ARUBA

CLIMATOLOGICAL SUMMARY 2018

PRECIPITATION

The total amount of rainfall recorded at Reina Beatrix International Airport for the year 2018 was **339.5** mm. This is **28%** below normal (Figure 1).

During the first quarter of the year 2018 (January, February, March) a total of **81.6** mm of rainfall was recorded. This is **24.0%** of the total amount for 2018.

During the second quarter of the year 2018 (April, May, June) a total of **18.6** mm of rainfall was recorded. This is **5.5%**of the total amount for 2018.

During the third quarter of the year 2018 (July, August, September) a total of **38.3** mm of rainfall was recorded. This is **11.3%** of the total amount for 2018.

During the fourth quarter of the year 2018 (October, November, December) a total of **201.0** mm of rainfall was recorded. This is **59.2 %** of the total amount for 2018.

The last quarter of the year 2018, which ispart of the rainy season. was the *wettest* quarter,and the total amount of rain for that quarter was below normal values.

The *wettest* month for 2018 was October with a total of **113.8** mm which was above normal values for that month. The *driest* month for 2018 was May with a total of **0.0** mm which is below normal for that month.
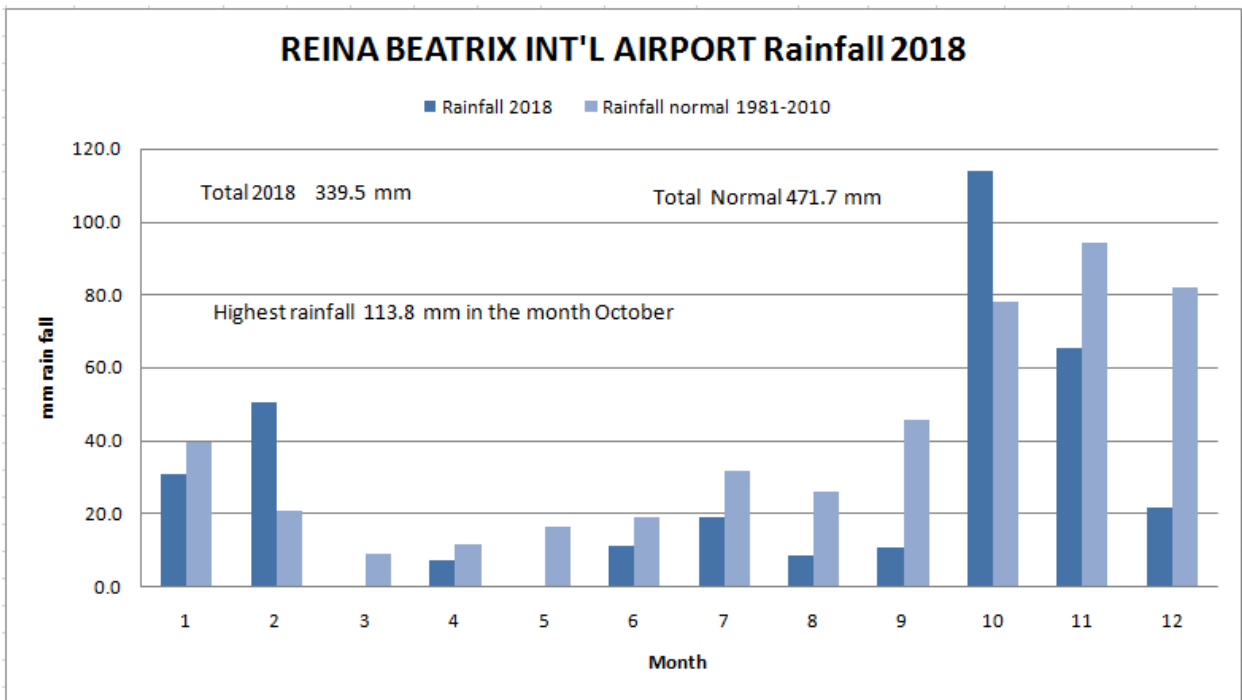
Figure 1. Rainfall 2018 versus 30 year normal (1981-2010) in mm.

TEMPERATURE

The year average air temperature recorded at the Reina Beatrix International Airport Aruba for 2018 was **28.2** ℃ (normal value **28.1** ℃), which is around normal. (Figure 2a).

