



***CLIMATE CHANGE & TOURISM  
IN THE CARIBBEAN***

**REGIONAL WORKSHOP**

**CLIMATE CHANGE AND THE CARIBBEAN  
TOURISM SECTOR**

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# What are the projections of future Climate?

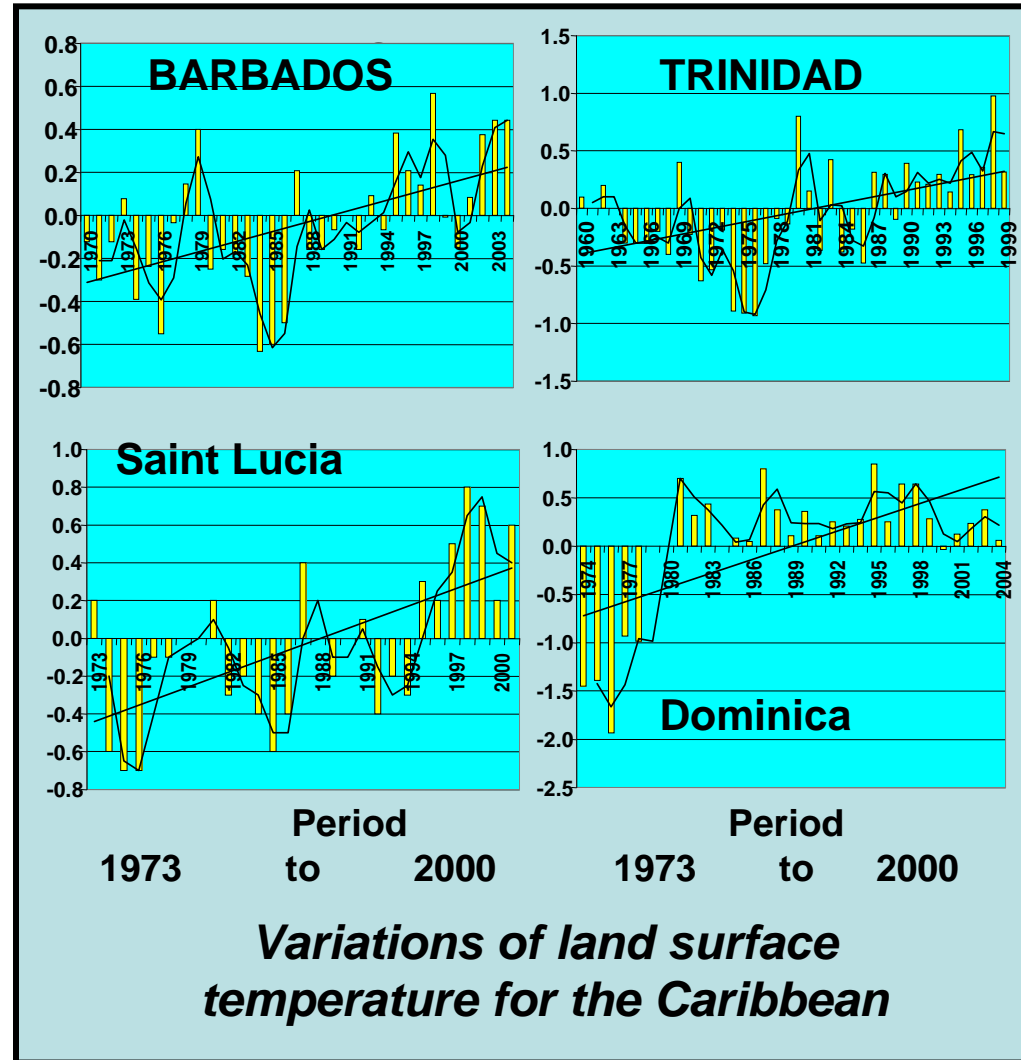
- **Unequivocal evidence that the earth's temperature is rising and attributable to anthropogenic activities – Green House Gases**
- **Projected trends through 2100**
  - **rise in global temperatures of between 2 – 4.5°C**
  - **Sea level rise of between 11 -77 cm**
  - **Changed weather patterns**
  - **More intense extremes –drought ,floods**
  - **More intense hurricanes**

# Climate Change Trends in the Caribbean

- **Past 3 decades trend of increasing mean temperature**
- **Significant >> in minimum temp.(1.4 deg. since 1960)**
- **No. of warm days in region >>, no. of cold nights <<.**
- **Frequency of droughts >> since 1960 (Cuba)**
- **Frequency of occurrence of extreme events changing- Flooding & hurricane passage > in 1990's**

# Temperature Trends in the Caribbean

- Temperatures in the Caribbean region are changing in a manner consistent with the observed variations at global and northern hemisphere levels.
- Temperature records have shown an increase in the last century, with the 1990s being the warmest decade since the beginning of the 20th century.



