

Number 71, August 2006

The Island Climate Update

Collaborators

Pacific Islands National
Meteorological Services

Australian Bureau of
Meteorology

Meteo France

NOAA National Weather
Service

NOAA Climate
Prediction Centre
(CPC)

International Research
Institute for Climate
and Society

European Centre for
Medium Range Weather
Forecasts

UK Met Office

World Meteorological
Organization

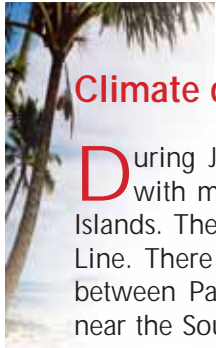
July's climate

- South Pacific Convergence Zone (SPCZ) located near the Solomon Islands
- High rainfall in the Southern Cook Islands and parts of southern French Polynesia
- Low rainfall persists throughout New Caledonia
- Temperature: above average in Tuvalu, and parts of central and southern French Polynesia; below average in New Caledonia and parts of Fiji

El Niño/Southern Oscillation (ENSO) and seasonal rainfall forecasts

- The tropical Pacific remains in a neutral ENSO state
- Above average rainfall expected over the Solomon Islands
- Below average rainfall likely over Tuvalu and Tokelau





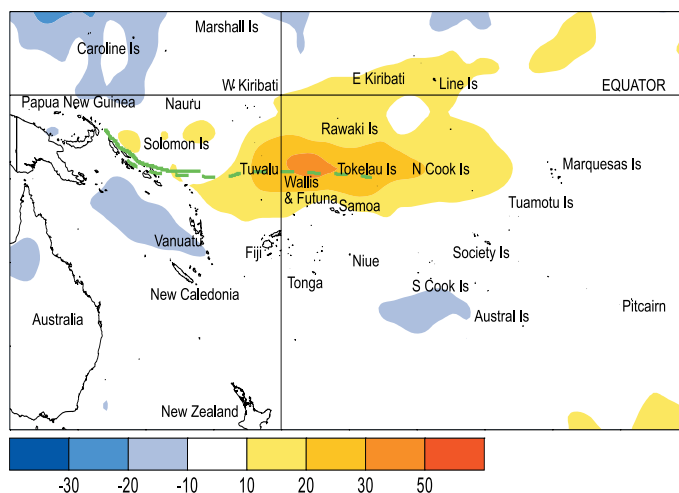
Climate developments in July 2006

During July, the SPCZ was weaker than average, with most of its activity being near the Solomon Islands. The SPCZ was fairly inactive east of the Date Line. There were weak regions of enhanced convection between Papua New Guinea and Vanuatu, and also near the Southern Cook Islands. Rainfall was between 250 and 325% of average in the Southern Cook Islands and parts of central and southern French Polynesia.

A region of suppressed convection affected Tuvalu, Tokelau, and the Northern Cook Islands. Rainfall was 50% or less of average throughout much of New Caledonia.

Mean air temperatures were 1.0 °C or more above average in much of Tuvalu, and parts of central and southern French Polynesia. In contrast, they were at least 0.5 °C below average throughout much of New Caledonia, and more than 1.0 °C below average in parts of Fiji.

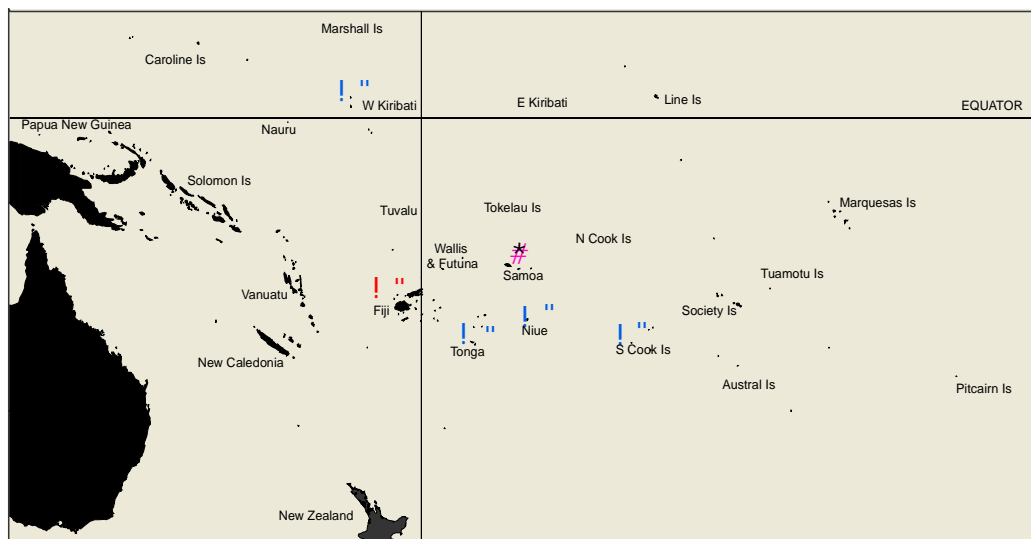
Tropical Southwest Pacific mean sea-level pressures were above average in the Tasman Sea, near average near the Date Line, and below average over the Southern Cook Islands. Equatorial surface easterlies occurred in 60% of observations at Tarawa, the lowest frequency of occurrence there since 55% in February 2005.



