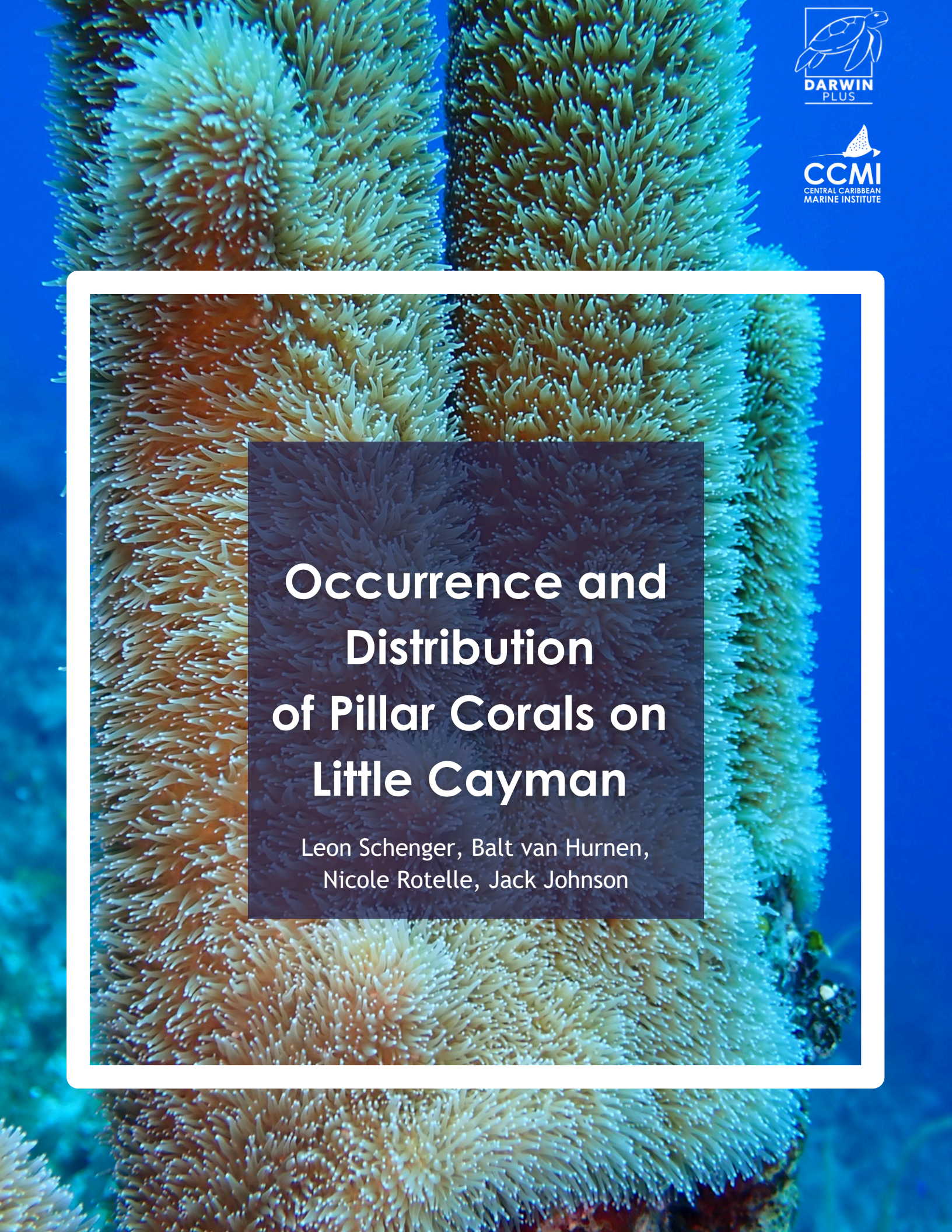

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Occurrence and Distribution of Pillar Corals on Little Cayman

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Introduction

No other habitat in the ocean supports more biodiversity than coral reefs. Although they occupy only 0.2% of the ocean floor, coral reefs are home to 25% of all marine species. Despite the vast number of species living on coral reefs, less than 1,000 species are known to be stony corals (Knowlton et al., 2010).

