Monthly Bulletin
Ministry of Agriculture
Hydrometeorological Service

June 2017

"To observe, archive and understand Guyana's weather and climate and provide meteorological, hydrological and oceanographic services in support of the Guyana needs and national and international obligations."

HYDROMETEOROLOGICAL BULLETIN

Hydrometeorological Service, 18 Brickdam, Stabroek, Georgetown
www.http://hydromet.gov.gy | Tel #: 592-225-9303 | Fax #: 592-226-1460

Highlights for June 2017 Bulletin

- Guyana classified as *Very Wet* for the month
- Observed rainfall consistent with Historical Average – *equal number of stations recorded below and above normal rainfall.*
- Warmer than average conditions dominated across much of the Earth's surface: Third highest May temperature recorded in 138 years.
- Chance for extremely wet weather condition for June – August 2017 is low, but still a bit higher than usual.
- ENSO-neutral conditions favored.

INSIDE THIS ISSUE

Below: Participation by the Hydromet Service staff at Farmers Day Exhibition at Cuffy Square.

Review of Synoptic Systems that influenced the Weather Conditions for June 2017

During May 2017, Guyana experienced *Wet* to *Very Wet* conditions. Systems responsible for the prevailing weather conditions includes the northward migration of the Inter–Tropical Convergence Zone (ITCZ) along with the movement of Easterly Waves / Tropical Waves, across the Western Atlantic and over Guyana. The interactions of the former and later resulted in the induced troughs of low pressure at the lower and mid-levels along with ridging at the upper levels in the troposphere.

Throughout the month, The ITCZ was found oscillating between latitudes 5° to 9º North, while in some cases to the East of Guyana (Between Surinam and French Guyana) and to the north of Guyana along the Coast or over the Atlantic Ocean in other instances. In addition to the ITCZ, tropical waves were passing at intervals one every four to five days. Below is a review of the dominant system(s) influencing the weather conditions throughout the month.

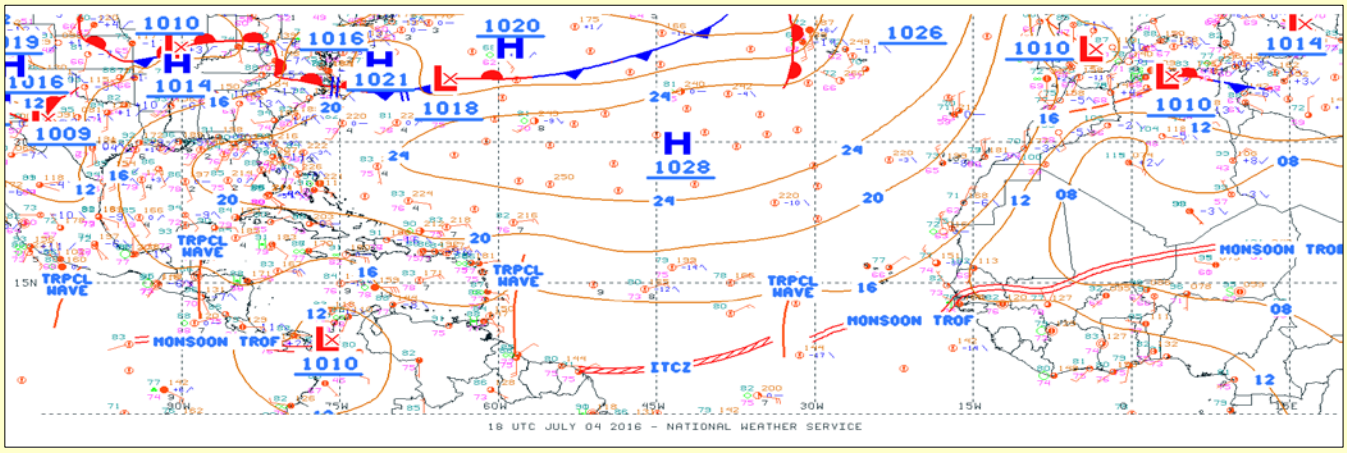


Figure 1 Surface chart showing interaction between ITCZ and Tropical wave over Coastal Guyana

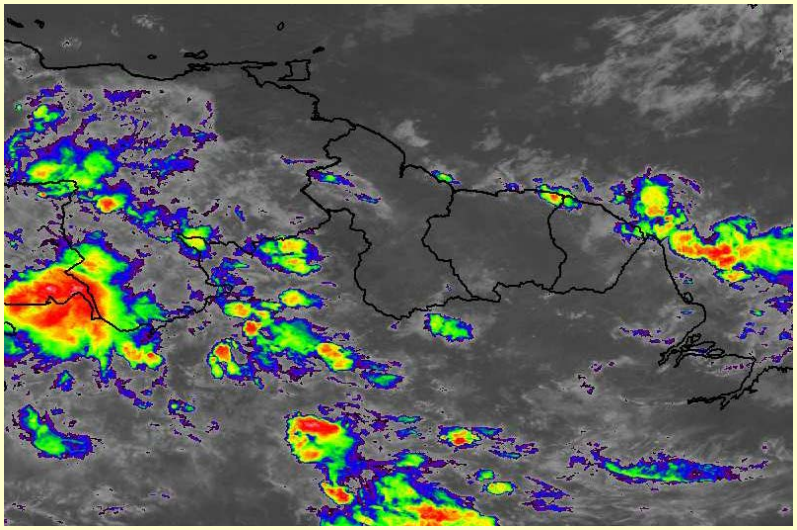


Figure 2 Satellite image (valid May 07, 2017 at 09:15 local time) showing deep convection to the South West and East of Guyana

Throughout the month, interaction between Tropical waves and the ITCZ (shown in Figure 1 above) was responsible for the observed weather condition. This resulted in rainfall amounts in excess of three (3) inches within a 24 – hour period on several occasions (Region 4 at Georgetown recorded 83.0 mm on May 05, 2017). The ITCZ continued to be active throughout the month, however, as can be seen from Figure 2 to the left, the position of the ITCZ resulted in reduced rainfall amounts at times. This pattern continued to repeat itself over the period as shown in the figures below.

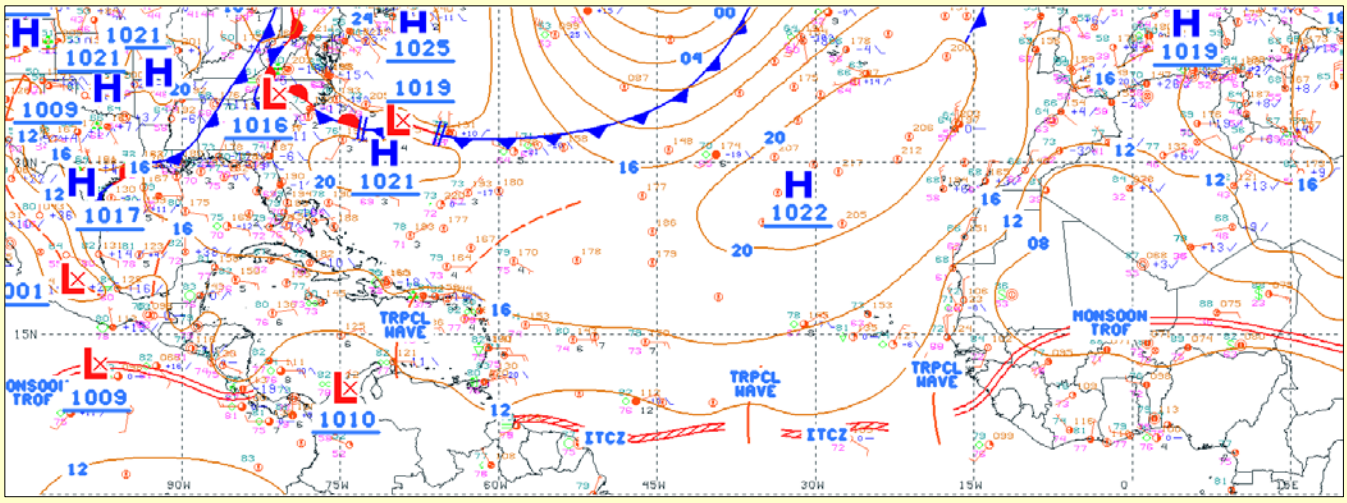


Figure 3 Surface chart (valid May 22, 2017 at 02:00 local time) showing interaction between ITCZ and Tropical wave over Coastal Guyana

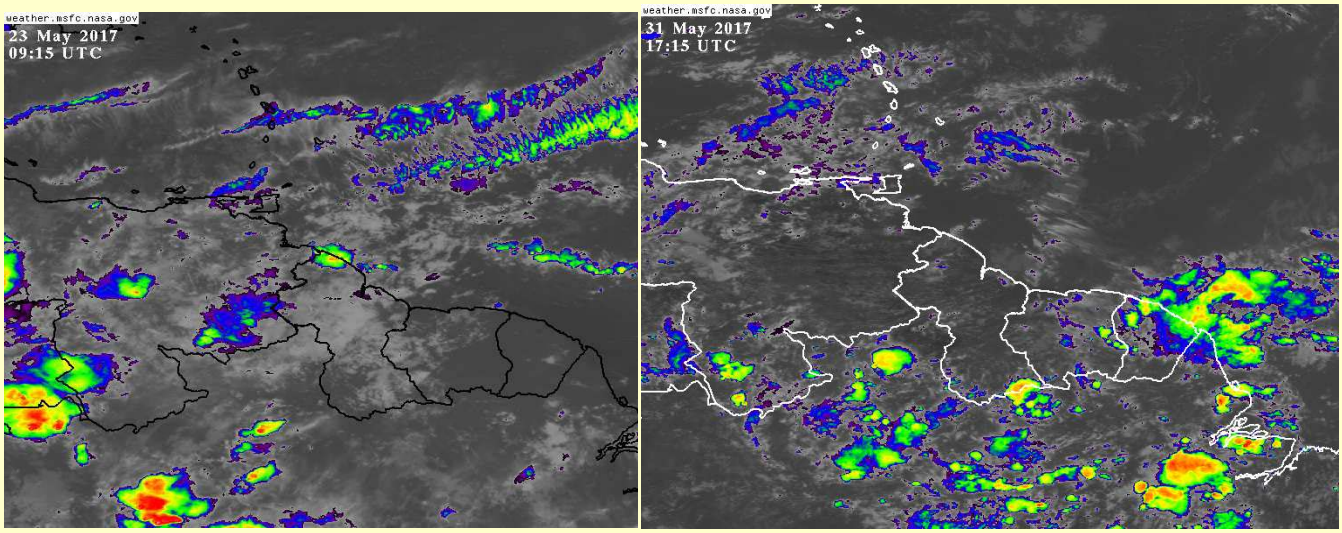


Figure 4 Satellite image valid May 23, 2017 and May 31, 2017

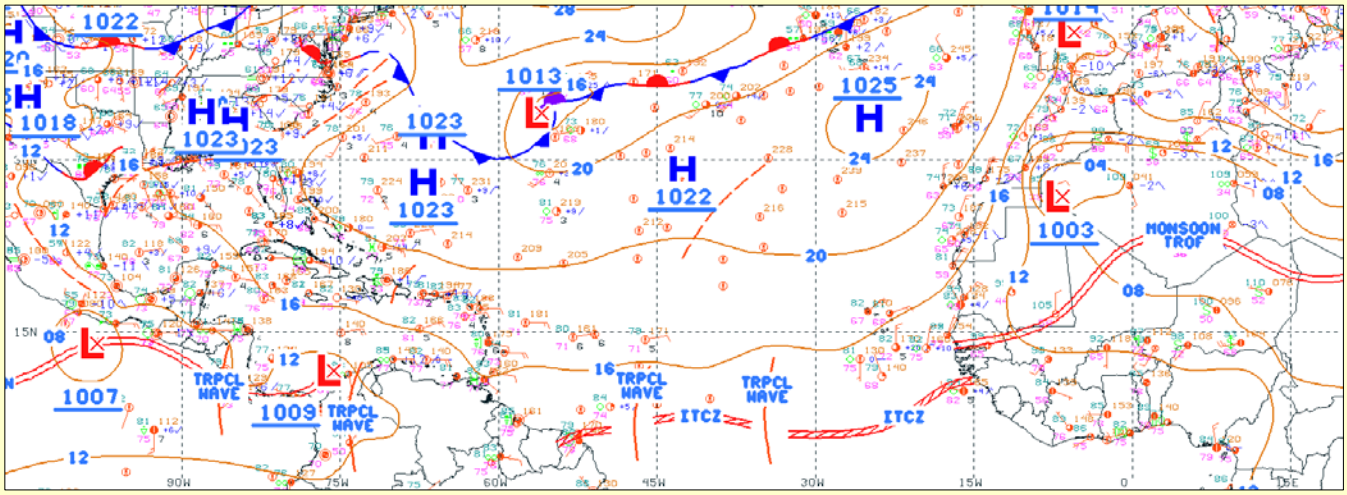


Figure 5 Surface chart (valid May 31, 2017 at 08:00 local time) showing interaction between ITCZ and Tropical wave over Coastal Guyana

Review of Seasonal Outlook provided in April.

