

# Climatological Summary 2019

&

~ Hurricane Season Review ~

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## Introduction

*The country of Sint Maarten is located in the extreme northeast section of the Eastern Caribbean. It is part of an island which is approximately 37 square miles shared by two countries: French St. Martin to the north and Dutch Sint Maarten to the south, which occupies 16 square miles. The island is relatively flat but has a central range with various peaks. Pic Paradise on the French side is the highest point (1400ft) on the island while Sentry Hill is the highest point on the Dutch side (1100ft).*



*The Princess Juliana International Airport (PJIA) is located on the south western strip of Sin. Maarten at latitude 18.02° north and longitude 63.06° west.*

## ISLAND CLIMATOLOGY

*Based on records (1981-2010) at Princess Juliana International Airport (PJIA), the normal annual rainfall is approximately 1170mm or 46 inches. Like many other Caribbean islands, the driest months are from January to June while the wettest months are from July to November. December, May and June are considered to be transition-months since they can be either dry or wet.*

*The driest month on record is March while the wettest is November. On average, there are about 145 rain days a year with April having the least (8 days) and November the most (15 days). Rainfall during December to April is mainly as a result of old frontal boundaries or shear lines, dipping southwards from the northeast coast of the United States while the rainfall during May and June are often associated with upper level trough interactions and from July onwards, rainfall is mostly from tropical cyclones.*

*The normal daily average temperature is 27 °C or 81 °F, the normal maximum and minimum temperatures are 32 °C and 23 °C respectively. August and September are the warmest months while February is the coolest.*

*On average St. Maarten receives approximately 250 hours of sunshine monthly with 8 to 10 hours daily. The months with the most sunshine hours are March and April and the least hours are recorded in November.*



## ABOUT US

*The Meteorological Department of St. Maarten (MDS) — most commonly referred to as the Met. Office — is a scientific organization that operates 24 hours a day, all year round, monitoring and continuously keeping watch of the weather conditions across the island*

## OUR MISSION

*Our aim is to “Protect life and property through the issuance of timely and appropriate weather products for the adjacent waters, air space and the general public and to provide meteorological, hydrological and seismological related services to specific sectors, in order to sustain social and economic developments.”*

## OUR VISION

*The vision of the Meteorological Department of St. Maarten is to be “A leading weather service provider collaborating with stakeholders to deliver services of high quality and accuracy.”*



## 2019 Hurricane Season

The 2019 Atlantic Hurricane season officially came to an end on November 30<sup>th</sup> 2019. The season produced eighteen (18) named storms, six (6) hurricanes; three (3) of which were major (Cat 3 or higher). In an average season there are twelve (12) named storms, six (6) hurricanes with at least three (3) being major hurricanes.

Overall, this season was an active one reasons being warmer Atlantic temperatures and weak vertical wind shear.

In the 2019 season a few records were made:

- The 2019 Atlantic hurricane season will go down in the record books as the fourth year in a row with above average activity.
- This was a record fifth consecutive hurricane season that saw a tropical cyclone form before June 1. Subtropical Storm Andrea formed southwest of Bermuda on May 20.

St. Maarten did not receive any significant impacts during the 2019 Atlantic Hurricane Season. A Tropical storm watch was issued for Tropical Storm Jerry from September 19<sup>th</sup> to 21<sup>st</sup>. Special bulletins were issued for rough seas due to the presence of Tropical Storm Karen in the region.

Although the hurricane season has officially ended we must be reminded firstly, that adverse weather conditions are possible even outside of the hurricane season and secondly, in a few months the 2020 hurricane season will be here. Therefore, preparedness is the key and it is never too early.

### **Cyclone Statistics for 2019 Season.**

	NORMAL	NOAA'S PREDICTION	ACTUAL
<b>NAMED STORMS</b>	12	10-17	18
<b>HURRICANES</b>	6	5-9	6
<b>MAJOR HURRICANES</b>	3	2-4	3



## Local Effects

The 2019 Atlantic Hurricane season was a quiet one for the island of St. Maarten. A Tropical storm watch was issued for the island for tropical storm Jerry. However, there were no significant impact on the island.

Many tropical waves moved across the area with little impact. Surges due to the passage of Tropical Storm Karen through the Caribbean Sea affected the Boardwalk on September 24<sup>th</sup> 2019.

On October 14<sup>th</sup> instability associated with an upper level trough brought heavy rainfall and thunderstorms over the island leading to flooding across many areas. 69.0 mm/2.7 inches of rainfall was recorded within a 6-hr period.



**Impact of Surge on Boardwalk in Philipsburg: September 24<sup>th</sup> 2019**





**Impact of Surge on Boardwalk in Philipsburg: September 24<sup>th</sup> 2019**



*Photos compliments Paul Elinger*

**Summary**

Below is a recap of the 2019 Atlantic Hurricane Season and associated effects on St. Maarten.

	Storm Name	Active Dates	Highest Category	Min. Pressure (mbar)	Max. Winds		Local Effects	Observed Rainfall (mm)	Observed Winds Gusts	
					Kt.	Mph			Kt.	Mph
1	Andrea	May 20-21	STS	1006	35	40	None	-	-	-
2	Barry	Jul. 4-15	Hurricane Cat. 1	993	65	75	None	-	-	-
	TD3	Jul. 22-23	TD	1013	30	35				
3	Chantal	Aug. 20-23	TS	969	90	104	None	-	-	-
4	Dorian	Aug. 24- Sept 7	Hurricane Cat. 5	910	160	182	None	84.2	-	-
5	Erin	Aug. 15-17	TS	1003	40	46	None	-	-	-
6	Fernand	Sept. 3-5 17	TS	1000	45	52	None	-	-	-
7	Gabrielle	Sep. 3-10	TS	995	55	63	None	-	-	-
8	Humberto	Sept.13-19	Hurricane Cat. 3	950	110	127	None	-	-	-
9	Imelda	Sept. 17-19	TS	1004	40	46	None	-	-	-
10	Jerry	Sept. 17-24	Hurricane Cat. 2	976	90	104	None	-	-	-
11	Karen	Sept. 22-27	TS	1003	40	46	minor	-	-	-
12	Lorenzo	Sept. 23- Oct. 2	MH Cat. 5	925	140	161	None	-	-	-
13	Melissa	Oct. 11-14	TS	994	55	63	None			
	TD15	Oct. 14-16	TD	1006	30	35	-	-	-	-
14	Nestor	Oct. 18-19	TS	996	50	58	None	-	-	-
15	Olga	Oct. 25	TS	992	45	52	None	-	-	-
16	Pablo	Oct. 25-28	Hurricane Cat. 1	977	70	81	None	-	-	-
17	Rebekah	Oct. 30 <sup>th</sup> – Nov. 1	STS	982	45	52	None	-	-	-
18	Sebastien	Nov. 19- 24	TS	991	60	69	None	-	-	-

## **Overview of the Storms formed in the 2019 Hurricane Season**

### ***Subtropical Storm Andrea (May 20<sup>th</sup> to 21<sup>st</sup>)***

Andrea was a short-lived subtropical storm that formed well east of the Bahamas and moved northward before dissipating southwest of Bermuda.

