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Fiji Climate Summary January 2023

ISO 9001:2015 certified Climate Services

Issued: February 7, 2023
Next Issue: March 7, 2023
Since : August 1980*
Volume 44 : Issue 01

1. IN BRIEF

Typical La Niña event rainfall pattern continued to be observed at most parts of the country during the month.

During January , active convergence zones, troughs of low pressure, moist northwesterly and easterly winds and the rain bands were dominant, contributing to wetter than normal conditions observed at most parts of the country. Generally *average* to *above average* rainfall was recorded during the month. There were two (2) episodes of flash flooding recorded during the month.

Overall, out of the 25 rainfall monitoring stations that recorded in, in time for the compilation of bulletin, 1 recorded well *below average* rainfall, 8 below *average*, 9 *average*, 6 *above average*, and 1 recorded *well above average* rainfall (Table 2, Figures 1-5).

The highest monthly rainfall of 729.9mm was observed at Rarawai Mill, followed by Nadi Airport with 711.9mm, Nadarivatu with 611.5mm, Keiyasi with 555.5mm, Nacolevu with 524.5mm, Sigatoka with 513.5mm, Momi with 491.5mm and Penang Mill with 490.5mm,

On temperatures, the highest day-time temperature of 36.9° C was recorded at Korolevu on the 10th , followed by Wainikoro with 36.6°C on the 5th, Levuka with 36.4°C on the 29th and Yasawa-i-Rara with 36.0°C on the 31st.

The coolest night-time temperature of 16.7°C was recorded at Nadarivatu on the 29th, followed by Monasavu with 17.9°C on the 17th, Rarawai Mill (Ba) with 19.6°C on the 15th and Savusavu Airfield with 20.4°C on the 28th.

South-easterly winds were dominant at Nadi Airport while north-westerly winds were the most observed winds at Nausori Airport during January (Figure 8).

Warmer than normal sea surface temperature anomalies were observed across most of the Fiji Group during the month (Figure 9).

2. WEATHER PATTERNS

The weather in January, 2023 was influenced by active convergence zones, troughs of low pressure, moist northwesterly and easterly winds and the rain bands associated with two tropical depressions TD04F and TD05F (TC Irene). Northwesterly winds prevailed over the country from 1st till the 13th day of the month.

The month started with an active convergence zone lying slow moving over the western parts of Viti Levu, bringing heavy rain and causing some flash floods over the western division and interior of Viti Levu. Occasional rain prevailed over the rest of the Fiji group. This convergence zone affected the western parts of the country before drifting to the south on the 6th.

TD03F developed to the south of Vanuatu on 6th and gradually moved southeast. The associated troughs of low pressure and rain bands brought occasional showers over the western parts of Viti Levu with afternoon showers over the eastern and central parts of the country. It affected the group till the 7th of the month.

TD04F developed to the southwest of New Caledonia on the 7th of the month and tracked southeast. Associated trough of low pressure and northwesterly wind flow brought some showers over the western parts of the country while afternoon showers and thunderstorms was experienced over the interior parts of Viti Levu and Vanua Levu. It affected the group till the 9th.

From the 10th till the 17th, a trough of low pressure to the north of the group, a trough to the west, moist northwesterly wind flow affected most parts of the country with rain and showers which was heavy over some places causing flash floods. Rain activity was enhanced a shallow low which developed within the trough to the west.

From the 18th till the 22nd, the trough of low pressure, active rain bands together with the northwesterly winds associated with TC Irene brought occasional heavy rain over most parts of the country with afternoon and evening. Moderate swells over Fiji waters generated by TC Irene and the King tide caused coastal inundation over some low lying coastal areas of Fiji during 21st to 24th.

From the 23rd till the end of the month, moist east to northeast wind flow prevailed over the group. Some showers was experienced over the eastern parts and interior of larger islands. Elsewhere, afternoon or evening showers was experienced. Isolated afternoon thunderstorms with heavy falls and lightning was experienced especially about the main islands.

The weather for Rotuma was dominated by northerly wind flow together with a series of troughs of low pressure. Fine weather with brief showers prevailed over the island for the first week. Troughs of low pressure affected Rotuma from the second week, which brought occasional rain and few thunderstorms over the group.

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 exceptions were at Navua, Savusavu Airfield, Udu Point, Vanuabalavu, Lakeba, Dobuilevu, Monasavu and Rotuma which recorded *below average* rainfall. Matei registered less than half its normal monthly rainfall, while Nadi Airport registered more than twice its normal monthly rainfall.

Overall, out of the 25 rainfall monitoring stations that recorded in, in time for the compilation of bulletin, 1 recorded well *below average* rainfall, 8 below *average*, 9 *average*, 6 *above average*, and 1 recorded *well above average* rainfall (Table 2, Figures 1-5).

