

CARIBBEAN SIDS Climate Service

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The Caribbean



Physical and socio-economic
background and Food Production
issues

Should Influence Climate Service

CARICOM in CONTEXT

- 15 Member States and 5 Associate States
- Mainly developing small island states
- Extensive coastlines relative to land area
- Significant amounts of their economic wealth and infrastructure in coastal regions
- Small climate sensitive interlocking economies (e.g., agricultural and tourism based, also industry and services fairly dominant) that often lack significant diversity at the national level thereby making them particularly vulnerable to economic shocks.
- Agriculture's contribution to GDP is declining, but still very important for employment
- ...Fisheries also important
- Only about 8 % of farmed land under irrigation
- Limited or no natural resources, with Trinidad and Tobago (oil and gas), Jamaica (bauxite) and Guyana (bauxite and precious metals) being exceptions.
- Expanding populations that are dominated by youth
- CARICOM has 6 of the top ten highest ranked countries with losses as a percentage of GDP from Climate (Climate Risk Index 1993 to 2012 Global Climate Risk Index 2014)
- The Caribbean can account for seven of the world's top 36 water stressed countries
- At risk to natural disasters, particularly weather and climate related

Size and Population of CARICOM Countries

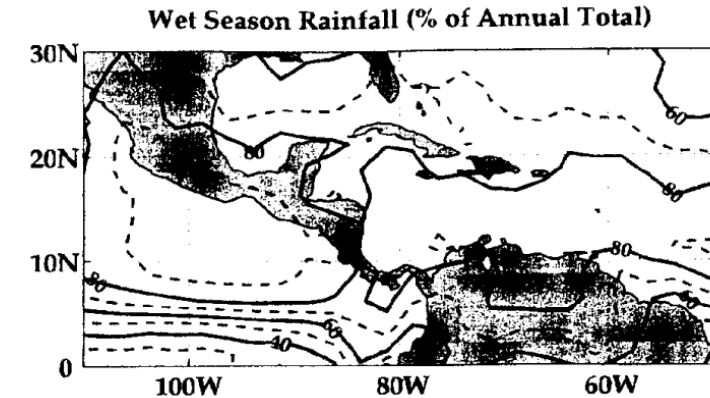
Countries	Size (Sq. Mi.)	Population
Antigua/ Barbuda	170	90,801 (2010)
The Bahamas	5358	372,380 (2014)
Barbados	166	277,668 (2012)
Dominica	290	69,623 (2012)
Grenada	133	108,580 (2013)
Haiti	10714	10,413,211 (2012)
Jamaica	4244	2,714,734 (2013)
St. Kitts/ Nevis	104	46,398 (2013)
St. Lucia	238	169,115 (2012)
St. Vincent/ Grenadines	150	109,903 (2011)
Trinidad/ Tobago	1981	1,340,557 (2013)

Source: www.caricomstats.org

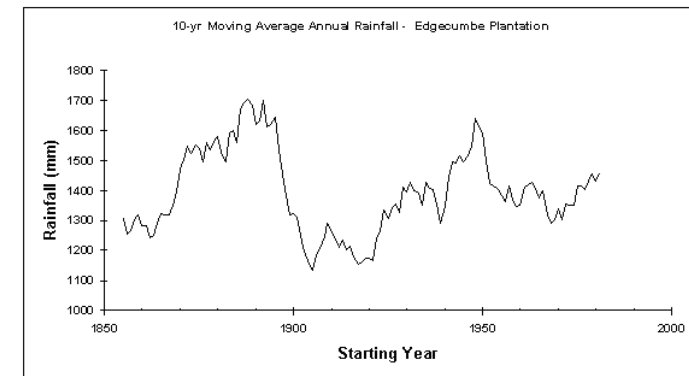
Caribbean Weather and Climate

RAINFALL (most limiting and variable)

- Characterized by a wet and a dry season...
- ...except northern Guyana with two wet and two dry seasons associated with ITCZ – extended dry seasons cause water availability concerns
- At least 70 to over 80 % of the rainfall occurs during the wet season
- Large seasonal, interannual and inter-decadal variability...
- ...associated with ENSO, Pacific-Atlantic, SST and SLP anomalies and gradients, NAO and CLLJ
- Tropical systems such as Tropical waves, tropical Cyclones, Frontals Systems, localized convection
- Rainfall also cyclical – 50 to 60 years



