



ANNOUNCEMENTS

Concern about drought continues in the southern Caribbean, particularly in the vicinity of Grenada. With normal to below normal rainfall forecasted in this area for the next few months, and being the dry season, the concern will likely heighten. Temperatures are likely to continue to be above normal by up to 0.5 °C for at least until the end of 2012. The CAMI project is about to re-commence its e-forum as the project and face-to-face forums approach their end.

REGIONAL OVERVIEW ON WEATHER AND CLIMATE FOR NOVEMBER 2012

Rainfall in the islands of the eastern Caribbean was normal to below normal during the month. Trinidad, Tobago and St. Lucia were normal; Grenada and Barbados severely dry; St. Vincent abnormally dry; and Dominica and Antigua moderately dry. Guyana was normal to abnormally wet. Rainfall in Jamaica was normal while Belize was severely dry in the south and moderately dry in the north.

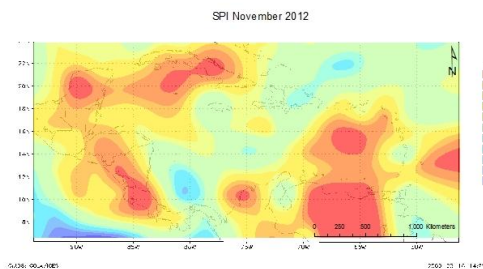


Figure 1. SPI for the Caribbean for November 2012. More information on the SPI can be viewed at <http://63.175.159.26/~cdpmn/spimonitor.html>.

Most annual cropping takes place over a period of about three months or just over. Trinidad was moderately to severely dry; Tobago abnormally dry; Grenada exceptionally dry; Barbados and Dominica extremely dry; St. Vincent moderately dry; and St. Lucia and Antigua normal. Guyana was normal in the north and abnormally dry elsewhere.

Jamaica was normal in the west and abnormally wet in the east and Belize predominantly moderately dry. See Figure 2.

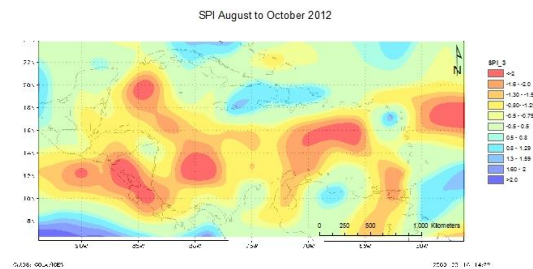


Figure 2. SPI for the Caribbean for September to November 2012 more information on the SPI can be viewed at <http://63.175.159.26/~cdpmn/spimonitor.html>

Concern about agricultural drought continues in the southern Caribbean, particularly in the vicinity of Grenada; this is even if rains in the next few months become more normal. Agriculture is already being impacted and this is likely to continue as the dry season approaches. There is also some indication of impacts on water resources.

The official 2012 hurricane season has ended. The 2012 Atlantic hurricane season was extremely active, tied with 1887, 1995, 2010, and 2011 as the third most active year on record. The season produced nineteen tropical cyclones and named storms, ten hurricanes, and one major hurricane. The number of named storms is well above the average of 12, the number of hurricanes is also above the average of six, but the number of major hurricanes is below the average of three.

Much of the region, particularly the eastern Caribbean, recorded above average temperatures.

NATIONAL OVERVIEWS

Antigua

Antigua experienced well below normal rainfall during November. The average total for the month of 64.8 mm was the lowest since 2007 and the 10th lowest on record for November (1928 – 2012); this was 43% of the normal total (1981 – 2010). At the airport, notwithstanding the well below normal rainfall, the 11 rainy days (≥ 1 mm) were near normal (1971 – 2012); however, there were no heavy rainfall days (≥ 10 mm), which has only happened on four other occasions for the month; the last time being 1997. The mean temperature of 27.0°C was near normal. Further, the mean daily maximum and minimum temperatures were near normal and above normal respectively. The outlooks call for near normal rainfall and above normal temperature for December and above normal rainfall and near normal temperature for the period December to February. This was a good month for field preparation and harvesting by farmers; it was also a good month for planting given the near record high rainfall of October and the outlook for the next few months.

Barbados

The 2012 Atlantic Hurricane Season officially ended without the development of any tropical cyclones in the Atlantic Basin during the month of November. Coupled with this, Barbados' cumulative rainfall total up to the end of the month at the Airport reached 1084.9mm. In comparison, the 1981-2010 average cumulative total up to the end of November is 1180.59mm.

