

CORAL REEFS FACTSHEET

Who hasn't dreamt about visiting a coral reef and diving through hundreds of colourful fish, meeting turtles and anemone, and seeing sharks and rays cruising between huge coral fans and sponge castles.

WHAT ARE CORAL REEFS AND WHY ARE SO MANY PEOPLE WORRIED ABOUT THEM?

Coral reefs are underwater ecosystems that are made up of hard corals produced by small colonial animals known as coral polyps. Each polyp in a colony constructs a calcareous cup that it sits in, and together the colony will build a hard mass that we know as a coral.



Generally, a hard coral consists of up to millions of individual coral polyps living together as a colony.

There are also soft corals. Unlike hard corals they are flexible and because of this they are often mistaken for plants. Instead of creating hard limestone skeletons like hard corals, soft corals are supported by tiny limestone spiky structures called spicules.

Soft corals tend to be brightly coloured, and a number of animals such as fish, prawns and sea slugs like to use the branches of the soft corals as their home. These animals are often camouflaged by having the same colour pattern to the soft coral that they live on.

WHERE CAN CORAL REEFS BE FOUND?

Corals are found in oceans all over the world, from the cold waters of the Aleutian Islands (near the coast of Alaska) to the Mediterranean, to the warm tropical waters of the Caribbean Sea. The biggest coral reefs are found in the clear, shallow ocean waters of the tropics and subtropics, and the largest coral reef system is the Great Barrier Reef. This is more than 2,400 km long!

Most of the larger coral reefs that we find today are estimated to be between 5,000 and 10,000 years old!

WHY ARE CORAL REEFS IMPORTANT?

Coral reefs are sometimes called "the rainforests of the sea" because they offer food, shelter and breeding sites for over 25% of all marine species. They are the main habitat for more than 4,000 species of fish, 700 species of coral, and multitudes of other animals and plants.

Another reason coral reefs are so important is that they directly and indirectly provide about US\$30 billion each year to people around the world through food, fisheries and tourism. Globally, around 850 million people live within 100km of a coral reef. Many of these people directly benefit from the economic, social and cultural services their local reef provides.

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CORAL REEFS UNDER SIEGE

Three-quarters of the world's coral reefs are currently threatened. In the case of the Great Barrier Reef, more than half of its coral cover has been lost, and in 2016 the Great Barrier Reef suffered a major bleaching event which has left only about 7% of the reef unaffected.



SO WHAT IS CAUSING EVENTS LIKE THE ONE SEEN IN THE GREAT BARRIER REEF?

1. Ocean warming

Since the industrial revolution – when humans began burning fossil fuels – the ocean has absorbed over 90% of the extra heat trapped by the rising concentrations of atmospheric greenhouse gases. As a result, the world's oceans are warmer now than at any point in the last 50 years. The warming of the oceans has occurred from the surface to a depth of about 700 meters, where most marine life thrives. The image below from Climate Central shows where the areas of the ocean that have experienced the most warming.

