

Perspectives on Coastal Management and Resilience in the Caribbean



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Outline

- The IOCARIBE Region
- Coastal management and resilience defined
- Common Challenges
- A SIDS CASE STUDY - BARBADOS



Geographic Scopes in the Caribbean



4,4 million km²

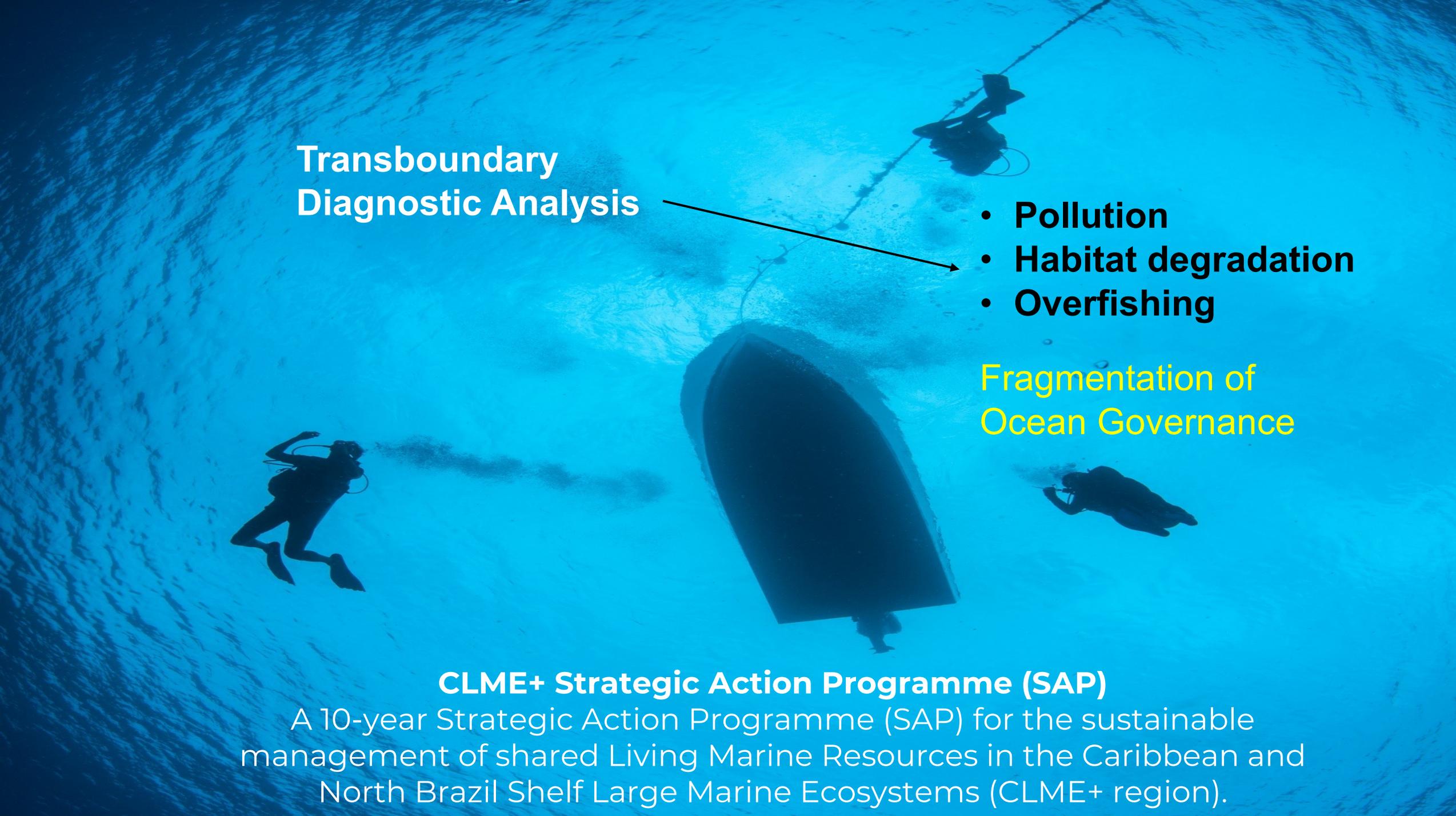
26 States +

18 Overseas Territories,

of which 22 are SIDS

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An underwater photograph showing three divers and a boat. One diver is at the top right, another at the bottom left, and a third at the bottom right. A boat is in the center. The water is blue and slightly hazy. A black arrow points from the text 'Transboundary Diagnostic Analysis' to the boat.

Transboundary Diagnostic Analysis

- **Pollution**
- **Habitat degradation**
- **Overfishing**

Fragmentation of
Ocean Governance

CLME+ Strategic Action Programme (SAP)

A 10-year Strategic Action Programme (SAP) for the sustainable management of shared Living Marine Resources in the Caribbean and North Brazil Shelf Large Marine Ecosystems (CLME+ region).

