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Fiji Climate Summary

February 2019



**ISO 9001:2015
certified Climate
Services**

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1. IN BRIEF

The weather during February was influenced by a series of troughs of low pressure, tropical disturbances and tropical cyclone Pola.

Three significant rainfall episode was experienced during the month. A period of heavy rainfall was experienced in the Central Division during the 1st week with RKS, Nausori Airport and Koronivia recording 24-hour rainfall of 145mm, 110mm, and 104mm on the 4th, respectively. Consequently, there were reports of flooding in the Rewa River catchment.

Later during the month, Northern Division registered heavy rainfall between 12th and 15th. On the 13th, Wainikoro and Vaturekuka recorded 127mm and 122mm of rainfall, respectively.

The month concluded with the passage of tropical cyclone Pola through the Eastern Division. Gale force winds were experienced at Ono-i-Lau with maximum sustained wind of 64 km/hr and gust of up to 96 km/hr registered in the morning of 28th. Strong breeze were also recorded at Vanuaba-

lavu and Matuku. Pola also resulted in significant rainfall over the Southern Lau group with Ono-i-Lau registering 24-hour rainfall of 137mm on the 27th.

Overall, it was drier than usual month at most of the stations in the Western and Northern Divisions. Less than half the *normal* rainfall was recorded at Viwa, Nadi Airport, Nabouwalu and Vunisea. In contrast, *average* rainfall was registered across the Central Division. Rotuma also recorded *average* rainfall.

Two new high air temperature records for February were established during the month. Vanuabalavu registered 33.9°C registered on the 9th, which was the highest daily maximum air temperature for February since observations began in 1985. Furthermore, a record new high mean monthly minimum air temperature for February was set at Nabouwalu during the month with 25.9°C.

2. WEATHER PATTERNS

February started with a trough of low pressure to the north of Vanua Levu, with trade showers affecting the group. From the 3rd to the 6th the trough drifted south affecting the eastern parts of Viti Levu, Vanua Levu, Lomaiviti and Lau groups. The trough together with the moist easterlies triggered heavy falls over the eastern parts of Viti Levu. There were reports of flooding in the Rewa catchment during this rainfall episode.

Tropical Disturbance 06F formed north of Fiji and moved over Fiji Waters on the 7th passing just to the east of the Lau group. Meanwhile, another system developed near Rotuma and was numbered Tropical Disturbance 07F, which tracked behind 06F. On the 9th, TD06F drifted south away from the group, while TD07F was upgraded to a tropical cyclone and named Tropical Cyclone (TC) Neil. TC Neil did not have a major impact on Fiji.

As TC Neil dived south away from the group on the 11th, a southeast wind flow was directed over the country. Meanwhile, another Tropical Disturbance, 10F, formed to the far north of Fiji. TD10F passed over the Southern Lau group but quickly moved south away from Fiji on the 14th, directing a moist northerly wind flow over the group till the 20th.

From the 20th till the 22nd trade showers were experienced over the group while on the 23rd another low pressure system near Samoa was upgraded to a tropical disturbance, TD11F. TD11F intensified to depression on the 25th, then named TC Pola on the midnight of the 26th. Pola resulted in gale force winds with heavy rain over the Southern Lau group as it's centre tracked to the east of Fiji between 27th and 28th. By the afternoon on the 28th, TC Pola moved south away from Fiji Waters directing south to southwest winds over the group.

Rotuma was mainly affected by series of troughs of low pressure which brought rain and showers over the island on a number of days.

3. RAINFALL

The rainfall during the month generally ranged from *below average* to *average*. Out of the 25 stations, 3 registered *well below average* rainfall, 11 *below average*, 10 *average* and Ono-i-Lau was the lone station to record *above average* rainfall.

It was drier than usual month at most of the stations in the Western and Northern Divisions. Less than half the *normal* rainfall was recorded at Viwa, Nadi Airport, Nabouwalu and Vunisea. In contrast, *average* rainfall was registered across the Central Division. Rotuma also recorded *average* rainfall.

An episode of significant rainfall was experienced in the Central Division during the 1st week with RKS, Nausori Airport and Koronivia recording 24-hour rainfall of 145mm, 110mm, and 104mm on the 4th, respectively. Consequently, there were reports of flooding in the Rewa River catchment.

Later during the month, a period of significant rainfall was recorded in the Northern Division between 12th and 15th. On the 13th, Wainikoro and Vaturekuka recorded 127mm and 122mm of rainfall, respectively.

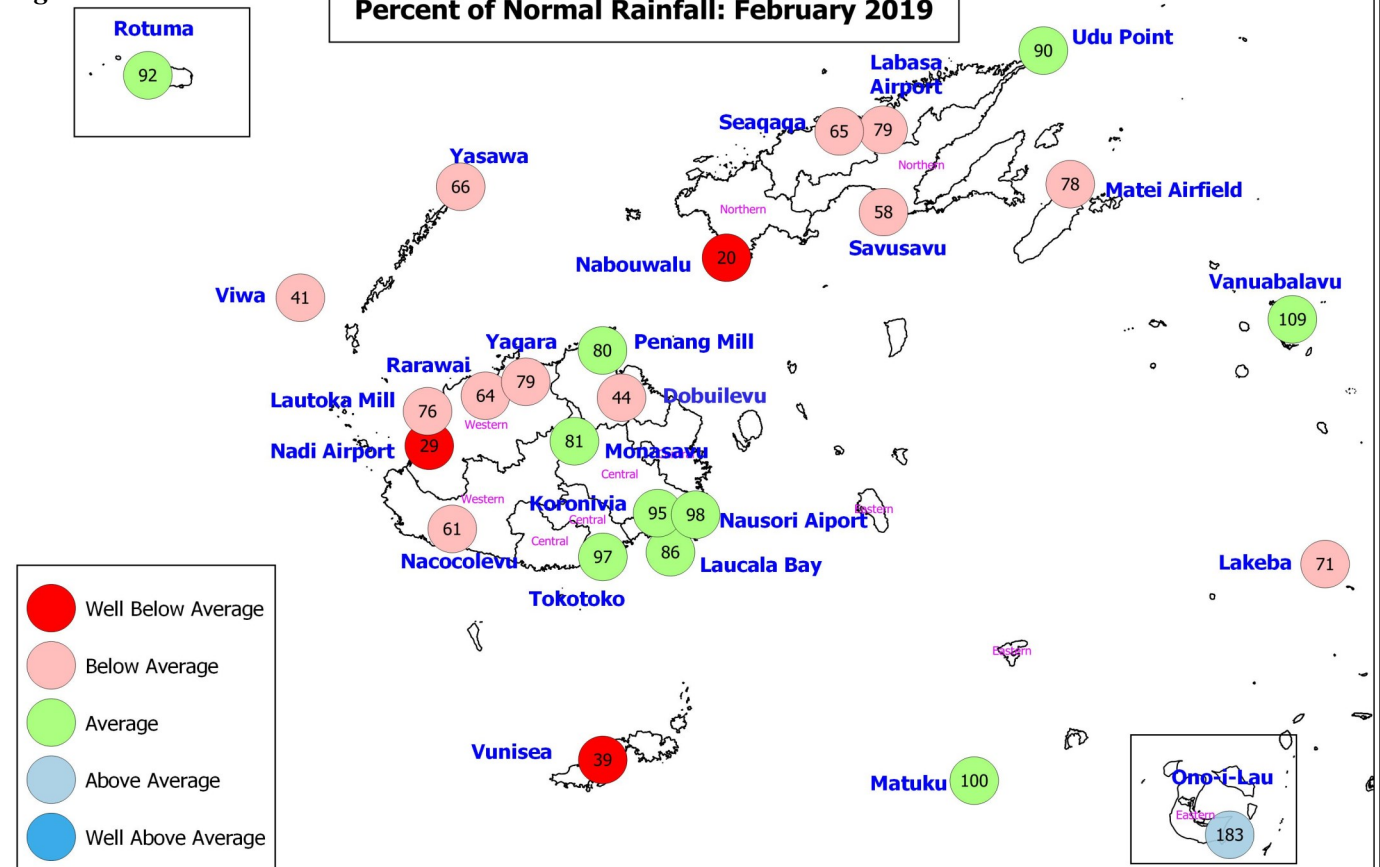
The month concluded with yet another significant rainfall event during the passage of tropical cyclone Pola. Ono-i-Lau registered 137mm of rainfall on the 27th.