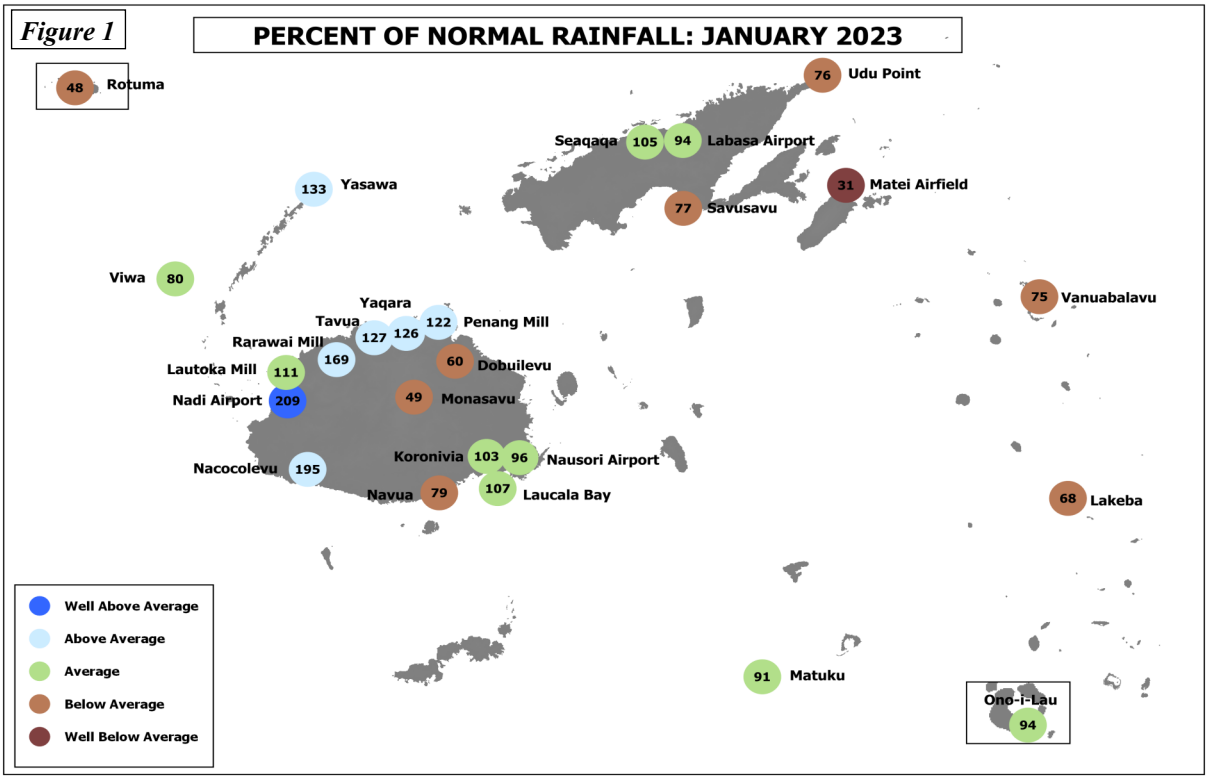
The highest monthly rainfall of 729.9mm was observed at Rarawai Mill, followed by Nadi Airport with 711.9mm, Nadarivatu with 611.5mm, Keiyasi with 555.5mm, Nacocolevu with 524.5mm, Sigatoka with 513.5mm, Momi with 491.5mm, Penang Mill with 490.5mm, Tavua with 455.55mm and Seaqaqa with 451.0mm. On the other hand, Saqani recorded the month's lowest total monthly rainfall of 105.0mm, followed by Matei with 115.2mm, Lakeba with 165.3mm, Ono-i-Lau with 167.1mm, Rotuma with 168.1mm, Vanuabalavu with 181.3mm, Viwa with 209.5mm and Matuku with 210.1mm (Table 2).

Active convergence zone lying slow moving over the western parts of Viti Levu from 1st to 5th, resulted in significant 24-hour rainfall of 231mm was recorded for Tavua, followed by 164mm at Nadarivatu, 133mm at Yasawa-i-Rara, 125 at Rarawai Mill (Ba), 118mm at Lautoka Mill, 103mm at Yaqara with 103mm all on the 2nd and 114 at Nadi Airport on the 5th. During this period, some flash floods occurred over the Western Division and interior of Viti Levu.

A trough of low pressure to the north of the group, a trough to the west, moist northwesterly wind flow affected most parts of the country from 10th to 17th, resulted in Seaqaqa, Vaturekuka (Labasa), Wainikoro and Udu Point registering their highest 24-hour rainfall of 167mm, 134mm, 109mm and 108mm all on the 12th, respectively This led to flash flooding of some places in northern Vanua Levu and parts of Western Division.

Nacocolevu recorded the highest number of rain days (rainfall ≥0.1mm) with 28 days, followed by Rarawai Mill (Ba), Labasa Airport and Navua all with 24 days, Monsavu, Laucala Bay (Suva) and Savusavu Airfiled all with 23 days, Nadi Airport, Nausori Airport and Nasinu all with 22 days, and Koronivia, Dobuilevu Matuku and Rotuma all with 21 days. Consequently, Vanuabalavu recorded the least number of rain days with 14 days, followed by Matei and Lakeba both with 17 days, Udu Point, Tavua and Penang Mill all with 18 days, Yasawa-i-rara with 19 day, and Ono-i-Lau, Viwa, Yaqara and Lautoka Mill all with 20 days.

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 21 climate stations that reported in time for the analysis of data, 15 recorded anomalies ≥+0.5°C, 5 within ±0.5°C and Nadi Airport was the lone station with anomaly ≤-0.5°C.

The warmest days on average were recorded at Saqani with 33.1°C, followed by Savusavu Airfield, Labasa Airport and Seaqaqa all with 32.7°C, Korolevu with 32.6°C, Keiyasi and Wainikoro both with 32.4°C, Koronivia with 32.3°C, and Viwa with 32.2°C. Consequently, Nadarivatu recorded the coolest days on average with 25.6°C, followed by Monasavu with 27.0°C, Matuku with 30.6°C, Nadi Airport and Momi both with 31.0°C, Nacocolevu, Vaturekuku (Labasa) and Rotuma all with 31.1°C and Udu Point with 31.2°C.

The highest day-time temperature was observed at Korolevu with 36.9°C on the 10th, followed by Wainikoro with 36.6°C on the 5th, Levuka with 36.4°C on the 29th, Yasawa-i-Rara with 36.0°C on the 31st, Keiyasi with 35.3°C on the 22nd, Labasa Airport with 35.1°C on the 25th and Navua and Savusavu Airfield both with 35.0°C on the 9th and 10th, respectively. On the other hand, the coolest day-time temperature of 16.7°C was at Nadarivatu on the 29th, followed by Navua, Korolevu, and Sigatoka with 20.4°C, all on the 18th, Keiyasi with 20.7°C on the 18th and Vaturekuka (Labasa) with 21.1°C and Wainikoro with 21.5°C both on the 1st.

Vanuabalavu, and Matei and Vanuabalavu recorded their highest monthly average maximum temperature since observations began in 1985 and 1956, respectively, while Savusavu Airfield recorded its highest daily maximum temperature since observations began in 1956 (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 21 stations, 9 recorded anomalies ≥+0.5°C, 4 within ±0.5°C, and 8 with anomaly ≤-0.5°C.

The coolest days on average was at Nadarivatu with 19.3°C, followed by Monasavu with 20.2°C, Keiyasi with 20.7°C, Rarawai Mill (Ba) and Vaturekuka (Labasa) both with 22.6°C, Savusavu with 22.9°C, Navua and Wainikoro both with 23.1°C, and Labasa Airport with 23.2°C, and Nacocolevu, Penang Mill, Lakeba, Yasawa-i-rara, Korolevu and Sigatoka all with 23.4°C. Consequently, on average, the warmest night-time temperatures were observed at Viwa with 25.2°C, followed by Levuka and Ono-i-Lau both with 25.0°C, Saqani with 24.9°C, Matuku with 24.8°C, Laucala Bay (Suva) with 24.5°C and Momi with 24.4°C.

