

Fiji Islands Weather Summary

April 2005

Rainfall Outlook till July 2005

FIJI METEOROLOGICAL SERVICE

IN BRIEF

April was exceptionally wet as enhanced convection affected the country for most of the month. Above average rainfall was experienced over most parts of the country and there were three sites which received well above average rainfall. Significantly higher than normal rainfall was recorded at Vunisea (336%), Nadi Airport (266%), Lautoka (239%) and Penang (205%). Matuku was the lone site that received a low rainfall of 136mm (79%) during the month.

Significant falls were recorded where Vunisea set new one-day record of 258mm on the 16th receiving more than a months rainfall in 24 hours. Other sites that recorded more than 100mm of rainfall in one day were Penang Mill (181mm), Labasa Airport (163mm), Monasavu (159), Nabouwalu (124mm), Nausori Airport (120mm) and Navua (101mm). Vunisea also recorded a new monthly high of 786mm replacing 694mm in 2000.

Many parts, especially in the central, western and the northern division reported flash floods, which threatened life and property from 18th to 20th. Two people drowned in

WEATHER PATTERNS

A series of troughs brought rain over Fiji on most days. On a couple of occasions, heavy rain led to floods and strong gusty winds caused minor damage to crops.

From the 1st till the 8th of April, moist easterlies caused trade showers over the eastern parts of the country and afternoon showers elsewhere. Also between the 2nd and 4th, a westward moving trough moved across the country. From the 8th till the 12th, another trough moved across Fiji from the northeast merging to become a monsoonal trough which lingered near Kadavu and extended over Lau Group till the 14th. On the 15th, this monsoonal trough intensified and shifted northwards. As a result, the country experienced heavy rain till the 20th.

Strong and gusty winds affected the country between the 18th and 20th. Western, northern and central divisions experienced floods due to continued heavy rain. Vunisea recorded a 24 hour rainfall total of 257.7mm on the 16th and

Rakiraki on 21st and 22nd while crossing the flooded. Several road and schools were also closed across the country.

Daytime temperatures were generally average to above average across the country. Three new daytime temperature records were set at Rotuma, Udu Point and Labasa Airport.

The night-time temperatures were generally above average except at Ono-I-Lau, Udu Point and Penang Mill. Two new monthly and daily night-time highs were recorded in April (Table 2).

Total sunshine hours were below average and winds were near normal at most sites.

Most models indicate central Pacific temperatures to remain on the warm side of neutral over the next 5 months with one predicting greater than 30-50% chance of El Niño conditions developing this year.

The outlook for the next three months is for rainfall to *vary around average* across the country from May to July.

other notable 24 hour rainfall totals were: 163.5mm in Labasa on the 18th, 159.1 mm in Monasavu and 175.7mm in Vanua Balavu on the 20th.

On the 21st, a ridge accompanied by strong southeast winds displaced the trough to the north of Fiji. Rain eased to a few showers till the 22nd. Between the 23rd and 26th, a trough slipped over the Vanua Levu from the north and caused scattered rain over the country.

A second ridge moved over Fiji from the south later on the 26th and brought fresh to strong southeast winds, as well as trade showers about the eastern parts till the 30th.

Rotuma's weather was notable as it experienced more frequent fresh and occasional gusty winds during the month. Rain was experienced almost everyday except on the 1st and 12th due to a convergence zone or trough remaining near the island.

Inside this issue:

In Brief and Weather Patterns	1
Table and Rainfall in the last three months	2
Temp. and RR Graphs for Nadi Airport, Labasa & Laucala Bay	3
Other Climatic variables and New Records Table	4
TC season statement and SOI Graph	5
ENSO Status and Rainfall Outlook for on-coming three months	6
SCOPIE Rainfall forecast—Individual Sites	7
Rainfall and Preliminary Climate data Summary	8

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**

TABLE 1: RAINFALL FROM FEBRUARY TO APRIL 2005

Station	Actual Rainfall (mm)	Rainfall in the last three months (Below Average, Average or Above Average)	No. of Rain days in Feb 05 (% of total rain)	No. of Rain days in Mar 05 (% of total rain)	No. of Rain days in April 05 (% of total rain)
Penang Mill	690.8	Below Average	11 (11)	11 (9)	22 (80)
Monasavu Dam	1392.6	Average	23 (25)	27 (24)	28 (51)
Vatukoula Mine	611.4	Below Average	9 (10)	12 (28)	14 (62)
Rarawai Mill, Ba	581.3	Below Average	7 (11)	11 (24)	16 (65)
Yasawa-I-Rara	513.4	Below Average	4 (6)	13 (24)	17 (70)
Viwa Island	592.1	Average	9 (16)	14 (19)	17 (65)
Lautoka (FSC Res.)	647.6	Average	7 (15)	16 (16)	20 (69)
Nadi Airport	690.2	Average	7 (9)	18 (29)	19 (62)
Nacocolevu, Sigatoka	503.1	-	-	-	-
Tokotoko, Navua	974.6	Average	16 (12)	23 (25)	25 (63)
Laucala Bay, Suva	798.3	Average	17 (14)	19 (38)	26 (48)
Nausori Airport	1044.2	Average	16 (18)	18 (44)	26 (38)
Nabouwalu	775.1	Average	18 (35)	20 (21)	26 (44)
Labasa Airport	592.5	Below Average	10 (20)	13 (30)	11 (50)
Savusavu Airport	479.5	Below Average	13 (28)	9 (23)	18 (49)
Udu Point	1188.7	Below Average	18 (62)	14 (7)	24 (31)
Matei Airport	766.3	Below Average	15 (26)	12 (19)	22 (55)
Lakeba Is.	632.4	Average	9 (3)	12 (40)	22 (57)
Matuku Is.	320.0	Below Average	4 (5)	11 (52)	12 (43)
Ono-I-Lau Is.	406.7	Below Average	4 (6)	12 (48)	17 (46)
Vunisea, Kadavu	1594.7	Well Above Average	16 (5)	14 (46)	24 (49)
Rotuma	836.7	Average	21 (18)	24 (35)	28 (49)

