Volume 6: Issue: 06

# Fiji Islands Weather Summary June 2006

## Rainfall Outlook till September 2006

*FIJI METEOROLOGICAL SERVICE*

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## IN BRIEF

June rainfall was generally below average across most of the country. The only exception was the Eastern Division where rainfall was generally average and in cases well above average. Despite the country experiencing some episodes of relatively cool weather with temperatures dropping to about 13°C in coastal areas, overall the day and night-time temperatures were a little above normal.

Sites in the Western Division received below average to well below average rainfall. Viwa Island and Vatukoula recorded only 38% and 33% of normal rainfall respectively, being the driest sites during the month.

In the Central Division all sites received below average rainfall.

Northern Division generally recorded average rainfall with Nabouwalu being the only site receiving below average rainfall.

Ono-i-Lau was the wettest recording thrice its normal rainfall while Lakeba recorded twice its monthly rainfall total.

Day-time air temperatures were mostly average to above average across the country. A new high mean monthly maximum temperature 28.9°C was recorded at Matuku and a new low daily maximum temperature of 24.5°C was recorded at Levuka on the 29th.

Night-time air temperatures were mostly average to above average across the country. A new high mean monthly minimum temperature of 23.6°C was recorded at Matuku and a new high daily minimum temperature of 24.5°C was recorded at Levuka on the 5th.

Total sunshine hours recorded were below average at all reporting sites.

The current ENSO conditions show *neutral* conditions and most computer prediction models expect it to remain same for the rest of the year.

Based on model predictions and current ocean and atmospheric conditions the rainfall for the next three months (July-September) is likely to be around average to above average

## WEATHER PATTERNS

Three troughs of low pressure and two cold fronts affected Fiji for the month of June. Two of these systems caused widespread rain. Isolated heavy falls were registered. Additionally, these troughs and fronts were interspersed by mobile high pressure moving systems or ridges of high pressure, across or to the south of the country. The onset of the latter was usually marked by a surge of cool and dry southeast trades. In a few such occasions, strong wind warnings were issued for all or certain parts of the Fiji Waters.

On the 1st, a trough moving east across the country, brought rain to most places. Early on the 2nd, it cleared the group, allowing a ridge from the southwest and associated cool and dry southeast flow onto the country till the 9th. This cool and dry period was unimpeded by a weak cold front that had become slow moving to the south of Fiji since the 6th.

From the 10th, though, a relatively moist easterly flow began to set in, in response to a second cold front approaching from the west. This front moved across the country on the 13th and 14th but tarried over the southern parts of Fiji till the 16th. Coupled with an enhanced on-shore trade flow, rain was recorded especially over the southern parts of Fiji as well as the interior and south-eastern parts of the larger islands, till the 16th. Isolated heavy falls were registered during this period.

Between the 17th and 18th, a second trough drifted across Fiji, further enhancing rain and subsequently bringing substantial falls to a few places. From the 19th an intense ridge following this trough extended over Fiji, sustaining a cool and dry southeast trade flow episode till the 27th. The whole Fiji Waters was issued with a *strong wind warning* for most of this period.

On the 28th, a third trough drifted onto Fiji from the north, causing widespread rain, and a few significant falls till the 29th. As the trough moved east, the resultant south-east flow from the associated complex area of low pressure to the south, enhanced by a ridge from the southwest, caused further cooler and drier weather for Fiji till the end of the month.

As was in May, Rotuma registered rain for most of June, which was largely from the SPCZ and waves in the easterlies moving across the island. A few substantial falls were recorded

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## TABLE 1: RAINFALL FROM APRIL TO JUNE 2006

