



ANNOUNCEMENTS

Some influence from dry Saharan air continued in August, affecting convection and rainfall in some parts, and tropical cyclone development. However the hurricane season continues to be forecasted to be above normal. Temperatures are likely to be normal to above normal across most of the Caribbean by up to 0.5 °C at least until November.

REGIONAL OVERVIEW ON WEATHER AND CLIMATE FOR AUGUST 2013

Mixed conditions were experienced in the eastern Caribbean islands. Trinidad and Antigua were moderately dry; Tobago, St. Vincent and Dominica, normal; Grenada exceptionally dry; Barbados very wet; St. Lucia moderately wet. In Guyana, the west was normal, but the east was abnormal to moderately wet. Jamaica was abnormally wet in the west and moderately wet in the east, while Belize ranged from abnormally dry in the south to extremely wet in the north.

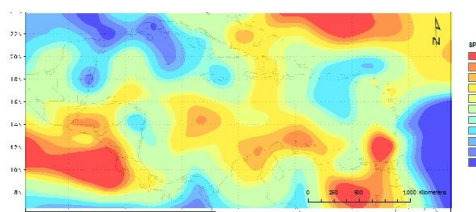


Figure 1. SPI for the Caribbean for August 2013. More information on the SPI can be viewed at <http://63.175.159.26/~cdpmn/spimonitor.html>.

Most annual cropping takes place over a period of about three months. The three month period June to August, resulted in varied conditions in the eastern Caribbean islands. Trinidad was normal; Tobago and St. Vincent moderately dry; Grenada exceptionally dry; Barbados normal to abnormally wet; St. Lucia moderately wet and Antigua abnormally dry. The

western portions of Guyana were normal and the east ranged from abnormal to very wet. Conditions in Jamaica ranged from abnormally dry in the west to abnormally wet in the east, while Belize ranged from abnormally dry in the south to very wet in the north.

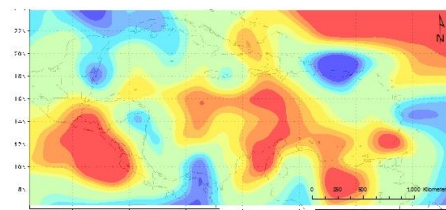


Figure 2. SPI for the Caribbean for June to August 2013. More information on the SPI can be viewed at <http://63.175.159.26/~cdpmn/spimonitor.html>

August 2013 turned out to be a relatively mild one in terms of tropical storm formation when compared with August of 2012. Only two tropical systems, Erin (on the 15th) and Fernand (25th), formed in the Atlantic Basin compared with eight systems in August of the previous year. Both systems were short-lived with ‘Erin’ remaining over open water in the far central Atlantic.

NATIONAL OVERVIEWS

Antigua

August turned out, just like July, to be another below-normal rainfall month, with 14 rain-days ($\geq 1\text{mm}$), the highest being 11.6mm occurring on the

10th. This is consistent with the dry and stable air dominant for much of the month.

The average maximum temperature however, was normal 30.9 (the August long-term average is 31.1°C). The highest maximum recorded was 31.6°C on 31st while the lowest minimum of 22.4°C was recorded on 11th. The average day-time air temperature was 28.2 (the August long-term average is 28.3°C).

Table 1 Summary conditions at VC Bird, Airport

WX:	PARTLY CLOUDY		
WINDS:	E'N AT 16.9 km/hr		
MAX 10-MIN WIND:	29.6 km/hr	DATE:	7th AT 15:00
SEA LEVEL PRESS:	1014.9 mb NORMAL		
TOTAL RAINFALL:	57.7 mm	MAX 24-HOUR:	11.6 mm DATE : 10th
MAX 6-HR RAINFALL:	7.6 mm	DATE:	10th AT 24:00
RAINFALL STATUS :	BELOW NORMAL		
AVG MAX TEMP:	30.9 C	MAX:	31.6 C DATE: 31st AT 18:00
AVG MIN TEMP:	25.6 C	MIN:	22.4 C DATE: 11th AT 06:00
AVG TEMP:	28.2 C	Max:	28.7 DATE: 27th Min: 26.7 DATE: 10th
AVG REL HUM:	75.1 %	Max:	84.0 % DATE: 21st Min: 65.0 % DATE: 14th

