



The Great Barrier Reef is a vast, diverse and spectacular ecosystem, but like all coral reefs globally, it is under pressure from climate change and other stressors. There are parts of the Reef that still are essentially pristine and vibrant, and which offer an incredible visitor experience. Others have been impacted by disturbances such as coral bleaching.

While reducing greenhouse gas emissions is a global challenge – and Australia is playing its part under the Paris Agreement – the Australian Government is also investing significantly in Reef resilience and adaptation measures. This includes an investment of \$150 million [for the research and development phase of the world-leading Reef Restoration and Adaptation Program](#).

2021 conditions and forecast

The latest information on the health of the Reef can be found via the [Reef Health updates](#) published on the Great Barrier Reef Marine Park Authority's (the Authority) website. Monthly updates are released throughout the year, with increased frequency over the Australian summer, as this is the period when the most significant impacts on Reef health from climate-induced extreme weather conditions are likely.

Prior to each summer, the Authority convenes a pre-summer workshop with leading Reef science experts and management partners to review events from the previous summer and consider forecasts for the coming summer. The [findings from the 2020-21 pre-summer workshop](#) can be found on the Authority's website.

The Authority takes a comprehensive approach to summer Reef health:

- Monitoring the forecast conditions and actual observations.
- Understanding the science of Reef health and impacts by working with science institutions, particularly the Australian Institute of Marine Science.
- Collecting in-water observations and reports using the "Eye on the Reef" database and app, surveys from the Authority's Reef Joint Field Management Program, tourism operators and the public.
- Regularly communicating Reef health observations and Reef management actions.

Coral bleaching and the cumulative impacts of the 2016, 2017 and 2020 events

Coral bleaching is a stress response when a coral colony is exposed to warmer, or cooler, than usual sea temperatures for an extended period, usually at least a few weeks in duration. Large-scale marine heatwaves create mass coral bleaching events in which very large numbers of corals bleach severely, on many different reefs over a wide area. These events are usually associated with significant levels of coral mortality and sub-lethal effects, such as reduced reproduction.

The Great Barrier Reef has experienced three mass bleaching events in the past five years (2016, 2017 and 2020). The cumulative area of shallow coral reef that has severely bleached at least once since 2016 now makes up a very substantial proportion of coral reefs of the Great Barrier Reef. It is important to note that bleached corals are not dead corals – on mildly or moderately bleached reefs, there is a good chance most bleached corals will recover and survive. Coral mortality depends on a number of factors, including past exposure to stress events, the extent of the current stress event and the tolerance of the coral species to heat stress.

Coral recruitment, which is essential for reef recovery, is also impacted by the frequency and intensity of coral bleaching. There is now, from this and past events, a reduced number of mature corals to spawn; and those mature corals which bleached and survived have a reduced fitness to spawn. Nonetheless, the annual mass coral spawning event remains a key regenerative process for the Great Barrier Reef World Heritage Area.

The Reef has shown the ability to recover from impacts in the past; however, a number of things play into recovery capacity of the Reef and effective recovery can only occur if disturbance-free periods are long-enough.

Information on the bleaching event that occurred in the latter part of the 2019-20 summer and the cumulative impacts to the Reef over the past decade are detailed in the inaugural [Reef Snapshot: Summer 2019-20](#).

Annual Reef Snapshots



In 2020, the first [Annual Reef Snapshot](#) was released, providing a concise, easy to understand summary of how the Reef fared over the past summer, what this meant for coral and the actions being taken to help coral health.

The snapshot is a joint initiative of the Australian Government's lead management and science agencies for the [Great Barrier Reef](#), the [Great Barrier Reef Marine Park Authority](#), the [Australian Institute of Marine Science](#) and [CSIRO](#) and is based on the latest available science and information at the time of writing.

A Reef Snapshot: Summer 2020-21 will be released post the summer period.

Long-term monitoring of Reef health

The Australian Institute of Marine Science reports annually on the condition of reefs in the Great Barrier Reef World Heritage Area, through its comprehensive [Long-Term Monitoring Program](#). The [2019-20 report](#) presents the results of field surveys of coral reefs across the Great Barrier Reef conducted over September 2019 to June 2020. The report from this survey season found that while the reefs surveyed were beginning to recover from the recent disturbance history; the third mass coral bleaching event in five years would likely set-back this recovery.

The 2020-21 Long-Term Monitoring Program survey commenced in late August 2020 and will give a clearer picture of the impacts of the 2020 bleaching event in the next annual update due in mid 2021.

Crown-of-thorns starfish outbreaks

Crown-of-thorns starfish are native coral predators on the Reef. When densities of starfish reach a point where the consumption of coral tissue exceeds coral growth, an outbreak is established. Outbreaks of crown-of-thorns starfish continue to impact reef health across all management areas, with the most severe impacts occurring on reefs in the Townsville–Whitsunday (offshore) and Mackay–Capricorn (inshore and offshore) management areas.

Management actions to reduce the impacts of threats such as crown-of-thorns starfish outbreaks are essential to giving the Reef the best chance of recovery. The [Crown-of-thorns Starfish Control](#)

[Program](#) continues throughout the Marine Park, with the latest control program data available on the Authority's [crown-of-thorns starfish project dashboard](#).

As climate change driven impacts on the Reef grow, particularly to hard corals, tactical control of crown-of-thorns starfish is increasingly the most effective scalable management tool to protect corals and World Heritage values associated with coral reefs.