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Fiji Islands Climate Summary September 2008

Since : August 1980* **Volume 29 : Issue 9**

IN BRIEF

Rainfall varied considerably across the Fiji Islands in September. In the Western Division, most of the Central Division, Labasa and Vunisea, rainfall was *below average*. Rainfall was *above average* at Udu Point and across most of the Lau and Lomaiviti Groups. Elsewhere rainfall was *near average*. September's weather comprised of fast-moving cold fronts and troughs of low pressure affecting the Group but was dominated by mobile ridges of high pressure that were accompanied by brief cool, dry spells, strong winds and episodes of Trade showers that affected the interior and windward parts of the larger islands.

Rainfall over the July to September period was predicted to be *average* or *above average*. Of the 23 stations that reported in time for this summary, two sites received *above average* rainfall, eleven *average* rainfall and ten *below average* rainfall. A meteorological drought exists in parts of Western Viti Levu and Northern Vanua Levu particularly the greater Labasa, Ba, and Sigatoka Valley areas from October 1, 2008. However, this drought is not expected to intensify or continue for much longer.

Maximum air temperatures in September were *above average* across most of the country. Two daily maximum temperatures records were established at Matuku and Ono-i-Lau in the Lau Group during the month. Minimum air temperatures were *above average* across most of the country. Two daily minimum air temperature records were established at Levuka and Navua during the month.

The equatorial Pacific is currently in a *Neutral* ENSO state. There is a 90% probability of these conditions persisting through December 2008.

Average to *above average* rainfall is favoured across most of the Fiji Islands for the October to December period. The confidence in this prediction is *moderate to good.*

The 2008/09 Southwest Pacific tropical cyclone (TC) season will commence November 1 and continue until April 30, next year. There is average risk (2-3) of TCs passing through Fiji Waters in the coming season with 1-2 affecting land areas.

WEATHER PATTERNS

Four fast-moving cold fronts and troughs of low pressure affected Fiji in September with a few areas receiving heavy rainfall. The month was dominated by mobile ridges of high pressure that were accompanied by brief cool dry spells, strong winds and episodes of Trade showers that affected the interior and windward parts of the larger islands.

The first trough affected the northeastern parts of the Group from September 1 to 4 and brought some heavy rainfall over the area. Significant rainfall was recorded at Lakeba (147.0mm) and Vanuabalavu (84.1mm) on September 2. A moist easterly wind flow prevailed thereafter bringing showers over eastern parts of the Group.

A cold front approached the Group from the southwest on September 13 and was accompanied by a low pressure system that developed along it, to the south of Fiji, on September 14. Widespread rain was experienced across the country until September 15. As the low pressure system traversed southeastward, a ridge of high pressure pushed in from the southwest, directing a cool southwesterly wind flow onto the Group, causing overnight temperatures to drop. Monasavu and Ba's minimum temperatures on the night of September 15 were 13.0˚C and 13.7˚C respectively. This was followed by 11.5˚C at Navua and 11.9˚C at Monasavu on September 16.

Another fast-moving cold front swept over the southern parts of Group while the SPCZ to the north drifted over northern parts of the country on September 19 and 20. Lakeba recorded 85.0mm of rainfall on September 19. A strong ridge pushed in from the southwest and dominated the weather from September 21 to 27. As a result, a strong wind warning was issued during this time for all Fiji Waters.

On September 26 and 27, another fast-moving cold front approached from the southwest and progressed eastwards. Significant rainfall was recorded at Vunisea and Ono-I-Lau on September 27, with 47.3mm and 43.6mm respectively. Soon after, a trough developed to the northwest of Fiji and drifted onto the Group on the night of September 30, no substantial falls were recorded from this system.

Rotuma received intermittent showers during the month, largely due to the presence of the SPCZ close to the island. The highest daily rainfall during the month, 48.3mm was recorded on September 15.

*** Previously known as the Fiji Islands Weather Summary and Monthly Weather Summary**

RAINFALL IN RECENT MONTHS

Rainfall in September

Rainfall was below average across the Western Division and Central Division (except Navua) and at Labasa and Vunisea, Kadavu. Rainfall was above average across the Lau (except Ono-i-Lau) and Lomaiviti Groups and Udu Point. Elsewhere rainfall was near average (Table 1, Figures 1-4).

