

Weather Summary for Fiji Islands – May 2003 Rainfall Outlook till August 2003

FIJI METEOROLOGICAL SERVICE

In Brief

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Further Information:

**The Director
Fiji Meteorological
Service
Private Mail Bag NAP
0351
Nadi Airport
Fiji**

**Ph: (679) 672 4888
Fax: (679) 672 0430**

**Email: fms@met.gov.fj
Web Site: www.met.gov.fj**

Rainfall varied considerably across the country for a third consecutive month as is typical during the transition from *Wet* to *Dry* season. Rainfall ranged from average to above average in the Central Division, below average in the Eastern Division, and below average to above average in the Western and Northern Divisions.

Both day and night-time air temperatures were above average across the Group with a new high night-time temperatures record set at Nabouwalu on the 15th and a new high day-time temperature record set at Rotuma on the 1st.

Cooler nights were experienced towards the

Weather Patterns

May was marked by a sharp reduction in rainfall over most parts in the of the country especially in the second half of the month.. There was only one occasion when the entire country received heavy rainfall in May.

The month began with a slow moving trough of low pressure passing over the country, giving way to a ridge of high pressure extending from the south. The ridge remained the dominant weather feature though usual trade showers were experienced about the eastern parts of the country. Other areas experienced mostly fine weather with a few episodes of afternoon showers.

On the 7th, another weak trough of low pressure approached the country. It moved across Viti Levu and eastern parts of the country by the 9th producing showers over most areas. This was followed by a relatively moist easterly air stream which prevailed over Fiji till the 17th. During this period easterly winds increased, warranting a strong wind warning for all Fiji Waters from the 11th to 12th and for the Vatu-i-ra Passage and Northern Yasawa Waters till the 14th.

On the 18th, an active trough of low pressure moved across the country from the west and merged with another trough lying just north of

end of the month due to the migration of high pressure systems to the south of the country that enhanced southerly winds.

There were numerous reports of flooding and landslides in the Central Division during the month. A landslide in Veisari led to the closure of the Queens Road on the 2nd. In a separate incident a child narrowly escaped death after heavy rainfall triggered a landslide in Wailoku. A freak storm on the same day flattened sugar-cane in the Western Division.

Total sunshine hours were above average at Nadi Airport, Laucala Bay, Nacocolevu and Rotuma.

Vanua Levu to produce heavy downpours and squally conditions throughout the country. As a result, most of the Central Division experienced flooding and landslides and the strong winds also caused flattening of sugar cane in the Western Division. Showers persisted over some places on the 19th and 20th as the trough lingered around the eastern parts of the group.

A ridge of high pressure extended over the country, becoming the dominant weather feature till 30th. This system maintained a cool southeasterly air stream with mostly brief showers experienced about the eastern parts of the larger islands.

Rotuma was mostly under the influence of moist east to northeast wind flow apart from a few incidences when the SPCZ, moved close to the island producing some rain.

TABLE 1: Rainfall from March to May 2003

<u>Station</u>	<u>Actual Rainfall (mm)</u>	<u>Has rainfall in the last three months been below average, average or above average?</u>	<u>No. of Rain days in Mar (% of total rain)</u>	<u>No. of Rain days in Apr (% of total rain)</u>	<u>No. of Rain days in May (% of total rain)</u>
Penang Mill	1133.9	Above Average	21 (47)	17 (42)	19 (11)
Monasavu	989.2*	Most Likely Below Average	27	17	24
Vatukoula Mine	1001.7	Above Average	24 (59)	20 (32)	11 (09)
Rarawai Mill, Ba	1053.7	Above Average	15 (67)	15(21)	09 (12)
Yasawa-I-Rara		NA	405.8mm	NA	NA
Viwa Island		NA	197.3mm	182.0mm	NA
Lautoka	683.3	Average	17 (74)	14 (18)	07 (08)
Nadi Airport	568.3	Average	18 (73)	15 (18)	10 (09)
Nacocolevu	651.7	Above Average	19 (56)	10 (29)	10 (15)
Navua	1049.6	Average	23 (30)	22 (47)	21 (23)
Laucala Bay, Suva	1004.1	Average	24 (46)	25 (29)	24 (25)
Nausori Airport	1078.0	Above Average	21 (40)	22 (35)	25 (25)
Nabouwalu	1008.1	Above Average	21 (38)	25 (42)	21 (20)
Labasa Airport	829.8	Average	20 (48)	17 (42)	08 (10)
Savusavu Airport	493.5	Below Average	14 (21)	16 (63)	13 (16)
Udu Point			NA	NA	NA
Matei Airport	556.3	Below Average	18 (28)	17 (39)	19 (33)
Lakeba	363.7	Below Average	21 (46)	14 (37)	15 (17)
Matuku			186.4mm	143.7mm	NA
Ono-I-Lau	363.2	Below Average	15 (73)	05 (14)	08 (13)
Vunisea, Kadavu	657.6	Average	25 (43)	17 (30)	21 (27)
Rotuma	617.7	Below Average	22 (30)	26 (42)	20 (28)

* Data is not available from Monasavu on the 19th and 21st of April.

