NATURAL HAZARD RISK ASSESSMENT AND RISK RESPONSE AT THE ENTERPRISE LEVEL: BUSINESS CONTINUITY PLANNING AS A STRATEGY TO SUSTAIN ECONOMIC GROWTH

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Presentation Outline

- SIDS and Climate Change
- Impact of climate risks on Negril's Resort Area
- Business Continuity as a Strategy to Respond to Negril's Climate Risks
- Questions & Answers


13
CLIMATE
ACTION

Climate Change
Why the Business Sector Should Care

"Scientific evidence for warming of the climate system is unequivocal"

- Intergovernmental Panel on Climate Change, 2007

Take a Look at the Evidence

Independent analyses by NASA and the National Oceanic and Atmospheric Administration (NOAA).

Source: http://climate.nasa.gov/climate_resources/139/

Why Does Climate Change Concern SIDS

"Small island developing States (SIDS) have long been recognized by the international community as a special case whose needs and concerns have to be addressed":

A. Their Land:Sea ratio are largely skewed

They are vulnerable to Sea Level Rise

B. 90% of SIDS are located in the tropics

They are seasonally affected by extreme weather events

C. Large percentages of the population, infrastructure, urban centres and biodiversity are located along the coast.

The economic impact of Climate change on SIDS will be significant

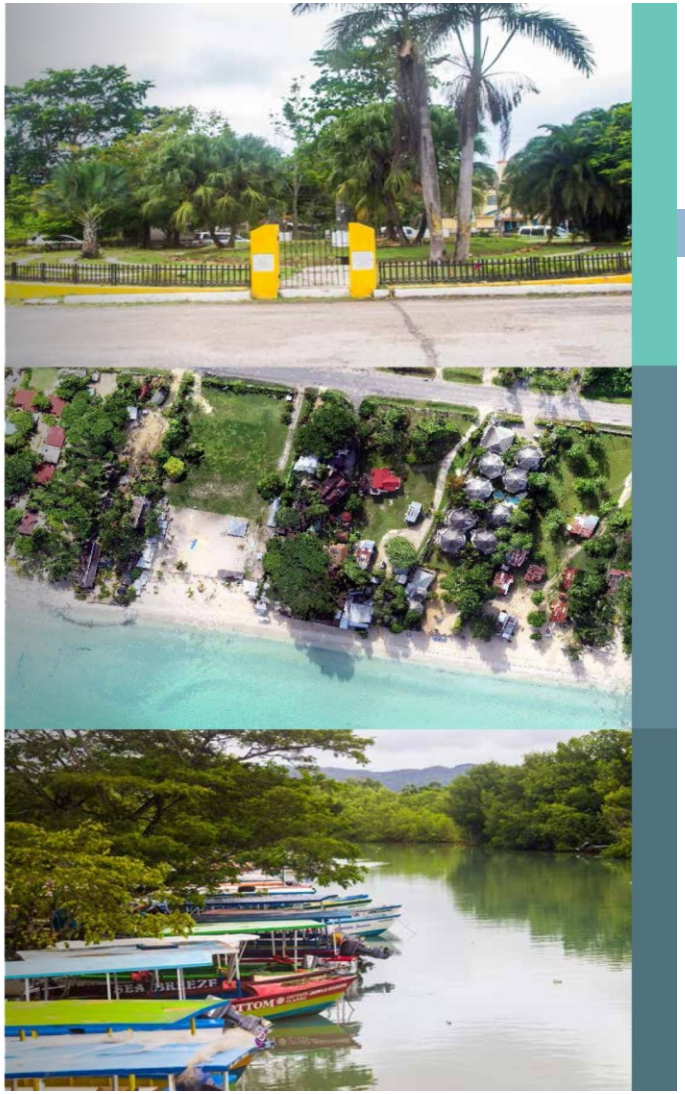
UNFCCC (2005) climate change, small island developing States. Issued by the CLIMATE CHANGE SECRETARIAT (UNFCCC), Bonn, Germany

PROJECT/PROGRAMME: "ENHANCING THE RESILIENCE OF THE AGRICULTURE SECTOR AND COASTAL AREAS TO PROTECT LIVELIHOODS AND IMPROVE FOOD SECURITY"

CLIMATE RISK ATLAS

of Coastal Hazards & Risk in Negril

DRAFT



The priority hazards within the scope of this project include:

- **Storm surge and Sea Level Rise**
- **Wave Overtopping**
- **Coastal Erosion**

GEOGRAPHIC PROFILE OF NEGRIL

Settlements
Canal
River
Road
Swamp
Study Boundary
Parish Boundary

Elevation (metres)

10
20
40
60
80
100
150

Project Name
Enhancing the Resilience of the Agriculture Sector and Coastal Areas to Protect Livelihoods and Improve Food Security Programme

Component 3:
Improving institutional and local level capacity for sustainable management of natural resources and in disaster risk reduction in the targeted vulnerable areas; and raising awareness for behaviour modification

NOTES

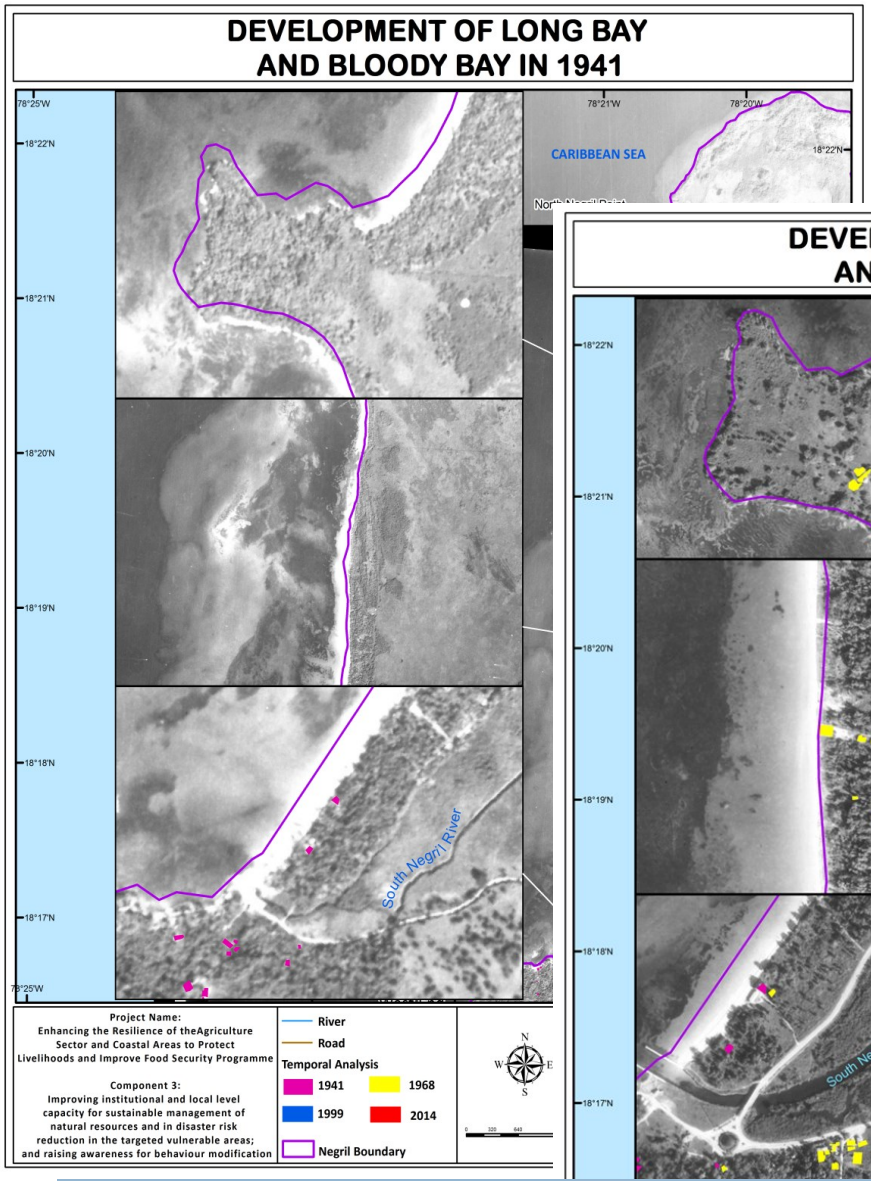
Produced: September 2015
Map Projection: JAD 2001
Datum: WGS_1984
Author: ODPEM

