



**ANNOUNCEMENTS**

The Caribbean Agro-Meteorological Initiative (CAMI) is proud to announce the first Regional CAMI Monthly Bulletin. This bulletin seeks to provide monitoring and forecast information at the Caribbean basin scale, particularly for rainfall, which is seen as the most variable and limiting climate parameter in Caribbean agriculture. This bulletin also includes monthly review briefs submitted by the National Meteorological Services (NMS) of CAMI countries. CAMI will continue to encourage and assist its NMS in developing their own national bulletins. As training continues through 2012, more agri-relevant information will be included. CAMI collaborators welcome feedback from farmers and the wider agricultural community on this bulletin, indicating usefulness, relevance, appropriateness of language and possible changes to be made.

**REGIONAL OVERVIEW ON WEATHER AND CLIMATE FOR SEPTEMBER 2011**

Rainfall experienced in CAMI islands of the eastern Caribbean varied. Tobago, St. Lucia and Antigua were generally near-normal; Grenada, St. Vincent and Barbados above normal; Trinidad normal to above normal; and Dominica normal to below normal. From west to east in Guyana conditions were normal to below normal. Further to the west, Jamaica was generally near-normal. In Belize the north and south of the country were above normal and the remainder near-normal.

Most annual cropping takes place over a period of about three months or just over. A look at the three month rainfall totals ending in September shows that apart from in the very south, conditions in the islands of the eastern Caribbean were varying degrees of above normal. Trinidad and Grenada were normal and Tobago below normal. For the three month period, Guyana, rainfall was normal in the west and below normal in the east. In the western Caribbean, conditions in Jamaica ranged from very wet in the west to near-normal in the east; and in Belize the south was near-normal and the north above normal.

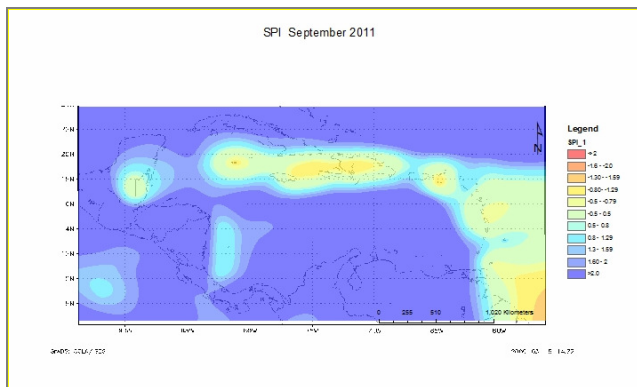


Figure 1. Standardised Precipitation Index (SPI) for the Caribbean for September. More information on the SPI can be viewed at (<http://63.175.159.26/~cdpmn/spimonitor.html>)

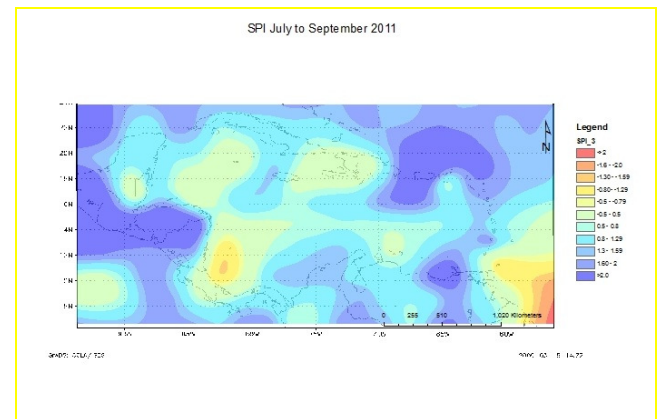


Figure 2. SPI for the Caribbean for July to September. More information on the SPI can be viewed at <http://63.175.159.26/~cdpmn/spimonitor.html>

Temperatures in the region were generally above normal. The national overviews that follow elaborates these points.

