

Fiji Islands Weather Summary

July 2005

Rainfall Outlook till October 2005

FIJI METEOROLOGICAL SERVICE

IN BRIEF

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July was a typically cool month with cloudy and wet conditions experienced occasionally during the month which resulted from the passage of troughs, convergence zones and fronts. Well above average rainfall during the month was recorded at Yasawa-I-Rara and Lakeba.

Sites in the Western Division received average to above average rainfall except Yasawa-I-Rara which recorded well above average rainfall of 249% of *Normal* rainfall.

Sites in the Central Division received average to above average rainfall.

Sites in the Eastern Division received generally average to above average rainfall with Ono-I-Lau recording below average rainfall of only 61% of *Normal*, whereas Lakeba recorded well above average rainfall of 277% of *Normal*. A new one-day high rainfall of 171.5 mm was recorded at Lakeba on the 24th.

Sites in the Northern Division received generally average to below average rainfall except Savusavu which recorded well

below average rainfall of only 25% of *Normal*. Matei recorded above average rainfall of 182%.

Day-Time Air Temperatures were generally average to below average across the country.

Night-Time Air Temperatures were generally below average with a new low Night-Time Air Temperature of 14.0 °C recorded on the 10th and 11th at Tokotoko, Navua.

Total sunshine hours were above average at most sites around the country.

In the latest survey of the General Circulation Models (GCM), most models favour neutral temperature patterns till December 2005.

Based on model predictions and current ocean and atmospheric conditions, most parts of the country can expect rainfall to be generally **Below Average** for the next three months.

WEATHER PATTERNS

July was typically cool. Passage of troughs, convergence zones and fronts brought cloudy and wet conditions to Fiji occasionally during the month.

A trough brought a few showers over the country on the 6th. Again on the 11th and 12th, showers were experienced as a convergence zone from the north moved southeast across Fiji. The eastern and northern areas reported isolated heavy falls. A front on the 20th brought a few showers to most parts. An active trough with an associated low pressure system caused strong winds and widespread rain between the 22nd and 24th. Matei recorded a 24 hour rainfall of 120mm and Vanua-balavu recorded a 24 hour rainfall of 127.6 mm on the 24th. An additional front

produced showers over most places on the 29th and 30th.

During the rest of the month, mobile ridges of high pressure from the south and south-east influenced Fiji. The resulting moist southeast airstream brought brief showers to the southern and eastern parts. The rest of the country was dry.

Rotuma reported wet conditions on most days of the month due to the close proximity of a convergence zones. The dry days were the result of the convergence zone moving to the far north of the island.

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TABLE 1: RAINFALL FROM MAY TO JULY 2005

Station	Actual Rainfall	Rainfall in the last three months (Below Average,	No. of Rain days in May 05	No. of Rain days in June 05	No. of Rain days in July 05
Penang Mill	139.7	Below Average	10 (6)	11 (72)	8 (22)
Monasavu Dam	566.5	Below Average	17 (27)	14 (39)	17 (34)
Vatukoula Mine	167.0	Average	02 (2)	7 (75)	5 (23)
Rarawai Mill, Ba	150.3	Below Average	01 (0)	5 (65)	4 (35)
Yasawa-I-Rara	351.4	Above Average	07 (7)	6 (63)	3 (30)
Viwa Island	234.7	Average	03 (3)	5 (73)	3 (24)
Lautoka (FSC Res.)	144.0	Below Average	02 (3)	5 (61)	3 (36)
Nadi Airport	141.8	Below Average	02 (1)	6 (56)	4 (43)
Nacocolevu, Sigatoka		-	02	-	-
Tokotoko, Navua	508.9	Below Average	14 (17)	15 (45)	17 (38)
Laucala Bay, Suva	509.5	Average	15 (12)	19 (48)	20 (40)
Nausori Airport	483.2	Average	17 (15)	14 (37)	19 (48)
Nabouwalu	229.5	Below Average	17 (27)	16 (44)	14 (29)
Labasa Airport	159.7	Below Average	02 (4)	6 (74)	4 (22)
Savusavu Airport	158.7	Well Below Average	07 (13)	9 (72)	6 (15)
Udu Point	329.6	Average	15 (8)	15 (64)	9 (28)
Matei Airport	457.0	Average	09 (11)	12 (48)	7 (41)
Lakeba Is.	524.8	Above Average	15 (11)	8 (47)	14 (42)
Matuku Is.	272.0	Below Average	10 (19)	7 (56)	6 (25)
Ono-I-Lau Is.		-	08	-	-
Vunisea, Kadavu	413.7	Average	12 (7)	15 (66)	21 (27)
Rotuma	1015.4	Above Average	21 (39)	21 (51)	18 (10)

