

# Coral Reefs

## Coral Reefs In Singapore

Our coral reefs are a unique natural heritage - no other major city in the world can boast coral reefs within 45 minutes of the city centre!

Singapore reefs are found around islands south of the mainland, like Sentosa, Pulau Hantu, The Sisters, Pulau Satumu (where Raffles Lighthouse stands) and many others. We have two basic types of reefs: fringing reefs which grow on the underwater slopes surrounding islands; and patch reefs which occur in shallow parts of the sea, independent of islands. Compared to other reefs in the region, our reefs are 'compressed vertically'. Within 6 metres depth, the three zones of reef flat, reef crest and sea slope can be experienced.



Flabellina nudibranch  
Flabellina sp.



Despite being within one of the world's busiest ports, Singapore's reefs still support rich biological communities.

## Key Coral Reef Organisms



## What are Coral Reefs?

Coral reefs are one of the richest ecosystems in the world. They have been likened to 'oases' in the 'deserts' of nutrient-poor waters. Nowhere else on Earth can one see marine life of such vibrant colours, shapes and forms!

Coral reefs are built by hard corals over hundreds and even thousands of years. Other reef organisms with hard skeletons, like sea-snails, crabs and calcareous algae, are also involved in reef building. The reef is riddled with many crevices and even underwater caves. These make perfect hiding places for the myriads of reef organisms.

The rich life in this habitat is possible only through high rates of primary production (by algae, hard coral), input from neighbouring habitats (like seagrass beds and coastal mangrove forests) and efficient nutrient recycling and retention within the reef, through a complex food web.



Knobbly Sea-Star  
Protoreaster nodosus



Jellyfish



Copperband Butterflyfish  
Chelmon rostratus

## Why Are Coral Reefs Important?

- They sustain high biodiversity and are important habitats for other marine organisms, including the young of food fishes, crabs and prawns
- They provide people with food, chemical diversity for the discovery of new medicines and building materials
- They protect the shore from erosion caused by wave action and storms
- They support a huge eco-tourism and recreation industry in many countries



Feather-star  
Himerometra nigripinna

## Where are Coral Reefs Found?



Coral reefs are found in warm (greater than 20°C), shallow waters between 30 degrees North and South of the Equator. South-east Asia is home to about 32% of the world's coral reefs.

## Threats to Coral Reefs

- In Singapore**
- Habitat loss
  - Pollution (chemical pollution or solid waste pollution-marine debris)
  - Prolonged changes in seawater temperatures and salinity
  - Coral breakage by SCUBA divers, snorkellers and boat anchors
- Worldwide**
- Over-collection and over-fishing (e.g. for souvenir and aquarium trades)
  - Destructive fishing methods (dynamite fishing, fish poisons)
  - Storms and typhoons



Cuttlefish  
Sepia sp.

## Conservation of Coral Reefs

We can conserve reefs by:

- Zoning marine areas for different usage (e.g. sanctuary/reserve, fishing zone, diving zone)
- Reducing reef damage by constructing mooring buoys and controlling numbers of SCUBA divers and snorkellers at diving/snorkelling sites
- Educating people on the importance of reefs and how to harvest reef products only where necessary, and at a sustainable rate
- Controlling pollution, over-collection and destructive fishing methods
- Enhancing reefs through artificial reefs and re-stocking with threatened species



Hard Corals are one of the few animals which can "photosynthesize"! We can do this because of single-celled algae (called zooxanthellae) living in our flesh! When there is light, we get sugars made by our algae partners, but we still capture plankton in the water currents.

Once a year, many hard corals take part in a 'grand event' when they all release their eggs and sperms into the water at the same time! We call this mass coral spawning! How do you think corals coordinate their timing?

Sea Fan  
Melithaea sp.



Tiger Cowry  
Cypraea tigris

