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A Report on the Artificial Reef Use in Grenada, West Indies

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Abstract: Coral reef rehabilitation in the Caribbean is of major ecological and economic importance in the West Indies. Local organizations in Grenada constructed a cement pyramid artificial reef structure with rugosity (termed "The Pyramid") and placed a number of these artificial reefs in a shallow marine area fringing two major natural reefs in the southwest coastal region of Grenada. Benthic data for two nearby natural reefs were compared to the benthic evaluation of the artificial reef pyramids. This comparison demonstrated that the artificial reef pyramids were similar in many respects to the natural reefs but were significantly different in macro- and coralline algae cover, two key indicators of reef health. This report is the first benthic evaluation of an artificial reef through comparison to natural reefs in Grenada.

Keywords: manmade reefs; tropical reefs; Caribbean; coral reef health; benthic; marine protected area

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1. Introduction

The coastal coral reefs of southwest Grenada, West Indies, are home to multiple species of corals, sponges, algae, and fish, which all contribute to the delicate balance and beauty of the coral reefs. These ecosystems provide numerous services: nurseries for fish, coastal protection, ecotourism, and food to residents [1–5]. Many shallow-water coral reefs that are near coastlines protect the land from storm and wave-induced flooding; without reefs, damage to coastal communities can worsen during major storm systems [5,6]. In some areas, restoration of these habitats is encouraged through the implementation of marine protected areas (MPAs) and the design of artificial reefs [7,8].

The collapse of the Caribbean coral ecology. The Caribbean reef collapse is associated with loss of reef building and maintaining organisms. Elkhorn coral (*Acropora palmata*) is one of the major reef builders in the Caribbean, but its population has experienced up to 98% reduction in the last three decades due to climate change, bleaching events, runoff and pollution, unsustainable fishing, hurricanes, and diseases [9–13]. Observed first in the 1980s, long-spined sea urchins (*Diadema antillarum*) suffered a large die-off due to disease [9]. Loss of urchins and increase in fertilizer runoff shifted the reefs from coral-dominated to algae-dominated, limiting coral recruitment and further growth. Overgrowth of macroalgae also affects the health and growth rates of corals and coral recruitment, and it is commonly the result of nutrient pollution from sewage, wash water, and agricultural runoff [14,15]. The global increase in sea surface temperatures (SSTs) is correlated with an increase in coral bleaching events, including in the Caribbean Sea [16–18]. Hurricane frequency has increased because warm SSTs help to sustain hurricane formation and duration, increasing damage to reef systems [19–21].

Restoration efforts. In the early 2000s, marine protected areas (MPAs) were created to protect Grenadian coastal reefs, and enforcement of fishing restrictions began in 2010 [22]. In 2017, the Grenadian government launched a Grand Anse Marine Protected Area, making it the fourth MPA of Grenada. These MPAs are in place to protect the marine environment against overfishing, harmful recreational activities, and agricultural runoff. To mitigate or reverse some of this damage in the Grenadian reefs, several reef restoration projects are currently under development. Grassroots programs are also focused on increasing the health of the Grenadian reefs. The Grenada Artificial Reef Project' (GARP) aims to construct artificial reefs that act as nurseries for nearby ailing reefs.

Artificial reefs are used for different purposes, from reef degradation mitigation, coral and fish nursery zones, tourism zones, and coastal protection structures. Artificial reefs are suggested to increase the amount of new surface substrate for reef organisms and are reported to increase populations of tropical fish in range edges on nearby natural reefs, increasing species diversity [23]. Multiple studies have reported an improvement to fisheries due to artificial reefs because they act as a recruitment and nursery habitat for juvenile fish [24–27], but there are few studies on benthic migration efficacy or benthic health benefits for the natural reefs, acting as a secondary coral nursery. Artificial reefs have long been theorized to create a corridor between natural reef sites, serving as a secondary nursery and recruitment area, but few studies have directly examined this question in benthic terms to make a confident conclusion [28–30].

