

Monthly Bulletin

Ministry of Agriculture

Hydrometeorological Service

January 2018



"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

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Highlights

- ❖ Guyana classified as *Wet* for the month Dec 2017
- ❖ Nearly 70% of the rainfall stations recorded rainfall amounts above their Historical Average .
- ❖ Warmer than average conditions dominated across much of the Earth's surface: Third highest December temperature recorded in 138 years.
- ❖ Chances for extremely wet weather condition for Jan – March 2018 are higher than usual.
- ❖ La Niña condition is likely with transition to ENSO Neutral during March to May.

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Below: Primary school students being given a tour of the Georgetown Botanical Gardens Meteorological Observatory by a Meteorological Observer.



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

Climatologically the secondary rainy season was likely to commence mid to late November. This rainy period is primarily due to the southern migration of the Inter Tropical Convergence Zone (ITCZ), the presence of surface troughs and some influences from the subtropical jet over South America; this was not the case due to some

atmospheric dynamics and the position of some synoptic features (evidence of climate change). Investigations into this delay lead mainly to the position of the suppressed phase of the Madden Julian Oscillation. During December 2017, Guyana experienced *Very Wet* conditions.

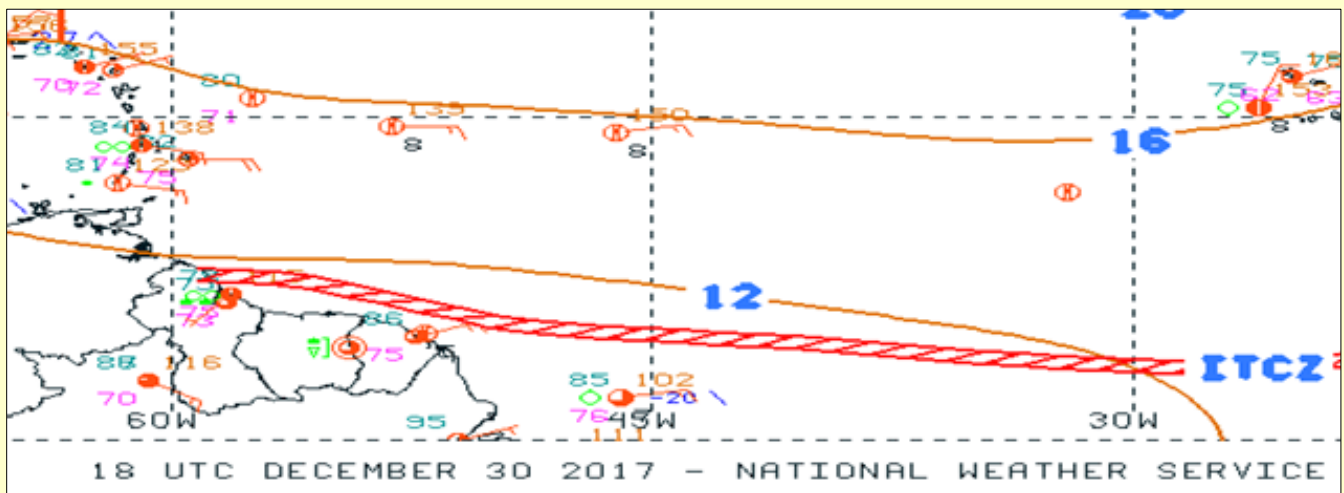


Figure 1 Surface chart (December 30, 2017 18:00 UTC) showing position of the ITCZ along Coastal Guyana

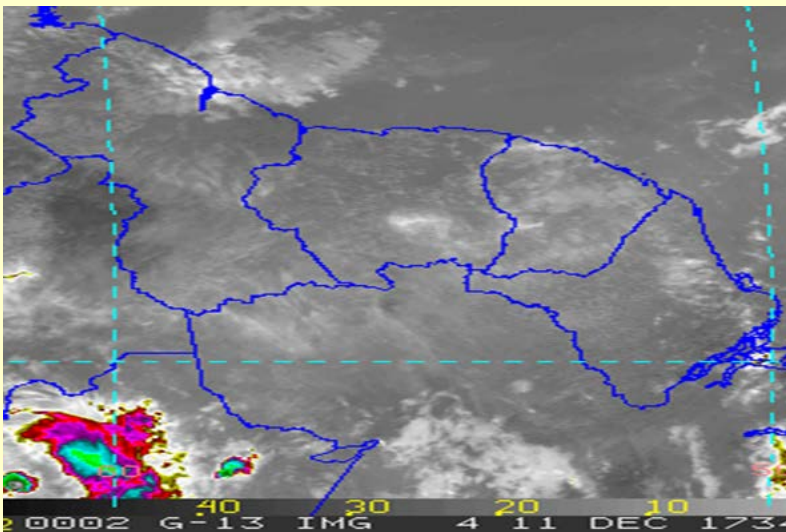


Figure 2 Satellite image (valid Dec 11, 2017 at 11:15UTC) showing shallow convective and layered clouds associated with unstable conditions in the atmosphere.

Throughout the first half of the month, mostly sunny skies were observed throughout Guyana. Ridging at the mid and upper level, coupled with the effects of the Saharan Dust Layer (Figure 3) produced subsidence that reduced the moisture in the atmosphere; additionally, strong vertical wind shear hindered the development of clouds significantly as shown in Figure 2 to the left. Nevertheless, diurnal heating, clouds advected by the Trade Winds along with weak to moderate influences of the ITCZ (located north of Guyana as shown in Figure 1 above) produced significant amount of rainfall due to weak instabilities during the latter part of this period..

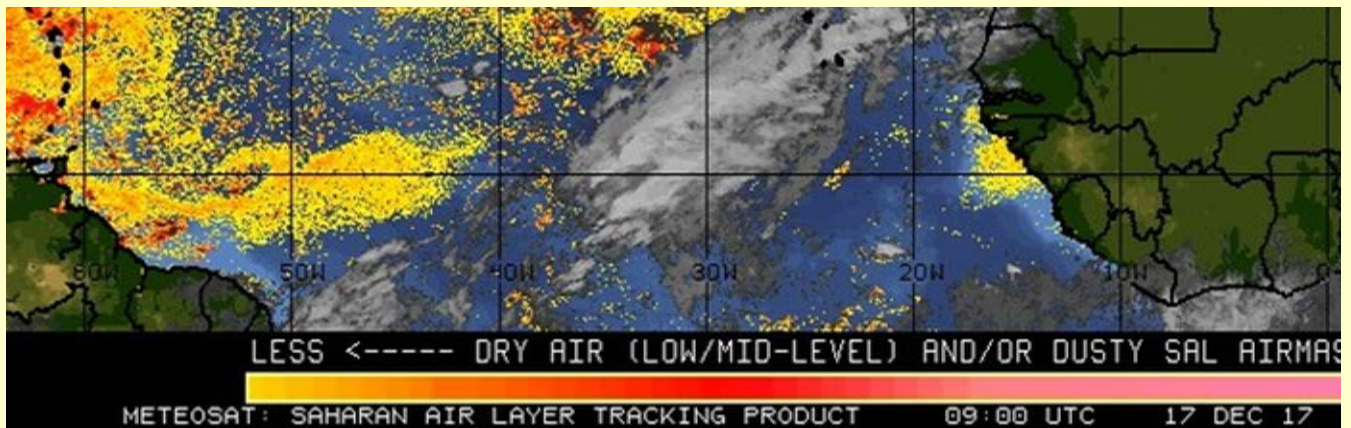


Figure 3 Satellite Image (Dec 17, 2017 at 05:00 local time) showing Dust in the atmosphere along Coastal Guyana

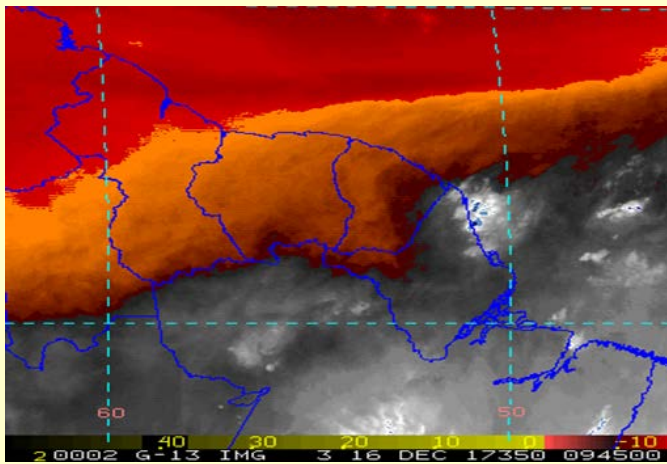


Figure 4 Satellite image showing dry atmosphere throughout Guyana.