Rainfall in the last three months

Rainfall in May

Rainfall varied considerably across the country for a third consecutive month. Rainfall recording sites in the Western Division recorded below average to average rainfall except for Rarawai Mill, Ba which received above average rainfall.

Rainfall ranged from above average at Matei Airfield to average in Nabouwalu and Labasa Airfield and below average at Savusavu Airfield in the Northern Division. Rainfall was below average in the Eastern Division

In the Central Division all the recording sites recorded above average rainfall except for Navua which recorded average rainfall. Rainfall ranged from 79-107% of normal.

Rainfall in the three-months from March to May

The Rainfall forecast for period from March to May in the February Fiji Islands Weather Summary was for rainfall to be below average to average across the country. The skill level of the forecast for the above period was moderate.

For areas where data is available the forecast was generally successful except for the northern parts of Viti Levu and Western Vanua Levu which received more rainfall than expected.

Figure A

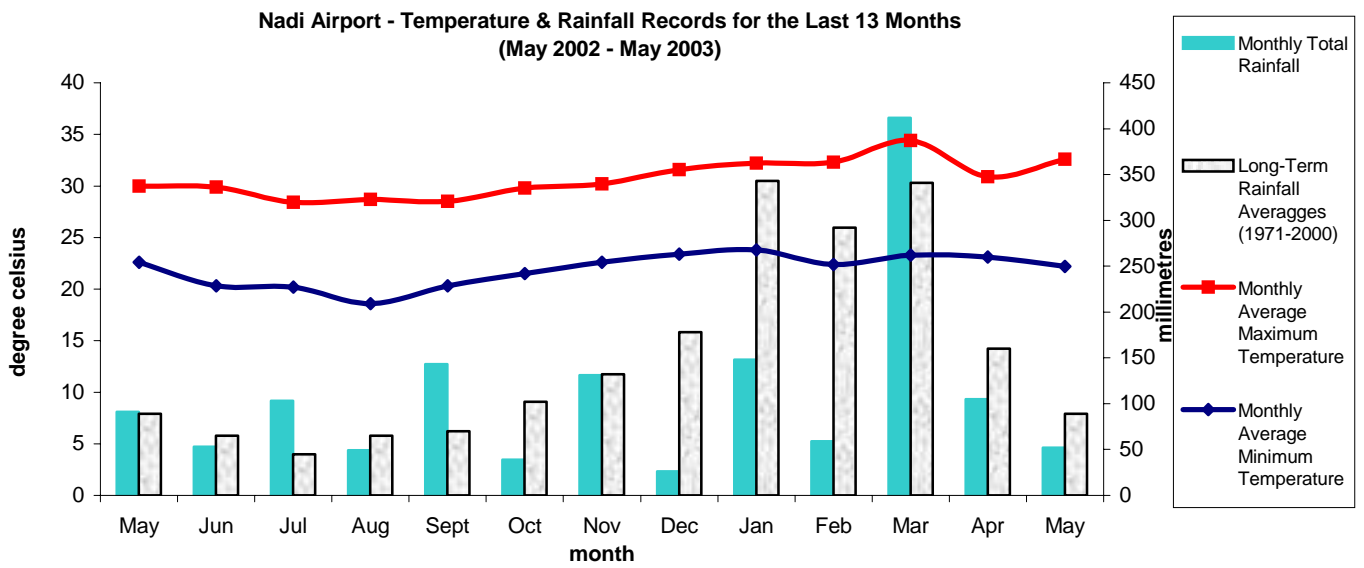


Figure B

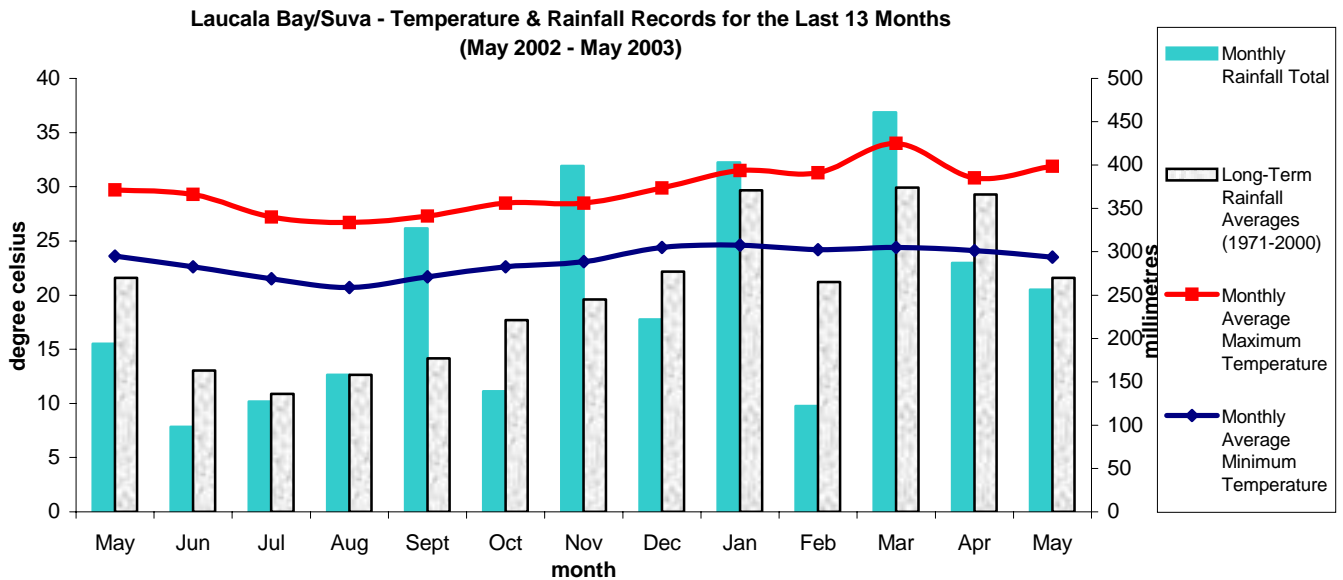
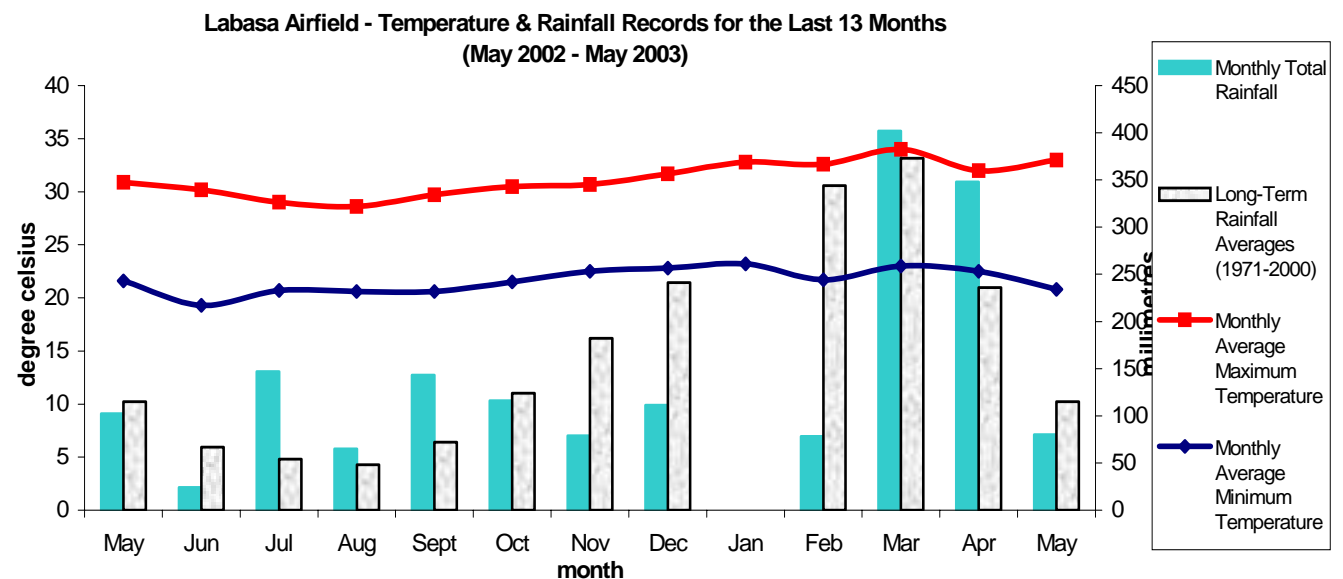


Figure C



Climate in May

Mean Day-time and Night-time Air Temperatures and 0900 hrs Relative Humidity

Day-time temperatures in May were above average across the country with a new day-time high of 33.2°C being recorded at Rotuma . The greatest positive departures from normal were observed at Monasavu, Ono-I-Lau and Nabouwalu which recorded monthly averages 2.1, 2.0 and 1.9°C respectively above normal.

Night-time temperatures were also above average across the country with a new night-time high of 26.5°C recorded at Nabouwalu. The greatest positive departures from normal were observed at Vatukoula, Nadi and Ono-I-Lau which recorded 2.1°C, 2.0, 1.9°C above average respec-

tively. The coolest nights were generally on the 5th, 19th and from 27th-31st. There was no distinct pattern with the warmest days during the month however 2nd-7th and 14-16 were generally the warmest days in May.