Below is a brief review of the Seasonal Outlook for Guyana which was provided by the Hydrometeorological Service earlier in April 2017.

Precipitation: All Regions across Guyana should have expect *above-normal* rainfall for the period April to June 2017.

Usually, Guyana would experience 41 to 55 wet days during this season, however, 43 to 60 were expected for April – June 2017, with the maximum in Region 4 and 5. This would have indicated the possibility of water accumulation; hence, maintenance of drainage was advised. The regional normal rainfall accumulation for this season can be seen in the figure to the right.

Temperature: Region 4 expected warmer temperatures than normal (26.9 °C) while all other locations expected near-normal temperatures.

Drought: Drought is not a concern at this moment. The above-normal rainfall for this coming season is expected to recharge reservoirs, conservancies and aquifers to satisfactory levels.

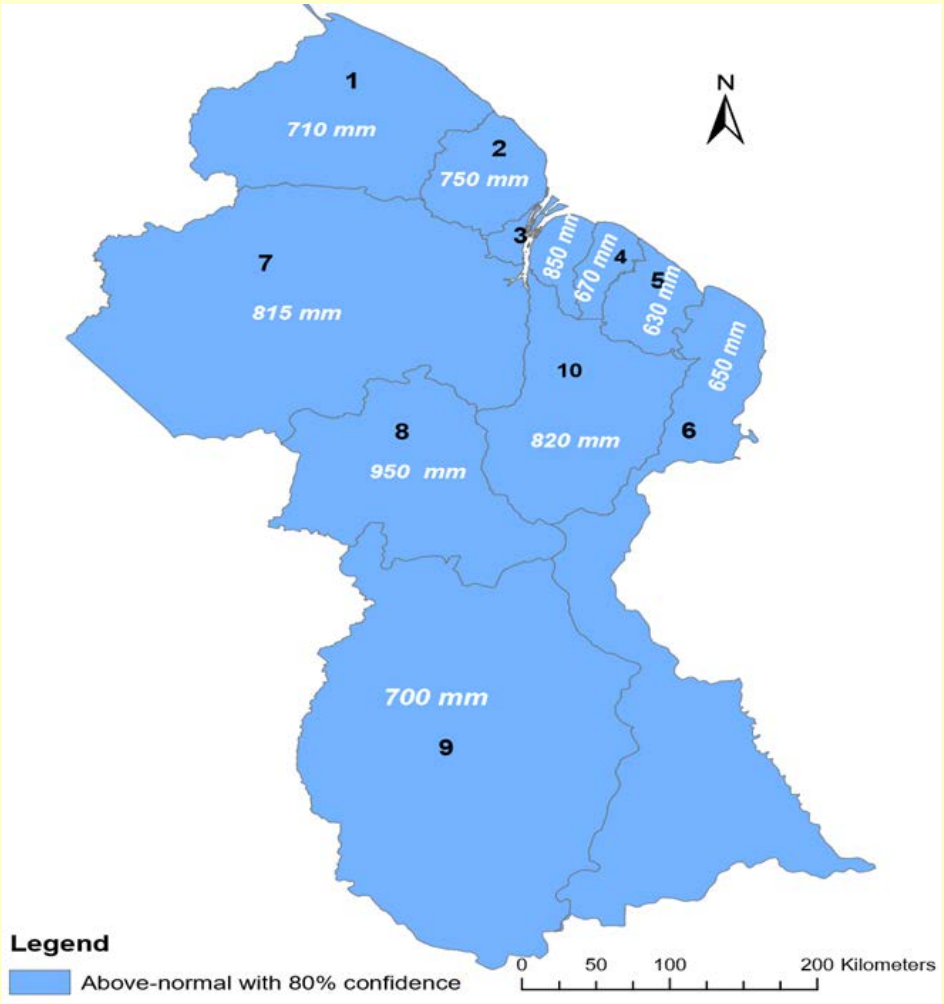


Figure 6 Map of Guyana showing rainfall Seasonal Normal and probabilistic forecast[1] across Guyana for period April to June 2017.

[1]The forecast and projection above was prepared taking into account the usual Climatological trends along with current dynamical models and Climate Prediction Tools (CPT)

Review of Climatological Trends and Comparison with Year to Date Rainfall

What Usually occurs: May – June – July compared to observed rainfall

The month of May generally finds Northern Guyana transitioning into its primary rainy season. During this period, the northwards migration of the ITCZ is usually the main contributing system responsible for the rainfall events. Apart from the ITCZ, the weather during this period can also be influenced by other less significant contributors such as Tropical Waves, Surface Troughs and localized convections.

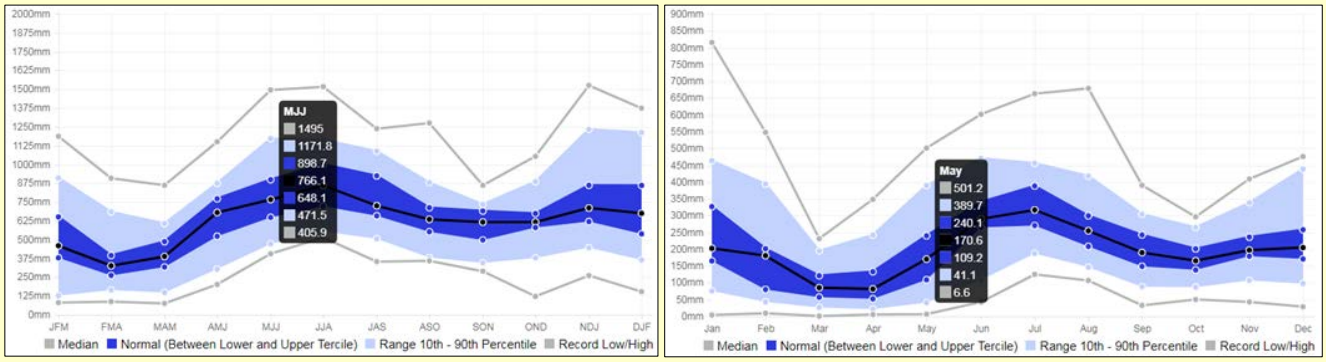
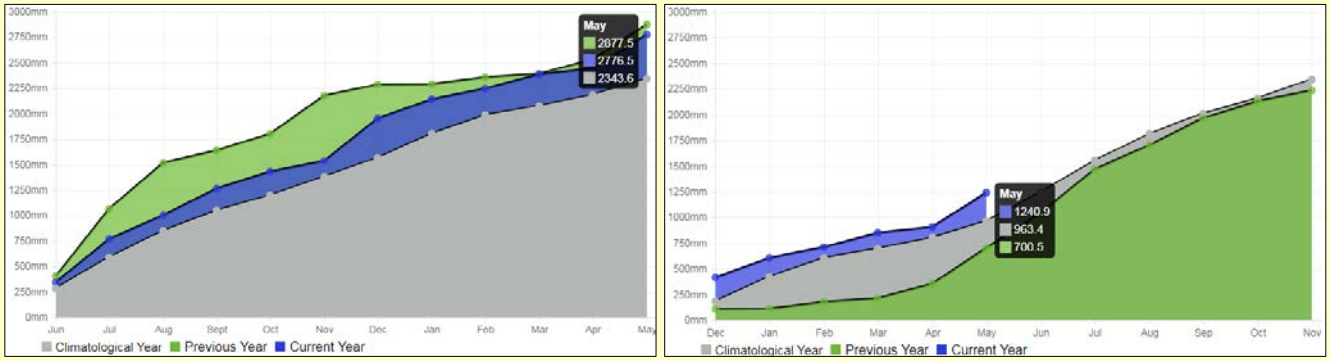


Figure 7 Seasonal and monthly rainfall variation for Region 1 at Mabaruma with emphasis for MJJ and May.



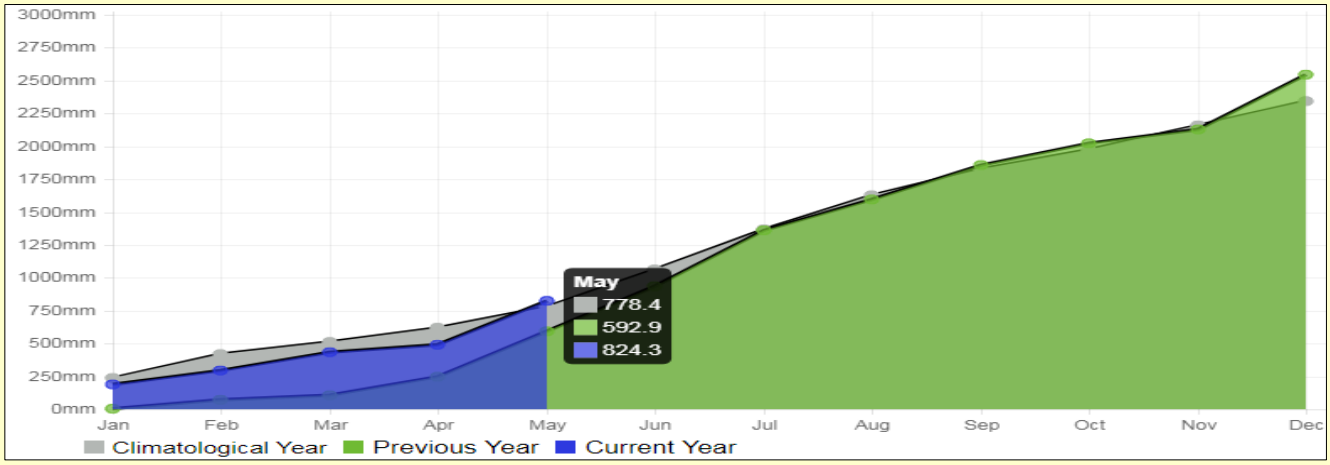


Figure 8 Graph showing Accumulated Rainfall (up until May 2017) for (a) Water Year - June to May (b) December to November Year (c) Calendar Year, and comparison with Climatological and Previous year for Region 1 at Mabaruma

Figures 8a, 8b and 8c above shows a comparison of the monthly accumulated rainfall for the current year along with the previous year and the Climatological years for Region 1 at Mabaruma. As shown in figure 8c, the accumulated rainfall for 2017 trailed the climatological accumulated values up until April as a result of a deficit in rainfall amount at the beginning of the calendar year. It was only until May that the accumulated rainfall was consistent with the accumulated climatological normal. This was due to a sharp increase in rainfall for May 2017 (shown by the noticeable change in the gradient of the blue plot in the figure). A comparison between figures 8a and 8b, that is the *Water Year* (June to May) and Dec – Nov year with figure 8c (*Calendar year*) was also done.

