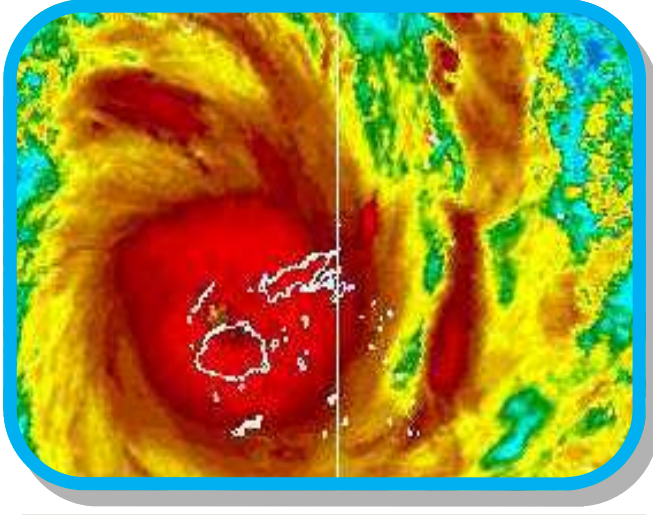
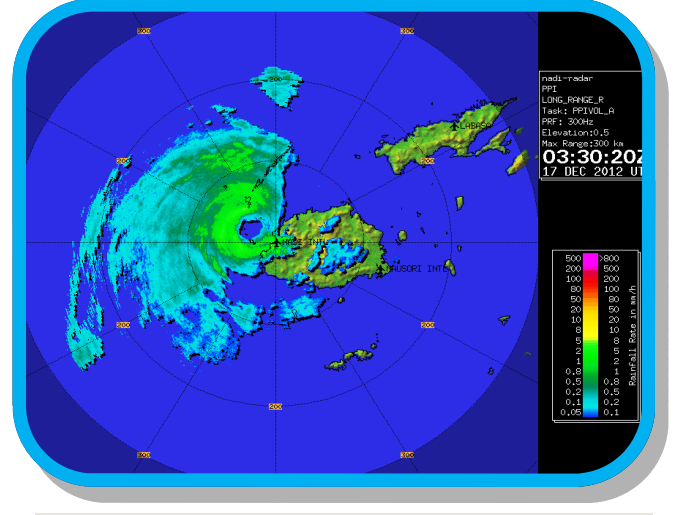


# FIJI METEOROLOGICAL SERVICE



Satellite imagery of Tropical Cyclone (TC) Evan at 11.30am on 17th December 2012 (Source: US NOAA).



Doppler Radar imagery of TC Evan at 3.30pm on 17th December 2012 (Source: Fiji Meteorological Service (FMS)).

## ANNUAL CLIMATE SUMMARY 2012



Pictures of the January 2012 (top frames) and March 2012 (bottom frames) flooding in Nadi. (Source: FMS).

**Issued  
May 28, 2013**

**HIGHLIGHTS OF 2012**

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- *Weather and climate conditions varied significantly from one month to another as the country was influenced by continually shifting El Niño Southern Oscillation (ENSO) phases;*
- *Weak to moderate La Niña conditions persisted over the first quarter, but neutral ENSO conditions prevailed from May till the end of 2012;*
- *Above average cloudiness were experienced in the Fiji region;*
- *The South Pacific Convergence Zone (SPCZ) was located to the southwest of its mean position for most of the year, subsequently causing a significant impact on Fiji's rainfall;*
- *The Sea Surface Temperatures (SST) were below normal during the beginning of the year (Figure 23A), and around normal, for the rest of the year (Figure 23B);*
- *A total of 27 new climate extremes (13 rainfall and 14 temperatures) were established in 2012 (Table 1);*
- *Normal to wetter than normal conditions were experienced across the country with annual rainfall ranging from 99% to 148% of normal;*
- *Two major floods affected the country during the year, in January and late March;*
- *The March 2012 flood was one of the worst experienced in Nadi in recent decades (after 2009 and 1999);*
- *The average mean temperature was 0.6°C warmer than normal for the second consecutive year, ranking second highest and equivalent to 2001 & 2000. 2007 remains the warmest year on record, in which a 1.0°C warm anomaly was registered;*
- *The day-time (maximum) and the night-time (minimum) air temperatures were 0.7°C and 0.6°C warmer than normal respectively;*
- *Stronger than normal wind speeds were observed in most parts of the country, typical of La Niña and neutral ENSO years;*
- *Sunshine hours were below normal at most locations around the country for most of the months in 2012;*
- *No significant sea level anomalies were observed in the Fiji region, though anomalies of 0-5cm were observed during January and July (Figure 21A & 21B);*
- *A severe tropical cyclone affected the country in December with the northern, western and southern parts of the country experiencing damaging gale, destructive storm and very destructive hurricane force winds.*

*Note: All comparisons are done against a "Climatic Normal". This is defined to be an average climate condition over a 30-year period. Fiji uses 1971-2000 as its "climatic normal" period.*



## WEATHER PATTERNS

The weather in 2012 was significantly wet over many parts of the country, and in particular, the Western Division. New total annual rainfall records were established at Lautoka Mill, Penang Mill (Rakiraki) and Nadi Airport, ranking highest in the 112, 96 and 69 years of record, respectively.

In the first quarter, two severe floods, in January and March, hit the Western Division. In December, a category 4 Severe Tropical Cyclone Evan ravaged the Western, and parts of the Northern and Southern Divisions.

**January** was influenced by active troughs of low pressure, slow moving convergence zone, a tropical depression (TD) and transient ridges of high pressure, which resulted in *average to well above average* rainfall across the country. Three very significant rainfall events were registered during the month, from 5<sup>th</sup> to 6<sup>th</sup>, 21<sup>st</sup> to 24<sup>th</sup> and 30<sup>th</sup> to 31<sup>st</sup>. During the second event, severe flooding occurred in parts of the country, particularly in the Western Division. Subsequent to this incident, Nadi Airport, Lautoka Mill, Penang Mill, Rarawai Mill, Vatukoula, Viwa, Udu Point, Vunisea and Lakeba pushed their rankings to the top 5 of the historical rainfall record for the month. In contrast, Rotuma experienced *below average* rainfall in January.

Fiji experienced widespread and heavy rain over the first two weeks of **February** as troughs of low pressure, tropical depressions, and rain bands associated with TCs Cyril and Jasmine affected the country. Though the TCs did not directly impact the country, associated outer rain bands enhanced heavy rain over most places. The SPCZ and prevalent moist easterly winds caused rain in Rotuma throughout the month.

**March** was wetter than *normal*, country-wide, but in particular, the Western Division, where stations recorded 149% to 340% of their *normal* rainfall. This was largely attributed to a rapidly developing TD17F, which subsequently brought widespread torrential heavy rain at the end of the month. This in turn led to severe flooding and the consequential destruction to property and livelihoods in the Western Division, till the 31<sup>st</sup>. The SPCZ and trade easterly flow regulated rainfall activity in Rotuma in March.

The weather in **April** was dominated by the SPCZ, troughs of low pressure, moist easterly wind flow and transient ridges of high pressure. Parts of the Western Division experienced strong and gusty winds from the 1<sup>st</sup> to the 3<sup>rd</sup>, as an active convergence zone, affected the country. A TD embedded along it, but located to the northwest of Fiji, later developed into TC Daphne, which fortunately, did not directly affect the group. A maximum 10-minute sustained wind of 52km/hr and a gust of 76km/hr were recorded at Nadi Airport on the 1<sup>st</sup>. Outer rain bands associated with the *Daphne* contributed to significant 24-hour rainfall over some stations. Rotuma received 62% of its *normal* rainfall in April, driven by the SPCZ and the moist easterly trade flow.

**May** displayed the characteristics of a typical transition month, with the sub-tropical ridges directing southeasterly winds, interspersed by troughs of low pressure and frontal systems. The southeasterly winds coupled with radiative cooling resulted in cool nights at most places during the latter part of the month. Almost all climate recording stations around the country observed their lowest minimum temperature of the month between the 25<sup>th</sup> and 31<sup>st</sup>, with the lowest of 13.4°C recorded at Rarawai Mill (Ba) on the 25<sup>th</sup>. Rotuma continued to record some rainfall in May, due to the presence of the SPCZ and prevailing moist easterly winds.

The country's weather was affected by a series of fronts and troughs during the earlier part of **June**, while the rest of the month saw the setting in of the cool and dry weather pattern. From the 13<sup>th</sup> to 15<sup>th</sup>, a trough caused widespread heavy rain which also warranted the issuance of flood warnings for Viti Levu, Yasawa and Mamanuca Groups, Kadavu and nearby islands. Significant 24-hour rainfall in excess of 100mm were recorded on the 13<sup>th</sup> at 20 stations, with the highest of 165.6mm at St. John's College (Levuka). Towards the latter part of the month, a high directed cool southeasterly winds over the country. This lowered the minimum temperatures around the country, with the lowest of 12.2°C recorded at Rarawai Mill on the 28<sup>th</sup>. The moist trade easterlies maintained showers in Rotuma for most of the month.

**July** was relatively dry in most parts of the country as the sub-tropical high pressure systems dominated Fiji's weather. 93% of the stations in the Western and Northern Divisions experienced *below average to well below average* rainfall during the month. Labasa Airfield did not get any rain during the month, while Udu Point received 5.4mm and Vanuabalavu 6.3mm. These were also the new low monthly rainfall records for these stations. Rotuma also recorded *below average* rainfall during the month.

**August** was dominated by the semi-permanent ridges of high pressure that directed broad southeasterly wind flow, interspersed by troughs of low pressure. Rainfall was generally *average to below average* over the country during the month. The cool southeasterly winds maintained cool nights in most places, with Rarawai Mill (Ba) recording the lowest of 12.3°C on the 27<sup>th</sup>. Rotuma received brief showers during the month, caused by the moist easterly wind flow.

**September** was considerably wetter than *normal*, with the majority of the stations recording *above average to well above average* rainfall. An active trough on the 25<sup>th</sup> brought widespread rain and squally thunderstorms, with some significant rainfall recorded over the Western Division. This consequently led to "flash floods" in certain areas of the Western Division on the 25<sup>th</sup>. Rotuma experienced *above average* rainfall during the month.

## WEATHER PATTERNS

**October** was warm and humid, with a number of new high temperature records established. The weather during the month was influenced by the prevailing southeasterly wind flow and a series of troughs of low pressure, resulting in generally *average to above average* rainfall recorded across the country. Rotuma was considerably drier than *normal*, recording only 57% of its *normal* rainfall, during the month.

The weather in **November** varied considerably, with rainfall ranging from *well above average* to *well below average* across the country. A fast moving trough associated with TD 02F brought strong winds over the western and southern parts of the country on the 22<sup>nd</sup>, with Ono-i-lau recording the highest sustained wind of 27 knots and a maximum momentary gust of 42 knots. Rotuma received its share of rain for the month from the SPCZ and associated moist easterly trade flow.

Fiji's weather in **December** was influenced by the moist south-east wind flow, series of troughs of low pressure and severe TC *Evan*. *Evan* affected Fiji as a category 4 cyclone on the 16<sup>th</sup> and 17<sup>th</sup>. It entered the Fiji waters from the northeast on the 16<sup>th</sup> whilst tracking south-westwards, but keeping to the north of Vanua Levu. Early on the 17<sup>th</sup>, it took a gradual southward turn, passing between Viti Levu and the Yasawa group and tracking right over the Mamanucas. The Western Division faced the brunt of this TC with very destructive hurricane force winds. The northern, central and southern parts of Fiji were mostly affected by destructive storm force winds or damaging gales. Although damages brought by *Evan* were severe, no lives were lost during this event. Associated torrential rain caused major flooding in Rakiraki, Tavua, Wainibuka and the Rewa Delta. December rainfall in Rotuma as due mainly to the SPCZ and prevalent moist easterly wind flow.

