



**ANNOUNCEMENTS**

The entire Caribbean should continue to monitor for low water availability over the coming months as the majority of the region enters or draws closer to its climatological dry season, particularly with an El Nino watch still in place. In the near future, drought concerns continue to exist in the western Caribbean, particularly in the vicinity of the Cayman Islands, Jamaica, Cuba and Hispaniola.

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

Mixed conditions prevailed in the eastern Caribbean and Guyana for the month, with the south being normal to below normal and the north normal to above normal. Trinidad, Tobago and Antigua, were normal; Grenada and Dominica moderately dry; Barbados and St. Vincent extremely dry; St. Lucia exceptionally dry; and Guyana ranging from abnormally wet in the northwest to moderately dry in the east. Conditions in Jamaica ranged from extremely wet in the west to normal in the east, while in Belize the range was from moderately dry in the south to extremely wet in the north.

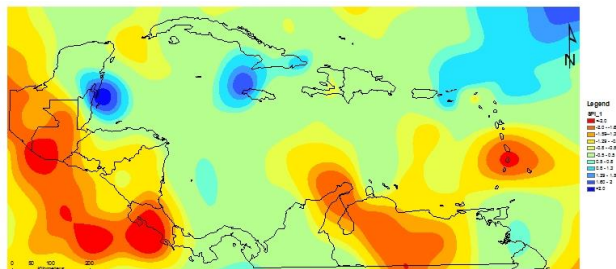


Figure 1. SPI for the Caribbean for December 2014. More information on the SPI can be viewed at <http://63.175.159.26/~cdpmn/spimonitor.html>.

Most annual cropping takes place over a period of

about three months. For the three month period October to December, mixed conditions were experienced in the eastern Caribbean and Guyana. Trinidad, Grenada, St. Lucia and Antigua were normal; Tobago very wet; Barbados abnormally wet; St. Vincent abnormally dry; Dominica extremely dry; and Guyana from very wet in the north to normal in the south. Conditions in Jamaica ranged from moderately wet in the west to moderately dry in the east, while in Belize they ranged from normal in the south to moderately wet in the north.

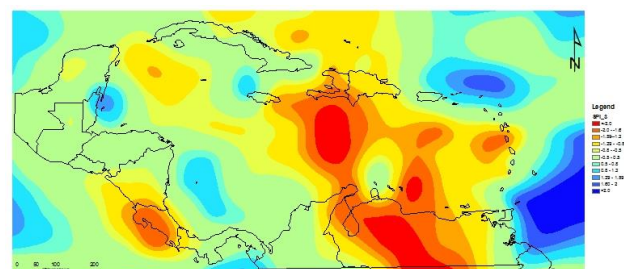


Figure 2. SPI for the Caribbean for October to December 2014. More information on the SPI can be viewed at <http://63.175.159.26/~cdpmn/spimonitor.html>

The month of December acts as a transition month from the ‘wet’ season into the ‘dry’ and rainfall amounts tend to be variable. A broad area of Low pressure dominated conditions over the eastern and central Atlantic during much of the first half of December. This resulted in a weakened Bermuda/Azores high pressure system which generated easterly trade-winds of between 18-28km/hr across the eastern Caribbean. The ridge

strengthened during the last dekad of the month, sustaining east-northeasterly winds which varied between 28-37 km/hr. Throughout the month in the vicinity of Jamaica, surface troughs were the most dominant weather features.

## NATIONAL OVERVIEWS

### Antigua

This December was cooler than normal with average rainfall. The mean temperature for the month was 25.5°C, the coolest in three years. Further, the mean daily maximum temperature, 28.3°C, and the absolute maximum, 29.4°C, were below normal. The mean daily minimum temperature, 23.0°C was near normal. Rainfall for December was 79.5 mm. For the month, at the V. C. Bird International Airport, the number of wet days ( $\geq 1$  mm) and heavy rainfall days ( $\geq 10$  mm) were near normal with 13 and 3 days respectively. The tropical upper level trough system dumped very heavy rain (36.5 mm) on the island on December 4, resulting in this day being the wettest for the month and the third wettest of the year.