The coolest night-time temperature of 16.7°C was recorded at Nadarivatu on the 29th, followed by Monasavu with 17.9°C on the 17th, Rarawai Mill (Ba) with 19.6°C on the 15th, Savusavu Airfield with 20.4°C on the 28th, Navua, Korolevu and sigatoka all with 20.4°C, Nacocolevu with 20.6°C and Keiyasi with 20.7°C, all on the 18th, respectively. On the other hand, the warmest night-time temperature of 27.3°C was recorded at Viwa on the 8th , followed by Ono-i-Lau with 27.2°C on the 20th, Levuka with 26.9°C on the 1st, Lakeba with 26.5°C on the 8th, Rotuma with 26.4°C on the 3rd, and Seaqaqa with 26.2°C on the 11th.

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

TABLE 1. CLIMATE RECORDS ESTABLISHED IN JANUARY 2022

Element	Station	Observed (record)	On	Rank	Previous (record)	Year	Records Began
Daily Maximum Temperature	Savusavu Airfield	35.0°C	10th	New High	34.4°C	2018	1956
Monthly Average Max Temperature	Savusavu Airfield	32.7°C	-	New High	32.1°C	2014	1956
Monthly Average Max Temperature	Matei	32.0°C		New High	32.0°C	2014 2018	1956
Monthly Average Max Temperature	Vanuabalavu	32.0°C		New High	31.4°C	2018	1985

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 JANAURY 2023

	RAINFALL					AIR TEMPERATURES								SUNSHINE	
	TOTAL		RAIN *	MAX. DAYS +	FALL MM	ON	AVERAGE DAILY MAX.	#	MIN.	#	EXTREME MAX.	ON	MIN.	ON	TOTAL HRS	* %
	MM	%					C	C	C	C	C		C			
NADI AIRPORT	711.9	209	22	114	5		31.0	-0.5	23.6	0.6	33.9	23	21.5	19	163	77
LAUCALA BAY	378.9	107	23	64	18		31.9	0.8	24.5	0.3	33.6	10	22.0	16	166	85
NACOCOLEVU RESEARCH	524.5	195	28	93	13		31.1	-0.4	23.4	1.2	33.1	23	20.6	18	136	85
ROTUMA ISLAND	168.1	48	21	26	7		31.1	0.1	23.8	-1.1	32.1	27	22.4	13	196	125
VIWA ISLAND	209.5	80	20	34	3		32.2	0.7	25.2	0.0	34.1	25	23.0	14		
YASAWA-I-RARA	314.8	133	19	133	2		32.1	1.1	23.4	-1.1	36.0	31	21.2	13		
UDU POINT WEATHER	286.7	76	18	108	12		31.2	0.4	23.6	-0.8	32.6	28	22.0	13		
NABOUWALU	STATION TEMPORARILY CLOSED															
LABASA AIRFIELD	369.5	94	24	81	12		32.7	0.9	23.2	0.7	35.1	25	21.6	1		
SAVUSAVU AIRFIELD	212.4	77	23	38	16		32.7	2.1	22.9	-0.7	35.0	10	20.4	28		
KORONIVIA RESEARCH	380.0	103	21	110	16		32.3	1.7	23.7	0.8	34.6	10	21.5	18		
NAUSORI AIRPORT	341.1	96	22	139	16		31.9	1.4	23.8	0.6	33.6	10	22.0	18		
NAVUA (AWS)	294.5	79	24	56	18		31.8	1.4	23.1	1.0	35.0	9	20.4	18		
MONASAVU HYDRO DAM	322.1	49	23	78	2		27.0	1.5	20.2	1.2	29.3	7	17.9	17		
FSC LAUTOKA MILL	419.8	111	20	118	2		31.7	0.4	23.8	0.0	32.8	28	22.5	29		
FSC RARAWAI MILL	729.9	169	24	125	2		32.0	-0.2	22.6	-1.4	34.5	23	19.6	15		
FSC PENANG MILL	490.5	122	18	136	8		31.6	0.7	23.4	-0.6	33.5	27	10.5	28		
MATEI AIRFIELD	115.2	31	17	23	4		32.0	2.0	23.7	-0.4	33.1	9	22.4	18		
VANUABALAVU	181.3	75	14	76	11		31.9	1.8	23.5	-1.1	33.0	25	20.9	10		
LAKEBA	165.3	68	17	41	12		32.0	1.7	23.4	-0.7	33.0	20	21.9	18		
VUNISEA	MISSING OBSERVATIONS															
MATUKU	210.1	91	21	64	4		30.6	0.5	24.8	0.5	33.0	30	23.2	18		
ONO-I-LAU	167.1	94	20	42	1		31.8	2.1	25.0	0.9	34.0	31	23.4	2		
YAQARA AWS	391.5	126	20	103	2		31.7		23.6		33.7	24	22.1	15		
LEVUKA AWS	264.0		24	57	12		32.1		25.0		36.4	29	23.2	17		
KEIYASI AWS	555.5		27	84	2		32.4		20.7		35.3	22	20.7	18		
LOMAIVUNA AWS	426.0		22	88	8		U/S		U/S		U/S		U/S			
NADARIVATU AWS	611.5		26	164	2		25.6		19.3		28.7	25	16.7	29		
RKS LODONI AWS	MISSING OBSERVATION															
MOMI AWS	491.5		23	71	5		31.0		24.4		33.2	25	22.4	18		
SIGATOKA AWS	513.5		27	78	13		31.5		23.4		33.4	10	20.4	18		
VATUREKUKA AWS	427.0		21	134	12		31.1		22.6		32.8	25	21.1	1		
KOROLEVU AWS	253.0		21	46	24		32.6		23.4		36.9	10	20.4	18		
WAINIKORO AWS	363.5		23	109	12		32.4		23.1		36.6	5	21.5	1		
SAQANI AWS	105.0		17	16	18		33.1		24.9		34.5	7	23.7	12		
SEAQAQA AWS	451.0	105	24	167	12		32.7		24.1		34.4	26	22.4	28		
DOBUILEVU TB3	245.0	60	21	79	2											
NASINU TB3	421.5		22	90	12											
TAVUA TB3	455.5	127	18	231	2											

