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March 2006

# Fiji Islands Weather Summary March 2006
# Rainfall Outlook till June 2006

*FIJI METEOROLOGICAL SERVICE*

## IN BRIEF

March was considerably warm and dry. All the sites received below average to well below average rainfall except for Savusavu which received average rainfall. The SPCZ remained to the north of the group and absence of any major organised weather systems basically resulted in generally low rainfall across Fiji Group. Even though the interior and western parts of the main islands experienced thunderstorms and afternoon showers, this was not sufficient to reach the average rainfall for the month.

In the Western, Central and Eastern Divisions, about 60% of the sites recorded below average and 40% recorded well below average rainfall. Notably, Monasavu recorded a new monthly low of 238.8mm for the month of March.

In the Northern Division, all the sites recorded below average to well below average except at Savusavu which received average rainfall.

The day and night time were generally above average across the country. New highs of mean monthly maximum temperature were recorded at Laucala Bay (32.5°C), Udu Point (32.0°C), Nabouwalu (31.9°C), Labasa Airport (33.2°C), Navua (31.2°C), Lakeba (31.3°C) and Ono-I-Lau (31.5°C) A new low of daily maximum temperature of 30.0° C was recorded at Levuka on the 4th.

New highs of mean monthly minimum temperature were also recorded at Monasavu with 20.2°C and Levuka with 25.4°C. The hot and uncomfortable conditions prevailed as a result of high humidity and absence of persistent rainfall event which produces the cooling effect.

Although the month was hot and humid, resulting in uncomfortable conditions, only one new record in daily maximum temperature was established at Levuka.

Based on model predictions and current ocean and atmospheric conditions, most parts of the country can expect average rainfall in the upcoming three months.

**Inside this issue:**



## WEATHER PATTERNS

The South Pacific Convergence Zone [SPCZ] remained to the north of Fiji for most of the time in March. Even though the country experienced frequent passages of troughs of low pressure from the east, they were inactive to produce widespread and significant rainfall. The prevailing moist wind flow was generally light and from the eastern quadrant which only brought light showers on the eastern coasts. Daily maximum temperatures persisted in the lower 30s for most of the month that maintained hot and uncomfortable weather conditions. Afternoon showers and thunderstorms about the main islands were particularly enhanced .

A weak front moved over Fiji from the south on the 1st and dissipated on the 4th. Showers were confined to the southern, central and western parts of the group. A trough from the northeast meandered over Fiji from the 5th till the 11th before moving to the southwest on the 12th. A second easterly trough progressed across the country on the 16th and 17th. A third trough moved over the country on the 23rd and dispersed on the 25th. A fourth weak trough developed northeast of Fiji on the 27th and dissipated over the group on the 28th. During the movement of the aforementioned troughs, the interior and western parts of the main islands experienced afternoon thunderstorms, while scattered showers affected the rest of the country.

For the rest of the month, a moist east to northeast airstream brought light showers to the eastern parts of the group, while the interior and western parts of the main islands continued to experience afternoon showers and thunderstorms and these were occasionally heavy. Savusavu reported a 24 hr rainfall total of 117.6 mm on the 22nd from an

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## TABLE 1: RAINFALL FROM JANUARY TO MARCH 2006

| Station | Actual Rainfall (mm) | Rainfall in the last three months (Below Average, Average or Above Average) | No. of Rain days in Jan 06 (% of total rain) | No. of Rain days in Feb 06 (% of total rain) | No. of Rain days in Mar 06 (% of total rain) |
|---|---|---|---|---|---|
| Penang Mill | 1033.6 | Average | 21 (47) | 22 (39) | 20 (14) |
| Monasavu Dam | 1192.5 | Below Average | 27 (37) | 23 (43) | 25 (20) |
| Vatukoula Mine | 1179.3 | Average | 14 (44) | 19 (36) | 14 (20) |
| Rarawai Mill, Ba | 925.3 | Average | 13 (50) | 19 (30) | 14 (20) |
| Yasawa-I-Rara | 522.4 | Below Average | 15 (34) | 18 (44) | 15 (22) |
| Viwa Island | 729.5 | Average | 15 (59) | 13 (18) | 11 (23) |
| Lautoka (FSC Res.) | 1038.3 | Average | 16 (69) | 14 (21) | 16 (10) |
| Nadi Airport | 780.9 | Average | 15 (47) | 15 (29) | 17 (24) |
| Nacocolevu, Sigatoka | - | | - | - | - |
| | | | | | |
| Tokotoko, Navua | 856.3 | Below Average | 25 (39) | 18 (34) | 21 (27) |
| Laucala Bay, Suva | 760.9 | Below Average | 28 (32) | 23 (42) | 24 (26) |
| Nausori Airport | 783.9 | Below Average | 26 (31) | 23 (41) | 24 (28) |
| | | | | | |
| Nabouwalu | 749.9 | Average | 28 (51) | 21 (35) | 20 (14) |
| Labasa Airport | 1476.0 | Above Average | 19 (39) | 23 (54) | 10 (07) |
| Savusavu Airport | 633.2 | Below Average | 14 (16) | 12 (40) | 11 (44) |
| Udu Point | 979.3 | Average | 23 (53) | 18 (30) | 24 (17) |
| Matei Airport | 962.1 | Average | 22 (46) | 27 (30) | 22 (24) |
| | | | | | |
| Lakeba Is. | 481.6 | Below Average | 16 (60) | 18 (22) | 20 (18) |
| Matuku Is. | - | | - | - | - |
| Ono-I-Lau Is. | 472.7 | Below Average | 15 (61) | 11 (22) | 9 (17) |
| Vunisea, Kadavu | 589.2 | Below Average | 25 (28) | 19 (33) | 21 (39) |
| | | | | | |
| Rotuma | 1579.2 | Above Average | 28 (61) | 24 (25) | 25 (14) |

