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AT THE WATER'S EDGE - AWE

Working with coastal communities to enhance their resilience to the impacts of climate change, with the use of nature-based solutions

Grenville Bay Area - Grenada
(Telescope, Grenville, Soubise and Marquis)

Telescope Bay © Marjo Aho

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At the Water's Edge - AWE

At the Water's Edge or AWE, is a multi-year project utilizing coastal resilience approaches to demonstrate innovative, cost effective solutions to address coastal climate impacts on the island of Grenada. The solutions are scalable, and can be replicated by other Small Island Developing States (SIDS) contending with similar climatic issues. AWE's main goal is to **work with coastal communities to enhance their resilience to the impacts of climate change, using ecosystem based adaptation (EbA) or nature-based solutions,** alternatives to traditional grey infrastructure.

Implemented through two major components; a Socio-Economic (non-structural) and a Reef (structural) Component, AWE's Living Edge Plan; a series of linked actions with policies to strengthen coastal communities' resilience, was developed in collaboration with the targeted communities, local and international partners and government agencies. Grounded in sound science, AWE builds upon the Government's articulated strategies for climate adaptation and mitigation, while also addressing specific Sustainable Development Goals.

Location: The Grenville Bay Area - GBA (The communities of Telescope, Grenville, Soubise & Marquis)

The Main Issues: The northern barrier reef within the Grenville Bay has deteriorated significantly over the years, due to erosion and other natural and human influences. Evidenced by a substantial decrease in the reef's height, it now has well below 10% live coral cover, the minimum necessary for natural reef regeneration. As a result, this reef, the coastline's first line of defense specifically responsible for the reduction of wave energy arriving at Telescope's shores, is unable to function as it should.

This has left residents grappling with the impacts of severe coastal erosion, which has been increasing steadily by approximately 65cm coastal loss per year, threatening lives, homes, and critical infrastructure such as roads.

Coastal Erosion in Telescope © Shawn Margles

Northern Reef Grenville Bay © TNC

AWE Solutions: 1. Mangrove Restoration and Beach Revegetation, 2. Reef Re-Engineering.

Alternatives: Take No Action. The cost of which exceeds that of the solutions.

Current Status: 1. Mangrove Restoration and Beach Revegetation *(on-going)* 2. Reef Re-Engineering *(Parts 1 and 2 of 3parts- completed*). This brief focuses on **2. Reef Re-Engineering**

Reef Re-Engineering of the Northern Barrier Reef in Grenville Bay:

Part I - Scoping and Design: Using 50+ years of data for the Grenville Bay, the proposed innovative hybrid structures and their placement were modelled intensively, (by IH Cantabria, one of only three institutions in the world with the requisite capacity to generate said models) and designed to ensure that once placed, the hybrid reef will fulfill the following criteria:

- reduce 80-90% of the wave energy passing over it
- could be built with small boats and local community labor
- promote natural biological growth and accretion of coral and crustose coralline algae (CCA)
- be constructed with common local materials at a cost less than that of a traditional grey infrastructure

Environmental Benefits: The complete Reef Re-Engineered hybrid breakwater structures (Full Build-Out) will reduce 80-90% wave energy and alongshore currents, thus reducing erosion and run-up flooding at the beach. As the structures are seeded with corals and become reefs, they will grow and maintain their function, while increasing fish and other vital marine life in the bay.

Installed Pilot Structure with Corals 2015 © TNC

Pilot Structure 2016 © TNC

Socio-Economic Benefits: Increased fish populations - more fish available to fishers, enhanced food security, increased economic activity within the community.

Part II - Reef Re-Engineered Hybrid Pilot Structures: In 2015, 30 meters of hybrid pilot structures were installed on the northern reef, funded by the Federal Foreign Office of the Government and People of Germany, for approximately **$500,000EC**. These funds were used for construction only, and spent within the communities for purchase of rocks from the neighboring quarry, materials from hardware stores, hiring of welders to construct the steel gabion baskets, hiring of truckers, boat operators, preparation workers, and 12 Fishers; the local labor used to install the structures on the reef and delineate them with safety markers. 95% of the labor for this aspect of AWE has been sourced from the targeted communities.

Part III - Full Build-Out: The full installation of 300 meters, will see a tenfold increase to the pilot's economic activity within the area. Approximately $**5,000,000EC** will be spent on materials and labor within the communities, exclusive of the money earmarked for yearly monitoring activities.

