

# Coral Reefs

## Why are coral reefs special?

### Millions of humans depend on coral reefs

Many countries get a lot of income from tourists attracted to their coral reefs. This tourism creates a lot of jobs. Coral reefs are also a significant source of food for millions of people. For people who live in coral reef areas, coral reefs are part of their lives.



© Chuck Savall

### Coral reefs save lives

Just like species in the rain forest, reef animals and plants contain medicinal compounds, many of which are just being discovered. Several important drugs have already been developed from chemicals found in coral reef organisms.

### Coral reefs protect beaches

Coral reefs act as a buffer protecting inshore areas from the pounding of ocean waves. Without coral reefs, many beaches and buildings would become vulnerable to wave action and storm damage.

### Some animals live nowhere else

Coral reefs are a high-density location of biodiversity. This means that the variety of species living on a coral reef is greater than almost anywhere else in the world.



© Jeff Dawson

**WOW!!** Scientists estimate at least 1 million species of plants and animals are associated with the coral reef ecosystem.

In Southeast Asia it is estimated that 70-90% of all fish caught are dependant on coral reefs at some stage during their life cycle.

## Does Vietnam have coral reefs?

### Absolutely!

There are at least 28 reef areas in the coastal waters of Vietnam. Biodiversity is greatest in the south-central areas where over 300 coral species have been recorded!

However, Vietnam's estimated 1,100 km<sup>2</sup> of coral reefs face a variety of threats, particularly in areas of high human population density.



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## What is a coral reef?

Coral reefs are made of limestone and are created by living things. The most important reef-building organisms are corals. Coral reefs support over 25% of all known marine species.

### City in the sea

A good way to imagine a coral reef is to think of it as a bustling city, with the buildings made of coral, and thousands of animals coming and going, carrying out their business. In this sense, a coral reef is like a city under the sea.



### Animal, vegetable or mineral?

Although coral is often mistaken for a rock or a plant, it is actually composed of tiny, fragile **animals** called coral polyps.

### What is a coral polyp?

A coral polyp is a coral animal. Coral polyps can be the size of a pinhead while others are larger, sometimes 30 cm in diameter. One coral branch or mound is covered by thousands of these animals.



© Willis Greiner

A polyp has a sac-like body and an opening or mouth encircled by stinging tentacles. The polyp uses calcium carbonate from seawater to build itself a hard, cup-shaped skeleton.



© Chuck Savall

### Farmers or hunters?

Coral polyps eat in two different ways,

(1) The polyps of many coral types are fed by tiny algae called zooxanthellae. These algae live within coral polyps, using sunlight to make sugar for energy, just like plants do.

(2) Another way that corals eat is by catching tiny floating animals known as zooplankton. At night the polyps come out of their skeletons to feed, making the reef look like a "wall of mouths". The polyps stretch out their long, stinging tentacles to capture the zooplankton floating by.

### How is a coral reef constructed?

As the polyps of hard corals grow, they produce limestone for their skeletons. When they die, their skeletons are left behind and are used as foundations for new polyps, which build new skeletons over the old ones. An actual coral mound or tree is composed of layer upon layer of skeletons covered by a thin layer of living polyps.

### How long does it take for coral to grow?

Corals grow at different rates, depending on water temperature, salinity, turbulence, and the availability of food. The massive corals are the slowest growing species, adding between 0.5 and 2.5 centimetres per year to their length. Branching and Staghorn corals can grow much faster, adding as much as 20 centimetres to their branches each year.

### Are coral reefs older than Grandma?

The coral reefs existing today began growing as early as 50 million years ago. Most established coral reefs are between 5,000 and 10,000 years old (of course individual coral polyps don't live this long!).

### What shapes a coral?

The variety of shapes and sizes of coral colonies largely depends on the type of coral. Some form hard, pointed shapes, while others form soft, rounded shapes.



© Steve Turek

The shape of coral colonies also depends on the location of the coral. For example, where there are strong waves corals grow into robust mounds or flattened shapes. In more sheltered areas they may grow in delicate branching patterns.



© Joe Seger

### An underwater rainbow

Most coral polyps have clear bodies and their skeletons are white, like human bones. Most corals get their color from the zooxanthellae inside them. Zooxanthellae produce pigments. These pigments are visible through the clear body of the polyp and give the coral its beautiful color.



© Mary L. Frost

**Sunlight:** Corals need to grow in shallow water where sunlight can reach them. Since corals depend on the zooxanthellae (algae) that grow inside of them and this algae needs sunlight to survive, corals too need

sunlight to survive.

**Temperature:** Reef building corals require warm water conditions to survive. Corals generally live in water temperatures ranging from 20 to 32 degrees Celsius.

**Clear Water:** Corals need clear water to survive and don't thrive well when the water is murky. Sediment and plankton can cloud the water, which reduces the amount of sunlight for zooxanthellae.

**Clean Water:** Corals are sensitive to pollution and sediment. Sediment can settle on coral, blocking out sunlight and smothering coral polyps. Pollution from sewage and fertilizers increases nutrient levels in the water, harming corals.

**Saltwater:** Corals need saltwater to survive and require a certain balance in the ratio of salt to water. This is why corals don't live in areas where rivers drain fresh water into the ocean.

## What is killing our coral reefs?

We have lost over a quarter of the world's coral reefs. If the present rate of destruction continues, at least

60% of the world's coral reefs will be destroyed in the next 30 years.

### Many human activities damage coral reefs.

#### Pollution

Pollution is one of the biggest causes of coral reef degradation. Oil, gas, and pesticide poison coral and marine life. Floating rubbish can cover reefs, blocking off sunlight that polyps need to survive. Rubbish also kills reef animals.



© Chloe Schauble

#### Sedimentation

Construction, farming, mining, and logging can all lead to soil erosion. Dirt, silt, and sand end up in the ocean and make the water cloudy. This kills coral by depriving it of the light it needs to survive. Vietnam's reefs are affected by sedimentation from many rivers throughout the country, especially the Mekong and the Red rivers.

#### Collection

Many reefs are being destroyed by coral mining. Coral is also collected for coral souvenirs and jewelry and sold to tourists and exporters.

#### Coastal development

In many areas, developers have built things directly on top of coral reefs. It also



adds to the marine pollution load.

#### Careless recreation

Careless boating, diving, snorkeling, and fishing can damage coral reefs. Dropping anchors onto reefs crushes and breaks coral. Whenever people grab, kick, walk on, stir up sediment or collect coral, they contribute to coral reef destruction.

#### Destructive fishing practices

Fishing practices such as using dynamite or cyanide are destroying reefs. Dynamite blows apart the coral reducing the reef to rubble. To catch fish with cyanide, fishers dive down to the reef and squirt cyanide in coral crevices and on the fast-moving fish, to stun them and make them easy to catch. However, small fish and other marine animals are poisoned by this and die.



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You  
can  
help!

1. **Don't pollute.** Never put rubbish in the water and don't litter the beach. Consider picking up some of the rubbish left by others.

2. **Support the creation of marine protected areas** (parks and reserves).



3. **Be an informed consumer.** Don't buy illegally or unsustainably harvested coral reef items (coral, turtles etc).
4. **Support reef-friendly businesses.** Ask what your local hotels, dive shops, tourist guides and restaurants are doing to help save coral reefs. Let them know you care about reefs.
5. **Keep learning** about coral reefs.
6. **Spread the word.** Share your knowledge about coral reefs and their protection with your friends and family.
7. **Look but don't touch.** When snorkelling or diving on a reef keep hands and feet away from the delicate coral animals.

#### Text and information sources

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