MAURITIUS METEOROLOGICAL SERVICES

CLIMATE DECEMBER 2018

Introduction

December 2018 was warm and wet. The mean monthly rainfall recorded islandwise was 261 mm which is 151 % of the normal. ENSO conditions and the Indian Ocean Dipole were neutral. The Madden Julian Oscillation was active over the equatorial Indian Ocean during the first fortnight whereby it enhanced the convective activity. During the second week, the westerly wind burst in the equatorial region resulted in the formation of two low pressure systems, one in the Bay of Bengal named PHETHAI by the Indian Meteorological Services on the 14 and the second in the Indonesian region was named KENANGA by the Indonesian Meteorological agency on the 15. During the third week, a tropical low formed to the east of Agalega, which intensified and was named CILIDA by the Mauritius Meteorological Services on 19.

1. Rainfall

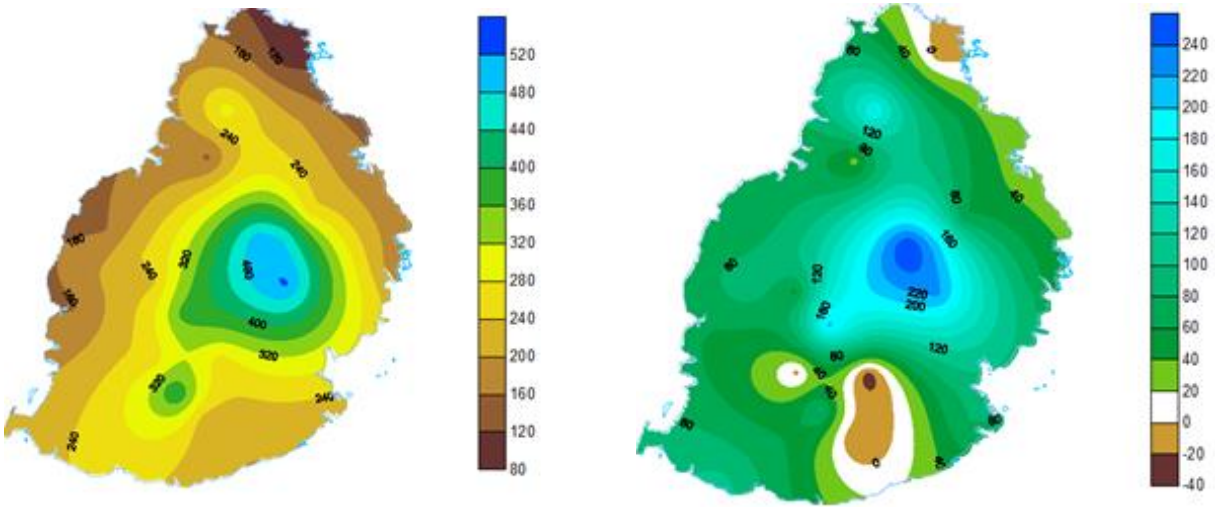
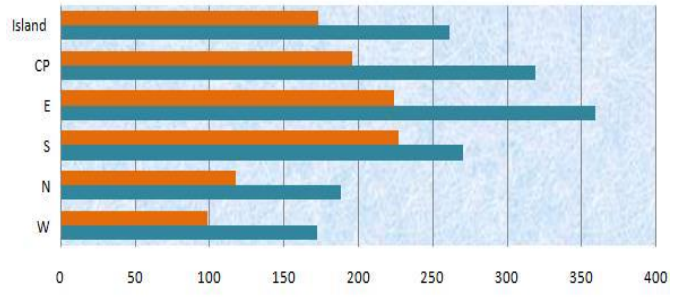


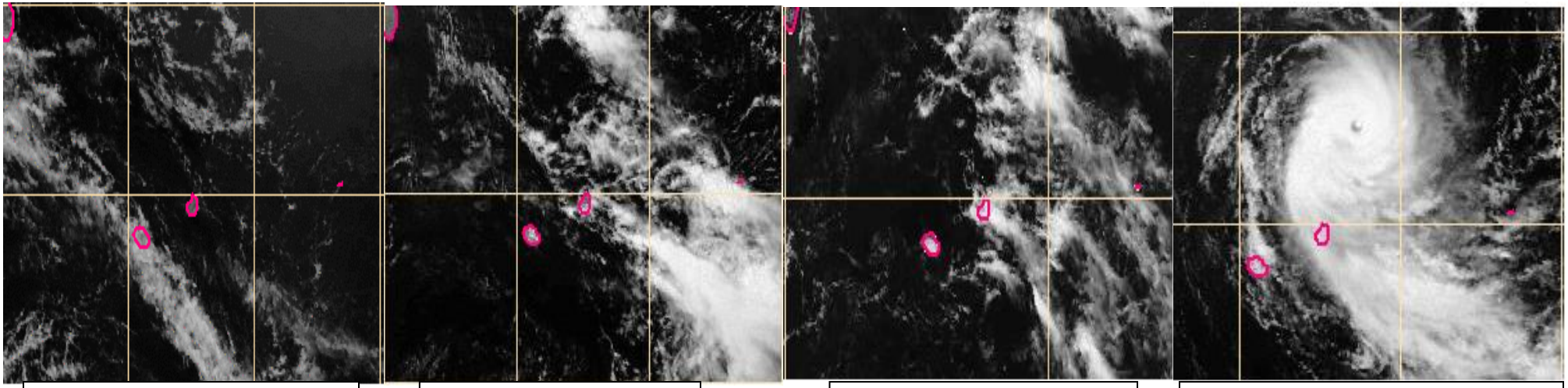
Fig. 1: (a) Observed rainfall (b) rainfall anomaly (mm)