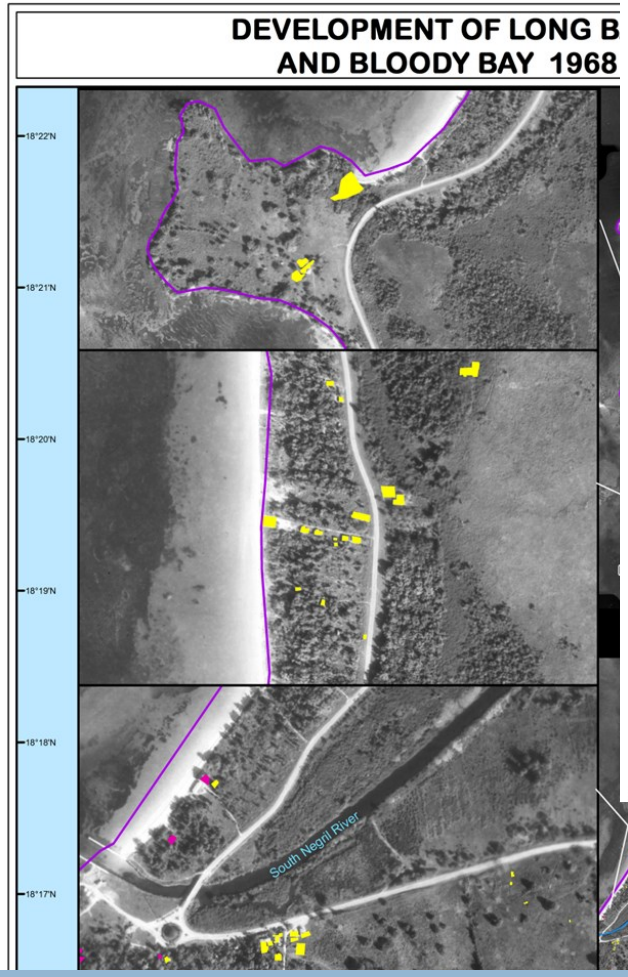
0 1,250 2,500 5,000 Meters

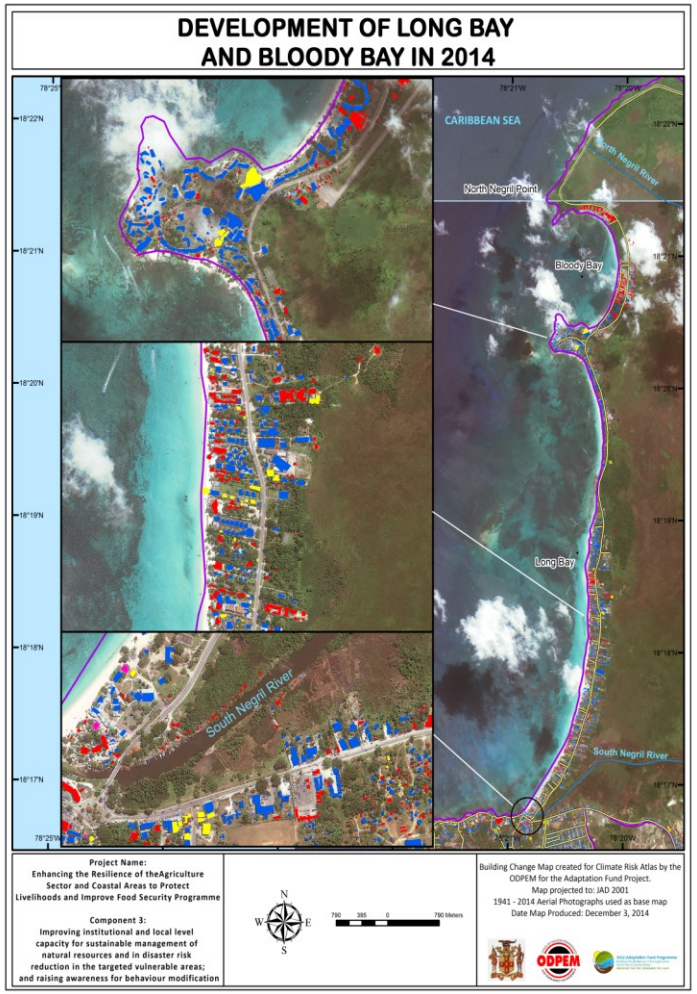
Profile of Negril

- Third largest resort area in Jamaica
- Since 2013, received 19.4% - 20.50% of stop over visitor arrivals by resort area
- Direct employment in accommodation subsector provides 9,810 jobs (28%)
- Population based on 2011 census ~ 11,716
- Main tourism resource – 9km of white sandy beach
- Faces serious climate risk – up to 55m of shoreline eroded over a 10 year period

Understanding Negril's Climate Risk







Multi-temporal Analysis 1941, 1968, 1999, 2013

HISTORICAL SHORELINE FOR LONG BAY, NEGRIL 1968 - 2013

SHEET 3

1968 Shoreline

1991 Shoreline

2000 Shoreline

2013 Shoreline

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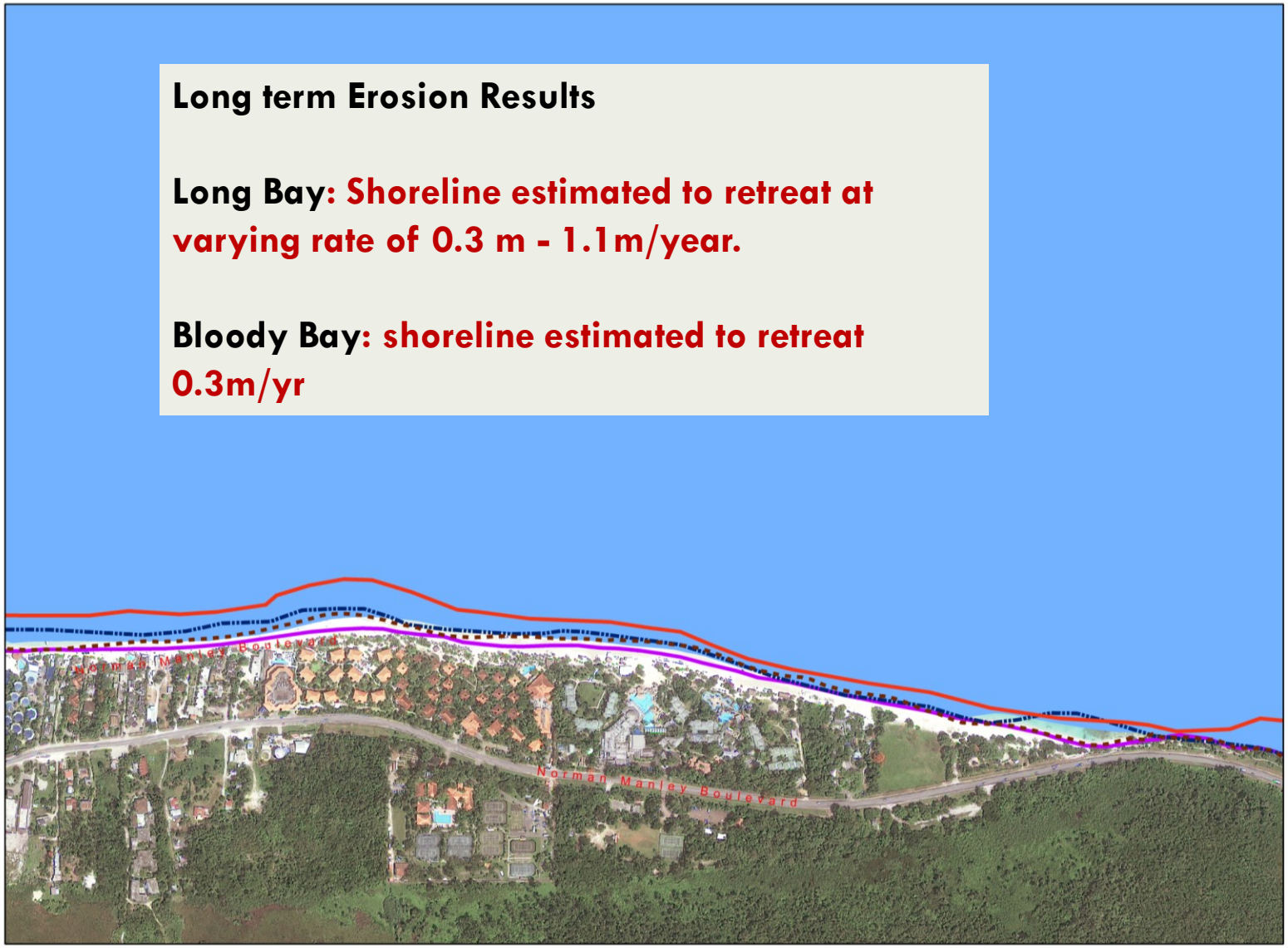
110 55 0 110 Meters

