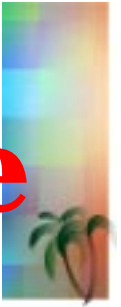


# 29

7 February 2003

# The Island Climate Update



An overview of the present climate in the tropical South Pacific, with an outlook for the coming months, to assist in dissemination of climate information in the Pacific region

Produced by the National Institute of Water and Atmospheric Research, New Zealand

NIWA

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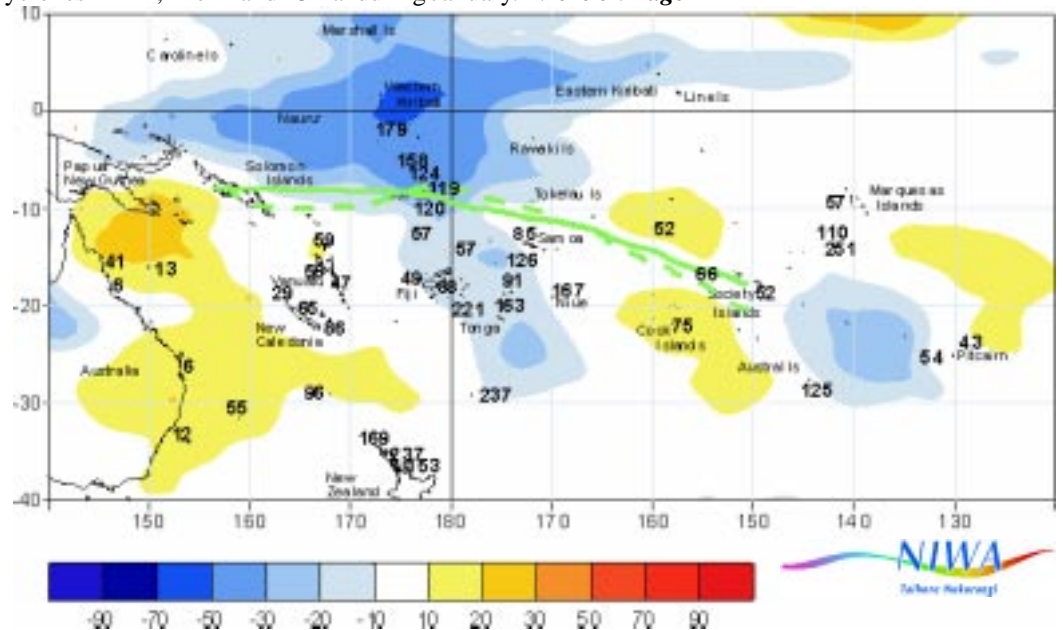
UK Meteorological Office

International Research Institute for Climate Prediction, IRICP

World Meteorological Organisation, WMO

### January's climate

The decaying El Niño continues to affect Southwest Pacific climate patterns with enhanced convection and above average rainfall over the equatorial regions of Kiribati and Tuvalu. Continuing suppressed convection and below average rainfall was evident over eastern Australia and New Caledonia, extending to parts of Vanuatu, Wallis and Futuna and Fiji. Rainfall was below average in Northern and Southern Cook Islands, parts of French Polynesia and Pitcarin Island. The South Pacific Convergence Zone (SPCZ) was in its normal position during January. There were three tropical cyclones 'Ami', 'Beni' and 'Cilla' during January. **More on Page 2**



Outgoing Long-wave Radiation (OLR) anomalies, in  $Wm^{-2}$  are represented by hatched areas, and rainfall percentage of average, shown by numbers. High radiation levels (yellow) are typically associated with clearer skies and lower rainfall, while cloudy conditions lower the OLR (blue) and typically mean higher rainfalls. The January 2003 position of the South Pacific Convergence Zone (SPCZ), as identified from total rainfall, is indicated by the solid green line. The average position of the SPCZ is identified by the dashed green line.