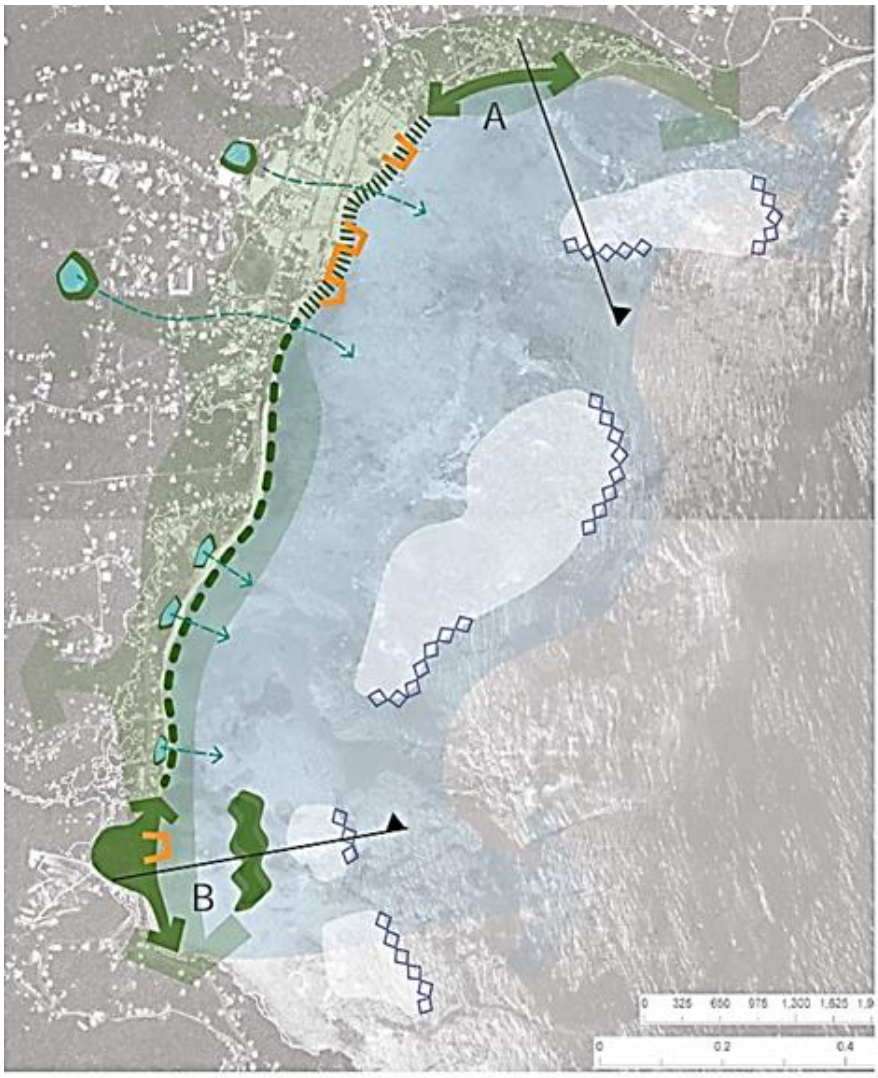
The Conservancy's (TNC's) Commitment to the Government and People of Grenada: With a cadre of 3000+ employees (coastal engineers, marine restoration scientists, coral restoration experts, urban planners, policy makers amongst others), the Conservancy through its vision; **A resilient Caribbean where people and nature thrive,** is committed to continue working with the Government and People of Grenada to increase resilience to the impacts of climate change, to conserve and strengthen marine areas, and build capacity for sustainable environmental management through AWE and other on-going initiatives such as CCI and ECMMAN.

With the AWE project, the Conservancy is again underscoring its commitment to Grenada. Originally envisaged as a 5-year pilot project, AWE is currently entering its seventh year, working in tandem with government agencies and the targeted communities, particularly the community of Telescope to ensure that project objectives are achieved for the betterment of Grenada's coast, and those who live and depend on it. We are here for the long-haul.

- The successful hybrid pilot has been monitored by TNC and the Fishers since its installation. They are stable, are attracting a plethora of marine species such as lobsters, conchs (Lambie), sea urchins and blue spotted stingrays, to name a few, they are reducing wave energy to the extent expected of the small pilot scale structures (~10%) and, recruiting corals.
- The full buildout will see increased collaborations and partnerships with communities, government agencies, educational institutions and others, to implement coral protection and restoration strategies through the use of advanced technologies, (Mote Labs) promoting enhanced coral growth on the reefs.
- As done for the Pilot, funds will also be set aside by TNC to address incidentals for the full buildout. The Conservancy is committed to monitoring the installed structures for a period of 10 years, using both TNC Scientists and trained community members, after which, the hybrid structures would be sufficiently encrusted with CCA and overgrown with coral, thereby becoming part of and, once again performing the functions of a natural barrier reef.

ANNEX:

AWE'S Living Edge Plan: - ***Marrying Grenville Bay's Greenway and Blueway***



"Living Edge"

Strengthen coastal community resilience through a series of linked actions and policies.

Site-Specific Actions

Upstream

Stormwater ponds
- many small ponds form whole system
- reduces peak storm flows
- creates more steady downstream flow improving vegetated edges of stream
- vegetated border provides filtration, habitat, and lower water temperature

Water's Edge

Shoreline pilot project

A Telescope Beach public waterfront
- beach grading and planting
- public amenities

B Soubise waterfront enhancements
- shoreline revegetation
- fishing related facilities

Urban shoreline improvements

Public/private greenway

Resilient fishers infrastructure
- stable permanent structures
- allow for safe boat storage and repair
- allow for stabilization of adjacent shoreline

In the Bay

Mangrove planters
- create habitat
- protect shoreline

Selective reef enhancement
- help adapt to changing conditions
- help buffer wave action for inner bay

****** The Resilient Fishers Infrastructure outlined in the Living Edge Plan will be realized under **Resilient Islands:** *Integrating Ecosystem- and Community-based Approaches to Enhance Climate Change Adaptation in the Caribbean.* Resilient Islands is being implemented in 3 Caribbean countries of which Grenada is one, over a five year period (2018-2022). It is funded by the Government of Germany.