### ***Hurricane Barry (July 11<sup>th</sup> to 15<sup>th</sup>)***

Barry formed over the north-central Gulf of Mexico from a non-tropical origin and moved slowly west-northwestward across the northern Gulf. The cyclone made landfall as a category 1 hurricane over south-central Louisiana and produced heavy rainfall and flooding along the Mississippi Valley.

### ***Tropical Depression Three***

This was a short-lived tropical cyclone that developed over the northwestern Bahamas and dissipated off the east coast of Florida a day later.

### ***Tropical Storm Chantal (Aug. 20<sup>th</sup> to 23<sup>rd</sup>)***

Chantal was a short-lived tropical storm over the northwestern Atlantic Ocean.

### ***Hurricane Dorian (August 24<sup>th</sup> to Sept. 7<sup>th</sup>)***

Dorian formed east of the Lesser Antilles on August 24<sup>th</sup> and moved through the Windward Islands and became a hurricane near the Virgin Islands on August 28<sup>th</sup>. Dorian was the strongest hurricane to hit the northwestern Bahamas in modern records, resulting in numerous deaths and causing devastation on Great Abaco and Grand Bahama Island.

### ***Tropical storm Erin (August 26<sup>th</sup> to 29<sup>th</sup>)***

Erin was a weak tropical storm that formed a few hundred miles east of the southeastern United States and recurved away from the United States before dissipating well south of Nova Scotia.

### ***Tropical Storm Fernand (September 3<sup>rd</sup> to 5<sup>th</sup>)***

Fernand was a short-lived tropical storm that made landfall in northeastern Mexico, causing one direct death from flooding.

### ***Tropical Storm Gabrielle (September 3<sup>rd</sup> to 10<sup>th</sup>)***

Gabrielle was a tropical storm that existed for a week over the eastern Atlantic Ocean without affecting land.

### ***Hurricane Humberto (September 13<sup>th</sup> to 19<sup>th</sup>)***

Humberto was a category 3 hurricane that skirted the extreme eastern portions of the Bahamas before raking Bermuda with sustained hurricane-force winds for several hours that caused significant island-wide damage. The hurricane also produced large ocean swells and rip currents along the southeastern coast of the United States that resulted in two fatalities.

### ***Hurricane Imelda (September 17<sup>th</sup> to 19<sup>th</sup>)***

Imelda was a short-lived tropical storm that moved inland over Texas just after it developed. The storm and its remnants meandered inland for a couple of days after landfall and produced historic rainfall totals and devastating flooding over portions of southeastern Texas.

***Hurricane Jerry (September 17<sup>th</sup> to 24<sup>th</sup>)***

Jerry was a category 2 hurricane that developed over the tropical Atlantic Ocean east of the Lesser Antilles. Jerry passed northeast of the Leeward Islands while weakening to a tropical storm, and eventually passed very close to Bermuda after becoming a post-tropical cyclone. Jerry did not directly affect any land areas while it was a tropical cyclone.

***Tropical Storm Karen (September 22<sup>nd</sup> to 27<sup>th</sup>)***

Karen was a tropical storm that formed over the southeastern Caribbean Sea and produced significant flooding across portions of the Windward Islands. The storm moved northward and made landfall on Vieques and Culebra, Puerto Rico, before dissipating over the central Atlantic a couple of days later.

***Hurricane Lorenzo (September 23<sup>rd</sup> to October 2<sup>nd</sup>)***

Lorenzo was one of the strongest hurricanes on record in the eastern or central Atlantic. It briefly became a category 5 hurricane and later brought hurricane-force winds and large damaging waves to portions of the Azores when it passed just west of those islands as a category 1 storm.

***Tropical Storm Melissa (October 11<sup>th</sup> to 14<sup>th</sup>)***

Melissa evolved from an extratropical low to a subtropical storm and then to a tropical storm while it meandered off the coast of New England over the course of a few days. Minor to moderate coastal flooding and beach erosion occurred along portions of the mid-Atlantic and New England coasts.

***Tropical Depression Fifteen (October 14<sup>th</sup> to 16<sup>th</sup>)***

Tropical Depression Fifteen was a short-lived cyclone that formed between the west coast of Africa and the Cabo Verde Islands. It encountered an unfavorable environment and quickly dissipated near those islands.

***Tropical Storm Nestor (October 18<sup>th</sup> to 19<sup>th</sup>)***

Nestor was a short-lived tropical storm that formed over the central Gulf of Mexico. The cyclone became extratropical and weakened before moving inland along the coast of the Florida Panhandle. Nestor produced a few damaging tornadoes in Florida along with localized flooding, causing an estimated \$125 million in damage.

***Tropical Storm Olga (October 25<sup>th</sup>)***

Olga was a short-lived tropical storm that became an extratropical cyclone shortly before making landfall in Louisiana accompanied by gale-force winds. Strong and damaging winds associated with this system spread well inland over the southeastern United States.

***Hurricane Pablo (October 25<sup>th</sup> to 28<sup>th</sup>)***

Pablo was a category 1 hurricane on the Saffir-Simpson Hurricane Wind Scale that formed from a non-tropical low over the northern Atlantic and passed near the eastern Azores.

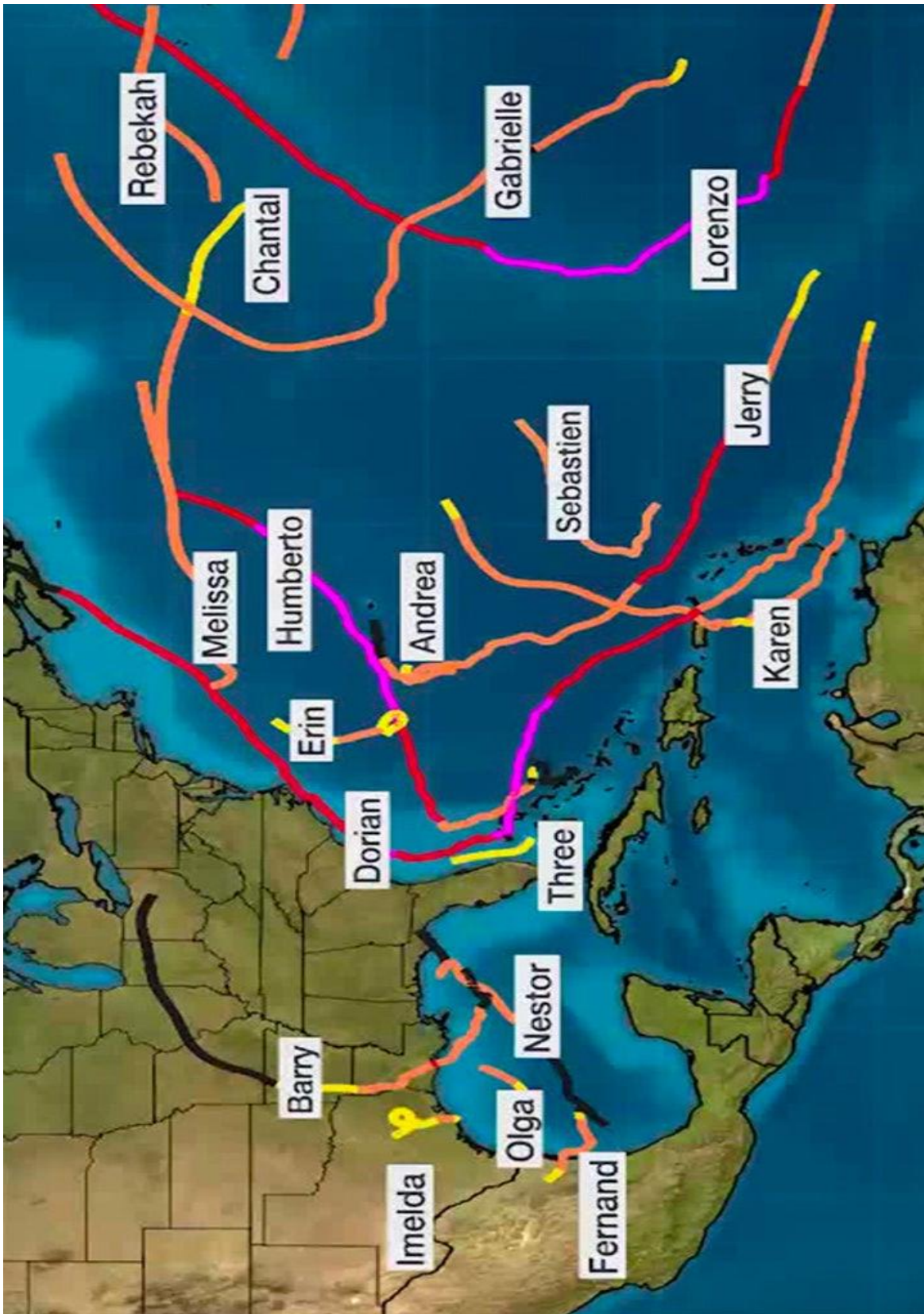
***Subtropical Storm Rebekah (October 30<sup>th</sup> to November 1<sup>st</sup>)***