Monasavu recorded the highest total monthly rainfall with 420mm, followed by Lomaivuna with 419mm and Nadarivatu with 387mm. On the other hand, the lowest total monthly rainfall was registered at Kubulau with 40mm, followed by Nabouwalu with 56mm and Nadi Airport with 85mm.

Koronivia and Penang Mill registered the highest number of rain days ($\geq 0.1\text{mm}$) with both 24 days, followed by Seaqaga with 22, and Nausori Airport, Lomaivuna, Matei Airfield and Rotuma with all 21. On the other hand, Kubulau recorded the least number of rain days with 6, followed by Korolevu with 10 and Momi with 11.

Figure 1

Percent of Normal Rainfall: February 2019



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 monthly maximum air temperatures were *above normal* over most parts of the country during the month, with 19 out of the 23 stations registering anomalies $\geq 0.5^\circ$ and 4 within $\pm 0.5^\circ\text{C}$ (Table 2 & Figures 2-5).

The warmest day-time temperatures on average was at Keiyasi with 33.7°C , followed by Nacocolevu and Rarawai Mill with both 33.3°C , and Yaqara, Viwa and Seaqaqa with all 32.9°C . On the other hand, the coolest day-time temperatures on average was at Monasavu with 26.5°C , followed by Nadarivatu with 26.6°C , and Udu Point and Ono-i-Lau with both 30.7°C .

Keiyasi registered the highest daily maximum air temperature during the month with 36.1°C on the 10th, followed by Rarawai Mill with 35.0°C on 28th, and Nabouwalu with 34.9°C on the 28th. On the other hand, the lowest daily maximum air temperature was recorded at Monasavu with 23.9°C on the 3rd, followed by Nadarivatu with 24.4°C on the 15th, and Wainikoro and Vaturekuka with both 25.4°C on the 13th.

A record breaking daily maximum air temperature for February was set at Vanuabalavu during the month with 33.9°C registered on the 9th (Table 1).

B. Minimum Night-time Air Temperatures

More than half of the stations registered *above normal* minimum air temperatures during the month, with 14 out of the 23 stations registering anomalies $\geq +0.5^\circ\text{C}$, 7 within $\pm 0.5^\circ\text{C}$ and 2 $\leq -0.5^\circ\text{C}$ (Table 2 & Figures 2-5).

The coolest nights on average during the month was at Nadarivatu with 18.9°C , followed by Monasavu with 20.0°C , and Koronivia and Nacocolevu with both 22.6°C . On the other hand, Nabouwalu recorded warmest nights on average with 25.9°C , followed by Lakeba with 25.4°C , and Laucala Bay and Udu Point with both 25.3°C .

An episode of cool nights were experienced during the last week of the month with Nadarivatu registering lowest night-time temperature of 15.4°C on the 26th, followed by Monasavu with 17.0°C on the 26th, and Rarawai Mill with 18.8°C on the 28th. On the other hand, an episode of warm nights were experienced between 9th and 16th with Seaqaqa registering the highest minimum air temperature of 27.7°C on the 11th, followed by Savusavu Airfield with 27.5°C on the 11th, and Nabouwalu and Lakeba with both 27.4°C on the 11th and 12th, respectively.

A record new high mean monthly minimum air temperature for February was set at Nabouwalu during the month with 25.9°C (Table 1).

TABLE 1. CLIMATE RECORDS ESTABLISHED IN FEBRUARY 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>
Daily Maximum Air Temp.	Vanuabalavu	33.9°C	9 th	New High	33.7°C	2018	1985
Mean Monthly Min. Air Temp.	Nabouwalu	25.9°C	-	New High	25.7°C	2016	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 FEBRUARY 2019

