Climatological Summary 2023

& Hurricane Season Review

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Front page photo compliments Paul Ellinger
A beautiful day in August 2023 in St. Maarten overlooking Divi Little Bay with the island of St. Eustatius in the backdrop.

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INTRODUCTION

The country of Sint Maarten is located in the extreme northeast section of the Caribbean. It is part of an island approximately 37 square miles shared by two (2) countries: French *Saint Martin* (to the north) and Dutch *Sint Maarten* (to the south). They occupy 21 and 16 square miles respectively. The island is relatively flat but has a central range with various peaks. *Pic Paradis* is the highest point (1400ft) on the French side and the entire island, while *Sentry Hill* is the highest point on the Dutch side (1100ft).

The Princess Juliana International Airport (PJIA) is located on the southwestern strip of Sint Maarten at latitude 18°02' north and longitude -63°06' west.

ISLAND CLIMATOLOGY

Based on records (1991-2020) at the Princess Juliana International Airport (PJIA), the normal annual rainfall is approximately 1112mm or 44 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 "*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 140 rainy days a year, with March and April having the least (8 days) and August and November with the most (14 days).

Rainfall during December to April comes mainly from old frontal boundaries or shear lines, dipping southwards from the northeast coast of the Unites States. The rainfall during May and June are often associated with upper-level trough interactions. From July onwards, rainfall is mostly associated with tropical cyclone activity.

The average daily temperature is 27°C/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*.

The Caribbean heat season is from June to October. Based on the climatological data (1991-2020), Sint Maarten experiences approximately thirty-nine (39) hot days (days with maximum temperature above 32.2°C/90°F) during that season. Heat waves are also prevalent during this season. A heat wave period is considered: two (2) or more consecutive days when the maximum temperature is above 32.2°C/90°F.

On average, Sint 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 Sint Maarten (MDS) -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 Sint Maarten is to be a leading weather service provider collaborating with stakeholders to deliver services of high quality and accuracy.

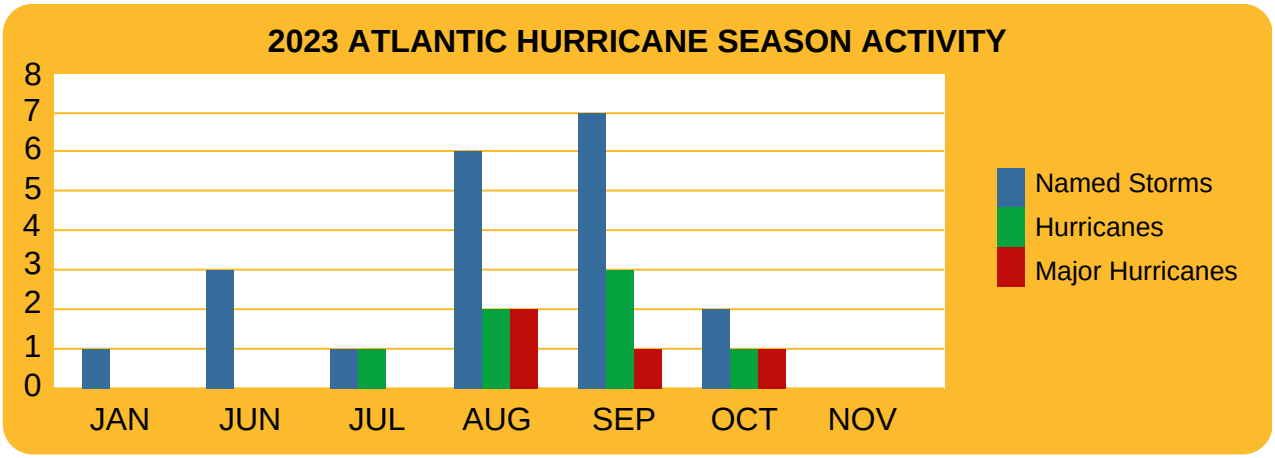
OUR TASKS

- Observe, Record & Transmit Surface/ Upper Air Data
- Produce Monthly Climate Outlooks & Bulletins
- Produce Public & Marine Weather Forecasts
- Maintain National, Regional & International Standards/ Policies
- Issue Special Reports/ Warnings for Tropical Storms & Other Hazardous Weather Phenomena
- Monitor Weather Conditions 24 Hours Daily/ All Year Round
- Produce Aviation Forecasts & Flight Folders
- Compile & Analyze Meteorological & Climatological Data

2023 HURRICANE SEASON

SUMMARY

The Atlantic Hurricane season officially came to an end on the 30th of November, 2023. There were twenty (20) named storms this season, ranking 2023 as the fourth for the most-named storms in a year since 1950. This season produced seven (7) hurricanes; three (3) of which were major.



The 2023 Atlantic seasonal activity fell within the NOAA Climate Prediction Centre's predicted ranges for named storms and hurricanes in the August updated outlook.

2023 ATLANTIC HURRICANE SEASON

	AVERAGE (1991-2020)	NOAA (AUG. 2023)	2023 SEASON
NAMED STORMS	14	**11-21**	20
HURRICANES	7	**6-11**	7
MAJOR HURRICANES	3	**2-5**	3

There were no major impacts from any hurricanes or storms in St. Maarten the Eastern Caribbean this season. Several islands issued watches and warnings during the passage of TS Bret in June, TS Phillippe in September, and Hurricane Tammy in October. Many systems also remained over open water this season.

The El Nino phenomenon is known to suppress storm activity in the Atlantic basin. However, this year, the Atlantic basin experienced the highest number of named storms in modern history under the influence of an El Niño. The unusually warm ocean temperatures in the Atlantic, was able to offset the typical effects of El Niño.

LOCAL WEATHER EFFECTS

During the 2023 Atlantic Hurricane season, there were no significant impacts by storms or hurricanes on St. Maarten. In August, there were two heavy rainfall events: August 2nd - 33.9mm/ 1.3in as a result of a surface trough; August 20th - rainfall associated with Tropical Storm Franklin located in the Caribbean Sea was 55.3mm/ 2.1in.

On October 3rd, Tropical Storm Phillipe passed approximately 35 miles northeast of the island with only rough sea conditions reported along the eastern shores, and a 24-hour rainfall total of 45.6mm/1.8in was recorded.

Between October 19th and 22nd, tropical storm/hurricane watches and warnings were issued for Tropical Storm Tammy, which was then upgraded to a Hurricane. Tammy moved approximately 60 miles east of St. Maarten on October 22nd but eventually drifted further east without causing any damage to the island. Rainfall associated with the passage of Tammy was 83.8mm/3.3 inches.

A few days later, on October 27th, instability associated with a surface trough produced 37.4mm/ 1.5in of rainfall.

Other notable weather impacts occurred in 2023:

Heat Season (June to October)

In 2023, there were 109 hot days during the heat season; this was the highest number of hot days recorded in a season since 2001. This amount was more than 270% of the normal. There were fifteen (15) heat wave periods. The longest heat wave lasted nineteen (19) days from September 12th to 30th. In total there were 28 hot days in September. September 2023 was the warmest month of the year, with an average temperature of 30.2°C/86°F and a maximum temperature of 34.4°C/94°F recorded on September 16th.

Rainfall Events

There were no significant flooding events in 2023 on St. Maarten.