## RAINFALL IN THE LAST THREE MONTHS

**Rainfall in March**

Rainfall in March ranged from well below average to average across most of the country.

Sites in the Western Division recorded well below average to below average rainfall. Rainfall ranged from 35% to 69% of *Normal* rainfall. Monasavu and Penang Mill recorded 35% of Normal rainfall.

Central Division recorded below average rainfall for all the sites . Rainfall ranged from 53% to 59% of *Normal* rainfall.

Eastern Division recorded well below average to below average rainfall that ranged from 30% to 75% of *Normal* rainfall.

Northern Division recorded well below average rainfall to average rainfall. Labasa Airport and Nabouwalu recorded well below average rainfall of 27% and 30%of *Normal* rainfall respectively. Rainfall ranged from 27% to 98% of *Normal* rainfall.

**Forecast Verification**

**Rainfall in the 3-months from January to March 2006**

The Rainfall Outlook for the period January to March 06 in the December 05 Fiji Islands Monthly Weather Summary was for rainfall to be generally ***Average to Above Average*** for most parts of the country. The confidence level of the forecast was ***moderate***.

Out of the nineteen sites that reported in time for this summary received ***nine*** sites received ***below average*** rainfall, ***nine*** sites received ***average*** rainfall and Labasa Airport was the only site that received ***above average*** rainfall in the past three months.

