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Fiji Climate Summary February 2023

ISO 9001:2015 certified Climate Services

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1. IN BRIEF

February weather was influenced by active trough of low pressure systems, moist northerlies, as well as rain bands associated with Tropical Depression 08F and Severe Tropical Cyclone Judy.

Flash flooding associated with the dominant weather features were mostly concentrated in the Western and Northern Divisions.

Overall, out of the 25 rainfall monitoring stations that reported in, in time for the compilation of bulletin, 8 stations recorded *well above average,* 11 recorded *above average,* 5 *average,* while Rotuma was the lone station with *below average* rainfall (Table 2, Figures 1-5).

The highest total monthly rainfall of 1052.5mm was observed at Nadarivatu, followed by Vaturekuka (Labasa) with 760.5mm, Rarawai Mill (Ba) with 752.2mm, Yaqara with 741.0mm, Lautoka Mill with 688.6mm, Tavua with 682.0mm, Nadi Airport with 643.7mm, Penang Mill with 580.2mm, Labasa Airfield with 548.0mm, Yasawa-I-Rara with 521.9mm, Momi with 520.5mm and Seaqaqa with 505.0mm.

On temperatures, the highest day-time temperature of 36.0°C was observed at Koronivia on the 3rd, followed by Levuka with 35.7°C on the 9th, Korolevu with 35.6°C on the 26th, Yasawa-I-Rara with 35.5°C on the 1st and Ono-i-Lau with 34.9°C on the 27th.

The coolest night-time temperature of 16.1°C was recorded at Nadarivatu on the 6th, followed by Monasavu with 17.6°C on the 7th, Vanuabalavu with 20.1°C on the 19th, Yasawa-I-Rara with 21.0°C on the 19th, Rarawai Mill (Ba) and Lakeba, both with 21.0°C on the 6th and Vaturekuka (Labasa) with 21.4°C on the 19th.

Northerly winds were dominant at Nadi Airport while north-westerly winds were the most observed winds at Nausori Airport during February (Figure 7).

Warmer than normal sea surface temperature anomalies were observed across most of the Fiji Group during the month (Figure 8).

The continuous heavy rainfall increased soil saturation, resulting in a number of landslides occurring across the country. There was a reported drowning victim, when a 30 year old farmer of Nayalayala settlement in Taveuni was swept away after he tried crossing a flooded river on the 4th.

2. WEATHER PATTERNS

The weather in February was dominated by the moist northerlies as well as active troughs of low-pressure systems, rain bands from both Tropical Depression 08F and Severe Tropical Cyclone Judy.

The month started with a trough of low pressure with associated cloud and rain located to the north of Fiji. The trough then gradually moved southwards over the northern and eastern parts of the group on the 2nd to 3rd. This brought heavy rain and caused flooding over Vanua Levu before drifting to the south on the 4th. The trough affected other parts of the country until the 10th.

TC Gabrielle which formed to the far west of Fiji drifted towards the southeast and was located to the far southwest of Fiji on the 11th. The associated convergence zone, strong north-westerly winds and rain bands brought periods of rain over the western division and caused flash floods till the 18th.

On the 19th, the trough cleared the group while another weak trough was analysed to the south of Fiji and lingered around the southern parts of the country till the 25th which brought some showers over most parts of the group.

Another tropical disturbance TD08F developed to the southwest of Samoa on the 24th and gradually moved westwards and intensified into TC Judy on the 27th to the southwest of Rotuma and southern parts of Solomon Islands. The associated trough of low pressure and rain bands which extended to the Fiji group brought occasional showers over the northern and western divisions and affected the country till the end of the month.

Rotuma's weather was influenced by the moist east to northerlies together with a series of troughs of low-pressure systems from the 1st to the 20th before a westerly wind flow dominated the island from the 21st to the 25th. By the 26th, TD08F lay to the north of Rotuma with the associated trough affecting the island till the end of the month.

*Previously known as the Fiji Islands Weather Summary and Monthly Weather Summary

3. RAINFALL

Typical wet season rainfall continued to be experienced at most parts of the country during the month. There were generally *above average* to *well above average* rainfall recorded across the country. The only exception was for Rotuma which recorded *below average* rainfall. Viwa, Yasawa-I-Rara, Nadi Airport, Lautoka Mill, Rarawai Mill (Ba), Tavua, Yaqara and Matuku observed more than twice their normal monthly rainfall.

Overall, out of the 25 rainfall monitoring stations that recorded in, in time for the compilation of bulletin, 8 stations recorded *well above average,* 11 recorded *above average,* 5 *average,* while Rotuma was the lone station with *below average* rainfall (Table 2, Figures 1-5).

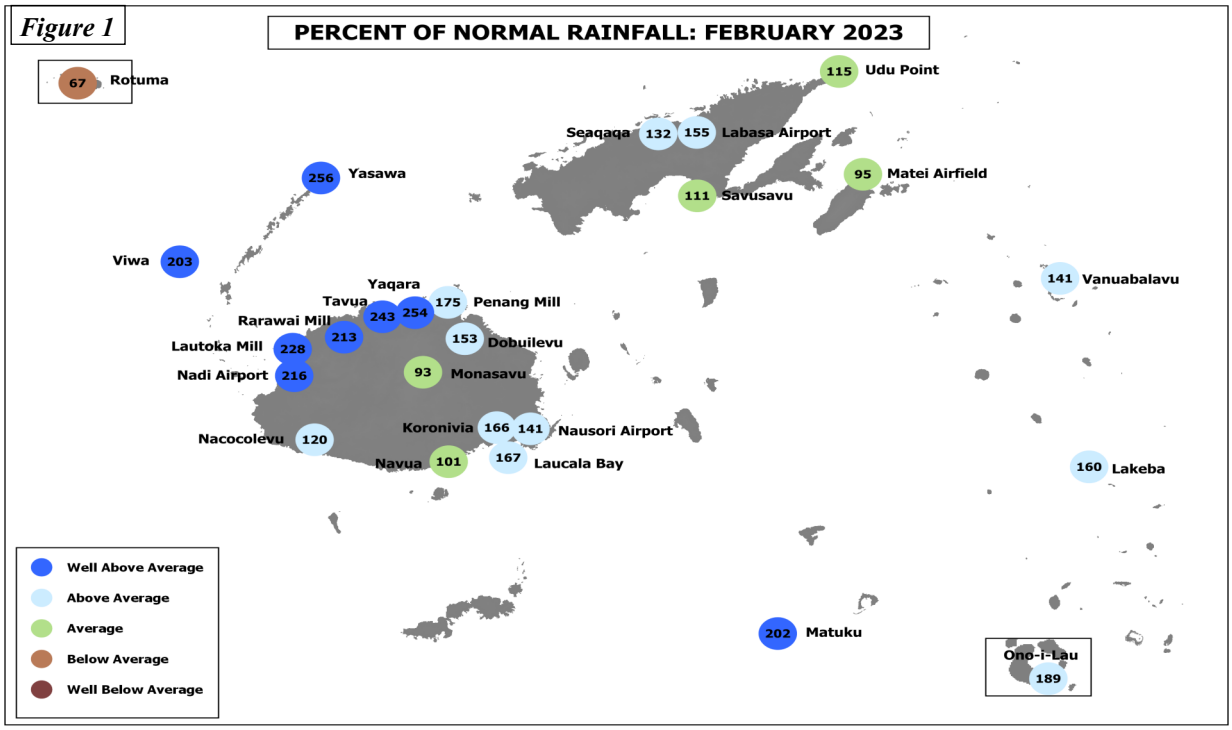
The highest monthly rainfall of 1052.5mm was observed at Nadarivatu, followed by Vaturekuka (Labasa) with 760.5mm, Rarawai Mill (Ba) with 752.2mm, Yaqara with 741.0mm, Lautoka Mill with 688.6mm, Tavua with 682.0mm, Nadi Airport with 643.7mm, Penang Mill with 580.2mm, Labasa Airfield with 548.0mm, Yasawa-I-Rara with 521.9mm, Momi with 520.5mm and Seaqaqa with 505.0mm. On the other hand, Rotuma recorded the month's lowest total monthly rainfall of 205.5mm, followed by Matei Airfield with 243.5mm, Savusavu Airfield with 253.2mm, both Keiyasi and Nacocolevu with 289.0mm and Navua with 294.0mm (Table 2).

