UWI
ST. AUGUSTINE CAMPUS

BEYOND 5
FROM THE CARIBBEAN FOR THE WORLD

# BRIDGING ACADEMIA AND ACTION:

## ADVANCING PARTNERSHIPS FOR SDG 14, KNOWLEDGE-SHARING, AND OCEAN LITERACY

UN OCEAN CONFERENCE
VIRTUAL SIDE EVENT ON SDG 14

13 JUNE 2025 |
14:00 - 15:30 CEST


INTERNATIONAL ASSOCIATION OF UNIVERSITIES
UNIVERSITAS BERGENSIS
UNIVERSIDAD DE COSTA RICA
International Science Council

Presented by **Deborah Villarroel-Lamb**

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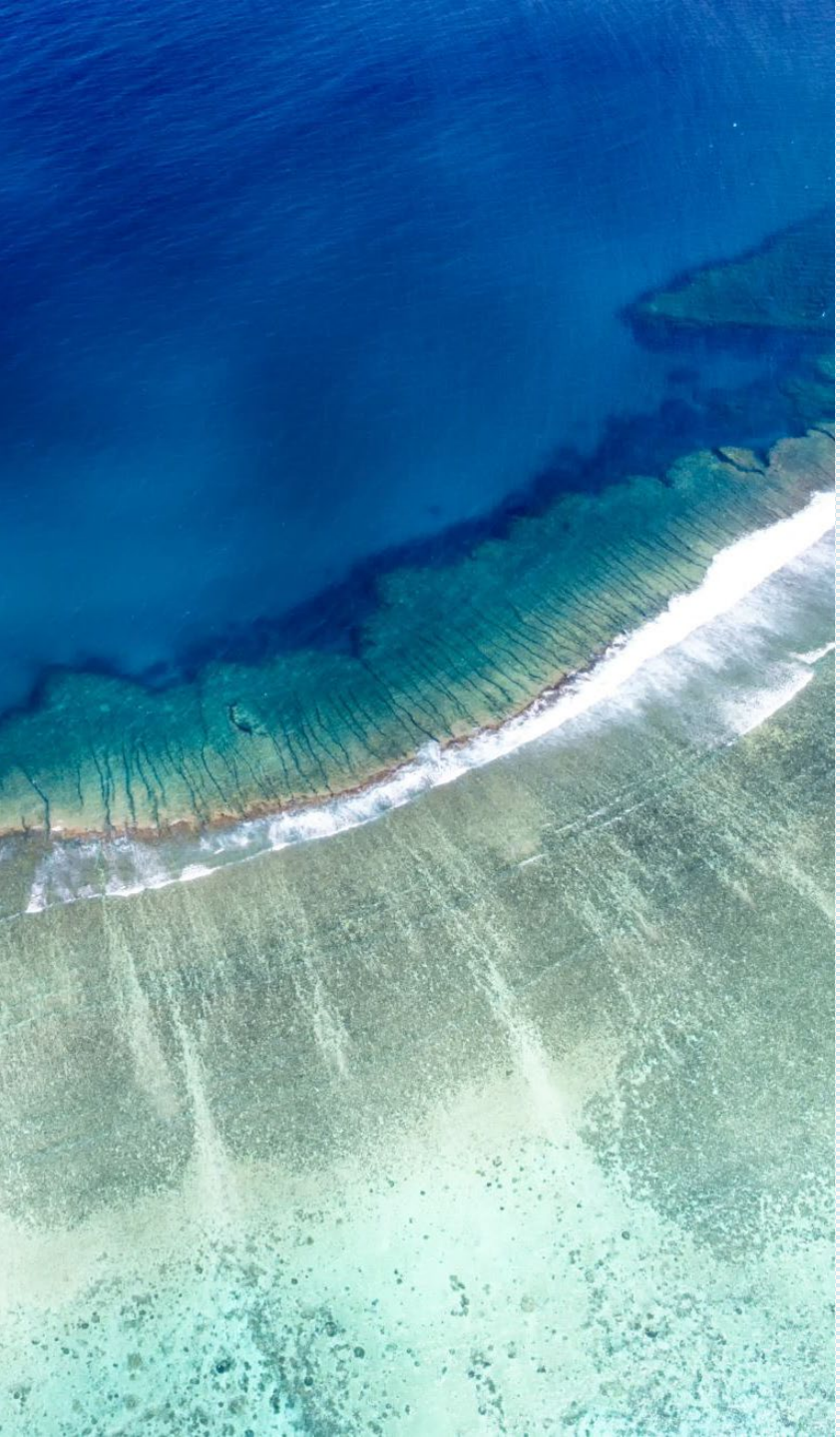
# A little bit about the UWI…