RAINFALL IN THE LAST THREE MONTHS**Rainfall in April**

Enhanced convection and above average rainfall was experienced during April. It was exceptionally wet and almost all sites received average to above average rainfall with three sites receiving well above rainfall. Significantly higher than normal rainfall was recorded at Vunisea (336%), Nadi Airport (266%), Lautoka (239%) and Penang (205%). Mataka was the lone site that received lowest rainfall of 136.2mm (79%) during the month. New monthly (785.7mm) and daily (257.7mm) records were set at Vunisea this month (table 2).

Average to above average rainfall received in the Western Central and the Northern Divisions ranging from 90% to 266%. Monasavu received 136% of its normal rainfall and for the first time exceeded normal monthly rainfall since September 2004.

The Eastern Division also received average to above average rainfall ranging from 124-174% except at Mataka where rainfall was 79% which is marginally below average.

Forecast Verification**Rainfall in the 3-months from February to April 2005**

The Rainfall Outlook for the period February to April in the January 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 one sites that reported in time for this summary, ten sites received below average rainfall and the other ten sites received average rainfall. The only site that received above average rainfall was Vunisea, Kadavu.

Figure A

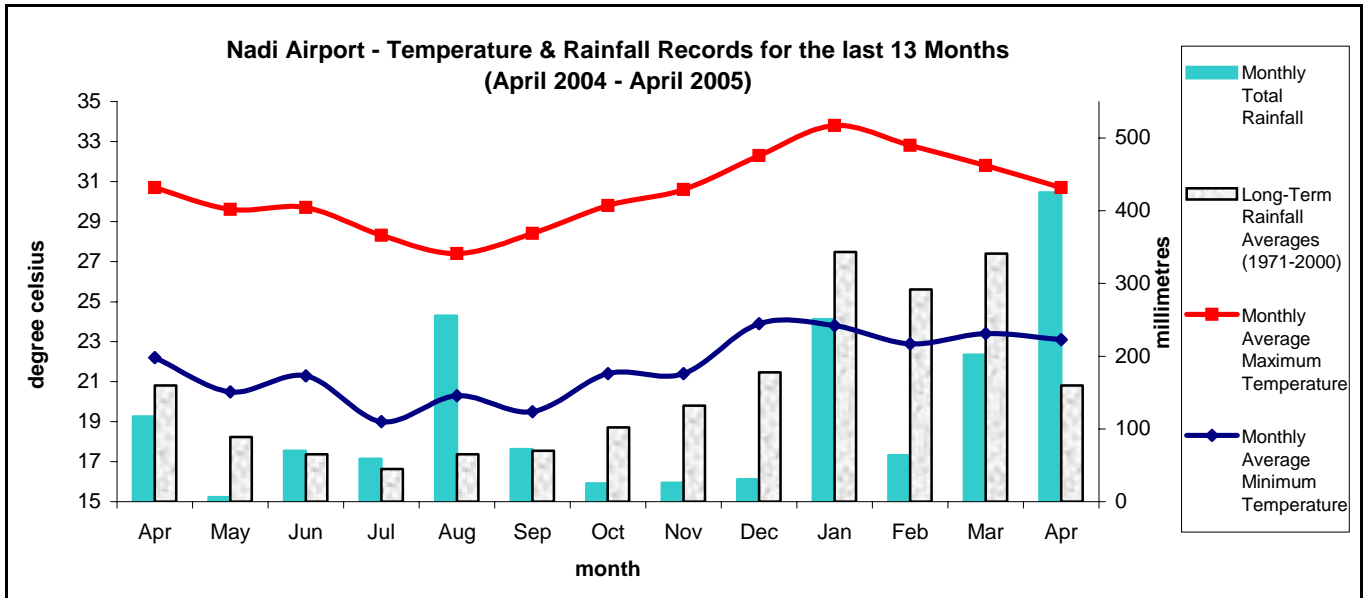


Figure B

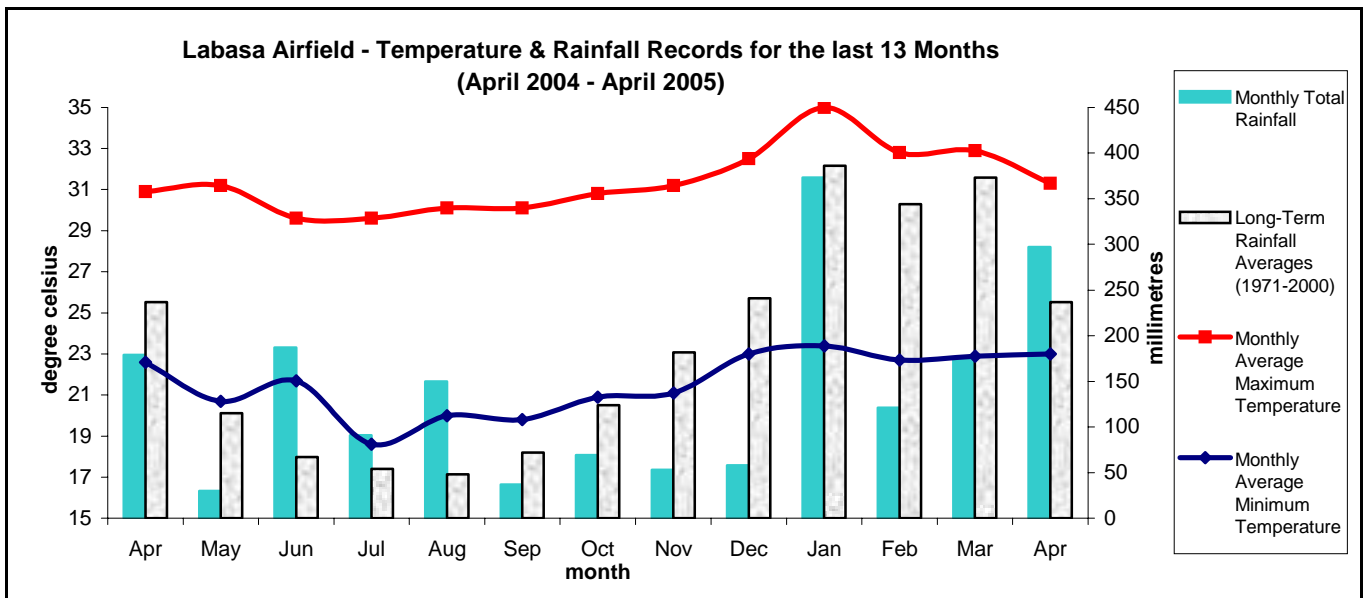
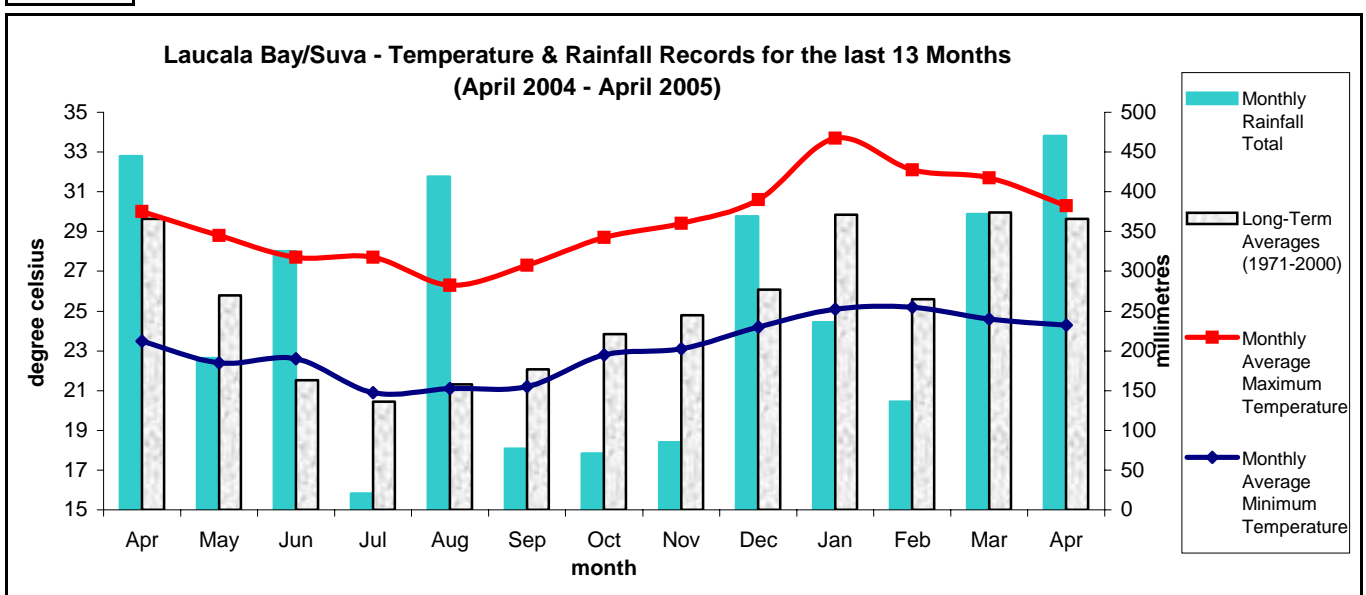


Figure C



Climate in April 2005

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

The day-time temperatures were generally average to above average across the country with Rotuma, Udu Point and Labasa Airport recording new day-time highs (Table 2). The greatest positive departure of 1.3°C was recorded at Nabouwalu followed by 1.2°C at Nacocolevu and 1.0°C at Rotuma).

