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April 2004

Fiji Islands Weather Summary
April 2004
Rainfall Outlook till July 2004

FIJI METEOROLOGICAL SERVICE

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IN BRIEF

Two tropical depressions and a slow moving trough of low pressure caused heavy rain, strong and squally winds in parts of the country during the first half of April. There was flooding associated with all three events however the second and third flooding events were particularly severe with significant damage amounting to several millions of dollars in the Central and upper Western Division. Ten lives were lost with an equal number reported missing.

Overall, rainfall varied around average across the country in April. The parts of Viti Levu affected by the Tropical Depression and significant rainfall event received above average rainfall while the rest of the island received average. In the Northern Division rainfall was mainly below average. In the Eastern Division rainfall was above average except for Rotuma which received below average rainfall. In the last three months rainfall was average across the country except in the Northern Division where below average was recorded along the southern coastline of Vanua Levu as well as Matei. Udu Pt. received above average.

Day-time and night-time air temperatures as well as relative humidity varied around average. Total sunshine hours were around average at all the recording stations.

Based on model predictions and current 'neutral' ocean and atmospheric conditions, Fiji's rainfall is expected to be near average in the next three months.

WEATHER PATTERNS

During the first four days of the month a ridge of high pressure affected the Fiji group maintaining the fresh to strong southeast winds over the country.

Early on the 5th a trough of low pressure near Rotuma gradually moved south towards Fiji. Around midday 06th, a TD (11F) developed along the trough, about 220km to the NW of Labasa. As TD 11F approached Vanua Levu on the same evening, it rapidly intensified and made landfall early on the 07th. It was accompanied by strong winds and heavy rain causing flooding in some areas of Vanua Levu. TD 11F continued to move rapidly SE and was SE of the Lau Group by midnight 07th. By this time a 2nd TD (TD 10F) had formed along the trough referred to above and which then moved closer to Fiji and was located about 280km NNW of Nadi. The islands in the northern Yasawa Group experienced strong and gusty winds early on the 08th. By 1.30p.m TD 10F reached the Viti Levu coastline near Rakiraki and was moving rapidly across Viti Levu causing extensive flooding in northern and eastern parts of the island. A number of landslides also occurred one of which caused a public bus to be washed into a flooded river in the Wainibuka area along the Kings Road. TD 10F was located to the SE of the Lau Group by midday of the 09th.

The trough of low pressure associated with the TDs was still in the vicinity of the Fiji Group and was NE of Vanua Levu by midday on the 11th. A third depression (TD 12F) developed along the trough but remained north of the country as the trough became near stationary in the area between Vanua Levu and Rotuma. On the 13th the trough moved back over the Group and remained for the next two and half days. A considerable amount of rain fell over the country before the trough moved SW of Viti Levu around midnight 15th. With soil saturated from the passage of TD 10F/11F, there was extensive flooding in the Navua and Tailevu areas.

For the next five days, a ridge of high pressure directed dry and cool southerlies onto the group with fine weather conditions prevailing across the country. Early on the 21st a weak trough developed across Vanua Levu and the Lau Group then drifted west affecting parts of the Yasawa Group. Significant falls were recorded over these areas. During this period Yasawa received 71.2mm of rain on the 21st whilst Matuku received 73mm on the 24th.

For Rotuma, there were a number of occasions during the first half of April when the SPCZ moved slowly across the island. This was evident by the amount of rainfall recorded during this period. The first event occurred from the 03-06th with the highest 24hr rainfall recorded on the 05th - 56.4mm. The second event, though not as impressive as the first occurred on the 13th with Rotuma receiving 27.2mm. The second half of the month was dry as the SPCZ remained north of the island.

