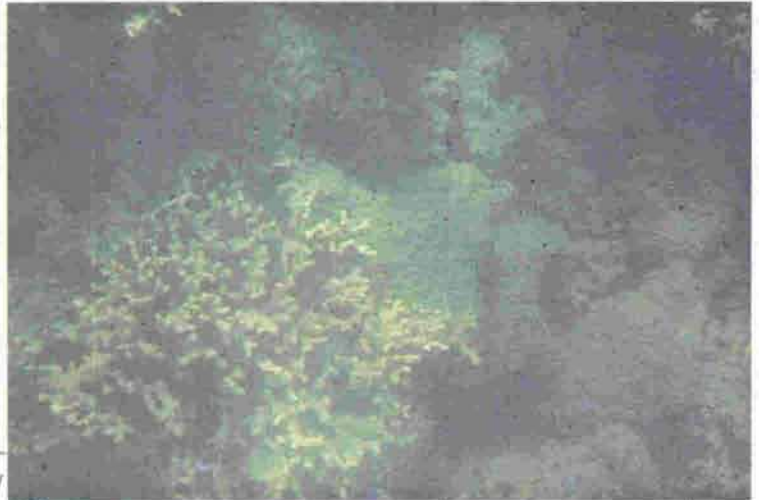


Overexploiting Coral Reefs: Reef Blasting in Nauru

Reef exploitation in one form or another is becoming one of the major environmental problems in the Pacific, especially in the small island states. This is a case study of the impact of blasting on the Nauruan reef in the late 1980s.

A dying coral reef:
A sign of the future?

(Photo: SPREP)



Background

Coral polyps and coralline algae are the main building components of a reef. The skeletons of dead coral and other organisms are bound together by coralline algae. New and young corals grow on dead coral and so help build up a reef. When live coral can no longer occupy the reef surface due to exposure to heat during low tide, the surface of the reef stops growing. However, live coral polyps will still help the reef grow outward. Coral reefs occur around the world in warm sub-tropical or tropical oceans, particularly on the eastern sides of continents and the western Pacific Ocean.

The two main factors required for coral growth are warm temperatures and sunlight. The water temperature range should be 18°C - 28°C. This requirement limits coral reef formation to latitudes between 30°N and 30°S.

There must also be sufficient sunlight to support the algae, zooxanthellae, which live in a symbiotic relationship with the coral. This means that flourishing coral growth is only found in clear, shallow water down to a depth of about 15m, with growth decreasing down to about 60m. Both requirements also explain why reefs are



generally found in shallow areas on continental shelves associated with islands or atolls.

Reef Destruction

Reef systems in the tropical Pacific are more productive than any other marine or terrestrial system. The marine life forms supported by such systems are incredibly diverse. These systems are also extremely fragile and many reefs throughout the Pacific are under threat as they are suffering constant degradation.

For atolls and small island states which depend so much on the marine life associated with reef systems, the destruction of these systems cannot continue at the present rate. The destruction or exploitation of reefs for "development" must be

carefully considered in the light of marine resources, environment, health and socio-economy that may be affected. Be it channel blasting, nuclear testing, the dumping of waste or any other form of destruction and exploitation, the damage done to the reefs is irreversible in most cases. An example of such a situation is documented below.

The Nauru Experience

The Republic of Nauru lies 42 km south of the Equator in the Central Pacific. It is 21.2 km² in area.

Nauru is rich in phosphate as a result of guano (bird droppings) deposits, and it is the main export commodity of the county, bringing in millions of



dollars annually. Although most Nauruans enjoy a good standard of living, the sea still provides their main source of protein, fish.

In the late 1980s, the Anibare Bay boat channel was blasted to allow launches from the cruise liner Queen Elizabeth II to land. The channel would allow better access for the small aluminium fishing boats.

Several months later, there was an outbreak of toxic fish poisoning. However, this was not the first time that such poisoning had occurred. This was because hospitals had not necessarily recorded all cases of fish poisoning in the past.

The incidence of the onset of ciguatera fish poisoning on Nauru supports the linkage between reef disturbance and ciguatera fish poisoning. Loose coral boulders produced by blasting provide new surfaces on which algae will settle and increase in density. They in turn provide more favourable habitats for the toxic dinoflagellate, *Gambierdiscus toxicus*. In this way, population densities of the dinoflagellate may increase and at the same time help increase the amount of toxin in the herbivorous fishes. Humans cannot resist these higher levels of toxins.