Relative Humidity (RH) at 0900hrs was were generally average across the country in May except for a few sites. Nadi Airport recording the highest positive departure of - +8.9% above normal and Rotuma recording the highest negative departure of -3.7% below normal.

Soil Moisture and Runoffs

Soil moisture conditions generally ranged from excessive to ample in the Central Division for the first two weeks except for Suva where the conditions were moderate to ample. Soil moisture conditions returned to excessive to ample during the last fortnight of the month.

In the Western Division, conditions were generally moderate to dry during the first half of the month and the conditions were ample to moderate at Rarawai, Penang and Nacocolevu and limiting to dry conditions in Nadi and Lautoka. Monasavu had excessive to ample soil conditions throughout the month.

In the Northern Division the soil moisture were generally excessive to ample at Nabouwalu, limiting to dry at Savusavu and Labasa Airports. The conditions were limiting to dry for first two weeks and then ample to dry at Matei Airport over the last fortnight.

Limiting to dry conditions prevailed at Ono-I-lau and Lakeba, excessive to ample at Rotuma and at Vunisea the soil conditions were moderate to dry the first 2 weeks and then generally ample conditions in the last 2 weeks.

There were significant runoffs at Nausori (187.7mm), Monasavu (184.9mm) and Suva (134.0mm) in May.

Sunshine, Radiation & Winds

Total sunshine hours were above average at Nadi Airport, Laucala Bay, Nacocolevu and Rotuma (104-132%).

The solar Radiation recorded at Nadi Airport and Laucala Bay was 93% and 95% of average respectively.

Average wind speeds during the month were below average at all wind recording sites except for Nausori Airport where the winds were about average .

Records set in May 2003

<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>
Max Temp	Rotuma	33.2	01st	New High	33.0	1994/95	1933
Min Temp	Nabouwalu	26.5	15th	New High	26.2	1995	1956

Summary for 2002/03 Tropical Cyclone Season

The 2002/03 South Pacific Tropical Cyclone Season has officially ended, however there is still a small chance of Tropical Cyclones developing.

There have been nine tropical cyclones to date this season which is about equal to the long-term average of 9-10 events over the 1969/70 to 2001/02 period. January was the most active month this season with three occurrences. The 2002/03 tropical cyclone season has been the most active since 1998/99 when there were also nine occurrences.

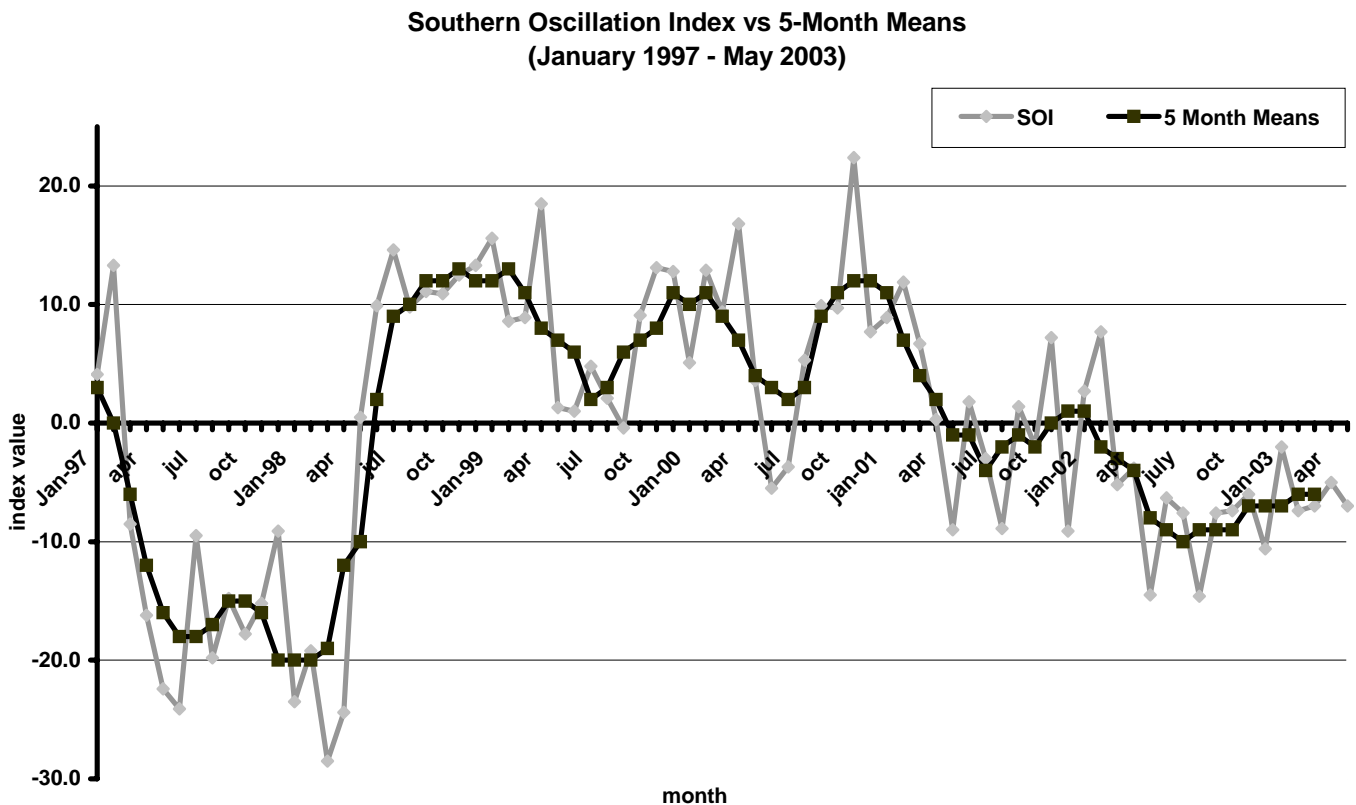
Of the nine cyclones this season, seven originated in the Fiji's area of responsibility and two in the Brisbane's that later drifted into Fiji's area.