The rainfall for the past couple of months, more so November, has eroded the drought to the point where it is at slight levels. All of the minor surface water catchments, including ponds used by farmers, are 80-100% full; however, the main catchment, Potworks Reservoir, is only one-third full. Notwithstanding, water is still being rationed, and the Production Engineer at the Antigua Public Utilities Authority categorised the water situation as still at crisis levels. Much of the rains of the last two months fell in a very short period of time. Thus, soil moisture went from extremely low to extremely high; this has resulted in farmers being challenged by soil wash, water logged soil and the outbreaks of pests and diseases. The rains have also caused a surge in weeds and the giant African snail.

### Barbados

Well below-normal rainfall was experienced in Barbados during December. One five-day dry-spell occurred (at the Airport) between the 4<sup>th</sup> and 8<sup>th</sup> while there were two four-day dry-spells between the 12<sup>th</sup> and 15<sup>th</sup> and again between 21<sup>st</sup> and 24<sup>th</sup>. Thus,

Grantley Adams Airport recorded a total of just 27.9mm of rainfall or 31% of the long-term average of 89.6mm over a period of six rain days (rainfall  $\geq 1$ mm).

However, most of the other rainfall stations across the island experienced higher rainfall totals, with some stations reporting as high as 75mm. The Airport rainfall total for 2014 of 1057.3 mm was well below normal when compared with the 1981-2010 average of 1270.54mm.

There were ten days on which the maximum temperature equalled the long-term average (1981 to 2010) maximum temperature of 29.5°C and eighteen days on which this was exceeded. The highest maximum of 30.1°C occurred on days 4 and 5 while the lowest minimum of 22.5°C was recorded on the 19<sup>th</sup>.

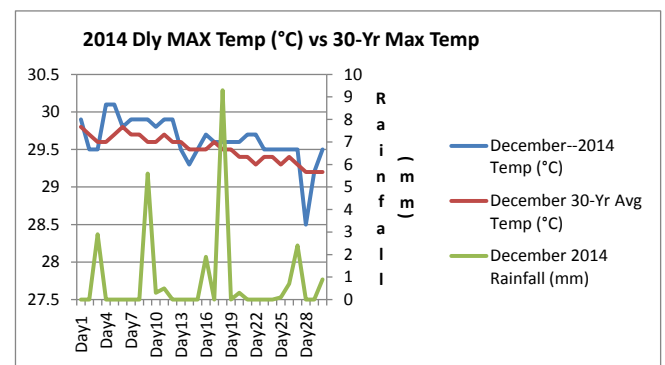


Figure 3 December 2014 rainfall and maximum temperatures, along with the 30 year average of maximum temperature at Grantley Adams Airport, Barbados.

### Belize

Cloudy and rainy weather greeted December, but drifted east of Belize by the end of the 1<sup>st</sup> day. Showers occurred over central and southern Belize the following day. Cloudiness and showers continued over southern and central areas into the 5<sup>th</sup>.

On the 8<sup>th</sup> skies were cloudy with periodic bouts of showers occurring across much of the country. By the 10<sup>th</sup>, a weak front had crossed Belize, with some light intermittent showers/rain occurring mainly along coastal areas into 11<sup>th</sup>. The following day was cloudy with periodic bouts of coastal showers. Skies were cloudy at times and light showers or periods of rain occurred mainly along southern and central coastal areas on the 12<sup>th</sup>. Sunny and mostly dry

weather began the third week (from 15<sup>th</sup>) and continued into the 18<sup>th</sup>, after which some cloudiness with isolated showers were experienced through to the 20<sup>th</sup>.

A strong cold front influenced the following week particularly from Christmas morning when it was cool and cloudy with most showers observed offshore the coast. The following day, skies started out cloudy with light rain observed at the International Airport and surrounding areas. Weather on the 27<sup>th</sup> turned out generally cloudy with occasional light showers. Surface winds measured at the cayes (San Pedro and Cay Caulker) ranged between 28-37 km/hr during the day, with the windy weather persisting into the 28<sup>th</sup>.