Artificial reefs are relatively easy to make, but efficacious placement depends on structure design, depth, distance from the shore, environmental and surrounding natural reef conditions, as well as wave and current conditions [28,31–33]. Various materials have been used in the creation of artificial reefs, including concrete, wood, automobiles, or retired oil and gas platforms, each with benefits and drawbacks [34]. Concrete as an artificial reef substrate, as used in Grenada, is popular due to its high compatibility with marine environments, durability, stability, ready availability, and the flexibility to create a variety of forms. It is commonly used in artificial reefs and fish habitats [28,31,35,36]. Concrete can provide an exceptional habitat for a variety of encrusting and fouling organisms to settle and grow [26], ultimately providing a location to forage and shelter for various invertebrates and fish [34]. Placed correctly, artificial reefs may be effective in protecting coastal areas from erosion caused by strong storm surges, while improper placement may unintentionally increase sedimentation, but ecological impact is an important factor in implementation, design, and placement [6,37–41].

Artificial reefs of many different designs are not new to the Caribbean; there are many attempts at constructing artificial reefs spanning 40 or more years, but many more recent reefs are involving the general public [42–45]. Civilian conservation groups are volunteering to construct and deploy artificial reefs in many locations, many times without accurate measurements of the effects on natural reefs in the area. Recording initial benthic growth and comparing with well-established natural reef studies can augment our understanding of artificial reef interactions with the natural reef habitat in Grenada. This paper describes initial benthic diversity development on privately constructed cement artificial reef structures (termed Pyramids) off the west–southwest coast of Grenada. Pyramid artificial reefs were compared to two well-studied nearby natural coral reefs in terms of their benthic communities. Collected data suggest many similarities between the natural and artificial reefs, with specific health differences in the amount of macroalgae and coralline algae. This initial comparison reports artificial and natural reef benthic development in order to augment both private and government restoration efforts of the Grand Anse reef system in Grenada. The intent is to examine the long-term effect of an artificial coral nursery on coral health in the nearby natural reefs based on this report. The hope is to encourage more civilian conservation groups and researchers to collaborate and enhance efforts to restore natural reefs in the Caribbean.

2. Materials and Methods

Study Area. The artificial reef pyramids are placed inward of the Moliniere-Beausejour Marine Protected Area (MPA) on the southwest coast of Grenada (12°1′20.3154″ N, 61°46′4.011″ W). The average depth of placement is between 3.6 and 5 m on a mostly sandy substrate with some rubble and located 60 m from shore. Northern Exposure Shallow (NES) is located 1.21 km north–northeast from the Pyramid artificial reef system (12°1′57.30″ N, 61°46′14.28″ W, average depth 8 m), and Northern Exposure Deep (NED) is located 1.8 km north of the Pyramid artificial reef (12°2′22.14″ N, 61°46′4.74″ W, average depth 10 m), located outside the MPA; both NES and NED are part of a longer MPA abundance study.

Artificial Reef Design. The artificial reef system, started in 2015, consisted of 30 hollow concrete building blocks (4 solid sides and 2 open sides—30.5 × 20.3 × 20.3 cm^3) constructed into a pyramid with equal sides (183 cm per side on the base, terracing up to a single block, a total height of 140 cm). The blocks contain alternating faces of solid and open block edges to promote coral colonization and fish habitation by surface area and hiding sites, respectively. Blocks were adhered together by cement repair adhesive (Figure 1). Reefs were deployed at 3.5 to 4.5 m depth.