The *warmest* month of 2018 were September with an average of **29.6** ℃ and the *coldest* month of 2018 was February with an average of **26.6** ℃.
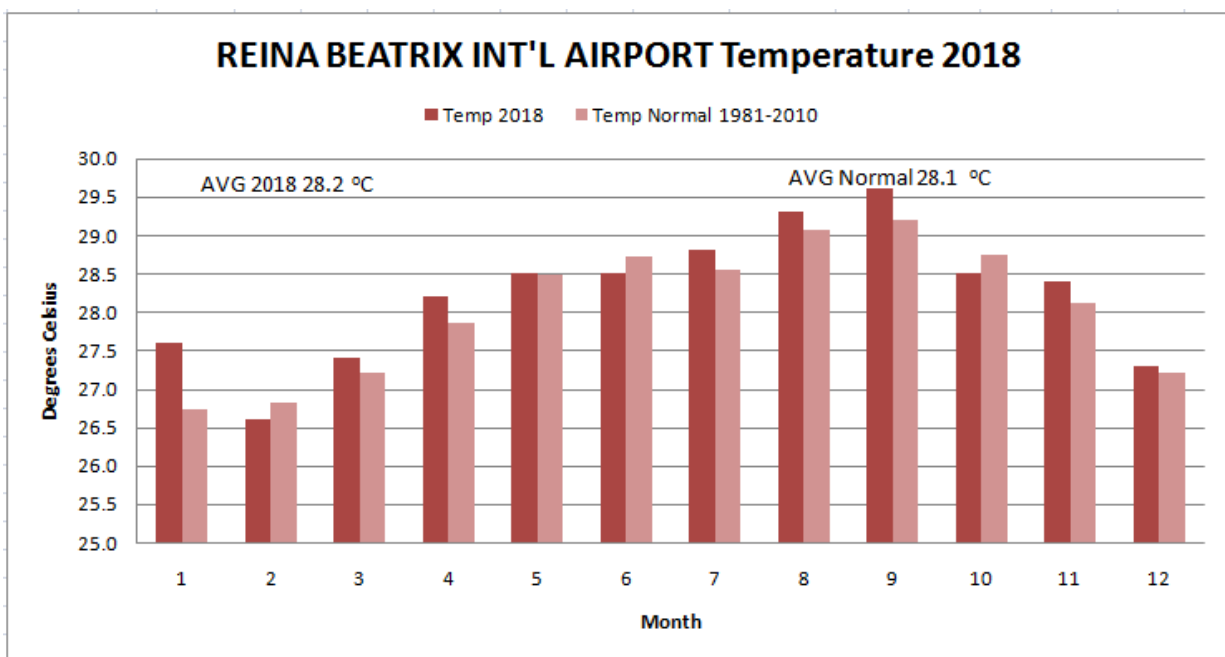

Figure 2a. Temperatures in degrees Celsius 2018.

The average maximum temperature for the year 2018 was **31.5** ℃ compared with the normal average maximum temperature **31.5** ℃ which is around normal. (Figure 2b).

The *absolute* maximum temperature was in August2018 with **34.2** ℃ and the *absolute* minimum temperature recorded was **22.0** ℃ in February 2018.

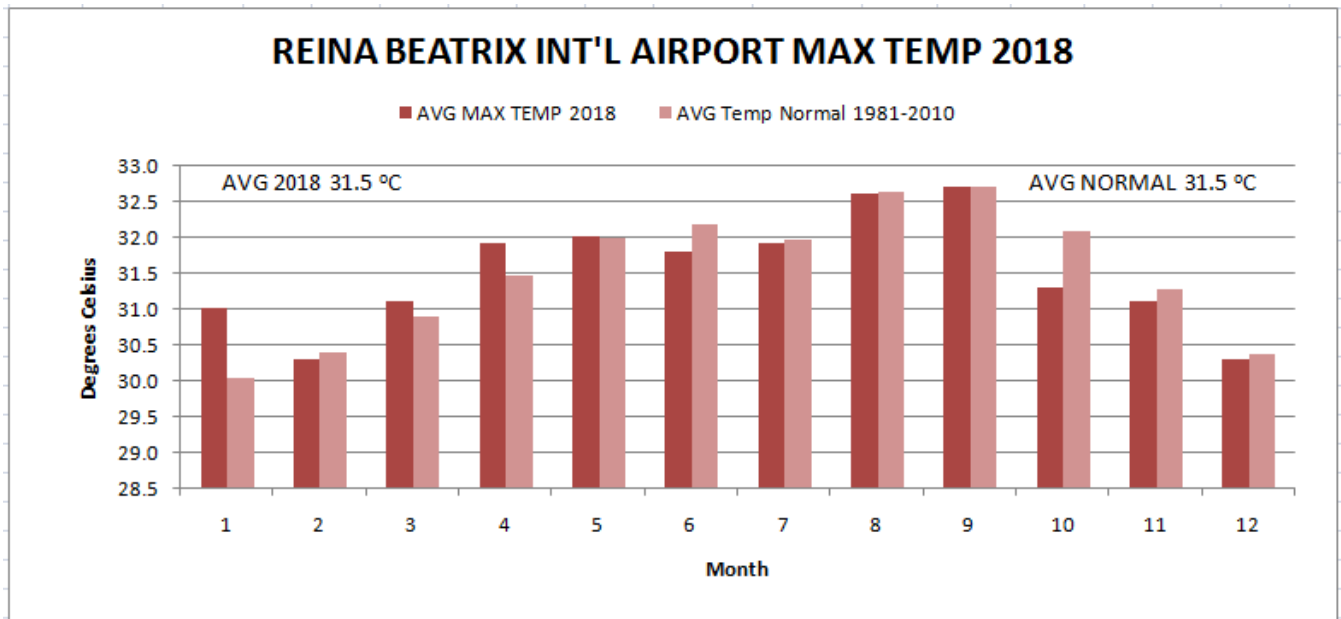### REINA BEATRIX INT'L AIRPORT MAX TEMP 2018

■ AVG MAX TEMP 2018   ■ AVG Temp Normal 1981-2010

AVG 2018 31.5 ℃   AVG NORMAL 31.5 ℃

Figure 2b. Maximum temperatures in degrees Celsius 2018.