TABLE 1: RAINFALL FROM FEBRUARY TO APRIL 2004

Station	Actual Rainfall (mm)	Rainfall in the last three months (Below average, average or above average)	No. of Rain days in February (% of total rain)	No. of Rain days in March (% of total rain)	No. of Rain days in April (% of total rain)
Penang Mill	917.2	Average	21 (40)	21 (32)	12 (28)
Monasavu Dam	1041.9	Below Average	23 (38)	24 (25)	23 (37)
Vatukoula Mine	1130.0	Average	19 (48)	15 (24)	10 (28
Rarawai Mill, Ba	996.8	Average	18 (47)	18 (37)	7 (16)
Yasawa-I-Rara	-	-	-	-	-
Viwa Is.	703.1	Average	17 (50)	19 (34)	9 (16)
Lautoka Mill(Research)	790.8	Average	18 (46)	21 (31)	9 (23)
Nadi Airport	871.9	Average	18 (58)	27 (28)	9 (14)
Nacocolevu, Sigatoka	645.4	Average	21	-	15
Tokotoko, Navua	1190.6	Average	20 (25)	20 (26)	20 (49)
Laucala Bay, Suva	953.8	Average	24 (27)	29 (26)	24 (47)
Nausori Airport	961.8	Average	23 (31)	23 (23)	21 (46)
Nabouwalu	673.2	Below Average	26 (39)	25 (37)	24 (24)
Labasa Airport	933.0	Average	15 (36)	20 (45)	11 (19)
Savusavu Airport	623.1	Below Average	14 (27)	20 (40)	16 (33)
Udu Point	1069.5	Above Average	19 (49)	26 (30)	20 (21)
Matei Airport	629.2	Below Average	19 (47)	18 (28)	12 (25)
Lakeba Is.	661.3	Average	16 (35)	19 (24)	15 (41)
Matuku Is.	-	-	-	-	-
Ono-I-Lau Is.	694.8	Average	12 (25)	18 (44)	11(31)
Vunisea, Kadavu	712.6	Average	17 (20)	25 (40)	18 (40)
Rotuma	914.8	Average	16 (36)	22 (39)	21 (25)

RAINFALL IN THE LAST THREE MONTHS

Rainfall in April

Rainfall in April varied around average across the country. Tropical Depression 10F and a slow moving trough of low pressure early in the month caused a considerable amount of rainfall activity in northern and eastern Viti Levu. Rainfall recorded at these sites was above the April average (122-157%). In the remaining parts of Viti Levu rainfall was mainly average except Nacocolevu which recorded above average rainfall (50-111%). Below average rainfall was recorded in the Northern Division except for Udu Point which recorded average. Rainfall was above average in the Eastern Division (122-139%) except for Rotuma which recorded below average rainfall (77%).

Rainfall in the 3-months from February to April

The Rainfall Outlook for the period February to April in the January Fiji Islands Weather Summary was for rainfall vary considerably around average. The confidence level of the forecast was moderate.

Of the twenty sites that reported in time for this summary, four sites reported below average and fifteen average and one site recorded above average.