The night-time temperatures were generally above average except at Ono-I-Lau, Udu Point and Peneng Mill and average at Yasawa-I-Rara. The greatest positive departures

were recorded at Matuku (1.8°C) and at Nacocolevu and Vatukoula (1.7°C). The greatest negative departure was recorded at Ono-I-Lau and Penang Mill which recorded 0.9°C and 0.5°C below normal.

Relative Humidity (RH) at 0900hrs at all sites were generally average to above average across the country. The highest positive departures were recorded at Ono-I-Lau (10%), Matuku (7%) and St. Johns College in Levuka (6%). Rarawai recorded highest negative departure of 9%.

SOIL MOISTURE AND RUNOFFS

In the Western Division, conditions were generally moderate to limiting during the first week. It became excess to ample for the next two weeks and then returning to moderate conditions over the last week of the month except at Rarawai, Vatukoula and Nadi where the conditions were excess to ample. Monasavu experienced excess conditions almost everyday.

In the Central Division, conditions were moderate initially then became excess to ample for most of the month except for Navua which experienced excess to ample conditions throughout the month.

In the Northern Division, the soil conditions were generally moderate to limiting during the first week then becoming moderate to ample for second and third week and then ample to excess for the rest of April. Rotuma experienced excess to ample moisture conditions.

Soil moisture conditions in the Eastern Division were generally moderate to ample then ample to excess during the month.

Significant runoffs were recorded at most sites around the country including Vunisea (605.9mm), Monasavu (597.8mm), and Navua (445.2mm).

SUNSHINE, RADIATION & WINDS

Total sunshine hours were below average at all recording sites during the month. Nadi Airport received 66%, Laucala Bay/Suva 69% and Nacocolevu 64%. The Global Solar Radiation recorded were 13.4 MJ/ M² (average per day) at Nadi Airport. No reports received from Laucala Bay and

Nacocolevu due to instrument failure.

Monthly average wind speeds were above average at Nadi Airport, Rotuma and Nausori Airport. Near average winds were recorded at Nabouwalu in April.

TABLE 2 : RECORDS SET IN APRIL 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>
Mly Rainfall (mm)	Vunisea	785.7	-	New High	694.0	2000	1946
Dly Rainfall (mm)	Vunisea	257.7	16th	New High	248.0	1983	1943
Dly MaxTemp (°C)	Rotuma	33.4	02nd	New High	33.1	1969	1933
Dly MaxTemp (°C)	Udu Point	34.0	16th	New High	33.1	1991	1956
Dly MaxTemp (°C)	Labasa Airport	34.2	01st	New High	33.8	1991	1956
Dly Max Temp (°C)	Nabouwalu	33.5	13th	Equal High	33.5	2003	1956
Dly Max Temp (°C)	Navua	32.5	01st	Equal High	32.5	1994	1992
Mly Min Temp (°C)	Vunisea	24.3	-	New High	24.0	1995	1947
Mly Min Temp (°C)	Mataku	25.7	-	New High	24.9	1996	1955
Dly Min Temp (°C)	Monasavu	22.0	4th	Equal High	22.0	1996	1980
Dly Min Temp (°C)	Vunisea	27.4	6th	New High	27.0	1996	1947

Tropical Cyclone Season Summary 2004/05

The South Pacific Tropical Cyclone Season officially ended on 30th of April 2005. A total of ten tropical cyclones formed in the tropical Southwest Pacific, of which nine formed in Fiji's Regional Specialised Meteorological Centre area of responsibility and one by Brisbane Tropical Cyclone Warning Centre.

The chances of a cyclone affecting Fiji during 2004/05 season was moderate to high given the sea surface temperatures in the western and central Pacific were on the *Warmer* side of *Neutral*.

Although ten cyclones formed in the region, none directly threatened Fiji group during the season. However, there have been some indirect effects to some parts of the country in terms of heavy rainfall and strong winds as a depression during late January passed over Fiji Group and later developed into TC Lola.

The oceanic and atmospheric features resembled El Niño like conditions during the season where the SPCZ remained slightly displaced eastwards most of the time. Seven of the ten tropical cyclones formed in the vicinity of SPCZ and to the east of the dateline which showed the

typical El Niño pattern of tropical cyclone formation and movement.