Environmental, Health and Socio-Economic Impact

Reef destruction affects not only health through fish poisoning, but may also damage the entire ecosystem. Physical factors such as beach and coastal erosion, and change in current pattern and direction, also result from reef destruction.

Ultimately all of this has an economic impact. Productive members of the society cannot work due to illness, and the cost of hospitalisation may be high. Money may also have to be spent on activities to counter beach or coastal erosion which commonly results from reef destruction. All these costs mean less money is available for other projects.

Healthy coral
(Photo: SPREP)



Tentacles with nematocytes

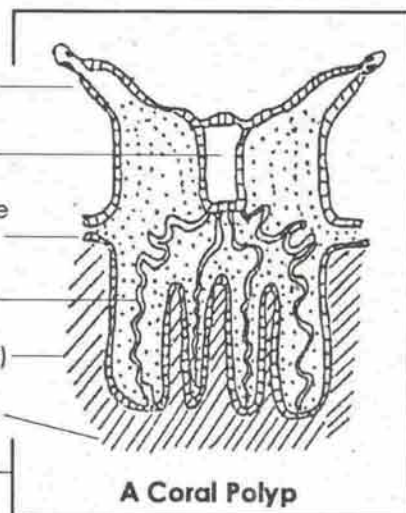
Mouth part

Connecting tissue sheet

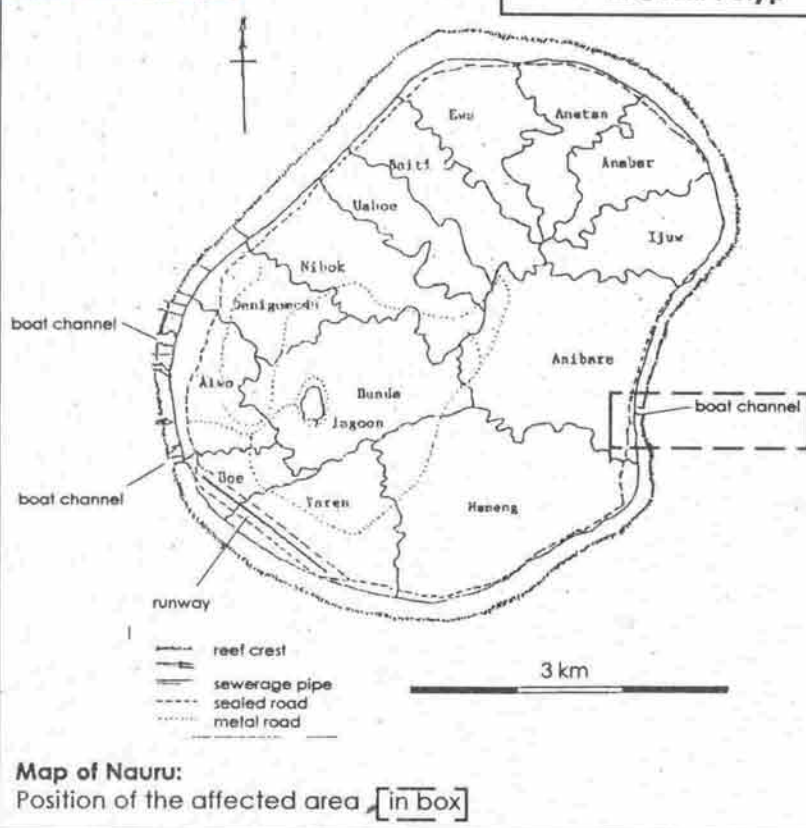
Digestive cavity

Theca (coral cup)

Basal coral plate



A Coral Polyp



Conservation and Management

Reef systems and the resources they contain need to be conserved and managed. We islanders should always bear in mind that our reefs are fragile and very vulnerable to human exploitation in all its forms. Any "development" which involves disturbance must be carefully considered in light of the biological and ecological processes that may be

adversely affected, and which in turn may affect the health and socio-economic well being of the human population and the environment.

Copyright ©
South Pacific Regional Environment Programme

The South Pacific Regional Environment Programme authorises the reproduction of this material, whole or in part, in any form provided appropriate acknowledgement is given. Original Text: English

Other leaflets are available in this series. Copies can be obtained by writing to:

The Director
SPREP
PO Box 240
APIA, Western Samoa.



This leaflet was prepared for SPREP by Temakei Tebano, Atoll Research Programme, Tarawa, Kiribati. Published with financial assistance from the United Nations Environment Programme (UNEP). Printed by Commercial Printers Ltd, APIA, Western Samoa. 1993.