	W	N	S	E	CP	Island
LTM (1981-2010) Rainfall (mm)	99	118	227	224	196	173
Actual Mean rainfall (mm)	172	188	270	359	319	261

Fig. 2: Regional rainfall distribution (based on 23 stations)

Rainfall was mostly of short duration, heavy and localised associated mainly with convective clouds building up during the day. Heavy rain warning was issued on the 5 and 10 when instability zones contributed to violent thunderstorm. Hails were also observed on the 05 at Sebastopol and Bel Air. Clouds associated with ITC CILIDA contributed significantly to the rainfall during the third week. Almost all regions over the island received above normal rainfall, except for some places in the south where rainfall was deficient. An excess of 260 mm was recorded in the region of Quartier Militaire. The highest rainfall of 537.2 mm was recorded at Sans Souci and the highest rainfall intensity was observed at Nouvelle Decouvert on 10 where 61.6 mm was recorded during one hour.



(a) Cloud free weather on 01

(b) Unstable weather on 05

(c) Perturbed weather on 10

(d) Intense Tropical Cyclone CILIDA on 22

Fig 3: Weather systems during December 2018

2. Surface Temperature

December 2018 is the fifteenth warmest November on record since 1969 (based on maximum temperature recorded at Plaisance)

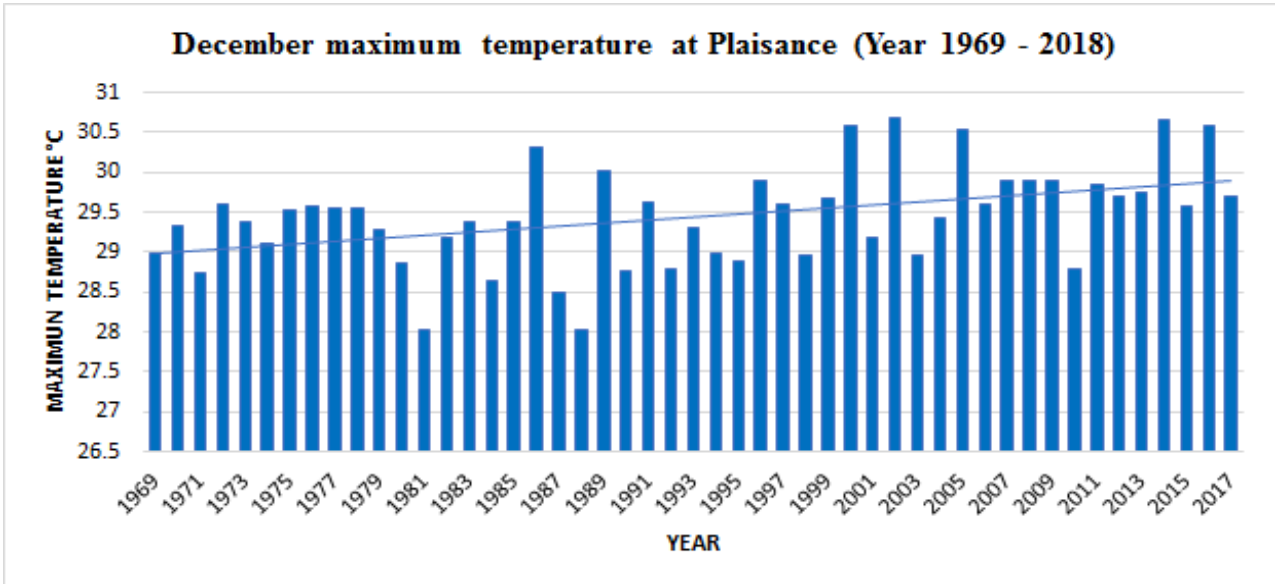


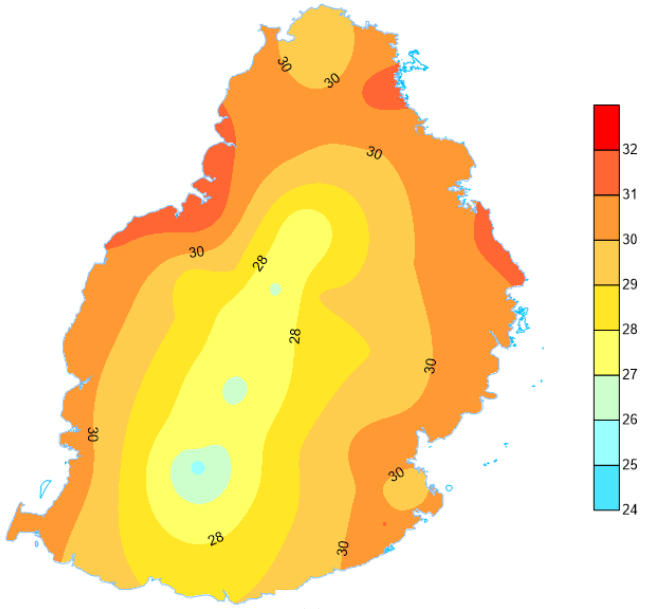
Fig. 4: Maximum temperature trend for December from 1969-2018

