Australian Government | Australian Institute of Marine Science

Media release: 19 November 2024

# Initial Great Barrier Reef monitoring results show coral mortality in north due to bleaching and cyclones

New data from the Australian Institute of Marine Science's (AIMS) in-water surveys show coral cover has declined on 12 of 19 reefs surveyed between Lizard Island and Cardwell following a summer of disturbance events.

These are the first routine surveys from AIMS' Long Term Monitoring Program (LTMP) at these sites since the Reef experienced a serious and extensive mass bleaching event, two cyclones and flooding between December 2023 and March 2024.

Scientists from the LTMP have analysed the in-water surveys which took place during August and October 2024. They found substantial losses of coral cover on 12 reefs ranging from 11% to 72% of pre-summer levels as a result of these disturbance events.

More than a third of hard coral cover was lost across the Cooktown-Lizard Island sector (from the recorded high of 31.4% a year ago to 19.3%), which is the largest annual decline for this sector in 39-years of AIMS' monitoring. Hard coral cover is a measure of the percentage of live coral on the reef surface.

In the Cairns sector, coral cover declined by just over a third across the five reefs surveyed to date. In the Innisfail sector, coral cover remained similar to pre summer levels across the four reefs surveyed. The LTMP expects to survey another 5-10 reefs in the Cairns sector and 4-5 reefs in the Innisfail sector in the coming months. Additional reefs may be surveyed in the Cooktown-Lizard Island sector later in the season, depending on weather conditions.

AIMS' Long-Term Monitoring Program (LTMP) leader Dr Mike Emslie said the levels of coral loss largely reflected the exposure of the reefs to the summer disturbances and the thermal tolerance of the constituent coral species within the communities, with some of the reefs experiencing multiple disturbance events over the summer.

"During February and March 2024, all the reefs we recently surveyed in this north Queensland region were subjected to levels of climate change-driven heat stress that cause bleaching. The heat stress got so high in some areas that mortality is not a surprising outcome. Tropical Cyclones Jasper and Kirrily also exposed many to wave heights likely to cause damage to corals, generally greater than four metres," he said.

"From what we have seen so far, the impact from these events is significant coral mortality in those areas hardest hit, although the level of mortality has been variable, and a few reefs escaped significant loss. We still have a lot of Reef to monitor and a full assessment of the impact on coral cover across the Marine Park will be available in mid-2025."

Inner and mid-shelf reefs in the **Cooktown-Lizard Island** sector bore the brunt of the impacts from bleaching, with one inner shelf reef losing almost three-quarters of its pre-summer hard coral cover.

**TOWNSVILLE** (Headquarters)
PMB No.3,
Townsville MC, QLD 4810
T: +61 7 4753 4444
E: reception@aims.gov.au

**DARWIN**
PO Box 41775,
Casuarina, NT 0811
T: +61 8 8920 9240
E: reception@aims.gov.au

**PERTH** Indian Ocean Marine Research Centre
The University of Western Australia, M096
35 Stirling Highway, Crawley WA 6009
T: +61 8 6369 4000
E: WAadmin@aims.gov.au

aims.gov.au

In contrast, the outer shelf reefs surveyed escaped with little to no coral loss, likely due to the make-up of these coral communities. However, the effects of upwellings of cooler oceanic water may also have been a factor.

“We saw mortality from coral bleaching that was variable within reefs. Some areas were more impacted by heat stress in the top few metres compared to corals deeper down the reef slope which were largely unaffected,” Dr Emslie said.

“Other sections of these reefs had bleaching mortality evident from the shallows to the bottom of the slope. Then you might swim 100m and see a section of the reef that was less affected.

“Coral types also fared differently. Mortality was most common in the table *Acropora* corals. This fast-growing coral has been partly responsible for the recent recovery on the Reef but is also susceptible to the kind of disturbance events we’ve seen this summer.

“Other coral types, such as branching *Acropora* were less affected, while massive corals – like *Porites* - were least affected. This points to the variability and dynamics on coral reefs.”