SUMMARY TABLE

A recap of the 2023 Atlantic Hurricane Season and associated effects on St.Maarten

	STORM NAME	ACTIVE DATES	HIGHEST CATEGORY	MIN. PRESSURE (MBS)	MAX. WINDS (KT.)	MAX. WINDS (MPH)	OBSERVED RAINFALL (MM)
1	**Unnamed STS**	Jan. 16-17	STS	976	60	69	
2	**Arlene**	Jun. 1-3	TS	998	35	40	
3	**Bret**	Jun. 19-24	TS	1001	55	63	
4	**Cindy**	Jun. 22-26	TS	1004	50	58	
5	**Don**	Jul. 14-24	H	986	65	75	
6	**Emily**	Aug. 20-21	TS	998	45	52	
7	**Franklin**	Aug. 20 - Sept. 1	MH	926	130	150	55.3
8	**Gert**	Aug. 21 - Sept. 1	TS	998	50	58	
9	**Harold**	Aug. 22-23	TS	995	50	58	
10	**Idalia**	Aug. 26-31	MH	942	115	132	
11	**Jose**	Aug. 29 - Sept. 1	TS	996	55	63	
12	**Katia**	Aug. 31 - Sept. 4	TS	998	50	58	
13	**Lee**	Sept. 5-16	MH	926	145	167	
14	**Margot**	Sept. 7-17	H	969	80	92	
15	**Nigel**	Sept. 15-22	H	971	85	98	
16	**Ophelia**	Sept. 22-23	TS	981	60	69	
17	**Philippe**	Sept. 23 - Oct. 6	TS	998	50	58	45.6
18	**Rina**	Sept. 28 - Oct. 1	TS	999	45	52	
19	**Sean**	Oct. 10-15	TS	1005	40	46	
20	**Tammy**	Oct. 18-28	H	965	95	109	83.8
21	**Vince**						
22	**Whitney**						

OVERVIEW OF THE STORMS FORMED IN 2023

JANUARY 2023

As part of its routine post-operational review, the National Hurricane Center (NHC) occasionally identifies previously undesignated tropical or subtropical cyclones from new data or meteorological interpretation. The NHC re-analysis has concluded that a low that developed over the Gulf Stream during mid-January became a short-lived subtropical storm. The subtropical storm moved rapidly northeastward, making landfall on the far northeastern coast of Nova Scotia just before the system became a post-tropical low.

JUNE 2023

June produced three (3) tropical storms:

1. ***Arlene*** was a short-lived tropical storm that made an unusual southward track over the eastern Gulf of Mexico. It remained offshore and did not directly impact land.
2. ***Bret*** was a tropical storm that formed over the tropical Atlantic. The cyclone brought tropical-storm-force winds and locally heavy rainfall to portions of the Lesser Antilles before it dissipated over the south-central Caribbean Sea.
3. ***Cindy*** was a relatively short-lived tropical storm over the tropical central Atlantic that did not directly impact land.

JULY 2023

In the month of July, only one (1) tropical cyclone formed and later became the first hurricane of the season. ***Don*** was a category 1 hurricane (on the Saffir-Simpson Hurricane Wind Scale) that remained over the open Atlantic Ocean without any direct impacts on land.

AUGUST 2023

August produced six (6) named systems:

1. ***Emily*** was a very short-lived tropical storm over the east-central tropical Atlantic that did not directly impact land.
2. ***Franklin*** formed over the Caribbean Sea and passed over the Dominican Republic as a poorly organized tropical storm. It subsequently became a Category 4 hurricane (on the Saffir-Simpson Hurricane Wind Scale) over the western Atlantic that brought tropical-storm conditions to Bermuda.

3. ***Gert***, first developed into a tropical storm in the tropical Atlantic, and its remnants later redeveloped into a tropical storm in the subtropical Atlantic.
4. ***Harold*** was a tropical storm that made landfall in South Texas, where it caused generally minor damage.
5. ***Idalia*** was a category 4 hurricane that rapidly intensified over the Gulf of Mexico. It made landfall as a category 3 hurricane in Florida was responsible for 12 fatalities and an estimated $3.6 billion in damage in the United States.
6. ***Jose*** was a compact tropical storm that moved northward over the central Atlantic before being absorbed by the larger and stronger Post-Tropical Cyclone Franklin.

SEPTEMBER 2023

In September seven (7) cyclones developed:

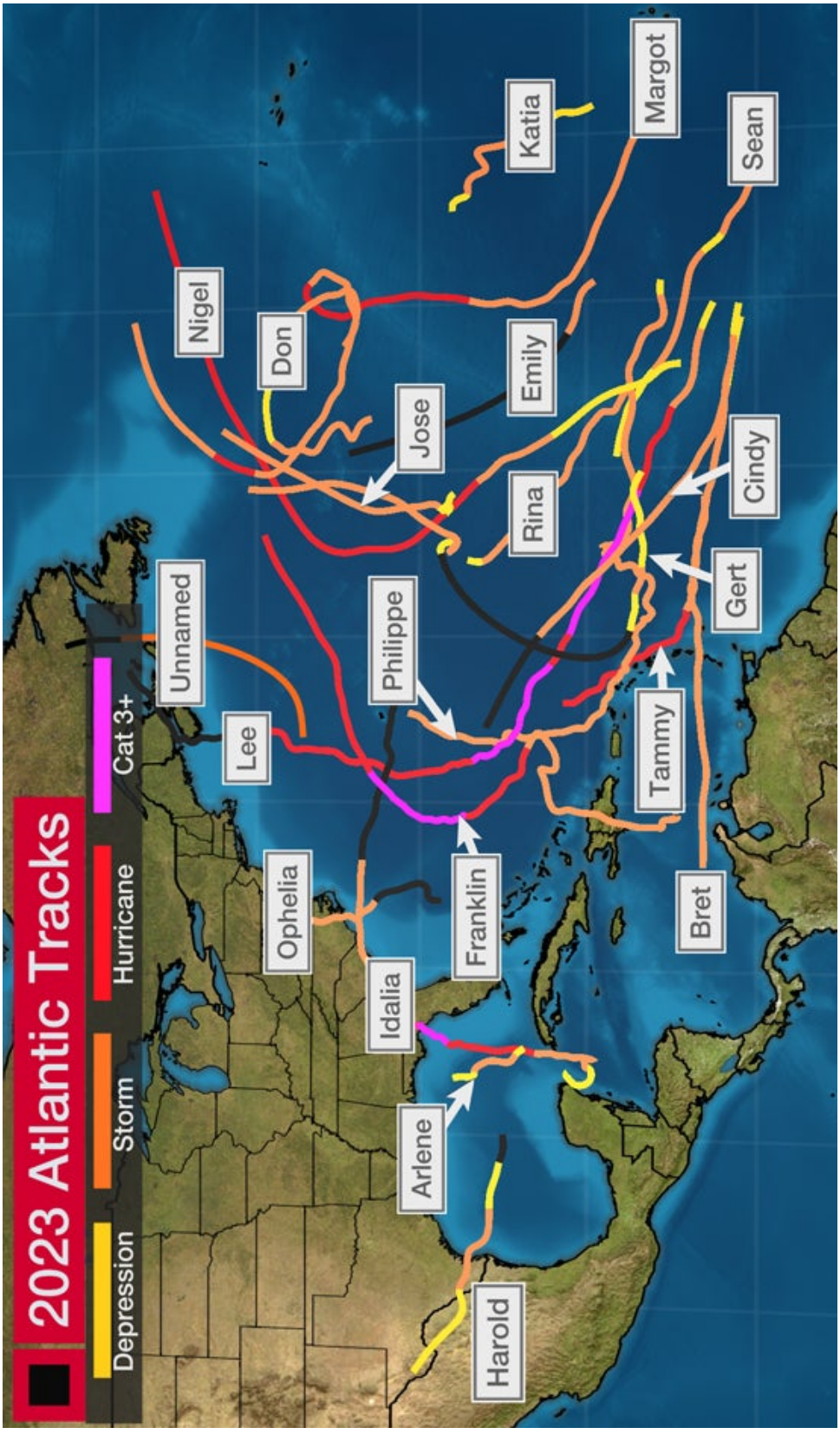
1. ***Katia*** was a short-lived tropical storm that formed over the eastern Atlantic just west of the Cabo Verde Islands but did not directly impact land.
2. ***Lee*** formed in the central Atlantic and became a major hurricane. It explosively intensified into a category 5 hurricane, but moved north of the Leeward Islands and remained over the Atlantic until it made landfall over Nova Scotia with some wind, storm surge, and rainfall impacts. Overall damage was relatively minor, four direct deaths were noted, all in the United States.
3. ***Margot*** was a large category 1 hurricane (on the Saffir-Simpson Hurricane Wind Scale) that made a clockwise loop over the east-central subtropical Atlantic and did not affect land.
4. ***Nigel*** was a category 2 hurricane that formed over the tropical Atlantic and recurved northward over the central Atlantic Ocean.
5. ***Ophelia*** was a tropical storm that formed along the eastern USA and made landfall near North Carolina. However, there were no reports of fatalities or injuries associated with Ophelia.
6. ***Philippe*** was a long-lived tropical storm that formed in the eastern Atlantic. It meandered generally westward, and eventually affected the Leeward Islands with heavy rainfall before the system turned northward and was absorbed by a larger non-tropical low.
7. ***Rina*** was a sheared tropical storm that formed over the central Atlantic Ocean in close proximity to Tropical Storm Philippe.