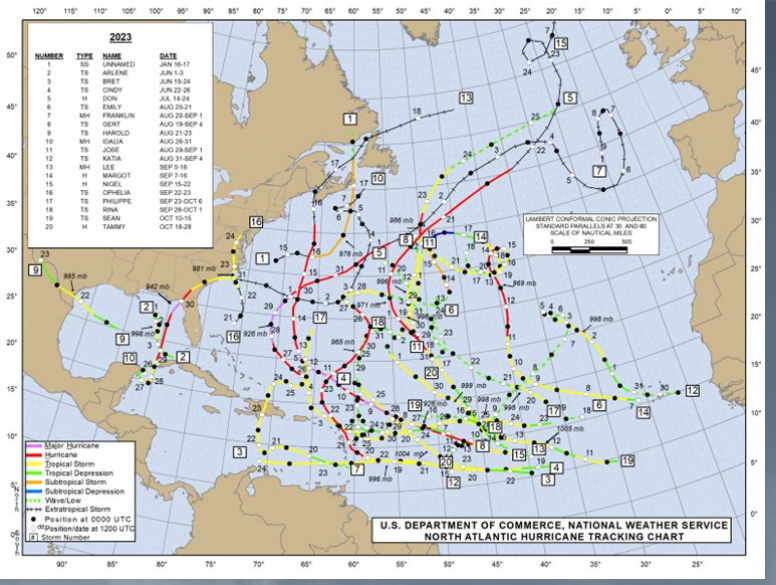

- The University of the West Indies is the main tertiary level institution in the English-speaking Caribbean
- There are four main campuses (Mona, Jamaica (1948); St. Augustine, Trinidad & Tobago (1960); Cave Hill, Barbados (1962); Five Islands, Antigua & Barbuda (2019));
- Global Campus (42 site locations of the Global Campus in the region, serving 16 countries in the English-speaking Caribbean)



# Some Caribbean Perspectives…

- The Caribbean Sea has a high level of biodiversity which includes fishes, mammal species; ~ 14% of world's coral reefs are found in the wider Caribbean
- The Caribbean Sea produces 170 million tons of oil every year - one of the largest oil-producing regions in the world.
- Overall population is over 30 million, with a density higher than 300/km$^2$ in some areas

(Arias-Isaza, 2003)



