Climate Change and Its Impacts

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Overview

- What is Climate Change?
- Impacts of Climate Change
  - Focus on specific sectors
- Response Strategies
  - Mitigation
  - Adaptation

What is Climate Change

- What is climate? Long term weather patterns
- Climate change is the shift in longterm trends of temperature, precipitation, wind and other meteorological parameters.

Anthropogenic Climate Change

- Current warming trends due to Green house gas (GHG) emissions
- GHGs trap heat
- GHG emissions from fossil fuel combustion

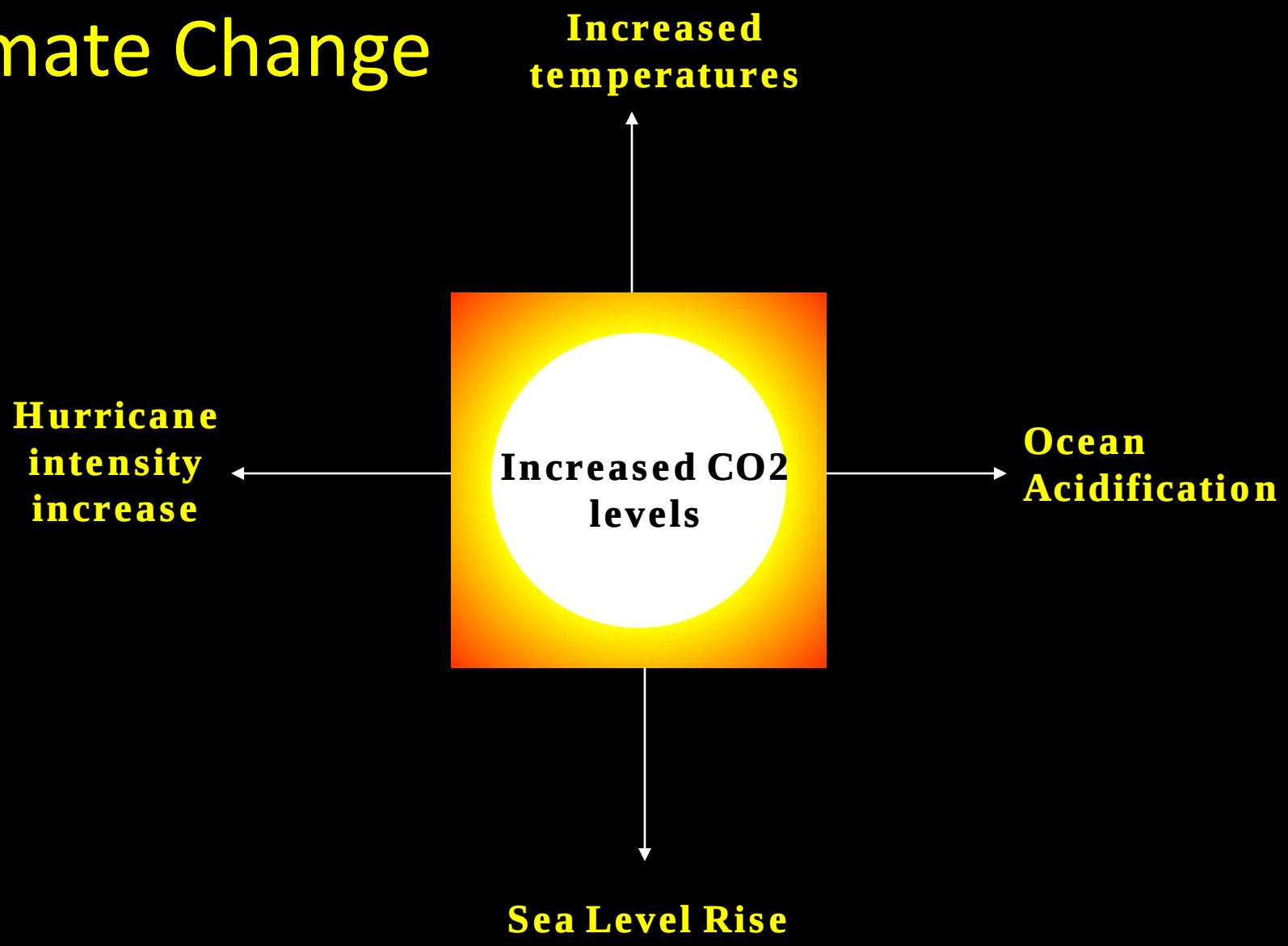
"Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures"

