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# Fiji Climate Summary October 2019



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## 1. IN BRIEF

El Niño Southern Oscillation– neutral phase continues to persist within the tropical Pacific region.

The presence of two troughs resulted in widespread rainfall experienced during the first and third week of the month, however, it did not result in any establishment of new rainfall records. Out the 27 stations, 4 stations recorded *well above average* rainfall, 8 *above average* rainfall, 10 *average*, 3 *below average* and 2 recorded *well below average* rainfall.

The highest total monthly rainfall of 557.2mm was recorded at Laucala Bay (Suva), followed by 517.0mm at RKS Lodoni, 506.5mm at Koronivia and 449.3mm at Tokotoko (Navua) and 404.5mm at Nasinu.

The highest 24hour rainfall of 255.0mm was recorded at Laucala Bay on the 7<sup>th</sup>, followed by 229.5mm at RKS Lodoni, 169.5mm at Nausori Airport, both on the 6<sup>th</sup>, 166.5mm at Nasinu and 166.0mm at Koronivia on the 7<sup>th</sup> respectively.

The highest daily day-time temperature of 35.6°C was recorded at Keiyasi, followed by 34.9° at Seaqaqa, both on the 12<sup>th</sup>, 34.6°C at Yaqara, 34.5°C at Nacocolevu both on the

22<sup>nd</sup> and 34.2 at Nadi on the 2<sup>nd</sup>.

*Above normal* night-time temperatures were recorded at most parts of the country during the month. Cool southerly wind flowed over the country during the 30<sup>th</sup> and 31<sup>st</sup>, leading to very low night time temperatures. The coolest night time temperature of 14.1°C was recorded at Nadarivatu, followed by 15.1°C at Monasavu, 17.2°C at Keiyasi and 17.5°C at Rarawai Mill (Ba), all on the 31<sup>st</sup> respectively.

*Below normal* sunshine hours were observed at the four sunshine stations that reported in, in time for this bulletin (Table 2).

As typically observed during the dry season, evaporation was high in the Western Division compared to the Central Division, with the highest evaporation of 18mm recorded at Nadi on the 29<sup>th</sup> (Figure 6).

Easterly to southerly winds quadrant were the dominant winds observed during the month at Nadi and Nausori Airports, with winds generally at light to moderate strength (Figure 8).

## 2. WEATHER PATTERNS

The weather in October was mostly influenced by a series of troughs of low-pressure systems coupled with the southeasterlies.

A southeast wind flow prevailed over Fiji from the 1<sup>st</sup> to the 5<sup>th</sup>. A trough of low pressure then moved onto the group from the west on the 6<sup>th</sup> bringing showers over most parts of the country. The trough lingered over Fiji for a few days becoming active with rain and thunderstorms from the 6<sup>th</sup> to the 8<sup>th</sup>. During this period, Suva recorded the highest 24-hour rainfall of 255.0mm on the 7<sup>th</sup> before the trough eventually weakening and moving away from the Fiji group on the 9<sup>th</sup>.

The southeast trades became dominant again over the group from the 10<sup>th</sup> to the 15<sup>th</sup> with an expected trough to drift over the country from the west. This particular trough of low pressure affected Fiji from the 16<sup>th</sup> till it weakened on the 18<sup>th</sup>.

Once again, a southeast wind flow dominated the country

from the 19<sup>th</sup> to the 21<sup>st</sup> before another trough of low pressure moved in from the north and affected mostly the northern part of Fiji from the 22<sup>nd</sup> to the 28<sup>th</sup>. Although this trough was anticipated to be weak, it dumped a significant amount of rainfall at Savusavu Airport on Vanua Levu on the 25<sup>th</sup> and recorded the highest 24-hour rainfall of 99.2mm in the country.

The same trough drifted back northwards and lay weak to the north of the country on the 28<sup>th</sup> and 29<sup>th</sup> bringing showers and possible thunderstorms especially on Vanua Levu. Meanwhile, a ridge of high pressure extended from the south directing a cool southerly wind flow over the country on the 30<sup>th</sup> and 31<sup>st</sup>.

Strong winds were forecast over Fiji waters from the 23<sup>rd</sup> to the 31<sup>st</sup>.

Rotuma's weather was mainly affected by a series of troughs and the moist easterlies during October.

### 3. RAINFALL

Majority of the stations recorded *average to well above average* rainfall during the month. Out of the 27 stations, 4 stations recorded *well above average* rainfall, 8 *above average* rainfall, 10 *average*, 3 *below average* and 2 recorded *well below average* rainfall (Table 2, Figures 1-5).

There were two notable heavy rainfall events during the month, which were on the first and third weeks. The two heavy rain events were due to the presence of troughs of low pressure, which moved over the Fiji Group on the 6<sup>th</sup> and another which moved over on the 21<sup>st</sup>. These resulted in most of the stations recording their highest 24hour rainfall during this periods. However, on the other hand, parts of northeast Viti Levu and Labasa in the Northern Division recorded *below average to well below average* rainfall during October.