At Lautoka, Ba and Rakiraki well below average (<40% of normal) rainfall was received during the month. Well above average (>200% of normal) rainfall was received at Lakeba, Lau.

A meteorological drought exists in parts of Western Viti Levu and Northern Vanua Levu particularly the greater Labasa, Ba, and Sigatoka Valley areas from October 1, 2008.

Rainfall in the last three months

Rainfall over the July to September period was predicted to be *average* or *above average*. The confidence level of the prediction was *very low* to *very good*.

Of the 23 stations that reported in time for this summary, two sites received *above average* rainfall, eleven received *average* rainfall and ten received *below average* rainfall. During this period, there was high variability in rainfall (Table 2).

The hit rate for the July to September prediction was 57%.

TABLE 1. PRELIMINARY CLIMATOLOGICAL SUMMARY FOR SEPTEMBER 2008

FIJI METEOROLOGICAL SERVICE — DATE 01/10/2008

PRELIMINARY CLIMATOLOGICAL DATA FOR MONTH 9 , 2008 : SUMMARY FOR DAYS 1 TO 30

	RAINFALL				AIR TEMPERATURES								SUNSHINE	
	TOTAL	*	RAIN DAYS	MAX. FALL	AVERAGE DAILY MAX.	#	AVERAGE DAILY MIN.	#	EXTREME MAX.	ON	EXTREME MIN.	ON	TOTAL HRS	*
	MM	%	+	MM	C		C		C		C			%
NADI AIRPORT	55	78	7	30	29.5	0.3	20.5	1.2	31.9	3	16.3	16	225	107
SUVA/LAUCALA BAY	102	58	21	19	28.4	1.2	22.3	1.3	30.7	7	19.1	17	161	118
NACOCOLEVU	42	45	4	16	29.9	2.0	19.4	0.9	33.5	7	14.5	17	104	60
ROTUMA	215	91	23	48	30.0	0.7	24.5	0.4	31.0	19	22.5	15	152	85
VIWA	34	54	6	19	30.5	2.3	24.1	1.4	32.0	10	22.2	15		
UDU POINT	186	164	21	38	29.0	0.4	22.9	0.4	30.5	9	20.5	15		
SAVUSAVU AIRFIELD	106	80	13	25	28.4	1.0	21.4	0.2	31.5	8	19.5	15		
LABASA AIRFIELD	46	63	7	26	31.1	1.0	20.0	0.7	33.9	9	16.3	12		
NABOUWALU	103	91	19	25	28.1	1.3	22.6	0.6	29.7	13	19.7	17		
KORONIVIA	132	77	20	36	28.0	1.1	21.1	1.3	31.0	29	15.7	17		
NAUSORI AIRPORT	98	59	26	15	27.7	1.1	20.7	0.7	29.6	9	15.5	17		
NAVUA/TOKOTOKO	257	112	20	52	26	27.3	-0.1	19.4	1.0	32.0	9	11.5	17	
MONASAVU	199	74	22	28	14	23.1	0.8	17.0	1.1	26.6	11	11.9	17	
LAUTOKA AES	19	26	6	10	20	30.3	1.6	21.3	0.6	32.9	6	17.9	16	
BA/RARAWAI MILL	21	28	6	6	20	31.6	1.2	18.6	0.4	34.1	4	13.7	16	
PENANG MILL	19	19	11	12	7	29.5	1.5	22.1	0.9	32.0	20	19.8	16	
MATEI AIRFIELD	174	110	25	37	2	28.2	0.7	22.6	0.8	29.5	5	20.4	4	
VANUABALAVU	167	197	15	84	2									
LAKEBA	307	304	14	147	2	28.6	1.7	21.1	-0.3	29.7	8	15.0	17	
ST. JOHNS COLLEGE	113	131	21	18	20	27.7	0.6	22.6	0.8	29.0	10	20.0	15	
VUNISEA	106	78	15	47	27	27.6	1.5	21.5	1.7	29.5	6	15.7	17	
MATUKU	136	141	12	43	19	29.2	2.8	23.7	2.9	31.9	7	19.9	20	
ONO-I-LAU	112	104	10	44	27	27.7	2.3	21.3	0.9	30.9	10	18.5	18	

