



Coral Reefs / GBR – Fact sheet¹

What are the main threats² to³ the Great⁴ Barrier⁵ Reef⁶?

1. Coral bleaching^{7,8} (climate change⁹)
2. Crown of thorn starfish^{10,11} outbreaks (nutrient loads¹²)
3. More frequent¹³, severe¹⁴ and intense¹⁵ storms (climate change^{16,17})

Value¹⁸ of the Great Barrier Reef¹⁹

- 56 billion²⁰ total economic, social and icon asset value
- \$6.4 billion Australian economic contribution annually
- 64,000 jobs supported by the GBR
- 2 million visitors²¹ every year

How²² much²³ coral is lost?

- In last 30 years²⁴ we lost 50%^{25,26} of the world's coral reefs have been lost
- In the last 20 years²⁸ four main bleaching events²⁷
 - 1998 – 16% worlds reefs²⁹ impacted, 60%³⁰ GBR affected
 - 2002 – >70%³⁰ reefs GBR affected
 - 2016³¹ – 12%³² worlds reefs bleached, 95%³³ northern GBR bleached, 29%³⁴ GBR lost
 - 2017³⁵ – 19% reefs GBR lost, mostly in central section
- Back³⁶-to-back³⁷ bleaching in 2016-2017 lead to a loss of >50%^{38,39} with zero recovery⁴⁰ in between
- GBR starts to recover⁴¹ after back-to-back bleaching
- Northwestern⁴² Australian reefs⁴³ were also⁴⁴ badly impacted
 - 2016 – 60-90%⁴⁵ of reefs bleached and died⁴⁶, first time bleaching⁴⁷ on record in Kimberley⁴⁸
 - 2017 – risk of moving further south⁴⁹ along Western Australian coast

What are the main causes⁵⁰ of mass bleaching⁵¹ / coral reef mortality⁵²?

There is only one answer: Climate⁵³ Change⁵⁴ and Global⁵⁵ Warming⁵⁶ caused by⁵⁷ humans⁵⁸, including in Australia⁵⁹., but what does this mean⁶⁰:

- Increased carbon emissions⁶¹
 - Global CO₂ concentrations passed 400 ppm⁶² – the last time CO₂ levels were this high, humans did not exist⁶³
- Increasing ocean⁶⁴ temperatures⁶⁵
 - Limiting warming to below 1.5°C⁶⁶ is required to preserve >10% of coral reefs worldwide
- Sea-level rise⁶⁷
 - The last half century, sea level rose about 2-3 mm⁶⁸ and by 2100 sea-level-rise is expected to be 0.26 to 0.98 m globally⁶⁹ and 0.68 m on the GBR⁷⁰
 - At least \$226 billion of assets and infrastructure will be exposed to inundation⁷¹ if sea levels rise by 1.1 m
- Ocean⁷² acidification⁷³
 - Ocean acidity increased by 26% since 1850⁷⁴, roughly 10x faster than any time in the last 55 million years⁷⁵
 - Around 1/3 to half of the CO₂ released by human activities is absorbed into the oceans⁷⁶ causing the ocean to become more acidic. This affects corals and shell-forming organisms⁷⁷ badly, including on the GBR⁷⁸

Isn't most of the reef already dead⁷⁹? Why should we even try⁸⁰?

- The reef is not dead^{81,82}, it is stressed through increasing temperatures and bleaching. If water temperature drops quick back to normal, corals can survive⁸³
- It's not too late⁸⁴ to save our coral reefs⁸⁵
- We need to act now⁸⁶ to give the reef time to bounce back.
- You don't need to live next to the reef⁸⁷ and you don't need to be a scientist⁸⁸ to help the reef⁸⁹
- The reef has brought me so much joy in my lifetime; I want my children to experience it as well⁹⁰
- It's world's largest reef, Australia's jewel and one of the most fascinating places⁹¹
- Explore it yourself⁹² and you will care and help to preserve⁹³ it for future generations
- Become a CoralWatcher and help to collect data on coral health⁹⁴ and see the reef recover
- A lot of science is lost when communicating it to the public⁹⁵, especially through media outlets

What can I do to reduce⁹⁶ my⁹⁷ carbon⁹⁸ footprint⁹⁹ and help¹⁰⁰ save¹⁰¹ the¹⁰² reef¹⁰³?

High impact actions

- Have one¹⁰⁴ fewer child¹⁰⁵
- Live car free¹⁰⁶ / buy more efficient car
- Avoid one flight per year¹⁰⁷
- Purchase¹⁰⁸ renewable¹⁰⁹/ green¹¹⁰ energy¹¹¹ – coal¹¹² free¹¹³
- Eat a plant-based diet¹¹⁴

Moderate impact actions

- Be energy efficient – do more with less¹¹⁵
- Travel smarter, live local and use public transport¹¹⁶
- Buy energy efficient¹¹⁷ products¹¹⁸
- Reduce, Reuse, Recycle¹¹⁹
- Eat¹²⁰ and buy¹²¹ local¹²²

Low impact actions

- Conserve¹²³ water¹²⁴
- Compost¹²⁵
- Minimize¹²⁶ waste¹²⁷

Inspirational people involved in sustainable living

- Kylie Ahern – Living off grid
<http://www.kylieoffgrid.com.au/>
- Rogue Ginger – Zero waste
<http://www.therogueginger.com/>