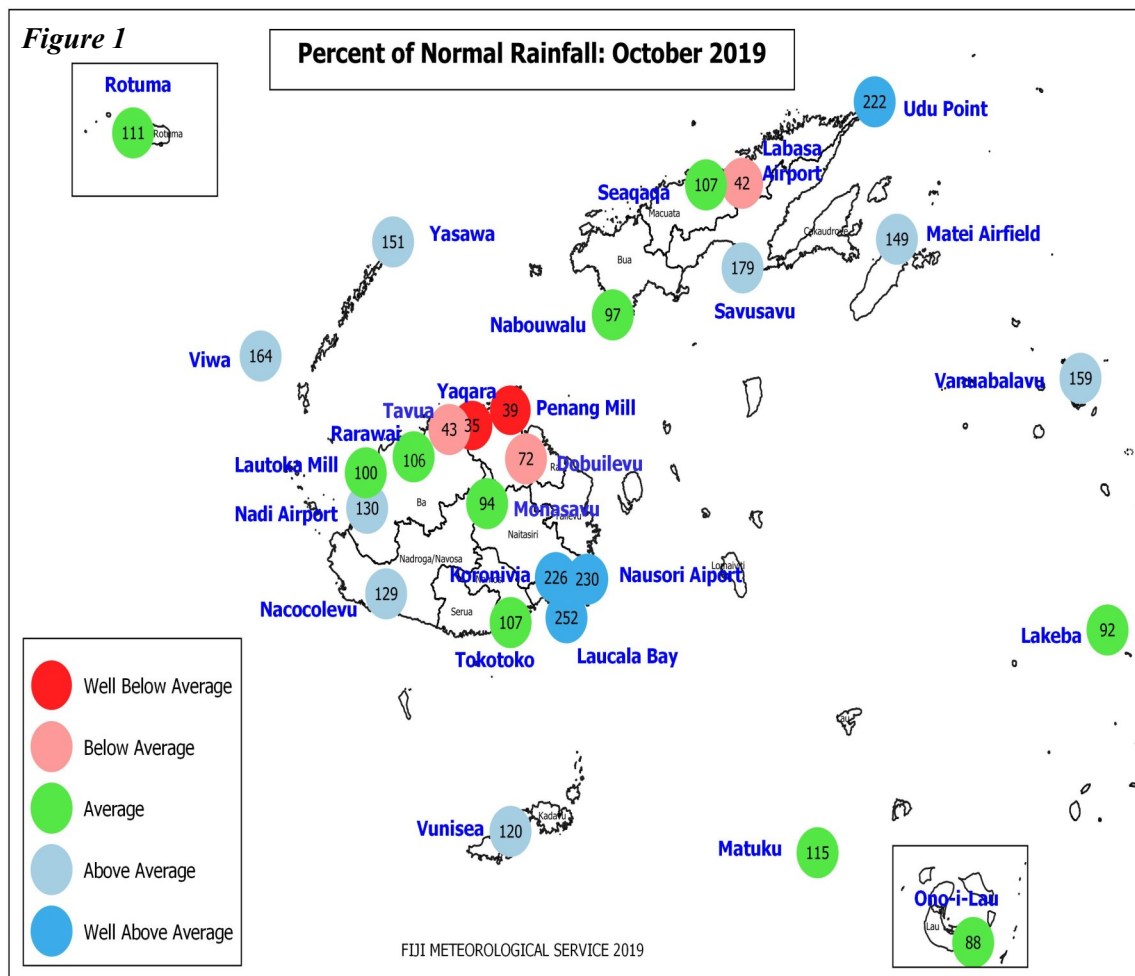
The highest total monthly rainfall of 557.2mm was recorded at Laucala Bay (Suva), followed by 517.0mm at RKS Lodonni, 506.5mm at Koronivia and 449.3mm at Tokotoko (Navua) and 404.5mm at Nasinu. On the other hand, the lowest monthly rainfall of 28mm was recorded at Yaqara, followed by 29mm at Tavua, 29.5mm at Nadarivatu and

44.1mm at Penang Mill (Rakiraki).

The highest 24hour rainfall of 255.0mm was recorded at Laucala Bay on the 7<sup>th</sup>, followed by 229.5mm at RKS Lodonni, 169.5mm at Nausori Airport, both on the 6<sup>th</sup>, 166.5mm at Nasinu and 166.0mm at Koronivia on the 7<sup>th</sup> respectively.

Rotuma recorded the highest number of rain days ( $\geq 0.1$ ) with 26 days, followed by 25 days at Koronivia, Navua and Lomaivuna, 24 days at Nabouwalu and Monasavu and 22 days at Udu Point, Nausori, Matei, RKS Lodonni and Wainikoro. On the other hand, Yaqara recorded only 7 rain days, followed by 9 at Tavua and 10 days at Lautoka.

There were no new rainfall records established during the month.



**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  $\geq 0.1$ 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

Generally *normal* to *above normal* mean monthly maximum air temperatures were recorded at various parts of the country during the month. Out of the 23 stations, 12 stations recorded *above normal* temperatures (anomalies within  $\geq +0.6^{\circ}\text{C}$ ), 9 *normal* temperatures (within  $\pm 0.5^{\circ}\text{C}$ ), while Udu Point was the lone station with anomalies within  $\leq -0.6^{\circ}\text{C}$  (Table 2 & Figures 2-5).

The warmest days on average were observed at Labasa Airport and Seaqaqa with  $32.1^{\circ}\text{C}$ , followed by Yaqara with  $31.7^{\circ}\text{C}$ , Rarawai Mill with  $31.5^{\circ}\text{C}$ , Nadi Airport with  $31.4^{\circ}\text{C}$  and Keiyasi with  $31.3^{\circ}\text{C}$ . On the other hand, the coolest day-time temperatures on average was at Monasavu with  $24.6^{\circ}\text{C}$ , followed by Nadarivatu with  $25.3^{\circ}\text{C}$  and  $27.5^{\circ}\text{C}$  at Vunisea (Kadavu) and Ono-i-Lau.

A handful of stations recorded their highest daily day-time temperature during the second and third week of the month. The highest of  $35.6^{\circ}\text{C}$  was recorded at Keiyasi, followed by  $34.9^{\circ}$  at Seaqaqa, both on the 12<sup>th</sup>,  $34.6^{\circ}\text{C}$  at Yaqara,  $34.5^{\circ}\text{C}$  at Nacocolevu both on the 22<sup>nd</sup> and  $34.2$  at Nadi on the 2<sup>nd</sup>. On the other hand, the coolest day-time temperature of  $20.5^{\circ}\text{C}$  was recorded at Monasavu on the 28<sup>th</sup>, followed by  $22.4^{\circ}\text{C}$  at Nadarivatu on the 5<sup>th</sup> and  $23.6^{\circ}\text{C}$  at Nausori Airport on the 26<sup>th</sup>.

There were no new air temperature records established during the month.

### B. Minimum Night-time Air Temperatures

Majority of the stations recorded *above normal* night-time temperature during the month. Out of the 22 stations, 18 stations recorded anomalies within  $\geq +0.6^{\circ}\text{C}$ , 3 within  $\pm 0.5^{\circ}\text{C}$ , while Vanuabalavu (Lau Group) was the lone station that had anomaly within  $\leq -0.6^{\circ}\text{C}$  (Table 2 & Figures 2-5).

Coollest average night time temperature of  $17.5^{\circ}\text{C}$  was recorded at Nadarivatu, followed by  $17.6^{\circ}\text{C}$  at Monasavu and  $21.3^{\circ}\text{C}$  at Kornivia and Rarawai Mill (Ba).

Nadi and Koronivia recorded their new average night time temperatures, replacing previous records established in 2018 (Table 1).