Figure A

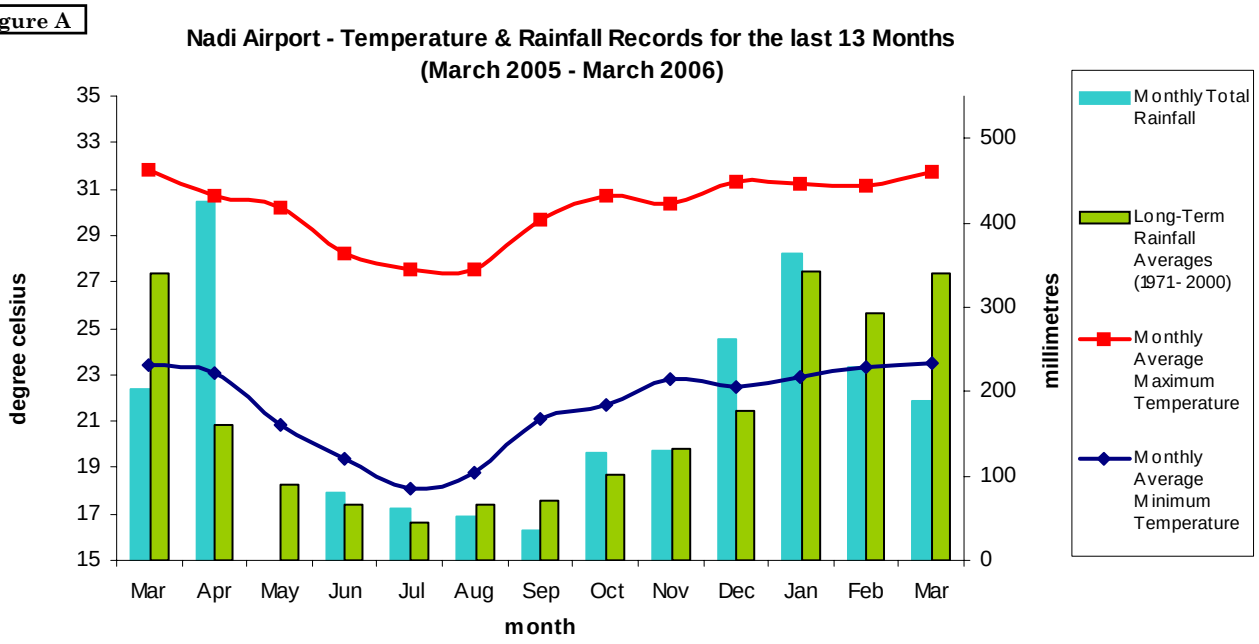



Figure B

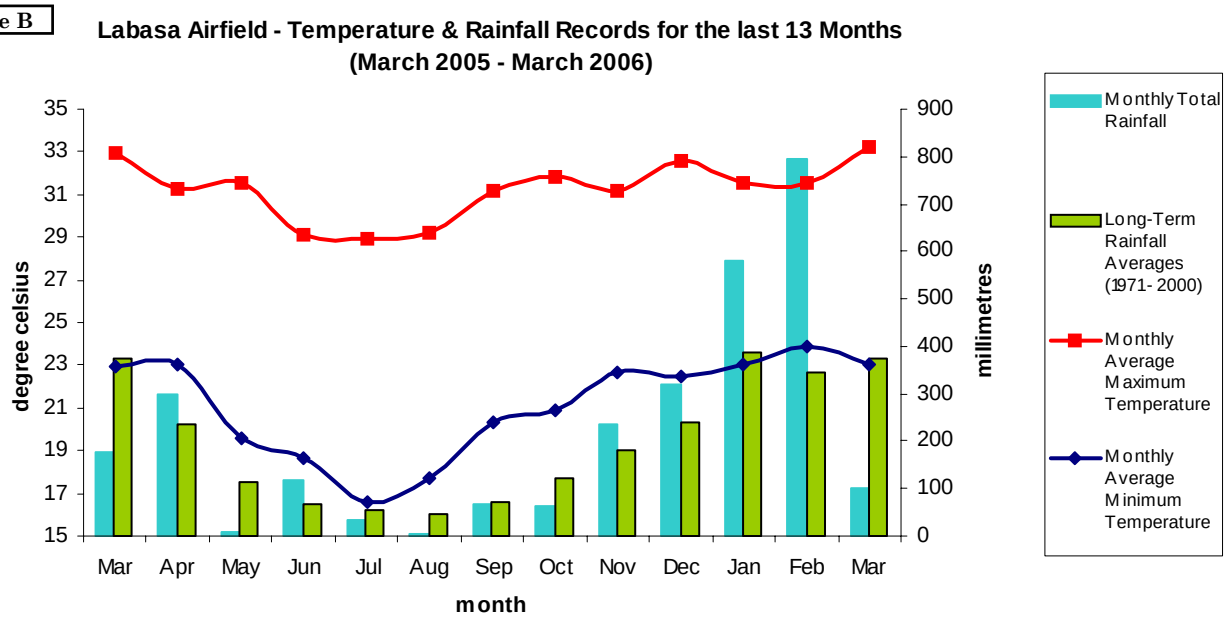
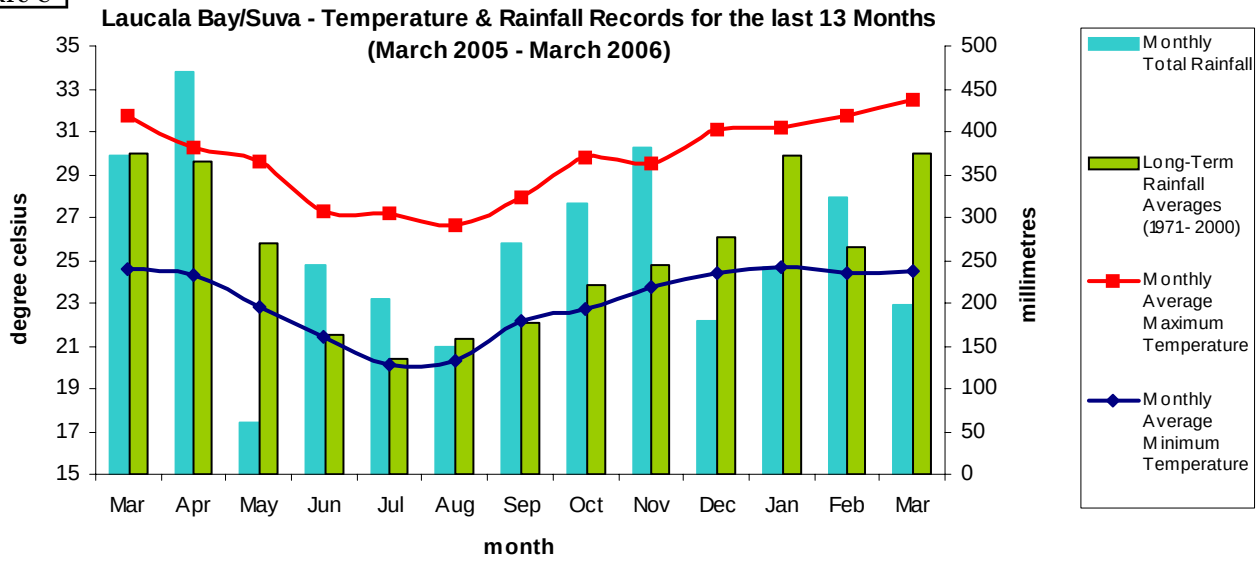