Table 1 Rainfall and Temperature Summary for December 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>	<b>88.5</b>	<b>80.6</b>	<b>87.5</b>	<b>105.9</b>	<b>77.4</b>	<b>101.2</b>
Mean.	71.2	109.4	163.1	165.1	141.9	162.3
Max	29.4	27.6	37.0	34.2	16.0	17.6
Rain days	8	8	11	12	14	14
<b>Temp (°C)</b>						
Mean	<b>19.1</b>	<b>19.4</b>	<b>21.1</b>	<b>19.6</b>	<b>18.8</b>	<b>21.0</b>
Min.						
Mean	18.6	19.0	20.6	19.1	19.0	20.9
Lowest	15.2	16.5	18.0	15.0	14.8	18.8
Min.						
Mean	<b>28.5</b>	<b>28.8</b>	<b>27.8</b>	<b>28.1</b>	<b>30.3</b>	<b>28.9</b>
Max.						
Mean	29.0	27.7	28.1	28.0	28.6	28.2
Highest	32.0	32.3	31.9	32.8	35.5	31.5
Max.						

n/a-not available; 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;\*-station data incomplete

### Dominica

At the Canefield Airport, 92.6mm of rainfall was recorded, which is 91% of the mean. The highest daily total recorded was 23.7mm on the 6<sup>th</sup>. There were 10 rainfall days which is below the average 16 days. The longest dry spell was 7 days during the second to third week. The average air temperature recorded was 26.8°C. The maximum daily temperature recorded was 32.1°C on the 1<sup>st</sup> and the minimum was 20.6°C recorded on the 15<sup>th</sup>. Average wind was easterly at a speed of 6km/hr. The highest wind gust was 43km/hr recorded on the 29<sup>th</sup>.

During the month, 191.7mm of rainfall was recorded at Douglas-Charles. This is about 87% of the mean. The maximum daily total recorded was 46.8mm on the 18<sup>th</sup> as a front system dipped southwards into the area. There were 18 rainfall days which is slightly below the average of 20 days. A 6-day dry spell also occurred during the second to third weeks. The average air temperature was 26.1°C. The highest temperature recorded was 29.8°C on the 2<sup>nd</sup> and the lowest recorded was 19.0°C on the 28<sup>th</sup>. Winds maintained an east south east direction at an average speed of 11km/hr. The highest wind gust recorded was 54km/hr on the 22<sup>nd</sup>.

Open field and greenhouse vegetable farmers reported high amounts of rainfall for the month of December. The temperatures were reported to be low at nights. Pests and diseases such as mole crickets, fungi and slugs affected production. The main crops affected were lettuce, tomato and culinary herbs. There was a loss of income reported by farmers who were severely affected. Farmers continued to establish root crops throughout all agriculture regions. Dasheen production was predominant. Others included yams, tannia and cushcush. Harvesting of the dasheen crop has begun at this time with limited reports of the diseases which affected it at this time last year. On the other hand, sweet potato, a dry season crop, is not thriving as well.

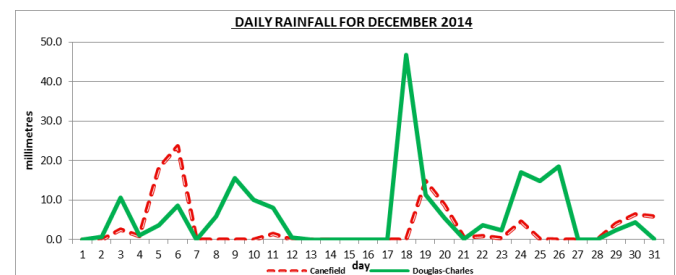


Figure 4 Daily rainfall at Canefield and Douglas-Charles Airports, Dominica during December 2014.

### Grenada

A total of 40.1mm of rain fell during the month, making it the second driest December in the last ten (10) years; with the lowest (in 2009) having 24.9mm. This is in comparison to the 213.3mm that fell in the previous month. Eight days of no rain with ten days of a trace characterized. The highest 24-hour total of 11.5mm fell on the 13<sup>th</sup>.