For the second half of the month, the most significant synoptic feature affecting Guyana's weather was the ITCZ. Even though it was not continuously organized throughout the period; the axis was shifting along Coastal and Northern Guyana, which resulted in the maximum rainfall being observed at areas within these locations. Apart from the ITCZ, subtropical jet and moisture surges also significantly influenced the weather condition, contributing to the high rainfall amounts observed during the period.

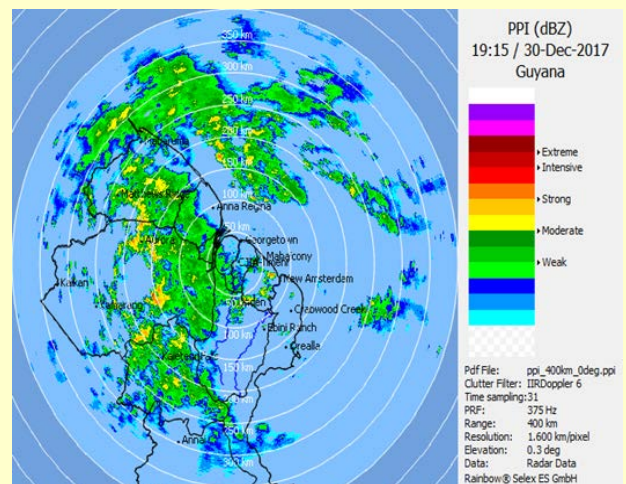
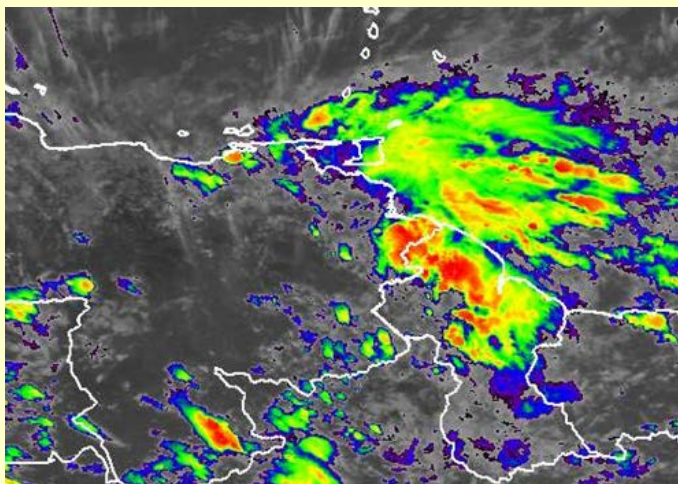


Figure 5 (a) Satellite and (b) Radar image showing moderate convective clouds and moderates echoes respectively, associated with an active ITCZ over Guyana

Review of Seasonal Outlook provided in November 2017.

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

Precipitation: Model output for November – January had suggests higher chances (85-90%) of above-normal rainfall across Guyana. The highest rainfall totals were expected in Regions 1 to northern 6, 7 and 10. Dry conditions were expected to continue in Region 9, however, slightly more wet days than usual were expected.

Additionally, 46 to 65 rain days were expected for Region 9 for the period.

Temperature: Mean maximum and minimum temperatures across Guyana was expected to be slightly above normal (30.8°C) and (22.2°C).

Drought: Drought was not a concern for the outlook period. The forecast above-normal rainfall during the outlook season should be enough to recharge reservoirs, conservancies and aquifers to satisfactory levels.

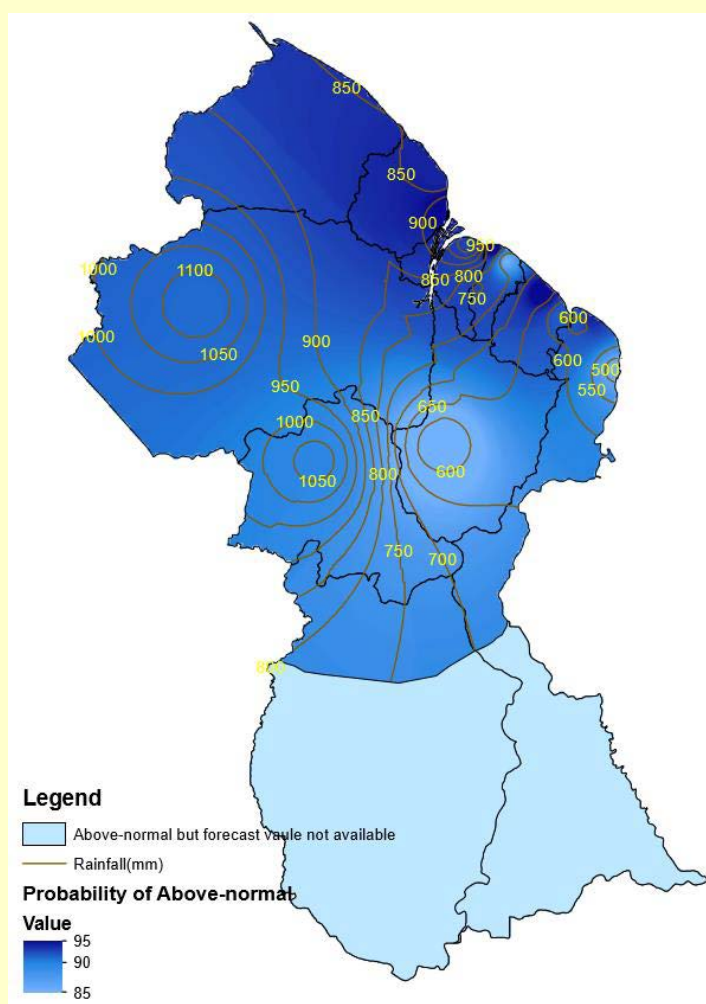


Figure 6 Map of Guyana showing probabilistic seasonal forecast¹ (chances of occurrence) along with forecasted seasonal accumulation across Guyana for period November 2017 – January 2018.

¹The 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 for Northern and Southern Guyana

What Usually occurs: January – February – March compared to observed rainfall

The month of December is usually part of Secondary rainy season. This is also the period in which the season intensifies. During this period, the Southwards 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.

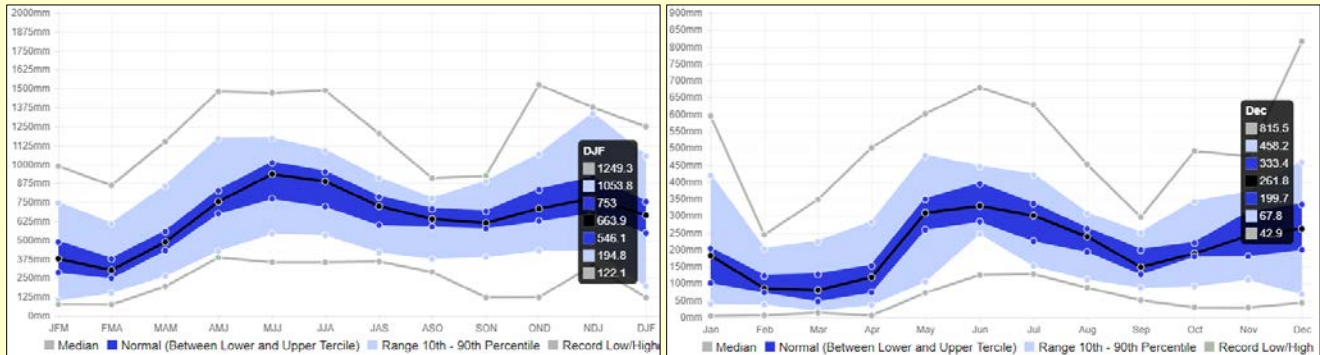


Figure 7 Seasonal and monthly rainfall variation for Region 1 at Mabaruma with emphasis for DJF and Dec.

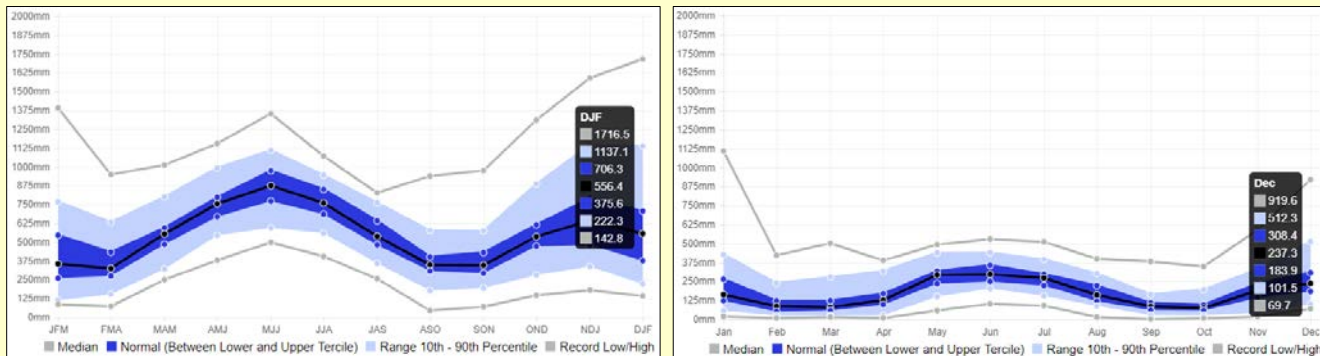


Figure 8 Seasonal and monthly rainfall variation for Region 4 at Georgetown with emphasis for DJF and Dec.