RAINFALL OUTLOOK - OCTOBER TO DECEMBER 2008

Although sea surface temperatures in the tropical Pacific have cooled slightly over the last three weeks the ENSO state remains *Neutral*. Subsurface temperatures have also cooled, pointing to the possibility of further reduction of surface temperatures over the coming weeks. This cooling has been largely driven by stronger than normal Trade Winds in the central and equatorial Pacific. The Southern Oscillation Index reflects the recent changes and has risen to a value of +14 for the month of September. Given the current conditions and trends, there is little potential for an El Niño event to occur in 2008 and switch to La Nina conditions is unlikely. There is a ninety percent probability of ENSO neutral conditions persisting over the coming months.

Rainfall is favoured to be *average to above average* across the country during October to December period except at Levuka where an equal chance of receiving *below average, average or above average* rainfall is predicted during this period. The confidence in this prediction is *moderate to good*. ***More detailed climate predictions will follow in the "Fiji Islands Climate Outlook" to be released in the coming days***.

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

Average *- Rainfall between 80 to 119%.*

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

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

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

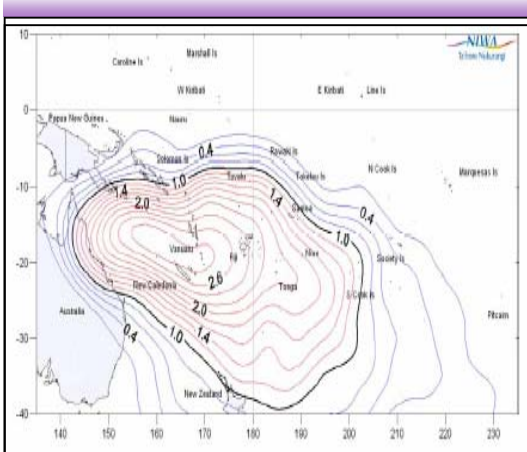
Well Above Average *- Rainfall more than 200%.*

TABLE 2. THREE MONTH RAINFALL : JULY TO SEPTEMBER 2008

Station	Actual Rainfall (mm)	Rainfall in the last three months (Below average, average or above average)	No. of Rain days in July 08 (% of total rain)	No. of Rain days in August 08 (% of total rain)	No. of Rain days in September 08 (% of total rain)
Penang Mill, Rakiraki	111.8	Below Average	03 (17)	08 (66)	11 (17)
Monasavu Dam	630.5	Average	18 (30)	16 (39)	22 (31)
Rarawai Mill, Ba	83.5	Below Average	04 (65)	03 (10)	06 (25)
Nacocolevu	122.4	Below Average	05 (43)	07 (22)	04 (35)
Viwa Island	104.6	Below Average	03 (52)	06 (16)	06 (32)
Lautoka (FSC Res.)	141.4	Average	03 (86)	04 (1)	06 (13)
Nadi Airport	131.0	Average	02 (56)	03 (02)	07 (42)
Tokotoko, Navua	635.2	Average	13 (17)	19 (43)	20 (40)
Laucala Bay, Suva	366.7	Below Average	18 (20)	20 (52)	21 (28)
*Koronivia	324.2	Below Average	16 (25)	20 (34)	20 (41)
Nausori Airport	322.4	Below Average	16 (31)	19 (39)	269 (30)
Nabouwalu	217.2	Average	14 (22)	20 (31)	19 (47)
Labasa Airport	64.2	Below Average	03 (24)	04 (05)	07 (71)
Savusavu Airport	243.0	Below Average	09 (45)	09 (11)	13 (44)
Udu Point	336.3	Average	07 (30)	17 (15)	21 (55)
*Matei Airport	349.6	Average	21 (34)	15 (16)	25 (50)
Vanua Balavu, Lau	225.8	Average	10 (19)	09 (07)	15 (74)
Lakeba, Lau	415.7	Above Average	06 (13)	16 (13)	14 (74)
Matuku, Lau	261.7	Average	08 (14)	11 (34)	12 (52)
Ono-I-Lau, Lau	252.4	Average	05 (34)	09 (22)	10 (44)
Levuka, Ovalau	334.7	Average	09 (47)	12 (19)	21 (34)
Vunisea, Kadavu	257.5	Below Average	17 (30)	17 (29)	15 (41)
Rotuma	904.4	Above Average	23 (50)	25 (26)	23 (24)

* Data missing : 1 day in July at Koronivia and 2 days in August at Matei.