Mean daily temperature for the month was 27.1°C with the lowest of 22.5°C occurring on 21<sup>st</sup>. The mean minimum temperature of 23.9°C was the second highest over the last ten years. The mean maximum temperature was 30.3°C with the maximum of 31.2°C, which took place on the 1<sup>st</sup>. The mean maximum is the lowest over the last ten years with the highest for the ten years being 32°C.

The Bermuda high peaked during the month with a high of 1031mb; this generated strong winds and moderate to rough seas during the month. Marine advisories were issued on the 11<sup>th</sup>, 21<sup>st</sup> and 22<sup>nd</sup> of the month.

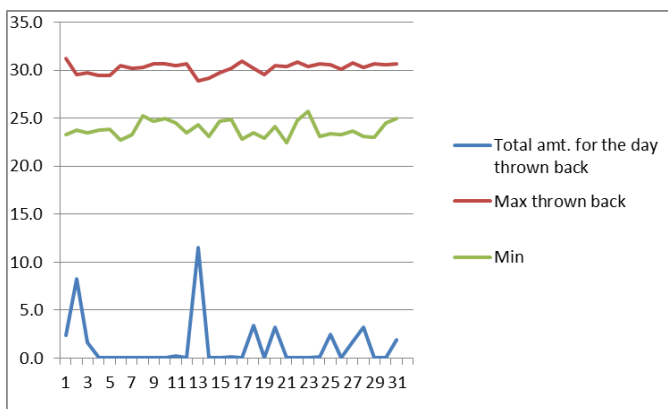


Figure 5 Daily rainfall and maximum and minimum temperatures at Maurice Bishop International Airport, Grenada for December 2014.

**Jamaica**

Most northern parishes, especially north-eastern parishes received above average rainfall. Flash flooding was reported across sections of St Ann, St Mary and Portland (between 15<sup>th</sup> and 18<sup>th</sup>), which was due to prolonged showers associated with a lingering surface trough.

Sangster in the northwest recorded 227.7mm of rainfall, while Norman Manley in the southeast received 18.4 mm of rainfall. There were nine rainfall days reported for Sangster while Norman Manley International airports recorded had six rainfall days. Manley received about 61% of average rainfall during the period, while Sangster received 240% above the average (1971-2000 mean).

The highest maximum temperature recorded for Sangster Airport was 32.0°C (24<sup>th</sup>). Meanwhile 33.3°C (26<sup>th</sup>) was reported for Norman Manley

Airport. The highest maximum temperature was exceeded at both airports during the month.

Table 2 Climatological Statistics for Manley and Sangster Airports for December 2014.

Monthly Averages	Norman Manley	Sangster
Extreme Maximum Temperature	33.3 °C <b>(33.1 °C)</b>	32.0 °C <b>(31.8 °C)</b>
Lowest Minimum Temperature	22.5 °C <b>(21.5 °C)</b>	21.0°C <b>(20.3 °C)</b>
Rainfall Total	18.4 mm <b>(30.0)</b>	227.7 mm <b>(95.0)</b>
Rainfall days (≥1mm)	6 days <b>(4.2)</b>	9 days <b>(13.4)</b>

Values in red indicate the 1992-2011 (20-year) averages. Values in orange represent 1971-2000 mean.

**St Lucia**

Rainfall for the month was exceedingly low in the country. This December ranked as the driest since 1973 at Hewanorra and also at George Charles since 1967. Average rainfall totals for December are 107.6mm and 144.3mm for Hewanorra and George Charles respectively. There were only 6 rainy days and three 4-day dry spells at Hewanorra while at George Charles there were 9 rainy days and 4 dry spells.

It would seem that the dry season has begun. The record-breaking low rainfall amounts for December has initiated a drought event at both Hewanorra and George Charles Met. Stations. In addition the windy conditions which existed in December reduced the available soil moisture and this is adversely impacting crop yield. The Flood and Drought Mitigation Committee is scheduled to meet in the first half of January to propose measures to cushion the effects of the drought.

Table 3 December 2014 monthly averages at Hewanorra Airport, St. Lucia.