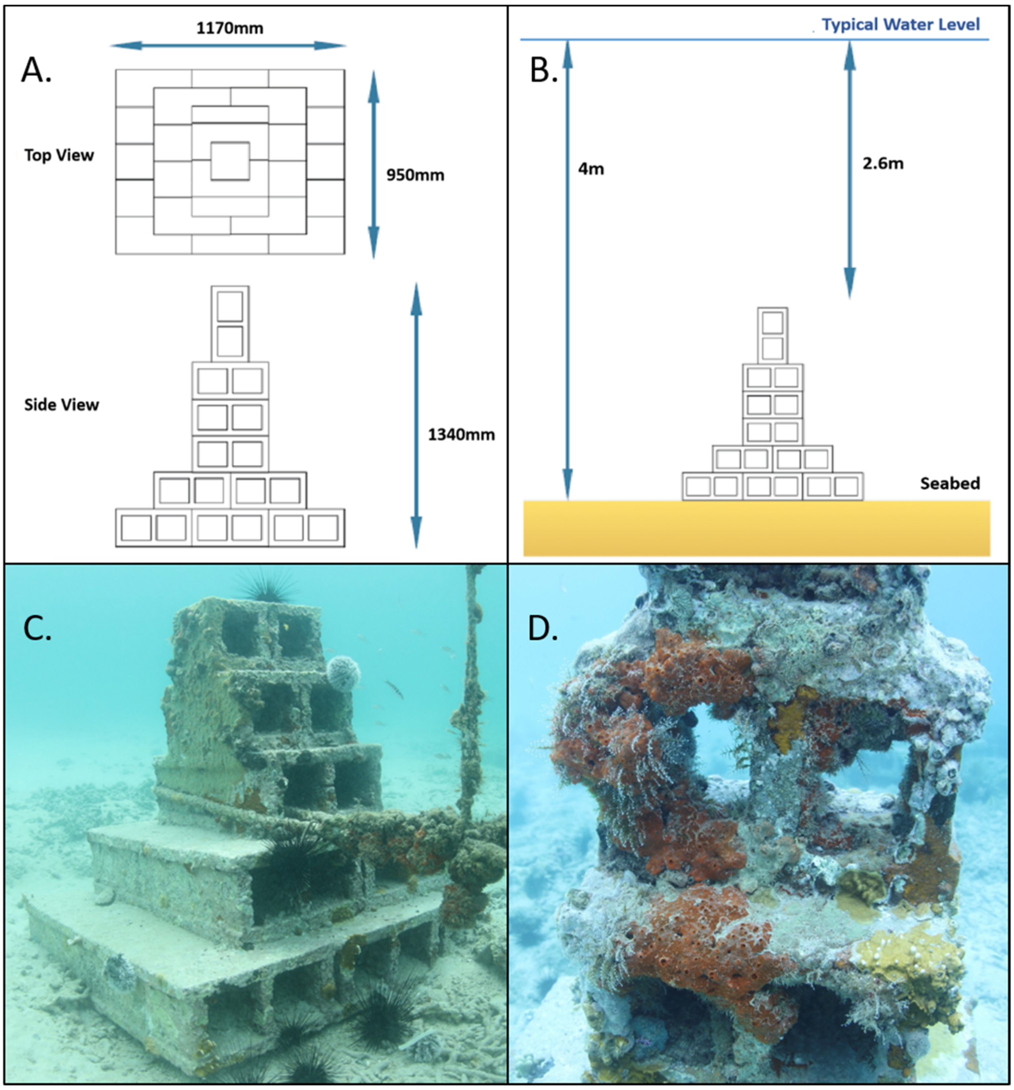

Figure 1. The "Pyramid" artificial reef design. (**A**) Schematic of the Pyramid reefs. Cement block dimensions: 30.5 × 20.3 × 20.3 cm. (**B**) Depth placement of the Pyramids. (**C**) Recently placed (less than 6 months) example Pyramid. (**D**) Example picture of data collection on Pyramid.

Recording Equipment. Video and photos were taken of each side of the surveyed pyramids with underwater cameras and video recording equipment. A Canon Digital 400D Rebel XTi 10.1MP SLR (Canon, Ōita, Japan) with a Sigma 15 mm f/2.8 EX DG Fisheye Autofocus lens (Sigma, Asao-ku, Japan) was used for photography, inside an Ikelite camera housing with E-TTL circuitry and an Ikelight DS-125 TTL external strobe (Indiana, USA).

Natural Reef Benthic Surveillance and Analysis. Due to international COVID travel restrictions, subsequent surveillance collections were not allowed between 2020 and 2022. Annual benthic surveillance of NED and NES sites was conducted using a protocol described previously [22]. Briefly, the substrate composition of NED and NES reef systems was surveyed with the Photo Quadrat (PQ) and Point Line Intercept (PLI) methods. Briefly, four sets of permanent anchors were used at each site to attach a measuring tape in a straight line between each pair of anchors, called a transect. Four 30 m permanent transects were surveyed at each of the two natural reef (NED and NES) locations. Each year, these transects are used to determine the benthic growth and diversity directly adjacent to the transect line. Data sampling occurred at ~6.5 m depth for NES and ~8 m depth for NED. Pictures were taken at a standard distance by using the calibrated distance PVC wand and measurement tape as reference points for the computer program. Coral Point Count with Excel extensions (CPCe v.3.6, Nova Southeastern University, Florida, USA) generated a 20 cm by 20 cm square, superimposed on the image, and created a randomized sampling within each picture (60 pictures per transect) [46]. The PLI method [47] estimated the relative abundance of major types of substrate cover commonly associated with the coral reefs in Grenada.