IPCC 2007

Change in Long-Lived GHGs, 1750-2005

Greenhouse Gas	1750 (Pre-Industrial Era)	2005	% Change
Carbon Dioxide (CO_2)	278 ppm	379 ppm	73
Methane (CH_4)	715 ppb	1774 ppb	40
Nitrous Oxide (N_2O)	270 ppb	319 ppb	85

Impacts of Climate Change



2005 Hurricane Activity

- **26 named storms, 15 hurricanes, 3,913 deaths, US $159 billion loss**
  - **Hurricane Dennis-** struck Grenada, Cuba Florida
  - **Hurricane Emily-** strongest to hit the Caribbean before August
  - **Hurricane Katrina-** most devastating storm to hit the US
  - **Hurricane Rita-** passed through the Gulf of Mexico to strike Texas and Louisiana
  - **Hurricane Wilma-** strongest Atlantic hurricane on record

http://news.bbc.co.uk

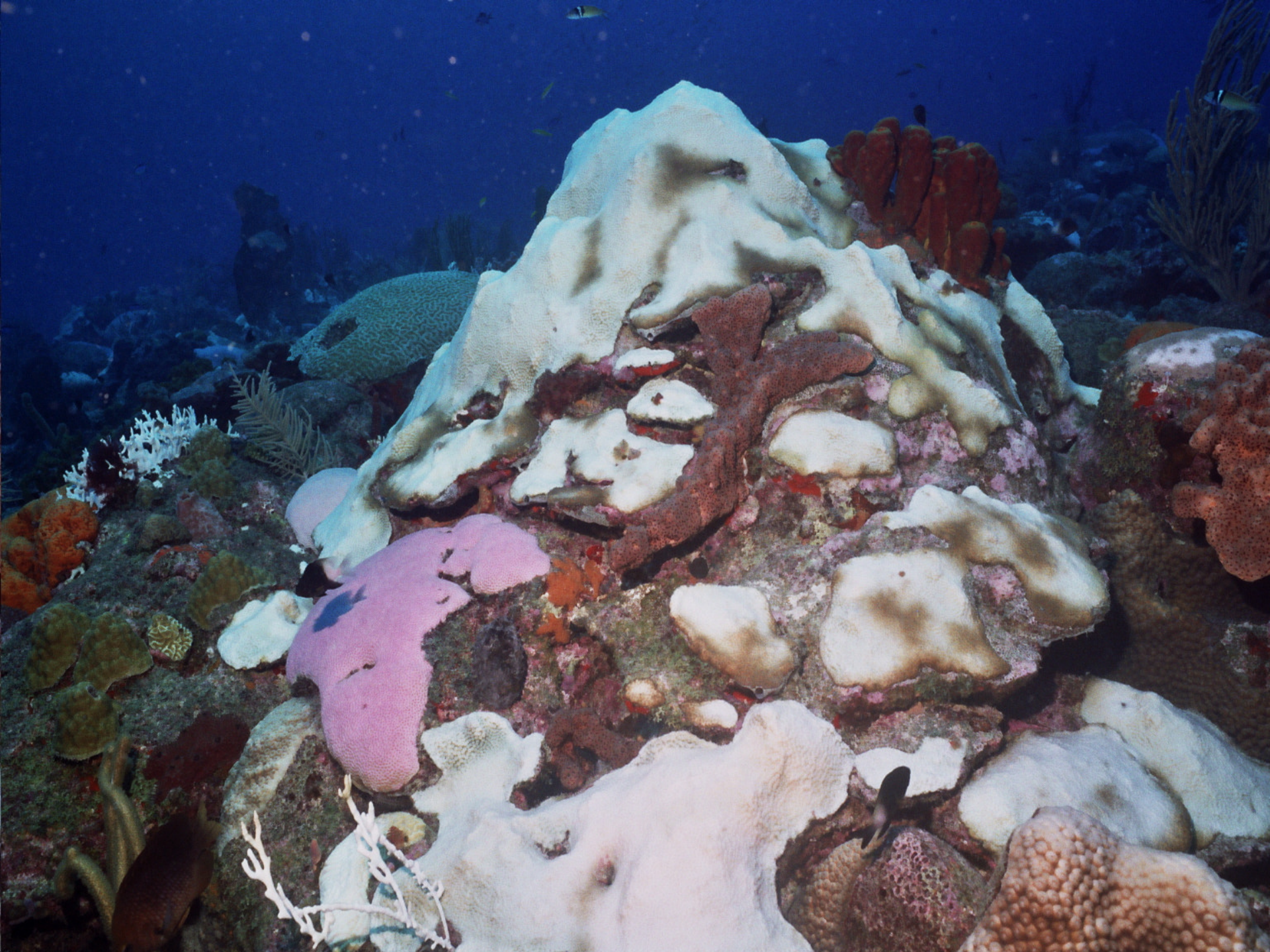
Small Island Developing States

- Among the most vulnerable to climate change impacts:
  - Sea level Rise- small and frequently low-lying
  - Extreme Events- Located in Hurricane belts
  - Degraded Natural Resources- e.g. coral reefs