### ENSO and sea surface temperatures

The El Niño event is likely to last through the southern hemisphere autumn. The Southern Oscillation Index (SOI) has weakened in January to -0.2, with a three month mean of -0.8, indicating that the current El Niño Southern Oscillation (ENSO) conditions may have peaked and appear to be waning. Sea surface temperatures (SST) in the equatorial Pacific weakened during January. **Details Page 2.**

### The next three months February to April 2003

Enhanced convection and above average rainfall is expected to persist over equatorial region, with average or above average rainfall in Tuvalu, Tokelau, Wallis & Futuna, Samoa, Northern Cook Islands and Society Islands. Below average or average rainfall is likely from Vanuatu trending south east to Austral Islands is likely. Below average rainfall is forecast for New Caledonia, Marquesas and Pitcairn Islands. **More on Page 3.**



Ministry for the Environment and Territory  
Department for Global Environment, International and Regional Co-operation



New Zealand Agency for International Development  
Nga Hoe Tuputupu-mai-tawhiti





## Climate developments in January 2003

**El Niño related convection continues in the equatorial region**

**Suppressed convection in eastern Pacific, southeast from Papua New Guinea to New Caledonia**

The SPCZ was close to its average position during January, extending southeast from Solomon Islands to Society Islands. This region merged with the Inter-Tropical Convergence Zone (ITCZ) resulting in enhanced convection over Western Kiribati and in the central equatorial Pacific just north and east of the dateline.

January rainfall was at least 180% of average (and approximately 500 mm or more

CLIMATE EXTREMES IN JANUARY 2003				
Country	Location	Rainfall (mm)	% of average	Comments
Australia	Brisbane	10.0	6	Record Low
Australia	Sydney	12.2	12	Extremely Low
Australia	Willis Island	27.0	13	Extremely Low
New Caledonia	Koumac	22.6	13	Extremely Low
Niue	Hanan Airport	433.3	167	Record High
Kiribati	Tarawa	501.2	179	Well above average
Fiji	Ono-i-Lau	367.0	221	Extremely High
Tonga	Fua'amotu Airport	413.1	203	Extremely High
French Polynesia	Hereheretue	526.2	199	Extremely High

Country	Location	Max Air Temp (°C)	Date	Comments
Fiji	Ono-I-Lau	33.2	10th	Record High
Fiji	Labasa	34.9	11th	Record High
Fiji	Vatukoula	37.4	12th	Record High

at Tarawa) over the central equatorial Pacific region. Three tropical cyclones brought high rainfall events to countries which were experiencing dry conditions i.e. New Caledonia, parts of Fiji and Tonga .

The large region of suppressed convection continues in the Indonesian region, extending to affect Papua New Guinea, northern Australia, Vanuatu and New

Caledonia, where rainfall is less than 60% of average in many areas. Rainfall was also below average in parts of Fiji, Cook Island, Society Islands and Marquesas Islands.

Temperatures were generally warmer than usual with Fiji recording three new high maximum temperature records during January.

**El Niño fading and likely to return to neutral state by late autumn of 2003**

**Equatorial Pacific SSTs weakened during January**

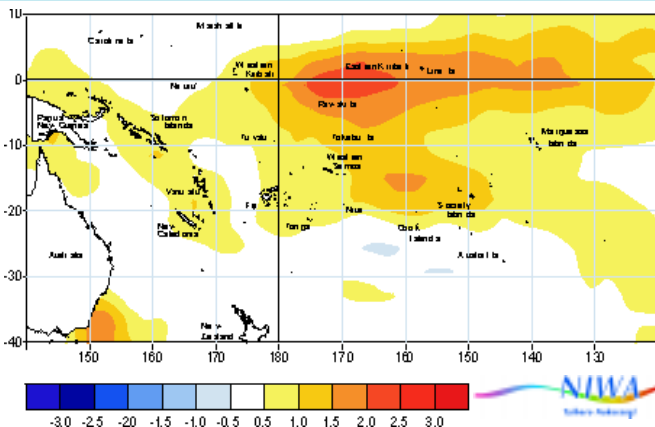
The El Niño event has peaked and is waning. There was noticeable cooling of SSTs off the South American coast during the month.

The NINO3 SST anomaly was weaker in January than in December (now +1.1°C), while NINO4 was constant at +1.3°C. Three month (November to January) means are about +1.5°C and 1.4°C for NINO3 and NINO4, respectively. Westerly zonal wind anomalies have reduced in horizontal extent to a region near the dateline, where SST anomalies remain around +2°C and convection remains strongly enhanced. The area of suppressed convection in the west