OCTOBER 2023

October produced two (2) named storms:

1. ***Sean*** formed in the central Atlantic Ocean and remained over the ocean.
2. TS ***Tammy*** formed in the central Atlantic and days later became a hurricane east of the Windward Islands. The cyclone brought hurricane-force winds and locally heavy rainfall to portions of the Lesser Antilles.

2023 ATLANTIC HURRICANE SEASON STORM TRACK



Map compliments : "Weather Underground"

2023 CLIMATE DATA

RAINFALL

The *total* rainfall recorded at the Princess Juliana International Airport, for the year 2023 was **899.7 mm/35.4 inches**. The normal annual rainfall ranges from about 976-1246 mm/38-49 inches (1991—2020). This year's total rainfall was below the normal range for the third consecutive year.

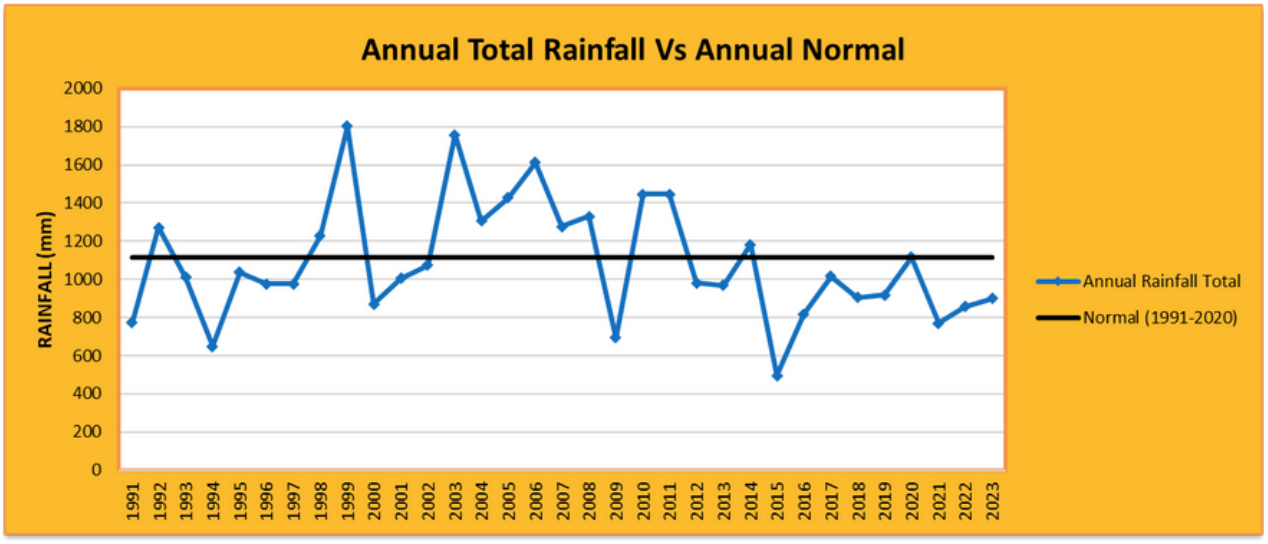


Figure. 1

October was the *wettest* month of the year, with a total of 273.7 mm/10.8 inches. The *driest* month was **March** with 11.9 mm/0.5 inches. The *wettest* day of the year was **October 22nd** when 83.8 mm/3.3 inches of rainfall was recorded. This was as a result of the instability produced by Hurricane Tammy. 62.3mm/2.5inches of rainfall was recorded within a 6-hour period.

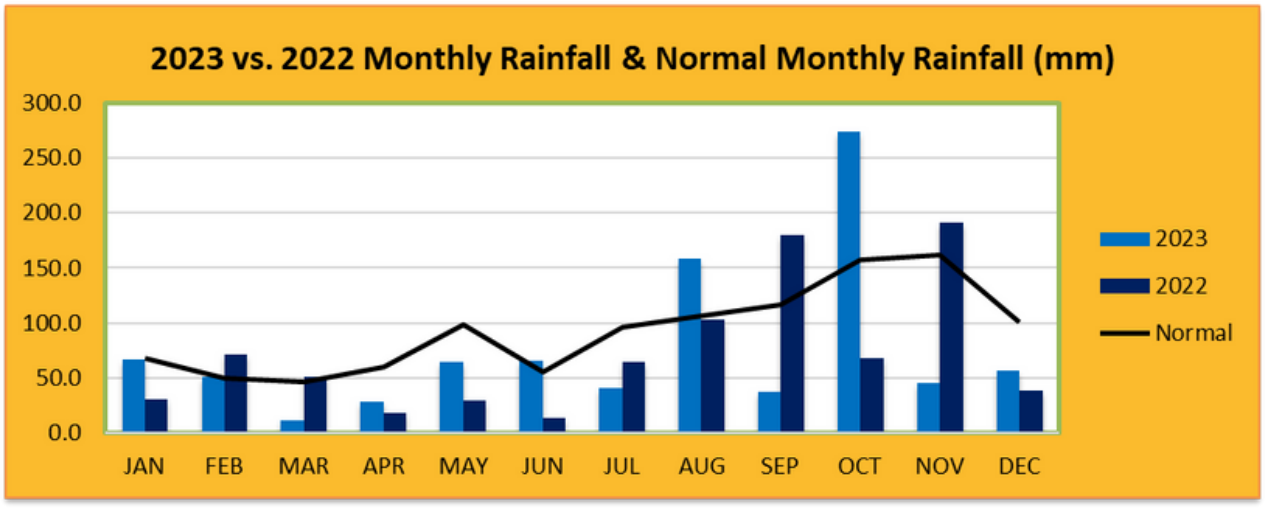


Figure. 2

A rain day is considered as any day, which records 1.0 mm or more of rainfall. On average there are approximately 140 rain days in a year on St. Maarten. For 2023, 127 rain days were recorded with the month of October having the most (18 days), while March had the least days (3).

March, July and September were the driest since 2015, and November was the driest since 2019. May 2023 was the wettest May since 2018, August was the wettest since 2011 while October 2023 was the wettest October since 2010.