Moist northerlies, series of active trough of low pressure systems, rain bands from Tropical Depression 08F and Severe Tropical Cyclone Judy brought significant rainfall throughout the country, especially across the Western and Northern Division. Highest 24-hour rainfall of 226mm was recorded for Vaturekuka (Labasa) on 3rd, followed by 204mm at Tavua on 16th, 203mm at Seaqaqa on 3rd, 192mm at Yaqara on 16th, 190mm at Penang Mill on 17th, 189mm at Nadarivatu on 16th and Lautoka Mill with 188mm, Momi with 179mm and Nadi Airport with 156mm all on the 16th, 156mm at Labasa Airfield on the 3rd and Rarawai Mill (Ba) with 139mm on 16th. During this period, series of flash flooding events occurred around low lying areas of Western and Northern Division.

Monasavu, Nadarivatu and Koronivia recorded the highest number of rain days (rainfall ≥0.1mm) with 27 days, followed by Lomaivuna with 26 days, Nacocolevu, Matei Airfield, and Savusavu Airfield all with 25 days, Nadi Airport, Navua and Lakeba all with 24 days, Yaqara, Lautoka Mill, Rarawai Mill (Ba), Vaturekuka (Labasa), Labasa Airfield and Vanuabalavu all with 23 days. Consequently, Udu Point recorded the least number of rain days with 15 days, followed by Seaqaqa with 16 days, Levuka with 17 days, Ono-i-Lau with 18 days, Sigatoka, Laucala Bay (Suva) and Momi, all with 20 days.

There was no new rainfall record established during the month.

Figure 1



Normal: *Long term average from 1981 to 2010*
Well Below Average: *Rainfall less than 40% of normal*
Below Average: *Rainfall between 40 to 79%*
Rain Day: *Rainfall ≥ 0.1mm*

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 Day-time Air Temperatures

Above normal day-time air temperatures were observed at most parts of the country during the month. Out of the 22 climate stations that reported in time for the analysis of data, 12 recorded anomalies ≥+0.5°C, 8 within ±0.5°C and Nadi Airport and Rarawai Mill (Ba) were the only two stations with anomalies ≤-0.5°C.

The warmest days on average were recorded at Korolevu with 32.5°C, Ono-i-Lau with 32.4°C, Koronivia with 32.2° C, Laucala Bay (Suva), Yasawa-I-Rara, Labasa Airfield and Vunisea, all with 32.0°C. Consequently, Nadarivatu recorded the coolest days on average with 24.9°C, followed by Monasavu with 26.5°C, Vaturekuka (Labasa) with 30.3°C, Vanuabalavu with 30.6°C, Momi with 30.8°C, Matei Airfield with 30.9°C and Nadi Airport with 31.0°C.

The highest day-time temperature was observed at Koronivia with 36.0°C on the 3rd, followed by Levuka with 35.7°C on the 9th, Korolevu with 35.6°C on the 26th, Yasawa-I-Rara with 35.5°C on the 1st and Ono-i-Lau with 34.9°C on the 27th. On the other hand, the coolest day-time temperature of 21.3°C was at Nadarivatu and 22.5°C at Monasavu, both on the 17th, followed by Vaturekuka (Labasa) with 25.2°C on the 14th, Seaqaqa with 25.7°C on the 17th, Momi with 26.7°C on the 16th, both Labasa Airfield and Levuka with 26.8°C on the 14th and 17th, respectively.

Koronivia recorded its highest daily maximum temperature since observations began in 1950 (Table 1).

B. Minimum Night-time Air Temperatures

Generally *above normal* night-time temperatures were recorded over most parts of the country during the month. Of the 20 stations, 8 recorded anomalies ≥+0.5°C, 6 within ±0.5°C, and 6 with anomalies ≤-0.5°C.

The coolest days on average was at Nadarivatu with 19.2°C, followed by Monasavu with 20.5°C, Yasawa-I-Rara with 22.4°C, Vaturekuka (Labasa) with 22.7°C, Rarawai Mill (Ba) with 22.8°C, Udu Point and Vanuabalavu, both with 23.0°C, Wainikoro with 23.1°C, Lakeba and Sigatoka, both with 23.2°C, and Korolevu with 23.3°C. Consequently, on average, the warmest night-time temperatures were observed at Viwa with 25.3°C, followed by Ono-i-Lau with 25.1°C, Vunisea and Laucala Bay (Suva), both with 24.9°C, Seaqaqa, Momi and Levuka, all with 24.7°C and Matuku with 24.3°C.

