Issued: 04 October 2007

Fiji Islands Climate Summary September 2007

FIJI METEOROLOGICAL SERVICE

IN BRIEF

Eighty air temperature records from 23 reporting stations have been broken since July 2007. The July to September 2007 period has been the warmest on record at a number of sites in Fiji. Adding the extreme conditions in the last three months are the eight new rainfall records set in September (Table 1).

September was exceptionally wet with all reporting sites (except Rotuma) recording *above* to *well above average* (>200%) rainfall. The high rainfall was due to the dominant influence of slow moving troughs of low pressure and an associated moist east to north east wind flow.

The drought on an agricultural timescale reported in last month's Fiji Island Climate Summary no longer exists, except for near-drought conditions in parts of the country. However, an apparent deficiency in surface and ground water supplies continues to exist around Rakiraki, Nabouwalu, Savusavu and Ono-i-Lau in the Lau Group. If the above average rainfall pattern that was experienced in September continues, it is likely all signs of drought will disappear in the coming months.

Eleven daily and 22 monthly average air temperature records were established in September. Except at a couple of sites, both air temperatures were above average (0.5˚C - 3.0˚C). Warm and moist winds and high relative humidity added to these extreme conditions. Sea Surface Temperatures around Fiji were greater than 1.0°C *above average.*

A weak La Niña event currently exists in the equatorial Pacific. Based on the latest observations and forecasts, there is a there is a 65% chance of maintaining La Nina conditions over the coming three months. The Trade Winds in the equatorial Pacific were stronger than normal while the SPCZ was south of its normal position in September. The Southern Oscillation Index was +1.5.

Based on current ENSO patterns in the Pacific, Fiji's rainfall is expected to be *above average* from October to December 2007. The confidence in this prediction is moderate. The ENSO conditions also result in a *near-normal* risk of tropical cyclones affecting the northern parts of the Fiji and *slightly higher than normal risk* for the southern parts of Fiji this coming tropical cyclone season from November 2007 to April 2008.

WEATHER PATTERNS

Slow moving troughs of low pressure and an associated moist east to north east wind flow were dominant in influencing Fiji's weather in September. Frontal systems migrating from the west enhanced the activity in the region near Fiji resulting episodes of continuous and heavy falls around the country. As these troughs of low pressure migrated eastwards, ridges of high pressure pushed in from the southwest bringing brief spells of fine conditions and strong winds over coastal waters as they progressed east, in most instances.

In the first three days, a weak trough was displaced to lie to the north of the country as a ridge to the south intensified. This ridge persisted until September 7. Most places recorded showers from the prevailing moist east to southeast flow during this period. A strong wind warning for all Fiji waters was issued and maintained for a week due to the sustained surge.

On September 8, a front drifted slowly towards the group from the west, while a ridge from the east withdrew further away. Ensuing moist easterly flow caused showers in most places. However, as the front moved across Fiji from September 11 to 16, showers were more frequent and almost widespread with isolated heavy falls and thunderstorms. All Fiji waters were also placed on strong wind warning for this latter part of this episode as the ridge following this front strengthened.

Between September 17 to 22, a trough remained slow moving to the west. Associated moist east to northeast flow caused showers and thunderstorms especially about the main islands during the afternoon and evening. Some significant falls were recorded during this period.

On September 23, a trough with associated active cloud drifted onto Fiji from the west. This trough brought widespread rain to the country with scattered heavy falls and isolated thunderstorms until September 27. The subsequent heavy rain also caused flash flooding of certain low-lying areas. An intensifying ridge following this trough displaced the former to the north and maintained a southeast flow over the group till the end of the month. Yet again, the whole Fiji waters were placed on strong wind warning as fresh and gusty and relatively cool southeast trades set in.

Rotuma received rainfall on 24 days of the month, largely from the SPCZ.

