

FACT SHEET

Coral Reefs

CORAL REEFS

Coral reefs are one of the Earth's most beautiful, ancient and complex ecosystems. They play an essential role in sustaining life in the sea and serve as a source of food and protection for human communities. But coral reefs face an uncertain future. As a result of growing human and environmental assaults, reefs are among the most threatened ecosystems on earth.

WHAT ARE CORAL REEFS?

Many of you might wonder, what are corals – Plants or Animals? They are actually animals with plants living inside them. A coral structure is actually composed of hundreds or thousands of these tiny animals growing together as a colony which make a coral. Several polyps make a coral which together form a reef.

Coral reefs are the most diverse communities on the planet. These tropical marine communities occupy less than 1% of the ocean floor, but are inhabited by at least 25% of all marine species. Scientists estimate that more than 25,000 described species from thirty-two of the world's thirty-three animal phyla live in reef habitats - four times the number of animal phyla found in tropical rain forests.



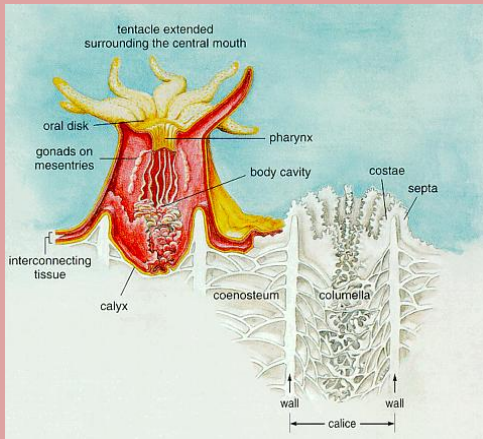
Coral reefs are one of the oldest complex ecosystems on Earth. Similar marine communities have existed for hundreds of thousands of years. Most of the reefs we see now have been growing for over 5,000 years. Coral reefs are found within the jurisdiction of more than 100 countries and occupy more than 600,000 square kilometers of tropical oceans. They generally require clear, warm water and high light intensity for survival. This limits them to shallow water, with maximum diversity occurring between 10 to 30 meters below the surface. Reefs exist in nutrient-poor environments and for that reason small changes in the nutrient content of the water can adversely affect their survival.

CORAL REEFS IN INDIA

Andaman and Nicobar, Lakshadweep, Gulf of Mannar (Tamilnadu), Gulf of Kutch (Gujrat) are well known for their coral reefs, each are being unique and distinct in their diversity.

ECOLOGICAL ROLE OF CORAL REEFS

In addition to their diversity, coral reefs are very productive marine communities. They play a critical role as habitat and nursery grounds for 10 to 20% of the world's fisheries. They are connected to other marine communities such as mangrove forests, sea grass beds, and the open seas as water currents transport larvae, plants, animals, nutrients, and organic materials. Coral reefs play a significant role in the development of mangroves and wetlands and protect coastlines from wave and storm damage and erosion.



The rocky framework of coral reefs is formed from the calcium carbonate deposited mainly by calcareous algae and the stony corals, most of which are colonial animals resembling tiny, interconnected sea anemones. Reef-building corals contain symbiotic algae in their tissues, enabling them to develop the large, massive, branching, or encrusting carbonate skeletons that provide habitat and food resources for support of other reef organisms, such as fish, lobsters, giant clams, sea urchins, etc. Reefs maintain a network of intimate ecological relationships and delicate food webs. Disruption of coral reef communities can break up these ecological bonds. Under natural conditions, a healthy coral reef can recover

from natural disturbance such as hurricanes, within 10 to 20 years.

"Globally, best estimates suggest that about 10% of coral reefs are already degraded, many beyond recovery, and another 20% are likely to decline further within the next 20 years. At least two-thirds of the world's coral reefs may collapse ecologically within the lifetime of our grandchildren, unless we implement effective management of these ecosystems as an urgent priority."

MAJOR THREATS

Human activities, both direct and indirect, are driving the loss of coral reefs, including:

- Over-fishing, particularly of long lived, low density fish such as grouper, and destructive fishing practices such as the ubiquitous use of cyanide and dynamite to capture fish.
- Pollution, especially from increased sedimentation (from poor land use) that smothers the coral tissue and nutrients (from runoff) that promote algae growth which, in turn, suffocates the corals.
- Physical damage from tourists damaging the reefs, anchors dropped in coral beds, and ships colliding with reefs.
- Alteration of coastline/Island habitats, such as deforestation, coastal development and so on.
- Harvesting live aquarium fish and coral for food, traditional medicine, and aquaria. These bring high prices and have resulted in destructive fishing practices that destroy the reefs, as well as their inhabitants. The United States is one of the top importers of live coral for aquaria.

Ecologically based management can provide important steps to restore reef ecosystems by addressing some of these threats, e.g. improved water quality and fisheries management are necessary to restore reef ecosystems. Protected areas such as sanctuaries, reserves, and no-fishing zones (where reef populations can remain unharvested and protected) can allow damaged ecosystems to recover and enable baseline studies on natural reef conditions to be conducted.

IMPORTANCE OF CORAL REEFS

- Coral reefs are vital to fisheries.
- Coral reefs are often considered the medicine cabinets of the 21st century. They offer great promise for pharmaceuticals now being developed as possible cures for cancer, arthritis, human bacterial infections, viruses and other diseases. And just one million of possibly nine million reef species have been identified.
- Coral reefs also buffer adjacent shorelines from wave action, helping to prevent loss of life, property damage and erosion. Globally, about 20 countries have few resources other than coral reefs. In developing countries, they contribute about 25 percent of the food catch, providing food to one billion people in Asia alone.
- Coral reefs are also living museums.
- Ecological research has helped identify some of the causes of reef degradation. Recent studies suggest that the loss of large predatory fish such as snappers and lobsters, have caused major disruptions of reef food webs. These disruptions have led to the loss of coral and increases in algae. Ecologists have discovered diseases such as black-band disease and white plague that can kill coral in less than 1/100th of the time it takes for coral to grow.
- Alternatives to destructive fishing practices can be obtained through information collected on the life and breeding cycles of threatened reef species such as groupers can lead to reduced stress through commercial breeding.
- Ecological knowledge is key to reef management and restoration, and ongoing monitoring and evaluation of the status of reefs are essential components of these efforts.
- Ecology can play a role in the development of new environmental technologies that integrate ecology, economics, technology, and social science.

Global Warming and Coral Reefs

Corals around the world have been adversely affected by sedimentation, bleaching and diseases such as cyanobacterial infections. These affect growth, reproduction, productivity and survival of coral. Recent studies indicate that both the variety and extent of coral diseases are increasing dramatically.

Coral bleaching occurs when coral expels its symbiotic zooxanthellae. As a result, the coral loses its coloration. Without zooxanthellae, the coral polyps have little energy available for growth or reproduction. This is due to elevated water temperatures, ultraviolet radiation, and diseases or viruses affecting the zooxanthellae

Climate Change and Global warming are already affecting corals in many part of the world. Increase in temperatures and changes in sea level are causing the corals to bleach. Changes in sea level are detrimental to established corals and reefs.



- a) A rise in sea level decreases the amount of available sunlight and may inhibit growth. Added emissions of carbon dioxide and other trace gases (called greenhouse gases) into our atmosphere may be causing a gradual warming of our planet. This warming could cause the polar ice caps to melt, thereby raising sea level.
- b) Rises in sea level can also release nutrients trapped in soil.

Coral diseases can wipe out entire strands of coral reefs. Diseases may be connected to the sea level rise and nutrient level increase.

REEF WATCH MARINE CONSERVATION

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