## SUNSHINE IN 2012

The total annual bright sunshine hours was *below normal* at Laucala Bay (Suva) and Nadi Airport (Figure 1).

The total annual bright sunshine hours at **Laucala Bay (Suva)** was 1651 hours (86% of *normal*). With the exception of March and August, *below normal* sunshine hours were recorded in the other months. The longest hours of bright sunshine was recorded in March (188 hours), while the lowest was in November (86 hours).

**Nadi Airport** recorded 2199 hours (86% of *normal*) of bright sunshine during the year. *Below normal* total monthly sunshine hours were recorded throughout the year, ranging from 69% to 99% of *normal*. The longest duration of bright sunshine was experienced in December (220 hours), while the shortest was in January (145 hours).

The bright sunshine hours at **Labasa Mill** varied through the year, with *above normal* sunshine hours recorded in March (104%), May (104%), August (108%) and December (107%), while *below normal* sunshine hours were observed in January (65%), February (68%), April (88%), June (17%) and November (81%). The data for July and September were not available for analysis.

**Rotuma** recorded *below normal* sunshine hours in January (76%), February (68%), March (96%), November (89%) and December (98%), while *above normal* sunshine hours were observed in April (112%), July (103%), August (110%), September (105%) and October (104%). The data for May and June were not available for analysis.

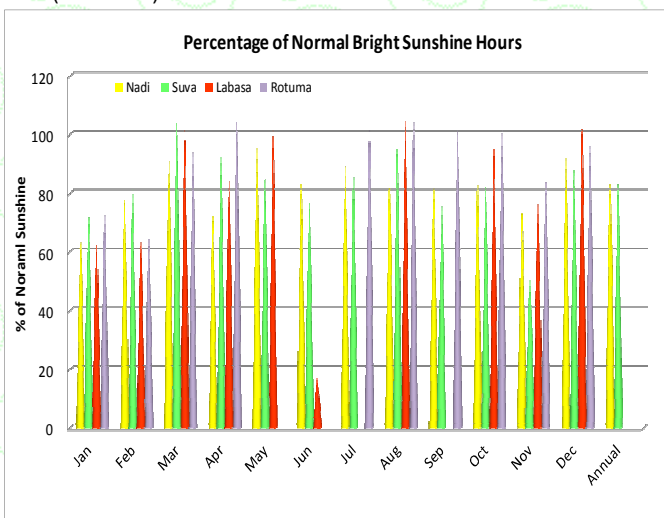


Figure 1: Total monthly and annual sunshine hours in 2012 at Laucala Bay (Suva), Nadi Airport, Labasa Mill and Rotuma.

**WIND SUMMARY - Mean Wind (10 minutes average)**

The 10-minute average wind statistics recorded at every three hourly intervals at Nadi and Nausori Airports, showed that east to southeast winds were the predominant wind directions during 2012. The mean annual wind speed at Nadi Airport and Nausori Airport was 5.5 knots and 3.3 knots, respectively.

Nadi Airport experienced calm conditions on 22.4% of the instances during the year. Southeast winds were predominant and accounted for 24.2% of the observations, followed by easterly winds with 13.9%, and westerly winds with 10.2% (Figure 2(a)). The winds at Nadi Airport were generally light to moderate in strength (Figure 2(b)), however, strong to near gale force winds were recorded between March 30<sup>th</sup> to April 3<sup>rd</sup> as a result of a TD17F hovering over the country. With the passage of TC Evan, Nadi Airport recorded a maximum

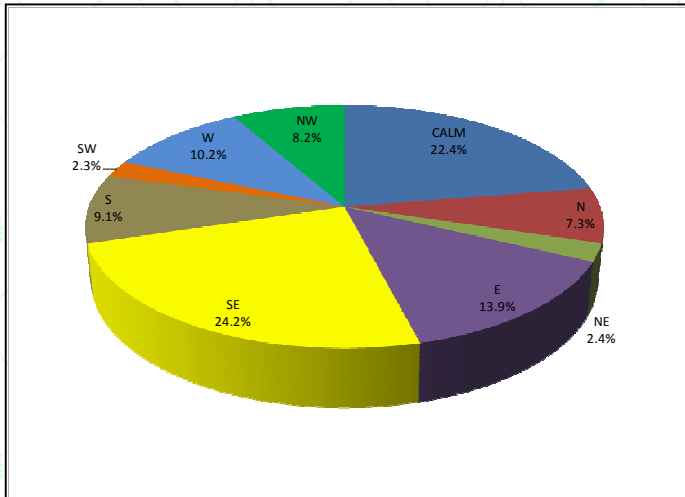
sustained wind of 60 knots on December 17<sup>th</sup>.

Calm conditions were predominant at Nausori Airport, accounting for 55.8% of the three hourly statistics. Easterly winds were the most common and accounted for 15.6% of the observations, followed by southeasterly winds with 14.2% and northeasterly winds with 6.4% (Figure 2(a)). The wind speed at the station was generally slight to moderate in strength (Figure 2 (b)), however, gale force winds of 37 knots was recorded during the passage of TC Evan on December 17<sup>th</sup>.

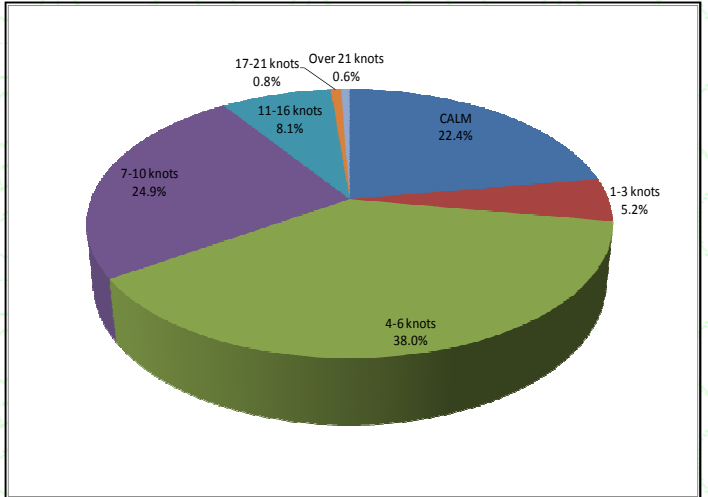
*light air: 1-3 knots, slight breeze: 4-6 knots, gentle breeze: 7-10 knots, moderate breeze: 11-16 knots, fresh breeze: 17-21 knots, strong breeze: 22-27 knots, near gale: 28-33 knots, gale: 34-40 knots, strong gale: 41-47 knots, storm: 48-55, violent storm 56-63 knots and hurricane: above 63 knots*

**ANNUAL FREQUENCY OF WIND DIRECTIONS AND SPEEDS AT NADI AND NAUSORI AIRPORTS**

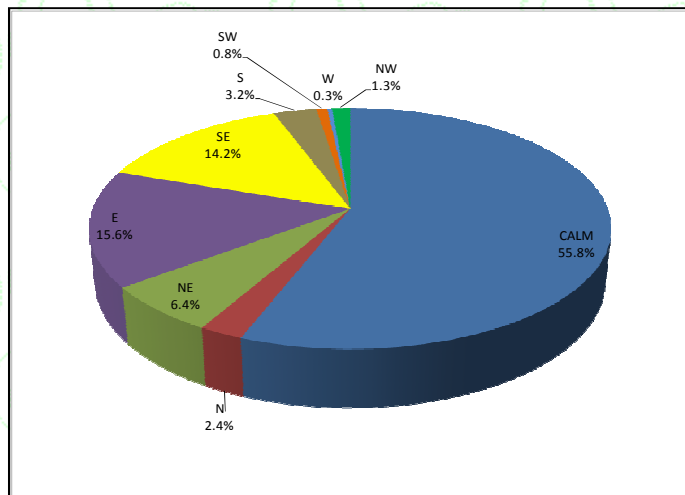
**Figure 2(a) Surface Wind Direction for Nadi Airport, Fiji. (WMO 91680 Lat 17° 45'35"South Long 177° 26'42"East Height above MSL 22m)**



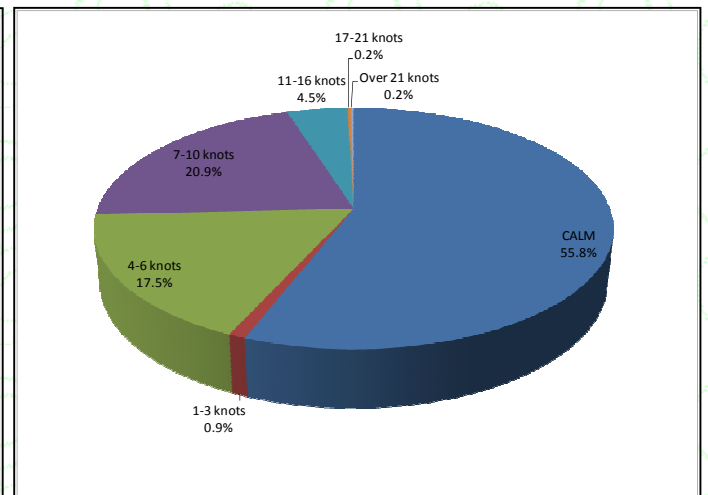
**Figure 2(b) Surface Wind Speed for Nadi Airport, Fiji. (WMO 91680 Lat 17° 45'35"South Long 177° 26'42"East Height above MSL 22m)**



**Figure 3(a) Surface Wind Direction for Nausori Airport, Fiji. (WMO 91683 Lat 18° 02'47"South Long 178° 33'33"East Height above MSL 3m)**



**Figure 3(b) Surface Wind Speed for Nausori Airport, Fiji. (WMO 91683 Lat 18° 02'47"South Long 178° 33'33"East Height above MSL 3m)**



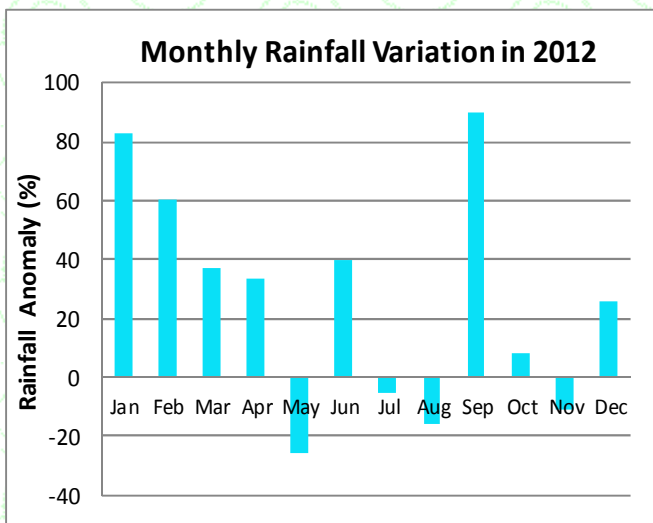


**RAINFALL**

Fiji's rainfall was largely influenced by the presence of weak to moderate La Niña over the first quarter of 2012. This cool phase peaked, and gradually decayed into neutral, in May; this neutral ENSO persisted throughout the rest of the year. The SPCZ was located to the southwest of its mean location, for the first five months of 2012. This subsequently led to enhanced rainfall over Fiji during the January to April period.

Most of the stations recorded wetter than *normal* conditions during the first quarter of the year, with more than 50% of the annual rainfall recorded at Labasa Mill (60%), Penang Mill (57%), Nadi Airport (63%) and Lakeba (52%). Apart from June, when most stations recorded *above normal* rainfall, the dry season months were drier than *normal*. It is worth noting that there was not much difference in the rainfall distribution for the stations on the windward and leeward sides, as the country continued to receive rainfall despite the collapse of the La Niña event.

Fiji's annual rainfall was 134% of *normal*. During the year, apart from May, July, August and November, where *normal* to *below normal* rainfall were recorded, Fiji's monthly rainfall was *above normal* (Figure 4 below).



**Figure 4:** Departures from mean monthly rainfall for Fiji. Negative departures were recorded in May, July, August and November.

