The Use of Geospatial Data to address the Unique Vulnerabilities of Caribbean SIDS

THE CASE OF JAMAICA, W.I.

Presenter: Nadine Brown

UN-GGIM Side Event - Unleashing the power of 'Where…'

April 22,2015
United Nations Headquarters, New York

PRESENTATION OUTLINE

- Jamaica Sustainable Development Needs and Vulnerabilities
- Vision 2030 Jamaica National Development Plan
- Examples of How Geospatial Data is being used to address vulnerabilities
- Conclusion

SIDS Sustainable Development Needs and Issues

- Small Size
- Fragile economies
- Heavy dependence on fossil fuels
- Exposure to natural disasters
- Exposure to the impacts of climate change

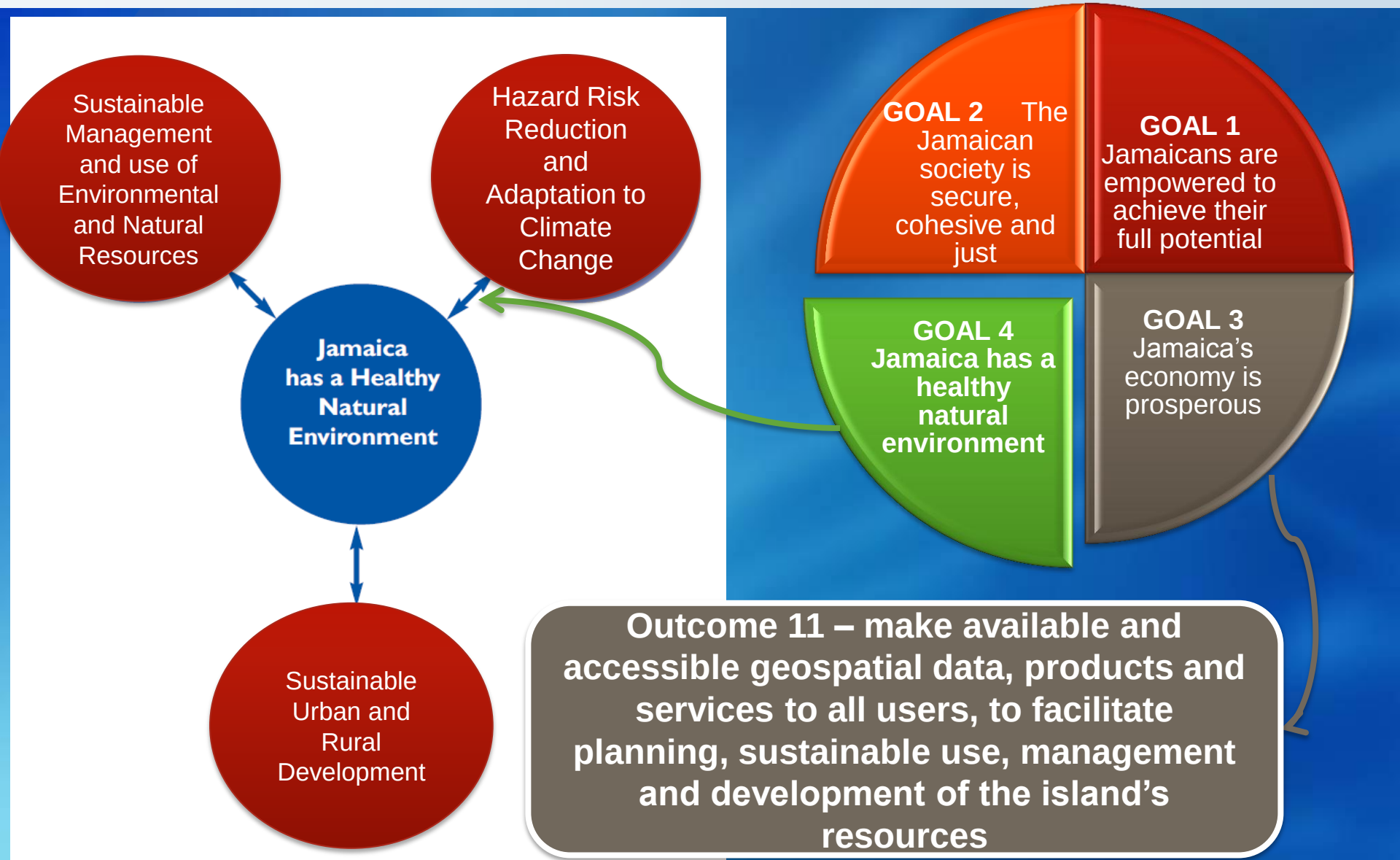
Environmental Vulnerabilities often Influence Economic Vulnerabilities

Jamaica

Total impact of natural disasters on Jamaica's economy - 2.0 % of total GDP between 2001 and 2012.