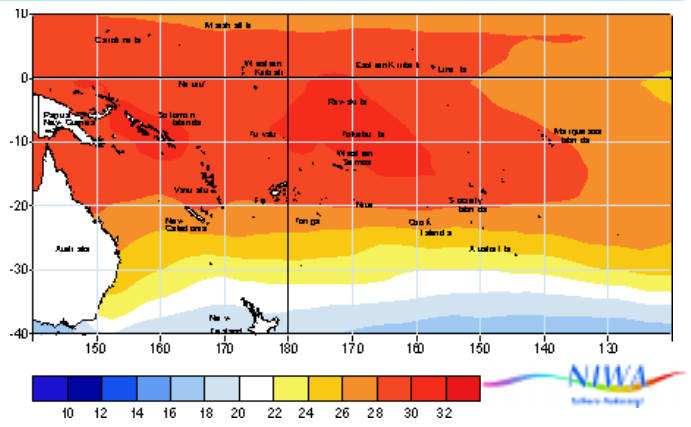
still affects eastern and central Australia, the Coral Sea and the north Tasman Sea.

Equatorial subsurface temperature anomalies have weakened east of the dateline, to be no more than +2°C across the eastern Pacific mixed layer.

Half of the Global Climate Models indicate a warm El Niño event into mid-autumn, with return to neutral conditions by late autumn.



Sea surface temperature anomalies (°C) for January 2003



Mean sea surface temperatures (°C) for January 2003



## Forecast validation

**Forecast period: November 2002 to January 2003**

The El Niño related region of enhanced convection over Western and Eastern Kiribati was expected to persist, resulting in continued above average rainfall there, and above average or average rainfall in Wallis and Futuna, Tuvalu, and Tokelau. A tendency towards below average rainfall was expected from Papua-New Guinea east-southeast to the Austral Islands, including New Caledonia, Fiji, Vanuatu,

Tonga, Niue, and the Southern Cook Islands. Near average rainfall was projected elsewhere.

The overall rainfall anomaly pattern was similar to what was expected. However, the region of above average rainfall was larger than expected, extending south from Tuvalu and Tokelau to include Wallis and Futuna and Samoa.

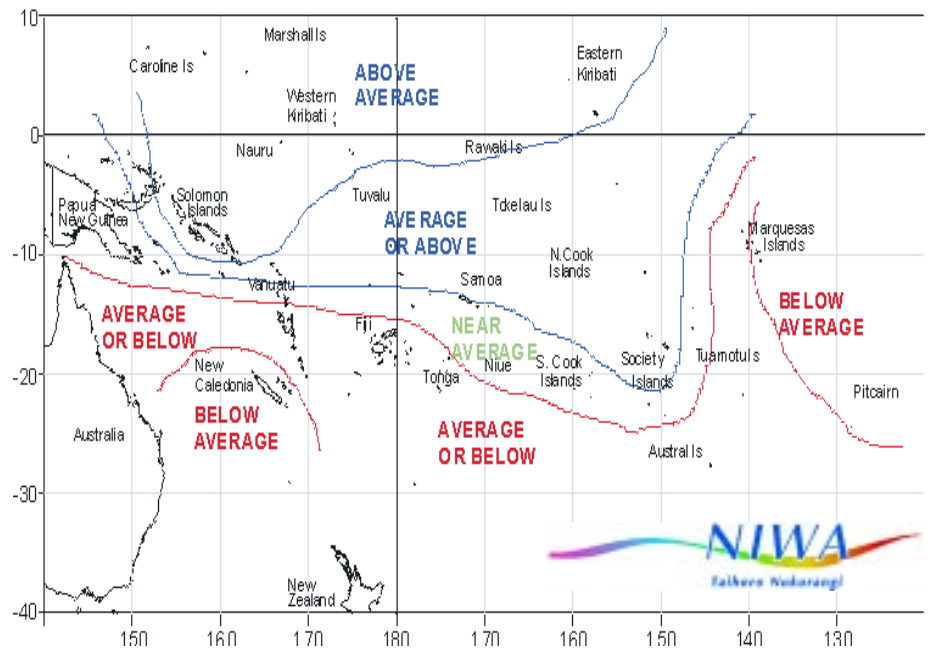


## Rainfall outlook: February to April 2003

**Above average or average rainfall in equatorial latitudes from west to east and the Solomon Islands trending southeast to Society Islands.**

**Below average or average rainfall from Vanuatu, Fiji, New Caledonia, trending east to the Marquesas Islands and Pitcairn Island.**

**Near average rainfall likely elsewhere.**



Rainfall outlook map for February to April 2003

Rainfall is expected to be above average in the equatorial Pacific from west to east due to continuing enhanced convection, resulting in above average rainfall in Western and Eastern Kiribati and the Solomon Islands. Average or above average rainfall is the likely outcome from

Tuvalu trending east southeast to Samoa, Northern Cook Islands and Society Islands.