| Station | Actual Rainfall (mm) | Rainfall in the last three months (Below average, average or above average) | No. of Rain days in Apr 06 (% of total rain) | No. of Rain days in May 06 (% of total rain) | No. of Rain days in June 06 (% of total rain) |
|---|---|---|---|---|---|
| Penang Mill | 296.0 | Below Average | 16 (58) | 9 (22) | 9 (20) |
| Monasavu Dam | 887.6 | Average | 20 (59) | 20 (25) | 15 (16) |
| Vatukoula Mine | 233.8 | Below Average | 9 (66) | 9 (24) | 7 (10) |
| Rarawai Mill, Ba | 319.0 | Average | 11 (54) | 7 (30) | 5 (16) |
| Yasawa-I-Rara | 230.9 | Below Average | 13 (39) | 12 (46) | 8 (15) |
| Viwa Island | 209.1 | Below Average | 11 (25) | 8 (63) | 5 (12) |
| Lautoka (FSC Res.) | 305.9 | Average | 11 (53) | 5 (34) | 5 (13) |
| Nadi Airport | 383.5 | Above Average | 9 (30) | 7 (60) | 6 (10) |
| Nacocolevu, Sigatoka | - | - | - | - | - |
| | | | | | |
| Tokotoko, Navua | 629.5 | Below Average | 16 (29) | 22 (51) | 17 (20) |
| Laucala Bay, Suva | 601.0 | Below Average | 24 (30) | 26 (50) | 19 (20) |
| Nausori Airport | 699.3 | Average | 24 (38) | 21 (49) | 21 (13) |
| | | | | | |
| Nabouwalu | 290.4 | Below Average | 19 (42) | 17 (34) | 14 (24) |
| Labasa Airport | 400.1 | Average | 15 (64) | 12 (22) | 7 (14) |
| Savusavu Airport | 345.4 | Below Average | 9 (32) | 16 (41) | 10 (27) |
| Udu Point | 591.9 | Average | 21 (63) | 16 (17) | 13 (20) |
| Matei Airport | 580.5 | Average | 30 (64) | 26 (14) | 21 (22) |
| | | | | | |
| Lakeba Is. | 458.7 | Average | 10 (15) | 17 (50) | 13 (35) |
| Matuku Is. | 336.6 | Below Average | 12 (34) | 14 (32) | 13 (34) |
| Ono-I-Lau Is. | 534.9 | Above Average | 11 (37) | 10 (14) | 16 (49) |
| Vunisea, Kadavu | 420.7 | Average | 16 (37) | 13 (15) | 18 (48) |
| | | | | | |
| Rotuma | 815.3 | Average | 19 (12) | 24 (39) | 25 (49) |

months.

## RAINFALL IN THE LAST THREE MONTHS

### Rainfall in June

The rainfall in June was mostly below average at most recording sites.

The rainfall in the Western Division was below average to well below average with Viwa Island and Vatukoula Gold Mine recording 38% and 33% of *normal* rainfall respectively.

All sites in the Central Division recorded below average rainfall.

Sites in the Northern Division recorded average rainfall except Nabouwalu which recorded below average rainfall of 73%.

Rainfall was quite variable in the Eastern Division with 2 sites receiving *well above average*, 1 site with *above average*, 1with *average* rainfall and 1 site receiving *below average* rainfall .
Rotuma received *above average* rainfall.

### Forecast Verification

### Rainfall in the 3-months from April to June 2006

The Rainfall Outlook for the period April to June in the March Fiji Islands Weather Summary was for rainfall to be generally average across most of the country. The confidence level of the forecast was low to moderate.

Out of the twenty one sites that reported in time for this summary, nine sites reported below average rainfall, nine