Rebekah was a short-lived subtropical storm that formed over the far northern Atlantic Ocean that passed just north of the Azores as a weakening extratropical low-pressure system.

***Tropical Storm Sebastien (November 19<sup>th</sup> to 24<sup>th</sup>)***

Sebastien was a late-season tropical storm that formed northeast of the Leeward Islands, and then recurved over the central Atlantic Ocean. Sebastien became an extratropical cyclone while passing near the Azores, and it affected the British Isles before dissipating.

2019 Atlantic Hurricane Season Storm Track

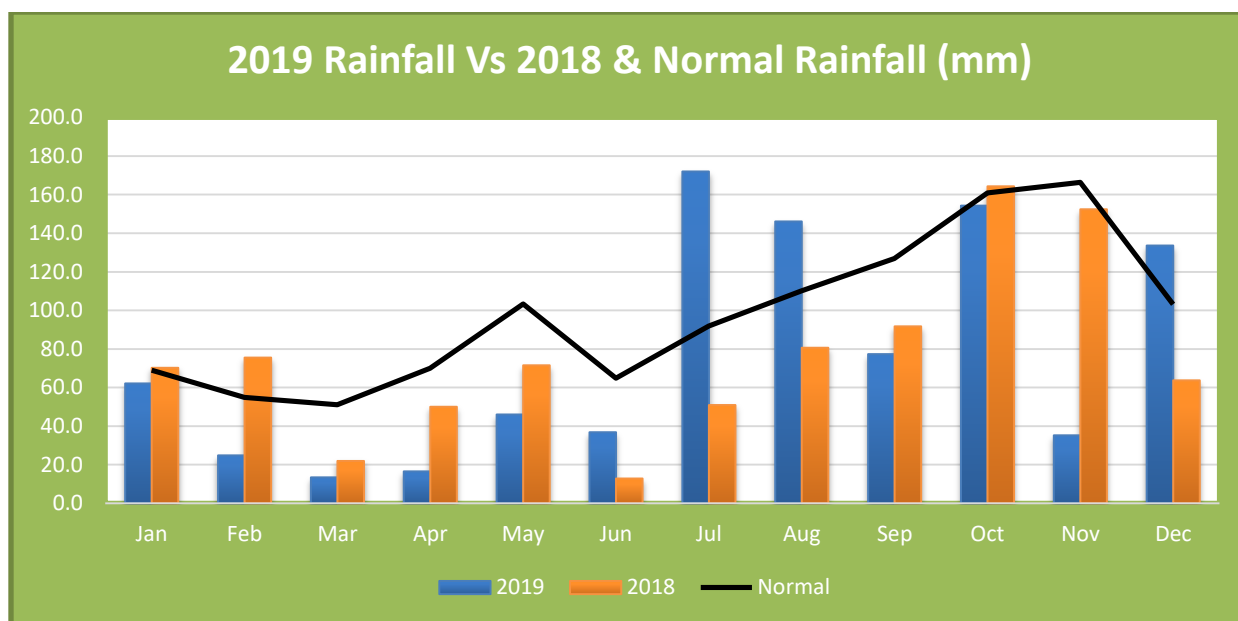


Map compliments "The Weather Channel"

**2019 Climate Data**

**Rainfall**

The total rainfall recorded at the Princess Juliana International Airport, for the year 2019 was **918.1 mm or 36.1 inches**. The normal annual rainfall ranges from about 1026 mm – 1274 mm/40 – 50 inches (1981–2010). This year’s total rainfall was below the normal range by approximately 22%. The year 2019 was slightly wetter than 2018.



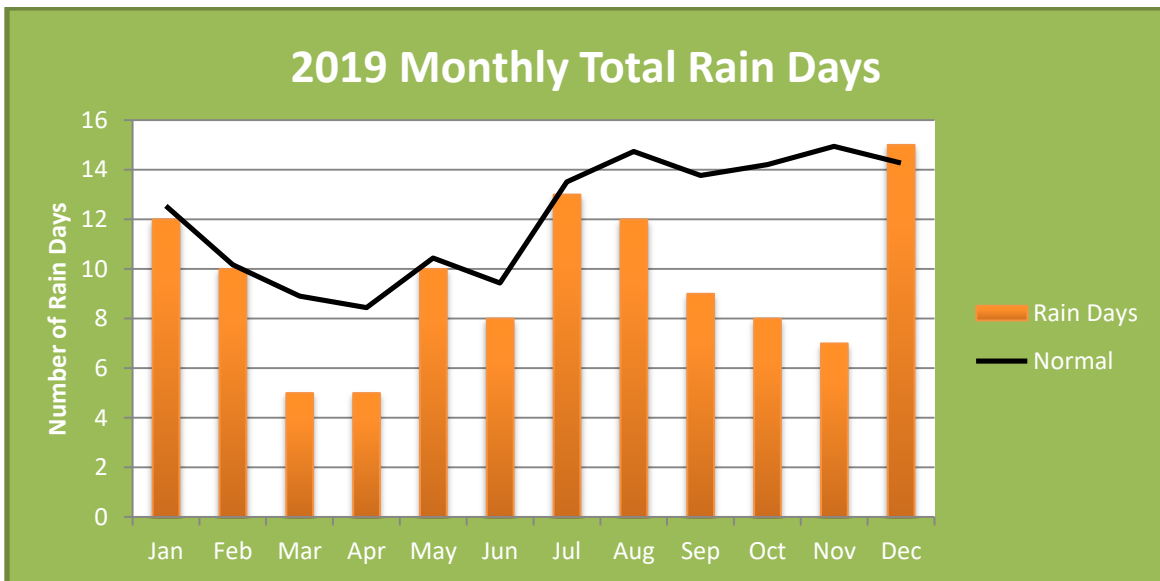
**Fig. 1**

**July** was the *wettest month* of the year, with a total of 172.0 mm or 6.8 inches. The *driest month* was **March** with 13.4 mm or 0.5 inches. The *wettest day* of the year was **October 14<sup>th</sup>**, when 105.8 mm or 4.2 inches was recorded as a result of the passage of a tropical wave across the region.

