

**FIJI
METEOROLOGICAL
SERVICE**

Private Mail Bag (NAP0351)
Nadi Airport, Fiji
Ph: +679 6724888
Fax: +679 6724050
Email: climate@met.gov.fj
Also online at:
<http://www.met.gov.fj>

Fiji Climate Summary

July 2018



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1. IN BRIEF

The weather during July 2018 was dominated by southeast wind flow, resulting in fine weather over most parts of the country and occasional trade showers over the windward side of the larger islands.

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 registered.

Notably, there was no rainfall at Keiyasi, Rarawai Mill, Yaqara and Yasawa-i-Rara during the whole month, while Nadi Airport, Lautoka Mill, Tavua, Seaqaqa and Labasa Airport registered less than 5mm of rainfall.

On the other hand, the wettest station was Tokotoko with 241mm of total monthly rainfall, followed by Rotuma with 172mm and Nasinu with 162mm.

Extended period of dry days were experienced over majori-

ty of the Western Division and northern parts of Vanua Levu with less than 5 rain days recorded throughout the month.

Significantly 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, Keiyasi with 11.8°C on the 8th and Nacolevu with 13.0°C on the 9th.

In contrast, a record new daily high minimum air temperature for July was set at Matei Airfield with 25.6°C on the 16th.

2. WEATHER PATTERNS

July's weather was dominated by broad southeast trade winds, frontal systems and troughs of low pressure.

From the 1st to the 3rd, a broad east to southeast wind flow prevailed over Fiji with fine weather and cool nights apart from trade showers over the interior and eastern parts due to a high pressure system to the far south of Fiji moving from the west to the east.

On the 4th and the 5th, a passing frontal system affected the southern parts of the group with cloud and showers.

On the 6th, a cool and dry southeast wind flow prevailed over the group with fine weather and cool nights with trade showers over the interior and eastern parts. This continued till the 15th, when a weak trough of low pressure affected the group with cloud and showers from the west and also a frontal system affected the southern parts on the 16th.

On the 17th, a high pressure system to the south of Fiji brought about another episode of cool south to southeast wind flow over the group with fine weather.

From the 20th till the 21st, another trough of low pressure moved over the country from the north affecting the group with cloud and showers.

On the 24th, another frontal system affected the country from the west with cloud and showers before gradually spreading to the rest of Fiji.

From the 25th till the 31st, a broad southeast wind flow prevailed over the Fiji group with fine weather over most parts of the country apart from brief showers over the interior and eastern parts.

Rotuma's weather was largely influenced by the South Pacific Convergence Zone during the month.

3. RAINFALL

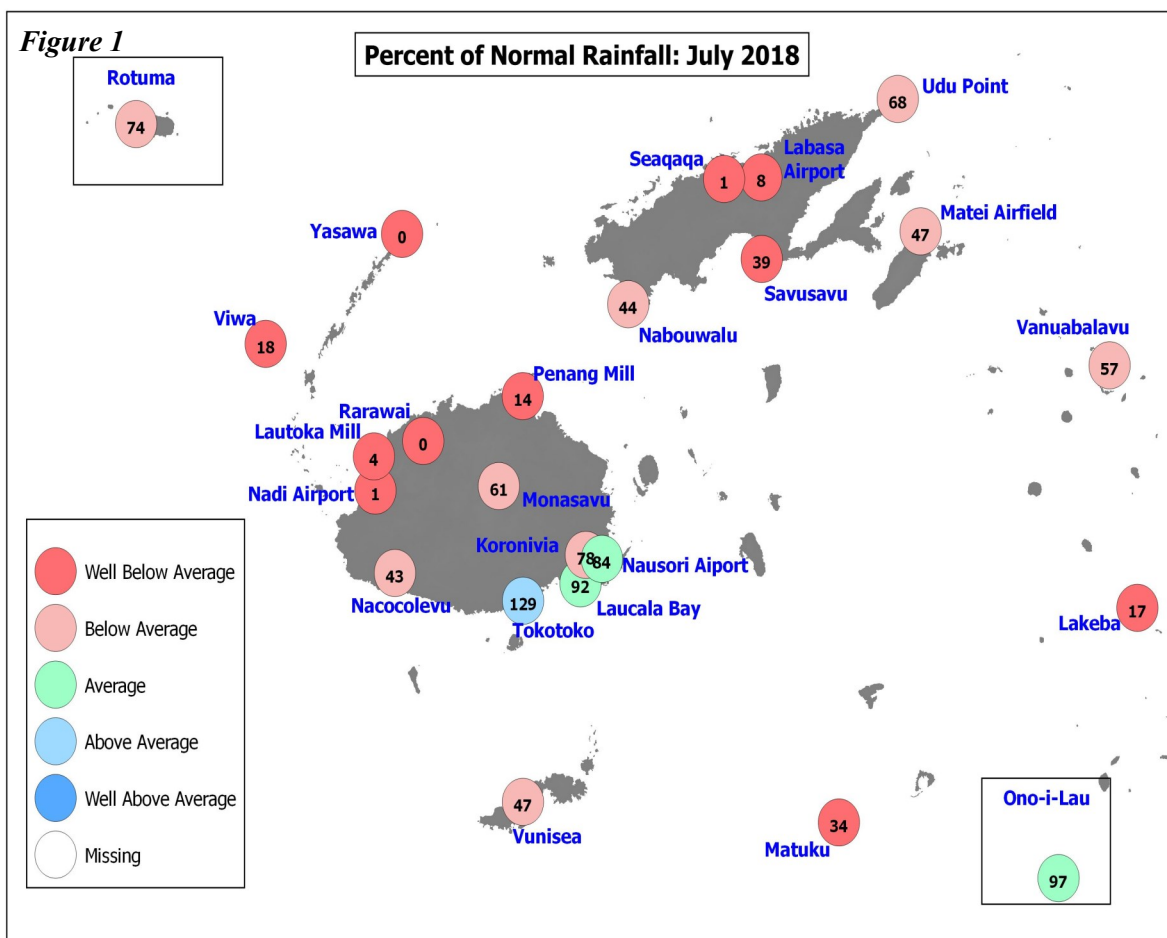
Apart from parts of the Central Division and Ono-i-Lau in the Eastern Division, drier than *normal* conditions were experienced over the rest of the country. Out of the 24 rainfall monitoring sites, 11 stations recorded *well below average* rainfall, 10 *below average*, 2 *average*, while Tokotoko was the lone station that recorded *above average* rainfall (Table 2 & Figure 1).