Figure A

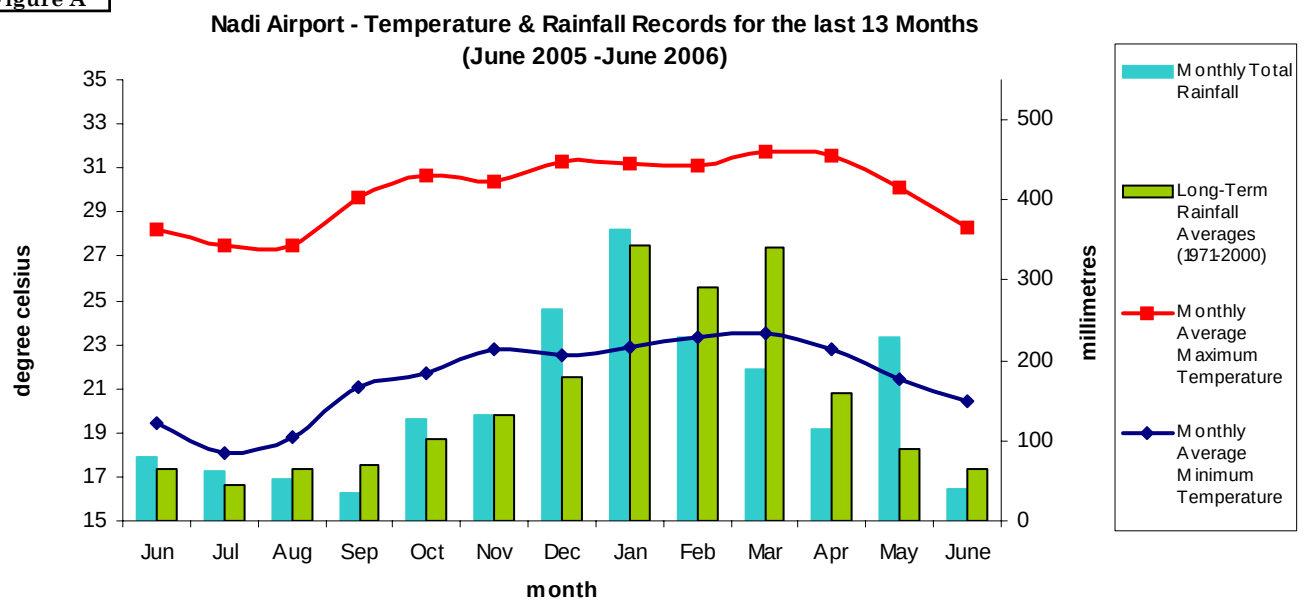



Figure B

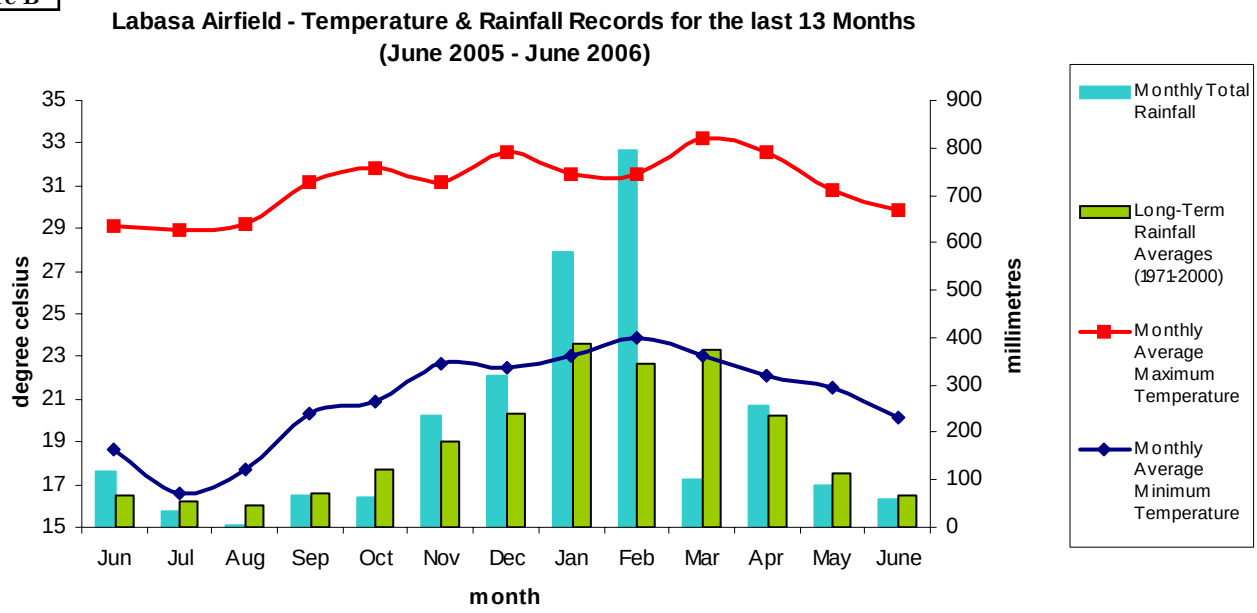
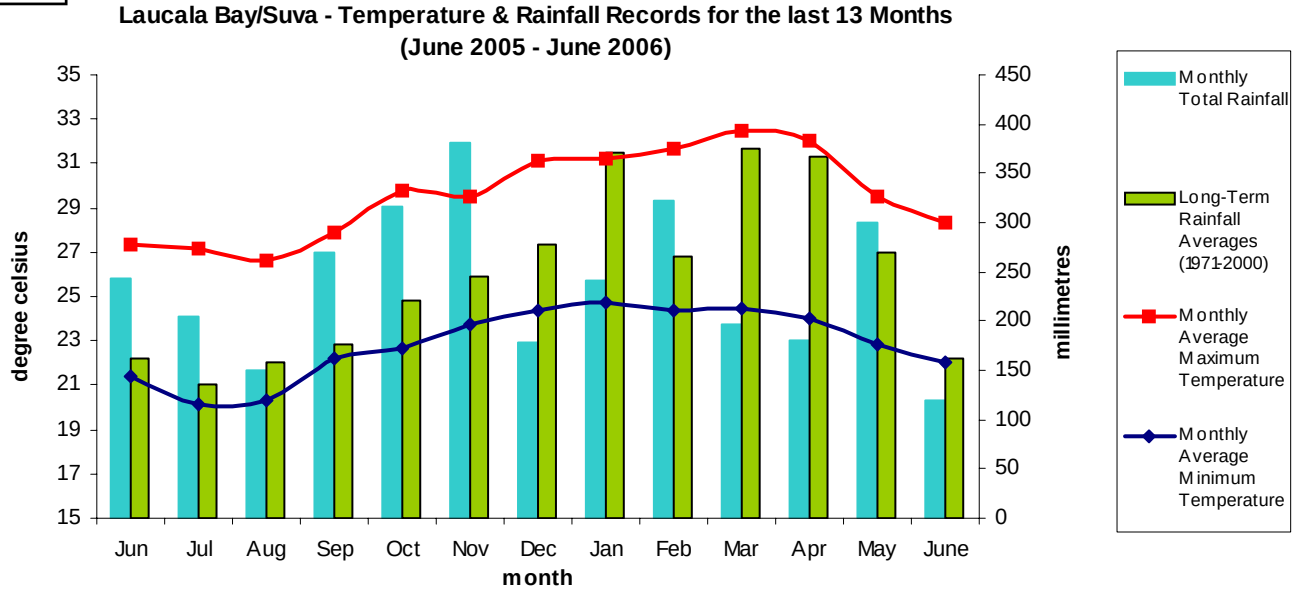



