Climate Change and You

SIX THINGS YOU SHOULD KNOW

1. There is weather and then there is climate…

- **Weather** is:
  - Short term changes in atmospheric variables such as temperature and rainfall.
  - Can change rapidly

  So…
- Weather is what is happening outside right now

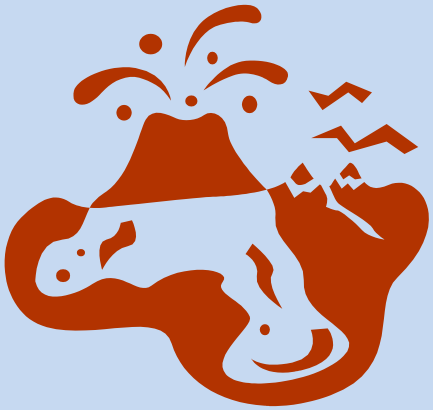
- **Climate** is:
  - Long term state of atmospheric variables like rainfall and temperature.

  So…
- Climate occurs over seasons or longer

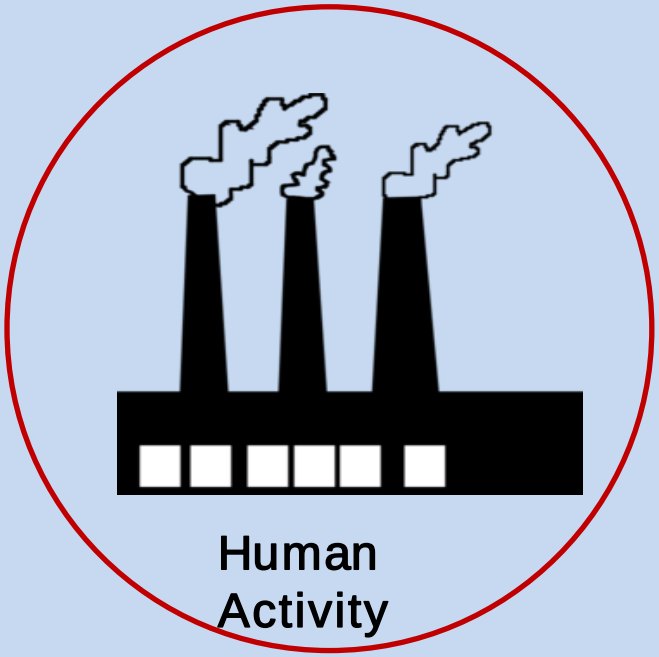
2. Human activity is changing our climate!

Things that can cause the climate to change are…

Natural Variations



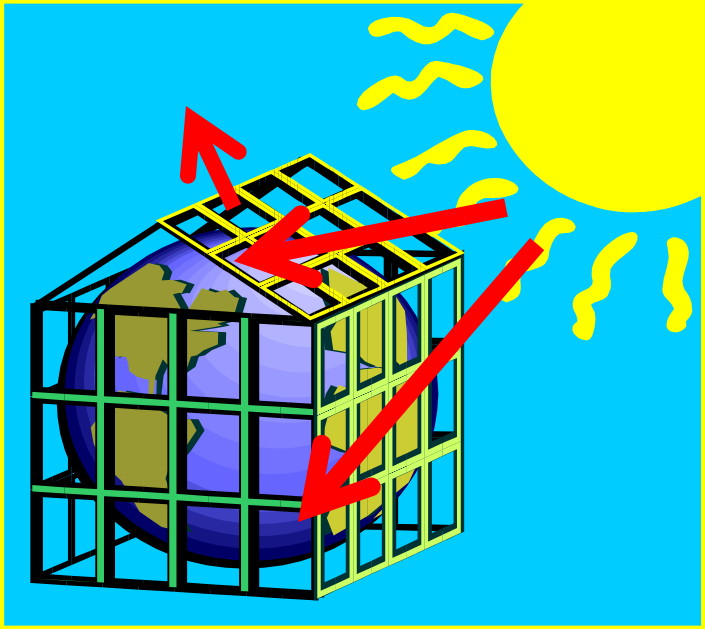
Volcanic Eruptions



Human Activity

2. Human activity is changing our climate!

The atmosphere acts like the glass of a greenhouse.



- Sun's rays hit the atmosphere and some are reflected.
- Some pass through and reach the earth and the earth warms.
- **Greenhouse Gases trap** heat from the earth .