Cloud Cover (oktas)	Wind Dir (° from N)	Wind Speed (kt)	Air Temp. (°C)	RH (%)	Rainfall (mm)
4	80	12	27.2	76	21.8
Max Temp (°C)	Min Temp (°C)	Daily Sunshine (Hrs)	Daily Evap (mm)	Soil 20 (°C)	
30.1	24.9	9.8	6.6	28.1	



Table 4 December 2014 monthly averages at George Charles Airport, St.Lucia.

Cloud Cover (oktas)	Wind Dir (o from N)	Wind Speed (kt)	Air Temp. (°C)	RH (%)	Rainfall (mm)
4	90	07	27.2	76	35.8
Max Temp (°C)	Min Temp (°C)	Daily Sunshine (Hrs)	Daily Evap (mm)	Soil 20 (°C)	
29.8	24.1				

### St Vincent and the Grenadines

Hot and dry conditions were evident across many areas in St. Vincent and the Grenadines, with grasses turning pale-green and wilting. Brisk winds enhanced the occurrence of light showers - mainly during the early morning and late night hours, which provided little relief to dry conditions. Here at the E.T. Joshua Airport – Arnos Vale, December’s rainfall total was a mere 51.1 mm. This was significantly lower than this station’s 30 year average of 173.0mm. Rain-days were also below normal for this station. The Montreal area recorded the highest rainfall total in the country with 243.4 mm.

Day-time maximum temperatures averaged 31°C. Sea wells were moderate to rough in open waters, prompting the issuance of advisories and warnings. The Bemuda-Azores High pressure system moved into our area generating moderate to strong winds throughout most of December. **Maximum winds** in the Arnos Vale area were recorded as 46km/hr on the 30<sup>th</sup> and 31<sup>st</sup>. During the last week of the month, Saharan dust haze intermittently reduced the visibility across the islands.

Table 5 Comparison of Parameters at E.T. Joshua Airport for December 2014

E. T. Joshua Airport Station	Rain-days	Rainfall mm	Mean RH %	Max/Min Temp. °C
December	12	51.1	75.5	31.0/21.8
30 year average*	18	173.0	75.3	30.9/21.3

### Trinidad and Tobago

Rainfall for the month was below average to average. December’s rainfall total at Piarco in Trinidad was 109.7 mm or 72.3% of the 1981-2010 average. At Crown Point in Tobago, the total was 126.2 mm or 99% of the average. The longest span of consecutive dry-days (rainfall ≤ 1.0 mm) at Piarco during the month was 8 days and this occurred from the 7<sup>th</sup> to

14<sup>th</sup>. At Crown Point, the longest period of consecutive dry days was 11, which lasted from the 2<sup>nd</sup> to 12<sup>th</sup>.

Accompanying the drier than average conditions during the month were higher than average temperatures. At Piarco, mean daily temperatures averaged 26.8<sup>0</sup>C which was 0.9<sup>0</sup>C above the average, while maximum temperatures averaged 32.2<sup>0</sup>C and peaked at 33.8<sup>0</sup>C, which is 0.4<sup>0</sup> C below the highest temperature ever recorded for December. At the same time, the mean minimum temperature of 23.2<sup>0</sup>C was 0.7<sup>0</sup>C above the Normal, indicative of warmer than average nights. However, the lowest temperature recorded for the month was 21.7<sup>0</sup>C. At Crown Point, temperatures averaged 27.8<sup>0</sup> C with maximum temperatures peaking at 31.9<sup>0</sup> C.

The few episodes of moderate rainfall from the middle of the month onward provided some relief for crops and animals from the drier conditions earlier in the month. At the same time the predominantly dry first half of the month would have eroded soil moisture content and water available for agriculture gained during November. The decrease in rainfall for rain-fed crops would have increased the potential for water stress, especially in newly planted crops, transplanted seedlings and developing crops during the first 15 days of the month. At the same time, the drier conditions would have been beneficial for fieldwork in general, and also, would have been unfavourable to some agriculture fungi, bacteria and insects.