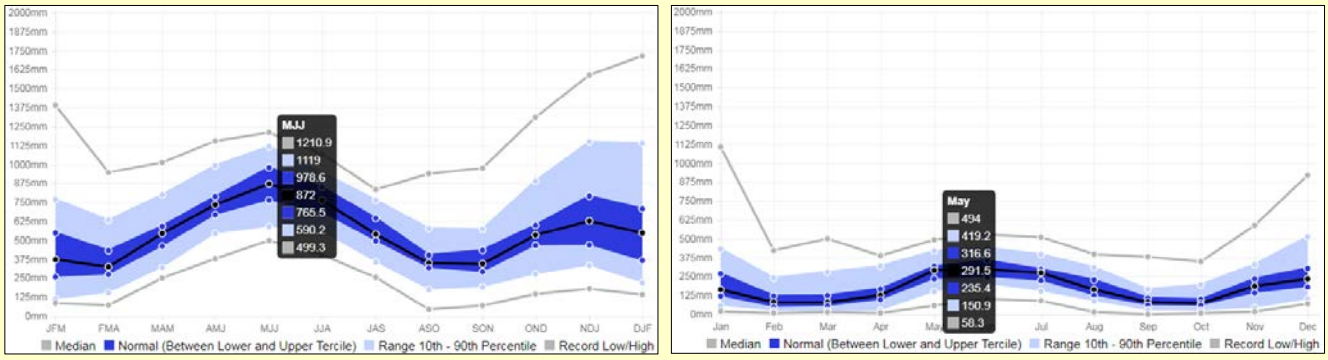
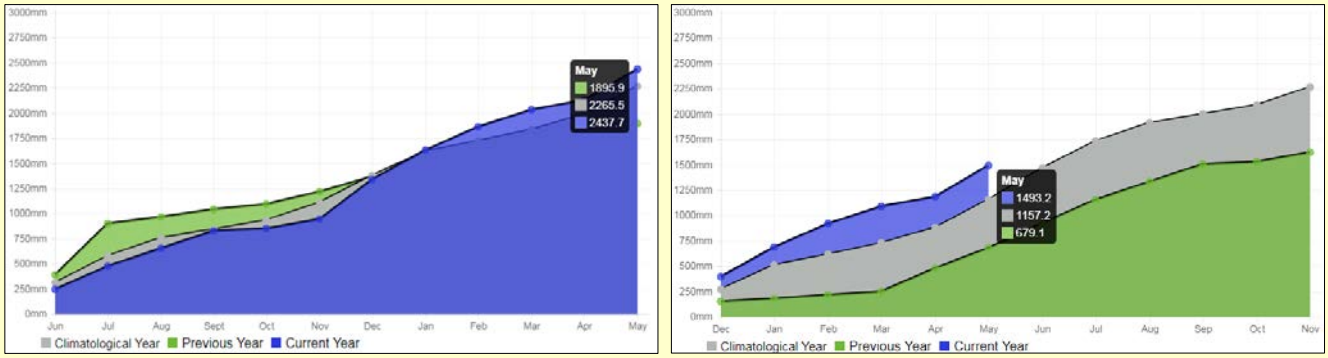


Figure 9 Seasonal and monthly rainfall variation for Region 4 at Georgetown with emphasis for MJJ and May.



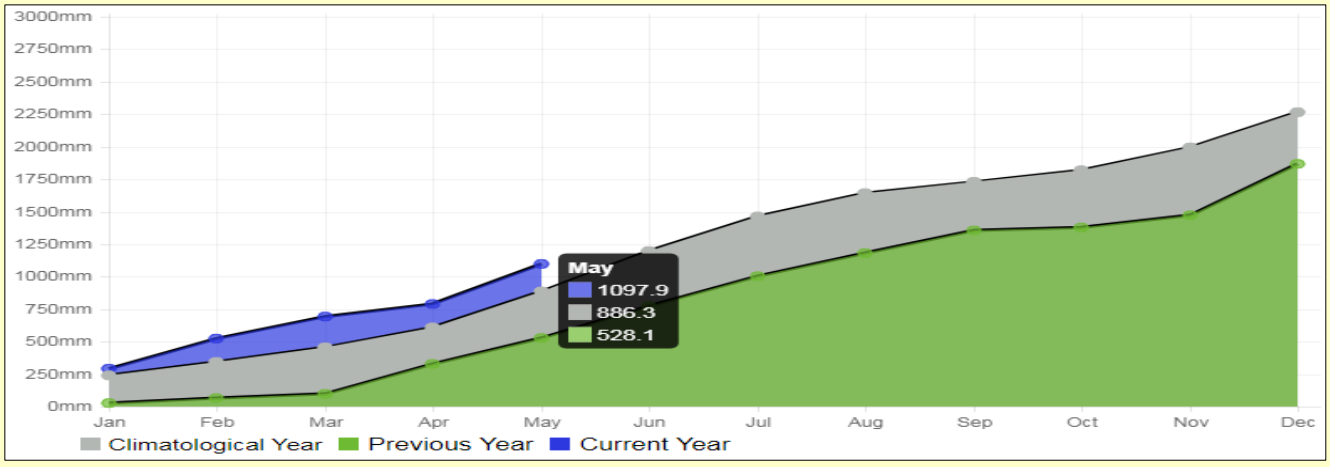


Figure 10 Graph showing Accumulated Rainfall (up until May 2017) for (a) Water Year - June to May (b) December to November Year (c) Calendar Year, and comparison with Climatological and Previous year for Region 4 at Georgetown

The most noteworthy observation made was that in contrast to the calendar year, for the water year and the Dec – Nov year, the current year accumulated rainfall was always consistently above the accumulated climatological normal, however, this can be explained as a result of the excess rainfall amount observed in December 2016.

For other location such as Georgetown, Skeldon and Ebini, the observed trend was more consistent with the usual condition. The observed accumulated totals were reasonably consistent, with values only slightly above the accumulated climatological normal

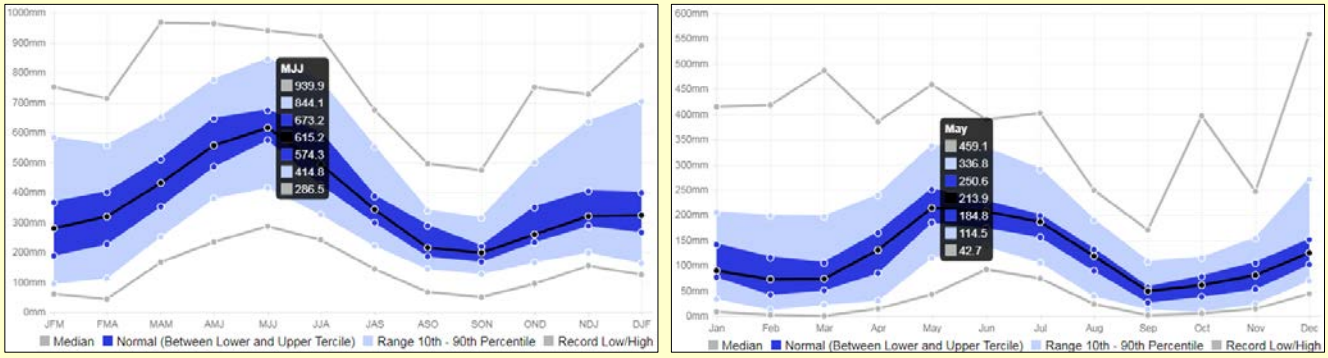


Figure 11 Seasonal and monthly rainfall variation for Region 6 at Skeldon with emphasis for MJJ and May.

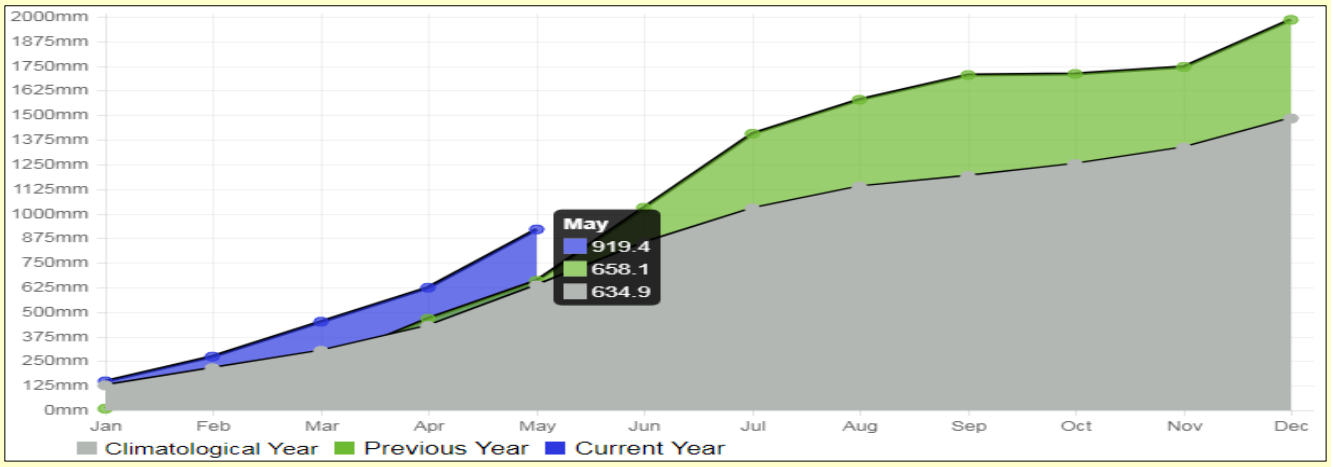


Figure 12 Graph showing Accumulated Rainfall (up until May 2017) for (a) Water Year - June to May (b) December to November Year (c) Calendar Year, and comparison with Climatological and Previous year for Region 6 at Skeldon

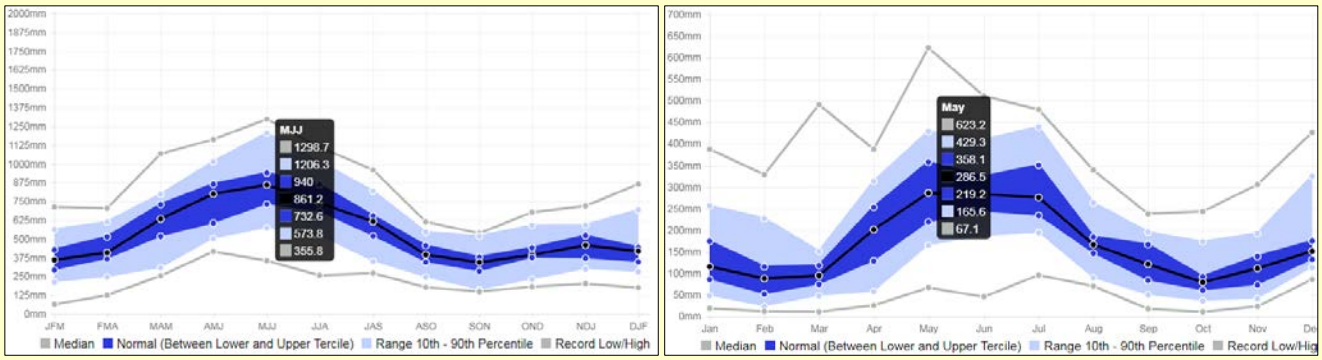
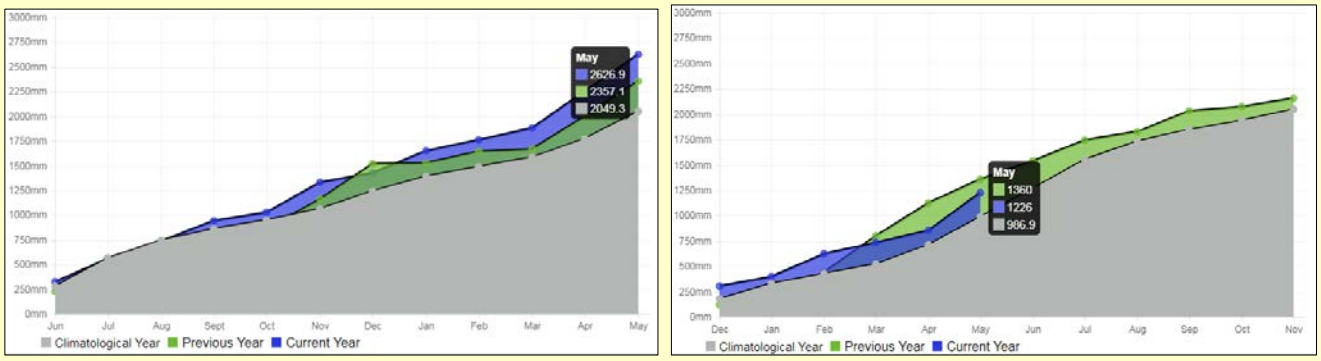


Figure 13 Seasonal and monthly rainfall variation for Region 10 at Ebini with emphasis for MJJ and May.