The annual rainfall ranged from 160% to 189% in the Western Division, 110% to 112% in the Central Division, 124% to 133% in the Northern Division and 121% to 139% in the Eastern Division.

Monthly rainfall was 183% of *normal* in January, 160% in February, 137% in March, 133% in April, 140% in June, 190% in September, 108% in October and 126% in December. May, July, August and November recorded less than 100% of *normal* rainfall. High variability in rainfall was observed during the months

of change from wet to dry (April and May) and dry to wet (September and October) periods.

At **Laucala Bay**, the annual rainfall was *normal* (112%). Wetter than *normal* conditions were experienced during March (152%), June (139%) and September (166%), while *normal* conditions prevailed during the rest of the months (Figure 20A & Table 5). When comparing the monthly rainfalls against their long term averages (30 years data), October recorded the lowest (driest) departure from *normal* (83%), followed by August (84%) and May (87%).

Wetter than *normal* conditions prevailed at **Nadi Airport**, where 189% of *normal* annual rainfall was recorded. Very wet conditions were experienced in June (487%), followed by September (302%), January (279%), March (204%), February (197%) and April (147%) (Figure 20B & Table 5). The driest month was May when only 42% of *normal* rainfall was recorded. The highest monthly rainfall of 959.7mm was recorded in January, while the lowest monthly rainfall of 32.7mm was recorded in July.

The annual total rainfall at **Vunisea** could not be calculated due to missing observations. Of the months which had complete records, *below normal* rainfall was observed in May, August and November ranging from 52% to 76%, while, January, February, March, July and September received *above normal* rainfall ranging from 135% and 254% of *normal*. (Figure 20C & Table 5)). The lowest monthly rainfall of 77.0mm was recorded in August followed by 97.0mm in May.

At **Labasa Mill**, rainfall varied considerably during the year, with January, February, June, September and October being wetter than *normal* (136% - 233%) and April, May, July and August, drier than *normal* (24% - 73%) (Figure 20D & Table 5). March, November and December received *normal* rainfall. The highest monthly rainfall of 754.4mm was recorded in February, followed by 567.1mm in January. The lowest rainfall amount of 12.4mm was recorded in July.

**Lakeba Island** also experienced *above normal* annual rainfall during the year, recording 122% of *normal*. Notably, more than 150% of *normal* rainfall were recorded in January, May and June (Figure 20E & Table 5). The highest monthly rainfall of 681.4mm was recorded in January and the lowest of 42.1mm, in July.

With the exception of February (111%), March (126%), September (147%) and November (128%), it was a relatively dry year for **Rotuma** (Figure 20F). The other months recorded *below normal* to *normal* rainfall, ranging from 54% to 91% of *normal*. The highest monthly rainfall of 459.9mm was recorded in March and the lowest of 124.6mm, in July.

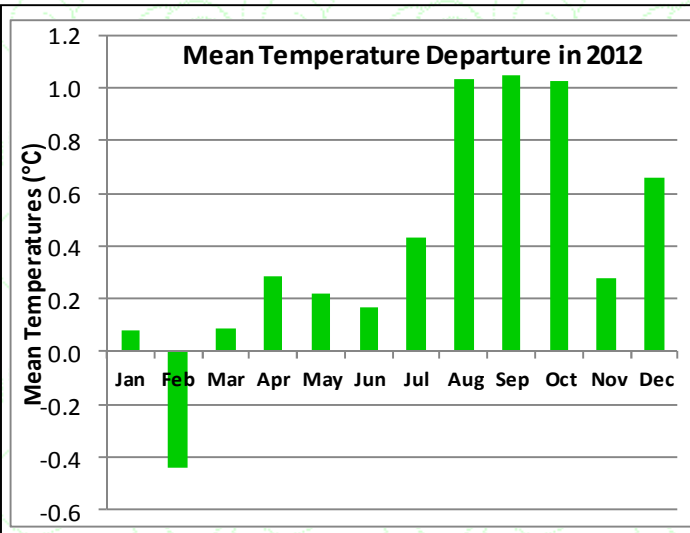
**MEAN AIR TEMPERATURE**

The annual average mean air temperature was 26.0°C, 0.6°C warmer than *normal*.

Apart from February, the rest of the year was warmer than *normal* with August, September and October recording significant positive departures, with values greater than 1.0°C (Figure 5).

At **Labasa Mill**, the annual average mean air temperature was 26.9°C (1.2°C warmer than the *normal*). With the exception of February (-0.3°C), the monthly mean temperatures were *above normal*. Notable significant positive departures (>1.0°C) were recorded in April (+1.0°C), May (+1.0°C), August (+1.3°C), September (+1.5°C) and October (+1.5°C). Other significant positive departures (>+0.5°C) were recorded in January, March, July, November and December (Figure 20D).

The annual average mean temperature at **Lakeba Island** was 26.1°C (0.6°C warmer the *normal*). The monthly average mean temperatures at Lakeba were consistently warmer than *normal* except for February and March, which recorded *below normal* departures from *normal* (Figure 20E). Notable significant positive departures of +1.5°C was recorded in October, followed by +1.0°C in December. Other significant (>0.5°C) positive departures were recorded in the July, August, September and November.



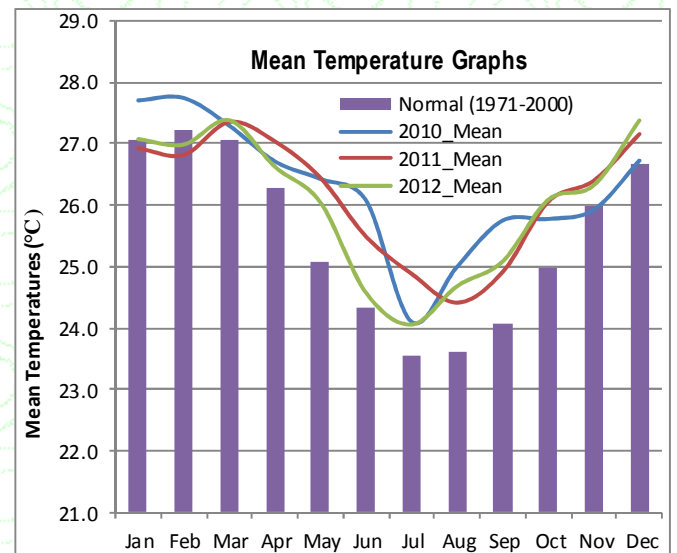
**Figure 5:** Monthly average mean temperature departure from *normal*.

Comparatively, 2012 was cooler than both 2010 & 2011 (Figure 6).

At **Laucala Bay**, the annual average mean air temperature was 26.1°C. *Normal* to warmer than *normal* temperatures were recorded during the year, with significant positive departures (>1.0°C) of +1.2°C and +1.0°C recorded in August and September, respectively. Other significant positive departures (>0.5°C) of +0.6°C and +0.9°C were recorded in March and December (Figure 20A). The highest negative departure of -0.3°C were recorded in February and June.

The annual average mean air temperature at **Nadi Airport** was 25.7°C, which was 0.2°C *above normal*. Except for May, the monthly average mean temperature was consistently cooler than *normal* during the first half of the year (Figure 20B) and *normal* to warmer than *normal* during the second half. Notable significant negative departures of -0.9°C was recorded in February, while the highest positive departure of +0.6°C was recorded in August.

At **Vunisea (Kadavu)**, the annual average mean air temperature cannot be calculated as June, August and September had missing data. For the available months, Vunisea recorded *above normal* mean temperatures except for January and February when the station recorded negative departures of -0.4°C. Notable significant positive departure of +1.3°C was recorded in October, followed by +0.6°C in July (Figure 20C).



**Figure 6:** 2012 Mean temperature relative to 2010, 2011 and *normal*.

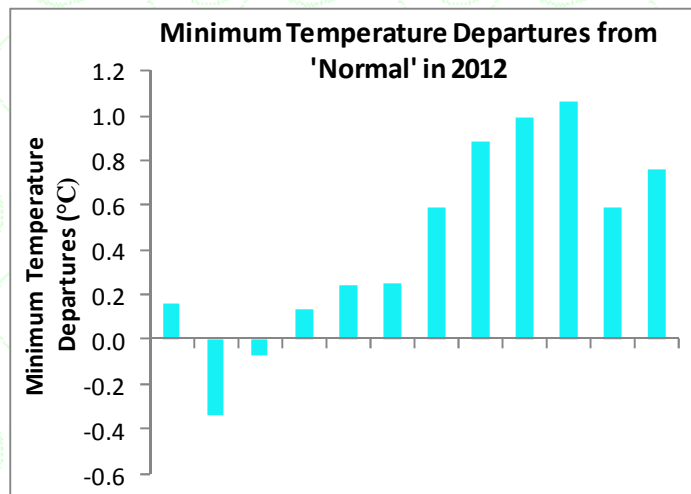
*Note: All comparisons are done against a “Climatic Normal”. This is defined to be an average climate condition over a 30-year period. Fiji uses 1971-2000 as its “climatic normal” period.*

## MINIMUM AIR TEMPERATURE

The annual average night-time (minimum) air temperature was 22.6°C, which was 0.4°C warmer than the *normal*.

The country experienced *normal* night-time air temperatures during the first half of the year, and warmer than *normal* over the second half. The months of August, September and October were significantly warmer than *normal*. This was occurring when the positive departures exceeded +0.8°C.

The average night-time temperatures ranged from 20.8°C to 24.0°C across the country. The January to March period was *normal* to *below normal*, but persistently ≥0.6°C warmer than *normal* from July to December (Figure 7).



**Figure 7 :** Night-time (minimum) temperature departure from *normal* with significantly warmer (≥0.6°C) period from July to October.

Comparatively, for the first quarter, 2010 is still warmer than 2011 or 2012. The same is true for May to June period (Figure 8).

A total of 3 daily and 7 new mean monthly night-time air temperature records were established around the country.

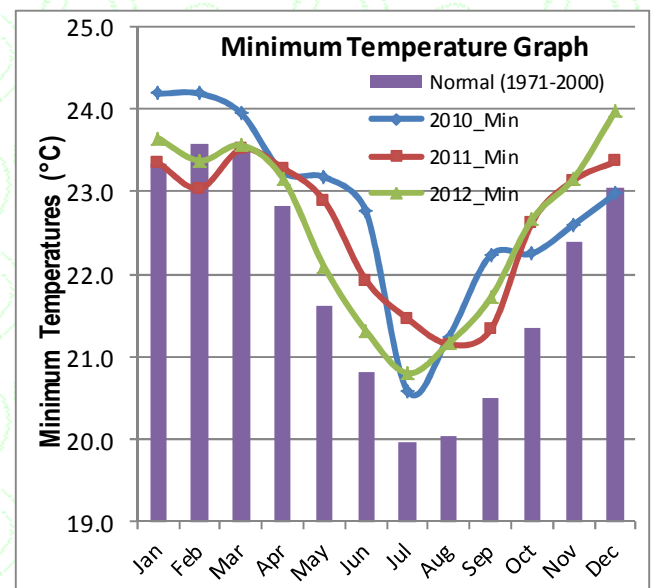
The annual average night-time temperature at **Laucala Bay** was 23.3°C (0.9°C warmer than the *normal*). Apart from October, warmer than *normal* conditions were experienced at the station. Significant positive departures (≥1.0°C) were recorded in March, April, May, August, September and December (Figure 20A).

At **Nadi Airport**, the annual average night-time temperature was 21.7°C (0.8°C above the *normal*). Positive departures or warmer than *normal* night-time temperatures were recorded throughout the year (Figure 20B). Significant positive departures of greater than 1.0°C were recorded from July to October, ranging from +1.2°C to +1.6°C.

**Vunisea's** annual average night-time temperature cannot be presented due to missing data. For the available data, apart from January and February, warmer than *normal* temperatures were recorded (Figure 20C). Significant positive departures, greater than, or equal to, +1.0°C, were recorded in July, August and October.