Fig. 2

A rain day is considered as any day, which records 1.0 mm or more of rainfall. Normally there are approximately 145 rain days in a year on St. Maarten. For 2019, there were 114 rain days with the month of December having the most (15 days) followed by July with thirteen (13) days.

February 2019 was the driest February since 2013, April 2019 was the driest April since 1995, while November 2019 was the driest November since 1973. December had the highest number of rain days for the year (15 days) while October had the lowest number of rain days for the month of October (8 days) since 1973 and November had the lowest number of rain days for the month of November (7 days) on record.

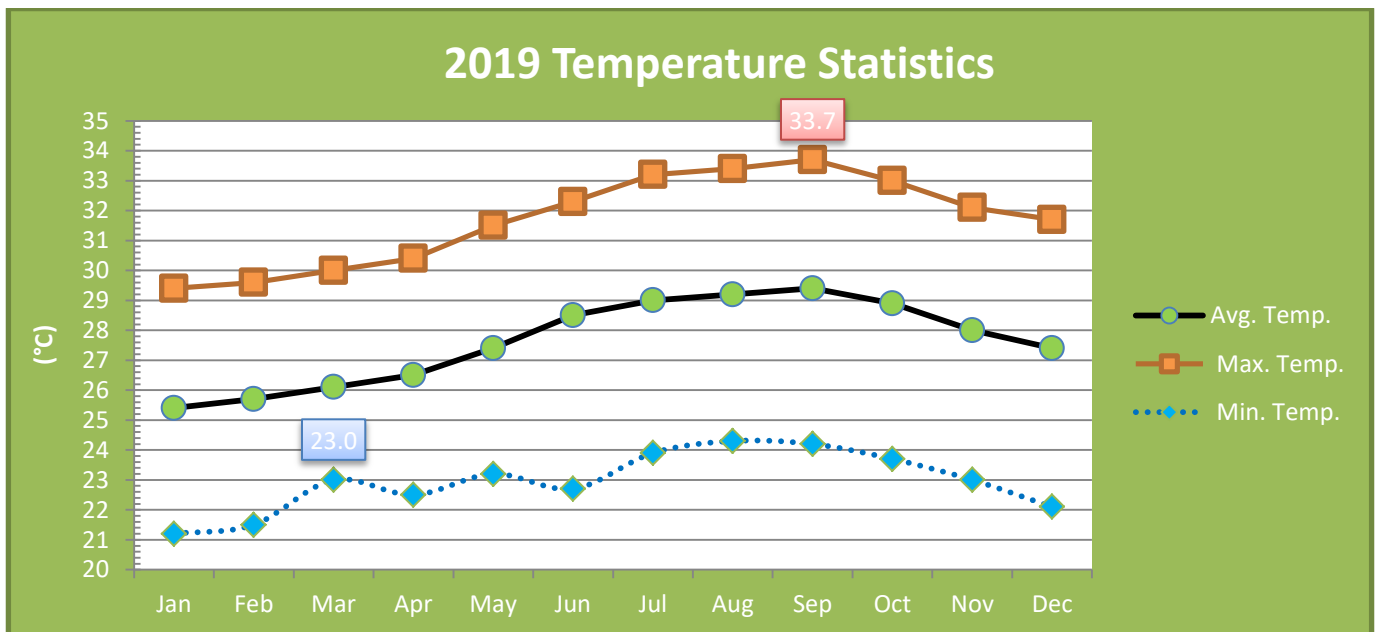
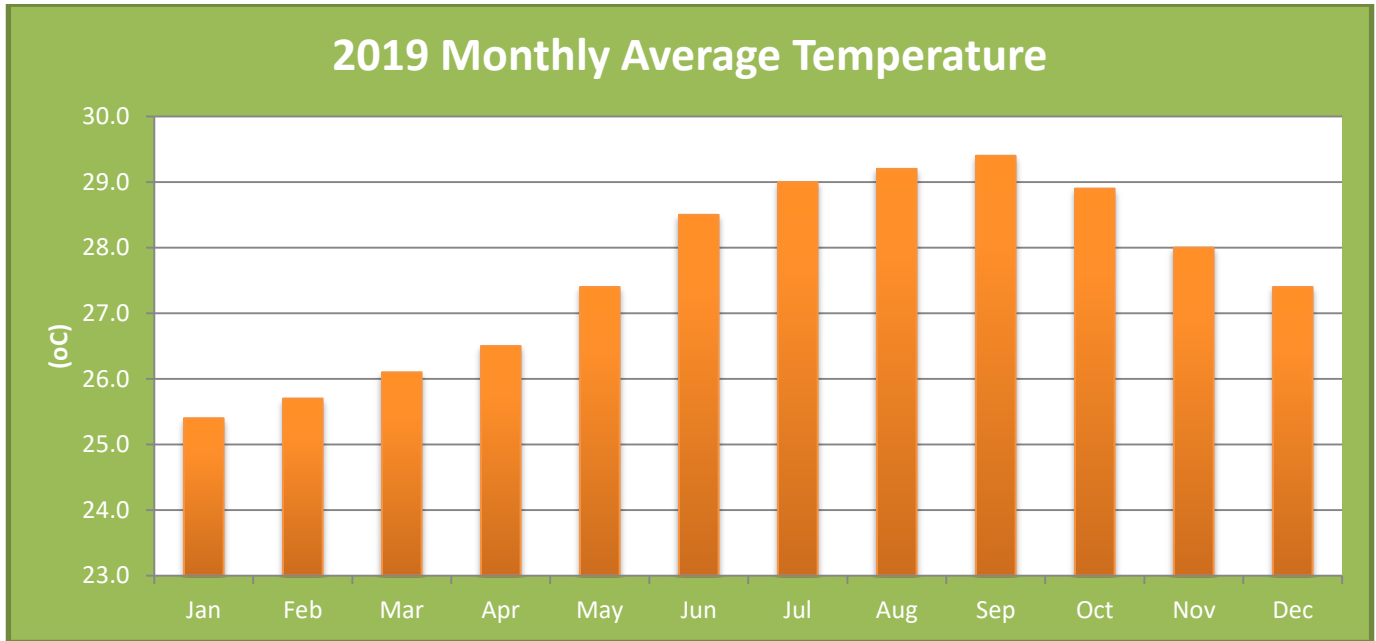




