Volume 5: Issue: 05
May 2005

Fiji Islands Weather Summary May 2005
Rainfall Outlook till August 2005

FIJI METEOROLOGICAL SERVICE

IN BRIEF

A considerably dry May saw monthly records broken across the country with some areas receiving negligible rainfall during the month.

The country's weather was largely influenced by high pressure systems, resulting in majority of the sites receiving well below average rainfall. Some sites in the Western, Northern and Central Division received as low as 5% of normal rainfall.

The monthly rainfall record was broken at Penang Mill, Vunisea (Kadavu), Laucala Bay (Suva), Nadi Airport and Tokotoko (Navua) replacing records set 1913, 1969, 1977 1987 and 1995 (table 2). Other sites that recorded significantly low rainfall were Rarawai Mill, Vatukoula and Labasa Airport.

The Daytime temperatures were generally warmer than normal across the country with majority of the sites experiencing 1.0ºC above normal. A new monthly daytime temperature record was set at Labasa Airport in May (table 2).

The night-time temperatures were generally near normal except at Udu Point and Penang Mill which experienced below normal temperatures.

Total sunshine hours were average to above average and winds were weaker than normal at most sites.

In the latest survey of Global Circulation Models (GCM), ten models favour neutral temperature patterns until October 2005 and two suggest warm conditions while none favour cold conditions. Most models indicate that Central Pacific temperatures to remain on the warm side of average over the next 5 months. One of the models favours El Niño developing and predicts that chance remains between 30-50% until end of June and thereafter becomes increasingly less likely.

The rainfall outlook for the months of June, July and August is most likely to be average or below across the country.

Inside this issue:

WEATHER PATTERNS

May was drier than usual with cool and dry southeast trade winds prevalent over Fiji.

This condition was observed from late April, signifying then, a possible early transition to the dry season. However, in May, some showers were observed in the eastern and southern parts of Fiji, but mostly as a consequence of either weak troughs or mobile fronts and subsequent instability after their passage. Mobile ridges of high pressure, generally moving from west to east were also notable in May. These caused a rather prolonged dry period especially in the Northern and Western Divisions.

Only scattered showers came from weak troughs or fronts about the eastern and southern parts of Fiji between the 1st and 4th, 8th and 10th, and from the 24th to the 28th.

A ridge from the south brought cool and nearly dry conditions to the entire country between the 11th and the 23rd .

For the rest of the month, moist east or southeast winds brought few light showers about the eastern parts of Fiji.

The western areas of the country experienced light afternoon showers on the 4th, 9th, 24th and 25th, when weak troughs were present over eastern Fiji, but the rest of the days were dry.

May was another wet month for Rotuma due to the close proximity of a convergence zone. Notable rainfall was on the 12th when the island reported a 24 hour total of 134.5mm.

Note: There are some corrections to the April summary which is inserted in table 1 on page 2. FMS apologises for the error.

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TABLE 1: RAINFALL FROM MARCH TO MAY 2005

Station	Actual Rainfall	Rainfall in the last three months (Below Average,	No. of Rain days in Mar 05	No. of Rain days in April 05	No. of Rain days in May 05
Penang Mill	620.8	Below Average	11 (10)	22 (89)	10 (01)
Monasavu Dam	1197.1	Below Average	27 (28)	28 (60)	17 (13)
Vatukoula Mine	554.6	Near Average	12 (31)	14 (68)	02 (less than 0.5)
Rarawai Mill, Ba	525.9	Near Average	11 (27)	16 (73)	01 (01)
Yasawa-I-Rara	506.1	Average	13 (24)	17 (71)	07 (05)
Viwa Island	504.8	Average	14 (22)	17 (77)	03 (02)
Lautoka (FSC Res.)	556.2	Average	16 (19)	20 (80)	02 (01)
Nadi Airport	627.1	Average	18 (32)	19 (68)	02 (less than 0.5)
Nacocolevu, Sigatoka	444.8*	Average	08 (40)	15 (60)	02 (less than 0.5)
Note : Data not available at the present time from Nacocolevu (Sigatoka) on 17th March, 28th April and 29th May 2005.					
Tokotoko, Navua	942.9	Average	23 (25)	25 (66)	14 (09)
Laucala Bay, Suva	902.7	Average	19 (41)	26 (52)	15 (07)
Nausori Airport	927.3	Average	18 (50)	26 (42)	17 (08)
Correction: 3 monthly rainfall total for Laucala Bay, Suva in April summary should have been 978.3mm and not 798.3mm.					
Nabouwalu	565.8	Average	20 (29)	26 (60)	17 (11)
Labasa Airport	478.7	Below Average	13 (37)	11 (62)	02 (02)
Savusavu Airport	366.7	Below Average	9 (30)	18 (64)	07 (06)
Udu Point	482	Below Average	14 (17)	24 (77)	15 (05)
Matei Airport	617.5	Below Average	12 (23)	22 (68)	09 (08)
Correction: Udu Point should have been reported as Above Average in the in the April summary.					
Lakeba Is.	669	Average	12 (38)	22 (53)	15 (09)
Matuku Is.	353.8	Below Average	11 (47)	12 (38)	10 (14)
Ono-I-Lau Is.	479.6	Average	12 (41)	17 (39)	08 (20)
Vunisea, Kadavu	1545.4	Well Above Average	14 (47)	24 (51)	12 (02)
Rotuma	1084.5	Average	24 (26)	28 (38)	21 (36)