A ridge of high pressure extended from the south directed cool southerly wind flow over the country, leading to very cool nights, observed during the last two days of the month. The coolest night time temperature of  $14.1^{\circ}\text{C}$  was recorded at Nadarivatu, followed by  $15.1^{\circ}\text{C}$  at Monasavu,  $17.2^{\circ}\text{C}$  at Keiyasi and  $17.5^{\circ}\text{C}$  at Rarawai Mill (Ba), all on the 31<sup>st</sup> respectively. On the other hand, warmest night time temperature of  $26.9^{\circ}\text{C}$  was recorded at Rotuma on the 20<sup>th</sup>, followed by  $26.5^{\circ}\text{C}$  at Nacocolevu on the 9<sup>th</sup>,  $26.0^{\circ}\text{C}$  at Matei on the 22<sup>nd</sup> and  $25.8^{\circ}\text{C}$  at Saqani on the 23<sup>rd</sup>.

**TABLE 1. CLIMATE RECORDS ESTABLISHED IN OCTOBER 2019**

<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>
Mean Mthly Minimum Temp.	Nadi Airport	$22.6^{\circ}\text{C}$	-	New High	$22.5^{\circ}\text{C}$	2007/ 2018	1942
Mean Mthly Minimum Temp.	Nausori Airport	$22.7^{\circ}\text{C}$	-	New High	$22.4^{\circ}\text{C}$	2018	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 OCTOBER 2019**

	RAINFALL				AIR TEMPERATURES								SUNSHINE		
	TOTAL	RAIN		MAX.	AVERAGE DAILY				EXTREME		TOTAL				
	MM	%	* DAYS +	MM ON	MAX. C	# C	MIN. C	# C	MAX. C	MIN. C	HRS	*			
NADI AIRPORT	133	130	14	46	6	31.4	1.1	22.6	2.1	34.2	2	20.1	31	185	78
SUVA/LAUCALA BAY	557	252	21	255	7	27.7	-0.5	23.5	1.6	30.2	1	21.7	8	113	69
NACOCOLEVU	121	129	15	32	7	30.3	1.2	21.8	2.1	34.5	22	19.4	20	161	84
ROTUMA	378	111	26	78	30	30.7	1.0	25.2	1.0	32.1	25	22.6	4	170	87
VIWA	OFFICER ON A/L (AWS).														
UDU POINT	366	222	22	70	27	28.5	-0.8	23.9	1.0	30.4	17	22.1	31		
SAVUSAVU AIRFIELD	305	179	13	99	25	28.2	-0.0	23.5	1.6	31.0	16	22.0	1		
LABASA AIRFIELD	52	42	7	15	7	32.1	1.3	20.1	0.3	33.2	11	18.0	8		
NABOUWALU	165	97	24	58	6	28.7	1.0	23.8	1.2	30.7	9	22.3	7		
KORONIVIA	507	226	25	166	7	28.0	0.2	21.2	0.7	31.5	23	19.4	5		
NAUSORI AIRPORT	449	230	22	170	6	27.8	0.2	22.7	1.8	30.5	15	20.5	20		
NAVUA/TOKOTOKO	300	107	25	56	7	NIL OBSERVATION (AWS-RR).									
MONASAVU	307	94	24	40	6	24.6	1.5	17.5	0.9	28.6	1	15.1	31		
LAUTOKA AES	102	100	10	32	14	30.9	1.4	22.6	1.0	34.0	3	20.0	31		
BA/RARAWAI MILL	114	106	16	37	21	31.5	0.3	21.2	1.6	34.0	20	17.5	31		
PENANG MILL	44	39	11	17	7	30.0	1.1	23.5	1.3	33.5	29	22.2	31		
MATEI AIRFIELD	297	149	22	77	28	28.5	0.3	23.2	0.8	30.0	16	21.3	8		
VANUABALAVU	190	159	15	52	7	28.6	0.6	20.7	-2.1	30.0	12	18.3	8		
LAKEBA	OFFICER ON A/L (AWS).														
YASAWA	146	151	11	64	7	29.5	0.6	23.1	0.1	31.8	11	21.0	16		
VUNISEA	OFFICER ON A/L (AWS).														
MATUKU	133	115	14	76	7	27.8	0.4	22.7	0.9	29.6	3	19.8	4		
ONO-I-LAU	76	88	11	23	7	27.5	1.1	20.9	-0.5	30.0	16	18.9	7		
YAQARA AWS	28	35	7	9	30	31.7		23.9		34.6	22	22.1	10		
LEVUKA AWS	248	179	17	68	7	U/S		U/S		U/S		U/S			
KEIYASI AWS	120		13	46	22	31.3		20.9		35.6	12	17.2	31		
LOMAIVUNA AWS	233		25	66	6	U/S		U/S		U/S		U/S			
NADARIVATU AWS	30		14	7	14	25.3		17.5		27.8	12	14.1	31		
RKS LODONI AWS	517		22	230	6	28.7		23.1		30.4	12	20.2	31		
MOMI AWS	110		14	41	14	30.1		22.5		33.0	29	19.8	31		
KOROLEVU AWS	154		17	44	18	U/S		U/S		U/S		U/S			
KORO ISLAND AWS	U/S					U/S		U/S							
SIGATOKA AWS	113		14	28	14	28.4		21.5		30.4	15	19.9	11		
RAKIRAKI AWS	53		13	24	7	U/S		U/S							
WAINIKORO AWS	232		22	92	28	U/S		U/S							
SAQANI AWS	272		19	69	6	29.7		23.9		32.3	13	22.1	8		
VATUREKUKA AWS	201		13	51	28	29.6		21.9		32.1	10	19.9	10		
KUBULAU AWS	U/S					U/S		U/S							
SEAQAQA AWS	155		16	29	28	32.1		22.7		34.9	12	19.6	1		
DOBUILEVU TB3	111	72	19	42	6										
NASINU TB3	405		21	167	7										
TAVUA TB3	29	43	9	8	27										