Figure A

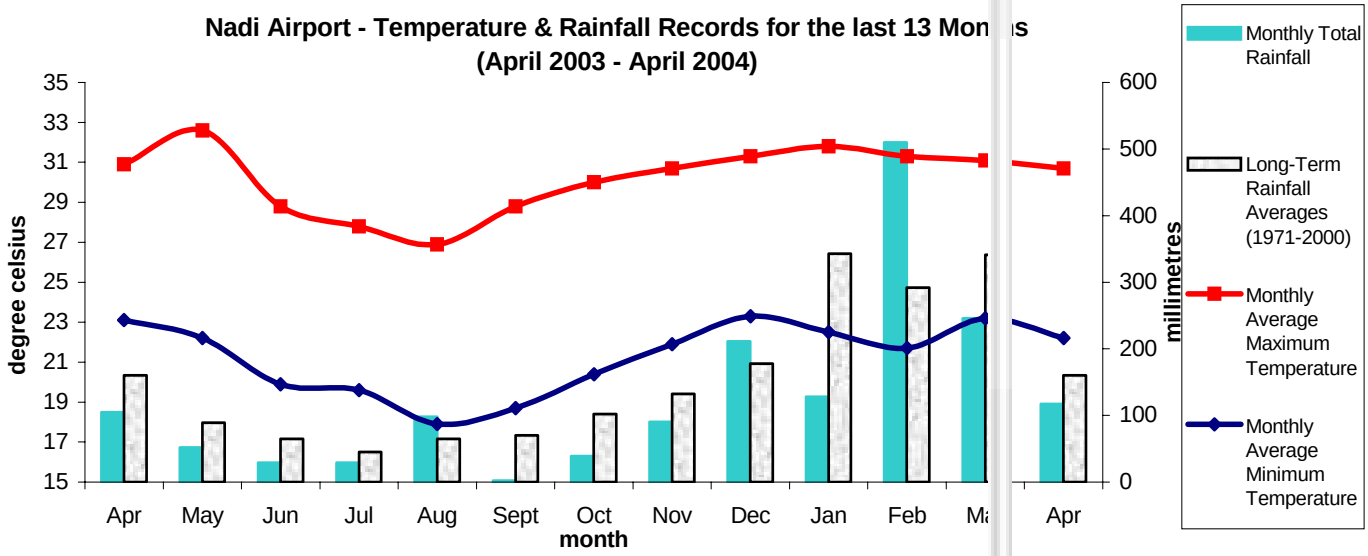


Figure B

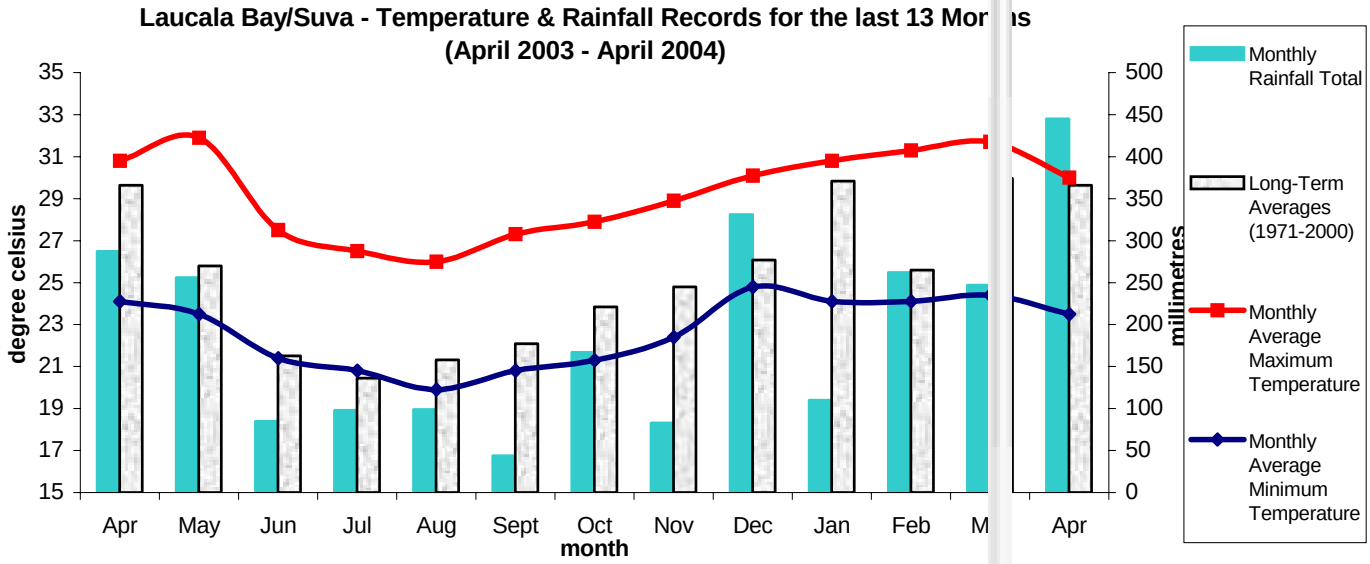
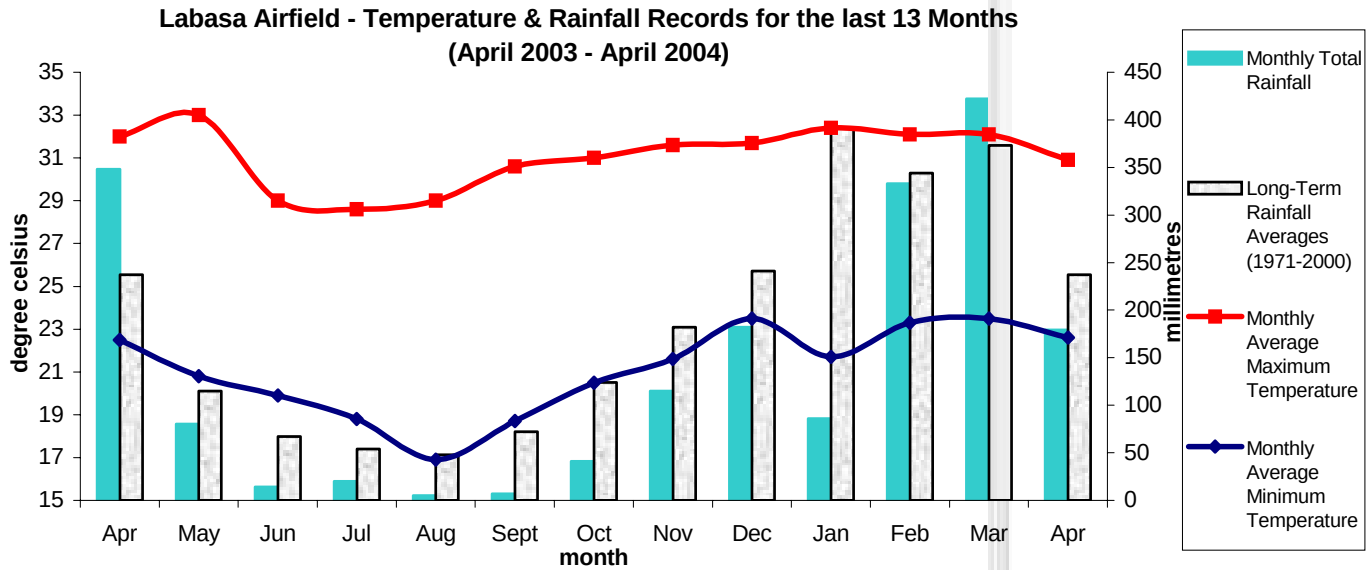


