

SUMMARY

Cyclone Justin crossed the coast in the vicinity of Cairns in March 1997. The 50 knot northerly winds that followed the passage of the cyclone led to the break-off of the Great Adventures Norman Reef pontoon, and its subsequent grounding on the reef flat. Sea Research was asked to resurvey the permanent transects that were set up near this pontoon for past monitoring programs as a prelude to repositioning the pontoon. The aim was to establish what damage had occurred in the benthic community due to the pontoon break-off, and to compare this with the effects of the cyclonic waves themselves on the benthic community. A quantitative survey was also made of the pontoon drag scar on the reef flat, and of surrounding reef benthic communities to determine the effects of the pontoon grounding. The survey was carried out in April 1997, almost a month after the cyclonic episode.

The same techniques used in the previous monitoring programs were employed. Quantitative measurements of the cover of corals and other encrusting organisms, of coral colony height, and coral colony damage, were made along permanent 20 m transects. A total of 40 transects were used, split between control and pontoon sites, and deep and shallow depth strata.

The percentage of damaged coral colonies in the benthic community was between 15-20% during this survey, an order of magnitude higher than during the 1992-93 monitoring program. In spite of the pontoon break-off, damage levels were higher in the control site than in the pontoon site. Coral colony height had decreased, at least nominally, along most transects since 1993, although the changes were not significant. It is suggested that expected gains due to coral growth between 1993 and the time of the cyclone were lost to cyclone induced coral breakage.

Although there had been an average 6% reduction in hard coral cover at the pontoon site this was not significantly greater than the almost 2% reduction in the control site. The reduction at the pontoon site was due to cyclonic breakage of fragile acroporids in the shallow community and to the shading death of poritid coral beneath the pontoon. Breakage of acroporids in the shallow control site was countered to some extent by rapid growth of staghorn acroporids in the deep site.

Overall benthic community damage was no higher in the vicinity of the pontoon than in the control site, despite the obvious structural damage caused by dragging chains and blocks, and by the pontoon itself. There had been some natural structural damage in the control site caused by cyclonic wave action.

In the reef flat community there was a gradient of decreasing coral cover, from 40% to around 10% cover, with increasing distance from the edge of the reef flat. The dragging pontoon had destroyed about half of this coral near the reef flat edge, but about two thirds of cover was dead further up on the reef flat. Almost all remaining corals were damaged but most had repaired themselves by the time of this survey.

Ball park estimates suggest that the pontoon break-off destroyed about 320 sq m of living hard coral on Norman Reef, whereas cyclonic wave action led to a natural loss of around 15 000 sq m of coral from the back face of the reef, a figure several orders of magnitude higher.