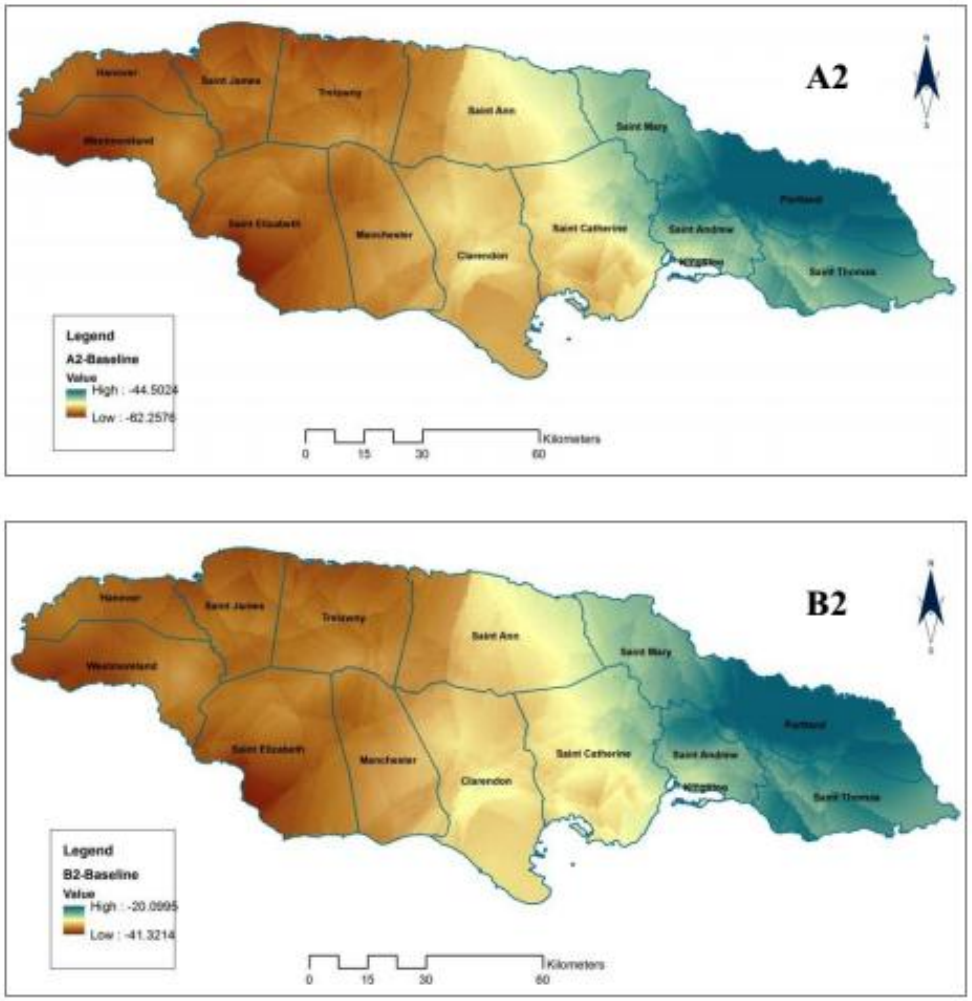
EVENT	Year	Category	Lives Lost	Cost ($JB)	Impact
					(% GDP)
Hurricane Michelle	2001	4	5	2.52	0.8
May/June Flood Rains	2002	-	6	2.47	0.7
Hurricane Charley	2004	4	1	0.44	0.02
Hurricane Ivan	2004	3	17	36.9	8
Hurricanes Dennis & Emily	2005	4	7	5. 98	1.2
Hurricane Wilma	2005	5	1	3.6	0.7
Hurricane Dean	2007	4	6	23.8	3.4
Tropical Storm Gustav	2008		12	15.5	2
Tropical Storm Nicole	2010		16	20.6	1.9
Hurricane Sandy	2012	2	1	9.7	0.8
Total			**72**	**115.53**	**~ 2.0 p.a.**

VISION 2030 JAMAICA - NATIONAL DEVELOPMENT PLAN



State of the Jamaican Climate

A. Source: Climate Studies Group, Mona (2012)



Source: Climate Studies Group, Mona (CSGM), 2012: State of the Jamaican Climate 2012: Information for Resilience Building (Full Report). Produced for the Planning Institute of Jamaica (PIOJ), Kingston Jamaica.

Figure 7.3.1: Change maps showing projected precipitation changes over Jamaica for the A2 (top) and B2 (bottom) simulations comparing baseline to 2071-2099 (produced using GIS mapping). Images produced using output from dynamic areal downscaling done for the island following the method outlined in Charlery (2010).

Near Term Climate Scenarios

- generated at the scale of the watershed
- for wind, temperature and precipitation
- Impact on key sectors – Tourism, Agriculture, water