Enfield and Alfaro, 1999



Caribbean Weather and Climate

Temperature

- relatively constant
- annual range 2 to 5°C
- diurnal range larger and influenced by...
- ...prevailing wind, topography, altitude, nature of the underlying surface, and cloudiness

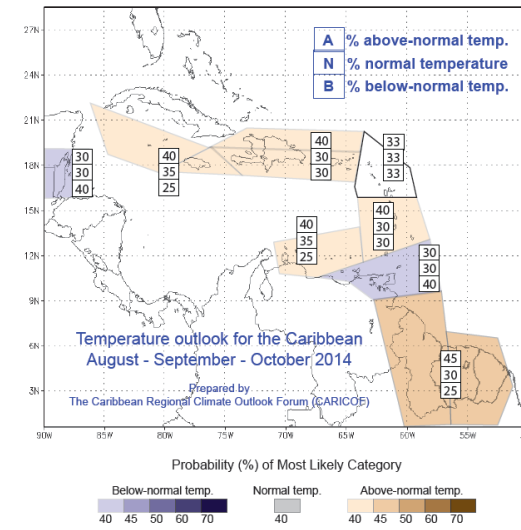
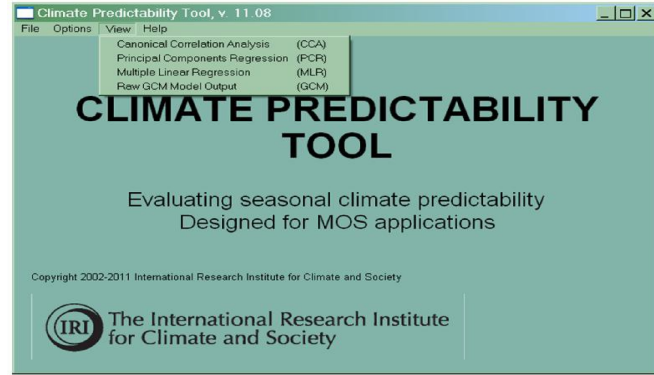
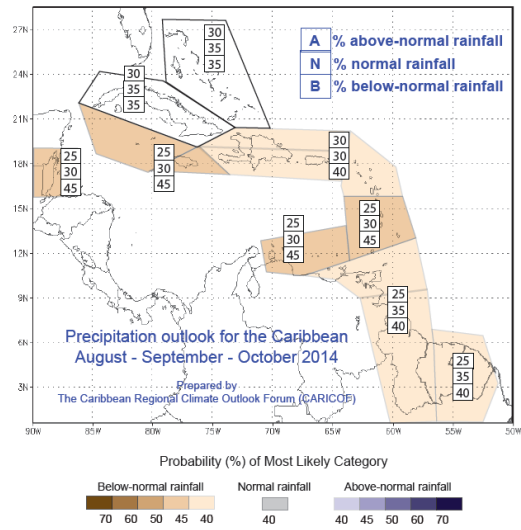
Wind

- predominantly easterly
- strongest during the dry season
- Highest gusts associated with tropical cyclones
 - Concerns over Climate Change – increasing temperatures, increasing drought threat, stronger cyclones, sea-level rise

Climate Related Services

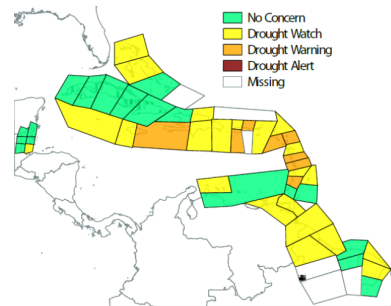
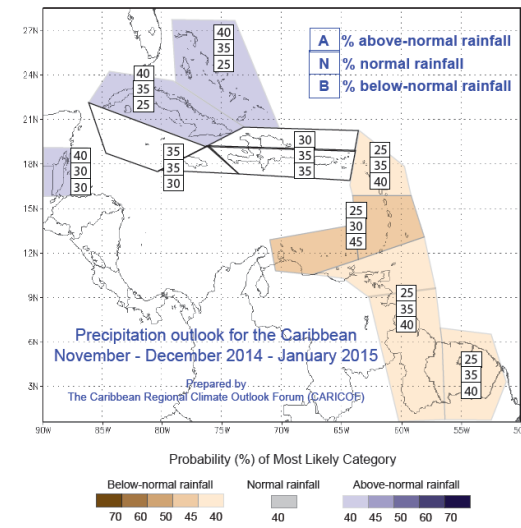
Information Products and Services