The Greenhouse Effect makes earth warm enough to live on!

2. Human activity is changing our climate!

Greenhouse gases are increasing!

CO_2 to Atmosphere

Human Activity

- Combustion: Burning of coal and fossil fuels
- Deforestation

Methane to Atmosphere

Human Activity

- Landfills
- Agriculture (rice)
- Livestock

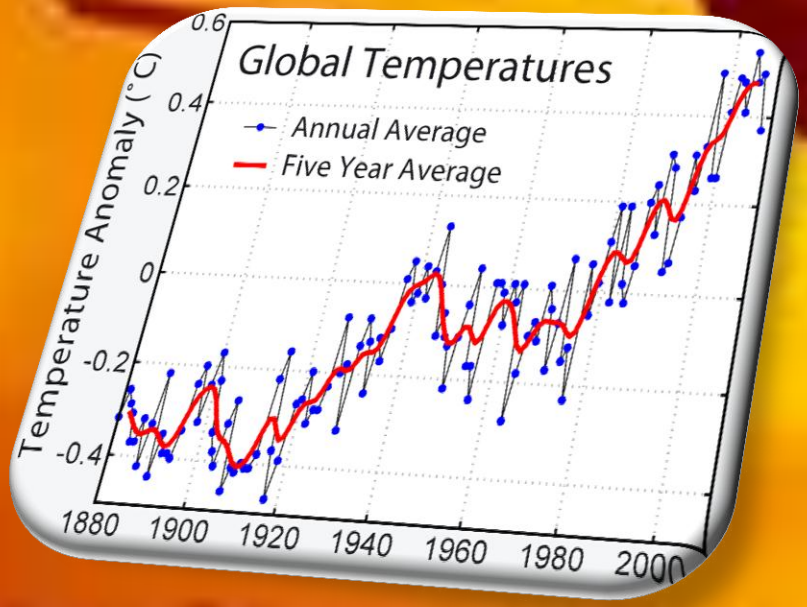
Other gases to atmosphere

Human Activity

- Ozone from car exhausts
- CFC's from aerosols

3. We have already seen changes in our climate

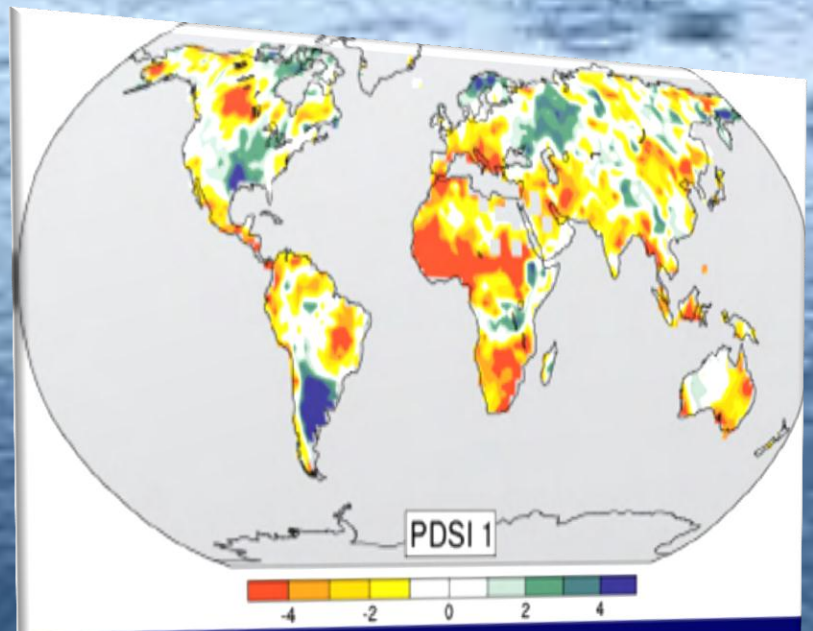
The earth has warmed



- The earth's average temperature has increased by 0.74°C over the past century.

