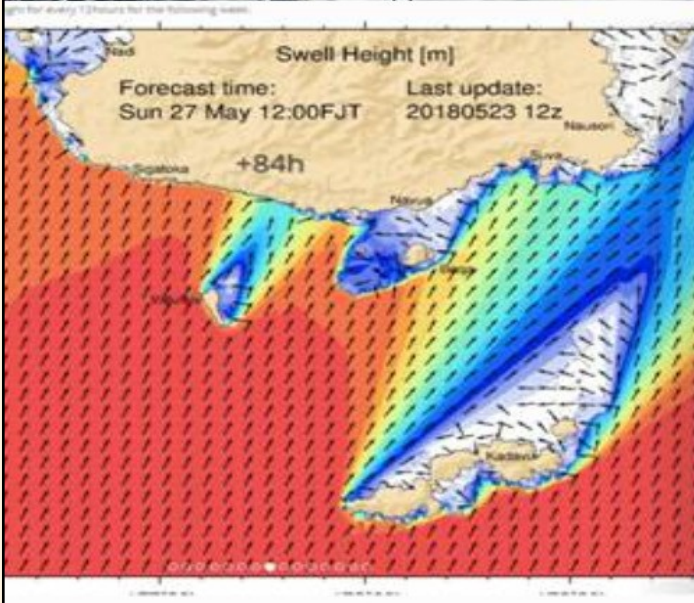




FIJI'S CLIMATE IN 2018

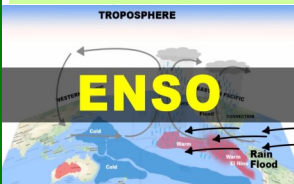


FIJI METEOROLOGICAL SERVICE

GOVERNMENT OF FIJI, MINISTRY OF INFRA-STRUCTURE, TRANSPORT, DISASTER MANAGEMENT AND METEOROLOGICAL SERVICES

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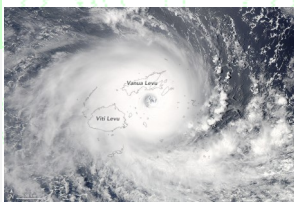
HIGHLIGHTS OF 2018



In general, El Niño Southern Oscillation conditions remained neutral for most of 2018. Weak La Niña prevailed at the beginning of the year which resulted in significant rainfall events in Fiji. In the last quarter of 2018, the Pacific Ocean flipped towards weak El Niño like conditions, but the event did not eventuate due to lack of support from the overlying atmosphere.

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Three tropical cyclones (TC) had direct impacts on Fiji during 2018. In February, the first system, severe tropical cyclone (Gita) passed just south of Ono-i-Lau, resulted in significant damages reported on the island.

Tropical cyclone Josie (Cat 1), the second TC affected the Fiji Group from March 31st to April 1st. Josie brought heavy rain which caused severe flooding, especially in the Western Division. Flood waters in Ba recorded the highest in our historical record. Seven lives were lost during this event with damages amounted to millions of Fijian dollars reported.

The third TC (Keni) affected Fiji between 10th and 11th April. Keni made a landfall over Kadavu and tracked very close to Ono-i-Lau. It resulted in hurricane force winds and storm surges reported in Kadavu and Ono-i-Lau. About 75% of houses were either damaged or destroyed including one casualty.

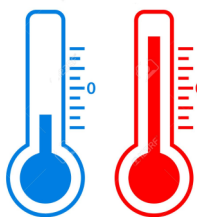


The national average rainfall during 2018 was 2538mm, which was 109% of the long term average (2324mm). This ranks 2018 as the 45th driest year in 62 years of record.

In 2018, a number of notable heavy rainfall events were recorded. The most significant event was during the 2nd week of January with Nadarivatu registering 405mm of rainfall on the 14th, with 640mm over a 48-hour period between 14th and 15th. A number of other stations in the Western Division recorded more than 200mm of rainfall on the 14th.



A period of suppressed rainfall was experienced from the 2nd half of June to early part of September. It was notably dry in the Western Division and northern half of Vanua Levu. Between June and September, Rarawai Mill and Yaqara in the northwestern Viti Levu registered 89 and 85 consecutive dry days, respectively.



The national average mean air temperature during 2018 was 25.9°C, which ranks as the 4th warmest year in Fiji (since 1959) after 2007, 2013 and 2017.

The national average maximum air temperature during 2018 was 29.8°C, which ranks as the 5th warmest year since 1959.

The national average minimum air temperature during the year was 22.1°C, which ranks as the 10th warmest in 60 years of record.



A total of 68 new daily or monthly climate records were established during 2018 (17 rainfall and 51 air temperatures). All the air temperature records were new high.

The annual total bright sunshine hours were near-normal at all three stations (Nadi Airport, Laucala Bay and Nacocolevu) during the year.

Note: All comparisons are with respect to "Climatic Normal". This is defined to be an average climate conditions over 30 year period. Fiji uses 1971-2000 period as its "climatic normal".

YEAR IN REVIEW

January's weather was mainly influenced by south east Trade winds and transient troughs of low pressure. The most significant rainfall event of the month was from the 13th to the 15th. During this event, an active trough of low pressure affected the country resulted in heavy and widespread rainfall across the country. Northwestern Viti Levu in particular experienced enormous amount of rainfall with Nadarivatu, Yaqara, Rarawai Mill, Lautoka Mill, Rakiraki and Penang Mill recorded 405mm, 328mm, 257mm, 226mm, 223mm and 211mm of rainfall on the 14th, respectively. Rotuma's weather was dominated by a series of troughs of low pressure producing rain and showers over most days.

Tropical cyclone (TC) Gita was the dominant feature in **February**. It entered Fiji waters on the 13th as a severe TC (Category-4). The center of Gita passed just to the south of Ono-i-Lau at around mid-day on the same day. The meteorological station at Ono-i-Lau recorded maximum sustained wind of 135km/hr and gust of 190km/hr on the 13th. This was accompanied by torrential rain, a record breaking daily rainfall of 271mm at Ono-i-Lau. Storm surge with estimated height of 1m was also experienced. The rest of the southern Lau group and Kadavu experienced near damaging gale force winds with heavy rain. The South Pacific Convergence Zone dominated the weather in Rotuma during the month.

March marked the end of the 2017-18 weak La Niña event. Troughs of low pressure systems and southeasterly wind flow dominated the month. The most significant event towards March end was associated with TC Josie. Torrential rainfall received over the interior and western part of Viti-levu, Nadarivatu, Lautoka Mill, Keiyasi and Nadi Airport registered 226mm, 188mm 167mm, and 153mm of rainfall, respectively, on the 31st. Rotuma recorded *below average* rainfall during the month.

TC Josie continued to affect Fiji as **April** commences. While the wind related damage was minimal, Josie brought about heavy rain which resulted in severe flooding to the Western Division. On the 1st, the flooding was exceptional in Ba with 234mm of rainfall registered at Toge in just two hours between 7am and 9am. Nadi town was also inundated with flood waters. Sadly seven lives were lost as a result of the floods associated with TC Josie. On the 10th, another tropical cyclone, severe TC Keni entered Fiji Waters as a Category 3 system. While the main islands of Viti Levu and Vanua Levu were spared, TC Keni made landfall on Kadavu before passing just west of Ono-i-Lau. It caused extensive damage, especially to the agricultural sector and infrastructure in Kadavu and Ono-i-Lau with one casualty reported. Rotuma was affected by series of troughs of low pressure throughout the month.