Figure C



# Climate in June 2006

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

Day-time air temperatures were mostly average to above average across the country. Greatest positive departures were recorded at Matuku (2.0°C), Yasawa-I-Rara and Penang (1.1°C) with above *Normal* respectively

Negative departures were recorded at Nadi Airport (0.7° C) and Lakeba (0.2°C) below *Normal* respectively.
Night-time air temperatures were mostly average to above average across the country. The notable departures were at Ono-i-Lau (0.9°C), Lakeba (0.5°C),
Nausori and Tokotoko,Navua (0.2 °C) below *Normal*

Relative Humidity (RH) at 0900hrs were mostly below average across the country. The greatest negative departures were recorded at Matuku(-8.4°C), Yasawa-i-Rara(-7.2°C), Udu Point and Laucala Bay, Suva both recording (-2.5°C).

The sites that recorded the greatest positive departures were at Levuka (10.2°C), Nadi Airport (4.0°C), Ono-i-Lau (3.0°C) and Savusavu (2.0°C).Ono-i-Lau (3.0°C) and Savusavu (2.0°C).
, The sites that recorded the greatest positive departures were at Levuka (10.2ºC), Nadi Airport (4.0ºC), Ono I Lau (3.0ºC) and Savusavu (2.0ºC).

## SOIL MOISTURE AND RUNOFFS

Soil moisture conditions were variable throughout the month.

In the Western Division, the soil moisture conditions was mostly limiting to dry throughout the month but except for Vatukoula, Rarawai and Lautoka which experienced moderate during the beginning of the month.

The Central Division recorded soil moisture conditions to be generally excess to ample during most of the month.

Sites in the Eastern Division experienced generally excess to ample conditions during the month with the exception of Lakeba and Matuku which had limiting to dry conditions during the first half of the month. Vunisea experienced moderate soil moisture conditions on the first half of the month.

Northern Division generally experienced limiting to dry with twom stations experiencing moderate soil moisture conditions towards the end of the month. Labasa Mill experienced access to ample and then moderate soil moisture conditions.

In Rotuma, the soil moisture conditions were limiting to dry on the first half of the month and excessive to ample on the second half of the month.

## SUNSHINE, RADIATION & WINDS

The total sunshine hours were below average at all the reporting stations with Nadi Airport recording(86%), Rotuma (85%), Laucala Bay-Suva (83%) and Nacocolevu with (97%).

Global Solar Radiation (average per day) was 13.0 MJ/ $M^2$ at Nacocolevu, 12.5 MJ/ $M^2$ at Nadi Airport, 10.5 MJ/$M^2$ at Laucala Bay– Suva and 15.0 MJ/ $M^2$ at Rotuma.

Monthly average wind speed was above average at all of the wind recording sites around the country. Rotuma received 0.3 knots, Nadi Airport received 0.1 knots, Nausori Airport received 0.5 knots, Vunisea and Nabouwalu which respectively recorded 2.9 knots and 3.6 knots above *Normal*.