The warm trend for summer 2018 continued with a very warm December. The first few days of the month were observed to be warm with the maximum temperature anomaly being more than 2°C at several stations along the east and southeast and part of the central plateau. Overall, the coastal regions recorded temperatures in the range 30-32 °C except for the southern part where the stations recorded temperatures around 28-29 °C.

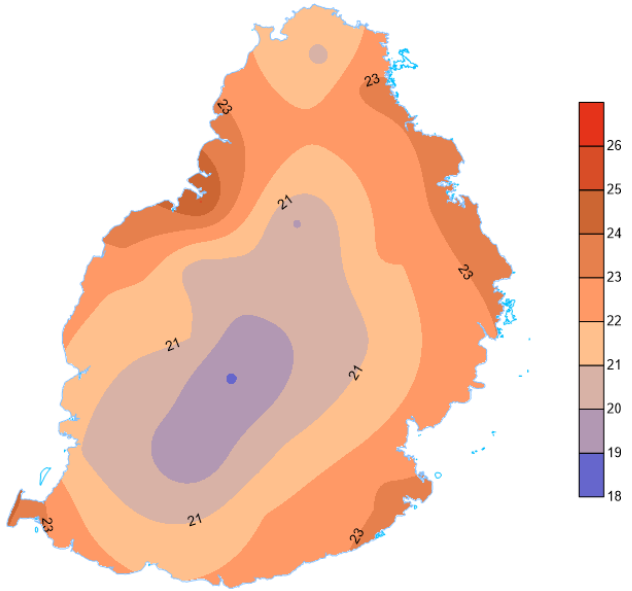
The pattern for the maximum and minimum temperature distribution (Fig 5 (a) and (b)) is somewhat similar. Most of the month an easterly to east south easterly wind regime influenced the island (Fig:11) whereby warm air advection from the ocean created a higher anomaly to the eastern part of Mauritius and the descending air to the western part resulted in a normal to slightly negative anomaly, Fig 6.

On the 23, two stations recorded had new record of extreme maximum temperature for the month of December, Mon Loisir Sugar Estate with 33.4°C (previous 32.9°C) and Queen Victoria with 33.3°C (previous 32.5°C). Thereafter, on the 26 Mon Desert Mon Tresor had new record of extreme maximum temperature 33.0°C (previous 32.5°C). The highest number of warm days was observed at Providence with 20 warm days.

During the first week of December, the light wind prevailing and clear sky contributed to a drop in the minimum temperature over most regions by approximately more than 1°C. Also, a new record in minimum temperature was observed at Bagatelle Dam with a value of 16.8°C (previous 19.0°C).



(a)

