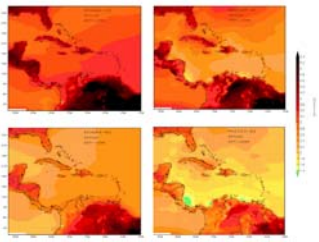
Enhancing Farming through Weather and Climate Information

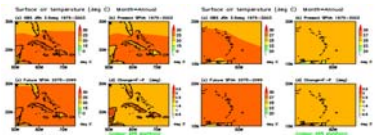
CARIBBEAN AGRO-METEOROLOGICAL INITIATIVE

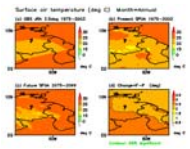
Climate Change and Climate Trends

What has been predicted?



Mean changes in the annual mean surface temperature for 2071-2099 with respect to 1961-1989, as simulated by PRECIS (ECHAM) and PRECIS (HADCM3) for SRES A2 (high emissions) and SRES B2 (low emissions). CSGM, UWI



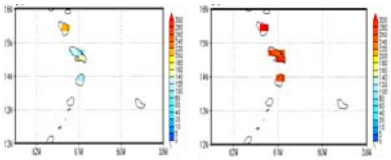


- Northern Caribbean- a 2.5°-3.0°C increase is expected over those islands
- Eastern Caribbean- a 2.0°-2.5°C increase is projected
- Southern Caribbean- Trinidad and Northern Guyana is projected to have a 2.0°-2.5°Cincrease
- However Southern Guyana is expected to have 2.5°-3.0°C temperature increase

- **Warmer temperatures**
  - ❑ Average of approx.1^{0}C increase in sea surface temperature
  - ❑ 0.5-4.2 ^{0}C increase from 2010 to 2099
- **Extreme temperature change over the Eastern Caribbean**
  - ❑ Increase in number of very warm days (>30^{0}C)
  - ❑ More days above critical temperature threshold
- **Rainfall Change over the Eastern Caribbean**
  - ❑ Drier mid-year, wetter end of year
    - o Models project decreases in annual precipitation (25 to 50%) but increase in intensity (up to 20% by 2050)
    - o Reduced length of rainy season 7-8% by 2050
    - o Increased length of dry season 6-8% by 2050
    - o summer drying to become more severe during the wet season
  - ❑ Indications of more persistent ENSO-like conditions: less but more intense tropical storms (10-20% wind speed increase)
- **Hurricanes**
  - ❑ Hurricane rainfall and wind speeds will likely increase in response to human-caused warming
- **Sea level rise**
  - ❑ 35-50cm over the next 50 years

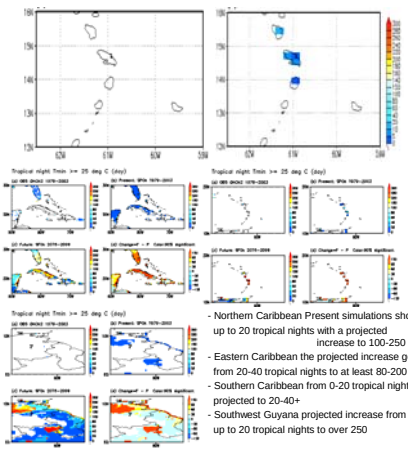
Tropical Days (Days MaxTemp ≥ 30º Celsius)

Present Climate | Future Climate



Tropical Days (Days MaxTemp ≥ 35º Celsius)

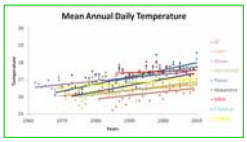
Present Climate | Future Climate

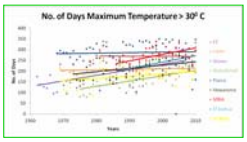


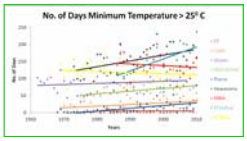
- Northern Caribbean Present simulations show up to 20 tropical nights with a projected increase to 100-250
- Eastern Caribbean the projected increase goes from 20-40 tropical nights to at least 80-200
- Southern Caribbean from 0-20 tropical nights projected to 20-40+
- Southwest Guyana projected increase from up to 20 tropical nights to over 250

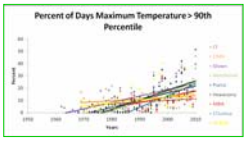
What are we seeing now?

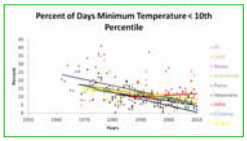
- **An average yearly increase of approximately 0.02^{0}C in average daily temperatures.**
- **Increase in number of very warm days (T_{max} > 30^{0}C) in some countries.**
  - ❑More day time temperatures above the 90th percentile
- **Increase in number of warm nights (T_{min} > 25^{0}C) in some countries**
  - ❑Fewer temperatures night time temperatures below the 10th percentile
- **No significant decrease in rainfall totals**
  - ❑No significant decrease in consecutive dry days
- **No significant increase in extreme rain events (Rain > 95th percentile)**
  - ❑No significant increase in 5day rainfall totals

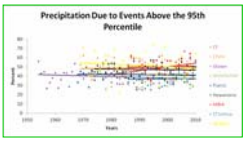


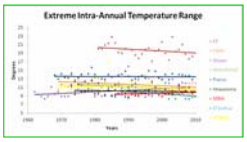


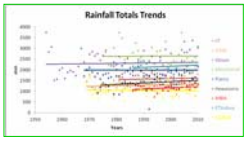


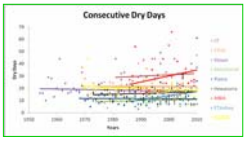












Some Implications for Agriculture

- **Super-optimum temperatures for growth and plant metabolic processes with the possibility of yield loss**
- **More frequent days of heat stress in animals**
- **Higher night time temperatures have implications for respiration and assimilate loss, as well as flower drop**
- **Despite no clear trend in rainfall the projected decline in rainfall can result in more frequent occurrences of drought and reduced plant water availability**
- **Higher intensity rainfall could lead to soil erosion and land degradation**
- **There can be shifts in the rain-fed growing season**

Partners

National Meteorological and Hydrological Services (NMHSs) of
Antigua and Barbuda, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Lucia, St Vincent and the Grenadines and Trinidad and Tobago
The Caribbean Agricultural Research and Development Institute (CARDI)
World Meteorological Organization (WMO)

Co-ordinated By

The Caribbean Institute for Meteorology and Hydrology

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