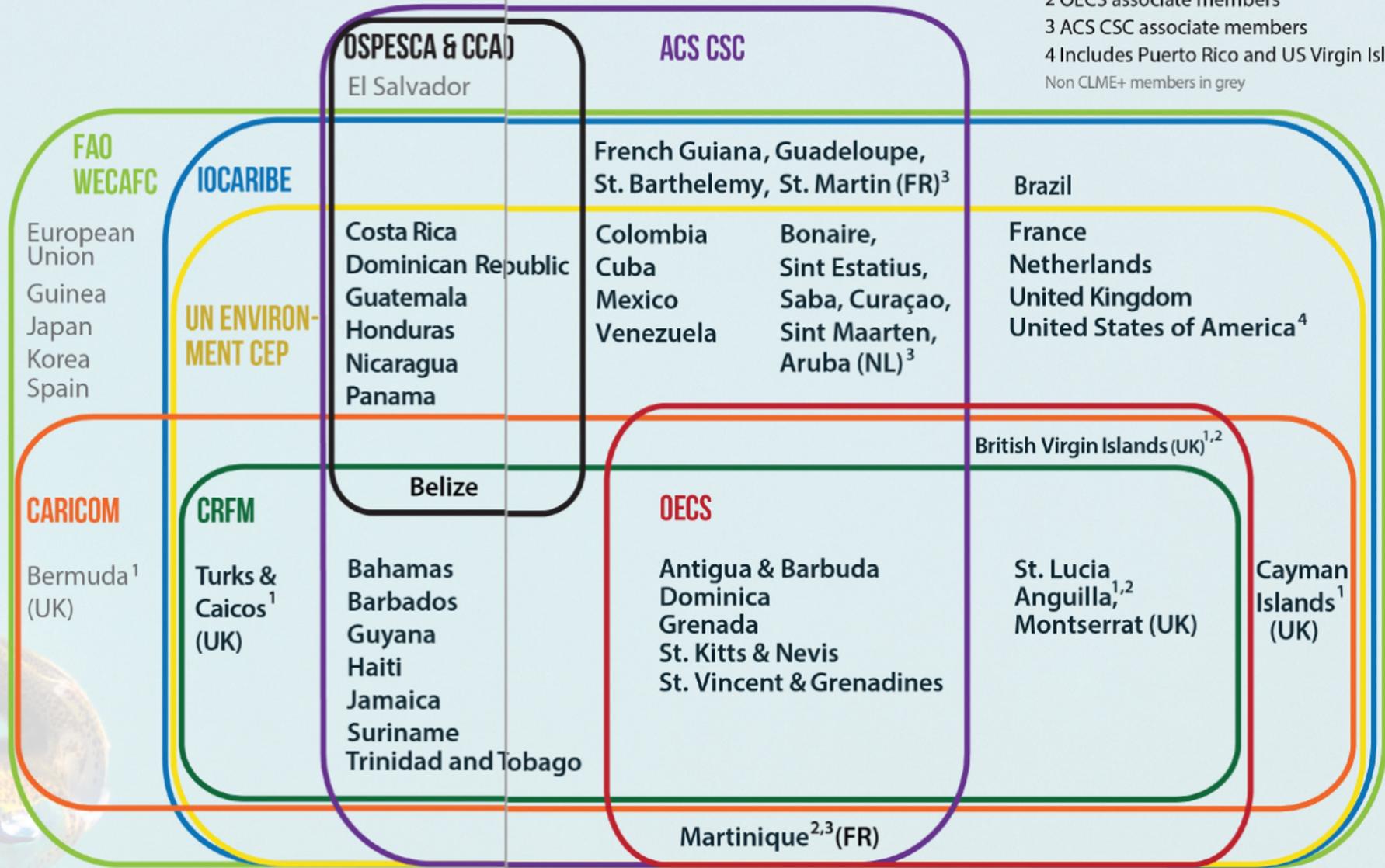
SDGs for Communities



COUNTRY MEMBERSHIP IN IGOs

ocean(-related) governance in the wider Caribbean

- Regional Seas Programme
- 3 Regional Fisheries Bodies
- LME Programmes
- UN Agencies + IGO's native to the region



1 CARICOM associate members
 2 OECS associate members
 3 ACS CSC associate members
 4 Includes Puerto Rico and US Virgin Islands
 Non CLME+ members in grey



unesco

Natural landscape features offer recreational opportunities, such as SCUBA diving, sea kayaking, and sailing.

Estuarine seagrasses and mangroves provide **key nursery habitat** for commercial fish and crustacean species.

Healthy rivers provide communities with **drinking water**.

Mangroves and saltmarshes act as **giant filter**, trapping sediments and nutrients.

Marine ecosystems including seagrasses, mangroves, and fishes act as **carbon sinks**, storing greenhouse gases.

Recreational opportunities

Key nursery habitats

Clean water

Nutrient recycling

Carbon sink



Healthy coral reefs are **biodiverse**, providing...

Rich biodiversity underpinning resilience

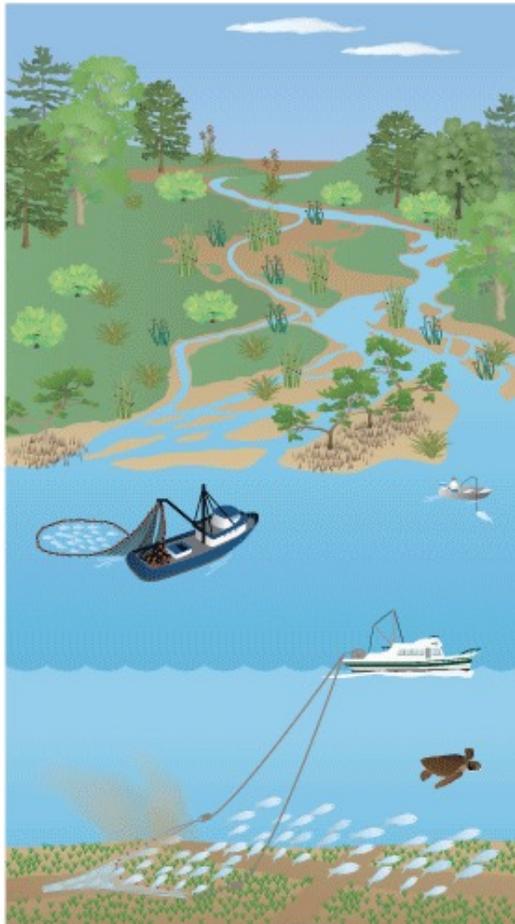
Sustainable fisheries

as well as creating jobs.