Barbados

Despite lower than expected tropical storm formation in August, several tropical waves contributed to the final rainfall total at Grantley Adams Airport, which jumped dramatically from just 66.3mm around the middle of August to 267.2mm by month end. Three major rainfall events contributed to this total as the tropical waves interacted with trough features and the I.T.C.Z to generate 44.9mm, 66.1mm and 73mm on the 10th, 18th and 26th August respectively. The rainfall total represents an 88% increase above the long-term (30-year) average of 141.9mm. There were 20 rain days which were five more than the average. Golden Ridge in St. George also observed 246.mm of rainfall over 17 rain days.

Wind-speeds were relatively brisk during the first 20 days of the month, averaging 27.8 km/hr but speeds decreased significantly during the remainder of the month to average just 18.5 km/hr. A 46.3 km/hr maximum wind-speed was recorded on 10th August.

For eighteen days of the month, the maximum temperatures ranged between 31.0°C and 31.7°C; the highest maximum of 32.3°C was observed on the 4th. On the remaining days maximum temperatures ranged between 29.5° and 30.8°C; the normal for July being 30.9°C. The lowest minimum was 22.3°C recorded on 11th August. The average day-time air temperature was 28.5° C while the average night-time air temperature was 26.4°C.

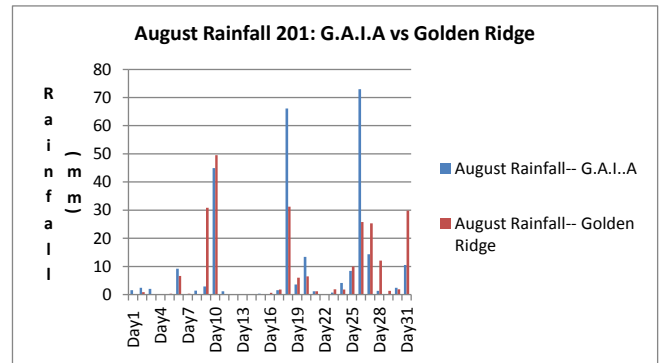


Figure 3. Rainfall at Grantley Adams and Golden Ridge, Barbados for August 2013.

September Outlook

A number of tropical waves will continue to traverse the eastern Caribbean during the month of September allowing for wet conditions to persist in the region. While some increase in tropical storm formation is likely over the Atlantic Basin, latest forecast models indicate that these systems may form and remain over open water and away from the immediate vicinity of the Lesser Antilles at least up to mid-September.

Belize

On the 1st, a Tropical Wave that eventually became TS Dorian, crossed Belize late in the evening. For the weekend coastal showers developed during the morning of the 3rd with periodic thunderstorms.

On 5th, weather conditions improved, except for southern Belize. Weather conditions continued generally sunny with isolated showers for the remainder of the week. Air temperatures remained consistently high as surface winds were light. Showers occurred along the coast on 10th as a weak tropical wave crossed the country that persisted into the 12th.

A tropical wave interacting with an upper level trough crossed Belize on 15th bringing with it much rainfall. The cloudy and rainy weather continued on 16th morning. At day's end the showers retreated inland. A dry stable southeasterly flow developed over that weekend bringing a change of good weather.

A tropical wave reached the coastline during the afternoon of the 19th. The wave's approach induced an increase in moisture resulting in coastal showers close to midday. These showers later spread inland. Another tropical wave reached the coastal waters on the 23rd morning. The wave's approach was heralded by several showers and thunderstorms organized in lines as they breached the coastline and continued into the 24th. The rainfall was particularly acute for central and northern areas. High winds also played a role in this weather event. At San Pedro, Ambergris Caye wind gusts to 68.5 km/hr were recorded. Cay Caulker, located a little further south measured a wind gust to 81.5km/hr. At the International Airport, the 24hour rainfall measured was 112.7mm. Flooding in areas of the Orange Walk district pressed the National Emergency Management Organization (NEMO) to assist persons incapacitated by flood waters.