3. We have already seen changes in our climate

Rainfall patterns have changed

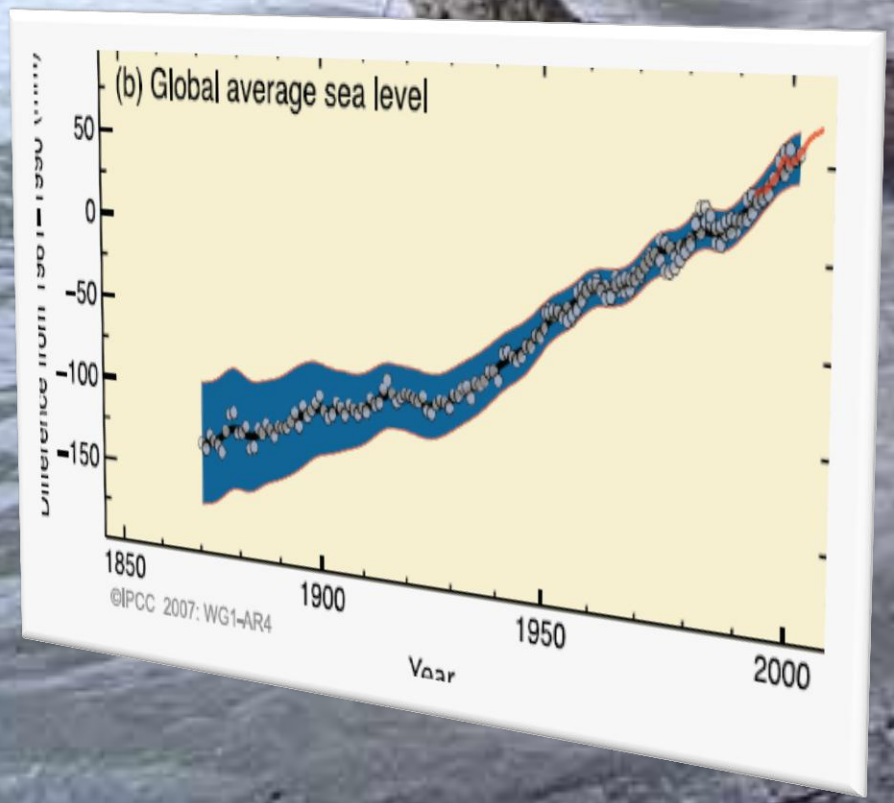


The most important spatial pattern of the monthly Palmer Drought Severity Index (PDSI) for 1900 to 2002.

- The world has seen changes in **amount, intensity, frequency and type** of precipitation.
- **Rainfall strongly characterized by variability –year to year variations.**

3. We have already seen changes in our climate

Global Sea Levels have risen



During 20th century average increase was **4.8 to 8.8 inches per century (1.2-2.2 mm/year)**

- Due to
  - the expansion of ocean water
  - melting of mountain glaciers and small ice caps

3. We have already seen changes in our climate

More extreme weather

Tropical storm and hurricane frequencies vary considerably from year to year. However, evidence suggests substantial **increases in intensity** and **duration** since the 1970s.

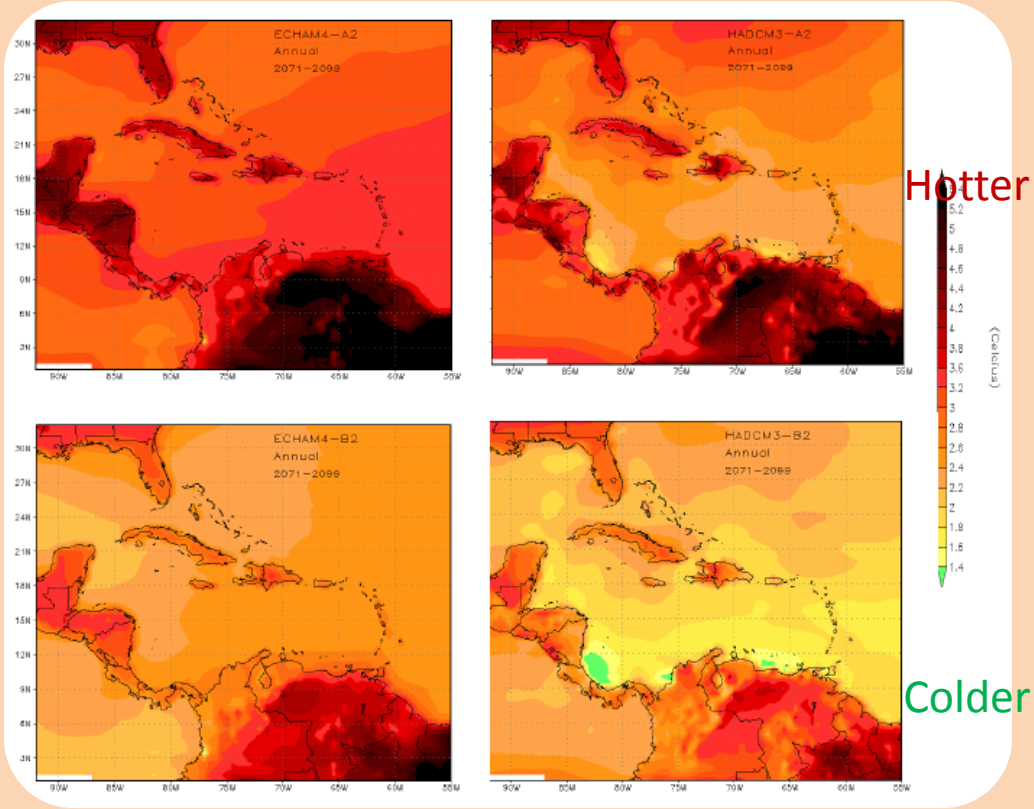
3. We have already seen changes in our climate