These photos were uploaded by reef and transect number (one through four) into Coral Point Count with Excel extensions (CPCe) [46], with adapted identification codes [22,48], and uploaded into the program for identification. The code consisted of 17 subcategories under eight umbrella categories for groups of organisms known to inhabit Caribbean coral reefs: coral (separated into morphology types, with massive, fire, plate, encrusting, and branched subcategories), Alcyonacea, algae (macroalgae or turf algae subcategories, only those visible by eye or photograph), sponge (erect or encrusting subcategories), cyanobacteria, mobile invertebrates, substrate, and technical issue (inability to identify due to shadows). When each point was categorized, the data were reported in a spreadsheet consisting of the total number of points for categories and used for statistical analysis. In total, each transect consisted of 60 pictures with 10 randomized data points to categorize, resulting in 600 data points for each transect and 2400 possible data points per natural reef. After confirming the similarity in a site, the data from the four transects in each category for the respective reef were averaged. These average populations in each category for each reef were used for comparison against the other reef and the artificial reef to determine similarity using a one-way ANOVA test.

Artificial Reef Surveillance. In May 2018, divers participating in the annual survey of the Marine Protected Areas, specifically, Northern Exposure Shallow (NES) and Northern Exposure Deep (NED), also collected data on the two artificial reef Pyramids. The Pyramids were examined due to their time of placement (~2 years), based on previous reports of initial coral colonization on concrete structures [49]. Pictures were collected of each brick on all four sides of the Pyramid for Coral Point Count with Excel extensions (CPCe) analysis later, using the same equipment described in the Recording Equipment section. Pyramid faces with solid-sided cinderblocks had the 17 × 17 cm^2 square placed consistently in reference to the size- and distance-calibrated PVC wand (the same wand described in Natural Reef Benthic Surveillance). On the open-sided faces of the Pyramids, each open hole was numbered consistently from left to right and top to bottom. Digital photographs and videos were later used for the benthic analysis of this artificial reef.

Artificial Reef Abundance Analysis. Photos from 2018 were used for analysis. Pictures were taken at a standard distance by using the distance-calibrated PVC wand. These photos were uploaded by Pyramid number (one and two) into Coral Point Count with Excel extensions (CPCe) [46], with the same identification codes as used above (See Natural Reef Analysis above). The calibrated wand was used for consistent distance of photography, and the known sizes of the cement blocks were used to create a consistent 17 cm × 17 cm square in each of the photos. Based on the aligned square, the program randomly plotted 10 data points. Each computer-selected point was then manually identified as 1 of 17 subcategories of benthic organisms, as mentioned in the natural reef analysis (above).

To determine if the Pyramid benthic categories for both Pyramids could be merged and compared as a whole to the natural reef data, a one-way ANOVA was performed. The benthic organisms for each photo were totaled for each of the pictures of construction blocks making up the side of the pyramid. Since there were 11 photos with 10 randomized areas picked, each photo had a potential for 10 identified organisms (total of 110 total possible categorized organisms per pyramid side), although many times there were no organisms identified on the randomly selected area. These 11 groups of total benthic organisms per pyramid side were compared to the totals per block of benthic organisms for the other three sides of the pyramid. These total benthic organisms per side of the pyramid were compared via one-way ANOVA to determine any significant differences. The Pyramids' average total organisms per pyramid were then compared via a separate one-way ANOVA to determine if the data from both Pyramids could be merged and treated as one "reef".

Once statistical similarity between the pyramids was established, the total benthic numbers for the two established pyramids were used, treating the two as one 'reef' for comparing to the two nearby reef systems. The total amount of organisms in each category for the Pyramids was used to compare to the two closest natural reefs: Northern Exposure Shallow and Northern Exposure Deep. A one-way ANOVA was calculated for each benthic category separately to determine statistical significance among the three reefs (NED, NES, Pyramids). GraphPad™ statistical analysis software (GraphPad Software, San Diego, CA, USA, www.graphpad.com) was used for preparation of data analysis and figure design.