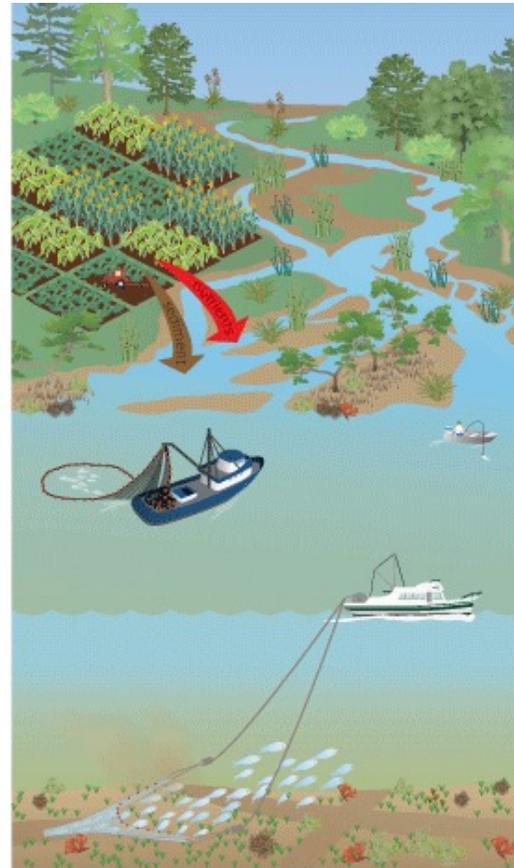
food,

The combined effect of human impacts rapidly deteriorate oceans and coasts

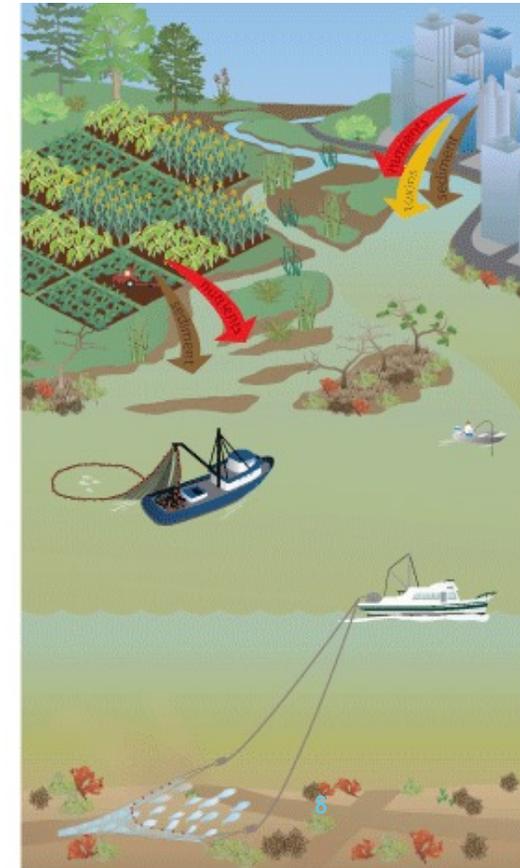
Overfishing



Overfishing + agriculture



Overfishing + agriculture + development



RESILIENCE NATURAL LINES OF DEFENSE



Crane Beach Before

RESILIENCE OF A BEACH



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WILL IT BOUNCE BACK?

Common Challenges

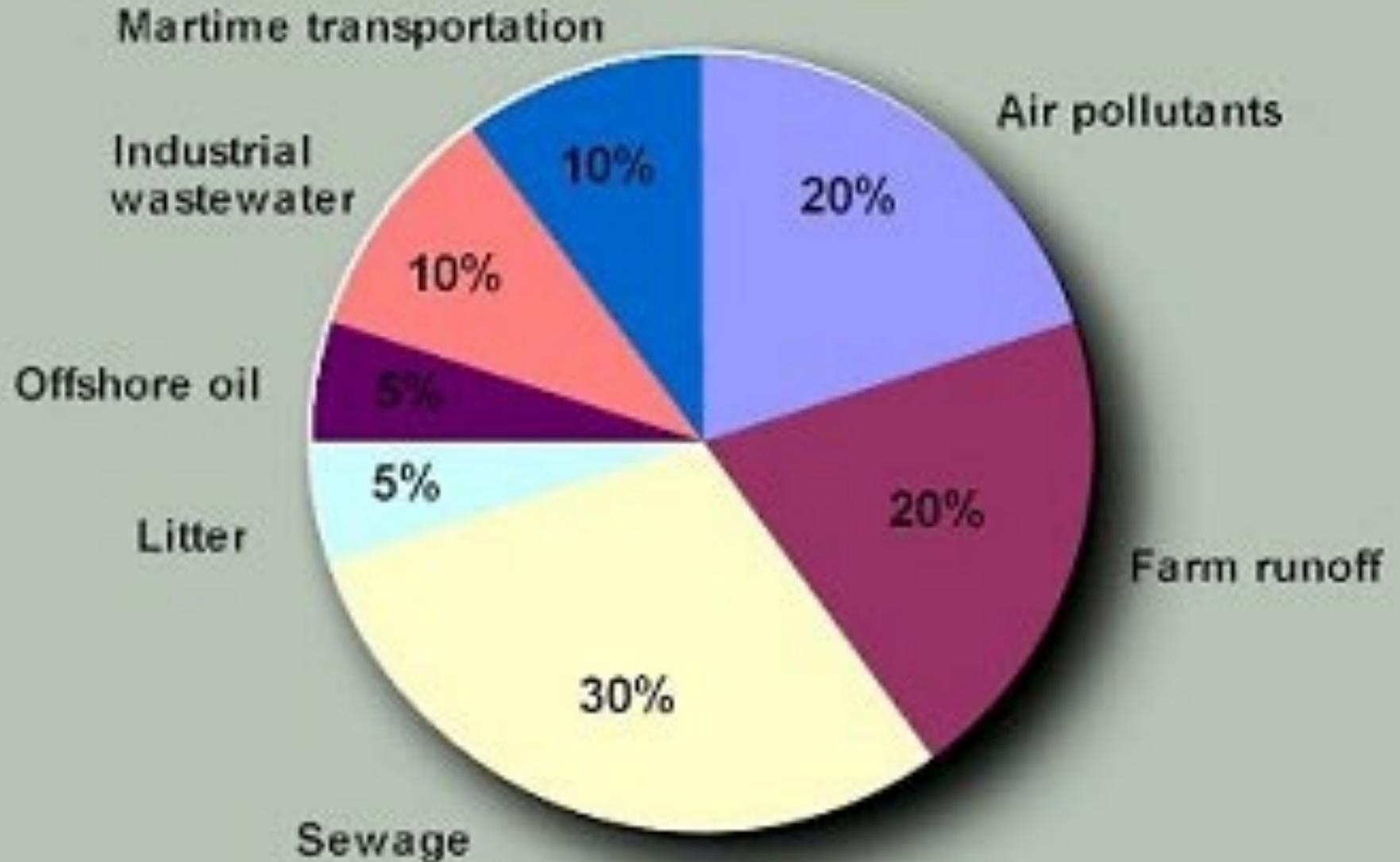
- Addressing coastal management and resilience is **OVERWHELMING**
- The size and number of elements
- Technical and human resource capacity
- Technological change
- Impacts are multiplying - - -
- For poor, small states, is it impossible...?