Figure C



# Climate in March 2006

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

Day-time air temperatures were above average at all of the recording sites. Greatest positive departures were recorded at Ono-I-Lau (2.2ºC), Nabouwalu (1.8ºC ), Penang Mill, Labasa Airfield and Nacocolevu with (1.7ºC) above *Normal* respectively..

Night-time air temperatures were mostly average to above average around the country. The only notable departure was at Navua,Tokotoko (0.2ºC) below *Normal*.

Relative Humidity (RH) at 0900hrs were below average across most of the country. The greatest negative departures were recorded at Vatukoula (-13.9%), Labasa Airfield (-5.8%), Lautoka Mill (-39.6 %), and Nabouwalu (-2.3%).

The sites that recorded the greatest positive departures were at Matuku (+8.9%), Penang Mill (+4.6%), Nacocolevu (+2.0%) and Yasawa-I-Rara (+1.7 %).

## SOIL MOISTURE AND RUNOFFS

Soil moisture conditions were variable throughout the month.

In the Western Division, the soil moisture conditions was mostly excess to ample for most 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. Ono-I-Lau and Lakeba recorded moderate soil moisture conditions.

Northern Division experienced generally excessi to ample soil moisture conditions. Savusavu had moderate soil moisture conditions beginning of the month followed by excess to ample soil moisture conditions.

In Rotuma, the soil moisture conditions were excessive to ample most of the month .

Significant runoff was recorded at Matei (127.2 mm), Savusavu (124.8 mm), Levuka (119.8 mm), and Monasavu (115.2 mm).

## SUNSHINE, RADIATION & WINDS

The total sunshine hours were below average at all the reporting stations with Nadi Airport recording(61%), Rotuma (55%), Laucala Bay-Suva (57%) and Nacocolevu with (56%).

Global Solar Radiation (average per day) was 23.0 MJ/$M^2$ at Nacocolevu, 19.5 MJ/ $M^2$ at Nadi Airport, 19.5 MJ/$M^2$ at Laucala Bay– Suva and 22.0 MJ/ $M^2$ at Rotuma.

Monthly average wind speed was above average at all of the wind recording sites around the country. Rotuma received 2.1 knots, Nadi Airport and Nausori Airport received 0.3 knots, Vunisea and Nabouwalu which respectively recorded 4.7 knots and 4.2 knots above *Normal.*

## TABLE 2 : RECORDS SET IN MARCH 2006

| Element | Station | Observed (record) | On | Rank | Previous (record) | Year | Records Began |
|---|---|---|---|---|---|---|---|
| Mly Rainfall (mm) | Monasavu | 238.8 | - | New Low | 263.6 | 2004 | 1980 |
| Mean Mly Max Temp (°C) | Laucala Bay | 32.5 | - | New High | 32.0 | 2001 | 1942 |
| Mean Mly Max Temp (°C) | Viwa Island | 32.6 | - | Equal High | 32.6 | 1998 | 1978 |
| Mean Mly Max Temp (°C) | Udu Point | 32.0 | - | New High | 31.9 | 2005 | 1951 |
| Mean Mly Max Temp (°C) | Nabouwalu | 31.9 | - | New High | 31.8 | 2002 | 1956 |
| Mean Mly Max Temp (°C) | Vatukoula | 33.1 | - | Equal High | 33.1 | 1998 | 1984 |
| Mean Mly Max Temp (°C) | Labasa Airfield | 33.2 | - | New High | 32.9 | 2005 | 1956 |
| Mean Mly Max Temp (°C) | Navua | 31.2 | - | New High | 31.0 | 2000 | 1992 |
| Mean Mly Max Temp (°C) | Lakeba | 31.3 | - | New High | 31.0 | 2000 | 1955 |
| Mean Mly Max Temp (°C) | Ono-I-Lau | 31.5 | - | New High | 31.1 | 1945 | 1943 |
| Mean Mly Min Temp (°C) | Monasavu | 20.2 | - | New High | 20.0 | 2003 | 1980 |
| Mean Mly Min Temp (°C) | Levuka | 25.4 | - | New High | 25.1 | 1997 | 1984 |
| Dly Max Temp (°C) | Levuka | 30.0 | 4th | New Low | 31.5 | 1990 | 1984 |