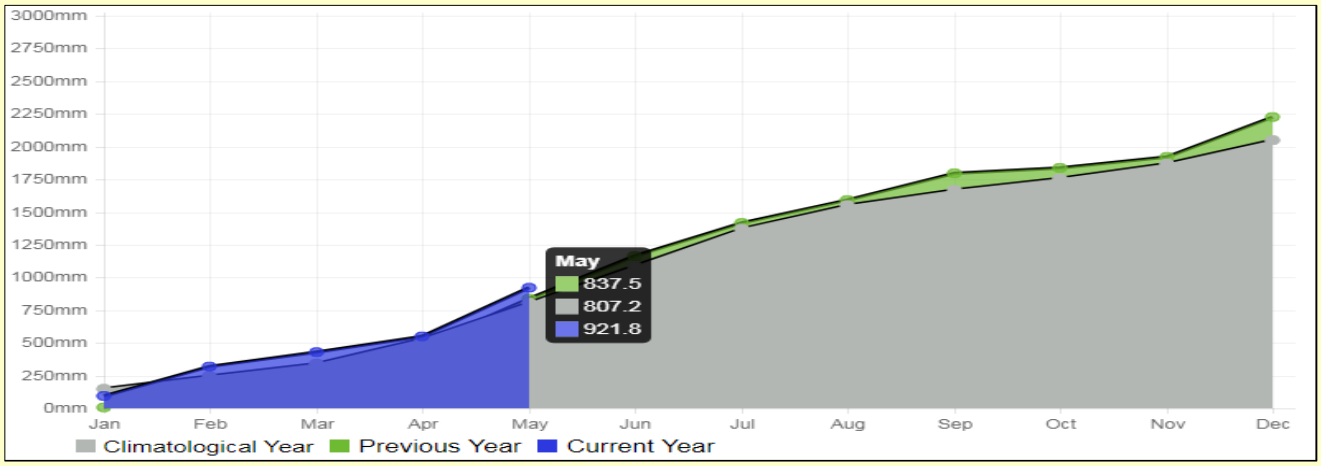
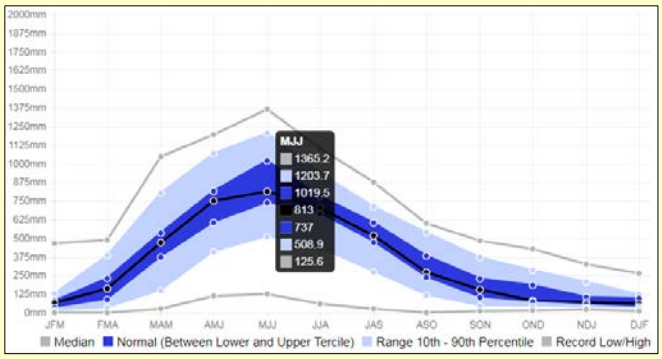


Figure 14 Graph showing Accumulated Rainfall (up until May 2017) for (a) Water Year - June to May (b) December to November Year (c) Calendar Year, and comparison with Climatological and Previous year for Region 10 at Ebini

Similarly to Mabaruma, Georgeotwn, Skeldon and Ebini also recorded a noticeable change in their rainfall patern. for May. Region 9 at Lethem observed accumulated rainfall was always consistent with the climatological trend, however, there was a significant observed rainfall for the month of March, which resulted in accumulated amount significantly above the accumulated climatological normal, notwithstanding, the general trend remain similar to the Climatology.



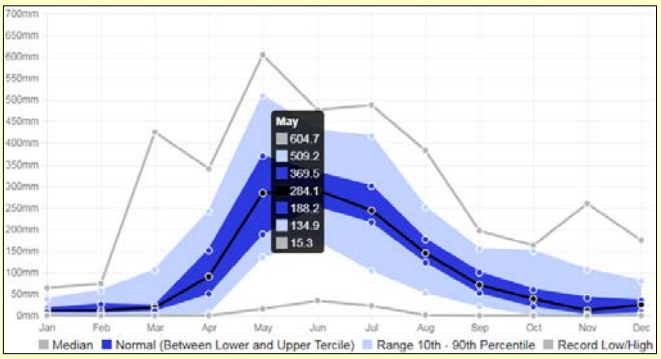
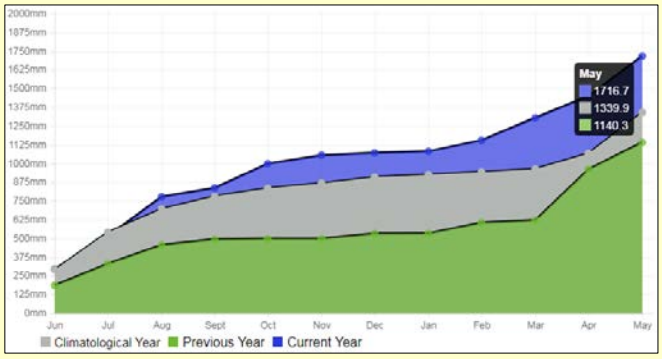
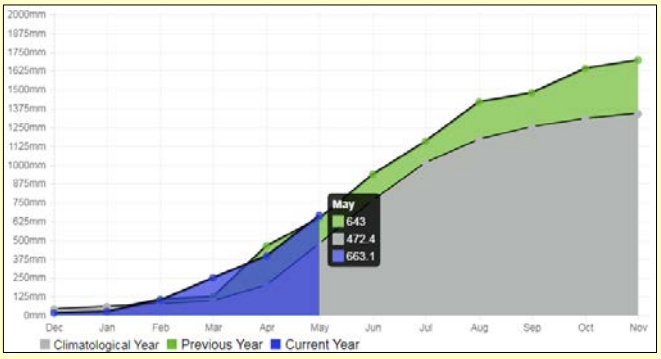


Figure 15 Seasonal and monthly rainfall variation for Region 9 at Lethem with emphasis for MJJ and May.





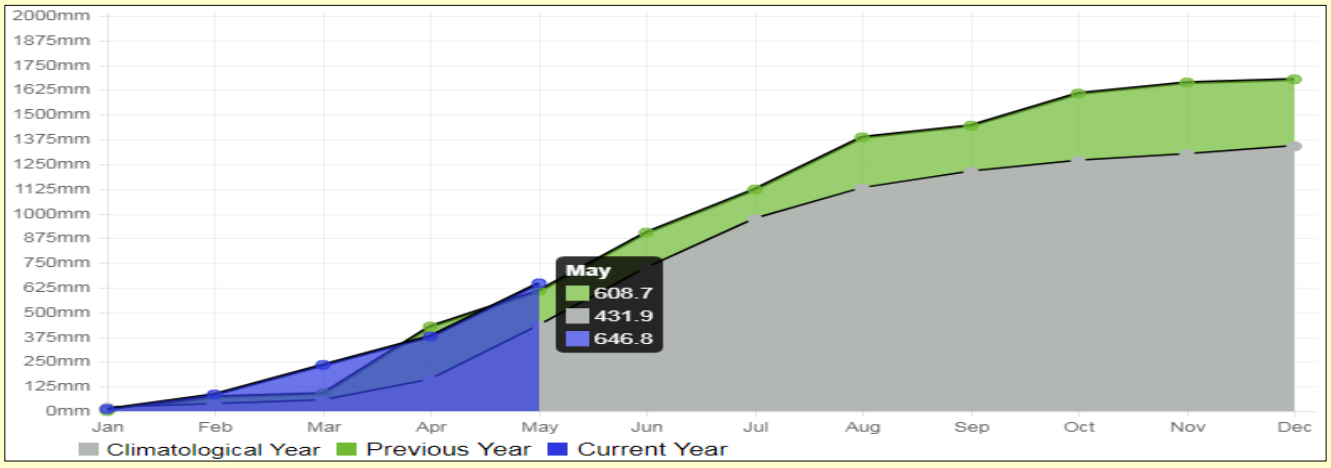


Figure 16 Graph showing Accumulated Rainfall (up until May 2017) for (a) Water Year - June to May (b) December to November Year (c) Calendar Year, and comparison with Climatological and Previous year for Region 9 at Lethem

May 2017 Rainfall Analysis

Guyana was classified as Very Wet (VW) for the month of May 2017, with a nationwide average rainfall of 302.6 mm distributed over 20 rain days

A detailed comparison of the May 2017 rainfall with the historical average for selected stations can be seen in Figure 17 below.

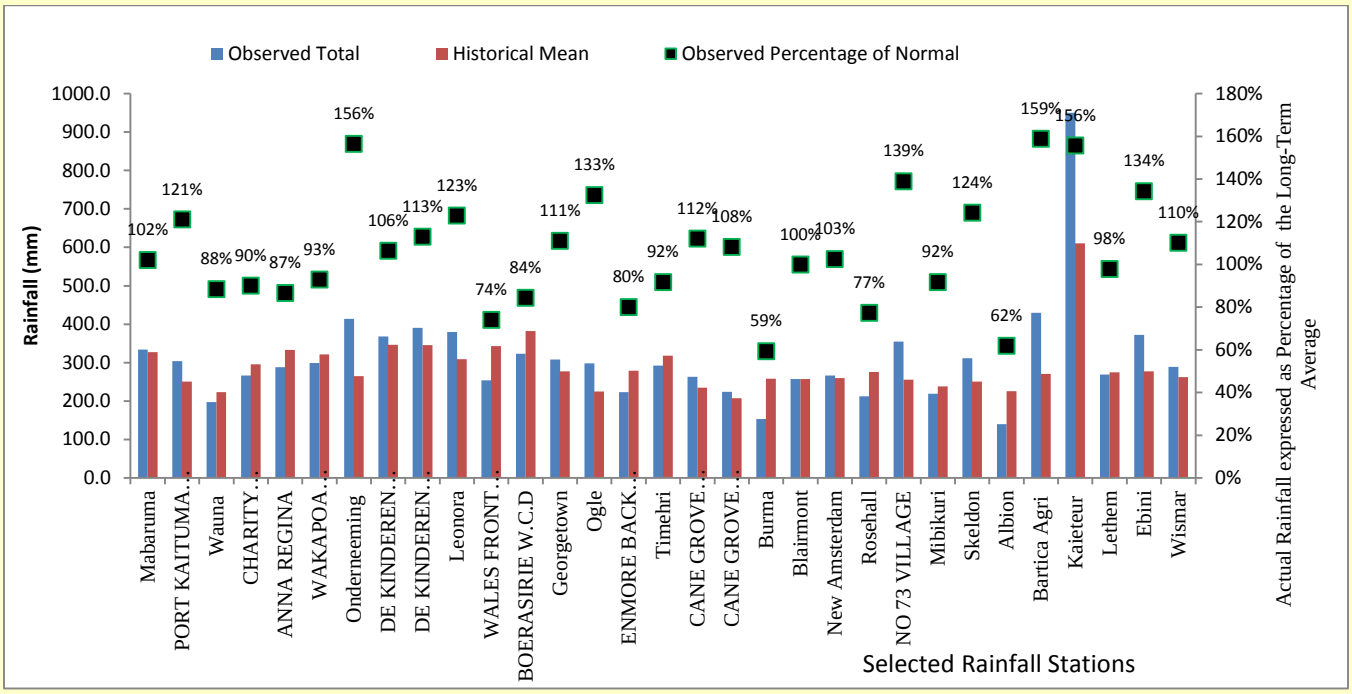


Figure 17 Comparison of the aaccumulated observed Rainfall for May 2017 expressed as a percentage of the Historical mean

According to the records collected and processed by the Hydromet most locations recorded rainfall amounts consistent with their historical averages. Along Coastal Guyana, Onderneeming in Region 2 recorded the highest deviation of 56% above its historical average at an observed total rainfall of 413.6 mm for the month. The second highest deviation from its historical average was recorded in Region 5 at Burma, however, in this instance, the rainfall amount was below the historical average by 41% at an observed total rainfall of 152.9 mm. Other noteworthy location where the observed rainfall amounts was less than consistent with their historical averages includes No. 73 Village, Bartica, Kaieteur, and Ebini

Details of the temporal distribution of daily rainfall for several locations are shown in Figure 18 to the left.

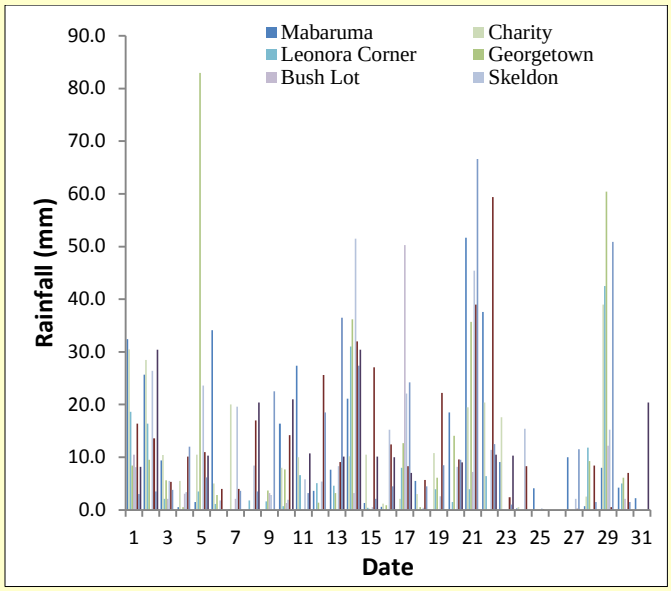


Figure 18 Temporal distribution of daily rainfall for May 2017 for selected stations throughout Guyana

Further analysis of the rainfall amount in Figure 17 above was done and the results presented in Figure 19 below as a histogram. The horizontal axis shows May 2017 accumulated rainfall expressed as a Percentage difference of the long-term average, with –ve values indicating rainfall amounts below the historical averages, while +ve values represent rainfall amounts greater than the historical average.