## Temperature

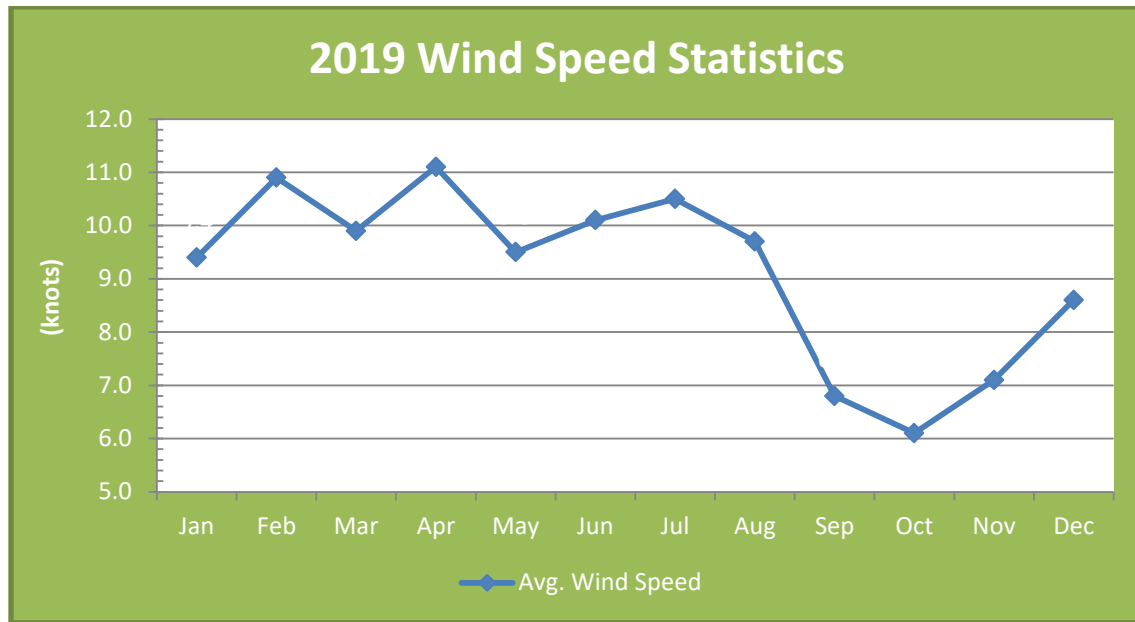
The average temperature recorded in 2019 was **27.6° C (82° F)** which was slightly above normal. The 30-year normal (1981–2010) is 27.2° C. **September** was the warmest month with an average temperature of 29.4° C (85° F) while **January** was the coolest month with an average temperature of 25.4° C (78° F). 2019 was warmer than 2018 on average.

The highest daytime *temperature* recorded in 2019 was **33.7° C (93° F)** which was recorded on September 14<sup>th</sup> while the lowest night time *temperature* was recorded on January 11<sup>th</sup> as **21.2° C (70° F)**.



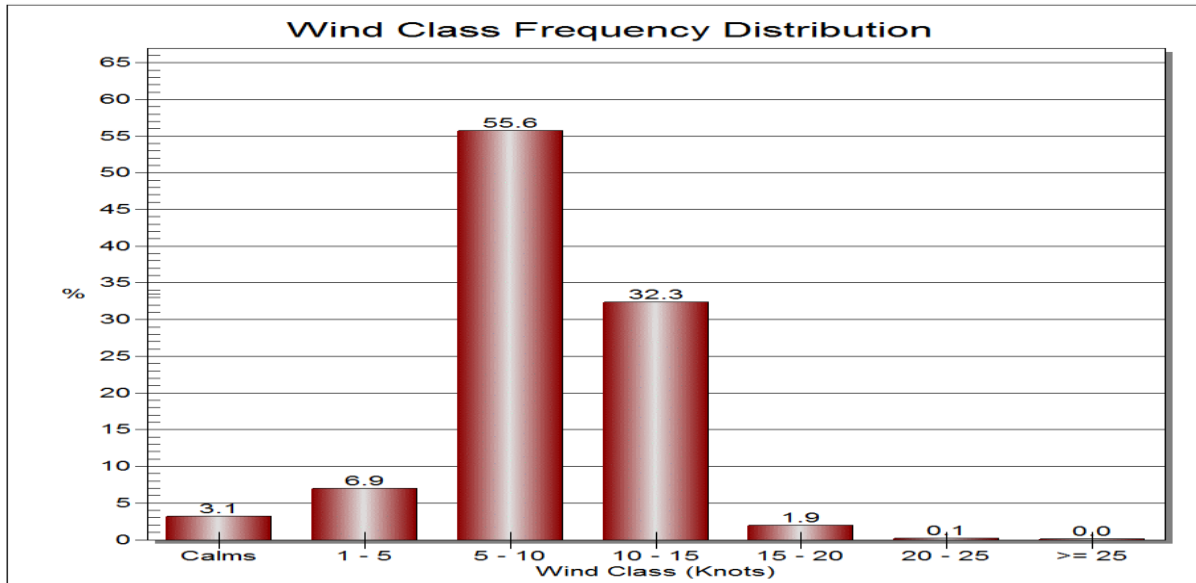
## Wind

Surface winds at the Princess Juliana International Airport for 2019 were generally from the east at an average speed of **9.0 knots** (10 mph) which was slightly above average compared to the 30-year average (1981–2010). The *highest monthly average wind speeds were recorded in April* as 11 knots (13 mph); while **October** had the *lowest monthly average wind speeds* at 6 knots (7 mph).

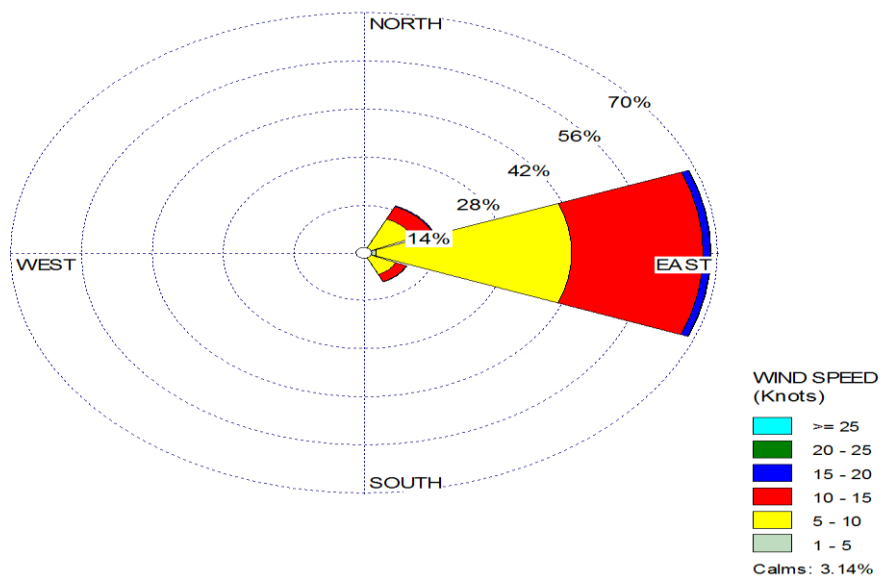


*This following wind analysis was obtained, by using the average hourly wind speeds and direction from 1<sup>st</sup> January to 31<sup>st</sup> December 2019.*

- Approximately 56% of the time, wind speeds at Juliana were between 5 and 10 knots.
- Approximately 32% of the time, wind speeds were between 10 and 15 knots.
- Approximately 7% of the time, wind speeds were between 1 and 5 knots.
- Approximately 3% of the time, wind were calm
- Approximately 2% of the time, winds speeds were between **15** and **20** knots.
- Wind speeds greater than 20 knots occurred on a minimal scale.



