

Fiji Islands Climate Summary

October 2008

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IN BRIEF

October 2008 was a typical transition month from Dry to Wet Season. The SPCZ while remaining to the north of Fiji for most of October moved south over the main islands twice during the month. Rainfall was also received when troughs of low pressure or tail-ends of eastward moving cold fronts affected the southern parts of the country. Afternoon thunderstorm activity also produced some rainfall about the interior and eastern parts of the larger islands.

Regardless of all the above activity, October rainfall was *below average* across the Northern Division, Lomaiviti Group, most of the Lau Group and parts of the Western Division. At Lakeba, Vanuabalavu, Udu Point, Labasa Airport and Penang Mill rainfall was *well below average* (< 40% of normal). The only sites that received *above average* rainfall were Ono-i-Lau, Vunisea and Monasavu.

Rainfall over the August to October period was predicted to be *generally above average*. The observed rainfall over the same period was in the *average to below average* categories. A meteorological drought exists in the Ba region from August 2008 and greater Labasa and Rakiraki and Sigatoka Valley region from September 2008.

The drought is not expected to intensify or persist for much longer as an El Niño event does not exist at the current time. In fact atmospheric conditions in the tropical Pacific are more La Niña-like with an SOI value around +13.

Maximum and the minimum air temperatures were generally *above average* across most of Fiji. Eleven new air temperature records were established at various locations around the country in October (Table 3).

Neutral ENSO conditions prevail in the Pacific Basin and these conditions are likely to persist in the coming months. *Average or above average* rainfall is favoured across most of the country for the November 2008 to January 2009 period. The confidence in this prediction is *low to moderate*.

The 2008/09 Southwest Pacific tropical cyclone (TC) season commenced on November 1 and continues until April 30, 2009. There is average risk (2-3) of TCs passing through Fiji Waters in the coming season with 1-2 affecting land areas.

WEATHER PATTERNS

The SPCZ while remaining to the north of Fiji for most of October moved southward over the Fiji Islands twice during the month. There were a few instances when troughs of low pressure or tail-ends of eastward moving cold fronts affected the southern parts of the Group. Transient ridges of high pressure remained to the south and were accompanied by periods of strong winds mainly in coastal waters.

The SPZC extended over the Group from the north, causing some showers mainly over the Northern Division on October 1. The SPCZ was pushed back north as a ridge intensified from the southwest from October 2-5. A Strong Wind Warning was issued for all coastal waters during this period. As the ridge weakened, the SPCZ moved back over the Group on October 5 and 6 with a moist easterly wind flow that brought rain and thunderstorms especially about the interior and eastern parts of the larger islands. Significant rainfall was recorded in Tokotoko-Navua (58.0mm) and Matei (100.6mm) on October 5. Monasavu recorded 72.0mm of rain on October 6.

The ridge intensified again from October 9-12 and directed a fresh to strong moist easterly wind flow over Fiji. A Strong Wind Warning was issued for all coastal waters during this period. An eastward moving cold front approached the

southern parts of the Group from the southwest from October 11-13. A combination of all these features contributed to rain and thunderstorms about the larger islands and the southern parts of the Group. On October 10, Rarawai Mill recorded 47.6mm and Vunisea with 60.7mm of rainfall.

From October 17-22, a trough approached the Group from the west-southwest and lingered over the southern parts. Significant rain was experienced mainly over Viti Levu and the islands to the south and southeast. Heavy rainfall was recorded in Koronivia, Nausori and Vunisea on October 17 with 103.7mm, 81.0mm and 48.9mm respectively. Nausori, Monasavu and Vunisea recorded 93.7mm, 84.0mm and 69.8mm respectively the following day.

Another slow moving trough developed to the southwest of Fiji from October 27-31. A prevailing moist and warm east to northeasterly wind flow together with the presence of this trough, helped to bring some rain over the interior parts of the main islands and the southern parts of the group.

Rotuma received rain for most of October, largely due to the SPCZ located close to the island. Significant falls occurred on October 13 with 41.3mm and October 25 with 42.3mm.

RAINFALL IN RECENT MONTHS

Rainfall in October

Rainfall was *below average* across the Northern Division, Lomaiviti Group, most of the Lau Group and parts of the Western Division. At Lakeba, Vanuabalavu, Udu Point, Labasa Airport and Penang Mill rainfall was *well below average* (< 40% of normal).