Jamaica has seen changes too!

Jamaican temperatures for 1992-2008 have increased at a rate of ~ 0.1 degree/decade

Rainfall has become more variable in recent years – more droughts and floods.

4. Changes will continue into the future



Mean changes in the annual mean surface temperature for 2071-2099 with respect to 1961-1989, as simulated by models.

Caribbean temperatures will continue to increase to 2099

Computer models suggest the Caribbean will warm by 1 to 5°C by the end of the century

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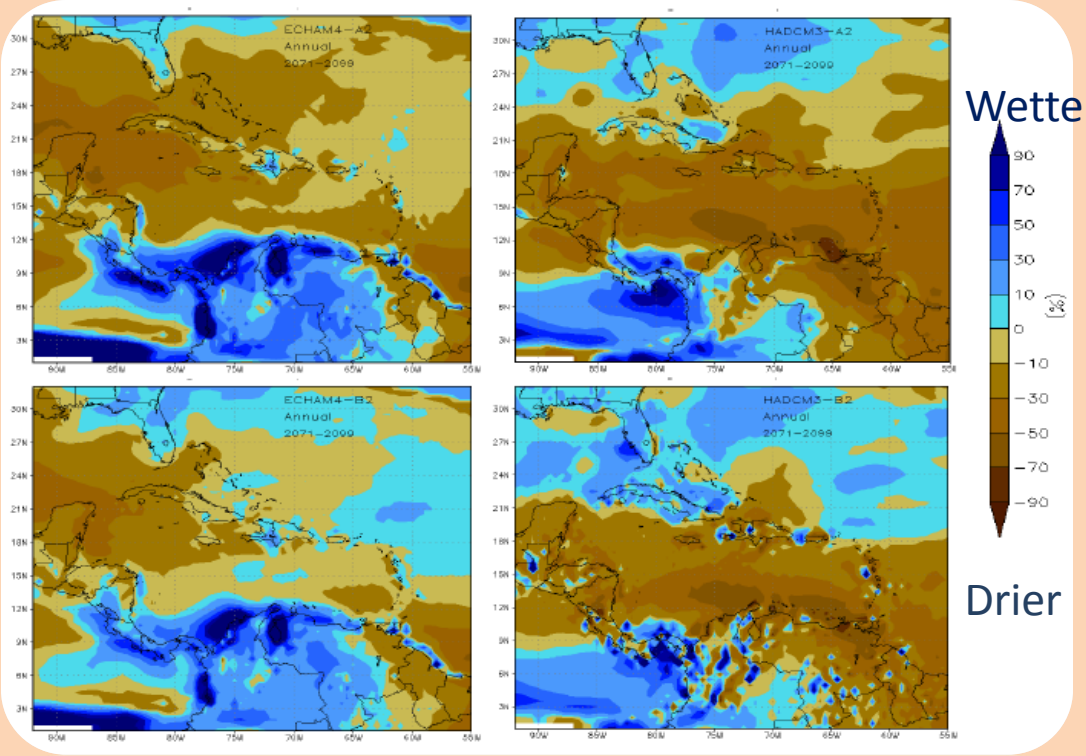

Mean changes in the annual rainfall for 2071-2099 with respect to 1961-1989, as simulated models

The **Caribbean and Jamaica will be drier by 2099.**

Drying will be between 25% and 30% in the mean for the Caribbean.