Figure C



Climate in April

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

Day-time temperatures varied around average across the country. The greatest positive departures were recorded at Nabouwalu, Penang Mill and Viwa which all recorded 0.8°C above normal. The greatest negative departures were recorded at Savusavu Airfield and Vunisea (-0.5°C).

Night-time temperatures also varied around average. The greatest positive departures from normal were recorded at Labasa Airfield and Vunisea which recorded 1.3 and 1.1°C respectively above normal. The greatest negative departure was recorded at Viwa and which recorded 1.4°C below normal.

Relative Humidity (RH) at 0900hrs varied around average across the country. The greatest positive departures from normal were recorded at Nabouwalu and Labasa Airfield 4%, Ono-I-Lau and Udu Point recorded 3% above normal . The greatest negative departures were recorded at Rarawai Mill and Penang Mill which recorded 7% and 5% below normal.

SOIL MOISTURE AND RUNOFFS

Soil moisture conditions varied throughout the month. The second half of the month was much wetter then the first.

In the Western Division conditions ranged from ample to moderate then limiting then ample to excessive at the end of the month . There was no pattern across the Division.

In the Central Division conditions were excessive to ample then ample to moderate in the second half of the month. In the Northern Division, conditions were ample to excessive then varied around moderate at the end of the month. In the Eastern Division, Lakeba recorded ample to moderate conditions for most of the month.. Vunisea recorded ample to moderate conditions and Ono-I-Lau recorded generally moderate to dry conditions

Rotuma recorded excessive to ample during the first half of the month then ample to moderate during the second half of the month

Significant runoffs were recorded at Vatukoula (222.6mm), Navua (200.4mm), Laucala Bay, Suva (148.0mm), Nausori Airport (130.8mm), Penang Mill (123.7mm) and Monasavu (112.4mm).

SUNSHINE, RADIATION & WINDS

Total sunshine hours were around average. Nadi Airport recorded 108%, Laucala Bay/Suva, 94%, Nacocolevu 108% and Rotuma 86% of normal.

Global Solar Radiation (average per day) recorded at Nadi Airport was 15.6MJ/ M^2.

Monthly average wind speed was well above average to above average at Nabouwalu, Nausori Airport and Nadi Airport, below average in Rotuma and Vunisea.

RECORDS SET IN APRIL 2004

Element	Station	Observed (record)	On	Rank	Previous (record)	Year	Records Began
No records set in April 2004							

NOVEMBER TO APRIL 2003/04 TROPICAL CYCLONE SEASON

The South West Pacific Tropical Cyclone Season officially began on 01/11/2003 and ended on 30/04/2004.

Tropical cyclone activity in the South Pacific region this season was expected to be near normal with normal being nine events. However, only three cyclones TC *Heta, Ivy and Grace* developed within the South Pacific region making the 2003/04 season the quietest since reliable records began in 1969/70. Prior to this present season the quietest season was 1994/95 when four events occurred.

Out-of-season cyclones have occurred in May and June but the chances of this occurring this year are very small.