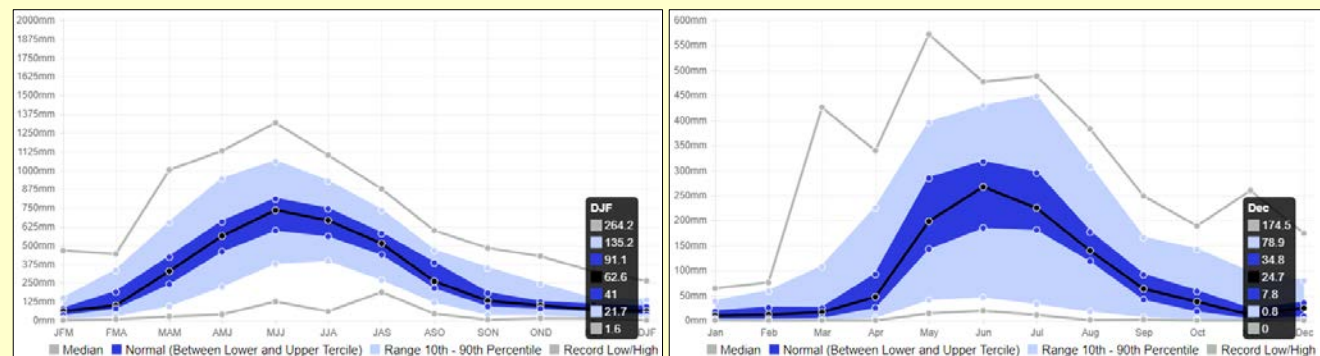


Figure 9 Seasonal and monthly rainfall variation for Region 9 at Lethem with emphasis for DJF and Dec.

December 2017 Rainfall Analysis

Guyana was classified as Wet (VW) for the month of December 2017, with a nationwide average rainfall of 254.8 mm distributed over 16 rain days

A detailed comparison of the December 2017 rainfall with the historical average for selected stations can be seen in Figure 10 below.

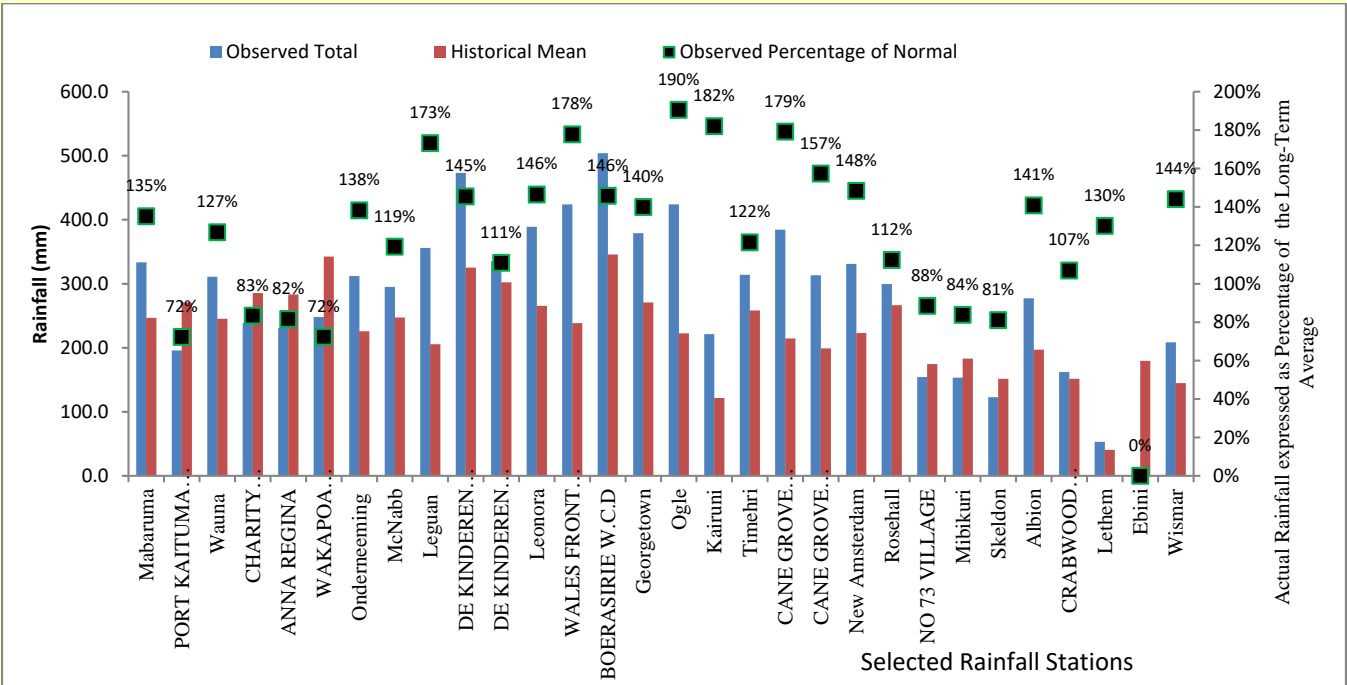


Figure 10 Comparison of the accumulated observed Rainfall for December 2017 expressed as a percentage of the Historical mean

According to the records collected and processed by the Hydromet most locations recorded rainfall amounts above their historical averages along Coastal Guyana. While not the highest observed rainfall amount, Ogle in Region 4 recorded the highest deviation of 90% above its historical average at an observed total rainfall of 424.4 mm for the month. In contrast, several stations received rainfall amounts less than their long term averages. Regions 1 and 2 at Port Kaituma and Wakapoa received rainfall amounts (195.9mm and 248.0mm respectively) almost 30% less than their long term averages. Additionally, according to Figure 17, several location long Coastal Regions 2 and 6 recorded rainfall amounts less than their historical averages. Details of the temporal distribution of daily rainfall for several locations are shown in Figure 11 to the left.

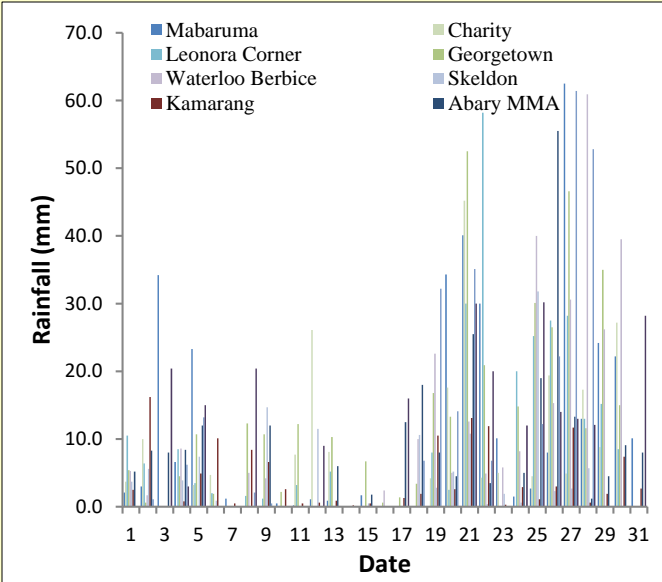


Figure 11 Temporal distribution of daily rainfall for December 2017 for selected stations throughout Guyana

Further analysis of the rainfall amount in Figure 10 above was done and the results presented in Figure 19 below as a histogram. The horizontal axis shows December 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. It is worthwhile to mention that more than 70 % of the rainfall stations recorded rainfall above their long term averages. Further, more than a fifth of the station recorded rainfall amounts greater than 50 % of their historical averages