Grantley Adams Airport recorded a total of just 54.0 mm for November; this represents the fifth lowest rainfall total between 1942 and the present. It is also 31% of the long-term normal of 171.4mm. A similar amount, 55.9mm was recorded at Golden Ridge in St. George. Although there were only 9 rain days (rainfall ≥ 1 mm) at the Airport, only a 4-day dry spell was experienced, which occurred at the start of

the month. One significant rain-event occurred on November 29th, resulting in 29.2mm of rainfall. Wind-speeds varied between 19 and 33 km/hr during the day and from 9 to 28 km/hr at night.

There were four days on which the maximum temperature equaled the long-term average maximum temperature of 30.7°C while they were 18 occurrences on which the extreme maximum temperature was greater than 30.7°C; the highest maximum of 31.3°C occurred on the 13th, 14th, 27th and 28th while the lowest minimum of 22.4°C was recorded on November 22nd. These findings are represented in the graph below.

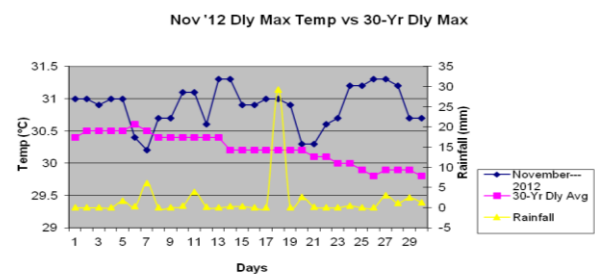


Figure 3. Temperature and rainfall information for November at Grantley Adams Airport.

December Outlook - A series of trough systems will move across the central Atlantic during month of December and these will contribute to the pattern of intermittent showers across Barbados and the eastern Caribbean. One significant rain event is expected near the middle of the month while a second rainfall event is expected near the second decade.

Belize

In the early part of November, generally good weather prevailed with occasional coastal showers which at times drifted or reformed inland at times.

A cold front crossed the country on November 8th resulting in mild morning temperatures. Temperatures dropped further the following morning (9th) with the International Airport registering 18°C. Light showers occurred mainly over southern coastal waters. Skies remained generally cloudy for most of the country the following day (10th). Showers migrated from northern and central, coastal areas to southern coastal areas during the day. For the next two days cloudy skies

remained the norm for southern coastal areas. While morning temperatures remained cool, a light northeasterly flow produced showers over northern coastal areas on 13th and 14th.

On 21st cloudiness and showers associated with a surface trough spread from north to south mainly along coastal areas. Rio Bravo in the Orange Walk district recorded the most rainfall (26mm). On 28th and 20th a trough created very unstable conditions over Belize and coastal waters. As a result coastal convergence produced extensive showers and rain along coastal and central Belize. On 30th the surface trough lost its identity. However, a moist northeasterly flow produced sporadic outbreaks of showers over some coastal and inland areas during the day and along the coast during the final hours.

Table 1 Rainfall and Temperature Summary for November 2012 for stations in Belize

Station	Liber-tad	Zoo	PGIA	Belmo-pan	Central Farm	Savannah
Elevation (m)	12	30	5	90	90	13
Rainfall (mm)	39	18	46	81	36	168
Mean.	96	223	201	197	176	214
Max	23	6.5	14.7	18.7	9.7	50.3
Rain days	4	5	8	12	7	16
Temp (°C)						
Mean Min.	17.7	19.4	20.6	19.4	18.1	20.6
Mean	19.0	20.4	21.6	20.1	20.1	21.8
Lowest Min.	13.5	15.0	16.6	14.6	13.4	17.5
Mean Max.	30.2	29.0	28.6	28.5	28.7	30.0
Mean	29.7	29.0	29.1	29.3	29.6	29.3
Highest Max.	31.9	31.0	31.0	30.4	30.2	31.2

Dominica

Below normal rainfall with above average temperature were recorded at both the Canefield and Melville Hall Airports for the month of November 2012.

At the Canefield Airport 75.9mm of rainfall was recorded which represents about 39% of the monthly mean. The maximum daily total of 18.7mm of rainfall was recorded on the 18th. There were 17 dry days with the longest dry spell period of 6 days occurring during the latter half of the month. On average there are 15 dry days. The averaged air temperature was 28.3°C which is 0.5° above the monthly mean. The maximum

temperature of 33.3°C was recorded on the 13th with the minimum temperature of 21.1°C recorded on the 21st. The maximum wind gust recorded was 35km/h on the 8th and 12th.