WINDSPEED

The year average wind-speed at 10 meters height for the year 2018 at the Reina Beatrix International Airport was **7.7 m**/sec (27.7 km/h) compared with the normal value of **7.3** m/sec (26.3 km/h) is just above normal.(Figure 3a).

The *highest* average wind-speed of **9.3** m/sec (33.5 km/h) was recorded during the month of May 2018. The *lowest*average wind-speedduring the month of October 2018 with a **5.2** m/sec (18.7 km/h).
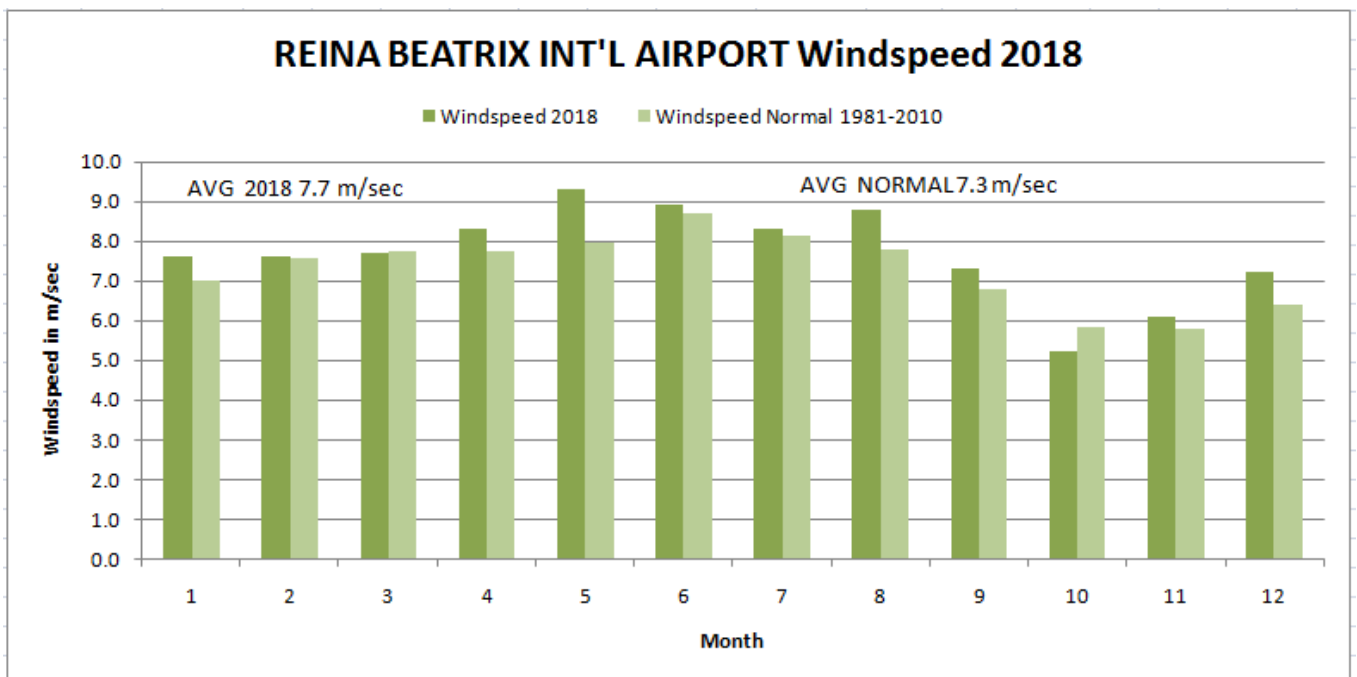

Figure 3a. Wind-speed 2018 in m/sec.