RAINFALL IN LAST THREE MONTHS, TEMPERATURES AND RELATIVE HUMIDITY

Rainfall was *above* to *well above average* across the country in September (including Suva, Nadi and Labasa Figures 1-3) except at Rotuma. Eight total monthly rainfall records were broken during the month. One-day high rainfall records were set at Monasavu (269.0mm) and St. John's College in Ovalau (90.0mm) (Table 1). Several sites recorded over 300% of normal rainfall. These were Labasa Airport (487%), Nabouwalu (371%), St. Johns College in Levuka (447%), Vanuabalavu (435%), Nacocolevu (397%), Rarawai Mill in Ba (346%), Nadi Airport (311%), Monasavu (341%) and Viwa Island (305%).

Rainfall from July to September 2007 was predicted to be *average to above average*. Sixteen of the twenty one recording sites received *above average* rainfall and the remaining five sites received *average* rainfall (Table 2).

Maximum Air Temperatures were generally 0.7 - 3.0˚C *above average* except at Tokotoko in Navua. The greatest positive departures from normal were recorded at Viwa Island (3.0ºC), Lakeba Island (2.5ºC) and Yasawa-i-rara (2.1ºC). Eleven new records were established and a record being equalled in September (Table 1).

Minimum Air Temperatures were 0.8 - 3.3˚C *above average* across the country except at Yasawa-i-rara where the night-time temperature was near average. The highest positive departures were recorded at Rarawai Mill (3.3ºC) and Nadi Airport (2.9ºC). Twenty-one new records were set in September (Table 1).

Relative Humidity at 0900hrs varied from *near average* to *above average* in the Western Division and generally above average elsewhere. The greatest positive anomaly was recorded at Lakeba Island (14.6%) while the greatest negative departure was recorded at St. Johns College in Ovalau (-4.0%).