# ENSO STATUS AND SOI GRAPH

## ENSO UPDATE
## EL NIÑO - SOUTHERN OSCILLATION

**The Southern Oscillation Index** (SOI) for March was +13.8 (February was +0.1) with the five-month running mean of +5 centred on January (December was +4). (see Figure D below).

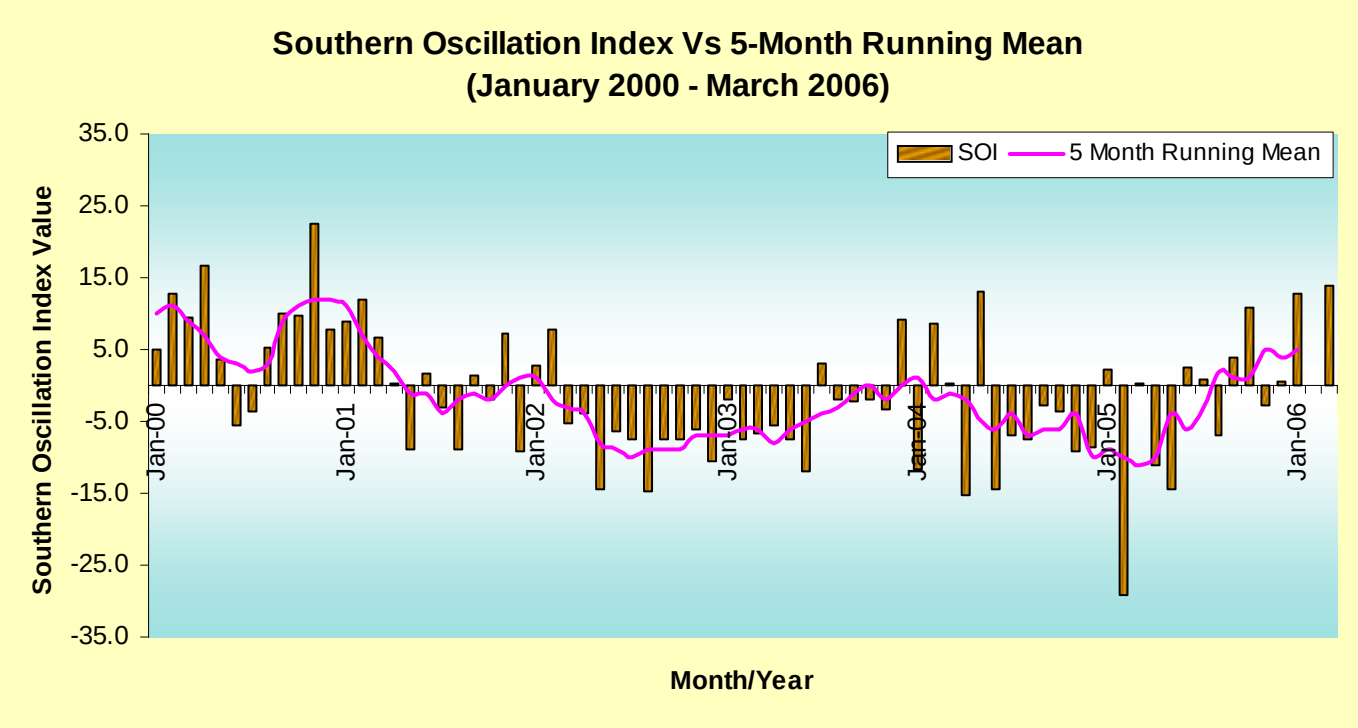
The overall ENSO pattern show a neutral Pacific, but with some features of a La Nina. Subsurface waters in the eastern equatorial Pacific remain significantly cooler than average hence raising the potential of a basin-wide La Nina event to develop. However the current conditions across the Pacific are looking less like a La Nina than they were two months ago.

On the other hand, the SOI has risen to +14. Trade Winds have generally been slightly stronger than average in the western to central Pacific during March.

Computer modelling of the Pacific temperatures generally indicate warming over the next few seasons, with neutral conditions in the southern winter and spring.