## TABLE 2 : RECORDS SET IN JUNE 2006

| Element | Station | Observed (record) | On | Rank | Previous (record) | Year | Records Began |
|---|---|---|---|---|---|---|---|
| Mean Mly Max Temp (ºC) | Matuku | 28.9 | - | New High | 28.1 | 1968 | 1955 |
| Dly Max. Temp (ºC) | Levuka | 24.5 | 29th | New Low | 28.5 | 1997 | 1984 |
| Mean Mly Min. Temp (ºC) | Matuku | 23.6 | - | New High | 23.3 | 1988 | 1955 |
| Dly Min Temp (ºC) | Levuka | 24.5 | 5th | New High | 21.1 | 2002 | 1984 |

# ENSO status and SOI Graph

## ENSO UPDATE
## EL NIÑO - SOUTHERN OSCILLATION

The Southern oscillation (SOI) has recently shown moderate monthly fluctuations after the 30 day value peaked at +20 on the 14th of April, the SOI continued to fall, peaking with a 30 day value of –12 on the 7th and 13th June. Since then it has increased slightly and was –8 on the 26th of June.

**State of atmospheric and ocean conditions.**
SOI for June was –5.5 (May was –9.8) with the 5 month running mean of +3 centred on April, March was +6.

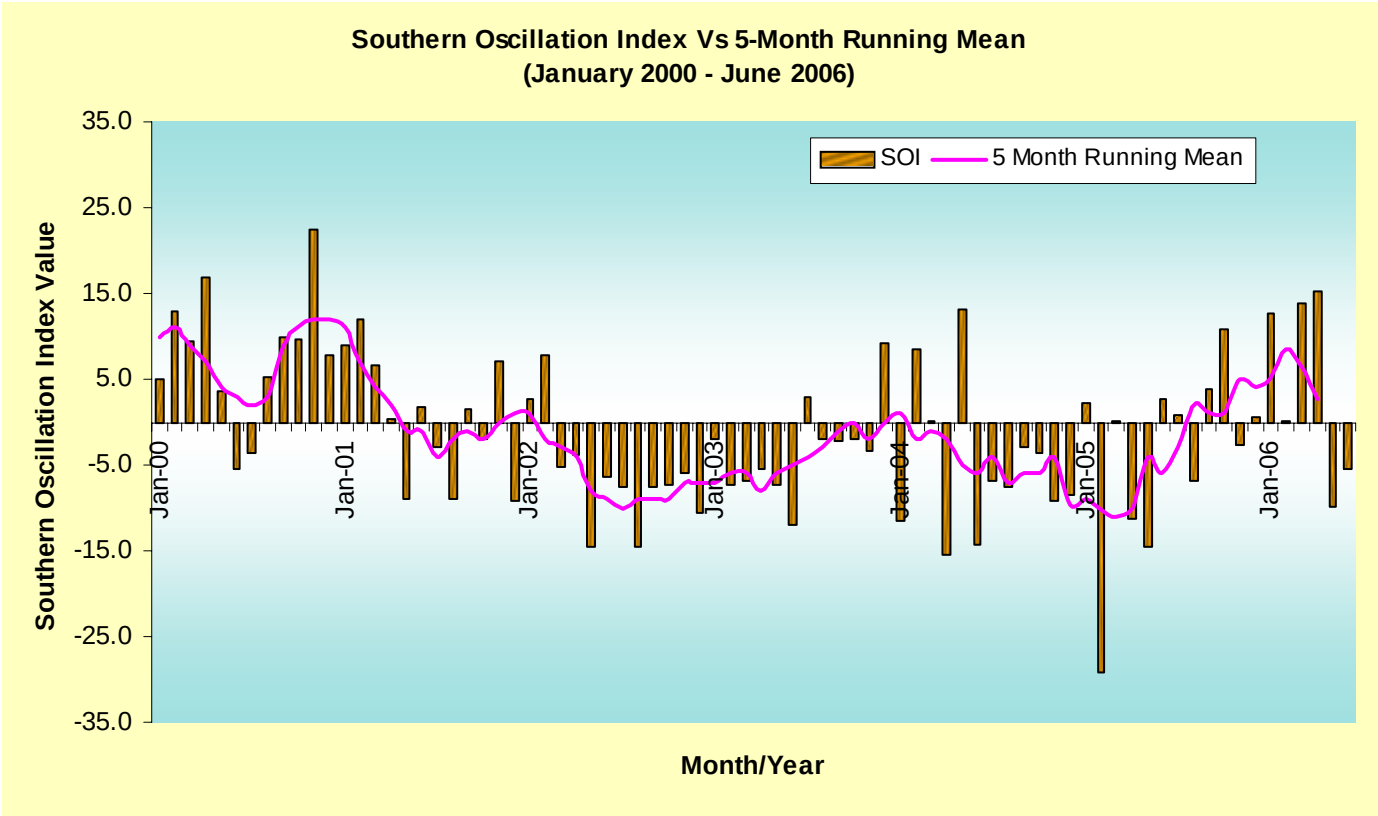
The overall ENSO remains neutral and most computer models predict conditions to remain neutral for the rest of 2006.