For decades, disease, habitat destruction, and particularly climate change have contributed to the loss of stony corals. Today, coral reefs are in a worldwide decline, and in the Caribbean, more than 50% of coral species are threatened with extinction (Gutierrez et al., 2024).

A species especially vulnerable to diseases, storms, and bleaching events is the Pillar coral, *Dendrogyra cylindrus*. The coral is structurally and behaviourally unique, but due to these stressors, its populations have declined drastically in many parts of the Caribbean (Cavada-Blanco et al., 2022; Neely et al., 2021).

Although also the reefs of Little Cayman have suffered considerably, their condition is generally better than in the rest of the Caribbean (Goodbody-Gringley & Manfrino, 2020). Little Cayman's reefs are more resilient due to the island's remoteness and high level of marine protection.

Today, we can still find 10 pillar coral colonies around Little Cayman Island. They will be featured in this booklet. These findings are the outcome of an extensive survey completed by the Central Caribbean Marine Institute to locate all remaining colonies on the island.

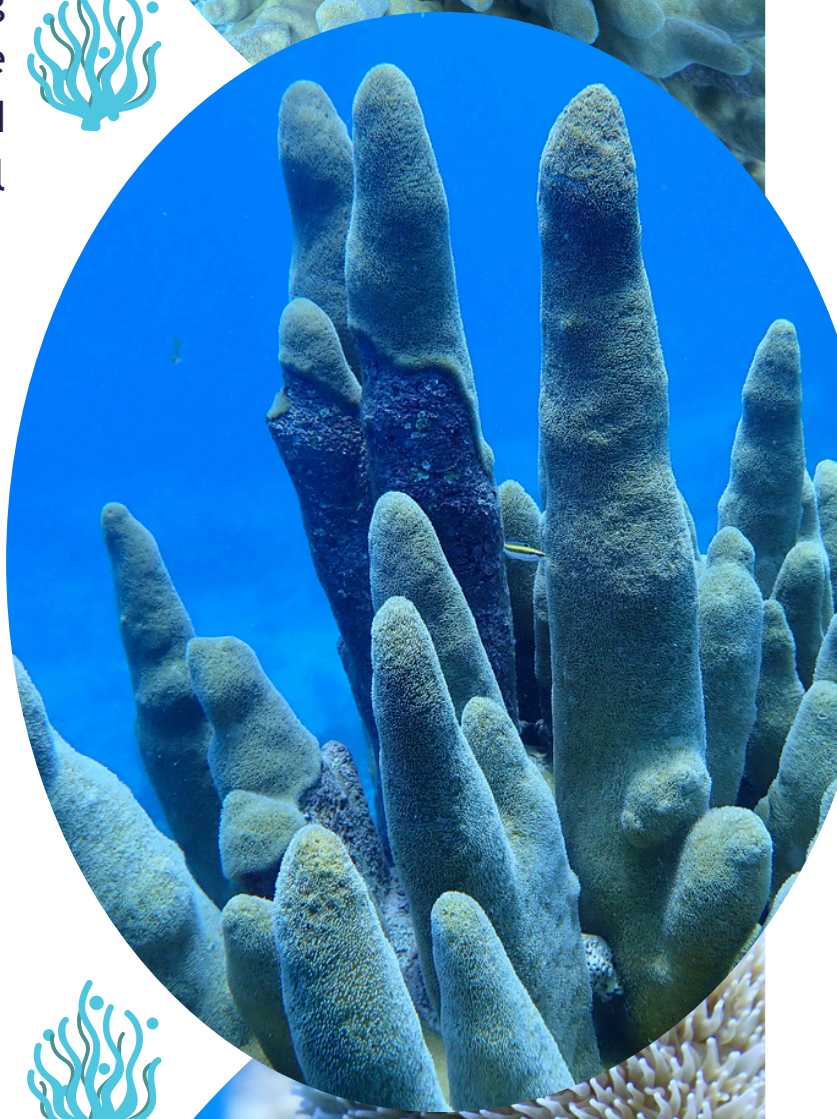
Pillar Corals

Dendrogyra cylindrus

Pillar corals can be recognized by their tall finger-like spires that can grow up to 10 ft. These vertical columns set them apart from most other stony corals that form encrusting or branching shapes. Pillar corals give a unique structure to coral reefs and add vertical complexity to coral ecosystems.

Habitat and distribution

The coral is typically found on flat or slightly sloping reefs and is commonly found between 15 and 50 feet. Pillar corals are present in the western Atlantic along most of the Caribbean islands, the southern Gulf of Mexico, the coast of Florida, and the Bahamas.



Importance

