

# Climate Change in the UK Overseas Territories

An Overview of the Science, Policy and You





# Acknowledgements

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# Contents

**Why Climate Change Matters for UK Overseas Territories**

**Unpacking Climate Change**

**Climate Change in the UK Overseas Territories:  
Present and Future Impacts**

**What can the UK Overseas Territories do about  
Climate Change?**

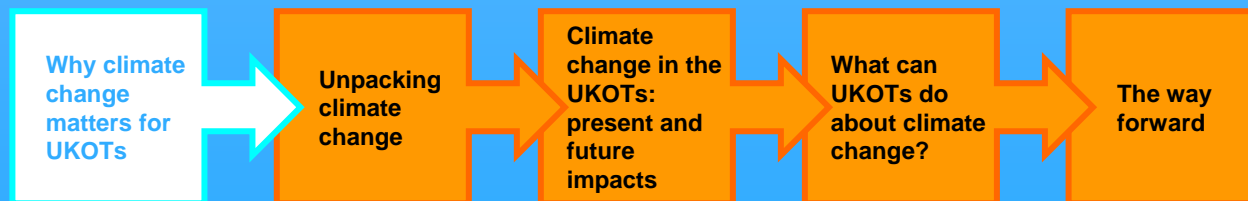
**The Way Forward**

# A Pressing and Complex Issue

*“... there have been natural and cyclical variations in the Earth’s climate in the past, [but] the current rate of change is faster than anything the planet has experienced before.”*

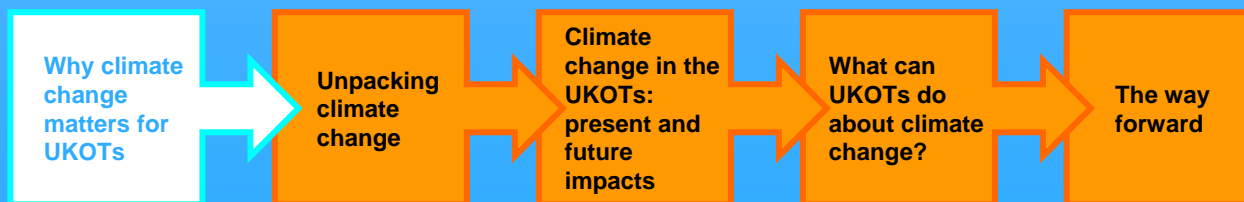


Photo courtesy: NASA & USGS



# Compelling Evidence

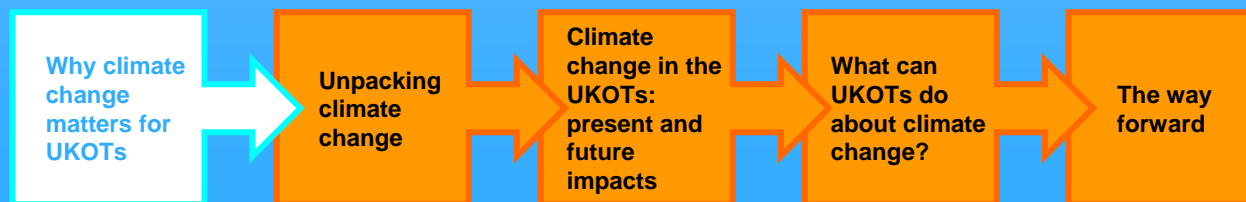
- The scientific evidence is indisputable.
- The world's climate changed during the 20th century
- Global average surface temperature increased by about 0.6°C
- Snow cover and ice extent have decreased
- The acidity of oceans has changed
- Sea levels around the world increased between 10 and 20 cm
- Seasonal patterns have changed the world over
- The 1990s was the hottest decade & 1998 the warmest year on record



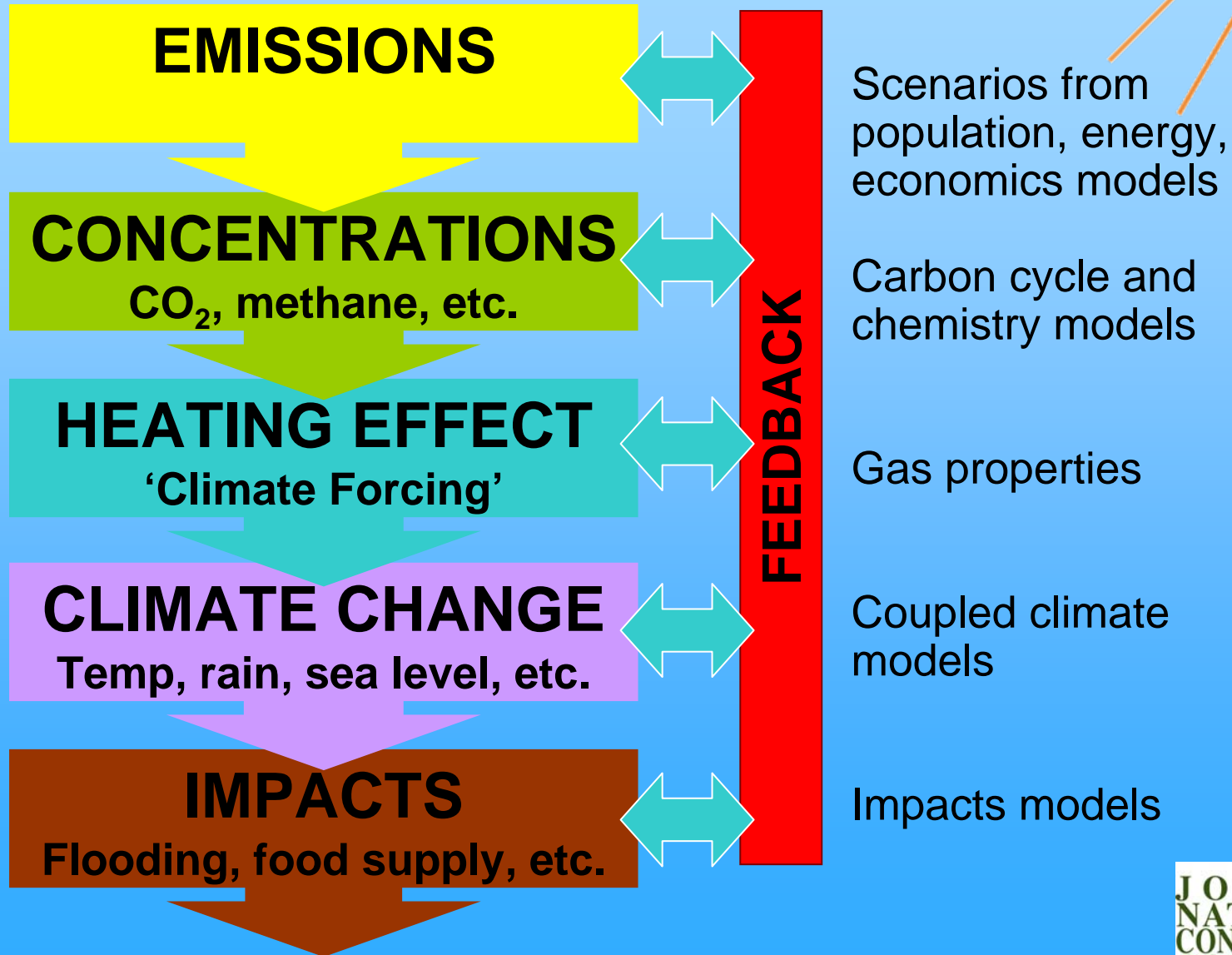
# A Very Complex Issue

- Climate change is one of the most complex issues of our time. The relationship between man and the environment is at the heart of the issue, and, as with all environmental issues, impacts and consequences come together in a large interconnected web.

*“Addressing climate change requires a global compact for reducing greenhouse gas emissions as well as local commitment to action.”*

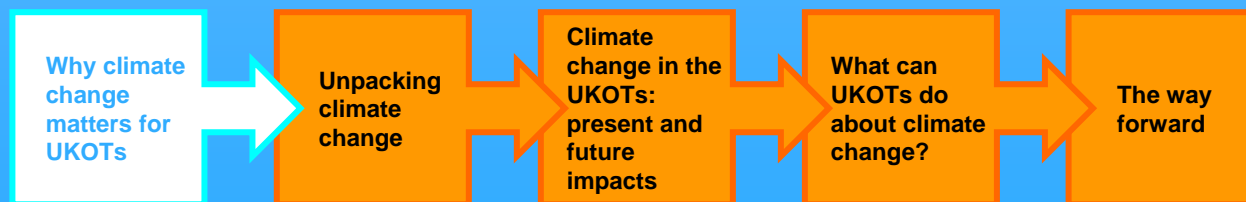


# A Very Complex Issue



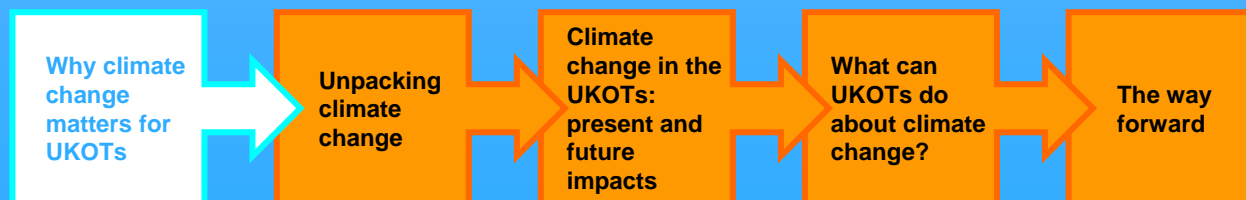
# A Very Complex Issue

- Although there is consensus that change is taking place, there is less agreement on what proportion of the change is natural climate variability and what proportion is human-induced.
- This makes it difficult for individual countries to decide what resources to allocate to reducing human impact on the climate system (mitigation) and what to spend on strengthening their structures to withstand change (adaptation).