Trade winds have been weaker than average in recent months causing a warming of sea surface and upper sub surface layer with temperature across the entire equatorial Pacific now above average. In the past month, however, surface temperatures have been nearly static and remain at levels well below those typical for an El Nino event. The atmospheric response to this warming is shown by the return to near average cloudiness in the Central Pacific

Despite the negative SOI, other ENSO indicators show only very weak trends. Further more, given that ENSO events typically begin to evolve between March and June, the risk of Pacific surface warming to levels high enough for an El Nino event to develop this year is low.

*For more information and interpretation, please contact Fiji Meteorological Service. (The ENSO Update is provided by the Australian Bureau of Meteorology and visit the website http:// www.bom.gov.au for a detailed information).*

**Figure D**



## RAINFALL PREDICTIONS AND OUTLOOK TO SEPTEMBER 2006

***FMS currently uses "The Seasonal Climate Outlook for Pacific Island Countries (SCOPIC) Model" for seasonal rainfall guidance.***

*The **SCOPIC** software system analyses the current sea surface temperature patterns across the Pacific Ocean and then finds the most similar patterns experienced throughout the available historical period.*

*For a particular location, the subsequent rainfall received in historical period is then used to construct a rainfall forecast for the next three month period in a form of a tercile probability distribution. It also allows for the predictor period to be varied to produce the maximum skills.*

The SCOPIC model predicts rainfall to be generally *average* across the country.

The model is predicting rainfall to be generally *above*

**RAINFALL OUTLOOK FOR FIJI ISLANDS JULY TO SEPTEMBER 2006**

**With the current neutral state of ocean & atmospheric conditions rainfall is likely to be near average across the country over the next three months.**

**Note: The confidence level of this predictions is moderate.**

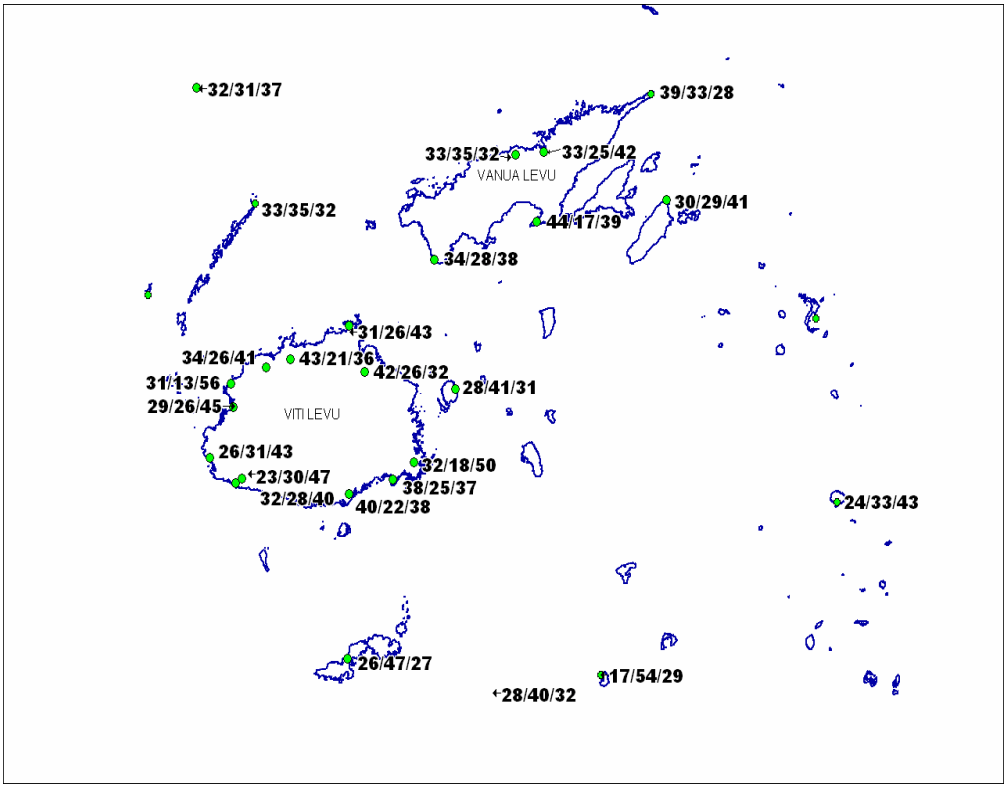
## PRELIMINARY CLIMATOLOGICAL SUMMARY FOR JUNE 2006