The average maximum wind-speed for the year 2018 was **15.1** m/sec (54.4 km/h) compared to the normal value of **14.5** m/sec (52.2 km/h), which is above normal. (Figure 3b).
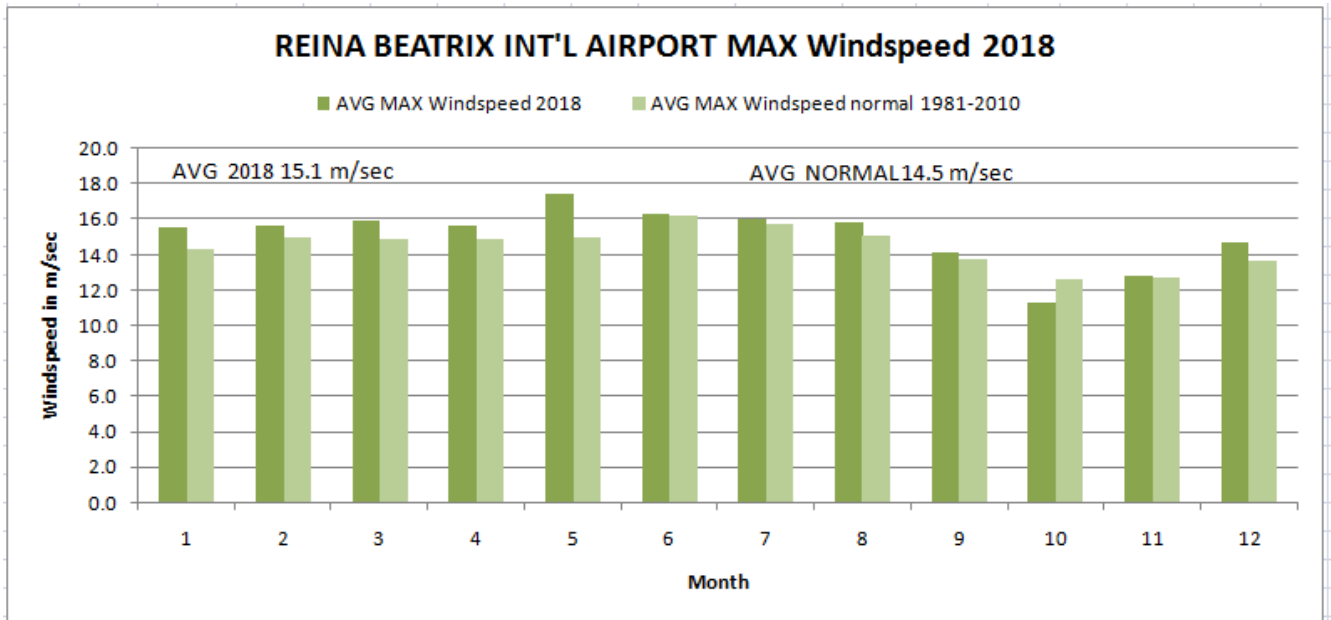

Figure 3b. Maximum wind-speed 2018 in m/sec.

The wind-rose figure indicates that for **66.3%** of the time the wind was between 11-17 knots. The wind was **25.2%** of the time between 17-21 knots and **8.5%**of the time between 7-11 knots. (Figure 3c).

The wind was **91.8** % of the time from the East and **8.2**% from the East-North East.
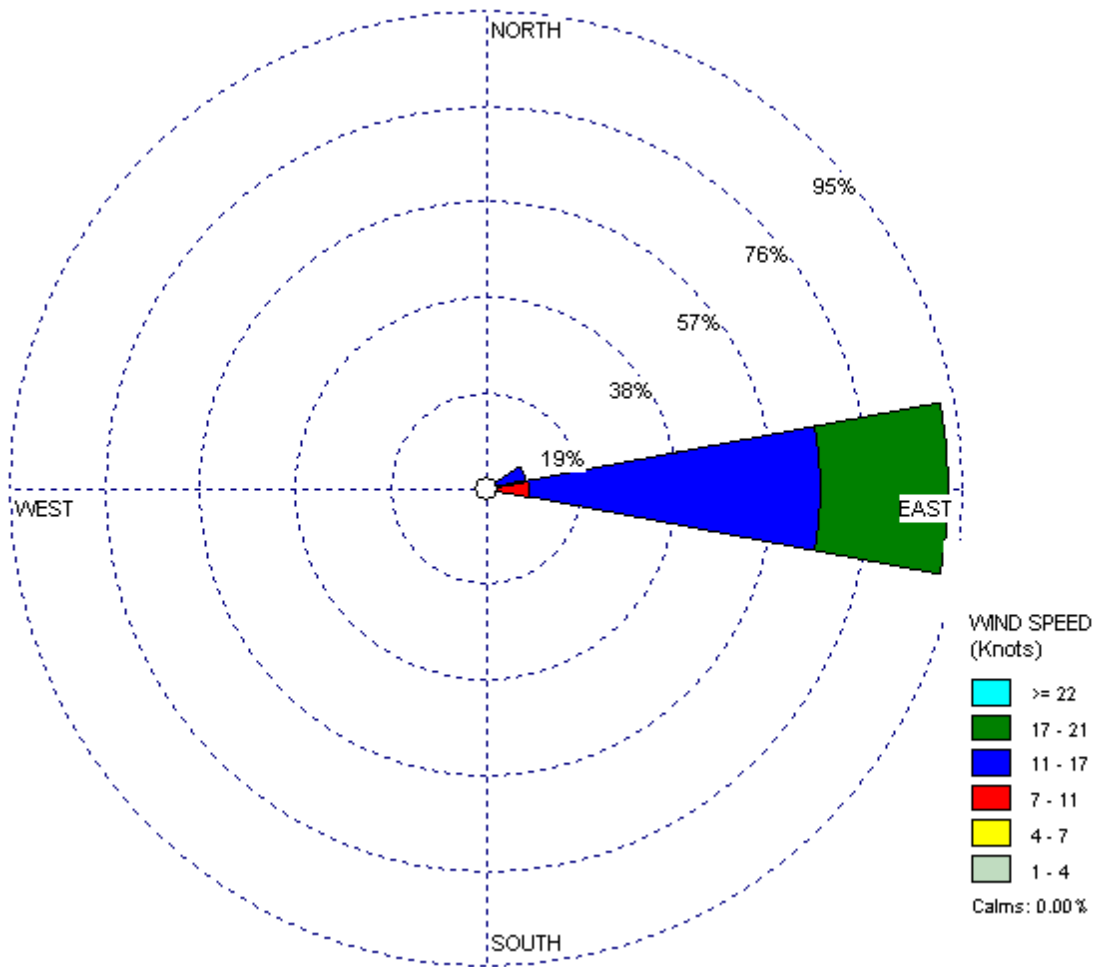
NORTH

