The Caribbean's First Climate Smart Capital City

in GRENADA

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Atlantean Inc.

Climate Smart Cities Grenada;

Grenada

2004 Hurricane Ivan. Damages worth 200% of GDP

2008 Financial Crisis. 2013 structural adjustment program

Unemployment reached 40%

EEZ 26,000 sq km. (75 x land mass)

Blue Growth a potential source of Jobs

Blue Growth Coastal Master Plan & Investment Prospectus

Grenada

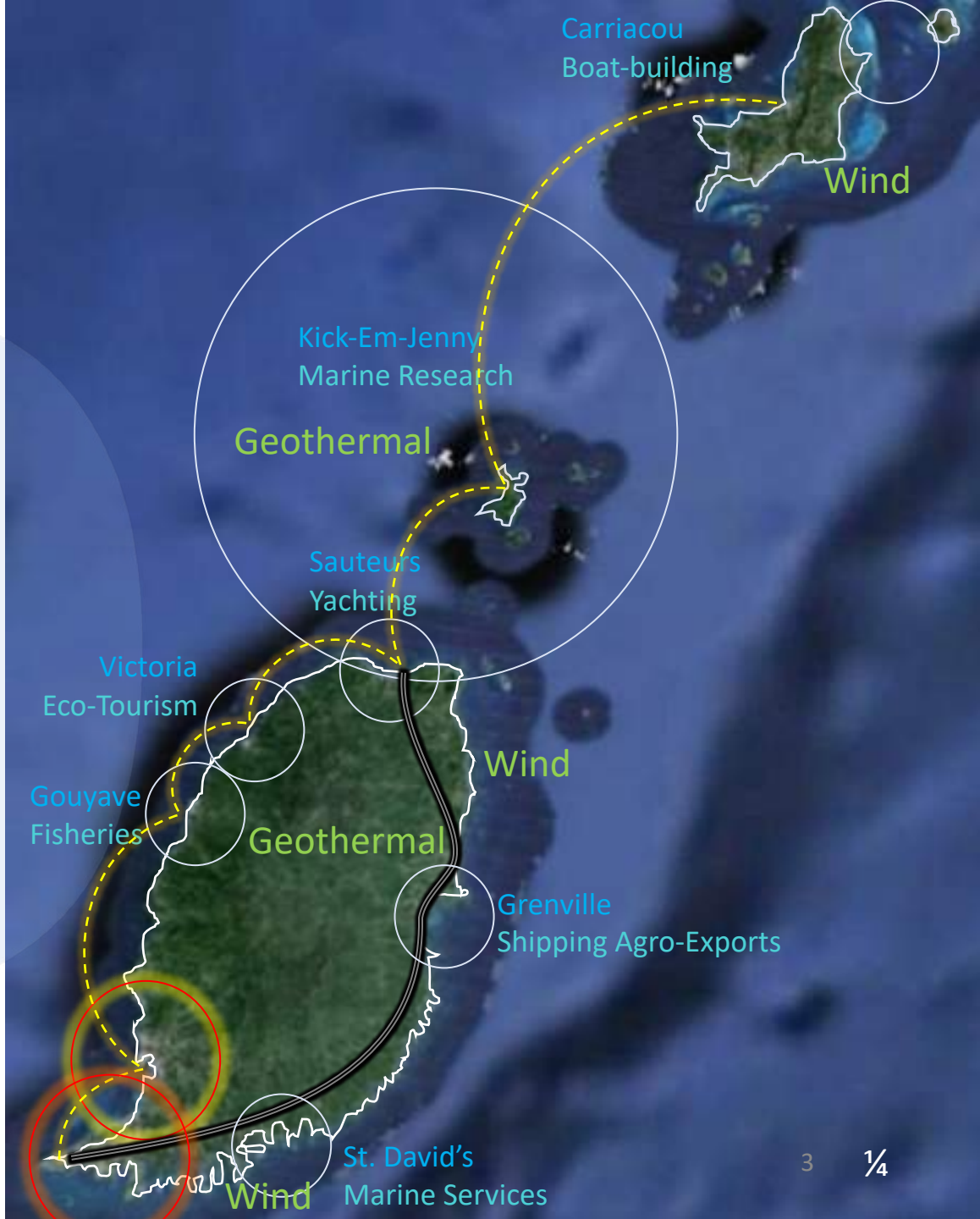
Blue Growth for economic renewal

Master Plan based upon existing coastal clusters

9 Clusters identified

Ferry and Road to connect them

Renewables overlay



Focusing on the Climate Smart City Project

Grenada Government Green Climate Fund World Bank

New York University (NYU)

STAKEHOLDER CONSULTATIONS AND CONSENSUS BUILDING

<u>Since 2018</u>
Ten missions
70+ consultation sessions
4 workshops
Over 5% of the population *directly engaged*

Conventional consultations with government, NGOs and private sector

Society-wide consultations with citizens in affected project areas

PROJECT IDENTIFICATION AND PROGRAM DESIGN

PROGRAM A: A COMPREHENSIVE MITIGATION STRATEGY

Grenada – Leapfrog to Energy Efficiency

PROGRAM B: ACTIVE PREPARATIONS FOR SEA LEVEL RISE AND HURRICANES

Carenage Coastal District

International Airport Shoreline Stabilization Project

Grenville/Soubise Intertidal Restoration Project

Grand Anse Protection and Enhancement Plan

PROGRAM C: ECOSYSTEM RESTORATION

Grenada Wastewater Resource Recovery

Integrated Participative Watershed Management

PROGRAM D: Urban Development

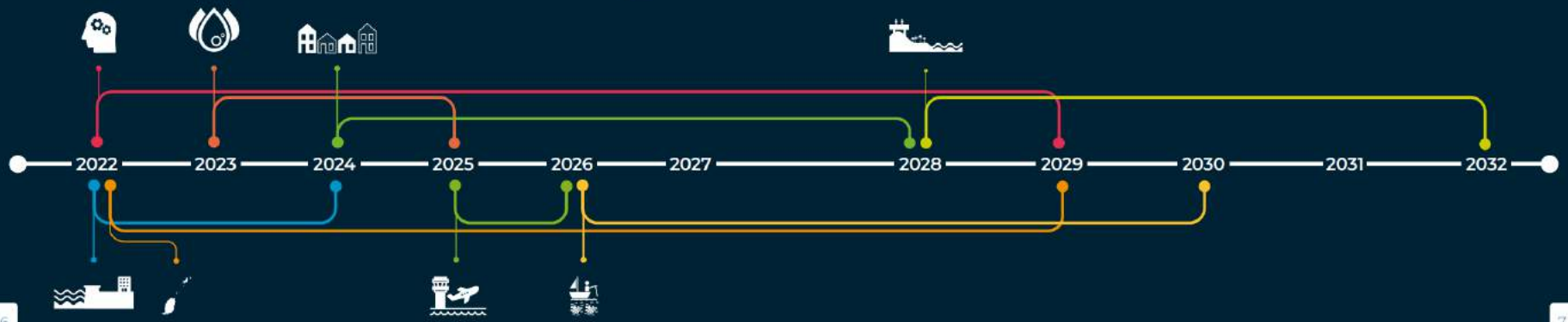
Urban Densification and Urban Expansion

PROGRAM E: Capacity Building

A Comprehensive Capacity Building Initiative

PROJECT OVERVIEW

Climate Smart Cities: Grenada is a program of activities that will build national resilience to climate change. The program focuses on cities – the town of St. George's, and Grenville, critical areas where employment, infrastructure, and government services concentrate, but also places that are highly vulnerable to sea level rise, storm surge, and flooding. It includes projects in the urban core and in the peri-urban areas and watersheds that surround those places. The activities are physical, social, and economic, and will bring jobs and job training to the people of Grenada.