The highest total monthly rainfall was recorded at Tokotoko with 241mm, followed by Rotuma with 172mm, Nasinu with 162mm, Laucala Bay with 126mm, Monasavu with 117mm, RKS Lodonu with 114mm and Koronivia with 102mm. On the other hand, Keiyasi, Rarawai Mill, Yaqara and Yasawa-i-Rara registered no rainfall during the month, while Nadi Airport, Lautoka Mill, Tavua, Seaqaqa and Labasa Airport received less than 5mm of rainfall.

Close to half of the rainfall monitoring stations recorded their maximum 24-hour rainfall during the first week of the month. This was due to the presence of a passing frontal system.

The highest 24-hour rainfall of 75mm was recorded at Tokotoko on the 21st, followed by Korolevu with 73mm on the 5th, RKS Lodonu with 69mm on the 5th, Laucala Bay with 57mm on the 5th and Nasinu with 54mm on the 5th.

Monasavu recorded the highest number of rain days (rainfall $\geq 0.1\text{mm}$) with 22 days, followed by Rotuma with 21, Koronivia with 19, Nausori Airport with 18 Tokotoko, Nasinu and RKS Lodonu and Lomaivuna with all 15. On the other hand, majority of the Western Division and the northern parts of Vanua Levu recorded less than 5 rain days. Notably, there was zero rain day at Keiyasi, Rarawai Mill, Yaqara and Yasawa-i-Rara.



Normal: Long term average from 1971 to 2000
Well Below Average: Rainfall less than 40% of normal
Below Average: Rainfall between 40 to 79%
Rain Day: Rainfall $\geq 0.1\text{mm}$

Average: Rainfall between 80 to 119%
Above Average: Rainfall between 120 to 199%
Well Above Average: Rainfall greater than or equal to 200% of normal

4. AIR TEMPERATURES

A. Maximum Daytime Air Temperatures

The mean maximum air temperatures were generally *above normal* over most parts of the country with 15 out of the 21 stations recording anomalies $\geq +0.5^{\circ}\text{C}$, 5 within $\pm 0.5^{\circ}\text{C}$ and Udu Point was the lone station to record anomaly of $\leq -0.5^{\circ}\text{C}$ (Table 2 & Figures 2-5).

Rotuma and Yasawa-i-Rara recorded the warmest days on average with 30.0°C , followed by 29.9°C at Rarawai Mill, 29.8°C at Labasa Airport, 29.2°C at Viwa and 29.0°C at Lautoka Mill. On the other hand, the coolest day-time temperatures on average was at Monasavu with 21.7°C , followed by Nadarivatu with 22.6°C , and Koro Is. and Matuku with both 27.4°C .

The highest daily maximum temperature was recorded at Lomaivuna with 33.3°C on the 16th, followed by Keiyasi with 32.9°C on the 17th, Yaqara with 32.8°C on the 17th and Labasa Airport with 32.0°C on the 19th. On the other hand, the lowest daily maximum air temperature was recorded at Monasavu with 18.4°C on the 7th, followed by Nadarivatu with 19.0°C on the 1st.

B. Minimum Night-time Air Temperatures

The mean minimum air temperatures were generally *normal* to *above normal* over most parts of the country, with 9 out of the 21 stations recording anomalies $\geq +0.5^{\circ}\text{C}$, 8 within $\pm 0.5^{\circ}\text{C}$ and 4 stations $\leq -0.5^{\circ}\text{C}$ (Table 2 & Figures 2-5).

The coolest nights on average was experienced at Nadarivatu with 14.7°C , followed by Monasavu with 15.5°C , Nacocolevu with 16.3°C and Keiyasi with 16.6°C . On the other hand, Rotuma recorded the warmest nights on average with 24.7°C , followed by Yasawa-i-Rara with 23.1°C and Viwa with 22.6°C .

Significantly cool nights were experienced during the first half of the month over the Western, Eastern and parts of the Northern Divisions. The lowest daily minimum air temperature was experienced at Nadarivatu with 11.0°C on the 10th, followed by Rarawai Mill with 11.6°C on the 8th and Keiyasi with 11.8°C on the 8th. On the other hand, the highest daily minimum air temperature was registered at Rotuma with 26.0°C on the 1st, followed by Matei Airfield with 25.6°C on the 16th. This temperature at Matei Airfield is a new daily high minimum air temperature record for July at the station since observations began in

TABLE 1. CLIMATE RECORDS ESTABLISHED IN JULY 2018

<u>Element</u>	<u>Station</u>	<u>Observed (record)</u>	<u>On</u>	<u>Rank</u>	<u>Previous (record)</u>	<u>Year</u>	<u>Records Began</u>
Daily Minimum Temperature	Matei Airfield	25.6°C	16 th	New High	25.4°C	2002	1956

Note: All comparisons in this summary are with respect to “Climatic Normals”. This is defined to be the average climate condition over a 30-year period. Fiji uses 1971-2000 period as its “climatic normal” period, unless otherwise stated.

