

# Caribbean Climate Outlook Newsletter

## Wet / Hurricane Season 2017 Special Edition

### The Caribbean wet / hurricane season: wet, hot, and stormy

#### What are the drivers of the Caribbean wet / hurricane season?

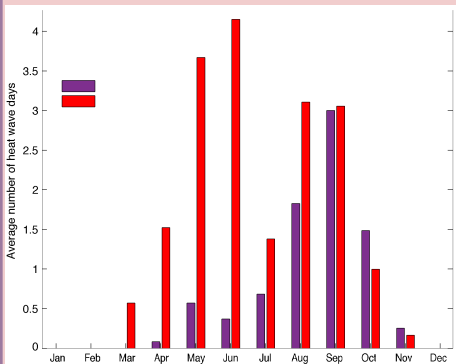
- 1) Temperature of the Caribbean Sea and Tropical North Atlantic:** when they are warmer, more evaporation takes place. This adds moisture to the atmosphere, so clouds, showers and storms can easily form, while also making us feel hotter. **Predictable?** Months in advance.
- 2) Temperature of the eastern equatorial Pacific:** particularly warm (El Niño) or cool (La Niña) episodes influence the winds in the atmosphere so that storm activity as well as rainfall in the Caribbean is reduced or enhanced, respectively. **Predictable?** Months in advance.
- 3) Air pressure:** in the wet season, air pressure is relatively low, with the exception of July in the northern Caribbean. Air pressure bottoms out around the month of September, when a band of low pressure and heavy showers called the ITCZ often spurs heavy showers, tropical waves and even tropical cyclones. **Predictable?** Two weeks in advance.
- 4) Saharan dust:** dry air blowing in from the Sahara can carry dust. This dryness and dust stabilise the atmosphere and cool the North Atlantic Ocean, contributing to reduced rainfall and hurricane activity. **Predictable?** Two weeks in advance.

#### How does heat affect us?

Many people do not realize that heat is one of the most dangerous climate hazards.

##### Excessive heat affects

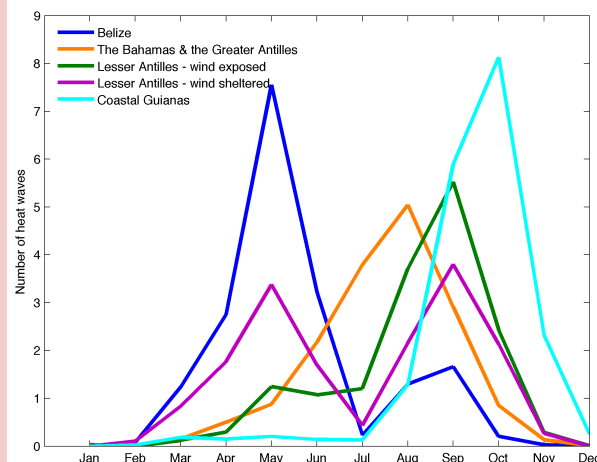
- **our health:** heat causes discomfort, illness and death;
- **our economy:** hot weather reduces labour productivity;
- **our energy needs:** access to cooling requires energy (e.g. A/C, fanning);
- **our food production:** crops and livestock suffer from excessive heat, reducing food productivity.



#### Stay informed. Be ready for heat.

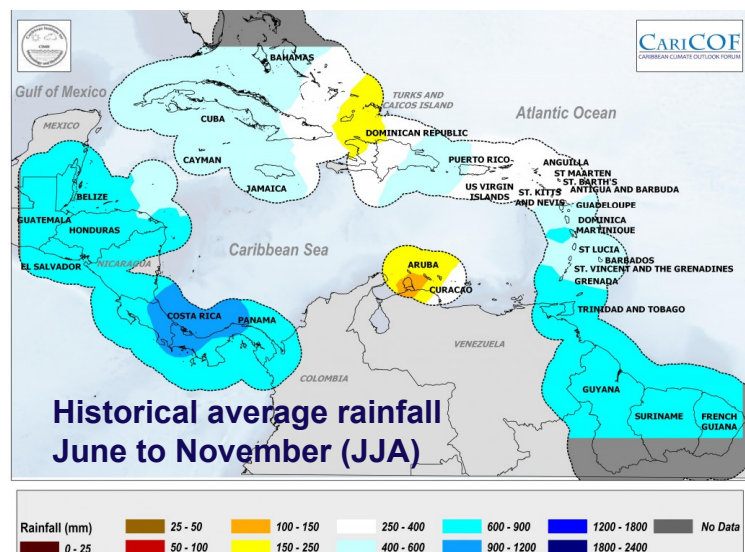
Climate and weather information enable early action in preparation for hot weather.