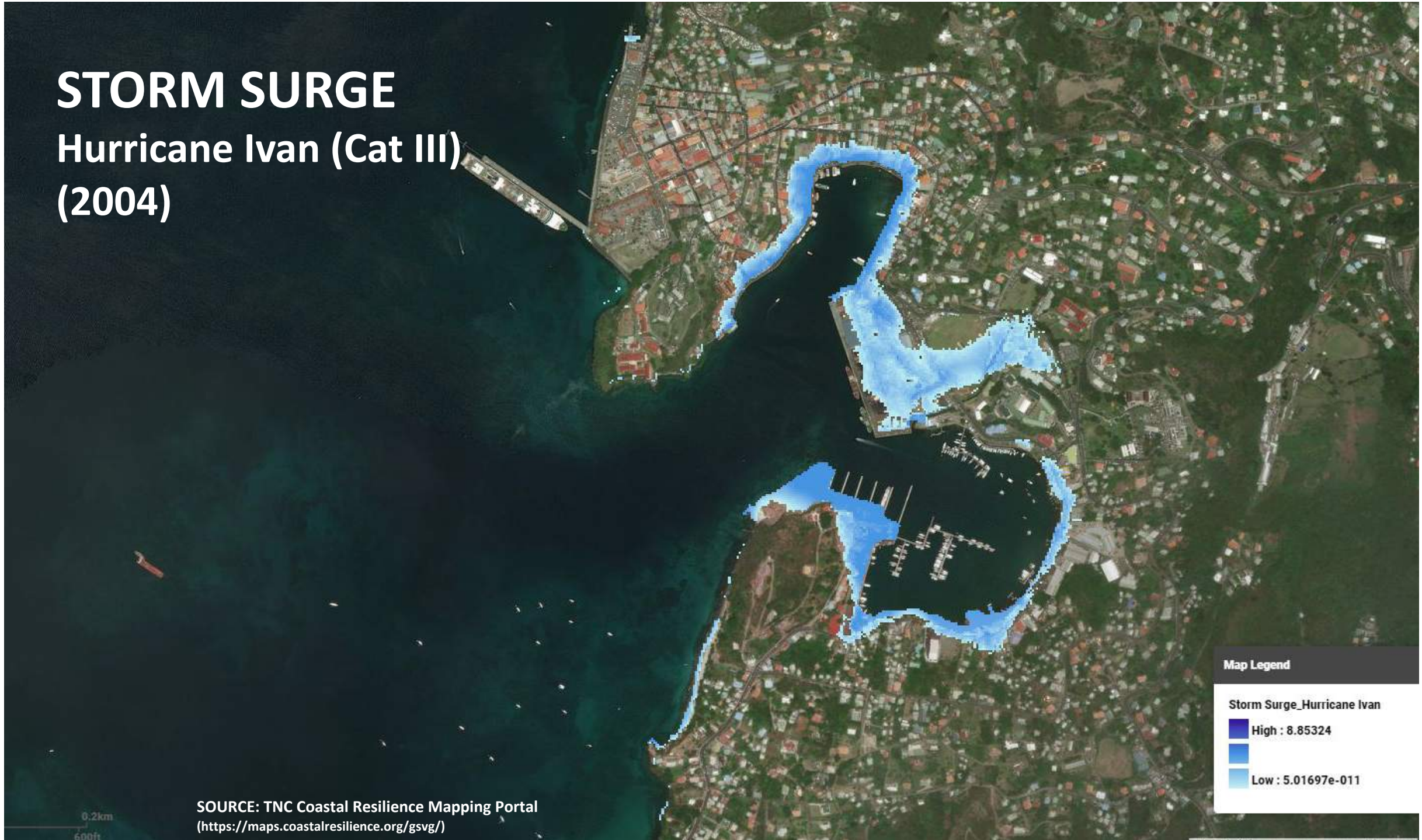
The Carenage


Grenada Port Authority Cruise Ship Terminal
Fort St. George Historical Site
Grenada General Hospital
Carenage Historic District
TAMCC
Port of St. George
Grenada Boy's Secondary School
Port Louis Marina

KEY ASSETS

STORM SURGE

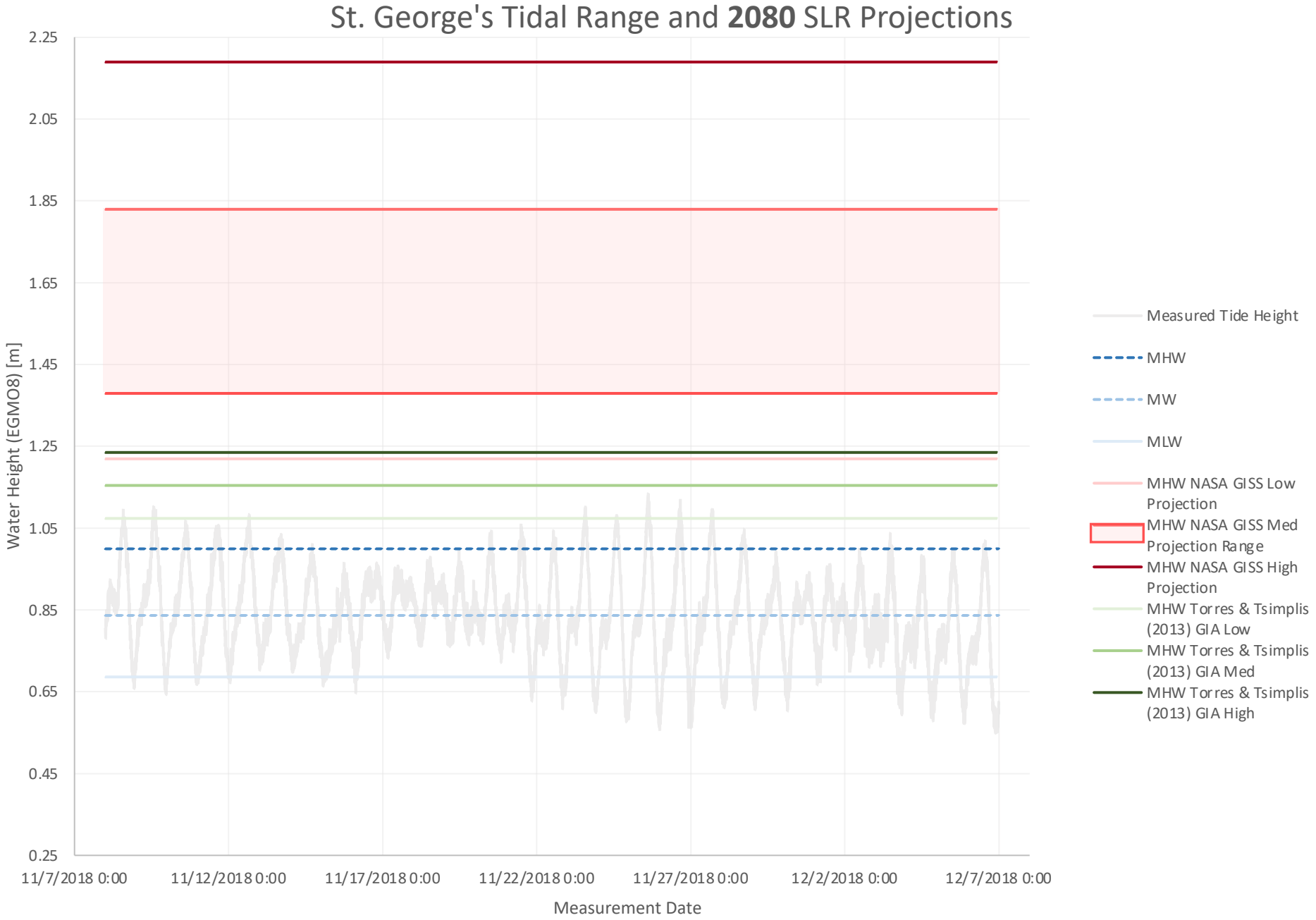
Hurricane Ivan (Cat III) (2004)