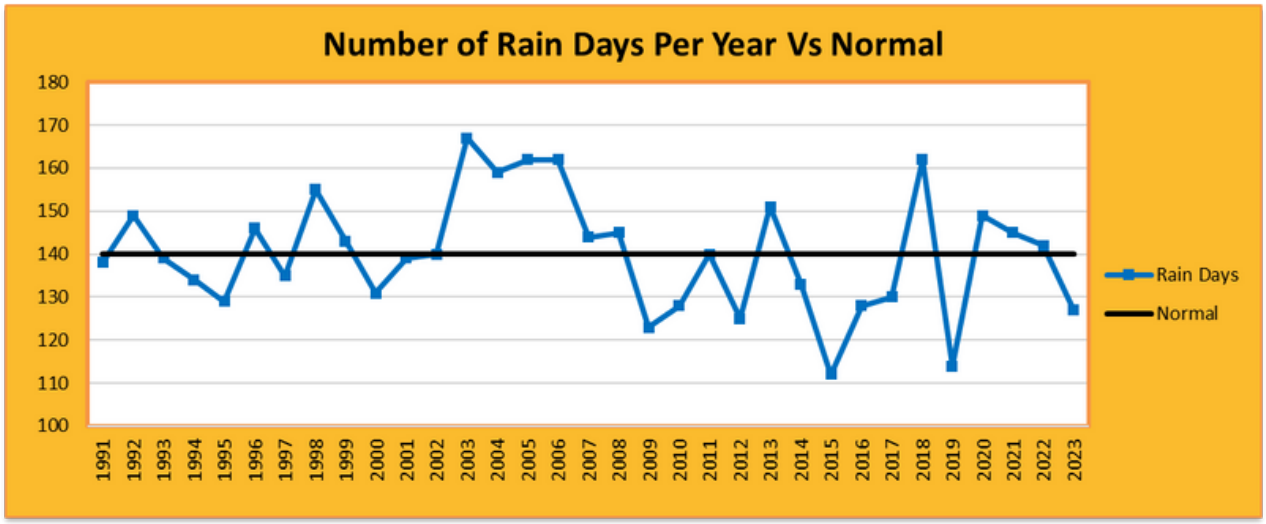


Figure. 3

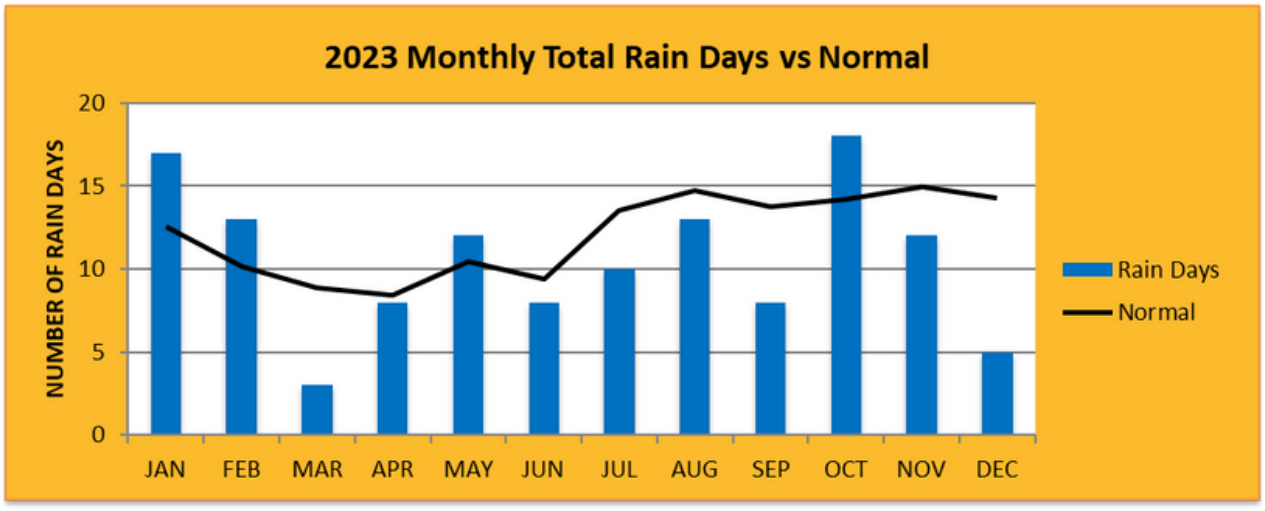


Figure. 4

TEMPERATURE

The *average* temperature recorded in 2023 was **27.9°C/82°F** which was above normal. 2023 tied with 2020 and 1991 for the second-warmest year on record at PJIA. The 30-year normal (1991—2020) is 27.3°C/81°F.

September was the *warmest* month with an average temperature of 30.2°C/86°F. This was the warmest September on record. **February** was the *coolest* month with an average temperature of 25.5°C/78°F.

The *highest* daytime temperature recorded in 2023 was 34.4°C/94°F which was recorded on **September 16th** while the *lowest* night-time temperature was recorded on **January 27th** as 21.0° C/70° F.