RAINFALL IN THE LAST THREE MONTHS

Rainfall in July

July was a typically cool month with rainfall generally average to above average across the country. Some sites received below average rainfall. Savusavu Airfield was the only site that received well below average rainfall while Yasawa-I-Rara and Lakeba reported well above average rainfall. A new one-day high rainfall of 171.5 mm was recorded at Lakeba.

Rainfall in the Western Division ranged from 56%-249% of *Normal*, 61%-277% of *Normal* in the Eastern Division, 116%-151% of *Normal* in the Central Division and 25%-182% of *Normal* in the Northern Division.

Forecast Verification

Rainfall in the 3-months from May to July 2005

The Rainfall Outlook for the period May to July in the April Fiji Islands Weather Summary was for rainfall to **Vary Around Average** across most of the country. The confidence level of the forecast was *moderate*.

Out of the twenty sites that reported in time for this summary, *nine* sites received **below average** rainfall, *seven* sites received **average** rainfall and three sites received **above average** rainfall. Savusavu Airport was the only site that received **well below average** rainfall.

Figure A

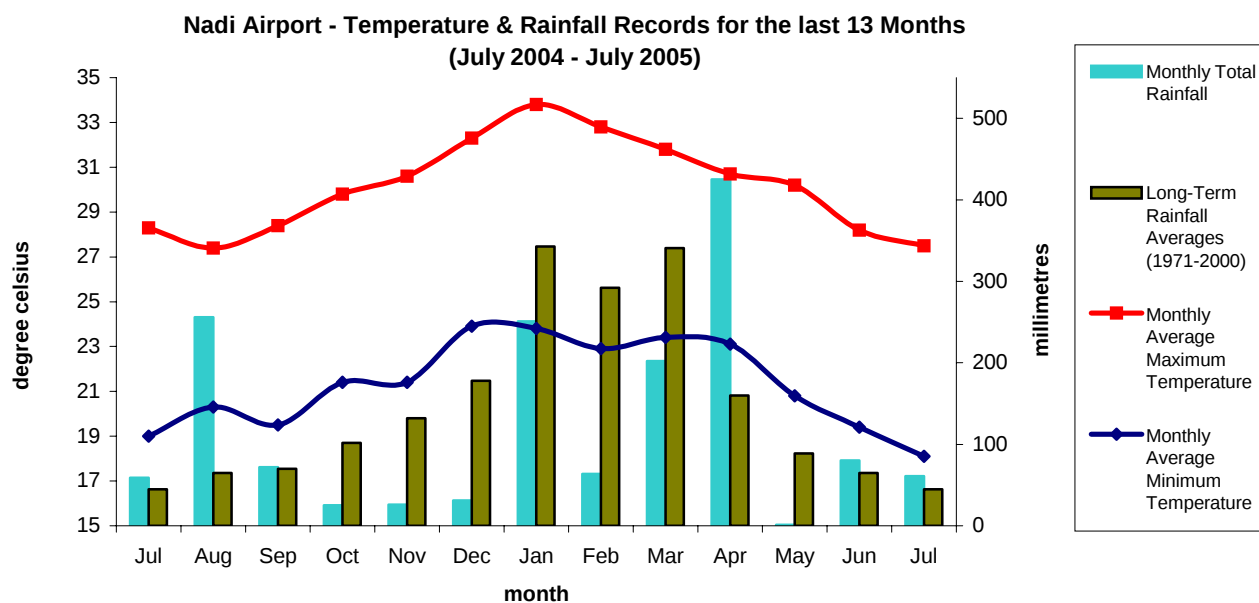


Figure B

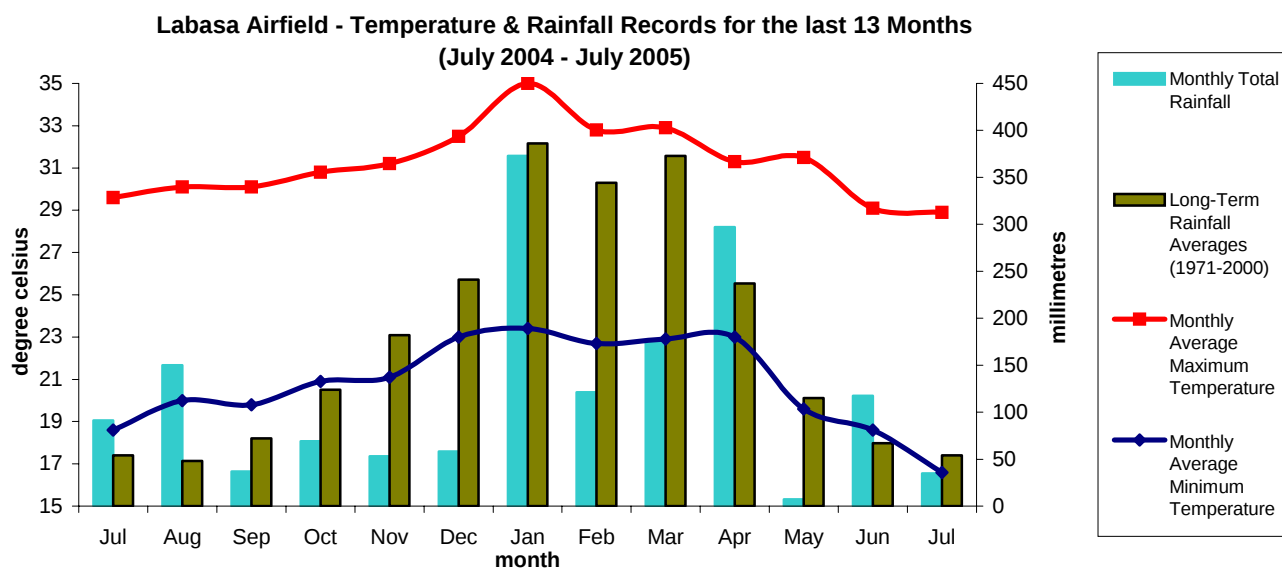
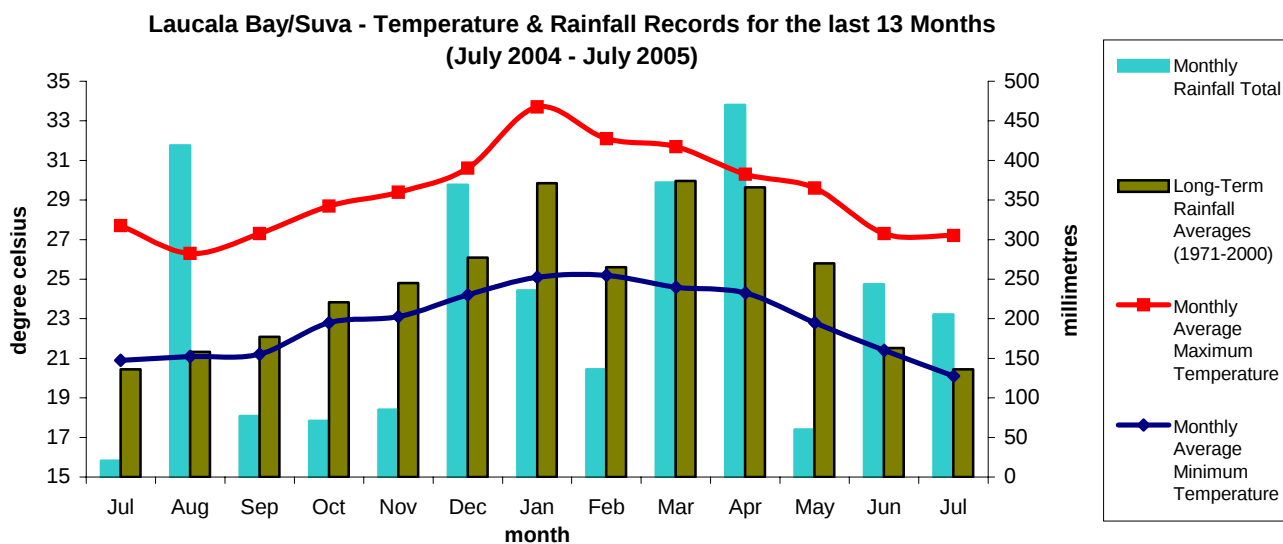