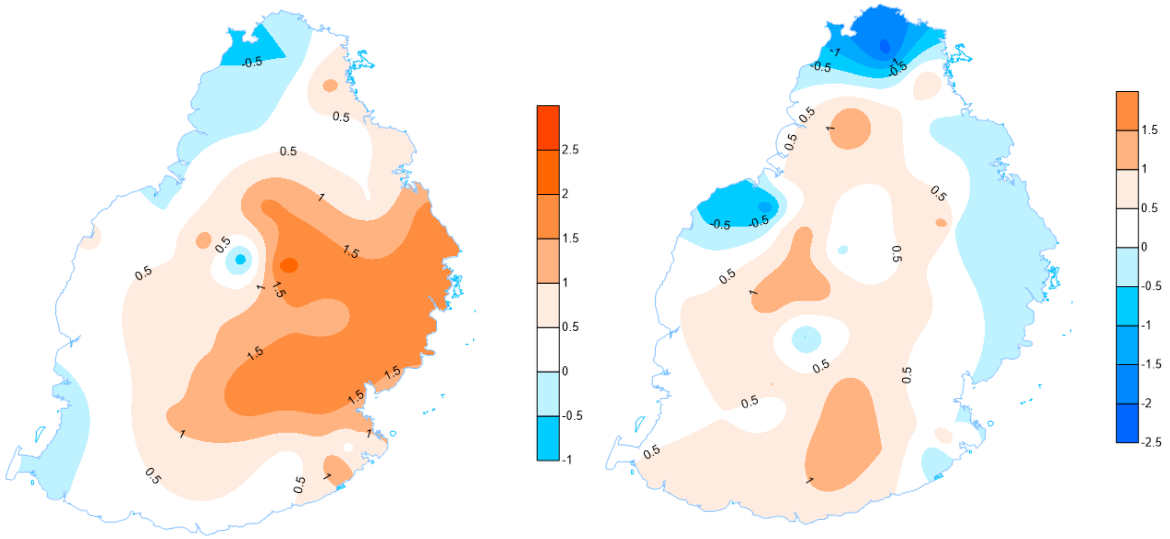


(b)

Fig. 5: (a) Maximum (b) Minimum temperature distribution

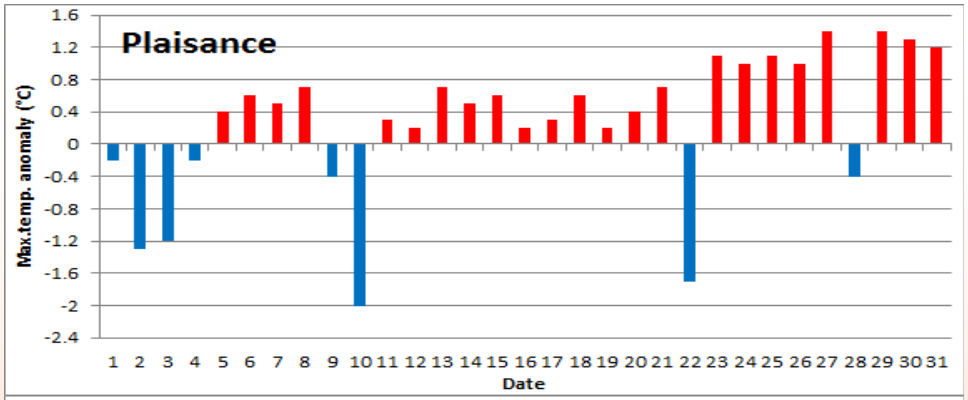
Some stations had up to 20 warm days (maximum temperature anomaly (anomax) >2°C).

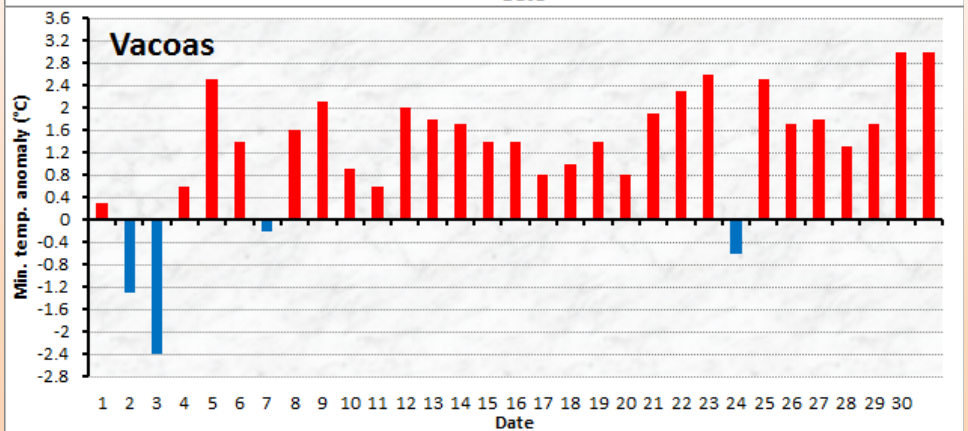
Stations	Highest anomax (°C)	Number of warm days.
Providence	4.1	20
Union Park MSIRI	3.4	17
N. Decouverte	4.9	13
Sans Souci	3	12
Bois Cheri	4	12
Mon Desert Alma	2.7	11
Belle Mare	3.5	10
Grand Bassin	3.7	10
Mon Bois	3.3	10
Mon Desert MT	3.3	10
Fuel	4.7	9
Queen Victoria	4.6	9
Digue Seche	3.3	6
Belle Rive(MSIRI)	3	6

