

For 38 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 scientists, governments and agencies involved in the management and protection of the Reef.

Researchers use hard coral cover as one indicator of reef condition. The LTMP also estimates coral bleaching levels, and populations of crown-of-thorns starfish, coral trout and sharks.

Each year results on hard coral cover are published as a summary, providing an overview on the status, condition and trend of reefs across the Northern, Central, and Southern regions of the Reef. More detailed data are collected, analysed and published by the program in other ways.

The [2023/2024 annual summary report](#) is now available. For this report, the upper reef slope of 94 reef perimeters (primarily on the mid to outer shelf) were surveyed between August 2023 and June 2024.

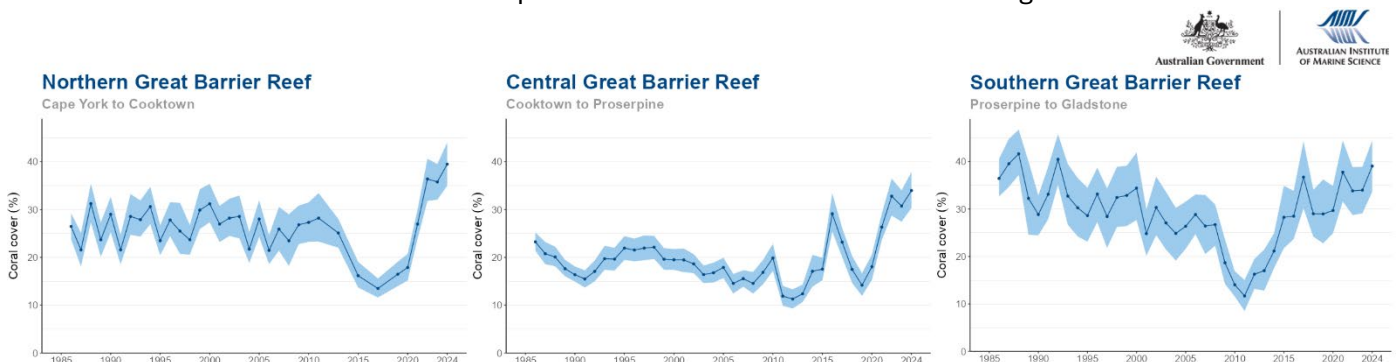
Overall findings in 2023-2024

Coral cover remains high while impacts of mass coral bleaching yet to be determined.

Average hard coral cover of the Reef remained high, increasing in each region and reaching regional highs in two of the three regions.

One of the Reef's most serious and extensive mass coral bleaching events resulted from peak heat exposure in March 2024. The highest levels of bleaching and early onset mortality were observed in the Southern region. Two cyclones crossed the Central region in December 2023 and January 2024. Due to the timing of the routine surveys, the results of the Annual Report do not reflect the final outcome of these disturbances but are a robust reference point to assess their impacts over the next survey season.

Crown-of-thorns starfish outbreaks persist on some reefs of the Southern region.



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 2023/24 survey year. Levels of variability among reefs (or credible intervals) are reflected as blue shading.

Percentages of hard coral cover were variable across the Reef. This variability is reflected as margin of error (95% confidence intervals) in the report.

- 2 reefs had 0-10% coral cover
- 36 reefs had 10-30% coral cover
- 35 reefs had 30-50% coral cover
- 21 reefs had 50-75% coral cover
- No reefs had more than 75% cover

Background – coral cover in recent years

Regional coral cover on the Great Barrier Reef fluctuates annually, as recorded by this 38-year program. The most dramatic changes have occurred over the past 15 years, where levels reached both historical lows and, most recently, highs.

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

This recovery was primarily, but not exclusively, driven by fast-growing but vulnerable corals. It continued despite a mass bleaching event in 2020, showing that bleaching events do not always lead to widespread mortality. In 2022, another mass bleaching event again affected all regions. It was the first to occur in a typically cooler La Niña year and, overall, was less intense than the 2016 and 2017 events. In 2024, hard coral cover in both the Northern and Central regions reached the highest levels in 38 years of monitoring.

The Southern region has generally had higher coral cover than the Northern or Central regions, but it has also experienced larger fluctuations. A rapid and substantial increase in hard coral cover occurred from an historic low in 2011 to 2017; however, ongoing outbreaks of crown-of-thorns starfish continued to stymie rises in coral cover in this region.

In the summer of 2024, the Great Barrier Reef experienced two cyclones and a marine heatwave, resulting in one of the most serious and extensive mass bleaching events recorded on the Reef. Survey results in this report reflect regional coral cover both before and during these summer disturbances, but do not reflect the final impacts of these events.

What do our findings mean for the Great Barrier Reef?

Our findings show that coral cover remained high during the survey period, which is good news. The observed increases in recent years show the Reef's capacity for recovery, but this does not mean that all is fine.