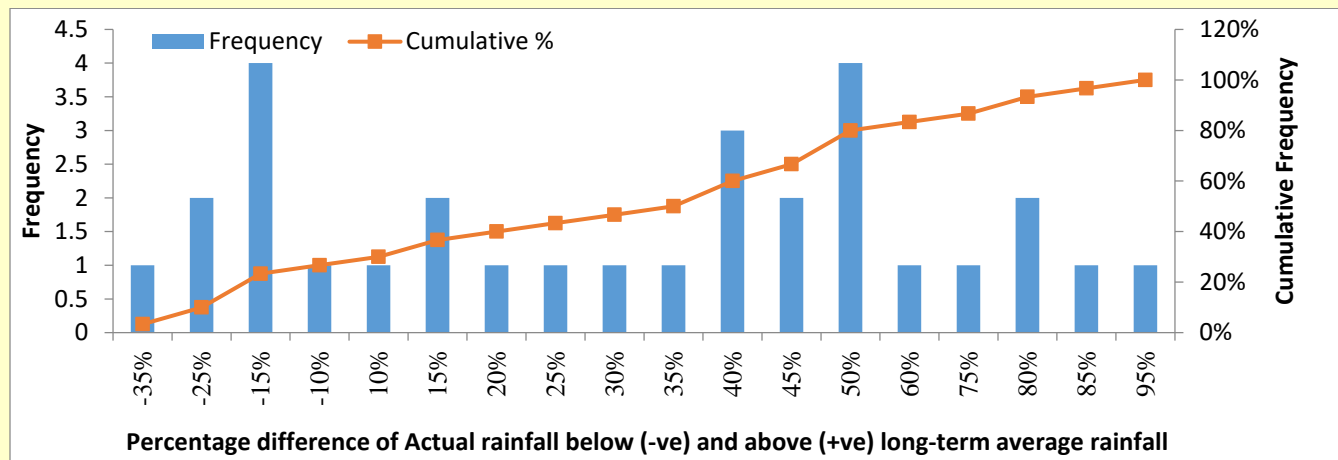


Figure 12 Histogram of December 2017 rainfall as percentage difference of Long term average rainfall

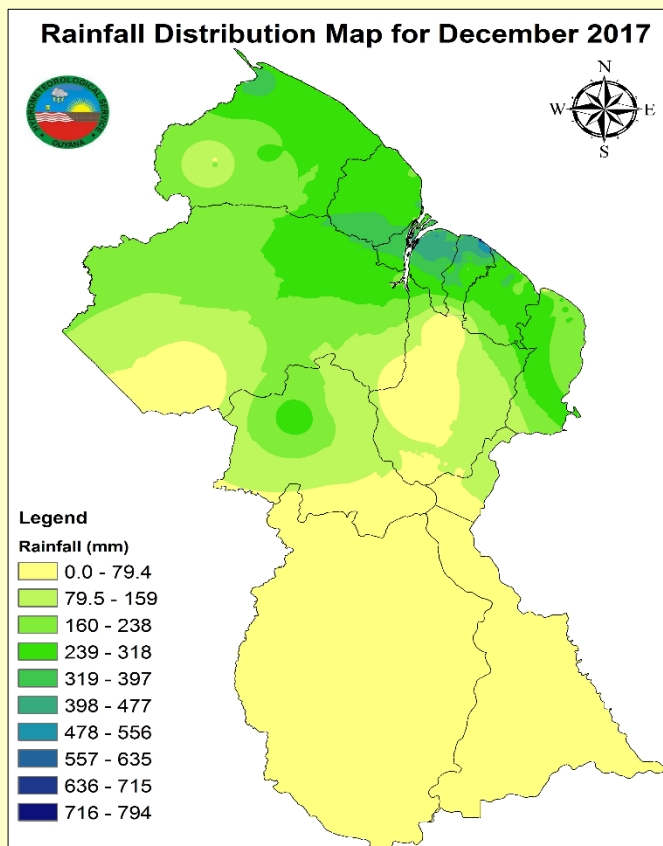


Figure 20 shows a spatial representation of the rainfall distribution across Guyana. Region 4 at Enterprise, E.C.D. recoded the highest accumulated rainfall for December 2017 at 804.1 mm in 24 rain days, shown as the dark blue spot on the map to the left and the . Region 4 at Helena # 2 recorded the highest one – day amount for the month at 133.1 mm on December 25, 2017. Table 1 below shows classification of rainfall by administrative regions across Guyana.

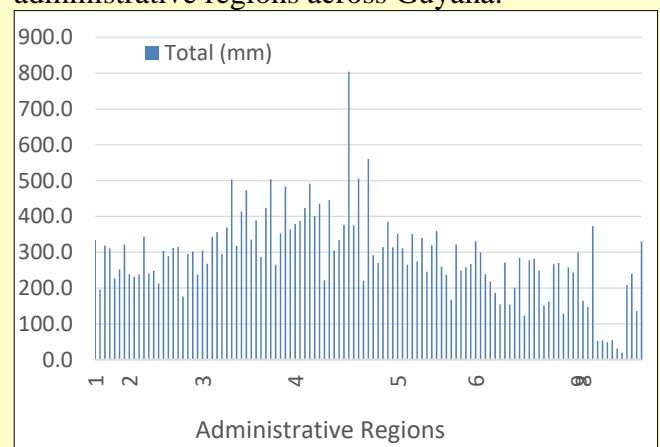


Figure 13 (a)Map and (b) Graph showing Spatial Interpolation (IDW) and distribution of rainfall amounts acrosss Guyana.

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

<i>Region</i>	Average Rainfall (mm)	Average Rain days	Classification	Station with the highest total
1	275.3	21 days	Very Wet (VW)	Mabaruma recorded 335.7mm of rainfall with 20 rain days.
2	206.0	20 days	Moderately Wet (MW)	Hibernia recorded 315.3 mm of rainfall with 24 rain days.
3	374.2	22 days	Exceedingly Wet (EeW)	Boerasire recorded 504.0mm of rainfall with 23 rain days.
4	398.5	21 days	Exceedingly Wet (EeW)	Enterprise E.C.D recorded 804.1mm of rainfall with 24 rain days.
5	227.0	18 days	Wet (W)	Burma recorded 359.6mm of rainfall with 20 rain days.
6	221.7	15 days	Wet (W)	New Amsterdam recorded 330.9mm of rainfall with 18 rain days.
7	248.8	20 days	Wet (W)	Dagg Point recorded 300.2mm of rainfall with 27 rain days.
8	215.1	19 days	Wet (W)	Kaieteur recorded 283.0mm of rainfall with 20 rain days.
9	29.8	6 days	Very Dry (VD)	Deer Creek recorded 54.5 mm rainfall with 5 rain days.
10	221.8	16 days	Wet (W)	58 Miles Mabura Road recorded 330.6 of rainfall in 22 rain days.

Climatological Summary for December 2017

Table 2 Summary of Observed data and Historical averages for Synoptic stations across Guyan during December 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
<i>MABARUMA</i>	333.5	246.9	31.2	*	22.6	*	*	*
<i>GEORGETOWN</i>	379.1	270.9	29.7	29.7	24.1	24	5.3	6.2
<i>TIMEHRI</i>	313.9	258.3	30.7	*	20.5	*	4.8	*
<i>OGLE</i>	424.0	222.6	29.8	*	23.8	*	5.5	*
<i>N/AMSTERDAM</i>	330.9	223	31.0	30.9	23.6	23.1	5.4	5.0
<i>KAIETEUR</i>	425.9	*	28.7	*	21.2	*	5.3	*
<i>LETHEM</i>	29.8	40.8	33.3	33.1	23.2	24.4	7.5	7.1
<i>KAMARANG</i>	128.3	*	29.6	*	20.3	*	5.0	*
<i>EBINI</i>	116.5	*	31.8	31.8	22.9	22.4	5.2	5.4

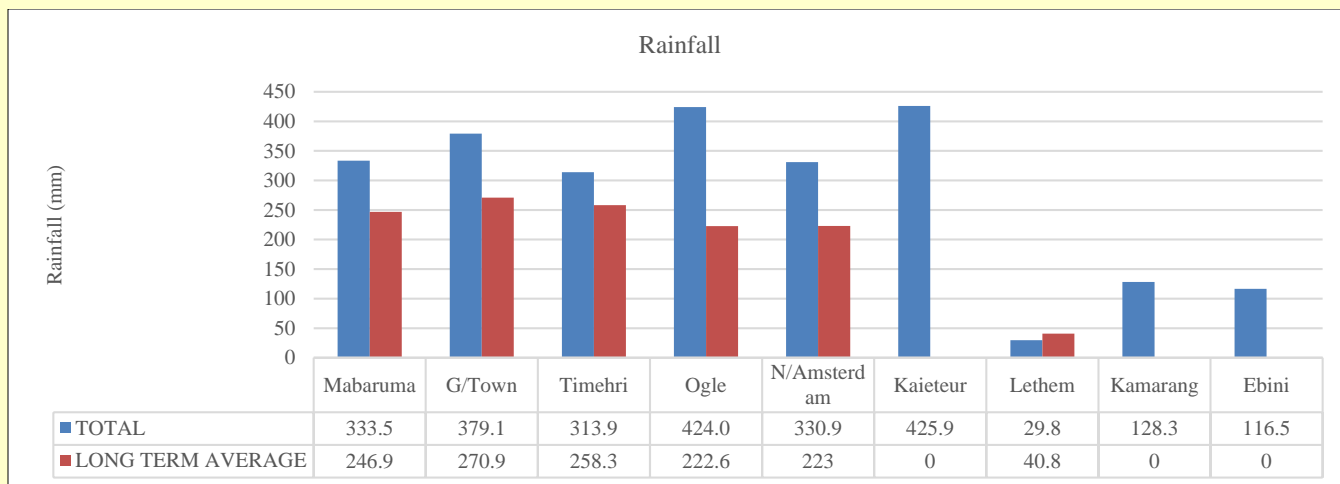


Figure 14 Comparison of December 2017 observed rainfall with its historical average for Synoptic Weather Stations across Guyana.