Table 2 Rainfall and Temperature Summary for August 2013 for stations in Belize

Station	Liber tad	Zoo	PGIA	Belmopan	Central Farm	Savannah
Elevation (m)	12	30	5	90	90	13
Rainfall (mm)	194.3	374	353.8	460.5	235.6	450.6
Mean.	188	257	184	232	168	352
Max	60	144	113	77	48	58
Rain days	15	14	18	17	10	14
Temp (°C)						
Mean Min.	23.1	23.2	25.1	23.3	23.3	24.3
Mean	23.4	22.9	24.6	22.4	22.4	24.0
Lowest Min.	20.2	22.0	22.6	20.2	21.3	22.3
Mean Max.	33.3	32.0	31.0	31.9	32.2	31.8
Mean	32.9	32.4	31.5	32.2	32.4	31.6
Highest Max.	35.8	34.6	32.5	34.2	35.0	33.5

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

A swift decrease in moisture at low levels through to 26th meant generally sunny weather. A weak tropical wave crossed the country during the morning of the

28th. Most showers occurred over southern Belize. Quite a few showers and thunderstorms occurred late 29th morning along the coast. On 30th morning, there was a sustained outbreak of showers and isolated thunderstorms across the country. A few showers and isolated thunderstorms occurred offshore northern Belize. At day's end the showers were far fewer than the previous day.

Dominica

Weak unstable conditions were the month's main contributors to the island's rainfall total. Four tropical waves traversed the area producing roughly a quarter of the rainfall total.

The Canefield airport recorded below normal rainfall this month. A total of 211.9mm was recorded and this represents 87% of the monthly mean. The highest daily total recorded was 33.7 on the 9th. There were 24 rainfall days and that's 4 days above the normal with no significant dry spells. The average air temperature recorded was 28.9°C, which is normal for the month. The highest temperature recorded was 35.0°C on the 17th and that's the second highest recorded since 1988. The lowest temperature recorded was 22.2° on the 11th. The average wind direction was south easterly at an average speed of 7km/hr. The highest wind gust of 57km/hr recorded on both the 2nd and the 3rd was associated with a ridge of high pressure.

Rainfall total recorded at the Melville Hall airport was also below normal. A total of 208.4mm was recorded, which was 82% of the monthly mean. The highest daily total of 48.7mm was recorded on the 31st. Twenty-six (26) rainfall days were recorded and this was 4 days above normal. There was a 4 day dry spell at the start of the month's second dekad. The average air temperature was 28.8°C, which is normal for the month of August. The highest temperature recorded was 32.2°C on the 30th and the lowest recorded was 22.9°C on the 10th. The winds maintained an east south easterly direction at an average speed of 13km/hr. Melville Hall's highest wind gust of 59km/hr recorded on the 31st was associated with a slow moving area of low pressure.

The weather for the month was generally favourable for the farming community. Farmers took the opportunity to prepare their lands and establish their

fields. The main crops established for the month were dasheen, yams, plantain and sweet potatoes. Vegetable establishments were observed in most of the regions with a higher number in greenhouse establishments to that of open field establishments. The hot pepper program is ongoing. There were limited reports of problems with the birds this month. Harvesting took place and farmers were encouraged to treat fields for the flower moth, mites and aphids. In the northeast region, meetings were held for the Women Onion Group that has started land clearing activities. The optimal time for planting onions is mid-September to mid-January. Harvesting of tree crops such as cocoa, nutmeg and coffee took place in the south region.

Continued attention was given to the Black Sigatoka Disease. In the south, a farm demonstration was done on de-leaving and farm visits were done to explore market opportunities. In the northeast, the spray cycle for the Black Sigatoka Disease has ended and farmers are adhering to advice. There has been a positive impact especially in plantain production and harvesting. Since the cut back of the Citrus Greening eradication activity in the northeast region, there has been limited reports of new infestation. Weeds were a problem confronted by many farmers. The Tannia Burning Disease was also reported.

