



**ANNOUNCEMENTS**

Though the dry conditions were alleviated during July or are expected to be alleviated during August elsewhere, it is recommended that water conservation 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.

**REGIONAL OVERVIEW ON WEATHER AND CLIMATE FOR JULY 2014**

Below normal conditions dominated in the eastern Caribbean. Trinidad, Tobago, St. Lucia and Dominica, were moderately dry; Grenada and Barbados abnormally dry; St. Vincent normal; and Antigua exceptionally dry. Conditions in Guyana ranged from moderately wet in the north to severely dry in the east. Jamaica was predominantly abnormally dry, while conditions in Belize ranged from extremely dry in the south to abnormally dry in the north.

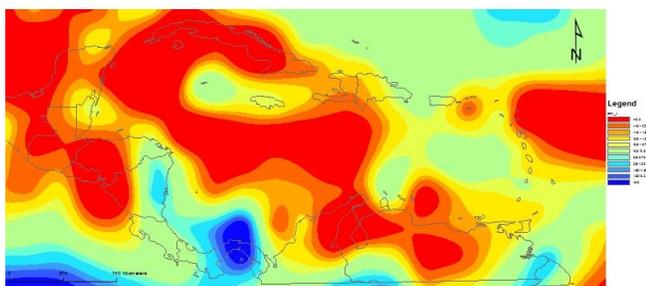


Figure 1. SPI for the Caribbean for July 2014. More information on the SPI can be viewed at <http://63.175.159.26/~cdpmn/spimonitor.html>.

Most annual cropping takes place over a period of about three months. For the period May to July, the islands of the eastern Caribbean were normal to below normal. Trinidad and Tobago, 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. Conditions in Jamaica ranged from normal in the west to moderately dry in the east, while Belize was abnormally dry in the west and moderately dry in the east.

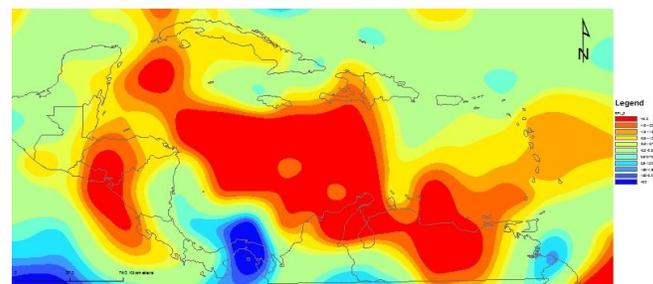


Figure 2. SPI for the Caribbean for May to July 2014. More information on the SPI can be viewed at <http://63.175.159.26/~cdpmn/spimonitor.html>

Tropical waves and trough systems continued to move in and out of the region, generating unstable conditions, with varying degrees of rainfall significance. However, persistent high pressure, often accompanied by strong Trade winds and dry Saharan air supported drier than normal conditions across most of the region. On the 21<sup>st</sup>, a tropical wave in the Central Atlantic was upgraded to Tropical Depression #2. By the 23<sup>rd</sup> the system was quickly downgraded back to a tropical wave, which affected parts of the eastern Caribbean with showers.

## NATIONAL OVERVIEWS

### Antigua and Barbuda

Antigua and Barbuda experienced another month of well below normal rainfall. The month's total of 23.2mm is the lowest July recording since 1976. Atmospheric conditions over Antigua and Barbuda were relatively dry and hazy for most of the month. At V.C. Bird Airport there were about fifteen (15) measurable rainfall days of  $\geq 0.1$ mm.

Table 1 Weather summary at VC Bird Airport for July 2014.

Weather Summary for April at V.C Bird Int'l Airport	
<b>Temperature (°C)</b>	
Absolute Maximum	31.2
Mean Daily Maximum	30.6
Mean Daily	27.5
Mean Daily Minimum	25.5
Absolute Minimum	23.3
Warmest Day	28.3
Coollest Day	26.8
<b>Rainfall (mm)</b>	
Total	23.2
Rainiest Day	5.6
Measurable Rainfall Days (rainfall $\geq 0.1$ mm)	15
Days $\geq 1.0$ mm	7
Days $\geq 10.0$ mm	0
Days $\geq 20.0$ mm	0