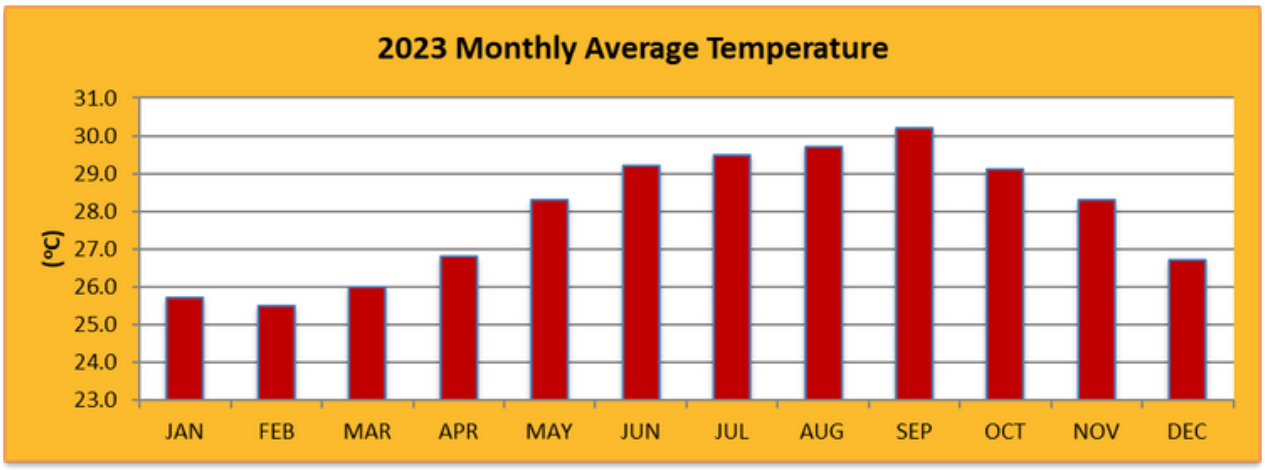


Figure. 5

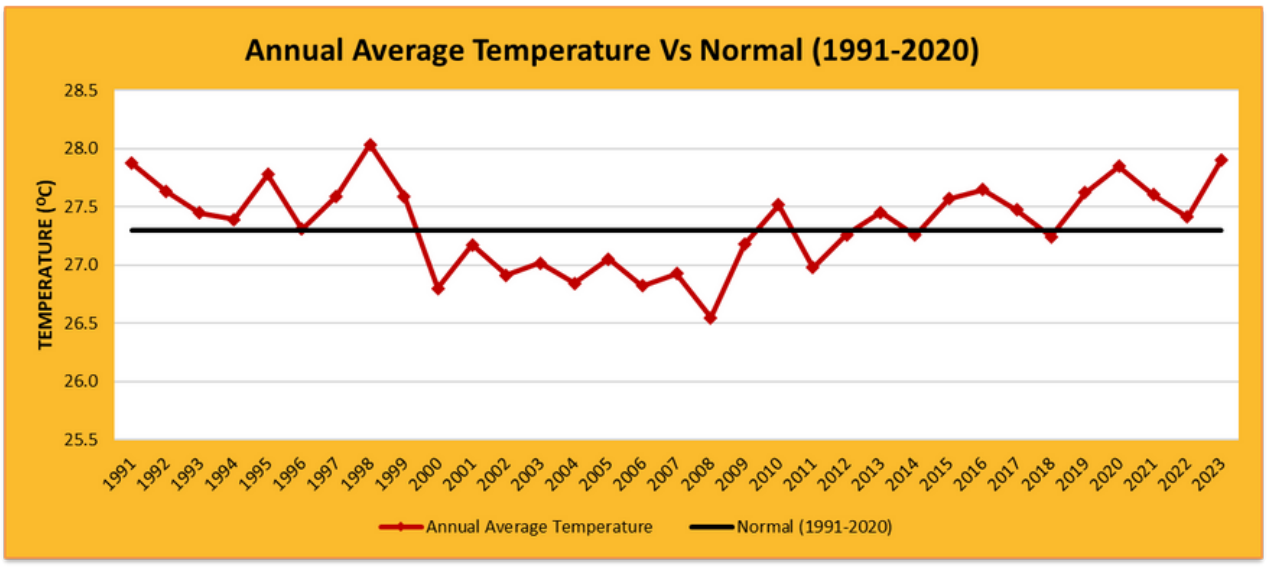


Figure. 6

Hot days and warm nights were very prevalent in 2023. The month of September had the highest number of hot days 28 out of the 30 days of September were hot days. There were 109 hot days for the 2023 heat season and 97 of these days stretched from July to mid-October. From 2018 there is an increasing trend in the number of hot days on St. Maarten. A hot day is considered as a day with a maximum temperature of 32.2°C or higher.

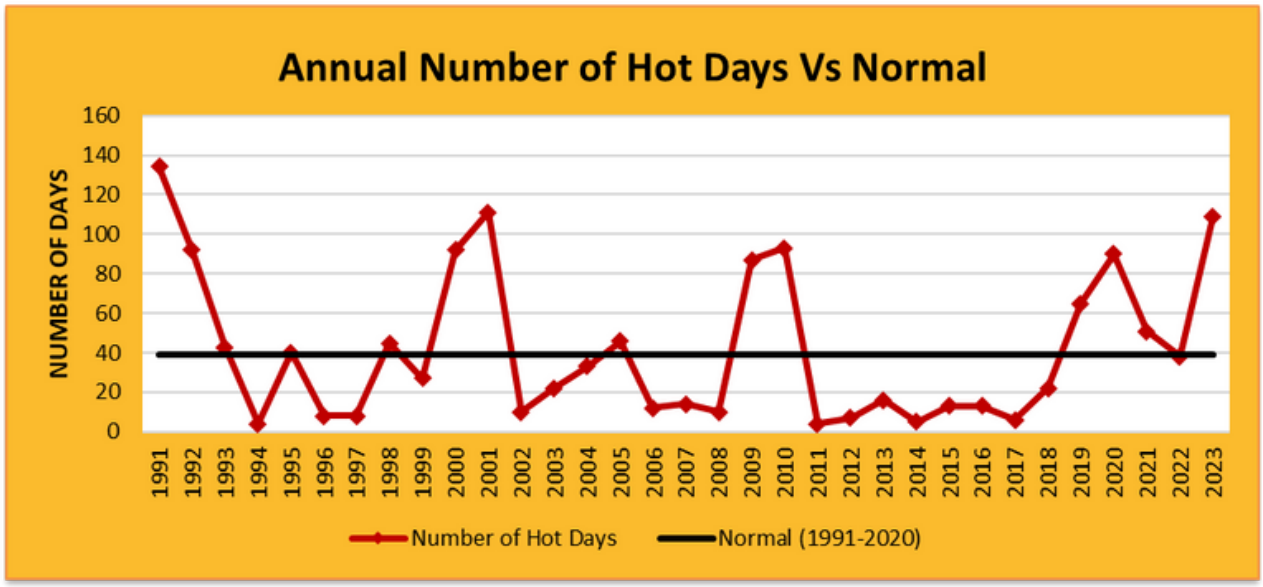


Figure. 7

Over the past 12 years, there is also an increasing trend in the number of warm nights in St. Maarten.

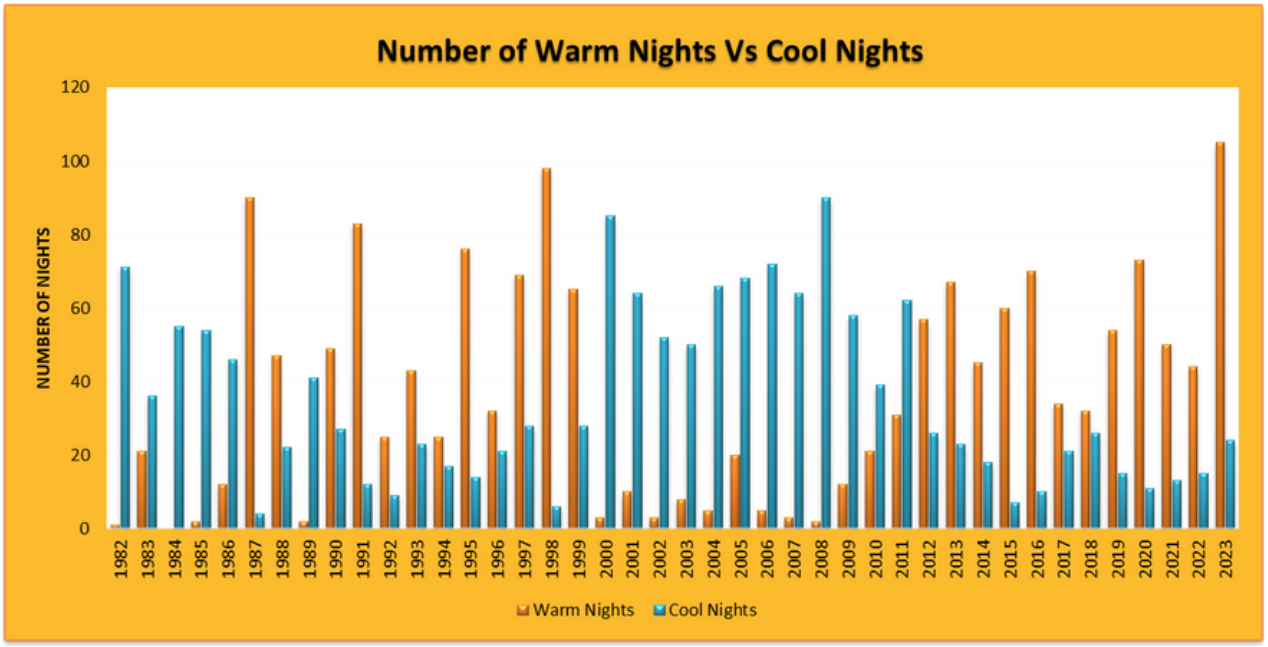


Figure. 8

WIND

Surface winds at the Princess Juliana International Airport for 2023 were generally from the east at an *average* speed of **9 knots/10 mph** which was slightly below the average compared to the 30-year average (1991—2020) of 10kt.

The *highest* monthly average wind speeds were recorded in **February** as 11 knots/ 13 mph while **September** had the *lowest* monthly average wind speeds of 8 knots/ 9 mph. The *highest* wind gust was recorded on **February 9th**, **August 17th** and **December 13th** as 31 knots/36 mph.