Pollution: Sources

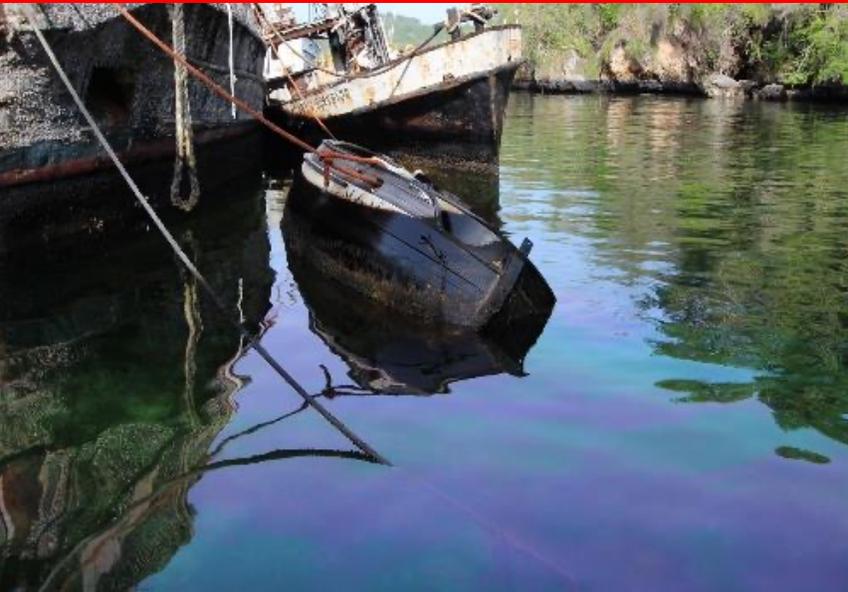
Pollutants Entering the Oceans





Pollution: Types

0.16 - 0.42 million tons of land-based sources of plastic entered the Caribbean Sea in 2010 & estimated to increase to 0.29–0.79 million metric tons per year by 2025. (Jambeck et al. 2015)



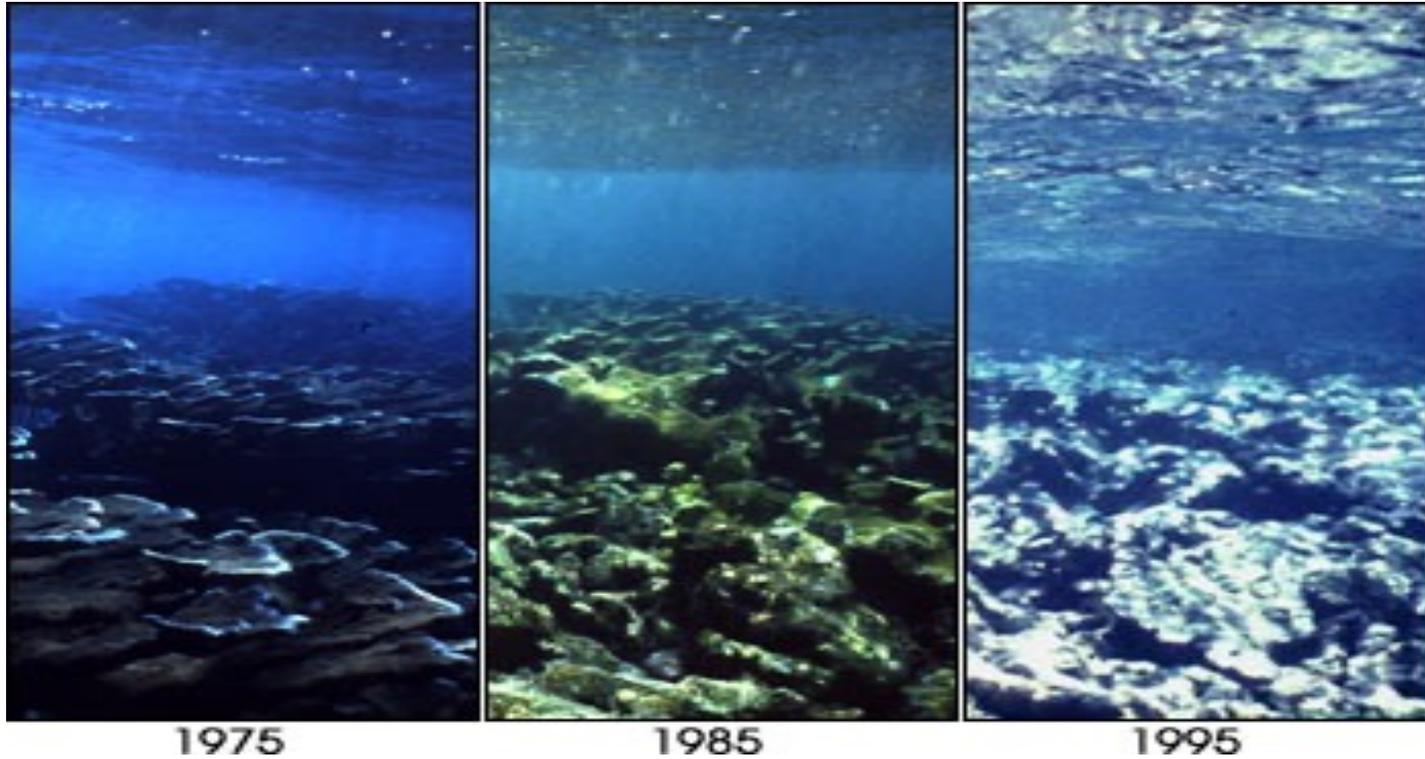


Just the Facts – Marine Litter

- Pervasive problem: economic, aesthetic, health & ecological impacts
- 8 million tons of plastic entering oceans each year
- 80% of marine litter comes from land-based sources
- Plastic is estimated to make up 60-80% of marine litter
- Vector for transfer of toxins & invasive species
- **65% or 275,000 tons of solid waste: Caribbean Sea**