3. Results

3.1. Coral

Total coral amounts and subcategory coral did not significantly vary between NES and NED. In order to compare the Pyramids to the local natural reefs (NES and NED), the multiple transect reports from each reef location were averaged. These averages in each category represented the amount of each benthic organism type found at each reef. ANOVA (one-way, $p = 0.01$) comparison of each benthic subcategory demonstrated that there were no significant differences in coral types between NED and NES (Figure 2).

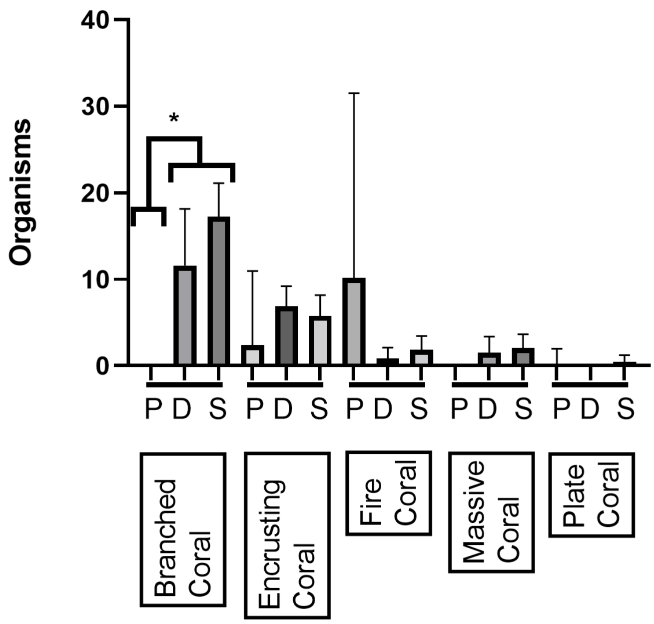

Figure 2. Comparison of major coral groups for Pyramids (P), Northern Exposure Deep (D), and Northern Exposure Shallow (S) Reefs. One-way ANOVA was performed for a comparison of each organism category, comparing the Pyramids, Northern Exposure Deep, and Northern Exposure Shallow. Star (*) and calculated p value designates statistically significant differences ($p = 0.001$) in organisms between designated reefs.

Since these artificial reefs are in a tidal zone, there was a concern that different sides of the Pyramid (shore versus deep-water sides) may have differences in organism growth.

Both Pyramids demonstrated no statistical difference among the four sides via ANOVA, demonstrating that each side for a Pyramid could be considered a repeat data collection, and averaged as the representative organisms for each Pyramid, similar to a transect line on a natural reef.

Since there was up to 6 m distance between the Pyramids, a second ANOVA determined that the Pyramids had no statistically significant differences between them. For comparison to the natural reefs, the total numbers from both Pyramids were averaged and treated as one 'reef' going forward, similar to the averages of four distanced transect lines' data representing the average benthic organism population of each natural reef.

Coral subcategory average data for all three sites (NED, NES, Pyramids) were compared. The ANOVA analysis did not find a significant difference in most of the coral types, except for branching coral ($p = 0.001$) (Figure 2).

3.2. Sponges

Few erect sponges were detected at any of the three sites (Figure 3). Encrusting sponges were reported in a significant 5.5-fold increase ($p = 0.005$) at the Pyramids versus either natural reef.