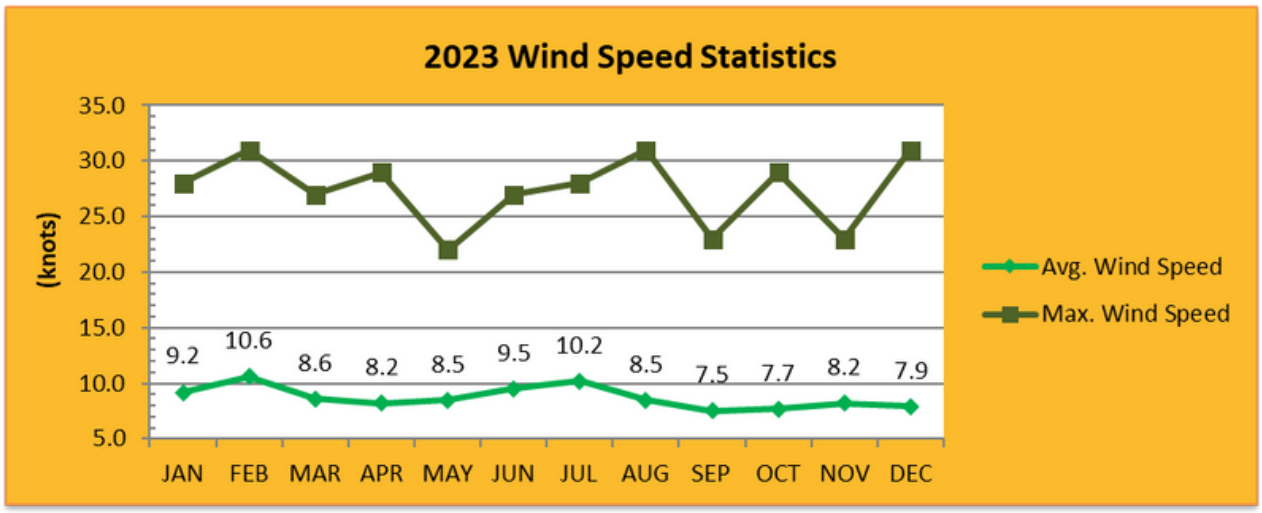


Figure. 9

This following wind analysis was obtained, by using the average hourly wind speeds and direction from the *1st January to 31st December 2023*.

Approximately:

- **60%** of the time, wind speeds at Juliana were between **5 and 10 knots**.
- **26%** of the time, wind speeds were between **10 and 15 knots**.
- **7%** of the time, wind speeds were between **1 and 5 knots**.
- **3%** of the time, winds were **calm**.
- **2%** of the time, winds speeds were between **15 and 20 knots**.

Less than 2% of the time, winds speeds were **greater than 20 knots**.

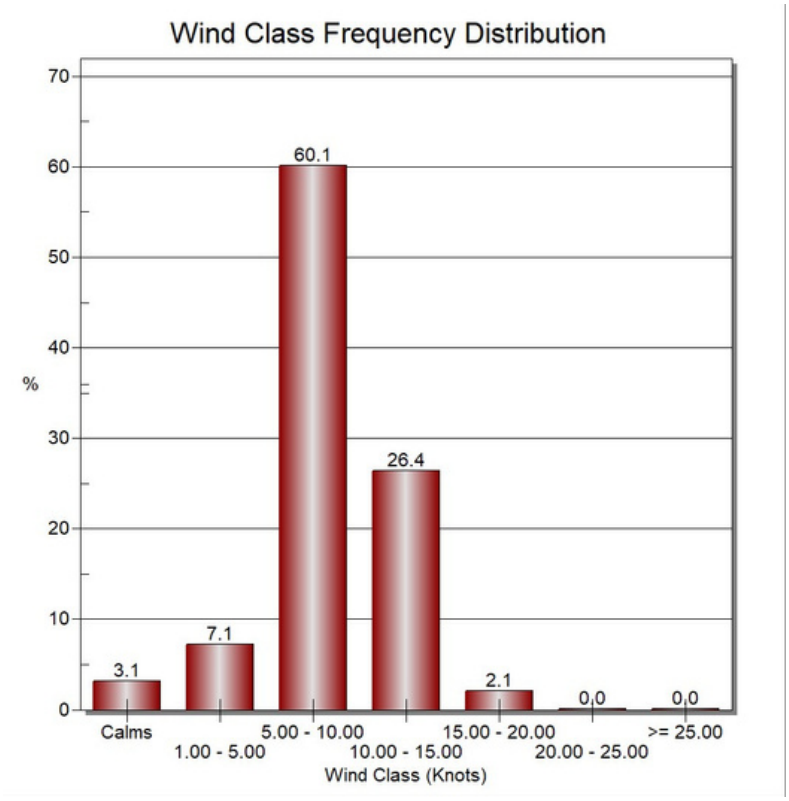


Figure. 10

2023 WIND ROSE

31% of the time, winds came from the **East northeast** (**ENE**).

27% of the time, winds came from the **East** (**E**).

15% of the time, winds came from **Northeast** (**NE**).

10% of the time, winds came from the **East southeast** (**ESE**).

3% of the time, winds came from the North northeast, Southeast or were calm.

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

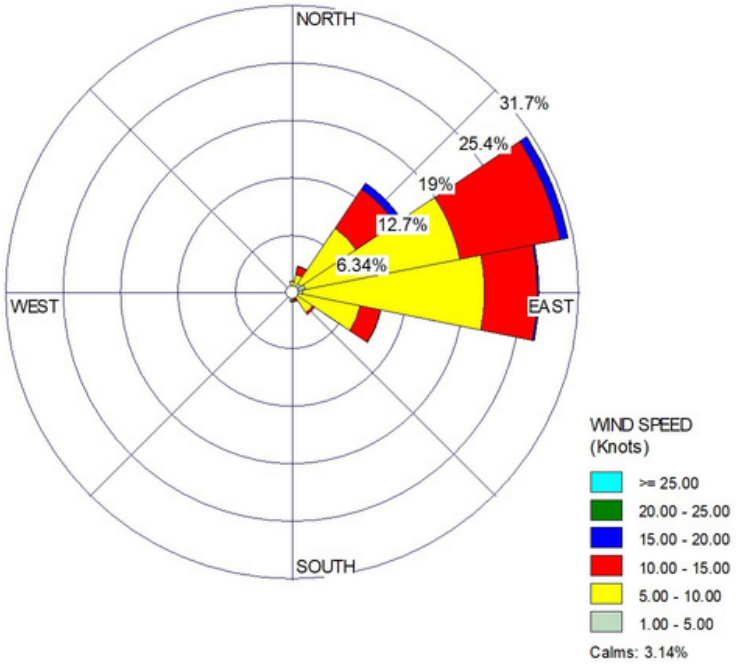


Figure. 11

AIR PRESSURE

At the Princess Juliana International Airport, on average, the *mean* sea level Pressure for 2023 was **1016.8 millibars**.

The *highest* monthly average was in **February** while the *lowest* was in **October**. The *highest* daily average was recorded as 1022 mb on **April 5th** while the *lowest* daily average of 1017.6 mb occurred on **October 2nd**.