Most notable observations made are that almost equal amount of stations recorded below and above normal rainfall. Additionally, the figure confirms the aforementioned observation which suggests that May 2017 rainfall total was consistent with their historical averages, since approximately 70% of the locations recorded rainfall amounts varying by less than a quarter of their historical average.

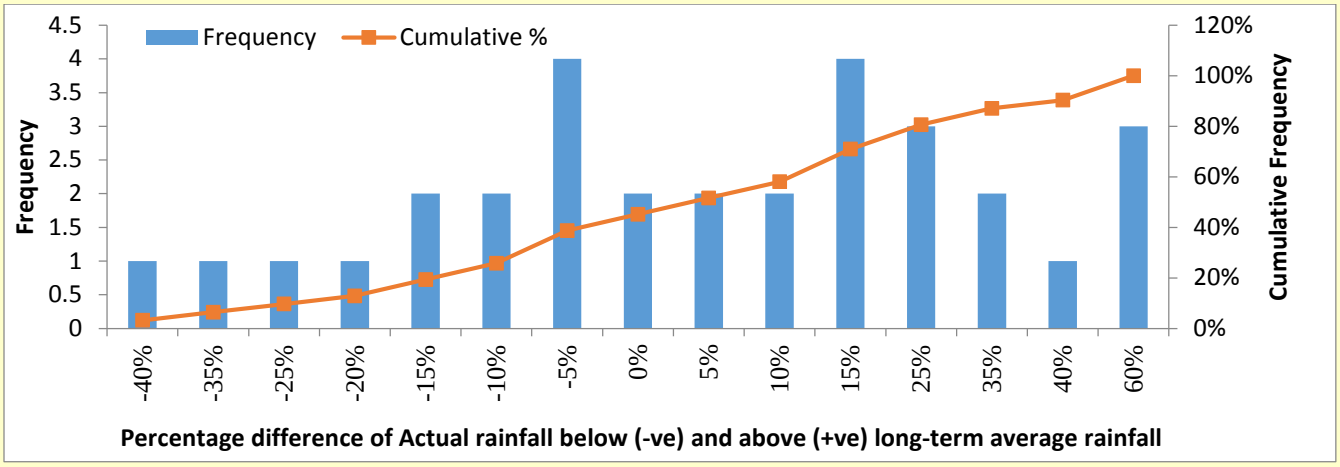


Figure 19 Histogram of May 2017 rainfall as percentage difference of Long term average rainfall

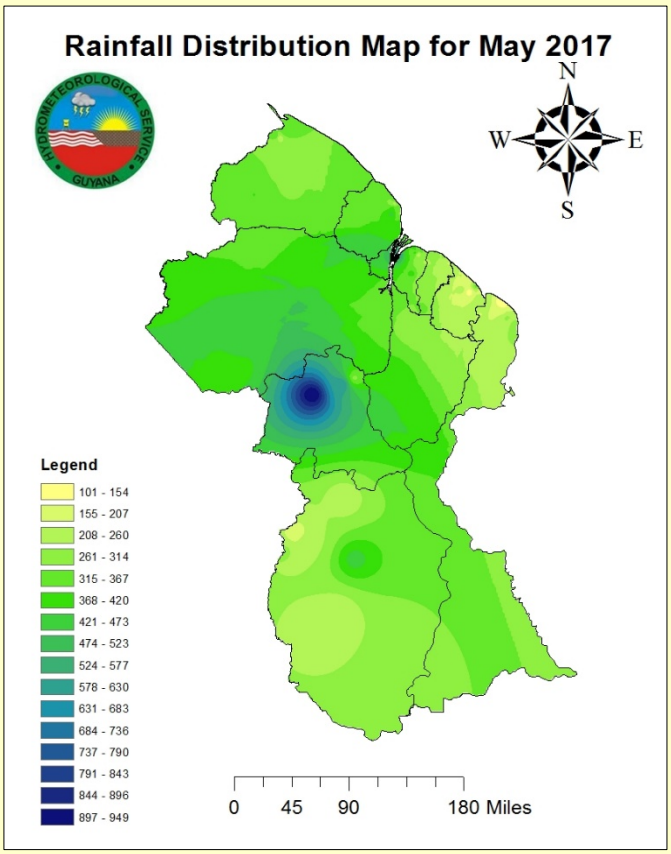


Figure 20 shows a spatial representation of the rainfall distribution across Guyana. Region 8 at Kaieteur recoded the highest accummulated rainfall for May 2017 at 950.2 mm in 28 rain days, shown as the dark blue spot on the map to the left – an observed rainfall 56% in excess of the historical average. Additionally, this location also recorded the highest one – day amount for the month at 196 mm on May 19, 2017. Table 1 below shows classification of rainfall by administrative regions across Guyana.

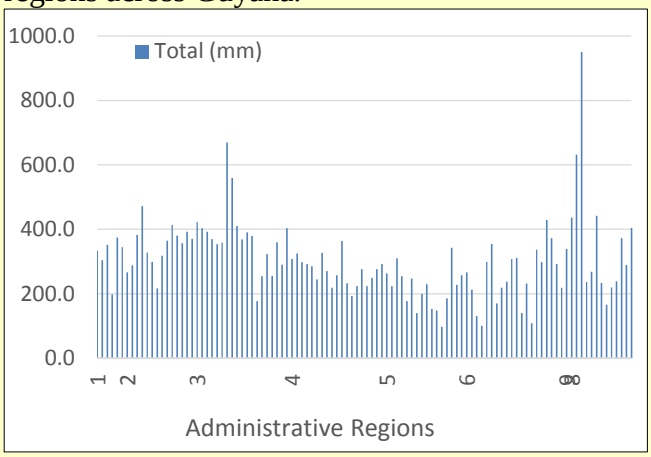


Figure 20 (a)Map and (b) Graph showing Spatial Interpolation (IDW) and distribution of rainfall amounts acrosss Guyana.

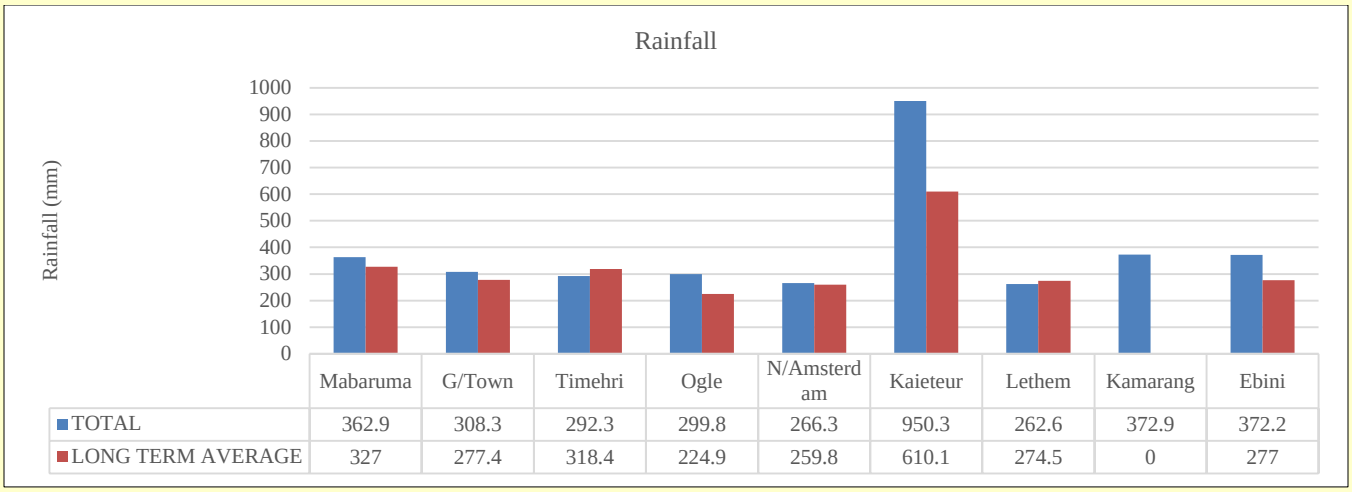
Table 1 Classification of Regional rainfall throughout Guyana for May 2017.

Region	Average Rainfall (mm)	Average Rain days	Classification	Station with the highest total
1	317.7	21 days	Very Wet (VW)	Arakaka recorded 374.5 mm of rainfall with 24 rain days.
2	346.5	21days	Exceedingly Wet (EeW)	Kabakaburi recorded 472.0 mm of rainfall with 20 rain days.
3	375.8	20 days	Very Wet (VW)	Fort Island Essequibo River recorded 669.4 mm of rainfall with 24 rain days.
4	268.7	20 days	Wet (W)	Enterprise E.C.D recorded 363.0 mm of rainfall with 19 rain days.
5	212.1	20 days	Wet (W)	Abary/MMA recorded 342.5 mm of rainfall with 25 rain days.
6	227.5	17 days	Wet (W)	#73 recorded 354.9 mm of rainfall with 20 rain days.
7	377.2	22 days	Exceedingly Wet (EeW)	Mahdia recorded 631.9 mm of rainfall with 27 rain days.
8	950.2	28 days	Extremely Wet (EtW)	Kaieteur recorded 950.2 mm rainfall with 28 rain days.
9	256.3	17 days	Wet (W)	Kumu Rupununi recorded 441.8 mm rainfall with 21 rain days.
10	320.9	22 days	Very Wet (VW)	58 Miles Mabura Road recorded 404.9 mm of rainfall with 23 rain days.

Climatological Summary for May 2017

Table 2 Summary of Observed data and Historical averages for Synoptic stations across Guyan during May 2017

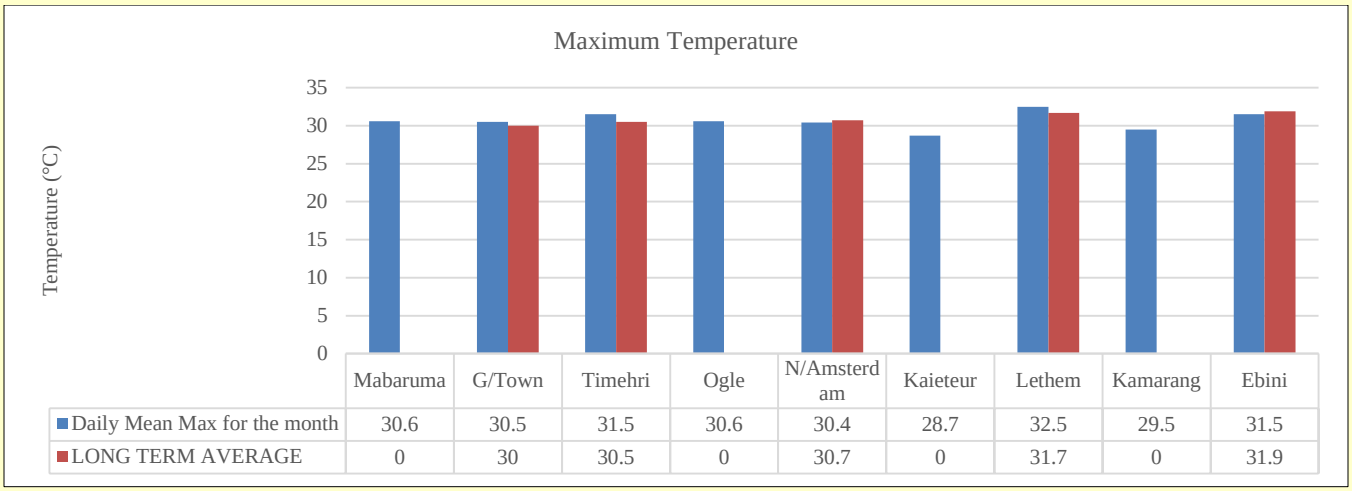
STATION	RAINFALL (mm)		MAX. TEMP (˚C)		MIN. TEMP (˚C)		SUNSHINE HOURS	
	TOTAL	LONG TERM AVERAGE	MEAN	LONG TERM AVERAGE	MEAN	LONG TERM AVERAGE	MEAN	LONG TERM AVERAGE
MABARUMA	362.9	327	30.6	*	23.6	*	*	*
GEORGETOWN	308.3	277.4	30.5	30	24.7	24.4	5.5	5.7
TIMEHRI	292.3	318.4	31.5	30.5	22.4	22.5	5.9	*
OGLE	299.8	224.9	30.6	*	24.1	*	6.7	*
N/AMSTERDAM	266.3	259.8	30.4	30.7	24.5	23.6	5.6	5.4
KAIETEUR	950.3	610.1	28.7	*	22.1	*	5.6	*
LETHEM	262.6	274.5	32.5	31.7	23.3	23.9	7.2	5.4
KAMARANG	372.9	*	29.5	*	21.4	*	4.9	*
EBINI	372.2	277	31.5	31.9	23.8	23	4.8	5.4



	Mabaruma	G/Town	Timehri	Ogle	N/Amsterdam	Kaieteur	Lethem	Kamarang	Ebini
TOTAL	362.9	308.3	292.3	299.8	266.3	950.3	262.6	372.9	372.2
LONG TERM AVERAGE	327	277.4	318.4	224.9	259.8	610.1	274.5	0	277

Figure 21 Comparison of May 2017 observed rainfall with its historical average for Synoptic Weather Stations across Guyana.