RAINFALL IN THE LAST THREE MONTHS

Rainfall in May

Well below to Below average rainfall was experienced across the group as the ridges of high pressure systems had a dominant effect on the country's weather. It was exceptionally dry in the Western, Northern and Central divisions with some site receiving merely 5% of normal rainfall. Rainfall varied considerably in the Eastern Division ranging from 16 to 92% of normal.

Five sites namely Penang Mill, Vunisea (Kadavu), Laucala Bay (Suva), Nadi Airport and Tokotoko (Navua) recorded lowest monthly rainfall totals for the month replacing records set in 1913, 1969, 1977, 1987 and 1995 respectively (table 2 on page 4).

All the sites in the Western, Central and Northern Divisions received rainfall ranging from 99% to 60% below normal except Monasavu which received 54% below normal.

The rainfall in the Eastern Division varied from well below average to average ranging from 16-92% of normal May rainfall. Rotuma was the lone site to record above average rainfall this month.

Forecast Verification

Rainfall in the 3-months from March to May 2005

The Rainfall Outlook for the period March to May in the February Fiji Islands Weather Summary was for rainfall to be ***average to below average*** across most of the country. The confidence level of the forecast was moderate.

Out of the twenty two sites that reported in time for this summary, ***seven*** sites received ***below average*** rainfall and ***fourteen*** sites received ***average*** rainfall. The ***lone*** site that received ***above average*** rainfall was Vunisea, in Kadavu.

