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Fiji Islands Weather Summary November 2004 Rainfall Outlook till February 2005

FIJI METEOROLOGICAL SERVICE

Inside this issue:

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IN BRIEF

The weather in November continued to be considerably drier than normal. Rainfall during the month was well below average (<40%) across most of the country except southeastern Vanua Levu, Taveuni and Kadavu. Tototoko, Navua recorded 108mm which is the lowest November monthly total rainfall since records began in 1993.

In the last three months, seventeen of the twenty-two climate reporting sites have recorded below average to well below average rainfall, with only four sites recording average or above rainfall. As rainfall has been in the tenth percentile (lowest 10 percent of historical record), a *meteorological drought* now exists in nearly all parts of the Western and Central divisions and parts of the Northern Division. Western Division.

Monthly average day time temperatures were generally average to below average. Yasawa recorded a new high mean day time temperature for the month of November. Night time temperatures were generally below average across the country with new lows recorded at Viwa, Matuku and Ono-I-Lau.

Total sunshine hours were around average. Nadi and Savusavu receiving 114%, Nacocolevu 111%, Laucala Bay/Suva 107% and Rotuma 95%.

With the current "weak warm" to "neutral" state of Ocean & Atmosphere, rainfall is expected to be average or below average across the country. Given the recent trend in weather, it is likely that December rainfall will be below average.

With sea surface temperatures in the equatorial Pacific being significantly warmer than normal there is likely to be significant tropical disturbance activity in the region during this season. Should a tropical disturbance, e. g. tropical depression or cyclone, affect Fiji directly or indirectly parts of the country could however receive above average rainfall.

WEATHER PATTERNS

The frequent influence of subtropical high pressure systems and ridges during November brought drier than usual conditions to most parts of Fiji. Only the occasional presence of weak troughs or fronts caused brief rainfall, although a few areas experienced one or two heavy falls during the month.

Moist southeasterlies and the passage of a weak easterly trough between the 1st and the 4th produced occasional light showers especially about the eastern and northern parts of the country. A few afternoon showers occurred about the western parts of the main islands. Another weak trough moved across the country during 7-8th resulting similar conditions. The northern and eastern parts of the group received isolated heavy rainfall after a trough that was initially located north of the country moved closer to Vanua Levu during 11-12th.

A ridge pushing from the southwest shifted the trough to the northeast of Fiji on the 13th and brought fine conditions till the 16th. Prevailing moist east to southeast winds and the development of a weak convergence zone to the west of Viti Levu brought a few showers to the eastern areas and afternoon showers elsewhere on the 18th and 19th.

Another ridge settled over the country from the 20-23rd bringing in fine weather conditions. As this ridge sagged south, a trough drifted over Vanua Levu and caused a few showers over the northern and eastern parts of the country from the 24th to the 26th. Yet another ridge pushing from the southwest displaced the trough to the north of Fiji resulting in mostly fine weather till the 28th. The trough drifted closer to Vanua Levu again later on the 28th and caused scattered light showers over most parts of the country till the 30th.

The South Pacific Convergence Zone caused wet conditions over Rotuma throughout the month. Particularly heavy falls of 143.8mm and 142.8mm were reported on the 9th and the 23rd, respectively.