Figure 14 shows a comparison of December 2017 actual accumulated rainfall with the historical average for the Synoptic weather stations across

Guyana. With the exception of Region 9 at Lethem, most stations across Guyana recorded rainfall totals above their long-term averages...

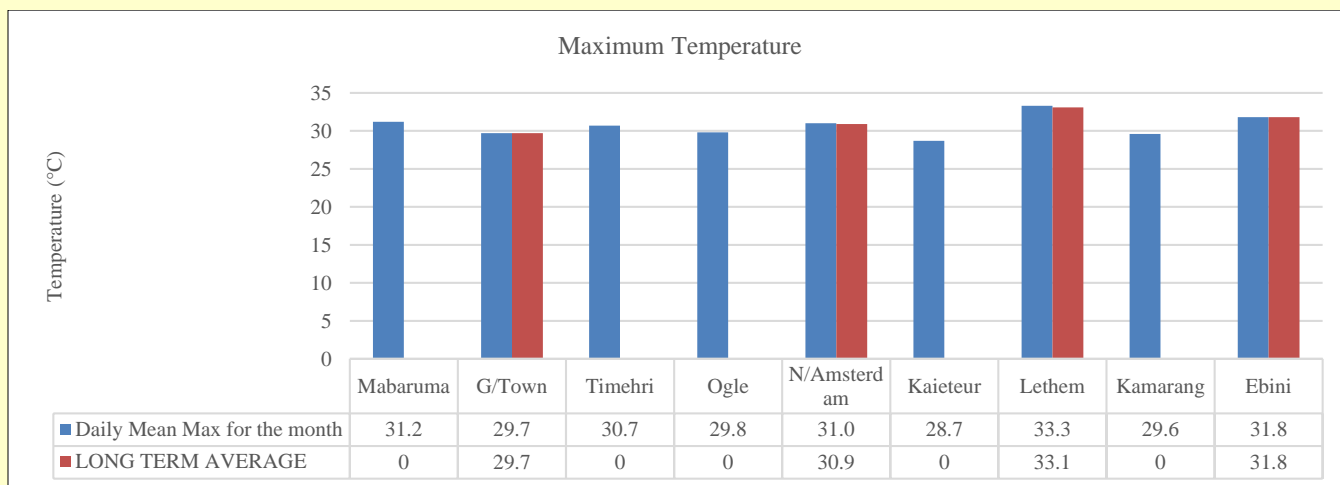


Figure 15 Comparison of December 2017 actual mean monthly Maximum Temperature with mean monthly historical average for December for Synoptic Weather Stations across Guyana

As with the previous month, during December 2017 all Synoptic stations recorded maximum and minimum temperatures consistent with their long-term averages – with only minor variation. According to the data available, Region 6 at New Amsterdam and Region 9 at Lethem recorded mean maximum temperatures slightly above their long term averages. For the minimum temperatures, only Region 9 at Lethem recorded slightly below

the long term average while Region 6 and 10 at New Amsterdam and Ebini respectively recorded slightly above the historical average. Since Region 9 at Lethem recorded the lowest amount of rainfall, for December 2017, it is not surprising that the highest mean maximum temperature of 33.3 °C was recorded at this location, additionally, this station also recorded the highest one-day Max Temperature of 35.2°C on December 03, 2017.

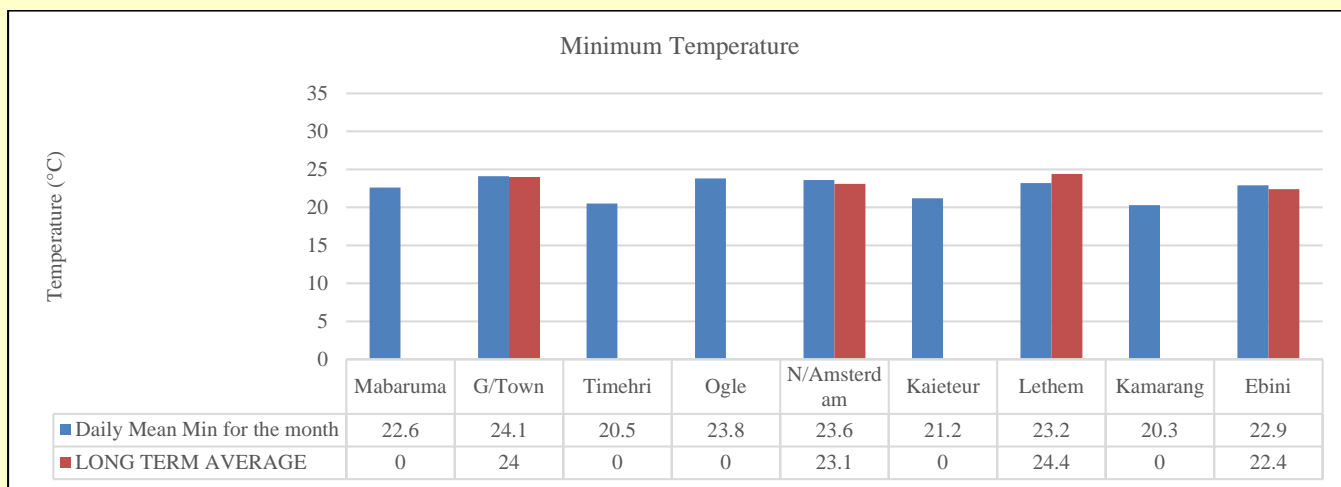


Figure 16 Comparison of December 2017 actual mean monthly Minimum Temperature with mean monthly historical average for December for Synoptic Weather Stations across Guyana

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 averages while Region 4 and 10 at Georgetown and Ebini recorded below their long term averages. In keeping with the usual trend for

the month of December, the highest daily mean sunshine hours of 7.5 hours/day was recorded in Region 9 at Lethem for December 2017. additionally, the highest one – day total of 10.9 hours was also recorded at this location on December 04, 2018.

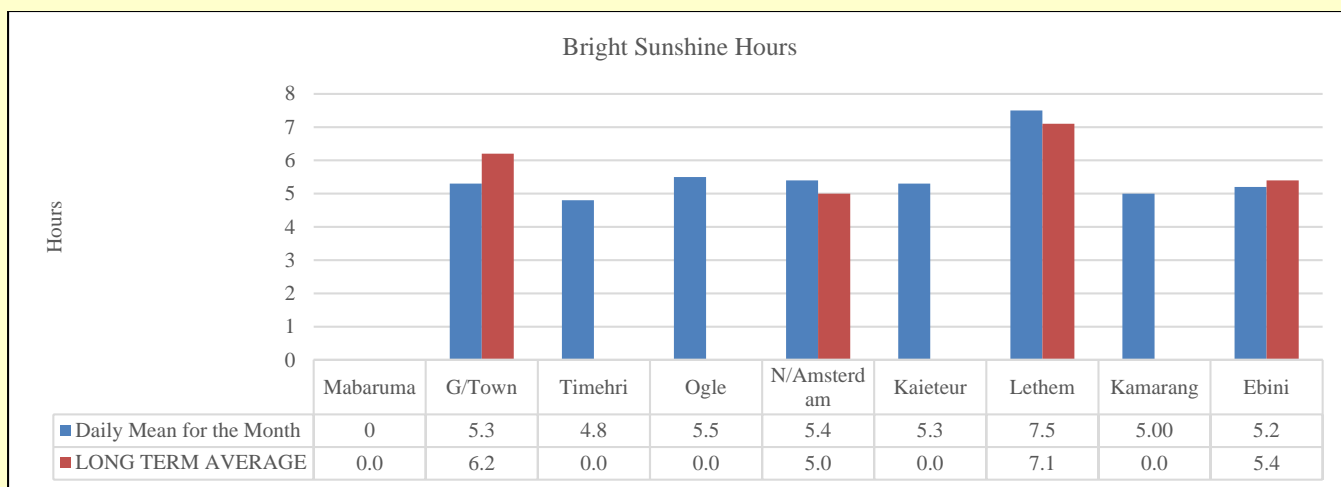


Figure 17 Comparison of December 2017 actual daily mean Bright Sunshine Hours with historical average for December for Synoptic Weather Stations across Guyana