TABLE 1 : CLIMATE RECORDS ESTABLISHED IN SEPTEMBER 2007

Element	Station	Observed (record)	On (date)	Rank	Previous (record)	Year	Records Began
Daily Rainfall	Monasavu	269.0mm	14th	New High	160.9mm	1999	1980
Daily Rainfall	St. John's, Levuka	90.0mm	24th	New High	78.4mm	2000	1984
Total Monthly Rainfall	Nacocolevu	377.3mm	-	New High	301.8mm	1949	1938
Total Monthly Rainfall	Viwa Island	192.1mm	-	New High	179.0mm	1979	1978
Total Monthly Rainfall	Labasa Airport	350.3mm	-	New High	249.9mm	1976	1956
Total Monthly Rainfall	Nabouwalu	418.9mm	-	New High	367.3mm	1975	1918
Total Monthly Rainfall	Monasavu Dam	919.8mm	-	New High	867.6mm	1999	1980
Total Monthly Rainfall	St. John's, Levuka	384.5mm	-	New High	262.0mm	1999	1984
Daily Max Temp	Lakeba Island	31.7ºC	09th	New High	31.1ºC	1992	1955
Daily Max Temp	Ono-I-Lau	30.6°C	10th	New High	30.1ºC	1947	1943
Daily Max Temp	Viwa Island	33.0°C	16th	Equal High	33.0°C	1996	1978
Daily Min Temp	Laucala Bay, Suva	25.4ºC	12th	New High	24.7ºC	1975	1942
Daily Min Temp	Nabouwalu	25.0ºC	19th	New High	24.8ºC	1961	1956
Daily Min Temp	Monasavu Dam	21.2ºC	18th	New High	19.6ºC	2006	1980
Daily Min Temp	Tokotoko, Navua	26.0ºC	12th	New High	23.5ºC	1999	1992
Daily Min Temp	St. John's, Levuka	25.0ºC	19th	New High	24.5ºC	2005	1984
Daily Min Temp	Lakeba Island	25.0ºC	18th	New High	24.9ºC	1996	1955
Daily Min Temp	Ono-I-Lau	25.2ºC	10th	New High	24.2ºC	1989	1943
Daily Min Temp	Penang Mill	25.5ºC	19th	New High	25.0ºC	1984	1930
Mean Monthly Max Temp	Nadi Airport	31.2ºC	-	New High	31.0ºC	1988	1942
Mean Monthly Max Temp	Laucala Bay, Suva	28.8ºC	-	New High	28.7ºC	1975	1942
Mean Monthly Max Temp	Viwa Island	31.2ºC	-	New High	30.2ºC	1996	1978
Mean Monthly Max Temp	Yasawa-I-Rara	30.6ºC	-	New High	30.5ºC	1984	1950
Mean Monthly Max Temp	Tokotoko, Navua	27.8 ºC	-	New High	27.1ºC	1996	1992
Mean Monthly Max Temp	Lakeba Island	29.4ºC	-	New High	28.3ºC	1974	1955
Mean Monthly Max Temp	Matuku Island	28.4ºC	-	New High	27.6ºC	1984	1955
Mean Monthly Max Temp	Vunisea, Kadavu	27.9ºC	-	New High	27.6ºC	1996	1947
Mean Monthly Max Temp	Ono-I-Lau	27.1ºC	-	New High	27.0ºC	1996	1955
Mean Monthly Min Temp	Nadi Airport	22.2ºC	-	New High	21.6ºC	1961	1942
Mean Monthly Min Temp	Laucala Bay, Suva	23.3ºC	-	New High	22.5ºC	1999	1942
Mean Monthly Min Temp	Viwa Island	24.4ºC	-	New High	24.0ºC	1988	1978
Mean Monthly Min Temp	Nausori Airport	22.4ºC	-	New High	21.9ºC	1961	1956
Mean Monthly Min Temp	Monasavu Dam	18.2ºC	-	New High	17.1ºC	1999	1980
Mean Monthly Min Temp	Tokotoko, Navua	21.8ºC	-	New High	21.3ºC	1999	1992
Mean Monthly Min Temp	Matuku Island	23.2ºC	-	New High	22.5ºC	2006	1955
Mean Monthly Min Temp	Vunisea, Kadavu	22.9ºC	-	New High	21.9ºC	1975	1947
Mean Monthly Min Temp	Lakeba Island	23.2ºC	-	New High	22.9ºC	1999	1955
Mean Monthly Min Temp	Ono-I-Lau	21.9ºC	-	New High	21.7ºC	1971	1943
Mean Monthly Min Temp	Rarawai Mill	21.5ºC	-	New High	28.8ºC	1961	1925
Mean Monthly Min Temp	Lautoka Mill	22.6ºC	-	New High	22.3ºC	1974	1930
Mean Monthly Min Temp	Penang Mill	22.9ºC		New High	22.6ºC	1975	1930