Marquesas and the Pitcairn Islands. Near average rainfall is expected elsewhere in the region.

Below average or average rainfall is likely from Vanuatu east to Austral Islands including Fiji and Tonga. Below average rainfall is expected in New Caledonia, the

The forecast model skills for the current outlook are generally moderate or high for most islands in the region.

### Probabilities of rainfall departures from average

Broad-scale rainfall patterns and anomalies in the southern tropical Pacific area are estimated from the state of large-scale regional climate factors, such as La Niña or El Niño, their effect on the South Pacific and Tropical Convergence Zones, surface and sub-surface sea temperatures, and computer models of the global climate.

Rainfall estimates for the next three months for Pacific Islands are given in the adjacent table. The tercile probabilities (e.g. 20:30:50) are derived from the interpretation of several global climate models. They correspond to the odds of the observed rainfall being in the lowest (driest) one third of the rainfall distribution, the middle one third, or the highest (wettest) one third of the distribution. On the long-term average, rainfall is equally likely (33% chance) in any tercile.

The probabilities shown express the expected shift in the distribution from the long-term average, based on predictions of oceanic and atmospheric conditions. The amount of inter-model forecast consistency is indicated by the levels of confidence expressed in the table.

### TROPICAL PACIFIC RAINFALL OUTLOOK (FEBRUARY - APRIL 2003)

Island Group	Rainfall Outlook	Confidence in the Outlook
Western Kiribati	20:20:60 (Above)	High
Eastern Kiribati	20:20:60 (Above)	High
Solomon Islands	20:30:50 (Above)	Moderate
Tuvalu	20:35:45 (Average or above average)	Moderate
Tokelau	20:35:45 (Average or above average)	Moderate
Wallis & Futuna	15:45:40 (Average or above average)	Moderate
Samoa	15:40:45 (Average or above average)	Moderate
Northern Cook Islands	20:45:35 (Average or above average)	Moderate
Society Island	20:45:35 (Average or above average)	Moderate
Papua New Guinea	20:50:30 (Near average)	Low
Niue	30:50:20 (Near average)	Moderate - High
Southern Cook Islands	25:50:25 (Near average)	Moderate
Vanuatu	50:40:10 (Average or below average)	Moderate
Fiji	40:40:20 (Average or below average)	Moderate - High
Tonga	40:35:25 (Average or below average)	Moderate
Austral Islands	40:40:20 (Average or below average)	Moderate
New Caledonia	45:40:15 (Below average)	Moderate
Marquesas	50:30:20 (Below average)	Moderate
Pitcairn Island	50:30:20 (Below average)	Moderate



# Tropical Cyclone Update

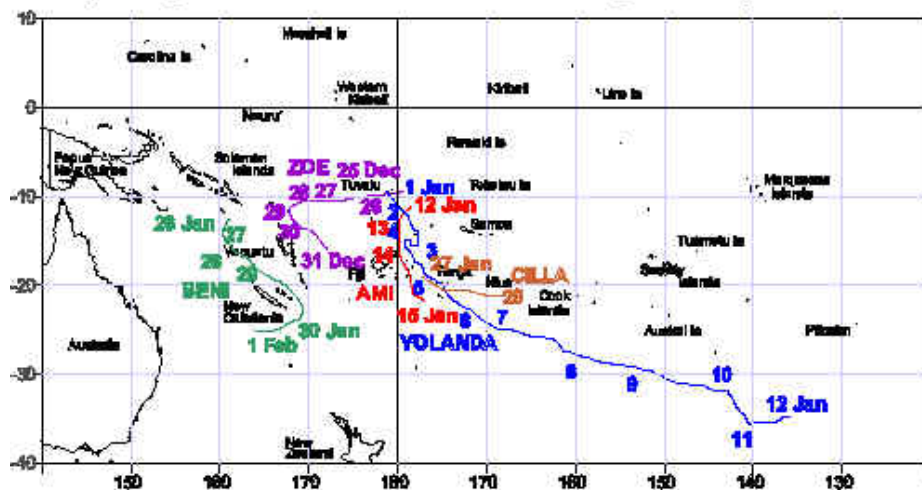
*The tropical cyclone outlook for the current moderate El Niño season (2002/2003) forecasts an eastward spread in cyclone occurrence, with more cyclones than normal expected east of the dateline, and somewhat fewer than normal in the west. So far, the observed pattern of cyclone occurrence has matched well with the forecast pattern.*

This tropical cyclone season (2002/2003) (see Figure 1) has been more active than past few seasons with 'Yolanda', which did not affect any countries and 'Zoe' affecting Solomon Islands, Vanuatu in December 2002. January 2003 was more active with 'Ami' causing havoc in Fiji and Tonga, 'Beni' affecting Vanuatu and New Caledonia and 'Cilla' affecting Tonga.