95%

76%

57%

38%

19%

WEST   EAST

WIND SPEED
(Knots)

>= 22

17 - 21

11 - 17

7 - 11

4 - 7

1 - 4

Calms: 0.00%

SOUTH

Figure 3c. Wind-rose data 2018 in knots.

ATMOSPHERIC PRESSURE

The average atmospheric pressure for 2018 recorded at the Reina Beatrix International Airport was **1012.2** hPa compared with the normal value of **1011.8** hPa which is a tab above normal (Figure 4).

The *highest* monthly average atmospheric pressure of **1014.6** hPa was recorded during February 2018 with the *lowest* during September 2018 of **1010.1** hPa.
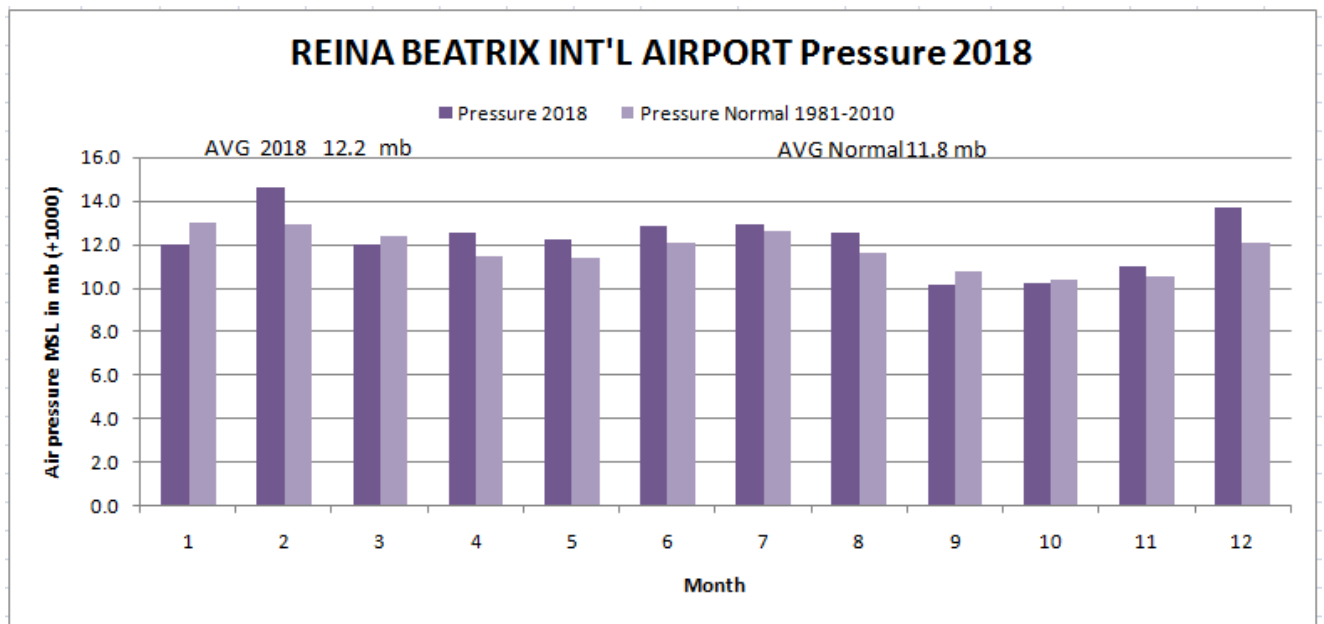

Figure 4. Atmospheric Pressure at MSL, (Mean Sea-Level) in hPa (+1000) 2018.

CLOUD COVERAGE

The average cloud coverage in 2018 was **60.5** % compared with the normal value of **47.3**% which is above normal. (Figure 5).