## NATIONAL OVERVIEWS

### Antigua and Barbuda

Above average rainfall was experienced for September with 174.2 mm (6.86 inches - island average); this was 121% of the normal total. At Coolidge, the number of rainy days/wet days of 16 was above normal with six heavy rainfall days ( $\geq 10$  mm). Tropical cyclones were responsible for over 80% of the total with rainfall from Katia, Maria and Ophelia. The mean temperature at Coolidge for September of 27.5°C was below normal; the mean daily maximum and minimum temperatures were near normal, 30.6°C and 25.0°C respectively.

Excess rainfall has resulted in a significant reduction in agricultural products. This is because the rainfall has caused moderate crop losses and has hampered field preparations. Significant losses have occurred due to soil erosion and root rot. Also, bacteria, fungi and weeds have been issues related to the excess rainfall. All products are down and in some cases scarce.

### Barbados

Two of the four systems which developed over the tropical Atlantic during September, namely Hurricane Katia and Hurricane Maria had a direct impact on Barbados' rainfall during the month. Although Hurricane Katia passed well to the north of the island chain, the resulting light wind- regime contributed to some localized shower activity across Barbados between September 1<sup>st</sup> and 4<sup>th</sup>, with this activity affecting mainly central and western districts.

Showers were more widespread with the passage of Tropical Storm Maria which passed just about 120 miles to the north of Barbados between September 9<sup>th</sup> and 10<sup>th</sup>. As a result, the first dekad (ten day period) produced 129.6mm of rainfall at Lears in St. Michael and 159.4mm at Golden Ridge, St. George. In contrast, there was no rainfall recorded at the

Airport during the first four days of the month, but this climbed to 88.8mm between 5<sup>th</sup> and 10<sup>th</sup>.

Another significant rain-spell occurred between September 14<sup>th</sup> and 18<sup>th</sup> as a trough system pulled the ITCZ northward across the island chain, resulting in rainfall in excess of 80mm (just over 3 inches) at the three (3) previously mentioned rainfall stations.

Intermittent showers continued to affect the island up to the 24<sup>th</sup> of September, but a dry spell ensued thereafter, which was in direct contrast to the weather conditions experienced over the remainder of the island chain due to a feeder band from Hurricane Ophelia that produced showers over the northern Lesser Antilles.

Total rainfall at the Grantley Adams International Airport for September was 191.8mm which is slightly above the long term average of 176.8mm but well below the September 2010 total of 303.8mm. Golden Ridge and Lears observed totals of 253.2mm and 264.2mm respectively.

Light winds from the south and southwest, which were observed for much of the month contributed to the very hot and humid conditions across the island. The maximum temperature recorded for September was 32.3°C which was also the highest temperature recorded for the year so far.

### Belize

A summary of rainfall totals for the three dekads in September, 2011 showed the north of the country experienced a deficit (ranging between 10 to 45%). For central Belize the surplus in rainfall registered was between 3 to 28%. Only Chaa Creek (CCK) in the west of the country measured a surplus (near 26%). The rainfall totals for the stations in the south were all above normal. The surpluses here ranged between 10 to 98% above average.

### Dominica

Rainfall for September varied widely in Dominica. The Melville Hall Airport which is located on the eastern coast of the island recorded 236.1mm, which was below the normal rainfall record of 319.1mm. The Canefield Airport on the other hand, which is located on the western coast, received a total of

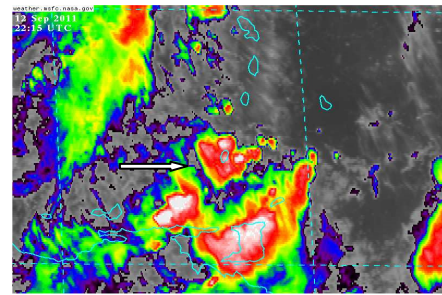
416.6mm, about 60% above the average. September is on average the wettest month for Canefield.