TABLE 2. DAILY CLIMATE REPORTING SITES: SUMMARY FOR JULY 2018

	RAINFALL				AIR TEMPERATURES								SUNSHINE	
	TOTAL	RAIN		MAX.	AVERAGE DAILY				EXTREME		TOTAL			
	MM	%	+	MM ON	MAX.	#	MIN.	#	MAX.	MIN.	HRS	%		
NADI AIRPORT	1	1	2	0 15	28.3	-0.3	18.7	0.3	30.2	19	13.6	8	245 112	
SUVA/LAUCALA BAY	126	92	12	57 5	27.2	0.4	21.2	0.5	30.1	16	19.0	27	172 127	
NACOCOLEVU	31	43	5	22 5	28.5	1.1	16.3	-1.6	30.6	16	13.0	9	205 123	
ROTUMA	172	74	21	35 19	30.0	0.9	24.7	0.6	31.7	5	23.1	8		
VIWA	10	18	3	7 20	29.2	1.4	22.6	-0.0	30.5	17	20.0	26		
UDU POINT	60	68	5	28 16	27.4	-0.6	22.1	-0.2	29.2	16	20.1	22		
SAVUSAVU AIRFIELD	38	39	5	14 6	27.0	0.0	21.7	0.7	29.5	14	18.5	9		
LABASA AIRFIELD	5	8	1	5 5	29.8	0.6	17.8	-0.3	32.0	19	14.0	8		
NABOUWALU	41	44	10	11 6	27.6	1.3	22.7	0.9	30.3	11	20.5	24		
KORONIVIA	102	78	19	31 5	27.4	0.9	19.6	0.2	30.9	16	16.0	26		
NAUSORI AIRPORT	99	84	18	37 21	27.1	0.8	19.8	0.2	30.1	16	15.5	26		
NAVUA/TOKOTOKO	241	129	15	75 21	27.7	0.5	19.0	0.9	30.9	15	15.9	27		
MONASAVU	117	61	22	39 13	21.7	0.6	15.5	-0.0	26.3	4	13.1	26		
LAUTOKA AES	2	4	2	1 14	29.0	0.7	18.0	-1.9	31.5	14	15.0	2		
BA/RARAWAI MILL	0	0	0	0 0	29.9	0.3	16.2	-0.8	31.5	16	11.6	8		
PENANG MILL	8	14	9	2 8	28.1	0.7	20.9	0.5	31.0	16	16.5	27		
MATEI AIRFIELD	49	47	13	23 9	28.0	0.9	22.4	0.8	30.5	24	20.4	24		
VANUABALAVU	49	57	8	20 5	27.3	0.3	21.1	-0.8	29.0	16	18.9	1		
LAKEBA	14	17	9	8 16	27.1	0.7	20.7	-0.3	28.6	12	18.4	2		
LEVUKA				U/S	28.9		21.1		33.0	16	19.0	6		
VUNISEA	54	47	10	15 17	26.7	1.0	20.9	1.3	28.6	16	18.2	6		
MATUKU	29	34	14	9 6	26.6	0.6	21.7	0.9	29.0	16	19.0	7		
ONO-I-LAU	89	97	14	52 16	27.0	2.5	21.0	0.8	29.1	14	18.8	26		
YASAWA-I-RARA	0	0	0	0 0	30.0	2.2	23.1	0.8	32.6	18	21.0	7		
YAQARA AWS	0	0	0	0 0	30.8		23.5		33.4	18	22.1	18		
KEIYASI AWS	0	0	0	0 0	29.6		16.6		32.9	17	11.8	8		
LOMAIVUNA AWS	68	15	22	5 5	28.8		18.8		33.3	16	15.2	8		
NADARIVATU AWS	10	7	4	4 4	22.6		14.7		25.6	16	11.0	10		
RKS LODONI AWS	114	15	22	5 5	27.2		19.5		28.8	18	15.6	26		
MOMI AWS	16	3	15	24 24	28.5		20.3		30.5	13	17.2	2		
KOROLEVU AWS	86	10	73	5 5	27.7		19.7		29.6	16	16.3	29		
KORO ISLAND AWS	U/S				26.6		21.3		28.6	16	19.0	6		
SIGATOKA AWS	U/S				27.5		18.0		29.9	16	14.6	9		
SEAQAQA	1	1	1	1 19										
NASINU	162		15	54 5										
TAVUA	2		1	2 15										

	TEMPERATURE (C)				HUMIDITY	WIND	SUN RAD		
	MEAN	DRY	WET	RH%			KT	%OF	MJ/
		(AVERAGE AT 9AM)	VP					POS	SQ.M
NADI AIRPORT	23.5	23.7	20.3	72	21.2	5.8	74	13.8	
SUVA/LAUCALA BAY	24.2	24.6	21.7	77	23.7		52	13.6\$	
NACOCOLEVU	22.4	23.9	21.5	81	23.8		62	14.8\$	
ROTUMA	27.3	27.9							
VIWA	25.9	25.9	22.5	74	24.7				
UDU POINT	24.7	25.7	22.7	77	25.4				
SAVUSAVU AIRFIELD	24.4	25.1	22.4	79	25.1				
LABASA AIRFIELD	23.8	25.7	22.3	74	24.4				
NABOUWALU	25.1	25.3	22.3	76	24.5				
KORONIVIA	23.5	24.3	21.8	80	24.3				
NAUSORI AIRPORT	23.4	23.4	21.1	81	23.4	4.6			
NAVUA/TOKOTOKO	23.4	24.5	22.1	80	24.7				
MONASAVU	18.6	18.3	17.1	89	18.6				
LAUTOKA AES	23.5	26.4	21.8	65	22.6				
BA/RARAWAI MILL	23.1	24.8	21.3	72	22.6				
PENANG MILL	24.5	24.3	21.5	77	23.5				
MATEI AIRFIELD	25.2	26.0	22.4	72	24.3				
VANUABALAVU	24.2	25.1	21.8	73	23.5				
LAKEBA	23.9	25.5							
LEVUKA	25.0								
VUNISEA	23.8	24.1	21.3	77	23.1				
MATUKU	24.1	24.5	20.8	71	21.9				
ONO-I-LAU	24.0								

MEAN TEMPERATURE IS (MAX+MIN)/2; WIND IS MEAN SPEED AT 06,12,18,24 HOURS.
 \$:SOLAR RADIATION CALCULATED FROM SUNSHINE DURATION. # :DEPARTURE FROM LONG-TERM AVERAGES (1971-2000). + :NUMBER OF DAYS WITH 0.1 MM OR MORE RAIN. * :PERCENT OF LONG-TERM AVERAGES.
 BLUE FONT: MISSING RECORDS OF LESS THAN OR EQUAL TO 5 DAYS.