Grenada

What was quite noticeable was the dry middle layers of the atmosphere of the Caribbean for this time of year, associated with the strength of the Saharan Air Layer over the eastern and central Atlantic. Also quite noticeable was the strong Bermuda/Azores high north of the island chain. This resulted in a generally slack pressure gradient across the region and as a result light winds.

August 2013 was the second driest on record, with only 61.1mm of rainfall. Twelve (12) days were with no significant rainfall, and three (3) with more than 5mm. The highest 24hr rainfall was on the 18th, 12.5mm, due to the passage of a tropical wave.

Temperatures were over 30°C daily with the highest max temperature recorded as 32.5°C on the 3rd. The month's mean maximum was 31.0°C. Night-time temperatures were comparable with the climatological average. This month's mean minimum

was 24.7°C, with the lowest being 23.0°C recorded on the 24th. Of note the highest minimum was 27°C, this occurred on the same day as the highest max, on the 3rd.

Although there were generally flat seas in August, the month continued the tradition of being a slow fishing month. Catches fell when compared to previous months. The numerous public holidays and festivals, rather than conditions, were the main contributing factor.

Despite the low rainfall during the month in review, good yields were experienced from some crops. For example, cabbages, yielded almost to a glut. Corn and water-melons were available in large quantities. Chinnepep reigned supreme while paw-paw vanished.

Guyana

Guyana had a country average of 202.5mm of rainfall with an average of 15 rainfall days when compared with the average of 190.6mm with 16 rainfall days from the ten(10) administrative Regions. Kaieteur in Region 8 recorded the highest monthly rainfall of 437.7mm with 25 rainfall days. The highest one day rainfall total was recorded at Helena #2 with a total of 114.0mm on the 17th. Data collected thus far has revealed that a total of thirty rainfall stations across Guyana recorded rainfall values above their long term average, while eleven rainfall stations recorded values below their average.

The average Maximum temperature for August 2013 was 33.0°C when compared to the long term average Maximum of 33.6°C. Lethem (Region 9) recorded the highest average monthly Maximum temperature of 32.1°C; while Timehri, on the 18th, reported the highest one day maximum temperature with 34.5°C.

Jamaica

Throughout the month the island was impacted by several surface troughs. These systems had a significant impact of the island's weather which resulted in increased levels of rainfall across the two main synoptic stations. Sangster International airport (Sangster) in the northwest recorded 20% above its 30 year monthly mean while Norman Manley International airport (Norman Manley) in the southeast received 146% above its 30 year mean rainfall. During the month, Sangster recorded

110.1mm of rainfall, while Norman Manley recorded 179.9mm. There were thirteen rainfall days reported for Sangster, while Norman Manley had nine rainfall days during the month.

Sangster Airport recorded 35.0°C (15th) which exceeds the 20 year mean on record for that station, while 34.6°C (3rd) was reported for Norman Manley Airport.

Table 3 Climatological Statistics for Manley and Sangster Airports for August 2013

Monthly Averages	Norman Manley	Sangster
Extreme Maximum Temperature	34.6 °C (34.9 °C)	35.0 °C (34.6 °C)
Lowest Minimum Temperature	21.4 °C (23.5 °C)	23.5 °C (22.4 °C)
Rainfall Total	179.9 mm (73.0)	110.1 mm (91.0)
Rainfall days (≥1mm)	9 days (7.3)	13 days (14.2)

Values in red indicate the 1992-2010(19-year) averages.

St Lucia

Saint Lucia recorded above average rainfall for August. Both Hewanorra and George Charles recorded rainfall figures above the long term means of 167.0 mm and 227.0 mm respectively. Hewanorra recorded 18 rainy days while George Charles recorded 24.