TABLE 1: RAINFALL FROM SEPTEMBER TO NOVEMBER 2004

Station	Actual Rainfall (mm)	Rainfall in the last three months (Below average, average or above average)	No. of Rain days in Sept (% of total rain)	No. of Rain days in Oct (% of total rain)	No. of Rain days in Nov (% of total rain)
Penang Mill	110.1	Well Below Average	4 (72)	2 (1)	3 (27)
Monasavu Dam	464.2	Below Average	22 (24)	20 (46)	13 (30)
Vatukoula Mine	119.8	Well Below Average	4 (35)	3 (49)	4 (16)
Rarawai Mill, Ba	86.4	Well Below Average	6 (73)	6 (24)	3 (3)
Yasawa-I-Rara	-	-	-	-	-
Viwa Island	76.9	Well Below Average	4 (53)	4 (20)	7 (27)
Lautoka (FSC Res.)	126.0	Well Below Average	5 (67)	4 (5)	4 (29)
Nadi Airport	123.4	Well Below Average	7 (59)	5 (20)	7 (21)
Nacocolevu, Sigatoka	62.7	Well Below Average	4 (53)	6 (46)	2 (1)
Tokotoko, Navua	397.8	Below Average	15 (19)	19 (54)	19 (27)
Laucala Bay, Suva	232.7	Well Below Average	20 (33)	22 (31)	14 (36)
Nausori Airport	271.0	Below Average	15 (54)	23 (21)	12 (25)
Nabouwalu	189.4	Below Average	9 (54)	17 (23)	13 (23)
Labasa Airport	158.5	Below Average	4 (23)	6 (43)	8 (33)
Savusavu Airport	247.2	Below Average	6 (25)	7 (18)	8 (57)
Udu Point	650.1	Above Average	10 (14)	10 (33)	11 (53)
Matei Airport	373.7	Below Average	8 (18)	13 (42)	16 (40)
Lakeba Is.	208.9	Below Average	9 (57)	9 (22)	10 (21)
Matuku Is.	151.8	Below Average	4 (57)	6 (23)	4 (20)
Ono-I-Lau Is.	251.5	Average	11 (85)	8 (11)	3 (4)
Vunisea, Kadavu	325.8	Above Average	11 (45)	17 (17)	12 (37)
Rotuma	1479.4	Above Average	21 (22)	26 (37)	19 (41)

RAINFALL IN THE LAST THREE MONTHS

Rainfall in November

Rainfall in November was well below average (<40%) across most of the Western and Central Divisions. Considerably low rainfall was received at Nacocolevu (0.7mm or 1%) and Rarawai Mill, Ba (3.0mm or 2%).

The Northern and Eastern Divisions received well below average rainfall at except at Matei, Savusavu, Udu Pt. and Vunisea. The remaining parts received average to below average rainfall.

Above average rainfall was received at Rotuma and Udu Point.

Rainfall in the 3-months from September to November

The Rainfall Outlook for the period September to November in the August Fiji Islands Weather Summary was for rainfall to be average or below average for most parts of the country. The confidence level of the forecast was low to moderate.

Out of the twenty two sites that reported in time for this summary, seventeen sites reported below average rainfall, one average and three sites above average.