Figure A

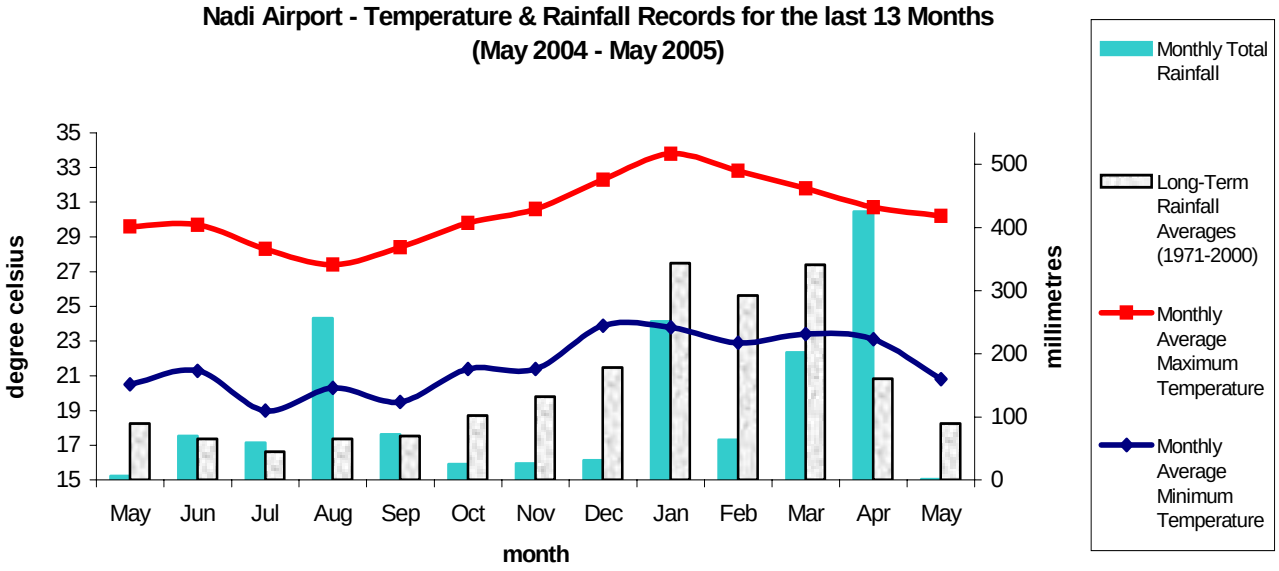


Figure B

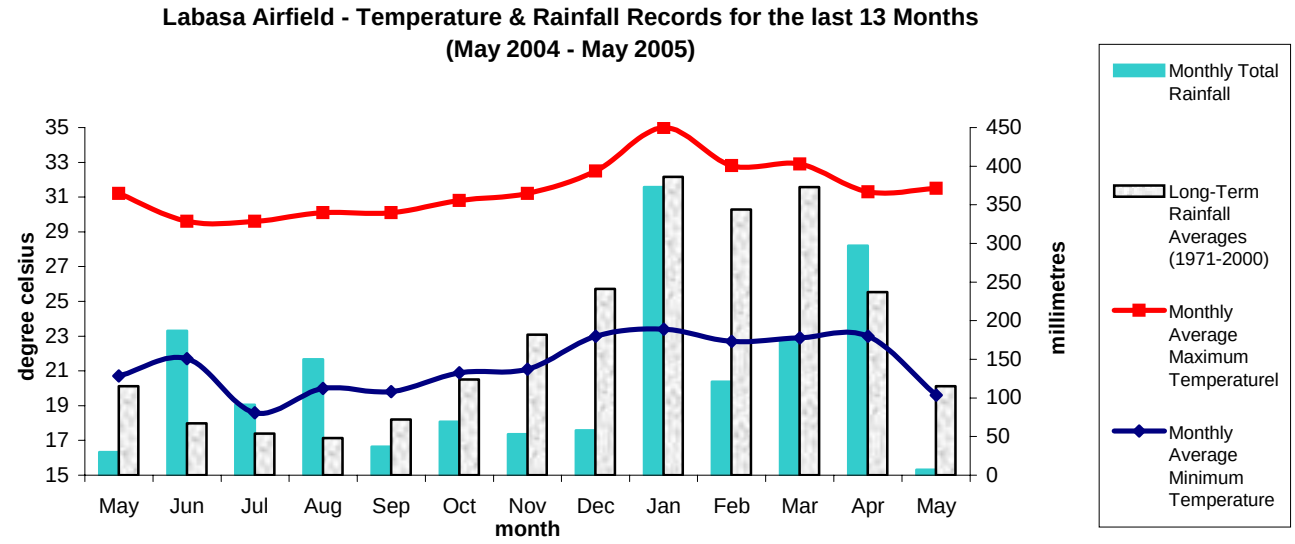
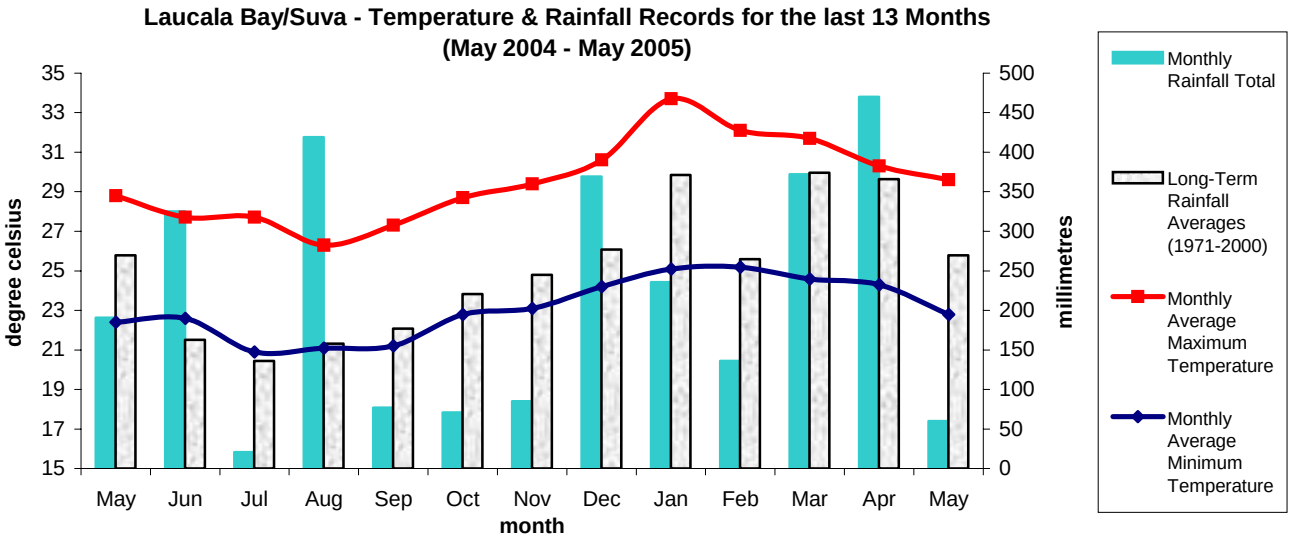


Figure C



Climate in May 2005

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

May was generally warmer than normal with majority of the sites experiencing more than 1°C above normal day-time temperatures. A new monthly day-time temperature was recorded at Labasa Airport (Table 2). The greatest positive departure of 2.0°C was recorded at Yasawa-I-Rara, followed by 1.9°C at Nacocolevu and 1.7°C at Nabouwalu.