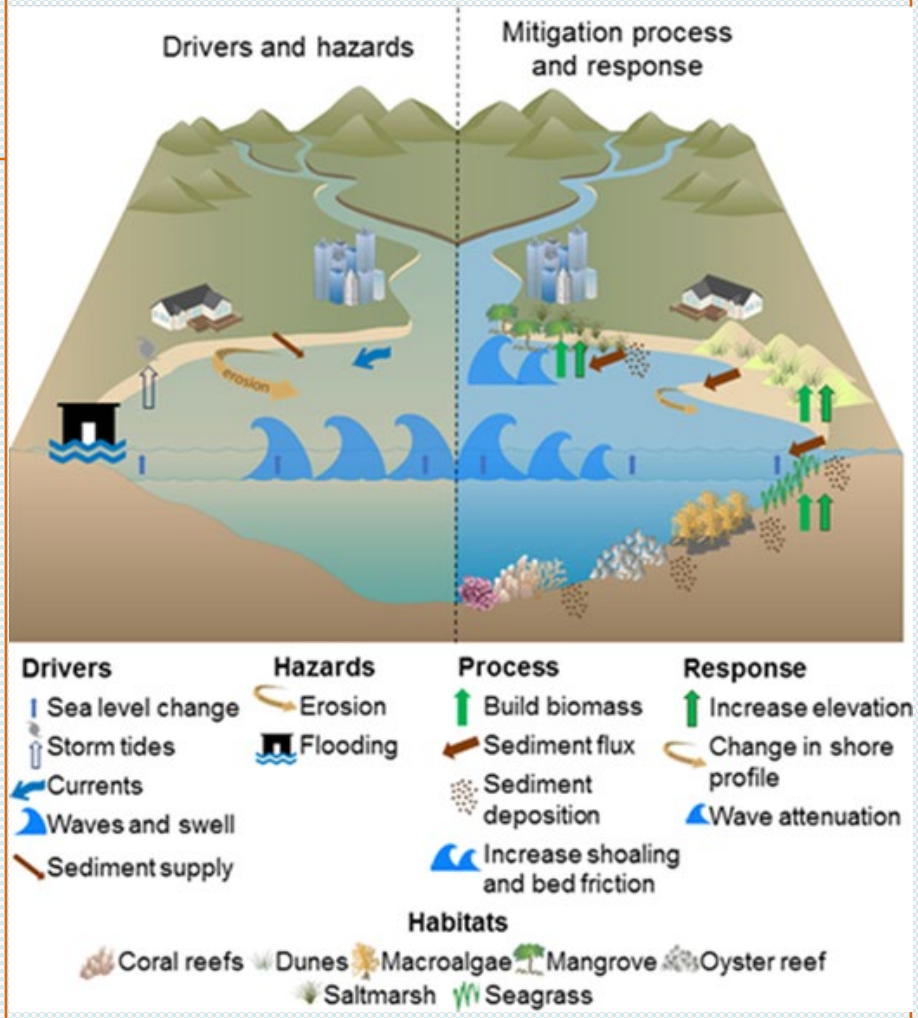

# Coastal Hazards & Climate Change Considerations

- ❑ Storms/Hurricanes/Tsunamis
- ❑ Coastal Erosion/Coastal Flooding
- ❑ Climate Change Issues
  - ❑ Sea Level Rise
  - ❑ More severe storms
  - ❑ Greater frequency of storm events

# The Problem…. a coastal engineering viewpoint

- Many varied and important functions in the coastal zone
- Increased pressure on coastal environments
- Improved need for greater scientific understanding and collaborative engagements for optimal solutions
- Limited human, technical and financial resources
- Etc…

Extracted from Morris et al. 2018



# Achieving Coastal Resilience - Some Opportunities

**Sustained Training/Education in key areas, e.g.,:**

- ❑ To improve local technical capacity to hazard/disaster mitigation strategies which then improves resilience
- ❑To sensitize decision makers to more state-of-the-art or optimal options (move away from reliance on hard engineering only)
- ❑Promote alternative methods (more cost-effective and sustainable) to augment the necessary scientific data
- ❑Increase awareness of the short-/medium-/long-term impacts of poor decisions in the coastal areas
- ❑Augment Collaborative Engagements with diverse local, regional and international stakeholders