TABLE 2 : THREE MONTH RAINFALL : JULY TO SEPTEMBER 2007

Station	Actual Rainfall (mm)	Rainfall in the last three months (Below average, average or above average)	No. of Rain days in July 07 (% of total rain)	No. of Rain days in August 07 (% of total rain)	No. of Rain days in September 07 (% of total rain)
Penang Mill, Rakiraki	270.7	Above Average	05 (14)	10 (11)	16 (75)
Monasavu Dam	1422.3	Above Average	12 (07)	20 (28)	26(65)
Rarawai Mill, Ba	356.1	Above Average	05 (19)	07 (09)	14 (72)
Nacocolevu	541.4	Above Average	07 (25)	05 (05)	16 (70)
Viwa, Mamanuca Group	341.8	Above Average	07 (41)	14 (03)	12 (56)
*Lautoka (FSC Res.)	255.2	Above Average	06 (19)	04 (02)	16 (79)
Nadi Airport	288.1	Above Average	06 (24)	02 (01)	15 (75)
*"Data missing" [Monasavu 31] and [Lautoka Mill - August 31].					
Tokotoko, Navua	646.1	Average	13 (26)	19 (27)	26 (47)
Laucala Bay, Suva	583.5	Above Average	12 (42)	18 (13)	29 (45)
Nausori Airport	539.0	Above Average	12 (29)	16 (13)	27 (58)
Nabouwalu	623.6	Above Average	20 (13)	18 (20)	26 (67)
Labasa Airport	458.6	Above Average	07 (12)	09 (12)	17 (76)
Savusavu Airport	387.9	Above Average	07 (10)	10 (43)	21 (47)
Udu Point	558.4	Above Average	09 (22)	14 (19)	24 (59)
Matei Airport	683.5	Above Average	24 (11)	25 (20)	30 (69)
*"Data missing" [Levuka - August 29, 30 and 31], [Matuku - August 29]					
Lakeba, Lau	227.2	Average	08 (21)	09 (24)	20 (55)
*Matuku, Lau	273.7	Average	11 (42)	05 (08)	13 (50)
Ono-I-Lau, Lau	401.5	Above Average	10 (39)	04 (09)	(52)
*Levuka, Ovalau	524.5	Above Average	16 (17)	12 (10)	23 (73)
Vunisea, Kadavu	365.0	Average	12 (24)	15 (21)	26 (55)
Rotuma	731.2	Average	23 (28)	23 (49)	24 (23)

METEOROLOGICAL EVENT– WATERSPOUT

Tornadoes (over land) or Water Spouts (over water) are very rare events in Fiji. Their usual occurrence in Fiji being within the structure of a tropical cyclone. A water spout was observed in the vicinity of the Nadi Bay on 18 September 2007 at about 5.30pm (Figure 4). Waterspouts have the similar basic structure of a Tornado where air moves upward. Their parent cloud can be as insignificant as a moderate cumulus or as significant as a supercell. Most are weak systems and caused by different atmospheric dynamics. They normally develop in moisture-laden environments with little vertical wind shear along lines of convergence. Waterspouts normally develop as their parent clouds are in the process of development, and it is theorised that they spin up as they move up the surface boundary from the horizontal shear near the surface, and then stretch upwards to the cloud once the low level shear vortex aligns with a developing cumulus or thunderstorm. Often the vortex is seen coming down from the cloud but not obviously touching the ground or ocean.

Figure 4

(Figure 4: Source: John Gray of Nadi)

UPCOMING TROPICAL CYCLONE SEASON

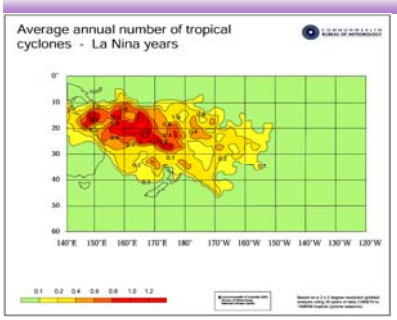


Figure 5: Source BoM, Australia (2007)

The 2007/08 tropical cyclone season will begin on November 1, 2007 and continue until April 30, 2008. On average Fiji is affected by 1 to 2 cyclones as season. Tropical cyclones are associated with destructive winds, prolonged heavy rainfall, severe flooding and storm surge. Tropical cyclones that have affect Fiji recently under similar conditions to that at present are Cyril (1984) Eric, Nigel, Gavin, Hina (1985) Keli and Martin (1986). There is a good chance that the first tropical cyclone of the coming season in the South Pacific region may occur before the end of December, which is normal in both neutral and La Niña seasons. Peak cyclone occurrence is usually from January to March.