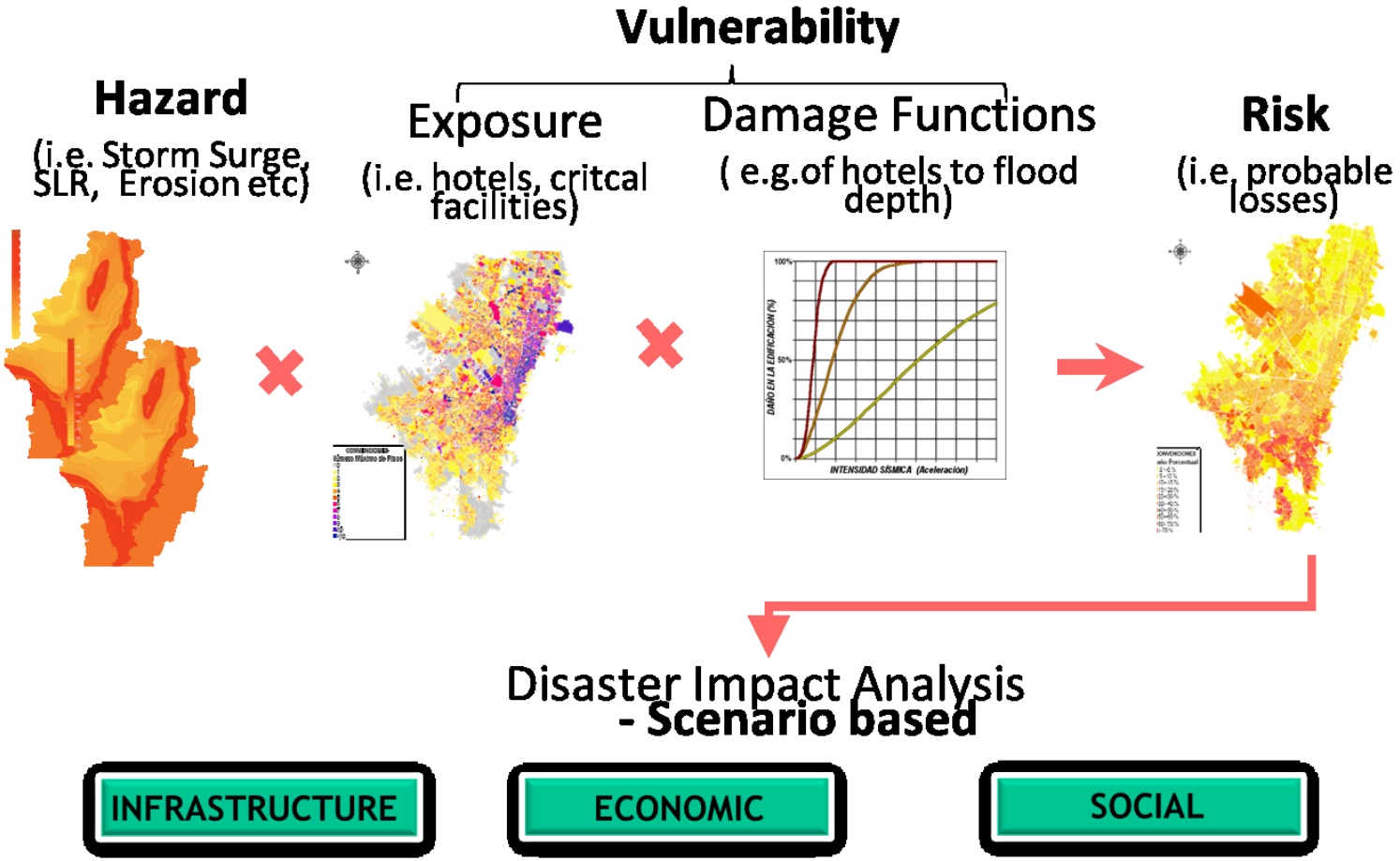
Long term Erosion Results

Long Bay: Shoreline estimated to retreat at varying rate of 0.3 m - 1.1m/year.

Bloody Bay: shoreline estimated to retreat 0.3m/yr



Methodology - Probabilistic Risk Assessment



Hazard Assessment – Storm Surge and SLR

- **Methodology – SLR**

  - A2 scenario - worst case of all the emissions scenarios regarding the concentration of GHGs.

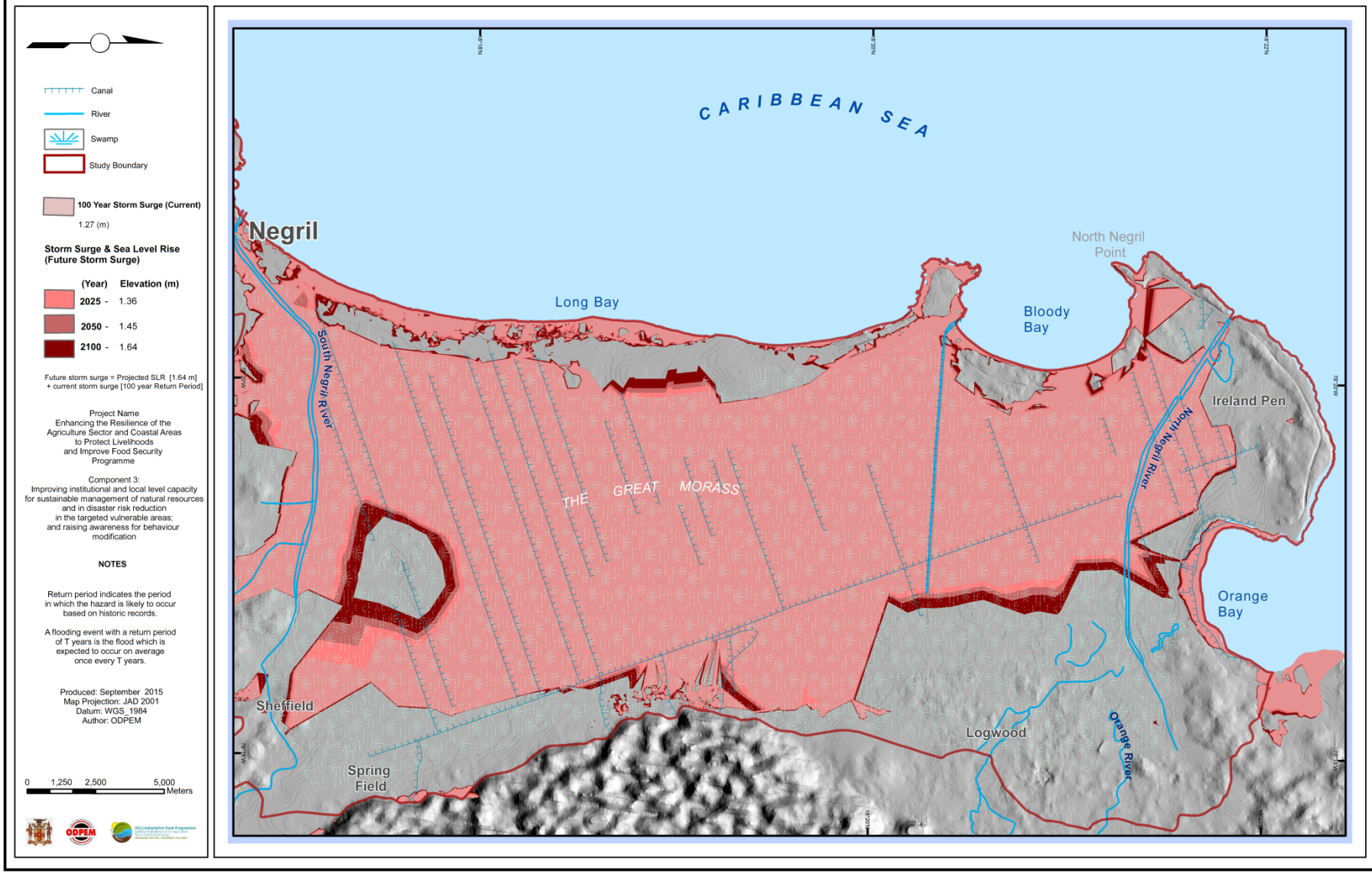
  - IPCC's projection for average SLR by the year 2100 is 0.37m.