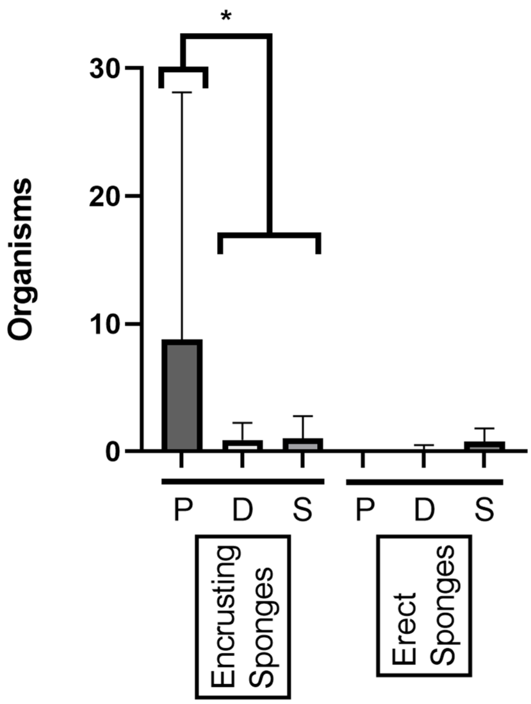

Figure 3. Comparison of major sponge morphology groups for Pyramids (P), Northern Exposure Deep (D), and Northern Exposure Shallow (S) Reefs. One-way ANOVA was performed for a comparison of each organism category, comparing the Pyramids, Northern Exposure Deep, and Northern Exposure Shallow ($p = 0.005$). Star (*) and calculated p value designates statistically significant differences in organisms between designated reefs.

3.3. Algae and Cyanobacteria

Cyanobacteria were 102 times more abundant by percentage at NED than the Pyramids. Cyanobacteria were documented with a lower abundance in NES than in NED; however, cyanobacteria were at a significantly higher ratio than the nearby Pyramids ($p = 0.0001$) (Figure 4). Among all locations, algae were the most abundant major category. At NED and the Pyramids, macroalgae represent 36% of the total algae reported at NED, but only 3.5% at the Pyramids. Macroalgae at NES were observed at a similar abundance when compared to NED, maintaining a large contrast to the low values found at the Pyramids ($p = 0.0009$) (Figure 4). There was a significantly ($p = 0.0007$) greater quantity of coralline algae at the Pyramids than at NED or NES: coralline algae accounted for 46% of the algae at the Pyramids.

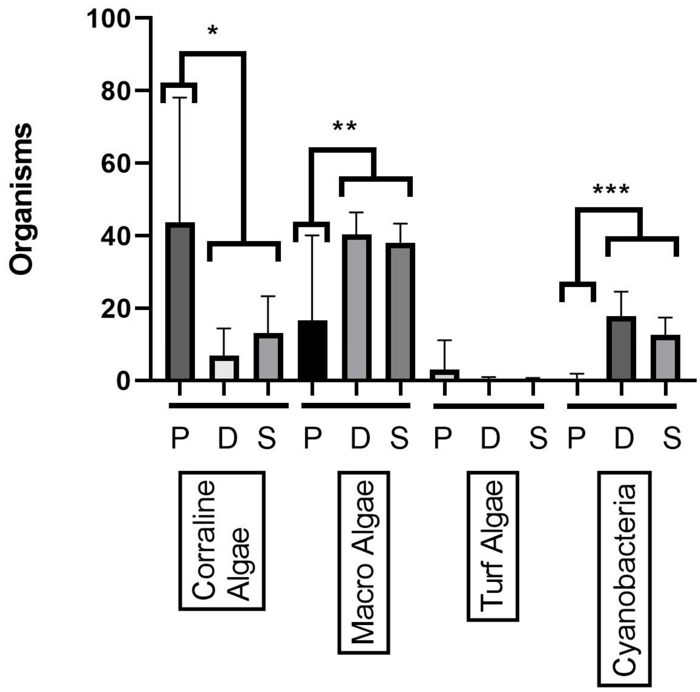

Figure 4. Comparison of major algae and bacterial groups for Pyramids (P), Northern Exposure Deep (D), and Northern Exposure Shallow (S) Reefs. One-way ANOVA was performed for a comparison of each organism category, comparing the Pyramids, Northern Exposure Deep, and Northern Exposure Shallow. Stars (*, **, ***) and calculated p value designates statistically significant differences (p = 0.0007, 0.0009, 0.0001, respectively) in organisms between designated reefs.

4. Discussion

Artificial reefs are increasingly used to augment and resupply nearby natural reefs [50]. This research describes the first attempts at developing a unique artificial reef nursery for the island of Grenada. Due to the cement block construction, the Pyramid artificial reef design balances between the external and internal surface area while providing an ideal attachment surface for coralline algae and coral larvae [13,28,35,51]. Previous research has suggested that a high internal-to-external surface area provides balanced artificial reef organism recruitment [52] and that varied height by stacked rocks increased fish recruitment [53]. Variation in the complexity and size of internal structure, like the cement blocks used here, allows ontogenic habitat shifts in fish [35]. Many of the artificial reef attempts in the Caribbean over the past 40 years have used rubble rock, cement balls, or sunken ships, but none reported having used a stacked and terraced cement pyramid design [42].