The night-time temperatures were generally near normal except at Udu Point and Penang Mill which experienced below normal temperatures. The country experienced a few cooler nights during the month especially on 12th and 13th. The greatest negative departures of 1.3°C were recorded at Matuku 0.7°C at Udu Point and 0.3°C at Labasa Airport. In contrast, Matuku and Vunisea recorded 1.4°C above normal night-time temperatures in May.

Relative Humidity (RH) at 0900hrs at all sites were generally near normal across the country except at Ono-I-Lau and Rarawai Mill which recorded 7 and 8% above normal. The negative departures were recorded at Lautoka Mill (5%), Matei Airport, Labasa Airport and Yasawa-I-rara each 4% below normal.

SOIL MOISTURE AND RUNOFFS

Soil moisture conditions in the Western Division were generally moderate to limiting during the first week and then limiting to dry conditions for the rest of the month except for Monasavu where conditions were excess to ample. However Lautoka and Penang Mills experienced almost dry conditions for the entire month.

In the Central Division, conditions were moderate for the first half of the month at Navua and Suva except for Nausori where conditions were limiting to dry nearly whole of May.

Northern Division experienced limiting to dry soil moisture conditions for most of the month except for Nabouwalu where ample to moderate conditions prevailed for the first three weeks and then limiting to dry conditions existed over the last week.

Moderate to limiting soil moisture conditions prevailed at Vunisea and moderate conditions at Ono-I-Lau, however, Matuku and Lakeba experienced generally dry conditions throughout the month.

Only significant runoff of 234.6mm was recorded at Rotuma during the month, however, small runoffs at Monasavu (97.9mm) and Ono-I-Lau (11.2mm) is also noted.

SUNSHINE, RADIATION & WINDS

May experienced continual bright sunshine resulting in all the sites recording above normal except at Nacocolevu (101%) where sunshine was average. Nadi Airport received 120%, Laucala Bay/Suva 137%. The Global Solar Radiation recorded were 14.5 MJ/ M^2 (average per day) at Nadi Airport, 18.5MJ/ M^2, Suva recorded 15.8MJ/ M^2 and Nacocolevu 15.0MJ/ M^2.

Generally winds were weaker than normal at most sites during the month except at Rotuma and Nausori Airport where it was near normal for most of the time.

TABLE 2 : RECORDS SET IN MAY 2005

Element	Station	Observed (record)	On	Rank	Previous (record)	Year	Records Began
Mly Rainfall (mm)	Penang Mill	7.8	-	New Low	7.9	1913	1910
Mly Rainfall (mm)	Vunisea, Kadavu	28.7	-	New Low	39.0	1969	1946
Mly Rainfall (mm)	Laucala Bay, Suva	60.4	-	New Low	62.0	1977	1942
Mly Rainfall (mm)	Nadi Airport	0.7	-	New Low	0.8	1987	1942
Mly Rainfall (mm)	Tokotoko, Navua	85.1	-	New Low	137.0	1995	1992
Mly MaxTemp (ºC)	Labasa Airport	31.5	-	New High	31.3	2003	1956

ENSO status and Rainfall Outlook to August 2005

ENSO UPDATE
EL NIÑO - SOUTHERN OSCILLATION

The Southern Oscillation Index (SOI) for May was –14.5 (April was –11.2) with the five-month running mean of –11 centred on March (February –10) (see Figure D below). After strong signals were observed in a number of El Niño indicators during February, March brought a general easing in the tropical Pacific atmosphere and to a lesser extent on ocean surface temperatures. The change in the atmosphere saw a rapid rise in the SOI becoming positive early April but since then the SOI has fallen.

Sea surface data for May continue to show positive anomalies across nearly the whole of tropical Pacific, including areas near dateline where anomalies exceeded +0.5°C. During late April, a rapid warming in the eastern Pacific resulted in response to the surface Kelvin wave, however this was short lived and May SST's in the region have displayed a general cooling trend as the impact of Kelvin wave declined. In contrast the SST's in the central Pacific have showed little change.

Positive anomalies generally in order of +0.5°C to +1.0°C are evident across much of equatorial Pacific and in the tropical Pacific to the south of equator. Recently, the large areas of positive anomalies in the eastern Pacific has decreased and small areas of negative anomalies have appeared in the far eastern equatorial Pacific.

