

ABSTRACT

A description of the fringing reef of Lime Cay, (Port Royal Cays, Jamaica), with guidelines for long-term monitoring.

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The Port Royal Cays are an important nearshore fishing site for the artisanal fishing industry, an important recreational site for both Jamaicans and tourists, and form a physical barrier providing coastal protection for the Palisadoes and Port Royal area. The degradation of the reefs in and around the Port Royal Cays could therefore have serious negative socio-economic impacts on the fishing and recreational activities in the area. Their degradation could also lead to structural changes in the coastline now being protected by the cays and the surrounding reefs.

The objectives of this study were to collect baseline data on the present ecological status of the reefs and to prepare guidelines for the future monitoring of the reefs. The fringing reef of Lime Cay was mapped and surveyed to a depth of 20 metres, along a centrally located transect line. Two benthic survey methods were employed: point-line transects and phototransects.

Using multi-dimensional scaling and cluster analysis the reef was divided into nine ecological zones. From shore to 20 metres depth the zones are: The Lagoon/weedbed

zone, the Rear zone, the Barren zone, the Reef flat zone, the Acropora palmata zone, the Porites porites zone, the Acropora cervicornis zone, the Madracis mirabilis/slope zone and the Gorgonian zone. Coral diversity on the reef showed three trends: An increase in diversity with depth, an "edge effect" at 9 metres in the deep A. cervicornis zone and decreasing diversity with increasing coral cover.

The transecting methods were compared to determine if the results obtained by the two methods could be empirically related to one another. Both methods detected similar trends with depth for coral cover, coral species richness and diversity, but the results obtained from the two methods differed in absolute terms. It was found that the difference in coral cover estimates generated by the two methods was significantly correlated ($r=0.811, P<0.05$) to the rugosity (surface relief) of the coral in the zone being transected. The greater the rugosity of the zone, the greater the estimate of the coral cover by the point-line transect method relative to that of the photographic transect. Knowledge of the rugosity could allow the results obtained by these methods to be compared directly.

Suggested guidelines for monitoring the reef are the establishment of permanent photographic transects in both shallow and deep parts of the reef, in recognisable coral zones with relatively high coral cover and diversity. Grazing organisms, urchins and fish should also be monitored because of the strong coral-algae-herbivore interactions observed on reefs, the result of which can mimic sewage pollution.