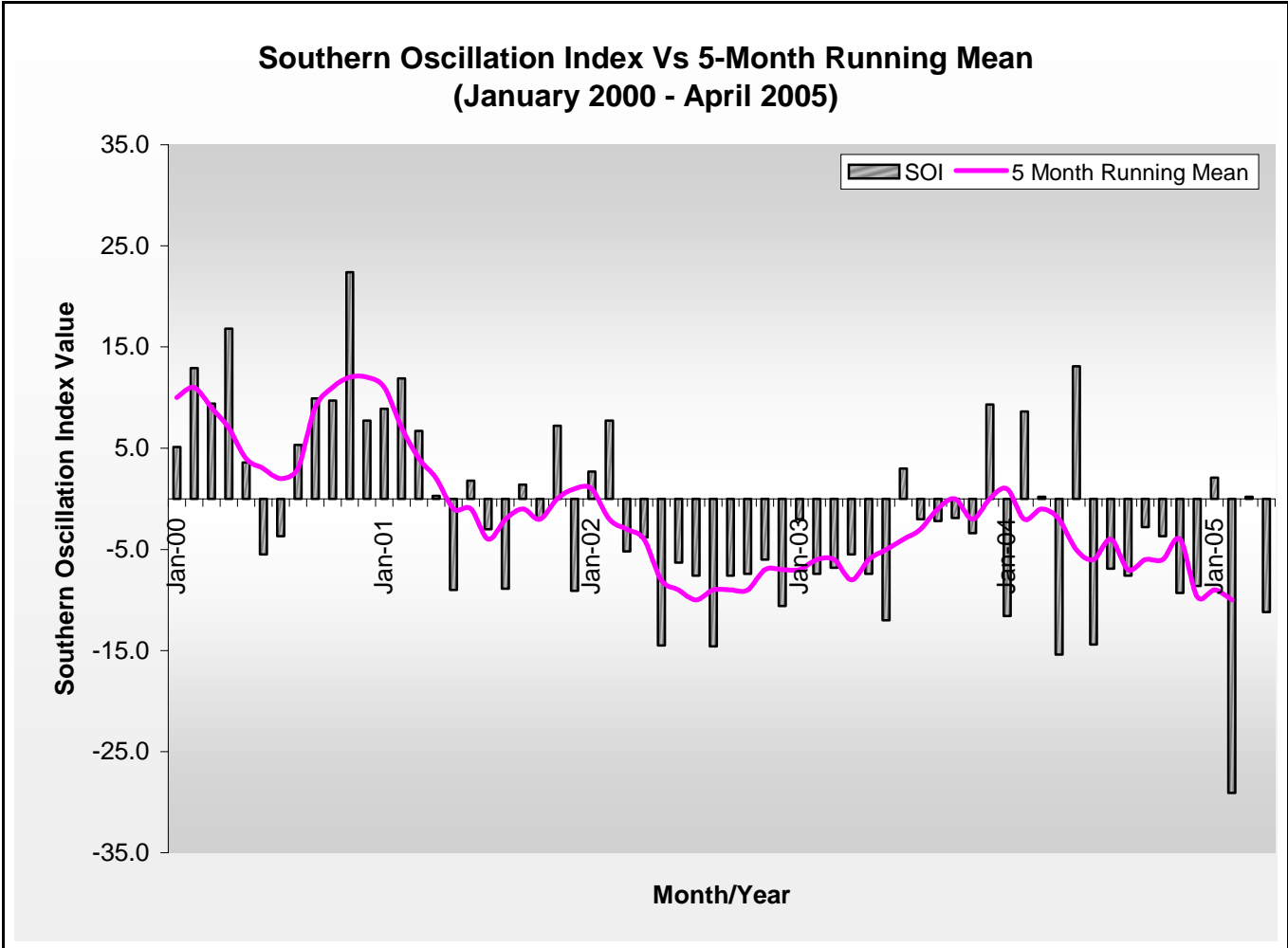
Nine tropical cyclones (excluding Ingrid) was named by Nadi Tropical Cyclone Warning Centre which formed in the SW Pacific for the season 2004/05. They were Judy, Kerry, Lola, Meena, Nancy, Olaf, Percy, Rae and Sheila.

The average number of tropical cyclones that form in a season is between 9-10 in this region and the mean number of cyclones that affect Fiji in a season (including pre-season events) since 1969/70 is between 1 and 2. per season.

The last tropical cyclone that directly affected Fiji was tropical cyclone Ami which caused extensive damage and flooding especially in the Labasa Area.

Next Tropical Cyclone updates will begin with the new 2005/06 season in November this year. For further information on the tropical cyclones, contact Fiji Meteorological Service on 6724888 or visit Website:<http://www.met.gov.fj>.

Figure D



ENSO status and Rainfall Outlook to July 2005

EL NIÑO - SOUTHERN OSCILLATION UPDATE

The Southern Oscillation Index (SOI) for April was -11.2 (March was $+0.2$) with the five-month running mean of -10 centred on February (January -9) (Figure D). After strong signals were observed in a number of El Niño indicators during February, March brought a general easing of conditions 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 has since fallen again. Sea surface data for April continued to show positive anomalies in the central to western tropical Pacific, including areas near the dateline where anomalies exceeded $+0.5^{\circ}\text{C}$. This represents a slight cooling of positive sea surface temperature anomalies in this region since March. However, there has been a rapid warming in the eastern Pacific in the response to the surfacing of the Kelvin wave in this region. In general there were positive anomalies across the whole tropical Pacific during April with a warming trend in the eastern Pacific.

Temperatures below the surface of the equatorial Pacific remain abnormally warm ($+2$ to $+4^{\circ}\text{C}$ above normal). The subsurface temperatures are seen as critical to any further developments and hence are being monitored closely. Despite the moderating of some indicators, the chance of a basin-wide El Niño occurring later this year remains higher than normal with one of the Coupled General Circulation Model predicting that chances of El Niño development remains elevated.