Highest average cloud coverage in 2018 was observed during October (**73.7**%) with the *lowest* during the month of February (**44.3** %).
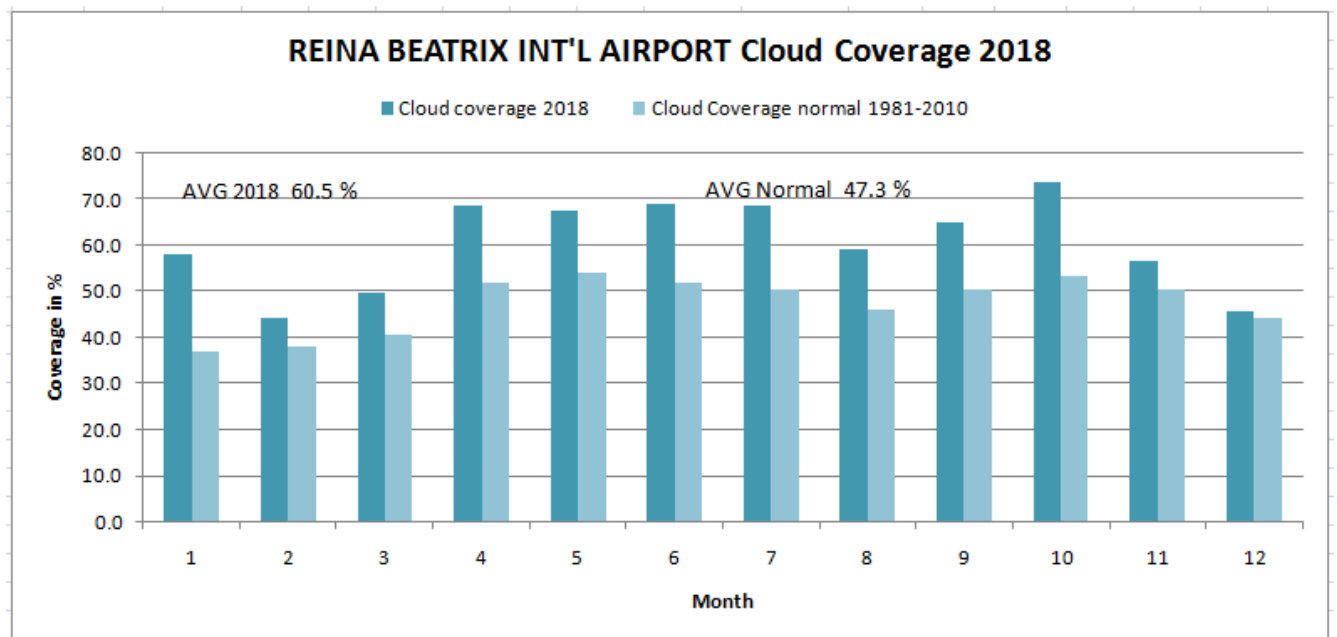
Figure 5. Total cloud coverage in percentage 2018.

RELATIVE HUMIDITY

The average relative humidity of 2018 was **77.5**% compared to the normal value of **77.4**%, which is around normal. (Figure 6). The months of February and July were exceptionally dry compared to the climate normal.

Highest monthly average relative humidity of **81.6**% was recorded during the month of July 2018 with a *lowest* monthly average of **73.9%** during the month of August2018.

Figure 6. Relative humidity in percentage 2018.

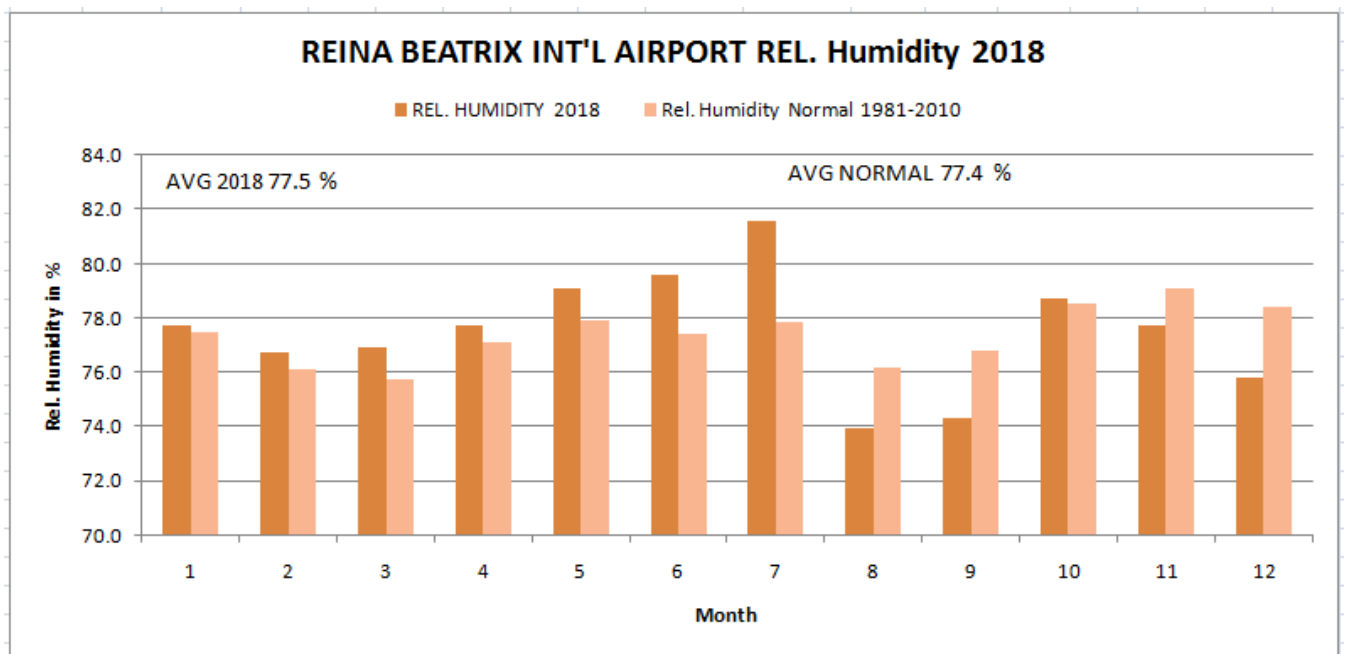**SPECIAL OCCURRENCE (EVENTS) DURING THE YEAR 2018**