UPCOMING TROPICAL CYCLONE SEASON



The map above shows average number of tropical cyclones during *Neutral* ENSO periods, from 1969/70 to 2007/08. Source: NIWA, 2008 (http://www.niwa.cri.nz/news/mr/2008/2008-09-18).

The 2008/09 Southwest Pacific tropical cyclone (TC) season will formally commence on Nov 1, 2008 and continue until Apr 30, 2009. With ***Neutral*** El Niño Southern Oscillation conditions (ENSO) expected through Dec 2008, near *average* numbers of TCs are predicted near and west of the Date Line. *Below average* numbers of TCs are predicted to occur east of Date Line.

On *average*, nine TCs occur over the entire southwest Pacific region per season with peak TC occurrence from Jan to Mar. There is a good chance this coming season that the first TC will occur in Dec which is normal in the prevailing ENSO condition.

In seasons similar to the on-coming one, two or more TC have occurred in the Vanuatu, New Caledonia, Fiji and Tonga region with fewer numbers occurring further east and north of these islands. On *average*, about half of the TCs that develop in this region reach category 3 or hurricane intensity with mean wind speeds greater than 64 knots.

For Fiji, there is average risk (2-3) of TCs passing through Fiji Waters in the coming season with 1-2 affecting land areas.

Figure 1

Nadi Airport - Temperature & Rainfall Records for the last 13 Months (Septembert 2007 - September 2008)

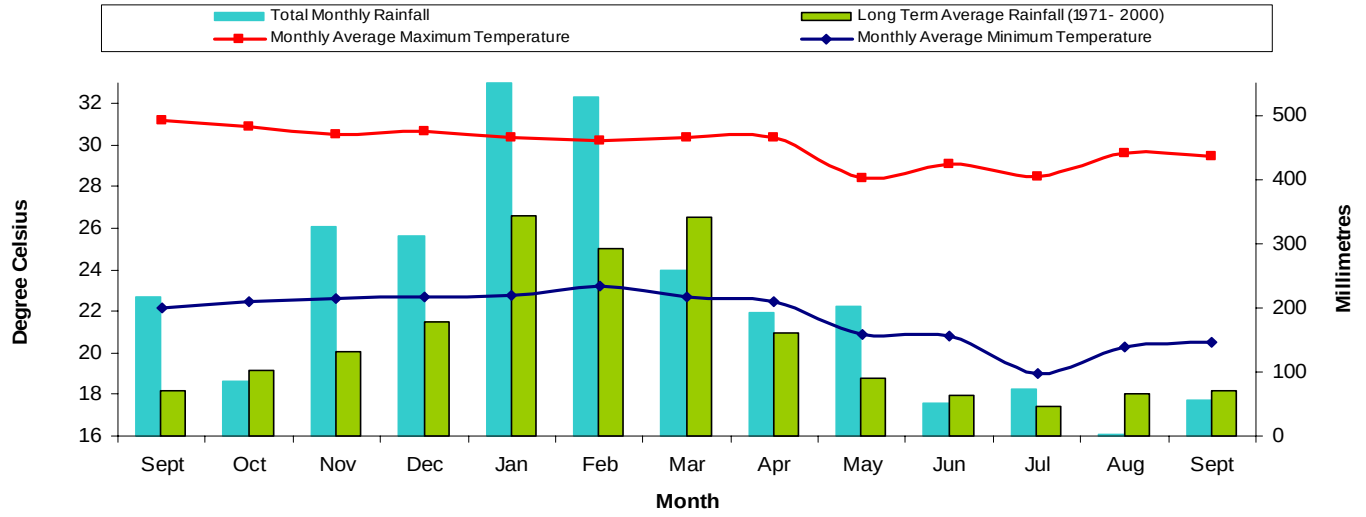


Figure 2

Labasa Airfield - Temperature & Rainfall Records for the last 13 Months (September 2007 - September 2008)