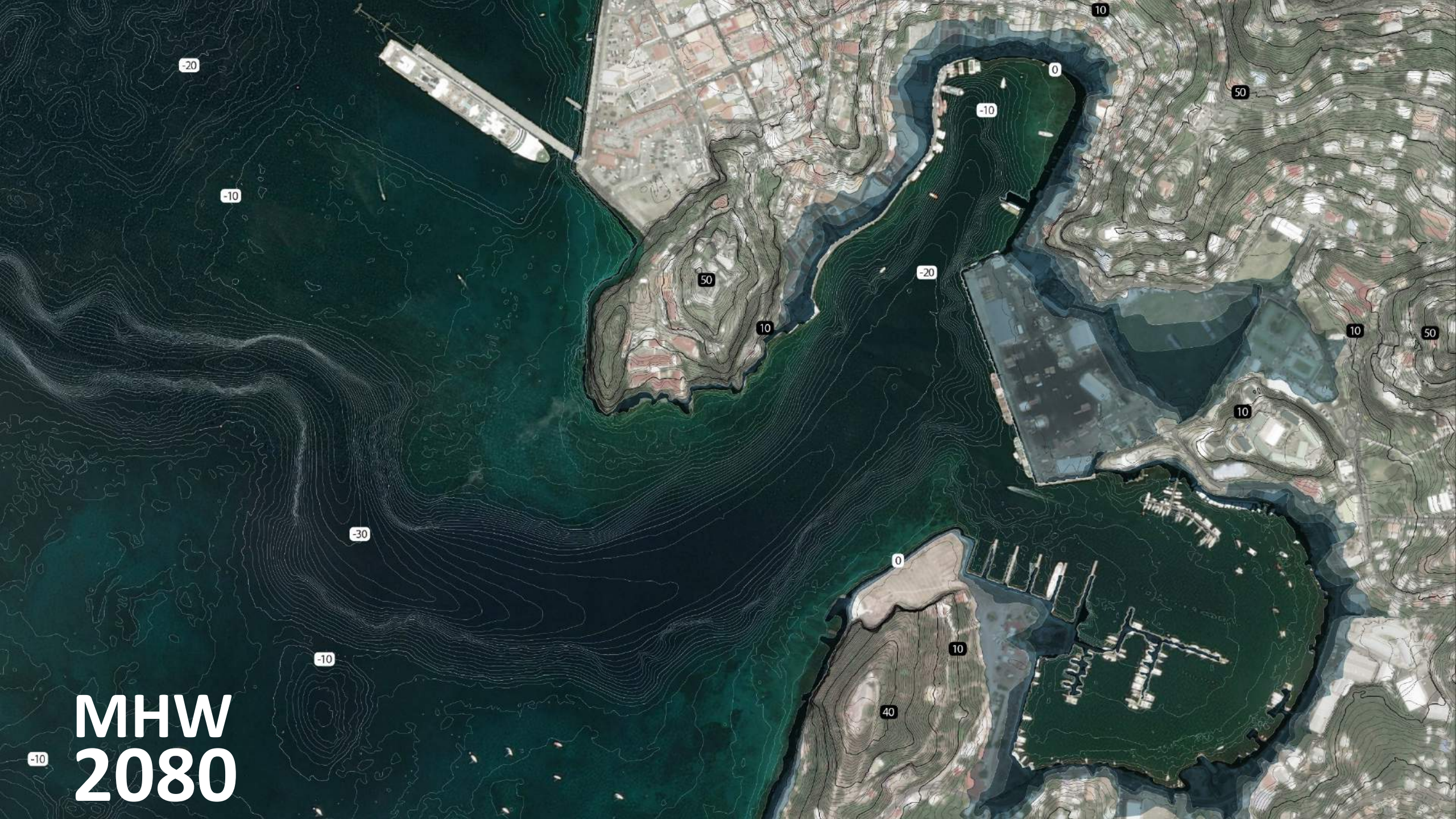


SOURCE: TNC Coastal Resilience Mapping Portal
(https://maps.coastalresilience.org/gsvg/)