In **May**, there were two significant rainfall episodes observed. The first event was on the 1st where a trough of low pressure affected Fiji. Widespread rainfall was recorded across the country with Vunisea, Korolevu, Ono-i-Lau and Sigatoka reported 161mm, 139mm, 119mm and 109mm of rainfall, respectively. The second episode was towards month end, between 26th and 28th of May. A trough with enhanced moist easterly wind flow resulted in heavy downpour over the Central Division with Laucala Bay, Nasinu, RKS and Tokotoko registering 24-hour rainfall of 215mm, 146mm, 138mm and 107mm respectively on the 27th. Consequently, there were reports of flash flooding in certain parts of the Central Division. On a different note, moderate to heavy southerly swells resulted in sea flooding and coastal inundation in Kadavu, Coral Coast, Southern Lau group and as far as Rotuma between 24th and 28th. Rotuma was abnormally dry

during the month, with less than half the *normal* total monthly rainfall recorded. Troughs of low pressure produced some good rainfall during the early part of **June**. However, fine weather prevailed over most parts of the country during the second half of the month, with the onset of cool southerly winds. On the 1st, a trough of low pressure affected Fiji which resulted in widespread rainfall across the country. Viwa, Vunisea and Monasavu registered 63mm, 56mm and 49mm of rainfall on the 1st, respectively. The second rainfall event was on the 7th with Koronivia, Yasawa-i-Rara and Tokotoko receiving 71mm, 61mm, and 58mm rainfall. The night-time air temperatures at some of the stations dropped below 15°C in the last two weeks of the month. Nadarivatu recorded minimum air temperature as low as 11.9°C (16th), followed by Rarawai Mill with 13.5°C (30th), Keiyasi with 13.6°C (29th) and Monasavu with 14.2°C (30th). It was again a drier than *normal* month in Rotuma.

The weather during **July** was dominated by the trade southeastly winds. Trade showers observed over the eastern parts of larger islands, with fine weather elsewhere. It was significantly drier than *normal* across the Western Division, majority of the Northern Division and at Vunisea, Matuku and Lakeba in the Eastern Division with less than half the *normal* monthly rainfall was recorded. Notably, there were no rainfall at Keiyasi, Rarawai Mill, Yaqara and Yasawa-i-Rara during July, while Nadi Airport, Lautoka Mill, Tavua, Seaqaqa and Labasa Airport reported less than 5mm of rainfall. Significant cool nights were recorded on occasions, with Nadarivatu recording the lowest daily minimum air temperature of 11.0°C on the 10th, followed by Rarawai Mill with 11.6°C on the 8th. Rotuma continued to experience drier than usual condition.

It was a significantly dry **August** with *well below average* rainfall recorded at 24 out of the 25 climate monitoring stations. Notably, Lautoka Mill to Yaqara corridor as well as Labasa Airport recorded no rainfall during the month. Furthermore, majority of the other stations in the Western and Northern Divisions including the Northern Lau Group recorded less than 10mm of the total monthly rainfall. There were some record breaking low total monthly rainfall observed during the month, with Nabouwalu, Laucala Bay, Monasavu, Vanuabalavu and Tokotoko recording its driest August since observations began at these stations in 1935, 1942, 1980, 1985 and 1992, respectively. Significantly hot days were experienced on occasions during the 2nd half of the month with Lomaivuna registering 35.9°C on the 23rd, followed by Keiyasi with 35.3°C on the 21st. In contrast, significantly cool night-time temperatures were recorded, with Nadarivatu registering 9.0°C and Monasavu with 10.4°C on the 9th. Rotuma remained drier than normal during the month.

In **September**, rainfall activity started to increase after significantly dry July and August. The most significant rainfall of the month was registered at Laucala Bay on the 25th with 156mm of rainfall, which resulted in flash flooding in parts of Suva. While some much needed rainfall was also registered in the Western Division, it was still significantly dry with less than half the *normal* total monthly rainfall recorded at majority of the stations. Extended period of dry days continued, with only one rainy day registered at Lautoka Mill, with Ba to Yaqara corridor and as well as Momi and Yasawa-i-Rara registering less than 5 rain days. Rotuma registered less than half the *normal* rainfall during the month.

Rainfall activity substantially picked up during **October**. New high total monthly rainfall record for October was set at Nabouwalu, Udu

Point, Matei Airfield and Monasavu during the month with observations at these stations beginning in 1918, 1946, 1956 and 1980, respectively. An extended period of widespread and significant rainfall was experienced from the 13th to the 20th. Consequently, this led to flooding in parts of Northern Division and eastern half of Viti Levu. Similarly, towards the later part of the month, heavy and widespread rainfall was experienced in the Central Division on the 25th with Nausori Airport, Laucala Bay, Koronivia, and Nasinu registering rainfall of 159mm, 143mm, 135mm and 116mm, respectively. Rotuma was the only place which received *below average* rainfall during the month.

Majority of the country experienced drier than *normal* condition during **November**. The exception to this was the Central Division where *above average* rainfall was registered at most of the stations. A prolonged period of significant rainfall was registered in the Central Division between 10th and 14th. In particular, Koronivia, RKS and Nasinu recorded 24-hour rainfall of 203mm, 173mm and 163mm on the 11th, respectively. There were reports of flooding in the eastern half of Viti

Levu during this period. It was the driest November on record at Rotuma since observations began in 1912.

December continued to observe drier than normal conditions at most places in the Western Division, parts of the Northern Division and Southern Lau Group. In contrast, Central Division recorded significantly wet condition. A record high 24-hour rainfall for December was registered at Vanuabalavu during the month. Significantly hot condition was experienced in parts of Fiji on Christmas Day, especially in the Western Division, with Rarawai Mill recording the highest temperatures of 36.0°C on the 25th. A period of significantly warm night-time condition was experienced from the 23rd to the 26th, with Yasawa-i-Rara recording the highest daily minimum air temperature of 27.7°C on the 25th. After prolonged period of drier than *normal* condition at Rotuma since April 2018, *above average* rainfall was registered during the month.

LARGE SCALE DRIVERS OF CLIMATE

Fiji's year-to-year climate variability is largely driven by the El Niño Southern Oscillation (ENSO) phenomena. The status of ENSO varied a lot during 2018. At the beginning of the year, weak La Niña conditions prevailed, changed to neutral during mid-year and then again change to weak El Niño conditions during the last quarter of 2018.

The Pacific Ocean continued to warm and reached weak El Niño like conditions during October. However, the atmosphere failed to respond to ocean warming with most of the indicators displaying ENSO neutral signatures till the end of the year.

The year started off with a weak La Niña event established in the tropical Pacific. The sea surface temperatures (SSTs) gradually warmed with a return to ENSO neutral state in March.

Consequently, an El Niño event was not declared as oceanic and atmospheric unison is essential for driving changes in the global weather and climate.

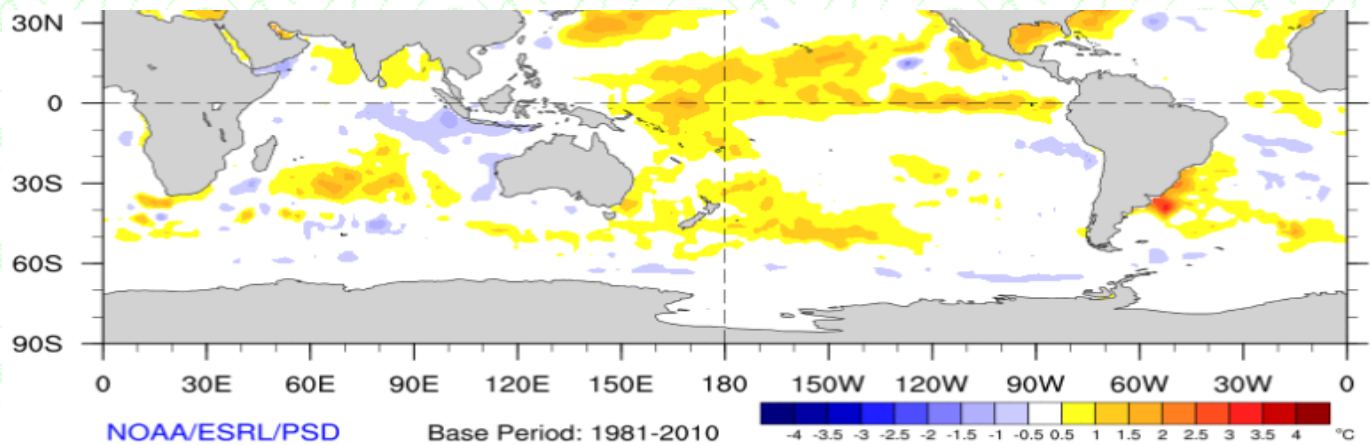


Figure 1: SST anomalies during October 2018. The SSTs were warmer than normal across most of the equatorial Pacific Ocean. Source: NOAA-USA.