There was 2.0mm of rainfall due to a tropical wave that moved through the area and a trough system that provided enhancement, resulting in showers from the 1<sup>st</sup> to the 2<sup>nd</sup>. Another tropical wave moved over the island from the 3<sup>rd</sup> to the 5<sup>th</sup> and produced additional showers. On the 8<sup>th</sup> and 9<sup>th</sup>, the islands received showers due to a moderate to brisk trade wind flow that transported shallow pockets of low level moisture across the islands. From these events, 2.9mm of rainfall was recorded at V.C Bird Airport. A weak mid-level trough and moisture surrounding the system produced 5.6mm of rainfall on the 14<sup>th</sup>, which turned out to be the highest 24 hour amount for the month. From the 15<sup>th</sup> to 17<sup>th</sup> the passage of another tropical wave brought about 3.9mm rainfall, while between the 18<sup>th</sup> and 28<sup>th</sup> some shallow cloud patches within a moderate trade wind flow produced about 0.6mm rainfall. On the 29<sup>th</sup> to the 31<sup>st</sup> a weak trough evident over the island resulted in 2.2mm at V.C Bird Airport.

The average air temperature at the V.C Bird Airport was about average at 30.6°C. The highest maximum of 31.2°C was on the 8<sup>th</sup>, while the lowest minimum temperature of 23.3°C was recorded on the 15<sup>th</sup>. The average relative humidity for the month was 71.7%.

### Belize

Table 2 Rainfall and Temperature Summary for July 2014 for stations in Belize

Station	Liber tad	Zoo	PGIA	Belmopan	Central Farm	Savannah
Elevation (m)	12	30	5	90	90	13
<b>Rainfall (mm)</b>	42.3	120.8	117.5	251.4	128.8	159.1
Mean.	171.2	199.5	222.6	272.1	229.7	311
Max	29.0	49.3	49.6	68.2	32.5	59.0
Rain days	2	9	8	13	12	7
<b>Temp (°C)</b>						
Mean Min.	24.5	23.7	26.0	23.6	23.1	25.0
Mean	23.4	23.1	24.7	22.4	22.4	24.3
Lowest Min.	20.2	22.3	22.8	22.0	21.8	22.7
Mean Max.	33.2	32.4	31.6	32.3	32.6	32.6
Mean	32.9	32.6	31.2	31.7	32.0	30.9
Highest Max.	35.3	34.0	32.7	34.0	34.5	33.9

Rainfall values in Green represent amounts above the monthly average; Temperature values in Red represent means above the monthly average; Temperature values in Blue represent means below the monthly average

On the 3<sup>rd</sup> there were showers over inland Belize and thunderstorms in the south of the country due to a Tropical Wave. The weather the following day started out cloudy with intense showers that caused some flooding in the south. Middlesex in the Stann Creek district measured 95mm for the 24hour period. Big Falls Plantation in the Toledo district recorded 84mm. On the evening of the 5<sup>th</sup>, showers started along southern coastal Belize due to another wave. The showers continued into the next morning especially over coastal and central Belize. Showers occurred again in the south during the early morning hours of the 8<sup>th</sup>. Showers and thunderstorms occurred over central and southern Belize during the day of the 11<sup>th</sup> due to yet another wave. The weather turned more showery on the 13<sup>th</sup> with showers and thunderstorms commencing in the south during the night and into the following morning, with cloudy and showery weather occurring over most districts during the day. More showers and thunderstorms occurred over central and coastal areas on the 14<sup>th</sup>. The International Airport measured 49.6mm, followed by La Democracia with 46.0mm and Belize Zoo with 35.8mm. Savannah in the Stann Creek

district recorded the most rainfall with 59mm. On the 22<sup>nd</sup> showers and thunderstorms developed in the south from the early morning as another wave approached. The showers affected mainly coastal, central and northern Belize by the next day. A few showers and isolated thunderstorms occurred over southern and central Belize on the 26<sup>th</sup>. Showers and thunderstorms were experienced in the south late on the night of the 27<sup>th</sup> and into the next morning as a tropical wave crossed the country.

### Dominica

Monthly rainfall totals continued to be below average. While the region saw an increase in the passage of these waves, only a few had any impact on the island. Dust haze continued to be a significant feature throughout the month.