At the Melville Hall Airport 159.1mm of rainfall was recorded which represents about 46 % of the monthly mean. The maximum daily total of 28.7mm of rainfall was recorded on the 14th. There were 13 dry days however; there were no significant dry spells. The averaged air temperature was 27.9°C which is 0.5° above the monthly mean. The maximum temperature of 31.2°C was recorded on the 01st, 02nd and 22nd with the minimum temperature of 20.8°C recorded on the 21st. The maximum wind gust recorded was 46km/h on the 11th, 17th and 29th. 72% of possible sunshine hours were recorded for the month which is a record high for November since record-keeping began in 1976.

The two stations have recorded below normal rainfall totals for the period September-October-November which have had significant impact on vegetable production. Huge losses have been recorded and consumers can expect shortages and inflated prices on the market in the coming month. There have been reports of tomatoes and peppers in greenhouses being affected by bacterial wilt; however successful production is being undertaken in other areas.

Grenada

The month of November has been the wettest month of the wet season. In contrast, for this November, rainfall measured at the Maurice Bishop Int'l Airport totalled 71.1mm which equates to 93.5 mm or 56.8 % lower than climatological mean of 164.6mm. Seventeen (17) days this month were categorized as rainy days with the highest volume of 24 hr rainfall measured on the 24th day of the month being 22.3mm influenced by a trough.

There has been significantly diminished rainfall collected at most of NAWASA's (National Water and Sewerage Authority) water treatment plants. For example the plants located at Tufton Hall on the west and Brandon Hall in the East have recorded almost 60% decrease. In addition many agro- met stations across our island have registered below average rainfall.

Wet/Hurricane Season Rainfall Synopsis - Of the 6 hurricane season months, five (5) were characterized with below average rainfall; the exception being the month of August which yielded just 8.1 mm above average. The total hurricane season rainfall for 2012 amounted to 520.5 mm which is the lowest on record in the 27years of operation. A closer analysis for 2012 reveals a trend in the rainfall for the period of September to November, which is indicative of an almost identical trend exhibited during the 2009 year of drought for that same period.

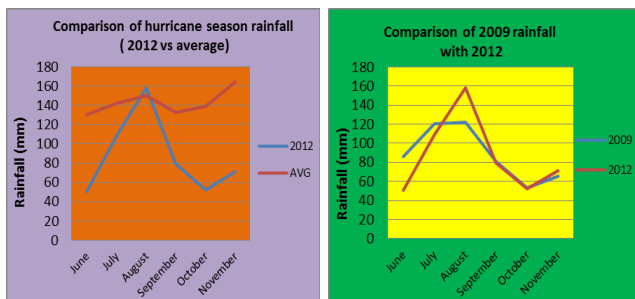


Figure 4 Hurricane Season rainfall in Grenada

Struggling farm lands, spiraling irrigation costs, reduction in stream flow and a general depletion in water resources are signaling factors of a drought. All citizens especially the farmers are cautioned to conserve the limited water resources.

The already bleak scenario of reduced rainfall has been amplified with the prevalence hotter days and warmer nights. The highest maximum of 33.5°C registered on the 2nd set a new record for the highest ever recorded over the 27years of operation. The minimum temperature of 23.0°C, read on the 25th showed an increase of 0.7°C compared to last year. The mean highest and lowest recorded air temperatures for the month were 31.9°C and 24.5°C respectively.

Guyana

For November, Guyana had an average of 177.1 mm of rainfall with an average of 11 rainfall days. The November average is 159.0mm with 12 rainfall days. Rainfall values recorded for November implied that Guyana was just above its average. St. Denny Mission in Region 2 (Pomeroon Supernaam) recorded the highest monthly rainfall with 485.8mm. The highest one day rainfall total was also recorded at St. Denny Mission in Region 2 with 152.0mm on

the 28th. A total of twenty eight (28) rainfall stations across Guyana recorded rainfall values above their average, while sixteen (16) stations recorded below average.

November was warmer than normal, average Maximum temperature for the Month was 32.6°C when compared to the average maximum of 31.0°C. This was a result of mostly dry conditions being observed in the early parts of the Month. Lethem (Region9) recorded the highest average monthly maximum temperature of 35.7°C. Lethem also reported the highest one day maximum temperature of 36.7°C on 8th, indicative of the high temperatures experienced in Guyana in the early part of November.