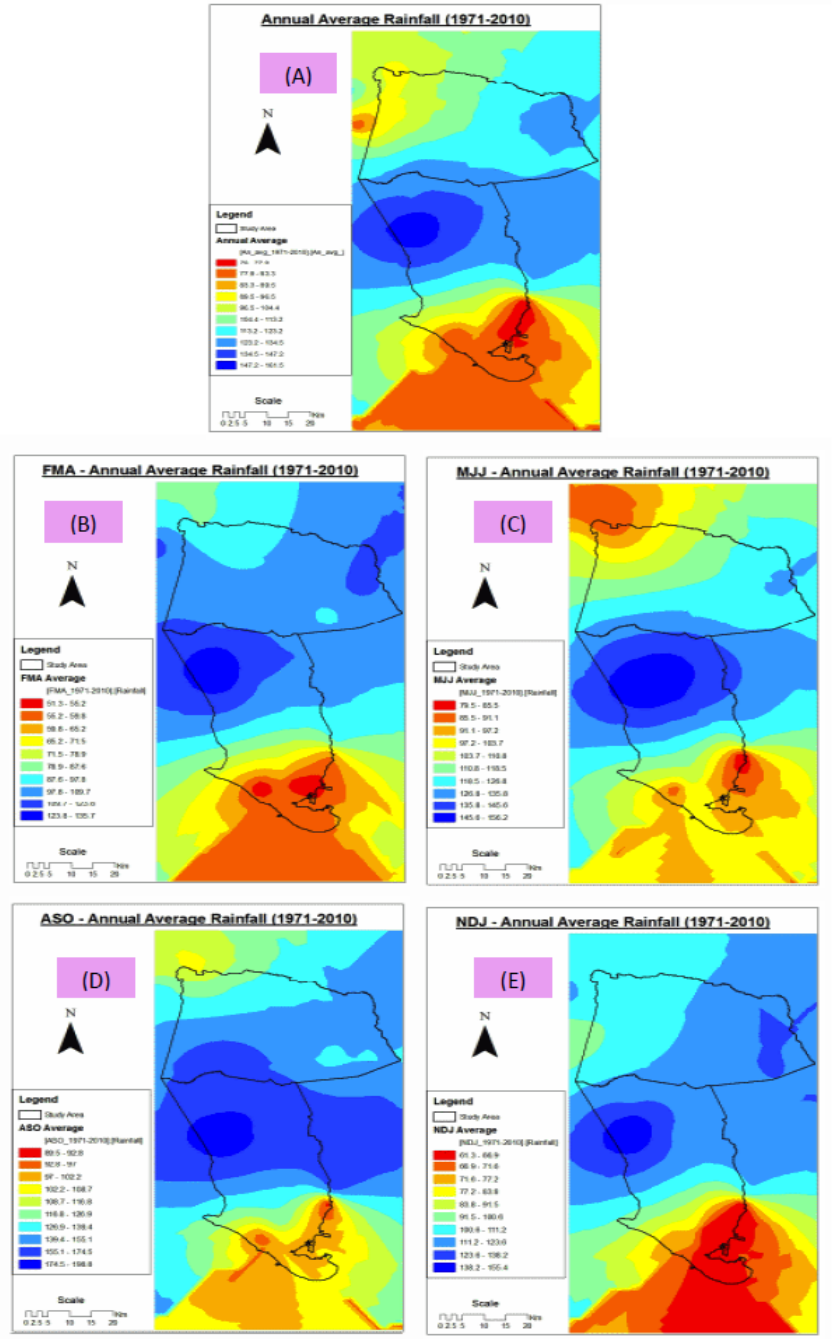
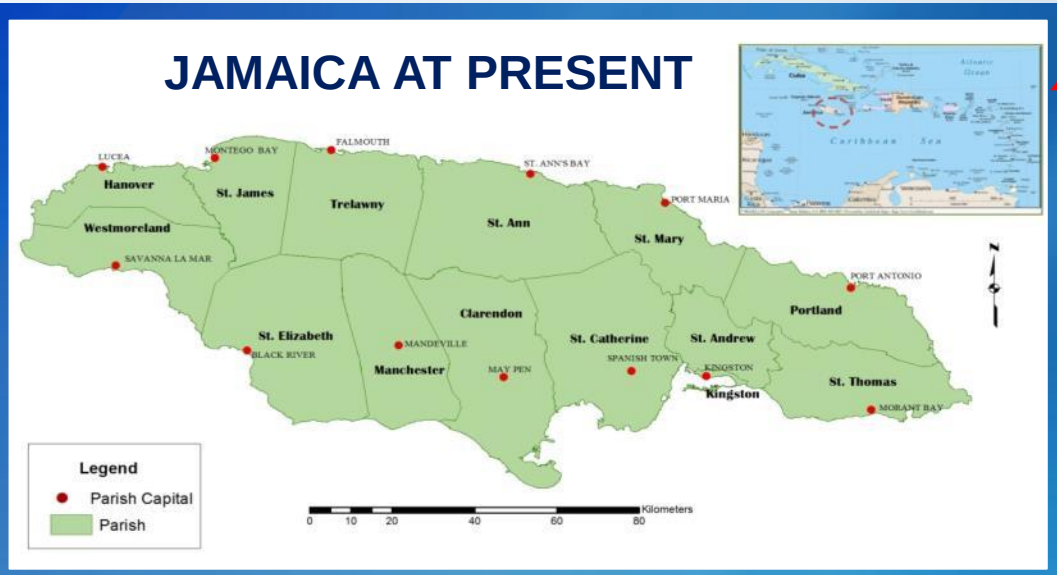


Figure 4-7: Map of rainfall means for Study Area for (A) Annual, (B) November-December-January (C) February-March-April (D) May-June-July and (E) August-September-October.

Source: Climate Studies Group, Mona (CSGM), 2014: Near-Term Climate Scenarios for Jamaica (Technical Report). Produced for the Planning Institute of Jamaica (PIOJ), Kingston Jamaica.