PRELIMINARY CLIMATOLOGICAL DATA FOR MONTH 6 , 2006 : 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 | ON | C | | C | | C | | C | | | % |
| NADI AIRPORT | 40 | 61 | 6 | 14 | 18 | 28.3 | -0.7 | 20.4 | 1.2 | 30.5 | 6 | 17.0 | 21 | 175 | 86 |
| SUVA/LAUCALA BAY | 120 | 74 | 19 | 21 | 11 | 28.3 | 0.6 | 22.0 | 0.6 | 31.4 | 5 | 18.9 | 28 | 116 | 83 |
| NACOCOLEVU | 101 | 135 | 12 | 50 | 17 | 30.3 | 1.9 | 19.5 | 0.8 | 31.5 | 4 | 14.5 | 22 | 144 | 97 |
| ROTUMA | 400 | 171 | 25 | 65 | 15 | 29.9 | 0.3 | 25.1 | 0.5 | 32.6 | 1 | 23.4 | 29 | 160 | 85 |
| VIWA | 26 | 38 | 5 | 13 | 18 | 29.3 | 0.9 | 24.3 | 1.1 | 31.6 | 2 | 20.0 | 22 | 0 | 0 |
| UDU POINT | 121 | 104 | 13 | 59 | 16 | 29.4 | 0.7 | 23.8 | 0.7 | 33.5 | 3 | 22.0 | 25 | | |
| LABASA AIRFIELD | 57 | 85 | 7 | 20 | 29 | 29.9 | 0.2 | 20.1 | 1.2 | 32.5 | 5 | 16.0 | 6 | | |
| NABOUWALU | 71 | 73 | 14 | 23 | 28 | 27.7 | 0.6 | 23.0 | 0.4 | 30.9 | 1 | 20.8 | 30 | | |
| SAVUSAVU AIRFIELD | 93 | 80 | 10 | 16 | 28 | 28.3 | 0.4 | 22.1 | 0.5 | 32.0 | 18 | 20.0 | 1 | | |
| MATEI AIRFIELD | 128 | 103 | 21 | 78 | 17 | 28.2 | 0.2 | 22.6 | 0.4 | 31.0 | 2 | 19.2 | 16 | | |
| YASAWA-I-RARA | 35 | 42 | 8 | 12 | 17 | 30.2 | 1.9 | 23.2 | 0.1 | 33.0 | 2 | 20.2 | 30 | | |
| VATUKOULA | 24 | 33 | 7 | 10 | 17 | 30.1 | 0.4 | 20.0 | 1.5 | 32.6 | 11 | 14.9 | 21 | | |
| MONASAVU | 137 | 53 | 15 | 48 | 12 | 22.1 | 0.3 | 16.8 | 0.7 | 25.5 | 4 | 10.6 | 22 | | |
| NAUSORI AIRPORT | 95 | 63 | 21 | 18 | 11 | 27.5 | 0.3 | 20.3 | -0.2 | 30.5 | 1 | 15.4 | 21 | | |
| NAVUA/TOKOTOKO | 124 | 64 | 17 | 23 | 11 | 27.3 | 0.5 | 20.0 | -0.2 | 30.5 | 15 | 15.5 | 21 | | |
| ST. JOHNS COLLEGE | 113 | 70 | 10 | 45 | 17 | 28.3 | 0.7 | 22.2 | 0.0 | 30.5 | 5 | 18.5 | 21 | | |
| LAKEBA | 161 | 207 | 13 | 50 | 17 | 27.0 | -0.2 | 21.5 | -0.5 | 29.6 | 18 | 17.5 | 21 | | |
| MATUKU | 113 | 105 | 13 | 28 | 14 | 28.9 | 2.0 | 23.6 | 1.9 | 30.8 | 5 | 21.7 | 18 | | |
| VUNISEA | 200 | 160 | 18 | 95 | 15 | 26.6 | 0.0 | 21.6 | 1.1 | 29.7 | 4 | 18.0 | 22 | | |
| ONO-I-LAU | 260 | 292 | 16 | 58 | 17 | 26.0 | 0.1 | 20.5 | -0.9 | 29.2 | 4 | 18.1 | 27 | | |
| BA/RARAWAI MILL | 53 | 59 | 5 | 33 | 17 | 30.1 | 0.1 | 19.3 | 1.3 | 32.8 | 11 | 13.4 | 21 | | |
| LAUTOKA AES | 40 | 55 | 5 | 36 | 17 | 28.8 | 0.0 | 21.1 | 0.4 | 31.2 | 10 | 15.7 | 21 | | |
| PENANG MILL | 59 | 59 | 9 | 21 | 12 | 28.8 | 1.1 | 21.9 | 0.5 | 32.0 | 10 | 17.0 | 23 | | |