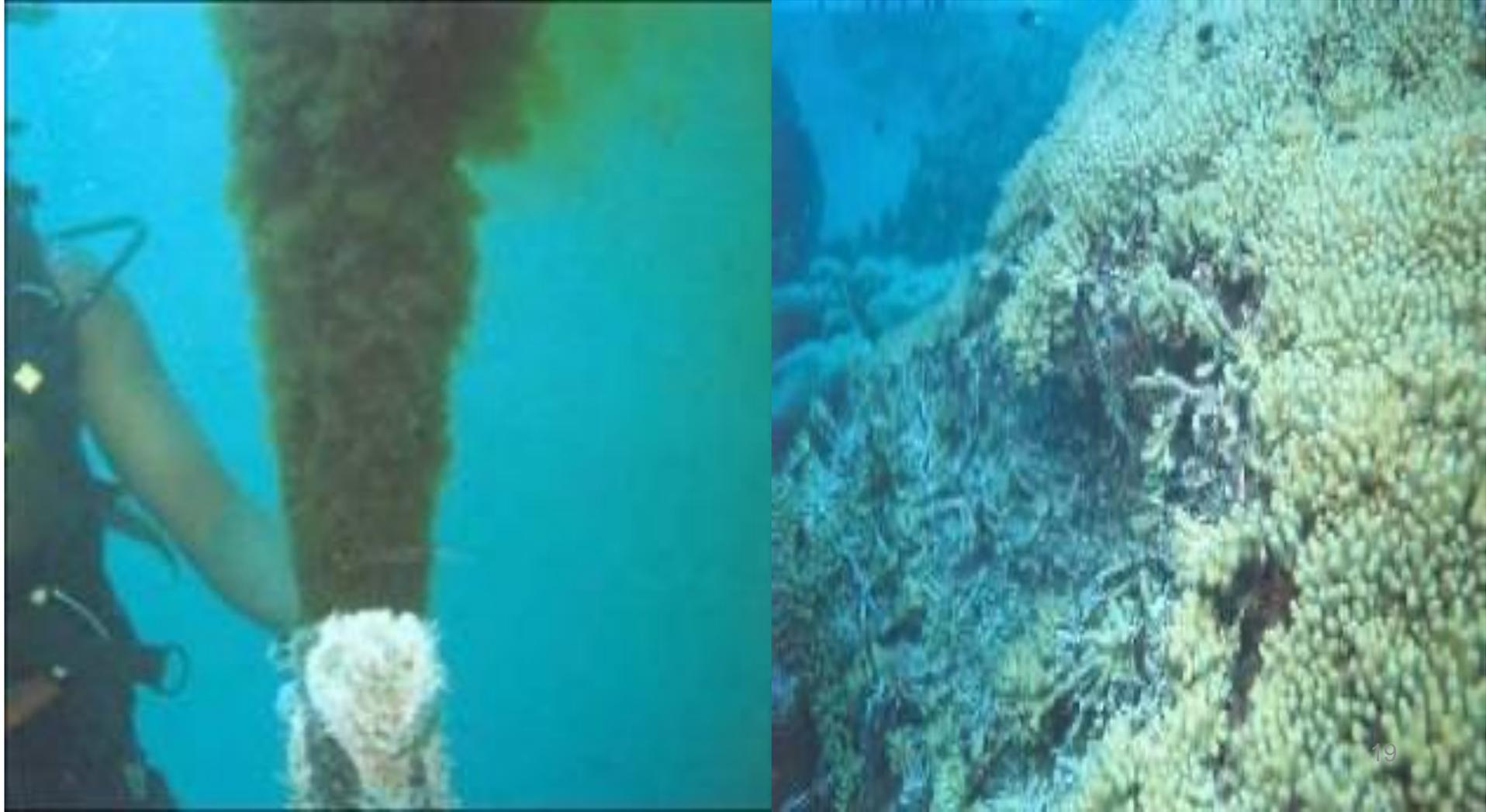


Coral Bleaching, Disease, Invasives, Short-term Gain





Discharge and Anchor Damage



Barbados Coastal Conservation Programme

Your Logo
Here



The government of Barbados (GOB) embarked on the Coastal Conservation Programme to:

- Enhance the knowledge of coastal processes and marine resources
- Develop options for solutions to major issues
- Put procedures and technology in place for effective management of the coastal zone and its resources

A NATIONAL IMPERATIVE

Links Coastal Management to Resilience

Working to ensure that the coast retains its vital and pivotal role in the Economic, Social and Physical Development of the country