The sub-surface temperature data for May still show positive anomalies (+1 to +2°C above normal) even though there have been decline in the horizontal and vertical extent. The positive anomalies are largely confined to east of 120W and above 50 meters depth. In contrast, the negative anomalies that have developed had intensified and spread from central to eastern Pacific in the wake of Kelvin wave and this may have acted to reduce the intensity of positive anomalies in the east.

Despite moderating some of the indicators, the equatorial Pacific remain above average and SOI continues to be negative, there is potential for an event to be triggered until end of June and thereafter becomes increasingly less likely. However, POAMA model run by the Australian Bureau of Meteorology still favours an El Niño event developing and predicts that the chance remains between 30 to 50%. This means that the risk is around double what may normally be expected at this time of the year.

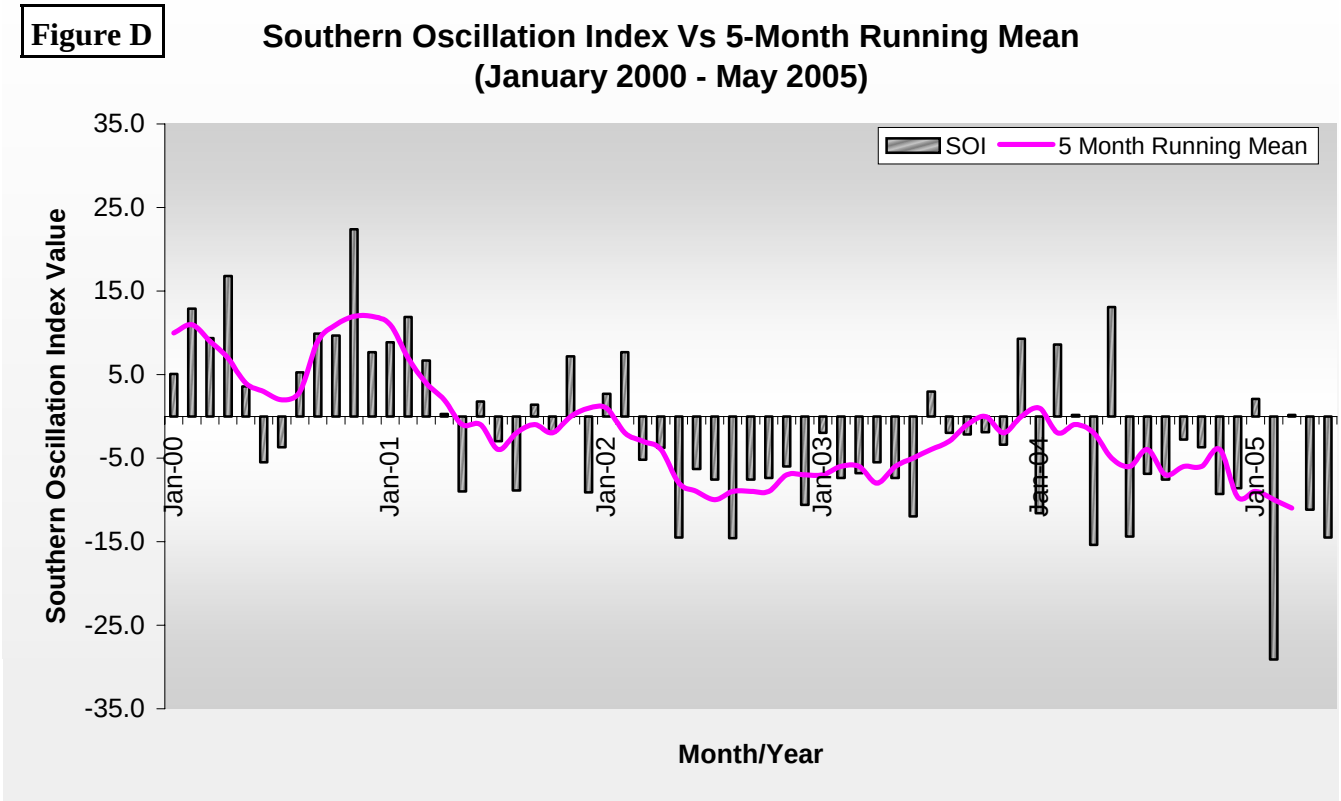
March to June is known as "predictability" barrier and model skill is at its lowest predicting across this span of months for ENSO.

In the latest survey of General Circulation Models (GCM), ten favours neutral temperature patterns in October 2005, two suggests warm (El Niño) conditions, with none predicting cold conditions. Most models indicate the central Pacific remaining on the warm side of average in the next five months.