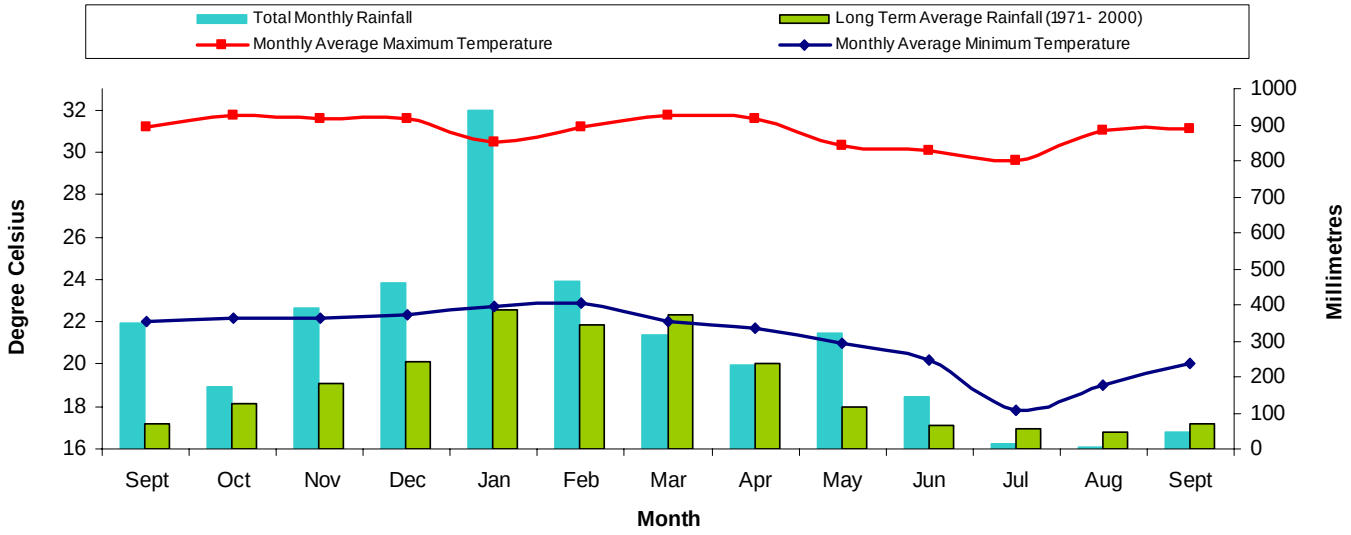
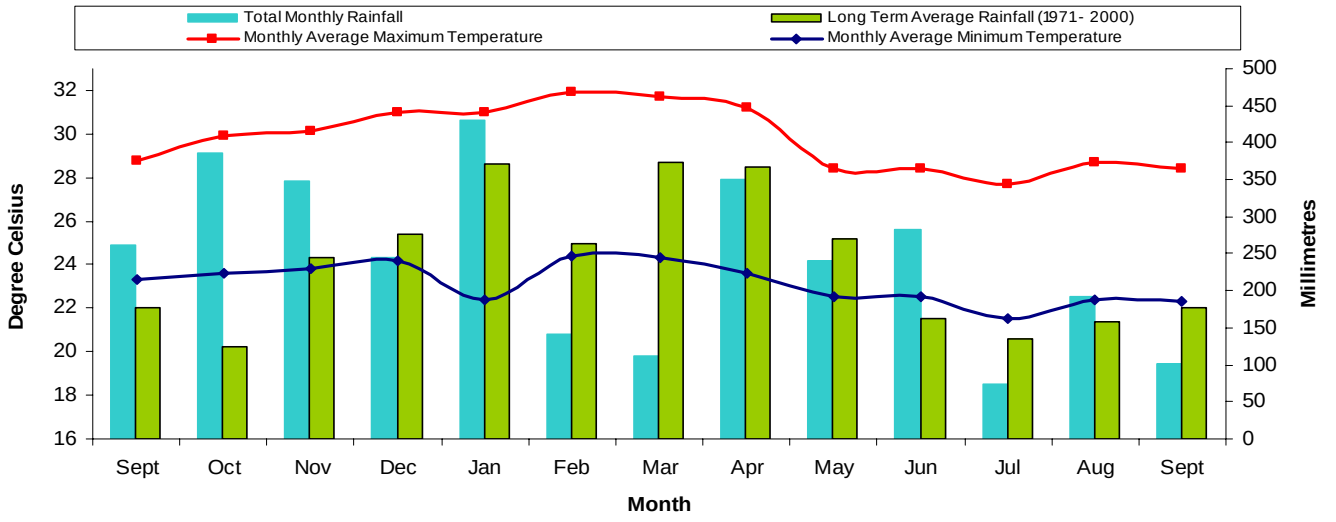