Figure A

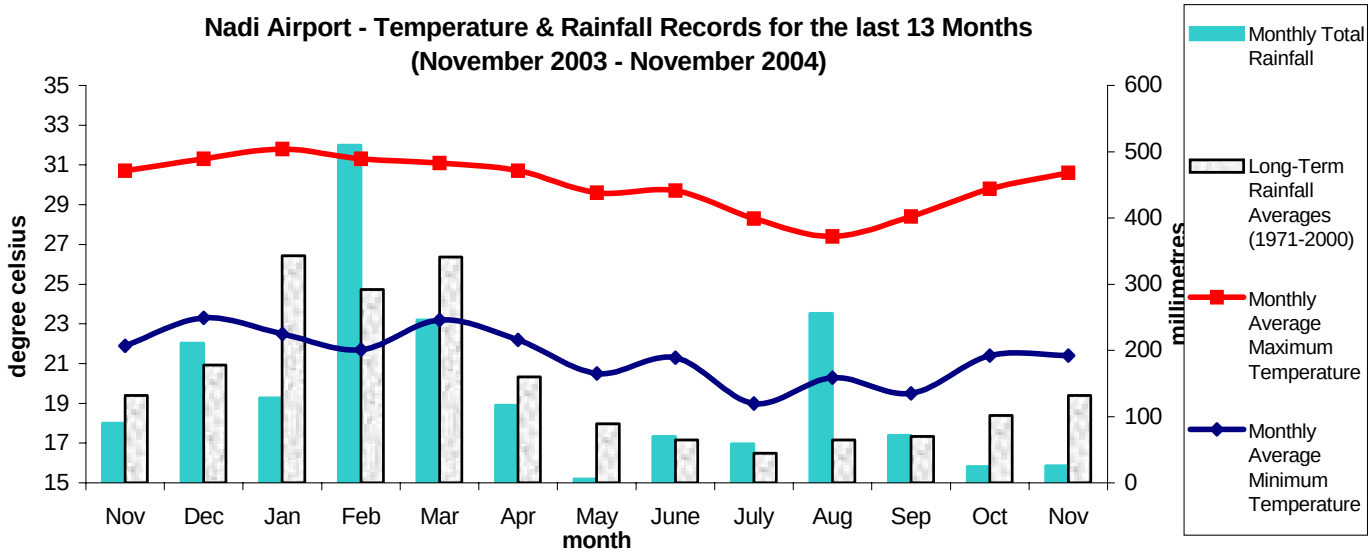


Figure B

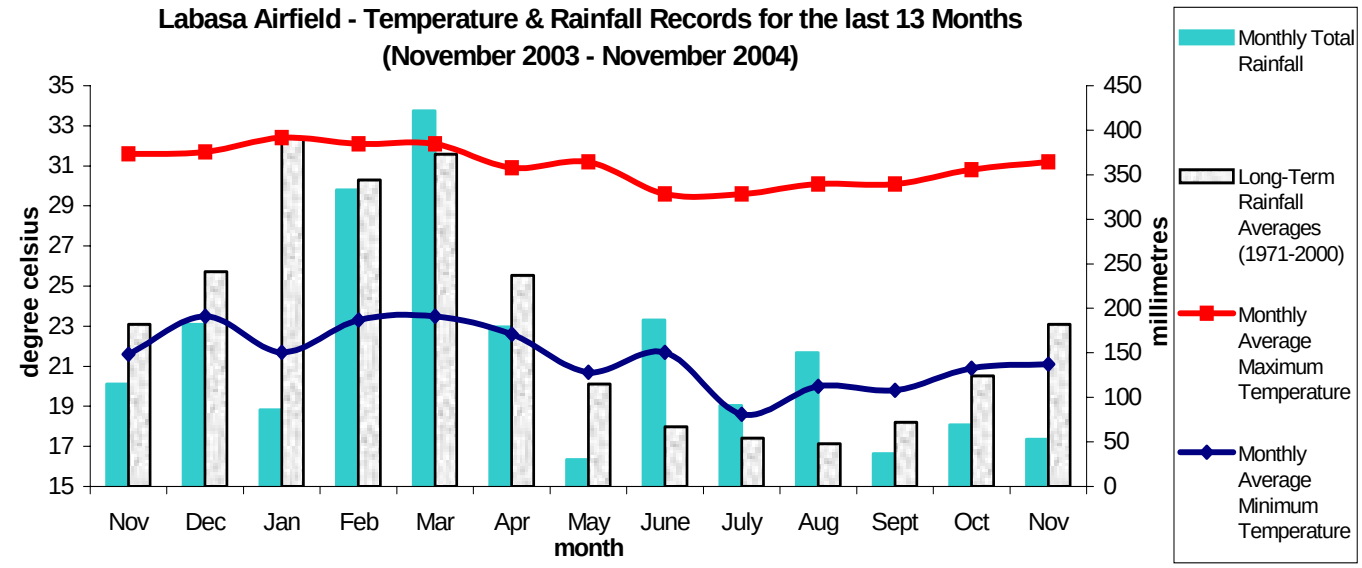
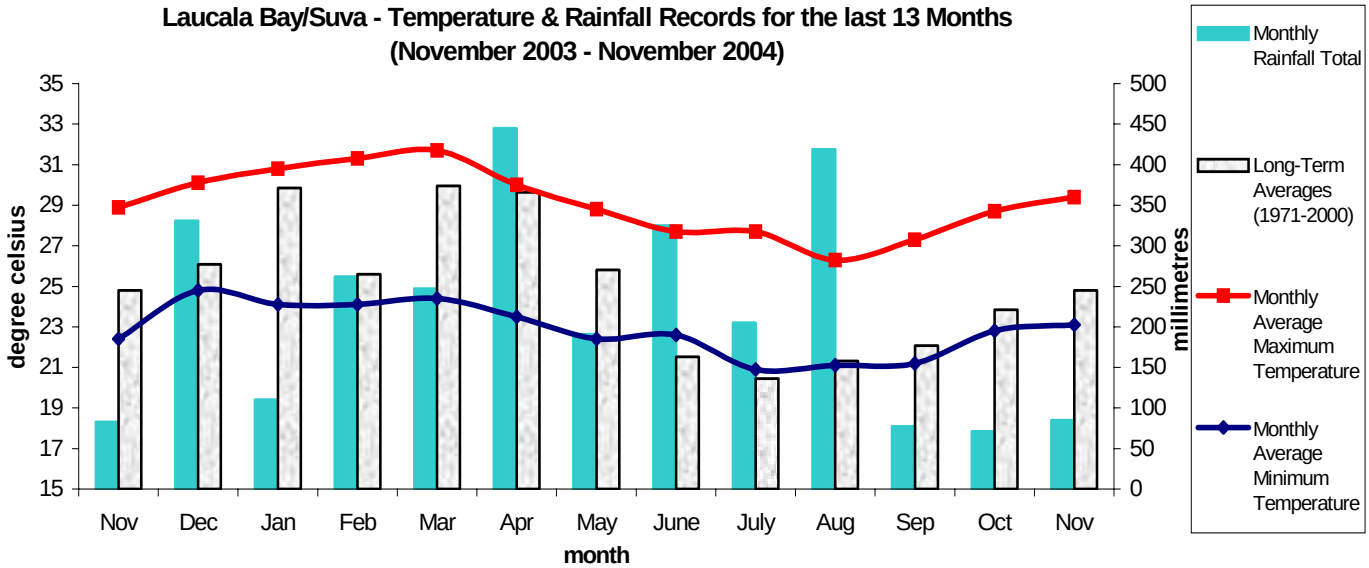