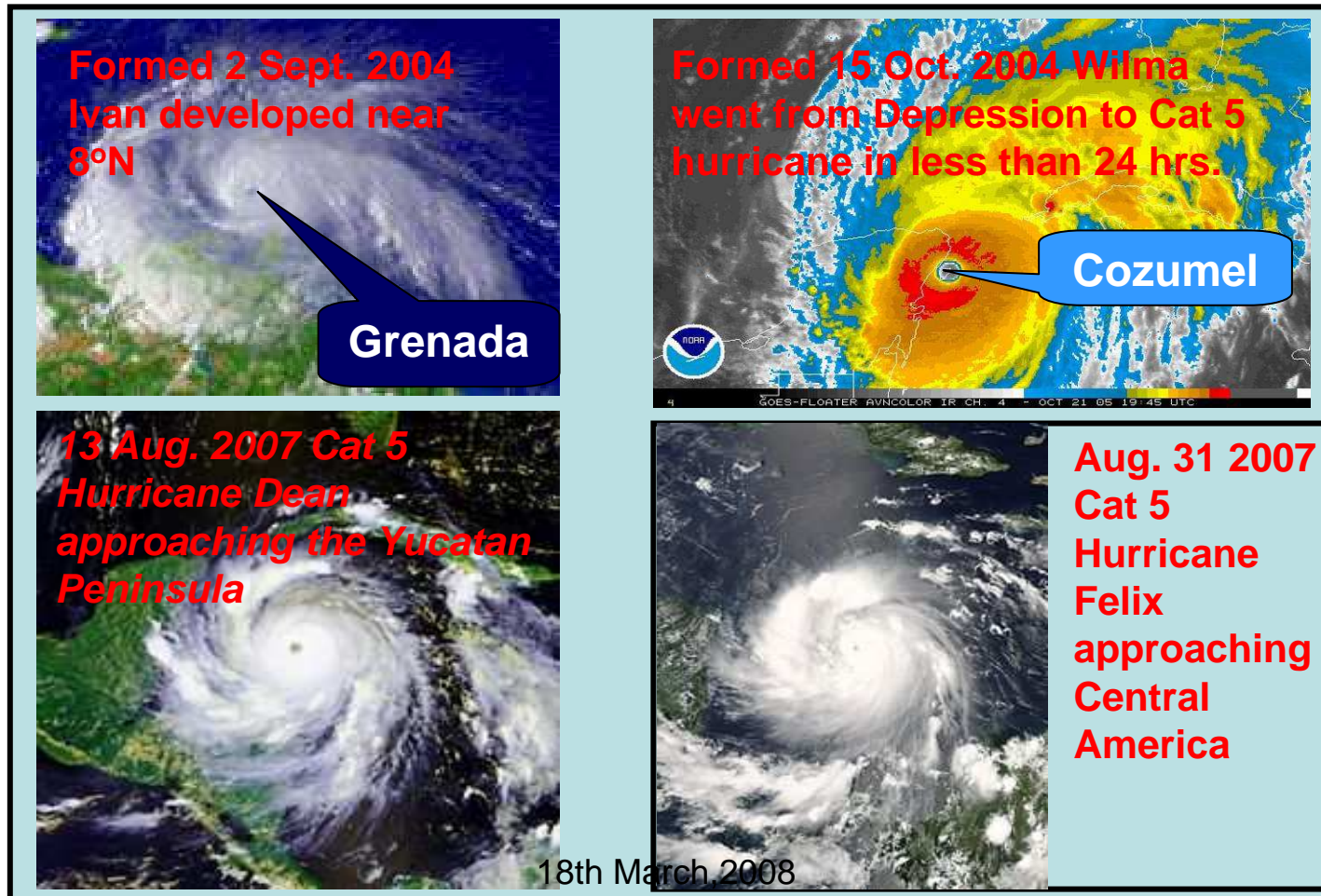
# IMPACT OF WARMER SEA TEMPERATURE

*More frequent episodes of Coral Bleaching  
since the 1980s*

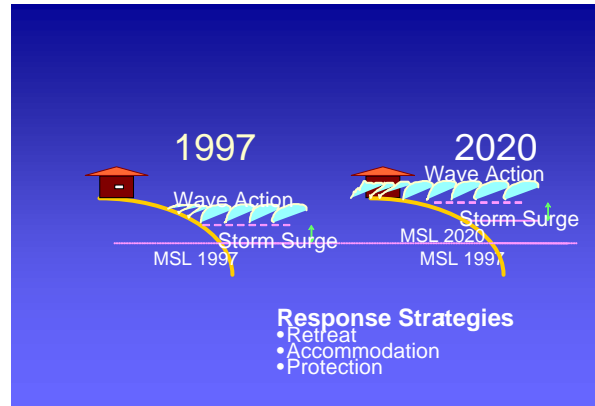


# Another Impact of Warmer Sea Temperature

**Hurricanes developing at lower latitudes and becoming more intense in a shorter period of time**



# The Impact of more intense hurricanes & Sea Level Rise

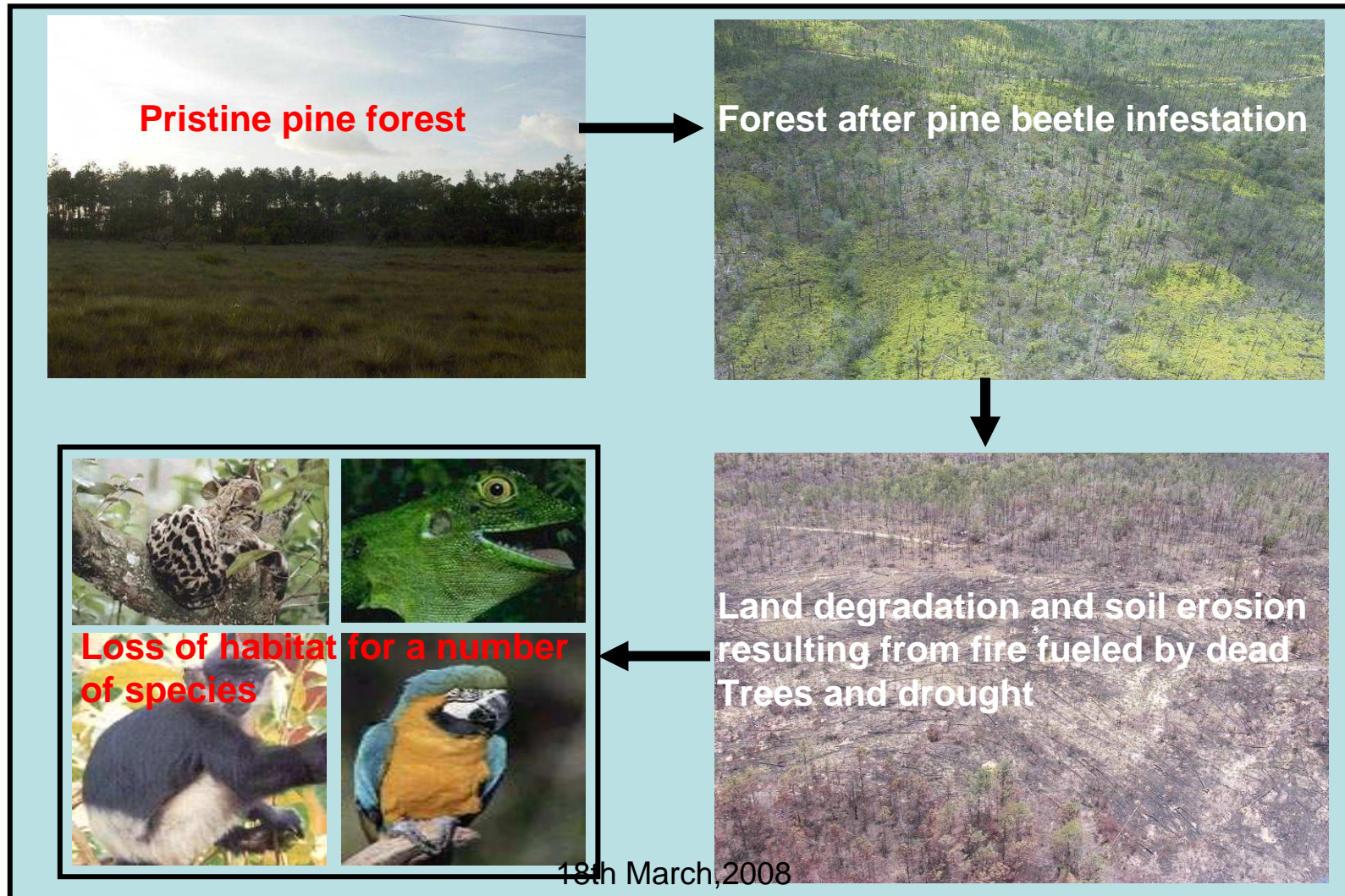