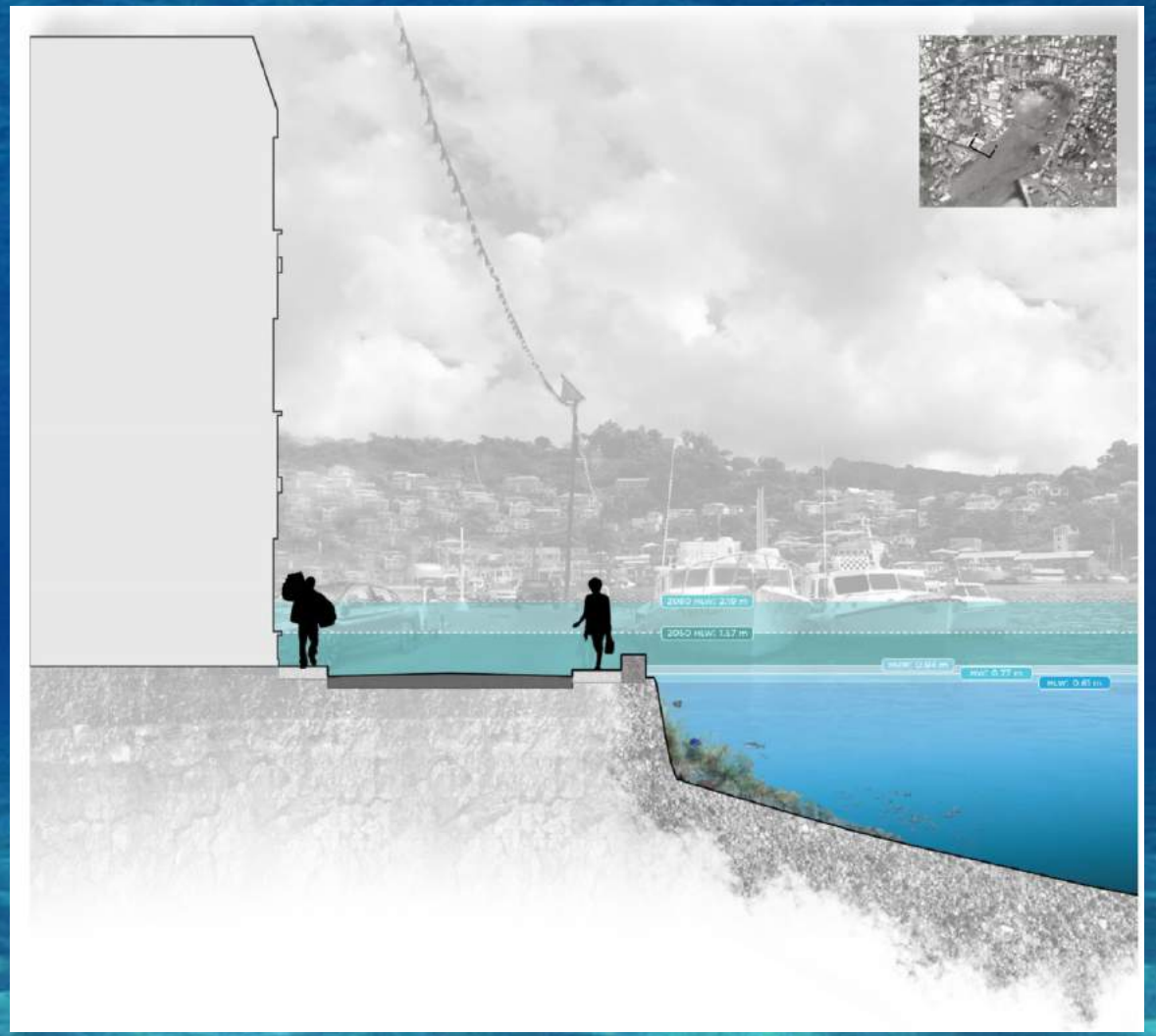
2.4

SLR 2080

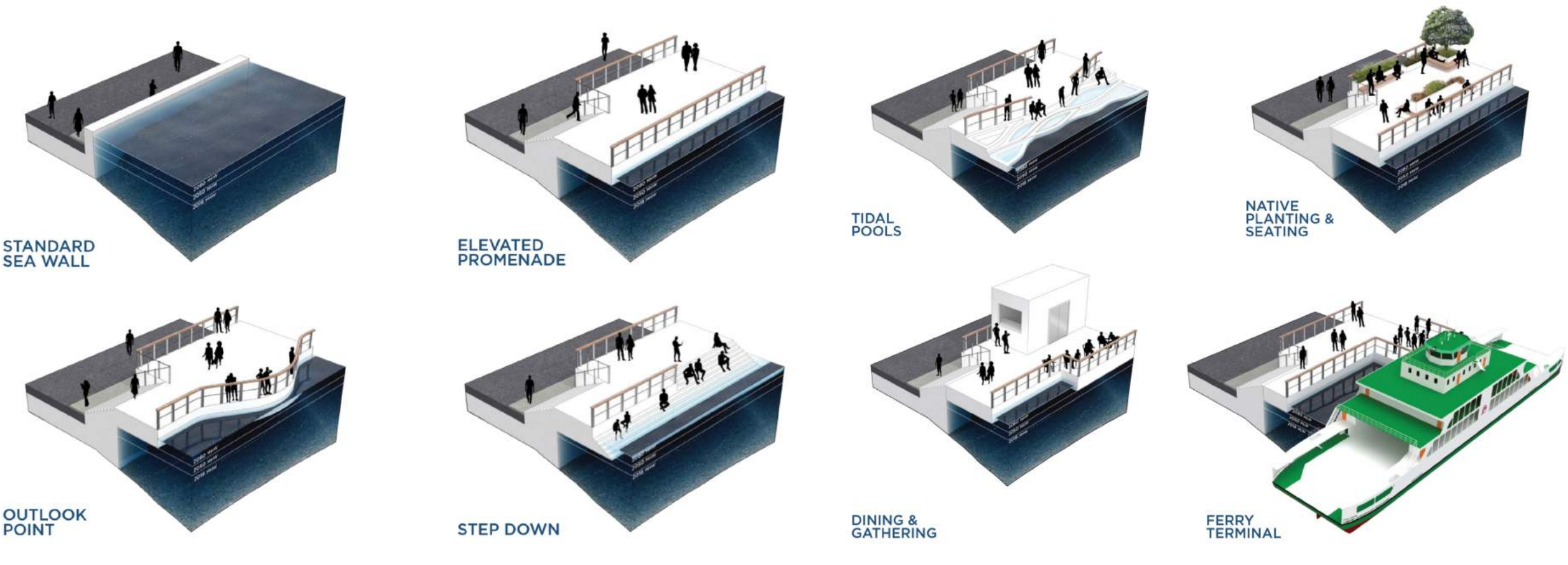

St. George's Tidal Range and **2080** SLR Projections
Water Height (EGMO8) [m]
2.25
2.05
1.85
1.65
1.45
1.25
1.05
0.85
0.65
0.45
0.25
11/7/2018 0:00
11/12/2018 0:00
11/17/2018 0:00
11/22/2018 0:00
11/27/2018 0:00
12/2/2018 0:00
12/7/2018 0:00
Measurement Date
Measured Tide Height
MHW
MW
MLW
MHW NASA GISS Low Projection
MHW NASA GISS Med Projection Range
MHW NASA GISS High Projection
MHW Torres & Tsimplis (2013) GIA Low
MHW Torres & Tsimplis (2013) GIA Med
MHW Torres & Tsimplis (2013) GIA High