D. cylindrus has been a rare species in reef environments for hundreds of thousands of years, and it is unique in many ways (Chan et al., 2018). It is the only member of its genus, the only column coral in the Caribbean, and the only species whose polyps are extended both during light and dark hours (Neely et al., 2020).

Occurrence on Little Cayman Island

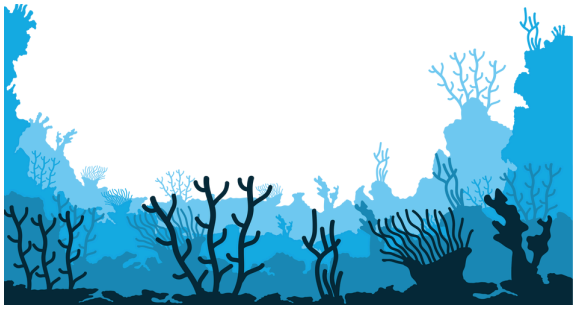
For this study, all dive sites on Little Cayman Island were visited to find any remaining pillar corals. On the north side of the island, seven colonies were found relatively close together. Most of them were in a very good condition. Just one colony at Coconut Wall is in a damaged state, and both colonies at Dot's Hot Spot show some signs of tissue damage.

Additionally, three colonies were found south of Little Cayman Island, with the overall biggest colony close to the Soto Trader shipwreck. The other two pillar corals are located at the less prominent dive sites Rockhouse Wall and Splitsville – but are definitely worth a visit! [JJ1]

No pillar coral is deeper than 60 feet, and most of the colonies can be tracked relatively easy with the right directions. In the following, the colonies will be briefly presented, along with navigation instructions so that you can find the pillar corals yourself!

Coconut Wall

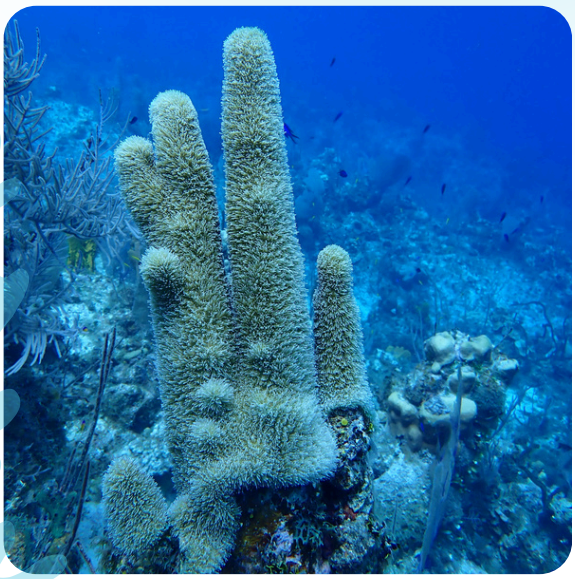
19.680767 -80.089833
Depth: 9 m / 30 ft
Size: 30 x 50 cm / 12 x 20 in
Heading from mooring: 220°



The pillar coral we can find at Coconut Wall is only a small part of an originally much bigger colony. Unfortunately, the coral was severely damaged in a stormby a uniquely strong ‘nor’ wester’ in February 2024. Because of their growth form, pillar corals are very vulnerable to strong wave action, and unfortunately, high seas caused large parts of the colony to break off.