Jamaica –Near Term Climate Scenarios

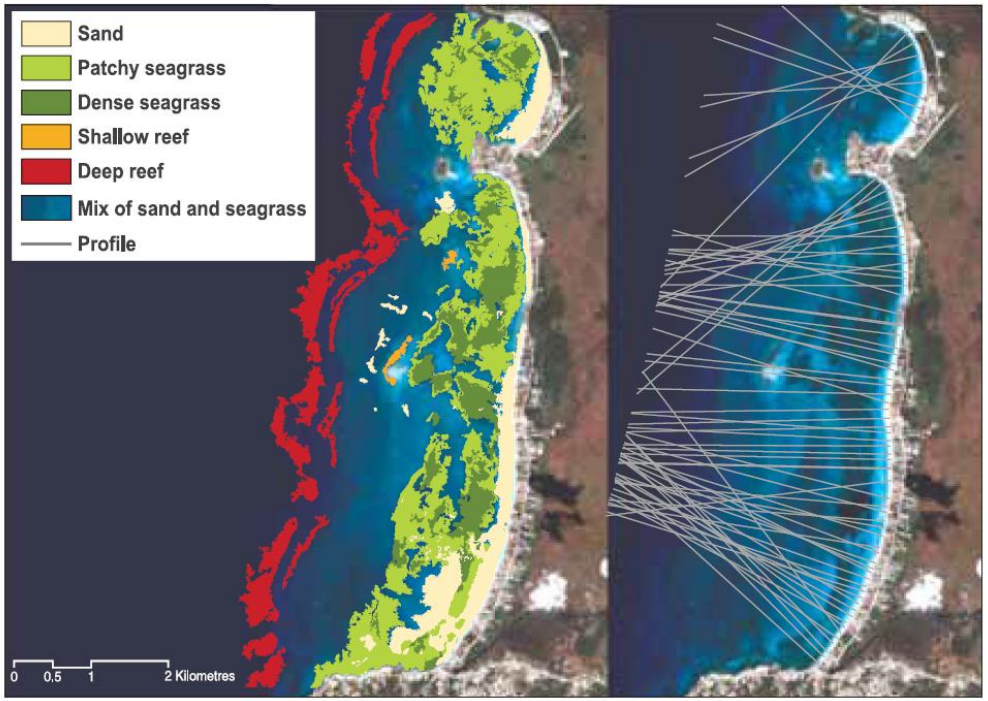


Mean temperature increases by 1.3 ^{o}C by 2020s.

Decrease in annual rainfall

If sea level rises by 0.18m the predicted loss of land area is 101.9 km2 and 416.4 km2 for a 10 m increase. Areas forecasted to be inundated are fast growing urban areas

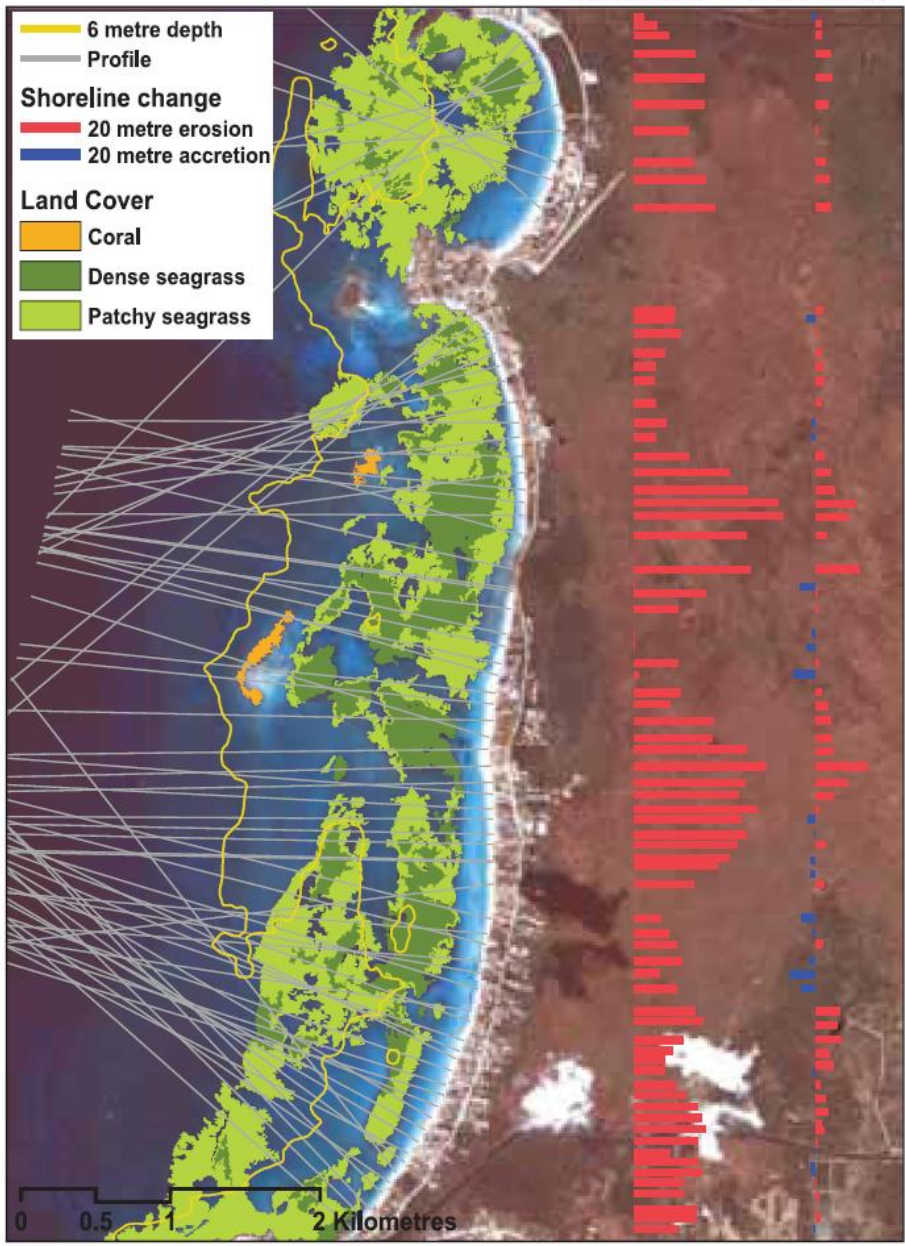
Map 4.3 Distribution of the coastal ecosystems and locations of the profiles used for the multiple regression analysis, based on the QuickBird satellite image (16 January 2008)