Figure C



Climate in November

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

Day-time temperatures were mainly average to below average across the country. The greatest positive departure was recorded at Yasawa-I-Rara which recorded 2.0°C above normal, Ono-I-Lau and Viwa recorded 1.1°C and 1.0°C respectively above normal. The greatest negative departures were recorded at Savusavu Airport and Tokotoko, Navua which recorded 1.2°C and 0.7°C below normal.

Night-time temperatures were generally below average across the country. The greatest positive departures were recorded at, Matuku which recorded 1.1°C above normal. Savusavu Airport and Vunisea recorded 0.5°C above normal. The greatest negative departure were recorded at Penang Mill which recorded 1.7 °C below normal, Ono-I-Lau and Viwa recorded 1.6 °C below normal.

Relative Humidity (RH) at 0900hrs were below average across the country except at Matei which recorded the only positive departure from normal of 0.5%. The greatest negative departures from normal were recorded at Ono-I-Lau and Matuku which recorded 19% and 15% below normal.

SOIL MOISTURE AND RUNOFFS

In the Central Division, conditions were generally limiting to dry for most of the month.

In the Western Division, conditions were limiting to dry for most of the month except at Monasavu which had ample to excessive conditions.

In the Eastern Division, all sites reported conditions generally limiting to dry for most of the month.

In the Northern Division, Nabouwalu, Savusavu Airport and Labasa Airport recorded limiting to dry conditions while Matei and Udu Point recorded excessive to ample conditions towards the end of the month

Rotuma recorded excessive conditions throughout the month.

Significant runoffs were recorded at Rotuma (448.0mm) and Udu Point (182.4mm).

SUNSHINE, RADIATION & WINDS

Total sunshine hours were around average in November. Nadi Airport and Savusavu Airport received 114%, Laucala Bay/ Suva 107%, Nacocolevu 111% and Rotuma 95%. Global Solar Radiation at Nadi Airport was 21.3MJ/ M^2 (average per day).

Monthly average wind speed was below average for Nabouwalu, Vunisea and Nausori Airport except for Nadi Airport and Rotuma which reported receiving above average surface winds.

RECORDS SET IN NOVEMBER 2004

Element	Station	Observed (record)	On	Rank	Previous (record)	Year	Records Began
Total Monthly Rainfall	Tokotoko, Navua	107.6	-	New Low	117.0	1993	1992
Mean Max. Temp (ºC)	Yasawa-I-Rara	31.9	-	New High	31.6	1981	1949
Dly Min. Temp (ºC)	Viwa	19.5	9th	New Low	20.6	1986	1978
Dly Min. Temp (ºC)	Matuku	26.8	25th	New High	25.7	1971,1993	1950
Dly Min. Temp (ºC)	Ono-I-Lau	26.1	16th	New High	26.0	1971	1943

Tropical Cyclone Season - November 2004 to April 2005

The South Pacific Tropical Cyclone Season officially began on 1st November and will continue till 30th April 2005.

Historical records of tropical cyclones show that there have been ten cyclones which have occurred in the month of December since the 1969/70 season. The years were 1970, 73, 77, 78, 87, 88, 92 (3 Events), 1998.

The chances of a cyclone affecting Fiji this season are high especially with ocean conditions currently being on the *Warm* side of *Neutral*. The average number of cyclones that affect Fiji in a season (including pre-season events) is 1 to 2. However, there have been as many as six events in 1996/97.