Remnants of the former colony can be found several feet towards the wall. Although the species, in general, has the valuable ability to regrow from those fragments, these pieces deceased in the following months. Can you find the fragments in the bottom-right picture?

Despite this setback, the rest of the colony we can find today is in a vital condition. The pillar coral at Coconut Wall is a good example of how storms can destroy corals which have grown and survived for decades!



Remaining pillars

Deceased part of colony

Joy’s Joy

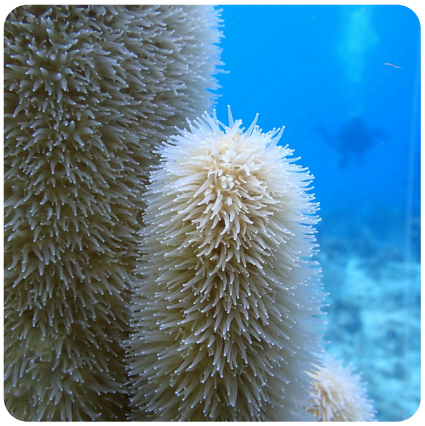
19.678767 -80.092983
Depth: 7 m / 21 ft
Size: 110 x 60 cm / 43 x 24 in (Colony 1)
70 x 80 cm / 28 x 31 in (Colony 2)
Heading from mooring: 210°

At Joy’s Joy, we can find two colonies at the same dive site! The northernly colony is in a great condition and belongs to one of the best individuals around the island. We can clearly see the complex pillars which can grow from these colonies.

The second colony is also in a good state, despite showing signs of damage. As apparent in the rightmost picture, one of their pillars was thrown apart. As unlucky as these damages are - for the colony, a detached pillar is also the chance, to settle at new sites! As is not uncommon, we can see signs of bioerosion at the foot of the colonies. Here, we can find no living tissue anymore.

Both colonies stand right next to each other, and it is likely, that one colony originates from the other. Asexual reproductions, e.g. through the regrowth of detached pillars, is a common phenomenon and was found in many instances (Cavada-Blanco et al., 2022). You shouldn’t miss the chance to pay both colonies a visit when diving at Joy’s Joy!

Colony One



Colony Two with broken pillar

Dot's Hot Spot

19.677133 -80.095483
Depth: 7 m / 23 ft
Size: 35 x 30 cm / 14 x 12 in (Colony 1)
70 x 30 cm / 28 x 12 in (Colony 2)
Heading from mooring: 220°


Wide pillars of colony one

Right next to Joy's Joy we can find – again! – two pillar corals. At the time of their visit, both corals had their tentacles retracted, which is a rather uncommon sight. Under these circumstances, the corals lose their fuzzy appearance, and their remarkable skeleton becomes visible.


Retracted tentacles & visible skeleton

Like all corals, pillar corals use their tentacles to filter the water for plankton and nutrients. This form of foraging, however, is not very efficient, which is why corals harbour symbiotic zooxanthellae. These algae photosynthesise, and thereby provide energy for the coral. Without this symbiosis, the coral would not only loose its colour, but also starve. This relationship has evolved over millions of years. Unfortunately, the algae are very sensitive to rising sea temperatures and are being repelled when the water becomes too warm. This process is known as coral bleaching, and it is the reason climate change poses and major threat to all corals (e.g. Hoegh-Guldberg,1999).


The second colony, twice as large

Some tissue of the colonies showed signs of disease and damage. Further investigation is required to confirm disease and to observe how the condition of the coral will develop in the future.