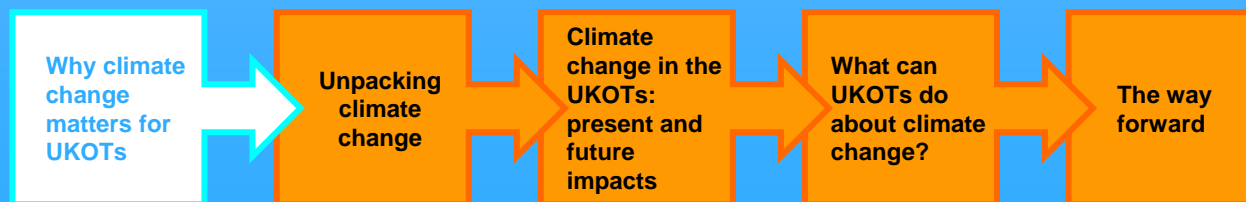
# What is the IPCC?

- The Intergovernmental Panel on Climate Change (IPCC) is a scientific body that was set up in 1988 by the World Meteorological Organisation and the United Nations Environment Programme.
- Assesses all research related to climate change, including options for mitigation and adaptation, and provides an objective source of information about climate change.



# What is the IPCC?

- **Working Group 1**
  - "The Physical Science Basis of Climate Change"
- **Working Group 2**
  - "Climate Change Impact, Adaptation and Vulnerability"
- **Working Group 3**
  - "Mitigation of Climate Change"
- Four Assessment Reports: 1990, 1995, 2001 & 2007

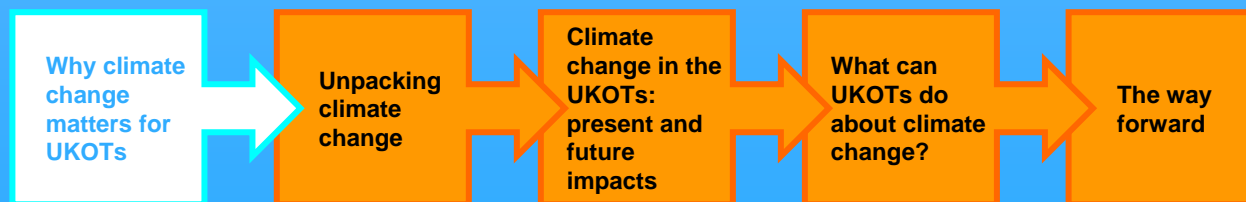


# UK Overseas Territories



# UKOTs: Much to Lose

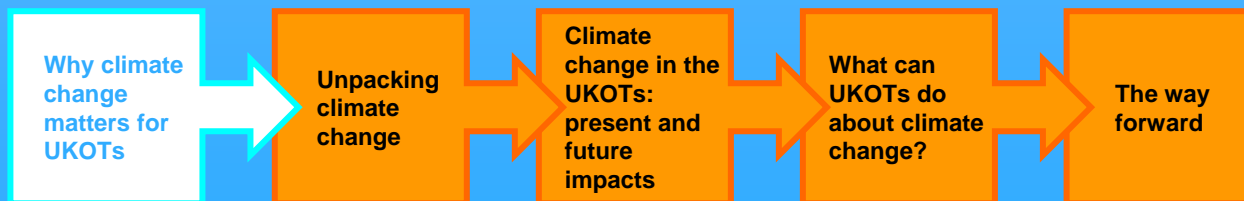
- Inherent vulnerabilities + climate change = increased risk
- Several ecosystems found in the UKOTs are identified as “most vulnerable” and “virtually certain to experience the most severe ecological impacts” of climate change
- Small islands are expected to experience some of the most severe impacts of increasing temperatures
- The economies of UKOTs are not highly diversified and they depend on a narrow range of goods or services
- UKOTs have high communication and transportation costs and are vulnerable to natural hazards



# The Time to Act is Now

- UKOTs should assume that future climate impacts will be more severe than anything experienced to date.
- Taking action now to cap greenhouse gas emissions and prepare for climate change impacts will be less costly and more effective than remedial measures in the future.

*“Addressing climate change is an opportunity for the UKOTs to build resilience in the face of the inherent vulnerabilities associated with their size and natural features...”*

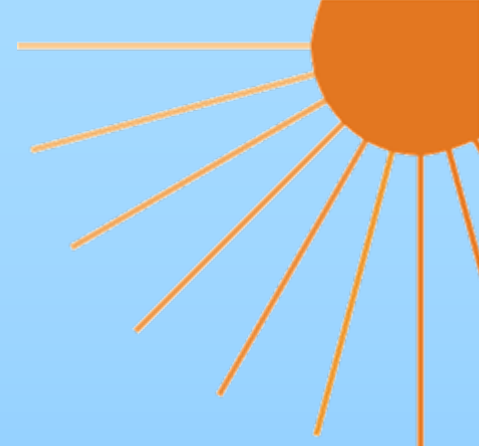


# What is Climate?

- **Weather** refers to short-term, atmospheric conditions, as measured by temperature, humidity, wind speed, atmospheric pressure, cloudiness, and precipitation. Weather conditions may change quickly.
- **Climate** is the average, or typical, weather conditions of a given area observed over a long period of time, usually 30 years or more. Climate is slow to change, but the implications of change are far reaching.
- When change occurs within a climate zone, humans and ecosystems are challenged by conditions that are on the edge or outside of the normal range.



# What Influences Climate?



Several factors influence climate:

- Latitude and altitude
- Distance from the ocean
- Mountain barriers
- Ocean currents
- Prevailing winds



Photo: Owen Day

- Volcanic activity and changes in the Earth's orbit around the sun can also affect climate



# El Niño vs. La Niña

- One phenomenon that has a major influence on climate in the UKOTs is the El Niño - Southern Oscillation (ENSO) or El Niño
  - Caused when the trade winds that blow from east to west along the equator in the Pacific decrease in intensity and bring about an increase in the ocean temperature.
  - El Niño events generally cause droughts in several regions, including the Caribbean, the western Pacific, Southeast Asia and Southern Africa.
- El Niño events are generally followed by a period of opposite conditions called La Niña, when water in the eastern Pacific is cooler and the winds that blow from east to west are stronger than normal.
  - In most locations, La Niña is associated with increased rainfall.



# The Greenhouse Effect

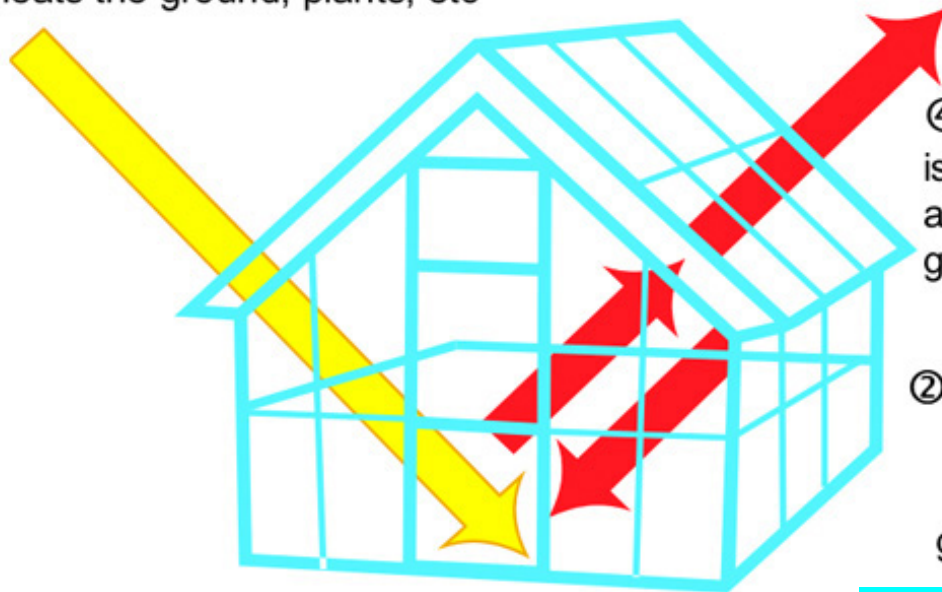
- The change that is now taking place in the global climate has its roots in the intensification of a natural phenomenon, the Greenhouse Effect.
- The atmosphere is made up of nitrogen (78%), oxygen (21%) and small amounts of other gases, such as carbon dioxide and trace amounts of hydrogen, methane, ozone, carbon monoxide, helium, neon, krypton and xenon.
- Carbon dioxide, methane, nitrous oxide and water vapour, are commonly known as greenhouse gases, because they help warm the atmosphere by trapping some of the energy reflected off the Earth.
- This natural warming is what makes the Earth habitable; without it, the Earth's average temperature would be an inhospitable  $-18^{\circ}\text{C}$  instead of the present  $14^{\circ}\text{C}$ .