	TEMPERATURE (C)			HUMIDITY RH%	WIND VP	SUN RAD
	MEAN	DRY	WET			
NADI AIRPORT	27.0	27.5	23.5	71	25.8	6.7 50 16.2
SUVA/LAUCALA BAY	25.6	25.9	23.8	83	27.8	31 16.5
NACOCOLEVU	26.0	27.4	24.3	77	28.1	45 19
ROTUMA	27.9	28.5	26.0	81	31.5	7.2 48 19
VIWA	OFFICER ON A/L (AWS).					
UDU POINT	26.2	26.7	24.5	83	29.1	7.6
SAVUSAVU AIRFIELD	25.8	26.4	24.2	83	28.4	
LABASA AIRFIELD	26.1	27.8	24.6	77	28.6	
NABOUWALU	26.3	26.9	24.3	80	28.3	11.1
KORONIVIA	24.6	25.8	23.4	81	27.0	
NAUSORI AIRPORT	25.3	25.8	23.4	81	26.9	5.6
NAVUA/TOKOTOKO	MISSING OBSERVATION > 10 DAYS.					
MONASAVU	21.0	20.4	19.4	91	21.8	7.0
LAUTOKA AES	26.7	28.5	24.6	72	28.0	
BA/RARAWAI MILL	26.3	27.9	23.8	70	26.3	
PENANG MILL	26.8	27.1	23.9	76	27.2	
MATEI AIRFIELD	25.8	27.1	24.8	83	29.5	
VANUABALAVU	24.7	26.7	24.1	81	28.1	6.8
LAKEBA	OFFICER ON A/L (AWS).					
YASAWA	26.3	26.7	24.5	83	29.0	12.3
VUNISEA	OFFICER ON A/L (AWS).					
MATUKU	25.3	25.8	22.9	77	25.6	6.6
ONO-I-LAU	24.2	25.6	22.4	75	24.7	9.7