Global Analysis

The combined global average temperature over land and ocean surfaces for December 2017 was 0.80°C (1.44°F) above the 20th century average of 12.2°C (54.0°F)—tying with 2016 as the third highest December global temperature since records began in 1880. Only December 2015 and 2014 were warmer – see Figure 25 (b) below. The last five years (2013–2017) are among the ten warmest

Decembers on record. December 2017 also marks the 33rd consecutive December (since 1985) and the 396th consecutive month with temperatures at least 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).*)

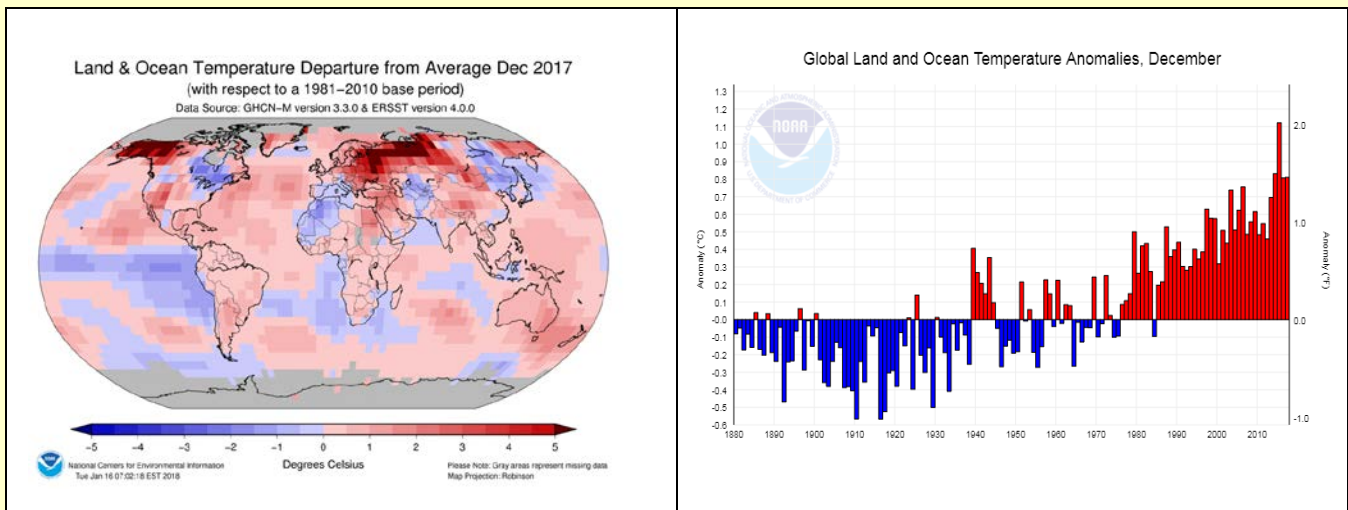


Figure 18(a) Global departure of December 2017 Land and Ocean Temperatures from the Historical averages taken for period 1981 - 2010. Compliments of NOAA². (b) Global Land and Ocean Temperature Anomalies for the month of December from 1880 to 2017³

During December 2017, warmer-than-average temperatures were observed across parts of the world's land surfaces while others areas observed cooler-than-average temperatures. However, the combined global average land surface temperature for December 2017 was 1.45°C (2.61°F) above the 20th century average of 3.7°C (38.7°F) and the second highest December temperature on record,

trailing behind 2015 by 0.43°C (0.77°F). Additionally, much of the world's oceans also had warmer-than-average conditions during December 2017, The December 2017 combined average global oceans surface temperature was 0.56°C (1.01°F) above the 20th century average of 15.7°C (60.4°F) and the sixth highest December temperature in the 138-year record..

² <http://www.ncdc.noaa.gov/sotc/service/global/map-blended-mntp/201712.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 January to March 2018

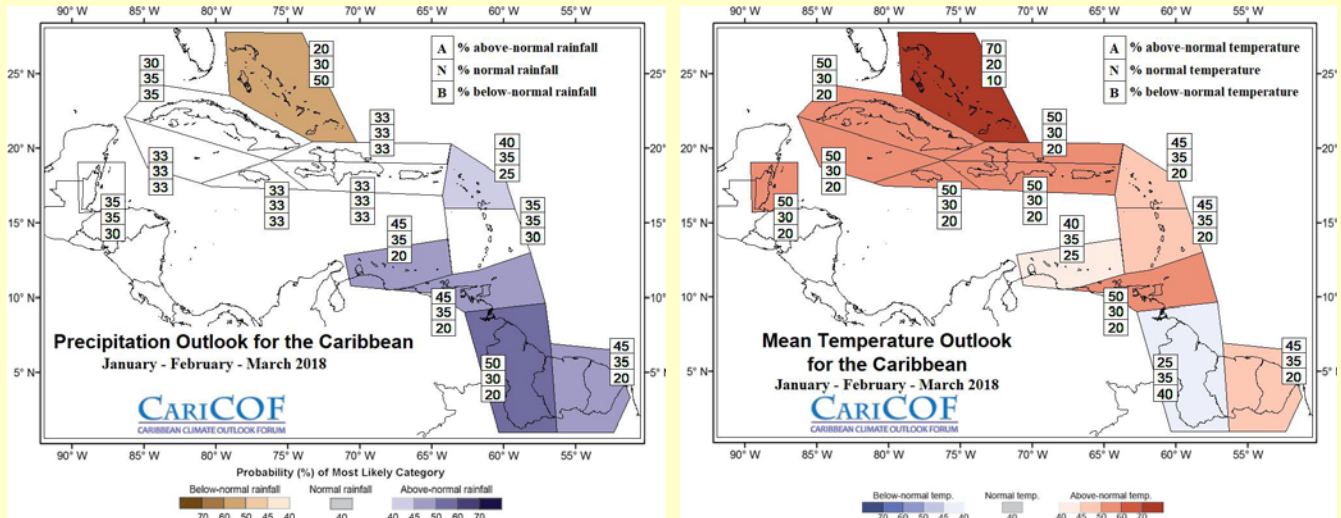


Figure 19 CariCOF (a) Precipitation and (b) Temperature outlook for the Caribbean for the period valid January – March, 2018 showing 80% confidence for *Above Normal to Normal* rainfall and 75% confidence for *Below Normal to Normal* Temperature for Guyana

According to the Outlook provided by CariCOF for the period January – March 2018 in Figure 26(a) above, Guyana can expect wetter to pretty much like usual for this period with a confidence of 80%. Since this is part of the secondary rainy season, the chance for extremely wet conditions are higher than usual.

Additionally, according to the Temperature Outlook in Figure 26(b) above, cooler than to pretty much like usual can be expected for this period with a confidence level of 75 %. Since there is a resonable chance for cooler conditions, extreme heat is not a concern at this time..

CariCOF Wet Days and Wet Spells Outlook for January – March 2018

Table 3 Climatological Normals and Forecasted Number of *Wet Days* and various categories of *Wet Spells* for selected locations across Guyana for the period January to March, 2018

January - March 2018	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	12-27	13-35	0.8-4.4	1-4.3	0.4-2.9	0.3-2.5	0-1	0-0.4
Guyana (Albion)	19-44	20-57	0.2-4.7	0.5-4.4	0-2.9	0.3-2.5	0-1	0-1
Guyana (Blairmont)	20-51	24-65	0.4-4.2	0.6-4.3	0-2.9	0.2-2.2	0-1.9	0-1.2
Guyana (Enmore)								
Guyana (Georgetown)	22-45	24-51	0.4-4.2	0.6-4.4	0.4-3	0.3-3	0-1.7	0-1.2
Guyana (New Amsterdam)	23-49	25-58	0.3-4.2	0.5-4.3	0-2.6	0.1-2.7	0-1	0-1.4
Guyana (Skeldon)	31-55	33-68	0.8-3.3	0.9-3.4	0-2.1	0.2-1.9	0-0.2	0-0.4
Guyana (Timehri)	21-46	24-58	0.4-3.9	0.7-3.9	0-3	0.2-2.4	0-1	0-0.9

brown is a decrease in frequency, **dark blue** an increase, **grey** none are expected

Wet Days: Usually, during January – February – March, 21 to 45 of the 90 days are Wet Days along Coastal Guyana – shown in Table 3 above. For January – March 2018, rainfall is likely to be above to normal for Guyana, as a result, the forecast indicates a slight increase in the amount of Wet Days across coastal Guyana.