Above average rainfall was experienced at Ono-i-Lau (southern Lau Group), Vunisea and Monasavu. Elsewhere rainfall was *average* (Table 1, Figures 1-4).

A meteorological drought exists in the Ba region from August 2008 and greater Labasa and Rakiraki and Sigatoka Valley region from September 2008.

Rainfall in the last three months

Rainfall over the August to October period was predicted to be *generally above average* across the country except at Rotuma where rainfall was expected to be *average or below average*. The confidence level of the prediction was *low to moderate*.

Of the 23 stations that reported in time for this summary, three sites received *above average* rainfall, seven received *average* rainfall and thirteen received *below average* rainfall. During this period, there was high variability in rainfall across the Fiji Group (Table 2).

TABLE 1. PRELIMINARY CLIMATOLOGICAL SUMMARY FOR OCTOBER 2008

PRELIMINARY CLIMATOLOGICAL DATA FOR MONTH 10, 2008 : SUMMARY FOR DAYS 1 TO 31

| | RAINFALL | | | | AIR TEMPERATURES | | | | | | | | SUNSHINE | |
|-------------------|----------|------|--------|-----------|------------------|------|--------|------|---------|--------|-------|----|----------|-----|
| | TOTAL | RAIN | | MAX. FALL | AVERAGE DAILY | | | | EXTREME | | TOTAL | * | | |
| | MM | % | + DAYS | MM ON | MAX. C | # C | MIN. C | # C | MAX. C | MIN. C | HRS | % | | |
| NADI AIRPORT | 69 | 67 | 12 | 37 18 | 30.1 | -0.2 | 21.7 | 1.2 | 32.0 | 19 | 14.5 | 4 | 210 | 89 |
| SUVA/LAUCALA BAY | 194 | 88 | 21 | 73 17 | 29.7 | 1.5 | 23.2 | 1.3 | 31.7 | 25 | 19.9 | 14 | 190 | 116 |
| NACOCOLEVU | 108 | 115 | 7 | 31 29 | 30.6 | 1.5 | 20.5 | 0.8 | 34.3 | 8 | 15.5 | 5 | 161 | 84 |
| ROTUMA | 255 | 75 | 23 | 42 25 | 30.3 | 0.6 | 24.9 | 0.7 | 31.5 | 1 | 22.5 | 14 | 204 | 104 |
| VIWA | 55 | 83 | 4 | 26 18 | 30.9 | 1.6 | 24.5 | 0.9 | 33.0 | 26 | 20.0 | 2 | | |
| UDU POINT | 51 | 31 | 13 | 21 5 | 29.8 | 0.5 | 23.7 | 0.8 | 32.2 | 28 | 22.0 | 3 | | |
| SAVUSAVU AIRFIELD | 105 | 61 | 8 | 29 27 | 28.9 | 0.7 | 21.8 | -0.1 | 32.4 | 19 | 20.0 | 11 | | |
| LABASA AIRFIELD | 40 | 32 | 3 | 37 15 | 32.0 | 1.2 | 20.8 | 1.0 | 34.3 | 26 | 14.8 | 4 | | |
| NABOUWALU | 72 | 42 | 19 | 13 1 | 28.8 | 1.1 | 23.4 | 0.8 | 32.5 | 31 | 20.9 | 2 | | |
| KORONI VIA | 240 | 107 | 17 | 107 17 | 29.1 | 1.3 | 22.1 | 1.6 | 31.5 | 31 | 17.9 | 14 | | |
| NAUSORI AIRPORT | 221 | 113 | 16 | 94 18 | 28.7 | 1.1 | 21.9 | 1.0 | 30.6 | 20 | 17.6 | 14 | | |
| NAVUA/TOKOTOKO | 272 | 97 | 19 | 74 21 | 28.0 | -0.3 | 19.5 | 0.2 | 30.6 | 24 | 16.0 | 13 | | |
| MONASAVU | 401 | 122 | 27 | 84 17 | 23.7 | 0.6 | 17.5 | 0.9 | 27.4 | 31 | 13.5 | 4 | | |
| LAUTOKA AES | 106 | 104 | 12 | 33 18 | 30.6 | 1.1 | 22.0 | 0.4 | 32.9 | 9 | 12.0 | 4 | | |
| BA/RARAWAI MILL | 81 | 76 | 7 | 48 10 | 32.2 | 1.0 | 20.4 | 0.8 | 34.0 | 23 | 12.2 | 4 | | |
| PENANG MILL | 21 | 18 | 8 | 12 1 | 30.7 | 1.8 | 23.1 | 0.9 | 33.0 | 25 | 20.2 | 20 | | |
| MATEI AIRFIELD | 126 | 63 | 17 | 101 5 | 28.9 | 0.7 | 23.5 | 1.1 | 30.5 | 26 | 20.2 | 3 | | |
| VANUABALAVU | 45 | 38 | 6 | 25 8 | 28.2 | 0.2 | 23.8 | 1.0 | 30.4 | 24 | 19.8 | 7 | | |
| LAKEBA | 38 | 31 | 6 | 23 1 | 30.4 | 2.7 | 22.0 | -0.1 | 33.0 | 22 | 20.0 | 11 | | |
| ST. JOHNS COLLEGE | 86 | 62 | 11 | 24 17 | 28.5 | 0.7 | 23.0 | 0.7 | 30.5 | 20 | 18.3 | 19 | | |
| VUNI SEA | 276 | 194 | 19 | 70 18 | 27.7 | 0.6 | 22.4 | 1.6 | 30.9 | 19 | 19.5 | 14 | | |
| MATUKU | 85 | 73 | 6 | 26 31 | 29.7 | 2.3 | 23.6 | 1.8 | 32.1 | 18 | 20.5 | 30 | | |
| ONO-I-LAU | 132 | 153 | 7 | 36 31 | 28.3 | 1.9 | 22.0 | 0.6 | 31.6 | 25 | 19.6 | 3 | | |