### 2019 Wind Rose



**69%** of the time winds came from the **East**.

**16%** of the time winds came from the **Northeast**.

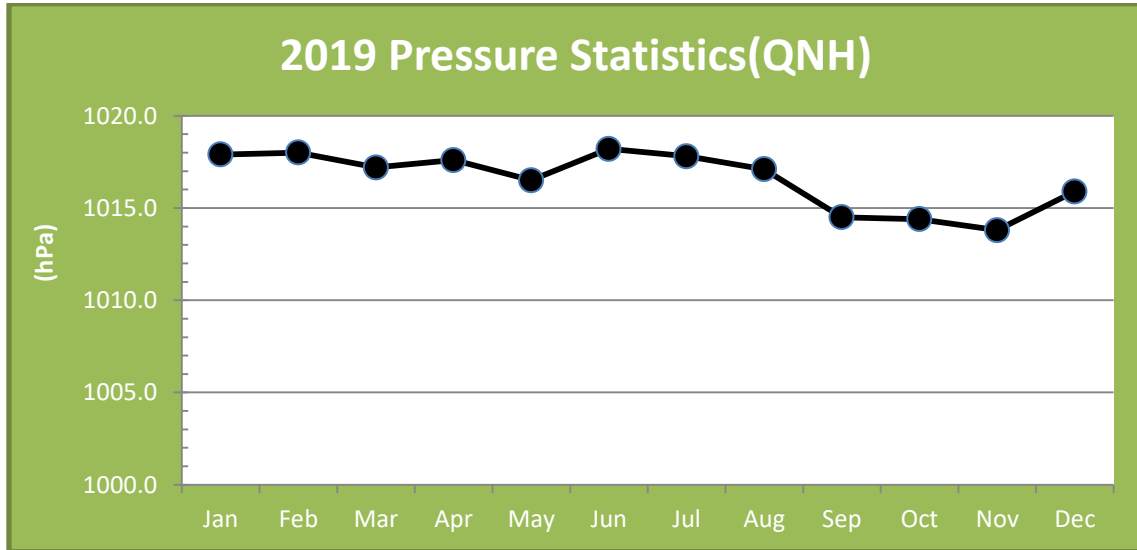
**11%** of the time winds came from **Southeast**.

**3%** of the time winds were calm.

Winds came from other directions 1% of the time or less.

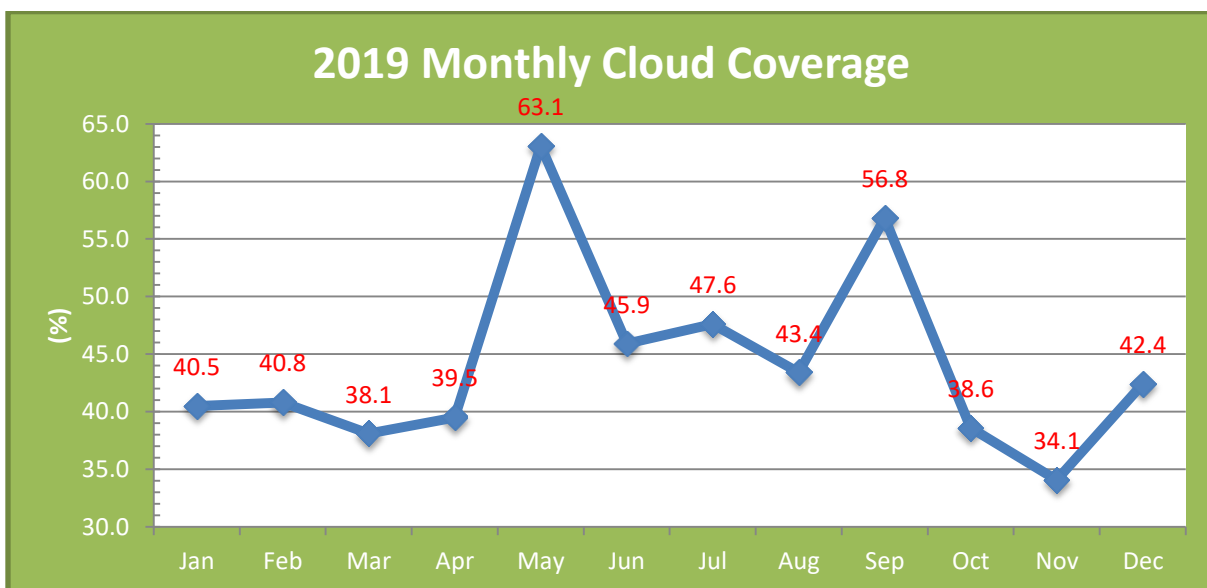
## Air Pressure

At the Princess Juliana International Airport, on average the mean sea-level Pressure for 2019 was **1016.6 millibars**. The Highest daily average was recorded on November 5<sup>th</sup> as 1023.2 mb while the lowest daily average of 1009.9 mb occurred on November 17<sup>th</sup>.



## Cloud Cover

The average cloud cover for St. Maarten over the past year as recorded at the Princess Juliana International Airport was about 44.2%. The *highest monthly average cloud cover* was 56.8% during the month of September while November had the *lowest value* of 34.1% this was the lowest for the month of November since 1983.