	RAINFALL				AIR TEMPERATURES								SUNSHINE		
	TOTAL MM	RAIN		MAX. MM ON	AVERAGE DAILY				EXTREME				TOTAL		
		%	+ DAYS FALL		MAX. C	#	MIN. C	#	MAX. C	ON	MIN. C	ON	HRS	%	
NADI AIRPORT	85	29	14	20	15	32.5	0.9	23.9	1.0	34.5	7	20.5	26	211	112
SUVA/LAUCALA BAY	227	86	18	78	4	31.7	0.5	25.3	1.3	33.5	17	23.5	24	161	92
NACOCOLEVU	139	61	15	36	6	33.3	1.8	22.6	0.0	34.6	15	19.6	26	177	109
ROTUMA	297	92	21	85	11	31.3	0.7	24.7	0.0	33.2	4	23.0	12	114	71
VIWA	100	41	15	23	1	32.9	1.6	24.7	-0.6	34.2	20	23.5	24	0	0
UDU POINT	223	90	18	85	21	30.7	-0.1	25.3	0.8	32.6	19	21.5	25		
SAVUSAVU AIRFIELD	142	58	16	32	20	31.0	0.3	25.1	1.4	34.0	15	23.4	26		
LABASA AIRFIELD	272	79	13	74	13	32.4	0.8	22.7	0.3	34.5	10	19.0	1		
NABOUWALU	56	20	16	17	28	32.0	1.6	25.9	1.5	34.9	28	23.6	12		
KORONIVIA	283	95	24	104	4	31.6	0.8	22.6	-0.3	34.0	19	19.5	26		
NAUSORI AIRPORT	263	98	21	110	4	31.6	0.8	24.0	0.7	33.5	19	21.0	26		
NAVUA/TOKOTOKO	274	97	20	66	5	31.6	0.6	23.6	2.0	32.7	28	20.0	26		
MONASAVU	420	81	20	79	5	26.5	0.8	20.0	0.6	28.5	20	17.0	26		
LAUTOKA AES	230	76	16	45	17	32.7	1.6	24.3	0.4	34.0	7	19.5	25		
BA/RARAWAI MILL	222	64	19	72	11	33.3	1.3	23.1	0.8	35.0	28	18.8	28		
PENANG MILL	268	80	24	52	21	32.1	1.6	24.1	0.2	34.0	7	20.2	27		
MATEI AIRFIELD	222	78	21	82	4	31.0	0.6	25.1	0.9	32.5	28	24.0	22		
VANUABALAVU	224	109	20	45	26	30.9	0.2	23.6	-1.1	33.9	9	21.1	27		
LAKEBA	160	71	18	45	26	31.4	0.9	25.4	1.3	33.2	18	23.8	2		
YASAWA	175	66	15	52	1	32.2	1.6	25.0	0.6	33.7	18	22.6	14		
VUNISEA	89	39	19	23	21	31.5	1.1	25.0	1.4	33.6	16	22.7	26		
MATUKU	184	100	14	53	3	31.1	0.4	25.2	0.5	33.0	18	22.5	26		
ONO-I-LAU	356	183	18	137	27	30.7	0.9	24.2	-0.4	33.5	18	22.0	1		
LEVUKA AWS	U/S					U/S				U/S					
YAQARA AWS	260	79	18	76	15	32.9		24.1		33.9	11	20.1	26		
KEIYASI AWS	U/S					33.7		22.7		36.1	10	20.0	26		
LOMAIVUNA AWS	419		21	82	4			24.1				20.9	26		
NADARIVATU AWS	387		19	58	19	26.6		18.9		29.5	6	15.4	26		
RKS LODONI AWS	325		18	145	4	31.2		23.4		33.0	20	21.1	26		
MOMI AWS	103		11	26	19	32.2		24.7		34.1	9	22.2	26		
KOROLEVU AWS	181		10	59	2			23.8				22.0	13		
KORO ISLAND AWS	U/S					31.4		24.8		33.9	17	22.8	26		
SIGATOKA AWS	171		12	33	6	32.0		23.1		34.0	16	19.6	26		
RAKIRAKI AWS	180		17	46	2	U/S		U/S							
WAINIKORO AWS	341		20	127	13	31.4		23.5		33.6	9	20.0	24		
SAQANI AWS	227		16	62	4	31.3		25.2		33.6	19	23.5	5		
VATUREKUKA AWS	349		15	122	13	31.2		23.8		34.0	9	20.2	24		
KUBULAU AWS	40		6	21	21	U/S		U/S							
SEAQAQA AWS	253	65	22	59	13	32.9		24.9		34.3	3	20.9	24		
NASINU TB3	279		19	95	4										
TAVUA TB3	162		14	34	15										

	TEMPERATURE (C)		HUMIDITY RH% VP	WIND KT	SUN RAD		
	MEAN	(AVERAGE AT 9AM)			%OF	MJ/ SQ.M	
NADI AIRPORT	28.2	29.1	25.6	75	30.2	60	19.3
SUVA/LAUCALA BAY	28.5	28.8	26.0	79	31.4	46	20.5\$
NACOCOLEVU	27.9	29.2	26.1	78	31.4	50	21.4\$
ROTUMA	28.0	28.5	25.7	79	30.9	34	17.9\$
VIWA	28.8	30.1	26.8	77	32.8		
UDU POINT	28.0	28.5	25.9	81	31.4		
SAVUSAVU AIRFIELD	28.1	28.5	26.0	82	31.7		
LABASA AIRFIELD	27.6	28.6	25.5	77	30.2		
NABOUWALU	28.9	51.0	26.3	77	31.7		
KORONIVIA	27.1	28.6	25.8	79	31.0		
NAUSORI AIRPORT	27.8	28.4	25.8	81	31.3	4.3	
NAVUA/TOKOTOKO	27.6	29.2	26.3	79	32.1		
MONASAVU	23.2	23.6	21.9	86	25.1		
LAUTOKA AES	28.5	30.4	26.7	75	32.3		
BA/RARAWAI MILL	28.2	28.2	25.6	80	30.8		
PENANG MILL	28.1	28.3	25.9	83	31.5		
MATEI AIRFIELD	28.0	29.1	26.2	79	31.7		
VANUABALAVU	27.3	28.6	25.7	79	30.9		
LAKEBA	28.4	29.2	U/S				
YASAWA	28.6	29.3	26.5	79	32.3		
VUNISEA	28.2	29.2	25.8	76	30.7		
MATUKU	28.2	28.9	25.8	77	30.9		
ONO-I-LAU	27.5	28.7	26.0	80	31.5		

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
(February, 2018 - February, 2019)**

