



LISTEN TO OUR OCEANS

CASE STUDY

CCell Reef - Royal Resorts, Cancun, Mexico



BACKGROUND

The Royal Resorts Cancun hotel, positioned 4.5km along Cancun's Hotel Strip and 400m from Sigfrido's channel, has offered its guests a stunning 200m beachfront for many years, making it an ideal location to showcase the CCell reef.

Since 2006, the hotel has experienced increased wave disturbance from marine traffic. The situation was exacerbated in 2021 with the creation of a new Isla Mujeres ferry terminal, with ferries passing the hotel several times a day. This surge in traffic has also adversely affected nearshore marine life.

In response to growing concerns about the beach condition and reduced marine life, the Royal Cancun Hotel partnered with CCell to test the installation of a CCell reef unit. This project focused on enhancing rock growth and biocolonisation, while evaluating the marine life within the surrounding waters.



Unit secured under pier

PROJECT SPECIFICATIONS

Structure:
CCell[®] Arch Reef Unit 1.0

Water Depth:
3.5m

Reef Dimensions:
2.4m in length, 2m wide, 1m tall

Installation:
2.5m depth, 80m from the shore

Installed:
October 2021



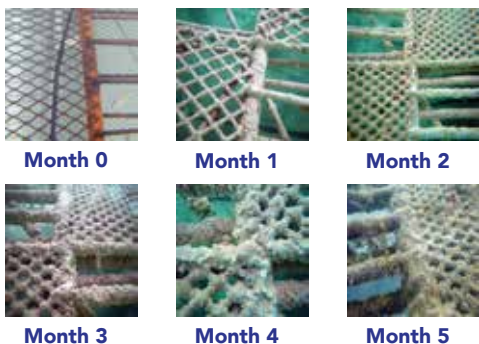
French grunt (*Haemulon flavolineatum*) shoal seeking shelter in CCell Habitat unit - July 2023

RESULTS

This unit has developed well since its initial installation. Noteworthy outcomes include:

1. Rapid accumulation of mineral-rich, texturised rock at a rate of 6mm per month.
2. Mineral accretion technology visibly improving the growth rates of nearby corals and reef-building organisms.
3. Scanning electron microscopic (SEM) analysis of the rock revealed its primary composition to be 87% aragonite (CaCO_3), followed by brucite $\text{Mg}(\text{OH})_2$
4. Photographic analyses showing a wide array of species from various phyla and notable improvements in both species and population diversity.

ROCK GROWTH



DISCUSSION

So far this project has exhibited significant progress in terms of both mineral accretion, and increased presence and settlement of diverse corals, molluscs, fish and other marine species.

The reef was confirmed as a viable ecological solution within the region. It elicited a positive response in both the hotel staff and guests, who embraced the initiative aimed at revitalising local marine biodiversity.

The combination of mineral-rich waters of the mesoamerican reef, and steady sea temperatures between 24-28°C, ensured a consistent and rapid accumulation of high-quality rock.

Electrical power to the reef was discontinued in April 2022 to assess the passive biocolonisation and servivability of the steel substructure.