The coolest night-time temperature of 16.1°C was recorded at Nadarivatu on the 6th, followed by Monasavu with 17.6°C on the 7th, Vanuabalavu with 20.1°C on the 19th, Yasawa-I-Rara with 21.0°C on the 19th, Rarawai Mill (Ba) and Lakeba, both with 21.0°C on the 6th and Vaturekuka (Labasa) with 21.4°C on the 19th. On the other hand, the warmest night-time temperature of 27.5°C was recorded at Ono-i-Lau on the 3rd , followed by Viwa, Vunisea and Lomaivuna, all with 27.4°C on the 25th, 27th and 4th, respectively, Levuka with 26.8°C on the 28th, Seaqaqa with 26.6°C on the 26th, Laucala Bay (Suva) with 26.5°C on the 26th, and Vanuabalavu with 26.5°C on the 1st.

There were no new night-time temperature records established during the month

TABLE 1. CLIMATE RECORDS ESTABLISHED IN FEBRUARY 2023

Element	Station	Observed (record)	On	Rank	Previous (record)	Year	Records Began
Daily Maximum Temperature	Koronivia	36.0°C	3rd	New High	34.5°C	1988	1950

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 1981-2010 period as its "climatic normal" period.

TABLE 2. DAILY CLIMATE REPORTING SITES: SUMMARY FOR FEBRUARY 2023

	RAINFALL					AIR TEMPERATURES								SUNSHINE	
	TOTAL		RAIN *	MAX. DAYS +	FALL MM	ON	AVERAGE DAILY MAX. C	# C	MIN. C	# C	EXTREME MAX. C	ON	MIN. C	ON	TOTAL HRS	* %
	MM	%														
NADI AIRPORT	643.7	216	24	156	16		31.0	-0.6	23.8	0.7	33.2	25	21.9	14	166	89
LAUCALA BAY	425.3	167	20	88	7		32.0	0.6	24.9	0.6	33.9	12	23.5	8	137	76
NACOCOLEVU RESEARC	289.0	120	25	57	16		31.5	-0.1	23.5	0.8	34.7	25	22.9	4	121	78
ROTUMA ISLAND	205.5	67	21	78	2		31.4	0.4	24.1	-0.7	33.0	22	22.6	12	155	103
VIWA ISLAND	458.8	203	22	63	5		31.8	0.2	25.3	-0.1	33.6	25	22.6	26		
YASAWA-I-RARA	521.9	256	21	78	16		32.0	0.9	22.4	-2.3	35.5	1	21.0	19		
UDU POINT WEATHER	315.7	115	15	53	12		31.2	0.1	23.0	-1.7	32.6	28	21.5	8		
NABOUWALU	STATION TEMPORARILY CLOSED															
LABASA AIRFIELD	548.0	155	23	156	3		32.0	0.3	23.5	0.9	34.0	24	22.1	19		
SAVUSAVU AIRFIELD	253.2	111	25	57	3		31.9	1.0	U/S		34.4	27	U/S			
KORONIVIA RESEARCH	462.2	166	27	85	6		32.2	1.3	U/S		36.0	3	U/S			
NAUSORI AIRPORT	373.7	141	21	64	5		31.9	1.0	23.9	0.5	33.5	12	22.5	21		
NAVUA (AWS)	294.0	101	24	55	9		31.9	1.0	23.4	1.3	34.8	28	22.2	11		
MONASAVU HYDRO DAM	480.2	93	27	80	21		26.5	0.7	20.5	1.1	29.1	1	17.6	7		
FSC LAUTOKA MILL	688.6	228	23	188	16		31.4	0.0	23.8	-0.1	32.6	5	21.8	5		
FSC RARAWAI MILL	752.2	213	23	139	16		31.5	-0.6	22.8	0.4	34.4	25	21.0	6		
FSC PENANG MILL	580.2	176	21	190	17		31.4	0.3	23.7	-0.1	33.5	1	22.5	18		
MATEI AIRFIELD	243.5	95	25	89	3		30.9	0.5	23.4	-0.8	32.4	7	21.9	4		
VANUABALAVU	301.1	141	23	47	3		30.6	0.0	23.0	-1.9	32.4	1	20.1	19		
LAKEBA	321.1	160	24	69	2		31.3	0.7	23.2	-1.2	32.7	28	21.0	6		
VUNISEA AWS	U/S						32.0	1.4	24.9	1.1	34.1	28	23.5	5		
MATUKU	336.8	202	21	63	5		31.2	0.6	24.3	-0.4	32.2	20	23.5	7		
ONO-I-LAU AWS	334.0	189	18	59	14		32.4	2.2	25.1	0.4	34.9	27	23.6	5		
YAQARA AWS	741.0	254	23	192	16		31.4		23.7		33.8	24	22.5	6		
LEVUKA AWS	396.0		17	89	17		31.9		24.7		35.7	9	22.5	4		
KEIYASI AWS	289.0		22	61	16		U/S		U/S		U/S		U/S			
LOMAIVUNA AWS	374.5		26	72	9		U/S		23.5		U/S		21.7	11		
NADARIVATU AWS	1052.5		27	189	16		24.9		19.2		28.5	24	16.1	6		
RKS LODONI AWS	MISSING OBSERVATION															
MOMI AWS	520.5		20	179	16		30.8		24.7		33.5	27	23.9	19		
SIGATOKA AWS	332.0		20	78	23		31.6		23.2		34.2	25	22.5	6		
VATUREKUKA AWS	760.5		23	226	3		30.3		22.7		32.2	24	21.4	19		
KOROLEVU AWS	317.0		22	63	23		32.5		23.3		35.6	26	22.4	11		
WAINIKORO AWS	396.5		21	88	3		31.5		23.1		33.0	19	21.9	19		
SAQANI AWS	MISSING OBSERVATION															
SEAQAQA AWS	505.0	132	16	203	3		31.6		24.7		34.0	24	23.2	11		
DOBUILEVU TB3	471.5	153	22	93	16											
NASINU TB3	333.5		22	45	5											
TAVUA TB3	682.0	243	21	204	16											