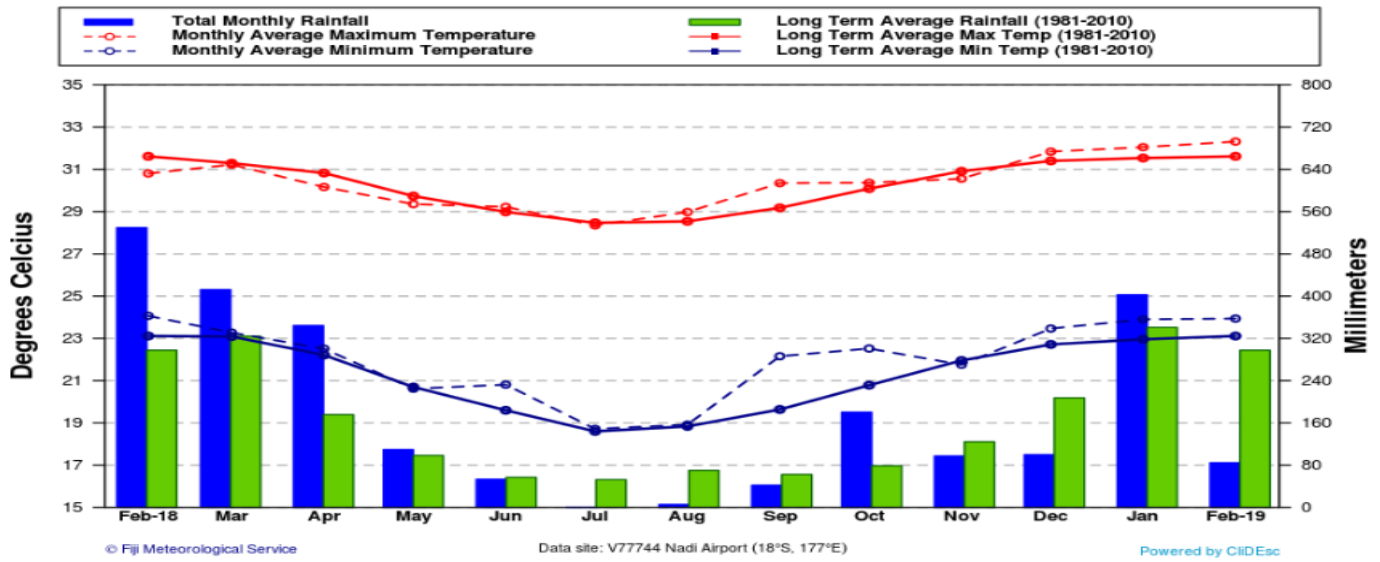


Figure 3

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

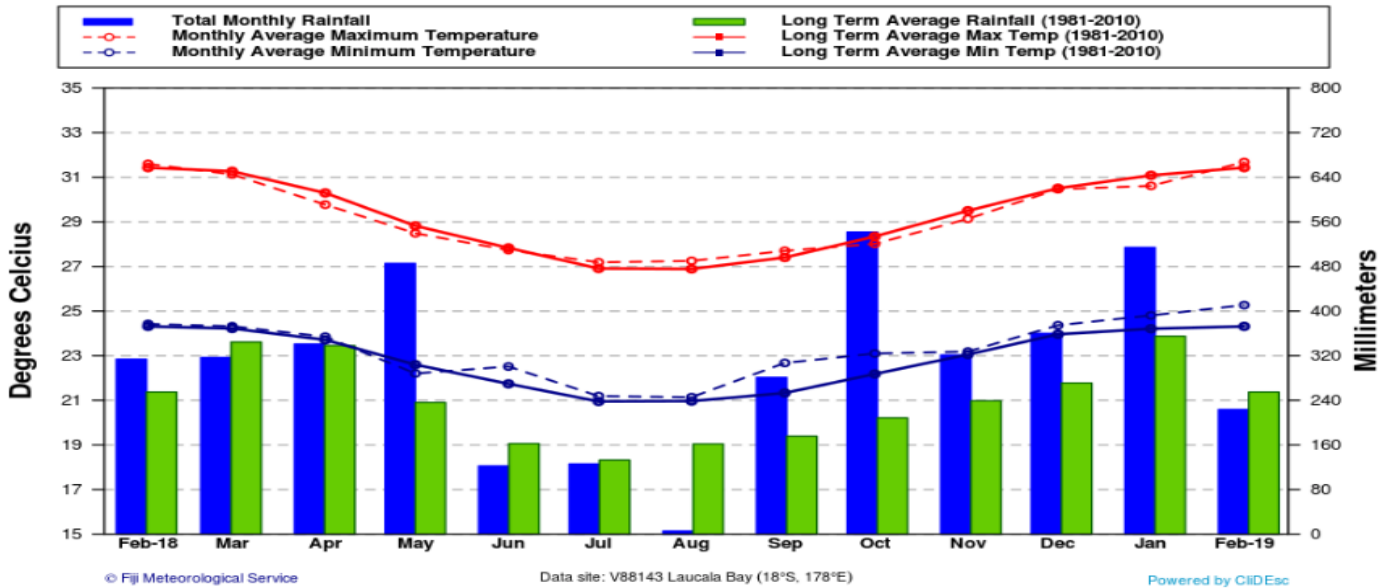


Figure 4

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

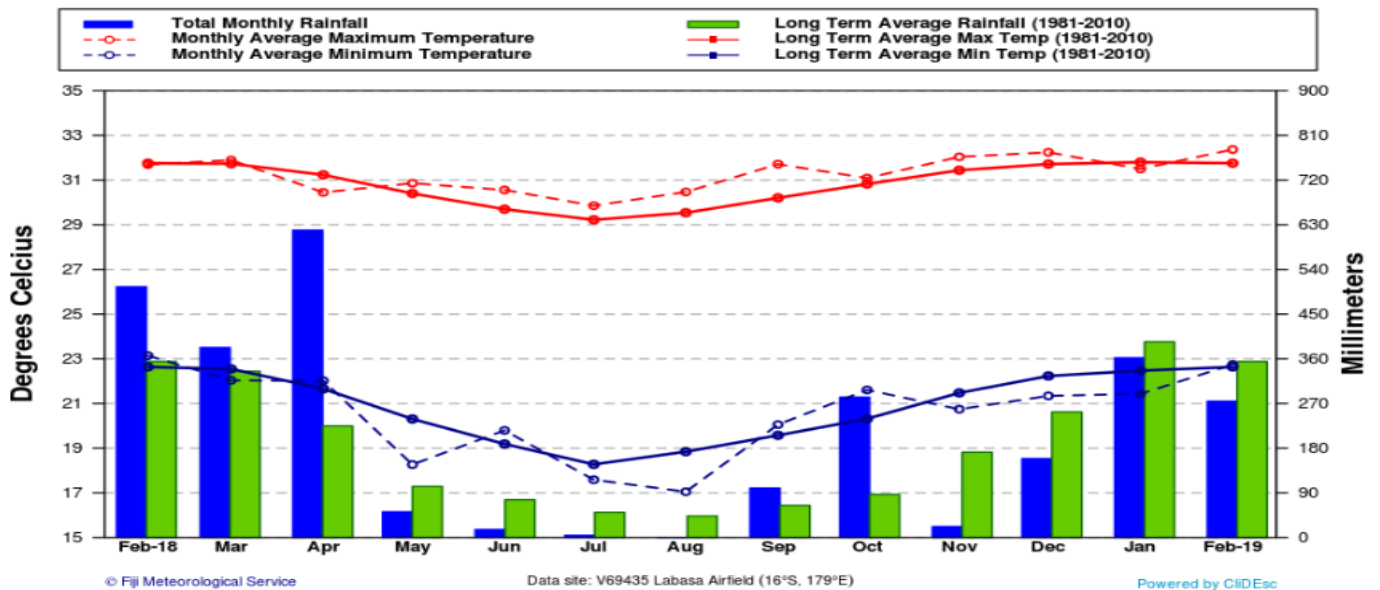
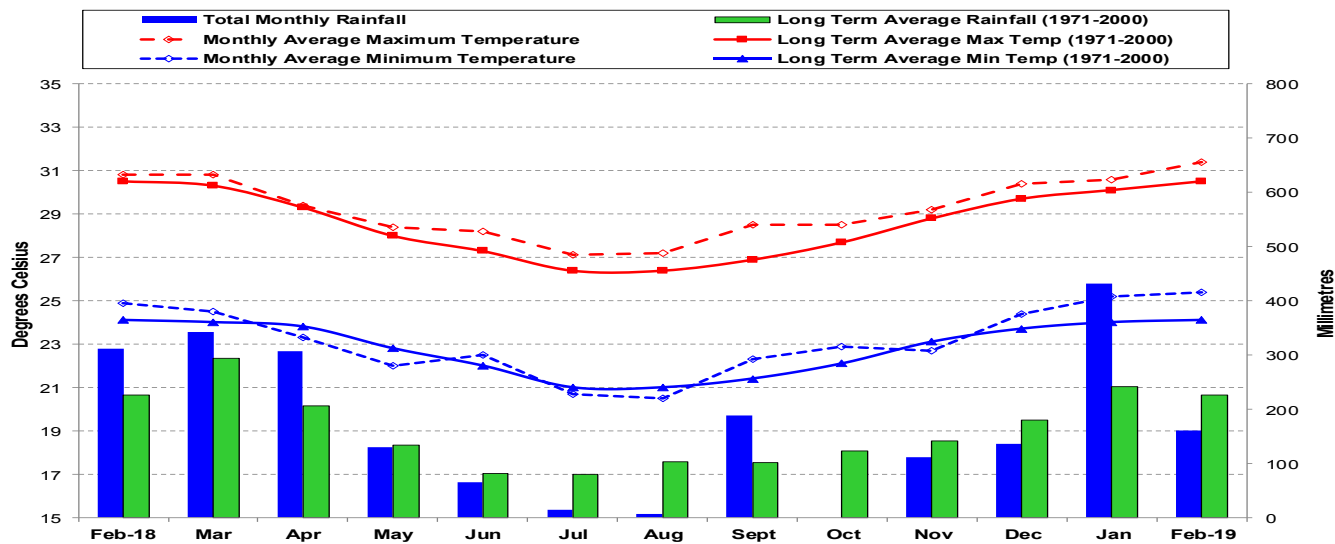