	TEMPERATURE(C) MEAN	DRY (AVERAGE AT 9AM)	WET (AVERAGE AT 9AM)	HUMIDITY RH% (AVERAGE AT 9AM)	VP (AVERAGE AT 9AM)	WIND KT
NADI AIRPORT	27.3	28.6	25.4	77	29.3	5.7
LAUCALA BAY	28.2	28.9	26.1	80	29.8	
NACOCOLEVU RESEARC	27.2	28.5	26.2	84	29.1	
ROTUMA ISLAND	27.4	28.9	26.1	81	29.8	5.0
VIWA ISLAND	28.7	30.0	27.1	80	31.7	
YASAWA-I-RARA	27.8	28.8	26.9	86	29.6	
UDU POINT WEATHER	27.4	29.4	26.2	78	30.7	
NABOUWALU	MISSING OBSERVATIONS					
LABASA AIRFIELD	28.0	29.2	26.1	79	30.3	
SAVUSAVU AIRFIELD	27.8	29.9	26.5	76	31.6	
KORONIVIA RESEARCH	28.0	29.1	26.2	80	30.1	
NAUSORI AIRPORT	27.9	28.4	26.0	83	28.9	4.8
NAVUA (AWS)	27.4					
MONASAVU HYDRO DAM	23.6	23.5	23.3	98	21.6	
FSC LAUTOKA MILL	27.7	29.1	26.6	83	30.1	
FSC RARAWAI MILL	27.3	28.0	26.0	85	28.3	
FSC PENANG MILL	27.5	29.2	26.4	80	30.3	
MATEI AIRFIELD	27.9	29.6	26.3	77	31.0	
VANUABALAVU	27.7	29.6	26.1	76	31.0	
LAKEBA	27.7	30.3	26.8	76	32.3	
VUNISEA	MISSING OBSERVATIONS					
MATUKU	27.7	28.7	25.7	79	29.4	
ONO-I-LAU	28.4	29.8	26.9	80	31.4	