	TEMPERATURE(C)		HUMIDITY	WIND
	MEAN	DRY (AVERAGE AT 9AM)	WET (AVERAGE AT 9AM)	RH% (AVERAGE AT 9AM)	VP (AVERAGE AT 9AM)	KT
NADI AIRPORT	27.4	27.5	25.6	85	27.5	5.8
LAUCALA BAY	28.5	29.2	26.2	78	30.3	4.9
NACOCOLEVU RESEARC	27.5	28.9	26.3	82	29.8	
ROTUMA ISLAND	27.8	29.3	26.6	81	30.5	
VIWA ISLAND	28.5	29.1	26.8	84	30.1	
YASAWA-I-RARA	27.2	27.5	26.1	90	27.5	
UDU POINT WEATHER	27.1	28.5	25.8	81	29.1	
NABOUWALU	STATION TEMPORARILY CLOSED					
LABASA AIRFIELD	27.8	27.9	25.6	83	28.1	
SAVUSAVU AIRFIELD	U/S	28.7	26.1	82	29.4	
KORONIVIA RESEARCH	U/S	28.9	26.2	81	29.8	
NAUSORI AIRPORT	27.9	28.2	25.8	82	28.6	5.4
NAVUA AWS	28.5					
MONASAVU HYDRO DAM	23.5	23.4	23.2	98	21.5	
FSC LAUTOKA MILL	27.6	28.3	26.1	85	28.8	
FSC RARAWAI MILL	27.2	27.6	25.7	86	27.6	
FSC PENANG MILL	27.5	28.7	25.9	81	29.4	
MATEI AIRFIELD	27.2	28.8	26.1	81	29.6	
VANUABALAVU	26.8	28.7	25.7	78	29.4	
LAKEBA	27.2	28.8	26.2	81	29.6	
VUNISEA AWS	27.5					
MATUKU	27.8	28.7	25.7	79	29.4	
ONO-I-LAU AWS	28.8					

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 (1981-2010). + :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