Scenario	Global Mean Sea Level Rise by 2100 relative to 1980-1999	Caribbean Mean Sea Level Rise by 2100 relative to 1980 – 1999 (+_ 0.05 relative to global mean)
IPCC B1	0.18-0.38	0.13-0.43
IPCC A1B	0.21-0.48	0.16-0.53
IPCC A2	**0.23-0.51**	**0.18-0.56**

Source: IPCC AR4, Meehl el at, 2007a

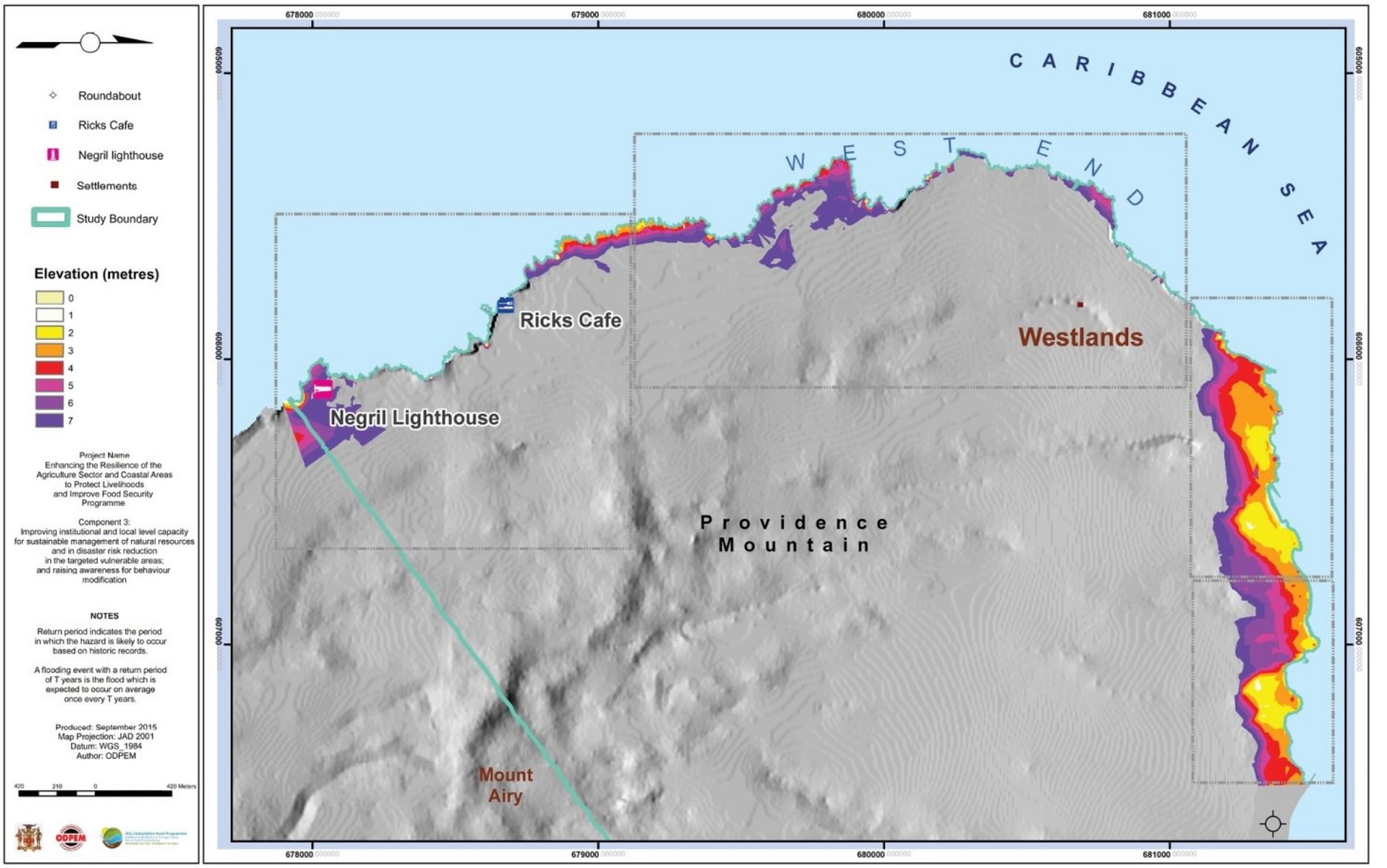
Future storm surge = Projected SLR (e.g. [0.185m]) + current storm surge [25, 50, 100 year RP]

STORM SURGE 100 YEAR (BASE LINE) & PROJECTED STORM SURGE FOR END CENTURY SCENARIO



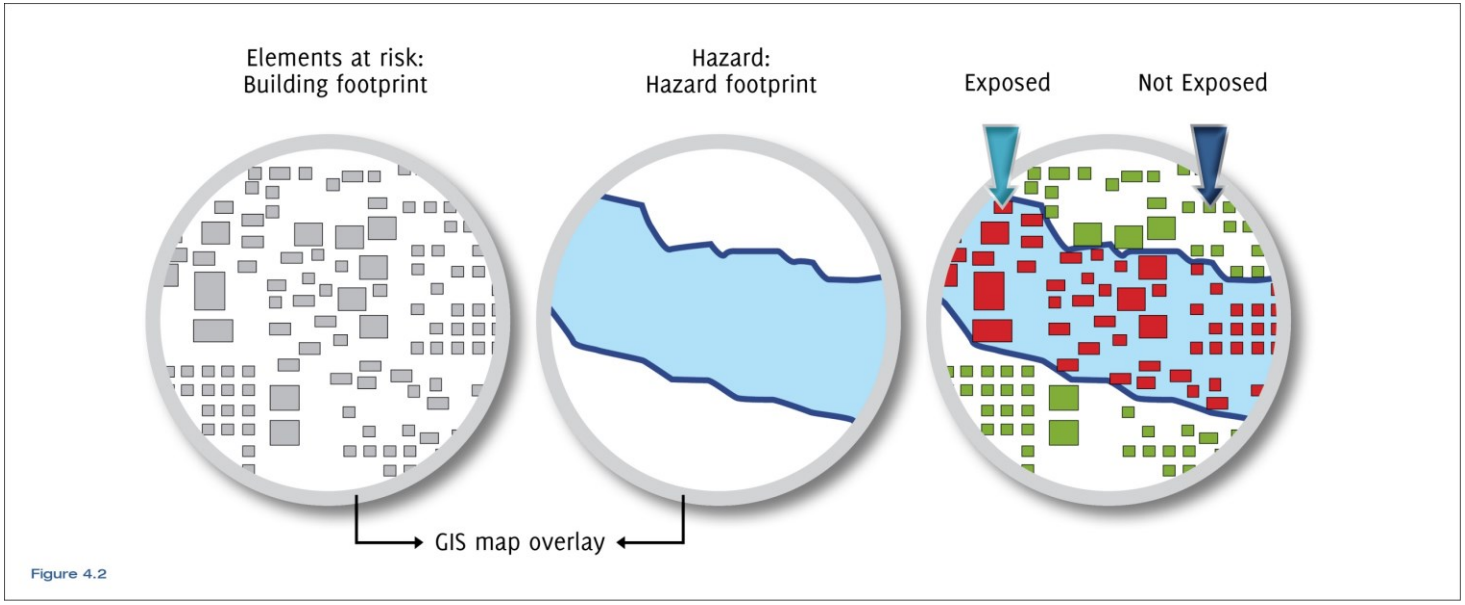
- ***Storm surge Inundation zone is expected to increase by 29% by 2100***