Figure 17 shows a comparison of May 2017 actual accumulated rainfall with the historical average for the Synoptic weather stations across Guyana. As already pointed out above, with the exception of Region 8 at Kaieteur, most stations across Guyana recorded rainfall totals consistent with their long-term averages...

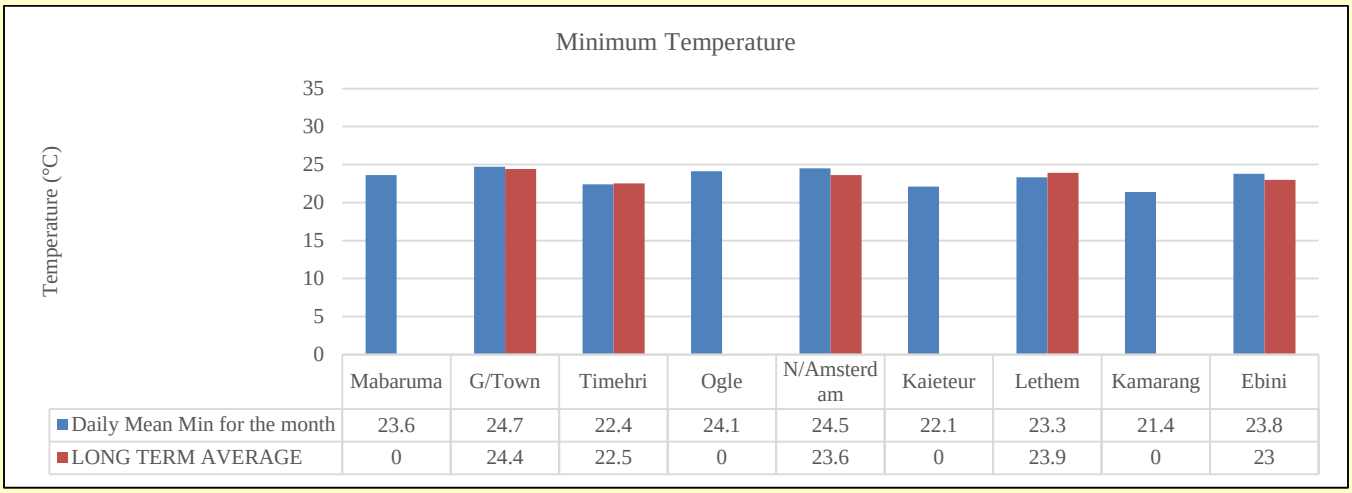


	Mabaruma	G/Town	Timehri	Ogle	N/Amsterdam	Kaieteur	Lethem	Kamarang	Ebini
Daily Mean Max for the month	30.6	30.5	31.5	30.6	30.4	28.7	32.5	29.5	31.5
LONG TERM AVERAGE	0	30	30.5	0	30.7	0	31.7	0	31.9

Figure 22 Comparison of May 2017 actual mean monthly Maximum Temperature with mean monthly historical average for May for Synoptic Weather Stations across Guyana

As with the previous month, during May 2017 all Synoptic stations recorded maximum and minimum temperatures with only a slight variation from their long-term averages. According to the data available, Region 4 at Georgetown and Timehri along with Region 9 at Lethem recorded mean maximum temperatures slightly above their long term averages while Region 6 and 10 at New Amsterdam and Ebini respectively recorded mean maximum temperatures slightly below their long term averages. For the minimum temperatures, Georgetown, New Amsterdam and Ebini recorded slightly above the long term average while Timehri and Lethem recorded slightly below average. For May 2017, the highest mean maximum temperature of 32.5 °C was recorded in Region 9

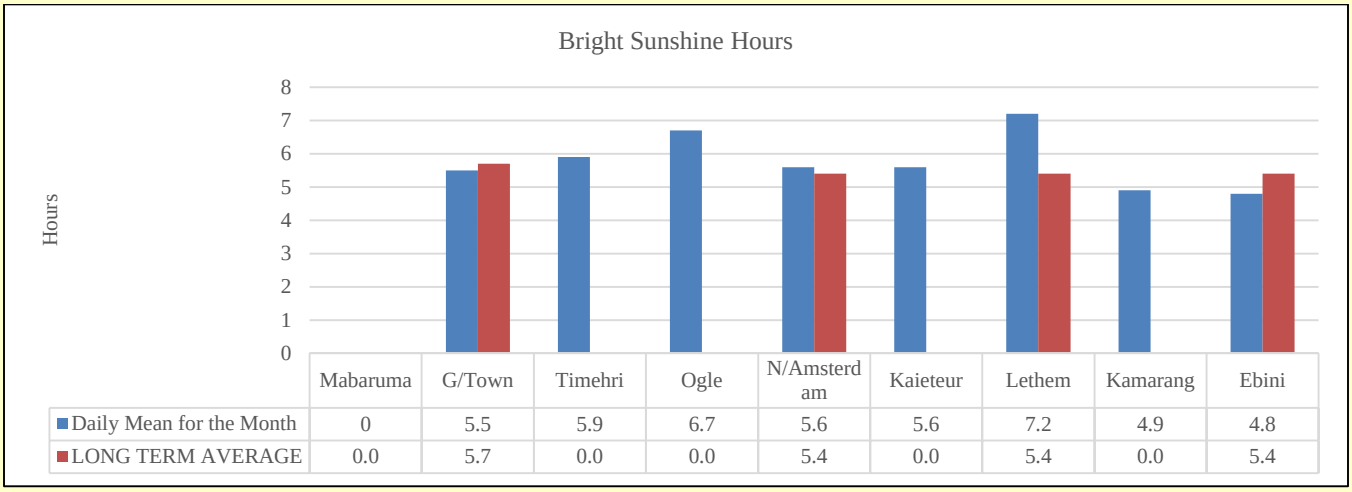
at Lethem, additionally, this location also recorded the highest one-day Max Temperature of 34.6°C on May 27, 2017. On the other hand, Region 7 at Kamarang once again recorded the lowest mean Minimum temperature at 21.4°C while also recording the lowest daily minimum temperature of 19.6°C on May 26.



	Mabaruma	G/Town	Timehri	Ogle	N/Amsterdam	Kaieteur	Lethem	Kamarang	Ebini
Daily Mean Min for the month	23.6	24.7	22.4	24.1	24.5	22.1	23.3	21.4	23.8
LONG TERM AVERAGE	0	24.4	22.5	0	23.6	0	23.9	0	23

Figure 23 Comparison of May 2017 actual mean monthly Minimum Temperature with mean monthly historical average for May for Synoptic Weather Stations across Guyana

According to the available data, Region 6 and 10 at New Amsterdam and Lethem respectively recorded daily mean bright sunshine hours above their long term average while Region 4 and 10 at Georgetown and Ebini recorded below their long term average. The highest daily mean sunshine hours of 6.7 hours/day was recorded in Region 4 at Ogle, additionally, the highest one – day total of 11.4 hours was also recorded at this location as well as at Lethem..



	Mabaruma	G/Town	Timehri	Ogle	N/Amsterdam	Kaieteur	Lethem	Kamarang	Ebini
Daily Mean for the Month	0	5.5	5.9	6.7	5.6	5.6	7.2	4.9	4.8
LONG TERM AVERAGE	0.0	5.7	0.0	0.0	5.4	0.0	5.4	0.0	5.4

Figure 24 Comparison of May 2017 actual daily mean Bright Sunshine Hours with historical average for May for Synoptic Weather Stations across Guyana

Global Analysis

The combined global average temperature over the land and ocean surfaces for May 2017 was 0.83°C (1.49°F) above the 20th century average of 14.8°C (58.6°F)—the third highest May temperature since global records began in 1880, trailing 2016 (+0.89°C / +1.60°F) and 2015 (+0.86°C / +1.55°F) – see Figure 25 (b) below. May 2017 also marks the 389th consecutive month with globally-average temperature nominally above the 20th century average. *(December 1984 was the last time a monthly temperature was below the 20th century average at -0.09°C (-0.16°F).).*

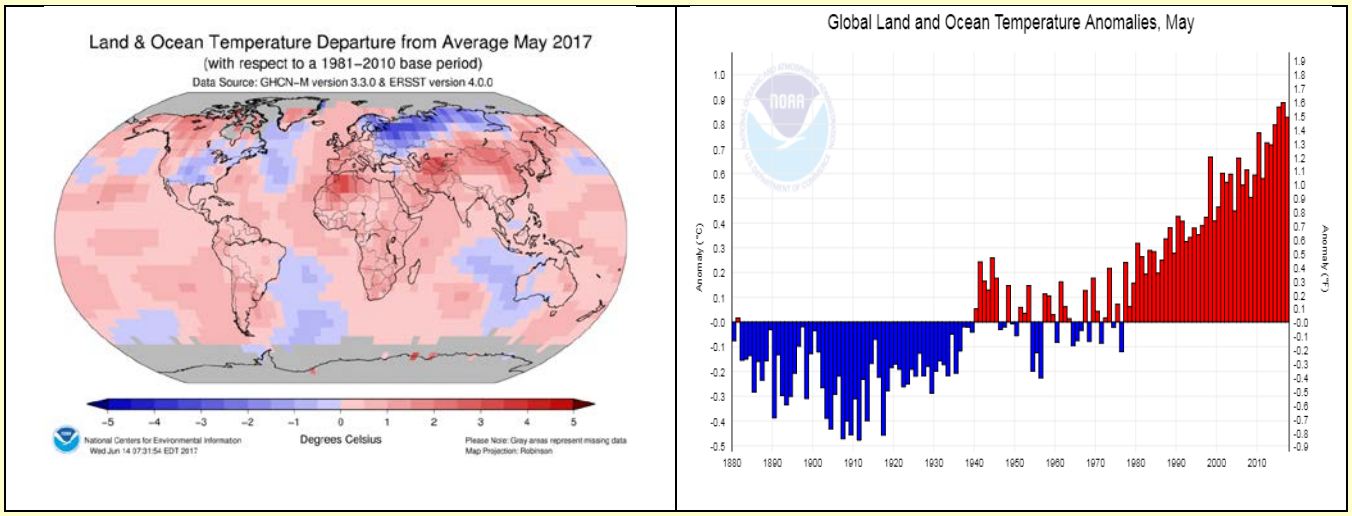


Figure 25(a) Global departure of May 2017 Land and Ocean Temperatures from the Historical averages taken for period 1981 - 2010. Compliments of NOAA[2]. (b) Global Land and Ocean Temperature Anomalies for the month of May from 1880 to 2017[3]

Warmer-than-average temperatures during the month were observed across much of the world's land surfaces, however, May 2017 was the coolest May land temperature since 2011 and the seventh highest since global records began in 1880 at 1.15°C (2.07°F) above the 20th century average of 11.1°C (52.0°F). Additionally, much of the world's oceans also had warmer- to much-warmer-than-average conditions during May 2017, The average May temperature for the global oceans was 0.71°C (1.28°F) above the 20th century average of 16.3°C (61.3°F). This was the third highest May global ocean temperature in the 138-year record, trailing behind 2016 (+0.76°C / +1.37°F) and 2015 (+0.72°C / +1.30°F.