Support from CariCOF

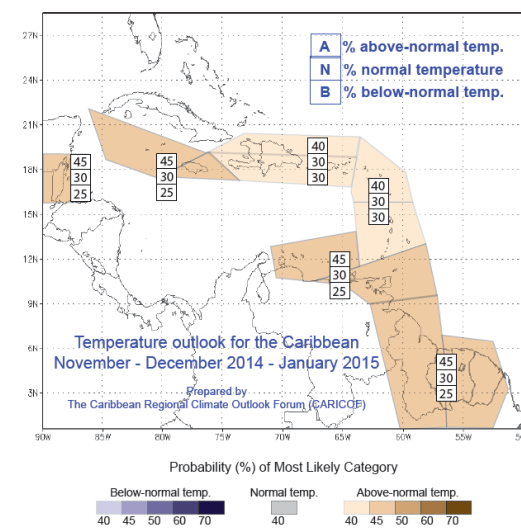


Tool(s) for Dynamic Downscaling?

**Future
Flood Risk Outlooks,
Sub-seasonal information and
forecasts
Future – Heat Waves
Coral Reef Watch**



Sep 2014 to Feb 2015 Drought Alert



Information Products and Services Dissemination

Caribbean climate outlook August to October 2013
CariCOF - The Caribbean Climate Outlook Forum

WHAT HAPPENED? April - May - June (AMJ) 2013

Wet and mild in eastern Caribbean; dry in Haiti, Bahamas, ABC Islands

+ impacts
drought relief after 2013 dry season, replenishment of aquifers in most areas

= impacts
growing water shortages in Haiti, losses from floodings in some other areas

Notable climate events
Suriname: May (usually the wettest month) 50% wetter than average in coastal areas.

Summary
- Very wet in April between Guadeloupe and Trinidad, dry in south-western Hispaniola and Belize; wet to extremely wet in May, but dry to extremely dry in Haiti and the Bahamas; very dry in June in Haiti, wet to extremely wet further east and south.
- Rather cool May, without usual rise in temperatures between March and May.

Headline Impacts
- Significant flood impacts in April: 2 deaths in Dominica, millions TT\$ losses in Trinidad and Tobago and disruption of normal life in some neighbourhoods of Paramaribo, Suriname.
- In May, flooded area in Suriname expanded, leading to evacuations in the hinterland, household disruptions in Paramaribo and loss of cattle stock in other districts.
- In June, floodings in most parts of Belize.

AMJ 2013 Precipitation

AMJ 2013 SPI Monitor

WHAT NEXT? August - September - October (ASO) 2013

Consensus Outlook
Near average to wet and warm across the Caribbean

+ impacts
sufficient drinking / recreational water production and aquifer replenishment

= impacts
Enhanced risk of excessive heat stress, floods, pests and vector borne disease outbreaks

Our typical ASO rainfall patterns

- Belize:**
AUG usually a short dry spell ("Mauga")
SEP wetter, most frequent tropical storms, OGT hurricanes and extreme rainfall events
- Islands north of 16°N:**
AUG usually a drier month within wet season ("mid-summer drought")
SEP wetter, most frequent tropical storms and hurricanes
OCT
- Islands south of 16°N:**
AUG frequent heavy rainfall; frequent and intense tropical storms and hurricanes
SEP wetter, frequent heavy rainfall; most frequent tropical storms and hurricanes
OCT wettest month, frequent heavy rainfall
Note: The ABC Islands are in the midst of their dry season, nearly no rainfall
- Gulanas:**
AUG No direct hits by tropical storms or hurricanes; occasional heavy rainfall
SEPT dry season, frequent dry spells, occasional heavy rainfall
OCT

ASO 2013 Precipitation Outlook

ASO rainfall likely normal to above-normal across most of the region; fair chance of wet conditions in many places within the Antilles and the Gulanas, rainfall in Bahamas, Belize, Cuba and Trinidad & Tobago hardly predictable.