Bush Gardens

19.666300 -80.106817
Depth: 11 m / 36 ft
Size: 25 x 60 cm / 10 x 24 in (Colony 1)
15 x 60 cm / 60 x 24 in (Colony 2)
Heading from mooring: 60°

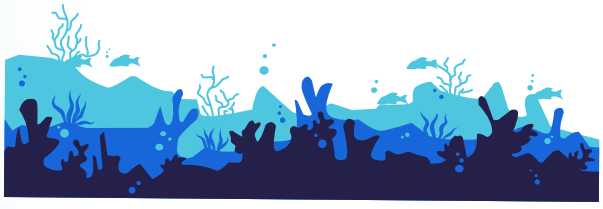

Fallen pillar on colony one

The colony at Bush Gardens is a great example for how fallen pillars can continue to grow. Right on top a thriving colony lays a single pillar. Seeing a pillar horizontal is an uncommon sight, and in the future, the tower will become the basis for new pillars which will continue to grow vertically towards the water surface.

Very close to this unique colony, we can find another, smaller pillar coral. It only has few living towers, and we can observe well how algae start to grow on dead pillars. The reasons for the death of the pillars is unknown, but the remaining towers appear to be in a good state.


Much smaller colony two with overgrown pillars

Both colonies can be found relatively easy, as they are standing solitarily on a sand patch. Although it is a little swim to reach them, their sight does not disappoint!



Soto Trader

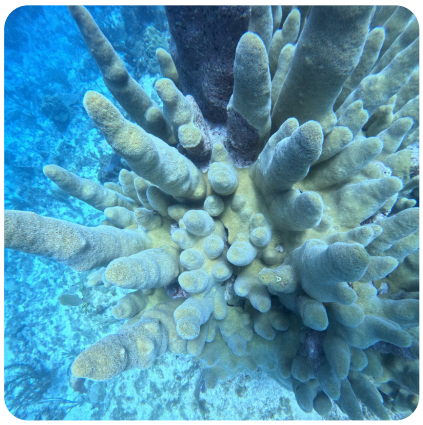
-80.082450

Depth: 10 m / 33 ft

Size: 250 x 130 cm / 51 x 60 in

Heading from mooring: 140°

In April 1975, the 120 ft cargo ship, Soto Trader, caught fire and exploded while discharging cargo on Little Cayman. The ship sank, and it is now one of the main dive attractions on the island.

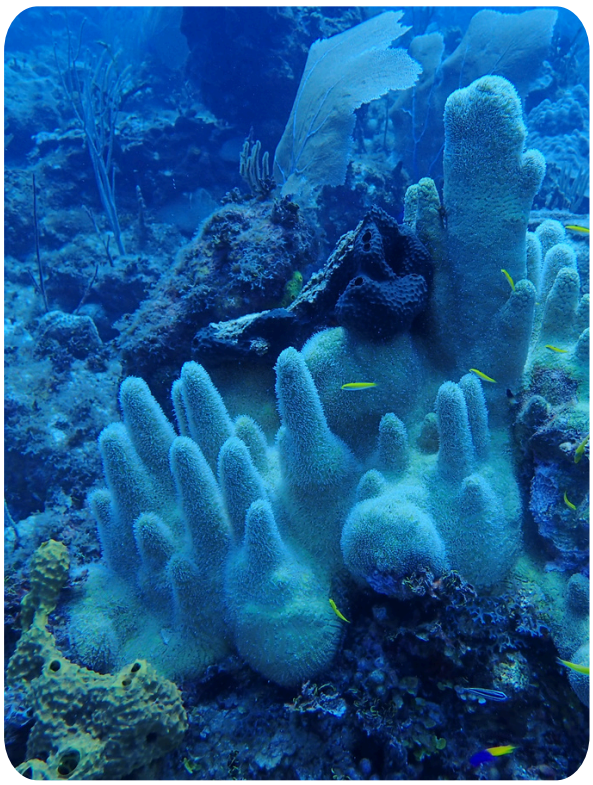


In proximity to the Soto Trader shipwreck, we can find the biggest and most prominent pillar coral of the island. Colonies of that size are extraodinarily rare, and the coral is in a great condition. Countless pillars are reaching up, and once this colony is found, its easy to forget about the shipwreck.