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. U/S: UNSERVICEABLE

Figure 2

**Nadi Airport - Temperature & Rainfall for the last 13 Months  
(October, 2018 - October, 2019)**

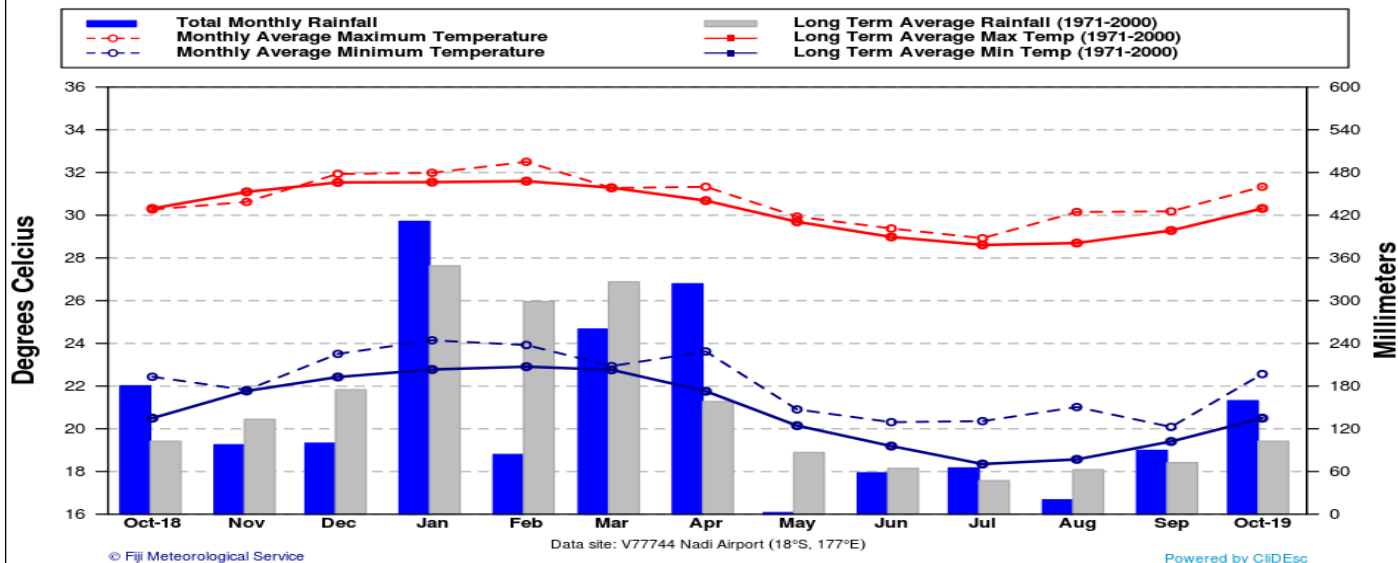


Figure 3

**Laucala Bay - Temperature & Rainfall for the last 13 Months  
(October, 2018 - October, 2019)**

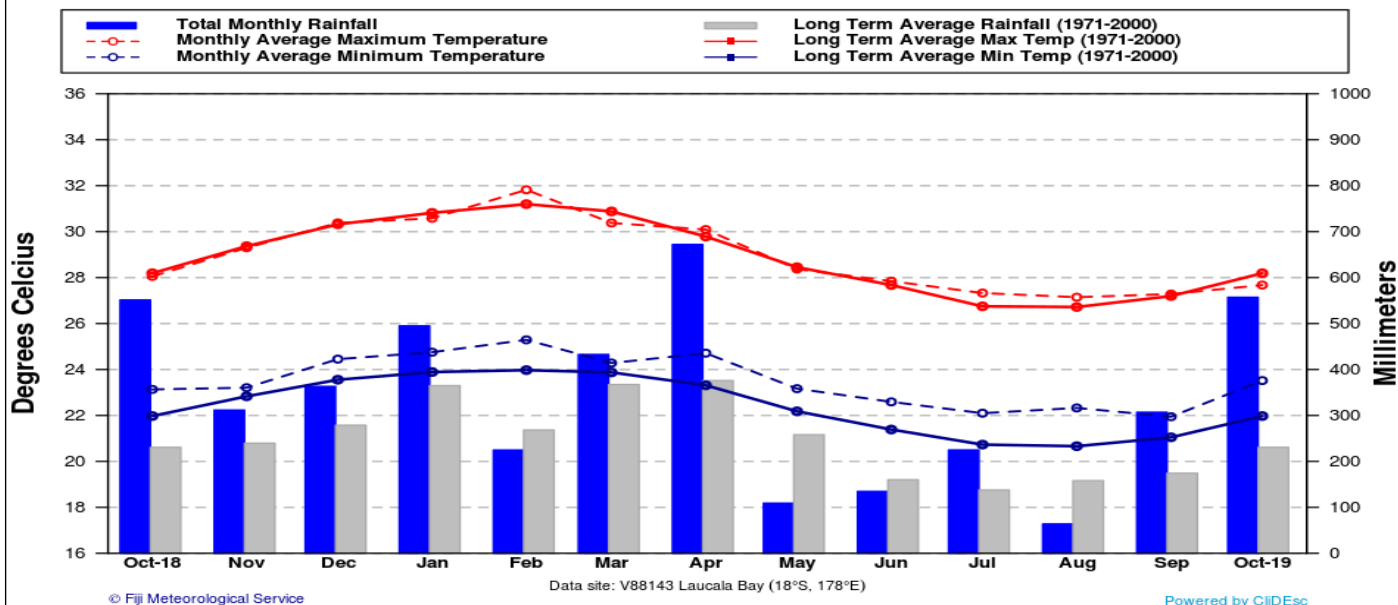
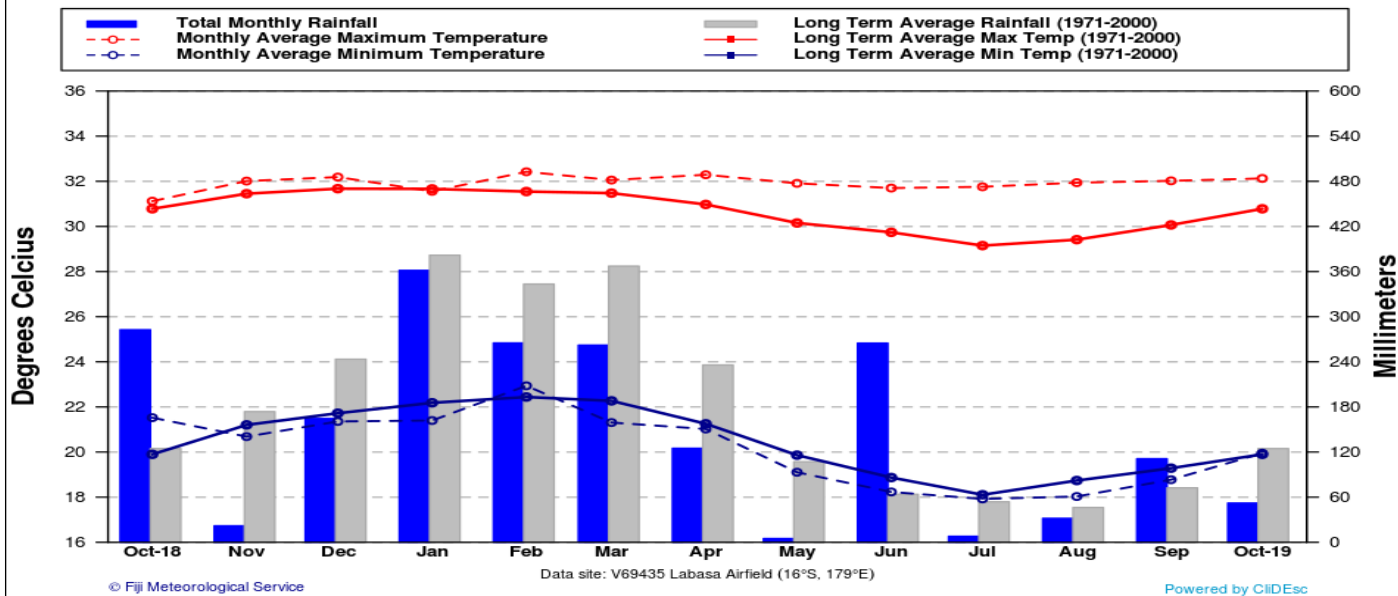


