

# Reef Balls - a scientific approach to building artificial reefs.

Cliff Lee-Juillerat remembers diving the reefs in Grand Case, St. Martin thirty years ago. They were lush, bursting with marine life. "Now the area is a marine desert," he says, devoid of the fish and coral that once brought beauty and livelihood to locals and tourists. St. Martin is not alone. Worldwide, 109 countries have reef systems. Of them, 93 are now extremely damaged.

Destruction of the rain forests has grabbed public attention in recent years, with good reason. Valuable natural resources are destroyed forever; the food chain is interrupted.

Though it's harder to see, under the ocean nature and humans bring on the same destruction. Hurricanes are, of course, a major cause. Storms and on-shore construction drain silt into the once-clear waters. The sediment settles on coral, killing it by blocking light and food supplies. Since fish can no longer feed on the coral, the underwater food chain is interrupted. Careless anchor placement by yachties, divers gathering living coral and over-fishing are all to blame.

Throughout the Caribbean, Cliff has seen juvenile tropical fish for sale in local markets. And he notes, "The fish net size is getting smaller and smaller - nothing escapes."

Coral is a vital link in the sea's food chain. Lack of awareness and regulation on fishing, coral-taking and mooring on reefs disrupts the interdependent ecosystem and disrupts the food chain, so fishermen must go further and further out to find fish.

Cliff is concerned about the underwater environment. He's been diving all his life, has degrees in Marine Science and Marine biology and is currently

environment. Often ships, cars or limestone boulders are sunk, creating a place for coral to take hold. But ships and cars move with the tides, breaking up coral life and releasing toxins. They biodegrade in 20 to 30 years. Limestone has few pockets for small micro-organisms to attach themselves. And all these methods are costly, requiring heavy equipment to deploy.

Seven years ago Todd Barber, an American businessman and avid diver, was also troubled by the damage to the world's reef systems. He discussed the issue with some diving buddies and they experimented with pouring concrete over a beach ball. "Because of the inflated center... we could float it into the ocean by small boat and save the tremendous expense involved with renting a crane and barge to transport the object," Todd said. "Sinking the ball would be easy, just deflate the beach ball center." And so began an innovative company - Reef Ball Development - with a new approach to artificial reef formation. Two years of research and development followed the beach ball experiment. Five years ago, patents were issued.

The beach balls are transformed to bottom-heavy concrete mounds with irregular Swiss cheese-like holes dotted over the surface. The holes create whirlpools within the ball, aiding in stability and simulating a natural habitat for marine life. Reef balls have maintained the same position after Category 3 hurricanes in less than 10 feet of

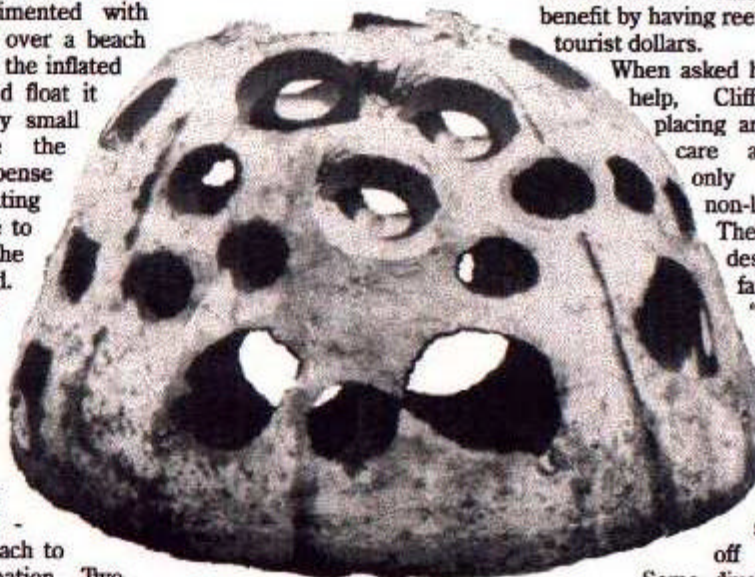
making pinpoint landings possible. In essence, reef balls are a seed for a natural reef.

They are used worldwide for a variety of purposes - with custom additives to attract soft or hard coral, angelfish or lobsters.

Disneyland used them to create an underwater habitat to be viewed from glass-bottom boats. In Cancun, Mexico, 300 reef balls were put in two years ago. Compared to other artificial reefs of the same size over the same time period, the fish population doubled, and

And he's hoping to the Caribbean tourist developing a Reef Ball for resorts and home envisions a two-day the first day will be The second day, participants place their own reef ocean. They will use GPS co-ordinates to own name. Cliff cultural activity as 1 participants, as we resort and island eco after year, participant friends will dive to a new reef life contributed. And benefit by having reef tourist dollars.

When asked for help, Cliff placing an care as only non-li They des far



## A reef ball

there was three to four times the diversity in types of fish. Of special interest to sailors in hurricane season, reef balls have also been used to build a protective harbor for mangrove planting.

Reef balls range in size from 8 pounds to 8000 pounds, measuring from 8 inches to 8½ feet in height. Costs run from \$125 to \$1000 US.

Cliff has become a champion

Some divers off one of their fins, but just do it with your hand actually touch the harmful. Now just hand close to the water surface. You'll be amazed quickly the coral can life - you can watch flood back. And the feeding right away!" almost hear the thank you.

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