Finding such a big colony is remarkable, and it is a surprise that we find no other colonies anywhere around. This spatial separation applies to all three colonies of the south side, and that illustrates how little we know about this species' ways of distribution.

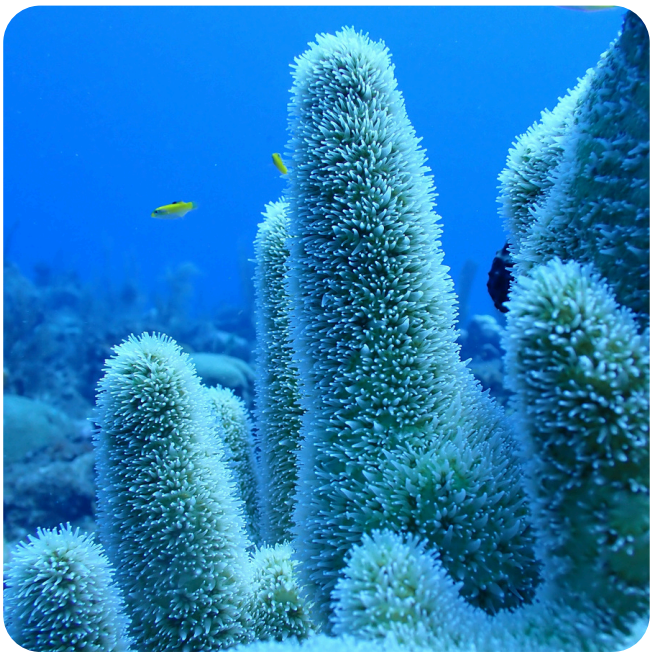
Rockhouse Wall

19.667367 -80.042167
Depth: 17 m / 56 ft
Size: 91 x 30 cm / 36 x 11 in
Heading from mooring: 220°



The colony growing at Rockhouse Wall is the deepest standing pillar coral around Little Cayman Island, and finding a colony at such a depth is rather uncommon.

Although it takes a swim of about 10 minutes from the mooring, the coral is, without a doubt, worth a visit. The colony is in a great state and shows no signs of diseases or damages. The coral stands a little exposed, which makes it easier to find it.

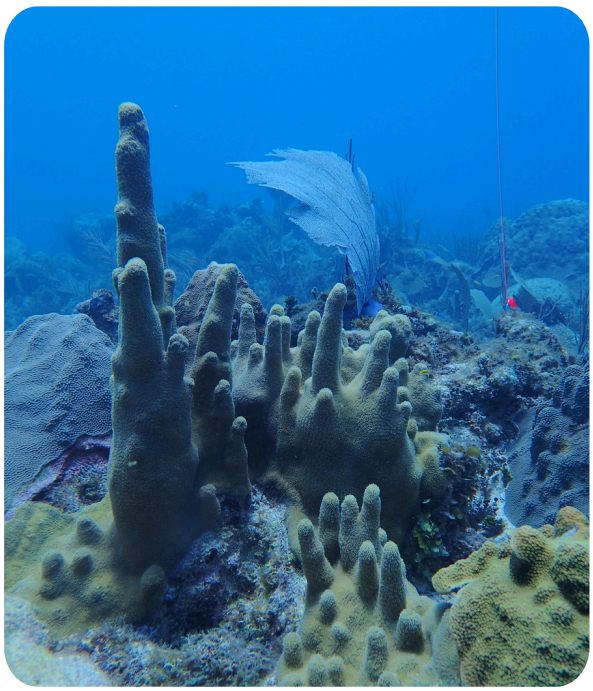


On the pictures, we can see why pillar corals are so important to coral reefs. A variety of little fish are hiding between the pillars, which provide them with shelter from predators or strong currents. The pillar coral is the only species in the Caribbean that grows directly vertical, making it unique and precious at the same time.