The latest observations of ocean temperatures, wind, cloud and atmospheric pressure are inconclusive with no clear trends apparent. The "Kelvin wave" of subsurface warming that has been tracked since February, has reached the coast of South America but with little response in surface temperatures in the eastern Pacific as yet. A modest level of cooling has occurred in the western to central tropical Pacific during the past fortnight. However, the Kelvin wave has certainly increased the heat content of the tropical Pacific, and hence provided some "pre-conditioning" of the tropical Pacific for further warming. Another moderate to strong Westerly Wind Burst (WWB) has reached the western Pacific and is expected to produce another Kelvin wave of subsurface warming. Subsurface warming is very important in the development of a basin-wide El Niño, so this latest WWB will be monitored closely, especially as it is occurring in the southern autumn, the critical time of year for El Niño development.

In the latest survey of international computer models, eight favoured neutral temperature patterns in September 2005, three suggested warm (El Niño) conditions, with one predicting cold conditions. By December 2005, one model now predicts the development of warm conditions and seven predicting neutral conditions and none predicting the development of cool conditions.

However, POAMA model run by the Australian Bureau of Meteorology is strongly in favour of an El Niño event developing during the southern autumn and winter and predicts that the chance of El Niño this year is estimated at between 30 to 50%. This means that the risk is around double what may normally be expected at this time of the year. However there is great deal of uncertainty whether an El Niño will develop or not and needs to be closely monitored over the coming months.

March to June is known as "predictability" barrier and model skill is at its lowest predicting across this span of months and this is one of the reasons why the models do not show consensus.

Information on **Interseasonal Patterns including the Madden-Julian Oscillation** can be found on the Australian Bureau of Meteorology website <http://www.bom.gov.au/climate/tropnote/tropnote.shtml> This information is part of the 'Weekly Tropical Climate Note' and is updated each Tuesday at 0330 UTC. For more information or interpretation please contact the Fiji Meteorological Service. (The ENSO Update is kindly provided by the Australian Bureau of Meteorology and can be found on their website <http://www.bom.gov.au>)

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 predicts that rainfall is likely to be *average or below* in the *Western* and *Northern* divisions while rainfall to *near average* in the *Eastern Division* for the upcoming three months.

Average rainfall is predicted in the *Central Division* and *Rotuma* from May to July.

RAINFALL OUTLOOK FOR MAY TO JULY 2005

Based on the global and local models, Fiji's rainfall for the next three months is likely to *Vary around Average* across the country. This means that while many places should be able to receive near average rainfall, there would be some places that may end up with below average rainfall in the coming three months and some places may get above average.

NOTE: The confidence level of this prediction is moderate.

SCOPIC—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

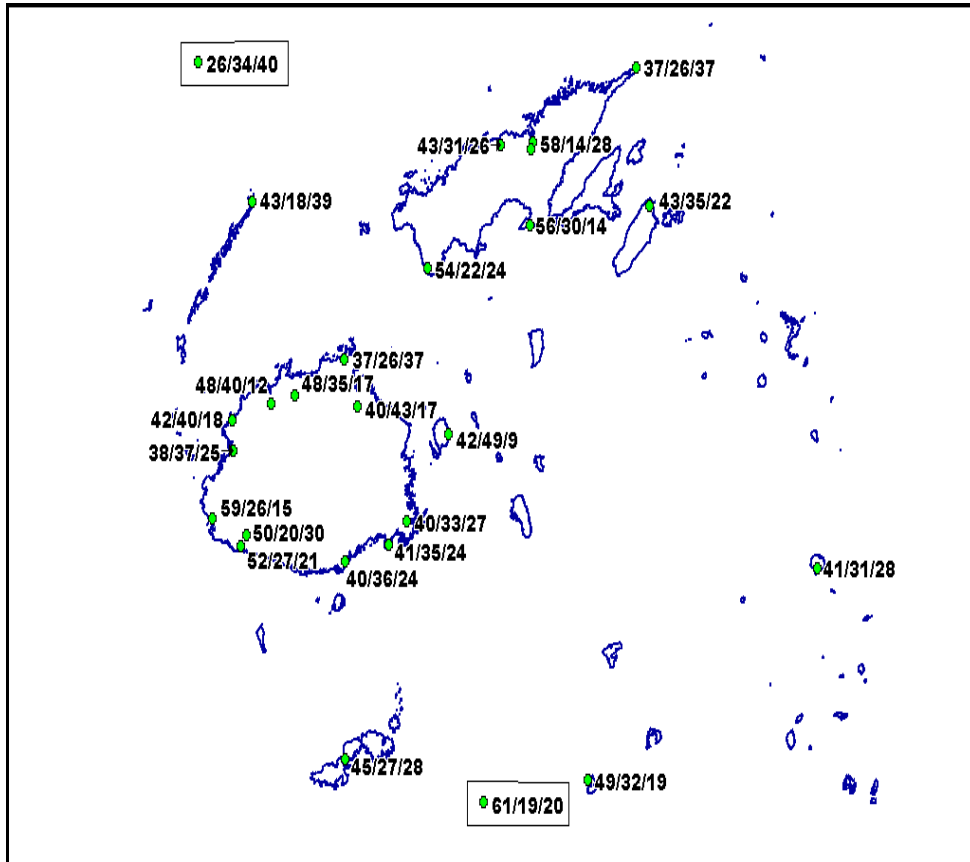
DRY/NORMAL/WET

‘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	425.7	590.7
Vatukoula	312.9	474.4
Rarawai	292.2	433.1
Penang	360.5	513.3
Lautoka	260.1	393.4
Nadi	260.1	373.5
Lomawai	246.0	349.0
Nacocolevu	276.3	374.5
Olosara	257.5	433.0
Yasawa	301.0	444.4