Outgoing Long-wave Radiation (OLR) anomalies, in Wm^{-2} (blue equals high rainfall and yellow equals low rainfall). The July 2006 position of the 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..

Country	Location	Rainfall (mm)	% of average	Comments
Cook Islands	Rarotonga Airport	335	322	Record high
French Polynesia	Tahiti - Faaa	161	303	Well above average
French Polynesia	Rapa	637	253	Record high
New Caledonia	Koumac	6	12	Extremely low

Soil moisture in July 2006



July 2006

- ! Dry
- ! Wet
- * Moderate

July 2005

- ! Dry
- ! Wet
- * Moderate

Estimated soil moisture conditions at the end of July 2006, using monthly rainfall data.

Estimates of soil moisture shown in the map (above) are based on monthly rainfall for one station in each country. Currently there are not many sites in the water balance model. It is planned to include more stations in the future.

The information displayed is based on a simple water balance technique to determine soil moisture levels. Addition of moisture to available water already in the soil comes from rainfall with losses via evapotranspiration. Monthly rainfall and evapotranspiration are used to determine the soil moisture level and its changes.

Please note that these soil moisture calculations are made at the end of the month. For practical purposes, generalisations were made about the available water capacity of the soils at each site.

At the end of July 2006, Tarawa, Fua'amotu, Hanan Airport, and Rarotonga were at field capacity (full). Nadi soils were dry, typical for the time of the year. Apia soils were moderate.

El Niño/Southern Oscillation (ENSO)

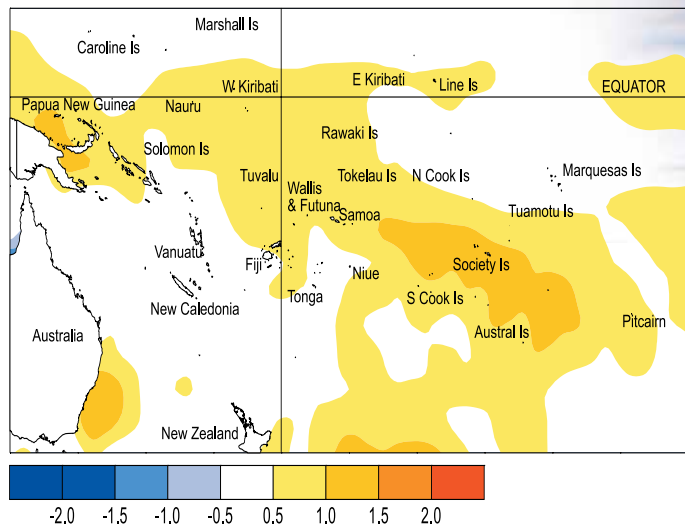
The tropical Pacific remains in a neutral state, though there has been continued warming in the upper layers of the Equatorial Pacific Ocean the past two months. Equatorial Pacific sea surface temperature (SST) anomalies are now positive across the whole basin.

The NINO3 SST anomaly for July was about +0.5 °C (+0.4 °C for May–July) and NINO4 was about +0.6 °C (+0.5 °C for May–July). Subsurface temperature anomalies have strengthened a little further in the east, with a +2 °C anomaly now east of 120°W in the top 50–100 m.

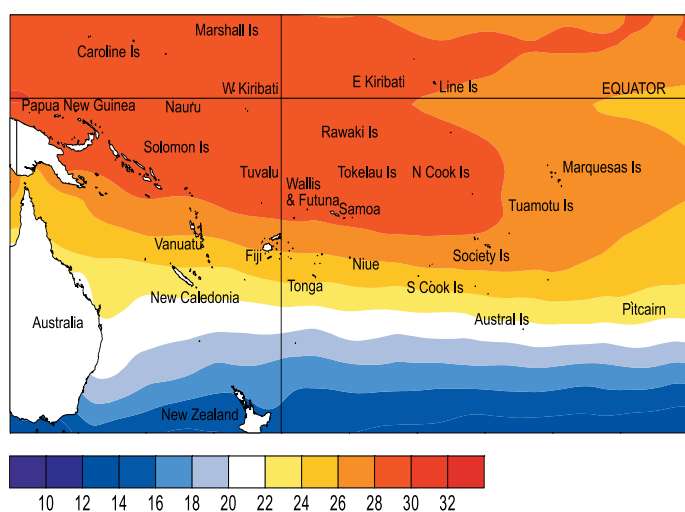
The Southern Oscillation Index (SOI) fell slightly to –0.9 in July, from –0.7 in June, with the May–July mean at –0.9. There have been significant westerly wind anomalies along the equator in July, west of the Date Line. The NASA ENSO precipitation index was +0.65 for July, up from –1.1 in June, suggesting a fairly rapid change in the organisation of convection in the tropical Pacific.