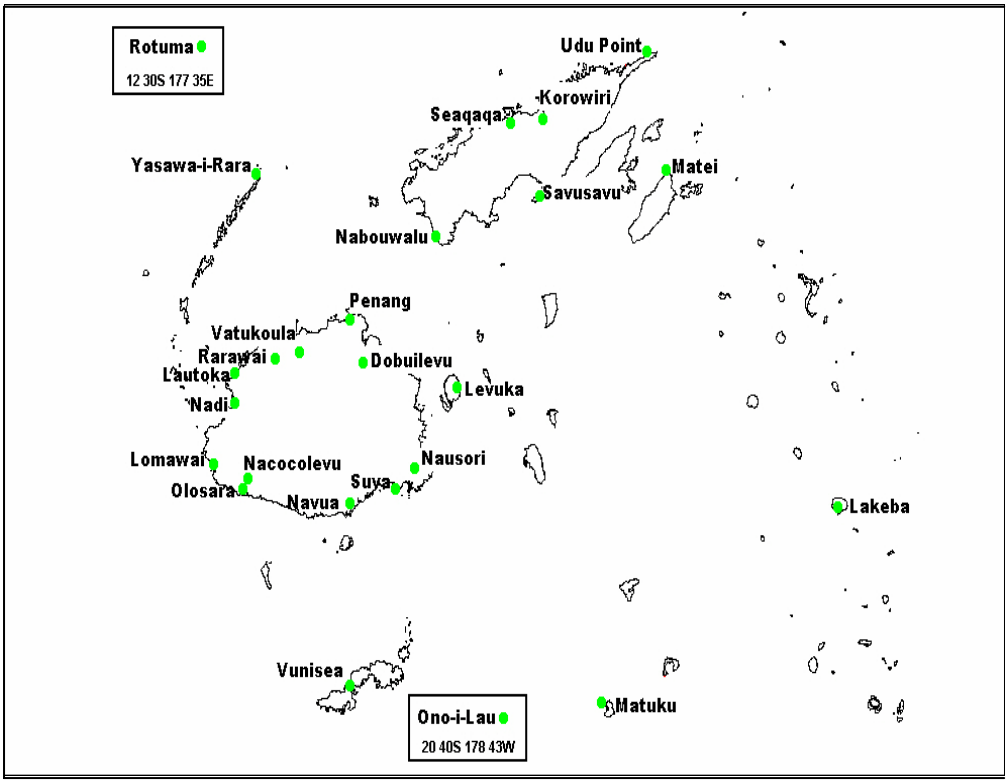
## SCOPIC Model
## (Seasonal Climate Outlook for Pacific Island Countries Model)

FIGURE E*:* Three Month Forecast for Selected Stations in Fiji using the Fiji Meteorological Services Rainfall Prediction Model




Please note that the probabilities are listed beside of the corresponding station marker or dot.

FIGURE F*:* Reference Map of selected Climate/Rainfall sites in Fiji




The forecast probabilities are presented as

DRY/NORMAL/WET

'DRY' range refers to rainfall less than 33rd percentile.

'NORMAL' (average) range refers to rainfall between 33rd and 67th percentiles.

'WET' range refers to rainfall above 67th percentile.

**Reference Table for 33rd and**

| Station | 33% (mm) | 67% (mm) |
|---|---|---|
| **Western Division** | | |
| Dobuilevu | 207.6 | 291.5 |
| Vatukoula | 124.6 | 212.7 |
| Rarawai | 110.0 | 220.6 |
| Penang | 152.6 | 235.1 |
| Lautoka | 112.7 | 221.6 |
| Nadi | 128.8 | 208.5 |
| Lomawai | 143.2 | 243.5 |
| Nacocolevu | 192.0 | 274.0 |
| Olosara | 198.3 | 314.8 |
| Yasawa | 120.9 | 191.2 |
| **Central Division** | | |
| Navua | 514.6 | 683.3 |
| Suva | 384.2 | 530.5 |
| Nausori | 363.8 | 531.1 |
| **Eastern Division** | | |
| Levuka | 281.8 | 436.6 |
| Lakeba | 199.6 | 315.8 |
| Matuku | 215.8 | 353.8 |
| Ono-I-Lau | 237.5 | 338.9 |
| Vunisea | 295.8 | 339.5 |
| **Northern Division** | | |
| Labasa Mill | 103.7 | 216.3 |
| Seaqaqa | 119.8 | 241.1 |
| Nabouwalu | 206.0 | 365.0 |
| Savusavu | 250.3 | 374.2 |
| Udu Point | 217.8 | 337.6 |
| Matei | 271.8 | 339.0 |
| **Rotuma** | 577.1 | 787.5 |