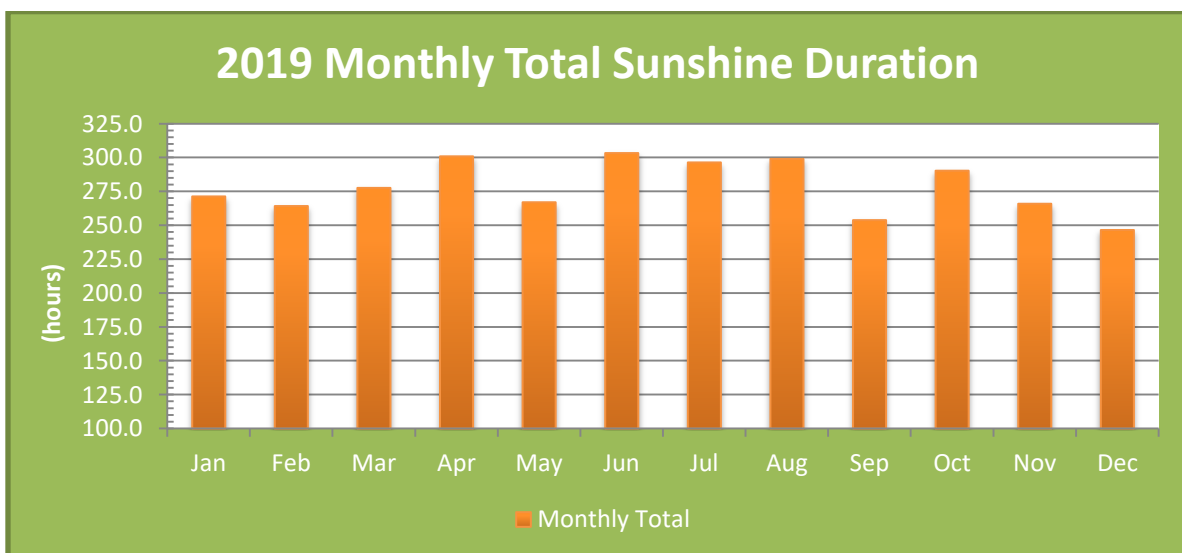
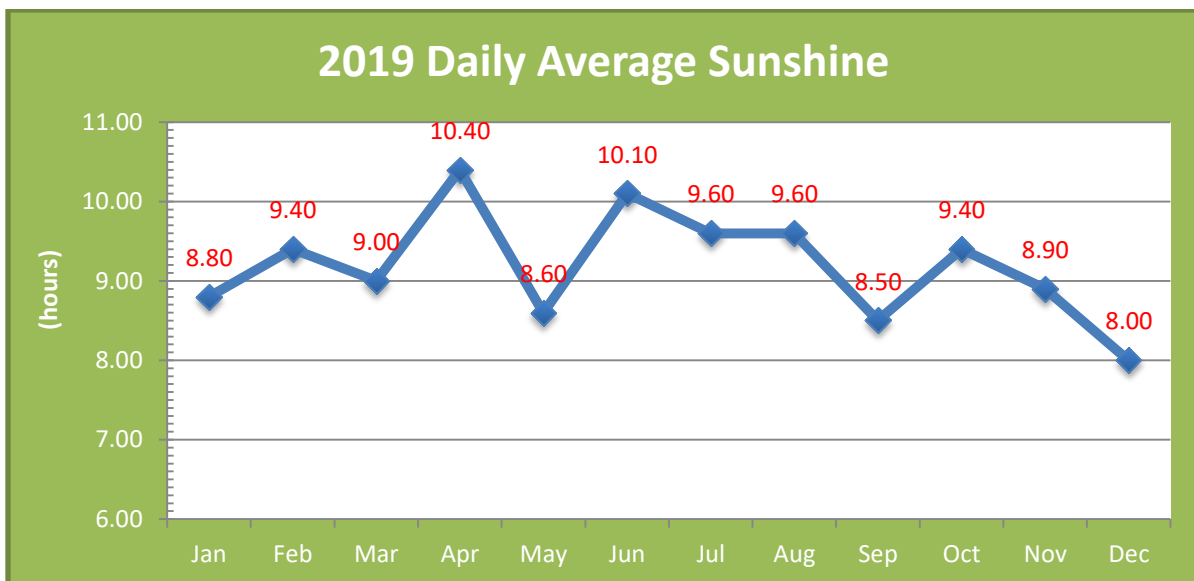


## Sunshine Duration

Approximately 75% of possible sunshine was recorded at the surface at the Princess Juliana International Airport, that is, 3337.4 hours out of a possible 4443.1 hours. The *average daily sunshine duration* was **9 hours 12 minutes**.

**June** received the most hours of sunshine in 2019, while **December** received the least. Daily average sunshine was the highest in the month of **April**; 10 hours and 24 minutes per day; while the lowest daily average was recorded in the month of **December** as 8 hours 00 minutes per day.

Maximum daily sunshine hours was recorded on **July 11<sup>th</sup>** as 12 hours 12 mins. There was only one (1) day when no sunshine was recorded due to overcast conditions: **August 28<sup>th</sup>**.



## Statistic Summary

Below is a recap of the 2019 climate data, in terms of averages, extremes, and totals:

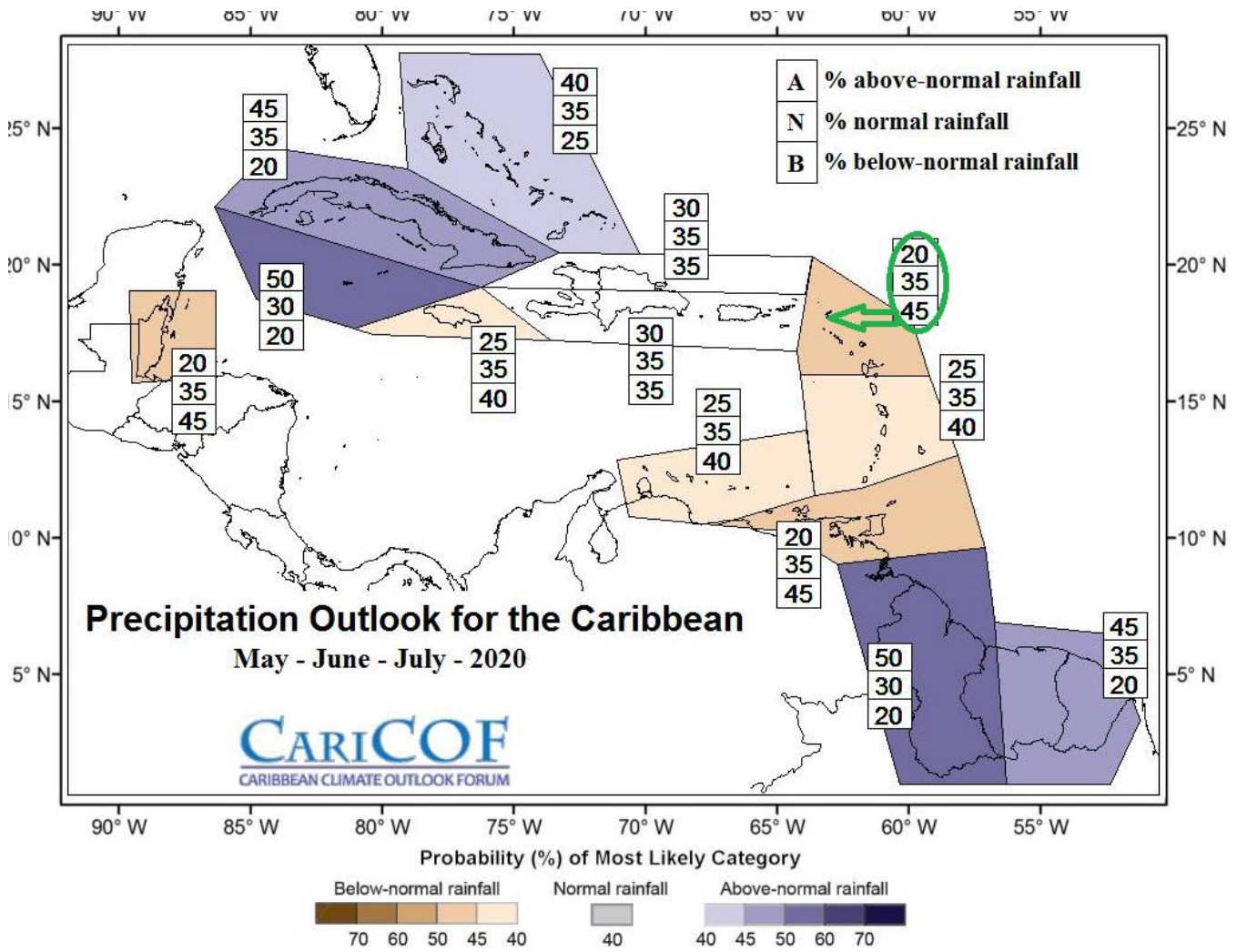
<b>Rainfall</b>		
Total Rainfall for the year	918.1 mm	36.1 inches
Wettest Month	172.0 mm/6.8 in	July
Driest Month	13.4 mm/0.5 in	March
24-hr Maximum Rainfall	105.8 mm/4.2 in	October 14 <sup>th</sup>
Number of Rain Days (with 1.0+ mm)	114 days	
Number of Heavy Rain Days (with 10.0+mm)	19 days	
<b>Temperature</b>		
Average Air Temperature	27.6° C	82° F
Absolute Maximum Temperature	33.7° C/ 93° F	<i>September 14<sup>th</sup></i>
Absolute Minimum Temperature	21.25° C/ 70° F	<i>January 11<sup>th</sup></i>
Warmest Month	29.4° C/85° F	<i>September</i>
Coollest Month	25.4° C/78° F	<i>January</i>
Average Relative Humidity	73%	
<b>Wind &amp; Pressure</b>		
Average Wind Speed	9.0 knots	10 mph
Average wind Direction	90 degrees	<i>East</i>
Maximum Wind Gust	36 kts	<i>37 mph</i>
Most frequent category speed	5-10 knots	<i>56%</i>
Average Air Pressure	1016.6 mb.	
<b>Clouds &amp; Sunshine</b>		
Average Cloud Coverage	42.2%	
Average Daily Sunshine Duration	9 hours : 12 minutes	
Month: Maximum Sunshine	<i>June</i>	
Month: Minimum Sunshine	<i>December</i>	
Daily Maximum Sunshine	<i>12 hrs. 12 min.</i>	<i>July 11<sup>th</sup></i>
Daily Minimum Sunshine	<i>0 hrs. 00 min.</i>	<i>Aug. 28<sup>th</sup></i>