Areas Susceptible to Wave Overtopping - West End (10, 25, 50, 100 (yr))



Exposure Analysis

- The interaction between the elements at risk (e.g . Houses, hotels, roads) and hazard footprint defines the exposure



Elements at Risk Database

- **Over 4000 assets** (buildings mapped using GPS)
- **Over 8, 500 building footprints were digitized** from 2014 imagery
- For each building the following attributes were defined:
  - Land use and building type
  - Material of construction
  - Number of floors

Land Use	Total Bldgs			Hazard: FUTURE STORM SURGE					
		Number of Structures							
		10 YR RP	% in Hazard Area	25 YR RP	% in Hazard Area	50 YR RP	% in Hazard area	100 YR RP	% in Hazard Area
Residential	5113	210	4%	225	4%	256	5%	319	6%
Resort	1254	553	44%	571	46%	604	48%	661	53%
- Guest House	170	74	44%	80	47%	85	50%	92	54%
- Villas/Cottages	144	17	12%	18	13%	20	14%	21	15%
- Hotel	940	462	49%	473	50%	499	53%	548	58%
Sewerage/ Lift Station	14	3	21%	3	21%	3	21%	8	57%
Total	8573	1112	13%	1177	14%	1290	15%	1501	18%

	Hazards				
Element at risk: Buildings	**Current Storm Surge [SS] 100 year RP**	**Future storm surge, 2100 [SS+ SLR]**	**Wave overtopping**	**Coastal Erosion**	
				100 Year Storm Event	SLR
Number of buildings Exposed	1191	1501	926	372	477
% of Total Buildings Exposed	14%	18%	11%	4%	5.6 %

HOTELS EXPOSED TO 100 YEAR STORM SURGE (BASE LINE) AND FUTURE STORM SURGE FOR END CENTURY SCENARIO

SHEET 1

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Map Projection: JAD_2001
Datum:WGS_1984
Author: ODPEM
Data Source: STATIN Jamaica, 2011

0 20 40 80 120 160 Meters

HOTELS EXPOSED TO 100 YEAR STORM SURGE (BASE LINE) AND FUTURE STORM SURGE FOR END CENTURY SCENARIO

SHEET 2

Swamp

Additional Hotels Exposed (2100)

Hotels Exposed

Project Boundary

100 Year Storm Surge

Future Storm Surge End Century, (2100)

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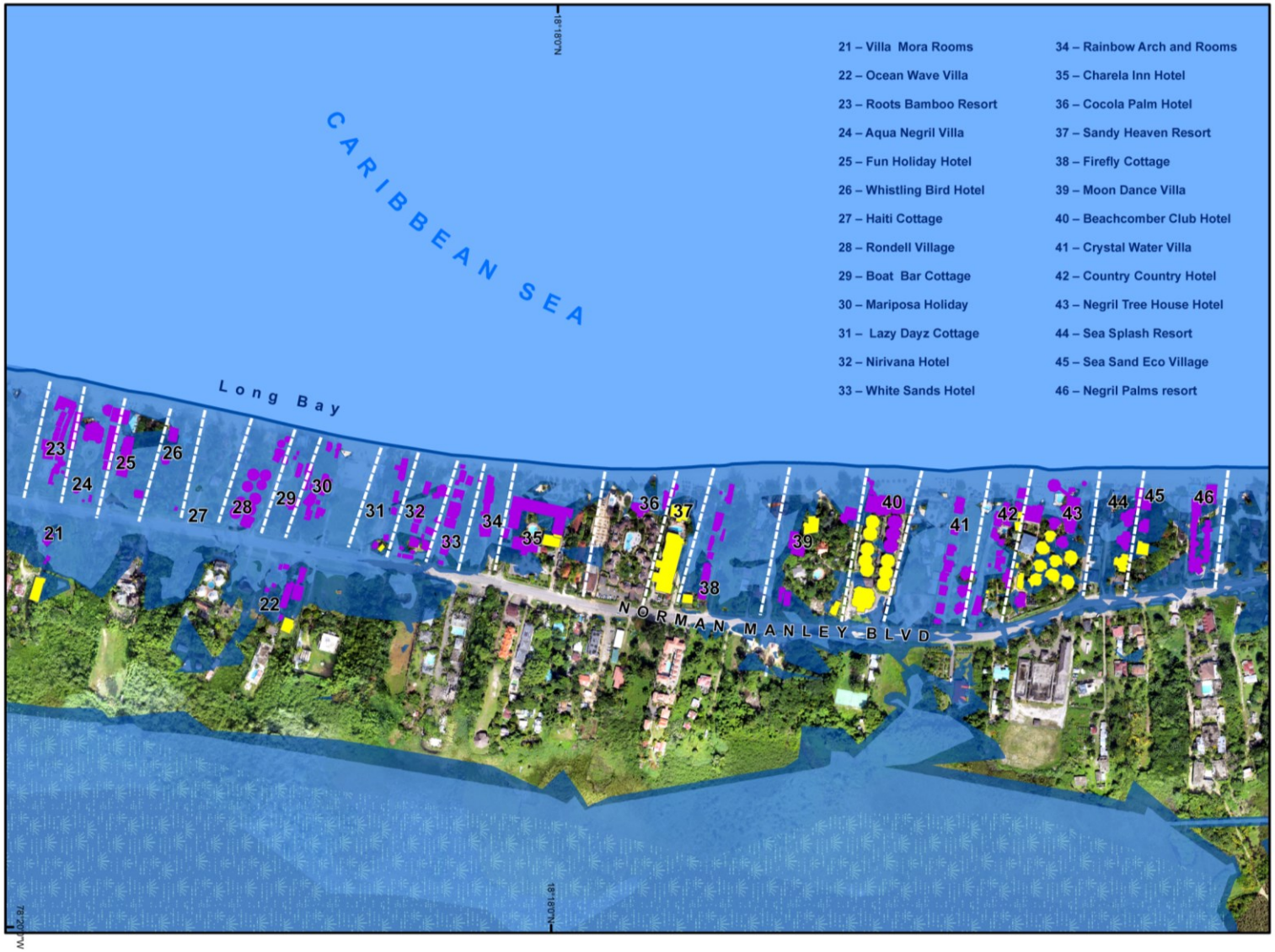
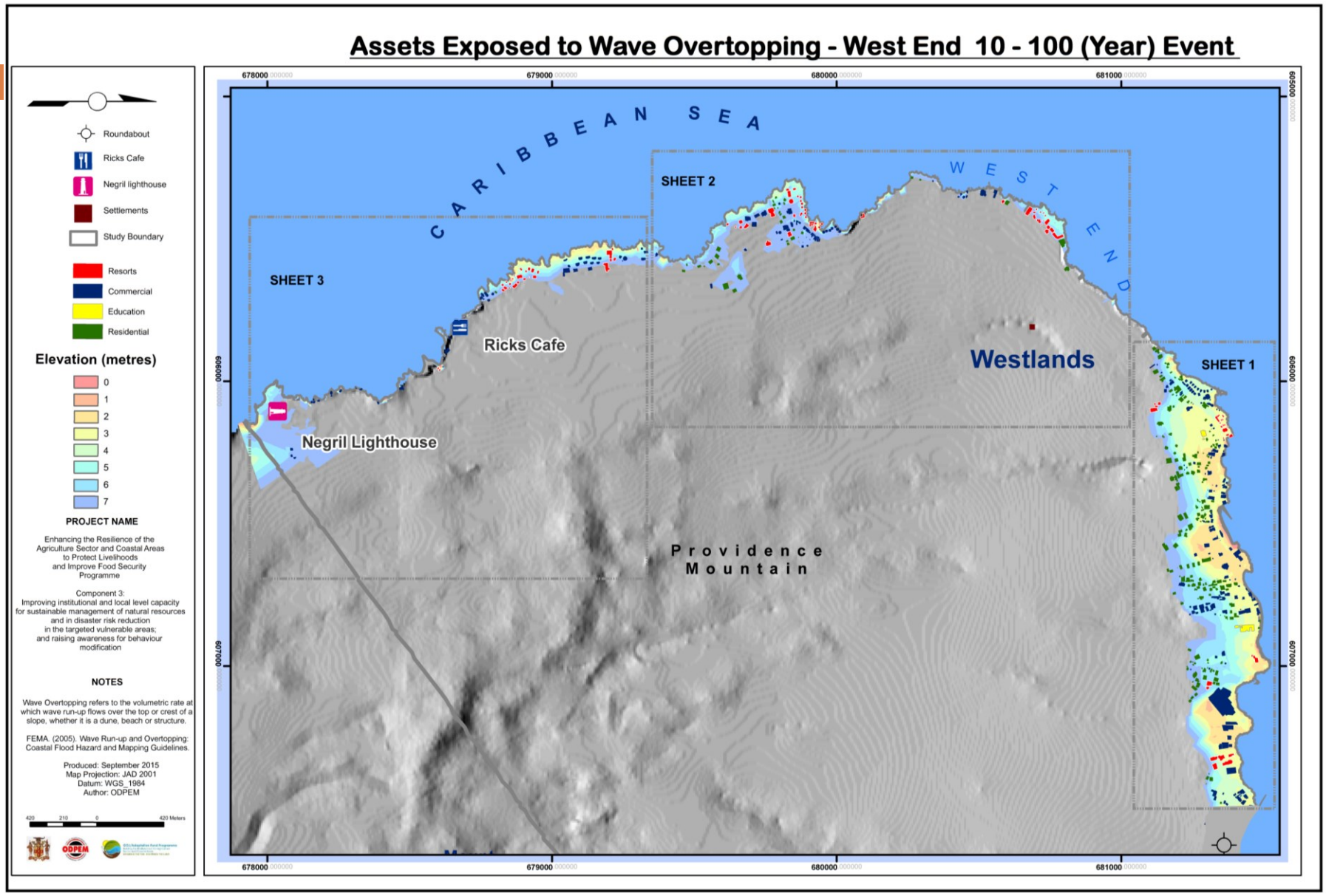
0 20 40 80 120 160 Meters