RAINFALL OUTLOOK - NOVEMBER 2008 TO JANUARY 2009

Neutral ENSO conditions prevail in the Pacific Basin. There have been minor fluctuations in ocean temperatures across the tropical Pacific Ocean in the past three weeks with surface temperatures now close the long term average across the basin. Subsurface waters are cooler than normal in the eastern Pacific, suggesting the possibility of further surface cooling in the coming weeks. The current conditions have been maintained by slightly stronger than normal Trade Winds particularly over the western half of the equatorial Pacific. As a result, the Southern Oscillation Index remains positive (+13.4). Given the current conditions, trends over the past few months and model forecasts, ENSO neutral conditions are likely to persist over the coming months.

Rainfall is favoured to be *average to above average* across the country during November 2008 to January 2009 period in most parts of the country. The confidence in this prediction is *low to moderate*.

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.

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%.

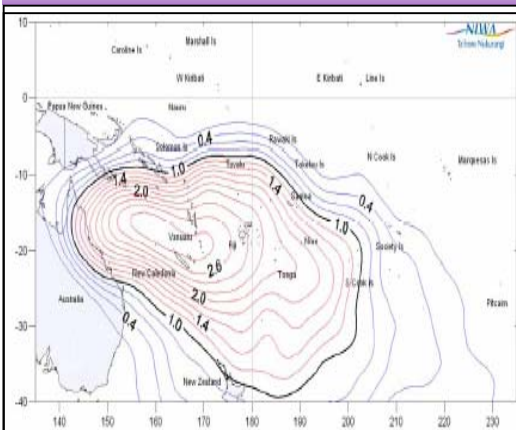
Well Above Average - Rainfall more than 200%.