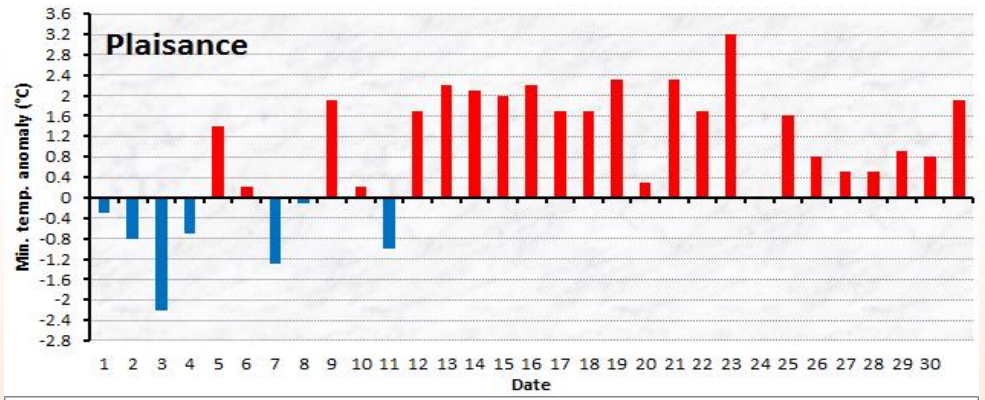


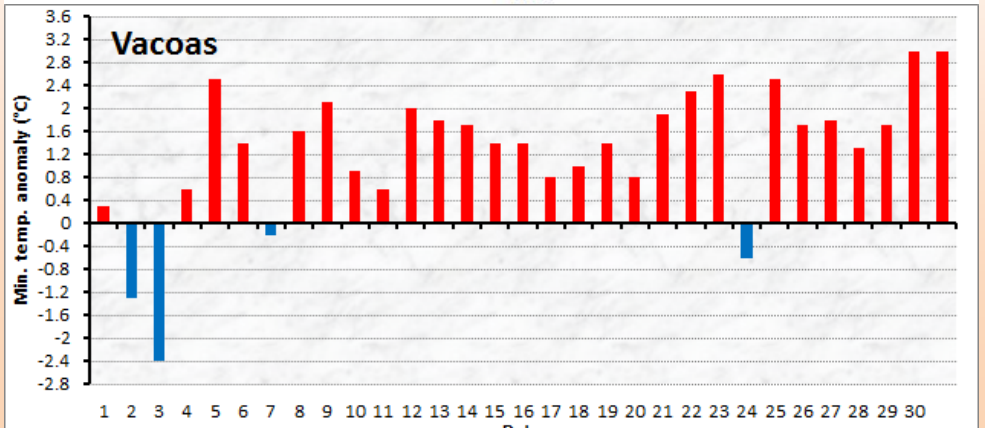
(a) (b)

Fig. 6: (a) Maximum (b) Minimum temperature anomaly









3. Sunshine and Humidity

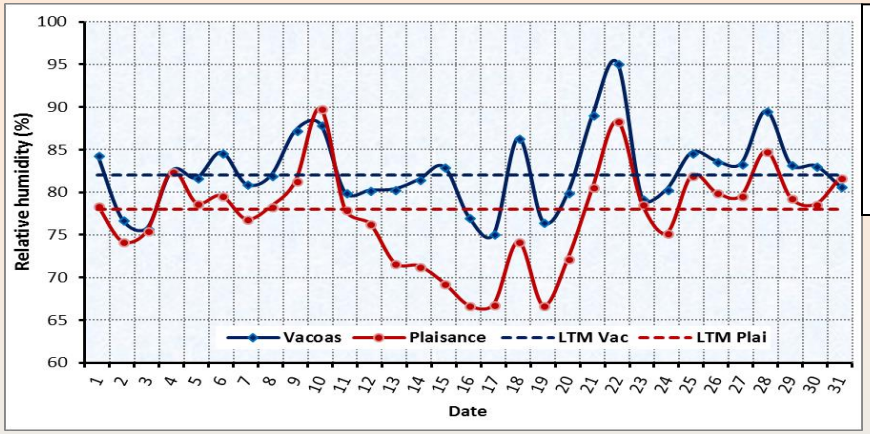


Fig. 9: Daily Relative Humidity: Vacoas (blue) and Plaisance (red)

The relative humidity (RH) for December peaked for Vacoas on the 22 and for Plaisance on the 10. The RH for Vacoas was an average close to normal except on three occasions (Fig 9) whereby the moisture content of the air increased associated with convective activity. For Plaisance, during the first and last week of the month, the relative humidity was close to normal. After the heavy rain event of the 10, but the air was drier and the least monthly mean value was 67 % for Plaisance for three days, i.e. on the 16, 17, 19.