# The Greenhouse Effect in a Greenhouse

① Energy from the Sun (sunlight) passes through the glass and heats the ground, plants, etc

③ ..most of this IR escapes to Space...



④ ...but some IR energy is reflected by the glass and trapped inside the greenhouse.

② All the time, invisible IR energy is being given off by the ground, plants, etc....

*Met Office Hadley Centre*

Why climate change matters for UKOTs

Unpacking climate change

Climate change in the UKOTs: present and future impacts

What can UKOTs do about climate change?

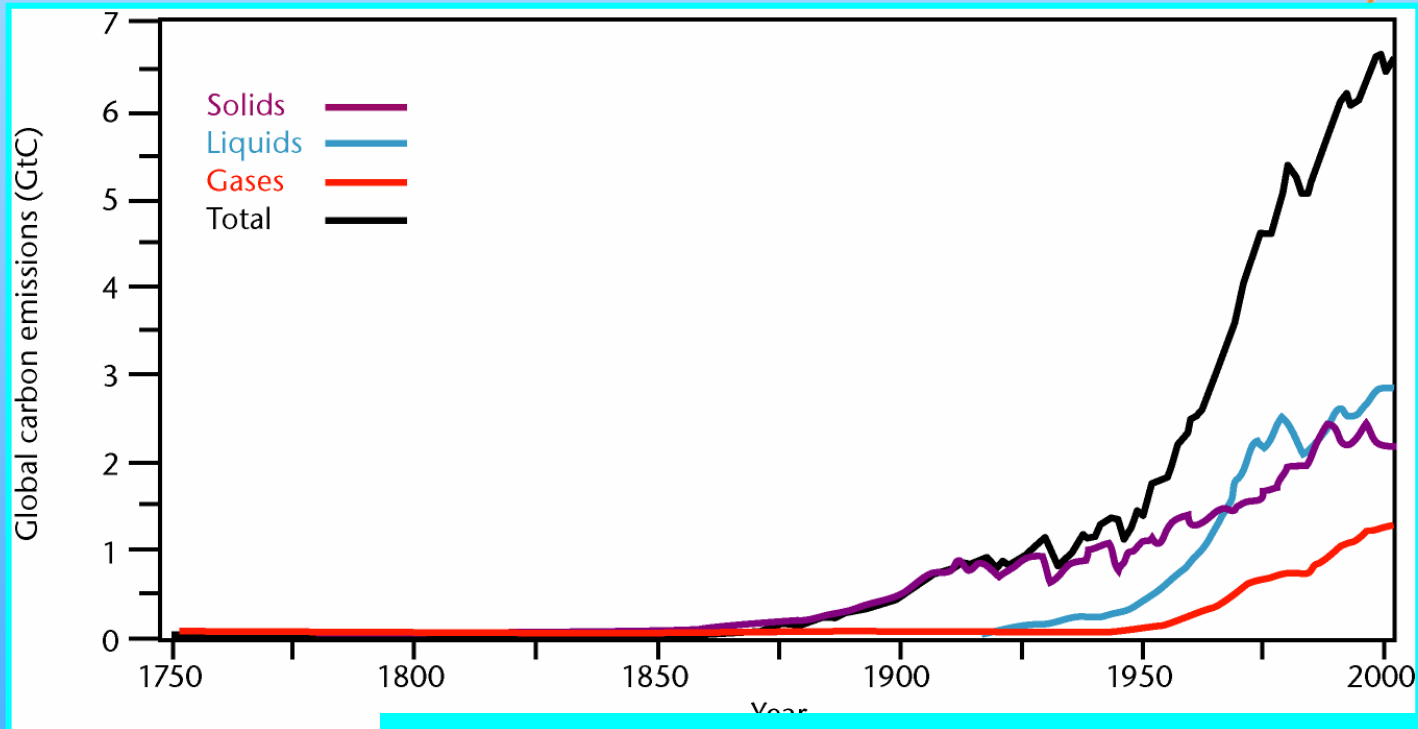
The way forward

# The Enhanced Greenhouse Effect

- Emissions of greenhouse gases have increased dramatically.
- Increases in carbon dioxide emissions account for approximately 70% of the enhanced greenhouse effect.
  - Scientists estimate the concentration of carbon dioxide in the atmosphere in the pre-industrial era at approximately 280 parts per million (ppm). Measurements in 2005 put it at 379 ppm.
- Natural sinks that remove carbon dioxide are also being compromised.
- Forests are being cut down for agriculture and human settlements.
- Oceans are reaching their carbon dioxide saturation point because their absorptive capacity is failing to keep pace with the increase in carbon dioxide emissions.



# Emissions of CO<sub>2</sub> from Fossil Fuels



*Emissions of CO<sub>2</sub> from burning fossil fuels in billions of tonnes (GtC)*

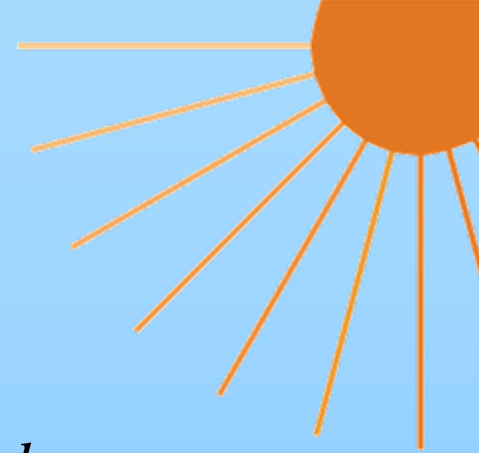


# Ocean Acidification

- Scientists are now observing trends of ocean acidification due to increased absorption of atmospheric carbon dioxide.
- Surface ocean pH already 0.1 units lower than pre-industrial values and, in one emissions scenario, by the end of the century could be lowered by an additional 0.14–0.35 units.
- Research suggests that if this trend continues, marine organisms such as coral, plankton and shellfish, might not be able to make their skeletons
- Coral reefs generate coral sand, provide nurseries and habitats for fish and other marine species and provide opportunities for recreation activities, particularly diving and snorkelling. Compromised coral reefs also weaken coastal defences and accelerate coastal erosion.



# Evidence for Climate Change



*IPCC conclusions about observed trends include:*

- **Temperature**

- 11 of the 12 warmest years since 1850 occurred between 1995 and 2006
- The warming trend over the last 50 years, an average of  $0.13^{\circ}\text{C}$  per decade, is nearly double that of the previous 100 years
- The temperature increase from 1850–1899 to 2001–2005 is an average of  $0.76^{\circ}\text{C}$



# Evidence for Climate Change

- **Precipitation**

- Between 1900 and 2005 there were increases in eastern parts of North and South America, northern Europe and northern and central Asia, and decreases in the Sahel, the Mediterranean, southern Africa and parts of southern Asia
- More areas are affected by drought globally since the 1970s

*Source IPCC 2007*



# Evidence for Climate Change

- **Sea level**

- Global average sea level has risen at an average rate of 1.8 mm per year since 1961
- Marked acceleration in the rate of increase to an average of 3.1 mm per year since 1993



# Evidence for Climate Change

- **Storms**

- Since 1970, there has been more intense tropical storm activity, marked by a 75% increase in the number of category 4 & 5 hurricanes.
- The largest increases were in the North Pacific, Indian and Southwest Pacific Oceans, but the number of hurricanes in the North Atlantic has also been above normal in nine of the past 11 years, including the record breaking 2005 season.

*Source IPCC 2007*



# Projected Changes

## Slow onset changes

- Sea-level rise
- Increase in air temperature
  - Average warming in regions where small islands are located likely to be between 2.0- 2.8°C by 2050 (vs. 1990 temperatures).
  - By 2080, the increase is likely to be between 3.1 and 4.3°C.
- Increase in sea surface temperature
- More rainfall and flooding during wet seasons
- Less rainfall in dry seasons