Figure 2

**Nadi Airport - Temperature & Rainfall for the last 13 Months
(July, 2017 - July, 2018)**

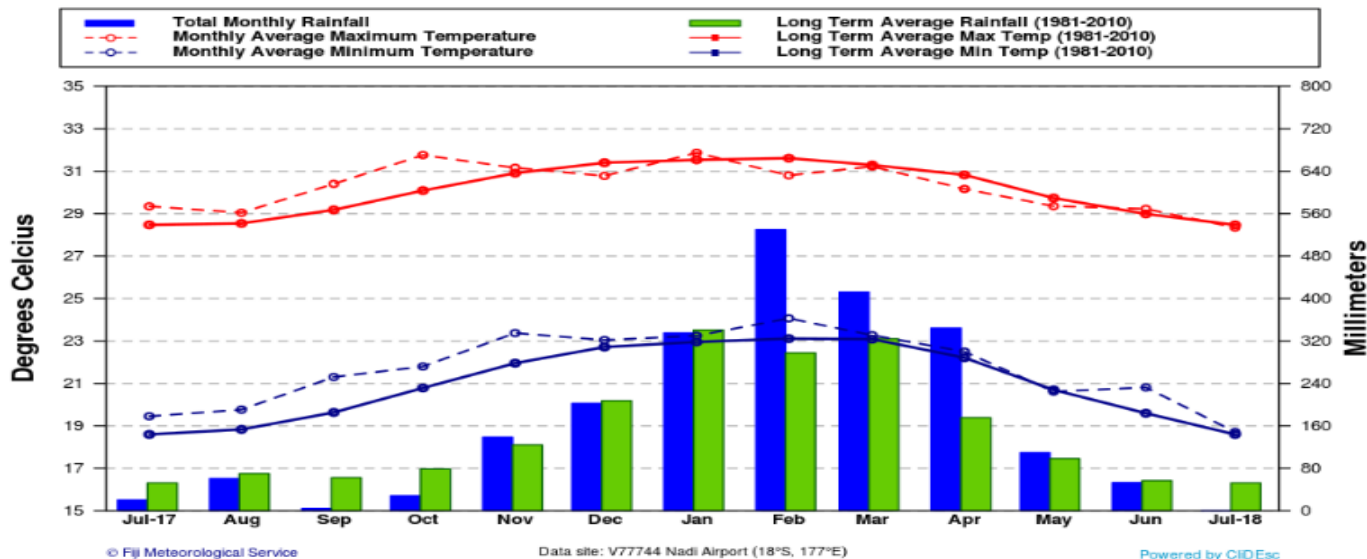


Figure 3

**Labasa Airfield - Temperature & Rainfall for the last 13 Months
(July, 2017 - July, 2018)**

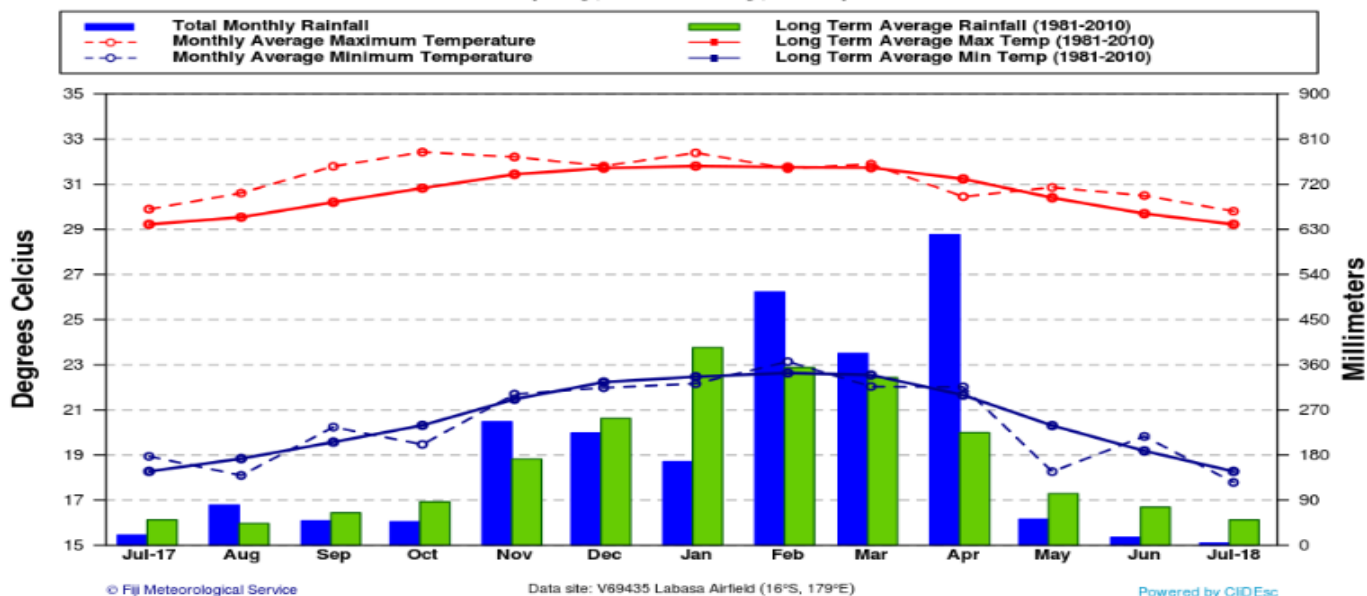