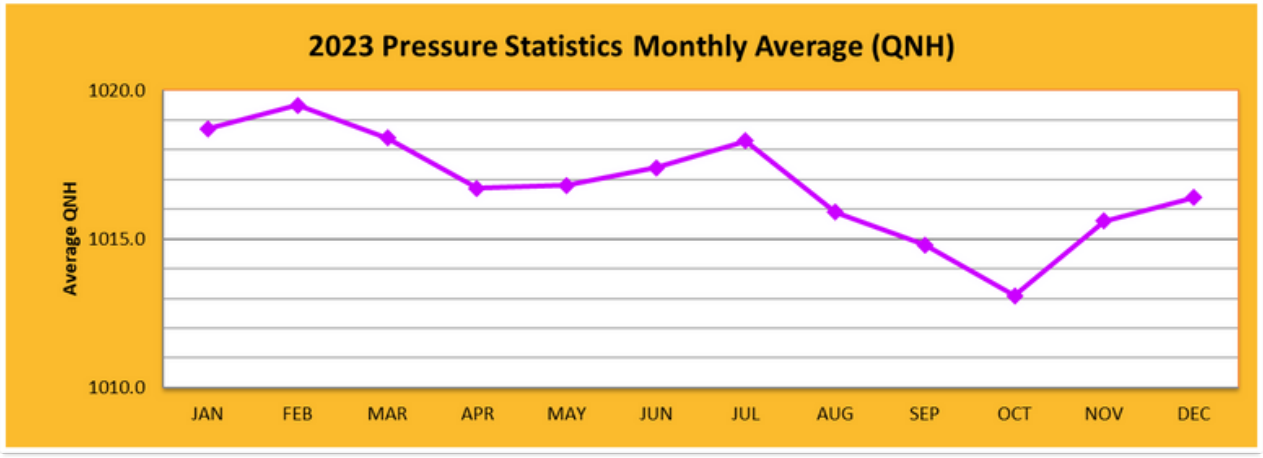


Figure. 12

CLOUD COVER

The *average* cloud cover for St. Maarten over the past year as recorded at the Princess Juliana International Airport was about **47%**.

The *highest* monthly average cloud cover was 63% during the month of **July** while **December** had the *lowest* value of 37%.

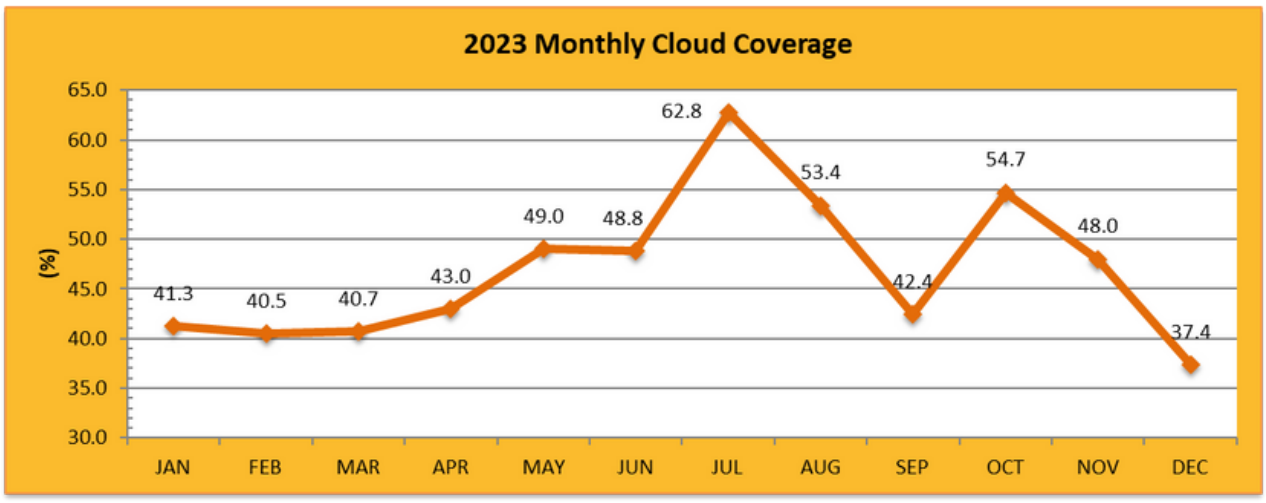


Figure. 13

SUNSHINE DURATION

Approximately 74% of possible sunshine was recorded at the surface at the Princess Juliana International Airport, that is, 3324.7 hours out of a possible 4443.1 hours. The *average* daily sunshine duration was **9 hours 12 minutes**.

May received the *most* hours of sunshine (316 hours) in 2023 and **June** was the month with the *highest* daily average sunshine: 10 hours and 24 minutes. **November** received the *least* sunshine and was the month with the *lowest* daily average: 7 hours 18 minutes.

The days with the *highest* daily sunshine hours were **August 1st** with 12 hours 12 minutes. The days with the *least* sunshine in 2023 were **October 3rd and 4th** when no sunshine was recorded due to overcast conditions.

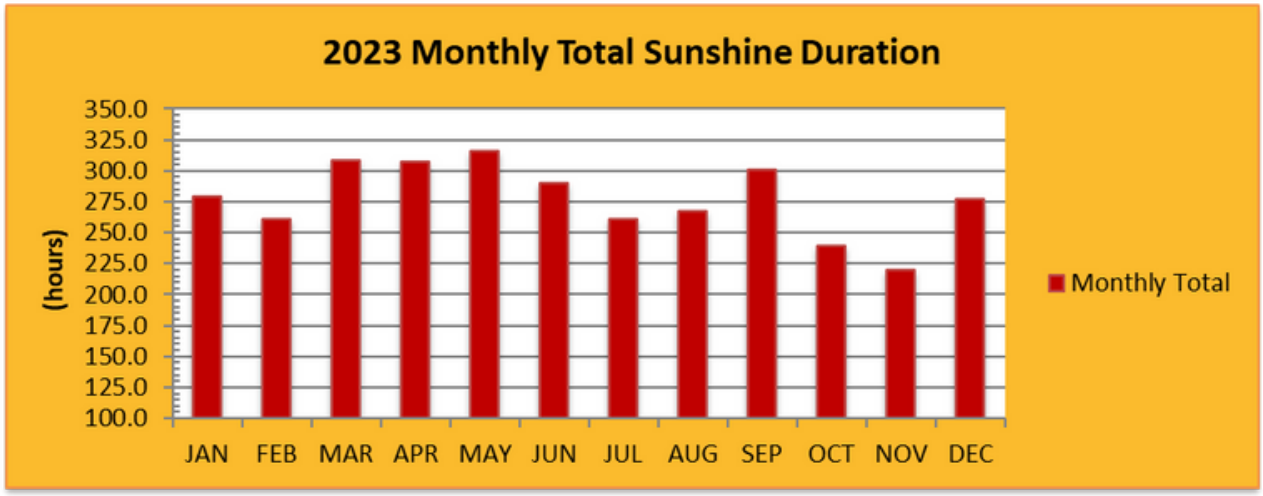


Figure. 14

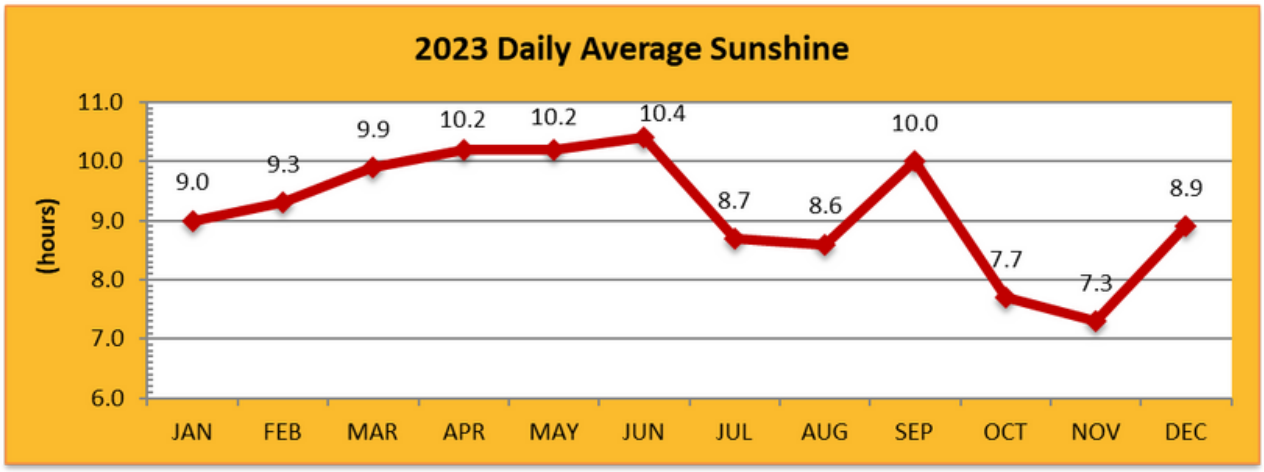


Figure. 15

STATISTICAL SUMMARY

A recap of the 2023 climate data, in terms of averages, extremes, and totals.