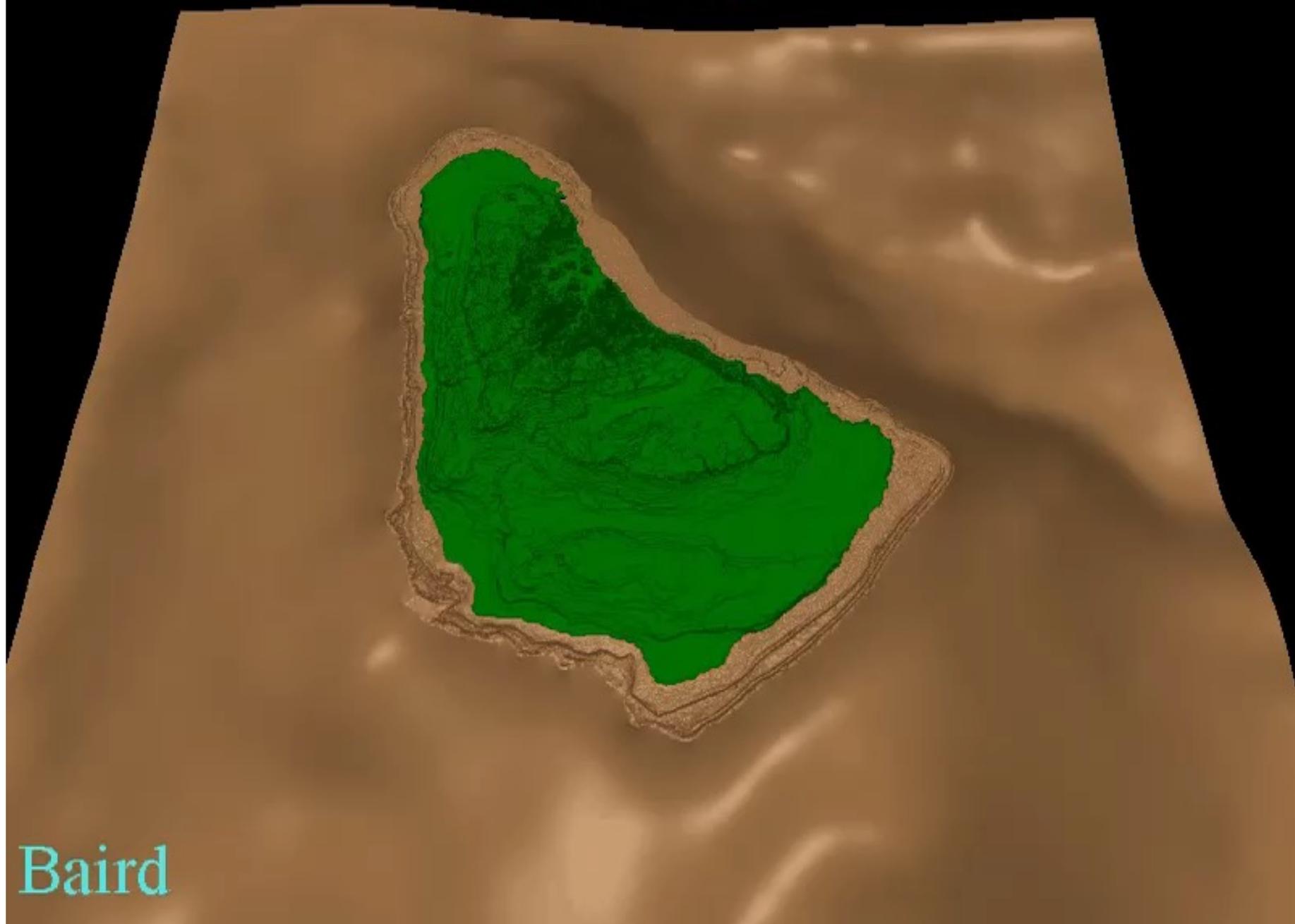


United Nations
Educational, Scientific and
Cultural Organization

Intergovernmental
Oceanographic
Commission

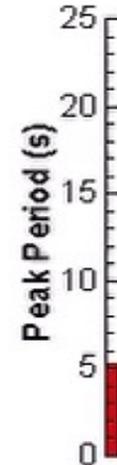
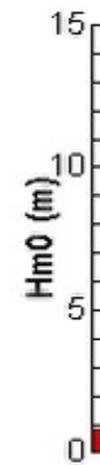
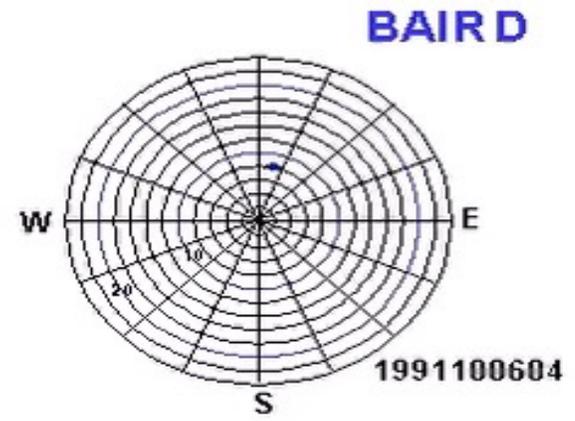
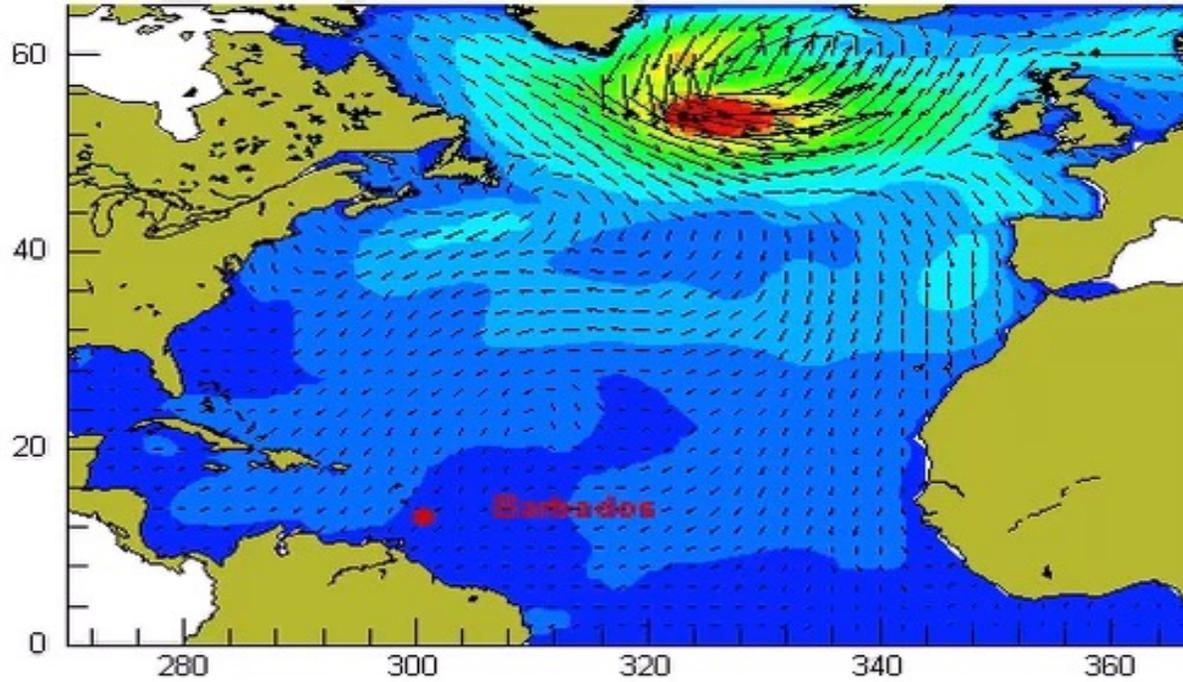