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

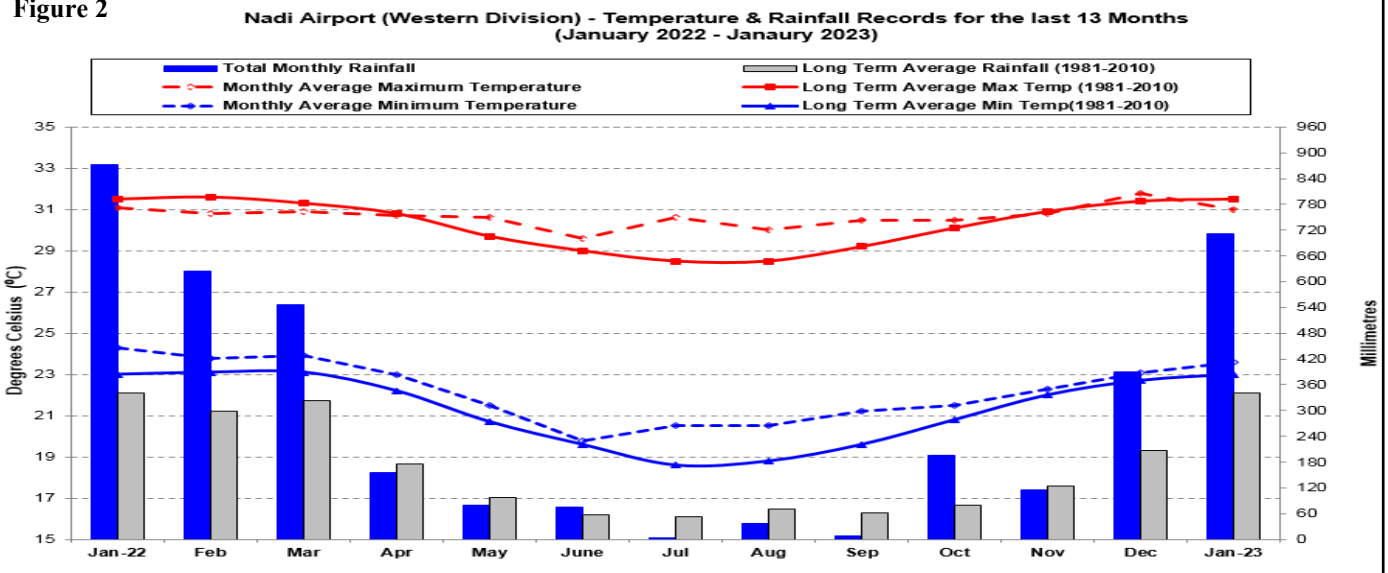


Figure 3

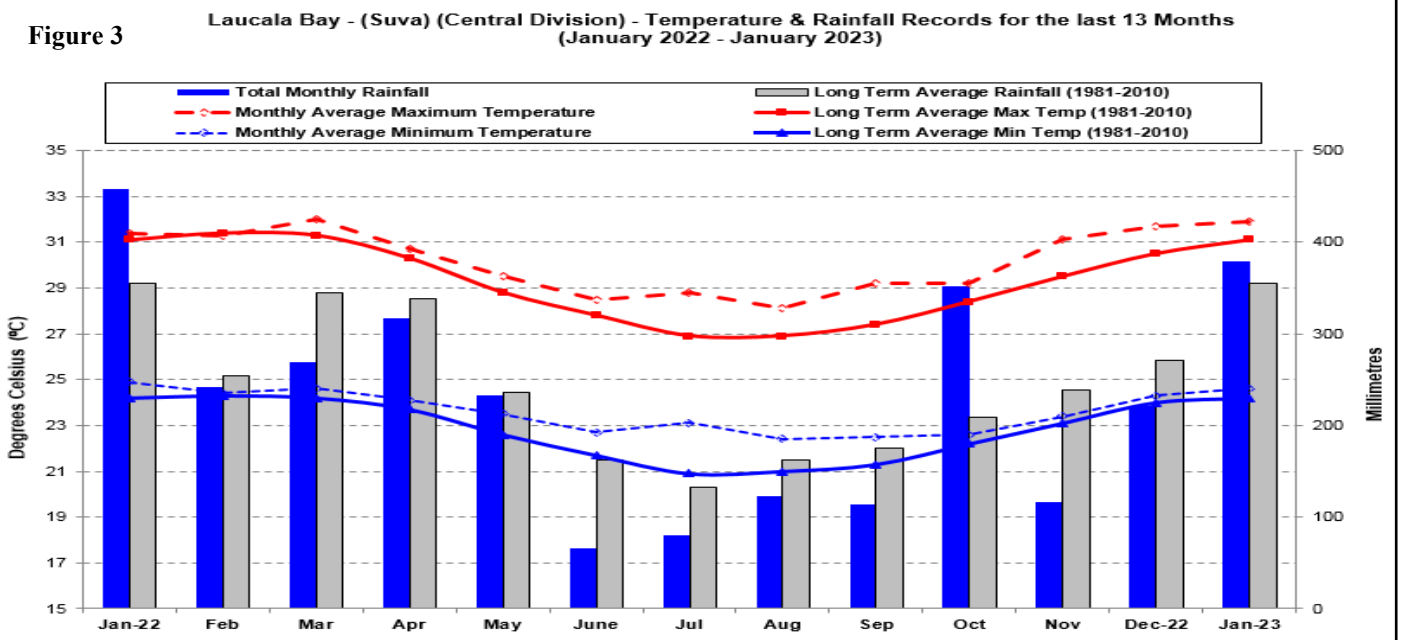


Figure 4

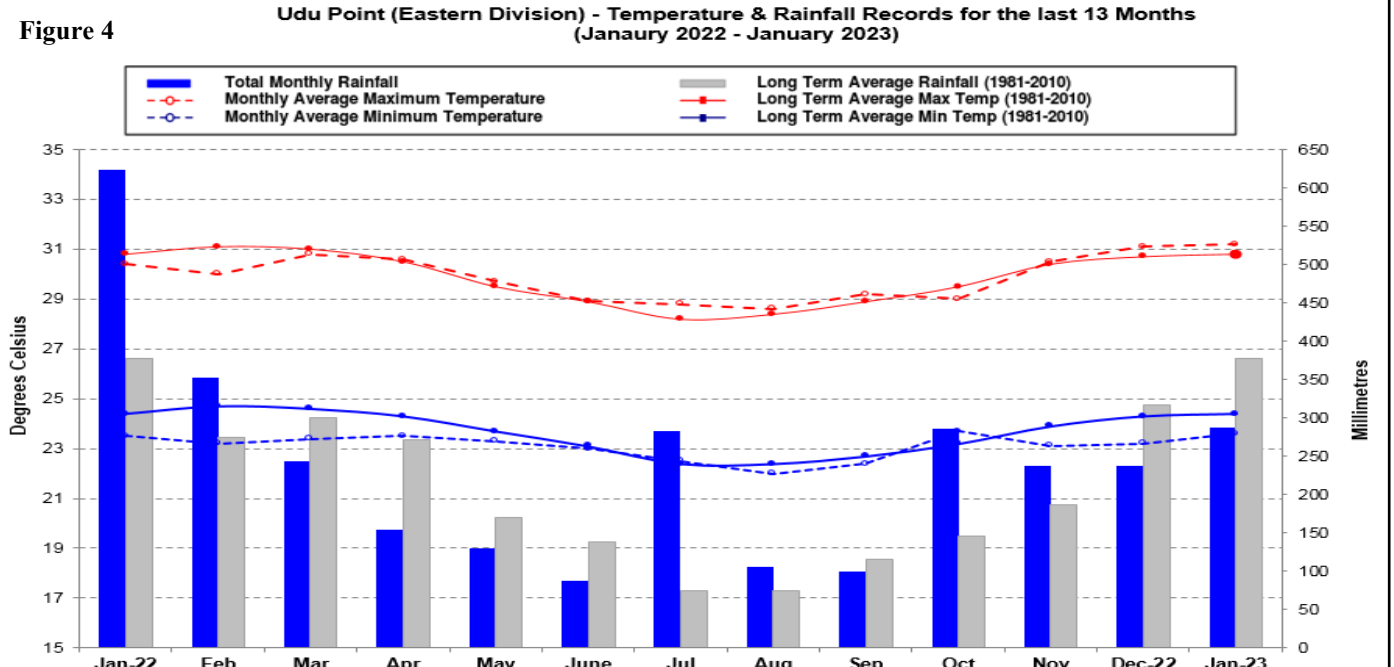
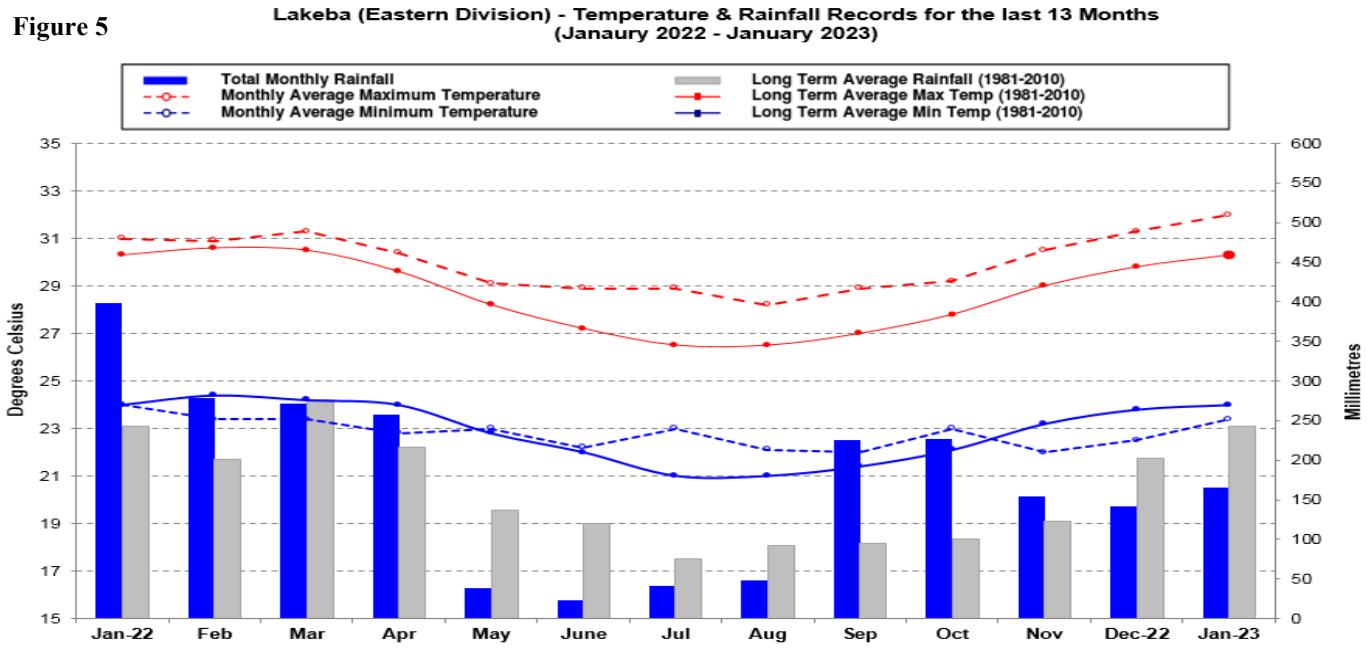


