Panama ReefMonitor Update

A joint effort of ReefKeeper International and Asociación Oceanica de Panamá to monitor Portobelo National Park's coral reefs

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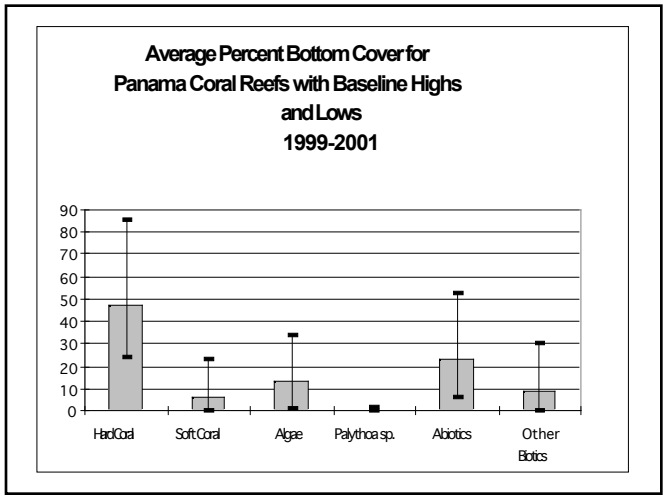
Portobelo's Coral Reefs: Healthy and Holding

Executive Summary

Coral reefs on the Caribbean side of Panamá were monitored quarterly from February 1999 through April of 2001 as a joint effort of ReefKeeper International and Asociación Oceanica de Panamá. This monitoring was conducted to establish baseline parameters for reef health so that significant changes can be noticed. All four reefs monitored are situated within Portobelo National Marine Park, making the future protection of these ecosystems more possible than if there were no regulatory framework in place.

The monitoring showed overall average percent bottom cover for all four reefs combined at 47.6%, and percent algal cover at 13.4%. Percent bottom cover by abiotics was 23.5%. Soft corals composed an average of 6.6%; other biotics (anemones, sponges, etc.) were 8.8% and *Palythoa sp*. were 0.1% of the total bottom cover.

These Panamá coral reefs appear to be healthy. Hard corals were the dominant form of bottom cover at all the reefs. The most recent monitoring events showed significant increases in hard coral cover and decreases in algal cover at all four reefs. Now is the time to take action to protect these reefs, before their health begins to decline. The mooring buoy system within the park should be utilized to prevent anchor damage, and efforts to increase public awareness about the reefs should be undertaken.



Introduction

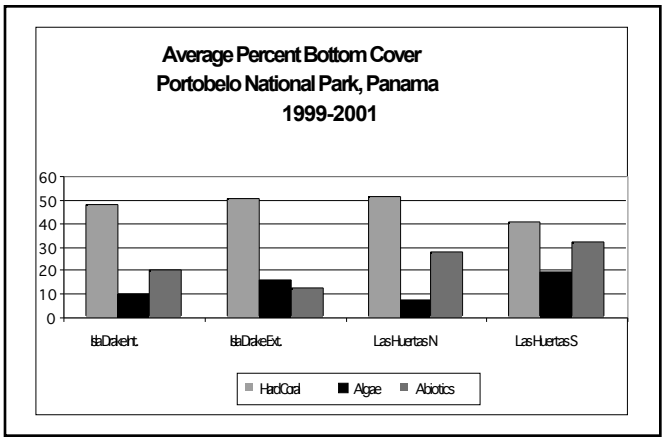
The four reefs monitored were Las Huertas Norte Reef, Las Huertas Sur Reef, Isla Drake Interior Reef and Isla Drake Exterior Reef. The data collected from these reefs included percent bottom cover composition and hard coral morphological type identification. Hard coral health was recorded one time at Isla Drake Interior Reef.

Overall averages from all four reefs combined are used to get an idea of coral reef health for this region of Panamá. Although these data are based on only as many as seven quarterly monitoring events, it is a good starting point. These data can allow for comparisons with other reefs in the

ReefMonitor Update is one of the publications issued by ReefKeeper International, a tax-exempt, nonprofit membership organization exclusively dedicated to the protection of coral reefs and their marine life. Working from Miami (FL), Boqueron (PR), and Cozumel (Mex), ReefKeeper International conducts an integrated program of field survey investigations, reef monitoring, policy analysis, grassroots organization, technical assistance, advocacy and public awareness. ReefKeeper activities are partially supported by Jamee & Marshall Field Fndn, Goldman Fund, Henry Fndn, Homeland Fndn, Curtis & Edith Munson Fndn, Elizabeth Ordway Dunn Fndn, Orchard Fndn, Patagonia Fndn, Pew Charitable Trusts, Rockefeller Brothers Fund and Turner Fndn. Memberships start at $25 per year.

Caribbean, and for future comparisons with the same reefs.

The annual averages determined for bottom cover composition can be used in the future to determine if fluctuations are seasonal or indicative of failing coral reef health. Furthermore, comparisons between reefs can be used to determine the extent of anthropogenic effects, based on the relative proximity of the reefs to the sources of those influences. By using this information and future data, it may be possible to eventually identify and reduce the detrimental effects that result from human influences on the reefs.



Survey Locations

The four reefs monitored were all located in the Caribbean Sea off the coast of Panamá. Isla Drake Interior Reef, Isla Drake Exterior Reef, Las Huertas Norte Reef and Las Huertas Sur Reef are all fringing reefs situated within Portobelo National Park. The monitoring took place at a depth of approximately 10 meters. Both Isla Drake reefs are situated around a small island, with Isla Drake Interior Reef being the shallowest and closest to shore of the two. Las Huertas Norte Reef and Las Huertas Sur Reef are located on the north and south sides of a bay, and lie at approximately the same depth.