'Yolanda' developed over southern Tuvalu on 1<sup>st</sup> December 2002 and then tracked south, passing east of Fiji on the 4<sup>th</sup>, then southeast over southern Tonga on the 5<sup>th</sup>. Maximum sustained winds reached 74 km/hr. Fortunately, no damage was caused by this event.

'Zoe' formed on Christmas eve (24<sup>th</sup> December 2002) from a tropical depression near Tuvalu and Fiji's Rotuma Island, intensifying to tropical cyclone intensity as it tracked west on the 26<sup>th</sup>. The system became very intense (Category 5, i.e. the strongest in hurricane definitions) over the Santa Cruz Islands of Tikopia and Anuta in the Solomon Islands from the 28<sup>th</sup> through to the 30<sup>th</sup>, generating high seas, with estimated maximum sustained wind speeds of 287 km/hr, and gusts to 350 km/hr. This event devastated these islands, however there were no casualties.

'Ami' developed just southeast of Tuvalu



**Figure 1 Tropical Cyclones from November 2002 through January 2003**

on 12<sup>th</sup> January 2003 and moved southeast towards Fiji's northern island of Vanua Levu. From the 13<sup>th</sup> to the 14<sup>th</sup>, Ami devastated the northern parts of Fiji and Lau Group (south east island group of Fiji) as it moved south. Average winds of 200 km/hr with momentary gusts of 230 km/hr were reported. Ami further tracked south west to pass just south west of Tonga bringing enormous seas and windspread wind and rain damage to the small island nation. Although Ami was not as strong as Zoe, it caused widespread damage in Fiji as it swept over a much larger area of habitants, killing 14 people. Fiji's Disaster Management Centre declared northern island of Vanua Levu a natural disaster zone. Fiji and Tonga are still reeling from damages of the tropical cyclone Ami.

'Beni' formed from a depression just south of the Solomon Islands on 26<sup>th</sup> January 2003. The system remained stationary over the Renell Bellona Group (the southern group of the Solomon Islands), where 2000 people

took shelter in caves. Beni initially moved west then southeast and passed west of Vanuatu on 28<sup>th</sup>, changing direction to south east on 29<sup>th</sup> towards New Caledonia. The average winds recorded at Ouanaham (New Caledonia) were 90 km/hr, with momentary gusts up to 136 km/hr. The system once again changed direction to move southwest affecting southern parts of New Caledonia from 30<sup>th</sup> till 31<sup>st</sup>.

'Cilla' formed on 27<sup>th</sup> January 2003 from a depression just southeast of Fiji's Lau Group, which was affected by Ami earlier in the month. It tracked east to affect the central Tongan island group of Ha'apai on the same night. Cilla was a short-lived cyclone, which trailed past just south of Niue on the 28<sup>th</sup> and weakened to a tropical depression.

**Acknowledgement to all National Meteorological Centres in Pacific for provision of information on Tropical Cyclones for current season.**

Visit The Island Climate Update website at: [www.niwa.co.nz/NCC/ICU/](http://www.niwa.co.nz/NCC/ICU/).

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## Sources of South Pacific rainfall data

This bulletin is a multi-national project, with important collaboration from the following Meteorological Services:

American Samoa Australia Cook Islands Fiji French Polynesia Kiribati New Caledonia New Zealand  
Niue Papua New Guinea Pitcairn Samoa Solomon Islands Tokelau Tonga Tuvalu Vanuatu

Requests for Pacific island climate data should be directed to the Meteorological Services concerned.

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**DISCLAIMER:** This summary is prepared as soon as possible following the end of the month, once the data and information are received from the Pacific Island meteorological services. Delays in data collection and communication occasionally arise. While every effort is made to verify observational data, NIWA does not guarantee the accuracy and reliability of the analysis and forecast information presented, and accepts no liability for any losses incurred through the use of this bulletin and its contents.

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