Drying will be most severe between May and November.

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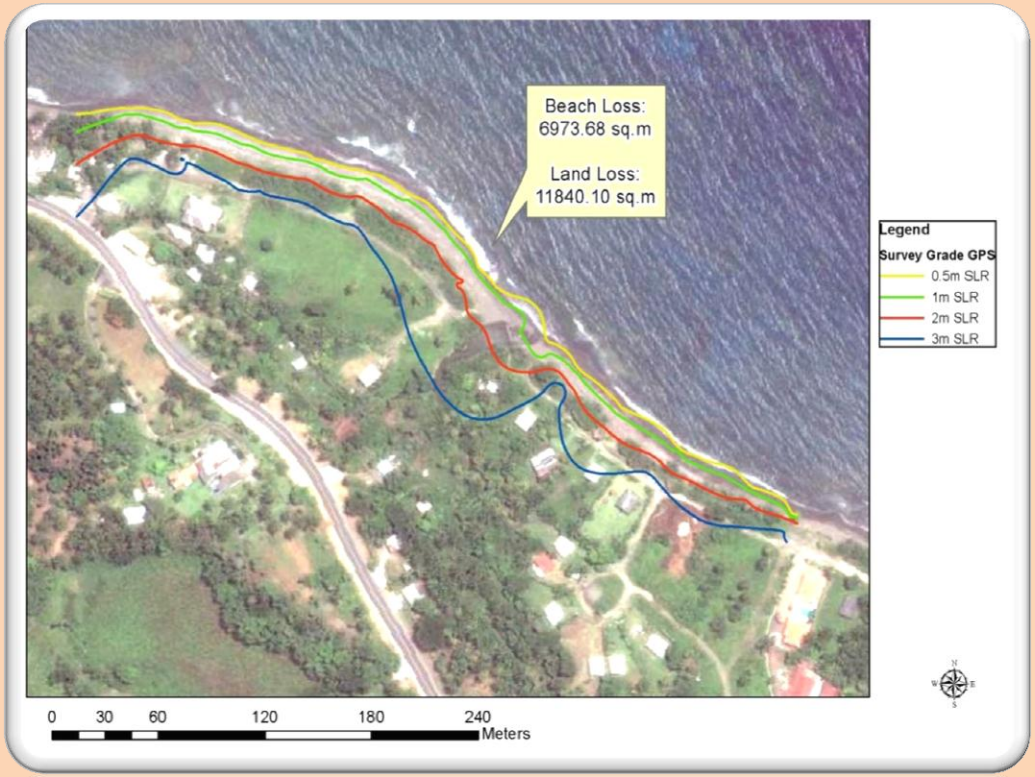


Projected land loss from sea level rise at Hope Bay, Portland.