*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**




**Tropical Cyclone Season—November 2005 to April 2006**

The 2005/06 Tropical Cyclone season is expected to formally last until 30th April. Currently we are in a Neutral phase of ENSO ( El Nino Southern Oscillation) phenomena but with some features of a La Nina.

Fiji's chances of being hit by a Tropical Cyclone (TC) is slightly higher in the neutral ENSO phase compared to El Niño phase and significantly reduced in a La Niña phase. So far we have had four TCs forming in our region. TC *Tam* formed to the North of Wallis and Futuna on 12th January, moved over Northern Tonga than moved Southeast then finally decayed on the 14th. TC *Urmil* formed to the North of Tonga on 14th January and moved south to southeast before being downgraded on the midnight of 15th.TC *Jim* moved into Fiji's region on midday of 30th January. It passed over the Loyalty Islands and generally moved southeast. TC *Vaianu* formed on 11th February and the system drifted southwest and later turned south, passing between Fiji and Tonga, being closer to Tonga. The TC decayed on 18th February. TC *Wati* formed on the 19th of March and was located west-northwest of Port Vila, Vanuatu moving west-southwest. The TC remained over the waters away from any populated land area and decayed on March 25th.

Based on statistical information, Fiji can expect to be hit by 10 to 15 TCs in a decade of which 2 to 4 could do severe damage. Since 1995, the only major damage was done by TC *Gavin (*1997– Western and South Western parts of Fiji) and TC *Ami* (2003– Northern and Eastern parts of Fiji). Therefore the chance of a big hit is rather high.

Based on the statistics 7 to 9 TCs form in the South-West Pacific region. Given the trend of more and more extreme events occurring in different parts of the world, one should always prepare for a worse one yet to come.

## RAINFALL PREDICTIONS AND OUTLOOK TO MAY 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 *average* to *above average* at Rotuma.

**RAINFALL OUTLOOK FOR FIJI ISLANDS APRIL TO JUNE 2006**

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

As this is the *Tropical Cyclone Season* Fiji can expect above average rainfall if a tropical disturbance or tropical cyclone passes over or reasonably close to the west of the Group.