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 - May 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 that rainfall is most likely to be ***average to below*** in the *Western* and *Northern* divisions while rainfall is likely to be ***average*** in the *Eastern Division* for the upcoming three months.

Average to above rainfall is predicted in the *Central* Division and Rotuma from June to August.
(See figure E for site specific forecast and Figure F for their locations).

RAINFALL OUTLOOK FOR FIJI ISLANDS JUNE TO AUGUST 2005

Based on the global, regional and local models, Fiji's rainfall for the next three months is most likely to *be* ***Average or below*** across the country.

This means while many areas should be able to receive near average rainfall, there would be some areas that may end up with below average rainfall in the coming three months. Although May have been considerably dry, June and July maybe wet.

Note: *In this month FMS has included table 3 which looks at the Linear Error in Probability Space and Hit Rates.*

Linear Error in Probability Space (LEPS): *Measures the accuracy of one set of forecasts compared to Climatology. Skill figures greater than 7.0 has a good skill for the forecast. For Example Nadi Airport has better skill than Suva.*

Hit Rate*: This is a categorical forecast score equal to the total number of correct event. For Example, over the historical record, Nadi Airport had 34.5% that had correct forecast.*

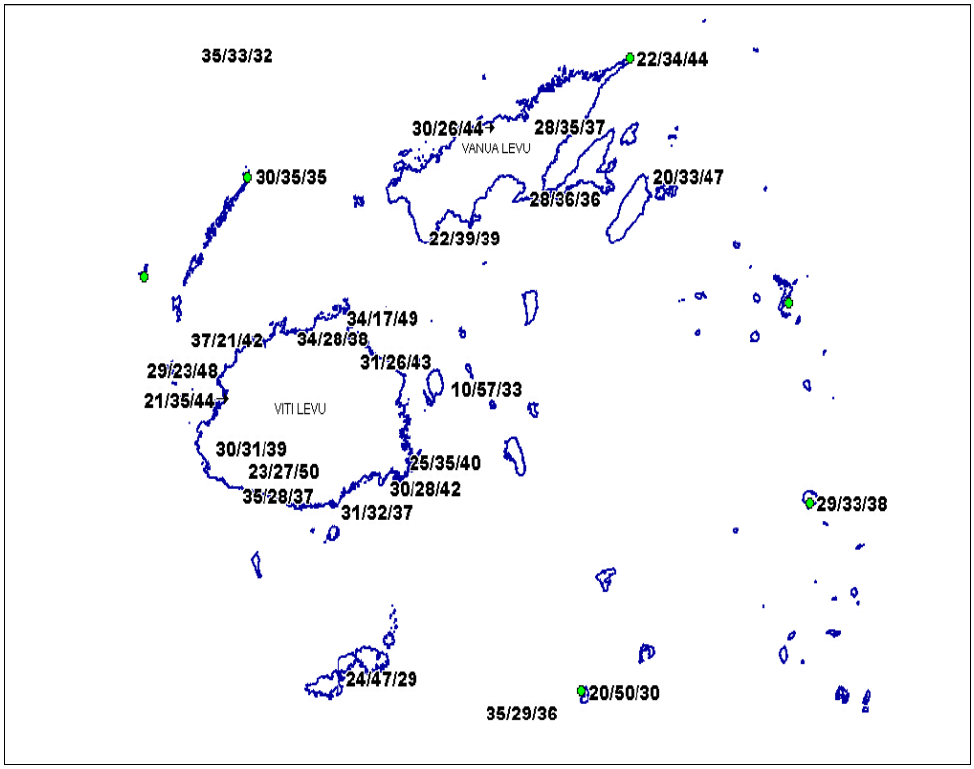
Forecast Skill

After looking at the skills for Fiji in table 3, it seems that the SST have low to moderate skill during this period as we know that the model forecast skill at this time of the year is at its lowest for ENSO. Therefore, the confidence level of this prediction is low to moderate.

Station	Linear Error in Probability Space (LEPS-%)	Hits Rates (%)
Nacocolevu	9.0	54.5
Nadi	7.5	34.5
Lautoka	2.5	36.4
Rarawai	4.1	43.6
Vatulouka	1.8	40.7
Penang	2.2	50.9
Dobuilevu	0.5	37.0
Navua	1.6	35.2
Suva	2.5	34.5
Nausori Airport	7.2	42.6
Nabouwalu	21.3	51.9
Labasa Airport	6.0	40.0
Savusavu Airport	10.2	46.7
Udu Point	6.5	42.0
Matei Airport	20.6	47.7
Lakeba Is.	7.1	43.4
Matuku Is.	3.5	42.9
Ono-I-Lau Is.	3.3	26.4
Vunisea, Kadavu	2.1	25.5
Rotuma	1.3	16.7