Hot weather is a factor of temperature and humidity. The Heat Index is a feel-like temperature index combining both. Because temperatures and humidity are lower between December and February, we generally feel comfortable. However, many days in August, September and October feel far from comfortable because the heat index is high. The figures to the left and right demonstrate that heat waves too tend to be frequent between August and October.



**Comparison of the number of heat waves in an eastern Caribbean location between temperature (red) and heat index-based (purple) heat waves by month.**

Seasonality of heat waves across the Caribbean



#### Our typical rainfall patterns from June to November

##### Belize & Caribbean Islands north of 16°N:

- Jun - wet season.** Usually frequent heavy showers.
- Jul to Aug - wet season.** Often includes a mid-summer dry spell.
- Sep to Nov - wet season.** Usually frequent heavy showers.

##### Caribbean Islands south of 16°N (except ABC Islands):

- Jun to Aug - first half of wet season.** Increasingly heavy showers.
- Sep to Nov - wet season.** Usually frequent heavy showers.

**ABC Islands:** Mostly dry until September. Alternation of wet spells and sunny days in October and November.

##### Guianas:

- Jun to Jul - long wet season.** Frequent heavy showers.
- Aug - transition to dry season.** Heavy showers become less frequent.
- Sep to mid-Nov - dry season.** Heavy showers at times.

**Second half of Nov - start of secondary wet season in coastal areas.** Heavy showers become frequent. Dry season in the south.

Mostly wet in the Greater Antilles but dry in Belize and Tobago; April hot at times

## + impacts

Drought relief in Grand Cayman

## - impacts

No major negative impacts

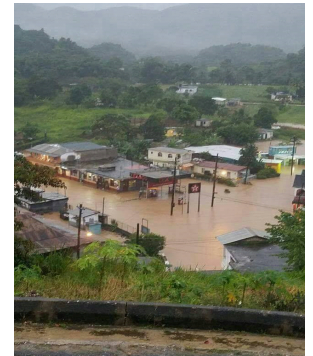
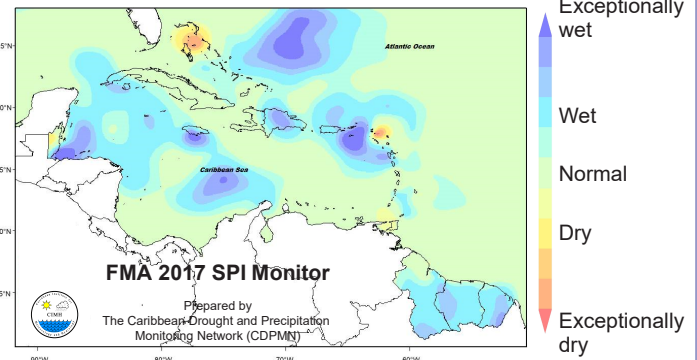
## Observations

- ♦ **RAINFALL:** *April:* NW Belize, NE Trinidad, Tobago very dry; east Belize, Cayman, Cuba, Dominican Republic and St. Croix very wet.
- March:* Dominica, N Dominican Rep., interior of Guianas, NE Puerto Rico, Tobago and US Virgin Islands very wet.
- February:* Antigua, NE Dominica, St. Lucia, St. Vincent very dry; interior Guianas very wet.

- ♦ **TEMPERATURES:** *February-March-April:* above-average for all places except Guyana and St. Croix.

## Notable climate records

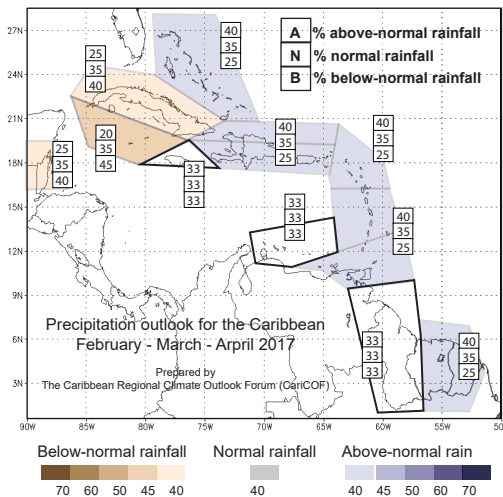
- ♦ **WET - FMA:** 1 location in Belize (198% of average), 1 in Dom. Republic (314% of avg.), 2 in Jamaica (277%-354%) and 1 in St. Croix (273% of avg.).
- April:* 1 location in Belize, 7 in Dominican Republic, 3 in Jamaica.
- ♦ **DRY - April:** 1 location in Grenada (4% of average).
- ♦ **HOT - FMA:** 1 location in Guyana recording its highest mean temp.
- April:* Locations recording their highest;
  - maximum temperature: 1 in Guyana
  - minimum temperature: 1 in Guyana, 1 in St. Lucia.
  - mean temperature: 1 in Belize, 2 in Guyana, 1 in St. Lucia.