Central Division		
Navua	764.2	992.1
Suva	677.8	849.4
Nausori	638.4	799.5

Eastern Division		
Levuka	520.5	760.2
Lakeba	327.1	501.1
Matuku	353.3	476.6
Ono-I-Lau	277.7	456.1
Vunisea	489.4	597.9

Northern Division		
Labasa Mill	374.8	482.7
Seaqaqa	324.4	515.3
Nabouwalu	483.7	666.5
Savusavu	414.2	630.8
Udu Point	405.2	559.0
Matei	502.0	706.3
Rotuma	748.1	912.8

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

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

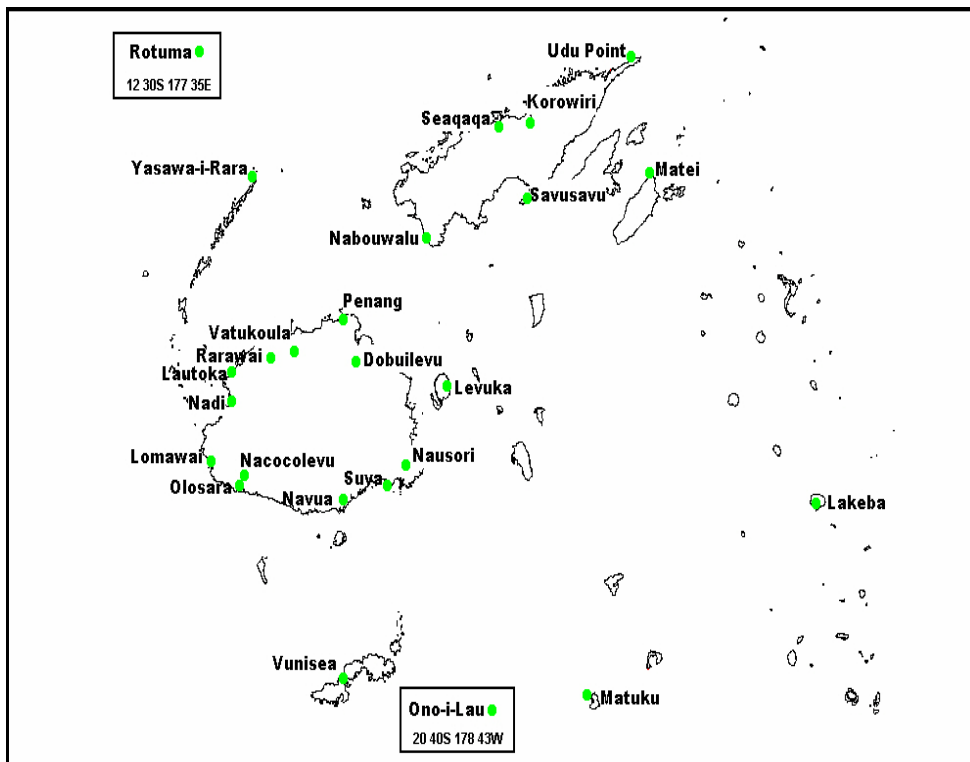
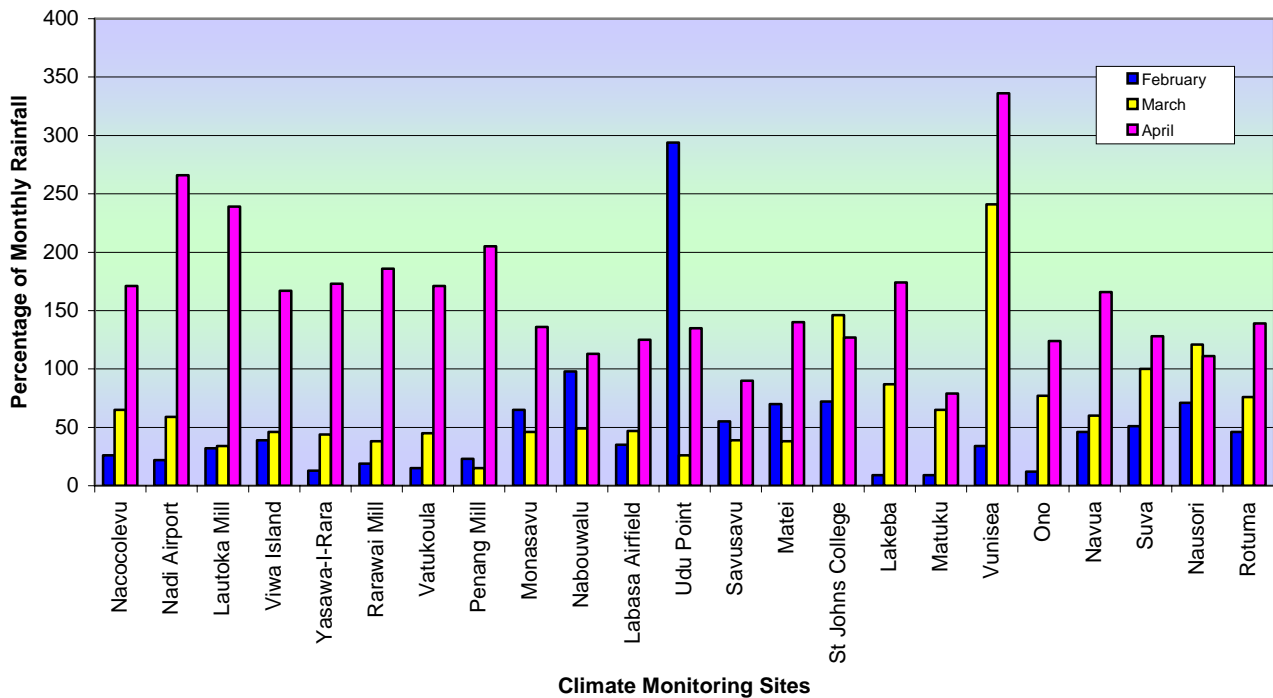