# For Example - Departmental Coastal Teaching

- Dr. Compton Deane's contribution during 60's,70's and 80's.
  - He started a Caribbean-wide research programme on beach erosion; He completed a postgraduate diploma in hydraulic engineering at Delft University in the Netherlands. In 1962, he joined the Department where he lectured in surveying and hydraulics; In 1966, he went to Japan to learn about tropical beach erosion and he went on to work as a specialist consultant to various public and private organisations throughout the Caribbean for the next two decades; From 1970 to 1973, he also served as Project Manager of UWI's Regional Beach Erosion Control Programme. He became a regional expert in the field. After his retirement from UWI in 1987, no formal coastal teaching or in-depth research at the Department
- In 2001, a series of short courses conducted across the islands of the Eastern Caribbean to increase awareness of coastal issues evolved into the development of an undergraduate module and graduate programmes in the Department circa 2003

# What are we doing at the UWI?

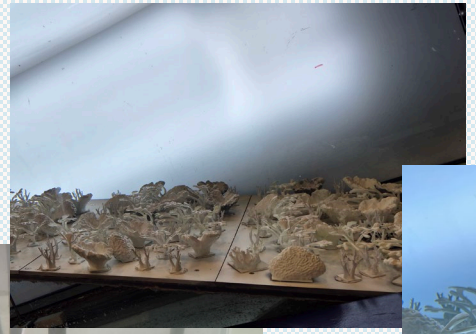
## Investigation into the impacts of the characteristics of vegetation on wave reflection and wave energy dissipation.

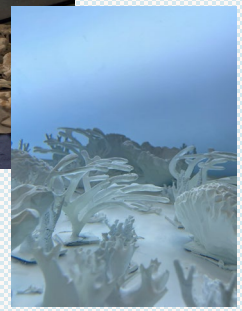
| Wave Condition No. | Wave Amplitude (m) | Wave Frequency (Hz) |
|---|---|---|
| 1 | 0.01 | 0.70 |
| 2 | 0.01 | 0.80 |
| 3 | 0.01 | 0.90 |

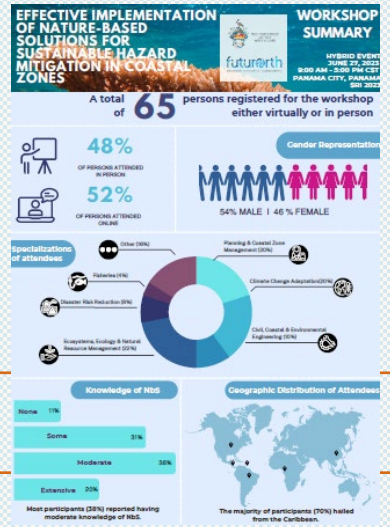
| Experiment No. | Description |
|---|---|
| 1 | Control (no stems) |
| 2 | 12" stems (100% max packing density) subaqueous & subaerial zone |
| 3 | 12" stems (50% packing density) subaqueous & subaerial zone |
| 4 | 12" stems (25% packing density) subaqueous & subaerial zone |
| 5 | 12" stems (100% max packing density) subaqueous zone |
| 6 | 12" stems (100% max packing density) subaerial zone |
| 7 | 8" stems (100% max packing density) subaqueous & subaerial zone |
| 8 | 8" stems (50% packing density) subaqueous & subaerial zone |
| 9 | 8" stems (25% packing density) subaqueous & subaerial zone |
| 10 | 8" stems (100% max packing density) subaqueous zone |
| 11 | 8" stems (100% max packing density) subaerial zone |
| 12 | 4" stems (100% max packing density) subaqueous & subaerial zone |
| 13 | 4" stems (50% packing density) subaqueous & subaerial zone |
| 14 | 4" stems (25% packing density) subaqueous & subaerial zone |
| 15 | 4" stems (100% max packing density) subaqueous zone |
| 16 | 4" stems (100% max packing density) subaerial zone |
| 17 | 2" stems (100% max packing density) subaqueous & subaerial zone |
| 18 | 2" stems (50% packing density) subaqueous & subaerial zone |
| 19 | 2" stems (25% packing density) subaqueous & subaerial zone |
| 20 | 2" stems (100% max packing density) subaqueous zone |
| 21 | 2" stems (100% max packing density) subaerial zone |