The annual average night-time temperature at **Labasa Mill** was near *normal* in 2012. Negative departures were recorded from January to March, as well as June to July, ranging between -0.2°C to -0.7°C. In contrast, positive departures were recorded in April (+0.2°C) and from August to November (+0.1°C to +0.8°C) (Figure 20D). The highest positive departure of +0.8°C was recorded in October, followed by +0.6°C in September.

The annual average night-time temperature at **Lakeba Island** (Lau Group) was 23.3°C, which was +0.6°C warmer than *normal* (Figure 20E). Significant (≥1.0°C) positive anomalies were recorded in September (+1.1°C), October (+2.2°C), November (+1.1°C) and December (+1.3°C). Negative anomalies were recorded in February (-0.2°C) and March (-1.2°C).



**Figure 8:** 2012 night-time (minimum) temperature relative to 2010, 2011 and *normal*.



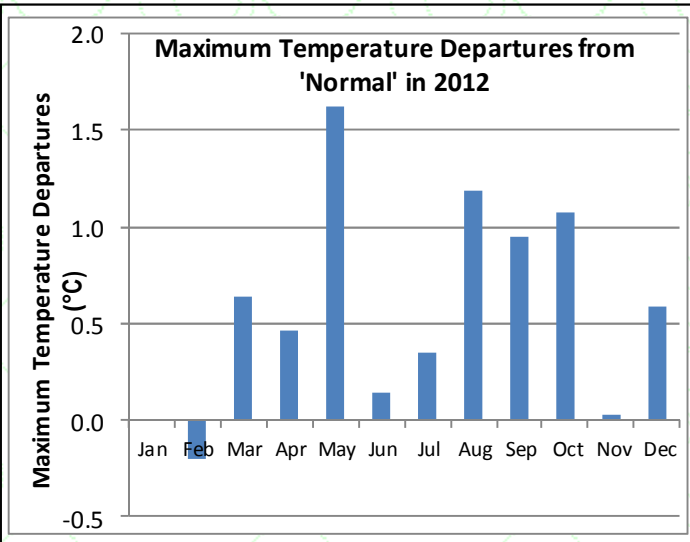
## MAXIMUM AIR TEMPERATURE

The monthly average day-time temperature was *normal* in January, February, April, June, July and November, while *above normal* temperature was recorded during rest of the months. The maximum temperature was significantly ( $\geq 1.0^{\circ}\text{C}$ ) warmer than *normal* during May, August and October (Figure 9).

The annual average day-time temperature at **Vunisea (Kadavu)** was  $1.0^{\circ}\text{C}$  warmer than *normal*. The temperatures fluctuated between  $26.0^{\circ}\text{C}$  and  $30.3^{\circ}\text{C}$  (Figure 20C). Apart from January and February, which recorded negative departures, positive departures were registered over the rest of the year. The most significant positive departure of  $+1.4^{\circ}\text{C}$  was recorded in October, followed by  $+0.8^{\circ}\text{C}$  in April (note that June, August and September data is missing).

The annual day-time temperature at **Labasa Mill** was  $1.6^{\circ}\text{C}$  warmer than *normal*. The monthly temperatures ranged from  $29.6^{\circ}\text{C}$  to  $33.0^{\circ}\text{C}$  (Figure 20D). Warmer than *normal* maximum temperatures were recorded throughout the year, with significant positive departures ( $\geq 2.0^{\circ}\text{C}$ ) recorded during March ( $+2.1^{\circ}\text{C}$ ), May ( $+2.0^{\circ}$ ), August ( $+2.4^{\circ}\text{C}$ ), September ( $+2.3^{\circ}\text{C}$ ) and October ( $+2.1^{\circ}\text{C}$ ).

Annual average day-time temperature at **Lakeba Island (Lau Group)** was  $28.8^{\circ}\text{C}$ , which was  $0.4^{\circ}\text{C}$  above *normal*. Apart from January and February, the island experienced consistently warmer than *normal* temperatures throughout the year (Figure 20E). Significant positive departures were recorded in April ( $+0.6^{\circ}\text{C}$ ), July ( $+0.6^{\circ}\text{C}$ ), August ( $+0.9^{\circ}\text{C}$ ), September ( $+0.7^{\circ}\text{C}$ ), October ( $+0.9^{\circ}\text{C}$ ) and December ( $+0.9^{\circ}\text{C}$ ).



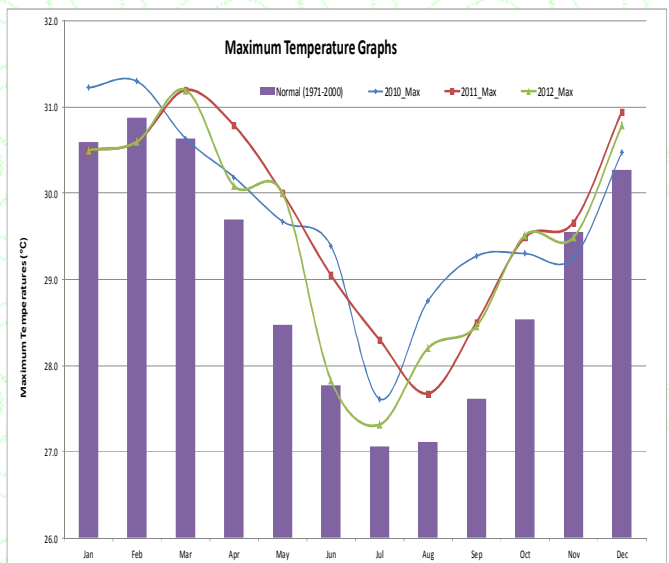
**Figure 9:** Monthly average day-time (maximum) temperature departure from *normal* with abnormally warm period from August to October.

The annual average day-time (maximum) air temperature was  $29.4^{\circ}\text{C}$  ( $0.4^{\circ}\text{C}$  warmer than *normal*). Comparatively, the first quarter of 2012 was similar to 2011, but cooler than both 2010 and 2011, from May to July (Figure 10).

A total of 4 new daily day-time (maximum) temperatures (2 new daily high and 2 new daily low maximum temperatures) and 1 new monthly high air temperature records were established in the year.

The annual average day-time temperature at **Laucala Bay (Suva)** was  $28.8^{\circ}\text{C}$ , with monthly temperatures ranging from  $26.0^{\circ}\text{C}$  to  $31.1^{\circ}\text{C}$  (Figure 20A). The annual departure was  $-0.2^{\circ}\text{C}$ . Significant positive departures of  $+1.1^{\circ}\text{C}$  and  $+0.8^{\circ}\text{C}$  were recorded in October and August, respectively. Significant negative departures of  $-1.1^{\circ}\text{C}$ ,  $-0.9^{\circ}\text{C}$ ,  $-0.8^{\circ}\text{C}$  and  $-0.6^{\circ}\text{C}$  were recorded in November, February, July and May, respectively. The rest of the months recorded *normal* temperatures.

At **Nadi Airport**, the annual average day-time temperature was  $29.7^{\circ}\text{C}$ , with monthly temperatures ranging from  $28.2^{\circ}\text{C}$  to  $31.2^{\circ}\text{C}$  (Figure 20B). Negative departures were recorded throughout the month, with the highest negative departure of  $-1.7^{\circ}\text{C}$  recorded during February, followed by  $-1.1$  in September,  $-0.8$  in April and  $-0.7^{\circ}\text{C}$  during January, June and November.



**Figure 10:** 2012 day-time (maximum) temperature relative to 2010, 2011 and *normal*.

*Note: All comparisons are made against a "Climatic Normal". This is defined to be an average climate condition over a 30-year period. Fiji uses 1971-2000 as its "climatic normal" period.*

**NEW RECORDS**

A total of 27 new climate extremes were established in 2012, which included 12 daily and 15 monthly records. Of these, 15 were for temperature and 12 for rainfall. In contrast, there were 64 and 102 new records established in 2011 and 2010 respectively.

There were 15 new monthly records established, of which 1 was maximum air temperature, 7 minimum air temperature and 7 rainfall records. In addition, there were 12 new daily records, which included 5 rainfall (all new highs), 4 maximum temperature (2 new lows and 2 new highs) and 3 minimum temperatures (1 new low and 2 new highs) (Table 1). October recorded the highest number of records, while the rest of the months recorded 5 or less. No new records were established in the months of February, April and May.

Table 1	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Daily Rainfall	-	-	2	-	-	1	-	-	-	-	-	2	5
Daily Maximum Temperature	-	-	1	-	-	-	1	-	-	2	-	-	4
Daily Minimum Temperature	-	-	-	-	-	-	1	-	-	1	1	-	3
Monthly Total Rainfall	1	-	1	-	-	1	3	-	1	-	-	-	7
Monthly Maximum Temperature	-	-	-	-	-	-	-	-	-	1	-	-	1
Monthly Minimum Temperature	-	-	-	-	-	-	-	2	-	4	-	1	7
Total	1	-	4	-	-	2	5	2	1	8	1	3	27

**SEA LEVEL**

Sea levels in the Fiji region during 2012 was *normal to above normal*. The mean sea level during the year at Lautoka SEA-FRAME station was 1.37m, with a maximum of 2.53m in December, and a minimum of 0.18m in November. The mean sea level at Suva SEA-FRAME station was 1.27m, with a maximum of 2.29m in April, and a minimum of 0.23m in June (Figure 11).

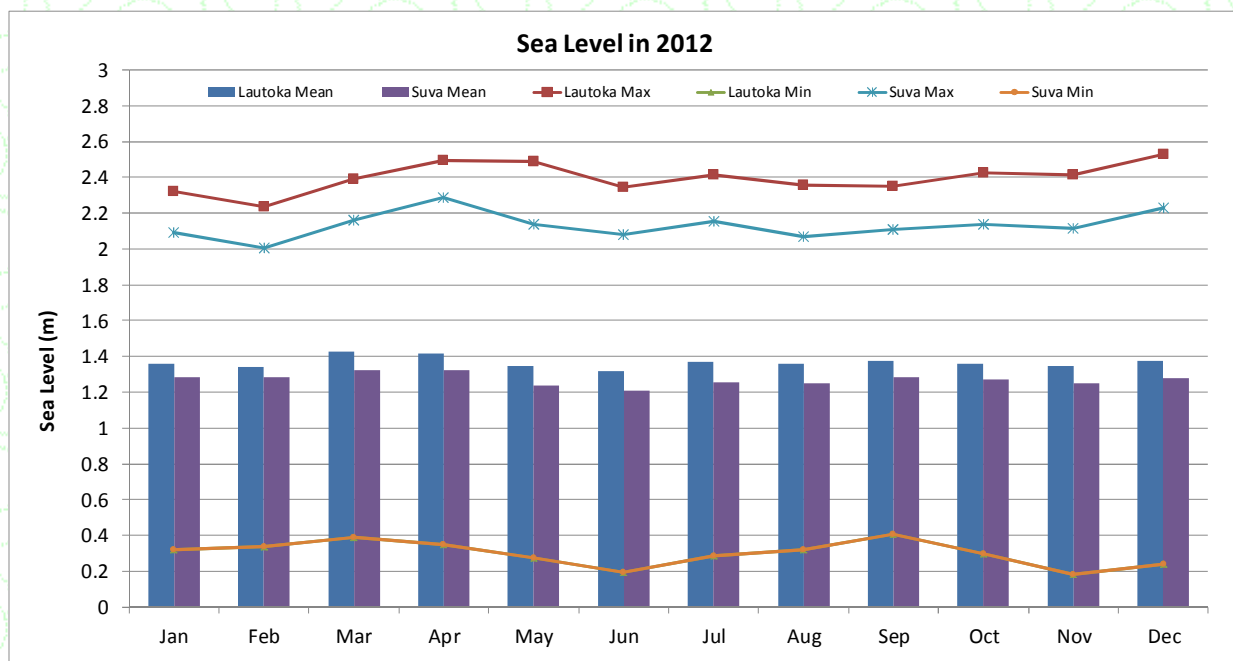


Figure 11: Sea level at Lautoka and Suva tide gauges.