Figure 5



5. DAILY RAISED PAN EVAPORATION

Figure 6

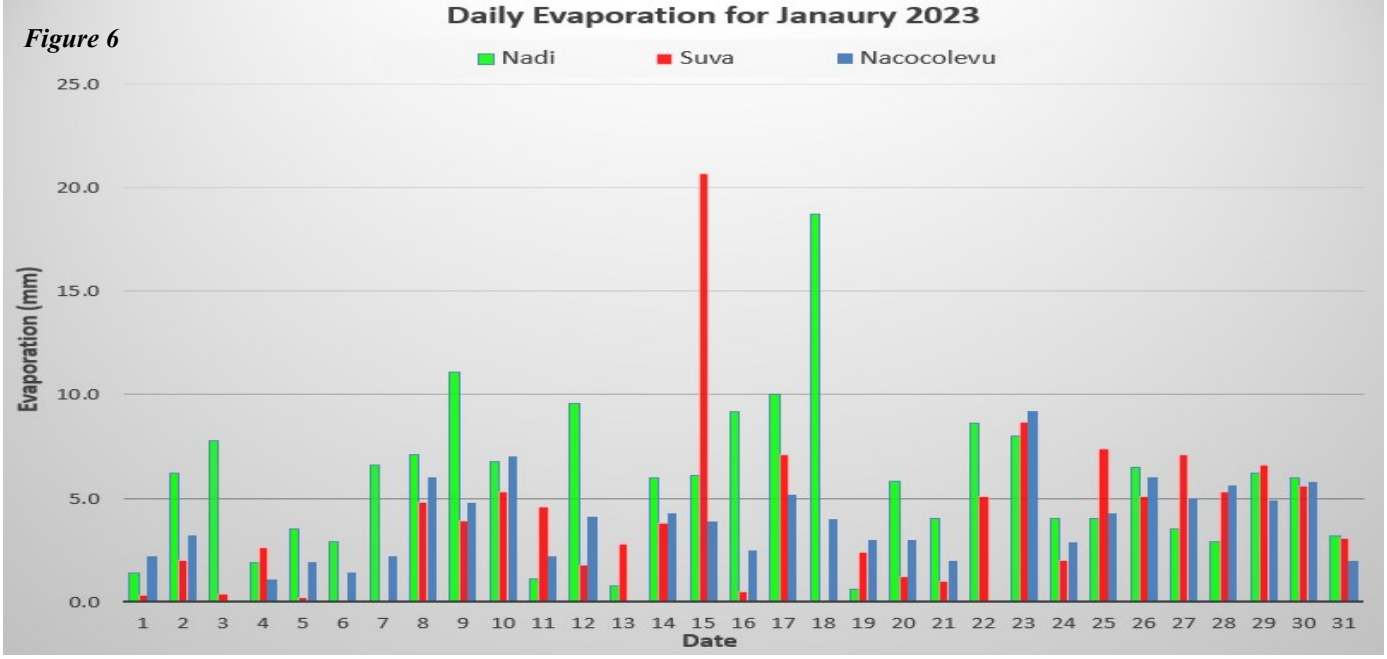


Figure 6: The total monthly raised pan evaporation at Nadi Airport, Laucala Bay (Suva) and Nacocolevu (Sigatoka) were 180.1mm, 121.4mm and 109.7mm respectively. Nadi's highest daily evaporation was 18.7mm on the 18th, with Suva's highest daily evaporation of 20.7mm on 15th and Nacocolevu (Sigatoka) recorded its highest of 9.2mm on the 23rd.

6. SOLAR RADIATION

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

7. WIND SUMMARY

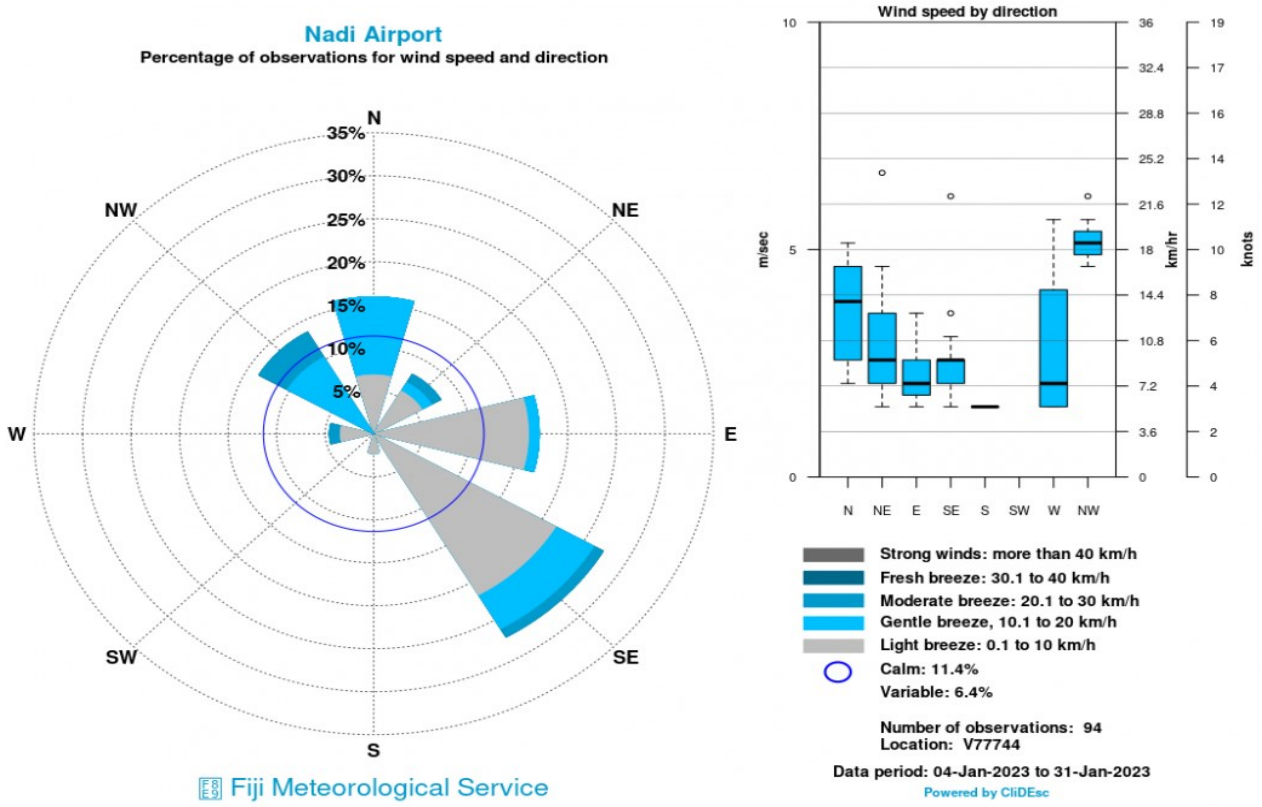


Figure 8a: Southeasterly winds were most dominant at Nadi Airport during the month, followed by easterly and northerly winds.