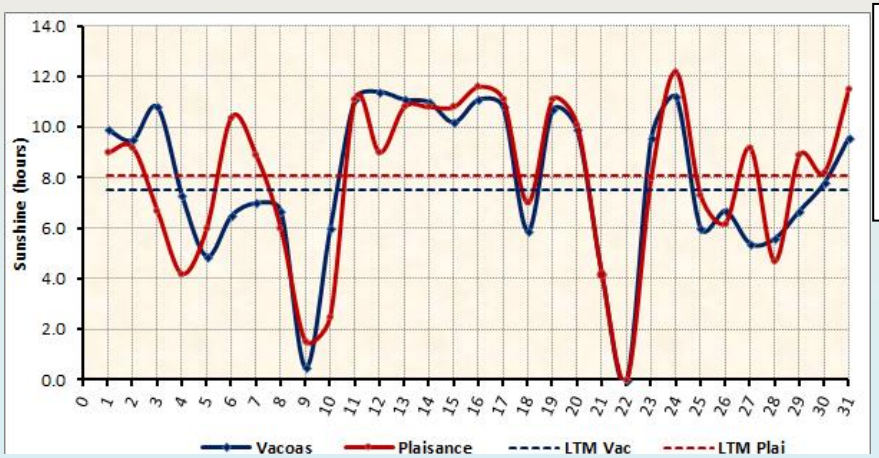


Fig. 10: Daily sunshine hours: Vacoas (blue) and Plaisance (red)

Daily mean sunshine hours were slightly below by 0.1 hours at Plaisance (8.0 hours) and at Vacoas, it was above by 0.3 hours (7.5 hours). For the period 9 to 10 and 21 to 22, the drop in sunshine hours were caused by the unstable weather and the passage of CILIDA near Mauritius respectively.

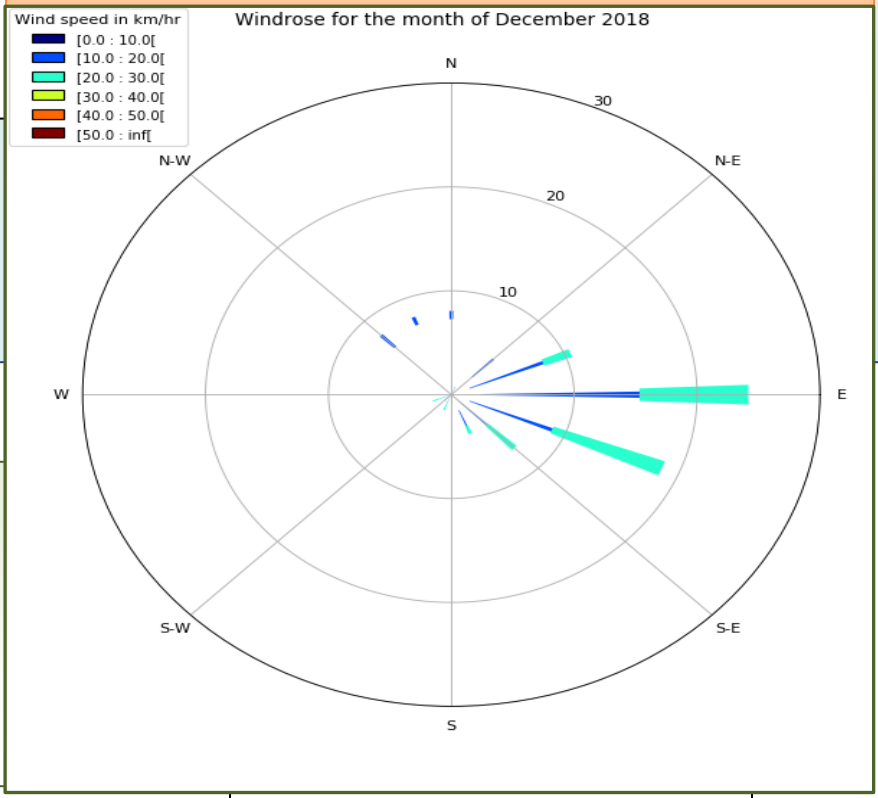


Fig. 11: Wind frequency at Plaisance

4. Winds

A light wind regime was observed for most of the month of December 2018. A predominantly easterly airstream influenced the region. The wind strengthened over the region when CILIDA was evolving close to our region by the third week of the month. After the passage of the named system to the east of Mauritius, the wind veered to westwards and for a short period of time towards the north. Also, the light wind regime contributed to the land breeze in the early morning when the wind direction was observed to blowing form the north west.