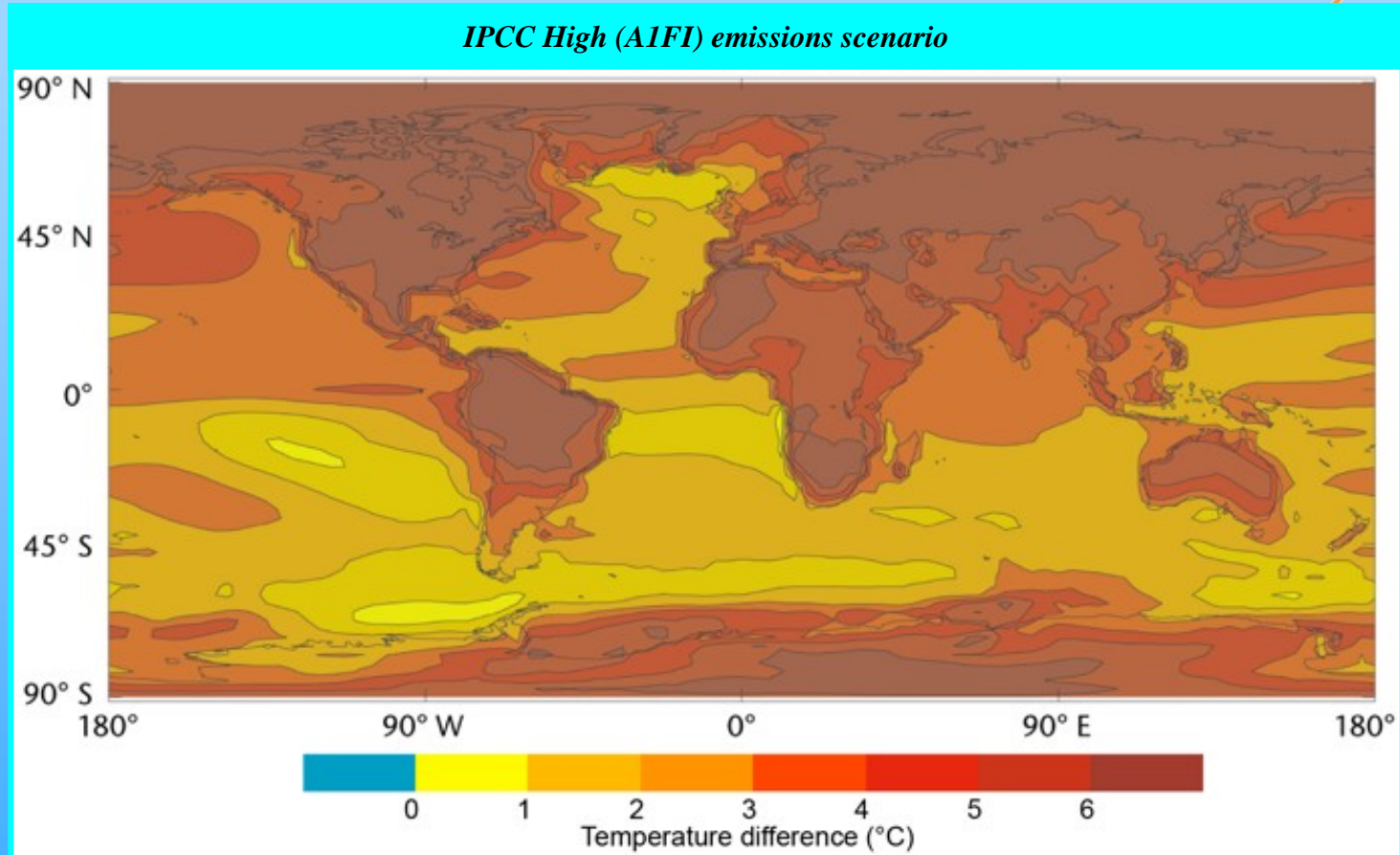
## Sudden, extreme events

- The frequency of extreme temperatures (e.g. heat waves) is likely to increase
- An increase in the intensity of rainfall
- An increase in the intensity of tropical cyclones

*Source: Tompkins et al., 2005*



# Global Temperature Projections: 2080



# Challenge of Making Projections in the UKOTs

- Data often not available for computer models.
- The spatial scales of most global climate models are too large to provide information about small countries like the UKOTs.
- The Caribbean is addressing this issue through joint collaboration between regional institutions and the Hadley Centre in the United Kingdom, under the Providing Regional Climates for Impacts Studies (PRECIS) project.



# Climate Change Impacts in the UKOTs

## 1. Livelihoods and Food Security - Tourism

- Seaside tourism in the Caribbean UKOTs and Bermuda is likely to be affected by impacts on marine and coastal environments. This could have serious knock-on effects in other sectors.
- Nature tourism, such as in South Georgia and the South Sandwich Islands, could also decrease due to a decline in key species.
- New carbon taxes and charges to reduce/offset greenhouse gas emissions will ultimately increase the cost of air travel and could affect UKOTs in the future
- Milder temperatures in other destinations, such as mountains, could make them more attractive holiday options.



# Climate Change Impacts in the UKOTs

## 1. Livelihoods and Food Security - Food security

- Water temperature influences the migration, growth, recruitment and mortality of fish, and may substantially affect fisheries in **many** UKOTs.
- This is of particular concern to those UKOTs where fisheries are important, such as South Georgia and the South Sandwich Islands where they account for 85 % of GDP.
- Changing growing seasons, drought and water shortages are placing a strain on agriculture in some territories.
- UKOTs at risk of storms may also experience increased damage to crops.



# Climate Change Impacts in the UKOTs

## 2. Health

- The IPCC projects that climate change will increase the burden of disease globally.
- The health risks associated with extreme weather in UKOTs will increase.
- It is also likely that the incidence of water and vector borne diseases will increase as water availability is affected and higher temperatures change the geographic distribution of vectors and shorten incubation periods.



# Climate Change Impacts in the UKOTs

## 3. Water Resources

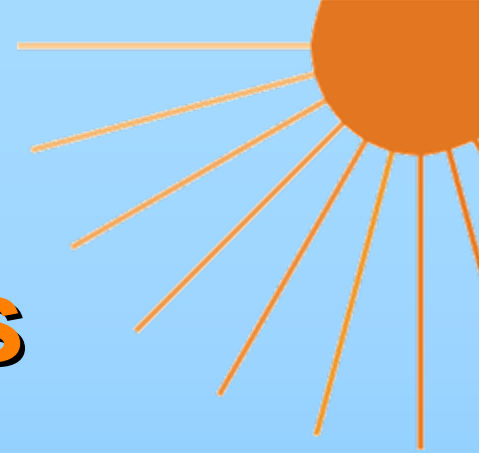
- The wet and dry cycles associated with ENSO events can seriously affect water supplies in countries that are heavily dependent on rain water.
- Ground water supplies, in small islands in particular, face possible threats from contamination by salt water.
- Drought prone regions that already experience water shortages, like the Mediterranean, are likely to see more acute scarcity.



Photo: Stephen Mendes



# Climate Change Impacts in the UKOTs

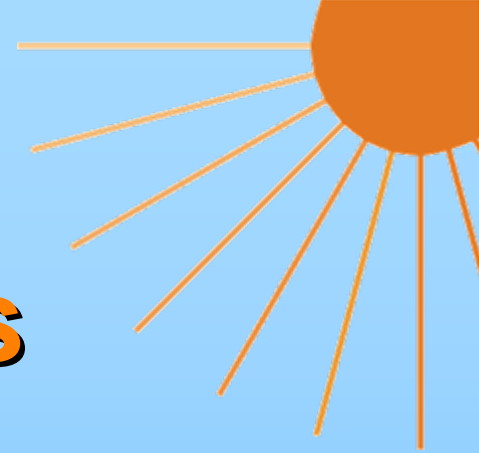


## 4. Economic and financial impacts

- Direct costs from damage to infrastructure, human settlements, crops etc.
- Indirect costs from lost earnings from tourism, fisheries or loss of ecosystem services.
- Extreme weather events, such as hurricanes or tropical storms, can be particularly costly. For example, Hurricane Ivan in 2004 cost the Cayman Islands USD3,432 million or 13% of GDP.
- There are also considerable costs associated with addressing climate change proactively by reducing risk and building resilience.



# Climate Change Impacts in the UKOTs



## 5. Infrastructure

- Most UKOTs have a high concentration of critical infrastructure such as ports, airports, houses and businesses in the coastal zone.
- Flooding and physical damage may lead to closure of roads, airports and bridges.
- The resulting disruption is also likely to affect communications as well as other key dependent sectors and services, including tourism, agriculture, health care delivery and market supplies.



# Climate Change Impacts in the UKOTs

## 6. Coastal and marine resources

- All but 2 (British Antarctic Territory and Gibraltar) are islands surrounded by water.
- The goods and services that coastal and marine ecosystems provide UKOTs are critical to the well-being of their people and economies.
- Oceans and seas are important ecosystems in all the UKOTs



Photo: Andrew McRob, BVI National Trust



# Climate Change Impacts in the UKOTs

## 6. Coastal and marine resources (cont.)

- Coral reefs cover a mere 0.2% of ocean floor, but they are home to 25% of its species. They are part of the tourism product of the Caribbean UKOTs and provide both white sand and coastal protection. Climate change will increase loss of coral reefs from bleaching and disease.
- Sea level rise will contribute to coastal erosion, landward intrusion of seawater, flooding (including higher storm surge flooding), and loss of mangroves and wetlands.
- Mangroves and other wetlands are an important part of several UKOTs and play a role in preserving biodiversity and in protecting the coastal zone from erosion



# Climate Change Impacts in the UKOTs

## 7. Biodiversity

- UKOTs biodiversity resources make a significant contribution to global biodiversity and have a high degree of endemism.
- 61 critically endangered species are found in the UKOTs vs. five in metropolitan UK.
- 58 endangered species occur in the territories (10 in metropolitan UK)
- 168 vulnerable species (metropolitan UK: 23)
- More than 200 endemic plant species, 20 known endemic bird species, and 500 endemic invertebrates in the UKOTs.