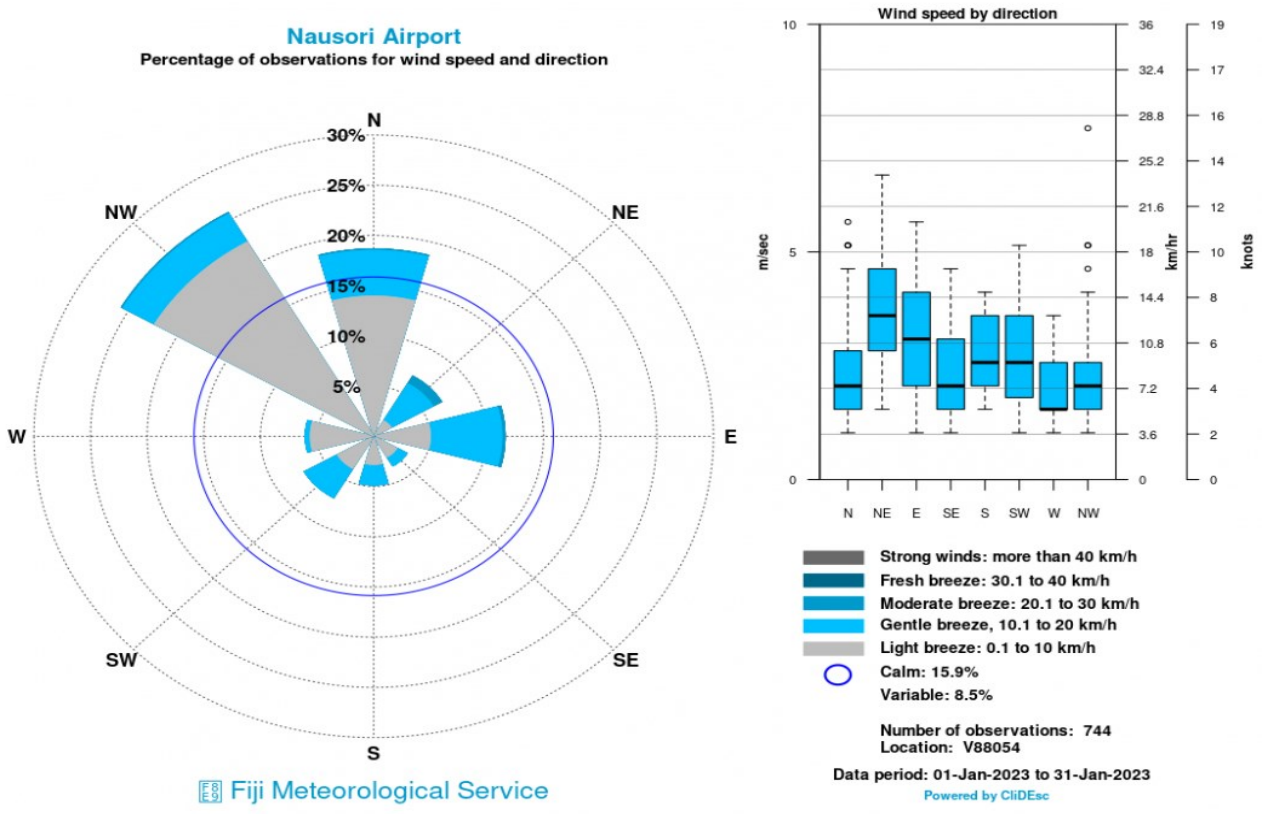


Figure 8b: Northwesterly winds were dominant at Nausori Airport, followed by northly, then easterly winds.

8. SEA SURFACE TEMPERATURE (SST)

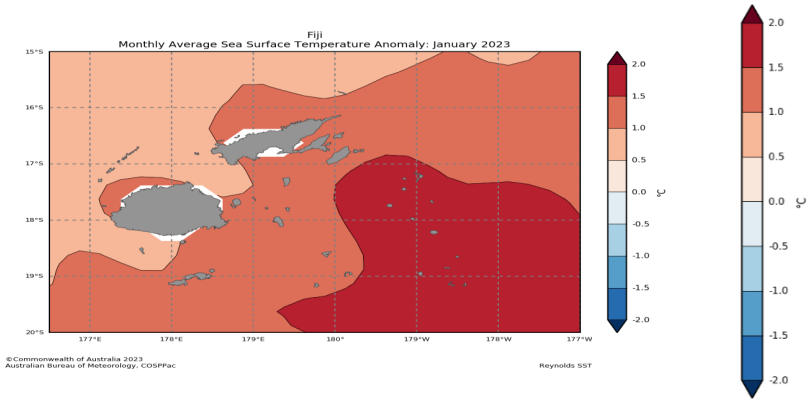


Figure 9:
Warmer than normal sea surface temperature anomalies were observed around Vanua Levu, north west of Viti Levu, Kadavu, Lomaiviti Group, Taveuni, and northern and southern Lau Group.