Coral. Annual long-term health evaluations of the local reefs provided the possibility to compare these to a private citizen-driven artificial reef initiative. NED and NES, the two closest natural reefs, are part of a yearly benthic population study, making this a unique opportunity to observe a new variable added to the local reef community. Similar subcategory types of coral to the nearby natural reefs were observed, suggesting, with limitations, that the artificial pyramid reefs were seeded similarly to the well-established reefs nearby. This similarity has been reported in successful artificial reef placement as a sign of long-term stabilization of natural reef health [54].

While the Pyramids did contain a relatively high abundance of coral, there was little subcategory diversity; a large amount was fire coral (*Millepora* spp.). *Millepora* is an early colonizer due to its large range of established depths (1–40 m), spreading due to storm damage fragmentation, soft tissue regeneration due to mechanical damage, and the ability to start out as an encrusting coral before developing a more erect outline [55]. Fire coral species are reported to quickly overgrow other species of true coral, as well as outcompete corals due to a high fecundity [56], so it is expected fire coral would be an initial colonizer of new substrate. While fire coral dominated the coral found on the Pyramids in Grenada, much older artificial reefs in St. Eustatius (Eastern Caribbean) contained very decreased amounts of fire coral compared to nearby natural reefs, along with decreased species diversity [57]. Future research will focus on the dynamics of new coral species interacting with already established *Millepora* colonies, and specific species identification of hard and soft coral. There are reports of *Acropora* sp. colonization bias in shallower artificial reef systems, raising concerns of species bias if the Pyramids will truly function as a secondary coral nursery [58,59]. Other research has found that coral cover is highest in depths of 3–5 m and declines with increasing depth; however, there is little variation in coral genera across these studied depth ranges [60]. The placement of the Pyramids is in depths of 3–6.5 m, which is seemingly an adequate depth for successful coral recruitment and coral cover. Still other analyses suggest that the depth of artificial reef placement does not affect coral recruitment as much as placement along high coral dispersal areas [61].

Coral ratios between the natural reef and Pyramids are similar, even though the Pyramids are relatively new, suggesting that benthic seeding is similar between the natural and artificial reefs. Artificial reef coral recruitment is a significant concern, not only for a potential unbalanced seeding of coral types for natural reefs [60,62], but also through uneven recruitment of coral-associated fauna (CAF), specifically observed on artificial reefs in the Caribbean [30]. There are not enough data currently to determine if these Pyramids will act as a secondary nursery and conduit to the natural reefs, as other artificial reefs have been reported for various fish species [63,64], but the coral recruits seem to have less harmful competition, which is assumed to lead to healthier coral colonies. Artificial reefs seem to be the most successful generally as a way to replace specific species or to increase the overall mass of coral in the area [65], so time will tell if coral cover increasing on the Pyramids will accentuate growth on the natural reefs in the area. Annual evaluations of the benthic community in the Pyramids will help determine the longevity of successful coral colonization and will provide important baseline data on how artificial reefs will affect Grenadian rehabilitation of natural reefs surrounding the island.

Sponges. Encrusting sponges were found to be the dominant sponge category at the Pyramids. While statistically significant, others have reported increases in erect sponges in a depth-dependent way, suggesting a selection in growth and colonization due to tidal wave action [66]. The lack of erect sponges is supported by reports of other young (>3 years) concrete artificial reefs, where only encrusting sponges were detected [67]. Sponges previously were considered a 'fouling' species, which many times prepare the area for coral colonization [68], but some recent data suggest they may reduce coral recruitment through space competition [69,70]. Still other artificial reef studies have reported a more cyclical nature of colonization: initial colonization by sponges and subsequent decrease in populations as more soft and hard coral groups colonized [71]. No boring sponges were reported at the Pyramids. Nearby natural reefs are also heavily populated by boring sponges, which can damage the physical structure of reefs [72,73]. Boring sponges can account for at least 70% of bio-erosional damage to coral skeletons [72] due to their ultimate ability to dissolve part of the carbonate in the skeletons through a chemical attack [74,75]. The lack of boring sponges at the Pyramids is an important health marker for coral development, although it is acknowledged that the size and age of the coral recruits may be a significant factor in the colonization of boring sponges, so caution keeps us from declaring no data in this category a sign of health.