SEISMIC ACTIVITIES:

There was only one earthquake event near Aruba recorded on May 13 2018 at 6:41 PM local time and had a magnitude of 2.8 with epicenter at latitude 11.260 degrees north and longitude 69.995 degrees west, which is about 28 kilometers south of Aruba and a depth of 10.0 kilometers.

EARTHQUAKES NEAR ARUBA YEAR 2018

Date	Local Time (AM/PM)	Latitude North (degrees)	Longitude West (degrees)	Magnitude	Depth (km)
May 13, 2018	6:41 PM	11.260	69.995	2.8	10.0

Table 1. Earthquakes near Aruba year 2018.

SEVERE WEATHER:

1. A moderate rain event took place from February the 15th to the 22nd as a trough in the mid to upper levels moved slowly over the Caribbean, producing 32.1 mm rainfall over Aruba during those days.
2. A second rain event took place during the 12th to 14th of October when a tropical wave moving through the local region combined with an upper level disturbance to induce 40.8 mm of rain during the period.
3. A third rain event took place during the 18th to 25th of October when a persistent disturbance in the upper levels combined with two tropical waves to induce 51.8 mm rainfall during that period.
4. And last but not least an upper level disturbance induced 35.6 mm rainfall over the island during the 4th to 7th of November.

CLIMATE ANOMALY 2018:

Global Temperature
Global mean temperature for the period January to October 2018 was 0.98±0.12°C above the pre-industrial baseline (1850-1900). The estimate comprises five independently maintained global temperature data sets and the range represents the spread of the data. 2018 is on course to be the 4th warmest year on record. This would mean that the past four years – 2015, 2016, 2017 and 2018 – are also the four warmest years in the series. 2018 is the coolest of the four. In contrast to the two warmest years, 2018 began with weak La Niña conditions, typically associated with lower global temperatures. The 20 warmest years have all occurred in the past 22 years. 2018 started with a weak La Niña event, which continued until March. By October, sea-surface temperatures in the eastern Tropical Pacific were showing signs of a return to El Niño conditions, although the atmosphere as yet has shown little response. If El Niño develops, 2019 is likely to be warmer than 2018.

Agriculture and Food Security
Exposure of the agriculture sector to climate extremes is threatening to reverse gains made in ending malnutrition. New evidence shows a continuing rise in world hunger after a prolonged decline.Cereal production in Latin America and the Caribbean in 2018 is forecast at 240.7 million tonnes, a 7.3% decline from the record output in 2017. The forecast production decline would mostly result from drought-reduced maize outputs in Argentina and Brazil. In Central America and the Caribbean, unfavourable rains affected 2018 maize production.

Tropical Storms
It was an active tropical cyclone season in the Northern Hemisphere (NH) in 2018. The number of tropical cyclones was above average in all four NH basins. As of 20 November, there had been 70 NH cyclones in 2018, well above the long-term average of 53 for this stage of the year. The Northeast Pacific basin was especially active, with an Accumulated Cyclone Energy (ACE)38 value of 316.3 kt2, the highest since reliable satellite records began. Southern Hemisphere activity in the 2017-18 season was near average, with 22 cyclones.
There were two significant hurricane landfalls on the United States mainland in 2018, each associated with severe damage. Florence weakened from category 4 to category 1 before landfall in North Carolina in September, but still caused extreme rainfall and significant flooding, especially in coastal regions as it tracked parallel to the coast before moving inland. Some rivers in the affected areas reached their highest levels after the storm had passed, prolonging the impacts. Michael, in October, made landfall in the Florida Panhandle as a category 4 system with a central pressure of 919 hPa, the most intense known landfall in this region and the most intense landfall in the continental United States since 1969 based on central minimum pressure, with severe wind and storm surge damage. At least 50 deaths in the United States were associated with Florence and 45 with Michael.

TROPICAL CYCLONE ACTIVITIES:

Overall, the 2018 Atlantic hurricane season featured above normal activity. Fifteen named storms formed, of which eight became hurricanes and two became major hurricanes - category 3 or higher on the Saffir-Simpson Hurricane Wind Scale. This compares to the long-term average of 12 named storms, 6 hurricanes, and 3 major hurricanes. There was also one tropical depression that did not reach tropical-storm strength. In terms of Accumulated Cyclone Energy (ACE), which measures the combined strength and duration oftropical storms and hurricanes, activity in the Atlantic basin in 2018 was also above normal. In addition, 7 systems were subtropical at some point in their lifetime this season, which eclipses the previous record of 5 in 1969.