TABLE 2. THREE MONTH RAINFALL : AUGUST TO OCTOBER 2008

| <u>Station</u> | <u>Actual Rainfall (mm)</u> | <u>Rainfall in the last three months (Below average, average or above average)</u> | <u>No. of Rain days in August 08 (% of total rain)</u> | <u>No. of Rain days in September 08 (% of total rain)</u> | <u>No. of Rain days in October 08 (% of total rain)</u> |
|-----------------------|-----------------------------|--|--|---|---|
| Penang Mill, Rakiraki | 113.8 | Below Average | 08 (66) | 11 (16) | 08 (18) |
| Monasavu Dam | 842.4 | Average | 16 (29) | 22 (23) | 27 (48) |
| Rarawai Mill, Ba | 109.8 | Below Average | 03 (07) | 06 (19) | 07 (74) |
| Nacocolevu | 177.9 | Below Average | 07 (15) | 04 (24) | 07 (61) |
| Viwa Island | 105.1 | Below Average | 06 (16) | 06 (32) | 04 (52) |
| Lautoka (FSC Res.) | 125.9 | Below Average | 04 (01) | 06 (15) | 12 (84) |
| Nadi Airport | 126.4 | Below Average | 03 (03) | 07 (43) | 12 (54) |
| Tokotoko, Navua | 799.6 | Above Average | 19 (34) | 20 (32) | 19 (34) |
| Laucala Bay, Suva | 487.7 | Average | 20 (39) | 21 (21) | 21 (40) |
| Koronivia | 483.0 | Average | 20 (23) | 20 (27) | 17 (50) |
| Nausori Airport | 444.6 | Average | 19 (28) | 269 (22) | 16 (50) |
| Nabouwalu | 242.1 | Below Average | 20 (28) | 19 (42) | 19 (30) |
| Labasa Airport | 89.0 | Below Average | 04 (04) | 07 (51) | 03 (45) |
| Savusavu Airport | 238.1 | Below Average | 09 (11) | 13 (45) | 08 (44) |
| Udu Point | 285.7 | Below Average | 17 (17) | 21 (65) | 13 (18) |
| *Matei Airport | 354.4 | Below Average | 15 (15) | 25 (50) | 17 (35) |
| Vanua Balavu, Lau | 227.5 | Below Average | 09 (07) | 15 (73) | 06 (20) |
| Lakeba, Lau | 400.0 | Above Average | 16 (14) | 14 (76) | 06 (10) |
| Matuku, Lau | 310.6 | Average | 11 (29) | 12 (44) | 06 (27) |
| Ono-I-Lau, Lau | 299.1 | Average | 09 (18) | 10 (38) | 07 (44) |
| Levuka, Ovalau | 261.2 | Below Average | 12 (24) | 21 (43) | 11 (33) |
| Vunisea, Kadavu | 456.0 | Above Average | 17 (16) | 15 (24) | 19 (60) |
| Rotuma | 706.3 | Average | 25 (34) | 23 (30) | 23 (36) |

* Data missing : 2 days in August at Matei and 1 day in October at Vanuabalavu.

TROPICAL CYCLONE SEASON 2008/09



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 commenced on Nov 1, 2008 and continues until Apr 30, 2009. With *Neutral* El Niño Southern Oscillation conditions (ENSO) expected into early 2009, 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 December 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
(October 2007 - October 2008)**