- Higher and stronger storm surge
- More severe damage to mangrove & corals
- Increase in coastal damage and beach erosion

# INSURED LOSSES

Storm	Class	Year	Estimated 1990 Insured Losses (000's)	Estimated 1990 Insured Losses if Maximum Wind Speed Increases by		
				5%	10%	15%
Hugo	4	1989	\$3,658,887	\$4,902,705 34%	\$6,514,172 78%	\$8,542,428 133%
Alicia	3	1983	\$2,435,589	\$3,382,775 39%	\$4,312,884 77%	\$5,685,853 133%
Camille	5	1969	\$3,086,201	\$4,120,733 34%	\$5,438,332 76%	\$7,095,008 130%
Source: Clark, 1997.						

# Impact of increases in Drought and Higher Temperatures on biodiversity and land degradation



# Increase incidences of unusually heavy rainfall



**One of many flood events in Georgetown, Guyana (2005, 2006 and 2007)**

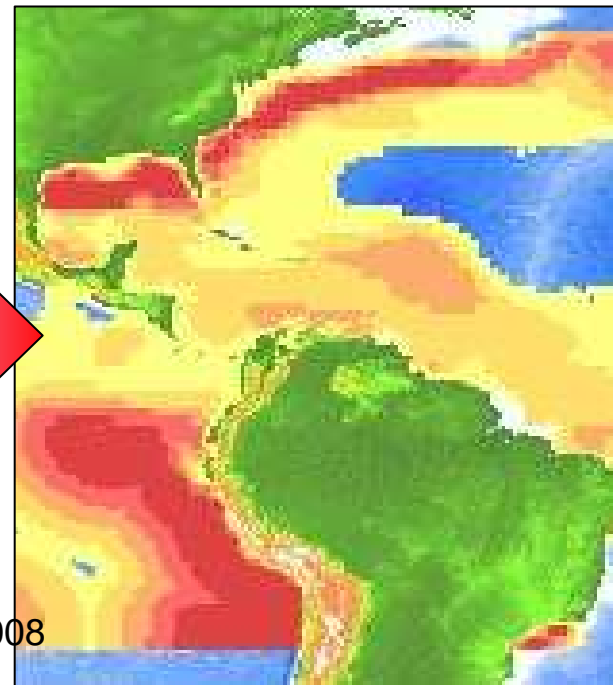
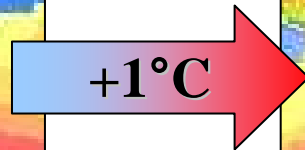
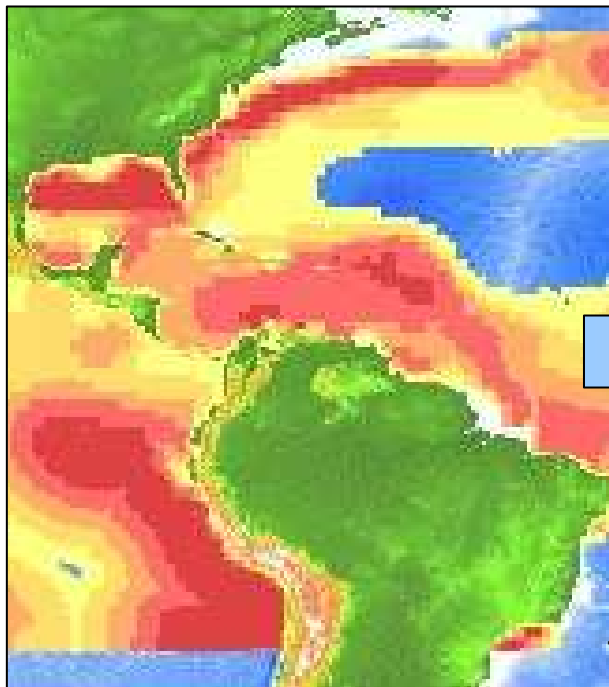