During the month of September, Dominica experienced a number of heavy rainfall events from troughs to spiral bands of Tropical Storms Maria and Ophelia. During the weekend of September 16<sup>th</sup> to 18<sup>th</sup> the south of the island recorded rainfall in excess of 125 mm (5 inches) as a result of a trough across the Eastern Caribbean. In the communities of Rosalie to Laplaine, there were seven landslides and flooding. This event caused damage to farms and a halt in vehicular traffic in that area. Rain gauges in Laplaine and Grandfond recorded 137.2 mm (5.4inches) and 3.5inches respectively for Sunday September 18<sup>th</sup>.

On September 28, rainfall from a rain band from tropical storm Ophelia caused major flooding. In the south western portion of the island houses, vehicles and roads were washed away as rivers, ravines, waterways and gullies overflowed. At the Canefield Airport a total of 157.4mm was recorded, while Springfield and Pond Casse recorded 225mm and 230.8mm respectively. The highest intensity for the above mentioned areas occurred between 8am and 10am that day.

**Grenada**

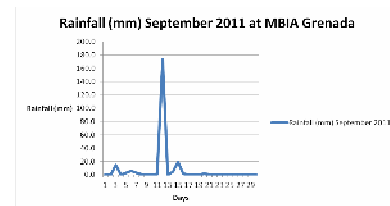
The Maurice Bishop International Airport (MBIA) recorded 229.0 mm of rainfall for the month of September, 2011. This is well above September’s average of 135.0 mm and the third (3<sup>rd</sup>) highest for that month. On the 12<sup>th</sup> September, a spiral band associated with Tropical Storm Maria produced 172.9 mm at the MBIA. This is the second highest 24-hour rainfall for that station (the highest is 177.5 mm which occurred on the 24<sup>th</sup> July 1990 in association with the passage of Tropical Storm Arthur). Only 29.0 mm of rain occurred after for the month at that station and limited rainfall prior.



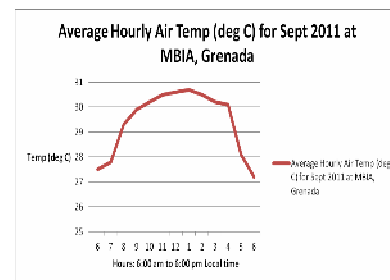
**Figure 3. Infrared Satellite Imagery 12<sup>th</sup> September, 2011 (local time)**

On many days, the air temperature reached to near 30 °C as early as 8:00 am and remained above that mark until 4:00 pm local time (See Fig 5). The average and highest Maximum temperatures for September were 31.2 and 32.3 degrees Celsius respectively.

Combined with September’s usually high and longer duration daytime temperatures, the low rainfall to the latter part of the month had farmers and water resource personnel concerned about a possible repeat of the 2009/2010 drought. Reports of shriveling cash crops were among the most popular farmers feedback regarding the low rainfall and high temperatures. Noteworthy, this followed the below-average rainfall of 99.9 mm (average is 135.0 mm) for August 2011 at the MBIA.



**Figure 4. Rainfall (mm) for September 2011 at the Maurice Bishop International Airport, Grenada**



**Figure 5. Average Hourly Air Temperature (degree Celsius) for September 2011 at MBIA, Grenada**



### Guyana

Despite occasional heavy rainfall, the month of September was fairly dry. The climatological average rainfall for the month of September is 97.5mm; however an average distribution total of 73.0mm was recorded for this month across Guyana. The highest daily rainfall of 84.2mm was recorded at Fort Island, Region 2 on the September 27<sup>th</sup>. Other maximum rainfall amounts recorded during this period was 35.3mm at Wales, Region 3 on 6<sup>th</sup>, 70.1mm at Ebini, Region 10 on the 12<sup>th</sup>, on the 16<sup>th</sup> 50.8mm recorded at Fort Island Region 2, 68.5mm at Anna Regina, Region 2 on the 20<sup>th</sup>, and 57.2mm on the 22<sup>nd</sup> at Laluni, Region 4 respectively. The effect on the agricultural sector as a result of these heavy rainfall events was minimal.