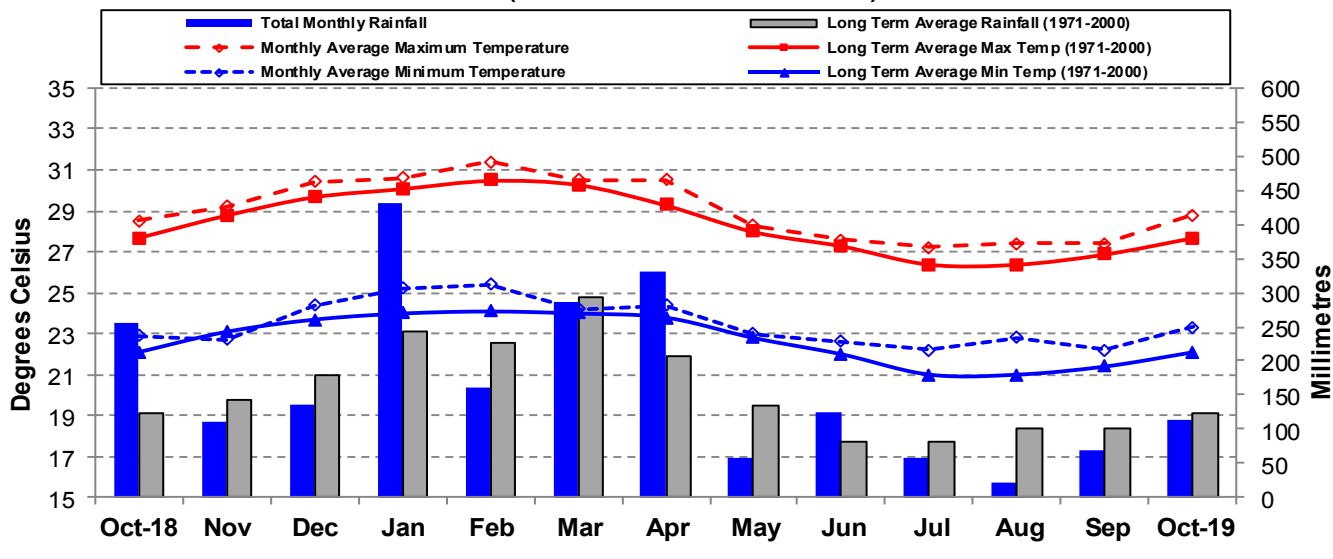
Figure 4

**Labasa Airfield - Temperature & Rainfall for the last 13 Months  
(October, 2018 - October, 2019)**

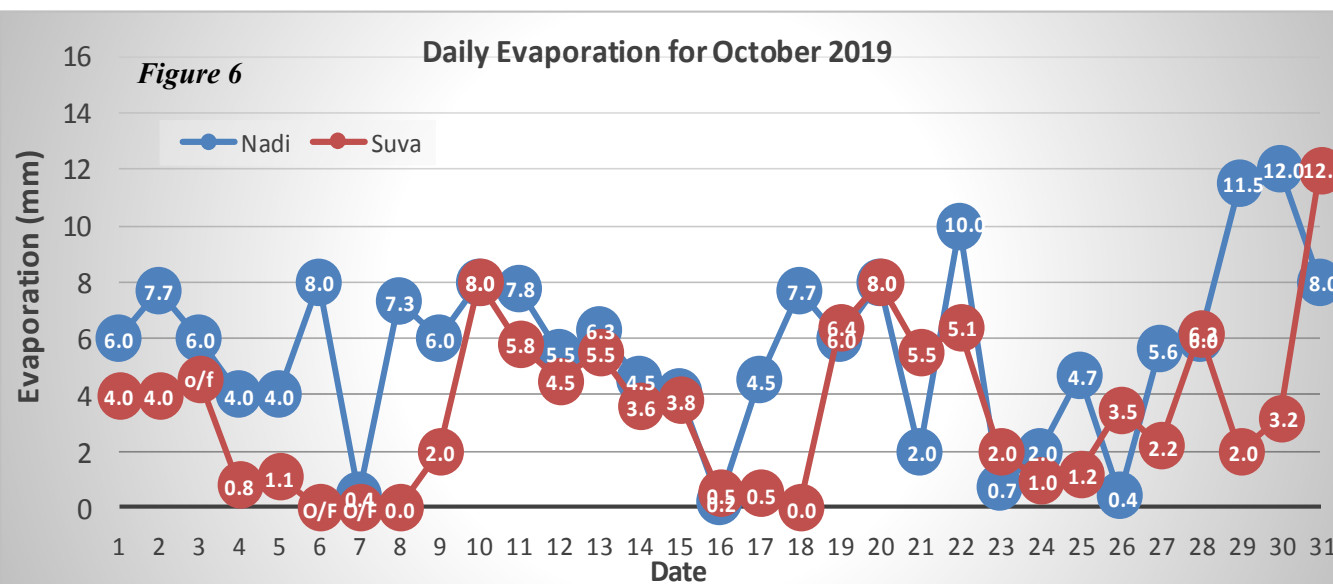




**Figure 5 Lakeba (Eastern Division) - Temperature & Rainfall Records for the last 13 Months (October 2018 - October 2019)**

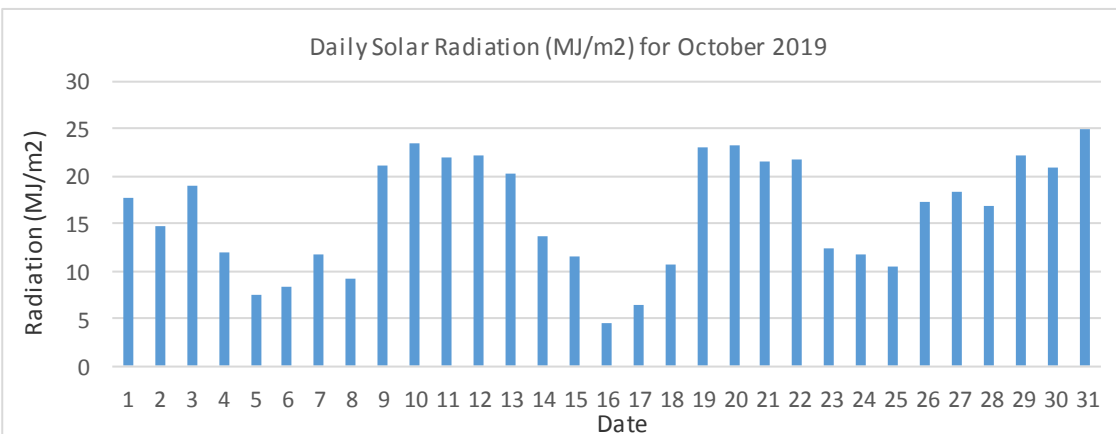


**5. DAILY RAISED PAN EVAPORATION**



**Figure 6:** The total monthly raised pan evaporation at Nadi Airport was 174.9mm, with the highest daily evaporation of 12.0mm recorded on 30<sup>th</sup>. Laucala Bay recorded total monthly evaporation of 108.3mm, with the highest daily evaporation of 12.0mm on the 31<sup>st</sup>.

**6. SOLAR RADIATION**



**Figure 7:** The mean daily solar radiation at Nadi Airport during October 2019 was 16.2MJ/m<sup>2</sup> compared to 21.5MJ/m<sup>2</sup> over 30 year average (1971-2000).