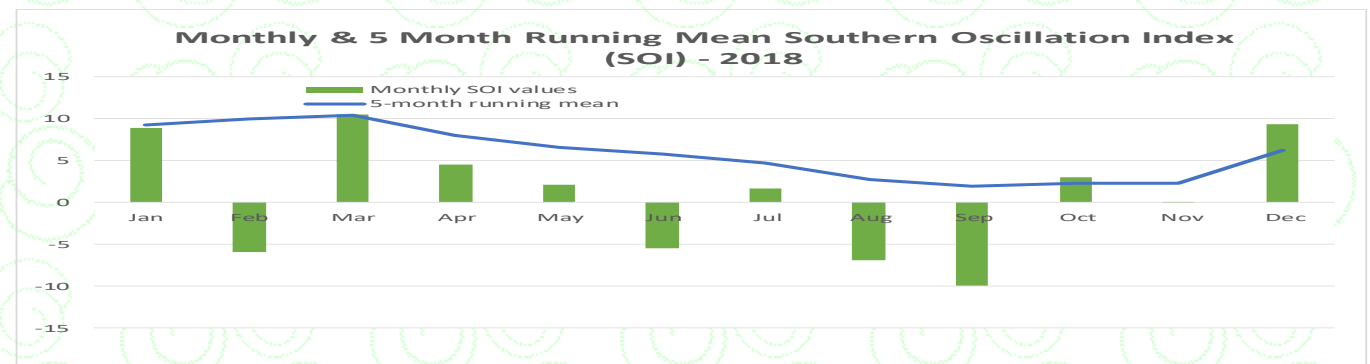


Figure 2: Southern Oscillation Index is one of the indicators of the persistence of El Niño or La Niña conditions, with sustained negative values of the SOI below -7 typically indicating El Niño and above +7 signifying La Niña. SOI values reflected La Niña pattern during the 1st quarter of the year, while it fluctuated within the neutral range through the rest of the year. Data Source: Bureau of Meteorology and Graphic by FMS.

RAINFALL

Rainfall recorded during the year was *average to above average* at most station around the country. Out of the 24 rainfall monitoring sites, 9 registered *above average* rainfall, 14 *average* rainfall, while Rotuma was the only station to record *below average* rainfall (Figure 3a).

A period of suppressed rainfall was experienced from the 2nd half of June to early part of September. It was notably dry in the Western Division and northern half of Vanua Levu. Between June and September, Rarawai Mill and Yaqara in the northwestern Viti Levu registered 89 and 85 consecutive dry days, respectively. Other parts of Fiji also experienced drier than usual conditions during this period, with peak dryness registered in August. Notably, Lautoka Mill to Yaqara corridor and as well as Labasa Airport recorded no rainfall at all during August. Some record breaking low total monthly rainfall were registered during August, with Nabouwalu, Laucala Bay, Monasavu, Vanuabalavu and Tokotoko recording its lowest total monthly rainfall for August since observations began at these stations in 1935, 1942, 1980, 1985 and 1992, respectively.

The national average rainfall during 2018 was 2538mm, which was 109% of the long-term average. This ranks 2018 as the 45th driest year in 62 years of record (Figure 3b).

The wettest location during the year was Nadarivatu with 5551mm of rainfall, followed by Monasavu with 4843mm, Lomaivuna with 3818mm and Nasinu with 3625mm. On the other hand, the driest was Viwa with

1874mm of rainfall, followed by Lautoka Mill with 2028mm, Lakeba with 2040mm and Yasawa-i-Rara with 2041mm.

A number of very heavy rainfall events were recorded during the year. The most significant rainfall event was during the 2nd week of January with Nadarivatu registering 405mm of rainfall on the 14th, with 640mm over a 48-hour period between 14th and 15th. A number of other stations in the Western Division recorded more than 200mm of rainfall on the 14th. During the passage of TC Gita, Ono-i-Lau registered a record breaking rainfall for February of 271mm on the 13th. Another heavy rainfall event led to a severe flooding in the Western Division on the 1st April, with one of the worst floods on record in Ba. Toge in Ba registered hourly rainfall of 119.5mm at 8am on the 1st, which was followed by 114mm an hour later. The station recorded accumulated 24-hour rainfall of 328mm from 9am to 9am between 31st March and 1st April. Towards May end, Central Division experienced heavy rainfall with Laucala Bay, Nasinu, RKS and Tokotoko recorded 24-hour rainfall of 215mm, 146mm, 138mm and 107mm all on the 27th, respectively. Consequently, there were reports of flash flooding in parts of the Central Division during the above event. During late November, a heavy rainfall event was again experienced in the Central Division with Koronivia, RKS, Nausori Airport and Nasinu receiving 203mm, 173mm, 163mm and 149mm of rainfall on the 11th, respectively.

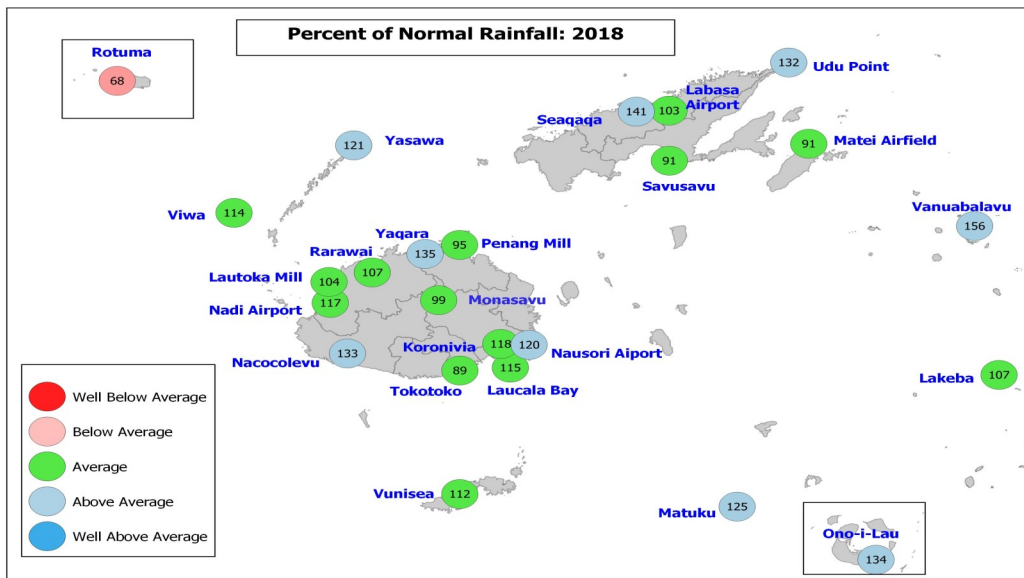


Figure 3(a): Percent of normal annual rainfall during 2018. Majority of the stations registered near average to above average rainfall.