*IUCN, 2007*



*Photo: Vin Fleming*



# Climate Change Impacts in the UKOTs

## 7. Biodiversity *cont.*

- UKOTs also hold regionally or globally important concentrations of species.
- Ascension Island supports the second largest green turtle rookery in the Atlantic
- Gough Island (Tristan da Cunha) has been described as the world's most important seabird island

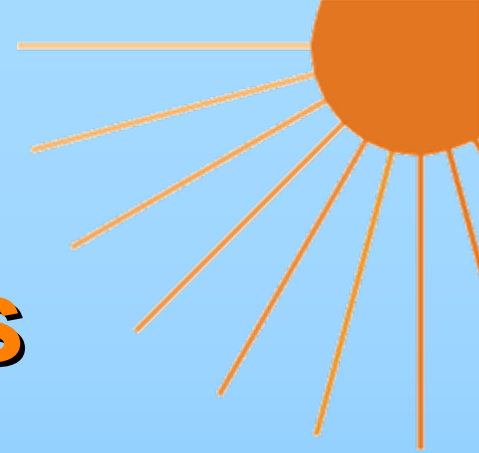


Photo: Charles Sheppard

*The reefs of Chagos Archipelago (British Indian Ocean Territory) are considered to be some of the most pristine and best protected in the Indian Ocean*



# Climate Change Impacts in the UKOTs



## 7. Biodiversity *cont.*

- Although biodiversity is threatened by climate change, proper management of biodiversity resources can reduce the impacts of climate change.
- Some of the ways in which this can be done include:
  - protecting and enhancing ecosystem services
  - managing habitats for endangered species
  - creating refuges and buffer zones
  - establishing networks of terrestrial, freshwater and marine protected areas



# Regional Impacts of Climate Change

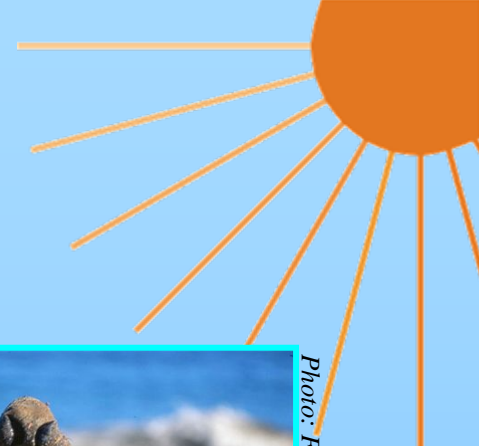


Photo: Falklands Conservation

## 1. Antarctic and sub-Antarctic

- British Antarctic Territory
  - South Georgia
  - South Sandwich Islands
- An increase in sea temperature could lead to loss of fish stocks, seabirds and marine animals.
  - Sea level rise could threaten beaches where fur seals and elephant seals breed and the tussac grass communities where the endemic South Georgia pipit lives and breeds.
  - Glacial retreat would increase the habitat of invasive species, including rats, mice and reindeer, which would endanger the pipit and lead to loss of habitat for certain burrowing petrel species.



# Regional Impacts of Climate Change

## 2. Bermuda

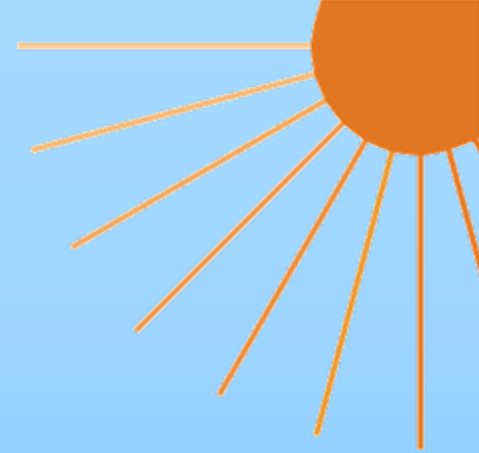
- Bermuda's mangrove forests are threatened by salt water inundation due to rising sea levels.
- Turtle nesting sites are subject to erosion from tropical storms and hurricanes that affect the island.
- Bermuda's coral system is distinctive for being the most northerly of its kind in the world and is among the more geographically isolated reefs. The fate of this reef system is linked to those of the Caribbean, which seed them.



Photo: Andy Dobson



# Regional Impacts of Climate Change

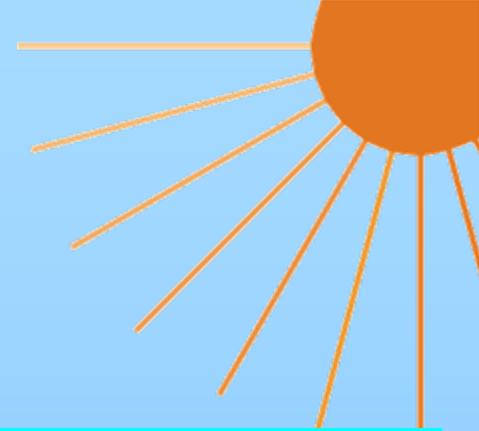


## 3. The Caribbean: Anguilla

- Depletion of fish stocks.
- Beach erosion, compounded by development in the coastal zone.
- A longer dry season and decreased availability of water could affect agriculture.
- Sea level rise will increase the risk of salt-water contamination of rivers and salt-water intrusion of ground water.
- Increased hurricane and storm intensity could disrupt sanitation and sewerage disposal systems as well as cause damage to coastal communities and infrastructure.



# Regional Impacts of Climate Change

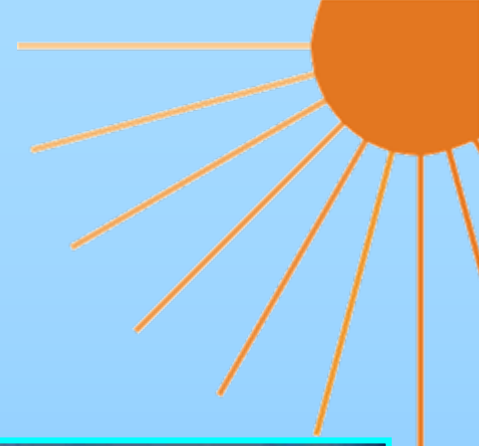


## 3. The Caribbean: British Virgin Islands

- Coral reefs are vulnerable to bleaching episodes from warmer seas and stress from hurricanes.
- Low-lying Anegada is vulnerable to the effects of sea level rise and to storm surges and wave action during hurricanes.

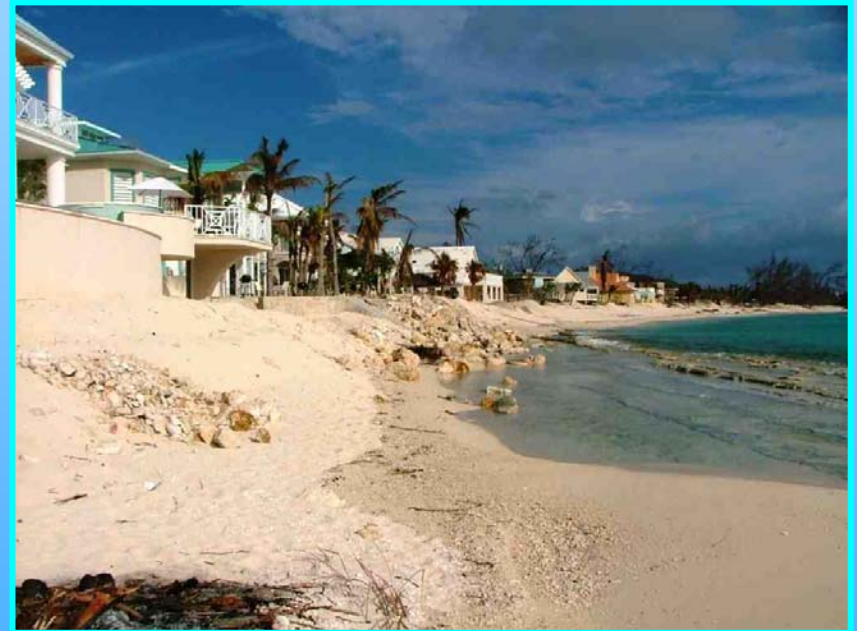


# Regional Impacts of Climate Change



## 3. The Caribbean: Cayman Islands

- Coral bleaching.
- Beach erosion and destruction of turtle nesting sites.
- As low-lying islands, the Cayman islands are vulnerable to the effects of sea level rise and to storm surges and wave action during hurricanes.



# Regional Impacts of Climate Change

## 3. The Caribbean: Montserrat

- Changes in coastal vegetation.
- Coral bleaching.



Photo: Owen Day



# Regional Impacts of Climate Change

## 3. The Caribbean: Turks and Caicos Islands

- Sea level rise will increase the risk of coastal erosion and salt-water intrusion of ground water
- This will jeopardise agricultural production in and around coastal communities.