Figure 3

Laucala Bay/Suva - Temperature & Rainfall Records for the last 13 Months (September 2007 - September 2008)



AIR TEMPERATURES, RELATIVE HUMIDITY AND SUNSHINE IN SEPTEMBER

Maximum Air Temperatures were generally *above average* across the country in September. The greatest positive anomalies were recorded at Matuku (2.8˚C), Ono-I-Lau and Viwa (2.3˚C) and Nacocolevu (2.0˚C). Tokotoko, Navua and Vanuabalavu, Lau were the only sites that recorded negative anomalies (Table 1).

Minimum Air Temperatures were also generally *above average* across the country in September. The greatest positive departures were recorded at Matuku (2.9˚C), Vunisea (1.7ºC) and Viwa (1.4˚C) (Table 1).

Air temperature anomalies greater or equal to +0.8˚C were recorded at a large number of sites (Table 1) around the country. In September, five air temperature records were established including one new low at Tokotoko in Navua. (Table 3).

Positive **Sea Surface Temperatures** anomalies in the order of 0.5 to 1.5ºC existed in the Fiji region in August (Figure 5). The highest positive anomalies were to the south of the Group.

Positive **Sea Level** anomalies in the order of 10cm to just over 15cm existed in the Fiji region in September (Figure 6). The greatest anomalies were to the south of the Group.

Relative Humidity at 0900hrs was generally *near average to below average* in most parts of the country. The greatest positive anomalies were recorded at Lakeba (5.6%), Nausori Airport (4.1%) and Nadi Airport (3.1%). The greatest negative anomalies were recorded at St. Johns College (-9.0), Savusavu Airport (-7.7%) and Penang Mill (-6.9%).

Sunshine hours were near average at Laucala Bay and Nadi Airport and below average at Nacocolevu and Rotuma. The Outgoing Longwave Radiation (OLR, proxy to cloudiness) in September show near normal cloudiness in the Fiji region (Figure 4).

Wind direction was predominantly from easterly direction in the southeastern Fiji region and near normal elsewhere (Figure 7).

Wind speed was *near average* at Nausori Airport and *below average* at all other wind recording sites in September (Table 1). Satellite images show *positive anomalies* in the southeastern portion of Fiji's Waters and near normal conditions elsewhere (Figure 7).

TABLE 3. CLIMATE RECORDS ESTABLISHED IN SEPTEMBER 2008

Element	Station	Observed (record)	On	Rank	Previous (record)	Year	Records Began
Monthly Total Rainfall	Lakeba	307.2mm	-	New High	261.0mm	1975	1924
Monthly Daily Rainfall	Lakeba	147.0mm	02nd	New High	132.0mm	1977	1924
Monthly Max Temp	Ono-I-Lau	27.7°C	-	New High	27.1°C	2007	1943
Daily Max Temp	Ono-I-Lau	30.9°C	10th	New High	30.6˚C	2007	1943
Daily Max Temp	Matuku	31.9°C	07th	New High	31.2°C	1984	1955
Daily Min Temp	St. Johns College, Levuka	25.2°C	12th	New High	25.0°C	2007	1984
Daily Min Temp	Tokotoko, Navua	11.5°C	17th	New Low	13.8°C	1993	1992