## **Conclusion**

This report provides a summary of all the meteorological data recorded at the Princess Juliana International Airport during the year 2019. The data was collected from various meteorological parameters under regulations stipulated by the World Meteorological Organization (WMO). These elements include rainfall, relative humidity, atmospheric pressure, wind speed and direction, cloud cover and sunshine duration among others.

The Meteorological Department St. Maarten (MDS) records and compiles climatological data for use in research in a number of fields and institutions. Records go as far back as the 1950's in certain parameters. Requests for data must be put in writing through the Department Head.

**Outlook for 2020**  
**Rainfall Outlook for May-Jun-Jul. 2020**



*Map compliments: CARICOF: [Caribbean Institute for Meteorology & Hydrology](#)*

Rainfall for the next three (3) months May-Jun-Jul 2020 is expected to be the usual or drier for St. Maarten, the eastern Caribbean, Jamaica, Belize, the ABC Islands and Trinidad and Tobago.

Normal rainfall for this season ranges between 194.1 mm – 282.1 mm or 8-11 inches. Based on historical data, the current state of the weather and some subjective input, the rainfall forecast for the next three (3) months in St. Maarten is as follows: a **45%** chance of being **below Normal** (less than 194.1 mm); a **35%** chance of being **Near Normal** (between 194.1 mm and 281.1 mm); and a **20%** chance of being **Above Normal** (more than 281.1 mm).

**Note** that the green arrow points to St. Maarten and the forecast probabilities are circled in green on the map above.



**List of Tropical Cyclone for the 2020 Atlantic Hurricane Season**

ARTHUR

HANNA

OMAR

BERTHA

ISAIAS

PAULETTE

CRISTOBAL

JOSEPHINE

RENE

DOLLY

KYLE

SALLY

EDOUARD

LAURA

TEDDY

FAY

MARCO

VICKY

GONZALO

NANA

WILFRED

**BE PREPARED!!!**

**BE ALERT!!!**

**BE READY!!!**

*Be reminded that it only takes one storm to impact our island to make it an active season for us. Therefore, everyone should prepare for every season, regardless of how much activity is predicted.*

**Appendix**

**Stages of Tropical Cyclone Development**

Below are the decisive factors (criteria) for the various development stages for tropical cyclones:

<b>Stage</b>	<b>Criteria</b>
<b><i>Tropical disturbance</i></b>	A discrete system of clouds, showers, and thunderstorms that originates in the tropics and maintains its identity for 24 hours or more.
<b><i>Tropical wave</i></b>	A type of trough of low pressure or tropical disturbance that moves generally from east to west, typically embedded in the tropical easterlies. They are also sometimes called easterly waves.
<b><i>Tropical Depression</i></b>	A tropical disturbance that has developed a closed circulation (counterclockwise winds blowing around a center of low pressure in the Northern Hemisphere). Tropical depressions contain maximum sustained (1-minute) winds of 38 mph (62 km/h or 33 knots) or less.
<b><i>Tropical Storm</i></b>	A well-organized warm-core tropical cyclone that has maximum sustained (1-minute) winds of 39-73 mph (63-118 km/h or 34-63 knots). Once a system reaches tropical storm status, it is given a name by the National Hurricane Center (located in Miami, Florida).
<b><i>Hurricane</i></b>	A warm-core tropical cyclone that has maximum sustained (1-minute) winds of at least 74 mph (119 km/h or 64 knots). Hurricanes are categorized by the Saffir-Simpson Scale. ( <i>see next page</i> )
<b><i>Extra-tropical Cyclone</i></b>	A cyclone that is no longer tropical in origin, which usually means the system moves away from the tropics and moves toward the poles. An extra-tropical cyclone has no wind speed criteria and may exceed hurricane force.
<b><i>Subtropical Cyclone</i></b>	A closed circulation, low-pressure system that has characteristics of both tropical and extra-tropical cyclones. Subtropical cyclones typically have a radius of maximum winds occurring relatively far from the center (usually more than 60 nautical miles), and generally have a less symmetric wind field and distribution of convection (clouds and thunderstorms).
<b><i>Post-tropical Cyclone</i></b>	A former tropical cyclone that no longer possesses sufficient tropical characteristics to be considered a tropical cyclone. Post-tropical cyclones can, however, continue carrying heavy rains and high winds.

## Saffir-Simpson Hurricane Scale

The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage.

	Category	Max. Sustained Winds			Effects
		mph	km/h	knots	
	1	74 - 95	119 - 153	64 - 82	Minimal Damage
	2	96 - 110	154 - 177	83 - 95	Moderate Damage
Major	3	111 - 129	178 - 208	96 - 112	Extensive Damage
	4	130 - 156	209 - 251	113 - 136	Extreme Damage
	5	157+	252+	137+	Catastrophic Damage

## Watches & Warnings

### ***Tropical Storm Watch***

Issued when tropical storm conditions (sustained winds of 39-73mph, 63-118 km/h, or 34-63 knots) are possible within the specified area within the next 48 hours (2 days).

### ***Tropical Storm Warning***

Issued when tropical storm conditions (sustained winds of 39-73mph, 63-118 km/h, or 34-63 knots) are expected somewhere within the specified area within the next 36 hours (1.5 days).

### ***Hurricane Watch***

Issued when hurricane conditions (sustained winds of 74+ mph, 119+ km/h, or 64+ knots) are possible within the specified area within the next 48 hours (2 days).

### ***Hurricane Warning***

Issued when hurricane conditions (sustained winds of 74+ mph, 119+ km/h, or 64+ knots) are expected within the specified area within the next 36 hours (1.5 days).

**Note:** Hurricane preparedness activities become difficult once winds reach tropical storm force, therefore, hurricane watches & warnings are issued well in advance of the anticipated onset of tropical-storm-force winds.

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