Figure 4

**Laucala Bay - Temperature & Rainfall for the last 13 Months
(July, 2017 - July, 2018)**

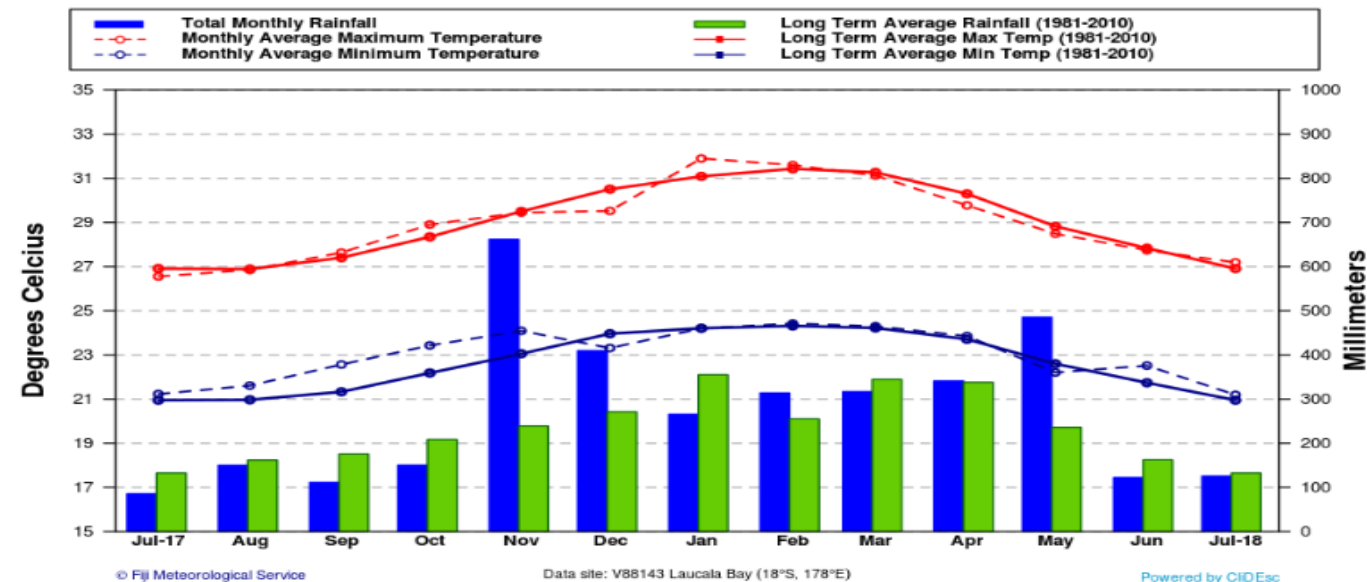
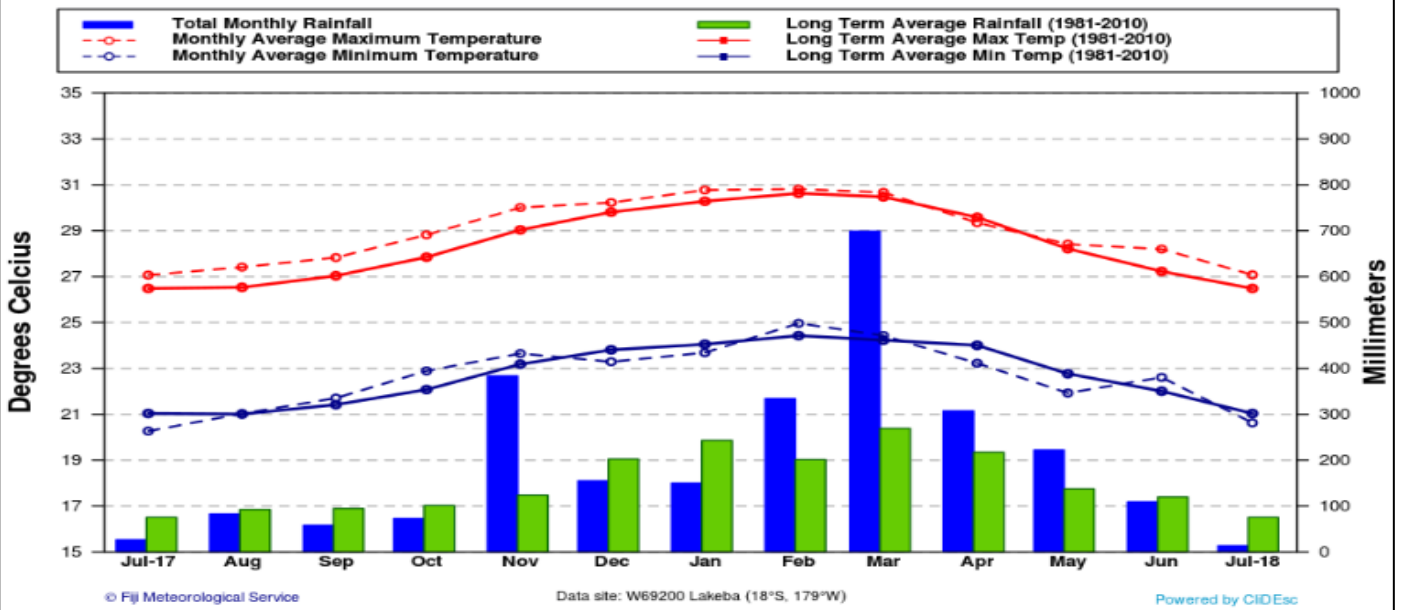


Figure 5

Lakeba - Temperature & Rainfall for the last 13 Months (July, 2017 - July, 2018)