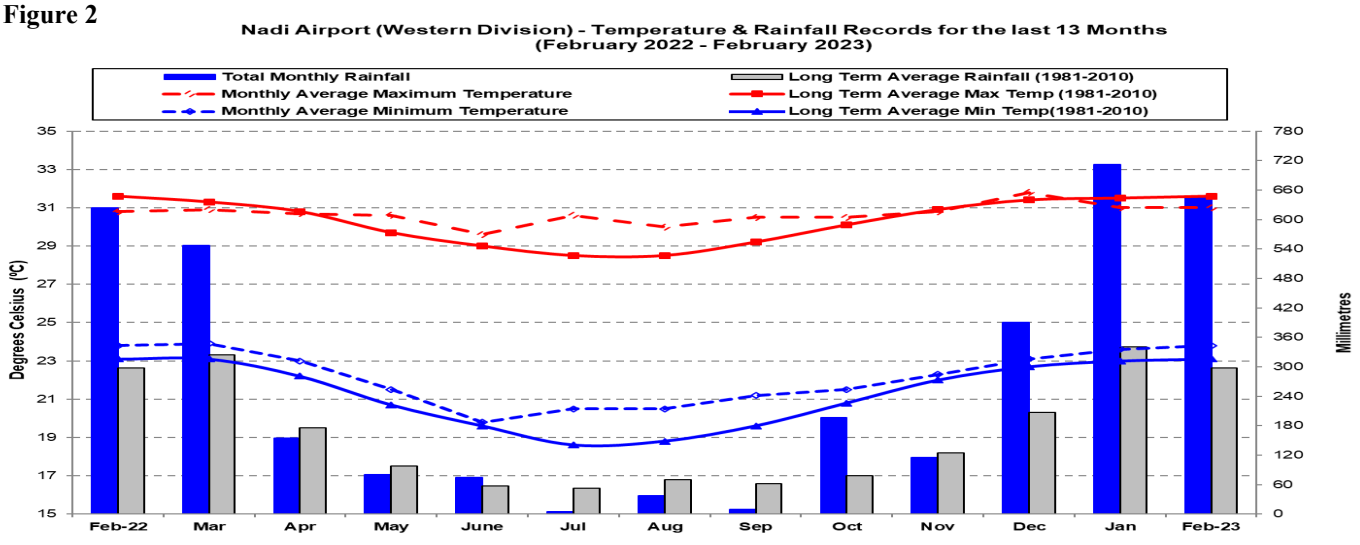


Figure 3

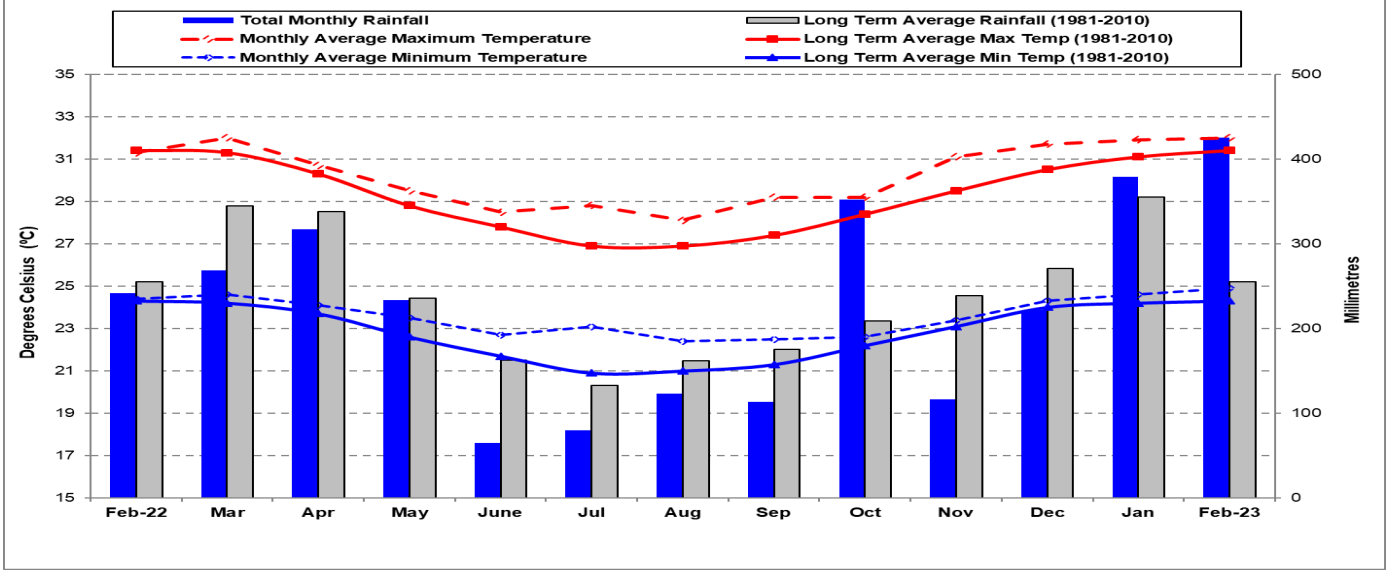


Figure 4

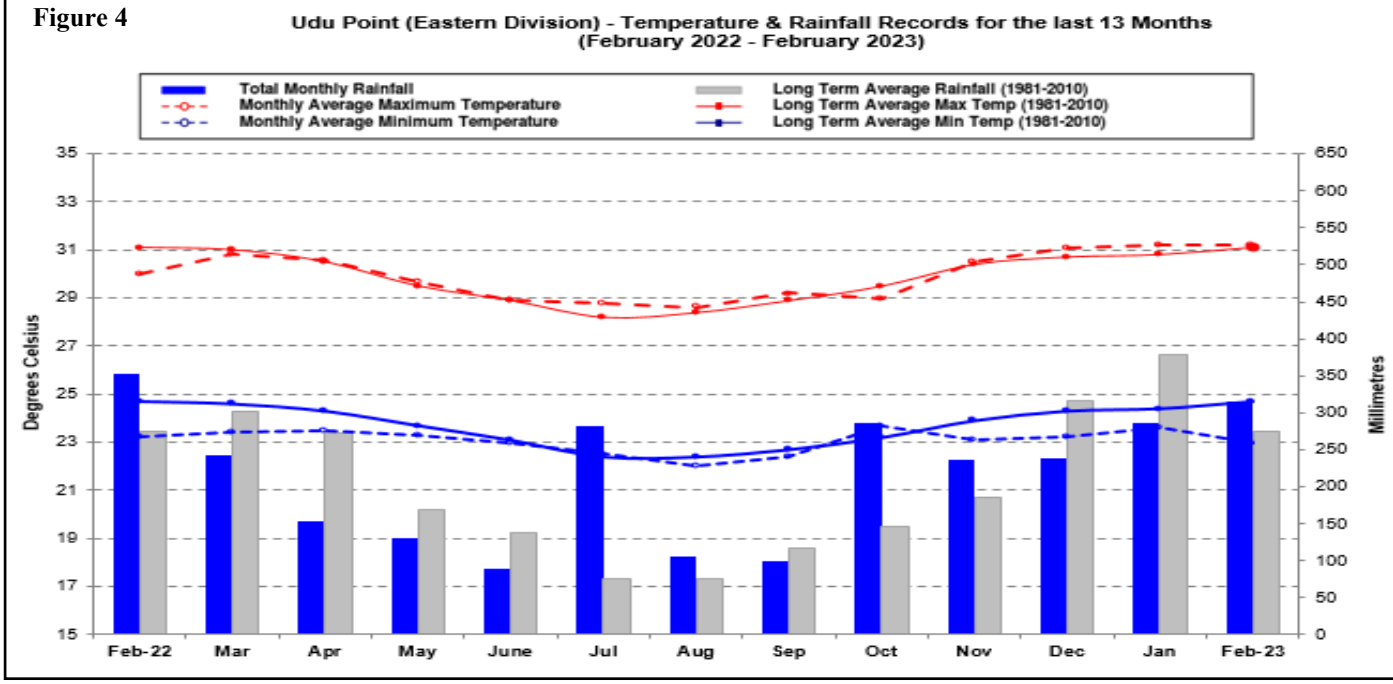
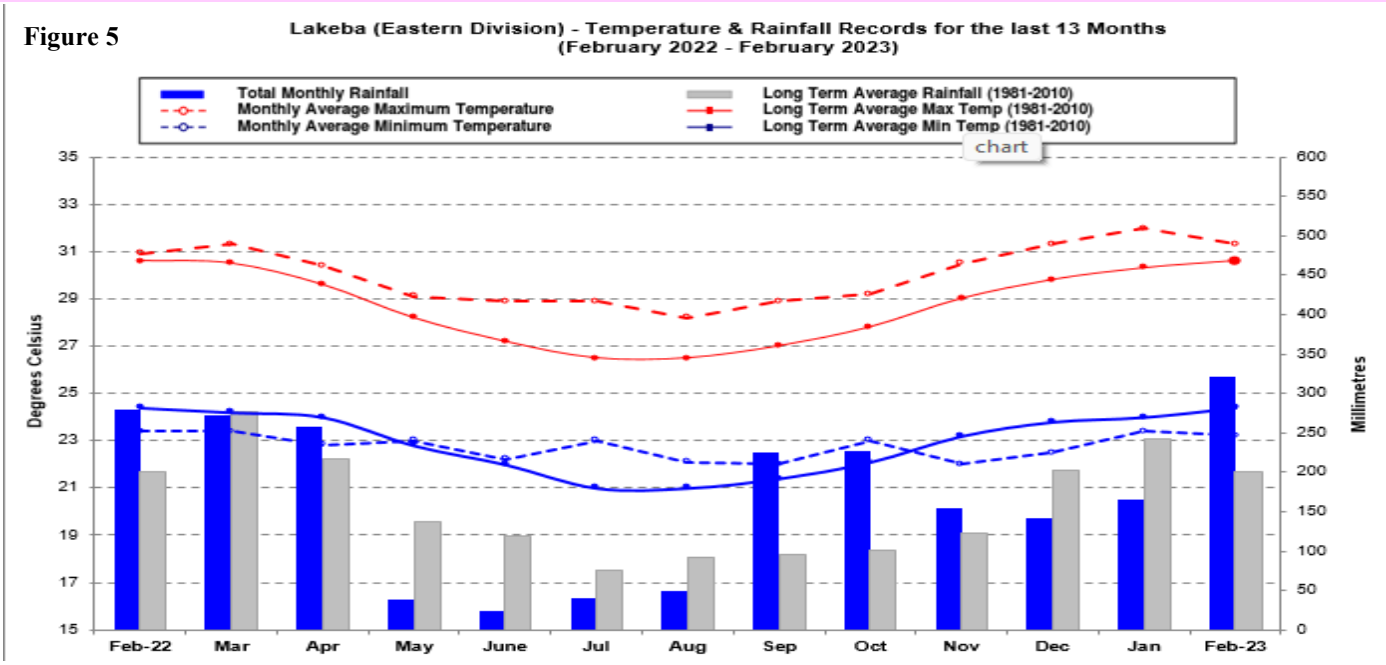