Table 4 July 2013 monthly averages at Hewanorra Airport

AVERAGE MONTHLY DATA FOR HEWANORRA					
Cloud Cover (oktas)	Wind Dir (o from N)	Wind Speed (kt)	Air Temp. (°C)	RH (%)	Rainfall (mm)
5	90	12	28.3	78	212.7
Max Temp (°C)	Min Temp (°C)	Daily Sunshine (Hrs)	Daily Evap (mm)	Soil 20 (°C)	
31.0	25.8	8.6	7.2	29.2	

Table 5 July 2013 monthly averages at George Charles Airport

AVERAGE MONTHLY DATA FOR HEWANORRA					
Cloud Cover (oktas)	Wind Dir (o from N)	Wind Speed (kt)	Air Temp. (°C)	RH (%)	Rainfall (mm)
5	90	07	28.5	77	267.1
Max Temp (°C)	Min Temp (°C)	Daily Sunshine (Hrs)	Daily Evap (mm)	Soil 20 (°C)	
31.0	24.8				

September and October are the months of highest rainfall in Saint Lucia and September is also the

warmest month of the year. The mean maximum temperature for Hewanorra for September is 31.0°C and ranges from 30.0°C to 32.4°C.

The seasonal precipitation outlook for the September, October and November period indicate likelihood for rainfall to be in the above normal category or to range from 632 mm to 1216 mm in Vieux-Fort and from 778 mm to 1361 mm in Castries. Most of the rains are produced by migratory tropical systems (tropical waves, tropical cyclones, etc.) and upper level weather systems.

Farmers should ensure that there is adequate drainage in their fields and carefully plan their activities to minimise losses associated with heavy rains.

St Vincent and the Grenadines

Dry air and Saharan Dust, put a limit to rainfall activity as tropical waves and trough systems moved across St. Vincent and the Grenadines. The highest daily rainfall (83.2mm) was recorded on the 6th in the Rabacca area. The highest ‘total rainfall’ (503.9mm) was recorded in the area of Hermitage. The maximum temperature was recorded on the 4th, in the Arnos Vale area. Occasionally, Saharan dust haze reduced visibility across the islands. Sea-swells were slight to moderate and occasionally rough in open waters prompting the issuance of small-craft advisories.

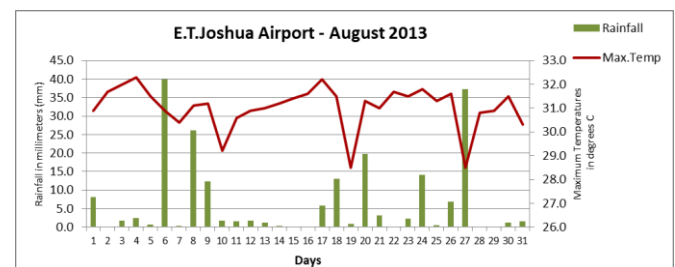


Figure 4 Maximum temperature and rainfall for E. T. Joshua, St. Vincent and the Grenadines.

At the E.T. Joshua Airport-Arnos Vale, total rainfall for August was 204.4 mm; 32.6mm less than the average (using 1981-2010). Total rain-days equaled the 30- year average; with the highest daily rainfall (40.0 mm) being recorded on the 6th. Three days had rainfall totals over 25mm. The rainfall distribution showed the first dekad (ten-day period)

had ~46%, the second dekad had 22%, and the third dekad had 32% of the month's total rainfall.

The average maximum temperature was 31.0°C, and the average minimum temperature was 25.3°C. The extreme maximum temperature recorded was 0.3 °C higher than the 30 year average of 31.9 °C, while the extreme minimum temperature equaled the average of 22.9°C. The mean relative humidity was 0.6% higher than the 30 year average of 77.9%.

