

The Great Barrier Reef may *disappear* by 2050

Environmental

Increase in ocean temperatures due to atmospheric warming.

- Coral Bleaching.
- Vulnerable to disease and death.

Ocean acidification which occurs when the ocean absorbs CO₂.

- Lowers pH in the ocean.
- Hinders the ability of coral to create their skeletons.

Increase in the frequency and severity of tropical storms.

- Cyclones damage coral.
- Rainfall causes flooding, resulting in sediment pile-up.
- Blocks sunlight from coral and provides nutrients to the coral predator the crown-of-thorns starfish.

Objectives

1. Identify environmental causes and impacts of climate change on coral in the Great Barrier Reef.
2. Recognize cultural, political, and economic impacts on local communities.
3. Find short-term and long-term solutions to this problem.

Political, Economic, Cultural

Excess commercial fishing.

- Surges in coral predators.
- Decrease in coral.

Boat touring in vulnerable areas of the reef.

- Loss of coral would create a massive decrease in jobs in fishing and tourism.
- Fewer tourists would travel to and create business in the area if the main attraction is destroyed.

Areas weakened by humans leave coral vulnerable to other threats.

- A loss of protection from storms.
- Aboriginal and Torres Strait Islanders have strong cultural connections to many areas of the reef, as their ancestors have previously resided there.



Coral Before Bleaching. "EKNMS slabahorn coral" by Wikimedia Commons. is free to use in the public domain



Coral After Bleaching. "Bent Sea Rod Bleaching" by Wikimedia Commons. is licensed under cc-by-2.0



Ocampo, Danny (2021). Crown-of-thorns starfish eat polyps and are natural residents of coral reefs. ABS-CBN News. SLIDESHOW: Protecting reefs from Crown-of-Thorns Starfish infestation | ABS-CBN News

Solutions

1. Cool-water injection.
2. Make fishing and tourism more sustainable.
3. Reduce sediment pile-up in the reef.
4. Expand protected marine areas.
5. Provide more nutrients to coral.

References

- Baird, M.E., Green, R., Lowe, R., Mongin, M. & Bougeot, E. (2020). Optimising cool-water injections to reduce thermal stress on coral reefs of the Great Barrier Reef. *PLoS One*, 15(10), 1-13. <https://doi.org/10.1371/journal.pone.0239978>
- Bragdon, A. (2020, November 30). The Great Barrier Reef is at a critical tipping point and could disappear by 2050. *Insider*. <https://www.businessinsider.com/great-barrier-reef-could-disappear-by-2050-why-2019-10>
- Brodie, J. & Waterhouse, J. (2016). A critical review of environmental management of the 'not so Great' Barrier Reef. *Estuarine, Coastal and Shelf Science*, 104-105, 1-22. <https://doi.org/10.1016/j.ecss.2012.03.012>
- Great Barrier Reef Marine Park Authority (2021). Storms and cyclones. Australian Government. <https://www.gbrmpa.gov.au/our-work/threats-to-the-reef/climate-change/storms-and-cyclones>
- Great Barrier Reef Marine Park Authority (2021). Traditional Owners of the Great Barrier Reef. *Australian Government*. <https://www.gbrmpa.gov.au/our-partners/traditional-owners/traditional-owners-of-the-great-barrier-reef>
- Mustika, Stoeckl, N., & Farr, M. (2016). The potential implications of environmental deterioration on business and non-business visitor expenditures in a natural setting: A case study of Australia's Great Barrier Reef. *Tourism Economics: The Business and Finance of Tourism and Recreation*, 22(3), 484-504. <https://doi.org/10.5367/te.2014.0433>
- NOAA Office for Coastal Management (2021). Coral Reefs. <https://coast.noaa.gov/states/fast-facts/coral-reefs.html>