# NBS-ENGROSSED



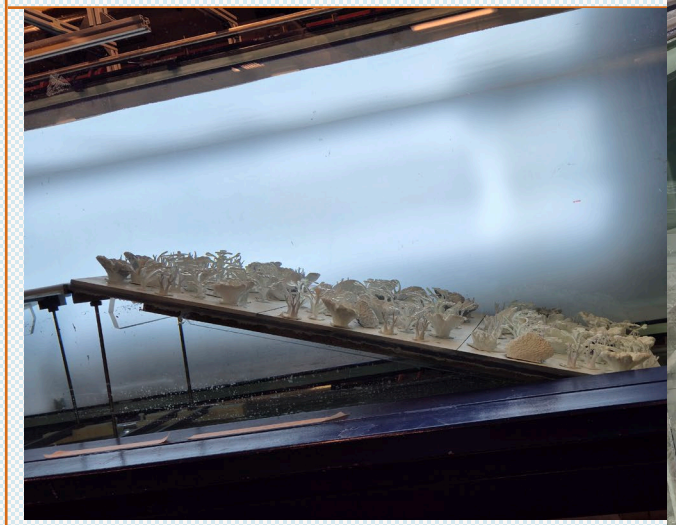


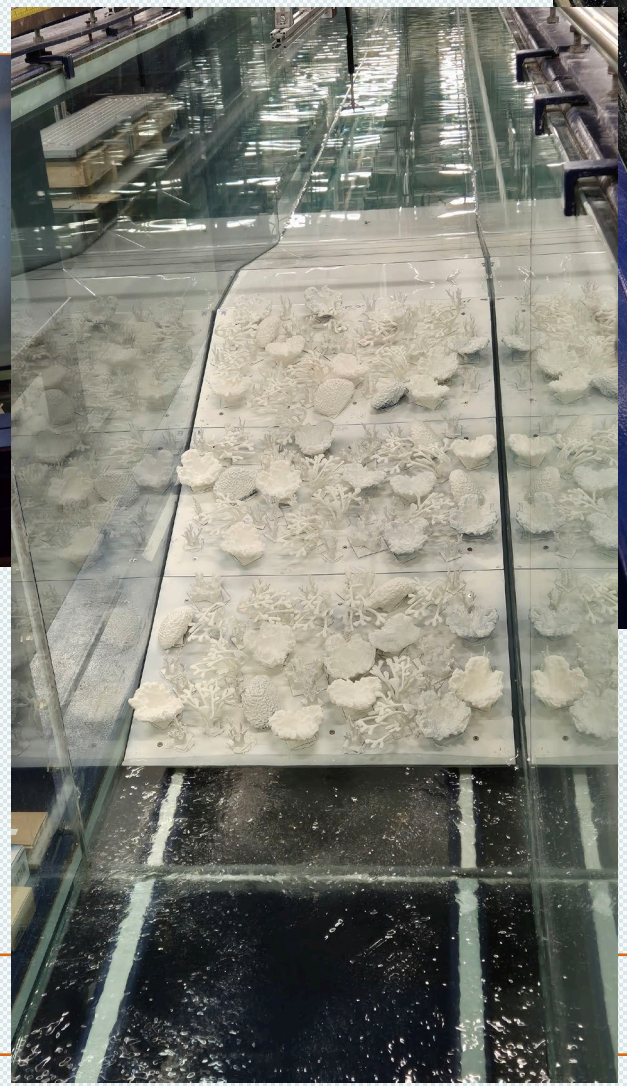





The NBS-ENGROSSED (**https://nbs-engrossed.com/**) project aims to generate a universal approach to the design specification of nature-based solutions so that it is more widely applicable. We engage stakeholders across multiple disciplines, collect field data, perform laboratory investigations, do numerical modelling and apply state-of-the-art tools to protect our coastal environment and our people.

# Larger Flume Experiments





Imperial College Experiments: here