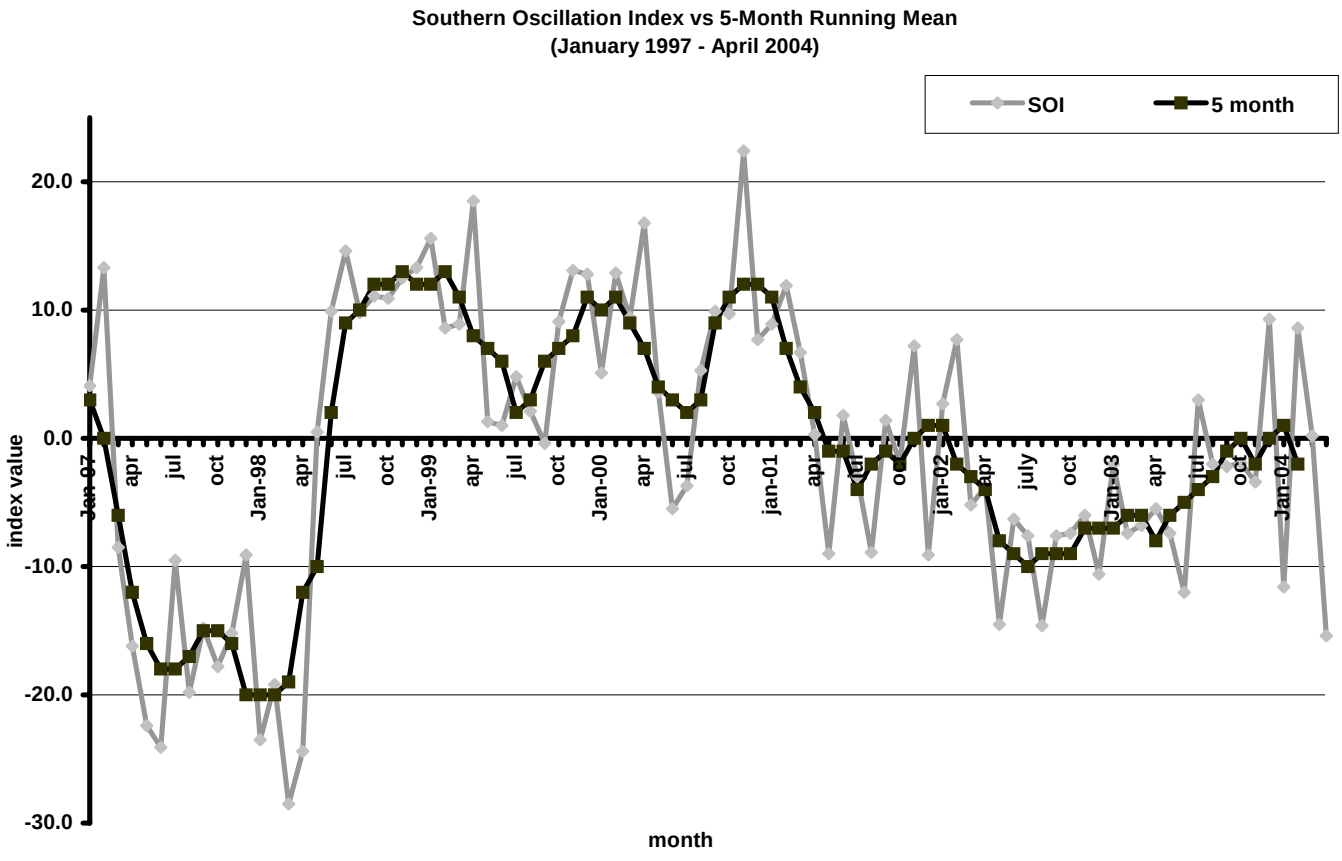
Prior to and during a cyclone information on the event and regular updates will be provided on the Fiji Met Service *http://www.met.gov.fj* website, via *Poll fax* and the media.

PRELIMINARY CLIMATOLOGICAL SUMMARY FOR APRIL 2004

	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	117	73	9	30	8	30.7	0.0	22.2	0.4	33.4	6	19.8	27	213	108
SUVA/LAUCALA BAY	445	122	24	153	8	30.0	0.1	23.5	0.2	31.6	6	20.5	29	145	94
NACOCOLEVU	172	111	15	33	14	30.0	-0.2	21.7	0.2	32.2	30	17.0	29	182	108
ROTUMA	227	77	21	56	5	31.0	0.5	25.0	0.2	33.0	15	21.8	19	158	86
*VIWA	115	50	9	42	14	31.4	1.1	23.4	-1.4	35.0	1	21.6	29	0	0
*UDU POINT	223	81	20	41	6	30.1	-0.1	23.9	-0.3	31.8	16	22.0	3		
LABASA AIRFIELD	179	76	11	103	6	30.9	-0.1	22.6	1.3	32.2	14	18.6	29		
NABOUWALU	166	55	24	28	6	29.8	0.8	24.5	0.5	33.5	9	22.6	19		
SAVUSAVU AIRFIELD	206	79	16	43	14	29.3	-0.5	24.1	0.9	32.0	6	21.0	19		
MATEI AIRFIELD	159	53	12	60	14	30.0	0.4	24.0	0.2	32.2	16	21.0	29		
*YASAWA-I-RARA															
VATUKOULA	316	143	10	228	8	32.0	0.6	21.8	0.8	33.4	10	18.5	29		
MONASAVU	385	74	23	116	14	24.9	0.8	18.6	0.0	29.3	19	15.0	29		
NAUSORI AIRPORT	438	123	21	136	15	29.2	-0.1	22.7	0.2	31.8	6	19.0	29		
NAVUA/TOKOTOKO	555	149	18	205	14	28.9	-0.1	23.2	0.7	30.0	1	18.5	29		
LAKEBA	271	132	15	125	7	29.3	0.0	24.6	0.8	31.7	6	21.2	21		
*MATUKU															
VUNISEA	286	122	18	82	15	28.3	-0.5	23.8	1.1	30.5	16	20.9	29		
ONO-I-LAU	184	121	10	95	7	27.8	-0.4	23.2	-0.4	29.4	29	21.2	20		
BA/RARAWAI MILL	157	76	7	65	8	32.0	0.5	21.7	0.5	33.7	11	17.9	29		
LAUTOKA AES	180	96	9	82	7	30.7	0.2	22.8	-0.1	32.7	7	20.7	28		
PENANG MILL	254	94	12	135	8	30.4	0.8	22.8	-0.4	32.0	9	20.5	9		