- Small islands have a low adaptive capacity
  - The ratio of adaptation costs to GDP is high

Impacts on Tourism

- Hurricanes may deter visitors
- Beach erosion
  - Sea Level Rise and extreme events
  - Uyarra et al (2005)- 80% of visitors viewed Beaches as critical
- Dive tourism will suffer due to coral reef degradation
- As the climate in high latitudes becomes more agreeable, desire for tropical getaway may decrease



Impacts on Infrastructure

- 50% or more SIDS residents live within 1.0km of the coast
- Critical infrastructure also resides in these areas (power plants, industries)
- Higher intensity storms will increase adverse impacts
- Coastal erosion is wreaking havoc on infrastructure

Impacts on Agriculture and Fisheries

- Decreases in crop yield
- Extended periods of drought and lower soil quality
- Increasing soil salinisation
- Loss of crops through increased hurricanes and tropical storms

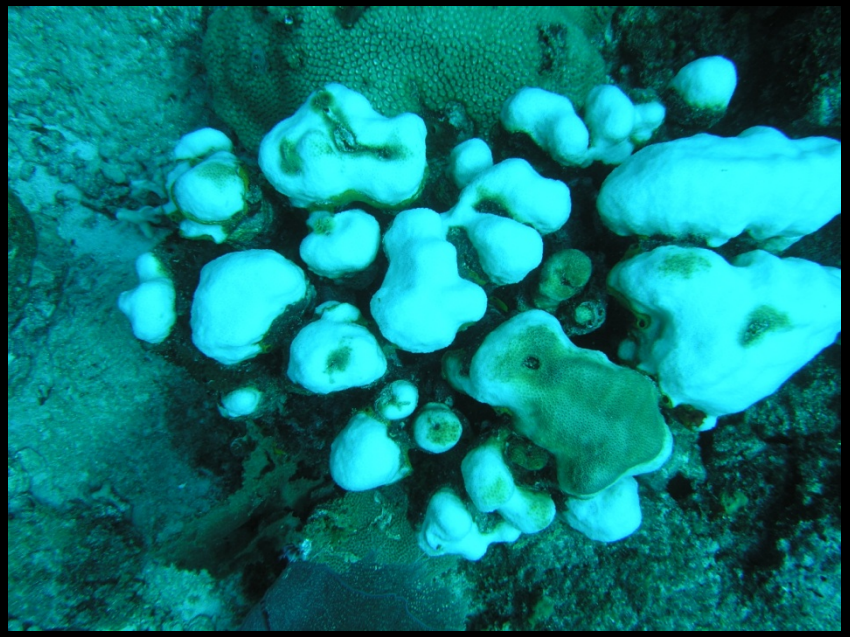
Ivan and Grenada Nutmeg

- Grenada was the 2nd largest producer of nutmeg
- Hurricane Ivan destroyed up to 85% of the crop

Image: World Bank

Impacts on Agriculture and Fisheries

- Quality of habitats will be reduced
- Alteration of nearshore current patterns
- Changes in reproductive habits of some fish species