Figure 5

Lakeba (Eastern Division) - Temperature & Rainfall Records for the last 13 Months (February 2018 - February 2019)



5. DAILY RAISED PAN EVAPORATION

Figure 6

Daily Evaporation for February 2019

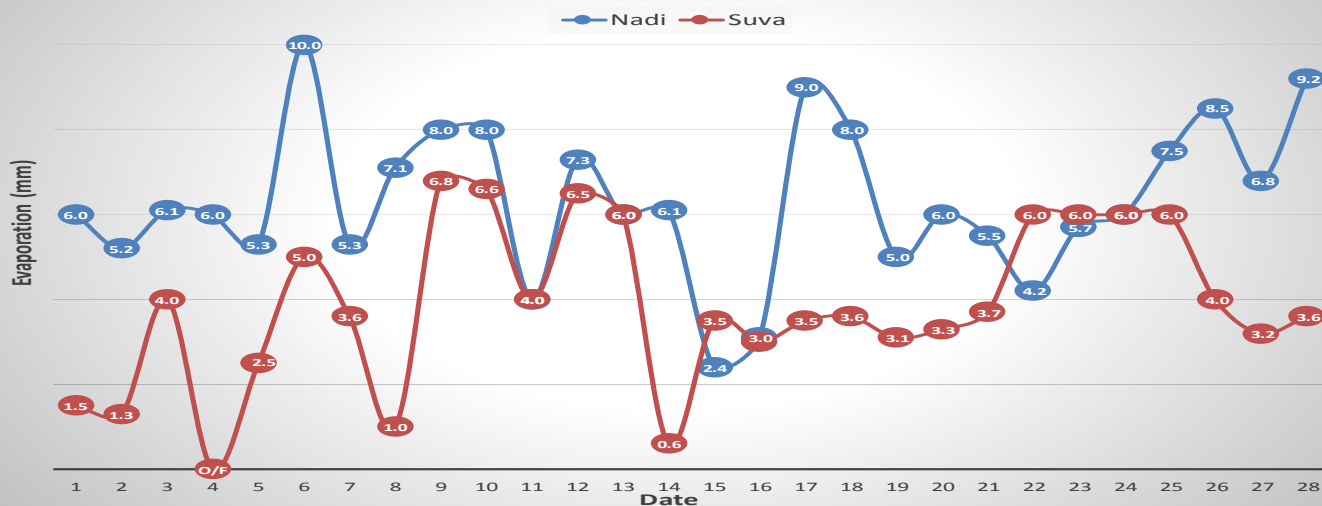


Figure 6: The total monthly raised pan evaporation at Nadi Airport was 177.3mm, with the highest of 10.0mm recorded on the 6th. Laucala Bay recorded total monthly evaporation of 107.9mm, with the highest daily evaporation of 6.8mm on the 9th.

6. SOLAR RADIATION

Figure 7

Daily Solar Radiation (MJ/m²) - February 2019

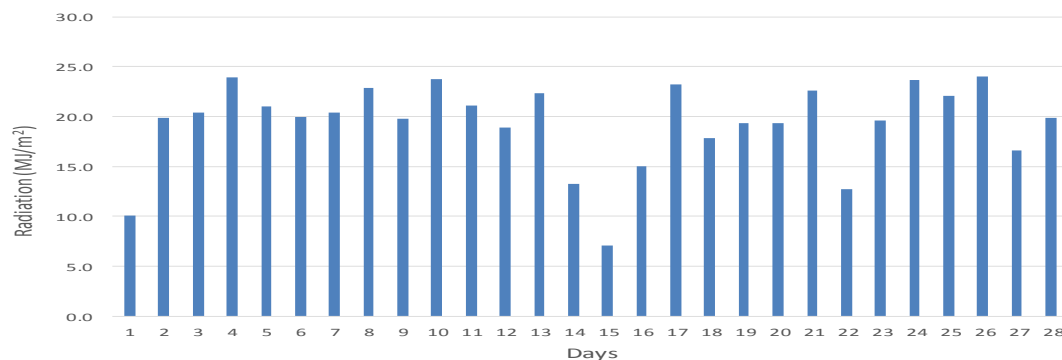


Figure 7:

The mean daily solar radiation at Nadi Airport during February 2019 was 19.3MJ/m² compared to 20.5MJ/m² over 30 year average (1971-2000).