Five of the cyclones formed east of the dateline which was expected under moderate ENSO conditions.

The three most devastating tropical cyclones of the season were *Zoe*, *Ami* and *Erica*. Fiji has only been directly affected by one cyclone this season (*Ami*) with three others (*Zoe*, *Cilla* and *Eseta*) brushing past the Group. *Ami* severely affected the northern and eastern parts of Fiji, with fifteen people swept away by floodwaters and four regarded as missing. The cyclone caused extensive damage in Vanua Levu and the Lau Group.

Zoe had marginal effects on Yasawa-I-Rara while *Eseta* produced significant rain and strong winds.

Figure D



ENSO status and Rainfall Outlook to August 2003

Southern Oscillation Index: The Southern Oscillation Index (SOI) for May was -7.4 (April was -5.5) with the five-month running mean of -6 centred on February (January was -6) (Figure D).

Neutral conditions continue in the tropical Pacific Ocean. Cooler than average surface water continues to dominate most of the central and eastern equatorial Pacific and the subsurface ocean temperatures show negative anomalies have subsided in the central Pacific but intensified in the east. Westerly winds are still evident in the western tropical Pacific but near average winds elsewhere. The SOI for the 30 days ending 31st May was -7.4, 2 points below the April value, but still consistent with the neutral conditions. Most computer models predictions indicate that the current neutral conditions in the Pacific will continue through to the Southern Hemisphere spring. Given the recent cooling in the eastern Pacific, a La Nina event remains a distinct possibility While a regeneration of El Niño cannot be ruled out entirely, this seems to be least likely this year.

(The ENSO Update and SOI are provided by of the National Climate Centre, Australian Bureau of Meteorology and can be found at <http://www.bom.gov.au>)

FMS Rainfall Prediction Model: *This model is based on schemes, which have run successfully at the Australian Bureau of Meteorology's National Climate Centre. These a statistical scheme based on the relationship between SOI and subsequent three-month rainfall totals. In each case the probability of low, medium or high rainfall in the oncoming three-month period is provided. The scheme uses the SOI averaged over the most recent three-month period. The reliability of the model is high during the wet season (Nov-Mar) but decreases during the dry season (May-Sept) and during the transitions months, April and October.*

The model forecasts rainfall to be below average to average across most of the Fiji Group. (Figure E).

Australian Rainman: *This is a Rainfall Prediction Model was created from joint efforts between Australia Meteorological and Agricultural Agencies. The model incorporates the use of SOI to test its effects on the probability of rainfall in upcoming months. It shows the relationship between ENSO (El Niño - Southern Oscillation) events and rainfall. Due to public demand this model is currently used to present the probability of receiving rainfall in the coming individual months over a three-month period. Please note that the reliability of forecast for one month is lower than for a combined three month period.*

The model predicts 'variable' rainfall across the country in the next three months (Table. 2).

Outlook for June to August 2003:

Based on the model predictions and current climatic conditions, Fiji's rainfall is likely to be vary around average.

NOTE: The confidence level in the outlook is 'Low to moderate'.