**NOTE:**
**The confidence level of this prediction is *low-moderate*.**

## PRELIMINARY CLIMATOLOGICAL SUMMARY FOR MARCH 2006

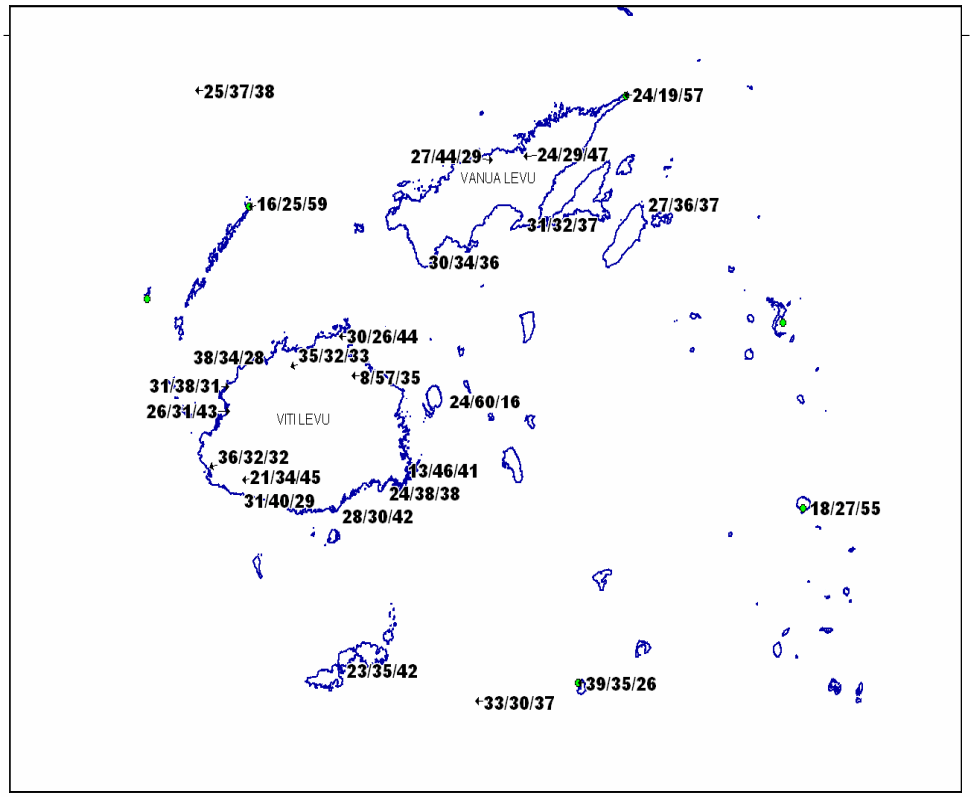
PRELIMINARY CLIMATOLOGICAL DATA FOR MONTH 3 , 2006 : SUMMARY FOR DAYS 1 TO 31

| | RAINFALL | | | | | AIR TEMPERATURES | | | | | | | | SUNSHINE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL | RAIN * | DAYS + | MAX. FALL | | AVERAGE DAILY MAX. | # | AVERAGE DAILY MIN. | # | EXTREME MAX. | | EXTREME MIN. | | TOTAL | * |
| | MM | % | | MM | ON | C | | C | | C | ON | C | ON | HRS | % |
| NADI AIRPORT | 190 | 56 | 17 | 33 | 30 | 31.7 | 0.4 | 23.5 | 0.7 | 33.4 | 18 | 22.0 | 21 | 239 | 125 |
| SUVA/LAUCALA BAY | 197 | 53 | 24 | 30 | 15 | 32.5 | 1.6 | 24.5 | 0.6 | 34.2 | 29 | 22.9 | 11 | 222 | 131 |
| NACOCOLEVU | 109 | 40 | 15 | 25 | 21 | 32.8 | 1.7 | 23.0 | 0.5 | 35.0 | 6 | 21.8 | 22 | 197 | 130 |
| ROTUMA | 224 | 61 | 25 | 32 | 17 | 31.3 | 0.7 | 25.3 | 0.6 | 32.2 | 28 | 24.2 | 12 | 195 | 118 |
| VIWA | 167 | 69 | 11 | 54 | 17 | 32.6 | 1.6 | 26.0 | 0.8 | 33.6 | 20 | 23.6 | 17 | | |
| UDU POINT | 164 | 51 | 24 | 43 | 5 | 32.0 | 1.3 | 25.1 | 0.7 | 33.0 | 28 | 23.5 | 11 | | |
| LABASA AIRFIELD | 102 | 27 | 10 | 50 | 20 | 33.2 | 1.7 | 23.0 | 0.7 | 34.8 | 29 | 21.2 | 3 | | |
| NABOUWALU | 102 | 30 | 20 | 30 | 6 | 31.9 | 1.8 | 25.2 | 0.9 | 34.0 | 13 | 23.3 | 22 | | |
| SAVUSAVU AIRFIELD | 278 | 98 | 11 | 118 | 22 | 31.4 | 0.8 | 23.9 | 0.3 | 32.6 | 16 | 21.0 | 14 | | |
| MATEI AIRFIELD | 227 | 60 | 22 | 41 | 11 | 31.0 | 0.7 | 24.9 | 0.7 | 32.0 | 8 | 22.5 | 11 | | |
| YASAWA-I-RARA | 116 | 42 | 15 | 34 | 19 | 32.0 | 1.4 | 24.8 | 0.2 | 33.9 | 28 | 22.9 | 12 | | |
| VATUKOULA | 230 | 60 | 15 | 52 | 3 | 33.1 | 1.5 | 23.1 | 0.9 | 34.8 | 1 | 21.5 | 21 | | |
| MONASAVU | 239 | 35 | 25 | 32 | 6 | 26.8 | 1.2 | 20.2 | 0.9 | 29.0 | 4 | 17.7 | 11 | | |
| NAUSORI AIRPORT | 225 | 59 | 24 | 55 | 9 | 31.7 | 1.2 | 23.7 | 0.5 | 32.9 | 27 | 22.1 | 10 | | |
| NAVUA/TOKOTOKO | 229 | 57 | 21 | 38 | 10 | 31.2 | 1.0 | 22.9 | -0.2 | 33.5 | 14 | 21.5 | 23 | | |
| ST. JOHNS COLLEGE | 237 | 75 | 17 | 63 | 4 | 31.3 | 0.8 | 25.4 | 1.0 | 32.0 | 1 | 23.5 | 12 | | |
| LAKEBA | 87 | 30 | 20 | 31 | 11 | 31.3 | 1.0 | 24.5 | 0.5 | 32.3 | 8 | 20.5 | 21 | | |
| MATUKU | 105 | 41 | 17 | 22 | 16 | 30.9 | 0.5 | 24.7 | 0.1 | 33.8 | 23 | 21.5 | 20 | | |
| VUNISEA | 226 | 75 | 21 | 42 | 5 | 31.3 | 1.3 | 24.8 | 1.3 | 32.5 | 14 | 22.1 | 22 | | |
| ONO-I-LAU | 80 | 32 | 9 | 20 | 9 | 31.5 | 2.2 | 25.0 | 0.6 | 33.4 | 22 | 22.1 | 5 | | |
| BA/RARAWAI MILL | 189 | 52 | 14 | 54 | 17 | 33.0 | 1.0 | 22.8 | 0.5 | 34.5 | 27 | 21.0 | 18 | | |
| LAUTOKA AES | 109 | 35 | 16 | 16 | 3 | 32.0 | 1.0 | 24.3 | 0.5 | 33.0 | 26 | 21.5 | 15 | | |
| PENANG MILL | 149 | 35 | 20 | 39 | 17 | 32.2 | 1.7 | 24.5 | 0.7 | 33.0 | 21 | 22.4 | 22 | | |