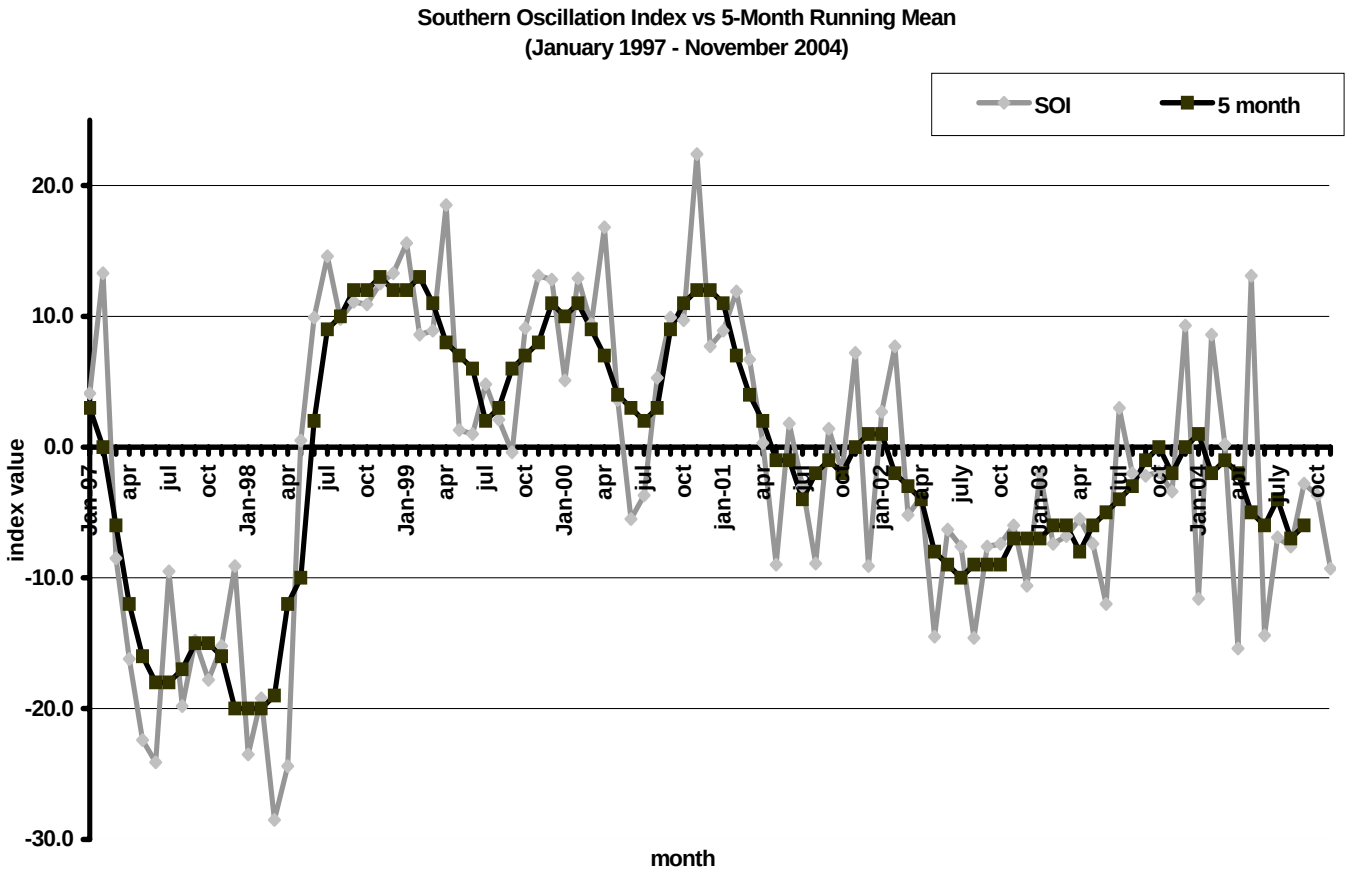
Prior to and during a cyclone information can be accessed from the Fiji Meteorological Service on its website http://www.met.gov.fj, via email: NadiTCC@met.gov.fj, via Weather fax - 6721 227 (Polling fax), via Fax 6720190 or Phone 6724 888. Information is also available through the local media.