This year's mass bleaching event was one of the most serious and extensive on record, and its full impact is yet to be recorded. In addition, these results only partially reflect the impact of two cyclones. Therefore, this year's results should be considered our best understanding of Reef condition before the summer's disturbances, and a good reference point from which to assess impacts on the Reef in the upcoming survey season.

Climate change is the greatest threat to the Reef. The increased frequency and extent of bleaching events in the last decade are unprecedented. These, with the combined pressures from multiple sources, pose a severe threat to its future.

Northern Great Barrier Reef – from Cape York to Cooktown

- 25 reefs were surveyed
- Average hard coral cover was estimated at 39.5%, a regional high, and an increase from 35.8% in 2023.

During 2024, this region experienced variable heat stress. The highest levels of heat stress and bleaching were recorded around the inner and mid-shelf reefs between Lizard Island and Cape Sidmouth and generally decreased in northern and offshore areas. All surveys were completed by February, before the peak of heat stress in March 2024.

Crown-of-thorns starfish and/or feeding scars were seen in low numbers on some reefs.

Central Great Barrier Reef – from Cooktown to Proserpine

- 39 reefs were surveyed
- Average hard coral was 34.0%, a regional high and an increase from 30.7% in 2023.

Heat stress and coral bleaching were variable in this region. 23 of the 39 reefs were surveyed months before the peak of the mass bleaching event in March 2024. The 16 reefs surveyed during the period of heat stress had low to moderate levels of bleaching.

Tropical Cyclone Jasper crossed the Central region in December 2023. No surveys were performed in this area after Cyclone Jasper. Its impact will be recorded next season.

Cyclone Kirrily crossed the Central region in January 2024. Surveys of 22 reefs after the cyclone recorded variable levels of damage, with some showing declines in hard coral, while others appear to have escaped relatively unscathed.

Southern Great Barrier Reef – from Proserpine to Gladstone

- 30 reefs were surveyed
- Average hard coral cover was 39.1%, an increase from 34.0% in 2023.

Nearly half the surveys of reefs in this region were carried out before peak heat stress in March 2024. This region experienced the highest levels of heat stress ever recorded for the region. Surveys conducted during peak heat stress in March at 11 reefs showed bleaching that ranged from medium (>10%-30%) to very high (60-90%) and early onset coral mortality was observed. Five reefs surveyed after peak bleaching still had bleaching levels up to 30%.

Crown-of-thorns starfish outbreaks persisted at four reefs in the Swains. The Southern region has experienced starfish outbreaks in recent years, which have been a major cause of coral cover decline.

Note: Bleached coral, while stressed is still alive and is recorded as live coral in AIMS' surveys.

The 2024 Great Barrier Reef mass bleaching event

The 2024 mass bleaching event was one of the most serious and extensive recorded on the Great Barrier Reef, and the fifth event since 2016. The full effect of this event on coral cover will be determined during next survey season, as the fate of corals can take months to unfold.

[Aerial surveys by the Great Barrier Reef Marine Park Authority and AIMS](#) showed the 2024 mass bleaching event of the Great Barrier Reef and Torres Strait had the largest footprint of coral bleaching ever recorded. 49% of reefs had high levels of bleaching (>30% of corals bleached) and 32% of reefs had very high to extreme levels of bleaching (>60% of corals bleached). High to extreme bleaching was observed across all regions of the Reef, with the highest impacts on the inshore and mid-shelf reefs.

The Southern region experienced the highest levels of heat exposure, with some reefs subjected to up to 15 DHWs* – the highest recorded for the Great Barrier Reef. The highest levels of early-onset mortality were recorded in this region.

- A full assessment of the bleaching event based on aerial surveys and heat exposure is [available on the AIMS website](#).
- Information on in-water levels of bleaching at 36 reefs by AIMS (carried out in addition to routine LTMP surveys) at the peak of the event is presented in this report.

** Levels of heat exposure for coral reefs are measured using Degree Heating Weeks (DHWs). It combines sea temperature extremes with the total time spent above bleaching temperatures. Coral bleaching is expected at 4DHWs. Coral mortality is expected above 8DHWs.*

Further information

- Read the full [Annuary Summary Report of Coral Reef Condition 2023-2024](#).
- Hear from [Dr Mike Emslie and Dr Daniela Ceccarelli about this year's results](#).
- Learn more about the [AIMS Long-Term Monitoring Program](#) - what we survey and how we do it.
- View individual reef survey data and sector reports, updated soon after each survey trip, via the AIMS [Reef Dashboard](#).
- AIMS Long-Term Monitoring program contributes to the [Reef 2050 Integrated monitoring and Reporting Program](#).

Stay up to date

Subscribe to the Long-Term Monitoring Program's ['Back from the Reef' regular survey email updates](#).

Media

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