GREAT BARRIER REEF

The world’s largest reef system

A Natural Wonder

The Great Barrier Reef is one of the seven wonders of the natural world. Pulling away from it, and viewing it from a greater distance, you can understand why. It is larger than the Great Wall of China and the only living thing on earth visible from space.

The Great Barrier Reef is the world's largest reef system composed of over 2,900 individual reefs and 900 islands stretching for over 2,600 kilometres over an area of approximately 344,400 square kilometres. The reef is located in the Coral Sea, off the coast of Queensland in north-east Australia.

The Great Barrier Reef is the world's biggest single structure made by living organisms. This reef structure is composed of and built by billions of tiny organisms, known as coral polyps. This reef supports a wide diversity of life, and was selected as a World Heritage Site in 1981.

The Great Barrier Reef has long been known to and used by the Aboriginal Australian and Torres Strait Islander peoples, and is an important part of local groups' cultures and spirituality.

The reef is a very popular destination for tourists, especially in the Whitsunday Islands and Cairns regions. Tourism is an important economic activity for the region, generating $1 billion per year.

How did it form?

Millions of years ago, the world's water levels were a lot lower and the reef, as we know it today, was actually part of the land.

Approximately 20,000 years ago the water levels were some 60 meters lower than they are today. Over the next 14,000 years the waters rose and the outlying hills became island and eventually became submerged and formed the Great Barrier Reef.

Due to the location in the tropics, coral began to form on the now submerged hills forming the reef as we know it today.

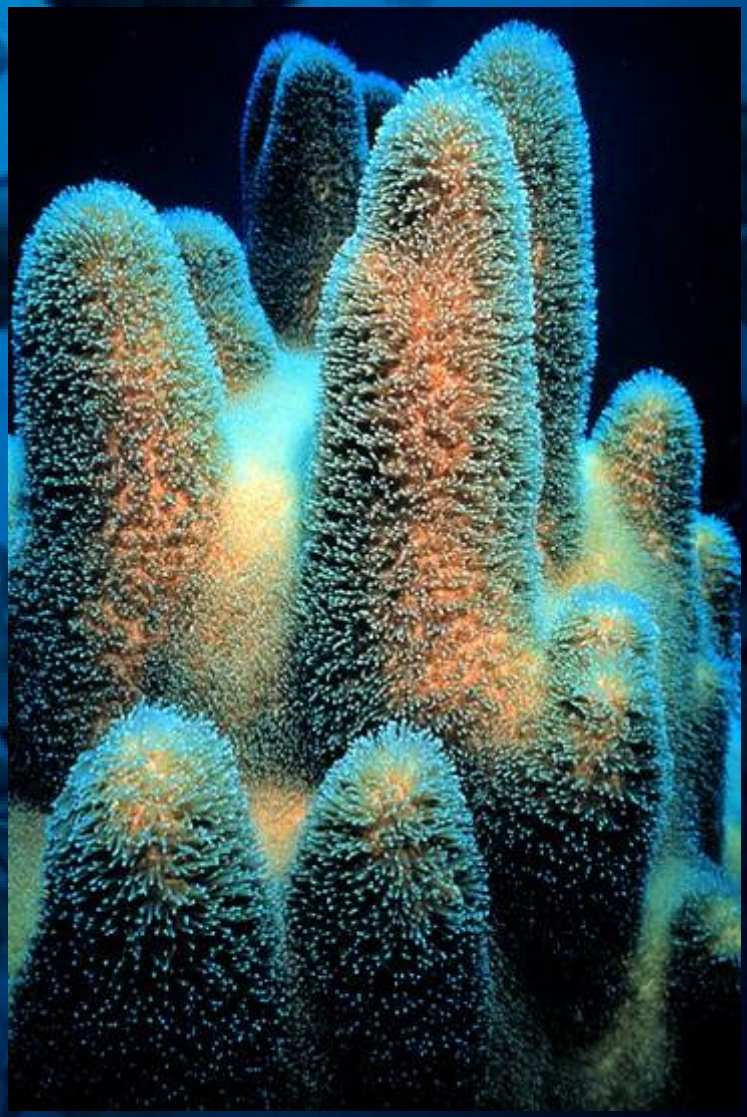
Sea levels here have not risen significantly over the past 6,000 years and hence it is believed that the living reef structure is between 6,000 – 8,000 years old.

What is it made of?

The Great Barrier Reef is made up of Corals.

Corals are marine organisms typically living in compact colonies of many identical individual "polyps." Hundreds, up to millions, of identical polyps make up one piece of coral and as they grow, they leave behind a substance called Calcium Carbonate that forms the skeleton. This is very similar to human bones.

A coral "head," which appears to be a single organism, is a colony of identical polyps. Each polyp is typically only a few millimetres in diameter. Over many generations the colony secretes a skeleton that is characteristic of the species.



Breeding

Corals breed sexually by spawning. Polyps of the same species release ‘gametes’ simultaneously over a period of one to several nights around a full moon only once a year, typically in October or November. These gametes then settle in new locations and begin to grow.

During this time, fish feed on the coral spawn and the reef comes alive. For this reason you are not allowed to fish around the time of full moons in October and November on the Great Barrier Reef

How does a coral feed?

Although corals can catch small fish and animals such as plankton using stinging cells on their tentacles, most corals obtain the majority of their energy and nutrients from algae called zooxanthellae.