Figure C



Climate in July 2005

MEAN DAY-TIME AND NIGHT-TIME AIR TEMPERATURES AND RELATIVE HUMIDITY AT 0900HRS.

Day-Time Air Temperatures were generally average to below average across the country. The greatest negative departure of 1.1°C was recorded at Nadi Airport, followed by Savusavu Airfield, St.John's College, Lakeba, Rarawai and Lautoka Mill which recorded 0.6°C below *Normal*. The greatest positive departure of 0.4°C above *Normal* was recorded at Laucala Bay, Suva.

The Night-Time Air Temperatures were generally below average with a new low Night-Time temperature of 14.0 °C recorded on the 10th and 11th at Tokotoko, Navua. The greatest negative departure of 1.9°C below *Normal* was

recorded at Udu Point, followed by Tokotoko, Navua and Penang Mill which recorded 1.7 °C below *Normal*.

Relative Humidity (RH) at 0900hrs were mostly below *Normal* across the country except at two sites in the Eastern Division which recorded above *Normal*. The greatest negative departures from *Normal* were recorded at Rarawai Mill -7%, Labasa Airfield -6% and Rotuma -5%. The greatest positive departures were recorded at Ono-I-Lau +12%, Matuku +10% and Nacocolevu +5%.

SOIL MOISTURE AND RUNOFFS

Soil moisture conditions were generally moderate to limiting dry throughout the month.

In the Western Division, soil moisture conditions varied generally around moderate to limiting dry except Monasavu which recorded excess to ample conditions throughout the month and Yasawa-I-Rara which recorded limiting to dry conditions most of the month except in the last week of the month where excessive to ample conditions were recorded.

In the Central Division soil moisture conditions were moderate to limiting dry then ample to excessive during the last week of the month.

Eastern Division experienced generally moderate to limiting dry soil moisture conditions with Levuka and Lakeba recording excessive to ample conditions in the last week of the month. Matuku recorded limiting to dry

conditions almost throughout the month

Sites in the Northern Division recorded generally moderate to limiting dry conditions except Matei which recorded ample to excessive conditions during the last week of the month.

In Rotuma soil moisture conditions were generally moderate to limiting dry throughout the month.

Runoffs during the month were recorded at most of the sites around the country. Significant runoffs during the month were recorded at Monasavu (116.7mm), Nausori (106.6mm), Lakeba (94.8mm), Laucala Bay, Suva (84.2mm), Tokotoko, Navua (68.0mm) and Matei (49.8mm).

SUNSHINE, RADIATION & WINDS

Total sunshine hours were above average at Laucala Bay, Suva (119%), Rotuma (104%) and Nadi Airport (103%). The only site that recorded below average sunshine was Nacocolevu which recorded 79% of *Normal* sunshine.

Global Solar Radiation (average per day) recorded at Rotuma was 16 MJ/M², Laucala Bay, Suva recorded 15.1 MJ/M².

Nadi Airport recorded 13.4 MJ/ M² and Nacocolevu recorded 13.0 MJ/ M².

Monthly average wind speed was below average to above average during the month. Rotuma and Nausori Airport recorded above average winds while Nabouwalu and Nadi Airport recorded below average winds.