7. WIND SUMMARY

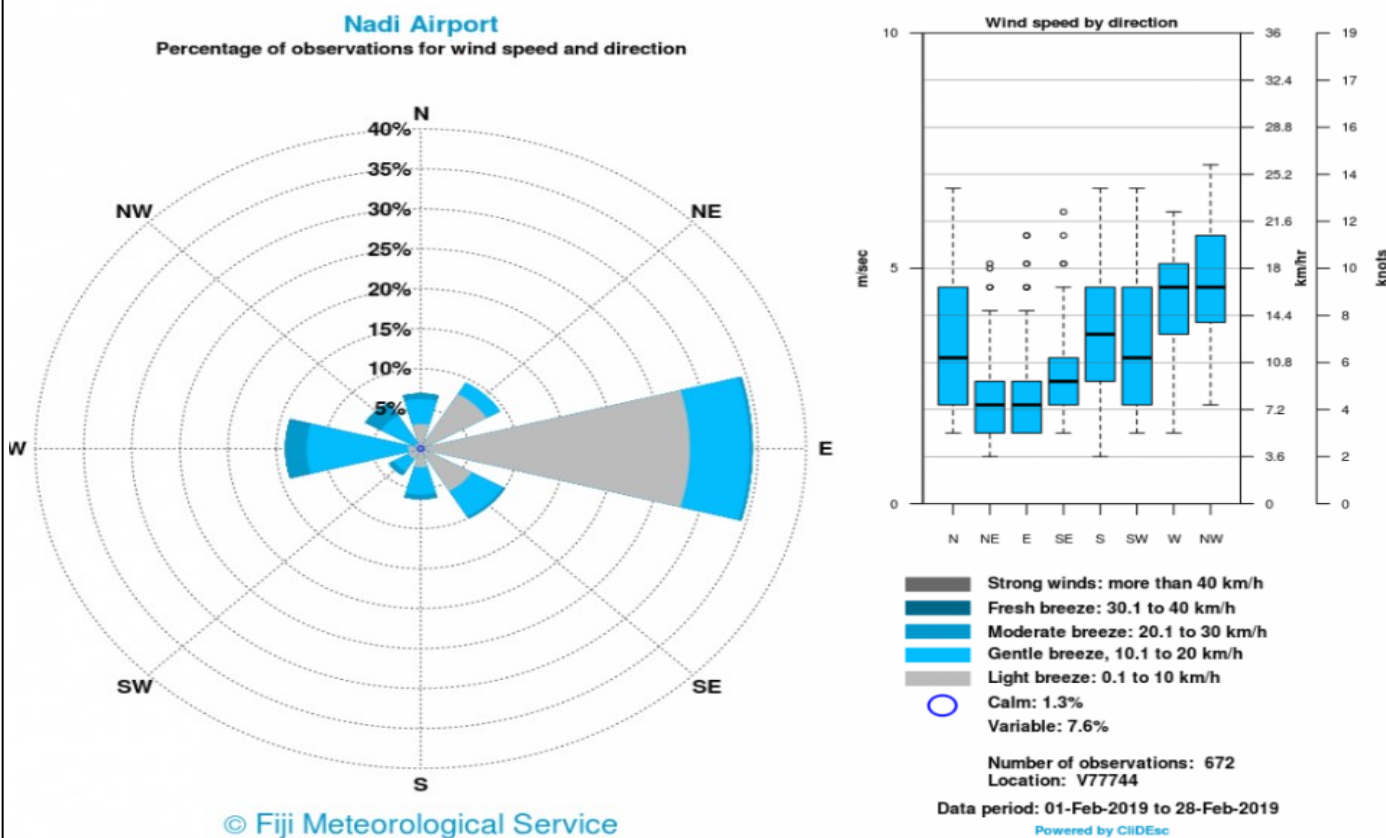


Figure 8a: The hourly wind observations at Nadi Airport during the month shows easterly winds as the most dominant, followed by westerly. Wind strengths ranged from light to moderate.

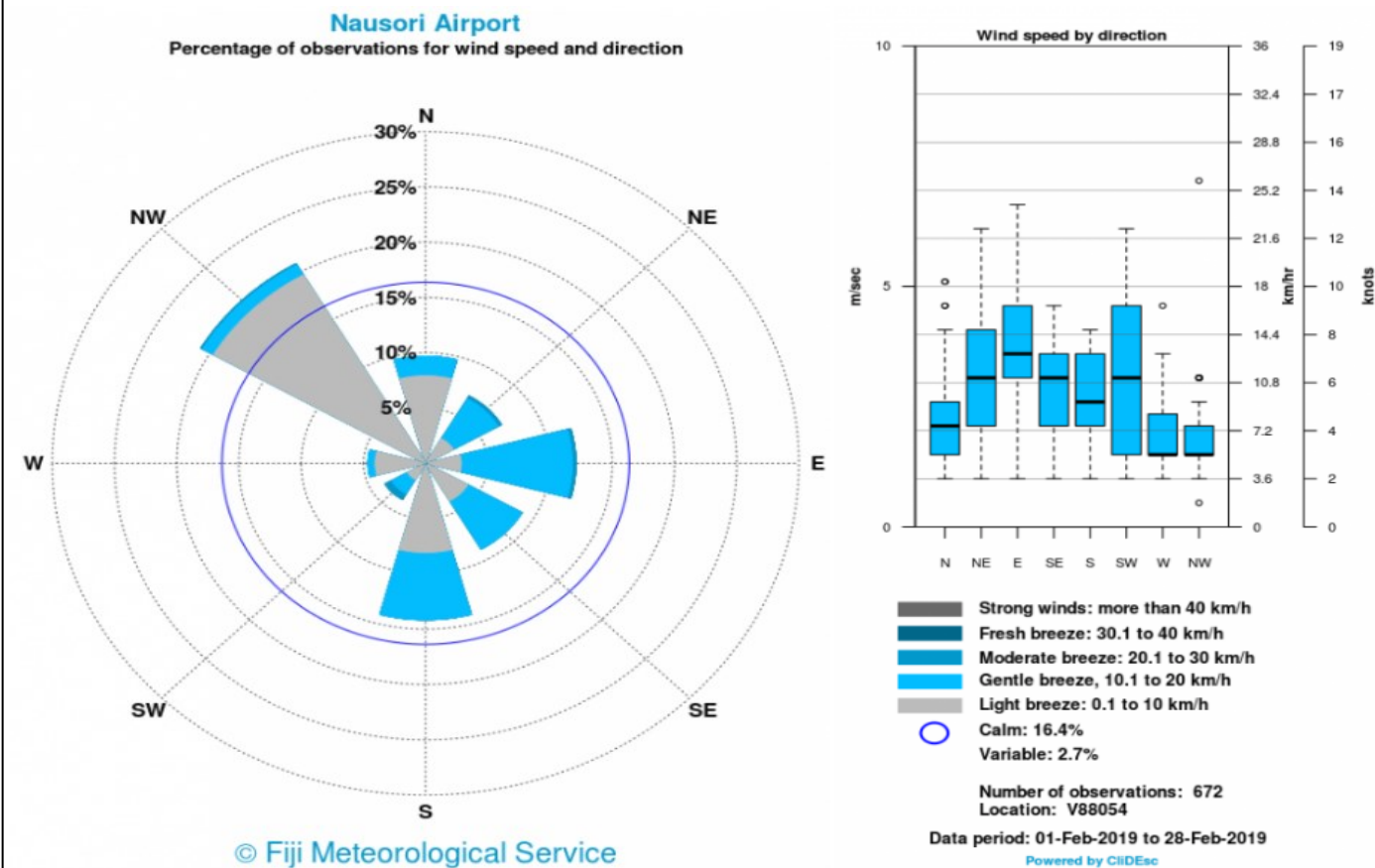


Figure 8b: The hourly wind observations at Nausori Airport during the month shows that northwesterly winds were dominant, followed by southerly and easterly winds. Wind speeds ranged from light to moderate.