Preliminary Climatological Summary for May 2003

FIJI METEOROLOGICAL SERVICE

DATE 04/06/2003

PRELIMINARY CLIMATOLOGICAL DATA FOR MONTH 5 , 2003 : SUMMARY FOR DAYS 1 TO 31

	RAINFALL				AIR TEMPERATURES								SUNSHINE		
	TOTAL	RAIN	MAX.		AVERAGE DAILY				EXTREME				TOTAL		
		* DAYS	FALL		MAX.	#	MIN.	#	MAX.	MIN.		*			
	MM	%	+	MM ON	C	C	C	C	C	ON	C	ON	HRS	%	
NADI AIRPORT	52	58	10	18	18	30.2	0.5	22.2	2.0	32.6	14	19.2	27	217	104
SUVA/LAUCALA BAY	256	95	24	122	18	30.2	1.7	23.5	1.3	31.9	15	21.0	19	193	132
NACOCOLEVU	97	114	10	43	18	30.5	1.6	21.5	1.8	32.5	12	19.0	27	181	112
ROTUMA	170	57	20	33	4	31.5	1.5	25.7	1.1	33.2	1	23.5	5	226	119
*VIWA	Faulty AWS														
*UDU POINT	Faulty AWS														
LABASA AIRFIELD	80	70	8	31	20	31.3	1.1	20.8	0.9	33.0	15	15.8	29		
NABOUWALU	203	119	21	43	2	29.7	1.9	24.5	1.3	32.3	15	21.3	19		
SAVUSAVU AIRFIELD	77	39	13	24	18	29.5	1.0	24.1	1.8	31.8	15	21.0	29		
MATEI AIRFIELD	184	79	19	81	20	29.5	1.1	24.2	1.3	30.8	3	21.2	21		
*YASAWA-I-RARA	Faulty AWS														
VATUKOULA	88	112	11	26	9	31.4	1.1	21.6	2.1	33.3	2	18.6	27		
MONASAVU	253	76	24	37	9	24.4	2.1	18.8	1.8	26.5	23	15.2	29		
NAUSORI AIRPORT	264	107	25	112	18	29.5	1.7	22.6	1.5	31.5	7	18.5	27		
NAVUA/TOKOTOKO	243	79	21	55	9	28.8	1.5	22.2	1.3	31.0	7	19.3	29		
LAKEBA	63	46	15	26	19	29.2	1.2	23.7	1.0	31.2	7	18.3	28		
*MATUKU	Faulty AWS														
VUNISEA	175	95	21	68	18	28.4	1.1	23.3	1.8	31.7	15	20.4	28		
ONO-I-LAU	45	43	8	13	17	28.7	2.0	24.0	1.9	31.7	7	21.7	27		
BA/RARAWAI MILL	128	134	9	44	18	31.8	1.2	21.0	1.9	33.8	2	17.7	28		
LAUTOKA AES	53	63	7	24	9	30.7	1.2	22.9	1.4	32.4	5	19.9	27		
PENANG MILL	128	80	19	30	12	30.0	1.5	22.8	0.7	31.5	16	19.5	29		

	PE	WATER BALANCE (MM)					TEMPERATURE (C)				HUMIDITY	WIND	SUN RAD				
		MAX.	LAST	DEF	NO	RO	NO	DLY	DRY	WET			RH%	VP	KT	POS	MJ/
		.1MM	DS	ON	DS	DYS	DYS	MEAN	(AVERAGE	AT			9AM)			SQ.M	
NADI AIRPORT	34	75	1	75	53	17	0	0	26.2	26.3	23.9	82	27.9	3.4	65	13.9	
SUVA/LAUCALA BAY	30	50	3	19	0	0	134	3	26.9	27.0	24.9	84	29.9		58	11.4	
NACOCOLEVU	30	39	2	34	0	0	4	1	26.0	26.3	24.1	83	28.4		56	15	
ROTUMA	38	31	22	30	0	0	64	6	28.6	29.5	26.1	76	31.2	2.4	68	18	
*VIWA	Faulty AWS																
*UDU POINT	Faulty AWS																
LABASA AIRFIELD	35	75	31	75	1	1	0	0	26.1	27.3	24.5	79	28.7				
NABOUWALU	31	26	1	24	0	0	97	10	27.1	27.2	24.8	81	29.3	6.1			
SAVUSAVU AIRFIELD	31	75	1	73	22	7	0	0	26.8	27.3	24.8	81	29.3				
MATEI AIRFIELD	32	68	4	10	0	0	32	1	26.8	27.6	25.1	81	30.0				
*YASAWA-I-RARA	Faulty AWS																
VATUKOULA	34	75	29	62	1	1	0	0	26.5	27.8	24.1	73	27.3	5.6			
MONASAVU	22	12	29	0	0	0	185	14	21.6	21.5	20.2	88	22.7				
NAUSORI AIRPORT	30	16	29	16	0	0	188	7	26.1	26.3	24.4	86	29.3	3.4			
NAVUA/TOKOTOKO	30	36	7	19	0	0	132	10	25.5	26.3	24.3	84	28.8				
LAKEBA	31	64	31	64	0	0	0	0	26.4	27.6	24.8	79	29.1				
*MATUKU	Faulty AWS																
VUNISEA	30	75	2	4	14	5	24	2	25.9	26.4	24.3	84	28.8	4.8			
ONO-I-LAU	28	75	2	75	41	16	0	0	26.3	26.0	23.7	82	27.7				
BA/RARAWAI MILL	34	49	8	27	0	0	26	2	26.4	27.0	24.1	78	27.7				
LAUTOKA AES	34	75	1	75	52	16	0	0	26.8	28.0	24.5	74	27.9				
PENANG MILL	34	75	3	35	8	5	0	0	26.4	25.6	23.8	86	28.1				