Linking Ecosystems to Risk and Vulnerability Reduction

Source: Risk and Vulnerability Assessment Methodology Development Project (RiVAMP)
Linking Ecosystems to Risk and Vulnerability Reduction
The Case of Jamaica
Results of the Pilot Assessment
UNEP,PIOJ (2010)

Map 4.4 Nearshore bed cover and shoreline changes along Negril's beaches, showing also the location of the 74 beach profiles used



Exposure of assets to Flooding

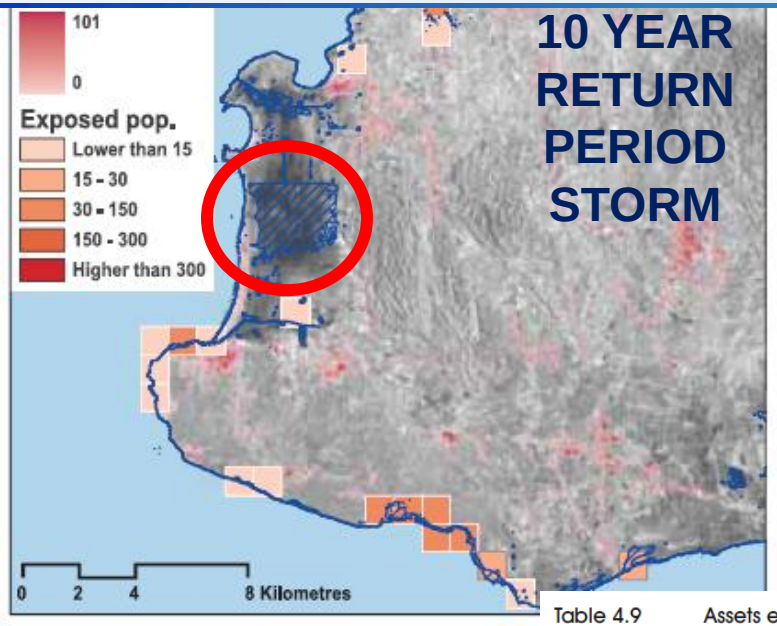
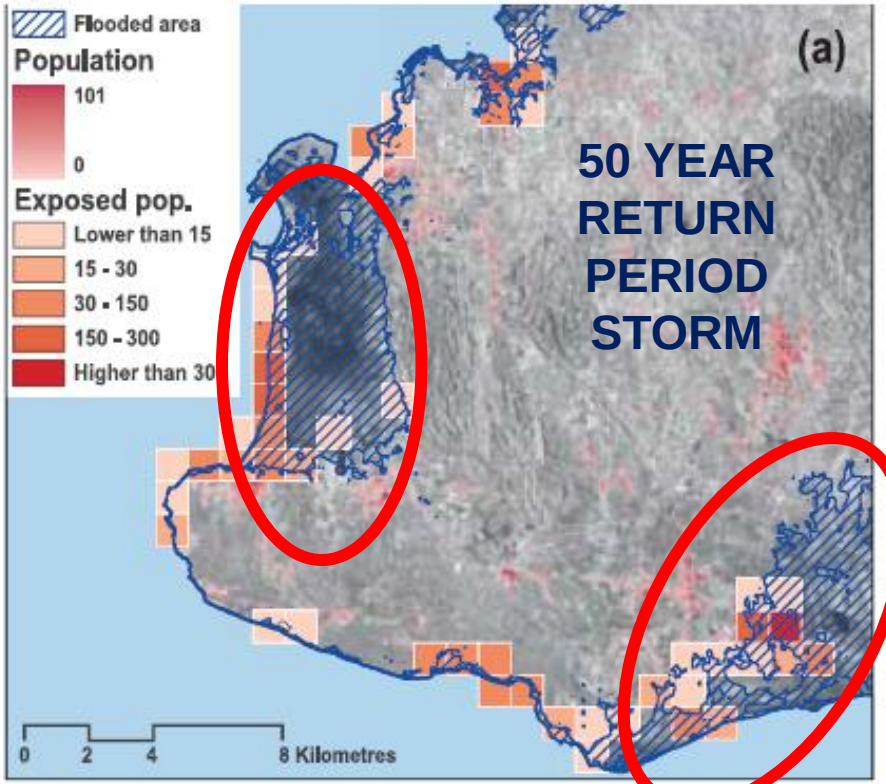


Table 4.8 Assets exposure from a 10-year return period storm

Asset type	Beach	Cliff
Hotels		2
Markets	1	
NWC priority facilities	1	
Wastewater facilities		2
Wells	1	