6. DAILY RAISED PAN EVAPORATION

Figure 6

Daily Evaporation for July 2018

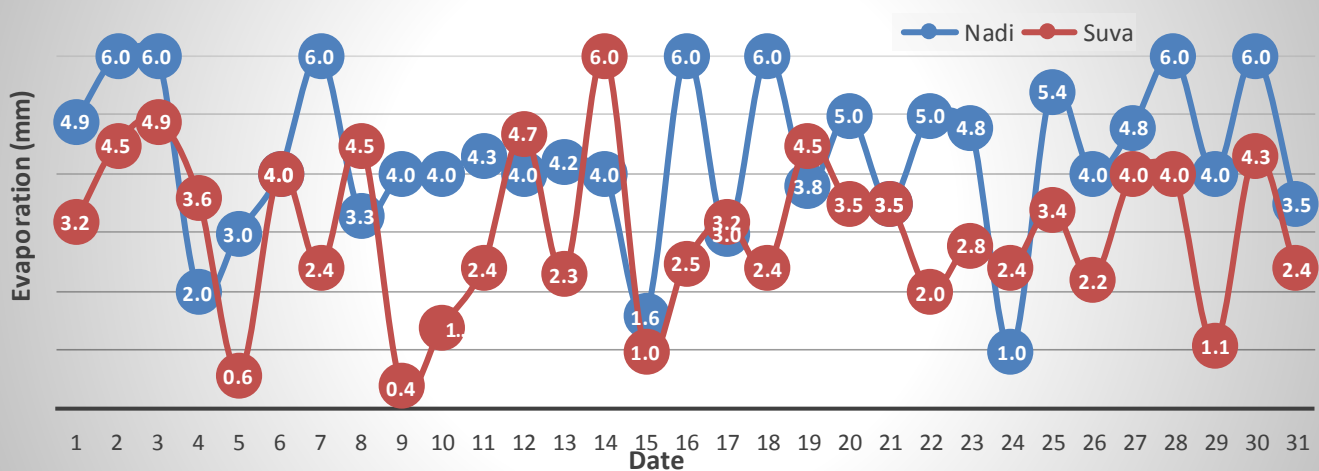


Figure 6: The total monthly raised pan evaporation at Nadi Airport was 133.1mm, with the highest of 6.0mm recorded on the 2nd, 3rd, 7th, 16th, 18th, 28th and 30th. Laucala Bay recorded total monthly evaporation of 94.1mm, with the highest daily evaporation of 6.0mm on the 14th.

7. SUNSHINE

Daily Solar Radiation (MJ/m²) - July 2018

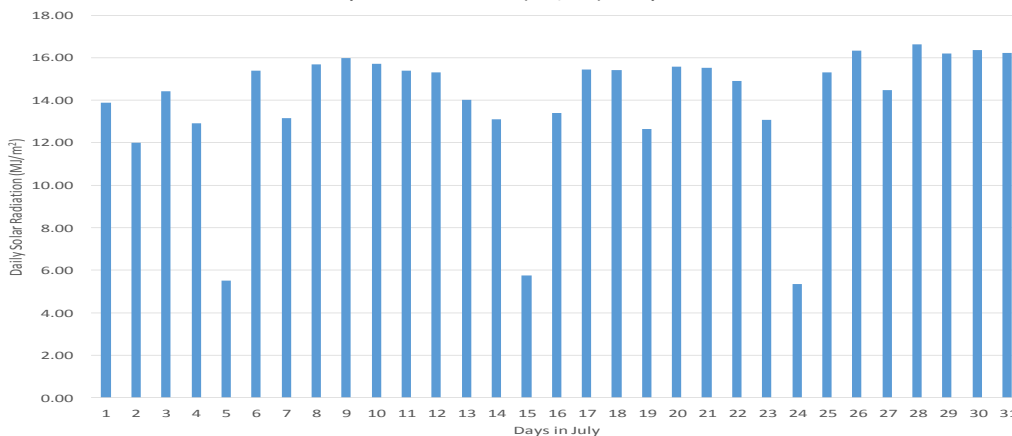


Figure 7: The mean daily solar radiation at Nadi Airport during July 2018 was 13.9MJ/M² compared to 14.7MJ/M² over 30 year average (1971-2000)

8. WIND SUMMARY

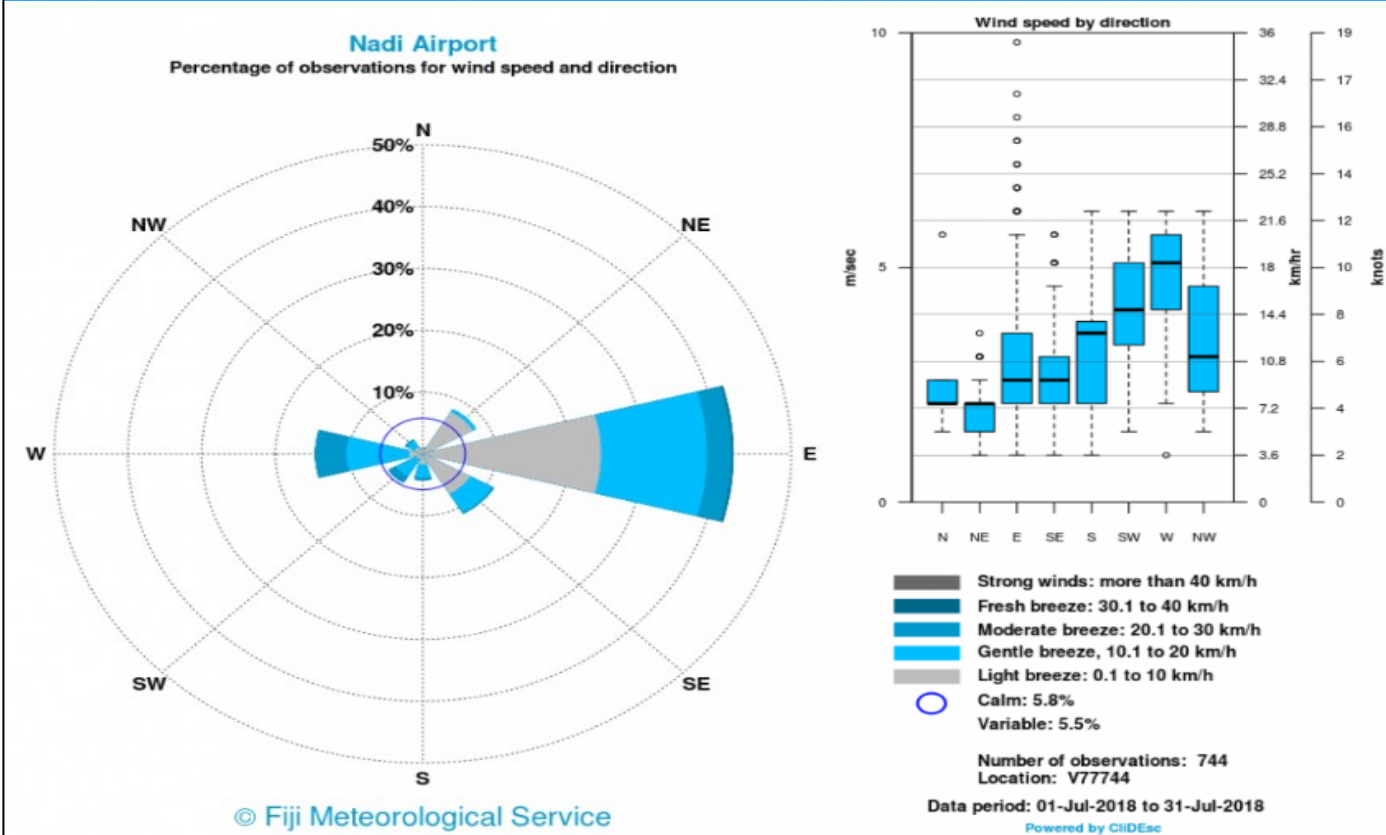


Figure 8a: The hourly wind observations at Nadi Airport during the month showed easterly winds were most dominant, followed by westerly and southeasterly. Wind strengths varied from light to moderate .