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

### FIGURE E

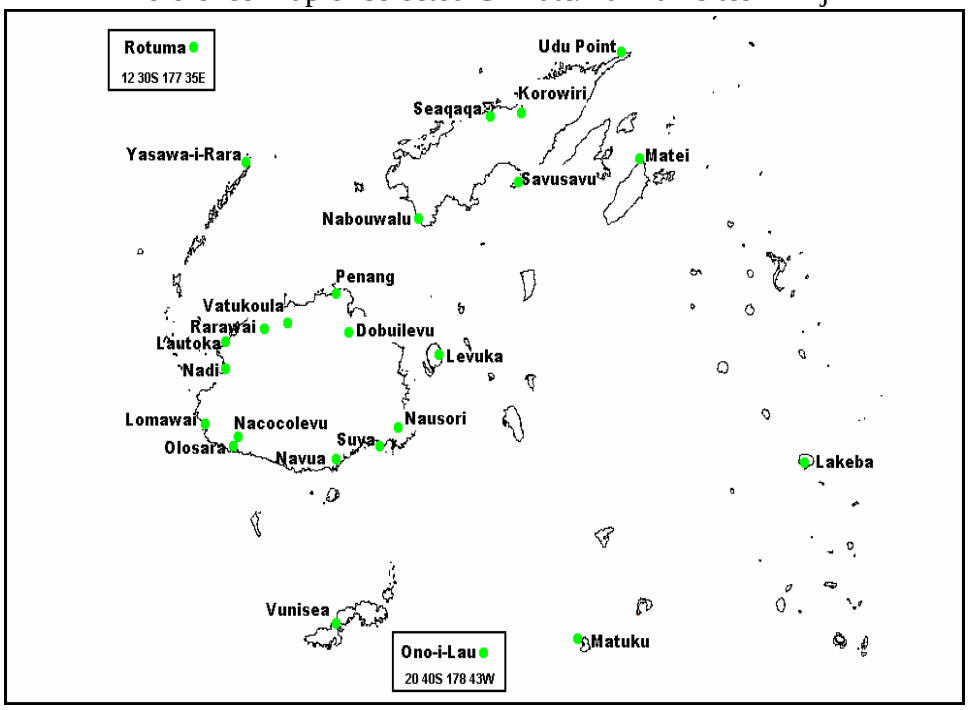
Three Month Forecast for Selected Stations in Fiji using the




Please note that the probabilities are listed beside 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 67th Percentile

| Station | 33% (mm) | 67% (mm) |
|---|---|---|
| **Western Division** | | |
| Dobuilevu | 433.6 | 608.0 |
| Vatukoula | 314.0 | 474.6 |
| Rarawai | 292.9 | 431.9 |
| Penang | 365.3 | 508.0 |
| Lautoka | 260.3 | 393.3 |
| Nadi | 256.1 | 373.0 |
| Lomawai | 241.3 | 348.6 |
| Nacocolevu | 276.0 | 370.2 |
| Olosara | 256.8 | 429.3 |
| Yasawa | 301.0 | 444.4 |
| **Central Division** | | |
| Navua | 764.2 | 992.1 |
| Suva | 678.1 | 854.0 |
| Nausori | 642.1 | 812.9 |
| **Eastern Division** | | |
| Levuka | 520.5 | 760.2 |
| Lakeba | 328.5 | 509.0 |
| Matuku | 354.1 | 472.3 |
| Ono-I-Lau | 281.5 | 458.6 |
| Vunisea | 491.4 | 611.3 |
| **Northern Division** | | |
| Labasa Mill | 372.0 | 481.3 |
| Seaqaqa | 320.9 | 503.2 |
| Nabouwalu | 483.0 | 667.0 |
| Savusavu | 426.0 | 633.8 |
| Udu Point | 405.4 | 559.0 |
| Matei | 508.0 | 704.7 |
| **Rotuma** | 750.0 | 906.8 |