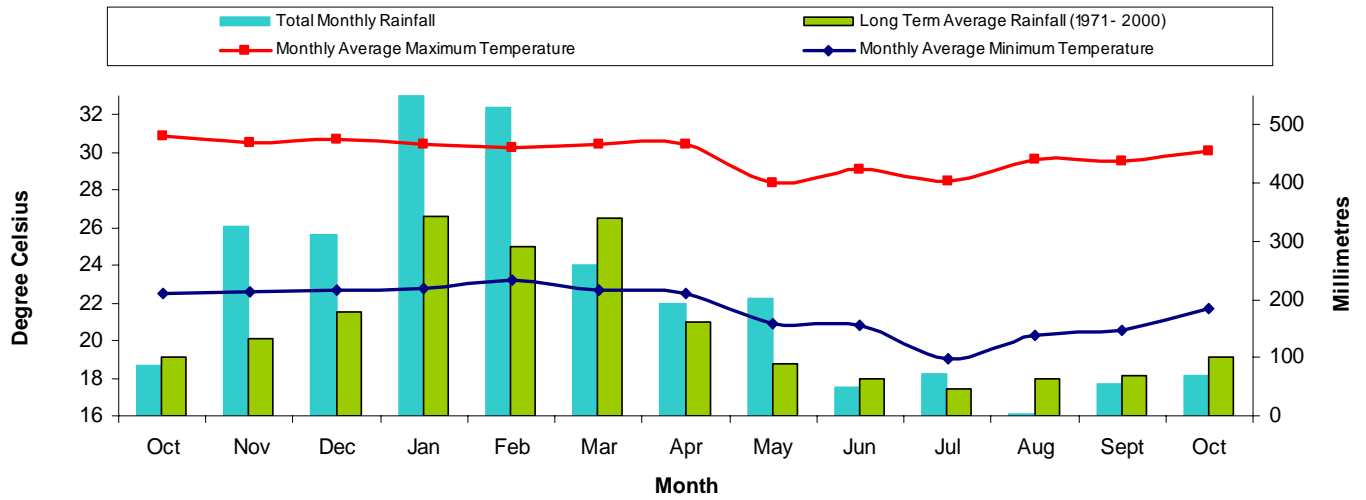


Figure 2

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

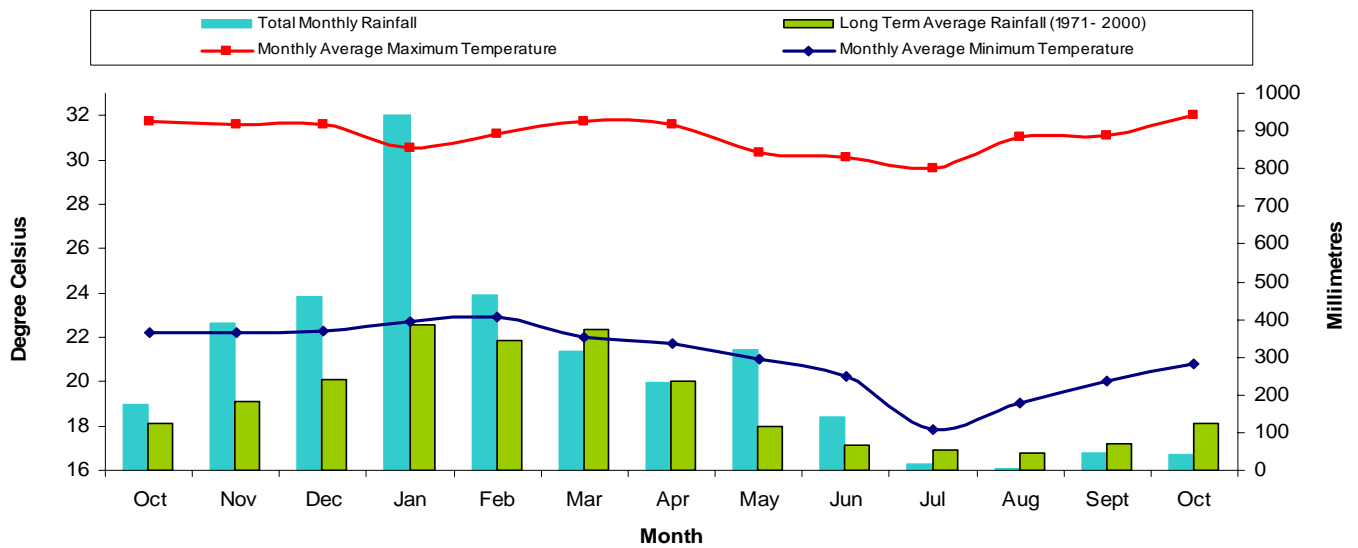
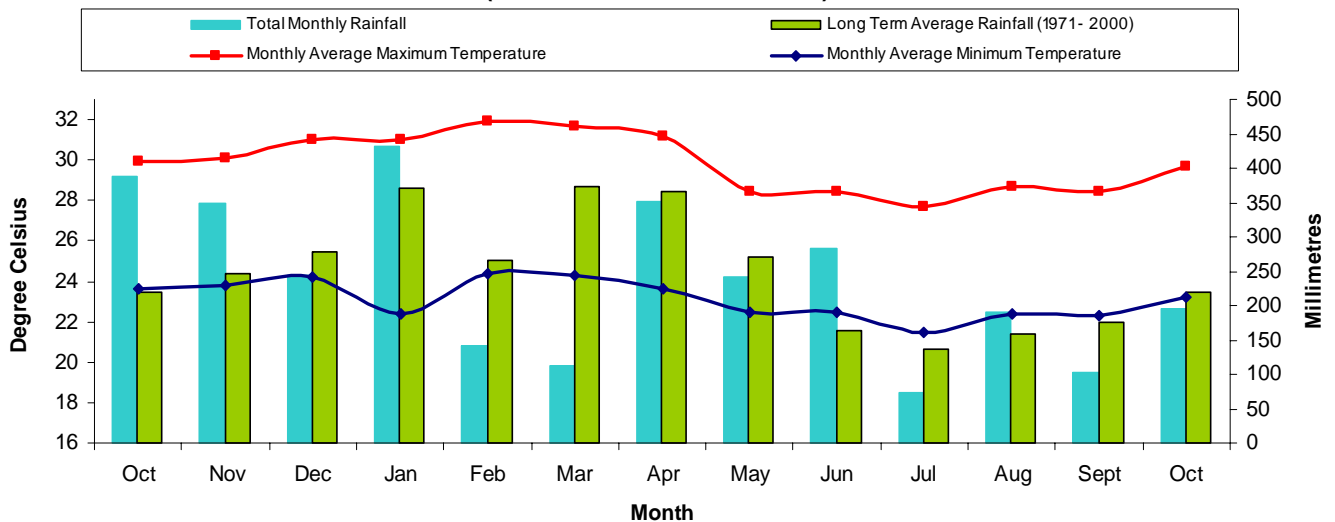


