorns Starfish Control Program](#).

Low coral bleaching (less than 10% of corals) was recorded on 28 of the 42 surveyed reefs this year.

Southern Great Barrier Reef – from Proserpine to Gladstone

- 31 reefs were surveyed.
- Average hard coral cover was estimated at 33.8%, relatively unchanged from the 2022 estimate of 33.9%. A summary of recent disturbances and changes in coral cover is available in the report.

Coral cover was highly variable among reefs. One reef had 0-10% coral cover, and eight had 50-75% coral cover, with the remaining reefs in between.

An assessment of the longer-term impact of the 2022 mass bleaching is available below.

Crown-of-thorns starfish outbreaks on some reefs continued to be the main cause of coral loss in the Southern region, particularly the Swain reefs. Four reefs had some degree of starfish outbreak (two with active outbreaks, two with incipient outbreaks) and three had low numbers and were classified as 'no outbreak'. Visit the AIMS website for information on [crown-of-thorns starfish outbreak categories](#).

Reefs in the Capricorn-Bunker group had notable occurrence of coral disease, which likely contributed to mortality in the region.

Low coral bleaching (less than 10% of corals) of sensitive species was recorded on 15 of the 31 surveyed reefs this year.

Assessment of the 2022 mass bleaching event

The 2023 survey season provided an opportunity to assess the longer-term impacts of the 2022 mass bleaching event on the Great Barrier Reef. This assessment is based on the 93 reefs (of the 111 surveyed this year) that were also surveyed in 2021 and/or 2022, allowing for a before and after comparison.

Of the 93 reefs:

- 19 reefs had strong statistical evidence of declines in coral cover:
 - Declines on 10 of these reefs were likely due to mortality from the 2022 mass coral bleaching event
 - Declines on nine of these reefs were due to crown-of-thorns starfish, Tropical Cyclone Tiffany and coral disease
- 23 reefs had evidence of increases in coral cover
- 51 reefs had very little change from the previous survey.

Coral bleaching does not always result in the death of a coral. Corals which experience bleaching but do not die may experience sub-lethal effects of limited growth, reduced reproduction and fewer young and be more susceptible to disease.

Overall, the 2022 bleaching event resulted in low coral mortality, but when combined with the sub-lethal effects of bleaching, crown-of-thorns starfish predation, cyclone impacts and coral disease, it has been enough to pause recent recovery in the Northern and Central regions, and keep coral cover almost the same as last year in the Southern region.

More information

- Read the full [Annual Summary Report of Coral Reef Condition 2022/2023](#).
- Learn more about the AIMS [Long-Term Monitoring Program](#).
- AIMS' Long-term Monitoring Program contributes to the [Reef 2050 Integrated Monitoring and Reporting Program](#).
- Access [individual reef survey and sector reports](#) on the AIMS website.

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