Jamaica

November generally signifies the end of the hurricane season for the Atlantic region. Throughout the month both Sangster International airport in the northwest and Norman Manley International airport the southeast recorded below average rainfall. The most significant weather features to affect the island during the month of November were Low Level Troughs, most of which developed over the north-western Atlantic and affected mainly northern

Table.2 Climatological Statistics for Manley and Sangster Airports for November 2012

Monthly Averages	Norman Manley	Sangster
Extreme Maximum Temperature	32.6 °C (33.9°C)	31.6 °C (32.8°C)
Lowest Minimum Temperature	22.9 °C (22.3°C)	21.8 °C (22.0°C)
Rainfall Total	36.4 mm	99.2 mm
Rainfall days (≥1mm)	1 days (5.7)	5 days (15.1)

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

During the month, Sangster in the northwest recorded 99.2 mm of rainfall, while Norman Manley in the southeast recorded 36.4 mm. There were five rainfall days reported for Sangster, while Norman Manley had only one rainfall day during the month. Both stations recorded below average rainfall, Sangster recorded approximately 93% of the 1971-2000 meanwhile Norman Manley recorded 41% of the 1971-2000 mean.

The highest maximum temperature recorded for Sangster Airport was 31.6°C (16th November) while 32.6°C (27th November) was reported for Norman Manley Airport.

St Lucia

Rainfall for November this year was generally below normal. Hewanorra’s rainfall was slightly below the long term mean of 177.5 mm. There were 10 rainy days with 4 having rainfall greater than 10 mm and 2 greater than 20 mm. The highest daily rainfall was 78.4 mm on the 12th. The total rainfall recorded at George Charles was well below the mean of 223.4mm. There were 12 rainy days with 4 days producing more than 10 mm and 3 days with rainfall greater than 20 mm. The highest daily rainfall was 62.7 mm on the 12th. A general trend of below average rainfall (in the north of the island) which started in June continues as the wet season draws to a close.

Table 3 November 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)
4	80	12	28.1	77	161.4
Temp (oC)	Min Temp (°C)	Daily Sunshine (Hrs)	Daily Evap (mm)	Soil 20 (°C)	
31.0	25.4	9.5	7.0	29.0	

Table 4 November 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)
4	90	07	28.3	76	158.4
Temp (oC)	Min Temp (°C)	Daily Sunshine (Hrs)	Daily Evap (mm)	Soil 20 (°C)	
30.8	24.7				

The seasonal precipitation outlook for the December, January and February period indicate near equal chances of rainfall being in the above normal, normal or below normal category or to range from 106.5 mm to 400.2 in Hewanorra and from 189.6 mm to 781 mm in Castries. Farmers who cultivate in the drier parts of the island should

engage in water conservation practices and consider options for irrigation.

St Vincent and the Grenadines

Total rainfall for November 2012, at E.T. Joshua Airport-Arnos Vale was 173.8mm; about 100 mm less than the November 30 year average. (Using 1981-2010 as the 30 year average) There were only four days with rainfall totals near to or more than 25mm. There was a five-day dry spell from the 19th to the 23rd. Average wind speeds increased slightly during the last week, and there was a general decrease in relative humidity. There were 16 rain-days, the highest being on the 12th with 41.3mm. The first dekad (ten day period) had ~39%, the second dekad had 56%, and the third dekad had 5% of the total rainfall for the month.

The average maximum temperature was 31.3°C, and the average minimum temperature was 25.3°C. The extreme maximum temperature recorded was 0.8°C higher than the 30 year average, while the extreme minimum temperature was 0.5°C higher than the 30 year average. The mean relative humidity was 1.1% below the 30 year average.

Extremes for October (date of occurrences): Barometric Pressure – highest 1016.6 mb (26th), lowest 1009.8 mb (9th); Air Temperature – highest 32.3°C (2nd), lowest 23.0 °C (17th); Relative Humidity – highest 95% (17th), lowest 55% (21st).

Trinidad and Tobago

In November 2012, rainfall recorded at the Observing station in Piarco International Airport, Trinidad was 181.4 mm. This amount was 22% below the long-term average (1971 to 2000). Rainfall at the A.N.R. International Airport, Crown Point, Tobago was 162.6 mm, 22% below the long-term average.

There were reports of flooding in parts of Trinidad on 8th and 13th November.