Figure 5



5. DAILY RAISED PAN EVAPORATION

Figure 6

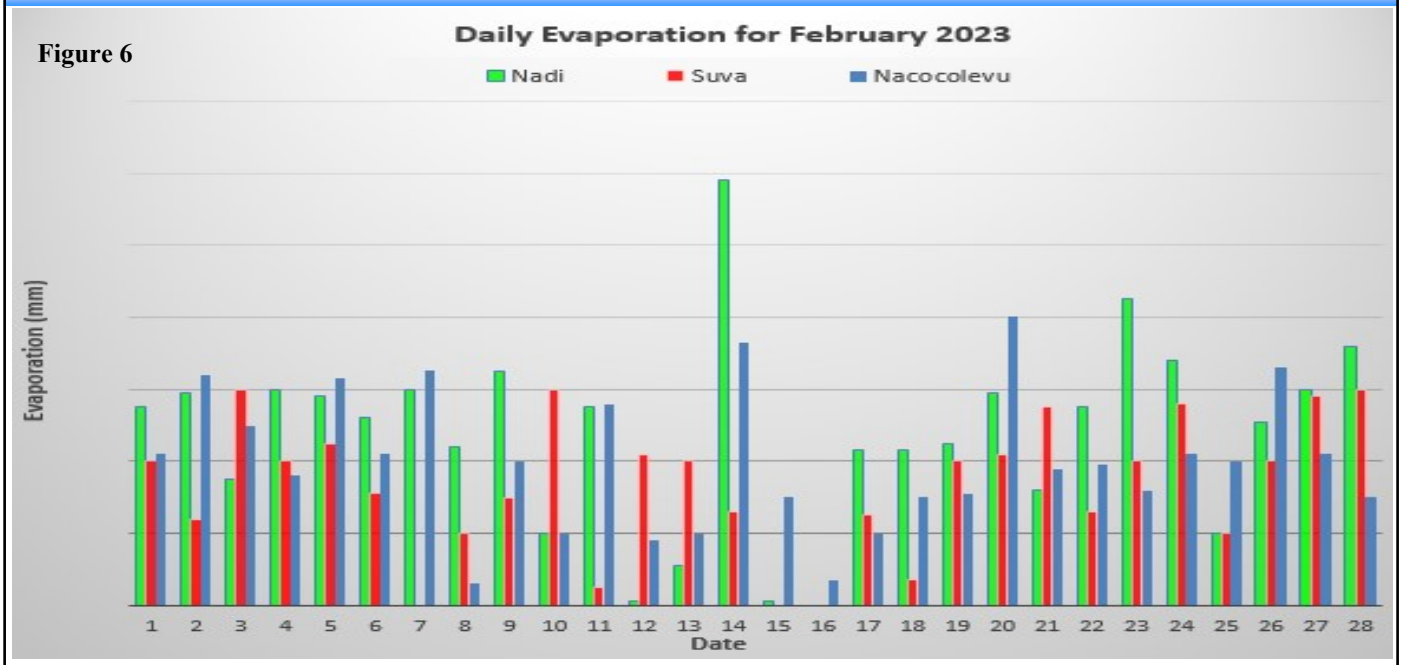


Figure 6: The total monthly raised pan evaporation at Nadi Airport, Laucala Bay (Suva) and Nacocolevu (Sigatoka) were 132.7mm, 93.2mm and 112.2mm respectively. Nadi's highest daily evaporation was 11.8mm on the 14th, with Suva's highest daily evaporation of 6.0mm on 3rd, 10th and 28th and Nacocolevu (Sigatoka) recorded its highest of 8.0mm on the 20th.

6. SOLAR RADIATION

The Nadi solar radiation instrument became unserviceable during the month of February 2023.

7. WIND SUMMARY

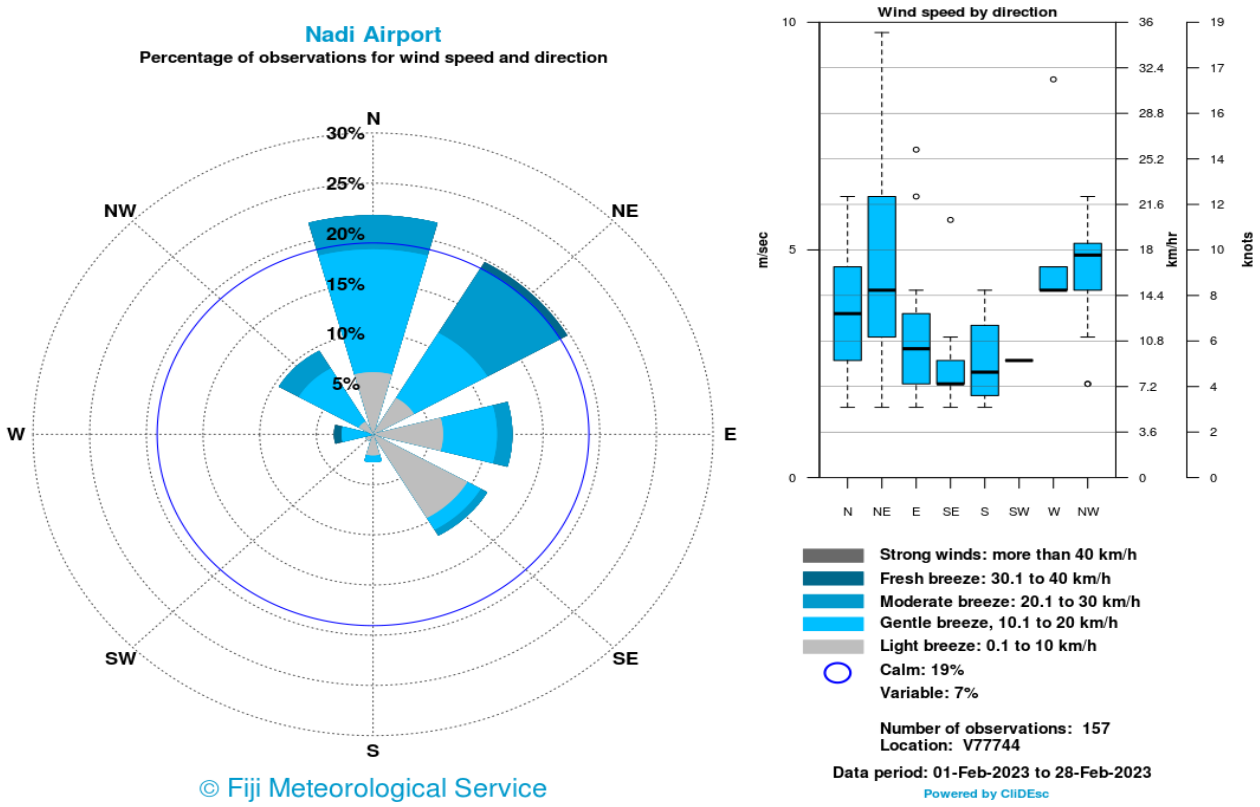


Figure 7a: Looking at Nadi's 3hourly observations, northerly winds were most dominant during the month, followed by north-easterly and easterly winds. Wind strength ranged from fresh to light breeze, with calm winds observed during 19% of the time.