MHW
2080

NASA: Carenage underwater by 2050



Grey with Green Infrastructure Options

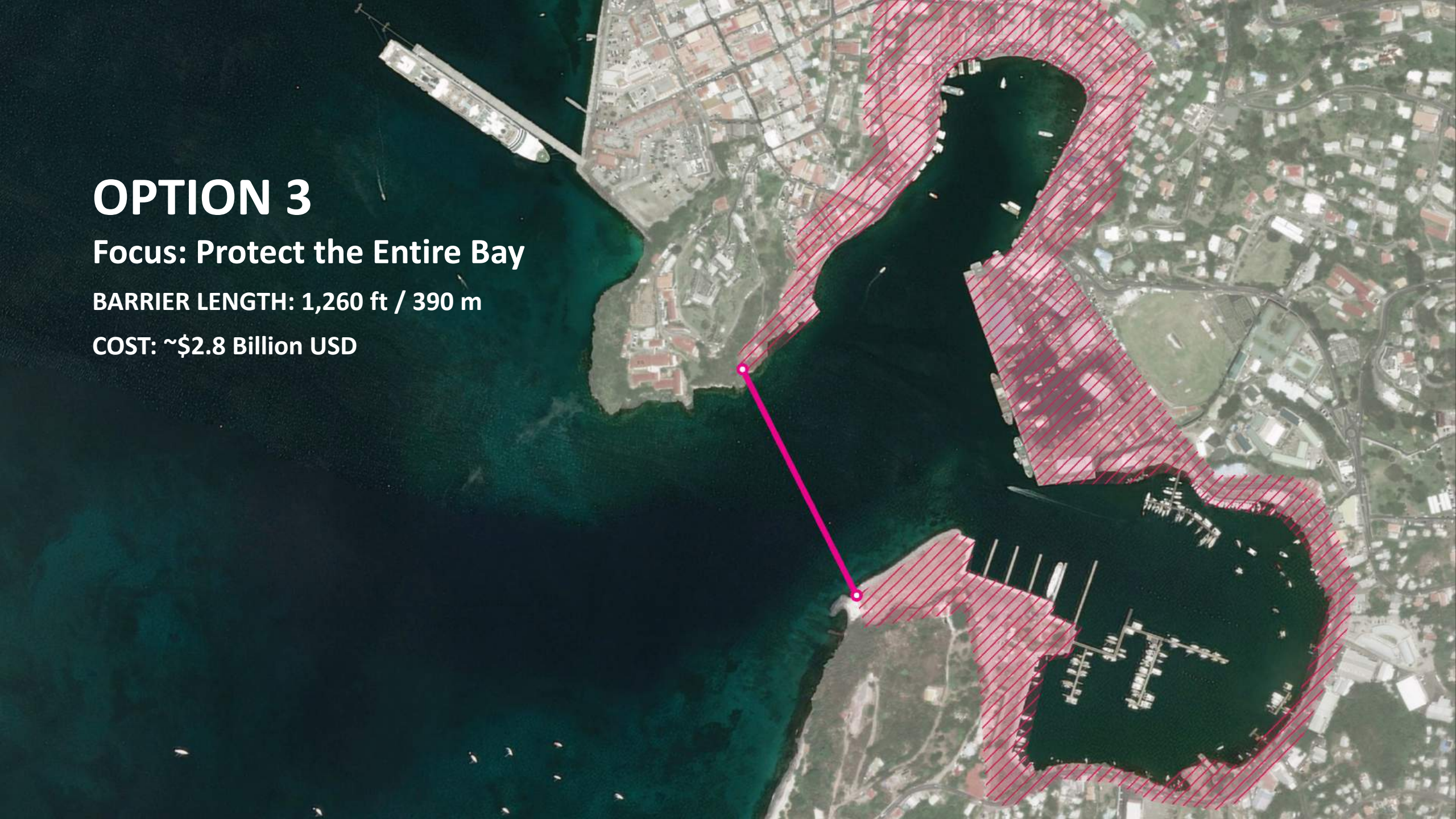


OPTION 3

Focus: Protect the Entire Bay

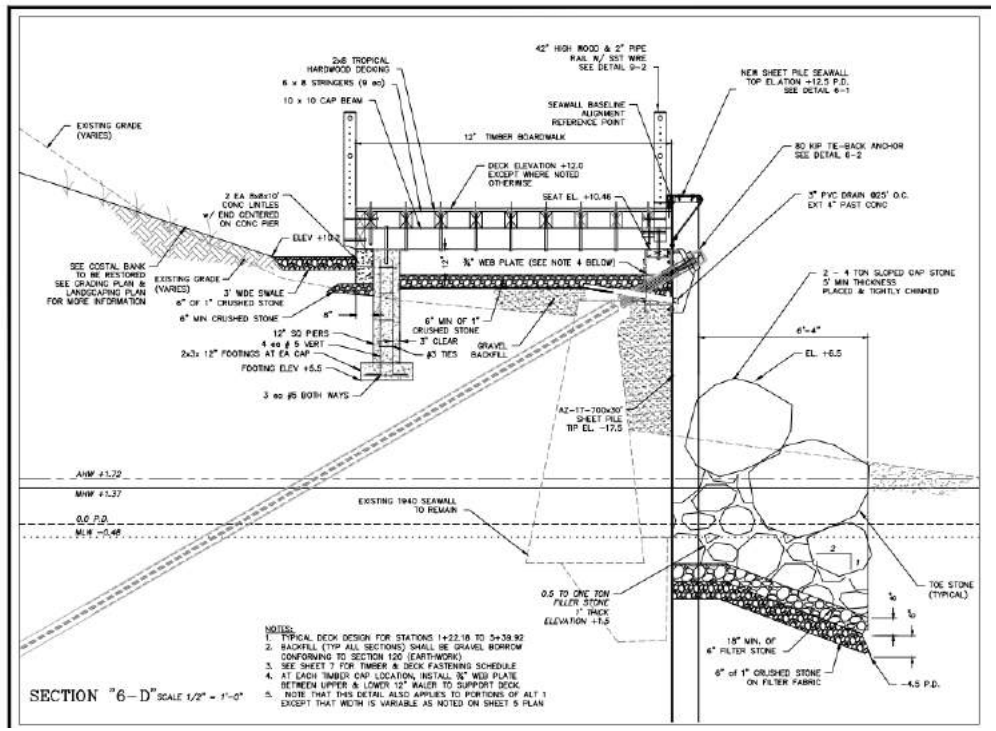
BARRIER LENGTH: 1,260 ft / 390 m

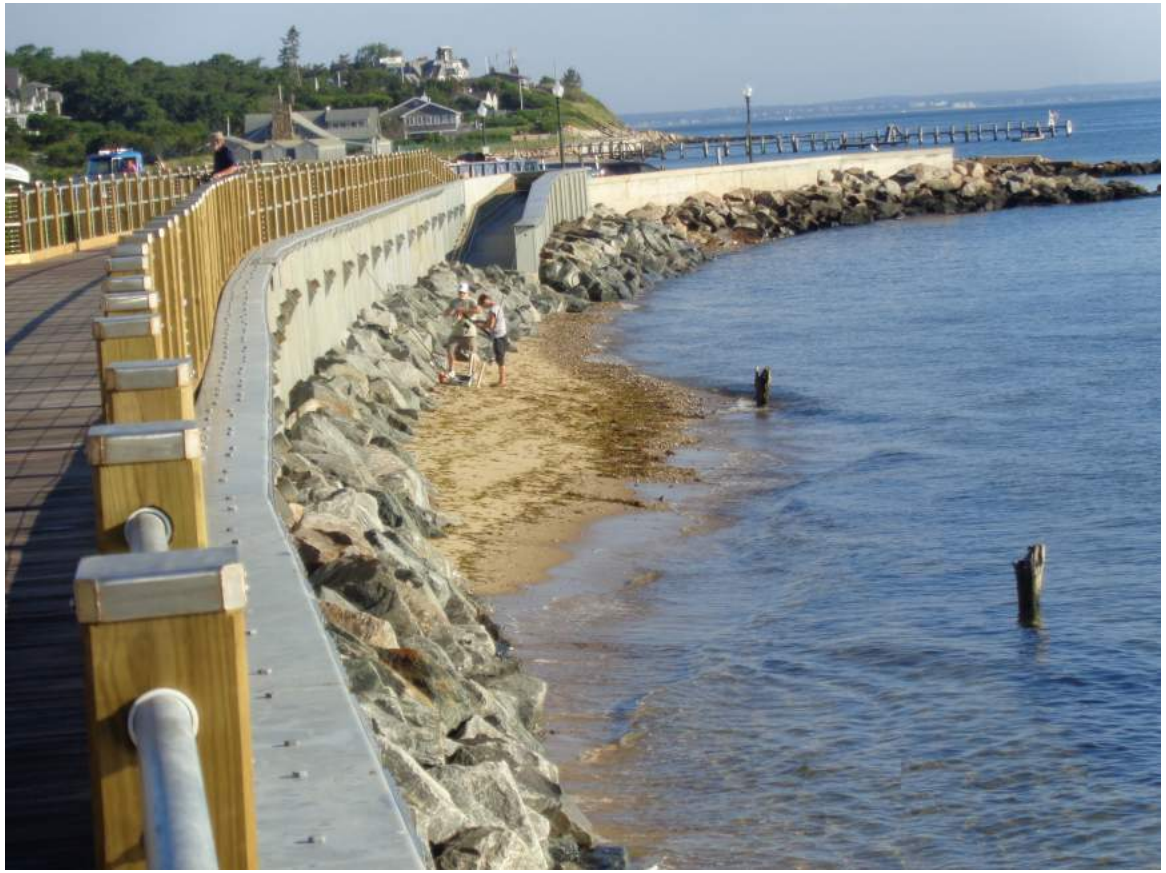
COST: ~$2.8 Billion USD



3.21 PROTECT

- **Case Study – Seawall (Continuous Promenade): North Bluff Seawall**
  - Location: Massachusetts, US
  - Mitigates Storm Surge & SLR
  - Creates Inland Flooding Challenge





OPTION 3

Focus: Protect the Entire Bay

BARRIER LENGTH: 10,500 ft / 3150 m

COST: ~$76 Million USD

St. George's:

Caribbean's First Climate Smart Capital City

$300 million


Climate Smart City
CLOC:
Living
University
Public
Transport
E- Government
Carenage
Capacity
Building
Southern
Traffic
Tourism:
Sports
Marine
Health
Creative
Omnibus
St.
George's
Airport
Green Spaces
PARKS &
RECREATION
Energy
Efficiency
Urban
Densification
LED
Sewage
(Grenville
Road)
Resilient
Buildings
Electric
Mobility
New Port
Blue Economy

Next Steps

- GCF Project Preparation Facility
- Updating of NAP and NDC
- Also Exploring Other Options
    - LED Lighting
    - Greening the Electricity Sector
    - E-Mobility

Thank you.