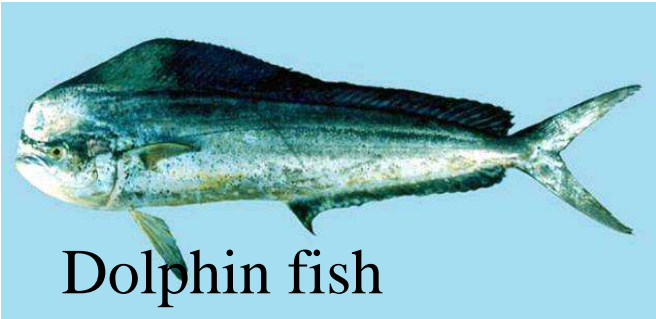
**August 31, 2007 Belize City, Belize  
Tropical wave dumped over 11 inches  
of rain in less than 9 hours**

# Impact of 1°C further rise in sea temperature on Artisan and Commercial Fishing



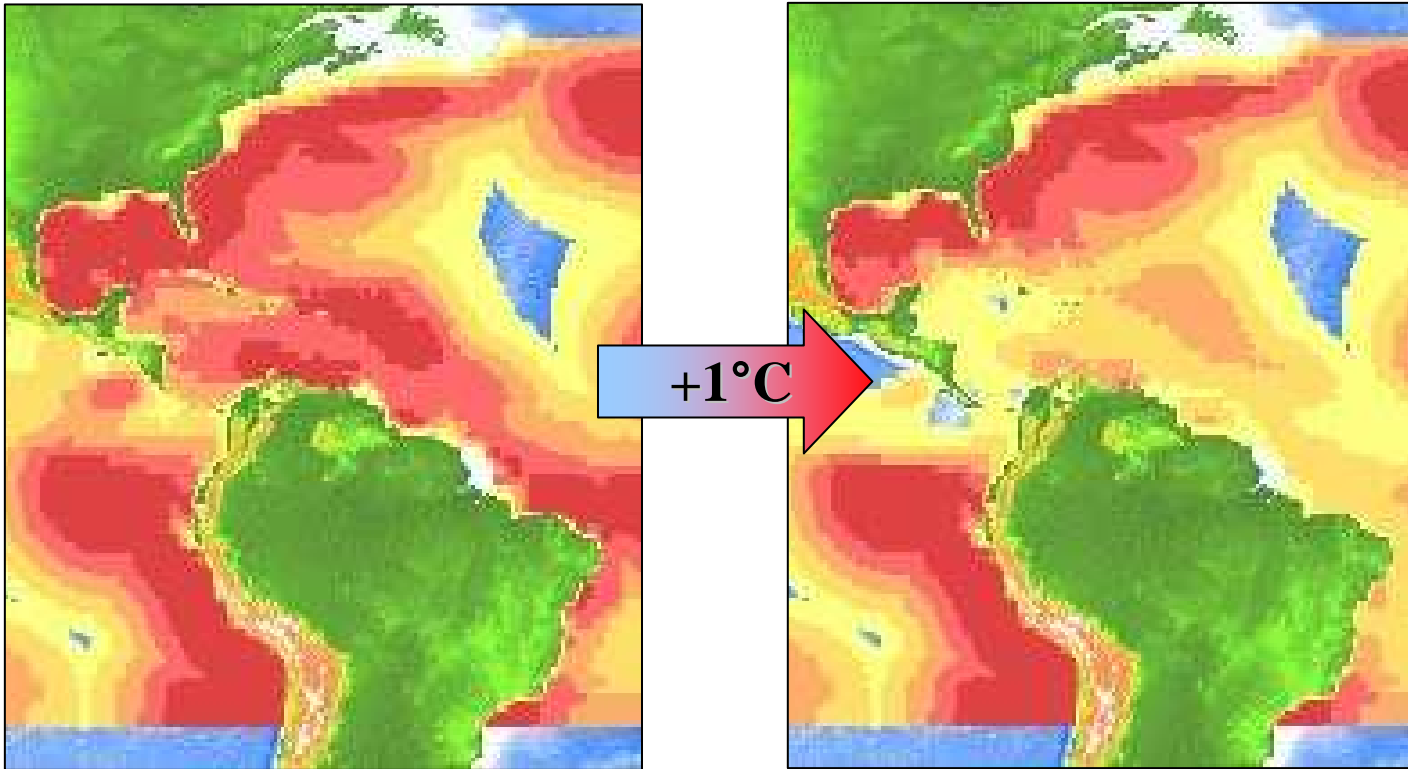