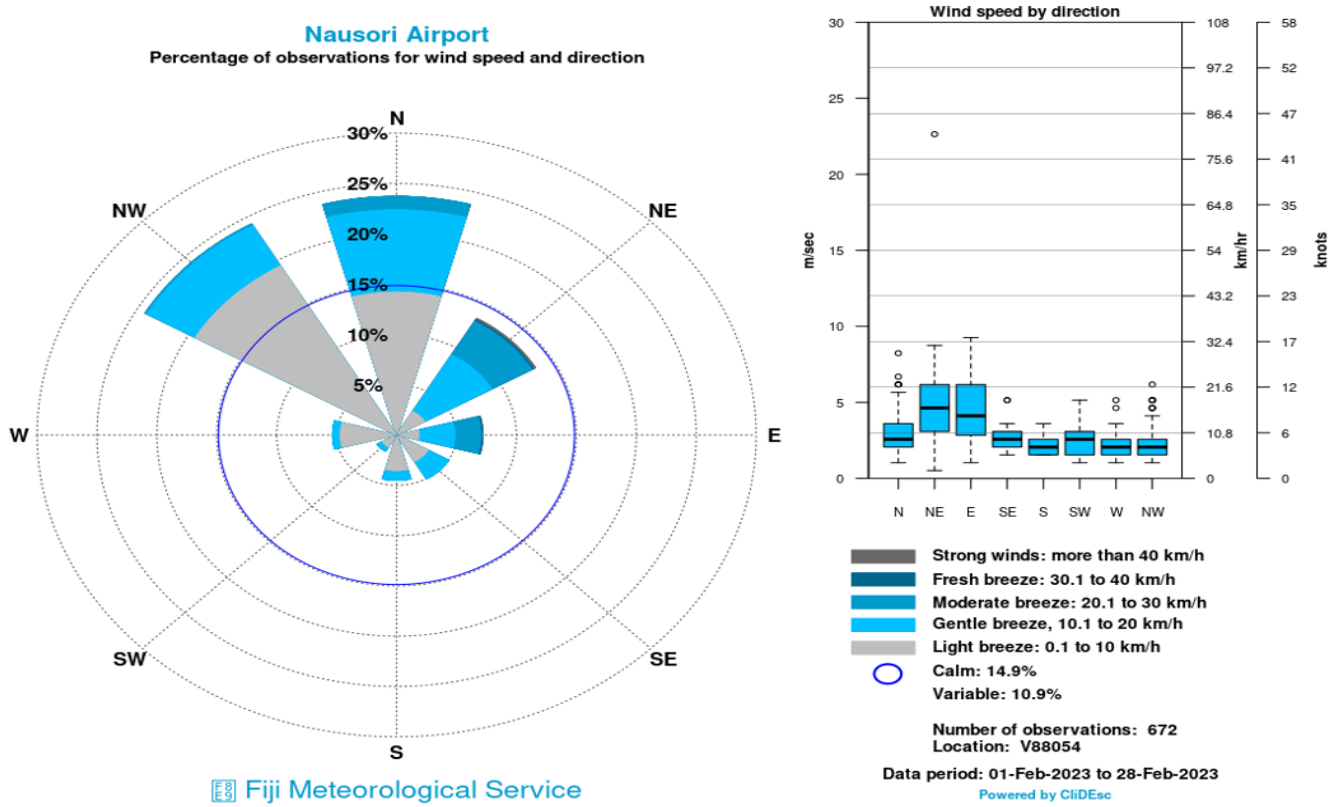


Figure 7b: For Nausori Airport's hourly wind observations, northwesterly winds were dominant followed by northerly, then northeasterly winds. Wind strength ranged from moderate to light breeze, while 14.9% of observations accounted for calm winds.

8. SEA SURFACE TEMPERATURE (SST)

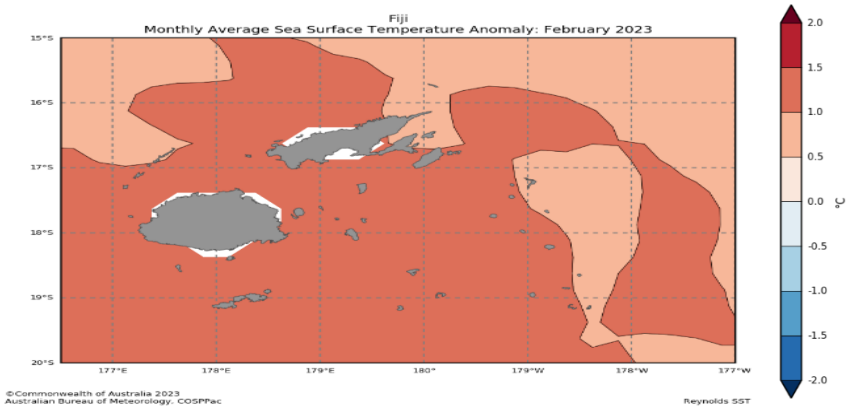


Figure 8:
Warmer than normal sea surface temperature anomalies were observed across the Fiji Group.

Source: http://oceanportal.spc.int/portal/app.html#climate

9. CLOUD COVER

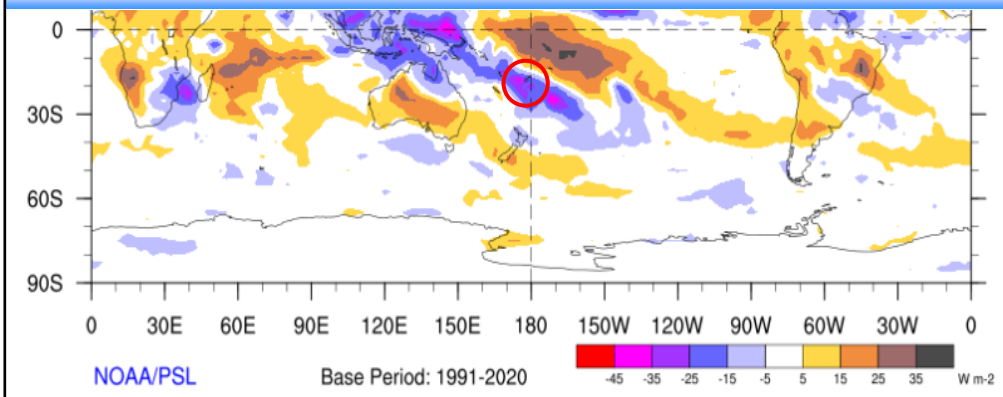


Figure 9:
Above normal cloud cover was present over the Fiji Group during February (*Fiji in red circle).*