Photo: Tara Palembe



# Regional Impacts of Climate Change

## 4. British Indian Ocean Territory

- Loss of reefs is leading to loss of some fish and other marine species.
- The biodiversity of reefs and their biological integrity is being compromised.
- Erosion is already causing and will continue to cause damage to the shoreline and to buildings and structures along the coast.
- As the sea level rises, the reef flats at the mean low tide level will become less effective in offering the shoreline protection from waves



Photo: Charles Sheppard



# Regional Impacts of Climate Change

## 4. South Atlantic: Ascension Island

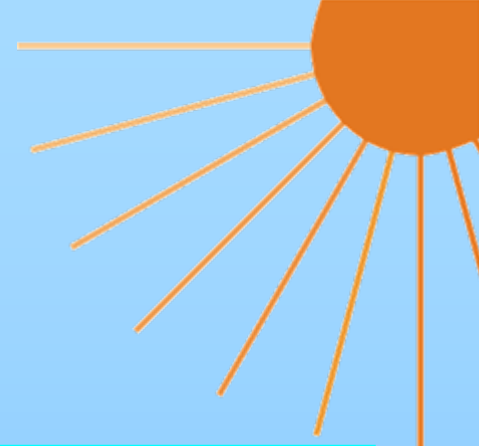
- Increase in sea temperature.
- Sea level rise will adversely affect nesting beaches and could cause a drop in sea turtle nesting success to nest inundation.
- Changes in regional seasonal rainfall patterns could advance the spread of invasive plant species and increase erosion



Photo: Anselmo Palombe



# Regional Impacts of Climate Change



## 4. South Atlantic: St. Helena

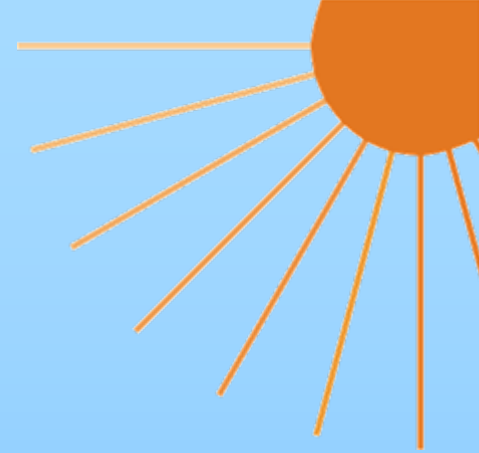
- Fish stocks and fishing industry at high risk.
- Increased risk of floods, droughts, and soil erosion.
- Research points to a strong warming trend (2°C over 60 years) and a slight decrease in rainfall that could lead to a reduction in water supplies.
- Altitudinal shifts in vegetation zones. Current ecological imbalances could become even more marked.



Photo: St. Helena National Trust



# Regional Impacts of Climate Change

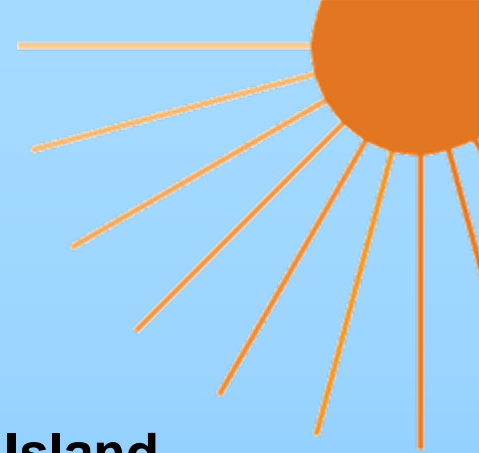


## 4. South Atlantic: Falkland Islands

- Cooler, less saline water may affect distribution and abundance of the main inshore fauna and flora.
- There is need for more research and data gathering. To date, little is known about the effects of climate change on plant communities or about what it means for whale and dolphin communities.



# Regional Impacts of Climate Change

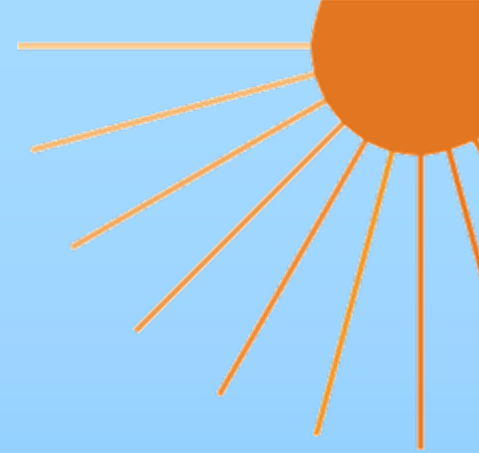


## 4. South Atlantic: Tristan da Cunha and Gough Island

- Increased threat from invasive species (e.g. rats and mice) due to warmer temperatures that allow them to thrive and displace more vulnerable native species.
- Tristan Albatross (*Diomedea dabbenena*), already considered 'critically endangered' by mouse predation, would be further threatened.
- Changes in oceanic circulation patterns due to warming sea temperatures could affect some fish species and marine predators (seabirds and seals)
- An increase in storm severity puts the sole harbour on Tristan da Cunha, the only means of access, at risk.



# Regional Impacts of Climate Change

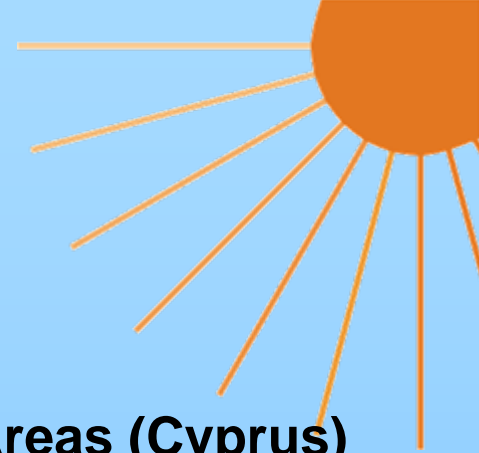


## 5. South Pacific: The Pitcairn Islands

- Changes in rainfall and salt-water intrusion will affect agricultural production.
- The tuna fisheries in the western and central Pacific could collapse.
- Diarrhoeal and vector borne diseases are expected to increase.
- Climate change could also increase the incidence of ciguatera poisoning.
- Variations in rainfall will affect water supplies in some Pacific islands.
- Coral reefs are also likely to be affected by bleaching events.



# Regional Impacts of Climate Change



## 6. Mediterranean: Gibraltar & Sovereign Base Areas (Cyprus)

- UNEP has warned that the Mediterranean would be one of the first regions to feel the impact of climate change on water resources due to a decrease in precipitation and higher evaporation rates.
- Sea level rise will increase saltwater intrusion into aquifers and estuaries.
- Desertification will increase
- There may be a reduction in crop yields in the southern part of the Mediterranean basin.
- Increased spread of pests and diseases region.
- Tourism adversely affected by uncomfortable summer heat.
- Fire risk increase, especially in inland locations - e.g. Spain



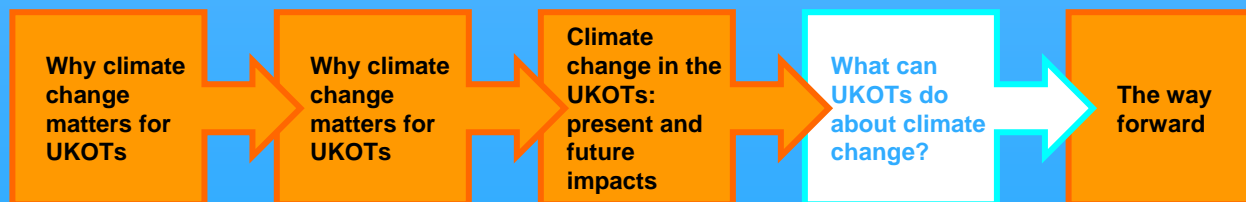
# What can the UKOTs do about Climate?

## MITIGATION

- Mitigation is a means of stemming climate change impacts.
- However, just as the effects of climate change felt today are the result of actions in the past, the benefits of mitigation will not be felt immediately.
- Mitigation refers to using policies and other interventions to reduce greenhouse gas emissions and improve the functioning of carbon and greenhouse gas sinks.

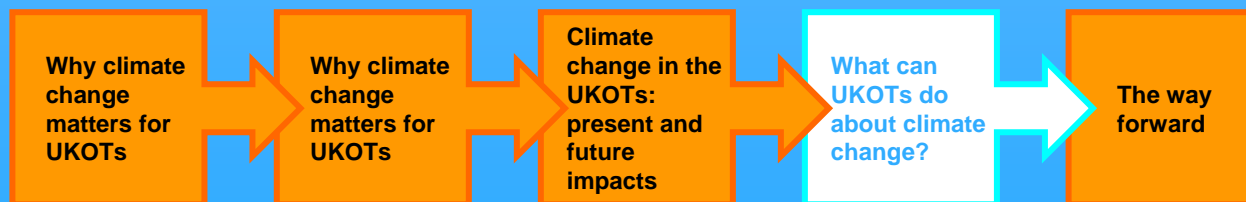


Photo: Harford, St. Helena National Trust



# Mitigation in the UKOTs

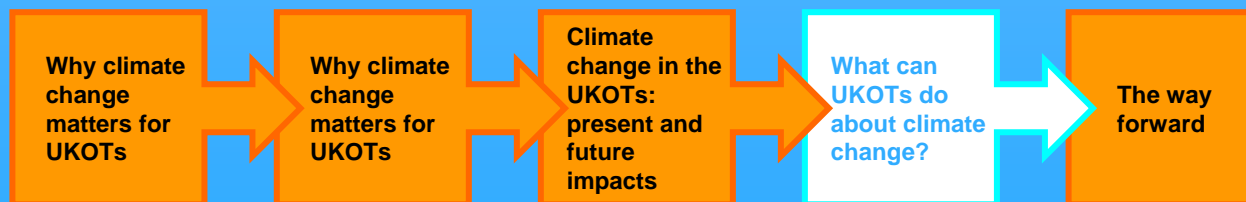
- Although UKOTs make a small contribution to global emissions of GHG, they can play their part by:
  - enhancing energy efficiency
  - diversifying their energy sources
  - increasing reliance on non fossil fuel sources of energy
  - promoting climate friendly technologies
- Climate change affects us all, therefore we all have a vested interest in doing whatever we can to reduce emissions, however small the contribution in global terms. Collectively, small efforts can add up to make a difference.