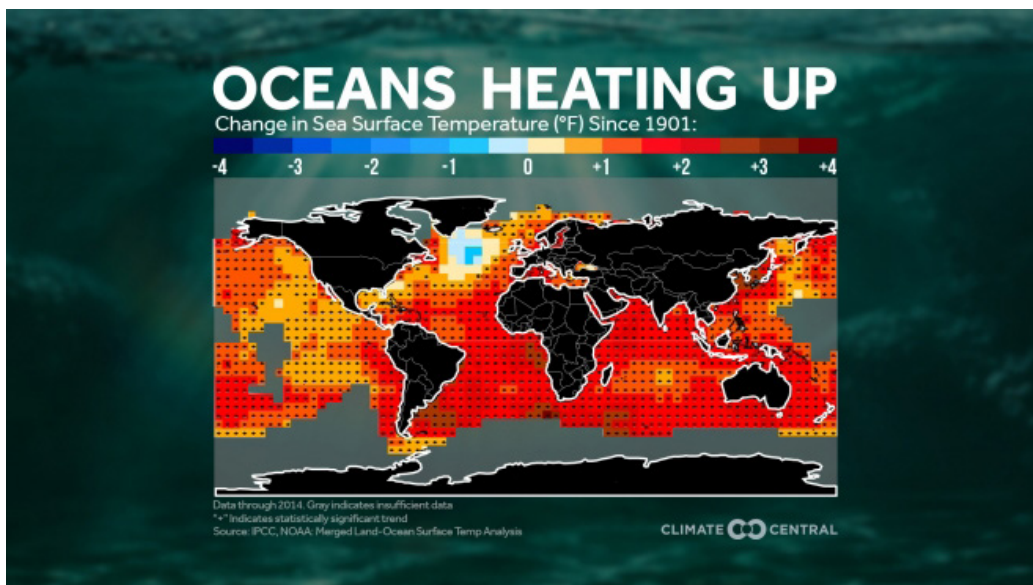


Image source: <http://www.climatecentral.org/gallery/maps/el-nino-impacts-on-ocean-warming>

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Corals are the organism most vulnerable to warming ocean temperatures. Even the slightest warming of ocean waters can cause corals to eject their symbiotic algae, resulting in coral bleaching. Bleaching slows coral growth and can make them susceptible to disease; and in some cases, can lead to large scale die-off. At current rates of temperature rise, coral reefs will disappear by 2050.

2. Ocean acidification

In addition to absorbing heat, ocean waters also absorb vast amounts of CO₂ (about a quarter of the CO₂ we release each year), and over the last 200 years, the ocean has absorbed around a third of the CO₂ produced by human activities. While this has been good news for humans because it has slowed the pace of climate change, it has been bad news for the oceans.

However, the absorption of CO₂ by the oceans is resulting in chemical changes, with the ocean becoming more acidic. This is known as ocean acidification, although at this stage the oceans are still technically alkaline.

Ocean acidification is estimated to have caused a decrease in oceanic pH of 0.1. The alkalinity of the ocean is very important in maintaining a delicate balance needed for animals such as shellfish, which will not be able to make strong shells if the water becomes too acidic. Corals may also be affected because their skeletons are made of the same shell-like material.

The image below from the Climate Commission shows the cause and effect of ocean acidification.