TABLE 2 : RECORDS SET IN JULY 2005

<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>
Dly Rainfall	Lakeba	171.5 mm	24th	New One Day High	122.7 mm	1976	1924
Min Temp	Udu Point	20.4 °C	-	New Low Mly Average	20.9 °C	1990	1951
Min Temp	Tokotoko, Navua	14.0 °C	10th and 11th	New Night Time Low	14.4 °C	1997	1992
Min Temp	Tokotoko, Navua	18.0 °C	-	New Low Mly Average	18.4 °C	1998	1992

ENSO status and Rainfall Outlook to October 2005

ENSO UPDATE

EL NIÑO - SOUTHERN OSCILLATION

The **Southern Oscillation Index (SOI)** for July was +0.9 (June was -2.6) with the five-month running mean of -4 centred on May (April was -10) (see Figure D below).

A varying combination of El Niño like and neutral ENSO indicators persisted through the later part of 2004 and early months of 2005. The carrying forward of some of these indicators over the early dry season caused some concern regarding the potential for an El Niño event to develop. With moderation of some of the oceanic and atmospheric indicators in the recent months, Pacific Basin is likely to remain neutral for the remainder of the year.

The equatorial Pacific Ocean has continued to cool with most areas now being only marginally warmer than average. There are currently no obvious triggers that would reverse recent trends and boost the level of warmth to an El Niño state. Furthermore, the current patterns of Pacific cloud, wind and subsurface temperatures remain neutral and the SOI has persisted in small positive values for the second successive month.

Sea surface Temperature (SST) data for July show weak positive anomalies across most of the tropical Pacific. Generally there was a cooling trend of +0.2°C to +0.5°C in the

anomalies in comparison with June.

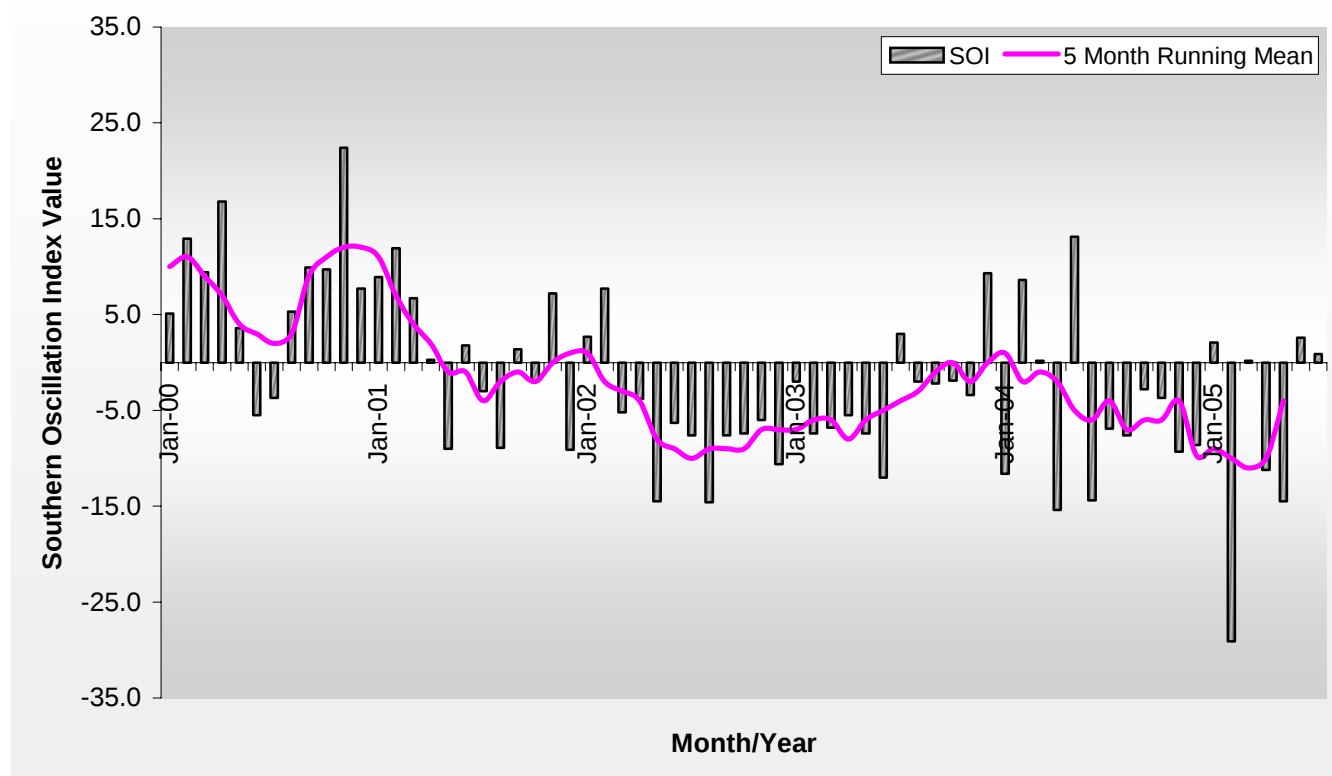
The sub-surface temperature data for July show that, in comparison with June, negative anomalies on the thermocline have intensified in the western to central Pacific, although they weakened in the recent weeks. In contrast, weak positive anomalies have developed in the in the top 50 to 100 meters so the mixed layer in the equator is generally a little warmer than the mean.