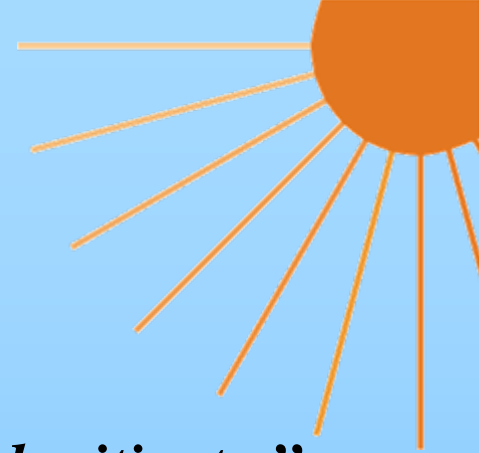
# What can the UKOTs do about Climate?

## ADAPTATION

- Adaptation is about being ready for climate change and responding to it by minimising the risks it presents to people's lives and livelihoods.
- It includes building capacity and putting measures in place to cope with and recover from impacts, as well as to live with climate-induced changes and take advantage of any benefits they might offer.
- Adaptation can be done at national, community or even individual levels.
- The benefits of adaptation are immediate.

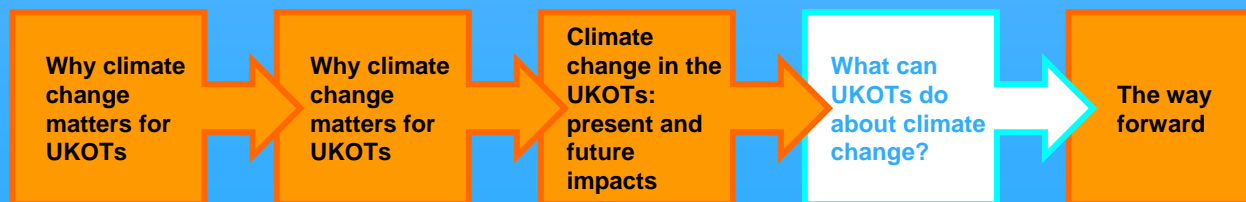


# What can the UKOTs do about Climate?



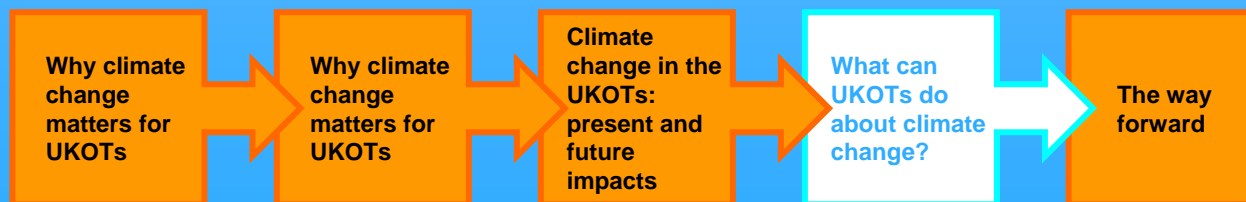
*“Good climate policy aims to both adapt and mitigate.”*

- Good climate policy aims to both adapt and mitigate. Adaptation is crucial because even the most rigorous mitigation measures taken today will not stave off the negative effect of the warming already in process.
- Unmitigated climate change at the current rate will challenge the capacity of man and nature to adapt.
- Given the small contribution they make to greenhouse gas emissions and the great extent to which they are affected by global warming, the thrust towards adaptation will be greater in UKOTs than the adoption of mitigative strategies.

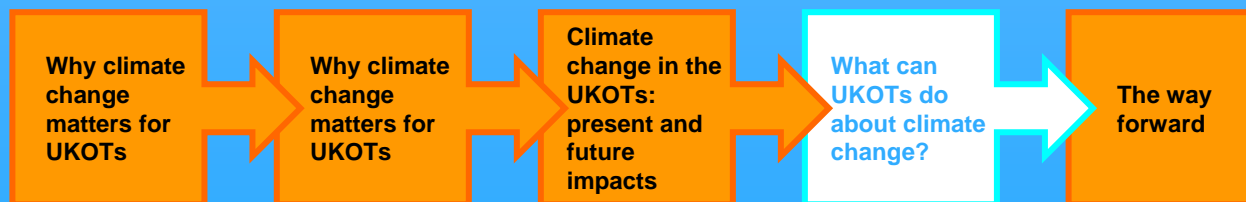
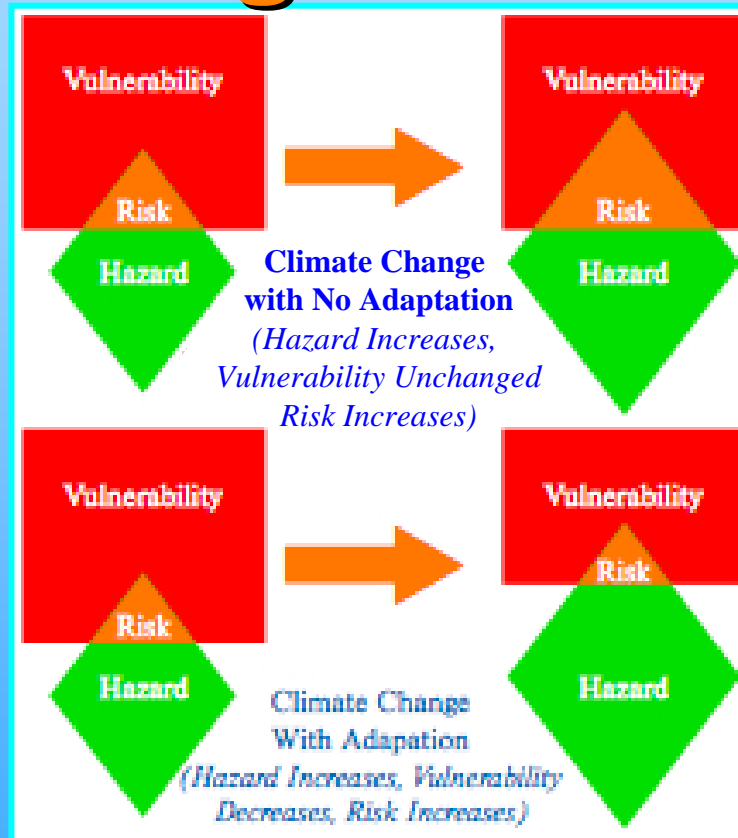


# Mainstreaming Adaptation

- Adapting to climate change is an opportunity for UKOTs to improve natural resource management and physical planning processes.
- Adaptive measures would make UKOTs better able to deal with the natural hazards that are part of their normal climate variability, as well as the growing human-induced stresses on the environment.
- Adaptive responses can be:
  - Technological (e.g. improving coastal defences)
  - Managerial (e.g. introducing crop rotation)
  - Policy-based (e.g. strengthening planning regulations).
  - Behavioural (e.g. preparing one's home for a hurricane).

