HEAT-HEALTH EARLY WARNING IN THE CARIBBEAN

Why (now) and how?

Dr. Cedric J. VAN MEERBEECK, Dr. Roché MAHON, Adrian TROTMAN

Caribbean Institute for Meteorology and Hydrology

Dr. Simon MASON, Dr. Hannah NISSAN

International Research Institute for Climate and Society

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Heat Waves in the Caribbean: a challenging, new reality

- **Limited Early warning capacity** for heat waves to improve preparedness and response action;
- **Limited human, technological and financial resources** to build and sustain early warning capacity;
- **Limited knowledge of community vulnerabilities** to heat stress in humans and animals.
- **Nearly no data on health outcomes** (morbidity and mortality) of heat stress and heat waves, and only slowly growing awareness of public health practitioners.
A new reality?
Local imprint of recent Global Warming

- >15% increase in frequency of warm days and nights; >7% decrease in frequency of cool days and nights; 1°C warming of hottest & coolest days and nights (Stephenson et al. 2014).

- Rapid increase in frequency of heatwaves since 1990s

- Season with heatwaves is expanding.
Phase 1: delivering (sub-)seasonal heatwave frequency forecast information

Forecasting the number of heatwaves within a season can increase lead times to support heat-health preparedness and heat stress mitigation.

Phase 1 roll out started under the USAID BRCCC Programme 2015-2017 and culminated in the monthly, experimental release of Caribbean Heat Outlooks during the hotter half year (rcc.cimh.edu.bb)
Phase 2: Leveraging regional & national sectoral partnerships to co-develop heat alerts (to begin in 2019)

- **Meteorological data needs**: Inventory hourly records of ambient and wet-bulb/dewpoint temperatures to produce historical time series of heat stress;

- **Health outcome data needs**: Creating national or within-country time series of morbidity and mortality related to heat stress to identify critical alerting thresholds.

- **Statistical modelling**: Building a seasonal heat stress forecast model.

- **Heat Alerting**: Co-develop an alerting protocol for heatwaves across timescales as part of a ‘Weather and Climate Ready Nations’ programme.
Thank you
rcc.cimh.edu.bb
Warming signals over South America

Natalia Herrera – nherrera@smn.gov.ar

Warming and wetting signals emerging from analysis of changes in climate extreme indices over South America

Both generalized increases in the frequency of warm nights and days over most of the SA locations are evident with a high spatial coherency of the signals.

- **Warm nights**: Strong increases in the north and weak in the southern parts of SA.
- **Warm days**: Increase over the northern part of SA, while the southern part has mostly non-significant (both increasing and decreasing) trends.

### Local annual trends (1969-2009)

- **TN90p** (Warm nights): %days TN>90th
- **TX90p** (Warm days): %days TX>90th

### Regional and subregional trends (1950-2010)

- **TN90p** (Warm nights): %days TN>90th
- **TX90p** (Warm days): %days TX>90th

#### Global and Planetary Change 100 (2013) 295–307

Regional and subregional trends (1950-2010)

- **TN90p** (Warm nights): %days TN>90th
- **TX90p** (Warm days): %days TX>90th

- **Warming and wetting signals emerging from analysis of changes in climate extreme indices over South America**

- **TX90p** (Warm days): %days TX>90th

- **ETCCDI (27 indices)**

- **Regional and subregional trends (1950-2010)**

- **Annual trends (1950-2010)**

<table>
<thead>
<tr>
<th>Sub-regions</th>
<th>TX90p</th>
<th>TN90p</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEB</td>
<td>3.05 (18.3%)</td>
<td>4.02 (24.1%)</td>
</tr>
<tr>
<td>AMZ</td>
<td>1.20 (7.2%)</td>
<td>2.28 (13.7%)</td>
</tr>
<tr>
<td>All SA</td>
<td>0.62 (3.7%)</td>
<td>1.54 (9.2%)</td>
</tr>
<tr>
<td>WSA</td>
<td>1.18 (7.1%)</td>
<td>1.60 (9.6%)</td>
</tr>
<tr>
<td>SSA</td>
<td>0.44 (2.6%)</td>
<td>1.30 (7.8%)</td>
</tr>
</tbody>
</table>

- **Warming signal over the continent as a whole**

- **Sub-regions adapted from the SREX Report (IPCC, 2012)**

- **Annual trends (1950-2010)**

- **Days/decade**

- **TN90p** (Warm nights): %days TN>90th
- **TX90p** (Warm days): %days TX>90th

- **Global and Planetary Change 100 (2013) 295–307**

- **Regional and subregional trends (1950-2010)**

- **Annual trends (1950-2010)**

- **Days/decade**

- **TN90p** (Warm nights): %days TN>90th
- **TX90p** (Warm days): %days TX>90th

- **Global and Planetary Change 100 (2013) 295–307**
The Regional Climate Center Network for Southern South America (RCC-SSA) is a network of climate monitoring stations that collects and analyzes climate data. The image shows a map that displays the linear trend of maximum temperature during the 90th percentile for the annual period, with data from various locations around South America.

Notes:
1. For each meteorological station, the color of the dot indicates the magnitude of the slope of the linear fit for the data period 1971-2010. Trends can be changed using the tool underneath the map.
2. The slope is shown for a meteorological station only if the record includes at least 90% of all possible index values for the selected period.
3. Meteorological stations for which the fitted trend (positive or negative) is significant at the 95% level are indicated with a black border around the colored dot.

The graph shows the linear trend over time for maximum temperature exceeding the 90th percentile for the annual period, with data points indicating year-by-year changes.

Thank you!