Figure 3

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



AIR TEMPERATURES, RELATIVE HUMIDITY AND SUNSHINE IN OCTOBER

Maximum Air Temperatures were generally *above average* across the country in October. The greatest positive anomalies were recorded at Lakeba (2.7°C), Matuku (2.3°C), Ono-i-Lau (1.9°C) and Penang Mill (1.8°C). Tokotoko, Navua and Nadi were the only sites that recorded negative anomalies (Table 1).

Minimum Air Temperatures were also generally *above average* across the country in October. The greatest positive departures were recorded at Matuku (1.8°C), Vunisea, Kadavu and Koronivia (1.6°C) and Laucala Bay, Suva (1.3°C) (Table 1).

Air temperature anomalies greater or equal to +0.5°C were recorded at a large number of sites (Table 1) around the country. In October, eleven new air temperature records were established (Table 3). Several locations experienced record low minimum temperatures from October 2-5 with Lautoka Mill recording the lowest minimum temperature of 12.0°C on October 4.

Positive **Sea Surface Temperatures** anomalies in the order of 0.5 to 1.5°C 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 continued to exist in the Fiji region in October (Figure 6). The greatest anomalies were to the south of the Group.

Relative Humidity at 0900hrs was generally *average to below average* in most parts of the country. The greatest positive anomalies were recorded at Lakeba (5.3%), Vanuabalavu (4.0%) and Ono-I-Lau (3.6%). The greatest negative anomalies were recorded at St. Johns College (-9.7%), Penang Mill (-8.1%) and Labasa Airport (-4.2%).

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

Wind direction was predominantly from an easterly direction in the Fiji region (Figure 7).