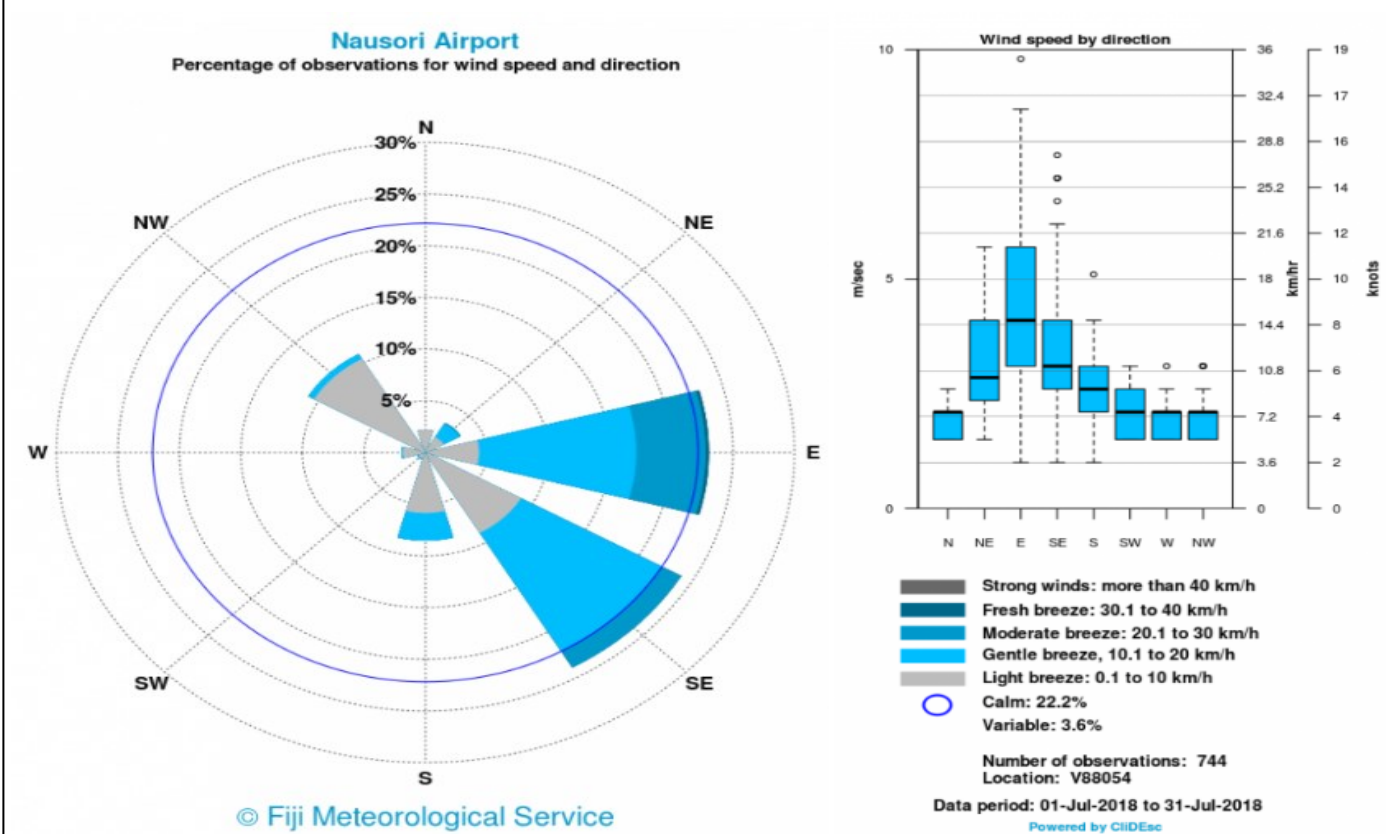


Figure 8b: The hourly wind observations at Nausori Airport during the month showed that south-easterly winds were dominant, followed by easterly winds. Wind speed ranged from light to fresh in strength.

8. SEA SURFACE TEMPERATURE (SST)

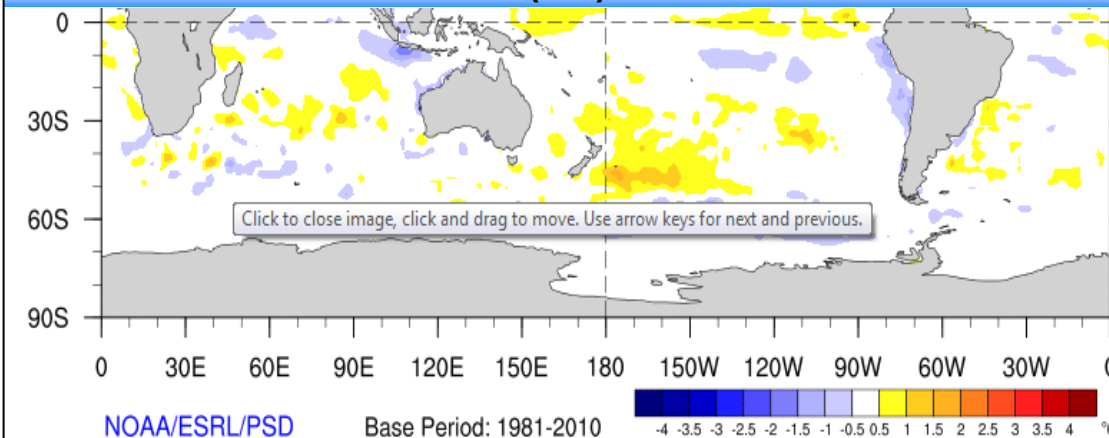


Figure 9: Near normal SSTs were present in the Fiji region during the month (base period: 1981-2010).