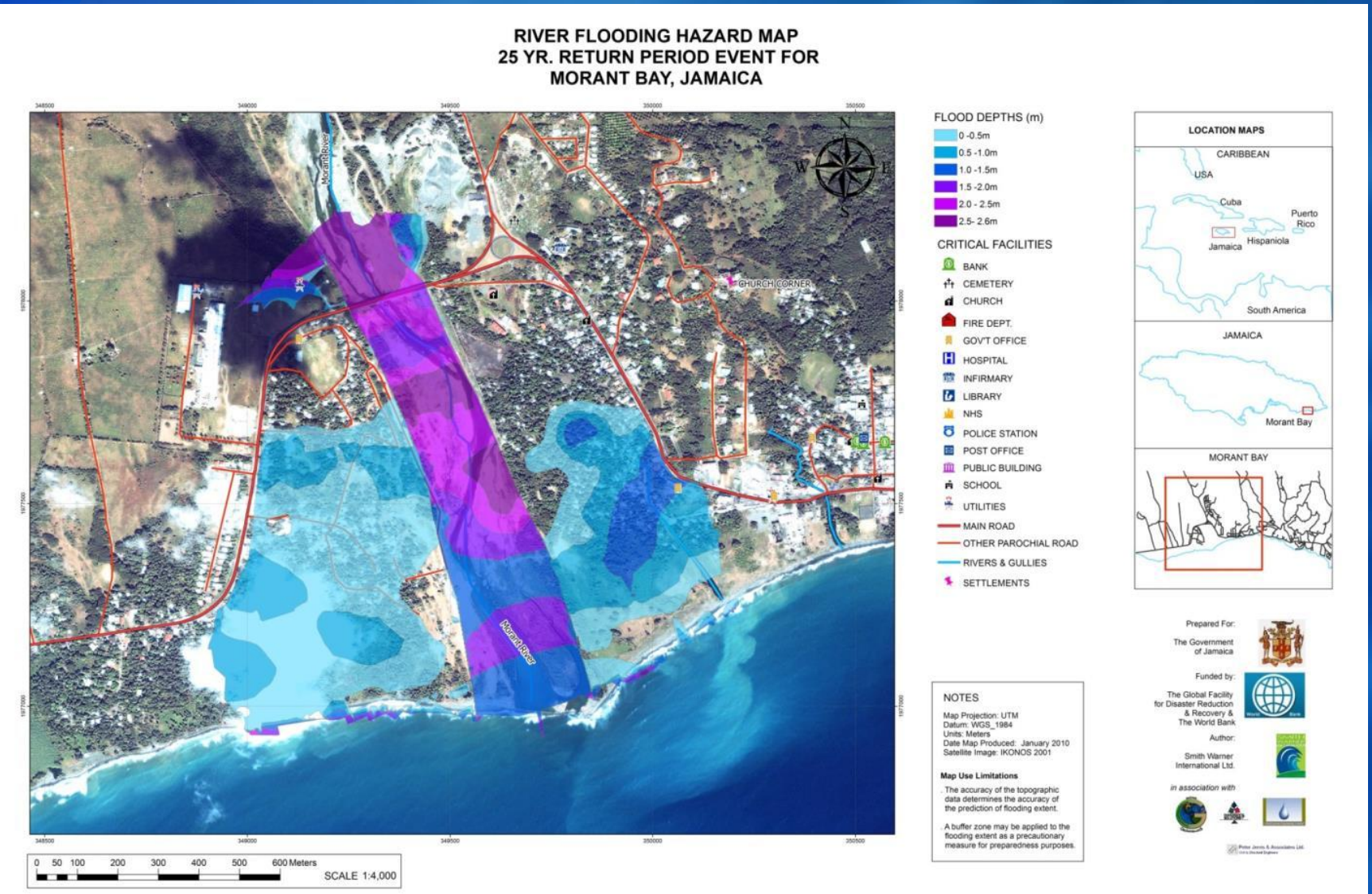
Table 4.9 Assets exposure from a 50-year return period storm

Asset type	Beach	Cliff
Emergency shelters		1
Health centres	3	
Health facilities	2	
Hotels	61	2
Markets	1	
Nwc priority facilities	2	
Public schools		1
Touristic facilities	3	
Waste water facilities	6	2
Wells	9	
licj airport	1	