7. WIND SUMMARY

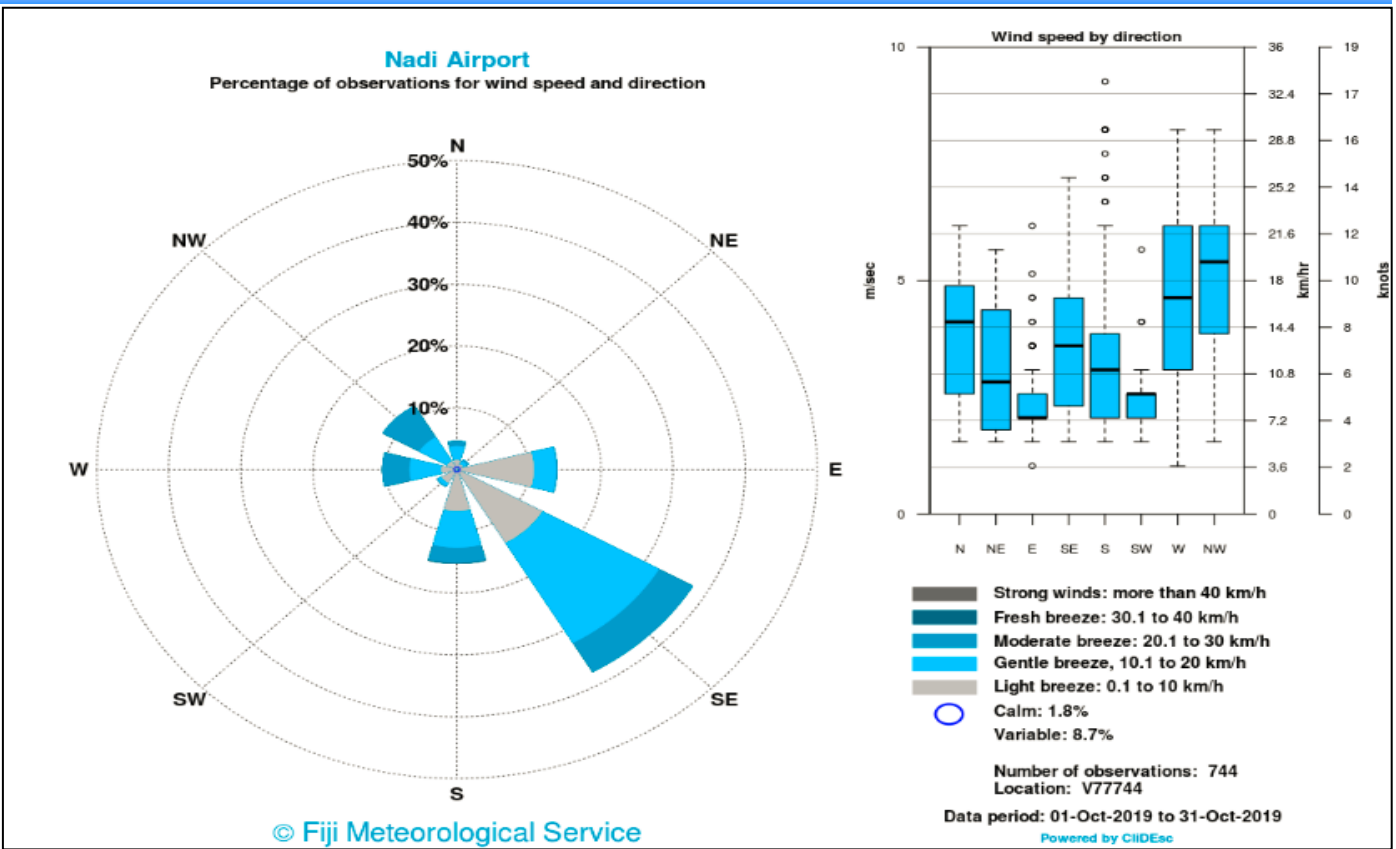


Figure 8a: The hourly wind observations at Nadi Airport during the month showed southeasterly wind was dominant winds, followed by southerlies then easterly. Wind speeds were generally light to moderate in strength.

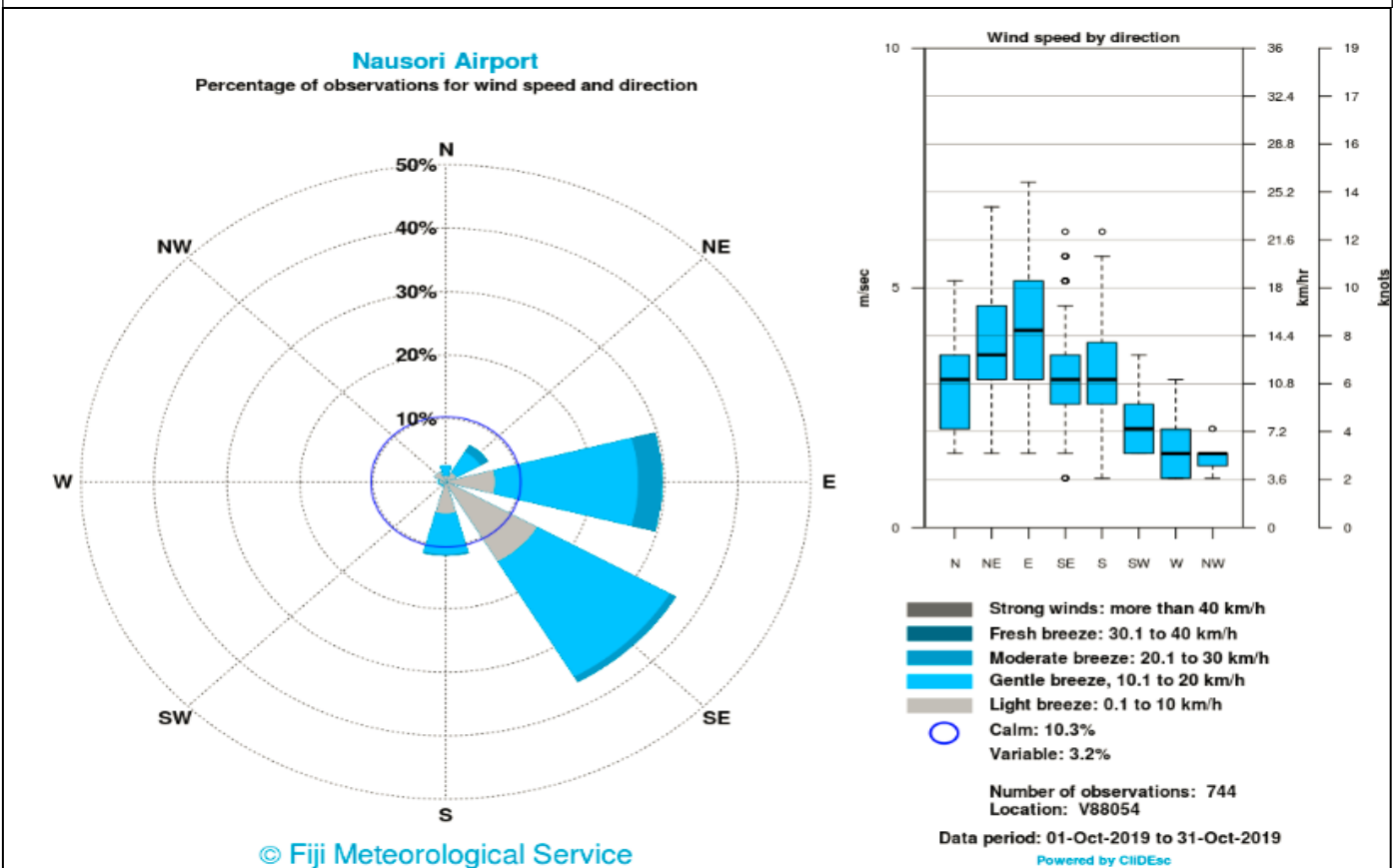
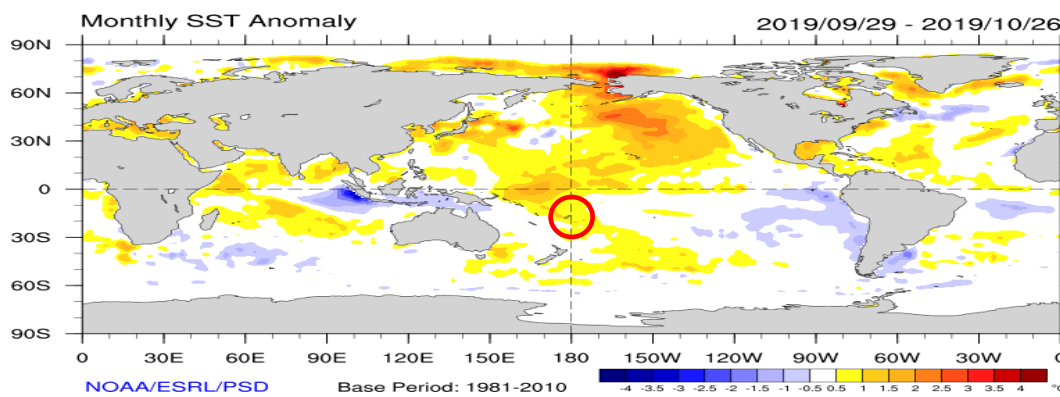


Figure 8b: The hourly wind observations at Nausori Airport during the month showed southeasterly winds as dominant, followed by easterly then southerlies. Wind speeds were generally light to moderate in strength.