With the prevailing and predicted climate pattern in the Pacific , there is an *near-normal risk of tropical cyclones affecting the northern parts of the Fiji and slightly higher risk for the southern parts of Fiji.*

Figure 1

Nadi Airport - Temperature & Rainfall Records for the last 13 Months (September 2006 - September 2007)

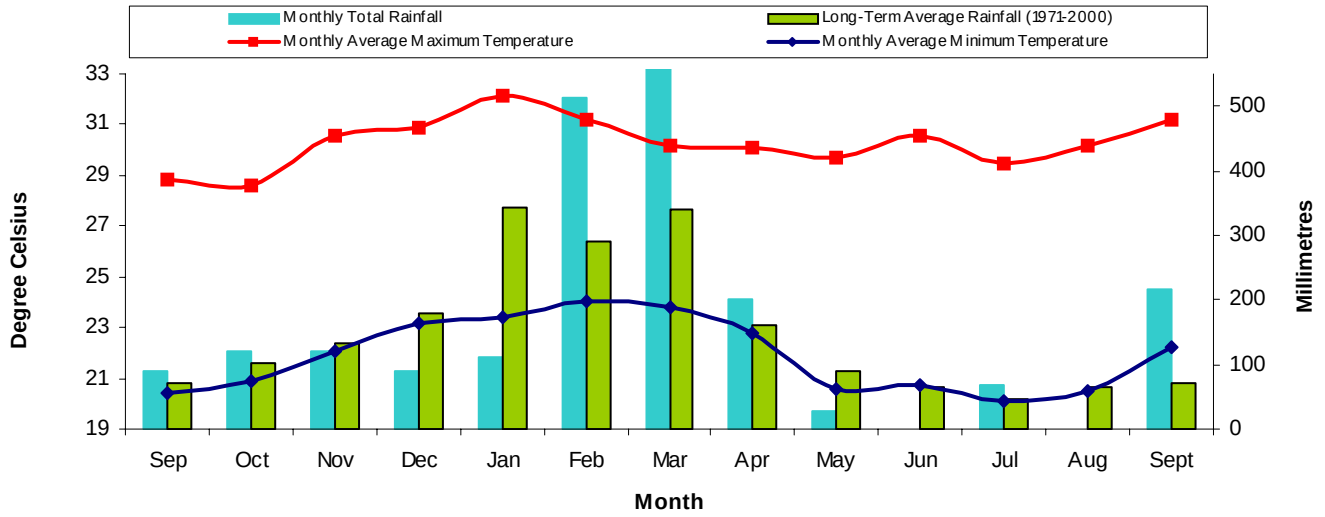


Figure 2

Labasa Airfield - Temperature & Rainfall Records for the last 13 Months (September 2006 - September 2007)