**SEASONAL CLIMATE FORECAST VERIFICATION**

The FMS has twenty six (26) sites around the country, which are used to monitor the climate of Fiji, on a daily basis. The forecasts (national, divisional and localised, using Seasonal Climate Outlook for Pacific Island Countries (SCOPIC), ECMWF, NCEP, POAMA, UKMET, IRI and APEC models) are issued seasonally (3-monthly) and verified for individual locations, against the observed actuals. Performance (or skill) of forecasts are presented in Figure 12.

In 2012, there was a 51% accuracy of the forecasts, or consistency, with the observed rainfall in the predicted category, 26% near consistent and 7% inconsistent. 16% of the forecasts could not be verified due to missing observations. For the Central Division, forecasts registered a 65% accuracy, followed by the Western (50%), Northern (50%) and Eastern Divisions (47%). The overall assessment of the model performance in 2012 is satisfactory given the total variance explained by the predictors (SOI and SST) in the Fiji region. Together with this, the impact of other factors impinging on the drivers of Fiji’s rainfall, seasonal forecasting skill is a real challenge, but one that will need to be significantly improved soon, through experience, skills and dynamical modelling.

In total, three hundred and twelve (312) individual seasonal climate predictions were issued. Of these, one hundred and fifty nine (159) of the forecasts were consistent, eighty two (82) near consistent and twenty one (21) inconsistent forecasts, while 50 forecasts could not be verified due to unavailability of the data. During the wet season, there were 57% consistent forecasts, 22% near consistent forecasts, 6% inconsistent forecasts and 15% unverified forecasts. In the dry season, 45% of the forecasts were consistent, 30% near consistent, 8% inconsistent and 17% unverified.

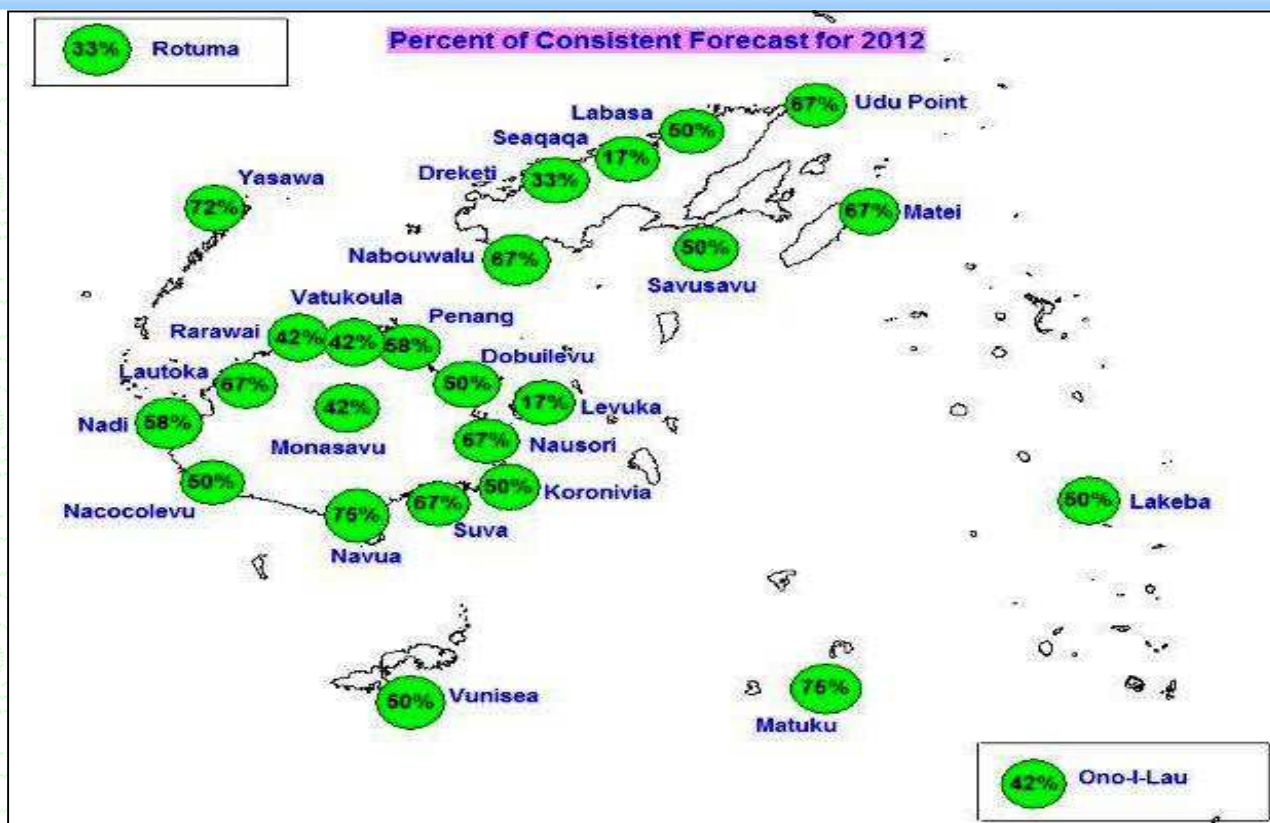
In the **Western Division**, 50% of the forecasts were consistent, 29% near consistent, 6% inconsistent and 16% unverified. The wet season had a higher consistency rate (63%) compared to the dry season (37%).

In the **Central Division**, there was a 65% consistency score, 27% near consistent and 8% inconsistent. For Central Division, there is slightly high consistency in the dry season prediction (67%) compared to the wet season prediction (63%). There was no inconsistent forecast during the dry season in the Central Division.

For the **Eastern Division**, 47% of forecasts were consistent, 28% near consistent, 7% inconsistent and 18% unverified forecasts. The Eastern Division had higher consistency rate (50%) in the dry season compared to the wet season (43%).

In the **Northern Division**, 50% of forecasts were consistent, 21% near consistent, 7% inconsistent and 21% unverified forecasts.

**FIGURE 12: FORECAST VERIFICATION**





## EL NIÑO SOUTHERN OSCILLATION (ENSO)

A moderate to weak La Niña event continued into 2012 from 2011. It peaked in January and decayed to neutral levels by April. Since then, the equatorial Pacific has been in neutral ENSO state.

During January 2012, La Niña conditions were dominant across the tropical Pacific Ocean. Cool sea surface and sub-surface temperatures persisted (Figure 13). Atmospheric indicators started to weaken with the SOI falling from +23.0 (recorded in December 2011) to +12.8 (in January) (Figure 13). Low-level trade wind anomalies continued to persist in the western and central Pacific. Cloudiness remained below average near the International Dateline (Figure 22A).

Through February and March, the weak La Niña phase continued to weaken. By April, the neutral ENSO conditions set in, supported by all the indicators. SSTs across the equatorial Pacific Ocean were close to normal, but remained above normal in the far east and west. The SOI value in April reached -7.1, consistent with the neutral conditions.

Neutral ENSO conditions prevailed in the equatorial Pacific till May. By June, the SOI was -10.4. Then the SST swung from neutral values towards weak El Niño conditions in August, with NINO3 SST anomaly reaching its peak value of +1.1°C. However, this warming was not sustained, but collapsed back to warm neutral. ENSO neutral conditions continued until the end of 2012.

Rainfall varied considerably across the country during the year between *below normal*, *normal* and *above normal*. The SPCZ was located close to the country, which also saw a series of troughs of low pressure and associated rain. The country experienced two major floods, the first in January and the other in March. In December, Fiji was struck by severe TC Evan.

There were six ENSO Updates issued in 2012, which continuously carried updates on the changing ENSO conditions and its impact on Fiji's weather.

## SEA SURFACE TEMPERATURE (SST) ANOMALIES

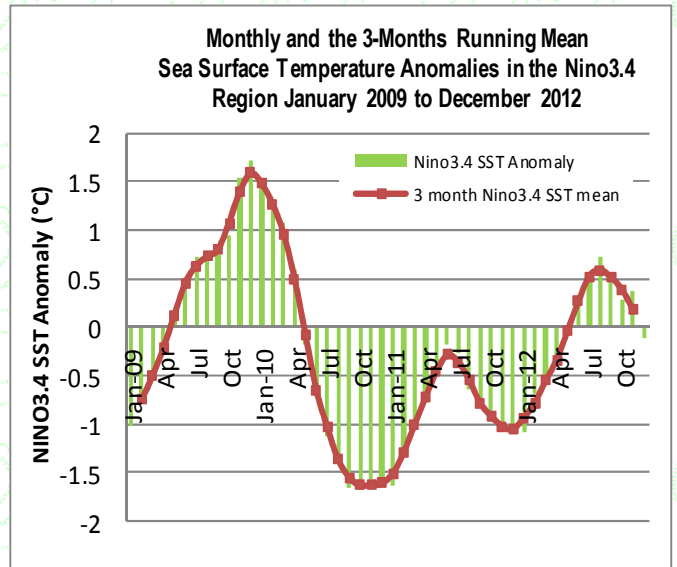


Figure 13: Monthly Niño3.4 SST variation and 3 monthly running mean from January 2009 to December 2012.

## SOUTHERN OSCILLATION INDEX (SOI)

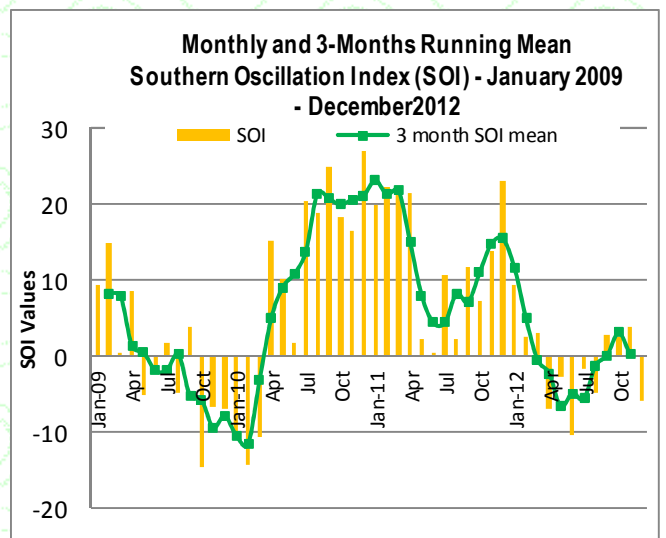


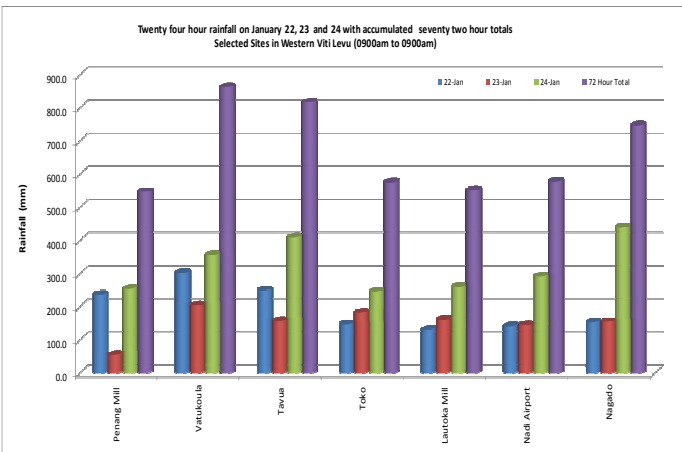
Figure 14: Monthly SOI variation and 3 month running mean from January 2009 to December 2012.

**METEOROLOGICAL & HYDROLOGICAL EVENTS**

**SEVERE FLOODING DURING JANUARY**

The western parts of Fiji experienced heavy rainfall and severe flooding as an active trough of low pressure associated with a tropical disturbance affected the country from January 21<sup>st</sup> to 26<sup>th</sup>.