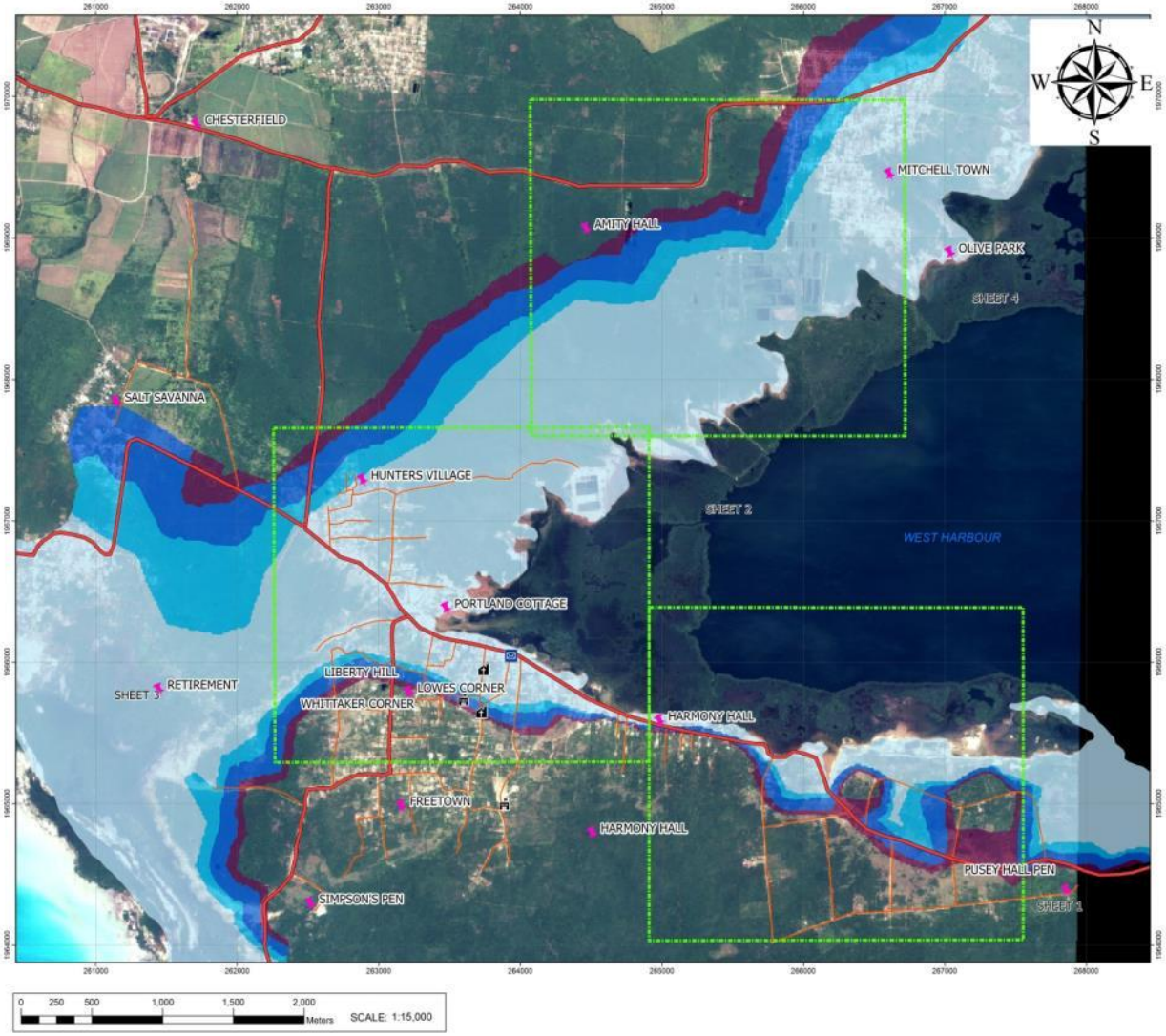


Source: Risk and Vulnerability Assessment Methodology Development Project (RiVAMP) Linking Ecosystems to Risk and Vulnerability Reduction
The Case of Jamaica
Results of the Pilot Assessment
UNEP,PIOJ (2010)

Coastal Multi-Hazard Mapping and Vulnerability Assessments



STORM SURGE HAZARD MAP
25, 50, 100, 150 YR. RETURN PERIOD EVENT FOR PORTLAND COTTAGE, JAMAICA - MASTER PLAN



CRITICAL FACILITIES

- CHURCH
- POLICE STATION
- POST OFFICE
- SCHOOL
- OTHER PAROCHIAL ROAD
- MAIN ROAD
- SETTLEMENTS
- SHEET INSETS

STORM SURGE VALUES (m)

- 25yr - 2.9m
- 50yr - 3.6m
- 100yr - 4.4m
- 150yr - 4.9m

NOTES

Map Projection: UTM
Datum: WGS_1984
Units: Meters
Date Map Produced: January 2010
Satellite Image: IKONOS 2001

A flooding event with a Return period of T- years is the flood which is expected to occur on average once every T- years.

Hazard Map Interpretation

. It is recommended that the 150 year storm surge hazard map be used for planning purposes;

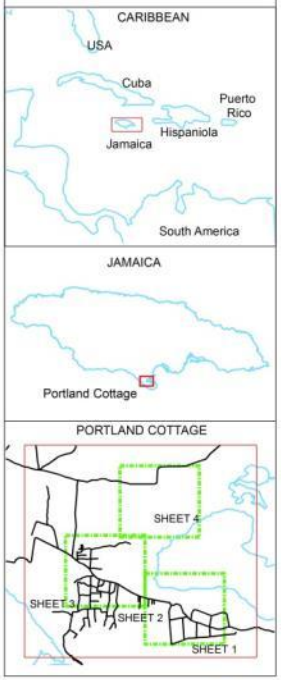
. It is recommended that the 50 year storm surge hazard map be used for preparedness measures;

Map Use Limitations

. The accuracy of the topographic data determines the accuracy of the prediction of storm surge extent.

. A buffer zone may be applied to the storm surge extent as a precautionary measure for preparedness purposes.