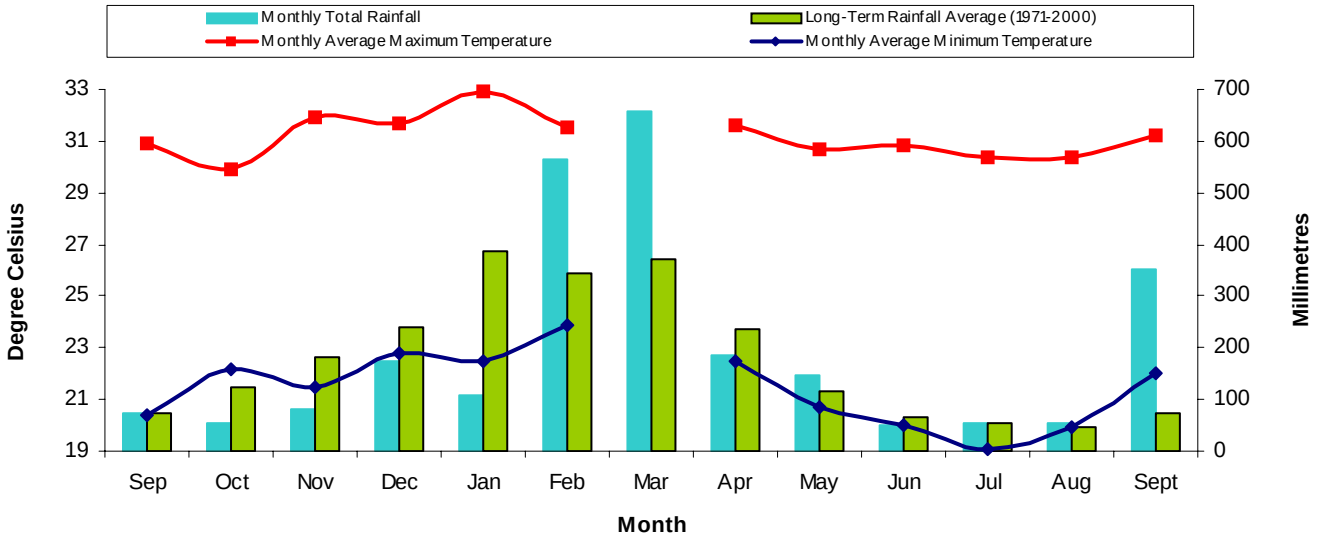
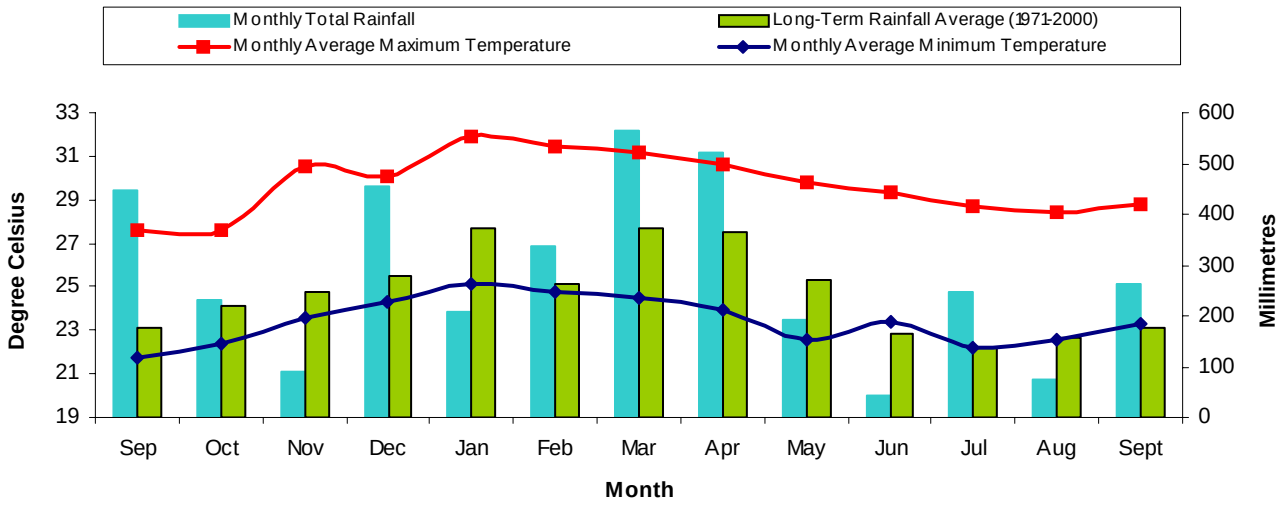


Figure 3

Laucala Bay/Suva - Temperature & Rainfall Records for the last 13 Months (September 2006 - September 2007)