Habitat becomes less favourable





Dolphin fish

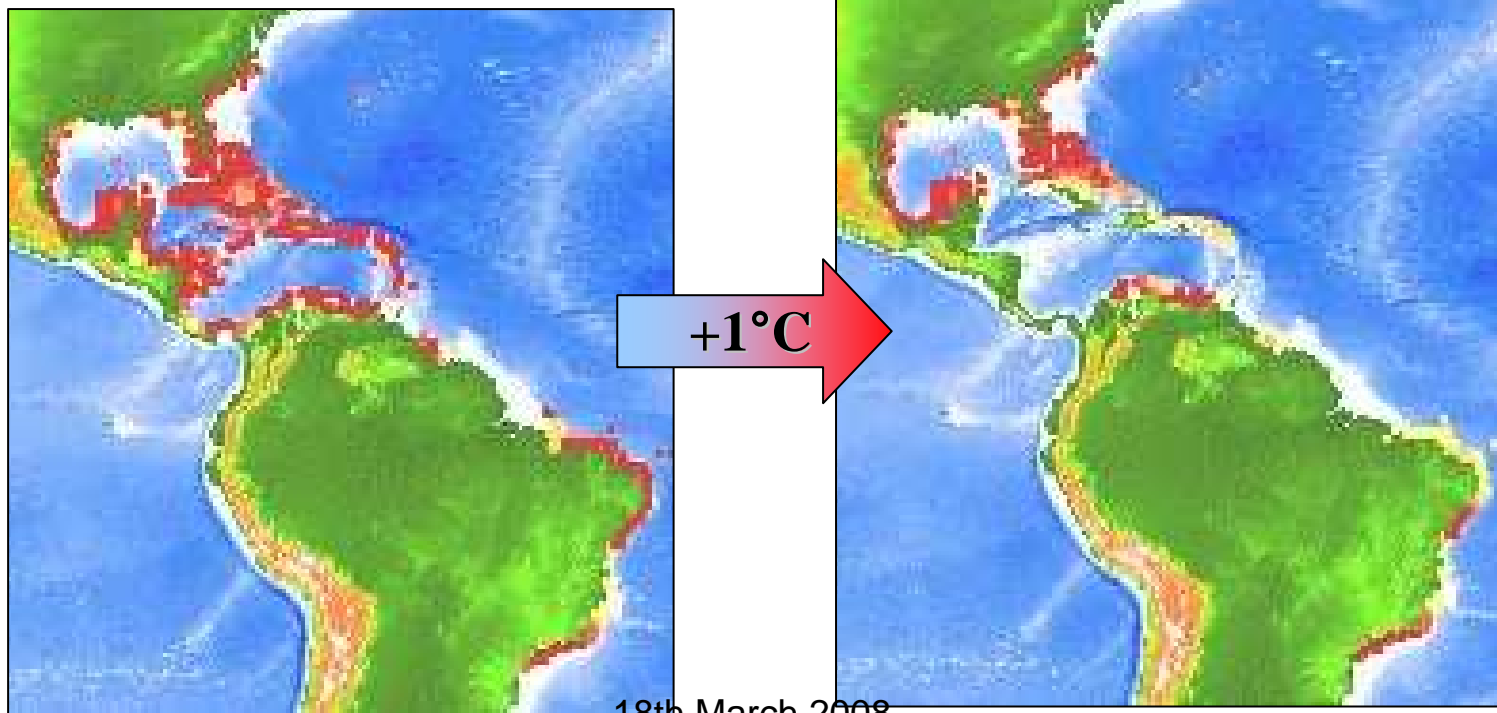
Habitat becomes less favourable



18th March, 2008



Habitat becomes less favourable



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# Impact OF 2°C rise on Agriculture