Between the 22<sup>nd</sup> and 24<sup>th</sup>, Vatukoula recorded the highest rainfall of 863.4mm, followed by 817.5mm at Tavua, 748.0mm at Nagado, 626.8mm at Legalega, 578.5mm at Nadi Airport, 576.0mm at Toko, 552.1mm at Lautoka Mill and 547.0mm at Penang Mill (Rakiraki) (Figure 15).



**Figure 15:** 24 hour and 72 hour rainfall at selected sites in Western Viti Levu from the 22<sup>nd</sup> - 24<sup>th</sup>.

The majority of the stations in the Western Division recorded rainfall in excess of 200mm on January 24<sup>th</sup>. The highest 24-hour rainfall was 440.0mm at Nagado, followed by 410.0mm at Tavua and 356.0mm at Vatukoula.

High intensity rainfall, with rates exceeding 25mm per hour, were recorded at Penang Mill, Tavua and Nadi Airport for several hours on January 24<sup>th</sup>. This subsequently led to severe flooding of major rivers, streams and low-lying areas in the Division, as well as the townships of Rakiraki, Ba and Nadi from the 23<sup>rd</sup> to 26<sup>th</sup> January (Figure 16).

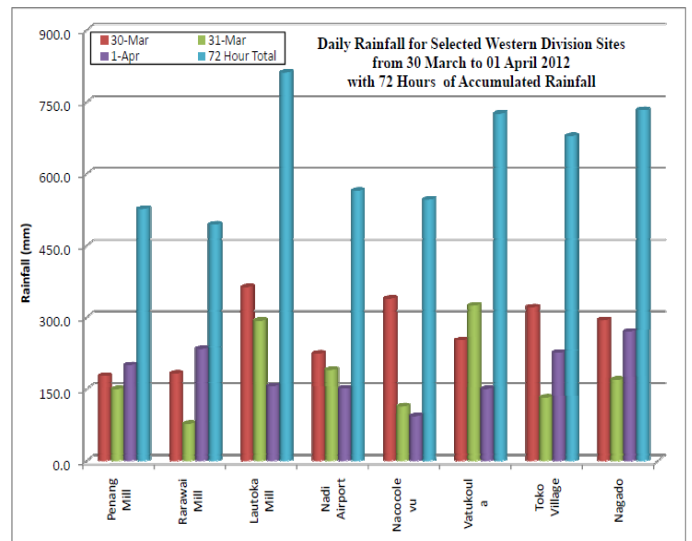


**Figure 16:** Flood waters over the Queens Road, Namotomoto village, and Nadi Muslim Primary School, on January 23<sup>rd</sup>, 2012.

**SEVERE FLOODING MARCH/APRIL**

On the March 28<sup>th</sup>, a tropical depression, TD17F, which had been hovering over Fiji for almost a week, anchored itself just west of Viti Levu. Overnight on the 29<sup>th</sup>, the TD underwent rapid development that triggered the torrential, widespread and high-intensity rain over Fiji. Rain was particularly torrential and prolonged in the Western Division, which consequently led to severe flooding of major rivers, streams and low-lying areas in the Division till the 31<sup>st</sup>.

From 30<sup>th</sup> March to 1<sup>st</sup> April, Lautoka Mill recorded the highest rainfall of 811.2mm followed by 733.0mm at Nagado, 725.9mm at Vatukoula, 679.0mm at Toko Village, 564.5mm at Nadi Airport, 546.0mm at Nacocolevu, 526.5mm at Penang Mill and 494.0mm at Rarawai Mill (Figure 17).



**Figure 17:** 24-hour and 72-hour rainfall at selected sites in Western Viti Levu from the 30<sup>th</sup> March to 01<sup>st</sup> April.

The majority of the stations in the Western Division recorded rainfall in excess of 200mm on March 30<sup>th</sup>, of which, the highest was 362.6mm at Lautoka Mill, followed by 339.0mm at Nacocolevu and 321.0mm at Toko Village. The severity of the floods can be seen in Figure 18, below.



**Figure 18:** Severe damages to infrastructure and public utilities at the Airport end of Nadi Bridge, after the March 2012 flood.

**TROPICAL CYCLONES ACTIVITY IN FIJI AND THE SOUTHWEST PACIFIC REGION**

The Regional Specialized Meteorological Centre (RSMC) - Tropical Cyclone Centre (TCC) Nadi Area of Responsibility (AoR) extends from the equator to 25°S and 160°E to 120°W. Five (5) tropical cyclones occurred inside the RSMC Nadi - TCC AoR in 2012. These tropical cyclones were namely; *Cyril*, *Daphne*, *Jasmine*, *Evan* and *Freda* (Figure 19). Though *Cyril*, *Daphne*, *Jasmine* and *Freda* did not directly affect Fiji, associated outer rain bands affected some parts of the country.

**TC Cyril** was the first cyclone to be named by RSMC Nadi in 2012. It developed as a tropical disturbance (TD11F) about 310km southeast of Nadi and was named with as a category 1 system on February 6<sup>th</sup>. *Cyril* reached a peak intensity of 50 knots and momentary gusts up to 70knots as it passed over Tonga. Heavy rain and destructive storm force winds caused damages mostly to vegetation and plantations in Tonga. TC Cyril moved out of Nadi's AoR on February 7<sup>th</sup> and weakened into an extra-tropical low on February 8<sup>th</sup>.

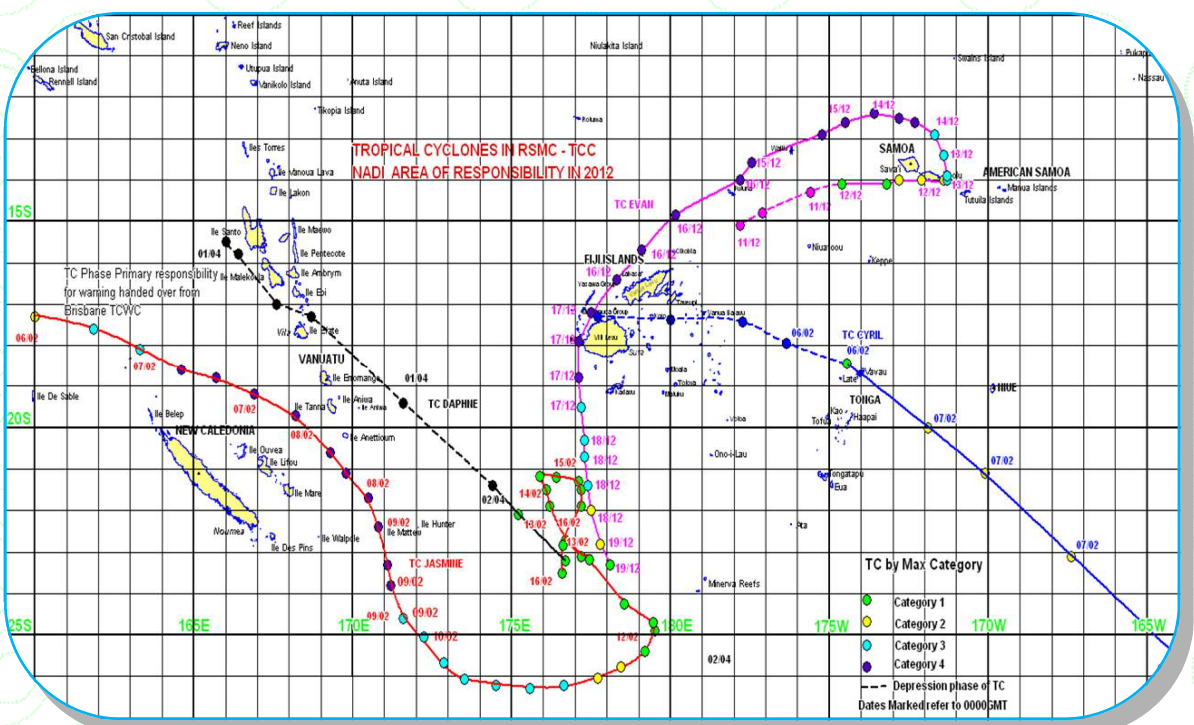
**TC Jasmine** was the 2<sup>nd</sup> cyclone in the year inside Nadi AoR. It initially developed and became a TC inside Brisbane's AoR, before moving into Nadi's AoR as a category 4 severe TC. *Jasmine* eventually exited Nadi's area, underwent extra-tropical transition and becoming an extra-tropical cyclone on February 16, before finally dissipating on February 19<sup>th</sup>. *Jasmine* affected Solomon Islands, Vanuatu, New Caledonia and Tonga. It did not directly affect Fiji, however, associated outer rain bands affected the western and the southern parts of the country.

**TC Daphne** was the third TC to occur in the Nadi AoR in the year. It developed as a TD 19F about 410km south of Honiara (Solomon Islands). It was upgraded to a tropical depression (TD) on April 1<sup>st</sup> and was later named whilst located to the southwest of Fiji on April 2<sup>nd</sup>. *Daphne* moved south-eastwards rapidly and subsequently tracked out of Nadi's AoR and into TCWC Wellington's AoR, 15 hours after being named. On its path, *Daphne* did not pose a direct threat to Fiji, however, associated, squally outer rain bands caused strong winds and torrential rain especially over the western parts of the country. The torrential rain also led to severe flooding of the Western Division. Five lives were lost, three listed as missing and thousands of tourists were stranded as a result.

**TC Evan** affected Fiji from December 16<sup>th</sup> to 17<sup>th</sup> as a category 4 system with estimated sustained winds of 100 knots and momentary gusts of 140 knots. *Evan* developed from a tropical disturbance located northwest of Cikobia on the 10<sup>th</sup>. The system gradually intensified into a category 1 status and was thus named "Evan" on the 12<sup>th</sup>. By midday of the 12<sup>th</sup>, *Evan* attained Category 2 status and tracked eastwards towards Samoa. The system further intensified to a category 3 and eventually attained category 4 status by midnight on the 14<sup>th</sup>. *Evan* circumnavigated Samoa and re-curved northwards on the 13<sup>th</sup> and maintained the northward track till midday on the 14<sup>th</sup>. Then it tracked northwestward and gradually turned southwestward towards Fiji at around midday on the 15<sup>th</sup> of December. The cyclone started to affected the country from the afternoon of the 16<sup>th</sup>. Early on the 17<sup>th</sup>, *Evan* tracked southward between Viti Levu and Yasawa, before moving over the Mamanucas later on the same day. The Western Division faced the brunt of this severe hurricane. The northern and southern parts of the country encountered destructive storm force winds. The Central/Eastern Divisions were mostly affected by damaging gale force winds. Though associated damage was severe, no lives were lost during *Evan*.

**TC Freda** developed from a TD05F located north of Port Vila (Vanuatu) on the December 26<sup>th</sup>. The system rapidly intensified and was named a category 1 cyclone on the 28<sup>th</sup>. *Freda* tracked south-southwest and subsequently moved into Brisbane AoR, for a brief period, before re-entering Nadi's AoR. *Freda* peaked as a category 4 hurricane on the 30<sup>th</sup>. By the 31<sup>st</sup>, it began to weaken rapidly and was later down-

graded into a tropical depression to the far southwest of Fiji. The cyclone affected the Solomon Islands, Vanuatu and New Caledonia. It did not pose any threat to Fiji.