Most stations reported temperatures of nearly 1 °C or more above the normal maximum (31.8°C) and minimum (22.1°C). Highest mean maximum air temperature was 34.3°C, with the highest daily maximum air temperature for the month reported at the National Weather Watch Centre, Timehri on the 5<sup>th</sup> with 35.8°C. The mean minimum air temperature recorded at the National Weather Watch Centre, Timehri was 22.1 °C. Sunshine values were above average everywhere for September with the highest amounts of sunshine recorded at NWWC, Timehri being 11.4 hours on the 30<sup>th</sup>.

Table 1. Average reports for synoptic stations in Guyana

Synoptic station	Total Monthly Rainfall (mm)	# rain days (>1m)	Ave. max Temp (°C)	Ave. min Temp (°C)	Ave. Sunshine Hrs
N.W.W.C	202.1	16	33.7	22.1	7.6
Georgetown	30.8	6	32.3	24.6	8.2
Ogle	29.4	4	32.0	24.4	***
Ebini	184.1	8	34.3	22.4	8.1
New Amsterdam	43.0	4	33.2	24.2	8.3
Lethem	88.0	15	33.4	24.3	8.2
Maabaruma	77.2	11	32.0	22.6	***

key \*\*\* - no record

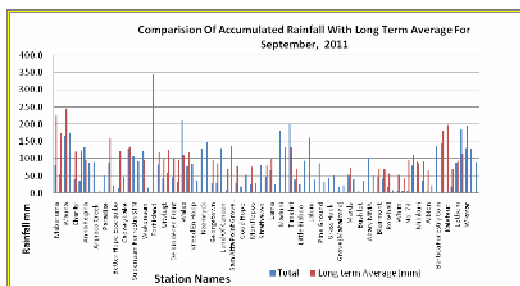


Figure 6. Comparison of accumulated rainfall along with long-term average for September 2011

### Jamaica

September marks the beginning of the primary rainfall season in Jamaica. This means that significant rainfall is expected across the island during this month and tropical storms and hurricanes usually contribute to the rainfall totals. Sangster in the north west recorded 149mm or 13% above the normal while Manley in the south recorded only 61mm or 57% below normal. There were only five rain days (>0.25mm) for Manley while there was 14 days for Sangster. The maximum temperatures was 35°C (29<sup>th</sup> September) for Sangster airport and 34°C (23<sup>rd</sup> September) for Manley. The maximum mean temperature was 33.7°C for the month at Sangster airport which exceeds the 1992-2010 mean by 0.9°C. Radar images confirmed that most of the rainfall activity for the month occurred over western and northern parishes and this would mean that most of the southern parishes received less rainfall. This might be the beginning of drought for farmers if this deficit in rainfall continues since the southern parishes represent most of the agricultural lands.

### St Lucia

Below average rainfall was recorded at both the GFL Charles and Hewanorra airports contrary to the general trend set since mid-2010. The total rainfall measured at Hewanorra was 162.5 mm which is 87.6 per cent of the 1972-2011 mean and at GFL Charles the total was 161.9 mm which is 72.8 per cent of the 1967-2011 mean. There were 21 rainy days (>0.1 mm) at Hewanorra with highest daily rainfall of 52.1 mm and 18 at GFL Charles with a highest daily measurement of 24.1 mm. Despite the below average rainfall there were some occurrences of torrential precipitation particularly during the two week period beginning on 08 September. Some flooding and minor landslides were reported, the most serious occurring in the Mabouya valley on Saturday 17<sup>th</sup> September. However, the impact of rainfall on the agriculture sector appears to have been minimal. Rainfall for the remainder of the year is expected to be normal to slightly above normal.

Average dry bulb (28.4°C) and maximum temperatures (31.5°C) were above normal at Hewanorra and this has been the trend for most of this year. The average minimum temperature was equal to the mean at Hewanorra but it too has been trending above normal this year.