21 – Villa Mora Rooms
22 – Ocean Wave Villa
23 – Roots Bamboo Resort
24 – Aqua Negril Villa
25 – Fun Holiday Hotel
26 – Whistling Bird Hotel
27 – Haiti Cottage
28 – Rondell Village
29 – Boat Bar Cottage
30 – Mariposa Holiday
31 – Lazy Dayz Cottage
32 – Nirivana Hotel
33 – White Sands Hotel
34 – Rainbow Arch and Rooms
35 – Charela Inn Hotel
36 – Cocola Palm Hotel
37 – Sandy Heaven Resort
38 – Firefly Cottage
39 – Moon Dance Villa
40 – Beachcomber Club Hotel
41 – Crystal Water Villa
42 – Country Country Hotel
43 – Negril Tree House Hotel
44 – Sea Splash Resort
45 – Sea Sand Eco Village
46 – Negril Palms resort

Buildings Exposed – Wave Overtopping



BUILDINGS EXPOSED TO PROJECTED COASTAL EROSION FROM FUTURE STORM SURGE FOR END CENTURY SCENARIO

How Do We Address This Exposure?

BUSINESS CONTINUITY PLANNING AS A RESPONSE TO CLIMATE RISK

"Every business continuity manager has a duty to assess the risks and to determine the threats to their organization. Business continuity is about the long-term survival of your organization and climate change may be one of the biggest threats you face." David Honour of Continuity Central

Business Continuity Management (BCM)

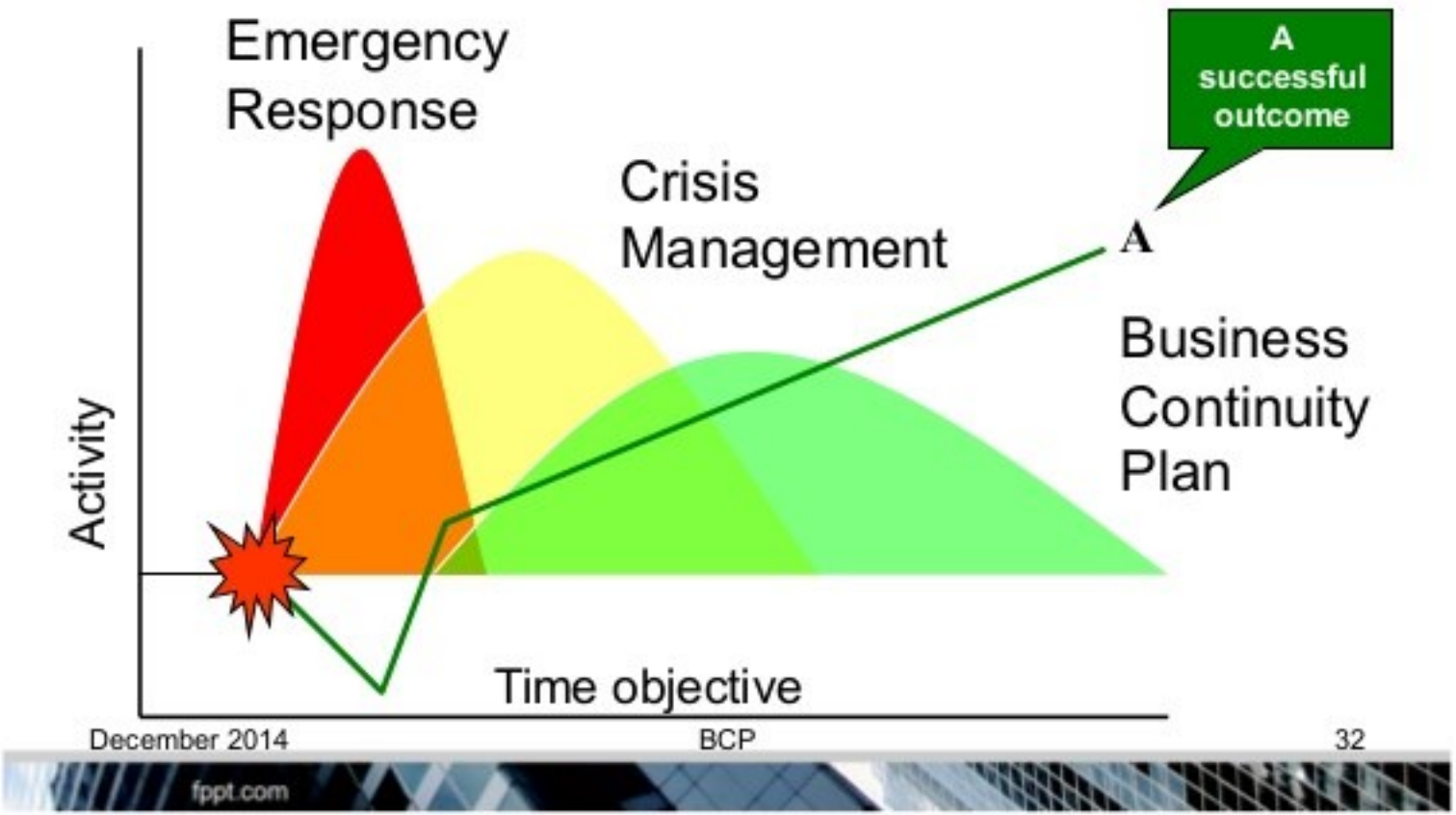
BCM is about being prepared to manage any disruption to your business to ensure the continuity of **critical** services to your customers.