Source: <http://www.esrl.noaa.gov/psd/map/clim/sst.shtml>

9. CLOUD COVER: 2018/07/01 - 2018/07/30

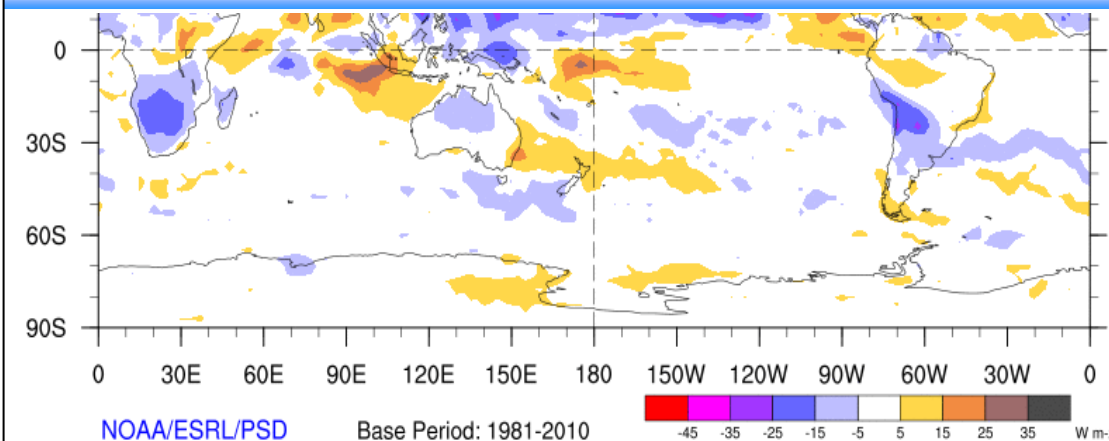


Figure 10: OLR anomalies indicate presence of near normal to below normal cloud cover in the Fiji region during the month (Fiji: ~17°S, 180°) (base period: 1981-2010).

Source: <http://www.esrl.noaa.gov/psd/map/clim/olr.shtml>

10. SEA LEVEL: Jul 27, 2018

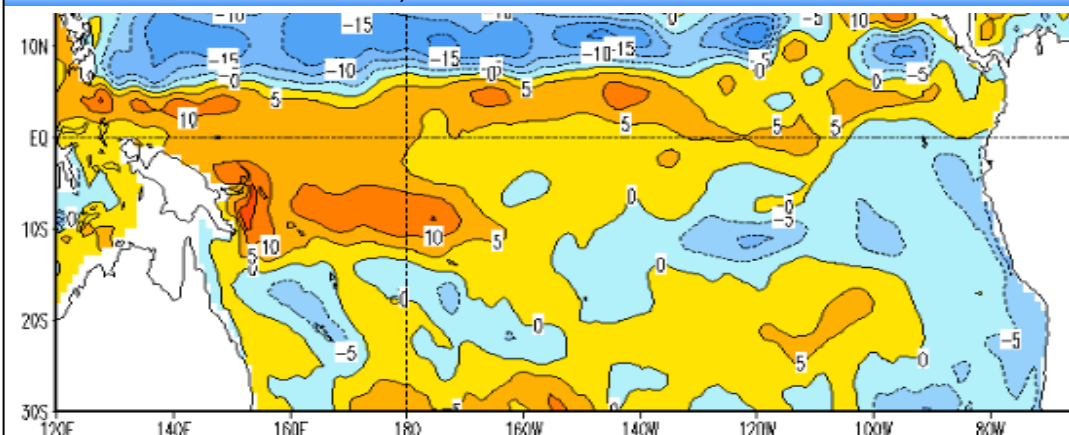


Figure 11: Sea level anomalies ranged from -5cm to +5cm in the in the Fiji Waters (base period: 1981-2010).

Source: http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/ocean/weeklyenso_clim_81-10/wksl_anm.gif

11. WIND ANOMALIES

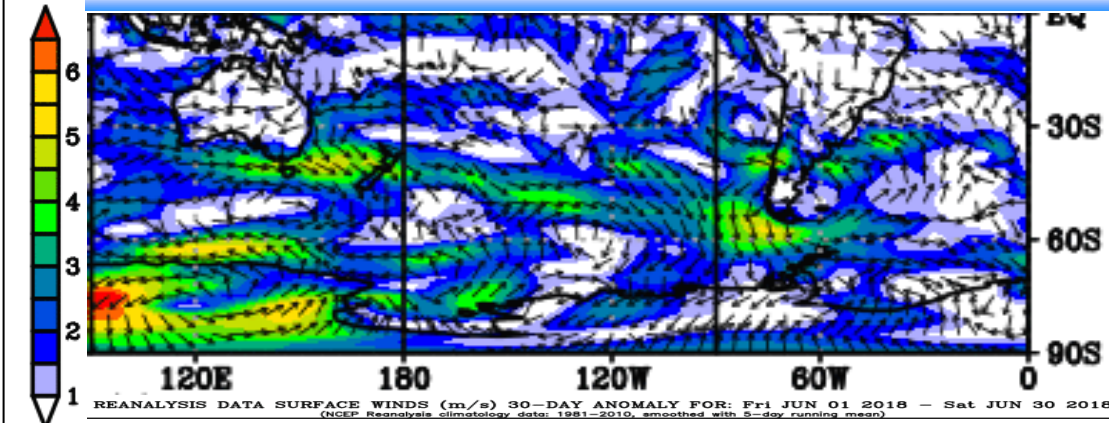


Figure 12: Easterly wind anomalies of 1-2m/s were present in the Fiji region (Fiji: ~17°S, 180°) (base period: 1981-2010).

Source: https://www.esrl.noaa.gov/psd/map/images/rnl/sfwnd_30b.rnl.html