**St Vincent and the Grenadines**

Hurricane Katia generated large waves on the east coast of mainland St. Vincent. Tropical Storm Maria was responsible for spiking the rainfall around the 8th and 9th and moist conditions lingered into the second dekad (ten day period) of the month and causing seas to be rough at ports hampering normal sea operations. The monthly total rainfall for September was above average, but it was not evenly distributed throughout the month. More than half (53%) the monthly total was collected by the first dekad. Meanwhile, the last dekad experienced less than 9% of the monthly total. There were 16 days with rainfall > 1mm. An eight day dry spell (daily rainfall <1mm) was broken on the last day of the month.

**Trinidad and Tobago**

Rainfall at the Observing station in Piarco International Airport, Trinidad recorded 234.9 mm. This amount was 18% above the long-term average (1971 to 2000). Rainfall at the A.N.R. International Airport, Crown Point, Tobago was 127.9 mm, 23% below the long-term average.

Rainfall at Piarco, by the second dekad, was 89% of the long-term average. On the first day of the 3<sup>rd</sup> dekad, rainfall amounts were equivalent to the long-term average. On the 12<sup>th</sup> and 17<sup>th</sup> of September, rainfall amounts totalled 93.3 mm and 50.7 mm respectively.

On the 16<sup>th</sup> September 2011, at Crown Point, rainfall total was 62mm which brought the rainfall total to 66% of the long-term average. There was a seven day dry spell beginning on the 24<sup>th</sup>.

Flooding was reported for both days in Trinidad, while none was reported in Tobago. No impacts to agriculture were reported.

Guyana that is likely to have normal to above normal, conditions in the remainder of the Caribbean should experience above normal conditions, with the highest certainty in the Eastern Caribbean. There is less certainty of such conditions in the north and northwest Caribbean.

Even though there has generally been normal rainfall in the Caribbean in the first month of this period, it is expected that the period will largely express above normal conditions particularly in the eastern Caribbean. These conditions are even more certain for the Windward Islands; and these conditions are likely to continue until the end of 2011. Guyana is expected to be near-normal until the end of the year.

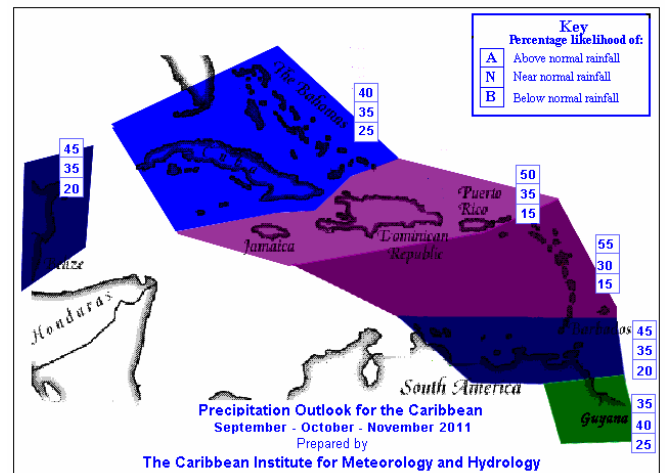


Figure 7. Precipitation outlook for the Caribbean September–October- November, 2011

**Caribbean Air Temperatures:**

The 2 m air temperatures are expected to be above normal across the Caribbean basin, particularly in the region of the eastern portion of the chain. These temperatures will approach normal in 2012, with the region of above normal petering out toward the eastern Caribbean with time.

**ENSO Conditions:**

Neutral to weak La Niña conditions existed in the Pacific at the beginning of the forecast period (1 September 2011). The La Niña continued to developed over the past month and it is expected to further strengthen into the northern hemisphere winter. La Niña conditions often result in above normal rainfall during the late wet season and

**REGIONAL OVERVIEW ON SEASONAL CLIMATE FORECASTS**

The rainfall outlook for the Caribbean for September to November suggests that apart from

following dry season. If this is the result, it re-enforces the likelihood of continued above normal rainfall in the region. This follows on the heels of above normal conditions that existed since the latter half of 2010 to present.

*Prepared by*

Caribbean Institute for Meteorology and Hydrology (CIMH) and the National Meteorological Services of  
Antigua and Barbuda, Barbados, Belize, Dominica, Grenada, Guyana,  
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