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Name                  Dates          Max Wind (mph)
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TS Alberto         25-31 May              65
H  Beryl            4-15 Jul              80
H  Chris            6-12 Jul             105
TS Debby            7- 9 Aug              50
TS Ernesto         15-18 Aug              45
MH Florence     31 Aug-17 Sep            140
TS Gordon           3- 7 Sep              70
H  Helene           7-16 Sep             110
H  Isaac            7-15 Sep              75
TS Joyce           12-18 Sep              45
TD Eleven          22-23 Sep              35
TS Kirk            22-28 Sep              60
H  Leslie       23 Sep-13 Oct             90
MH Michael          7-12 Oct             155
TS Nadine           9-12 Oct              65
H  Oscar           27-31 Oct             105
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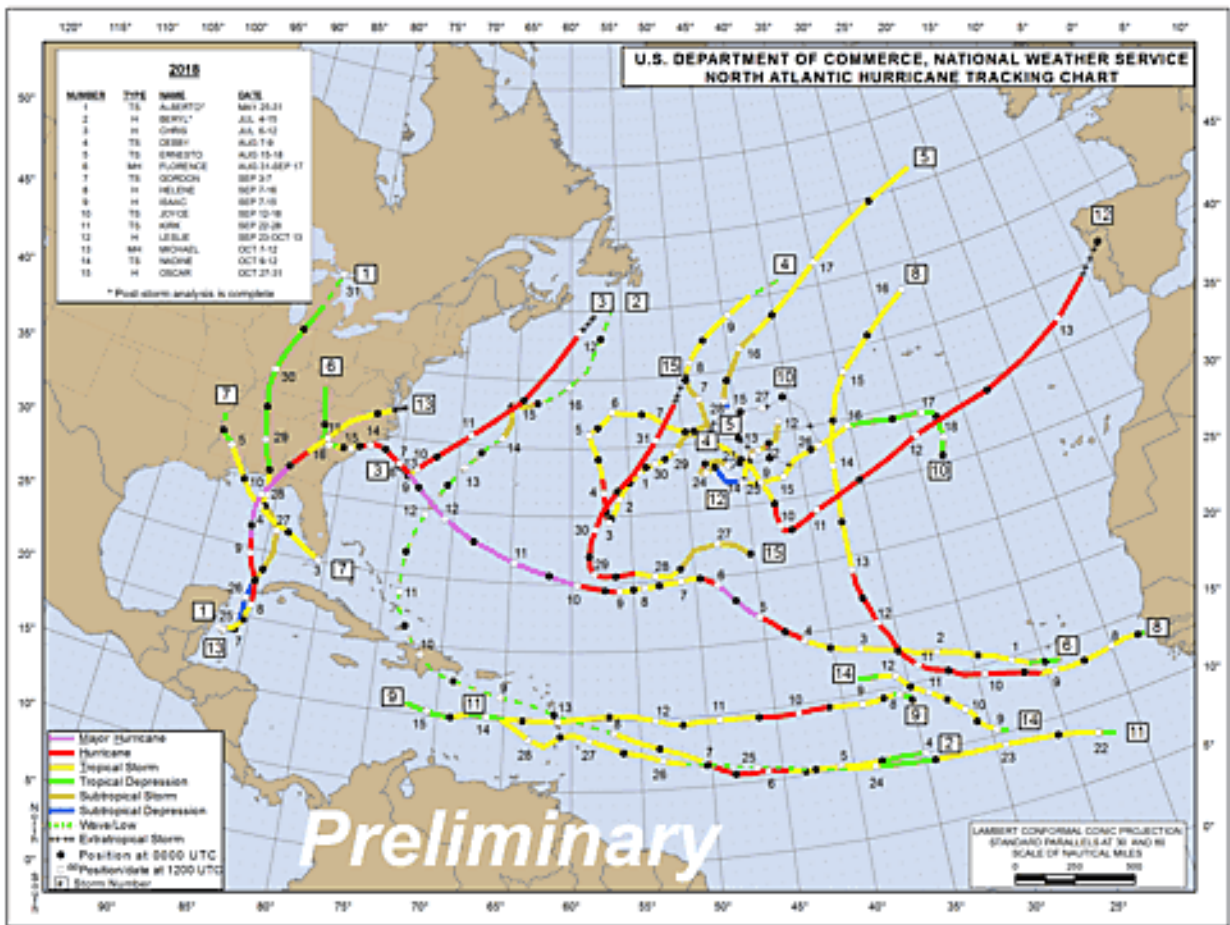
Table 2. Hurricanes 2018.

Figure 10. Storm tracks Atlantic Basin 2018.

In figure 10 we can see the storm tracks. Hurricane Isaac and Tropical Storm Kirk were closest to Aruba but were no major threat.

For the year 2019 a slightly below normal hurricane season is forecasted.
Keep in mind that these are extreme long-term forecasts and therefore changes can occur.

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