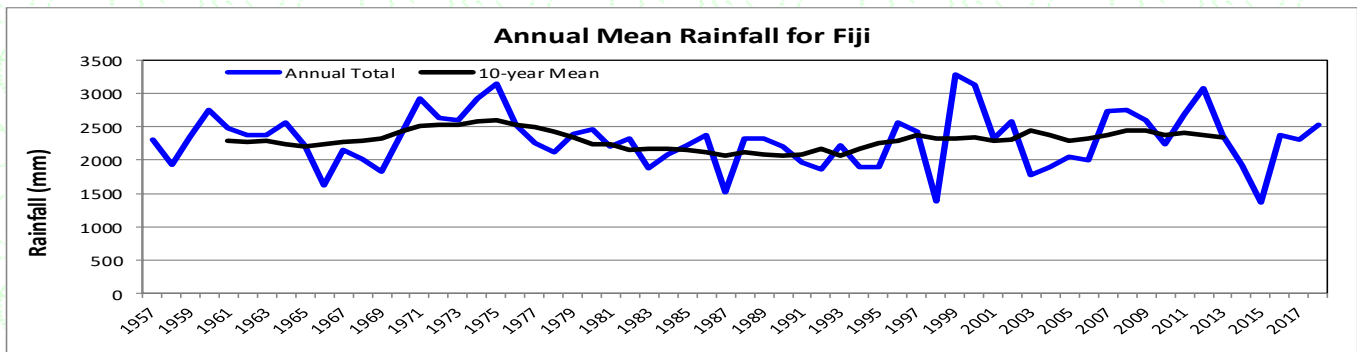


Figure 3(b): Time series of annual and 10 year mean rainfall for Fiji.

MEAN AIR TEMPERATURE

The national average air temperature during 2018 was 25.9°C, which was 0.6°C warmer than the *normal*. This ranks 2018 as the 4th warmest year in Fiji, with 2007 as the warmest, followed by 2013 and 2017.

air temperatures as greenhouse gas concentration increases in the atmosphere.

The national mean annual air temperature has increased by 0.8°C between 1959 and 2018, an increasing trend that is statistically significant (figure 4). This trend is consistent with the global pattern of rising

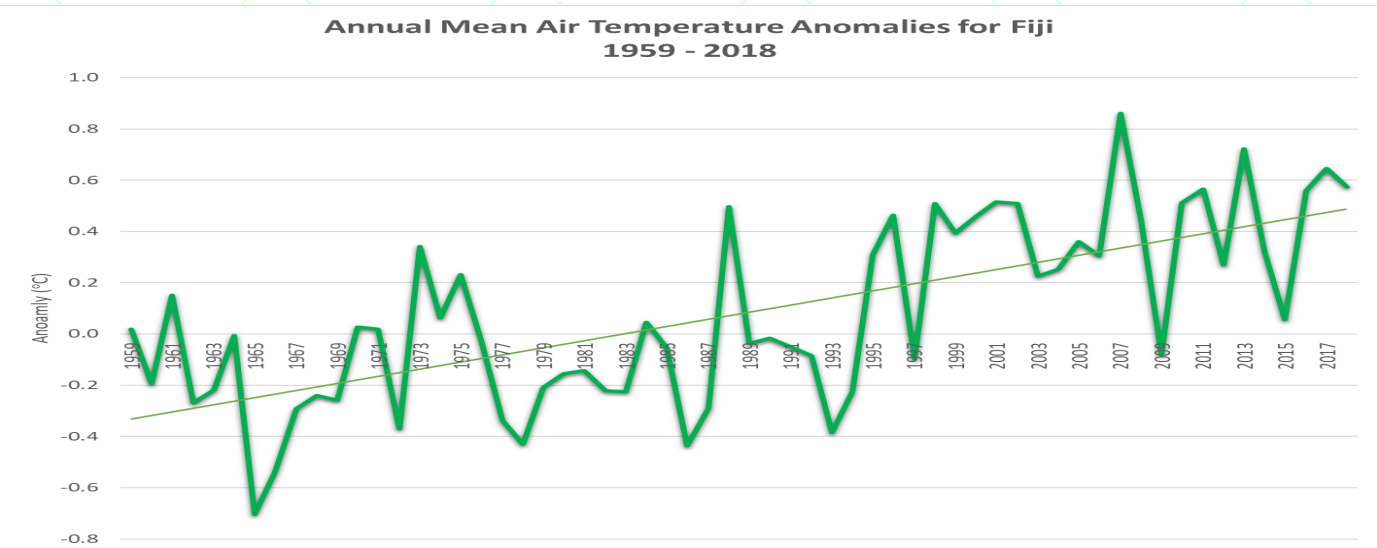


Figure 4: Time series of annual mean air temperature anomalies for Fiji with linear trend.

MAXIMUM AIR TEMPERATURE

The national average annual maximum air temperature during 2018 was 29.8°C, which was 0.6°C warmer than the *normal*. This ranked as the fifth warmest annual maximum air temperature on record. The year 1998 was warmest on record, followed by 2007, 2016 and 2017.

rawai Mill and Labasa Airport with both 31.3°C, and Yaqara with 31.2°C. On the other hand, the coolest annual mean maximum air temperature was registered at Monasavu with 24.3°C, followed by Nadarivatu with 24.5°C and Matuku with 28.6°C.

The national average maximum air temperature has increased by 0.9°C between 1959 and 2018, an increasing trend that is statistically significant (figure 5).

Yaqara recorded the highest daily maximum air temperature during 2018 with 37.6°C on February 25th, followed by Keiyasi with 36.3°C on September 17th, Rarawai Mill with 36.0°C and Nadi Airport with 35.6°C on December 25th.

The warmest location on average during 2018 was Keiyasi with the annual mean maximum air temperature of 31.4°C, followed by Ra-

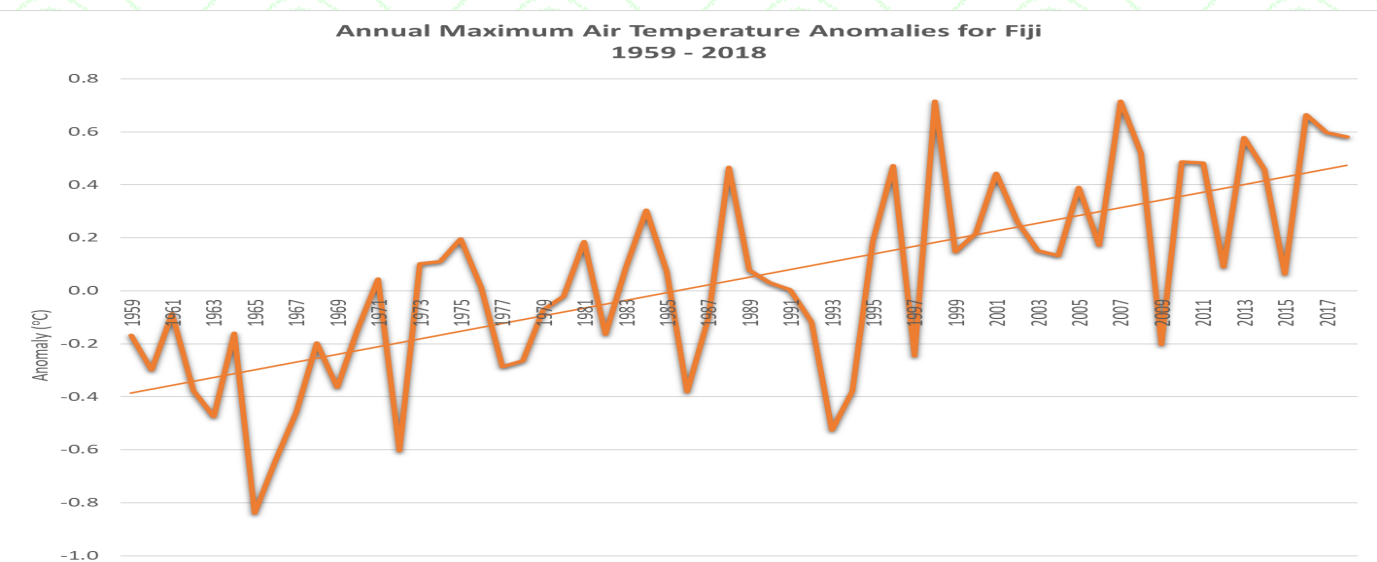


Figure 5: Time series of annual maximum air temperature anomalies for Fiji with linear trend.