At the Canefield Airport, a total of 129.9mm of rainfall was recorded, which is 52% of the mean. The highest daily total recorded was 55.8mm on the 23<sup>rd</sup> as a tropical wave, the remnant of tropical depression #2, affected the area. There were 10 rainfall days which is about half of the average number of rainfall days. There was an 11 day dry spell during the second and third dekad (10 day period). The average air temperature recorded was 29.0°C which is about average. The highest daily temperature recorded was 33.2°C on the 31<sup>st</sup> with the lowest being 23.1°C recorded on the 9<sup>th</sup>. The average wind direction was east south easterly at an average speed of 6km/hr. The highest wind gust was 43km/hr recorded on the 6<sup>th</sup>.

Melville Hall Airport recorded a monthly rainfall total of 149.9mm, which is 63% of the mean. This is the fourth consecutive month of below average rainfall. The highest daily total recorded was 58.7mm on the 30<sup>th</sup> as another tropical wave moved across the region. There were 17 rainfall days, which is 5 days below the monthly average with a 4-day dry spell during the second dekad. The average air temperature recorded was 28.6°C, which is about average. The highest temperature recorded was 31.2°C on the 17<sup>th</sup> and the lowest recorded was 22.6°C on the 30<sup>th</sup>. Winds maintained an east south east direction at an average speed of 15km/hr. The highest wind gust recorded was 67km/hr on the 10<sup>th</sup>.

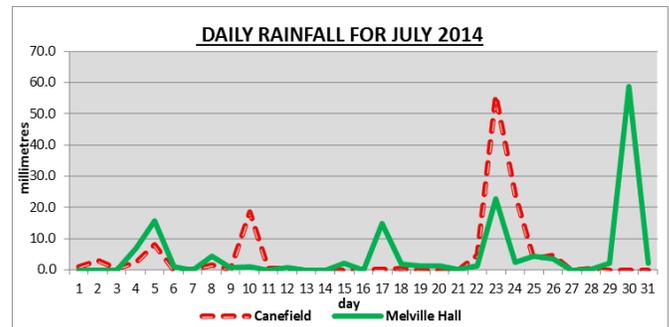


Figure 3 July 2014 daily rainfall at Melville Hall and Canefield

Farmers across most of the island reported sufficient rainfall for the month in which they were able to establish new crops and apply fertilizers. However, drier than average conditions in other parts, such as the west and north-eastern regions, reported that leaf-curling occurred in tomato leaves and there is stunted growth and lower yields in banana bunches. The intense rainfall events associated with the passage of tropical waves resulted in a few landslides but there were no significant crop losses. It has also brought about an increase in the number of Giant African snails, the incidence of Black Sigatoka, fungal infestations in culinary herbs, and a reduction in Dasheen Mosaic Virus.

### Grenada

July rainfall, which was 92.9mm, had almost doubled that of 2013, but was however, only 67.76% of the Long Term Average (LTA) (1986-2014) of 137.1mm. Tropical waves on the 10<sup>th</sup>- 11<sup>th</sup>, 18<sup>th</sup>-19<sup>th</sup> and 25<sup>th</sup> brought rainfall amounts of 15.4mm, 17.0mm and 16.7mm respectively. There were ten (10) other days with rainfall greater than 1.0mm, five (5) days with rainfall between 0.1mm and 1.0mm and thirteen (13) days with none or insignificant amounts. Although rainfall for the first quarter of 2014 was 84.82% more than 2013 and 46% more than the LTA (1986 – 2014), rainfall up to July was 15.6% less than 2013's 423.8mm and 24.36% less than the LTA of 472.9mm.

Mean daily temperatures for July was lower than that of last year's by an average of 0.2°C, reaching a mean of 27.5°C, while the mean maximum and minimum temperatures were 30.3°C and 24.6°C respectively. The highest maximum temperature was 32.1°C and occurred on the 4<sup>th</sup>, while the lowest minimum was 21.6°C and occurred on the 25<sup>th</sup> of the month.

The Bermuda Azores High peaked early during the month reaching a high of 1035mb on the 2<sup>nd</sup> and measured 1028mb and greater for more than half the month. Steep pressure gradients generated moderate to strong winds causing Marine advisories to be issued on the 9<sup>th</sup>, 10<sup>th</sup>, 18<sup>th</sup>, 19<sup>th</sup> and 20<sup>th</sup>.

recorded at most monitoring stations were significantly lower than the long term average. The rainfall was poorly distributed with the second half of the month producing most of the rainfall. This July was the twelfth driest at Hewanorra since 1973 and the fourth driest at George Charles since 1967.