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.

Figure D



ENSO status and Rainfall Outlook to July 2004

EL NIÑO - SOUTHERN OSCILLATION UPDATE

The Southern Oscillation Index (SOI) for April was -15.4 (March was 0.2) with the five-month running mean of -2 centred on February (January was 1) (Figure D).

As of 27/04/2004 the El Niño-Southern Oscillation status is neutral. However, there remains a somewhat increased risk of an El Niño developing this year. This statement follows the sharp decline of the Southern Oscillation Index (SOI) during April, a westerly wind burst that developed in the western Pacific at the end of March and the latest computer model output that shows a slightly increased probability of an El Niño event occurring. SOI has seesawed dramatically in recent months in response to active and inactive phases of the Australian monsoon and fluctuations in the surface atmospheric pressure in the central Pacific. A strong westerly wind burst (WWB) in the second half of March and early April, reached about as far east as the dateline. This WWB has initiated a Kelvin wave in the subsurface of the Pacific Ocean, which has produced some warming in the western Pacific and evidence of eastward propagation. Kelvin waves take about two months to cross from the western to the eastern Pacific, propagating subsurface warming as they go. However, it's too early to say just how strong this subsurface warming is going to be, and how far east a significant warming signal will penetrate. Subsurface temperatures are presently cooler than average across the central to eastern Pacific, as are the surface waters. Trade Winds have been close to average over the past two weeks east of the dateline, and have become stronger than average in the west following the dissipation of the WWB.

INTERSEASONAL PATTERNS - 04/05/2004

"Tropical weather in Southeast Asia, Australia and SW Pacific can be influenced by tropical weather patterns on intraseasonal time scales. The Madden-Julian oscillation (MJO) is normally seen as an alternating increase and decrease in broad scale tropical convection, of a scale that may, for example, encompass tropical Australia and the southwest Pacific. Active phases of the MJO typically recur about every 40-50 days and may last for two weeks or more, as the active area of the MJO moves west to east around the globe. Active phases are normally associated with an increase in shower and storm activity, and are a favoured time for the formation of tropical cyclones."

This southern hemisphere summer season, tropical convection (rainfall) near the dateline has been somewhat modulated by the Madden-Julian Oscillation [MJO], with three distinct active phases apparent. The first which began in later part of December/early January, coincided with significant rainfall in the Fiji region and development of TC *Heta*. The second occurred around mid-late February with TC *Ivy* developing near Vanuatu at the tail end of this phase. In between these two events was a clearly suppressed phase. The third event began in mid March, though the preceding 'inactive period' was partly obscured by continual active convection across much of Australia and the western Pacific.

Tracking the MJO recently has proved difficult during the locally "inactive/quiet" phase, as convection in the tropical central and western Pacific remained quite active. A continuation of the 45-day periodicity that was seen through the summer would see the next active phase begin to influence Australian longitudes around now. But the focus of convective activity in the tropics remains in the Indian Ocean, implying that the peak active phase of this MJO event is still west of Australian longitudes. As this continues to approach Australia and move east convection over near-equatorial regions is likely to increase. For a time-longitude plot of OLR anomalies see www.bom.gov.au/fwo/IDD65204.gif.

(The ENSO Update and Interseasonal Patterns are kindly provided by the Australian Bureau of Meteorology and can be found on their website http://www.bom.gov.au).

RAINFALL PREDICTIONS

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 predicts rainfall in the next three months to be below average to average across the country (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 a 35-70% chance (depending on location) of receiving average (mean) rainfall across Fiji in next three months (Table. 2).