### REGIONAL OVERVIEW ON SEASONAL CLIMATE FORECAST

**El Niño** conditions have been looming for some time now, with El Niño type Sea Surface Temperatures (SSTs) being exhibited, being 0.9 °C above average. ENSO-neutral conditions still persist, but most models suggest a maintenance of the SSTs between 0.5-1.0°C above average during the next few months and up until May 2015, initiating a weak El Niño event. This is a development the region should continue to monitor closely, as it may still have implications for rainfall for the 2015 dry

season, There is a real chance for below-normal rainfall and above normal temperatures south of 20°N during the dry season and can increase chances for above-normal rainfall in the Greater Antilles and The Bahamas.

**Caribbean Sea Surface Temperatures (SST)** are 1°C above-average north and north-east, but average east, of the Caribbean. However some cooling is expected. **The Trade Winds** are around about average at this time but could get stronger during the forecasting period, particularly in the southern Caribbean around the ABC Islands. Above average temperatures would cater to above normal rainfall, but this could be negated if the El Niño develops.

**January to March 2015**

There is a better than average chance for normal to below normal rainfall in the Leeward and Windward Islands, the Guianas (except for Guyana), ABC islands, and in the vicinity of Jamaica and the Cayman Islands. In contrast, there is a better than average chance for normal to above normal rainfall in The Bahamas. There is less predictability over the remainder of the region.

**April to June 2015**

The Lesser Antilles, the Guianas (except Guyana) and The Bahamas are more likely to expect normal to above normal rainfall, while Cuba is more likely to experience normal to below normal rainfall. Low predictability exist over the remainder of the region.

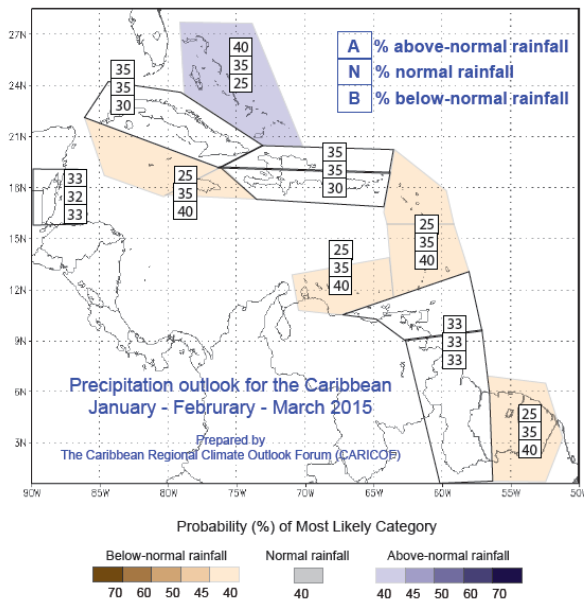


Figure 6 The January to March 2015 rainfall forecast

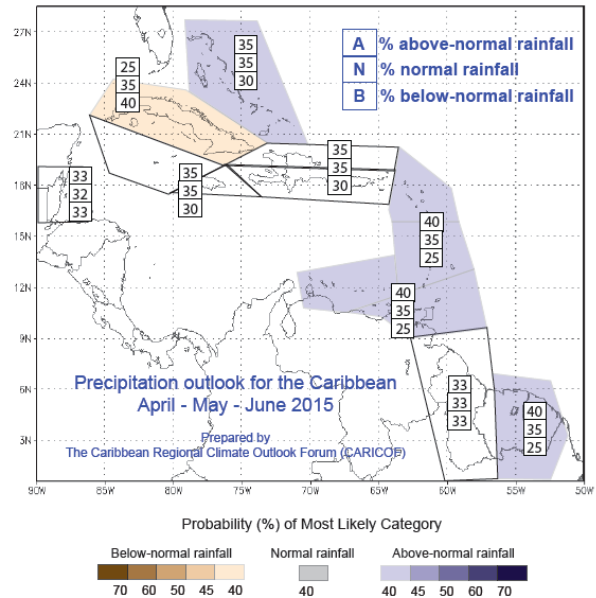


Figure 7 The April to June 2015 rainfall forecast

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