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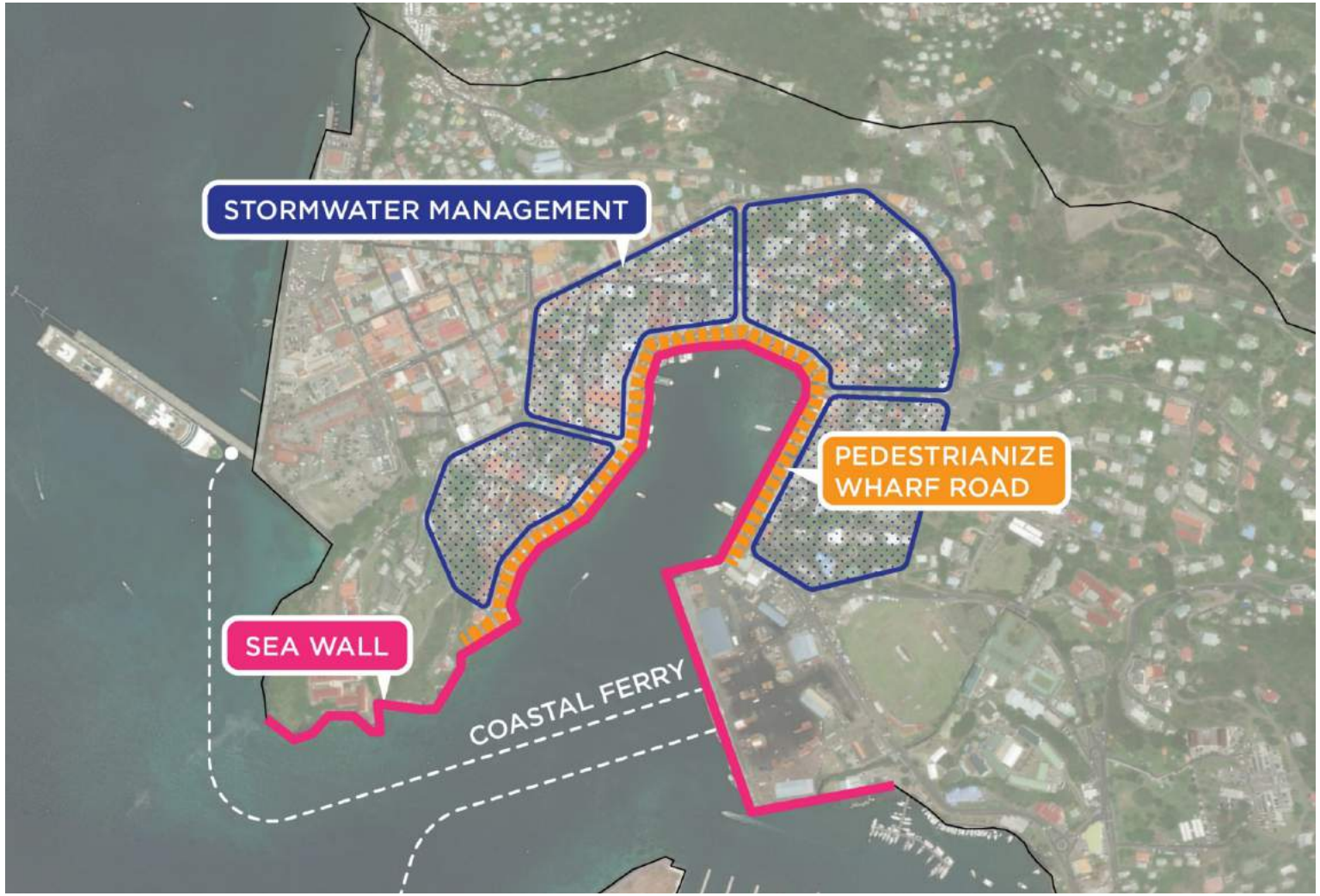
ANNEX

CARENAGE COASTAL DISTRICT

- Sea Level Rise barrier
- Stormwater management area
- New green transportation links
- Economic revitalization of heritage zone
- Expansion of tourism and local economic opportunities
- Increased urban density
- Creation of Heritage Benefit District to finance maintenance and ensure long-term viability of protective infrastructures

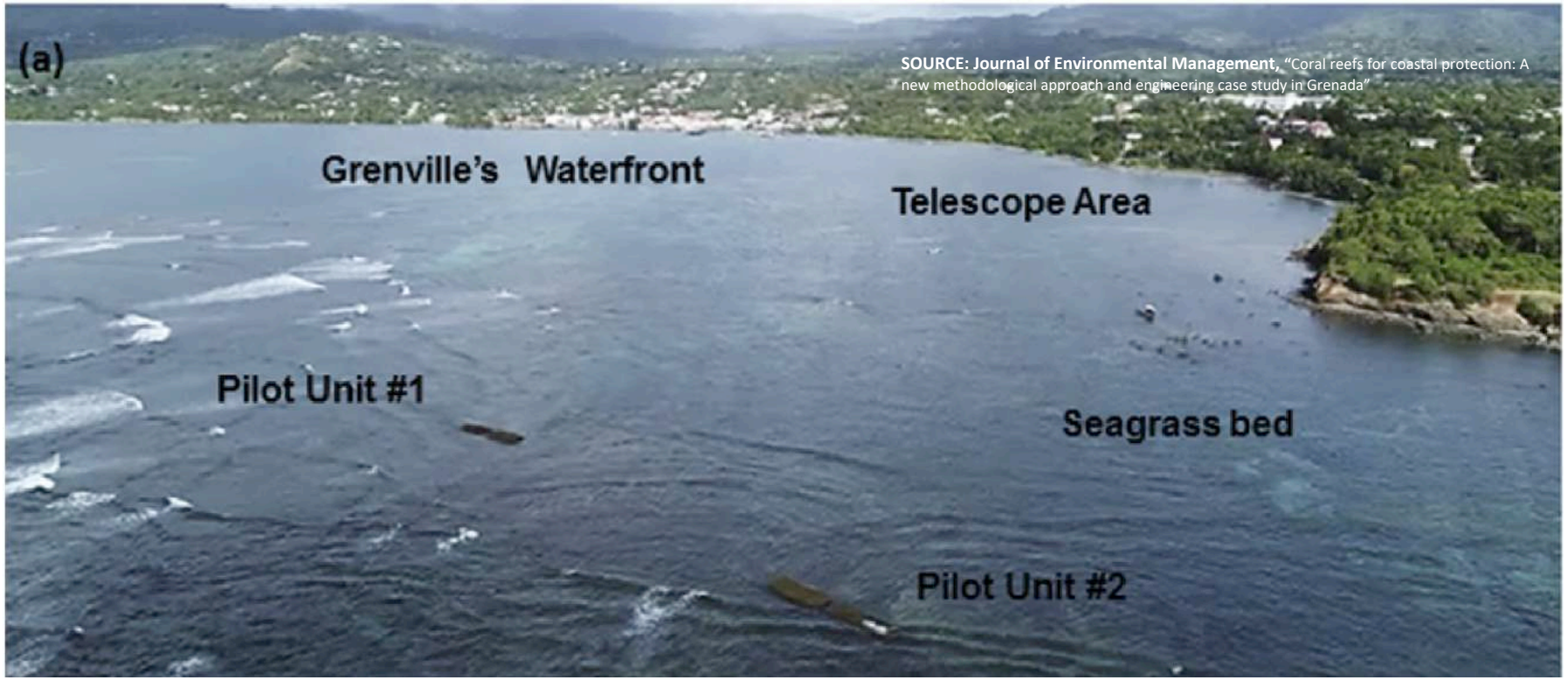


INTERNATIONAL AIRPORT SHORELINE STABILIZATION PROJECT

- Shoreline protection
- Marine engineering for future air travel capacity
- Preparation for future extreme events