Trinidad and Tobago

The relative dryness observed in July continued in Trinidad and Tobago during August, but was more prominent in Trinidad than in Tobago. At the Piarco in Trinidad, 114.0 mm of rainfall or 46% of the mean (1961-1990) was recorded, making August 2013 the 2nd driest on record since 1946 and the second consecutive month during the current wet-season in which rainfall recorded was less than 50% mean. Despite this, whenever rainfall occurred, it was most often moderate to heavy and covered wide areas. In fact, there were only 9 days with immeasurable rainfall. Of the remaining days, 9 of these produced rainfall that was greater than 5.0 mm. The wettest day (23.7 mm) occurred on the 10th. At Piarco, daily average temperatures (27.8°C) remained above normal at 1.4 °C, compared with the average of 26.4°C. While mean maximum temperatures stood at 33.1°C and mean minimum temperatures at 23.9 °C, as against an average of 31.2 °C and 22.9 °C respectively. Accompanying the rainfall deficit for the month was above average (246.1 hrs) total sunshine hours, 33.6 hrs greater than the mean. Relative Humidity (RH) was below average with 79%, with mean maximum RH of 93% and mean minimum of 56% .

At the ANR Robinson Airport in Tobago, conditions were closer to normal with 156.7 mm (par average) recorded. Even so, just about half of the days (14) were considered as, while there were six wet days (greater than 10.0 mm in 24 hrs), of which four were extremely wet (greater than 20.0 mm in 24 hrs) with the wettest day (35.0 mm) occurring on 10th. The mean temperature for the month was 27.4°C or 0.4°C warmer than expected and was accompanied by a mean maximum temperature of 31.3 (1.3 °C above average), while the mean minimum temperature observed was 24.0 °C (par

average). Total sunshine-hours received (222.3 hrs) was considerably less than last month's (293.9 hrs) and was less than the long term average of 253.2 hrs. In the presence of mixed conditions, mean daily RH stood at 76% which was 5% less than average, mean maximum RH stood at 86% while mean minimum was 64%.

The episodes of moderate to heavy rainfall would have drenched agriculture fields, making them soggy and at times unsuitable for field work, however there were no reports of crop losses as a result. At the same time, the rainfall would have replenish moisture and water available for agriculture purposes and left crops and pastures in good to excellent conditions going into the new month. The drier periods with accompanying high maximum temperatures would have assisted with maturing summer month crops. The combination of high temperatures followed by heavy rainfall would have encouraged agricultural pest and diseases to thrive.

REGIONAL OVERVIEW ON SEASONAL CLIMATE FORECAST

September to November 2013

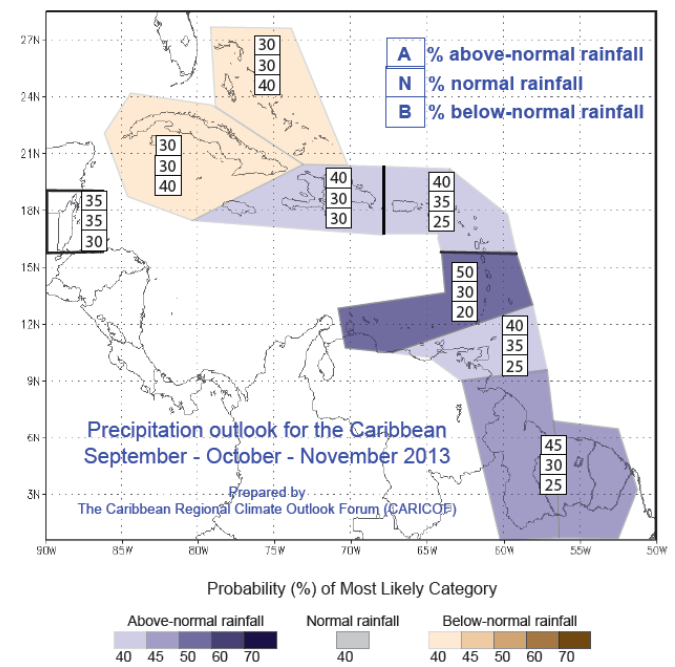


Figure 5 The September to November 2013 Rainfall Forecast

Normal to above normal rainfall is expected over most of the Caribbean, except in the northwest in the vicinity of The Bahamas and Cuba, which should

be normal to below normal. The Windward Islands, Barbados and the Dutch ABC islands express the greatest chance of having above normal rainfall, followed by the Guianas.