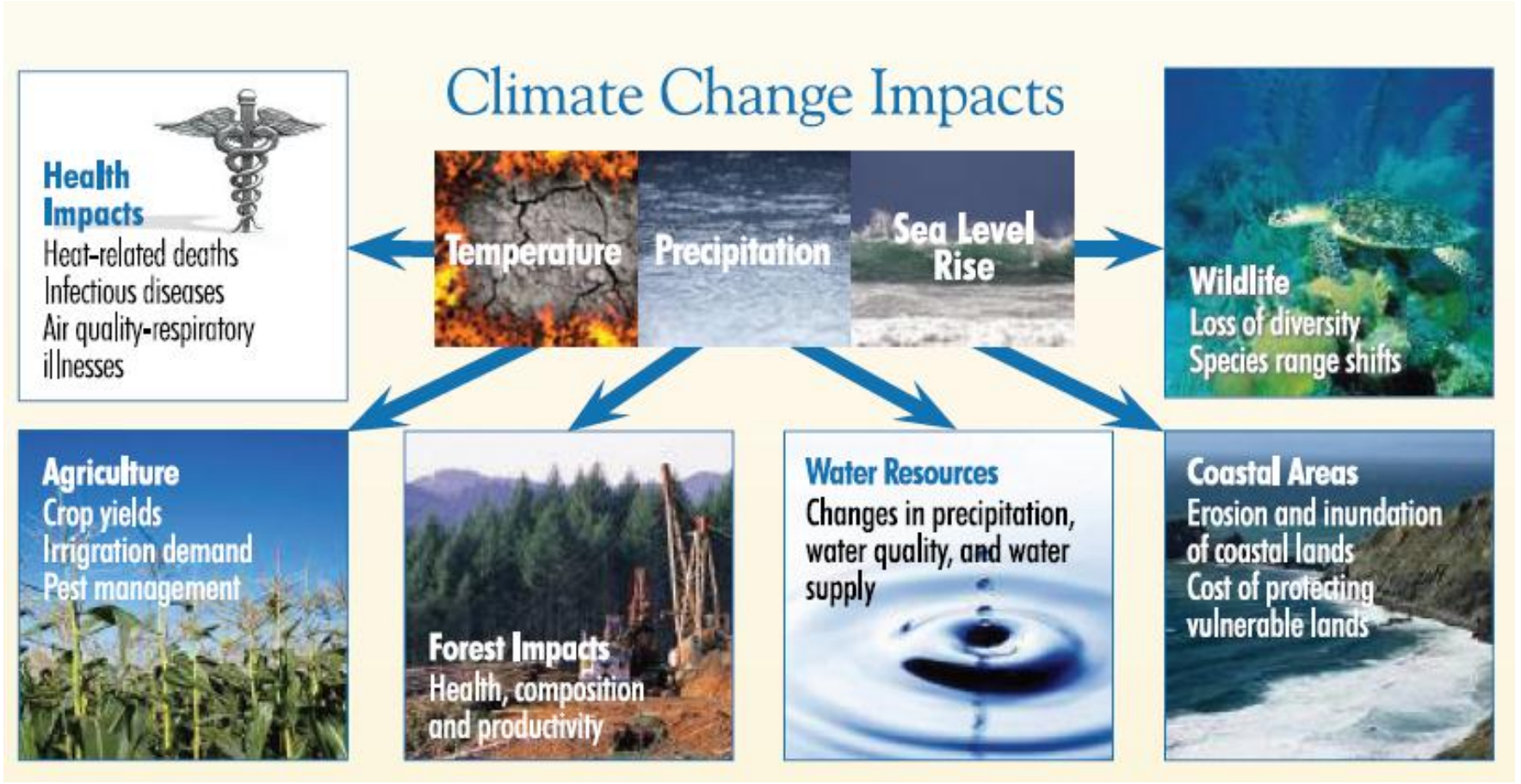
Sea level rise

- Caribbean sea level rise may be higher than in other regions because of its closeness to the equator.

Hurricanes

- Storms will likely be more intense, with higher rainfall rates and increased maximum winds.