GRENVILLE/SOUBISE INTERTIDAL RESTORATION PROJECT

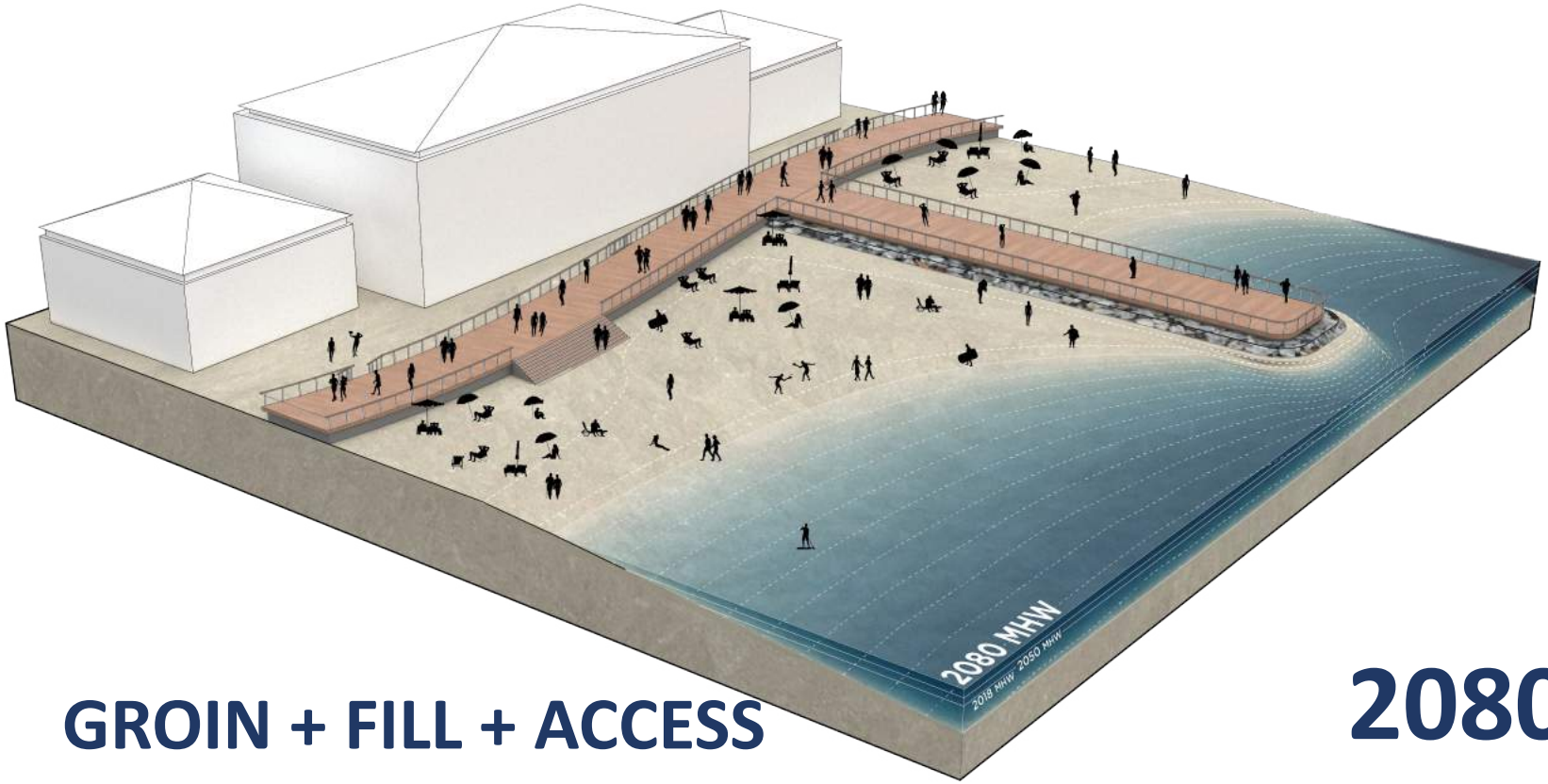
- Natural systems protection against sea level rise and storm surge
- Expansion of successful The Nature Conservancy pilot project
- Creates livelihood opportunities for fisherman
- Protects against erosion and rebuilds reefs



SOURCE: Journal of Environmental Management, "Coral reefs for coastal protection: A new methodological approach and engineering case study in Grenada"

GRAND ANSE
PROTECTION AND ENHANCEMENT PLAN

- Sea level rise protection
- Storm surge protection
- Beach enhancement
- Natural plantings and dune restoration
- Coral reef protection through runoff diversion