Reefs that were surveyed in the Cairns sector were hit by both bleaching and Tropical Cyclone Jasper which crossed the Reef in December 2023. The cyclone exposed the surveyed reefs to waves of more than four metres for between 33 and 40 hours, with evidence of damage highest at Mackay Reef due to a combination of freshwater inundation, cyclonic wave damage and coral bleaching.

In the Innisfail sector, the heat stress from the marine heatwave was lower, and the impacts from cyclones Jasper and Kirrily were less intense. Coral cover was largely unchanged on three reefs.

AIMS acting Research Program Director Dr Manuel Gonzalez Rivero said the preliminary results provide a first glimpse of impacts from the 2024 Austral summer.

“We don’t yet have a full picture of how each region of the Reef has fared – our continued monitoring will capture this. The losses of coral we’ve recorded so far are significant. Despite these losses, coral cover on most reefs is at moderate levels of between 10 and 30%.

“These initial results show the vulnerability of the Reef to bleaching events, which are increasing in frequency, footprint and intensity under climate change. Its resilience is being severely tested.

“The 2024 mass bleaching event on the Reef, its fifth since 2016, forms part of the fourth global bleaching event impacting both the northern and southern hemispheres of the Atlantic, Pacific and Indian Oceans during 2023 and 2024, documented in more than 60 countries and territories worldwide.

“Climate change is threatening reefs around the world. Their future relies on strong greenhouse gas emissions reduction, management of local and regional pressures, and the development of approaches to help reefs adapt to and recover from its impacts, which we are already seeing,” Dr Gonzalez Rivero said.

Results of the Cooktown-Lizard Island sector are available to view on AIMS’ Reef Monitoring Dashboard. Reef-level data from the Cairns and Innisfail sectors are also available.

The LTMP team are currently collecting data on reefs in the Southern region of the Great Barrier Reef.

As part of its response to the 2024 bleaching event, AIMS are also collecting detailed data on reef communities, physiology and genetics. This information will be made available through the scientific publication process.

**TOWNSVILLE** (Headquarters)
PMB No.3,
Townsville MC, QLD 4810
T: +61 7 4753 4444
E: reception@aims.gov.au

**DARWIN**
PO Box 41775,
Casuarina, NT 0811
T: +61 8 8920 9240
E: reception@aims.gov.au

**PERTH** Indian Ocean Marine Research Centre
The University of Western Australia, M096
35 Stirling Highway, Crawley WA 6009
T: +61 8 6369 4000
E: WAadmin@aims.gov.au

aims.gov.au

## About the LTMP

The LTMP quantifies long term trends in the status of coral communities across the Great Barrier Reef.

Researchers use hard coral cover as one indicator of the condition of each reef. Percentage hard coral cover is estimated by experienced scientists during manta tow surveys and is a metric which allows AIMS scientists to provide an overview of the Great Barrier Reef's status and keep policy makers, managers and other scientists informed in a timely manner.

The LTMP also does more detailed surveys on fixed sites on 71 reefs across the Great Barrier Reef. The detailed information includes what types of corals and species of fish are present, their abundance, and causes of mortality like crown-of-thorns starfish numbers, coral disease and bleaching observations.

The reefs featured in this release came from the Cooktown-Lizard Island, Cairns and Innisfail sectors. These are situated in the Northern and Central regions of the Reef. All surveys for this field season are scheduled for completion by July 2025.

The LTMP contributes to the Reef 2050 Integrated Monitoring and Reporting Program. Learn more about the LTMP and access detailed data displays at the level of individual reefs or regions.

-ENDS-

---


## Media contact:

Jo Manning, Media Officer: media@aims.gov.au; +61 456 196845


## Download images and vision here.

## More about the Australian Institute of Marine Science:

The Australian Institute of Marine Science (AIMS) is Australia's tropical marine research agency. In existence for half a century, it plays a pivotal role in providing large-scale, long-term and world-class research that helps governments, industry and the wider community to make informed decisions about the management of Australia's marine estate. AIMS science leads to healthier marine ecosystems; economic, social and environmental benefits for all Australians; and protection of coral reefs from climate change. More here: https://www.aims.gov.au/