[2] http://www.ncdc.noaa.gov/sotc/service/global/map-blended-mntp/201705.gif
[3] http://www.ncdc.noaa.gov/cag/time-series/global/globe/land_ocean/1/12/1880-2017

Climatological Outlook for the next few Weeks

CariCOF Precipitation and Temperature Outlook for June to August 2017

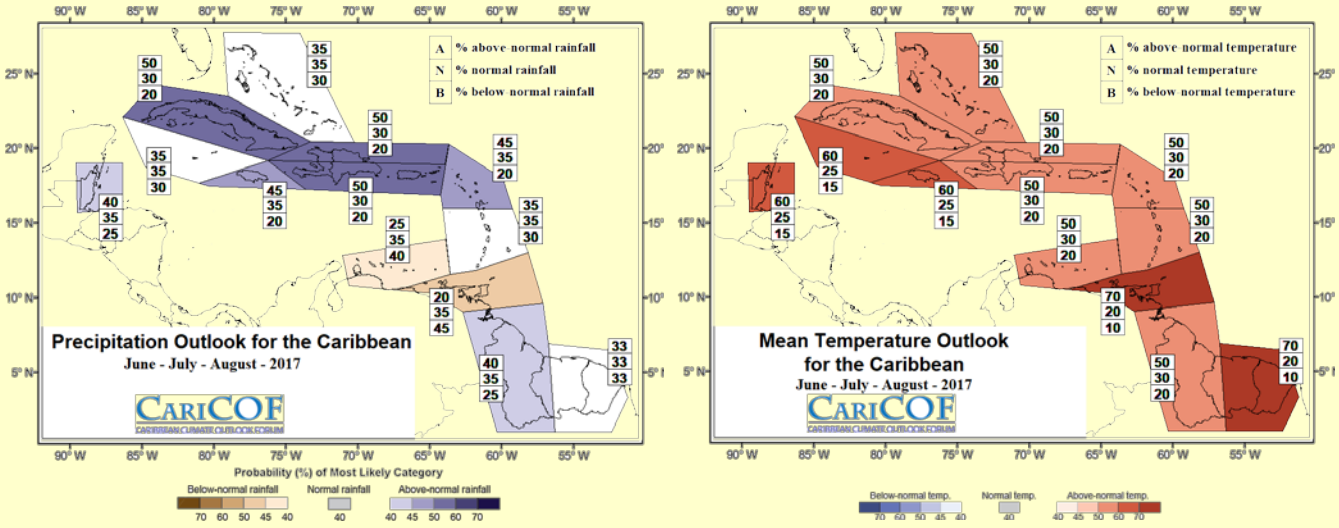


Figure 26 CariCOF (a) Precipitation and (b) Temperature outlook for the Caribbean for the period valid June – August, 2017 showing 75% confidence for *Above Normal to Normal* rainfall and 80% confidence for *Above Normal to Normal* Temperature for Guyana

According to the Outlook provided by CariCOF for the period June – August 2017 in Figure 26(a) above, Expect wetter to pretty much like usual for this period with a confidence of 75%. The chance for extremely wet weather conditions are low, notwithstanding this is the period of transition from the Primary wet season to the Primary dry season, as a result, chances of extreme wet are still a bit higher than usual. Additionally, according to the Temperature Outlook in Figure 26(b) above, warmer than to pretty much like usual can be expected for this period with a confidence level of 80 %. There is a resonable chance of extreme warm conditions which can cause minor discomfort at times.

CariCOF Wet Days and Wet Spells Outlook for June – August, 2017.

Table 3 Climatological Normals and Forecasted Number of ***Wet Days*** and various categories of ***Wet Spells*** for selected locations across Guyana for the period June to August, 2017

June to August 2017	No. of wet days		No. of 7-day wet spells (20% wettest)		No. of 7-day very wet spells (10% wettest)		No. of 3-day extremely wet spells (1% wettest)	
	Climatology	Forecast	Climatology	Forecast	Climatology	Forecast	Climatology	Forecast
Guyana_73	25-36	24-37	3.4-5.6	2.8-5.7	1.3-3.4	0.8-3.7	0-1	0-1.1
Guyana (Albion)	37-52	35-52	3.4-6.7	3.2-6.3	1.7-3.6	1.2-3.2	0-1	0-1.5
Guyana (Blairmont)	44-60	41-57	3.4-6.9	2.8-6.8	1.3-3.9	1-3.5	0-1	0-1.6
Guyana (Enmore)	41-57	38-56	3-6	2.7-6.2	0.9-3.4	0.7-3.2	0-1	0-1.3
Guyana (Georgetown)	51-63	45-61	3-5.6	2.6-6	1.3-3	1-3.2	0-1	0-1.1
Guyana (New Amsterdam)	46-59	41-56	3.8-6	2.9-6.2	1.3-3	1.1-3.1	0-1	0-1.2
Guyana (Skeldon)	45-52	42-53	3.1-6	2.5-6.2	1.3-3.9	0.8-3.6	0-2	0-1.7
Guyana (Timehri)	55-67	52-66	3.4-5.6	3-6	1.3-3.4	0.8-3.2	0-1	0-1.4

Wet Days: Ususally, during June – July – August , 50 to 65 of the 92 days are Wet Days along Coastal Guyana as shown in Table 3 above. For June – August 2017, rainfall is likely to be above to normal for Guyana, however, slightly less or the usual amount of Wet Days is expected across the Country

7 – Days Wet Spells: Usually, Coastal Guyana experiences between 3 to 6 '*Seven – Days' Wet Spell*, with 1 to 3 of them being Very Wet for the period June – July – August. For June to August 2017, according to the CariCOF Outlook shown in Table 3 above, either the usual or slightly less Wet and Very Wet spells are expected.

IRI-ENSO Forecast

***Synopsis*: ENSO-neutral is favored (50 to ~55% chance) through the Northern Hemisphere fall 2017.**

During May, ENSO-neutral continued, though sea surface temperatures (SSTs) were above average in the East-Central Pacific Ocean. The latest weekly Niño index values were near +0.5°C in most of the Niño regions. The upper-ocean heat content anomaly increased during May, reflecting the expansion of above-average sub-surface temperatures across the central and eastern Pacific in association with a *downwelling oceanic Kelvin wave*[4]. While ocean temperatures were elevated, the atmosphere was close to average. Atmospheric convection anomalies were weak over the central tropical Pacific and Maritime Continent, while the lower-level and upper-level winds were near average over most of the tropical Pacific. Both the Southern Oscillation Index (SOI) and Equatorial SOI were also near zero. Overall, the ocean and atmosphere system remains consistent with ENSO-neutral..

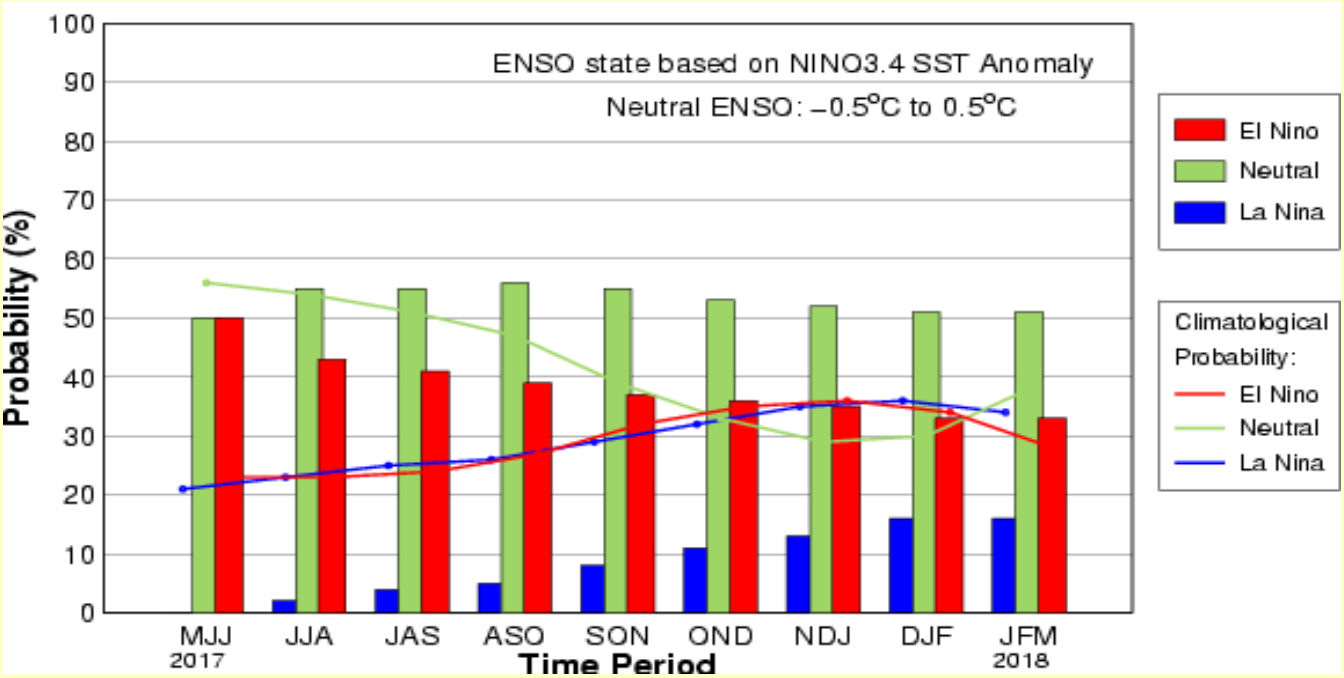


Figure 27 June 2017 CPC/IRI Official Probabilistic ENSO Forecast

[4] Visit https://www.climate.gov/news-features/blogs/enso/oceanic-kelvin-waves-next-polar-vortex

Recent and Current Conditions

In mid-June 2017, the NINO3.4 SST anomaly hovered close to the borderline of a weak El Niño level. For May the SST anomaly was 0.46 C, near the borderline of weak El Niño, and for Mar-May it was 0.30 C, in the ENSO-neutral range. The IRI's definition of El Niño, like NOAA/Climate Prediction Center's, requires that the SST anomaly in the Nino3.4 region (5S-5N; 170W-120W) exceed 0.5 C. Similarly, for La Niña, the anomaly must be -0.5 C or less. The climatological probabilities for La Niña, neutral, and El Niño conditions vary seasonally, and are shown in a table at the bottom of this page for each 3-month season. The most recent weekly anomaly in the Nino3.4 region was 0.4, approaching the borderline of weak El Niño. The pertinent atmospheric variables, including the upper and lower level zonal wind anomalies, have been showing neutral patterns. The Southern Oscillation Index (SOI) had been somewhat below average, indicating an El Niño tendency, but recently has returned to near-average. Subsurface temperature anomalies across the eastern equatorial Pacific have been just slightly above average. Overall, given the SST and the atmospheric conditions, an ENSO-neutral diagnosis remains appropriate.

Expected Conditions

The official diagnosis and outlook produced jointly by CPC and IRI issued by the NOAA/Climate Prediction Center ENSO Diagnostic Discussion stated that ENSO-neutral has an approximately 50 to 55% chance of persisting during northern summer and fall, with slightly lower chances for El Niño development. The model ENSO predictions from mid-June is shown below (Figure 28) in the IRI/CPC ENSO prediction plume. Those predictions suggest that the SST has the greatest chance for being in the ENSO-neutral or the weak El Niño range for June-Aug and show a slowly increasing likelihood (but still below 50%) for El Niño development in fall and early winter.

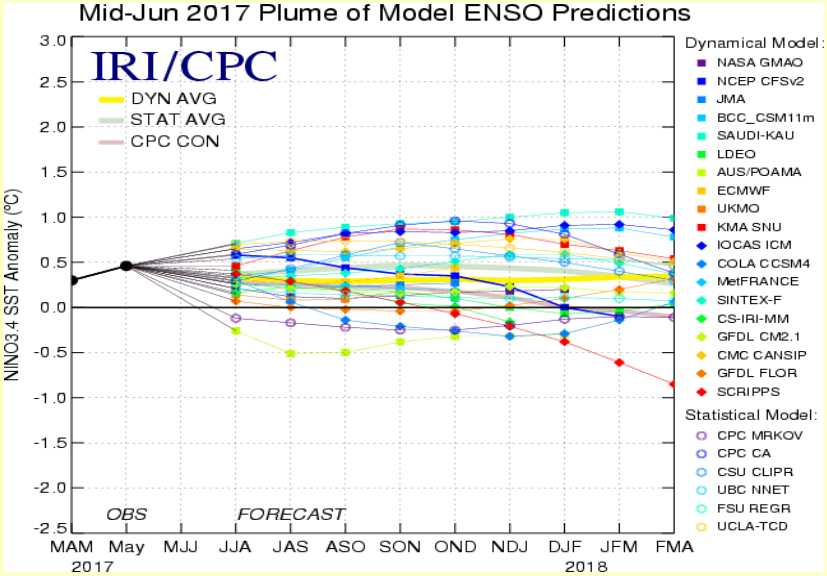


Figure 28 June 2017 Plume of Model ENSO Predictions

Table 4 Showing variation in seasonal climatological probabilities for La Niña, neutral, and El Niño conditions for each 3-month season.