MINIMUM AIR TEMPERATURE

The national average annual minimum air temperature during 2018 was 22.1°C, which was 0.6°C warmer than the *normal*. This ranked as the 10th warmest annual minimum air temperature on record since 1959. The year 2007 recorded the warmest minimum air temperature, followed by 2013, 2002 and 2000 at the 2nd, 3rd and 4th place, respectively.

The national average minimum air temperature has increased by 0.8°C between 1959 and 2018, an increasing trend that is statistically significant.

The coolest nights on average during 2018 was recorded at Nadariva-

tu with the annual minimum air temperature of 17.1°C, followed by Monasavu with 17.8°C, Keiyasi with 20.1°C and Rarawai Mill with 20.3°C. In contrast, the warmest nights on average was at Rotuma with annual minimum air temperature of 24.7°C, followed by Yasawa-i-Rara with 24.1°C, Udu Point with 23.9°C and Viwa with 23.8°C.

The lowest daily minimum air temperatures were recorded during the month of August, Nadarivatu with 9.0°C on the 9th, followed by Monasavu with 10.4°C on the same day, Rarawai Mill with 11.2°C on the 7th and Labasa Airport with 11.5°C on the 8th.

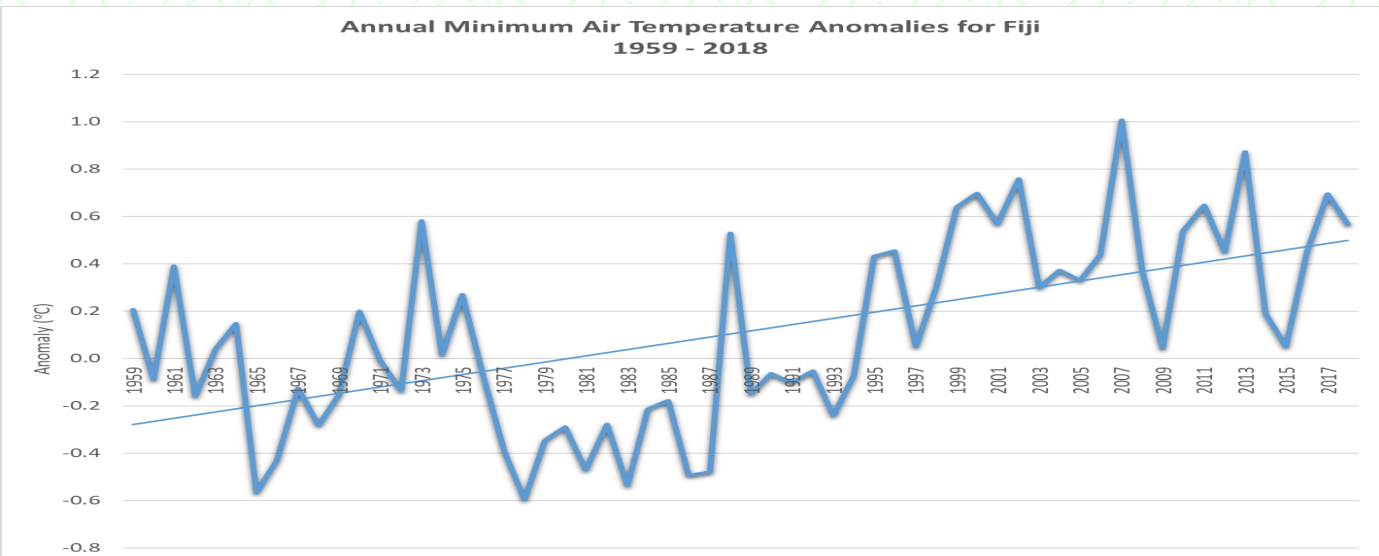


Figure 6: Time series of annual minimum air temperature anomalies for Fiji from 1959-2018.

SUNSHINE

The annual sunshine hours was *near normal* (within 10% of annual *normal*) at Nadi Airport, Laucala Bay and Nacocolevu. The total annual bright sunshine hours at Nadi Airport, Nacocolevu and Laucala Bay was 2536 hours, 1933 hours and 1827 hours, respectively (Table 1).

Nadi Airport registered 100% of *normal* bright sunshine hours during the year. The station registered *above normal* sunshine hours during January, July, August and November. On the other hand, *below normal* sunshine hours were recorded during February, September and October. The highest total monthly bright sunshine of 271 hours was registered in August, while the lowest of 149 hours was recorded in February (Table 6).

The annual total bright sunshine at Laucala Bay was 95% of the *normal*. *Below normal* sunshine hours were observed during February,

June, September, October and December, while *above normal* sunshine hours were registered in May July and August. The sunniest month was January with 207 hours of total bright sunshine, while October recorded the least hours of sunshine with 84 hours (Table 6).

Nacocolevu experienced 95% of the *normal* sunshine hours during 2018. It registered *below normal* sunshine hours in February, May, September and October. On the other hand, *above normal* sunshine hours were recorded during January, April, July and August. The sunniest month at Nacocolevu was January (228 hours), while May was least sunshine month (84 hours).

Location	Sunshine (hours)	% of Normal	Comments
Nadi Airport	2536	100	Normal
Laucala Bay	1827	95	Normal
Nacocolevu	1933	95	Normal

Table 1: Total bright sunshine hours during 2018.

WINDS

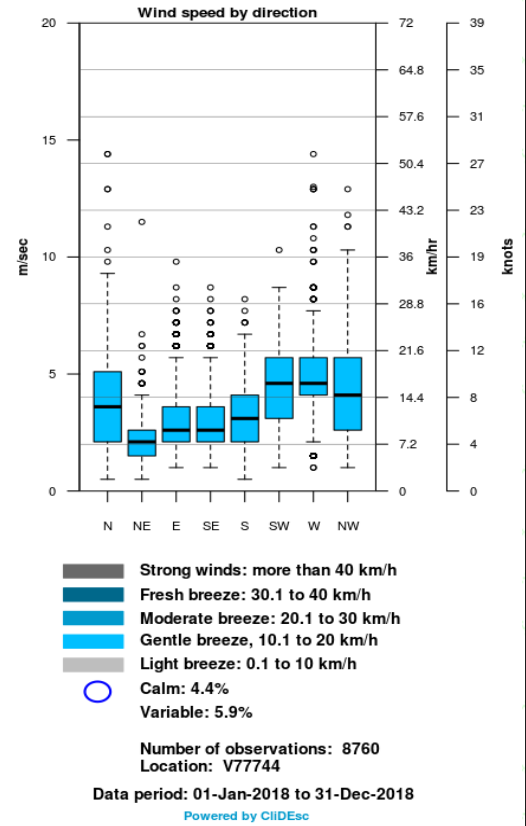
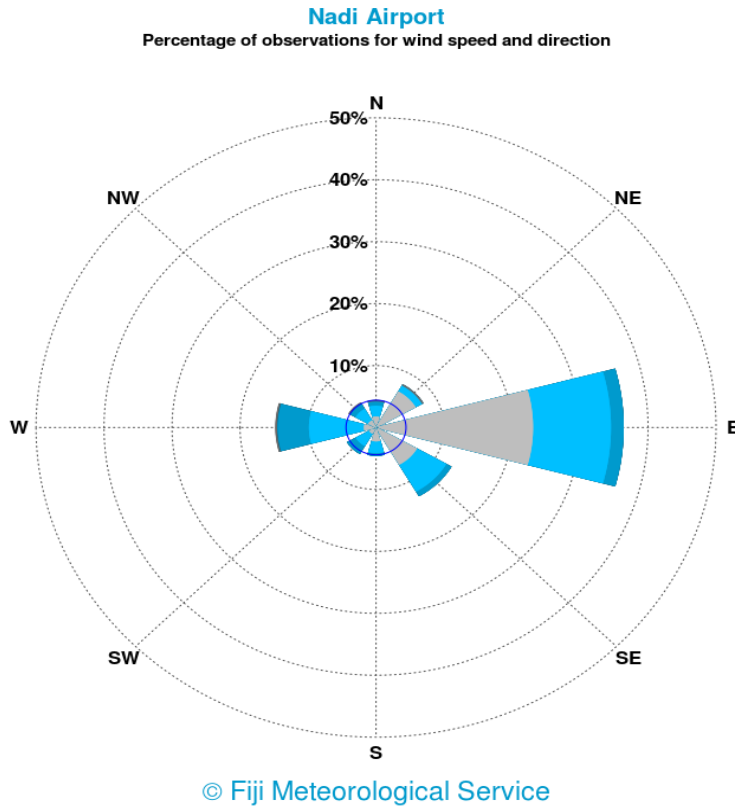