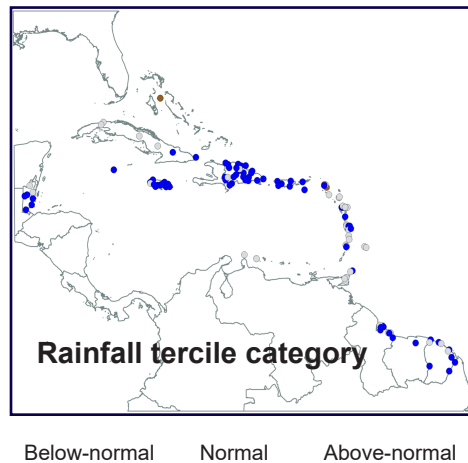
Credit: Lisa Rose- Cave Valley Extension Officer (RADA)

## How well did we predict?

### FMA 2017 Rainfall Outlook



### FMA 2017 Observed Rainfall



We successfully forecasted which areas would be wet, except Bahamas, Belize, Cayman and Cuba.

## POSSIBILITY OF AN EL NIÑO

## June to November 2017

### Recent observations:

ENSO neutral conditions; sea-surface has warmed to around 0.3 to 0.5°C above avg. in the equatorial E. Pacific (NINO3.4).

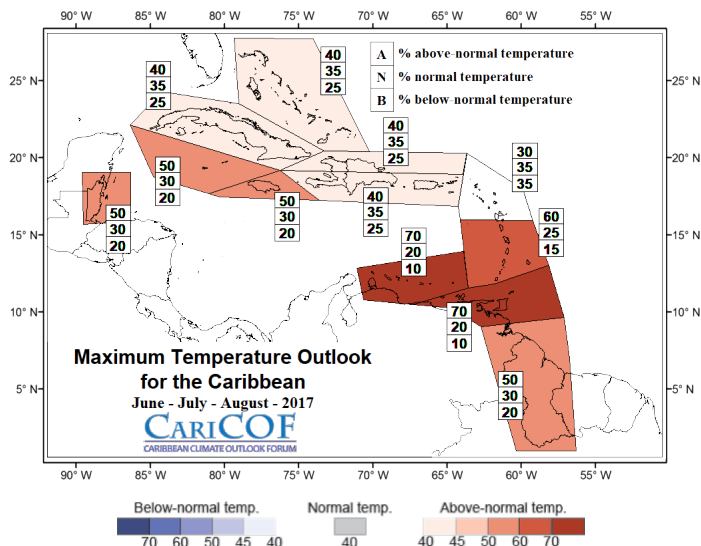
### Global Model guidance:

Most models indicate either warm-neutral or a weak to moderate El Niño conditions, with 45% chance of El Niño by JJA and September-October-November (SON).

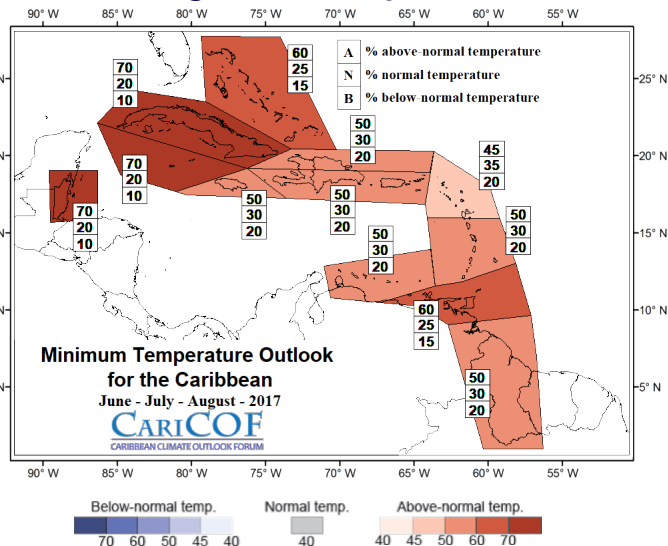
### Expected impacts on rainfall, drought and temperatures:

- ♦ As ENSO conditions are currently neutral, no impact on Caribbean rainfall is expected. However, with a possible El Niño on forecast, chances for drier than usual conditions in the southern Caribbean and Guianas would increase.
- ♦ An appearing El Niño tends to increase temperatures 2 to 3 months later, boosting chances of a hot August to October period.