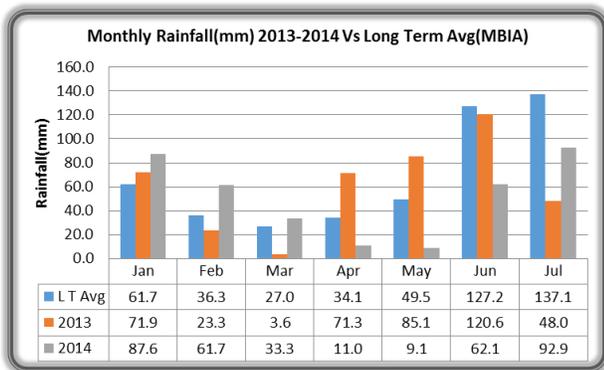


Figure 4 Monthly rainfall for 2014 compared to 2013 and the long term average at Maurice Bishop International Airport

The start of the rains resulted farmers having some very good production in mangoes, eggplants, lettuce, water melon and especially tomatoes.

**Jamaica**

Throughout the month, the island experienced very little rainfall activity especially over the eastern half of the island. Sections of Hanover, Westmoreland and St. Elizabeth accounted for most of the rainfall. Throughout the month high pressure ridges and Tropical Waves were the dominant weather features affecting the island.

During the month, Sangster in the northwest recorded 30.9 mm of rainfall, while Norman Manley in the southeast recorded 8.5 mm. There were four rainfall days reported for Sangster and one for Manley. Both Sangster and Manley recorded below average rainfall or approximately 59% and 28% of their respective 1971-2000-mean. The highest maximum temperatures recorded for Sangster Airport was 35.4°C (23<sup>rd</sup>) and for Norman Manley Airport 34.9°C (25<sup>th</sup>), which exceeded the 20 year mean maximum temperature by 0.9°C and 0.2°C respectively.

**St. Lucia**

July was another month with below normal rainfall in Saint Lucia. Despite the passage of a few tropical waves and Tropical Storm Bertha, the total rainfall

Table 3 July 2014 monthly averages at Hewanorra Airport

Cloud Cover (oktas)	Wind Dir (o from N)	Wind Speed (kt)	Air Temp. (°C)	RH (%)	Rainfall (mm)
5	90	16	28.1	77	107.0
Max Temp (°C)	Min Temp (°C)	Daily Sunshine (Hrs)	Daily Evap (mm)	Soil 20 (°C)	
30.9	26.1	8.9	8.5	29.3	

Table 4 July 2014 monthly averages at George Charles Airport

Cloud Cover (oktas)	Wind Dir (o from N)	Wind Speed (kt)	Air Temp. (°C)	RH (%)	Rainfall (mm)
5	10	09	28.5	73	87.8
Max Temp (°C)	Min Temp (°C)	Daily Sunshine (Hrs)	Daily Evap (mm)	Soil 20 (°C)	
31.0	25.2				

**St Vincent and the Grenadines**

Showers and thunderstorms associated the remnants of Tropical Depression #2 occurred on the afternoon of the 23<sup>rd</sup>. The highest winds gusted to near 59km/hr at the E.T. Joshua Airport on the 26<sup>th</sup>. Saharan dust haze intermittently reduced visibility across the islands. Sea-swells were moderate to occasionally rough in open waters, with above normal sea swells agitated by strong breezes that resulted in high-surf and small-craft advisories and warnings being issued.

207.7mm was recorded at the E.T. Joshua Airport-Arnos Vale for the month, which is 22.1 mm less than the average (1981-2010). There were 19 rain-days, 2 days less than the average for this station. The highest 24 hour rainfall (48.0 mm) was recorded on the 10<sup>th</sup>. There were three (3) consecutive days with rainfall <1mm (11<sup>th</sup> to 13<sup>th</sup>). The rainfall distribution showed the first dekad (ten-day period) had ~46%, the second dekad had ~23%, and the third dekad had 31% of the month’s total rainfall.

The average maximum temperature was 30.3°C, and the average minimum temperature was 25.3°C. The extreme maximum temperature was 31.3°C, which was 0.2°C less than the 30 year average, while the extreme minimum temperature of 22.7°C was 0.3°C less than the 30 year average. The mean relative humidity was 76.5%, 1.8 % lower than the 30 year average.