Figure 7a: Wind rose for Nadi Airport based on hourly wind observations during 2018.

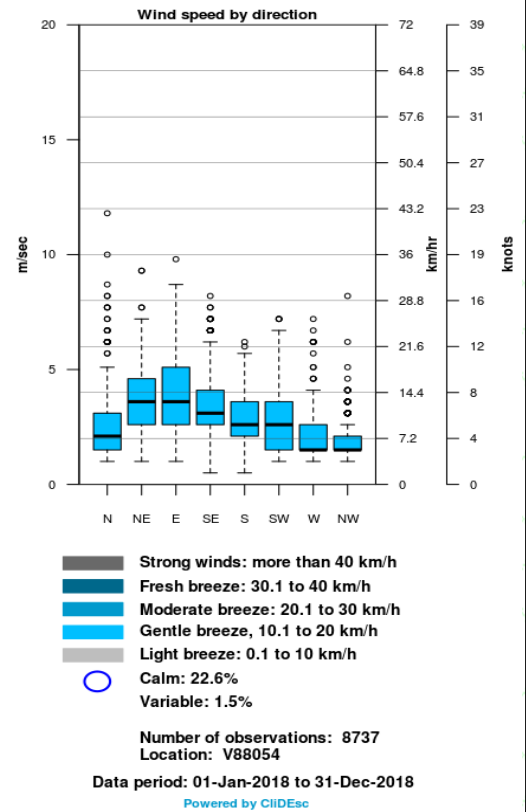
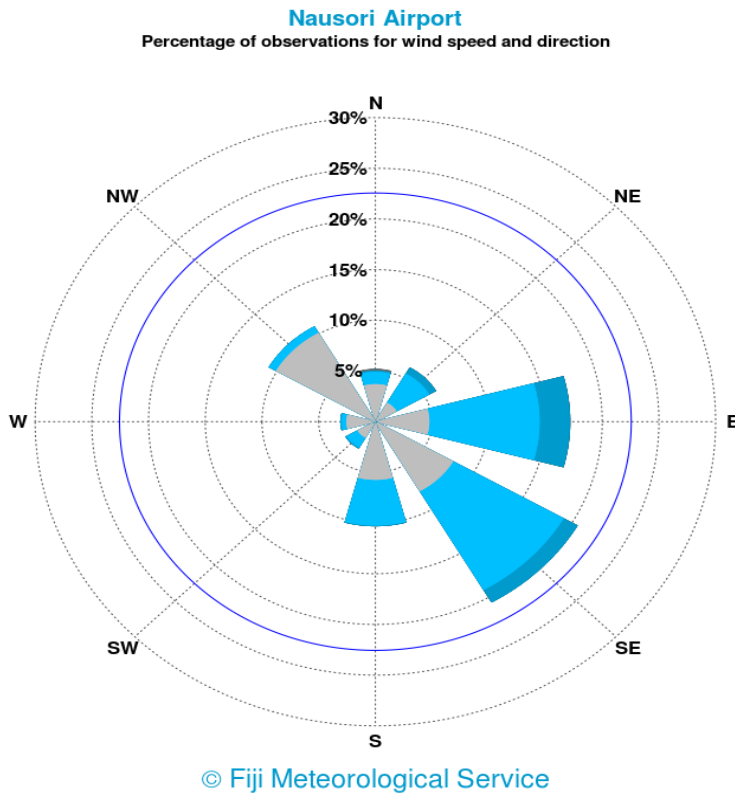


Table 7b: Wind rose for Nausori Airport based on hourly wind observations during 2018.

SEA LEVEL

The sea level at the Lautoka SEAFRAME station for the period October 1992 to December 2018 show an increasing trend of +4.4mm/year. Similar rising trends are also observed across the Pacific Island region (Figure 8). However, caution should be exercised in interpreting the overall rate of movement of sea level since the records are too short to be inferring long-term trends and have not been corrected for land movement or other parameters that may influence the reported rates. The rates are relative to the SEAFRAME sensor benchmark.

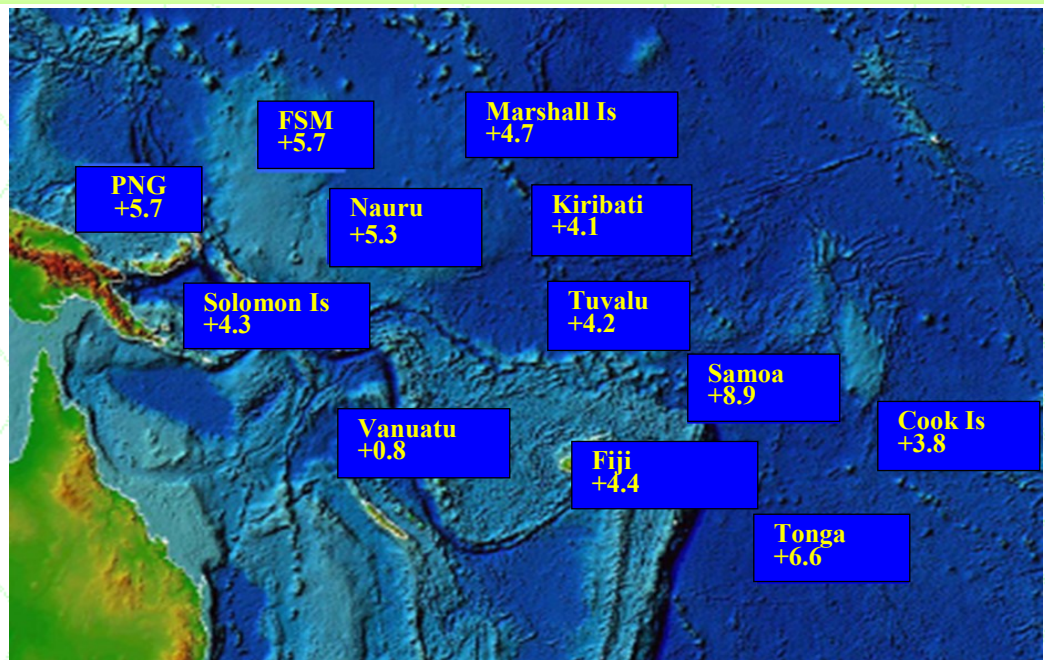


Figure 8: Sea level trends (mm/yr) in the Pacific Island region.