Algae and bacteria. The natural reef benthic community demonstrates similarity to the artificial reefs; however, some aspects of the Pyramid suggest a healthier benthic trend compared to the natural reefs. Organisms such as corals and crustose coralline algae promote overall health, while macroalgae and cyanobacteria are commonly discussed as negative impacts to coral health, as they inhibit coral recruitment [76,77]. Coralline algae act as an important reef builder by bringing reefs together and encouraging larval deposition [78]. The calcareous substrate that some species of coralline algae provide is an exemplary place for coral recruitment and metamorphosis [59,79]. The coralline algae recruitment mechanism to artificial reefs is still an area of research; some have hypothesized that recruitment varies by the pH of the cement formation, but recent substrate evaluation suggests more porous substances increase biofilms and therefore recruitment [80]. Specific species of bacteria that create biofilms demonstrated the ability to greatly increase colonization in certain coral species in vitro, suggesting that seeding the correct bacteria on the artificial reef may be more important than the composition itself [81]. Heavily seeding the appropriate bacteria on the surface of newly deployed artificial reefs would test this theory in marinis.

Both natural reefs in this study contained populations of macroalgae and cyanobacteria that were significantly larger than coralline algae, suggesting unhealthy conditions for populations of coral. In comparison, the pyramid reefs contain relatively few macroalgae or cyanobacteria, suggesting a healthier reef system. The increase in coralline algae and considerable lack of macroalgae suggests that the Pyramids are a permissive area for recruitment and growth of young corals. Observations of macroalgae on artificial reefs have varied widely in publications; some artificial reef studies have reported macroalgae populations increasing in the area of the artificial reef, especially when deployed during high sporulation times [71,82]. This difference in macroalgae populations to published data may be due to differences in herbaceous organism populations that control the macroalgae. Higher levels of *Diadema* spp. and herbaceous fish were associated in other reports with low abundance of macroalgae [83]. Previous research has described protected areas and reefs promoting an increased concentration of healthy herbivorous reef organisms, which positively alter the reef macroalgae composition [84,85]. *Diadema* spp. populations among the three sites were not significantly different, but herbaceous fish populations will be examined in the future to determine the reasons for differences in macroalgae between the reefs.

5. Conclusions

There are fewer benthic reports on similar shallow-water artificial reef projects in the Caribbean. Previous reports have observed similarities between artificial reefs and nearby natural reefs [86] but have mostly focused on fish species. Artificial reefs act as a buffer system for natural reefs, providing safe environments for coral recruits to grow; they create a connection between natural and artificial reefs [54]. Successful support of natural reefs by artificial reefs has been reported in both populations of invertebrates and zooplanktivorous fish [26,87,88]. It is likely that this observed interaction is not all beneficial or constant in different locations, so research on the effects of artificial reefs in each location is necessary to determine if there are benefits and no harmful effects on the local natural reefs. Civilian volunteer groups are initiating many artificial reef projects worldwide, raising concerns in the scientific and international communities about determining standards for effective artificial reefs [54,89–92]. Comparison to nearby reefs can provide comparable data on the benefits or harm of a particular artificial reef program aimed at reef restoration. Here, we describe the initial use of artificial reefs in a shallow-water environment around Grenada, with positive health signs that may in the future positively stabilize local natural reef systems. Expansion and comparison of this project on different islands in the Caribbean may divulge more information on using this type of artificial reef in shallow water specific to this area.

Author Contributions: B.L. (Wisconsin Lutheran College alumni) contributed to formal analysis, data collection and investigation, and writing—original draft preparation. P.S. contributed to pyramid design and site placement, coordinating resources on site, investigation/data collection, as well as supervision. J.S.H. contributed to conceptualization and methodology for examination of the site, data collection/investigation, writing—original draft, as well as editing and project administration. All authors have read and agreed to the published version of the manuscript.

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Informed Consent Statement: Not applicable.

Data Availability Statement: Supporting data can be found at Open Science Framework, https://doi.org/10.17605/OSF.IO/AFDGT.

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Conflicts of Interest: The authors declare no conflicts of interest.

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