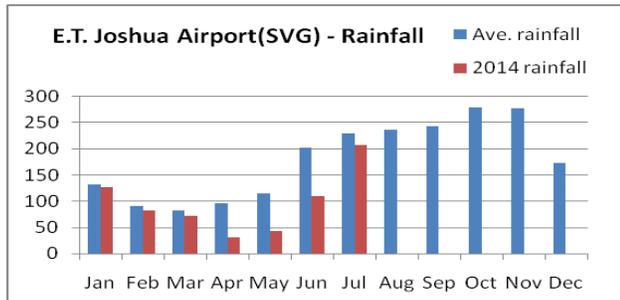


Figure 5 Monthly rainfall at E.T. Joshua Airport for 2014 compared to the averages for each month..

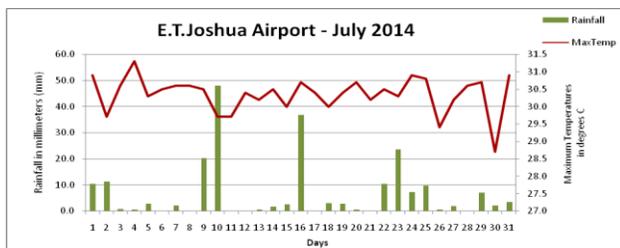


Figure 6 July 2014 daily rainfall and temperature at ET Joshua Airport.

### Trinidad and Tobago

Total rainfall for the month amounted to 229.1 mm or 92% of the 1981-2010 average at Piarco, while at Crown Point it totalled 178.6 mm or 76% of the average. At Piarco, mean daily temperatures exceeded the 1981-2010 normal by 1.6°C to reach a mean of 27.8°C, while the mean maximum and minimum temperatures were 32.5°C and 24.7°C respectively. Crown Point observed a mean temperature of 27.3 °C while the mean maximum and minimum temperatures were 28.8°C and 24.2°C respectively.

After a drier than usual June, rainfall occurrence continued to challenge the twin island republic. At Piarco, Trinidad, the first ten-day (dekad) rainfall total was 37.9 mm, but the bulk of this (34.8 mm) occurred on the last day of the period. Apart from the rainfall on day 10, only days 5 and 6 produced measurable rainfall of 0.2 and 2.9 mm respectively.

At Crown Point, Tobago, the first dekad rainfall reached only 13.6mm and similar to Piarco, most of the rain occurred on day 10 when 9.1 mm fell as days 5 and 6 accounted for 1.9 and 2.2 mm respectively.

Generous rains returned during the second dekad and brought much benefit to crops, pastures and water storage opportunities. The second dekad rainfall totals surpassed 100.0 mm for the first time during the current wet season in several locations in Trinidad while it passed 60.0 mm in most areas of Tobago. In the Piarco area, ten-day rainfall amounted to 145.0 mm, with the bulk of it occurring during the last five days. The wettest day, day 8 produced 83.9 mm. At Crown Point, the ten-day rainfall amounted to about 75.0 mm with day 10 as the wettest day producing 25.0 mm.

The last ten days of the month produced much reduced rainfall compared to the second dekad. This would have eroded some of the water gains made during the second dekad, but the rainfall received was still significant for agriculture. Dekad rainfall totals reached as much as 45.0 mm in some areas, with Piarco receiving 30.0 mm, while Crown Point received 25.0 mm. At Piarco, the wettest day during the period occurred on day 2 and produced 14.2 mm of rainfall, while at Crown Point, day 4 was the wettest with 10.5 mm recorded.

Rainfall over the last two dekads would have been very beneficial to agriculture in general and was sufficient to maintain the water available for agricultural purposes and further reduce agriculture water shortage accumulated over the previous five months. At the same time, the rainfall would have provided good topsoil moisture and boosted moisture content. The rainfall amount was also sufficient to reduce irrigation needs on drier days following the wet days. However, the combination of rainfall with high temperatures would have provided favourable conditions for some agricultural insect pests, fungal spores and diseases to thrive. At the same time the drier conditions would have assisted with ripening and maturing of crops and fruits while benefitting harvesting of mature crops and fieldwork in general.