No reports of damages to the Agricultural community were received.

REGIONAL OVERVIEW ON SEASONAL CLIMATE FORECAST

Three month Outlook

Rainfall in the Caribbean during December 2012 to February 2-13 will likely be consistent with neutral to borderline El Niño conditions combined with above normal tropical North Atlantic sea surface temperatures (SSTs). This means an increased likelihood of normal to above normal rainfall over the north-eastern Antilles, mostly normal rainfall over the remainder of the Antilles, but with increasing chances of below normal rainfall towards the westernmost part and the southernmost islands. Following this North to South trend, rainfall in the Guianas will likely continue to be below normal to normal. The largest uncertainties at this point are whether or not El Niño conditions will re-emerge after having largely dissipated during September to November, and how far atmospheric conditions will become consistent with typical El Niño conditions. All other things left unchanged, above normal North Atlantic SSTs, which are up to 1°C above average, increase chances of above normal rainfall over the Antilles, but below normal rainfall sums in the southern Antilles generally observed over the past several months may tend to lower local humidity and therefore rainfall chances. Therefore, with an El Niño relatively likely suppressing excessive rainfall especially in the eastern Caribbean, the effect of an El Niño will either dominate (below normal rainfall) or not (normal rainfall) the southernmost Antilles.

With this understanding, and with the southern portion of the Caribbean already experiencing below normal rainfall (and in the case of Grenada well below) there needs to be heightened monitoring of water resources and soil water availability (and maybe even controlled measures) over the next three months. The reality is that normal rainfall over the next three months would suggest dry season-like conditions which further suggest continued reduction of soil moisture and irrigation potential.

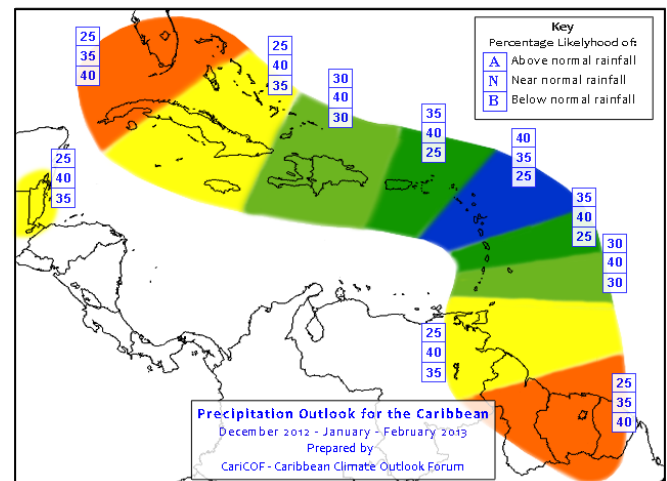


Figure 5 The December 2012 to February 2013 Rainfall Forecast

Depending on how El Niño manifests and affects rainfall, air temperatures could be either slightly above normal over the Antilles or significantly above normal if drier conditions settle. Similarly, warmer than average air temperatures are also expected over the Guianas in congruence with below normal rainfall, but there they should result from a combination of relatively cool surface waters near the equator and El Niño in the Pacific. Finally, the northwestern-most part of the Caribbean will probably experience slightly below normal air temperatures consistent with cooler than average SSTs.

Six month outlook

As in any six month forecast, there is considerable uncertainty as to the development of rainfall activity in the region. Although forecasting confidence is expected to improve as the Caribbean enters the dry season, climate conditions driving rainfall across the Caribbean show weak signal. With neutral ENSO conditions in the Pacific, below average SSTs over the tropical South Atlantic, but above SSTs being forecasted in the North Atlantic, it is (at best) somewhat likely that rainfall in the south-eastern Caribbean down to May 2013, is likely to be below normal, whereas above normal rainfall in the north-eastern portions is likely.

Though nearly half the ENSO forecast models predict borderline El Niño by the end of the year, most predict its disappearance early in the next year. Also, North Atlantic SST forecasts tend to moderate

SST anomalies by the latter part of the 6-month forecast period. Since seasonal climate predictions for the Caribbean mostly rely on SST anomalies, there is relatively little confidence in the forecast beyond the three month one.

Finally, in terms of air temperatures, a highly probable pattern of warmer than average Caribbean emerges from climate models for the next few months. This is with the exception of the northwestern-most part, i.e. Cuba and The Bahamas where air temperatures may be below normal in the first three months and rather near average between March and May.

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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