PRELIMINARY CLIMATOLOGICAL SUMMARY FOR NOVEMBER 2004

	RAINFALL					AIR TEMPERATURES								SUNSHINE	
	TOTAL		RAIN DAYS	MAX. FALL		AVERAGE DAILY				EXTREME				TOTAL	
	MM	* %	+	MM	ON	MAX. C	# C	MIN. C	# C	MAX. C	ON	MIN. C	ON	HRS	* %
NADI AIRPORT	26	20	7	9	1	30.6	-0.5	21.4	-0.4	32.9	26	17.6	23	256	114
SUVA/LAUCALA BAY	85	35	14	30	8	29.4	0.1	23.1	0.3	31.1	15	20.1	23	191	114
NACOCOLEVU	1	1	2	1	8	30.2	-0.2	19.4	-1.5	32.0	16	14.9	23	207	111
ROTUMA	609	216	19	144	9	30.7	0.4	24.8	0.3	32.1	15	22.7	7	187	95
VIWA	20	19	7	11	28	31.3	1.0	22.8	-1.6	33.0	8	19.5	9		
UDU POINT	344	169	11	140	11	30.5	0.4	22.8	-0.9	33.1	25	21.0	17		
LABASA AIRFIELD	53	29	8	13	3	31.2	-0.2	21.1	-0.1	34.0	16	15.6	23		
NABOUWALU	44	25	13	19	3	28.8	-0.1	23.2	-0.2	30.9	25	20.7	23		
SAVUSAVU AIRFIELD	142	75	8	92	25	28.2	-1.2	23.1	0.5	29.6	15	19.0	23		
MATEI AIRFIELD	150	62	16	50	2	29.0	0.1	23.2	0.1	31.5	25	21.5	9		
YASAWA-I-RARA	11	9	3	10	2	31.9	2.0	23.6	-0.4	33.7	11	22.4	5		
VATUKOULA	20	13	4	14	18	31.4	-0.3	20.5	-0.1	33.2	16	16.9	23		
MONASAVU	140	31	13	36	2	24.1	0.1	16.9	-0.6	27.2	12	14.3	22		
NAUSORI AIRPORT	69	28	12	25	8	28.3	-0.5	21.0	-0.8	30.7	25	17.4	23		
NAVUA/TOKOTOKO	108	38	19	31	8	27.8	-0.7	21.2	-0.5	29.0	15	17.5	24		
LAKEBA	43	30	10	9	25	28.2	-0.6	22.8	-0.3	31.5	25	18.0	23		
MATUKU	30	24	4	14	2	28.7	-0.0	24.0	1.1	30.4	26	22.4	8		
VUNISEA	121	83	12	71	8	28.5	0.1	22.5	0.5	31.0	10	18.0	11		
ONO-I-LAU	11	9	3	9	2	28.7	1.1	21.0	-1.6	30.7	25	19.2	20		
BA/RARAWAI MILL	3	2	3	2	18	31.7	-0.2	20.1	-0.7	33.3	15	15.0	23		
LAUTOKA AES	36	26	4	22	30	30.7	0.2	22.0	-0.7	33.4	26	18.5	23		
PENANG MILL	30	18	3	22	3	30.6	0.9	21.3	-1.7	32.4	25	17.5	23		

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 February 2005

EL NIÑO - SOUTHERN OSCILLATION UPDATE

The Southern Oscillation Index (SOI) for November was -9.3 (October was –3.7) with the five-month running mean of -6 centred on September (August was –7) (Figure D).

The progress towards an El Niño event this year has slowed over the past two months, as a consistent pattern of Pacific wind and cloud signatures has failed to materialise, and the Southern Oscillation Index (SOI) is only weakly negative. Furthermore, there is no example in the historical record of an El Niño developing this late in the year. However, central Pacific surface temperatures are persisting at levels characteristic of El Niño, and the situation will continue to be monitored closely.

Surface temperatures in the western to central Pacific have hovered near El Niño thresholds for about three to four months now, but subsurface temperatures are below the levels normally associated with El Niño.

The Trade Winds continue to fluctuate with a return to generally near or above normal strength during the past week following generally weaker during the first part of November. The past four to six months has been a sequence of Westerly Wind Bursts (WWB), each one of which has resulted in a temporary decline in the strength of the Trades. There has been no persistent and significant decline in the Trade Winds as normally occurs during an El Niño.