LOCATION MAPS



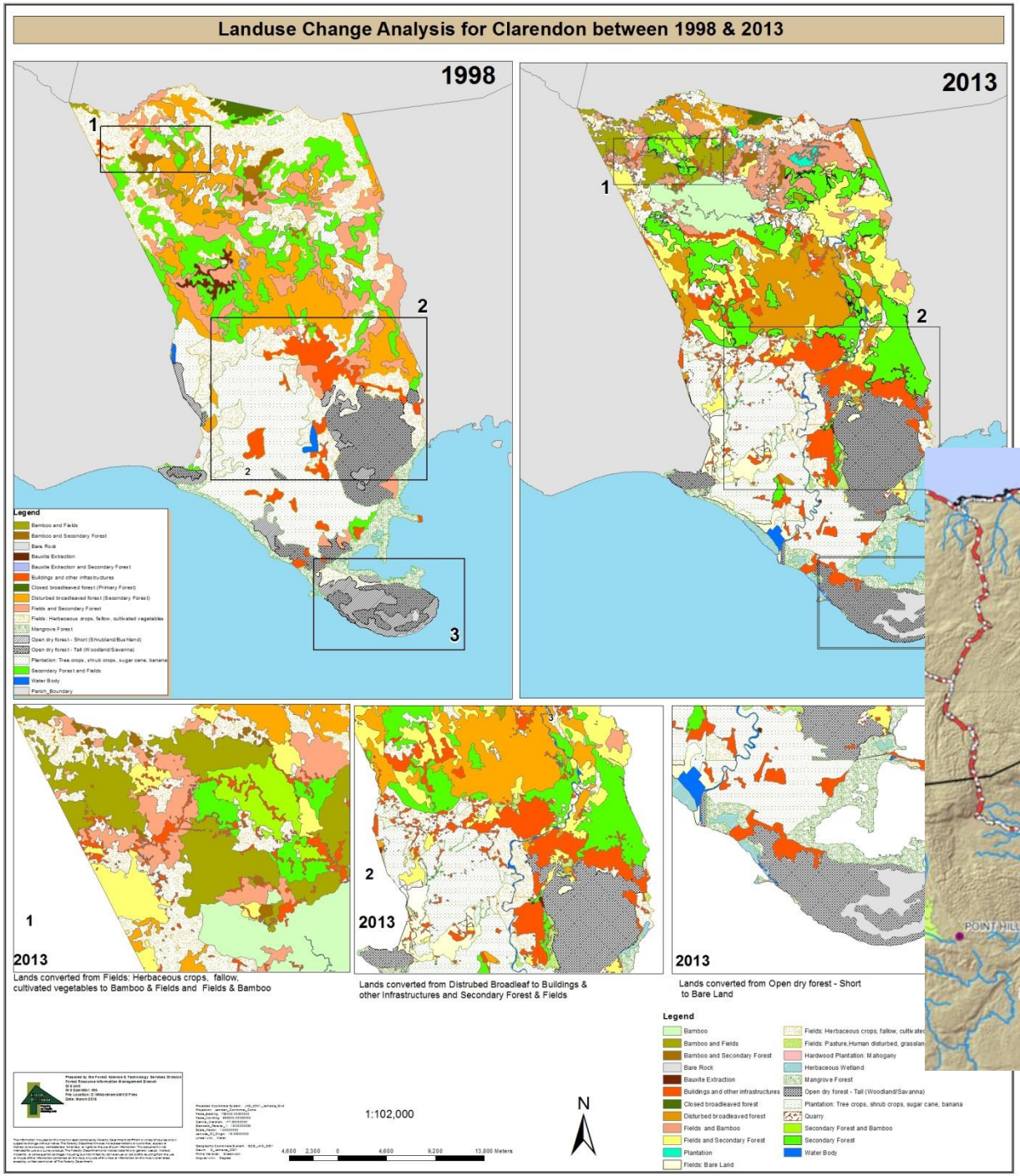
Prepared For:
The Government of Jamaica

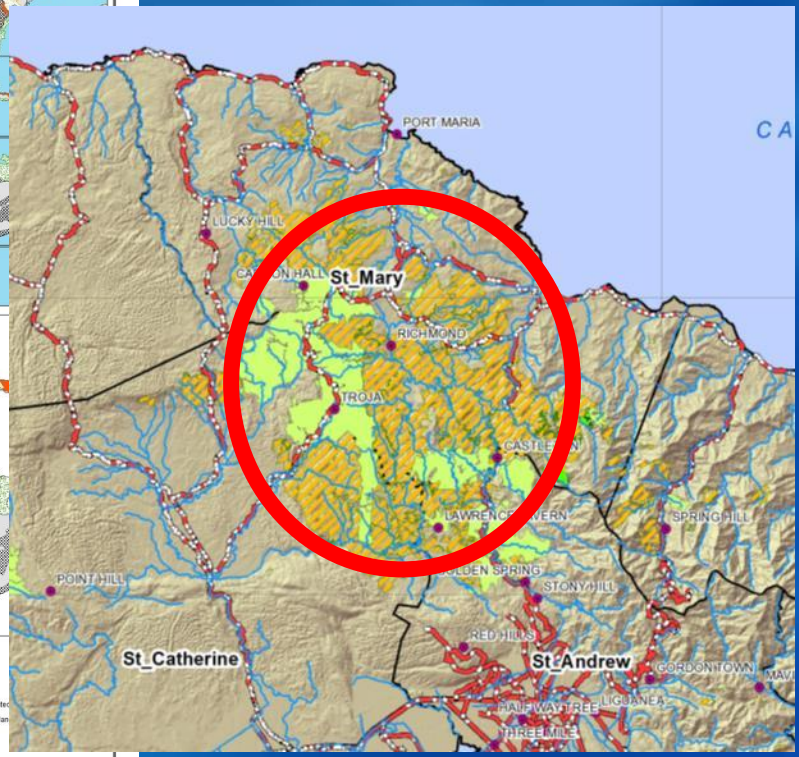
Funded by:
The Global Facility for Disaster Reduction & Recovery & The World Bank

Author:
Smith Warner International Ltd.

in association with

LAND USE CHANGE ASSESSMENT





CONCLUSION

- Geospatial data is critical to contribute to evidence-based decision making in addressing the unique vulnerabilities of SIDS
- Because of its ability to combine and analyse a multiplicity of data GIS and related technologies are useful tools for monitoring and reporting on Post 2015 SDGs;'
- While geospatial data may be useful to monitor and report on progress towards achieving SDG, many SIDS lack the human and institutional capacity required to do so.

Thank You !

Vision 2030 - “Jamaica, the place of choice to live, work, raise families and do business”