(a) Heavy rainfall event

In the morning of 10 December 2018, cumulonimbus clouds were observed in the Plaisance region and about 144 mm of rain was recorded in between 07 00 and 10 00 hr. Before midday, the thundery showers were observed to the east and just after midday, new convective clouds formed in the northern part of the island and about 103 mm was recorded at Pamplemousses. The rainfall recorded for the 10 December 2018 was a mean of 63 mm for the island which is about 36% of the monthly long-term mean. In the northern part of the island, the rainfall started mainly around midday with peaking intensity around 13 00 and decreasing gradually afterwards as can be seen in the intensity plot of Fig 13. The localised heavy rainfall in the northern region resulted in flooding and affected part of the population.

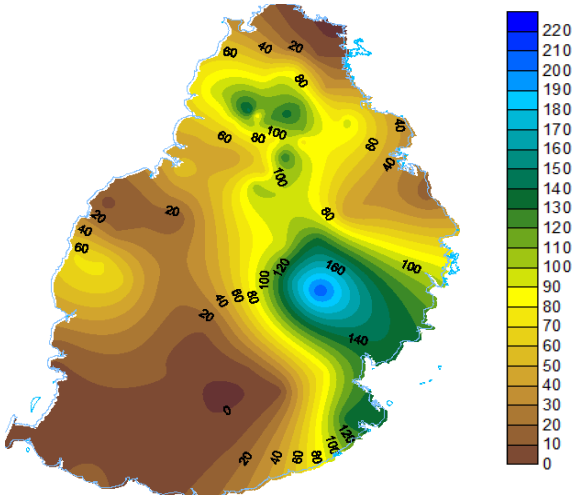


Fig 12: Rainfall amount in mm for 10 December from 10/047hr00 to 11/04hr00

(b) Intense tropical cyclone CILIDA

On the 17 December, a weak low-pressure circulation could be observed. As the environmental conditions became more conducive for cyclogenesis, convective activity strengthened over the low-pressure area and it started to deepen. It was named CILIDA at 10h00 LT on 19. CILIDA underwent rapid intensification as it changed from a Severe tropical storm in the morning to an intense tropical cyclone at night on the 20.
On the 22, at 22h00 LT, CILIDA passed at its closest position of 220 km to the north east of Mauritius and it maintained this distance till early morning of the 23. Afterwards, it started to move away. It initially moved slowly towards the south and after crossing the latitude od St Brandon, it started to recurve towards the Southeast.

Since CILIDA represented a potential threat for Mauritius, a cyclone Warning Class I was issued on 20 December 2018 at 16h10. The warning was upgraded to Class II on 21 at 16h10 LT and waived on 23 December at 04h10 LT. Cloud bands associated with CILIDA started to influence weather over the island as from Friday. Abundant and widespread showers were recorded all over the island on the night of 21. CILIDA contributed to 39 % of the long term mean for December.

Parameter	Value
Highest rainfall recorded	145.2 mm at Mon Bois (cumulated from 21/0400 to 22/0400)
Highest gust recorded	79 km/h at Champ de Mars
Lowest pressure	1003 hPa at Plaisance

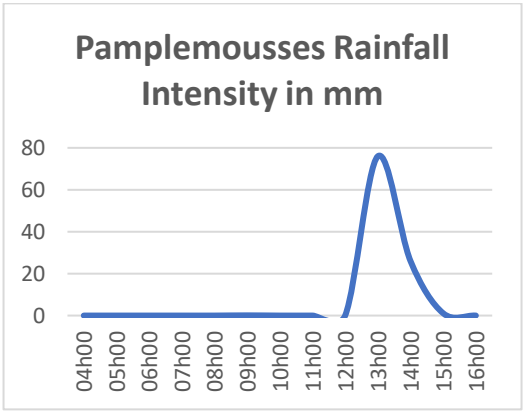


Fig. 13: Rainfall intensity at Pamplemousses for 10 December

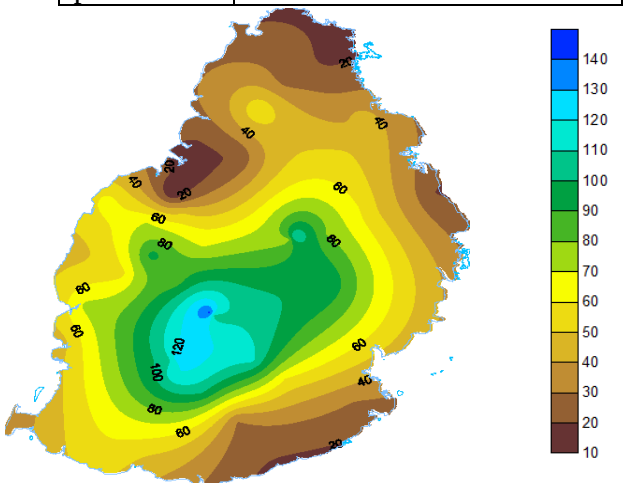


Fig 14: Cumulative rainfall in mm for 21-22 December from CILIDA

FORECAST FOR DECEMBER - JANUARY – FEBRUARY (DJF)

The central and eastern equatorial Pacific will be warmer than normal for JFM. However, satellite OLR images and wind anomalies at 850 hPa is not showing any typical El Nino pattern establishing yet. In the Indian Ocean, IOD will remain in a neutral positive phase whereas SIOD is expected to remain at peak intensity and eventually weakening as from second half of February. The Mascarene region will lie in a warm pool of SST for the period JFM due to the ongoing positive SIOD (Fig 15). Consequently, light wind and sultry conditions may prevail during this period.