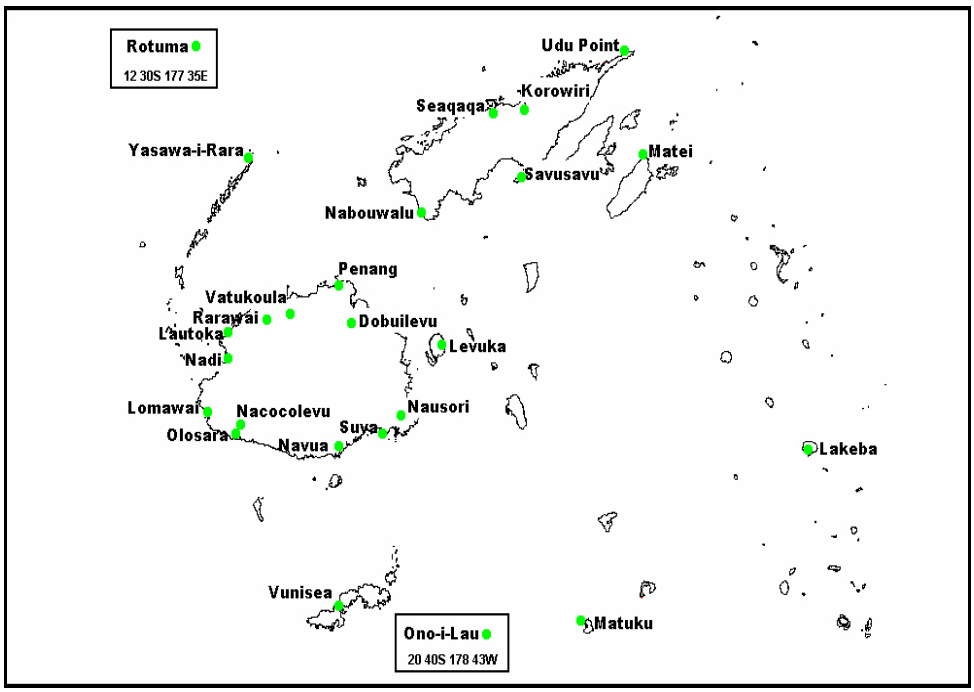
SCOPIC Model
(Seasonal Climate Outlook for Pacific Island Countries Model)

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



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



The forecast probabilities are presented as

DRY/NORMAL/WET

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

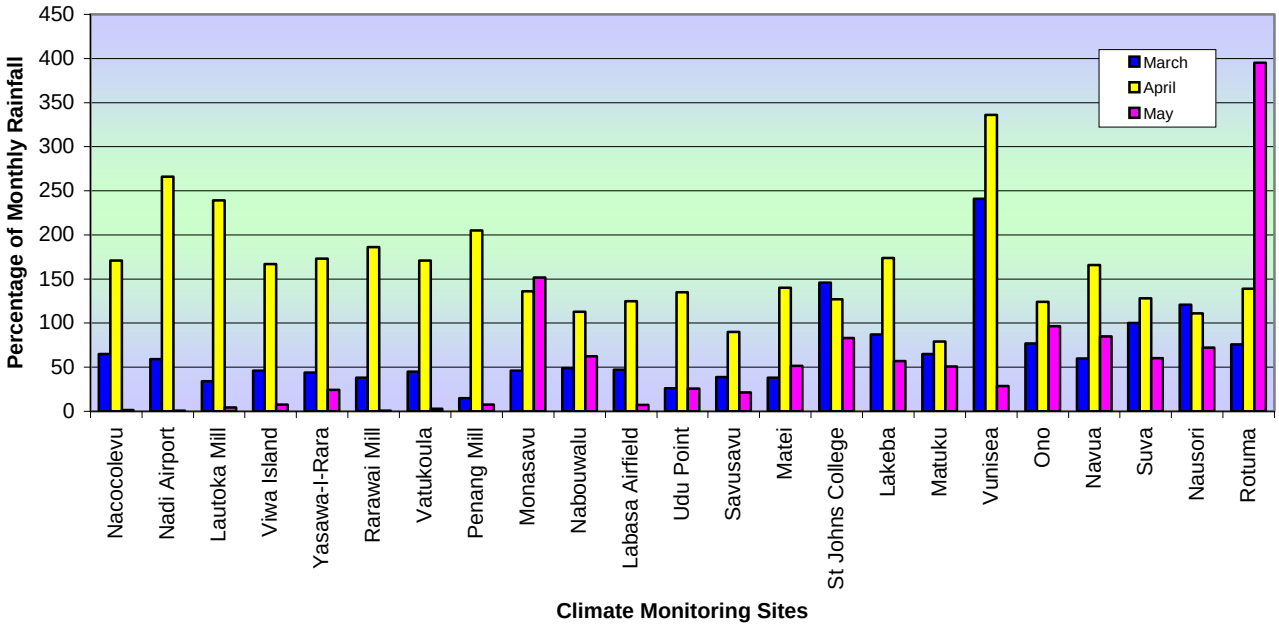
'NORMAL' (average) range refers to rainfall between 33rd and 67th percentiles.