## Consensus Day-time Temperatures Outlook



## Consensus Night-time Temperatures Outlook



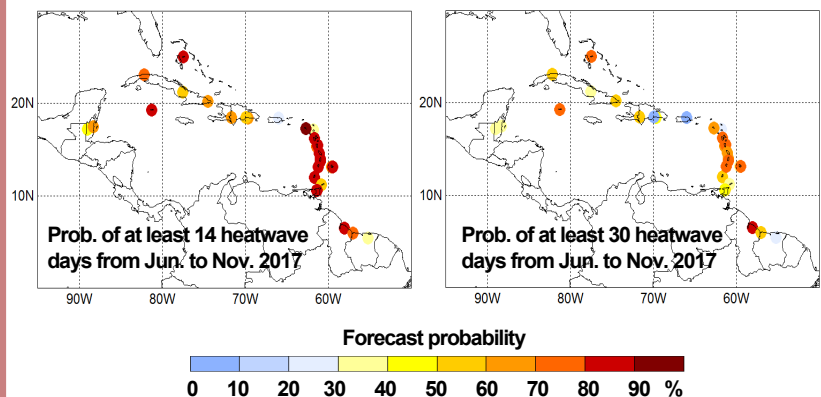
**Maximum (day-time) and minimum (night-time) temperatures averaged over the period June - July - August are forecast to be above- to normal.**

**Since temperatures are high and humidity is steadily increasing, it will feel increasingly hot towards August.**

## Implications of forecast heat

- **Very likely increase in heat stress from heatwaves in human populations or livestock.**
- **More discomfort related to heat compared to recent months.**
- **Night-time heat more uncomfortable than in most other years.**
- **Warm conditions conducive for mosquito breeding and faster mosquito life cycles.**
- **Increased cooling needs.**

## Experimental Heatwave outlook Jun. - Nov. 2017



### USUALLY:

- At least a few heatwave days are counted in most locations between June and November.
- Most heatwave days during this time tend to occur between August and October.

### FORECAST:

- increase in heatwave days forecast for JJASON 2017, with some locations possibly experiencing heatwaves 1/3 of the time.
- More than 50% chance of having at least 30 heatwave days in many places.
- Lesser Antilles (except Grenada and Trinidad & Tobago): 80% and 50% chance for at least 14 and 60 heatwave days, resp.

## Climate outlooks - background

The Caribbean Climate Outlooks are prepared by the Caribbean Regional Climate Outlook Forum (CariCOF). The Caribbean Institute for Meteorology and Hydrology, in its role as WMO Regional Climate Centre in demonstration phase, coordinates the CariCOF process. Contributors to the Outlooks are the Meteorological Services from the region. For more information on how the outlooks are produced, please visit [rcc.cimh.edu.bb](http://rcc.cimh.edu.bb)

The Precipitation and Temperature Outlooks are issued in the form of a map, which shows regions where the forecast rainfall or temperatures have the same probabilities to be:

- Above-normal (A) - within the wettest/hottest third of the historical record
- Near-normal (N) - within the middle third of the historical record
- Below-normal (B) - within the driest/coldest third of the historical record

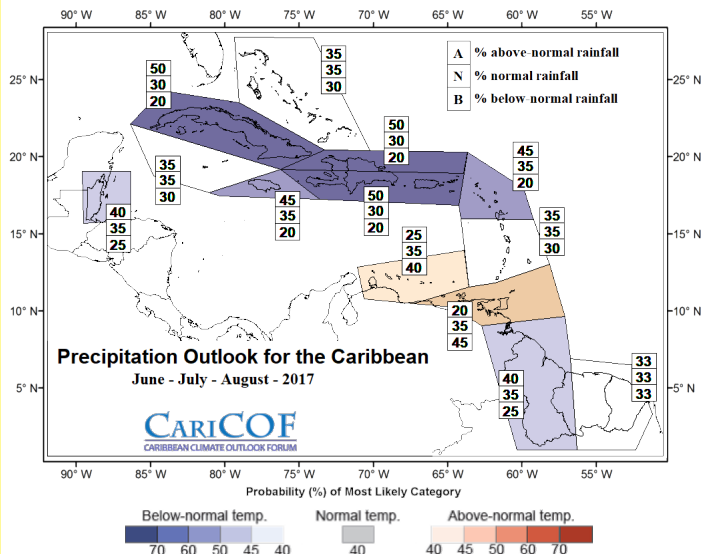
## DISCLAIMER

The information contained herein is provided with the understanding that The Caribbean Climate Outlook Forum makes no warranties, either expressed or implied, concerning the accuracy, completeness, reliability, or suitability of the Outlook. The information may be used freely by the public with appropriate acknowledgement of its source, but shall not be modified in content and then presented as original material.