8. SEA SURFACE TEMPERATURE (SST)

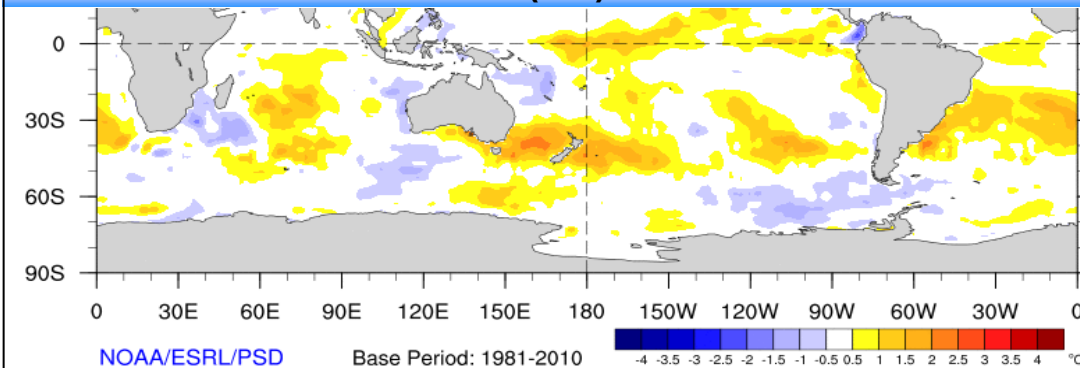


Figure 9: Sea surface temperatures were near normal in most of the Fiji Waters. However, positive anomalies were present in the northern Waters (base period: 1981-2010).

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

9. SEA LEVEL

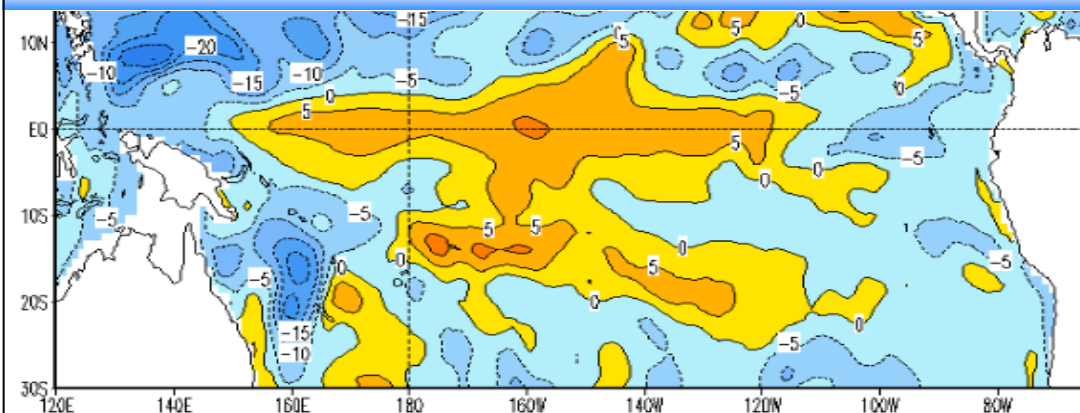


Figure 10: Sea level anomalies of 0cm to -5cm were present in the Fiji Waters (base period: 1981-2010).

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

10. CLOUD COVER

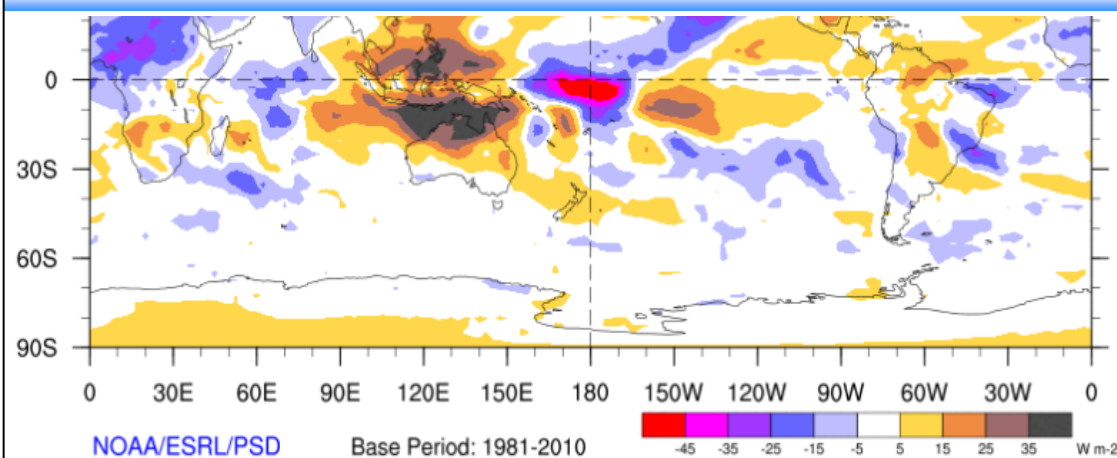


Figure 11: OLR anomalies indicate presence of normal to slightly above normal cloud cover in the Fiji region (Fiji: ~17°S, 180°) (base period: 1981-2010).

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

11. WIND ANOMALIES

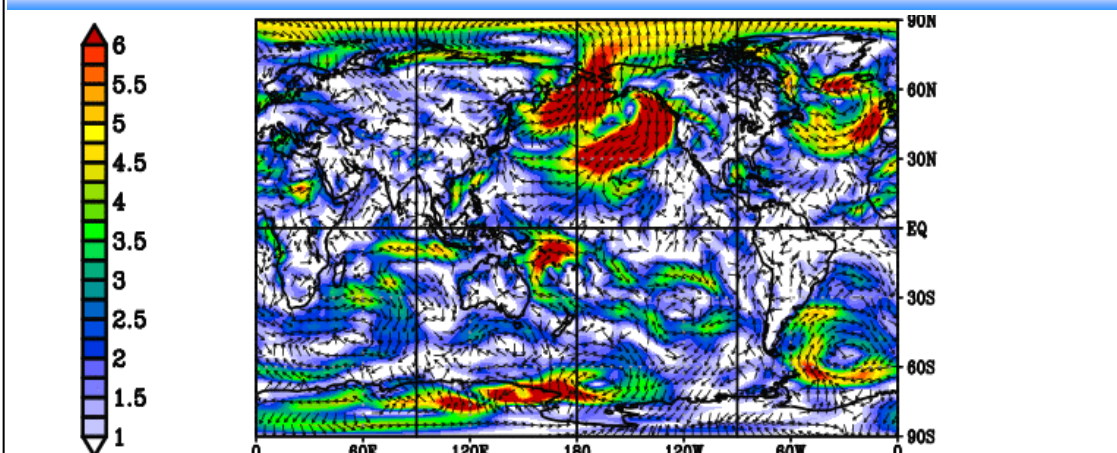


Figure 12: North-westerly wind anomalies of 1-2m/s were present in the Fiji region (Fiji: ~17°S, 180°) (base period: 1981-2010).