Monitoring was conducted at the Las Huertas Reefs in February, June and September of 1999 and in July of 2000. The monitoring at the Isla Drake Reefs took place in February, June, September and December of 1999 and in November of 2000 and April of 2001.

Bottom Cover

Overall Averages

The overall average bottom cover for all four reefs and all the monitoring events combined showed average percent hard coral cover at 47.6% with a range from 24.0% to 85.3%. Overall average percent abiotic cover was 23.5% and overall average percent algal cover was 13.4%, with a range of 1.1% to 34.0%. Other biotics and soft coral cover recorded overall averages of 8.8% and 6.6%, respectively. Overall average percent bottom cover by *Palythoa sp*. (false coral) was 0.1%.

Isla Drake Interior

The average percent hard coral cover at this reef was 48.3%. Average percent bottom cover by algae was 10.3% and abiotic cover was 20.7%. Soft coral was highest at this site, at 11.2% and other biotics were 9.5%. No *Palythoa sp*. were noted at this site.

Isla Drake Exterior

The average percent hard coral cover at this site was 50.6%, the second highest of the four reefs. Average percent bottom cover by algae was also second highest of the four reefs at this site, at 16.1%. Abiotic cover was 12.9% and average percent soft coral cover was 5.7%. The highest average percent bottom cover by other biotics (14.7%) was at this reef. No *Palythoa sp*. were noted at this site.

Las Huertas Sur

This site showed the lowest average percent bottom cover by hard coral at 40.3% and the highest average percent bottom cover by algae (19.4%). Average percent abiotic cover was also highest here, making up 32.0% of the total bottom cover. Average percent bottom cover by soft coral was 5.3% and other biotics made up 2.7% of the total

ReefKeeper's reef monitoring protocol uses 2 or more separate 50-meter transects laid out at each reef site studied using factory-marked fiberglass transect tape that follows the depth contour of the reef site. Point-intercept bottom cover data are noted at half-meter intervals along the 50 meters, producing 100 bottom cover data points for each transect. For hard coral colonies at data collection points, health condition is noted and species are identified when possible. If feasible, a visual record of each transect is made with photos taken every four meters along each transect and/or with a continuous video of each transect. This monitoring procedure is repeated every three months.

bottom cover. This was the only site were *Palythoa sp*. were noted, although the average was only 0.4%.

Las Huertas Norte

Average percent bottom cover by hard corals at this site was highest of the four reefs, at 51.2%. Algal cover at this reef was lowest of the four, making up only 7.6% of the total bottom cover. Abiotics constituted 28.3%, and other biotics were 8.5% of the total bottom cover. Average percent bottom cover by soft corals was 4.3%, and no *Palythoa sp*. were noted at this reef.

Hard Coral Health

Hard coral health was only recorded one time at one reef site throughout the years of monitoring. Isla Drake Interior Reef showed 70% of hard corals healthy, 20% sick and 10% bleached during the monitoring event in February of 1999.

Hard Coral Species

Hard coral species were not quantified; however, morphological types were. Leaf corals were the clear dominant type of coral at three of the reef sites. They composed between 37.2% to 45.3% of hard corals identified at Isla Drake Interior, Isla Drake Exterior and Las Huertas Sur. Branch corals dominated at Las Huertas Norte, making up 26.1% of all hard corals identified. Mound corals were also common, ranging from 12.3% to 23.7% of hard corals identified at Isla Drake Exterior, Isla Drake Interior and Las Huertas Norte. There were measurable amounts of all major morphological types.

Significance

Hard corals were clearly the dominant type of bottom cover at the four monitored reefs, which shows that these reefs are doing well. It is much easier to preserve healthy coral reefs than to recover those that have already suffered significant damage. High percent bottom cover by algae is often indicative of high nutrient content in the water. Although this does not appear to be a problem at these reefs, we have no way of knowing percent bottom cover by algae in the past. Therefore, it will still be important to keep an eye out for any future changes in algal cover.

Without more hard coral health data it is impossible to determine what percentage of these corals were healthy and what percentage were affected by sickness and bleaching. Therefore, it is important to remember that the high number of hard corals recorded did not necessarily represent healthy hard corals.

Hard coral morphological types were dominated by those with a high surface area to volume ratio, suggesting that there was possibly light limitation in the area. The corals that were able to obtain the most light were the ones that thrived.

The most recent (April 2001) monitoring results showed high increases in hard coral cover and decreases in algal cover. Because the increases in hard coral cover were more than 40% at some of the reefs, it should be considered that they are probably a result of random transect variability.

What is Next?

The protection of these coral reefs is necessary for them to survive in the future. Because they are located in a national park, which can be regulated, the first step has already been taken. The mooring buoy system now in place is another; however, it cannot be effective unless the buoy use is enforced.

The Portobelo National Park also must ensure that ship traffic does not approach the reefs by establishing ship traffic buffer zones. The northern coast of Panamá near the entrance to the Panamá Canal is bordered by coral reefs. A ship could easily destroy any one of these.

Why Monitor Reefs?

If you don't monitor the oil level in your car's engine, sooner or later you're going to be out of oil and out of an engine. The analogy strongly applies to coral reefs, and that's why ReefKeeper International sponsors reef monitoring by local volunteers. There's really no other way to catch problems before they become catastrophic – or even better yet, before they begin by having data to make a case against reef threatening human action. These volunteer reef monitors watchdog significant coral reef sites for changes in coral health, coral cover and other key early warning signs of environmental impact. The gathered data are sent to ReefKeeper, where they are analyzed for use in conservation efforts. Most significantly, these monitoring activities act as a deterrent, serve as a catalyst for other local conservation action, and focus attention on the value of these reef sites.