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

Station	33% (mm)	67% (mm)
Western Division		
Dobuilevu	196	294
Vatukoula	146	213
Rarawai	136	208
Penang	161	228
Lautoka	113	209
Nadi	118	207
Lomawai	126	246
Nacocolevu	178	265
Olosara	203	279
Yasawa	132	237
Central Division		
Navua	487	665
Suva	368	502
Nausori	362	493
Eastern Division		
Levuka	302	397
Lakeba	184	296
Matuku	260	364
Ono-I-Lau	251	333
Vunisea	281	425
Northern Division		
Labasa Mill	114	192
Seaqaqa	111	198
Nabouwalu	236	375
Savusavu	236	383
Udu Point	239	415
Matei	255	383
Rotuma	566	816

Figure G

**Comparison of Monthly Rainfall for March, April and May2005
for Climate Monitoring Sites in Fiji
(It shows the distribution of rainfall in the last three months. Comparatively large falls were experienced in April.)**



PRELIMINARY CLIMATOLOGICAL SUMMARY FOR MAY 2005

FIJI METEOROLOGICAL SERVICE DATE 01/06/2005

PRELIMINARY CLIMATOLOGICAL DATA FOR MONTH 5 , 2005 : 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	ON	C	ON	HRS	%
NADI AIRPORT	1	1	2	1	9	30.2	0.5	20.8	0.6	32.5	2	16.8	13	250	120
SUVA/LAUCALA BAY	60	22	15	19	10	29.6	1.1	22.8	0.6	31.2	6	20.6	18	200	137
NACOCOLEVU	2	2	2	2	10	30.8	1.9	21.0	1.3	33.2	6	16.7	13	163	101
ROTUMA	395	134	21	134	12	30.7	0.7	25.1	0.5	32.5	2	23.5	8		
VIWA	8	7	3	5	3	30.1	0.9	24.5	0.5	33.0	2	20.6	13		
UDU POINT	26	15	15	8	9	30.1	0.9	22.8	-0.7	31.6	5	21.1	21		
LABASA AIRFIELD	7	6	2	7	1	31.5	1.3	19.6	-0.3	33.5	5	15.7	13		
NABOUWALU	62	36	17	33	8	29.5	1.7	23.9	0.7	32.4	4	22.5	22		
SAVUSAVU AIRFIELD	21	11	7	6	27	29.1	0.6	23.2	0.9	31.9	9	21.0	18		
MATEI AIRFIELD	52	22	9	21	24	29.5	1.1	23.9	1.0	31.0	9	22.5	18		
YASAWA-I-RARA	24	29	7	7	10	30.9	2.0	23.9	0.4	32.8	5	22.0	12		
VATUKOULA	3	4	2	3	1	31.3	1.0	20.5	1.0	33.3	29	16.7	13		
MONASAVU	152	46	17	63	6	23.5	1.2	17.4	0.4	25.7	27	14.1	12		
NAUSORI AIRPORT	72	29	17	37	10	28.9	1.1	21.1	0.0	30.5	6	17.2	12		
NAVUA/TOKOTOKO	85	28	14	27	28	28.8	1.5	20.7	-0.2	31.5	6	17.5	12		
ST. JOHNS COLLEGE	83	50	14	42	9	U/S		23.7	0.8	U/S		21.0	13		
LAKEBA	57	42	15	10	27	28.4	0.4	22.8	0.1	29.6	4	19.5	16		
MATUKU	51	33	10	11	24	27.9	0.3	23.9	1.4	30.1	4	21.4	12		
VUNISEA	29	16	12	8	3	28.1	0.8	22.9	1.4	30.5	6	19.5	12		
ONO-I-LAU	97	92	8	44	10	27.6	0.9	21.9	-0.2	29.7	5	19.7	13		
BA/RARAWAI MILL	1	1	1	1	1	31.8	1.2	18.9	-0.2	33.2	5	16.0	13		
LAUTOKA AES	4	5	2	4	4	30.2	0.7	21.9	0.4	32.1	27	17.8	13		
PENANG MILL	8	5	10	3	22	29.9	1.4	20.8	-1.3	31.9	3	15.5	25		

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.