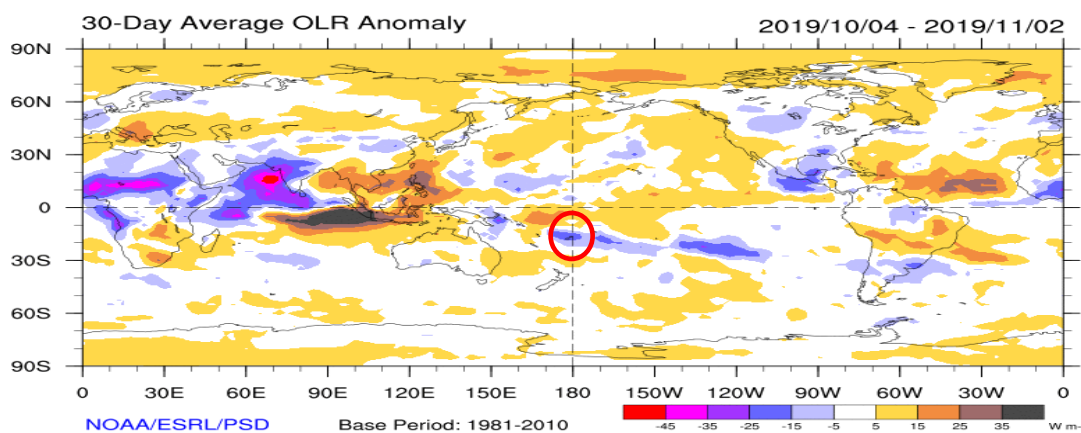
### 8. SEA SURFACE TEMPERATURE (SST)



**Figure 9:** Normal to slightly above normal SSTs were present in the Fiji region during September-2019 (base period: 1981-2010) (Fiji in red circle).

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

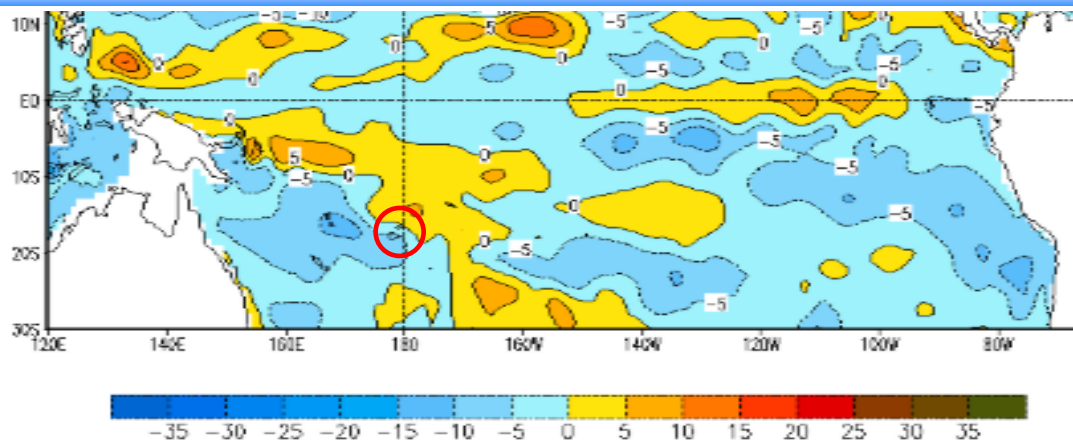
### 9. CLOUD COVER



**Figure 10:** Above normal cloud cover were present over most of the Fiji region during the month (base period: 1981-2010) (Fiji in red circle).

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

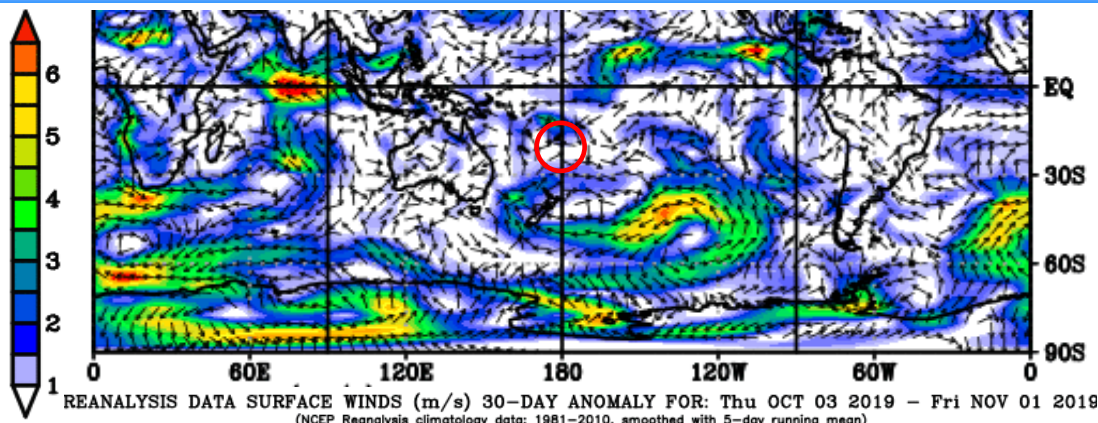
### 10. SEA LEVEL



**Figure 11:** Sea level anomalies of around 0 to -5cm were observed in most of the Fiji Waters (base period: 1981-2010) (Fiji in red circle).

Source: [http://www.cpc.ncep.noaa.gov/products/analysis\\_monitoring/ocean/weeklyenso\\_clim\\_81-10/wksl\\_anm.gif](http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/ocean/weeklyenso_clim_81-10/wksl_anm.gif)

### 11. WIND ANOMALIES



**Figure 12:** Variable wind anomalies of around 0-3m/s were recorded in the Fiji region (base period: 1981-2010) (Fiji in red circle).

Source: [https://www.esrl.noaa.gov/psd/map/images/rnl/sfcwnd\\_30b.rnl.html](https://www.esrl.noaa.gov/psd/map/images/rnl/sfcwnd_30b.rnl.html)