Normal to above normal temperatures are also expected all across the Caribbean, with the highest probability for above normal in the vicinity of Eastern Caribbean, the Guianas, Hispaniola and Jamaica.

ENSO Conditions

Eastern Pacific equatorial SST anomalies have recently hovered just below average (i.e. deviation of 0°C to -0.5°C). The outlook is for neutral ENSO conditions for September to November with the confidence for neutral decreasing during the December to February, 2014 period. Little impact is expected on Caribbean rainfall from ENSO with slight increase in rainfall in the Eastern Caribbean, mild temperatures and slight decrease in rainfall in the NW Caribbean, if [the expected ENSO conditions are] accompanied by above-average Tropical North Atlantic and Caribbean SSTs.

Conditions in the Tropical North Atlantic and Caribbean

Recent conditions in this region were of SSTs about 0.5-1°C above average, with stronger than average trade winds and a drier than average atmosphere. The above average SSTs are forecasted to last into December, with below average SSTs forecasted around the Bahamas into February. Apart from the northwest portions of the region, the atmosphere is expected to be much more moist during the September to November period. These conditions are expected to produce more rainfall and high humidity over the region apart from in the northwest, and above average storminess across Belize and the Antilles

December 2013 to February 2014

As in any long-lead forecast, there is considerable uncertainty as to the development of rainfall activity beyond November. Currently, for the period

December 2013 to February 2014, from the Guianas northward to Hispaniola are more likely to be normal to above normal, with the Guianas and the Leeward Islands having the highest probabilities for above normal. In the west from Belize northwestward to The Bahamas are most likely to have normal to below normal rainfall, with the highest probability for below normal.

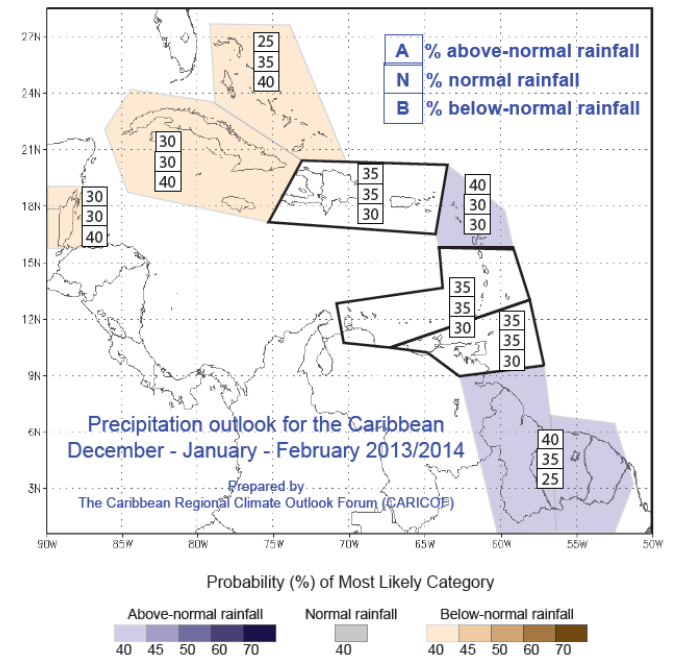


Figure 6 The December 2013 to February 2014 Rainfall Forecast

Air temperatures are very likely to be normal to below normal in the northwest around Cuba, Turks and Caicos and The Bahamas during the period December 2013 to February 2014. Elsewhere, normal to above normal temperatures are expected, with the highest probability for above normal over the Guianas.

Prepared by
Caribbean Institute for Meteorology and Hydrology (CIMH) and the National Meteorological Services of
 Antigua and Barbuda, Barbados, Belize, Dominica, Grenada, Guyana,
 Jamaica, St Lucia, St Vincent and the Grenadines and Trinidad and Tobago
CAMI is funded by the European Union in partnership with the institutions that have prepared this bulletin, along
with the Caribbean Agricultural Research and Development Institute and the World Meteorological Organization