NEW RECORDS

There were 68 new records established at various parts of the country in 2018.

Of the newly established records; 5 were daily maximum rainfall records, 12 total monthly rainfall records, 18 daily maximum air temperature records, 9 daily minimum air temperature records, 12 mean monthly maximum air temperature records and 9 mean monthly minimum air temperature records.

Out of the 12 total monthly rainfall records, 6 were new highs and 6 were new lows. All the air temperature records were new high.

The highest number of new records were established in August and October, with 12 records each. August was a significantly dry month, with 5 new lowest rainfall records.

In contrast, October was significantly wet, with 5 new rainfall records (Table 2).

Table 1.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Daily Rainfall	-	1	2	-	-	-	-	-	-	1	-	1	5
Total Monthly Rainfall	-	1	1	-	-	-	-	5	-	4	1	-	12
Daily Max. Temperature	2	2	2	1	-	1	-	4	4	1	1	-	18
Mean Monthly Max. Temperature	1	2	3	-	-	1	-	1	2	2	1	2	15
Daily Minimum Temperature	1	-	1	1	-	-	1	2	1	-	-	2	9
Mean Monthly Min. Temperature	-	1	1	1	-	-	-	-	2	4	-	-	9
Total	4	7	10	3	0	2	1	12	9	12	3	5	68

Table 2: Summary of new monthly climate records established during 2018.

TROPICAL CYCLONE ACTIVITY IN RSMC-NADI AREA OF RESPONSIBILITY IN 2018

Seven tropical cyclones (TCs) formed in the Regional Specialised Meteorological Centre Nadi - Tropical Cyclone Centre (RSMC Nadi-TCC) area of responsibility (AoR) in 2018 (Figure 14). Three of TCs directly impact Fiji.

TC Fehi was the first TC to form in the 2017-18 TC season. It developed towards the end of January. Fehi reached a maximum intensity of Category 1 and remained over open waters, passing to the west of New Caledonia. Fehi did not cause significant damage to any of the countries in the region.

TC Gita developed in February and reached a maximum intensity of a Category 5 system with sustained winds estimated up to 110 knots and gusts up to 155 knots. Gita was named when it was located to the northeast of Fiji and west of Samoa. Gita affected Samoa as a Category 2 TC, intensified to Category 3 and passed east of Niue, turned west in response to upper steering, intensified into Category 4 before approaching Tongatapu. Tongatapu was devastated during the passages of severe TC Gita. It affected Fiji twice, first at depression stage when passing just to the north of Fiji. Heavy rain which resulted in flooding and strong winds were observed. Severe TC Gita returned, passed just south of Ono-i-Lau with a lot of damage reported on the island. Severe TC Gita intensified further to Category 5 while tracking west-southwest, away from Fiji.

TC Hola formed in March and was named when the system was about 230km north-northeast of Vila. It reached a maximum intensity of Category 4 system with sustained winds estimated to 90 knots. Hola made a landfall on Vanuatu as Category 2 TC. It intensified to Category 3 and further to Category 4 before turning southeast. Hola passed just east of New Caledonia and weakened gradually.

TC Iris occurred in March but was short lived while in RSMC Nadi TCC area. It reached maximum intensity of Category 1 system, remained over open water, thus no significant impact to any of the islands.

TC Josie was named when it was analysed just east of Vanuatu on the 1st April. Josie tracked east-southeast towards Fiji. While it maintained a strength of Category 1 system throughout its lifetime, the rain bands associated with Josie resulted in heavy rainfall over Fiji, especially in the Western Division. Consequently, severe flooding were recorded with water level in Ba town recorded highest in our historical record. Seven lives were lost and damages amounted to millions of dollars in Fiji.

In April, **TC Keni** also developed just east of Vanuatu and tracked east-southeast towards Fiji. Keni intensified to a Category 3 TC as it entered Fiji Waters. While the main islands in Fiji were spared from direct impact, Keni made a landfall over Kadavu, before passing very close to Ono-i-Lau. Hurricane force winds were reported including storm surges in Kadavu and Ono-i-Lau. About 75% of houses were damaged or destroyed in Kadavu and Ono-i-Lau with one casualty reported

Liua was the first system to form in the South Pacific during the 2018-19 season. It was named on 26th September, making it the earliest-forming TC in the South Pacific basin since reliable records began. Liua reached a maximum intensity of a Category 1 system with maximum sustained winds estimated to 40 knots and gusts to 55 knots while it was in the RSMC Nadi-TCC AoR. Liua affected Solomon Islands, especially Makira, Guadalcanal and Malaita, with torrential rain and gale force winds.

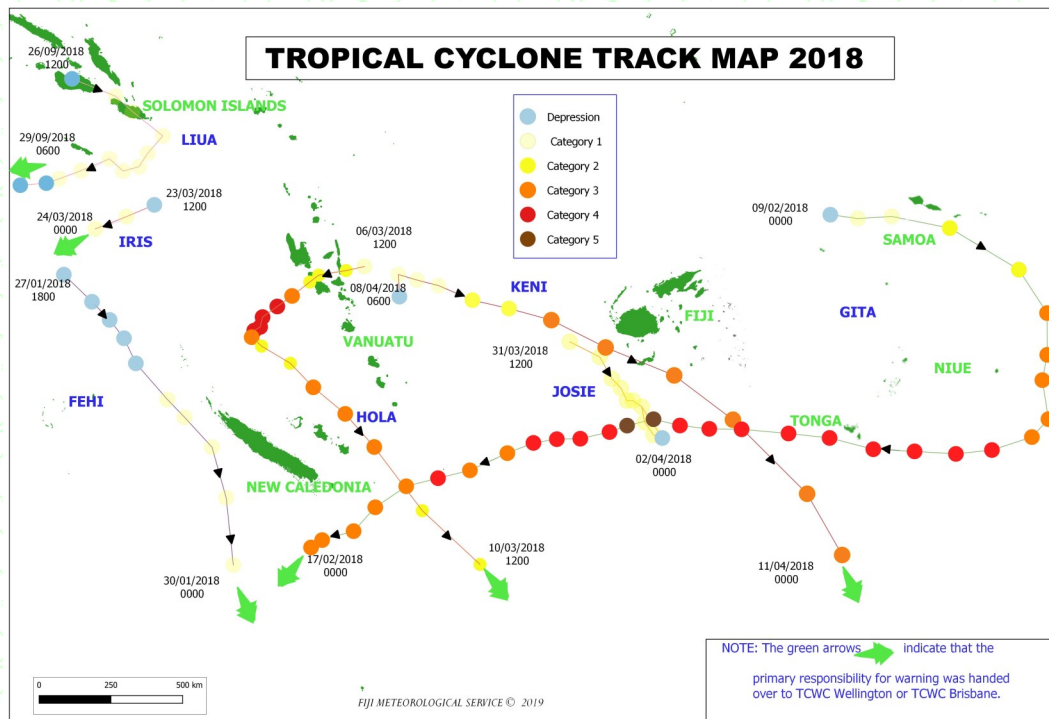


Figure 9: Tracks of tropical cyclones which occurred in the RSMC Nadi-TCC Area of Responsibility during 2018.