In the latest survey of General Circulation Models (GCM), eight favours neutral temperature patterns till December 2005, three suggests warm (El Niño) conditions, with one predicting cold conditions. By March 2006, only one model predicts the continuation of warm conditions with none predicting the development of cool conditions. There is roughly an even split between models indicating the central Pacific remaining on the warm side of average and those predicting cooler than normal temperatures.

For more information visit website <http://www.bom.gov.au/climate/tropnote/tropnote.shtml>. Please contact the FMS for interpretation. (The ENSO Update is provided by the Australian Bureau of Meteorology and visit the website <http://www.bom.gov.au>) for a detailed information.

Figure D

**Southern Oscillation Index Vs 5-Month Running Mean
(January 2000 - July 2005)**



RAINFALL PREDICTIONS

FMS currently uses “The Seasonal Climate Outlook for Pacific Island Countries (SCOPIC) Model” for seasonal rainfall guidance which has replaced FMS Model (Figure E): Predictions from this refined model are expected to be much better than the previous FMS model.

The **SCOPIC** software system analyses the current sea surface temperature patterns across the Pacific Ocean and then finds the most similar patterns experienced throughout the available historical period.

For a particular location, the subsequent rainfall received in historical period is then used to construct a rainfall forecast for the next three month period in a form of a tercile probability distribution. It also allows for the predictor period to be varied to produce the maximum skills.

The SCOPIC model predicts a likely situation for the rainfall to be generally **below average** across the country for the next three months.

The model is giving a higher probability for rainfall to be generally **above average** for Rotuma for the upcoming three months.

(See figure E for site specific forecast and Figure F for their locations).

RAINFALL OUTLOOK FOR FIJI ISLANDS AUGUST TO OCTOBER 2005

Based on model predictions and current ocean and atmospheric conditions, most parts of the country can expect rainfall to be generally *Below Average* for the next three months.

This prediction can significantly change if there is a tropical cyclone or tropical depression affecting or passing close to the country. November to April is the cyclone season but it has been noticed in the past that some tropical disturbances have developed in the month of October which is a transition month.