Can you provide business in alternate mode?

- A Business Continuity Management Plan comprises those documented arrangements that enable you to manage any disruption to your business and maintain the continuity of services to your customers.

So What if I have an Emergency Response Plan?

Positioning BCP with ER and CM



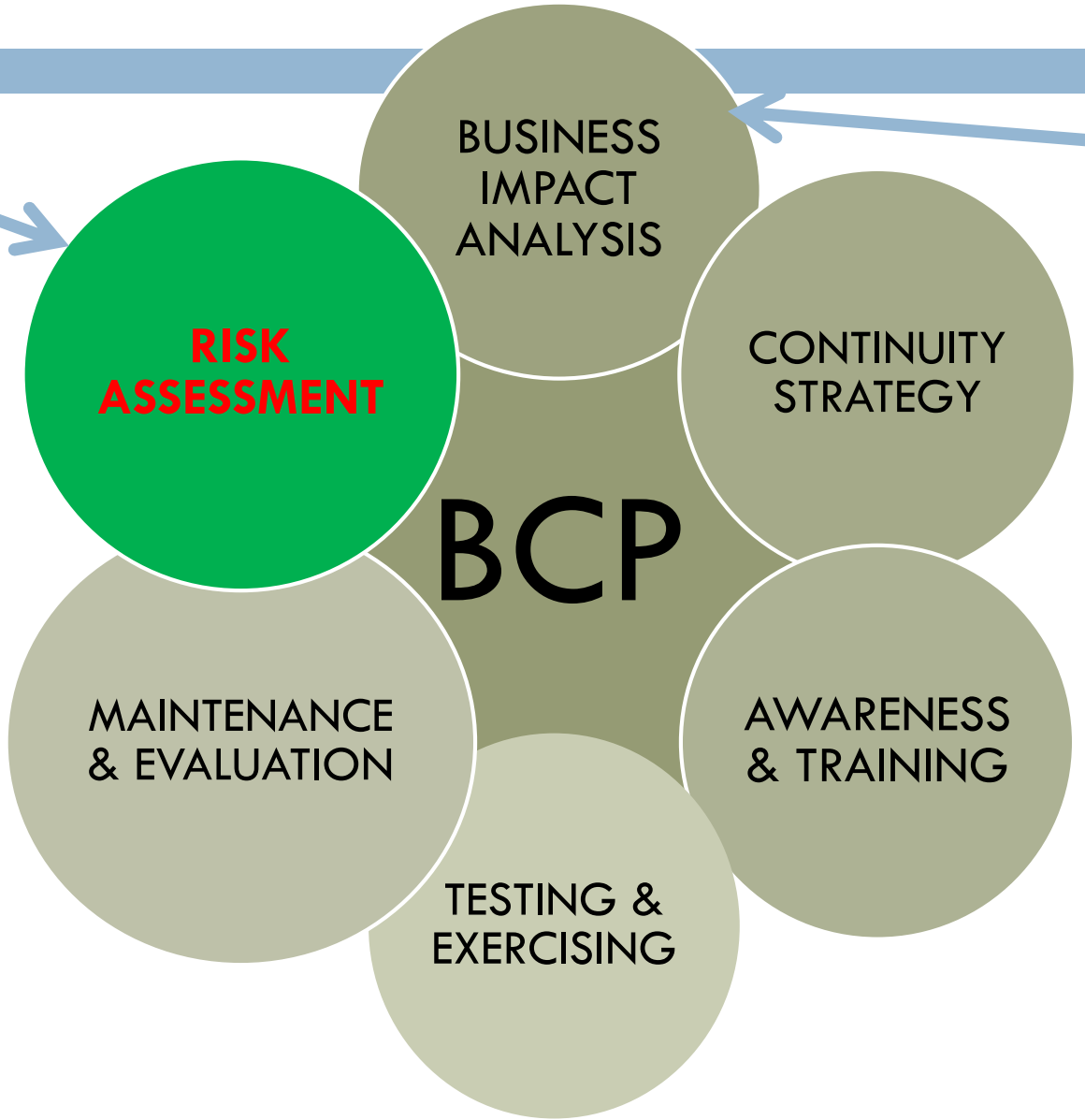
Source:http://www.slideshare.net/goudotmobi/developing-and-managing-business-continuity-planning-bcp

Steps in the BCP Process

Negril Climate Risk Atlas

Negril Climate Risk Atlas: Resort Area Level

Enterprise Level?



Current Limitations to BCP as a Strategy for Adapting to Climate Change

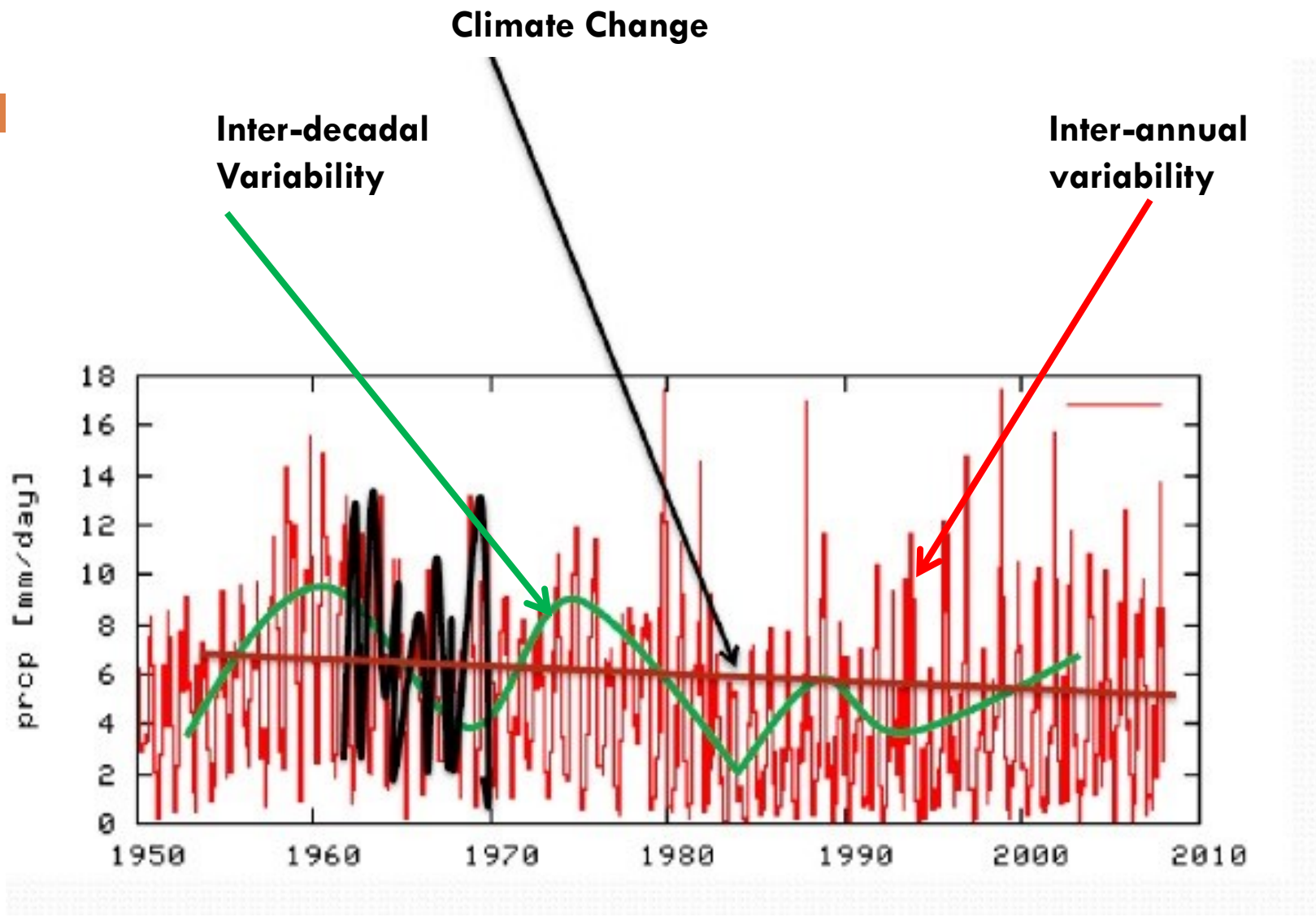
- Climate change is a long term and dynamic phenomenon and therefore requires a response that takes into account future and changing threats (and opportunities) and how these interact with business timescales.
- BCM, however, tends to be focussed on short timescales and does not generally engage with long-term drivers.