Cloudiness in the central Pacific has oscillated between above and below average values since May, mostly as a result of the sequence of WWBs. This indicates that the atmosphere is yet to fully respond fully in a consistent fashion to the above average sea surface temperatures in this region. A sustained period of above average cloudiness would be expected during an El Niño. Cloudiness near the dateline was somewhat below average in the second half of October and a little above average during the past week.

In the most recent survey of computer model guidance, a 7 to 4 majority keep central to eastern Pacific temperatures in the neutral range until April next year. The central Pacific is likely to remain warmer than average for the next season, which is a situation that is sufficient to increase the risk of above average temperatures persisting.

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 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 to be mainly average to above average in the next three months (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 13-62% chance (depending on location) of receiving median rainfall across Fiji in next three months (Table 2).

RAINFALL OUTLOOK FOR DECEMBER 2004 TO FEBRUARY 2005

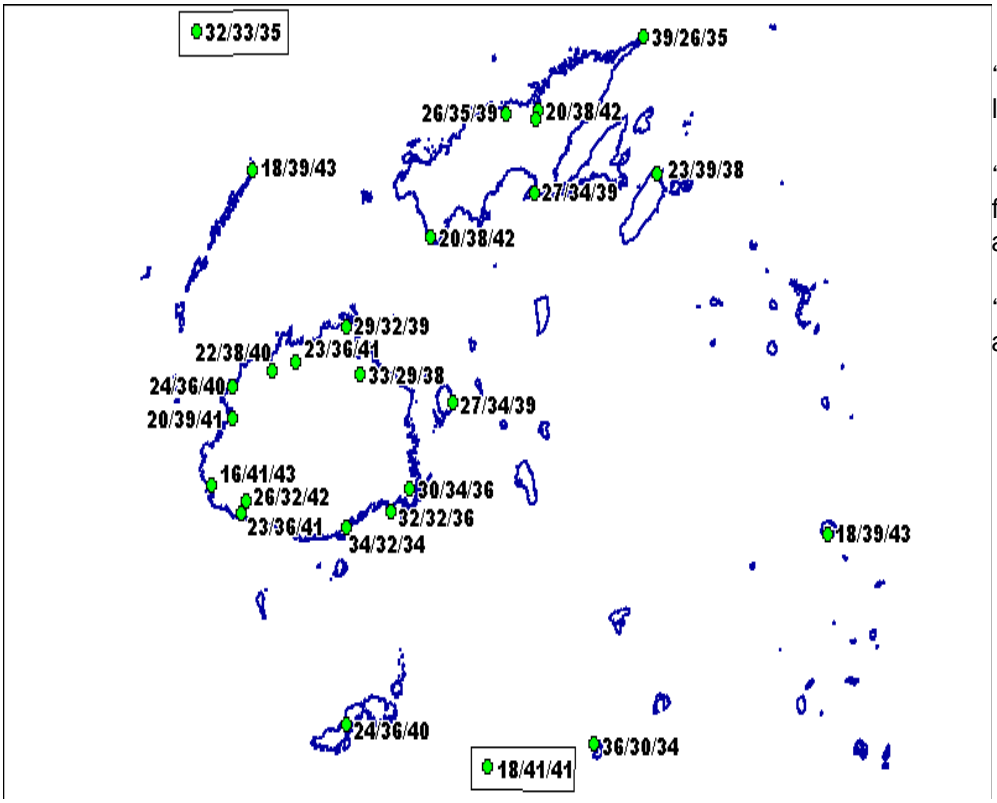
With the current "weak warm" to "neutral" state of Ocean & Atmosphere, rainfall is expected to be average or below average across the country. Given the recent trend in weather, it is likely that December rainfall will be below average.

With sea surface temperatures in the equatorial Pacific being significantly warmer than normal there is likely to be significant tropical disturbance activity in the region during this season. Should a tropical disturbance, e.g. tropical depression or cyclone, affect Fiji directly or indirectly parts of the country could however receive above average rainfall.

NOTE: The confidence level of this prediction is moderate to high.