SEA LEVEL, SEA SURFACE TEMPERATURE, CLOUD COVER AND WIND FLOW IN SEPTEMBER

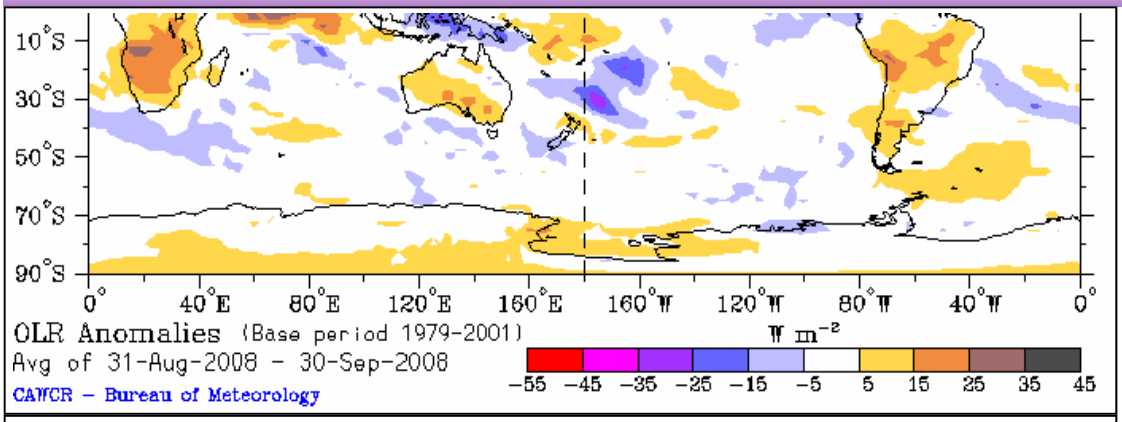


Figure 4. Southern Hemisphere Outgoing Longwave Anomalies (Wm^{-2}) for the period 31 Aug 2008 to 30 Sep 2008. Near normal cloud cover existed across most of Fiji, (~17ºS, 180º). http://www.bom.gov.au/bmrc/clfor/cfstaff/matw/maproom/OLR/m.lm.html

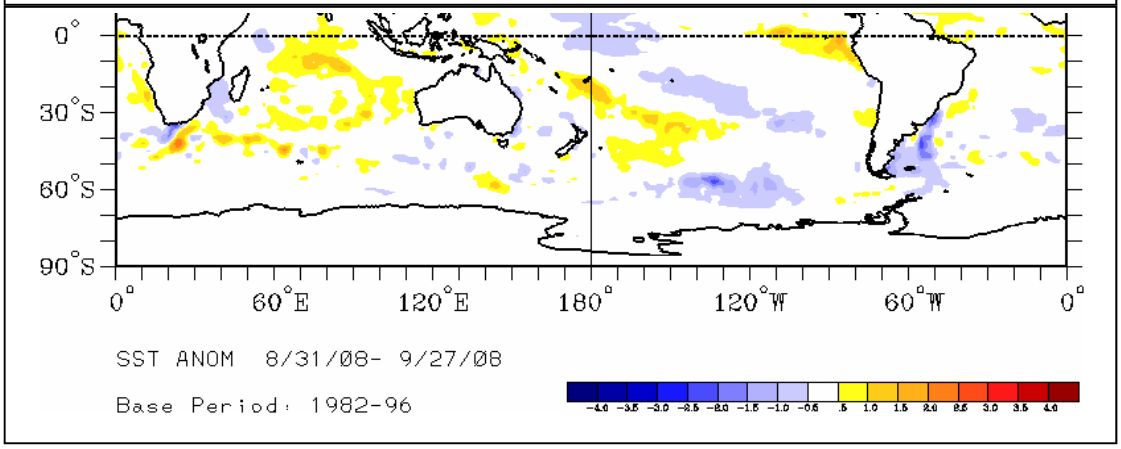


Figure 5. Southern Hemisphere SST Anomalies (ºC) for the period 31 Aug 2008 to 27 Sep 2008. Positive anomalies in the order of 0.5-1.5ºC existed in the Fiji region, (~17ºS, 180º). http://www.cdc.noaa.gov/map/images/sst/sst.anom.month.gif