Source: https://www.esrl.noaa.gov/psd/map/images/rnl/sfcwnd_30b.rnl.html

REANALYSIS DATA SURFACE WINDS (m/s) 30-DAY ANOMALY FOR: Sat FEB 02 2019 - Sun MAR 03 2019
(NCEP Reanalysis climatology data: 1981-2010, smoothed with 5-day running mean)

12. TROPICAL CYCLONE POLA

Tropical cyclone Pola was the 5th cyclone to occur in the South Pacific during the 2018-19 season. It was the 2nd cyclone which affected Fiji Group during the season. Pola attained a maximum intensity of Category 4. It was a mid-gale cyclone and lived for almost 3 days.

A low pressure system near Samoa developed into a tropical disturbance and was numbered TD11F on the 23rd. TD11F quickly developed into a depression on the 25th and further developed to a Category 1 tropical cyclone and was named TC Pola on the midnight of the 26th while it was to the far northeast of Vanua Levu. TC Pola gradually moved south with centre tracking to the east of the Lau group un-

derwent rapid intensification and reached Category 4 status intensity by the afternoon on the 27th (Figure 13). Gale force winds were experienced at Ono-i-Lau with maximum sustained wind of 64 km/hr and gust of up to 96 hr registered in the morning of 28th. Strong breeze were also recorded at Vanuabalavu and Matuku (Table 3). Pola also resulted in significant rainfall over the Southern Lau group with Ono-i-Lau registering 24-hour rainfall of 137mm on the 27th. The maximum hourly rainfall at Ono-i-Lau during the passage of Pola was 25mm, which was registered between 5-6am on the 28th.

Station	Maximum sustained wind speed		Maximum gust		Wind strength
	Speed (km/hr)	Date & Time	Speed (km/hr)	Date & time	
Ono-i-Lau	64	28/02-8.40am	96	28/02-7.10am	Gales
Vanuabalavu	45	27/02-12.30pm	66	27/02-12.30pm	Strong breeze
Matuku	46	28/02-7.50am	50	28/02-1.30am	Strong breeze

Table 3: Maximum sustained wind speed and gust recorded at meteorological stations during the passage of tropical cyclone Pola.

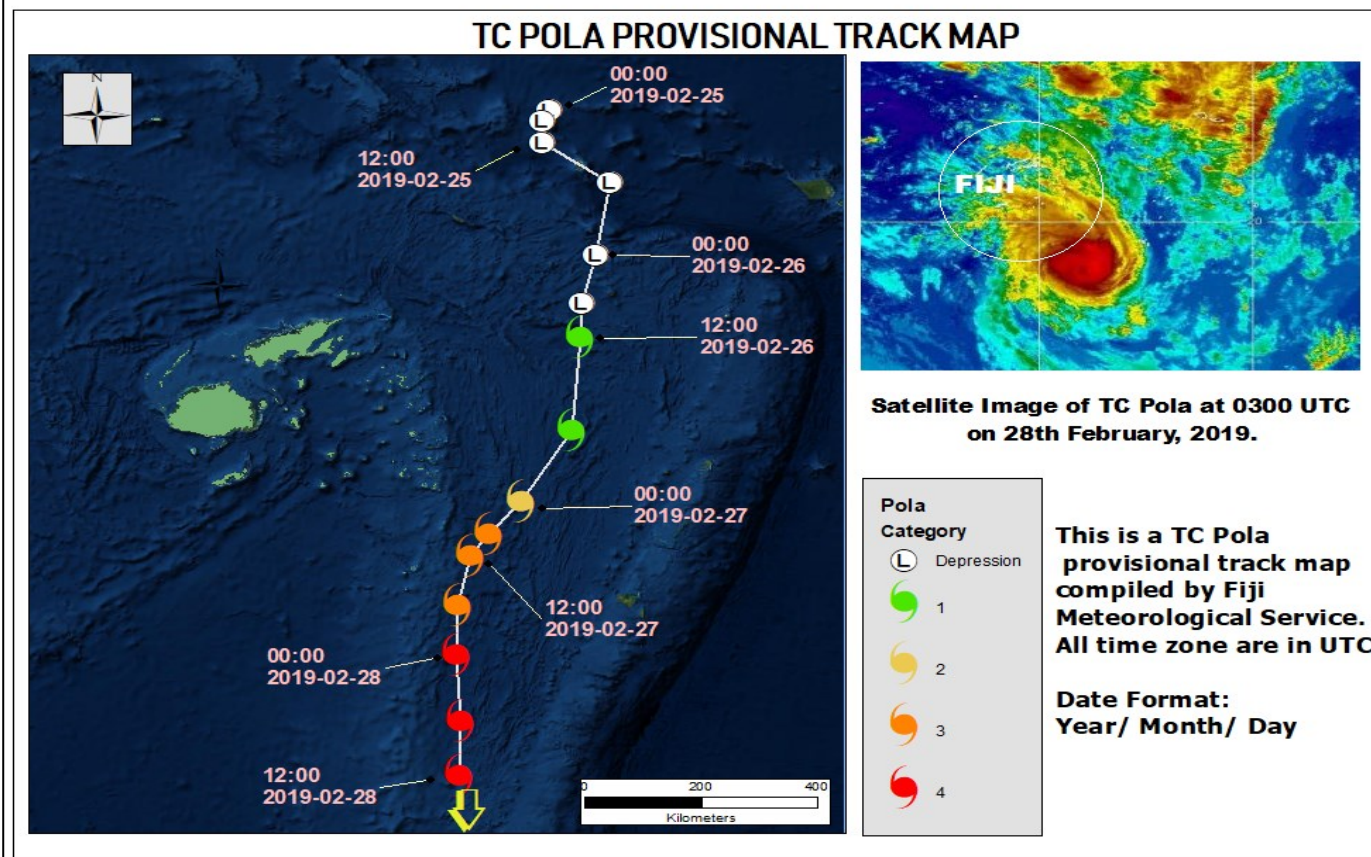


Figure 13: Provisional track map of tropical cyclone Pola.