Figure F

**Comparison of Monthly Rainfall for February, March and April 2005
for Climate Monitoring Sites in Fiji**



PRELIMINARY CLIMATOLOGICAL SUMMARY FOR APRIL 2005

FIJI METEOROLOGICAL SERVICE

DATE 02/05/2005

PRELIMINARY CLIMATOLOGICAL DATA FOR MONTH 4 , 2005 : SUMMARY FOR DAYS 1 TO 30

	RAINFALL				AIR TEMPERATURES						SUNSHINE				
	TOTAL	RAIN	MAX.	FALL	AVERAGE DAILY				EXTREME		TOTAL	*			
	MM	%	MM		ON	MAX.	#	MIN.	#	MAX.	MIN.		HRS		
					C	C	C	C	C	ON	C	ON	%		
NADI AIRPORT	425	266	19	81	19	30.7	0.0	23.1	1.3	33.6	4	20.0	29	131	66
SUVA/LAUCALA BAY	470	128	26	77	19	30.3	0.4	24.3	1.0	33.2	3	22.3	30	106	69
NACOCOLEVU	265	171	15	63	18	31.4	1.2	23.2	1.7	35.0	3	18.6	12	108	64
ROTUMA	408	139	28	59	10	31.5	1.0	25.3	0.5	33.4	2	23.0	6		
VIWA	386	167	17	71	11	30.8	0.5	25.2	0.4	33.0	2	23.0	12		
UDU POINT	373	135	24	55	7	30.7	0.5	23.3	-0.9	34.0	16	21.5	28		
LABASA AIRFIELD	297	125	11	164	18	31.3	0.3	23.0	1.7	34.2	1	19.9	6		
NABOUWALU	339	113	26	124	18	30.3	1.3	24.7	0.7	33.5	13	22.9	24		
SAVUSAVU AIRFIELD	235	90	18	87	18	30.0	0.2	24.6	1.4	33.0	2	23.6	12		
MATEI AIRFIELD	421	140	22	84	18	29.8	0.2	24.5	0.7	32.0	8	23.0	27		
YASAWA-I-RARA	361	173	17	132	18	30.6	0.7	24.3	-0.1	33.6	8	22.4	24		
VATUKOULA	378	171	14	98	18	31.4	-0.0	22.7	1.7	34.4	2	19.1	29		
MONASAVU	712	136	28	159	20	24.5	0.4	19.3	0.7	28.3	2	15.2	29		
NAUSORI AIRPORT	394	111	26	120	20	30.0	0.7	23.3	0.8	32.9	13	20.7	30		
NAVUA/TOKOTOKO	618	166	25	101	18	29.8	0.8	23.3	0.8	32.5	1	21.0	24		
ST. JOHNS COLLEGE	305	127	18	60	20	30.2	0.8	25.3	1.4	32.0	1	23.5	9		
LAKEBA	358	174	22	90	18	29.4	0.1	24.8	1.0	31.7	13	23.1	28		
MATUKU	136	79	12	36	18	30.2	1.0	25.7	1.8	31.7	2	22.4	2		
VUNISEA	786	336	24	258	16	28.7	-0.1	24.3	1.6	32.5	1	21.5	26		
ONO-I-LAU	188	124	17	56	14	28.2	-0.0	22.8	-0.9	31.7	10	18.4	28		
BA/RARAWAI MILL	385	186	16	74	20	31.5	-0.0	22.5	1.3	34.6	4	18.3	29		
LAUTOKA AES	447	239	20	96	16	30.9	0.4	23.6	0.7	34.2	4	20.5	28		
PENANG MILL	551	205	22	181	18	30.1	0.5	22.7	-0.5	32.6	10	21.4	28		

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.