BCM and Climate Change - Amend BCM Scope

Long Term Considerations

- Continuity managers now need to be involved with products, services, locations, functions with a longer planning horizon
- These processes or activities were not previously covered by the BCMS eg new building or new initiative
- Alternatively, identify activities/business functions that fall within the banner of climate change and link them

- If there are no activities with long planning horizons focus on business processes with short planning horizon
- Focus on variability – variations in climate on shorter time scales (inter-annual variability and inter-decadal variability)


Climate Change
Inter-decadal
Variability
Inter-annual
variability
prcp [mm/day]
18
16
14
12
10
8
6
4
2
0
1950
1960
1970
1980
1990
2000
2010

Impacts to Tourism Sector from Climate Risks

- Physical Risk
- Loss of ecosystem resources
- Failure to meet Regulatory Obligations
- Loss of Reputation
- Risk of Litigation
- Loss of Revenue
- Loss of personnel
- Loss of vital records

Sample Continuity strategies

- Accept that Climate Change is real and accept the notion, that though it is an external risk, BCP can help
- Risk rate your suppliers
- Move critical operations/equipment/facilities (from ground floor)
- Elevate critical facilities above flood levels
- Cross train your workforce

What happens if Businesses fail to put a BCP in Place?

The London Chamber of Commerce and Industry conducted research on disaster recovery in 2003 and found the following:

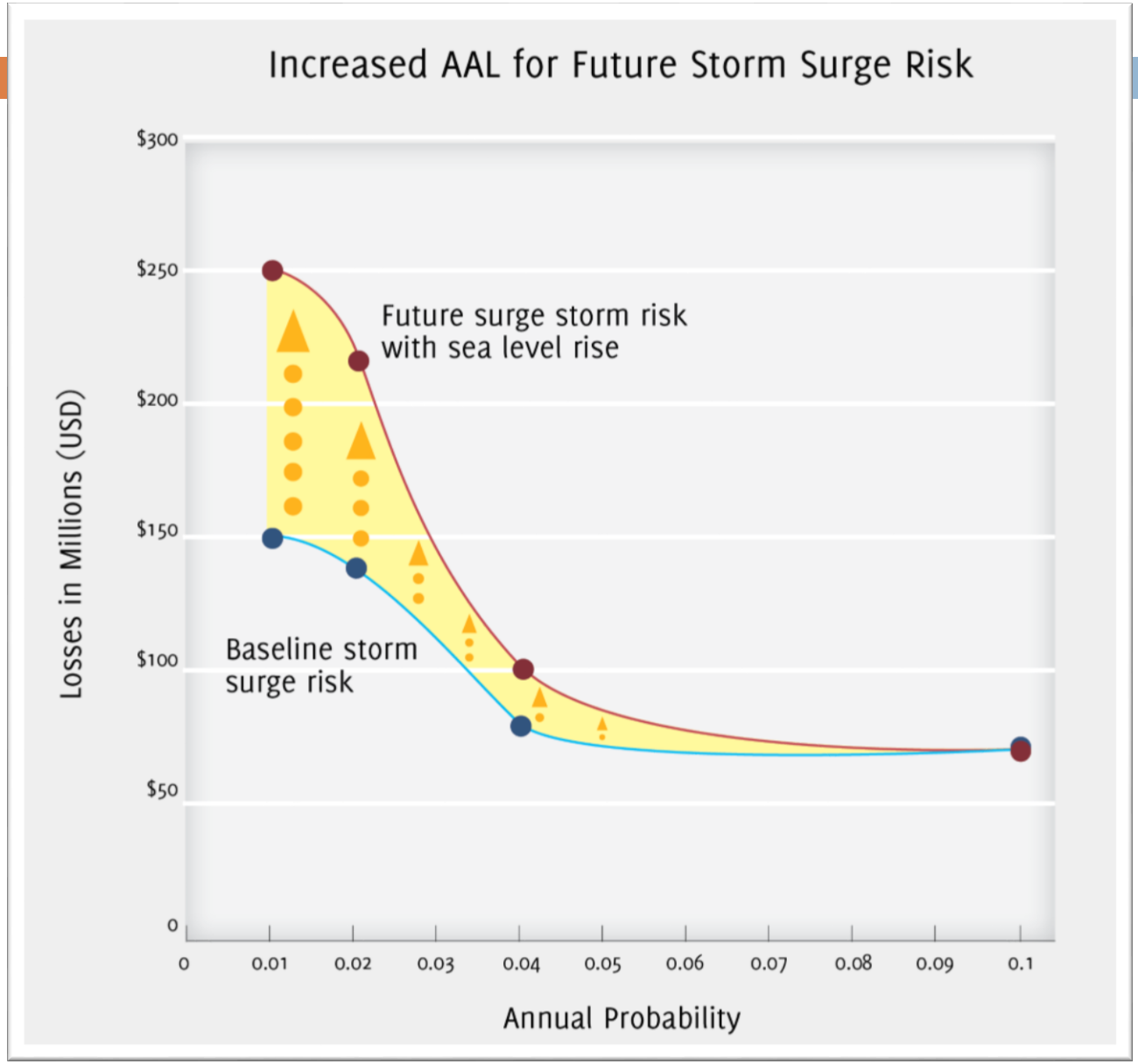
- 90% of businesses that lose data from a disaster are forced to shut within two years of the disaster
- 80% of business without a well-structured recovery plan are forced to shut within twelve months of a flood or fire
- 43% of companies experiencing disasters never recover

How is BCM Relevant to Negril's Situation?

Negril's Contribution to Tourism and National GDP

2014 Tourism Statistics		
	Value	**% Contribution to GDP**
National GDP	US$13.6 B	
Tourism Contribution to GDP	US$943 M	7
National Earnings from Stop Over Visitors	US$ 2.13B	15.81
Negril's Earnings from Stopover visitors	US$437.4 M	3.25
Hazards	**Exposed Value**	**Average Annual Loss**
Baseline Storm Surge	US$460.1	US$4.94
Future Storm Surge with SLR	US$621.2	US$6.76

Risk Analysis – Risk Curve



Conclusion and Recommendations

Conclusion

- Climate change is real
- Impacts are already being felt and will continue to be felt
- The tourism sector and by extension the national economy is threatened
- Business continuity plans can help

Recommendations

- Go beyond Emergency Response plans, develop BCP's
- In your risk assessment, factor climate change. It may change overall risk levels
- Identify long term (Climate change) and short term (climate variability) considerations and consider both in your business strategies

Q & A