DS IS SOIL MOISTURE DEFICIT, LIMIT 75 MM; RO IS WATER SURPLUS (INDEX OF RUNOFF)
 DEF (AE-PE) IS EVAPOTRANSPIRATION DEFICIT (INDEX OF IRRIGATION WATER NEEDED).
 PE IS LONG TERM MEAN PENMAN POTENTIAL EVAPOTRANSPIRATION (CALCULATED OR ESTIMATED).
 MEAN TEMPERATURE IS (MAX+MIN)/2; WIND IS MEAN SPEED AT 06,12,18,24 HOURS.
 \$: SOLAR RADIATION CALCULATED FROM SUNSHINE DURATION. # : DEPARTURE FROM NORMAL.
 + : NUMBER OF DAYS WITH 0.1 MM OR MORE RAIN. * : PERCENT OF NORMAL.

Note: This summary is prepared for rapid dissemination as soon as possible following the end of the month. The quantitative data are obtained daily on the phone or radiotelephone from a network of climate stations reporting 9 am observations; these data must be treated as provisional. Water balance calculations are approximate and are intended for guidance purposes only. Also, FMS does not guarantee accuracy and reliability of the forecast information presented in this summary but the Department should be sought for expert advice, any clarification or additional information. Any person wishing to re-print any information provided in this summary must seek permission from the Director of Meteorology.

Three Month Rainfall Outlook Probabilities for June to August 2003

The forecast probabilities are presented as

FIGURE E: Three Month Forecast for Selected Stations in Fiji using the Fiji Meteorological Services Rainfall Prediction Model

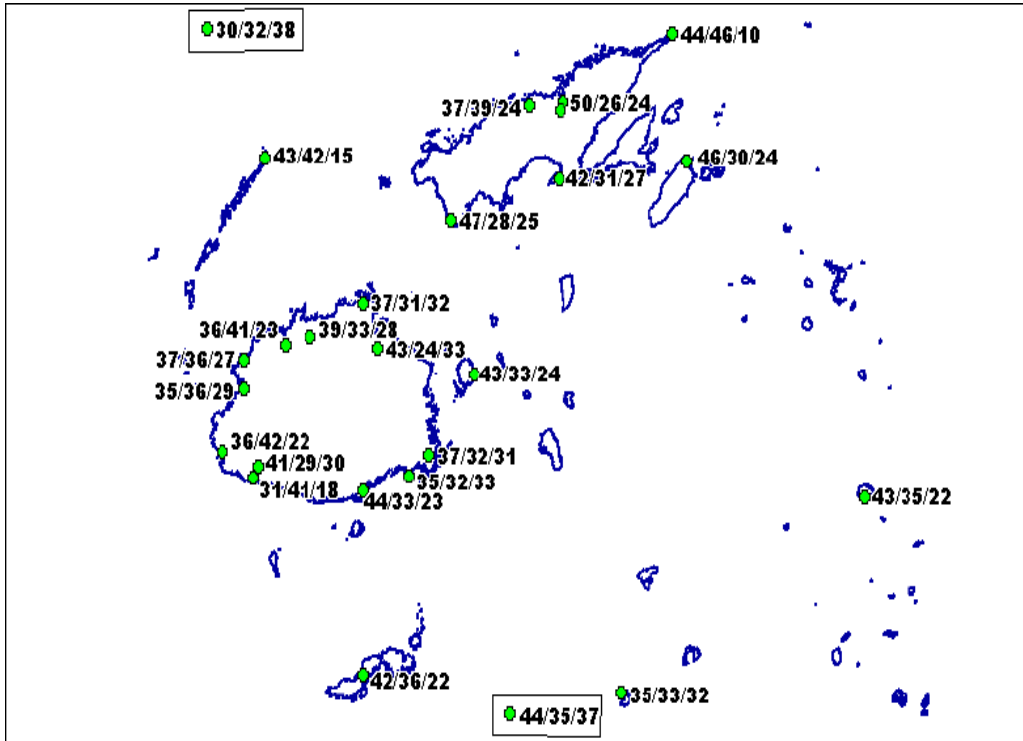
DRY/NORMAL/WET

'DRY' range refers to rainfall less than 33rd percentile.

'NORMAL' (average) range refers to rainfall between 33rd and 67th percentiles.

'WET' range refers to rainfall above 67th percentile.

Reference Table for 33rd and 67th Percentile



Please note that the probabilities are listed beside of the corresponding station marker or dot.