7 – Days Wet Spells: Usually, Coastal Guyana experiences between 1 to 4 ‘Seven – Days’ Wet Spell, with 1 to 3 of them being Very Wet for the period January – February – March. For January to March 2018, the forecast does not indicate any change from the usual number of Wet and Very Wet spells as shown in Table 3.

IRI-ENSO Forecast

Synopsis: La Niña is likely (~85-95%) through Northern Hemisphere winter, with a transition to ENSO-neutral expected during the spring.

In mid-January 2018, the tropical Pacific reflected La Niña conditions, indicated by the pattern of below-average sea surface temperatures (SSTs) across the central and eastern equatorial Pacific Ocean, which was in the range of weak to moderate La Niña. In addition, most atmosphere variables were suggestive of La Niña conditions. The latest weekly Niño-3.4 index value was -0.8°C , and the Niño-3 and Niño-1+2 indices were at or below -1.0°C during much of the month. Negative sub-surface temperature anomalies in the central and east-central equatorial Pacific weakened at the end

of the month as anomalously warm waters in the western Pacific at depths greater than 100 m propagated eastward to approximately 140°W . The atmospheric conditions over the tropical Pacific Ocean also reflected La Niña, with suppressed convection near and east of the International Date Line. Additionally, the low-level trade winds continued to be stronger than average over the western and central Pacific. Overall, the ocean and atmosphere system remained consistent with La Niña.

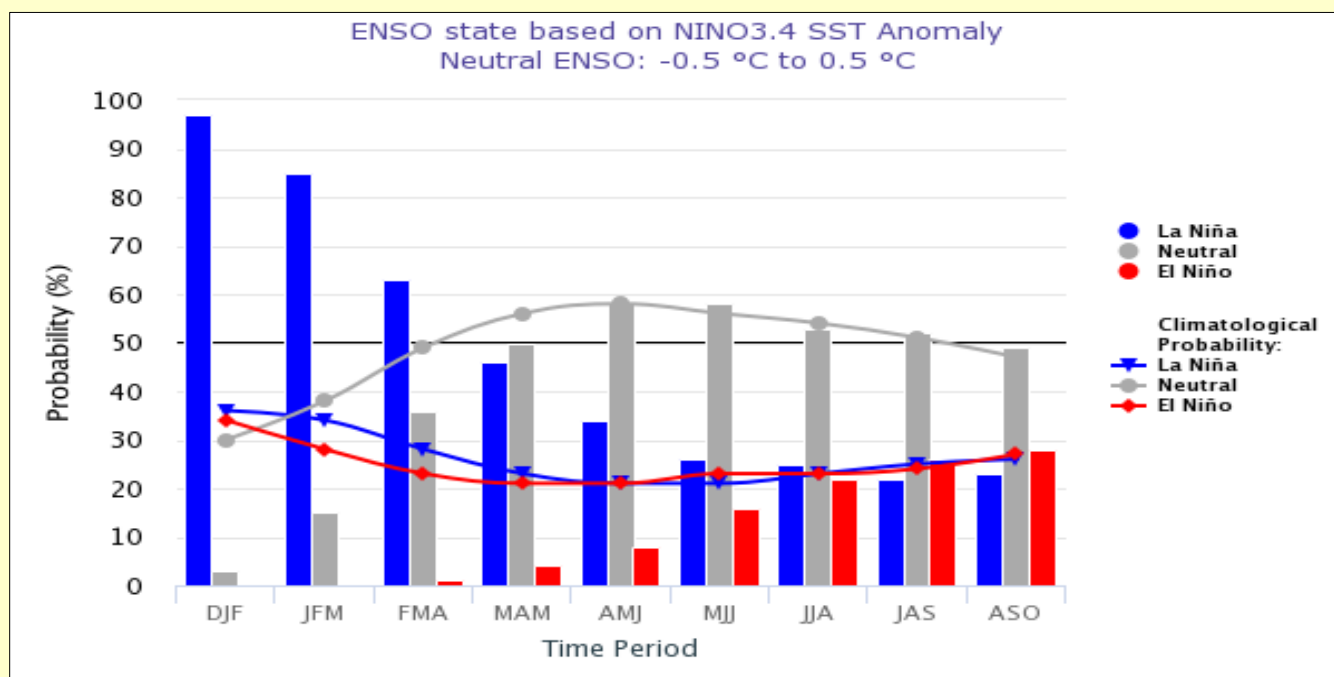


Figure 20 January 2018 CPC/IRI Official Probabilistic ENSO Forecast

Recent and Current Conditions

In mid-January 2018, the NINO3.4 SST anomaly was in the upper portion of the weak La Niña range. For December the SST anomaly was -0.79 C, indicating weak La Niña, and for October-December it was -0.70 C, also in that 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 in the annex IV for each 3-month season. The most recent weekly anomaly in the Nino3.4 region

was -0.9, showing weak La Niña. The pertinent atmospheric variables, including the lower level zonal wind anomalies, the Southern Oscillation Index and the anomalies of outgoing longwave radiation (convection), have been showing patterns suggestive of La Niña, although the Southern Oscillation has been weak recently. Subsurface temperature anomalies across the eastern equatorial Pacific, while recently weakening significantly, are also still consistent with La Niña. Given the current and recent SST anomalies, the subsurface profile and the La Niña patterns in most key atmospheric variables, it appears we are in the later stage of a weak La Niña.

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 La Niña is strongly favored for the remainder of winter, with a likely transition to ENSO-neutral during spring. As of mid-December,

80% of the dynamical or statistical models predicts La Niña conditions for the initial Jan-Mar 2018 season, dropping to 48% for Feb-Apr and 28% for Mar-May. For these seasons, no model predicts El Niño conditions, so that the remaining probability is only for neutral conditions (Table 4).

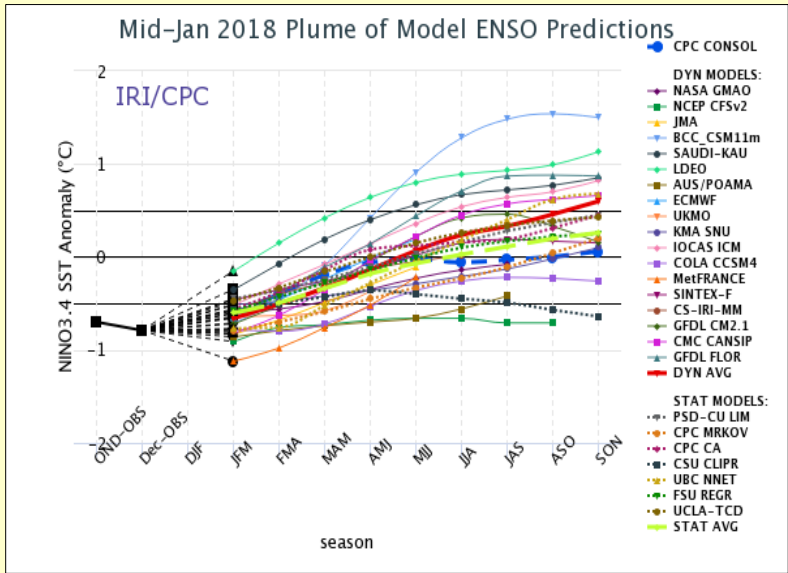


Figure 21 January 2018 Plume of Model ENSO Predictions

Table 4 Showing IRI/CPC Mid – January model-Based Forecast probabilities for La Niña, neutral, and El Niño conditions for each 3-month season.