Interesting websites

- <https://theconversation.com/feeling-helpless-about-the-great-barrier-reef-heres-one-way-you-can-help-76014>
- <https://50reefs.org/>
- <http://www.chasingcoral.com/>
- <http://earthhour.org.au/home/>
- <https://climate.nasa.gov/evidence/>
- <https://www.marineconservation.org.au/pages/coral-bleaching.html>
- <https://www.nrdc.org/stories/how-you-can-stop-global-warming>
- <http://www.wwf.org.au/get-involved/change-the-way-you-live/ecological-footprint-calculator/the-ecological-footprint-calculator-is-under-maintenance#gs.kWFgSKk>
- <https://www.theguardian.com/environment/2017/jun/03/great-barrier-reef-australia-must-act-urgently-on-water-quality-says-unesco>
- <http://www.environment.gov.au/marine/gbr/long-term-sustainability-plan>
- <http://www.gbrmpa.gov.au/about-the-reef/reef-health>
- <http://e360.yale.edu/features/inside-look-at-catastrophic-bleaching-of-the-great-barrier-reef-2017-hughes>
- <http://www.abc.net.au/news/2017-02-24/50-reefs-first-global-plan-says-only-10-pc-reefs-can-be-saved/8293514>
- <http://iopscience.iop.org/article/10.1088/1748-9326/aa7541/meta;jsessionid=760EC848216723459CB39E1738C6D617.c2.iopscience.cld.iop.org>
- https://www.sciencemag.org/news/2017/07/best-way-reduce-your-carbon-footprint-one-government-isn-t-telling-you-about?utm_source=newsfromscience&utm_medium=facebook-text&utm_campaign=carbonfootprint-14079
- https://www.theguardian.com/environment/2017/sep/10/my-job-is-to-clean-up-the-environment-china-really-wants-to-do-that?utm_source=esp&utm_medium=Email&utm_campaign=GU+Today+AUS+v1++AUS+morning+mail+callout&utm_term=243114&subid=22766480&CMP=ema_632
- <https://www.theguardian.com/sustainable-business/blog/china-future-renewables-global-warming>
- <https://www.climatecouncil.org.au/uploads/1b331044fb03fd0997c4a4946705606b.pdf>

Books

- Client Earth by James Thronton & Maritn Goodman, 2017
<https://scribepublications.com.au/books-authors/books/client-earth>
- Renewable Energy – Power for a Sustainable Future by Godfrey Boyle, 2017, 3rd edition
<https://global.oup.com/academic/product/renewable-energy-9780199545339?cc=au&lang=en#>
- Children Living in Sustainable Built Environments – New Urbanisms, New Citizens by John Horton, Peter Kraftl, Pia Christensen, and Sophie Hadfield-Hill, Dec 2017
<https://www.amazon.com/Children-Living-Sustainable-Built-Environments/dp/113880939X>
- Practical Self Sufficiency – Australian Guide to Sustainable Living in the 21st Century by Dick Strawbridge & James Strawbridge, 2017
<https://www.bookdepository.com/Practical-Self-Sufficiency-Dick-Strawbridge/9781740337700>
- The Renewable Energy Home Manual by Lindsay Porter, 2015
https://www.veloce.co.uk/shop/products/productDetail.php?prod_id=V4759&prod_group=Non-automotive%20subjects&
- How to Live Off-Grid – Journey Outside the System by Nick Rossen, 2008
&
Off the Grid – Inside the Movement for More Space, Less Government, and True Independence in Modern America, 2010
<https://www.booktopia.com.au/search.ep?author=Nick%20Rosen>

Papers & Articles

- Paper: Redefining community based on place attachment in a connected world by Gurney et al. 2017
<http://www.pnas.org/content/early/2017/09/01/1712125114.full.pdf>
- Paper: Coral reefs in the Anthropocene by Hughes et al. 2017
<https://www.nature.com/nature/journal/v546/n7656/full/nature22901.html>
- Paper: Global warming and recurrent mass bleaching of corals by Hughes et al. 2017
<https://www.nature.com/nature/journal/v543/n7645/full/nature21707.html>
- Article: Towards a climate policy toolkit – Special review of Australia’s climate goals and policies by Australian Government, Department of Climate Change Authority, 2016



<http://climatechangeauthority.gov.au/reviews/special-review/towards-climate-policy-toolkit-special-review-australias-climate-goals-and>

- GBRMPA – Managing the Great Barrier Reef
<http://www.gbrmpa.gov.au/managing-the-reef>
- WWF – Great Barrier Reef
<http://www.wwf.org.au/what-we-do/oceans/great-barrier-reef#gs.BU56nP8>
- Your Home – A guide to environmentally sustainable home solutions, Australian Government, 2013
<http://www.yourhome.gov.au/introduction>
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- Large scale battery reference platform to demonstrate the efficacy of a large energy storage system by Redflow sustainable storage flow, 2017
<http://redflow.com/products/redflow-zbm-2/redflow-lsb/>
- Previous and current trends in ecosystem destruction and a call to action
http://scientistswarning.forestry.oregonstate.edu/sites/sw/files/Ripple_et_al.%20_8-6-17_scientists_warning.pdf

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