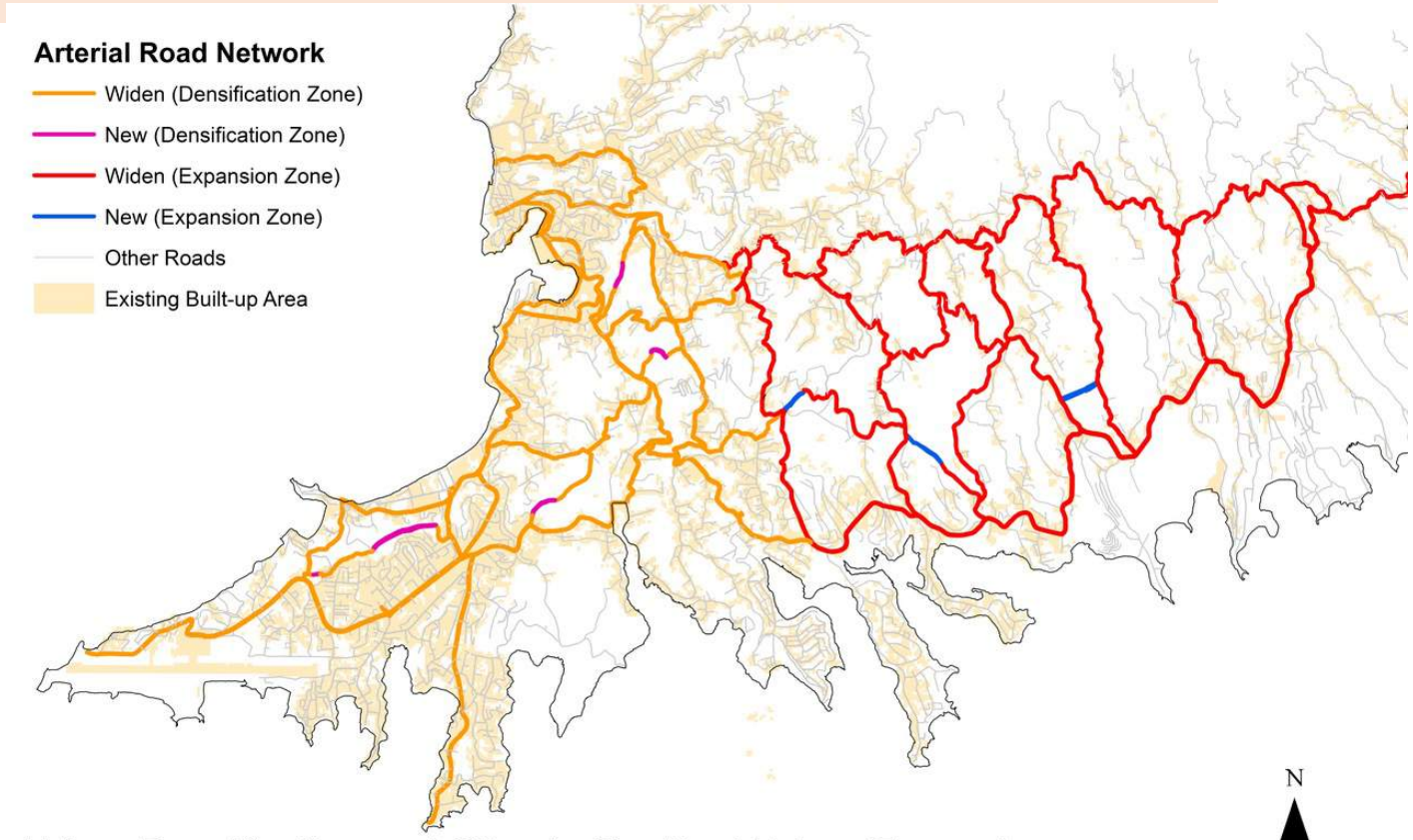


GROIN + FILL + ACCESS

2080

URBAN DENSIFICATION AND URBAN EXPANSION

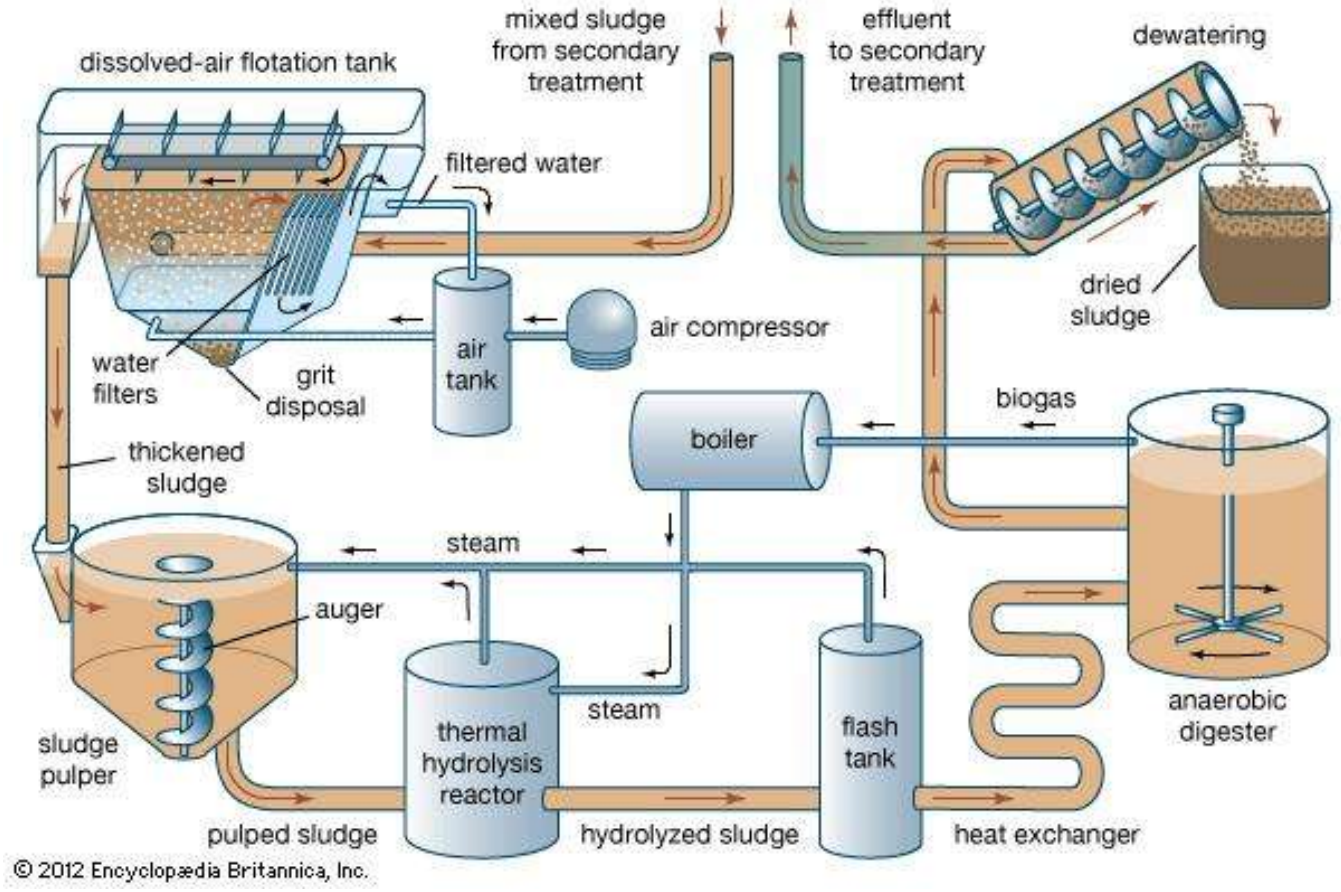
- Long-term plan for urban development
- Identification of critical corridors for densification
- Identification of road widening for congestion relief and public transportation
- Consideration of hazard zones and drainage and landslip issues
- Preservation of natural areas through green network



Urban Densification and Climate Resilient Urban Expansion
Grenada 2050 Draft Plan

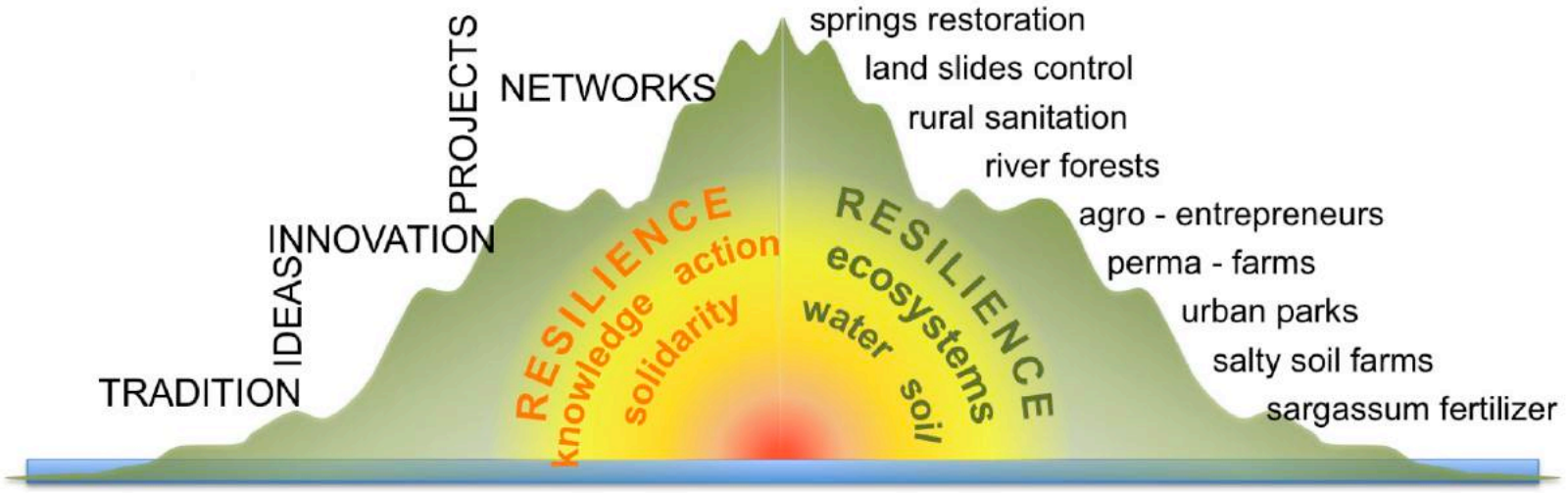
GRENADA WASTEWATER RESOURCE RECOVERY

- Biogas capture and solar power inputs allow carbon neutral process
- Enhanced collection system for sewage
- Processing of septic wastes
- Preservation of coral reefs and protection of water quality
- Energy-positive operating model



INTEGRATED PARTICIPATIVE WATERSHED MANAGEMENT

- Community-designed projects for integrated watershed management
- Livelihoods in rural and peri-urban areas
- Improved agricultural practices for greater sustainability
- Strengthened community networks
- Engagement and uplift of vulnerable populations



The Green Omnibus is a collective space
to support local organizations and projects
that combine
+ sustainable management of natural resources
+ the human bonds that make us resilient.

GRENADA – LEAPFROG TO ENERGY EFFICIENCY

- Energy efficiency in public sector buildings
- Energy efficient public lighting, island-wide
- Implementation of household appliance program to replace outdated and inefficient appliances
- Implementation of large consumer cooling and refrigeration replacement program
- Identification of point sources of emissions such as landfills and power generating facilities

A COMPREHENSIVE CAPACITY BUILDING INITIATIVE

- Improvement of agricultural extension service
- Vocational training for green jobs
- Aid for teachers and curriculum development
- Public knowledge portal on climate change

	Individual	Household	Community	Sector
K-12				
Vocational/Technical	Disaster Risk Reduction and Public Health		Building - Construction	Building - Construction
Continuing Education	Disaster Risk Reduction and Public Health	Energy Efficient Lighting		Building - Construction