**Figure 19:** Tracks of TCs inside the RSMC Nadi AoR in 2012



APPENDIX

FIGURE 20A : LAUCALA BAY, SUVA

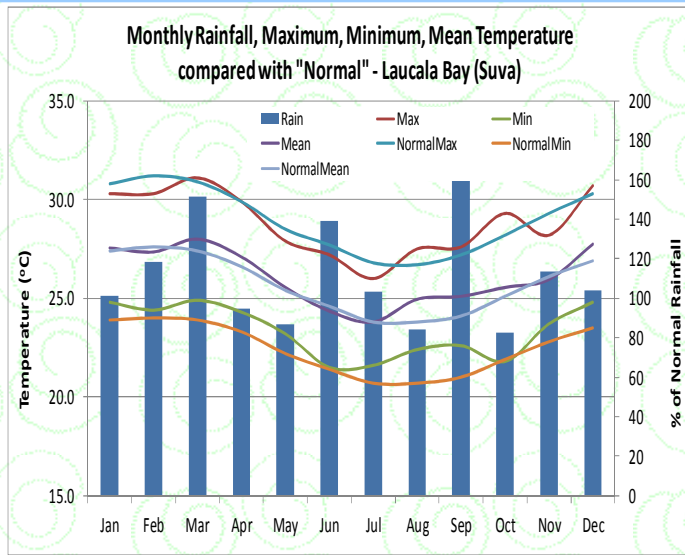


FIGURE 20D : LABASA MILL

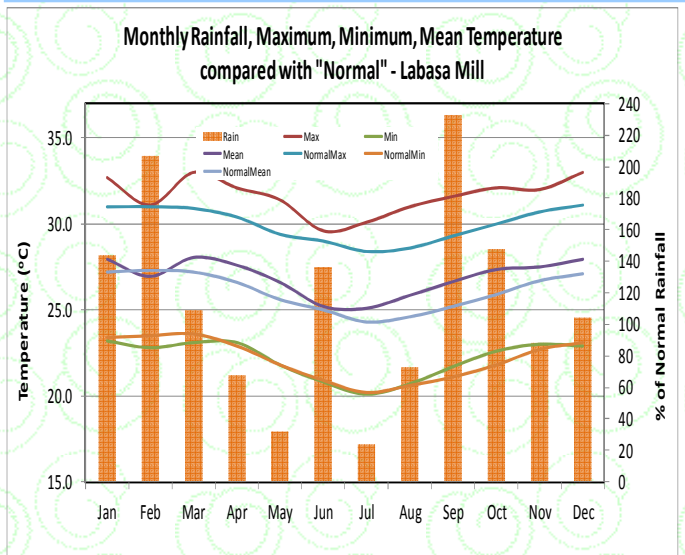


FIGURE 20B : NADI AIRPORT

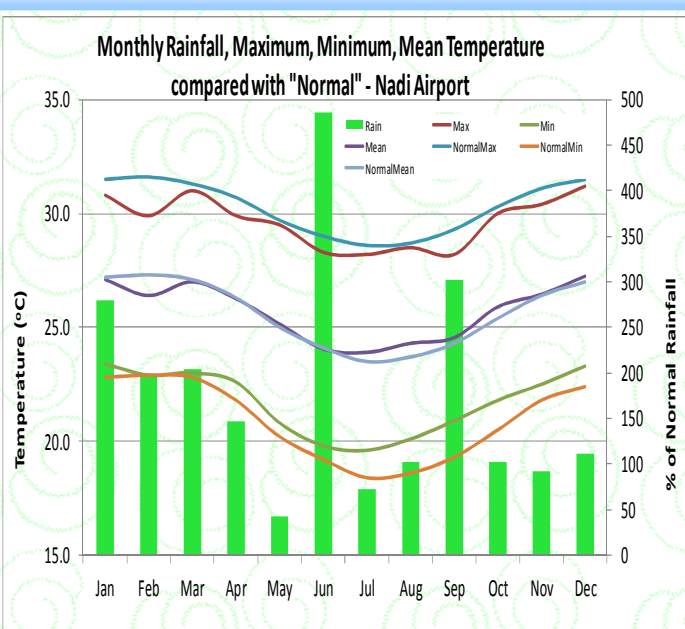


FIGURE 20E : LAKEBA ISLAND

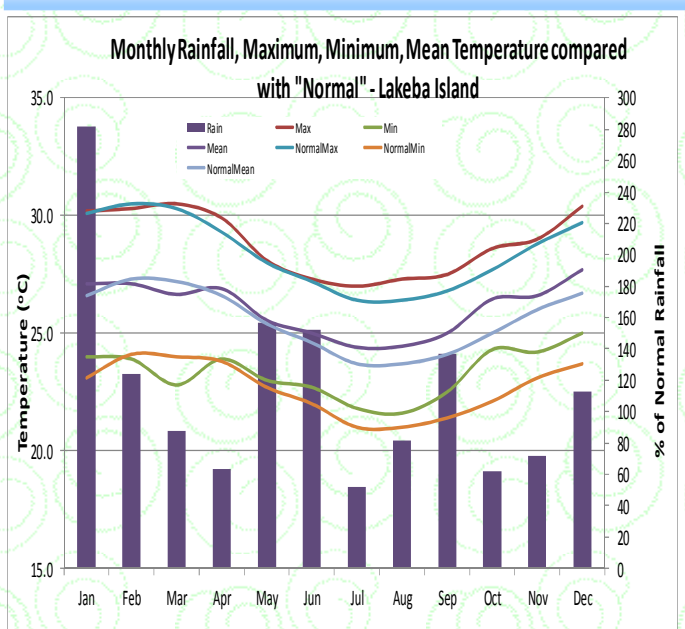


FIGURE 20C : VUNISEA, KADAVU

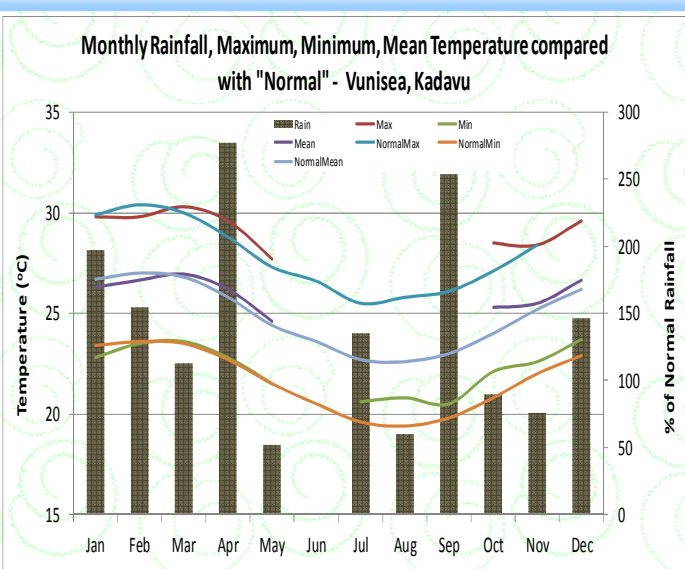
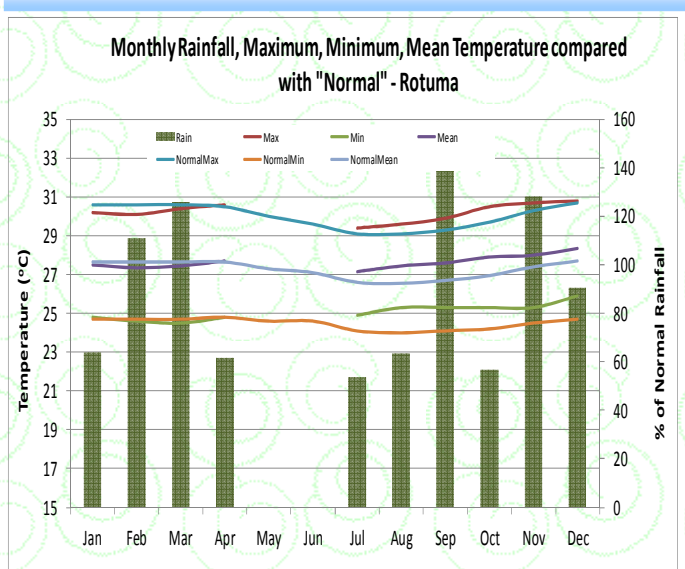
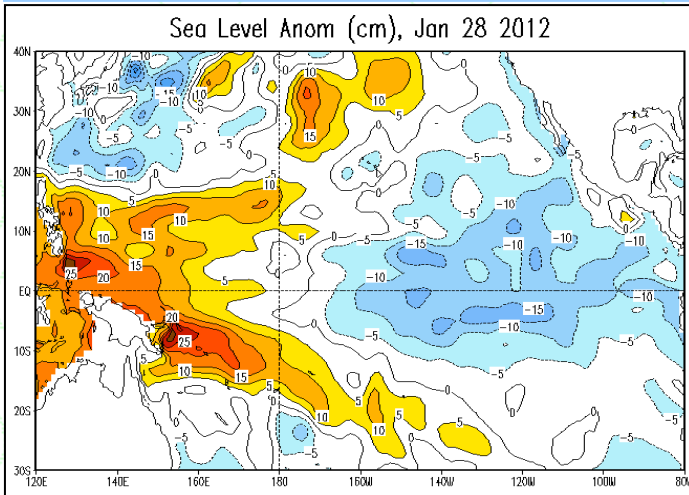


FIGURE 20F : ROTUMA

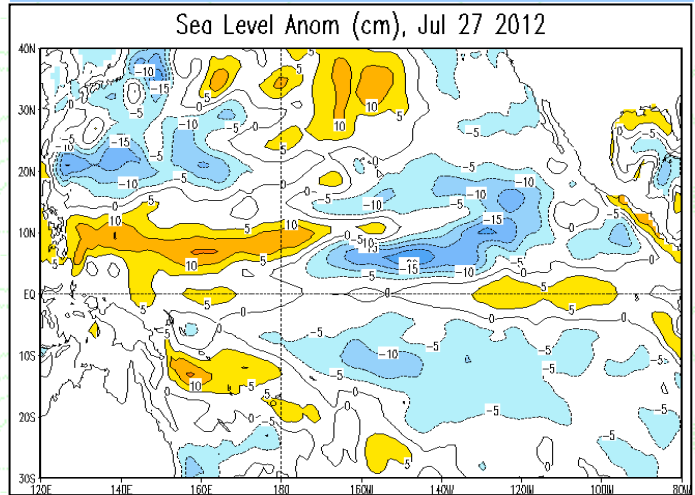


**FIGURE 21A: SEA LEVEL— JANUARY 2012**



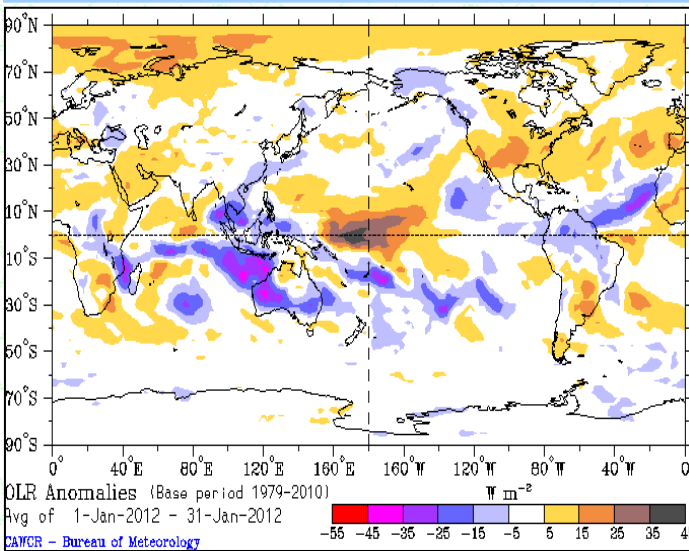
Source: [http://www.cpc.noaa.gov/products\\_analysis/monitoring/enso\\_update/sealevel.gif](http://www.cpc.noaa.gov/products_analysis/monitoring/enso_update/sealevel.gif)