By being comparably deep, it makes sense to visit this dive site on days with good light!

Splitsville

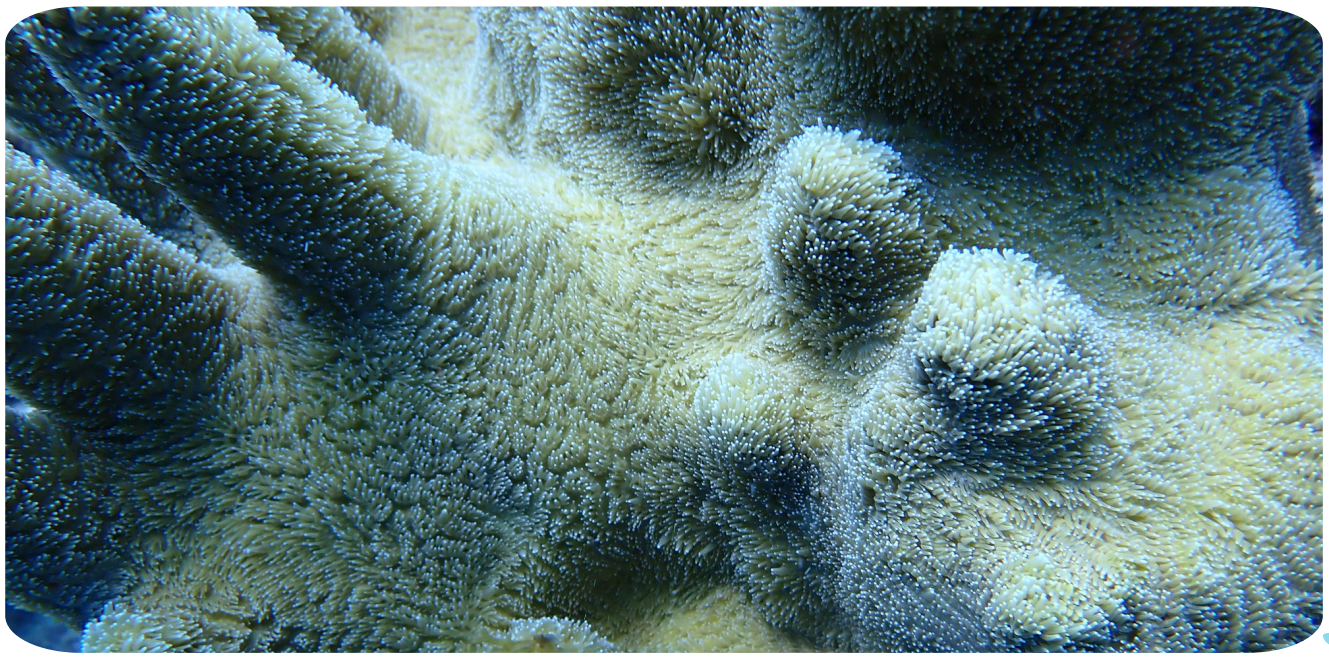
19.674683 -80.034433
Depth:10 m / 33 ft
Size: 122 x 61 cm / 48 x 24 in
Heading from mooring: 120°



The dive site at Splitsville impresses by harbouring many large and healthy corals. One such example is this pillar coral, which is directly embedded into several mountainous star corals.

The colony is comparably big, with the tallest pillar reaching about 3 ft up. While the growth rates of *D. cylindrus* are not well understood, studies from Key Largo reported a pillar growth of about 2 cm (0.7 in) per year (Hudson and Goodwin, 1997). This means that we can expect this individual to be around 50 years old!

When diving at Splitsville, you can also encounter many dead elkhorn corals, which are an uncommon and impressive sight. Unfortunately, the visibility tends to be challenging sometimes, so it is recommended to visit this dive site on calm days.



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