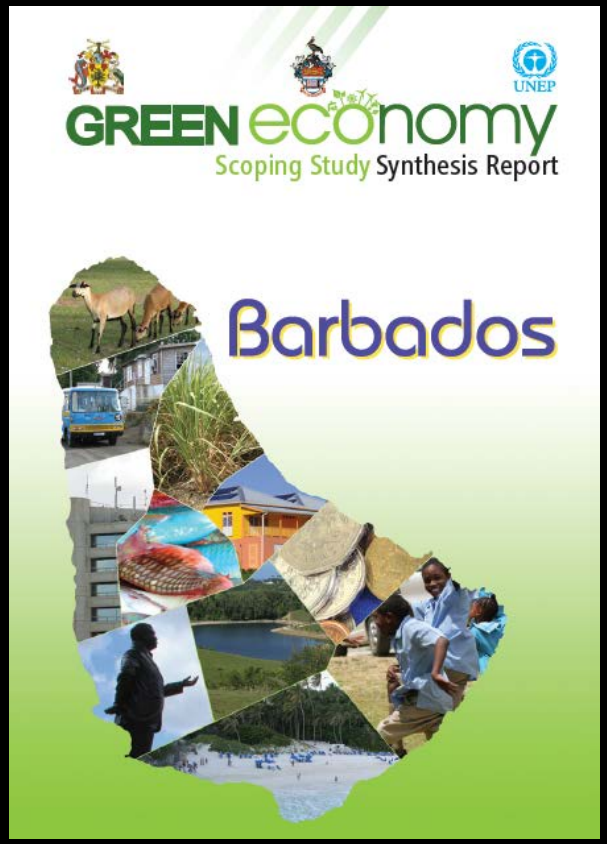


Responding to Climate Change

- Response can take the form of:
  - Mitigation
  - Adaptation

- Stern Report 2007 posits that:
  - Climate change is a serious threat to global economic growth
  - Unabated climate change will cost 5-20% of global GDP annually
  - Early collective action could limit the losses to 1% of GDP instead

The Barbados Model



THE GREEN ECONOMY

Regarded as a multi-pronged response to the crises in climate, fuel, food, water and the financial system

(Prime Minister Stuart , March 2011)

What does this Model Portend?

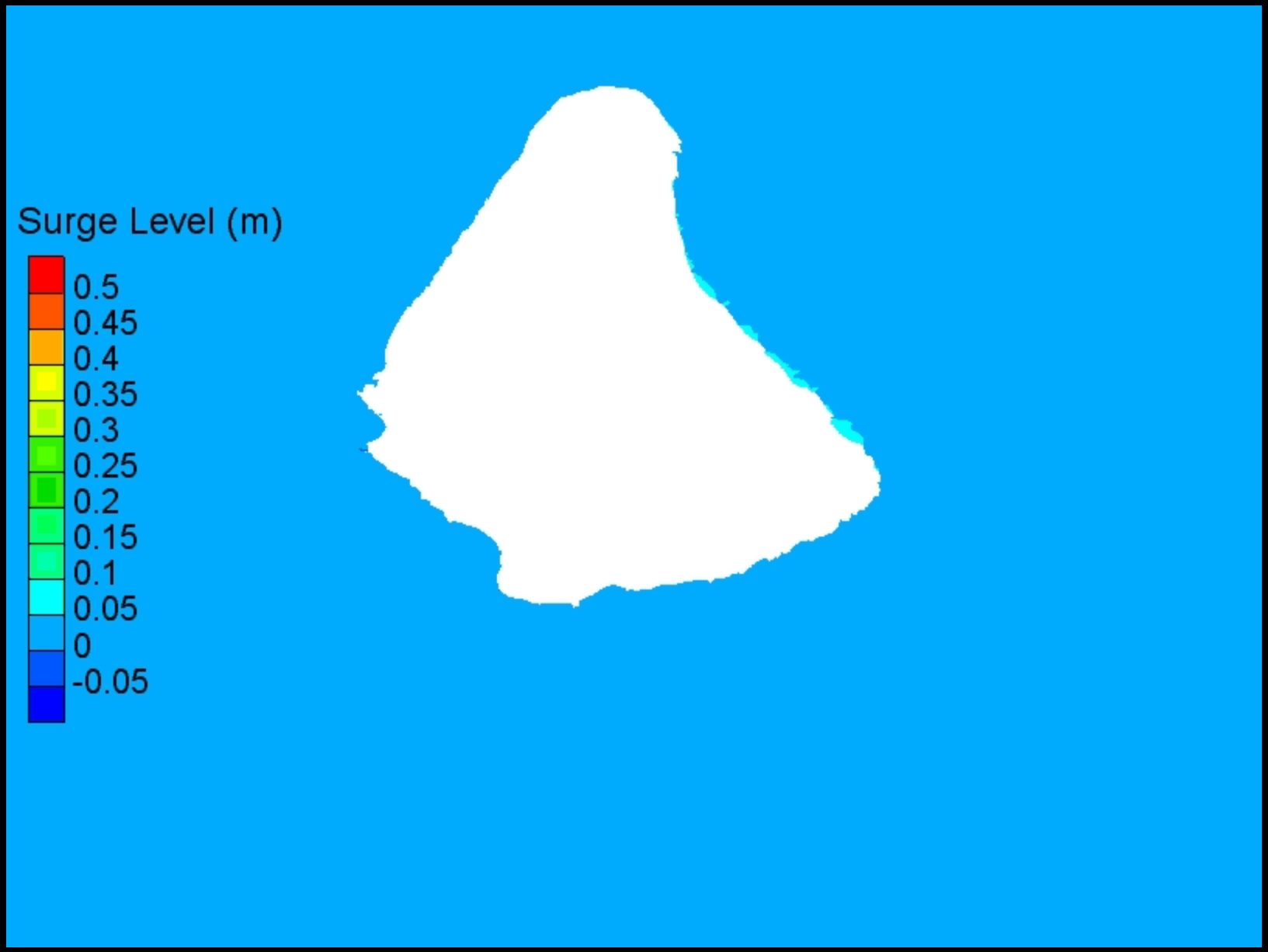
- Increased investments in economic sectors that build on/enhance:
  - The island's natural capital
  - Reduce ecological scarcities
  - Reduce environmental risks