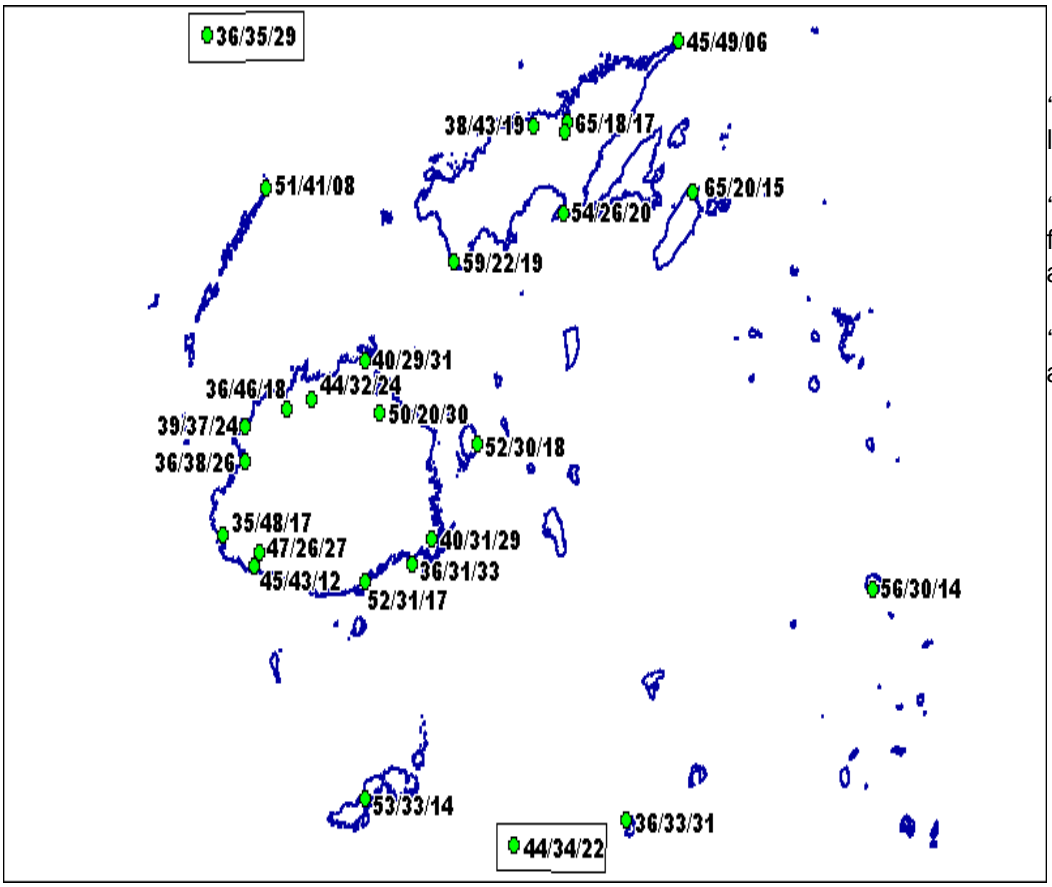
RAINFALL OUTLOOK FOR MAY TO JULY 2004

Based model predictions and current 'neutral' conditions, Fiji's rainfall is expected to be near average in the next three months.

NOTE: The confidence level in the outlook is 'moderate' due to the outlook period including the transition period from Wet to Dry Season.