Season	La Niña	Neutral	El Niño
JFM 2018	69%	31%	0%
FMA 2018	50%	50%	0%
MAM 2018	30%	70%	0%
AMJ 2018	17%	79%	4%
MJJ 2018	16%	65%	19%
JJA 2018	15%	54%	31%
JAS 2018	15%	49%	36%
ASO 2018	15%	42%	43%
SON 2018	16%	36%	48%

In summary, the probabilities derived from the models on the IRI/CPC plume – see Figure 28 above, suggest, on average, a preference for weak La Niña conditions for Jan-Mar 2018, a 50% chance for each of La Niña or neutral for Feb-Apr,

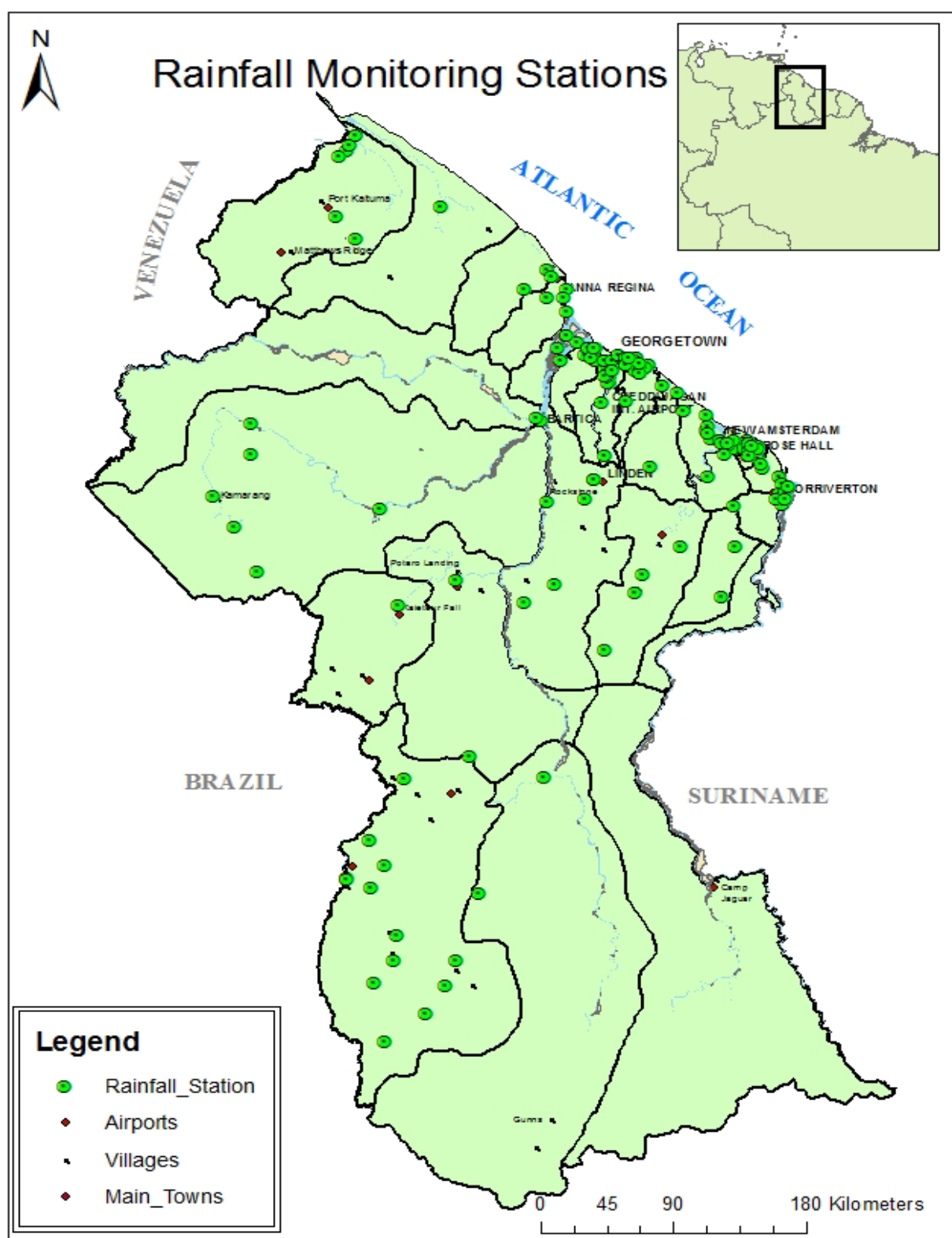
and neutral having highest probability status from Mar-May through Jul-Sep. Chances for El Niño are small through Apr-Jun 2018, rising to 31% for Jun-Aug and up to 48% by Sep-Nov.

Annex I

Glossary of Terms

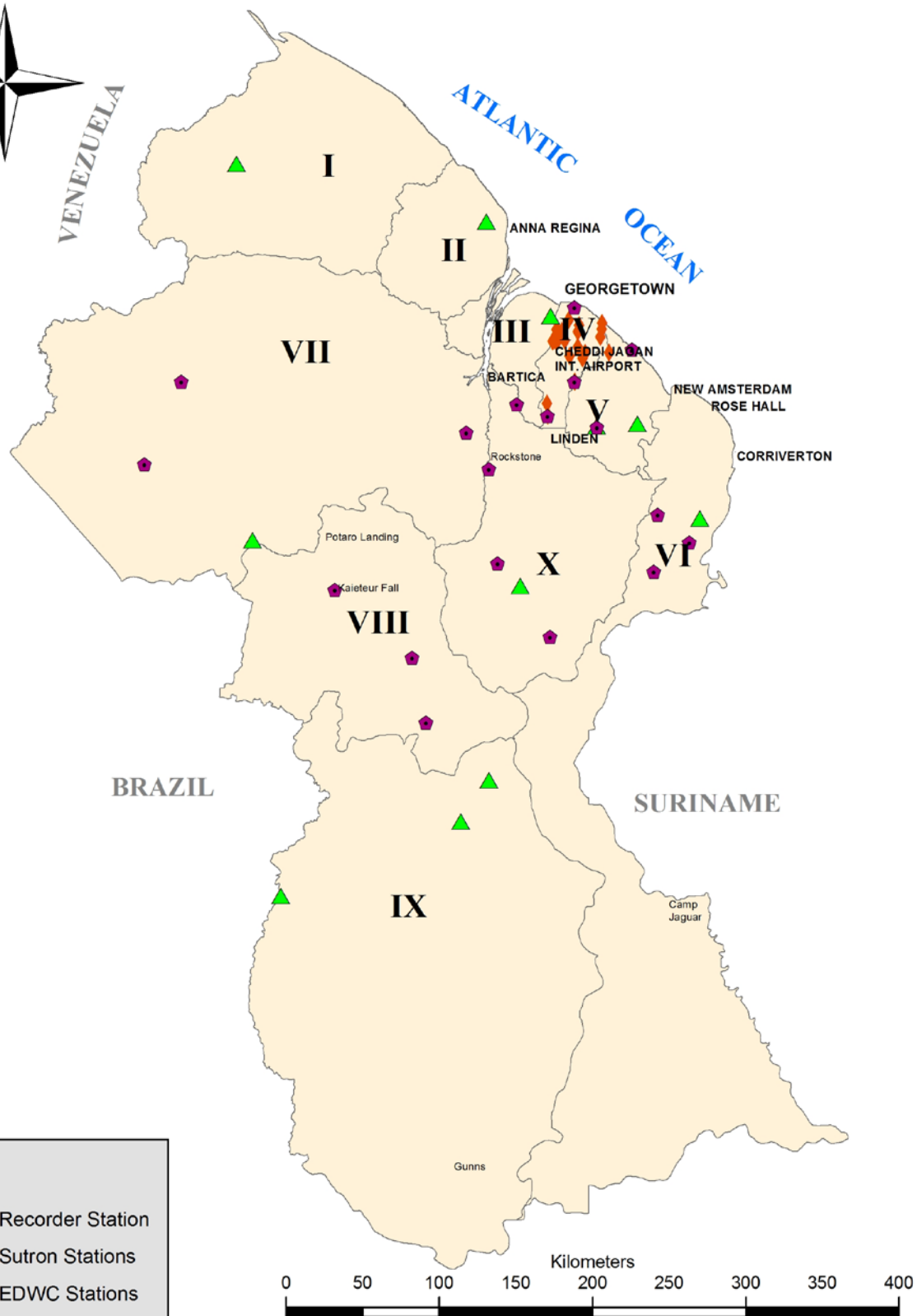
- **CariCOF** - Caribbean Climate Outlook Forum
- **CPC** – Climate Prediction Center
- **ENSO** - *El Niño–Southern Oscillation* is an irregularly periodical variation in winds and sea surface temperatures over the tropical eastern Pacific Ocean, affecting much of the tropics and subtropics.
- **Historical 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**
- **Secondary 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





Administrative Distribution of Hydrological Stations



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

Table 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%

Sources

- <http://carogen.cimh.edu.bb/index.php/component/countrydata/countrydata?dataset=rainfall>
- http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/?enso_tab=enso-cpc_update
- NOAA National Centers for Environmental information, Climate at a Glance: Global Time Series. <http://www.ncdc.noaa.gov/cag/>
- NOAA National Centers for Environmental Information, State of the Climate: Global Climate Report for December 2017 <https://www.ncdc.noaa.gov/sotc/global/2017012>.
- http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.html
- <http://www.ncdc.noaa.gov/sotc/global/201705>
- <http://iri.columbia.edu/wp-content/uploads/2017/05/figure1.gif>
- http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf

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