**REGIONAL OVERVIEW ON SEASONAL CLIMATE FORECAST**

**ENSO**-neutral conditions persist with Eastern Pacific equatorial Sea Surface Temperatures (SSTs) still at 0.5°C. Most models indicate a continued upward trend to about 0.5-1.5°C above average by November 2014 and January 2015, initiating a weak to moderate event. This is a development the region should continue to monitor closely, as it may have implications for rainfall during the late wet season and into the 2015 dry season. Due to ENSO, there is a real chance for a shift to, and in some cases maintenance of, below-normal rainfall south of 20°N for August to October, with the likelihood for below normal rainfall increasing substantially into November 2014 to January 2015.

**Caribbean SSTs** are near to below average, and this is predicted to remain throughout the forecasting period with only a slight probability of any change occurring north of the Greater Antilles. **The Trade Winds** are near average but could get stronger during the forecasting period, particularly in the southern Caribbean around the ABC Islands. Below average temperatures and stronger trade winds slow down strong convection, thus potentially reducing precipitation and stormy events throughout the wet season, especially in the Eastern Caribbean.

**August to October 2014**

Normal to below normal rainfall, with greatest likelihood of below normal, is expected across the majority of the Caribbean with highest certainty over the Windward and ABC islands, and in the western Caribbean around Jamaica, Cayman Islands and Belize. In the remainder of the Caribbean, there is only slightly better than average chance for normal to below normal rainfall.

**November 2014 to January 2015**

Normal to below normal conditions, with greatest likelihood for below normal, are forecasted for the eastern Caribbean from the Leeward Islands southward to the Guianas, with greatest certainty for

below normal in the vicinity of the Windward and the ABC islands. Contrastingly, normal to above normal rainfall, with highest likelihood for above normal, is expected in the northern Caribbean and Belize. Greater uncertainty exists in the remainder of the Caribbean.

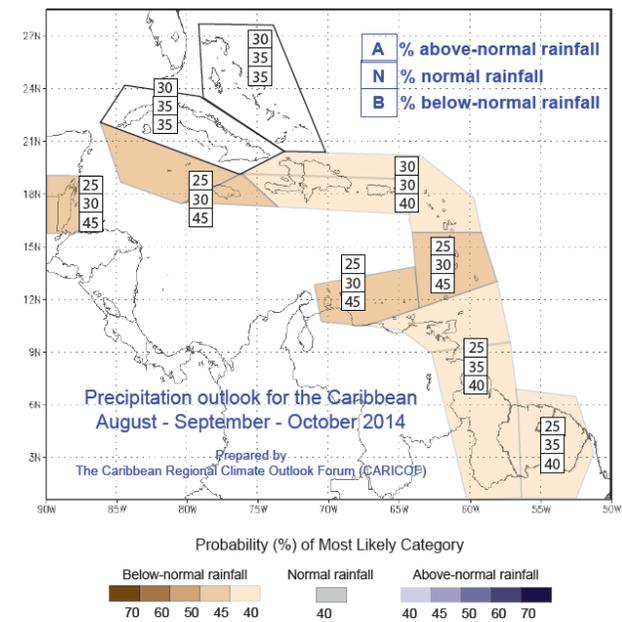


Figure 7 The August to October 2014 rainfall forecast

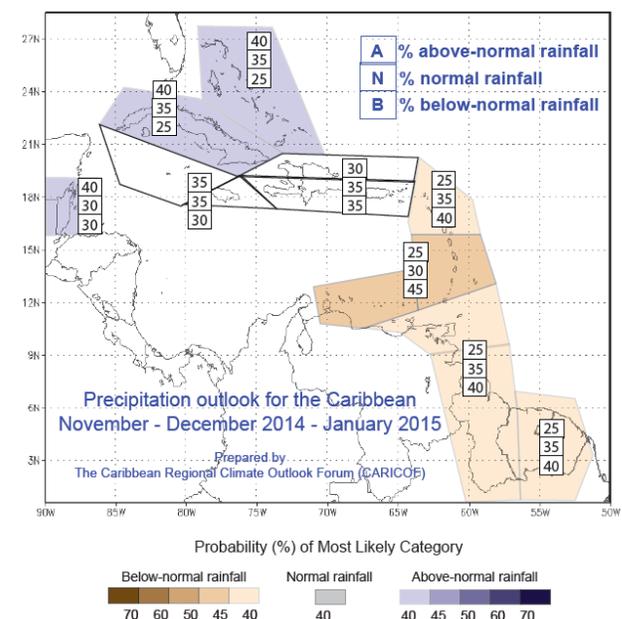


Figure 8 The November 2014 to January 2015 rainfall forecast

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