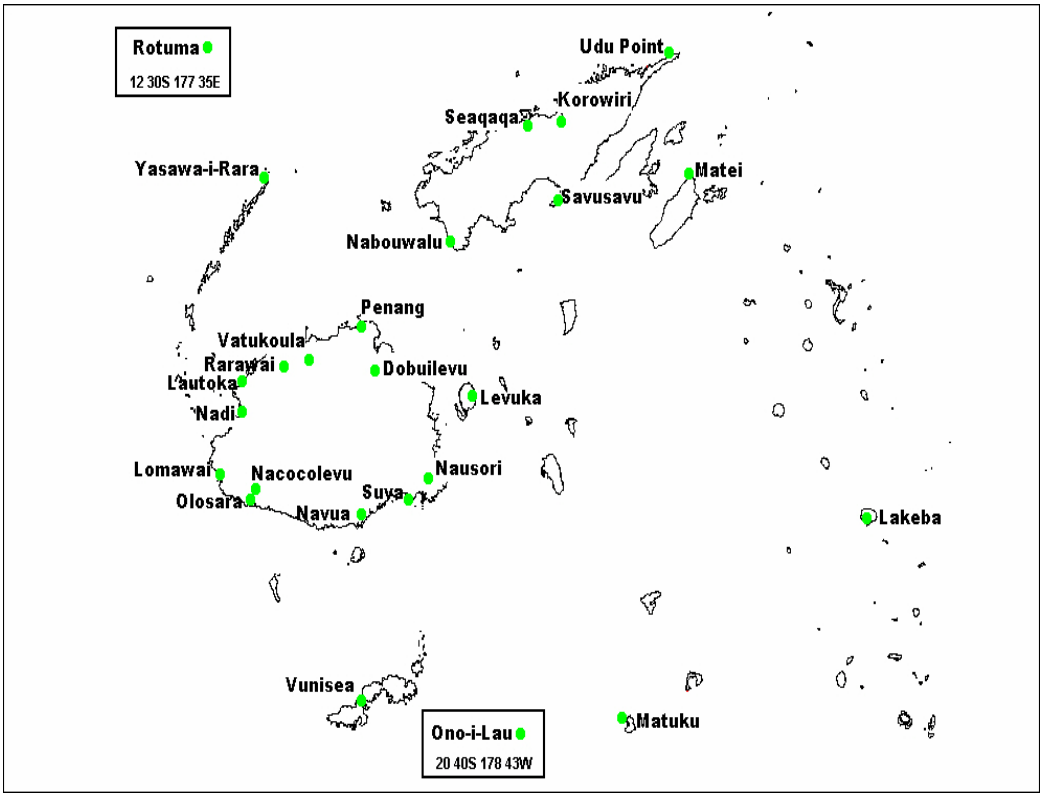
Three Month Rainfall Outlook Probabilities for May to July 2004

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



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



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	246	380
Vatukoula	145	248
Rarawai	153	254
Penang	179	298
Lautoka	1052	236
Nadi	148	225
Lomawai	168	285
Nacocolevu	203	296
Olosara	217	333
Yasawa	171	274
Central Division		
Navua	611	793
Suva	424	612
Nausori	386	558
Eastern Division		
Levuka	304	481
Lakeba	244	352
Matuku	261	391
Ono-I-Lau	217	342
Vunisea	316	456
Northern Division		
Labasa Mill	174	250
Seaqaqa	159	264
Nabouwalu	305	445
Savusavu	315	473
Udu Point	256	466
Matei	315	524
Rotuma	688	576

TABLE 3: Monthly Rainfall Outlook Probabilities for May to July 2004

	May 2004		June 2004		July 2004		May to July 2004 combined	
Station Name	**Average***	**Probability#**	**Average***	**Probability#**	**Average***	**Probability#**	**Average***	**Probability#**
Western Division								
Dobuilevu	130	**42**	98	**73**	56	**38**	284	**70**
Vatukoula	78	**46**	73	**74**	50	**35**	201	**61**
Rarawai	95	**33**	89	**35**	39	**52**	223	**39**
Penang	161	**32**	99	**37**	55	**41**	315	**35**
Lautoka	84	**56**	72	**41**	49	**43**	205	**49**
Nadi	89	**41**	65	**56**	45	**37**	199	**46**
Lomawai	90	**44**	72	**49**	62	**46**	224	**50**
Olosara	99	**53**	90	**46**	77	**52**	266	**58**
Nacocolevu	85	**58**	75	**52**	71	**49**	231	**58**
Yasawa-I-Rara	85	**46**	82	**63**	43	**44**	210	**70**
Central Division								
Navua - Tamanoa	287	**55**	196	**62**	186	**49**	669	**48**
Suva	270	**41**	163	**60**	136	**33**	569	**52**
Nausori	248	**48**	150	**57**	118	**41**	516	**62**
Eastern Division								
Lakeba	136	**50**	78	**59**	80	**44**	294	**62**
Ono-I-Lau	103	**54**	89	**44**	92	**42**	284	**56**
Northern Division								
Korowiri	116	**46**	73	**41**	52	**30**	241	**40**
Seaqaqa	125	**43**	63	**44**	52	**24**	240	**55**
Nabouwalu	171	**51**	98	**60**	92	**41**	361	**63**
Savusavu	196	**35**	117	**42**	96	**47**	409	**62**
Udu Point	167	**38**	116	**57**	89	**28**	372	**62**
Rotuma	296	**54**	234	**57**	233	**38**	763	**63**

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.

The probabilities in the three-month combined column are not an average of the three individual months. The model in this case has been re-run for three combined months. There is a higher degree of skill association with predicting rainfall for three combined months compared to three individual months.

** 'Long-term Average' for the 30 year period from 1971-2000.*
 # Probability of expecting at least normal rainfall.