<<< see outlook discussion on page 2 >>>

JULY 2013 Find out more at cimh.edu.bb/icc and cimh.edu.bb/?p=precipoutlook or e-mail cmwbesck@cimh.edu.bb
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Caribbean Drought & Precipitation Monitoring Network (CDPMN) August 11, 2014

CARIBBEAN DROUGHT BULLETIN

August 2014 | Volume I | ISSUE 3

Announcement

Though the dry conditions were alleviated during July or are expected to be alleviated during August elsewhere, it is recommended that water conservation measures continue as much as possible, particularly across the eastern Caribbean and Jamaica, as below normal rainfall is likely across much of the region for the next 3 months and leading into the 2015 dry season.

Month at a Glance

Below normal conditions dominated in the eastern Caribbean, Trinidad, Tobago, St. Lucia, Dominica, Anguilla and St. Maarten were moderately dry; Grenada, Barbados and St. Kitts abnormally dry; St. Vincent normal; Antigua exceptionally dry; and St. Croix extremely dry. Read more...

Headline Impacts

Hundreds of acres of farmland in the southern parish of St. Elizabeth, Jamaica were destroyed by fire. The massive blaze also damaged property and farm supplies. Reports indicated that the severe drought conditions and high winds caused the fire to spread more quickly. (Antigua Observer, July 6th, 2014)

The St. Lucia Water and Sewage company (WASCO) placed the entire island under a water emergency schedule as the drought situation worsened. (Caribbean 360, July 10th, 2014)

Farmers in Jamaica have increased the prices of their produce due to the severe effects of drought. (Daily Nation, July 16th, 2014)

Government contemplates importing produce as the drought continues in order to prevent a food shortage in Jamaica. (Antigua Observer, July 15th, 2014)

A car washing business in Jamaica is cutting staff to stay afloat in drought. They have been hard hit by the National Water Commission restrictions and threat of fines for the use of piped water to wash vehicles. (Jamaica Observer, July 25th, 2014)

May-June-July (MJJ) Rainfall Summary

For the three month period, rainfall in the islands of the eastern Caribbean were normal to below normal. Trinidad, Tobago, St. Kitts, Anguilla, St. Maarten and St. Croix were normal; Grenada, St. Lucia and Dominica severely dry; and Barbados, St. Vincent and Antigua moderately dry. Conditions in Guyana ranged from moderately wet in the northwest to exceptionally dry in the east. Aruba was moderately dry while Puerto Rico was normal. Conditions in Jamaica ranged from normal in the west to moderately dry in the east, but Grand Cayman was abnormally dry. Conditions in Cuba ranged from severely dry in the west to normal in the east. Belize was abnormally dry in the west and moderately dry in the east.

Caribbean Drought Bulletin 1

CAMI MONTHLY BULLETIN

Caribbean Agro-Meteorological Initiative
Enhancing Farming Through Weather and Climate Information

Volume 37 Issue 1 October 2014

ANNOUNCEMENTS

The entire Caribbean should continue to monitor for low water availability over the coming months as the majority of the region draws closer to its climatological dry season, particularly with an El Niño watch still in place, and with many parts of the region experiencing less than average rainfall for the wet season thus far. For those more familiar with the name Melville Hall Airport in Dominica, please note that its name has been officially changed to Douglas-Charles Airport.

REGIONAL OVERVIEW ON WEATHER AND CLIMATE FOR OCTOBER 2014

There were diverse rainfall experiences during the month in the eastern Caribbean and Guyana. Trinidad and Grenada were moderately wet; Tobago and Barbados abnormally dry; St. Vincent and Dominica severely dry; St. Lucia and Antigua normal; and Guyana from very wet in the west to abnormally dry in the east. Conditions in Jamaica ranged from normal in the west to severely dry in the east, but Belize was moderately wet in the south and abnormally wet in the north.

Figure 2. SPI for the Caribbean for August to October 2014. More information on the SPI can be viewed at <http://63.175.159.26/~cdpmn/spimonitor.html>

Three tropical cyclones, Fay, Gonzalo and Hanna developed in the Atlantic Basin during October. Hanna formed in the south-eastern Gulf of Mexico on the 22nd and moved slowly eastward across the Yucatan Peninsula into the western Caribbean Sea near Nicaragua/Honduras where it dissipated on the 28th. Fay developed just north of the Lesser Antilles as a Sub-tropical Depression on October 10th; and moved northwards across Bermuda as a strong tropical storm early on October 12th leaving significant damage in its wake. This system briefly

experienced in the eastern Caribbean and Guyana. Trinidad, Tobago, Barbados, St. Lucia and Antigua were normal; Grenada moderately wet; St. Vincent and Dominica moderately dry; and Guyana abnormally wet in the west and normal in the east. Conditions in Jamaica ranged from normal in the west to extremely dry in the east, while Belize was normal.