Such corals require sunlight and grow in clear, shallow water, typically at depths shallower than 60 metres. Corals are the major contributors to the physical structure of the coral reefs that develop in tropical and subtropical waters.

Most corals grow very slowly. They increase in diameter between 1-3cm per year and can grow vertically between 1 to 25cm per year. So if you break a piece of coral off, you are killing many years of growth.

What else lives on the reef?

The Great Barrier Reef supports a diversity of life, including many vulnerable or endangered species:

- 30 Species of whales and dolphins
- Six species of turtles
- Dugongs
- Crocodiles
- 215 species of birds
- 17 species of sea snakes
- more than 1,500 species of fish
- 400 species of coral
- 350 species of trees and plants

What are the threats to our reef?

- Climate Change
- Pollution
- Crown of Thorns
- Fishing
- Shipping
- Human Use

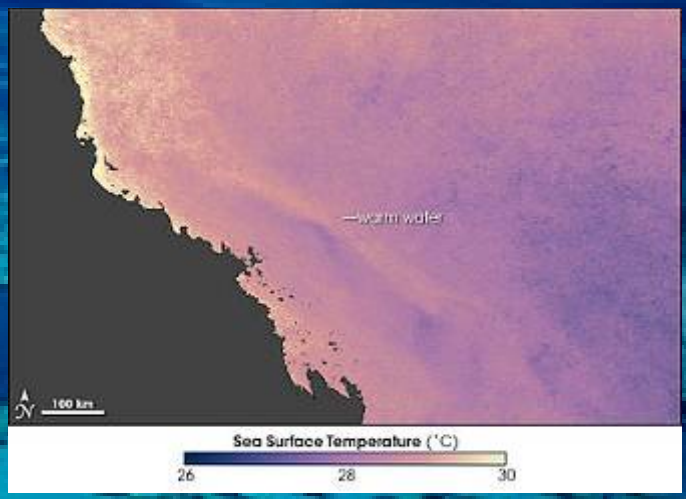
Climate Change

The Great Barrier Reef Marine Park Authority considers the greatest threat to the Great Barrier Reef to be climate change, causing ocean warming which increases coral bleaching.

Coral bleaching is when the water is too hot for the coral to survive and it dies off leaving just the skeleton.

Mass coral bleaching events due to elevated ocean temperatures occurred in the summers of 1998, 2002 and 2006, and coral bleaching is expected to become an annual occurrence.

Climate change has implications for other forms of reef life—some fish's preferred temperature range leads them to seek new habitat, thus increasing chick mortality in predatory seabirds. Climate change will also affect the population and sea turtle's available habitat.



Pollution

Another key threat faced by the Great Barrier Reef is pollution and declining water quality. The rivers of north eastern Australia pollute the Reef during tropical flood events. Over 90% of this pollution comes from farm runoff.

Farm run-off is caused by overgrazing, excessive fertiliser use, and pesticide use.

The runoff problem is exacerbated by the loss of coastal wetlands which act as a natural filter for toxins and help deposit sediment. It is thought that the poor water quality is due to increased light and oxygen competition from algae.

Crown of Thorns

The crown-of-thorns starfish preys on coral polyps. Large outbreaks of these starfish can devastate reefs. In 2000, an outbreak contributed to a loss of 66% of live coral cover on sampled reefs in a study by the RRC (Reefs Research Centre.) Outbreaks are believed to occur in natural cycles, worsened by poor water quality and overfishing of the starfish's predators.

The best way to control the COTS are to monitor them and kill excess starfish. You kill them by injecting a poison into the body but you have to be trained to do this as the COT is poisonous to humans.

Fishing

The unsustainable overfishing of keystone species, such as the Giant Triton, can disrupt food chains vital to reef life.

Fishing also impacts the reef through increased water pollution from boats, by-catch of unwanted species (such as dolphins and turtles) and habitat destruction from trawling, anchors and nets.

As of the middle of 2004, approximately one-third of the Great Barrier Reef Marine Park is protected from species removal of any kind, including fishing, without written permission.

Sea floor before bottom trawling

Sea floor after bottom trawling

Shipping

Shipping accidents are major concern, as several commercial shipping routes pass through the Great Barrier Reef. Although the route through the Great Barrier Reef is not easy, reef pilots consider it safer than outside the reef in the event of mechanical failure, since a ship can sit safely while being repaired.

There have been over 1,600 known shipwrecks in the Great Barrier Reef region. On 3 April 2010, bulk coal carrier Shen Neng 1 ran aground on Douglas Shoals, spilling up to four tonnes of oil into the water and causing extensive damage to the reef.

Human Use

Humans cause a great deal of damage to the reef.

As more and more people dive and snorkel the reef, people accidently and sometimes deliberately stand on the reef breaking off years of growth.

Also the oils in our skin and sunscreens we use go into the ocean and this causes a decrease in water quality.

We must be careful when we enter the water. Even a rock that looks dead is alive so it is better we try not to stand on anything other than sand.

What can I do to help?

- If you go to the reef, be careful not to touch the coral
- We need to decrease global warming so riding your bike to school or walking is better than using the car. This will help keep ocean temperatures normal and prevent excess Coral Bleaching
- Reducing our use of plastic, which is made of oil, will help too as we won't have so much of it floating in our ocean.
- Use natural products for everything you can. Chemicals, like bleach and most heavy duty cleaners that get washed into our drains, end up in the ocean and hurt the water quality and in turn hurt the reef.
- Tell your friends and family to help too

EVERY LITTLE BIT HELPS