TABLE 3: Total Monthly Rainfall (mm) and Percentage of Normal Rainfall

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Nadi Airport	Actual (mm)	335.2	529.7	412.5	344.4	109.5	53.3	0.5	5.5	42.2	180.4	97.5	99.8	2210.5
	%	90	182	121	215	123	83	1	9	60	177	74	56	117
Penang Mill	Actual (mm)	393.6	320.8	506.5	475.2	60.3	45.9	8.9	5.7	35.2	340.4	69.6	71.5	2333.6
	%	99	96	119	177	37	46	16	8	37	298	44	27	95
Laucala Bay	Actual (mm)	265.2	313.8	316.8	341.0	485.5	122.4	125.9	5.6	281.2	541.9	321.3	360.0	3480.6
	%	71	119	85	93	180	75	93	4	159	246	131	130	115
Nausori Airport	Actual (mm)	413.8	264.2	346.5	340.5	261.7	190.1	98.6	34.4	114.0	542.0	450.7	449.6	3506.1
	%	114	99	90	94	106	126	84	23	69	278	184	169	120
Labasa Airport	Actual (mm)	166.8	505.1	382.7	619.1	52.0	16.1	4.5	0.0	99.7	282.7	22.0	159.1	2309.8
	%	43	147	103	261	45	24	8	0	139	229	12	66	103
Sa-vusavu	Actual (mm)	157.3	187.4	281.3	340.3	48.5	183.2	37.7	12.4	132.4	457.9	92.7	199.7	2290.0
	%	57	77	99	131	25	154	39	11	100	268	49	77	91
Lakeba	Actual (mm)	149.9	334.1	341.6	307.4	129.8	64.9	13.6	6.9	188.5	256.6	111	136.1	2040.4
	%	62	148	117	149	97	80	17	7	187	209	78	76	107
Matuku	Actual (mm)	239	381.1	349.9	482.4	155.6	161.7	28.6	21.2	28	213.1	82.6	146.8	2290.0
	%	87	206	137	279	101	150	35	19	29	186	65	96	125

TABLE 4: MEAN MONTHLY MAXIMUM AIR TEMPERATURES AND DEPARTURES FROM THE NORMAL (° C)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Nadi Airport	Max.	31.9	30.8	31.2	30.2	29.4	29.2	28.3	29	30.3	30.4	30.6	31.8	30.3
	Dep.	0.4	-0.8	-0.1	-0.5	-0.3	0.2	-0.3	0.3	1.0	0.1	-0.5	0.3	0.0
Rarawai Mill	Max.	32.7	31.5	32.0	30.9	30.3	30.1	30.1	29.9	31.9	31.0	31.9	33.1	31.3
	Dep.	0.6	-0.5	0.0	-0.6	-0.3	0.1	0.5	0.1	1.5	-0.2	0.0	0.8	0.2
Laucala Bay	Max.	31.9	31.6	31.1	29.8	28.5	27.7	27.2	27.2	27.7	28.0	29.1	30.5	29.2
	Dep.	1.1	0.4	0.2	-0.1	0.0	0.0	0.4	0.5	0.5	-0.2	-0.2	0.2	0.2
Nausori Airport	Max.	31.2	31.5	31.3	29.6	28.2	27.9	27.1	26.7	27.4	28.2	29.0	30.2	29.0
	Dep.	0.8	0.7	0.8	0.3	0.3	0.6	0.8	0.5	0.8	0.6	0.2	0.5	0.6
Labasa Air-port	Max.	32.4	31.7	31.9	30.4	30.9	30.6	29.9	30.5	31.7	31.1	32.0	32.2	31.3
	Dep.	0.7	0.1	0.4	-0.6	0.7	0.8	0.7	1.1	1.6	0.3	0.6	0.5	0.6
Savusavu Airfield	Max.	30.7	31.1	30.4	29.4	28.3	27.6	27.0	27.0	28.2	28.4	29.2	30.0	28.9
	Dep.	0.1	0.4	-0.2	-0.4	-0.2	-0.3	0.0	-0.1	0.8	0.2	-0.2	-0.2	0.0
Vunisea	Max.	31.8	31.4	31.1	29.5	28.3	27.6	26.7	27.1	27.1	28.2	29.2	29.7	29.0
	Dep.	1.9	1.0	1.1	0.6	1.0	1.0	1.0	1.3	1.0	1.1	0.8	0.3	1.0
Ono-i-Lau	Max.	29.2	29.8	29.3	28.2	26.7	253.9	25.0	24.9	25.4	26.4	27.6	28.7	27.3
	Dep.	1.8	1.8	2.6	1.4	1.9	2.1	2.0	2.8	2.7	2.5	2.1	0.8	2.0

TABLE 5: MEAN MONTHLY MINIMUM AIR TEMPERATURES AND DEPARTURES FROM THE NORMAL (° C)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Nadi Airport	Min.	23.2	24.1	23.3	22.5	20.6	20.8	18.7	18.9	22.2	22.5	21.8	23.5	21.8
	Dep.	0.4	1.2	0.5	0.7	0.4	1.6	0.3	0.3	2.9	2.0	0.0	1.1	0.9
Rarawai Mill	Min.	22.5	23.3	22.6	21.2	18.6	18.9	16.1	16.1	20.1	21.3	20.9	22.1	20.3
	Dep.	0.4	1.0	0.3	0.0	-0.5	0.9	-0.9	-1.3	1.9	1.7	0.1	0.4	0.3
Laucala Bay	Min.	24.2	24.4	24.3	23.9	22.2	22.5	21.2	21.1	22.7	23.1	23.2	24.4	23.1
	Dep.	0.3	0.4	0.4	0.6	0.0	1.1	0.5	0.4	1.7	1.2	0.4	0.9	0.7
Nausori Airport	Min.	22.9	23.9	23.4	22.7	21	21.1	19.8	19.2	21.6	22.4	21.9	23.4	21.9
	Dep.	-0.3	0.6	0.2	0.2	-0.2	0.6	0.2	-0.4	1.4	1.5	-0.1	0.8	0.4
Labasa Airport	Min.	22.2	23.1	22	22	18.3	19.8	17.6	17	20.1	21.6	20.8	21.4	20.5
	Dep.	0.0	0.7	-0.3	0.7	-1.6	0.9	-0.5	-1.7	0.8	1.8	-0.4	-0.3	0.0
Savusavu Airfield	Min.	24.5	24.6	23.8	24	23.2	23.1	21.9	21.7	23.2	23.4	23.4	23.9	23.4
	Dep.	1.0	0.9	0.2	0.8	0.9	1.5	0.9	0.9	2.0	1.5	0.8	0.9	1.0
Vunisea	Min.	24.3	24.8	24.5	23.9	22.1	22	21	19.7	21.5	22.8	22	24.1	22.7
	Dep.	0.9	1.2	1.0	1.2	0.6	1.5	1.4	0.3	1.7	2.0	0.1	1.2	1.1
Ono-i-Lau	Min.	24.7	25.1	24.8	23.4	22.2	21.9	21	20.7	21.2	22.4	21.9	23.4	22.7
	Dep.	0.5	0.5	0.4	-0.2	0.1	0.5	0.8	0.7	0.8	1.0	-0.7	-0.1	0.4

TABLE 6: SUNSHINE HOURS AND PERCENTAGE OF NORMAL

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Nadi Airport	Actual	238.4	148.8	175.0	205.8	224.7	201.1	245.0	271.3	181.1	159.3	264.4	220.7	2536
	%	113%	79%	91%	104%	108%	98%	112%	118%	86%	68%	119%	97%	100%
Laucala Bay, Suva	Actual	207.2	124.5	181.5	144.6	117.0	114.0	171.9	189.4	95.4	84.3	177.7	159.1	1827
	%	108%	71%	107%	94%	122%	81%	127%	132%	70%	52%	106%	82%	95%

This Summary is prepared as soon as ENSO, climate and oceanographic data/information is received from recording stations around Fiji and Meteorological Agencies around the region/world. Delays in data collection, availability of appropriate information, communication and processing occasionally arise. While every effort is made to verify observational data and information, the Fiji Meteorological Service does not guarantee the accuracy and reliability of the analyses presented, and accepts no liability for any losses incurred through the use of this Summary and its contents. The contents of the Summary may be freely disseminated provided the source is acknowledged. All requests for data should be addressed to the Director, Fiji Meteorological Service HQ, Namaka, Nadi.

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