RAINFALL

TOTAL RAINFALL	899.7 mm | 35.4 in	
WETTEST MONTH	273.7 mm | 10.8 in	October
DRIEST MONTH	11.9 mm | 0.5 in	February
24-HR MAX. RAINFALL	83.8 mm | 3.3 in	October 22nd
NO. OF RAIN DAYS (>1.0MM)	127 days	
NO. OF HEAVY RAIN DAYS (>10.0MM)	19 days	

TEMPERATURE

AVERAGE AIR TEMPERATURE	27.9°C | 82°F	
ABSOLUTE MAX. TEMPERATURE	34.4°C | 94°F	September 16th
ABSOLUTE MIN. TEMPERATURE	21.0°C | 70°F	January 27th
WARMEST MONTH	30.2°C | 86°F	September
COOLEST MONTH	25.5°C | 78°F	February
AVERAGE RELATIVE HUMIDITY	76%	

WIND & PRESSURE

AVERAGE WIND SPEED	8.7 knots | 10 mph	
AVERAGE WIND DIRECTION	80° East	
MAX. WIND GUST	31 knots | 36 mph	Feb 9th, Aug 17th, Dec. 13th
MOST FREQUENT CATEGORY SPEED	5-10 knots	60%
AVERAGE AIR PRESSURE	1016.8 mb	

CLOUDS & SUNSHINE

AVERAGE CLOUD COVERAGE	46.8%	
AVERAGE DAILY SUNSHINE DURATION	9 hrs 12 mins	
MONTH WITH MAX. SUNSHINE	May	
MONTH WITH MIN. SUNSHINE	November	
DAILY MAX. SUNSHINE	12 hrs 12 mins	August 1st
DAILY MIN. SUNSHINE	0hrs 00 mins	October 3rd & 4th

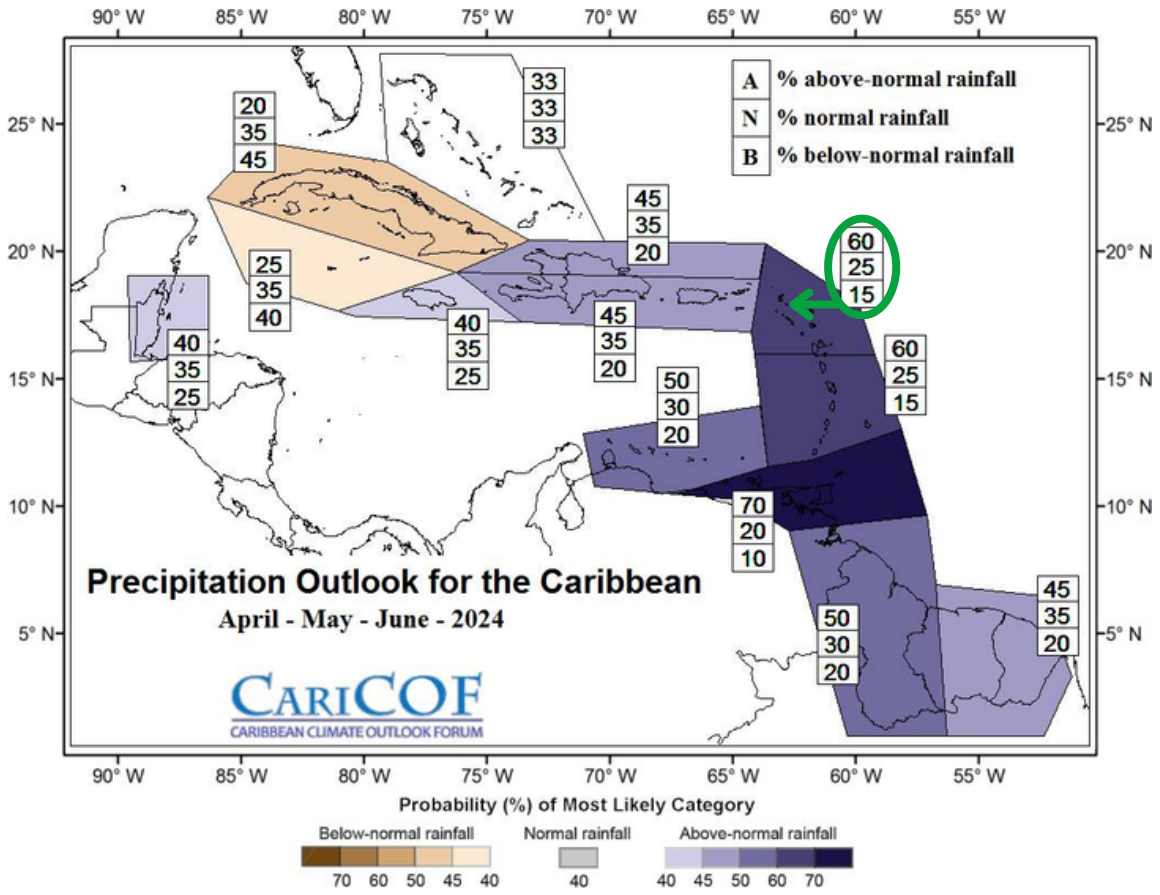
CONCLUSION

This report provides a summary of all the meteorological data recorded at the Princess Juliana International Airport during the year 2023. 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 several 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 2024

RAINFALL OUTLOOK FOR APR-MAY-JUN 2024



Map compliments : "CARICOF - Caribbean Institute for Meteorology & Hydrology

Rainfall for the next three (3) months Apr-May-Jun 2024 is expected to be wetter in St. Maarten and most of the entire east Caribbean but drier than usual in Cuba and the Cayman Islands.

Normal rainfall for this season ranges between 148-252 mm or 6-10 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 **60%** chance of being **above Normal** (more than 252 mm); a **25%** chance of being **near Normal** (between 148 mm and 252 mm); and a **15%** chance of being **below Normal** (less than 148 mm).

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

TROPICAL CYCLONE NAMES FOR THE 2024 ATLANTIC HURRICANE SEASON

ALBERTO	HELENE	OSCAR
BERYL	ISAAC	PATTY
CHRIS	JOYCE	RAFAEL
DEBBY	KIRK	SARA
ERNESTO	LESLIE	TONY
FRANCINE	MILTON	VALERIE
GORDON	NADINE	WILLIAM

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

STAGE	DECISIVE FACTORS (CRITERIA)
Tropical Disturbance	A discrete system of clouds, showers, and thunderstorms that originates in the tropics and maintains its identity for 24 hours or more.
Tropical Wave	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.
Tropical Depression	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.
Tropical Storm	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).
Hurricane	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. *(See next page)*
Extra-tropical Cyclone	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.
Subtropical Cyclone	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).
Post-tropical Cyclone	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 (MPH)	(KM/H)	(KNOTS)	EFFECTS
1	74-95	119-153	64-82	Minimal Damage
2	96-110	154-177	83-95	Moderate Damage
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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