BARBADOS



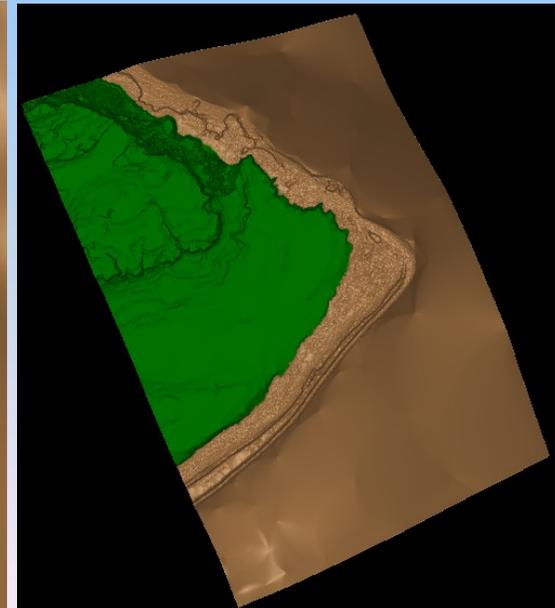
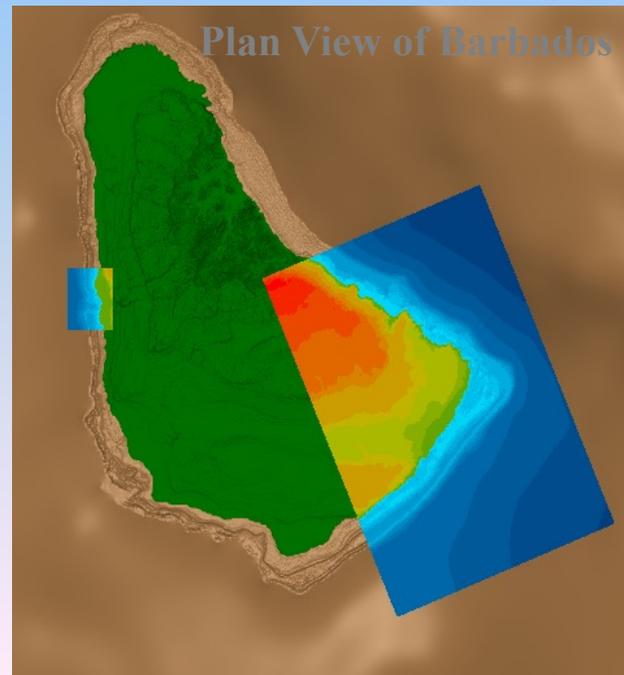
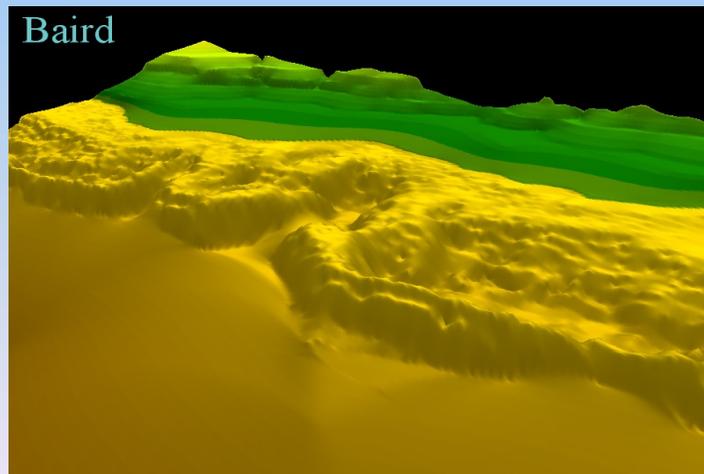
Baird

