

# CORAL BLEACHING

The depletion of carbonate and increasing heat stress due to climate change is causing coral reefs to bleach and die off at an alarming rate across the globe. The diverse and essential marine life that calls these coral reefs home is also experiencing population decline.

Organisms found in coral reefs are being used to create cures for many diseases such as cancer and arthritis.

Reefs protect coastlines from storms and erosion; therefore, they shelter ecosystems located between the reef and the coast as well as human settlements.

Coral reefs support the most diverse and essential marine ecosystems on earth.

Half of all fisheries in the world depend on coral reefs to maintain fish populations.

Provides food and income to over half a billion people.



Encourages tourism that supports coastal communities across the globe; in coastal communities about 90% of new economic development is dependent on tourism.

## THE SCIENCE

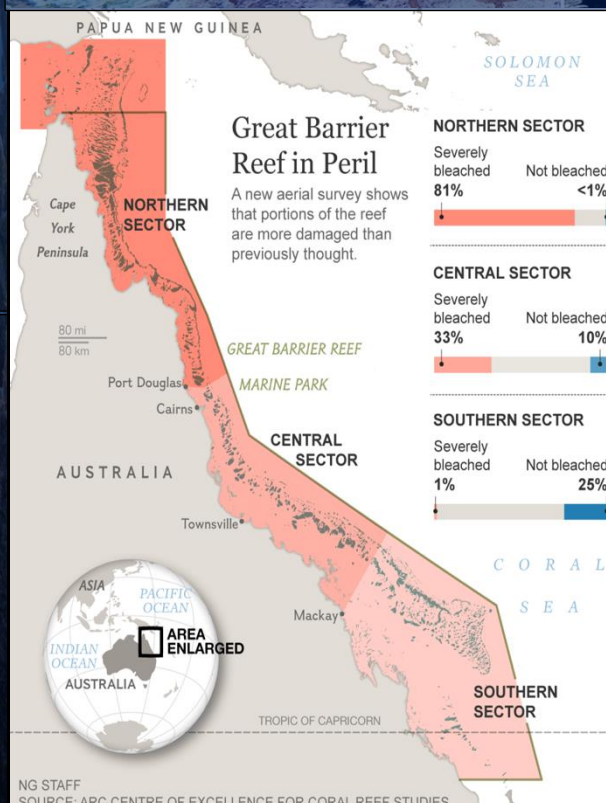
As the ocean absorbs ¼ of the carbon dioxide emitted into the atmosphere, carbonate is converted to bicarbonate ( $H_2CO_3$ ) and  $H^+$  ions are released. This depletes the essential building block of a coral's skeleton (carbonate) and also increases the acidity of the ocean. The acidity and heat cause the corals to expel the essential symbiotic algae - zooxanthellae - from their polyp; known as coral bleaching. Without this alga the coral dies.

## EFFECT ON THE SYSTEM AS A WHOLE

When coral dies it causes dramatic decrease in available food and habitat for the many coral dwellers. In turn, the population of these organisms decreases, and a trophic cascade is caused as the coral reef food chain collapses and keystone species are lost. New coral then struggles, or cannot, reestablish itself after it dies due to the lack of carbonate in the sea water.

## THIS IS URGENT!

We have lost over 50% of the world's coral reefs. If we are unable to limit warming to 1.5°C, we will lose 99% of our coral reefs. Currently, some places have already surpassed this warming. We have approximately **7 years** until the entire earth has warmed to this degree. Anything you do to reduce your carbon footprint helps slow the warming and increase the time we have to fix this.



## SOLUTIONS and SMALL CHANGES

End fossil fuel subsidies.

Introduce manmade planting structures, coral farming, and coral rehabilitation programs.

Implement upwelling technology in our oceans by installing giant sea pumps.

- Reduce your air travel.
- Reduce the amount of energy used in your home
- Eat local and organic foods/cut meats and dairy from your diet.
- Use alternatives to driving