5. Climate change is affecting our lives



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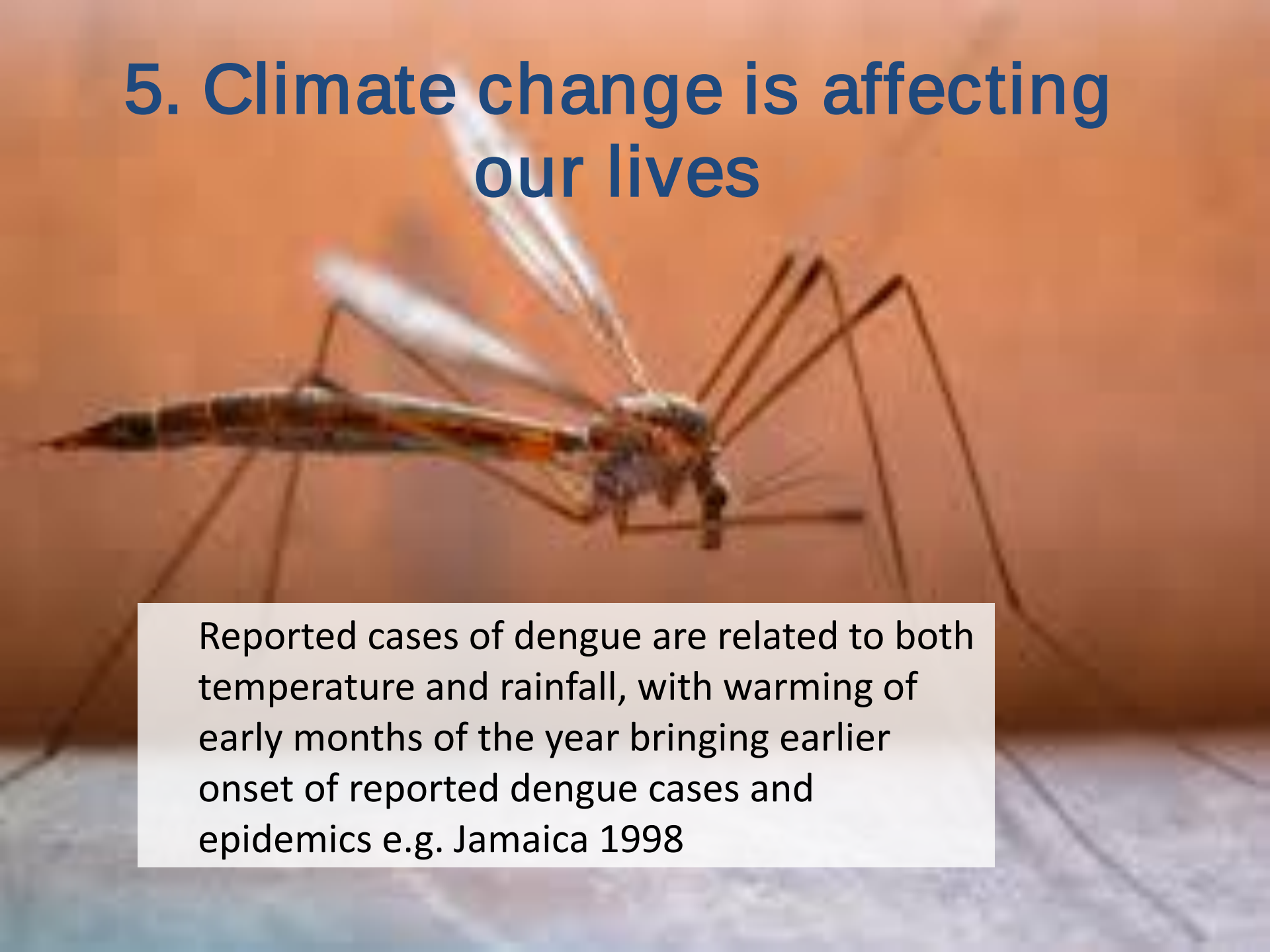

Reported cases of dengue are related to both temperature and rainfall, with warming of early months of the year bringing earlier onset of reported dengue cases and epidemics e.g. Jamaica 1998

5. Climate change is affecting our lives

- Farmers in St. Elizabeth have noticed a shortening of the early growing season and increasing prevalence of droughts during those months

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A devastating coral bleaching event in2005 was caused by higher than normal sea surface in the Caribbean.

5. Climate change is affecting our lives

EVENT	Year	Category	Cost($J billions)	Impact (% GDP)
Hurricane Michelle	2001	4	2.52	0.8
May/June Flood Rains	2002		2.47	0.7
Hurricane Charley	2004	4	0.44	0.02
Hurricane Ivan	2004	3	36.9	8.0
Hurricanes Dennis & Emily	2005	4	5.98	1.2
Hurricane Wilma	2005	5	3.6	0.7
Hurricane Dean	2007	4	23.8	3.4
Tropical Storm Gustav	2008		15.5	2.0
Tropical Storm Nicole	2010		20.6	1.9

6. We must change how we live

There is need to adopt **mitigation** measures to reduce greenhouse gas emissions at their source or enhance their removal from the atmosphere. These should include using **renewable energy** and planting more trees.

MITIGATION

6. We must change how we live

ADAPTATION

We must adjust to the changing climate to reduce the negative effects of climate change or exploit the positive ones. **Adaptation** measures may include technological, behavioral, managerial or policy.

6. We must change how we live

Sector	Impact	Adaptation Option
Agriculture	Varying productivity due to floods and drought	Protected agriculture
Tourism	Less demand – warmer world	Diversified tourism
Fisheries	Supply less - warmer ocean rising sea levels	Diversification of livelihood
Water	Variable supply - less rainfall	Efficient usage Harvesting
Infrastructure	Damage to coastal infrastructure - storm surge	Vulnerability mapping for zoning
Health	More dengue - warmer temps	Epidemic alert systems

6. We must change how we live

GLENGOFFE
A Good example

- **Community risks:**
  - Landslides and flooding from heavy precipitation
  - Extreme droughts on crop production
- **Community response:**
  - Contour farming
  - Re-forestation
  - Fruit trees production
  - Dry farming techniques
  - Drip irrigation

Climate has changed

Climate will continue to change

Climate demands change

Act Now!

Some References

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