Figure 1. SPI for the Caribbean for October 2014. More information on the SPI can be viewed at <http://63.175.159.26/~cdpmn/spimonitor.html>

Most annual cropping takes place over a period of about three months. For the three month period August to October, diverse rainfall conditions were

CariCOF newsletter

Bulletin of the Caribbean Drought and Precipitation Monitoring Network

Regional Agroclimatic Bulletin

www.cimh.edu.bb/rcc to become
www.rcc.cimh.edu.bb

Interface Mechanisms

Forums with the farming community and agricultural extension agencies to promote a better understanding of the applications of weather and climate information



Means for communication, awareness, education, and feedback. Suggested wet/hurricane and dry season

Caribbean Climate Outlook Forum

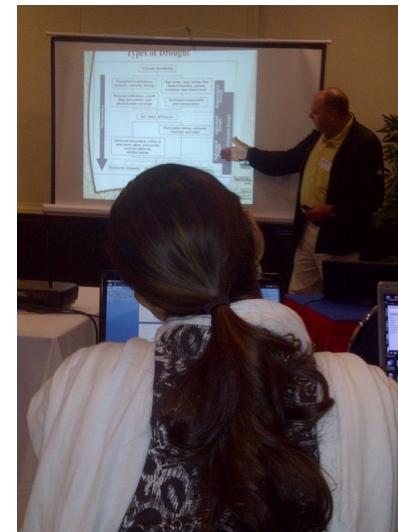
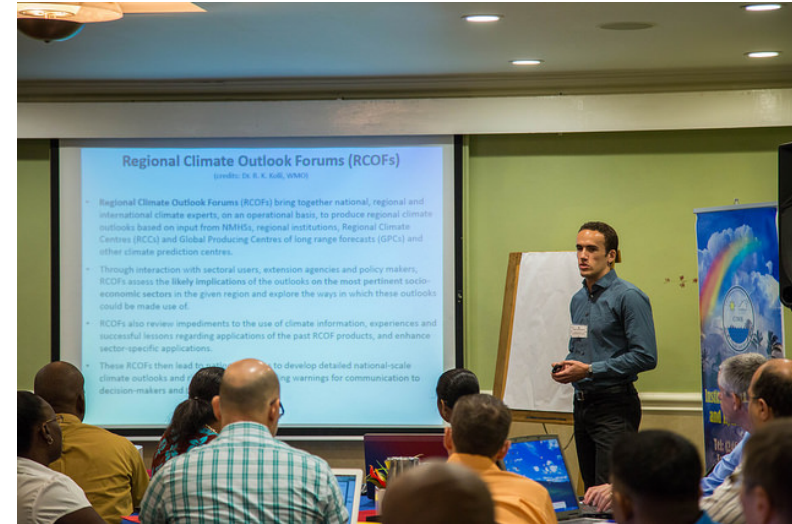


Stakeholder meetings bring meteorologists/ climatologists and the user-community together to discuss climate forecasts and other information; and provide feedback. Builds trust and understanding

Future – User Online Helpdesk; Interactive Web portal

Capacity and Awareness Building

- **Pre-CariCOF Seasonal Forecast Training** – rainfall, drought temperature, verification, communication outlook - terciles
- **Drought Monitoring and Planning training** began in 2012 in collaboration with NDMC USA, to be expanded in January 2015
- **Statistics** – Statistics in Applied Climatology in collaboration with University of Reading's Statistical Services Centre; advanced statistics
- **Agriculture** – for farmers (regional and national forums), for Extension Officers (special certificate course),
- **DRR** – Regional and sub-regional for DRM Managers and their Stakeholders
- **Health and Water** –on regional scale mainly through CariCOF – greater focus in 2015.



Observation and Monitoring

- Provision of observation equipment, retrofitting
- Enhancing database and monitoring through remote sensing (satellite, radar) and GIS technology and techniques
- Database (CDB funded project) release and launch of “light” synchronising version for Met Services
- Climate Impacts Database – link with DEWETRA