PRELIMINARY CLIMATOLOGICAL SUMMARY FOR SEPTEMBER 2007

PRELIMINARY CLIMATOLOGICAL DATA FOR MONTH 9 , 2007 : SUMMARY FOR DAYS 1 TO 30

	RAINFALL					AIR TEMPERATURES								SUNSHINE	
	TOTAL		RAIN DAYS	MAX. FALL		AVERAGE DAILY MAX.	#	AVERAGE DAILY MIN.	#	EXTREME MAX.		EXTREME MIN.		TOTAL	
	MM	% *	+	MM	ON	C		C		C	ON	C	ON	HRS	%
NADI AIRPORT	218	311	15	75	25	31.2	1.9	22.2	2.9	34.0	16	19.6	2	174	82
SUVA/LAUCALA BAY	262	148	29	65	24	28.8	1.6	23.3	2.3	31.5	10	21.7	29	77	56
NACOCOLEVU	377	397	16	76	24	29.8	1.9	20.5	2.1	33.5	17	16.1	27	105	61
ROTUMA	162	68	24	31	1	30.6	1.3	24.9	0.8	31.5	4	23.0	2	213	119
VIWA	192	305	12	85	24	31.2	3.0	24.4	1.7	33.0	16	22.5	29		
UDU POINT	329	291	24	85	6	29.3	0.7	23.5	1.0	31.5	25	21.5	29		
LABASA AIRFIELD	350	487	17	53	6	31.2	1.1	22.0	2.7	33.0	9	20.0	20		
NABOUWALU	419	371	26	84	26	28.4	1.6	23.0	1.0	30.6	9	21.0	30		
SAVUSAVU AIRFIELD	182	137	21	29	2	28.7	1.3	22.8	1.6	32.0	16	21.5	20		
MATEI AIRFIELD	475	299	30	93	23	28.6	1.1	23.3	1.5	30.1	21	21.3	8		
YASAWA-I-RARA	105	160	14	32	26	30.6	2.3	22.2	-0.2	32.2	7	20.1	23		
MONASAVU	920	341	26	269	14	23.1	0.8	18.2	2.3	26.3	21	16.2	30		
KORONIVIA	297	172		57	24	28.3	1.4	22.7	2.9	31.5	25	20.9	17		
NAUSORI AIRPORT	309	186	27	67	24	28.1	1.5	22.4	2.4	31.3	25	20.2	29		
NAVUA/TOKOTOKO	301	131	26	39	5	27.8	0.4	21.8	3.4	30.5	16	20.0	28		
LEVUKA	385	447	23	90	24	28.5	1.4	22.6	0.8	30.0	10	20.0	3		
LAKEBA	126	124	20	40	26	29.4	2.5	23.2	1.8	31.7	9	20.9	27		
VANUA BALAVU	332	389		52	3	28.5	1.2	23.1	0.8	31.1	21	20.3	3		
MATUKU	137	142	13	53	24	28.4	2.0	23.3	2.5	30.7	29	20.3	3		
VUNISEA	204	150	26	65	26	27.9	1.8	22.9	3.1	31.5	25	21.6	28		
ONO-I-LAU	210	195	13	85	24	27.1	1.7	21.9	1.5	30.6	10	19.4	3		
BA/RARAWAI MILL	256	346	14	109	24	31.8	1.4	21.5	3.3	34.5	18	17.1	6		
LAUTOKA AES	202	280	16	96	24	30.8	2.1	22.6	1.9	32.3	15	20.3	6		
PENANG MILL	204	213	16	51	26	29.9	1.9	22.9	1.7	32.0	9	21.1	27		

RAINFALL OUTLOOK FOR FIJI ISLANDS - OCTOBER TO DECEMBER 2007

The current ENSO condition in the equatorial Pacific is that of weak La Niña. Based on the latest observations and forecasts, there is a there is a 65% probability of maintaining La Nina conditions over the coming three months. The La Nina event is expected to reach maturity in early 2008.

Based on the current and predicted ocean and atmospheric conditions in the equatorial Pacific, rainfall in Fiji is expected to be *above average* from October to December 2007 (except at Rotuma where rainfall is expected to be near normal). The confidence level of the prediction is *moderate*.

(More detailed climate predictions will follow in the 'Fiji Islands Climate Outlook' to be released around mid September)

Normal *- Long term average from 1971 to 2000.*

Well Below Average *- Rainfall less than 39%.*

Below Average *- Rainfall between 40 to 79%.*

Average *- Rainfall between 80 to 119%.*

Above Average *- Rainfall between 120 to 199%.*

Well Above Average *- Rainfall more than 200%.*

For further information please contact: The Director, Fiji Meteorological Service, Private Mail Bag, NAP0351, Nadi Airport, Fiji Islands. Email: climate@met.gov.fj.