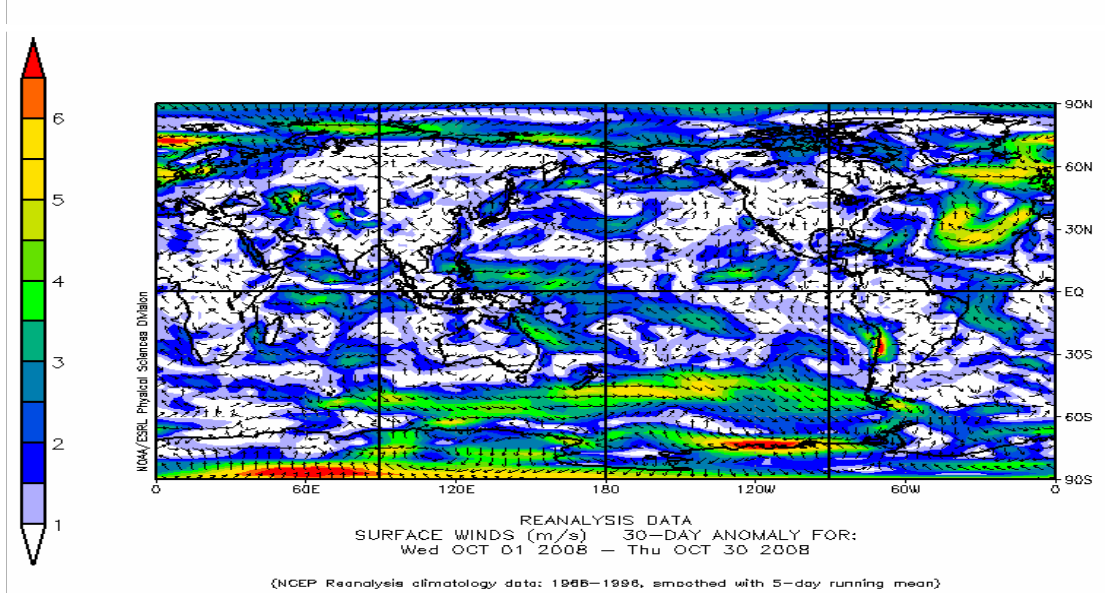
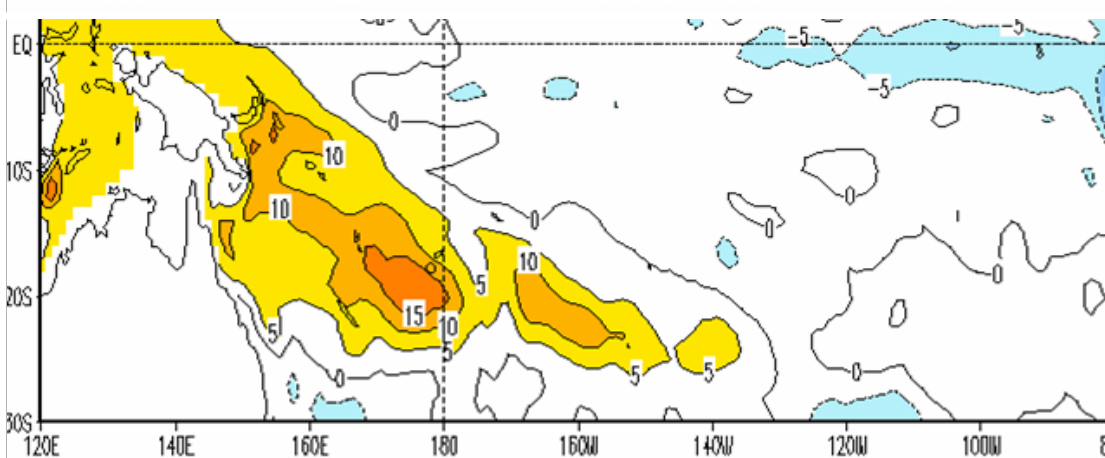
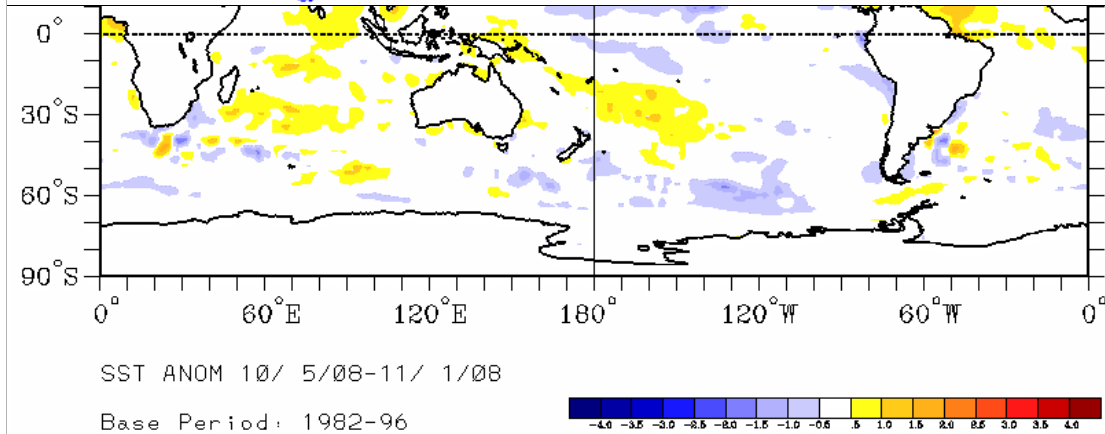
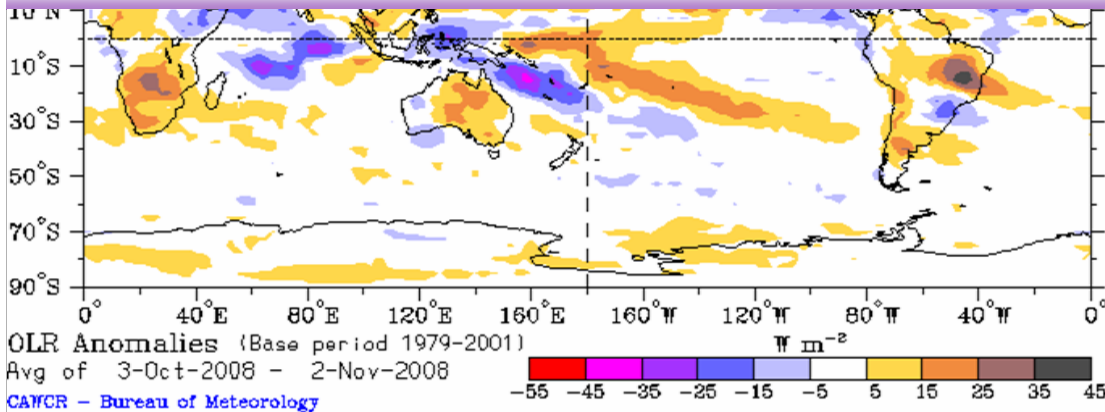
Wind speed was generally *below average* at all the wind recording sites in September. However, satellite images show slightly enhanced winds (positive anomalies) in the southern portion of Fiji's Waters and near normal wind speeds elsewhere (Figure 7).