Station	33% (mm)	67% (mm)
Western Division		
Dobuilevu	194	300
Vatukoula	142	208
Rarawai	137	222
Penang	159	228
Lautoka	118	215
Nadi	114	206
Lomawai	126	257
Nacocolevu	177	282
Olosara	203	284
Yasawa	133	250
Central Division		
Navua	487	665
Suva	368	500
Nausori	362	489
Eastern Division		
Levuka	277	382
Lakeba	182	295
Matuku	242	363
Ono-I-Lau	238	335
Vunisea	252	405
Northern Division		
Labasa Mill	103	191
Seaqaqa	111	198
Nabouwalu	231	338
Savusavu	234	381
Udu Point	239	416
Matei	255	384
Rotuma	576	777

FIGURE F: Reference Map of selected Climate/Rainfall sites in Fiji

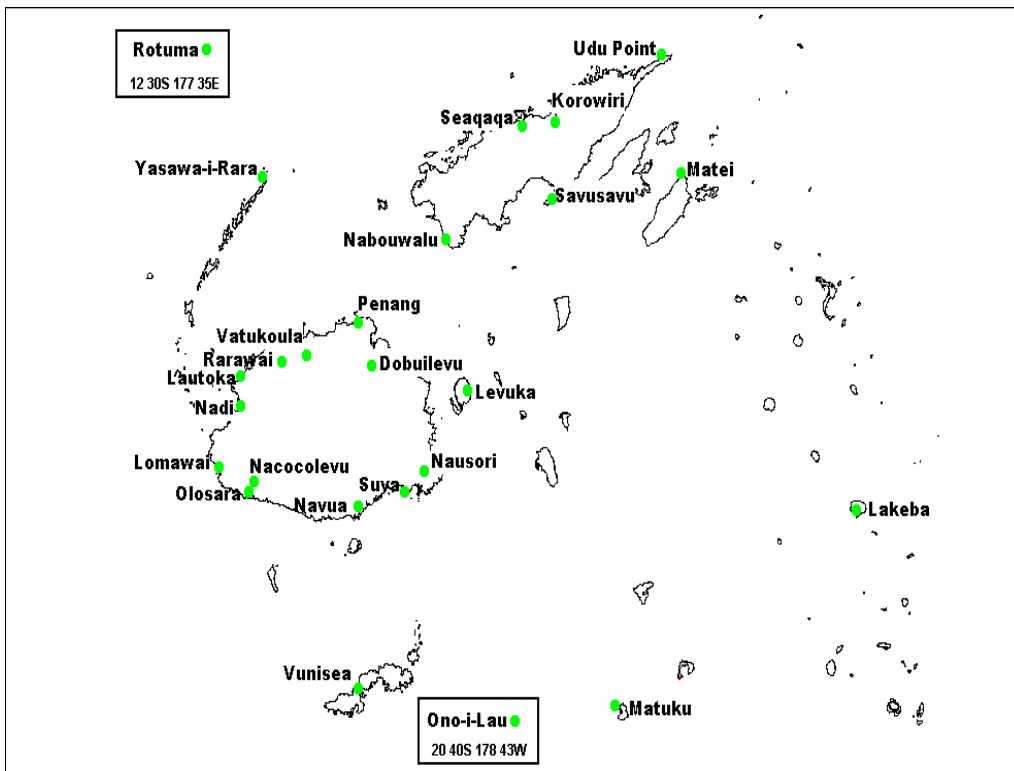


TABLE 3: Monthly Rainfall Outlook Probabilities for June to August 2003

Station Name	June		July		August	
	Average*	Probability [#]	Average*	Probability [#]	Average*	Probability [#]
Western Division						
Dobuilevu	98	50	56	47	80	57
Vatukoula	73	39	50	40	68	41
Rarawai	89	30	39	65	65	31
Penang	99	30	55	50	73	23
Lautoka	72	32	49	51	70	35
Nadi	65	50	45	46	65	45
Lomawai	72	34	62	53	79	33
Olosara	90	33	77	43	98	31
Nacocolevu	75	33	71	61	83	30
Yasawa-I-Rara	82	75	43	39	63	24
Central Division						
Navua - Tamanoa	196	51	186	44	202	42
Suva	163	33	136	37	158	38
Nausori	150	50	118	43	147	47
Eastern Division						
Lakeba	78	50	80	37	102	40
Ono-I-Lau	89	31	92	19	118	21
Northern Division						
Korowiri	73	23	52	24	52	51
Seaqaqa	63	50	52	32	56	63
Nabouwalu	98	40	92	26	105	43
Savusavu	117	50	96	48	116	51
Udu Point	116	50	89	36	85	52
Rotuma	234	60	233	39	210	37

Please note that the above figures should be used with caution, as there is some degree of uncertainty associated with them, and particularly the reliability of the model is low during the transition months and the dry season.

* 'Long-term Average' for the 30 year period from 1971-2000.

Probability of expecting at least normal rainfall.