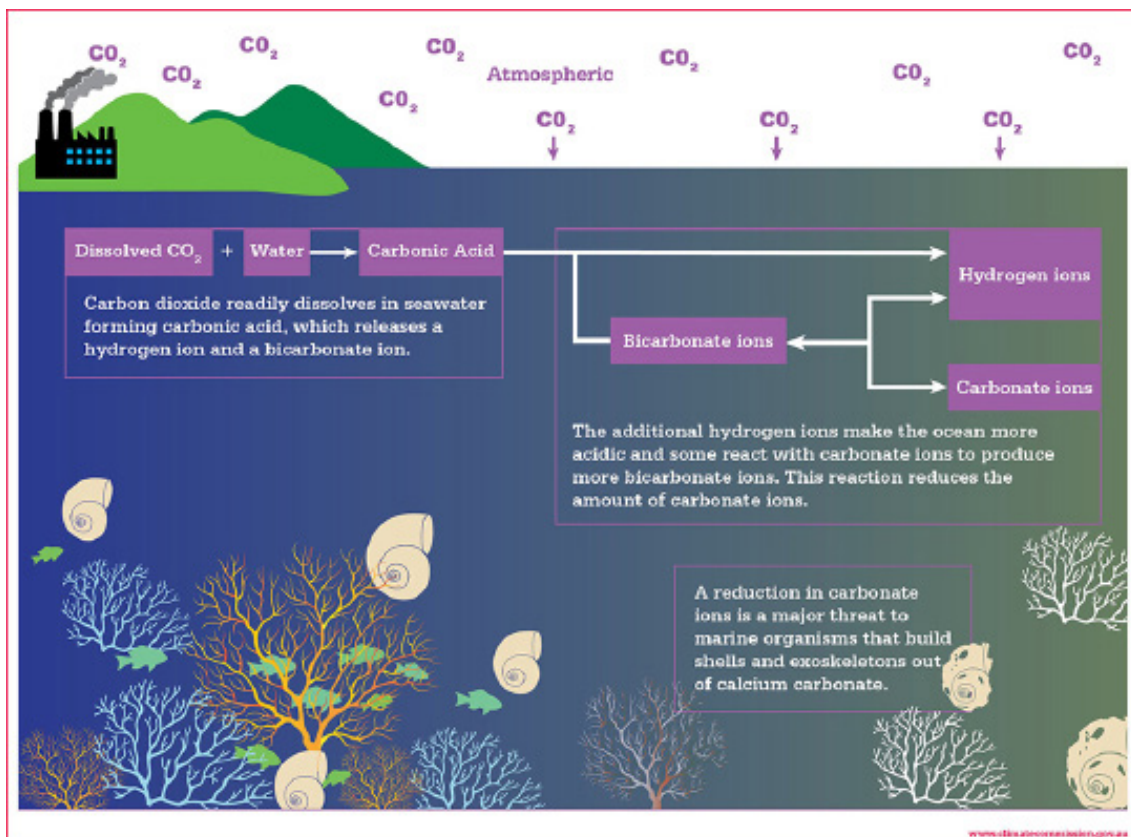


Image source: Climate Commission

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3. Overfishing, destructive fishing practices and bycatch

Overfishing - put simply - means catching too many fish. The result of this is that fish cannot sustain their population. If continued, the fish numbers will continue to decline to a point where there are no more left to catch.

Fishing fleets around the world are two to three times as large as what our oceans can sustainably support. Globally we have enough fishing vessels to cover at least four Earth-like planets. The situation as it stands is that:

- 52% of fish stocks are fully exploited
- 20% are moderately exploited
- 17% are overexploited
- 7% are depleted
- 1% is recovering from depletion

This means that almost 80% of the world's fish stocks are either fully to over-exploited, depleted, or collapsing. 90% of the global stocks of large predatory fish stocks are already gone.

Apart from the fact that this means there will be less tasty fish to have with chips, it also means that:

- We are losing both species AND entire ecosystems, meaning that our oceans are at risk of collapse.
- Millions of people around the world risk losing access to critical food sources, as well as the social, economic and cultural benefits healthy marine ecosystems offer to communities around the globe.
- Destructive fishing practices refers to any fishing practice that devastates fish habitats and harms marine environments. These include practices like cyanide fishing, blast or dynamite fishing, bottom trawling, and muro-ami (banging on the reef with sticks). It is estimated that over 50% of coral reefs in Southeast Asia are currently at risk from destructive fishing.
- Bycatch refers to the catching of non-target fish and ocean wildlife by fishing vessels. Essentially, when a fishing vessels throws out a net or line to catch a particular type of fish, other fish and animals will also be caught. Bycatch is one of the largest threats to maintaining healthy fish populations and marine ecosystems around the world, and some estimates put the global bycatch amount at 40% of the world's catch: equal to 63 billion pounds per year. Like overfishing, bycatch affects the ecological balance of coral reef communities.

4. Pollution

Pollution of marine waters can occur from materials being dumped in the ocean, or from materials running into the ocean from the land. These polluting materials include waste from urban, industrial and agricultural sites and practices, and may be things like oil, sewage, agrochemicals (like fertilizers or pesticides) and sediment loads from eroded landscapes.

Pollutants like sewage and agricultural run-off can increase the level of nitrogen in marine environments, resulting in an overgrowth of algae, which then smothers the reefs by cutting off their sunlight.

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WHAT CAN YOU DO?

Cut back on waste. Think about what you're buying and ask yourself "Do I really need this?" and "Is there a waste-free alternative to this thing I want or need?" This means considering what the product is both made from and packaged in. Cut back on plastics where you can – especially single-use plastic products and those that can't be recycled. With any waste that you do create, make sure it gets into the correct bin (e.g. recycling or landfill) and stays there.

Keep waste out of the sea. This means keeping waste off the land and out of waterways, as waste will blow from the land into waterways and then into the sea. If you see some waste at the beach or the park or when just walking down the street, pick it up and put it in the bin.