**Preliminary studies on the impact on the staples - corn, beans and rice for 2°C warmer and +/- 20% change in precipitation**

Crop	Scenario Name	Season Length (days)	Temperature Change (°C)	% Change in precipitation	Yield (kg/ha)	% change in Yield
Dry beans C3	Baseline	87	0	0	1353.6	
	Carib A	85	+2	+20	1163.7	-14%
		85	+2	-20	1092.6	-19%
Rice C3	Baseline	124	0	0	3355.5	
	Carib A	113	+2	+20	3014.4	-10%
		113	+2	-20	2887.5	-14%
Maize C4	Baseline	104	0	0	4510.6	
	Carib A	97	+2	+20	3736.6	-22%
		97	+2	-20	3759.4	-17%

# Likely Consequences of a Warmer Climate in the Caribbean

- **Will pose significant, and in some cases insurmountable challenges to the region's Economic and Social Vulnerability**
- **Expected Areas of Negative Impact**
  - Agriculture/Fisheries
    - Food security threat
  - Tourism
    - Economic sustainability
  - Health
    - Increase in vector borne diseases and other heat related diseases
  - Water
  - Human Settlements

# Dependencies of Tourism in the Caribbean

- Equitable climate
- Tourism plant-
  - Hotels and other facilities
  - Infrastructure- airports, cruise ship berths, roads, coastal protection structures etc.
  - Natural amenities – beach, reefs, wetlands
  - Access to clean and adequate supply of water
  - Access to ready supply of energy
  - Financial services especially insurance
  - Healthy environment free from diseases
  - Adequate supplies of food

# TOURISM AS A CONTRIBUTING CAUSE

- GHG emissions from the sector derived from:
- Transport- Road, Sea, Aviation
- Activity specific tourism e.g. sport
- Buildings and other tourism amenities – use of energy
- Increased stress on natural ecosystems – coastal ecosystems, natural resource base for ecotourism

# ADAPTATION AN IMPERATIVE

- **The IPCC, the world premier scientific advisory body on climate change concluded that Small Island Developing States (SIDS) and low lying coastal States of the Caribbean are among the most vulnerable to the adverse impacts of climate change.**
- **The presentation highlights some of the evidence leading to the IPCC conclusion.**
- **For the Caribbean basin it is therefore recognized that adaptation is an imperative for coping with the projected impacts associated with current and future climatic conditions.**

# WAY FORWARD FOR THE REGIONAL TOURISM SECTOR

- Sustainable tourism thrust of regional industry in consonance with actions to mitigate climate change impacts
- Improve environmental performance of industry through benchmarking & eco-labeling e.g. through Green Globe 21 – includes GHG emissions as one of nine key indicators.
- Explore potential of tourists to participate in carbon offsetting schemes-

# DECREASING TOURISM EMISSIONS FOOTPRINT

- Encourage green tourism
- Energy efficient building designs
- Water conservation – low flush toilets etc.
- Energy efficiency management practices
- Renewable energy use
- Encourage use of energy efficient vehicles, cycling & activities that use less energy.

## WAY FORWARD FOR THE REGIONAL TOURISM SECTOR

- More discriminatory approach to tourism destinations – “green tourism”- win-win situations for the Caribbean.
- Support the transition of the Caribbean region to become the world’s first “Carbon Neutral” tourism destination, thereby affording the region an unique labeling and branding platform that will support growth within the global eco-sensitive client market.

# WAY FORWARD FOR THE REGIONAL TOURISM SECTOR

- Partnership with government to facilitate development of an enabling policy environment for sustainable tourism.
- Partnership with regional insurance companies, climate science community to better define future climate risks and provide:
  - a rational basis for the design of insurance instruments e.g weather derivatives, catastrophe bonds, parametric insurance.
  - the basis for incentives from financial/government/insurance sectors for “smart development in the sector”

*THANK YOU*

18th March,2008

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