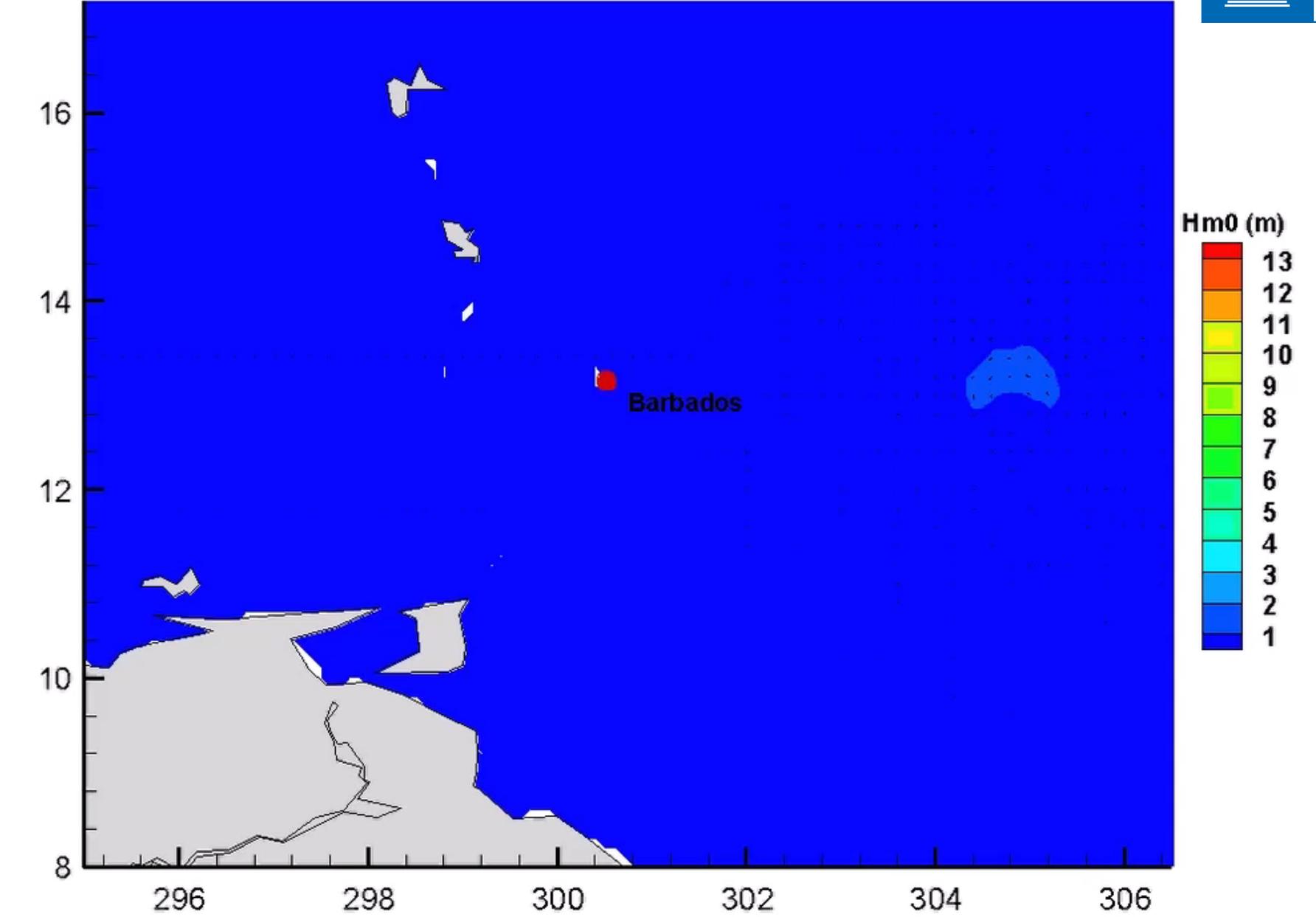
Wave climate at Barbados



Barbados Project - Nearshore Wave Modelling

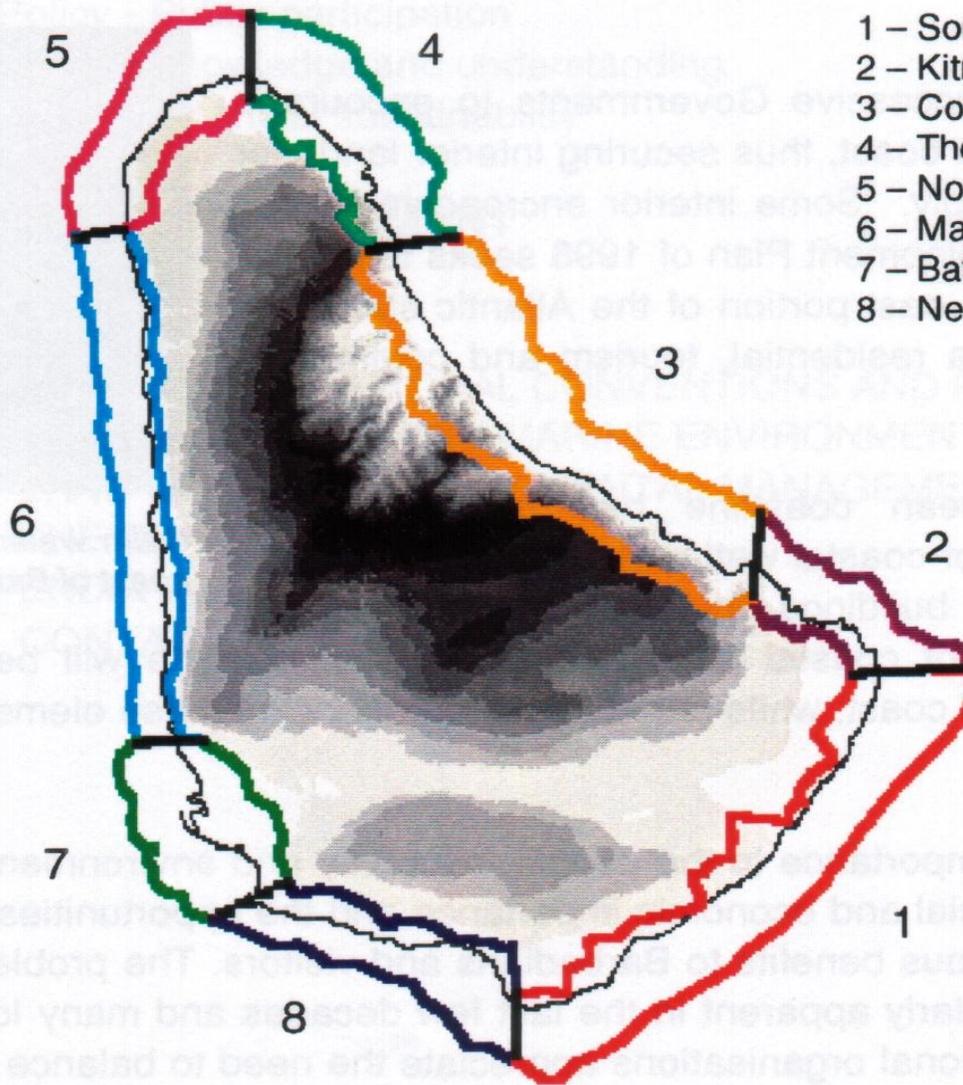
- 143 simulations were carried out using M21 NSW
- A Two-Stage Modelling Process
 - Coarse Grids ($\Delta X=20\text{m}$ $\Delta Y=100\text{m}$)
 - Nested Grids ($\Delta X=4\text{m}$ $\Delta Y=20\text{m}$)





Sub Areas

- 1 – South Point to Kitridge Point
- 2 – Kitridge Point to Conset Point
- 3 – Conset Point to The Choyce
- 4 – The Choyce to North Point
- 5 – North Point to Maycock's Bay
- 6 – Maycock's Bay to Batt's Rock
- 7 – Batt's Rock to Needham's Point
- 8 – Needham's Point to South Point



Coastal Zone Management Area

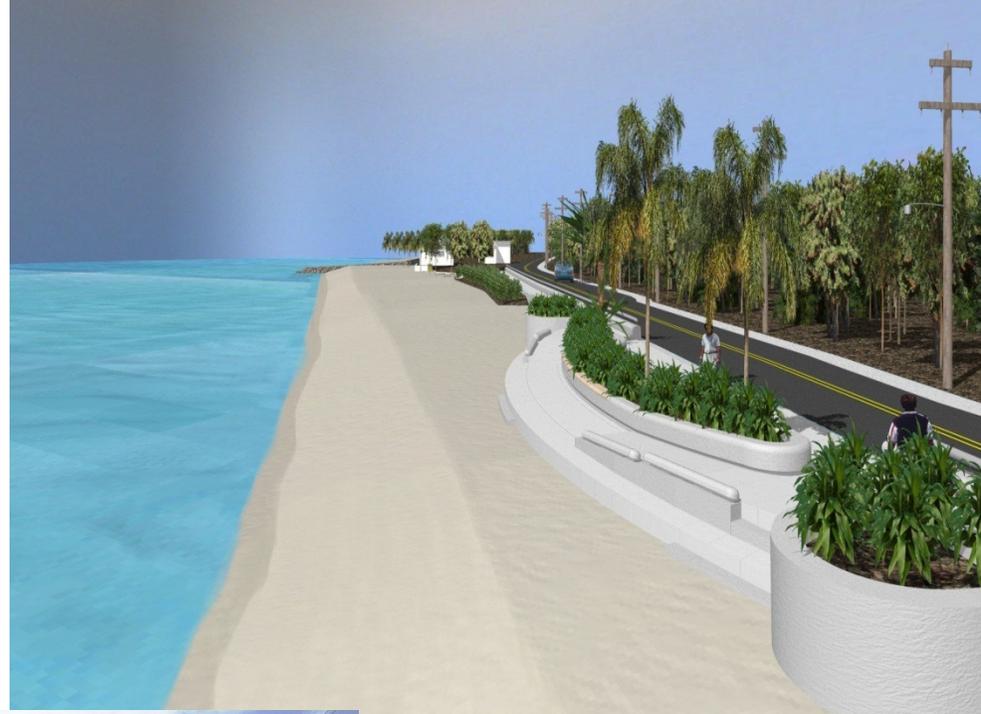
When all else fails?

- Some emergency or long-term works to reduce wave energy
- Properly designed and modeled coastal engineering
- Make the solution as soft and unobtrusive as possible

Rockley



Welches



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Thank you!