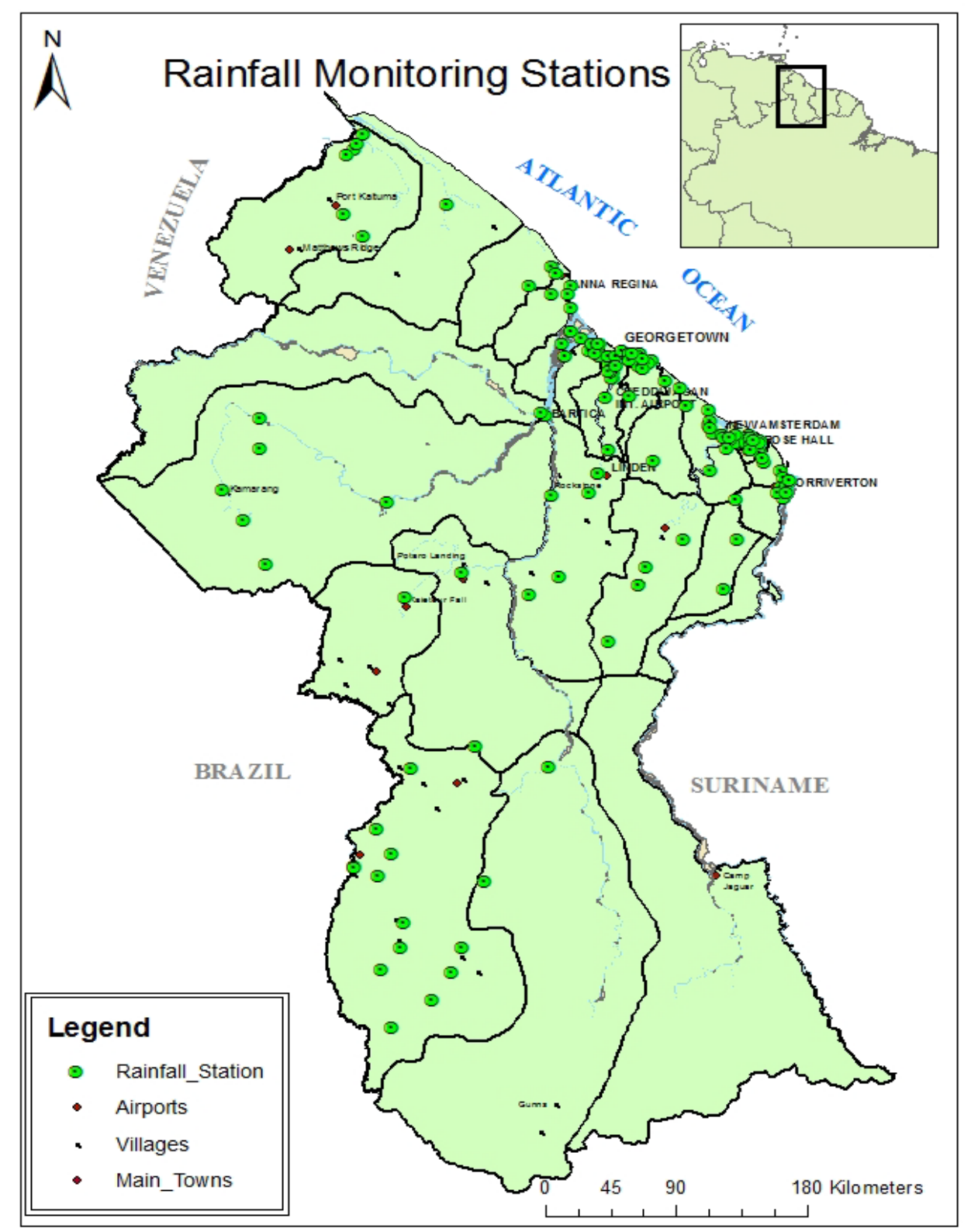
Season	La Niña	Neutral	El Niño
DJF	36%	30%	34%
JFM	34%	38%	28%
FMA	28%	49%	23%
MAM	23%	56%	21%
AMJ	21%	58%	21%
MJJ	21%	56%	23%
JJA	23%	54%	23%
JAS	25%	51%	24%
ASO	26%	47%	27%
SON	29%	39%	32%
OND	32%	33%	35%
NDJ	35%	29%	36%

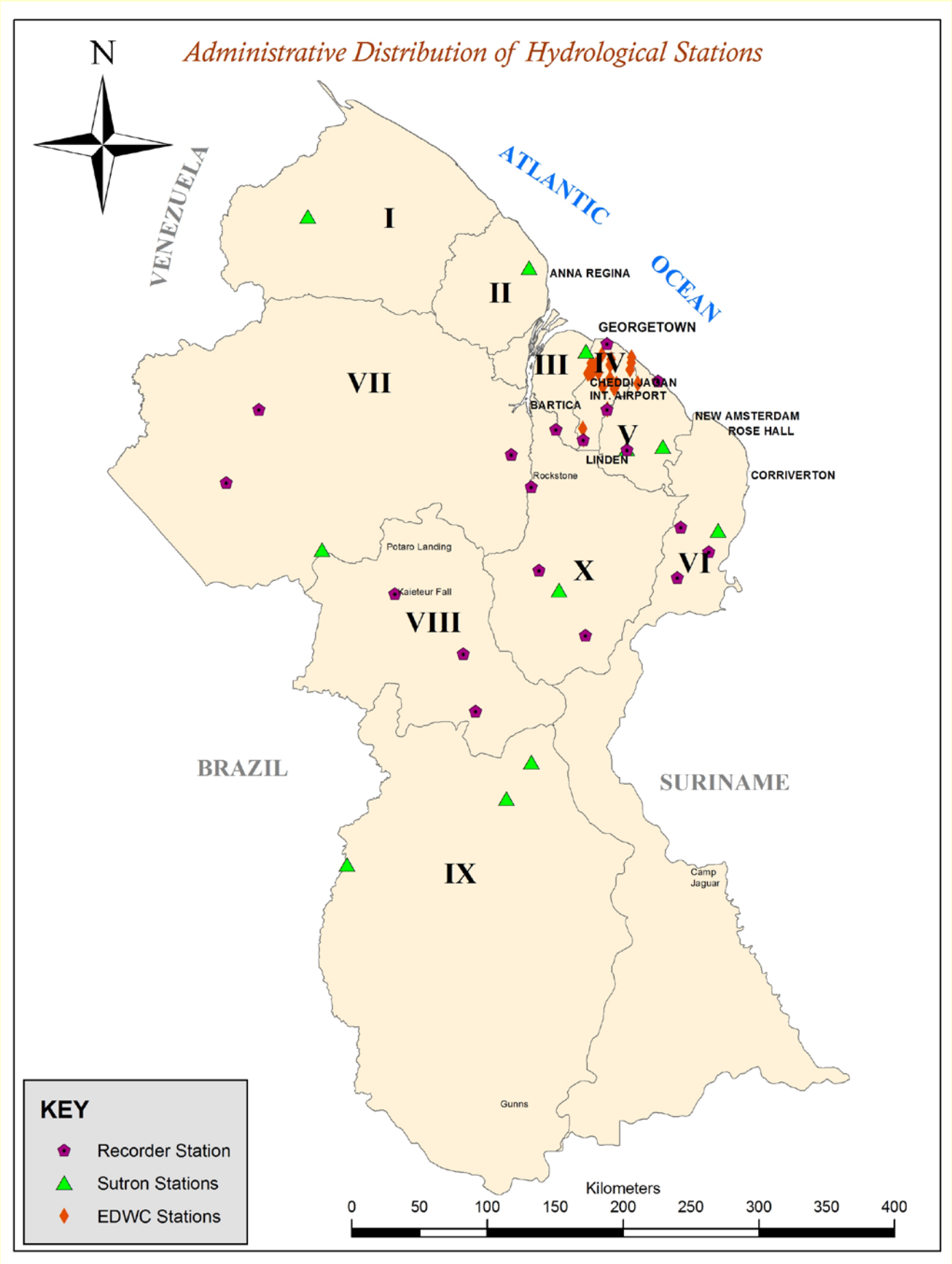
In summary, the probabilities derived from the models on the IRI/CPC plume describe, on average, a preference for ENSO-neutral throughout the forecast period, with chances for El Niño peaking at 40-45% during fall and winter. Chances for La Niña are relatively low throughout the forecast period.

Annex I
Glossary of Terms

- **CariCOF** - Caribbean Climate Outlook Forum
- **CPC** – Climate Prediction Center
- **ENSO** - *El Niño–Southern Oscillation* is an irregularly periodical variation in winds and sea surface temperatures over the tropical eastern Pacific Ocean, affecting much of the tropics and subtropics.
- **Historical Mean** - Arithmetical mean computed using all the available Historical data from time of commencement of data collection.
- **IRI** – International Research Institute
- **ITCZ** - *The Inter Tropical Convergence Zone* is a belt of low pressure which circles the Earth generally near the equator where the trade winds of the Northern and Southern Hemispheres come together.
- **Long Term Average** - Same as Historical Mean
- **NOAA** - National Oceanic and Atmospheric Administration
- **Normal** - An Arithmetical mean taken over a Thirty (30) years period defined by WMO - currently 1981-2010.
- **Primary Dry Season** - The Major Dry Season in Guyana Occurring during the period August to mid-November
- **Primary Wet Season** - A period of heavy rainfall in Guyana occurring during the period Mid-April to Mid-July as a result of the northward movement of the ITCZ
- **Secondary Dry Season**
- S**econdary Wet Season** - A rainfall season in Guyana occurring during the period mid-November to January as a result of the Southward movement of the ITCZ
- **SST** - Sea Surface Temperature
- **WMO** - World Meteorological Organization

Annex II


N
Rainfall Monitoring Stations
VENEZUELA
ATLANTIC
OCEAN
Port Kaituma
ANNA REGINA
GEORGETOWN
NEW AMSTERDAM
LINDEN
ORRIVERTON
Kamarang
Potaro Landing
BRAZIL
SURINAME
Camp Jaguar
Legend
Rainfall_Station
Airports
Villages
Main_Towns
0 45 90 180 Kilometers


N
Administrative Distribution of Hydrological Stations
VENEZUELA
ATLANTIC
OCEAN
I
II
III
IV
V
VI
VII
VIII
IX
X
ANNA REGINA
GEORGETOWN
CHEDDI JAGAN
INT. AIRPORT
BARTICA
NEW AMSTERDAM
ROSE HALL
LINDEN
CORRIVERTON
Rockstone
Potaro Landing
Kaieteur Fall
Camp
Jaguar
Gunns
BRAZIL
SURINAME
KEY
Recorder Station
Sutron Stations
EDWC Stations
Kilometers
0
50
100
150
200
250
300
350
400

Annex III

Classification of Precipitation Values

DESCRIPTION	ABBREVIATION	RAINDAYS	RAINFALL (mm)
Very Dry	VD	0-10 11-20	0-59.9 11-29.9
Dry	D	1-10 11-20 21-31	60-119.9 30-89.9 21-59.9
Moderately Dry	MD	1-10 11-20 21-31	120-179.9 90-149.9 60-119.9
Moderately Wet	MW	1-10 11-20 21-31	180-239.9 150-209.9 120-179.9
Wet	W	1-10 11-20 21-31	240-329.9 210-269.9 180-239.9
Very Wet	VW	1-10 11-20 21-31	330-449.9 270-389.9 240-329.9
Exceedingly Wet	EeW	1-10 11-20 21-31	450-569.9 390-509.9 330-449.9
Excessively Wet	EsW	1-10 11-20 21-31	›570 510-629.9 450-569.9
Extremely Wet	EtW	11-20 21-31	›630 ›570

Sources

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- http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/?enso_tab=enso-cpc_update
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Phone:
592-225-9303 | 592-261-4489 | 592-225-4247

Fax:
592-225-1460

E-Mail:
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