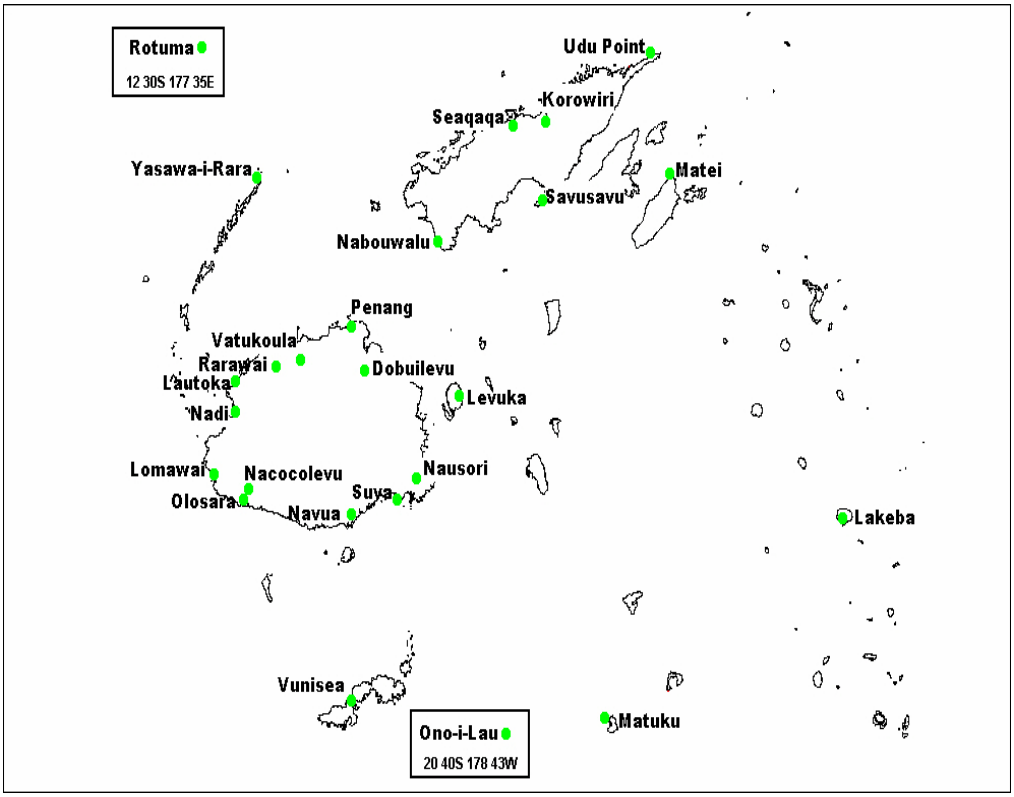
Three Month Rainfall Outlook Probabilities for December 2004 to February 2005

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	915	1133
Vatukoula	809	1189
Rarawai	719	1107
Penang	730	1047
Lautoka	657	890
Nadi	694	873
Lomawai	585	876
Nacocolevu	597	793
Olosara	542	744
Yasawa	530	742
Central Division		
Navua	875	1141
Suva	771	970
Nausori	786	944
Eastern Division		
Levuka	619	840
Lakeba	506	736
Matuku	501	619
Ono-I-Lau	407	590
Vunisea	512	723
Northern Division		
Labasa Mill	832	1085
Seaqaqa	919	1226
Nabouwalu	776	1015
Savusavu	650	851
Udu Point	736	997
Matei	808	1008
Rotuma	883	1098

TABLE 3: Australian Rainman Rainfall Outlook Probabilities for December 2004 to February 2005

	December 2004 to February 2005	
Station Name	**Average***	**Probability#**
Western Division		
Dobuilevu	964	**39**
Vatukoula	933	**22**
Rarawai Mill	896	**16**
Penang Mill	869	**24**
Lautoka Mill	766	**16**
Nadi Airport	815	**20**
Lomawai	707	**21**
Olosara	586	**13**
Nacocolevu	686	**16**
Yasawa-I-Rara	658	**14**
Central Division		
Navua - Tamanoa	975	**47**
Laucala Bay - Suva	866	**40**
Nausori Airport	821	**62**
Eastern Division		
Lakeba	634	**20**
Ono-I-Lau	559	**27**
Northern Division		
Korowiri (Labasa Mill)	952	**16**
Seaqaqa Pine	1091	**33**
Nabouwalu	910	**14**
Savusavu Airport	740	**23**
Udu Point	851	**33**
Rotuma	1013	**29**

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.

** Median Rainfall (middle point in a range of three collective month rainfall values ordered from lowest value ever recorded to highest ever recorded for each site)*
 # Probability of expecting at least normal rainfall.