**FIGURE 21B: SEA LEVEL— JULY 2012**



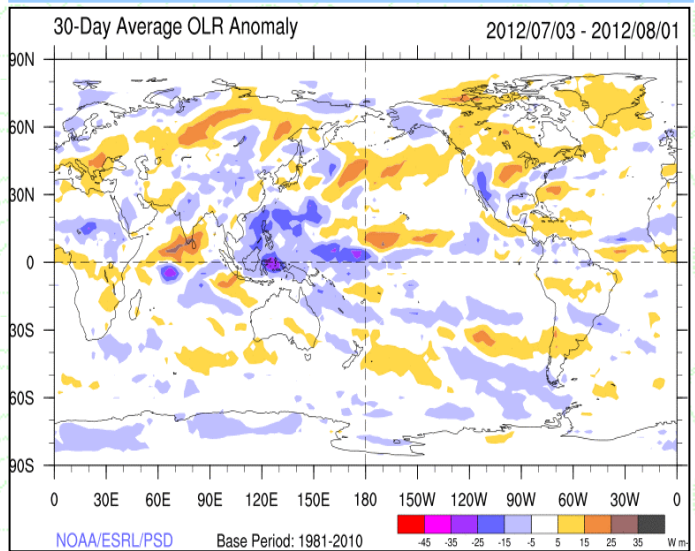
Source: [http://www.cpc.noaa.gov/products\\_analysis/monitoring/enso\\_update/sealevel.gif](http://www.cpc.noaa.gov/products_analysis/monitoring/enso_update/sealevel.gif)

**FIGURE 22A : JANUARY OUT-GOING LONGWAVE RADIATION**



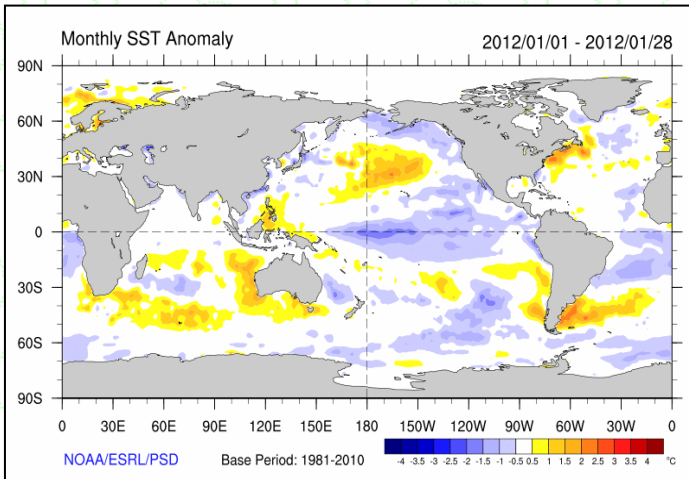
Source: <http://cawcr.gov.au/bmrc/clfor/cfstaff/matw/maproom/OLR/map.lastmonth.gif>

**FIGURE 22B : JULY OUT-GOING LONGWAVE RADIATION**



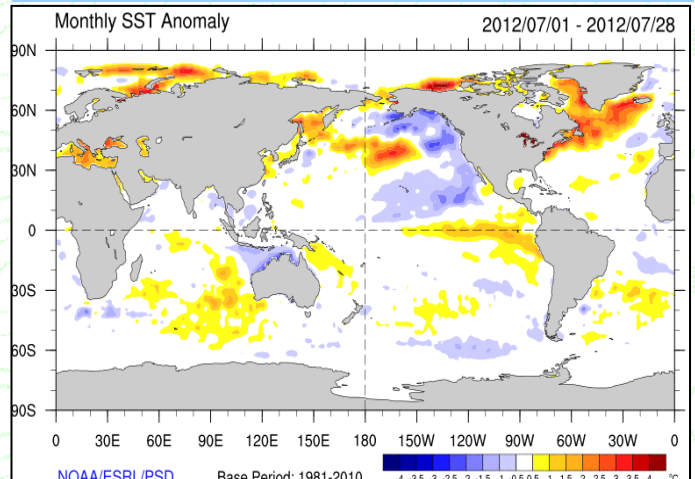
Source: <http://cawcr.gov.au/bmrc/clfor/cfstaff/matw/maproom/OLR/map.lastmonth.gif>

**FIGURE 23A: JANUARY SST (LA NINA PATTERN)**



Source: <http://www.cdc.noaa/map/images/sst/sst.anom.month.gif>

**FIGURE 23B: JULY SST (NEUTRAL PATTERN)**



Source: <http://www.cdc.noaa/map/images/sst/sst.anom.month.gif>

**TABLE 2: MAXIMUM AIR TEMPERATURE**

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Labasa Mill	Max	32.7	31.1	33.0	32.1	31.4	29.6	30.1	31.0	31.6	32.1	32.0	33.0	31.6
	Dep	1.7	0.1	2.1	1.7	2.0	0.6	1.7	2.4	2.3	2.1	1.3	1.9	1.6
Nabouwalu	Max	30.5	30.6	30.3	29.8	27.9	27.4	27.1	27.5	28.3	29.2	29.3	30.2	29.0
	Dep	0.4	0.2	0.2	0.8	0.1	0.3	0.8	1.2	1.5	1.5	0.4	0.6	0.7
Penang Mill	Max	30.5	30.2	30.2	30.0	28.9	28.0	27.8	28.7	28.9	29.9	30.3	31.1	29.5
	Dep	0.2	-0.3	-0.3	0.4	0.4	0.3	0.4	1.3	0.9	1.0	0.6	0.8	0.4
Nadi Airport	Max	30.8	29.9	31.0	29.9	29.5	28.3	28.2	28.5	28.2	30.0	30.4	31.2	29.7
	Dep	-0.7	-1.7	-0.3	-0.8	-0.2	-0.7	-0.4	-0.2	-1.1	-0.3	-0.7	-0.3	-0.6
Laucala Bay, Suva	Max	30.3	30.3	31.1	29.9	27.9	27.2	26.0	27.5	27.6	29.3	28.2	30.7	28.8
	Dep	-0.5	-0.9	0.2	0.0	-0.6	-0.5	-0.8	0.8	0.4	1.1	-1.1	0.4	-0.2
Nausori Airport	Max	29.9	30.0	30.3	29.5	27.6	27.0	26.3	26.9	27.1	28.5	28.3	30.1	28.5
	Dep	-0.5	-0.8	-0.2	0.2	-0.2	-0.2	0.0	0.7	0.5	0.9	-0.5	0.4	0.1
Vunisea, Kadavu	Max	29.8	29.8	30.3	29.6	27.7	Missing	26.0	Missing	Missing	28.5	28.4	29.6	Missing
	Dep	-0.1	-0.6	0.3	0.8	0.4	Missing	0.5	Missing	Missing	1.4	0.0	0.2	Missing
Lakeba	Max	30.2	30.3	30.5	29.9	28.1	27.3	27.0	27.3	27.5	28.6	29	30.4	28.8
	Dep	0.1	-0.2	0.2	0.6	0.1	0.1	0.6	0.9	0.7	0.9	0.2	0.7	0.4

**TABLE 3: MINIMUM AIR TEMPERATURE**

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Labasa Mill	Min	23.2	22.8	23.1	23.1	21.8	20.8	20.1	20.7	21.7	22.6	23	22.9	22.2
	Dep	-0.2	-0.7	-0.5	0.2	0.0	-0.1	-0.1	0.1	0.6	0.8	0.3	-0.2	0.1
Nabouwalu	Min	24.0	23.7	24.2	23.5	23.2	22.8	21.9	22.1	22.3	23.4	23.5	24.4	23.4
	Dep	-0.4	-0.8	-0.2	-0.3	0.4	0.5	1.2	0.6	0.6	0.9	-0.1	-0.2	0.2
Penang Mill	Min	23.6	23.0	23.8	22.2	22.1	21.6	20.6	21.5	22.0	23.2	23.4	24.1	22.6
	Dep	-0.4	-0.9	0.0	-1.0	0.0	0.2	0.2	0.8	0.8	1.0	0.4	0.6	0.1
Nadi Airport	Min	23.4	22.9	23.0	22.6	20.8	19.8	19.6	20.1	20.9	21.8	22.5	23.3	21.7
	Dep	0.6	0.0	0.2	0.8	0.6	0.6	1.2	1.5	1.6	1.3	0.7	0.9	0.8
Laucala Bay, Suva	Min	24.8	24.4	24.9	24.3	23.2	21.5	21.6	22.4	22.6	21.8	23.7	24.8	23.3
	Dep	0.9	0.4	1.0	1.0	1.0	0.1	0.9	1.7	1.6	-0.1	0.9	1.3	0.9
Nausori Airport	Min	23.4	22.8	23.1	22.9	21.1	20.0	20.2	20.1	21.2	22.1	22.4	23.6	21.9
	Dep	0.3	-0.5	-0.1	0.4	0.0	-0.5	0.6	0.5	1.2	1.2	0.6	1.0	0.4
Vunisea-Kadavu	Min	22.8	23.5	23.6	22.8	21.5	Missing	20.6	20.8	20.5	22.1	22.6	23.7	Missing
	Dep	-0.6	-0.1	0.1	0.1	0.0	Missing	1.0	1.4	0.7	1.3	0.6	0.8	Missing
Lakeba	Min	24.0	23.9	22.8	23.9	23.0	22.7	21.8	21.6	22.5	24.3	24.2	25	23.3
	Dep	0.9	-0.2	-1.2	0.1	0.3	0.7	0.8	0.6	1.1	2.2	1.1	1.3	0.6



**TABLE 4: SUNSHINE HOURS AND PERCENTAGE OF NORMAL**

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Rotuma	Actual	128.2	108.8	158.3	205.0	Missing	Missing	205.5	228.2	187.8	203.5	173.2	184.6	Missing
	%	76	68	96	112	Missing	Missing	103	110	105	104	89	98	Missing
Labasa Mill	Actual	113.3	105.5	175.6	159.0	202.2	33.5	Missing	218.3	Missing	188.4	146.6	189.6	Missing
	%	65	68	104	88	104	17	Missing	108	Missing	100	81	107	Missing
Nadi Airport	Actual	144.7	153.2	185.2	149.8	206.6	178.6	199.0	201.5	178.5	209.2	172.5	220.4	2199.2
	%	69	82	96	76	99	87	91	88	85	89	78	96	86.3
Laucala Bay, Suva	Actual	144.4	144.4	187.5	145.8	133.0	112.5	122.3	143.5	106.5	140.8	86	183.9	1650.6
	%	75	82	111	95	92	80	91	100	78	86	51	94	86.1

**TABLE 5: TOTAL MONTHLY RAINFALL (MM) AND PERCENTAGE OF NORMAL RAINFALL**

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Labasa Mill	Actual (mm)	567.1	754.4	411.3	169.0	37.2	99.4	12.4	37.9	174.7	187.5	166.8	276	2893.7
	%	144	207	109	67	32	136	24	73	233	148	88	105	124
Nabouwalu	Actual (mm)	450.9	497.7	369.2	443.2	189.7	99.7	52.1	120.3	160.2	184.1	236.2	399.5	3202.5
	%	145	180	110	148	111	101	57	115	142	108	136	157	133
Penang Mill	Actual (mm)	990.4	476.9	761.3	575.6	41.3	164.9	18.6	75.3	215.1	147.4	59.6	389.5	3915.9
	%	250	142	179	214	26	166	34	103	225	129	37	147	160
Nadi Airport	Actual (mm)	959.7	574.3	694.3	234.8	37.3	311.9	32.7	66.3	210.8	104.5	122.3	199	3547.9
	%	279	197	204	147	42	487	72	102	302	103	92	112	189
Laucala Bay, Suva	Actual (mm)	376.0	313.2	567.5	347.3	234.5	227	140.3	133.0	293.1	182.7	278.9	288.7	3382.2
	%	101	118	152	95	87	139	104	84	166	83	114	104	112
Nausori Airport	Actual (mm)	371.6	358.2	480.4	315.3	169.8	167.2	202.7	102.5	233.9	278.8	201.2	326	3207.6
	%	57	86	87	58	152	224	217	57	76	141	128	120	105
Vunisea, Kadavu	Actual (mm)	568.1	355.8	342.5	648.8	97	Missing	154.2	77	343.9	126.5	110.5	269.2	Missing
	%	197	154	113	277	52	Missing	135	60	254	89	76	146	Missing
Lakeba	Actual (mm)	681.4	281.0	256.0	130.0	210.6	122.8	42.1	83.7	138.6	75.8	101.2	202	2325.2
	%	183	160	137	133	74	140	95	84	190	108	89	126	134