PRELIMINARY CLIMATOLOGICAL SUMMARY FOR JULY 2005

	RAINFALL					AIR TEMPERATURES								SUNSHINE		
	TOTAL		RAIN MAX.		FALL	AVERAGE DAILY				EXTREME		ON	C	ON	HRS	*
	* DAYS					MAX. #		MIN. #		MAX. MIN.						
	MM	%	+	MM	ON	C	C	C	C	C	ON	C	ON			
NADI AIRPORT	61	136	4	48	23	27.5	-1.1	18.1	-0.3	29.6	19	14.5	5	226	103	
SUVA/LAUCALA BAY	205	151	20	72	23	27.2	0.4	20.1	-0.6	29.9	17	17.2	10	160	119	
NACOCOLEVU	78	109	7	55	23	27.1	-0.2	18.3	0.5	30.2	14	15.5	5	132	79	
ROTUMA	106	46	18	32	22	29.1	0.0	24.7	0.6	31.3	12	23.2	2	207	104	
VIWA	56	101	3	52	23	27.9	0.1	22.0	-0.4	31.5	13	19.4	10			
UDU POINT	93	104	9	59	24	27.5	-0.5	20.4	-1.9	29.5	16	15.0	6			
LABASA AIRFIELD	35	64	4	19	12	28.9	-0.3	16.6	-1.6	32.0	17	11.3	10			
NABOUWALU	66	72	14	27	23	26.4	0.1	21.2	-0.6	28.6	17	17.7	25			
SAVUSAVU AIRFIELD	24	25	6	13	23	26.4	-0.6	21.7	0.7	28.3	17	19.0	7			
MATEI AIRFIELD	187	182	7	120	24	27.1	-0.0	21.3	-0.4	29.0	14	17.6	4			
YASAWA-I-RARA	107	249	3	85	23	28.0	0.2	22.0	-0.3	30.5	20	17.6	4			
VATUKOULA	39	78	5	19	23	28.8	-0.4	17.8	0.3	31.7	16	15.5	9			
MONASAVU	194	100	17	83	23	21.0	0.1	14.5	-0.8	26.1	17	11.0	9			
NAUSORI AIRPORT	230	195	19	83	23	26.2	-0.1	18.6	-1.0	29.3	12	15.5	11			
NAVUA/TOKOTOKO	197	116	17	71	23	26.0	0.0	18.0	-1.7	29.5	14	14.0	10			
ST. JOHNS COLLEGE	146	164	18	50	23	26.4	-0.6	20.7	-0.9	29.0	14	18.7	11			
LAKEBA	222	277	14	172	24	25.8	-0.6	20.5	-0.5	27.8	12	16.3	10			
MATUKU	68	82	6	27	24	26.3	0.3	21.6	0.8	29.8	2	17.7	13			
VUNISEA	112	103	21	18	23	25.5	0.0	19.8	0.2	29.5	17	16.1	10			
ONO-I-LAU	56	61	5	34	24	25.3	0.3	19.1	-1.1	28.9	16	16.3	24			
BA/RARAWAI MILL	53	136	4	32	24	29.0	-0.6	16.7	-0.3	31.7	18	12.5	5			
LAUTOKA AES	52	106	3	37	23	27.7	-0.6	19.1	-0.8	29.5	21	16.0	9			
PENANG MILL	31	56	8	12	23	27.4	0.0	18.7	-1.7	29.5	17	14.5	8			

SCOPIC Model (Seasonal Climate Outlook for Pacific Island Countries Model)

FIGURE E
Three Month Forecast for Selected Stations in Fiji using the
SCOPIC Model

The forecast probabilities are presented as

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

Station	33% (mm)	67% (mm)
Western Division		
Dobuilevu	270.4	387.8
Vatukoula	162.1	267.2
Rarawai	156.1	277.5
Penang	171.7	320.3
Lautoka	158.4	250.0
Nadi	171.7	276.4
Lomawai	144.6	243.3
Nacocolevu	207.0	304.7
Olosara	210.0	331.4
Yasawa	152.5	247.5