Driven/supported by national policy reforms

Barbados Is Already Ahead

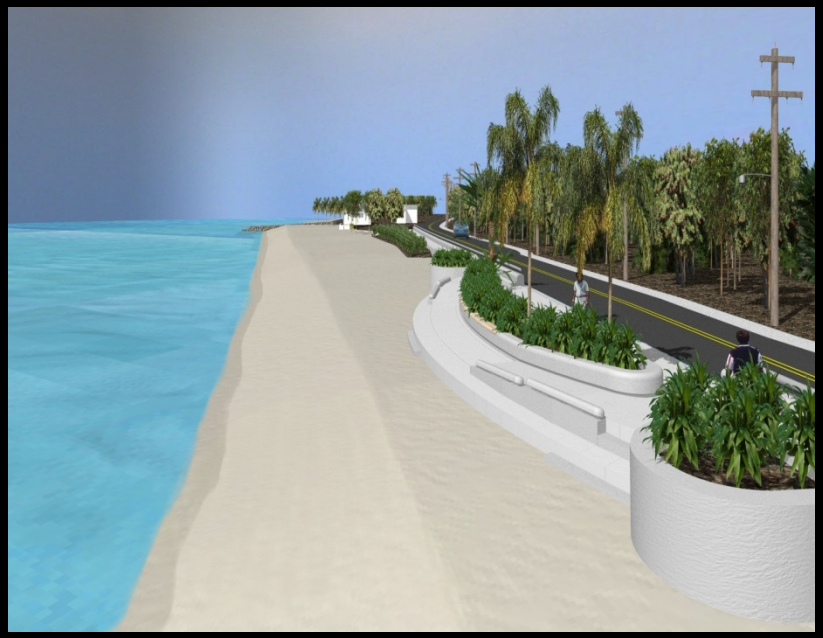
- Barbados Integrated Coastal Zone Management Programme is a national model built on science

- Cutting edge adaptation technology and methodologies e.g. coastal protection structures


Surge Level (m)
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-0.05

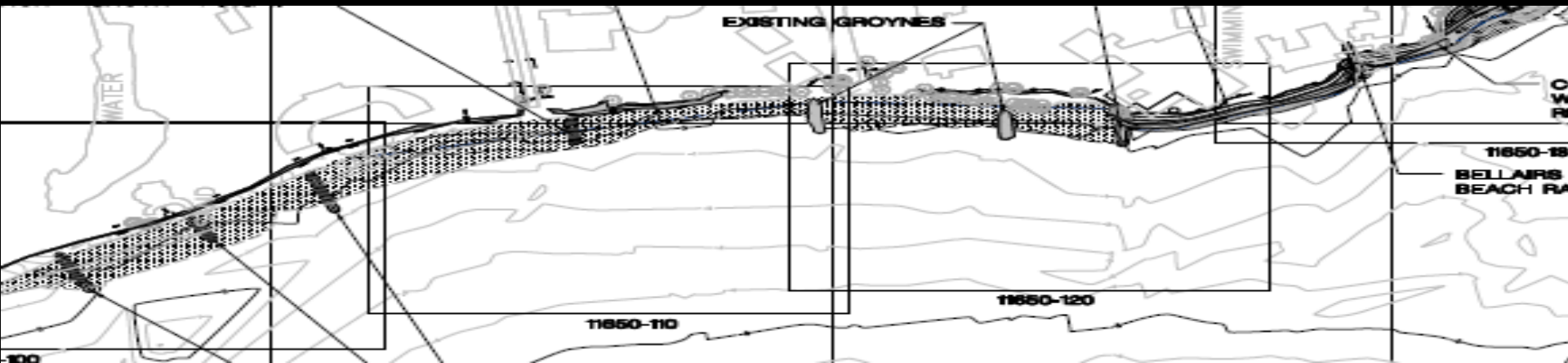
Rockley

Welches



CRMP

- Coastal Risk Assessment and Management Program encompasses various components of adaptation:
  - Baseline studies
  - Infrastructure
  - Policy



Thank You!!