GREAT BARRIER REEF MARINE PARK AUTHORITY

REEF BEAT

Townsville Bulletin THE NORTH'S OWN PAPER

# OUR GREAT BARRIER REEF

## WATER THE KEY TO THE REEF

If we talk about coral and the Great Barrier Reef it's obvious to everyone that water is necessary for coral and fish to survive but you may not be aware of just how important water is to everything that interacts with the Reef.

The Great Barrier Reef is under pressure. Everything we do on the Reef, along the shore and even on the land, affects this diverse and fragile ecosystem. Water links the land to the Reef. What we do on the land affects the quality of water flowing into the Reef.

If we look at the earth from outer space it's obvious that most of our planet is covered in water. Some people have referred to earth as the 'big blue marble in space' because of its appearance from the moon.

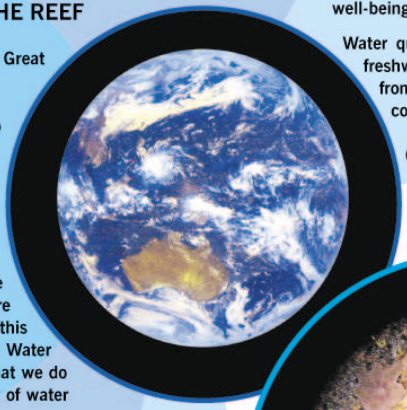
About 80 per cent of the world is covered by water and 97 per cent is salt water in the oceans. Fresh water makes up only 1 per cent and 2 per cent is frozen as polar ice.

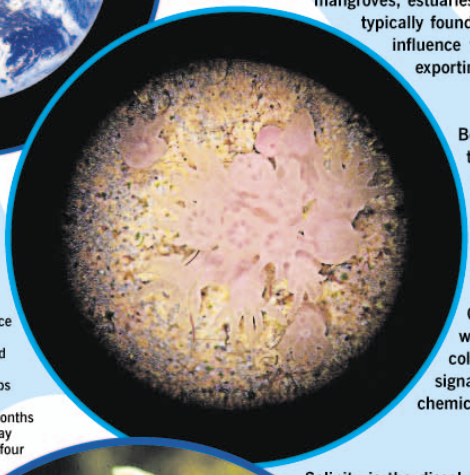
Coral reefs develop only in areas of the ocean with fairly shallow, clean, clear water with good penetration of sunlight. The water must have very low nutrient levels and the temperature must be warm (22° - 29°C), and very stable.

Given these conditions, remarkable coral reef ecosystems, representing some of the most species rich and complex ecosystems on earth, have developed on the Great Barrier Reef and in other tropical regions.

Reef-building coral polyps can survive only in water that has a stable temperature and chemistry, and there must be large amounts of direct sunlightall year-round.

If you live in North Queensland you may have wondered why there is no surf to enjoy on our beaches.
That's because the waves break way out to sea on the Great Barrier Reef.

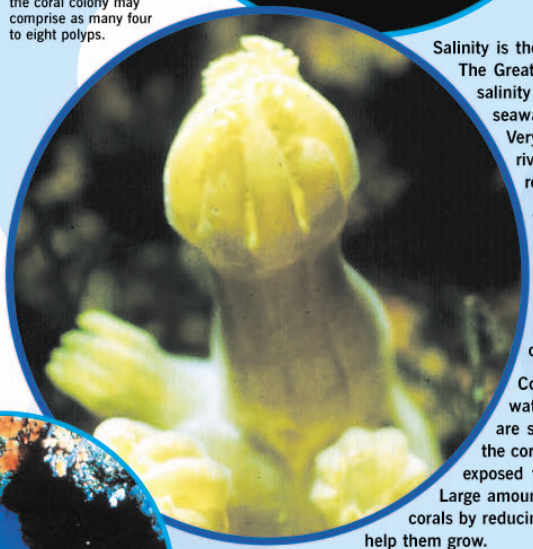


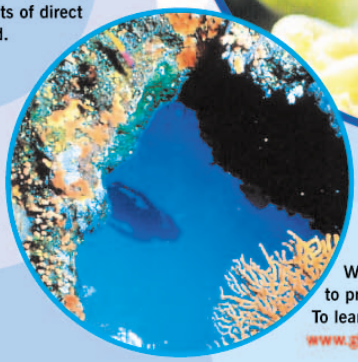


ABOVE: A view of the earth from space

RIGHT: A magnified view of the reef building coral polyps

BELOW: After 3 months the coral colony may comprise as many four to eight polyps.





We can always go surfing down south for our sport but for the Reef the waves are very important. As waves break on reef crests, they create powerful surges of clean, well-oxygenated water that is essential for the well-being of corals.

Water quality is central to the life of the Great Barrier Reef. Flooding by freshwater runoff, silt from muddy streams and rivers, and wastewater from human activities can create water conditions that make it hard for corals to survive.

Coastal environments, like mangroves, swamps and saltmarshes, are of tremendous importance to the function and existence of coral reefs. Reefs are exposed on one side to the vast open ocean and sometimes to land masses on the other. Communities like mangroves, estuaries, seagrass beds and lagoons typically found in the vicinity of coral reefs influence them by either importing or exporting nutrients.

Because water is so important to the Reef we need to ensure that the quality of the water is kept in a condition that will keep the plants and animals, large and microscopic, healthy.

Corals are good indicators of water quality. Changes in their colour and growth rates can signal the presence of harmful chemicals and toxins.

Salinity is the dissolved salt content of the water. The Great Barrier Reef needs a fairly constant salinity regime of 35gm of seasalt per litre of seawater.
Very low salinity water, originating from rivers during big flood events, rarely reaches the outer reef.

Oxygen is essential to reef organisms for respiration, a fundamental process that converts food to energy. Respiration of animals and plants consumes oxygen continually.
Few organisms can tolerate low oxygen levels for long periods of time.

Coral reefs only flourish in low nutrient waters, where nitrogen and phosphorous are scarce. Too many nutrients can harm the corals and may even kill them if they are exposed to high nutrient waters for too long. Large amounts of silt in the water can also affect corals by reducing light penetration that is required to help them grow.

Life on the Great Barrier Reef exists due to a delicate balance of oxygen, nutrients, sunlight and wave motion. If there is too much or too little of any of these the plants and animals struggle to survive.

When it comes to keeping the Great Barrier Reef great, water quality is one of the keys to preserving the Reef for the future.
To learn more about what you can do to help keep it great visit:
www.gbrmpa.gov.au and www.reefED.edu.au