TABLE 3. CLIMATE RECORDS ESTABLISHED IN OCTOBER 2008

| <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> |
|------------------|-------------------|--------------------------|-----------|-------------|--------------------------|-------------|----------------------|
| Monthly Max Temp | Labasa Airport | 32.0°C | - | New High | 31.9°C | 1987 | 1956 |
| Monthly Max Temp | Lakeba | 30.4°C | - | New High | 29.8°C | 2007 | 1955 |
| Monthly Max Temp | Matuku | 29.7°C | - | New High | 28.9°C | 2007 | 1955 |
| Monthly Max Temp | Ono-I-Lau | 28.3°C | - | New High | 28.1°C | 1995 | 1943 |
| Monthly Min Temp | Viwa | 24.5°C | - | New High | 24.4°C | 1995 | 1978 |
| Monthly Min Temp | Koronivia | 22.1°C | - | New High | 21.9°C | 2004 | 1965 |
| Monthly Min Temp | Vanuabalavu | 23.8°C | - | New High | 23.6°C | 2005 | 1978 |
| Monthly Min Temp | Matuku | 23.6°C | - | New High | 23.2°C | 1974 | 1985 |
| Daily Max Temp | Matuku | 32.1°C | 18th | New High | 31.9°C | 1955 | 1955 |
| Daily Max Temp | Ono-I-Lau | 31.6°C | 25th | New High | 31.3°C | 1983 | 1943 |
| Daily Min Temp | Laucala Bay | 25.8°C | 27th | Equal High | 25.8°C | 2007 | 1942 |
| Daily Min Temp | St. Johns, Levuka | 26.0°C | 29th | New High | 25.5°C | 2006 | 1984 |

This summary is prepared as soon as possible following the end of the month, once climate data is received from various recording stations around Fiji and ENSO information is received from various Meteorological Agencies around the World. Delays in data collection, communication and processing occasionally arise. While every effort is made to verify observational data, the Fiji Meteorological Service does not guarantee the accuracy and reliability of the analysis and rainfall predictions presented, and accepts no liability for any losses incurred through the use of this summary and its contents. The contents of the summary may be freely disseminated provided the source is acknowledged. All requests for data should be directed to the Fiji Meteorological Service HQ in Namaka, Nadi.

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



(NCEP Reanalysis climatology data: 1968-1996, smoothed with 5-day running mean)