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

9. CLOUD COVER

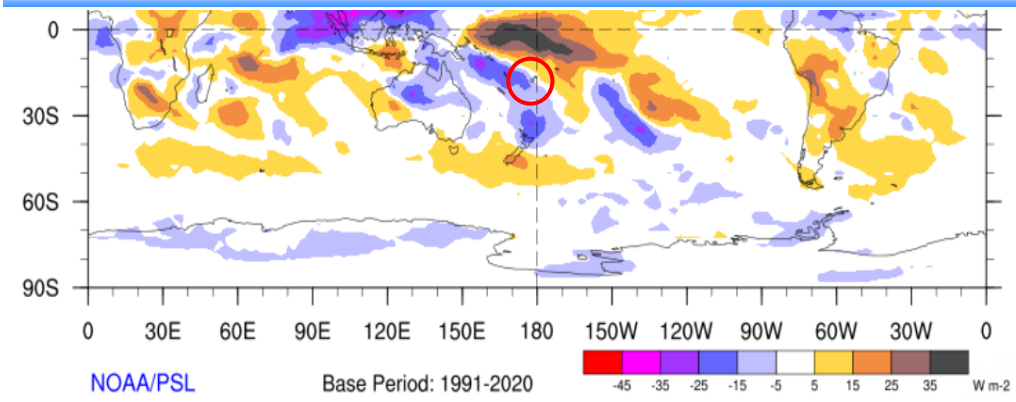


Figure 10:

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

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

10. SEA LEVEL

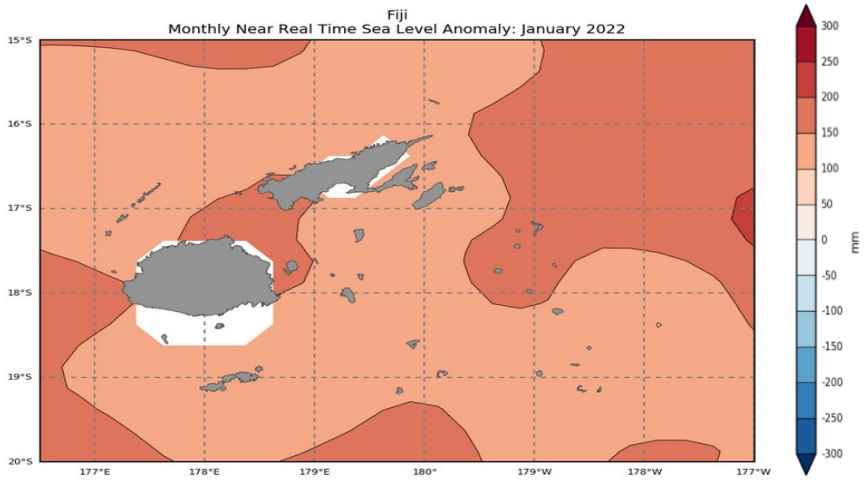


Figure 11:
Above normal sea level anomalies persisted across most of the Fiji Waters during January.

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

11. WIND ANOMALIES

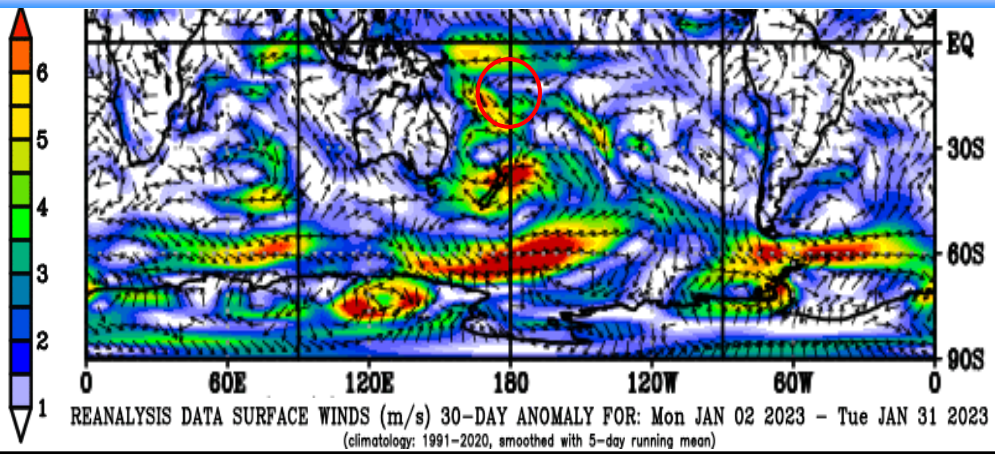


Figure 12:

Northwesterly 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

8. FLASH FLOODING

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

The first episode of flash flooding occurred when an active convergence zone lying slow moving over the western parts of Viti Levu brought heavy rain from 1st to 5th. Major flash floods occurred around low-lying areas in some parts of Western Division from Sigatoka to Rakiraki. Significant 24-hour rainfall of 231mm was recorded for Tavua, followed by 164mm at Nadarivatu, 133mm at Yasawa-i-Rara, 125 at Rarawai Mill (Ba), 118mm at Lautoka Mill, 103mm at Yaqara with 103mm all on the 2nd and 114mm at Nadi Airport on the 5th.

The second episode of flash flooding occurred between the 10th to 17th when a trough of low pressure to the north of the group, a trough to the west, and moist northwesterly wind flow affected most parts of the country with rain and showers which was heavy over some places causing flash floods. Major flash floods occurred at several crossings and roads in northern Vanua Levu and parts of Western Division. Significant 24-hour rainfall of 167mm was recorded for Seaqaqa, followed by 134mm at Vaturekuka (Labasa), 109mm at Wainikoro and 108mm at Udu Point all on the 12th.

There was a reported drowning victims when an elderly couple drowned while trying to cross a flooded Irish Crossing at Maururu, Ba on the 13th.

Figure 13: Toge Crossing in Ba on the 5th January, 2023. Source: Fiji Roads Authority

Figure 14: Qelemumu Crossing in Wainikoro on the 11th January 2023. Source: Fiji Roads Authority.

9. Storm Surge

During the 21st to 24th, moderate swells over Fiji waters generated by TC Irene and the King tide caused coastal inundation over some low-lying coastal areas of Fiji. There was a reported coastal sea flooding in Vabea Village on the island of Ono in Kadavu on the 20th.

Figure 15: Tidal waves at Nabea Village, Ono in Kadavu. Source: Cevakeiviji

Figure 16: Tidal waves at Nabea Village, Ono in Kadavu. Source: Cevakeiviji

10. MINI TORNADO

A mini tornado was reported by an Australian on holiday in Fiji ,while driving along Kinds Road through the Nasinu area at 2.15pm on 12th January. Tornado was sighted underneath an approaching thunderstorm over Suva. The tornado did touch the ground and lasted for couple of minutes. There was no report of any damage or injuries during this period.

Figure 17: A mini tornado in Suva on the 12th January, 2023. Source: Andrew Aubert

Figure 18: A mini tornado in Suva on the 12th January, 2023. Source: Andrew Aubert