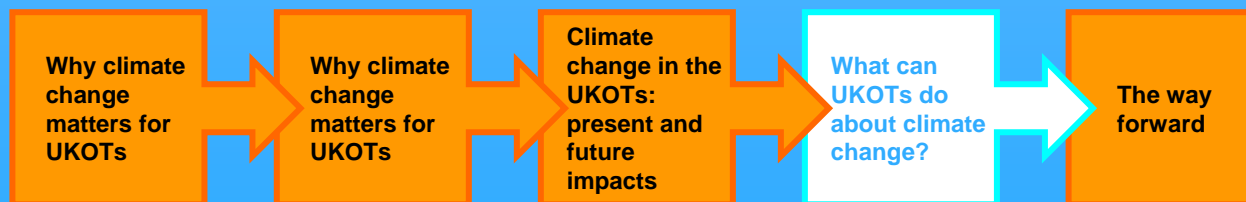


# Addressing Vulnerability

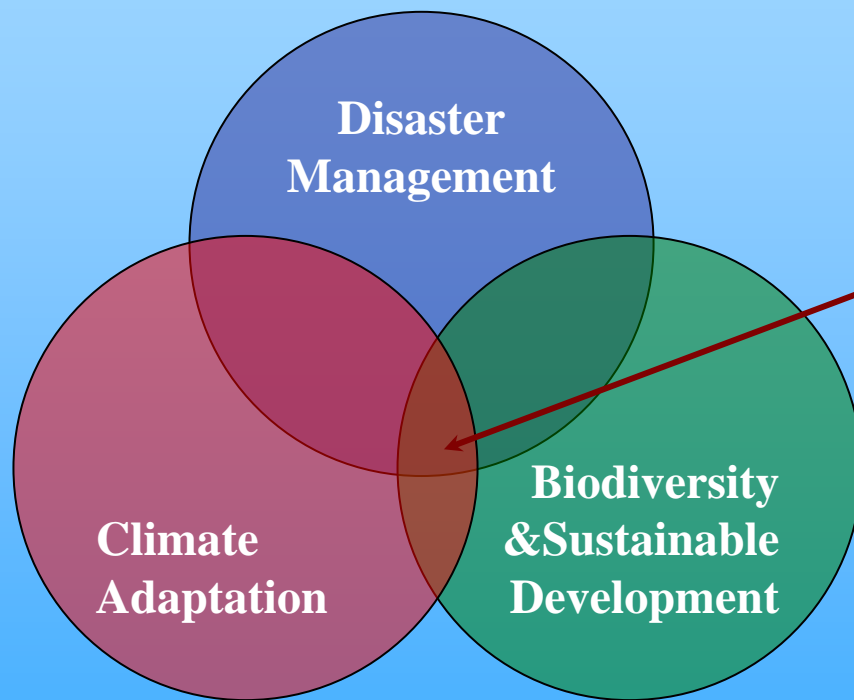


# Biodiversity and Natural Resource Management

- Natural resources and biodiversity can be managed and conserved in ways that help reduce the impacts of climate change.
- The resilience of ecosystems can be enhanced through the adoption of biodiversity-based adaptive and mitigative strategies.
- Management of ecosystems protects their ecological functions and also reduces the impacts of climate change. For instance, conservation of mangroves and coral reefs helps bolster coastal and shoreline defences; Protection of forests increases available carbon sinks.



# Meeting Multiple Objectives through Adaptation

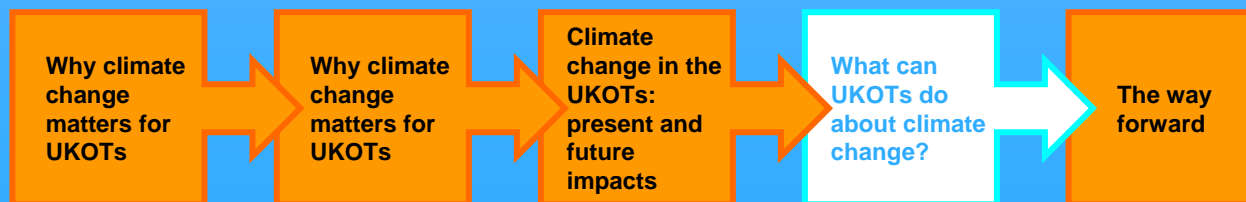


**Triple Dividend**



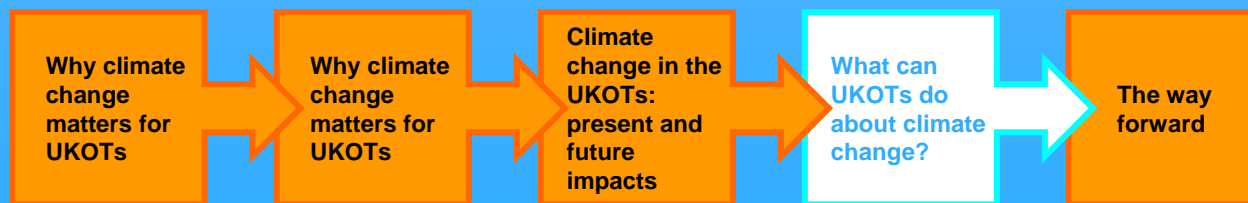
# Policy Responses for Adaptation and Mitigation

- The “four eyes” of policy responses:
  - Incentives
  - Institutions
  - Information
  - Instruments



# Policy Responses for Adaptation and Mitigation

Policy area	Policies that take climate change into account	Policies that ignore climate change risks
<b>Housing</b>	<ul style="list-style-type: none"> <li>• Building on higher ground</li> <li>• Using natural ventilation to cool buildings</li> <li>• Encouraging the use of small-scale renewable energy, e.g. small wind turbines and solar water heaters</li> </ul>	<ul style="list-style-type: none"> <li>• Building in low-lying or easily flooded areas</li> <li>• Using air-conditioning</li> </ul>
<b>Tourism</b>	<ul style="list-style-type: none"> <li>• Encouraging longer stay visitors</li> <li>• Promoting eco-tourism through investment in preservation of buffering ecosystems</li> </ul>	<ul style="list-style-type: none"> <li>• Encouraging visitors to the island on short stays/weekend breaks.</li> <li>• Promoting eco-tourism through the exploitation of natural resources</li> </ul>
<b>Energy</b>	<ul style="list-style-type: none"> <li>• Supporting individual use of solar panels and solar water heaters</li> </ul>	<ul style="list-style-type: none"> <li>• Preventing use of solar Panels or Solar water heaters</li> </ul>
<b>Transport</b>	<ul style="list-style-type: none"> <li>• Promoting low-energy forms of transport, e.g. cycling, shared cars, hybrid cars, energy efficient cars</li> <li>• Developing public transport.</li> </ul>	<ul style="list-style-type: none"> <li>• Encouraging use of large energy-intensive vehicles, e.g. Hummers, SUVs</li> </ul>
<b>Food Security</b>	<ul style="list-style-type: none"> <li>• Promoting and supporting local production of agricultural goods</li> </ul>	<ul style="list-style-type: none"> <li>• Increasing reliance on foods imported from overseas</li> </ul>
<b>Water Supply</b>	<ul style="list-style-type: none"> <li>• Encouraging water conservation, e.g. metering, public education</li> </ul>	<ul style="list-style-type: none"> <li>• Encouraging over-use of water (flat rate tariffs)</li> </ul>
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>• Ensuring roads have runoff/drainage systems</li> </ul>	<ul style="list-style-type: none"> <li>• Building roads that do not have runoff/drainage systems</li> </ul>



# Policy Responses for Adaptation & Mitigation

## Technologies

- Early warning systems
- Improvements to coastal defences
- Water and energy saving devices

## Economic & financial incentives

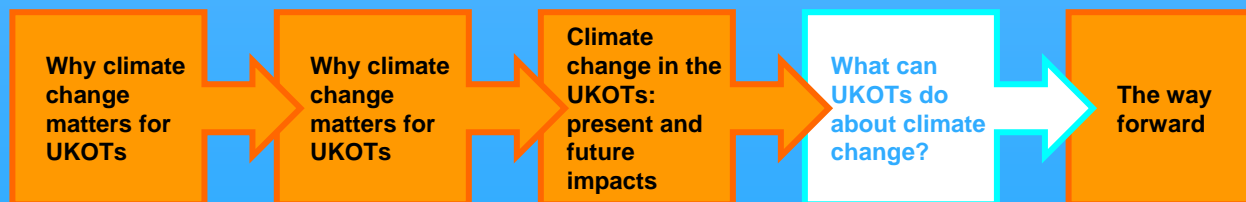
- Lower import duties on alternative energy products
- Tax breaks for using clean technologies

## Information Resources

- Regional climate models
- Forecasting of potential hazards

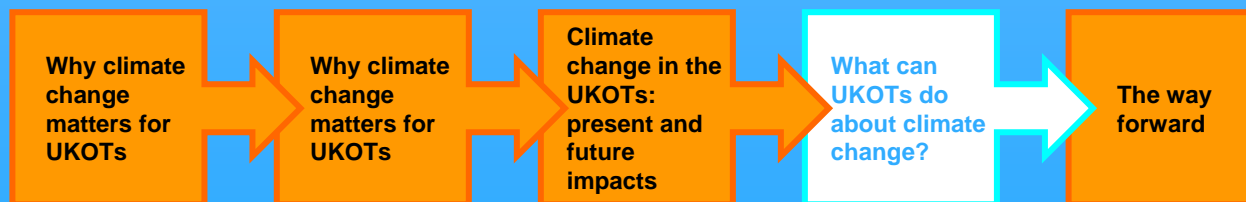
## Natural Resource Management

- Water conservation
- Sea level rise monitoring
- Ecosystem resilience



# Actions for Individuals & Businesses

- Individuals and businesses can make a difference by:
  - Reducing personal vulnerability to natural hazards
  - Reducing energy use in transportation and in the home
  - Practicing good environmental habits e.g. recycling, conservation
  - Improving business practices e.g. clean energy, waste reduction/recycling
  - Advocating for implementation of national adaptation plans and sustainable development policies



# The Way Forward

- **There is no quick fix to the climate change problem.**
  - It requires a compact between nations of all sizes and at all stages of development.
  - It requires a commitment to collective and individual action.
  - It requires social, economic, environmental and cultural policies.
  - It requires vision, leadership and creativity.
- **What does this mean for UKOTs?**
  - Urgent and immediate action - no country has the luxury of waiting
  - Greater priority for management and protection of ecosystems
  - Climate-proofing national policies and development plans
  - Reducing greenhouse gas emissions
  - Sharing of information - good practice and lessons