## How wet from June to August 2017

### Consensus Rainfall Outlook



June - July - August rainfall in the Caribbean is likely to be above- to normal in Belize, western Guianas, Greater Antilles (except Cayman) and the Leewards; but below-normal to normal in the ABC Islands and Trinidad & Tobago. Rainfall predictability in other areas is low for this period.

### Rainfall frequency and extremes

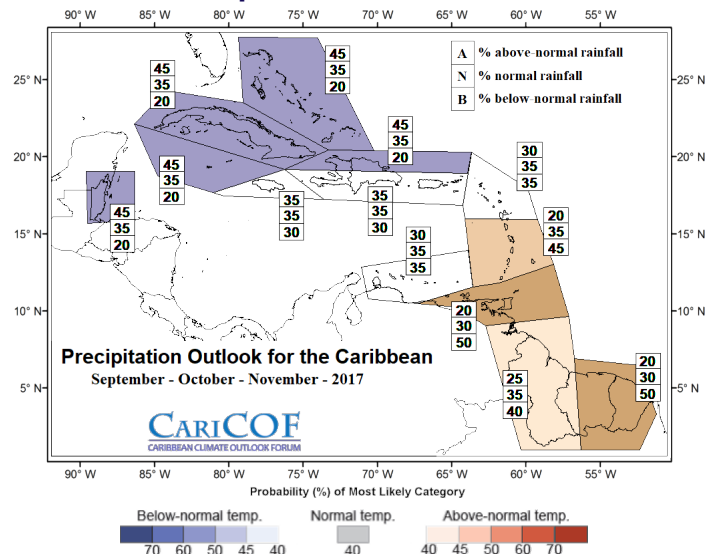
#### What usually happens from June to August?

- Number of wet days: roughly 30 to 45 in flatter areas of the islands, and 50 to 65 in mountainous areas and in the Guianas (ABC Is: 5 to 15 days).
- Number of wet spells: 3 to 6 (ABC Islands: up to 3), of which 1 to 3 are very wet (ABC Is: up to 2).
- Number of extremely wet spells: up to 1.

## Implications of forecast rainfall:

- Enhanced concern of potential for flooding at this time in the Greater Antilles, in particular in Dom. Republic, Jamaica and the US Caribbean Territories.
- Flash flood concern from possible extremely wet spells.
- Rain disruptions of outdoor activities on many occasions.
- Increased surface wetness makes environmental conditions more conducive to mosquitoes & moisture related pests.
- Recharge of large water reservoirs related to wet spells.

## How about September-October-November?



SON rainfall in the Caribbean is likely to be above- to normal in The Bahamas, Belize, Cayman, Cuba, northern Hispaniola; but below- to normal in Barbados, Guianas, Trinidad & Tobago and Windwards. Rainfall predictability in other areas is low for this period.

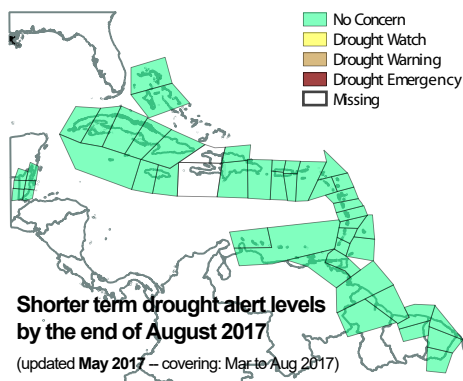
## THE CLIMATE OUTLOOK IN SHORT

A normal to wetter than usual wet season for The Bahamas, Belize and the Greater Antilles. The second half of the wet season may end up drier than usual from the Windward Islands southward, especially in view of a possible El Niño. Heat will be building up until August to October, including a few heat waves.

**+ impacts :** No major drought concerns; recharging water reservoirs.

**- impacts :** Flash flood potential developing; conducive to mosquito breeding; heat stress.

## Drought alert levels by the end of August



## MONITOR DROUGHT & CONSERVE WATER

### Drought conditions up to November

**Drought situation:** (as of May 1) Belize, Grand Cayman, and Trinidad & Tobago were in long term drought.

**Shorter term outlook:** Improvement of most residual shorter term drought situations. No concern by the end of August.

**Long term concern:** Long term drought to improve in Cayman in Belize, remaining possible in Trinidad & Tobago, and also possible in Antigua, St. Kitts & Nevis and St. Lucia.