Central Division

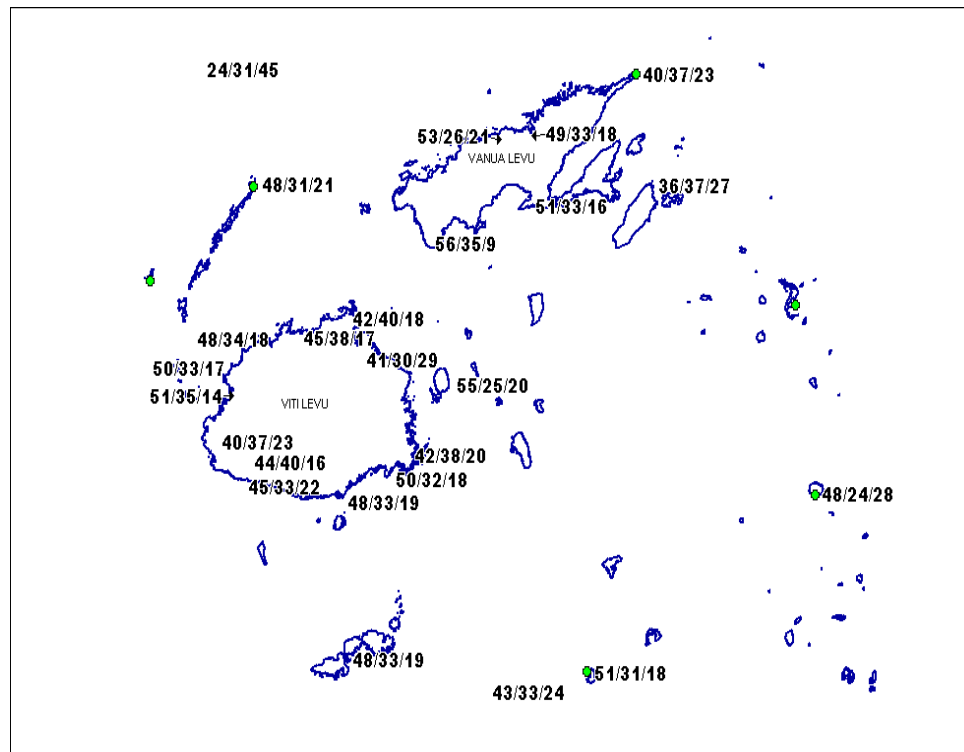
Navua	531.0	760.1
Suva	385.3	605.6
Nausori	384.5	570.5

Eastern Division

Levuka	307.9	249.1
Lakeba	235.4	340.2
Matuku	199.8	366.0
Ono-I-Lau	226.0	344.0
Vunisea	302.2	435.4

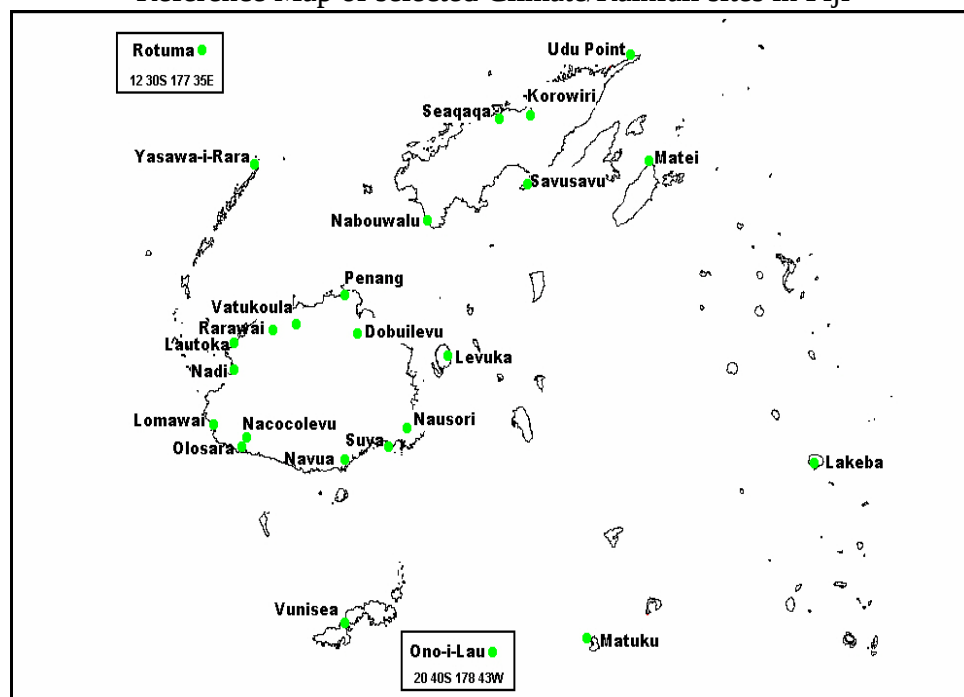
Northern Division

Labasa Mill	181.8	248.7
Seaqaqa	172.0	291.8
Nabouwalu	236.5	473.5
Savusavu	300.3	417.2
Udu Point	271.9	408.1
Matei	363.6	513.0
Rotuma	652.7	832.8



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

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



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. 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.