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

10. SEA LEVEL

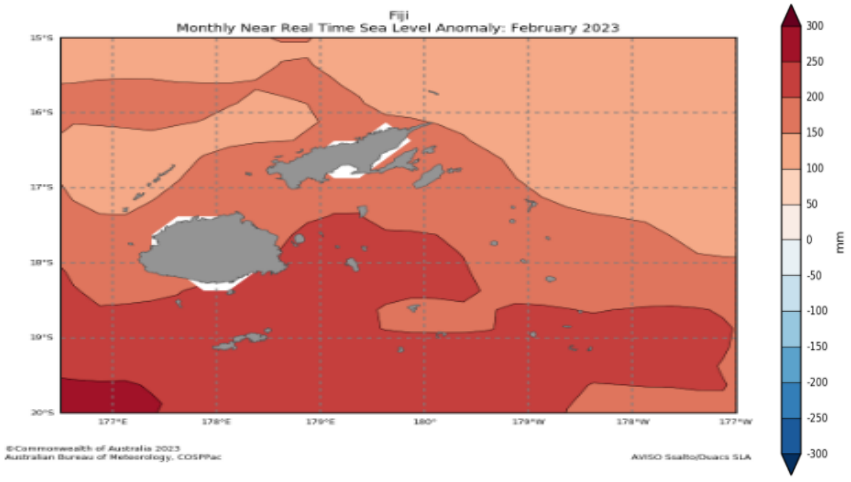


Figure 10:
Above normal sea level anomalies persisted across most of the Fiji Waters during February.

Source: http://oceanportal.spc.int/portal/app.html#sealevel

11. WIND ANOMALIES

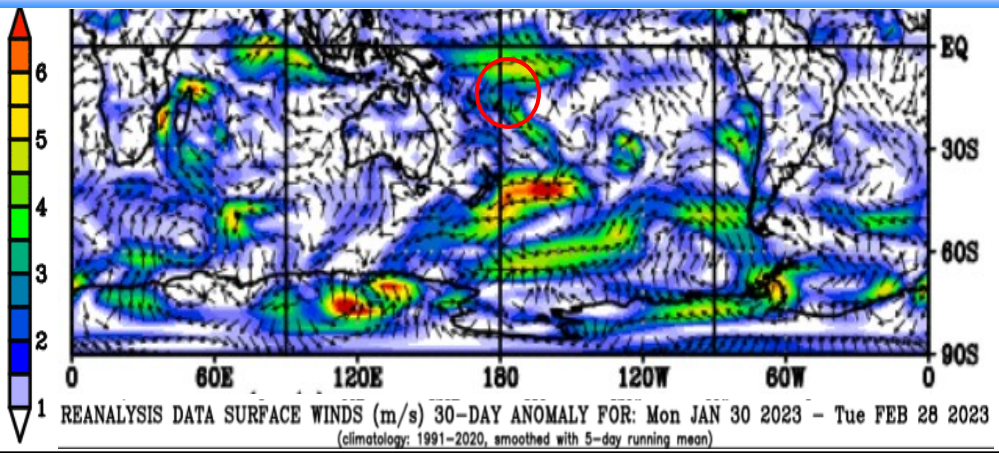


Figure 11:

Northeasterly wind anomalies were generally observed over the Fiji Group during the month (base period: 1981-2010) (*Fiji in red circle*).

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

12. FLASH FLOODING

Three episodes of flash flooding were recorded over the country during the month, especially across the Western and Northern Divisions.

The first episode of flash flooding occurred when a trough of low pressure with associated cloud and rain located to the north of Fiji gradually moved southwards over the northern and eastern parts of the country on the 2nd to 3rd. This resulted in significant rainfall being recorded at Seaqaqa with 203mm and Labasa Airfield with 156mm, both on the 3rd. Flash flooding occurred around low-lying areas of the Northern Division (Figure 12 to 14).

The associated convergence zone, strong north-westerly winds and rain bands brought periods of rain over the Western division from 11th to 18th. During this period, major flash floods occurred at several crossings and roads in most parts of the Western Division (Figure 16 to 19). Significant 24-hour rainfall of 105mm was recorded at Nadarivatu on 12th, followed by 105mm at Lautoka on the 14th, 126mm at Nadarivatu on the 15th, 204mm at Tavua, 192mm at Yaqara, 189mm at Nadarivatu, 188mm at Lautoka Mill, 179mm at Momi, 156mm at Nadi Airport and 139mm at Rarawai Mill (Ba), all on the 16th and 190mm at Penang Mill on 17th.

Due to localised heavy rain, the third episode of flash flooding occurred in some parts of Rakiraki on the 22nd (Figure 19 to 20).

There was a reported drowning victim when a 30 year old farmer of Nayalayala settlement in Taveuni was swept away after he tried crossing a flooded river on the 4th.

Figure 12: Flooding in Labasa town on 3rd February, 2023. Source: Fiji Sun.

Figure 13: A vehicle swept away at Munir Road in Seaqaqa on 3rd February, 2023. Source: Fiji Roads Authority.

Figure 14: Fallen coconut trees due to torrential rainfall in Siberia, Labasa on 3rd February, 2023. Source: Fiji Roads Authority.

Figure 15: Flooding in Balevuto, Ba on 17th February, 2023. Source: fijivillage.

Figure 16: Nadi town inundated with floodwaters on 17th February, 2023. Source: fijivillage

Figure 17: Flooding in low lying areas of Tavua on 17th February, 2023. Source: Women's Weather Watch.

Figure 18: Rabulu road (Tavua) damaged due to continuous flooding on 17th February, 2023. Source: fijivillage.

Figure 19: Flash flooding in Rakiraki Town on 22nd February, 2023. Source: Femlink Pacific.

Figure 20: Flooding in Rakiraki on 22nd February, 2023. Source: Femlink Pacific.

12. LANDSLIDE

The continuous heavy rainfall made the soil saturated and as a result, a number of landslides occurred across the country. Landslide occurred at Nadarivatu on 18th February and another landslide occurred at Nakabuta settlement, Kubulau road, Wainunu, Bua on 21st February. A landslide also occurred at Paipai, Lautoka following a heavy downpour on 23rd February, which disrupted travelling for more than 30 residents.

Figure 21: Landslide in Nadarivatu on 18th February, 2023. Source: Fiji Roads Authority.

Figure 22: Landslide at Nakabuta settlement, Kubulau road, Wainunu, Bua on 21st February, 2023. Source: The Fiji Times.

Figure 23: Landslide in Paipai, Lautoka after heavy downpour on 23rd February, 2023. Source: Fiji Sun.