Buy sustainable seafood. The most important thing you can do to help fish is to buy sustainable seafood. Look for the blue Marine Stewardship Council logo when purchasing wild-caught seafood and the green Aquaculture Stewardship Council logo when purchasing farmed seafood. Make a commitment to only buy and eat seafood that has been harvested and produced to the highest sustainability standards. You could also download the Australian Sustainable Seafood Guide to use when you go shopping: <http://www.sustainableseafood.org.au/>. You can also use the Australian Marine Conservation Society's sustainable seafood guide app: <http://www.sustainableseafood.org.au/pages/download-the-free-app.html>



Take only what you need. If you go fishing don't be a fool with fish. Only catch what you can eat and release the rest. And take your rubbish (including old fishing line and hooks) with you.

Support the creation of more marine sanctuaries. Write to your local member of parliament calling for greater protection of marine areas in your area or of those that you love.

Adopt a beach (or creek). If you live close to the coast, then volunteer your time to help keep your local beach clean or to help protect coastal habitats (including turtle nesting sites). If you don't live near the coast, then volunteer to clean up your local waterway. Improving the health of local waterways improves the health of the sea.

Help change climate change. The only way to address climate change is to dramatically cut our greenhouse gas emissions. While it is true that this requires governments and big businesses to take the biggest steps, there are steps we can all take. You can try increasing your energy efficiency by switching off your lights when you don't need them, choosing energy efficient appliances, and taking the bus instead of the car. You could also try shifting to renewable energy sources (like solar, wind and hydropower).

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BECOME AN OCEAN GUARDIAN AND JOIN THE GLOBAL MOVEMENT NOW!

Go to the Blue website to become an ocean guardian and take action for our ocean (<https://bluethemovie.org/take-action/>)



REFERENCE LIST:

- About The Reef - <http://www.gbrmpa.gov.au/about-the-reef/corals>
- What are Coral Reefs? - <http://www.livescience.com/40276-coral-reefs.html>
- Spalding, M., Ravilious, C. and E. Green. 2001. World Atlas of Coral Reefs. University of California Press, Berkeley, CA, USA and UNEP/WCMC. ISBN 0520232550.
- Burke, L., Reytar, K., Spalding, M. and A. Perry. 2011. Reefs at Risk Revisited. World Resources Institute, Washington DC, USA.
- Coral Sea Dreaming website - <https://www.coralseadreaming.com/about-the-ocean-channel/>
- WWF's Living Planet Report
- Only 7% of the Great Barrier Reef has avoided coral bleaching - <https://www.coralcoe.org.au/media-releases/only-7-of-the-great-barrier-reef-has-avoided-coral-bleaching>
- Gattuso, J.-P., Magnan, A., Billé, R., Cheung, W.W.L., Howes, E.L., Joos, F., Allemand, D., Bopp, L., Cooley, S.R., Eakin, C.M., Hoegh-Guldberg, O., Kelly, R.P., Pörtner, H.-O., Rogers, A.D., Baxter, J.M., Laffoley, D., Osborn, D., Rankovic, A., Rochette, J., Sumaila, U.R., Treyer, S. and C. Turley. 2015. Contrasting futures for ocean and society from different anthropogenic CO₂ emissions scenarios. Science 349 (6243): aac4722 [DOI:10.1126/science.aac4722].
- Climate Change Basics - <https://www3.epa.gov/climatechange/kids/index.html>
- Sea temperature rise - <http://ocean.nationalgeographic.com/ocean/explore/pristine-seas/critical-issues-sea-temperature-rise/>
- Ocean Acidification: The Other Carbon Dioxide Problem - <https://www.pmel.noaa.gov/co2/story/Ocean+Acidification>
- Impacts of ocean acidification on the Reef - <http://www.gbrmpa.gov.au/managing-the-reef/threats-to-the-reef/climate-change/how-climate-change-can-affect-the-reef/ocean-acidification>
- Coral reefs - http://wwf.panda.org/about_our_earth/blue_planet/coasts/coral_reefs/
- Wasted Catch: Unsolved Problems In U.S. Fisheries, Amanda Keledjian, Gib Brogan, Beth Lowell, Jon Warrenchuk, Ben Enticknap, Geoff Shester, Michael Hirshfield and Dominique Cano-Stocco, 2014
- Explore the issues - <https://bluethemovie.org/explore/>