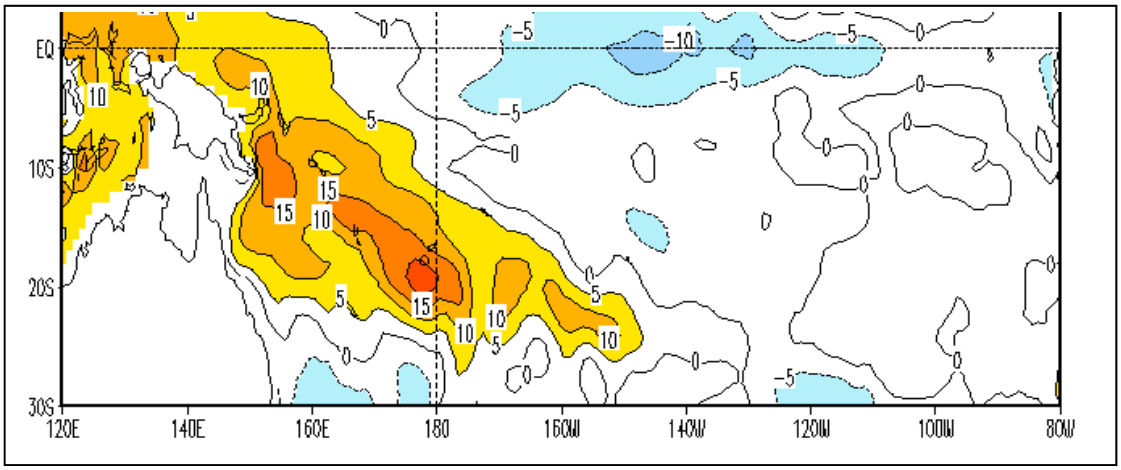


Figure 6. Southern Hemisphere Sea Level Anomalies (cm) as of Sep 20, 2008. Positive anomalies in the order of 10cm to just over 15cm existed in the Fiji region, (~17ºS, 180º). http://www.cpc.noaa.gov/products/analysis_monitoring/enso_update/sealev.gif

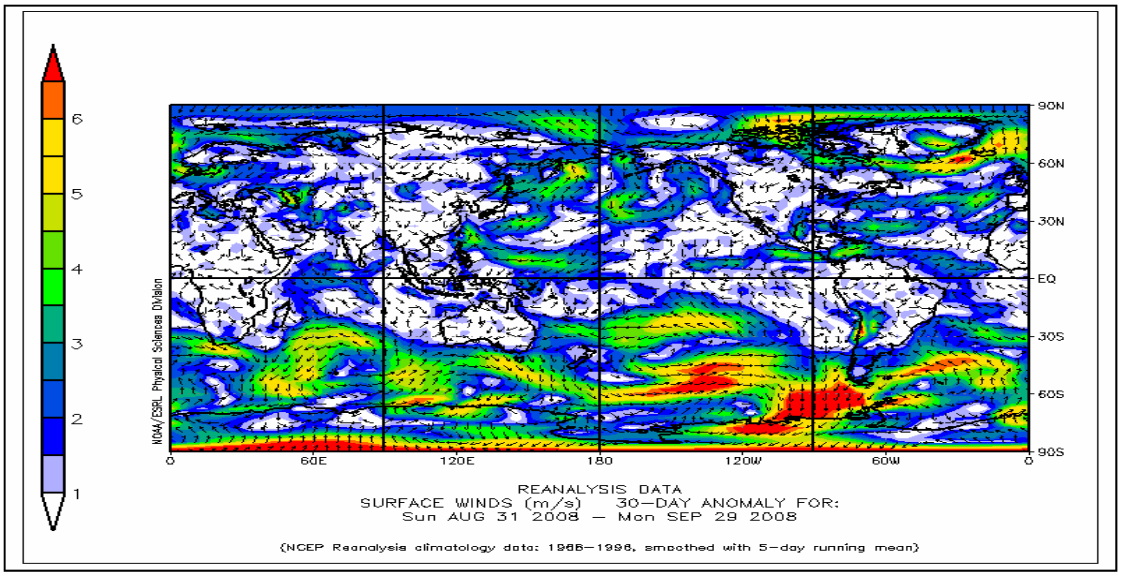


Figure 7. Global surface wind anomalies (m/s) for the period 31 Aug 2008 to 29 Sep 2008. Positive easterly anomalies evident in the southeastern portion of Fiji's Waters, near normal conditions elsewhere (~(17ºS, 180º).

http://www.cdc.noaa.gov/map/images/rnl/sfcwnd_30a.rnl.html