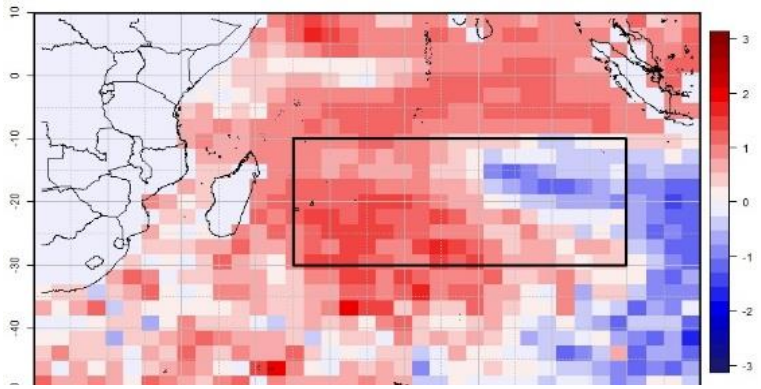
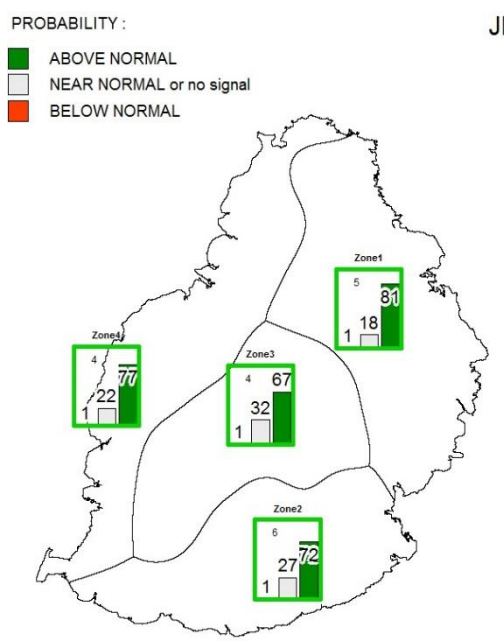


Figure 15: JFM sea surface temperature anomaly chart

Forecasts for Mauritius

- Rainfall amount is expected to be normal for JFM.
  - January rainfall will be below normal (~134mm), February and March are expected to be slightly above normal with (~400mm and~330mm respectively) (Fig. 16(a)).
- Day time maximum temperature will continue to remain above normal at most places (Fig. 16(b)).



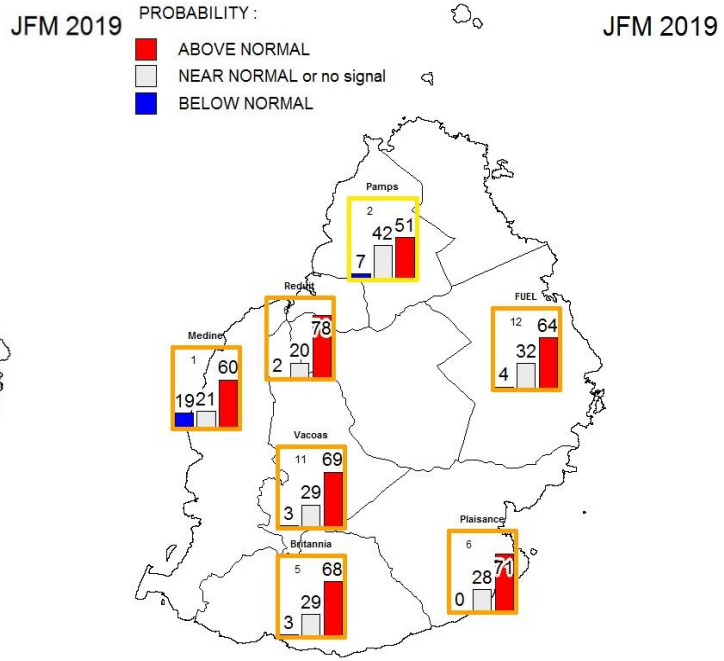


Fig. 16: Forecast of (a) rainfall and (b) temperature

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