Most models keep SST anomalies at or slightly above their present levels through the rest of the year, with four predicting at least a weak El Niño state by late 2006. The NCEP synopsis is for neutral conditions until October, and an uncertain outlook over summer 2006/07.

The IRI indicate neutral ENSO conditions are favoured for the remainder of 2006, with a 65% likelihood through September, and 60% thereafter. An El Niño is rated as a 35% probability by year-end, with La Niña at 5% probability.



Sea surface temperature anomalies (°C) for July 2006.



Mean sea surface temperatures (°C) for July 2006.

Madden-Julian Oscillation (MJO) and Subtropical highs

The MJO has shown some activity lately, with a convective centre moving across the Date Line over the last couple of weeks. The amplitude is fairly weak at present.

During July, the latitude of the subtropical high pressure belt was at about 30°S across the South Pacific. These were stronger than normal west of the Date Line, and weaker than normal east of the Date Line.

Forecast validation: May to July 2006

Suppressed convection with below average rainfall was expected over Tokelau, with near or below average rainfall in Western and Eastern Kiribati, extending to Tuvalu, the Northern Cook Islands, and the Marquesas Islands. Average or above average rainfall was expected to extend from Papua New Guinea southeast to the Austral Islands, including Vanuatu, Tonga, and the Society Islands, with above average rainfall in Niue and the Southern Cook Islands. Near average rainfall was expected elsewhere in the region.

affected the region near Papua New Guinea and the Solomon Islands, as well Niue, parts of Fiji, the Southern Cook Islands, and the Society and Austral Islands. Suppressed convection or below average rainfall occurred over New Caledonia, Wallis and Futuna, Tokelau, Eastern Kiribati, and Northern French Polynesia. Rainfall was higher than expected in the Solomon Islands and parts of Fiji, and lower than expected in Wallis and Futuna. Otherwise the overall rainfall anomaly pattern was similar to what was expected. The 'hit' rate for the May–July 2006 outlook was about 70%.

Areas of enhanced convection or above average rainfall

Tropical Pacific rainfall – July 2006

Territory and station name	July 2006 rainfall total (mm)	July 2006 percent of average
Australia		
Cairns Airport	42.6	147
Townsville Airport	15.8	113
Brisbane Airport	26.8	43
Sydney Airport	124.0	98
Cook Islands		
Rarotonga Airport	335.1	322
Penrhyn	103.4	74
Fiji		
Rotuma	189.7	95
Udu Point	81.2	91
Nadi	35.3	78
Nausori	80.4	68
Ono-I-Lau	64.6	70
French Polynesia		
Hiva Hoa, Atuona	149.0	96
Bora Bora Motu	151.2	202
Tahiti - Faa'a	160.8	303
Tuamotu, Takaroa	119.2	145
Gambier, Rikitea	102.2	66
Tubuai	130.4	90
Rapa	637.4	253
Kiribati		
Tarawa	221.6	141
New Zealand		
Kaitaia	97.6	59
Whangarei Airport	33.4	21
Auckland Airport	68.6	52

Territory and station name	July 2006 rainfall total (mm)	July 2006 percent of average
New Caledonia		
Ile Art, Belep	44.2	30
Koumac	6.2	12
Ouloup	18.6	20
Ouanaham	39.4	39
Poindimie	33.0	26
La Roche	35.8	36
La Tontouta	25.4	40
Noumea	42.6	32
Moue	27.6	32
Niue		
Hanan Airport	103.4	103
North Tasman		
Lord Howe Island	102.8	55
Norfolk Island	116.6	79
Raoul Island	123.4	73
Samoa		
Faleolo	179.4	211
Apia	69.2	60
Tonga		
Lupepau'u	112.2	113
Salote Airport	98.6	110
Fua'amotu Airport	70.2	64
Tuvalu		
Nui Island	95.5	39
Funafuti	317.4	126
Nuilakita	237.1	119

Rainfall totalling 200 percent or more is considered well above average. Totals of 40 percent or less are normally well below average. **Highlighted values are new records.**

Data are published as received and may be subject to change after undergoing quality control checks.

Tropical rainfall outlook: August to October 2006

Enhanced convection is expected to prevail over the Solomon Islands, where rainfall is likely to be above average.

Another large region of near or above average rainfall is expected from Vanuatu southeast to Pitcairn Island, including Wallis and Futuna, Tonga, Niue, the Southern Cook Islands, and the Society Islands and Austral Islands.

Near or below average rainfall is likely over Tuamotu and the Marquesas Islands.

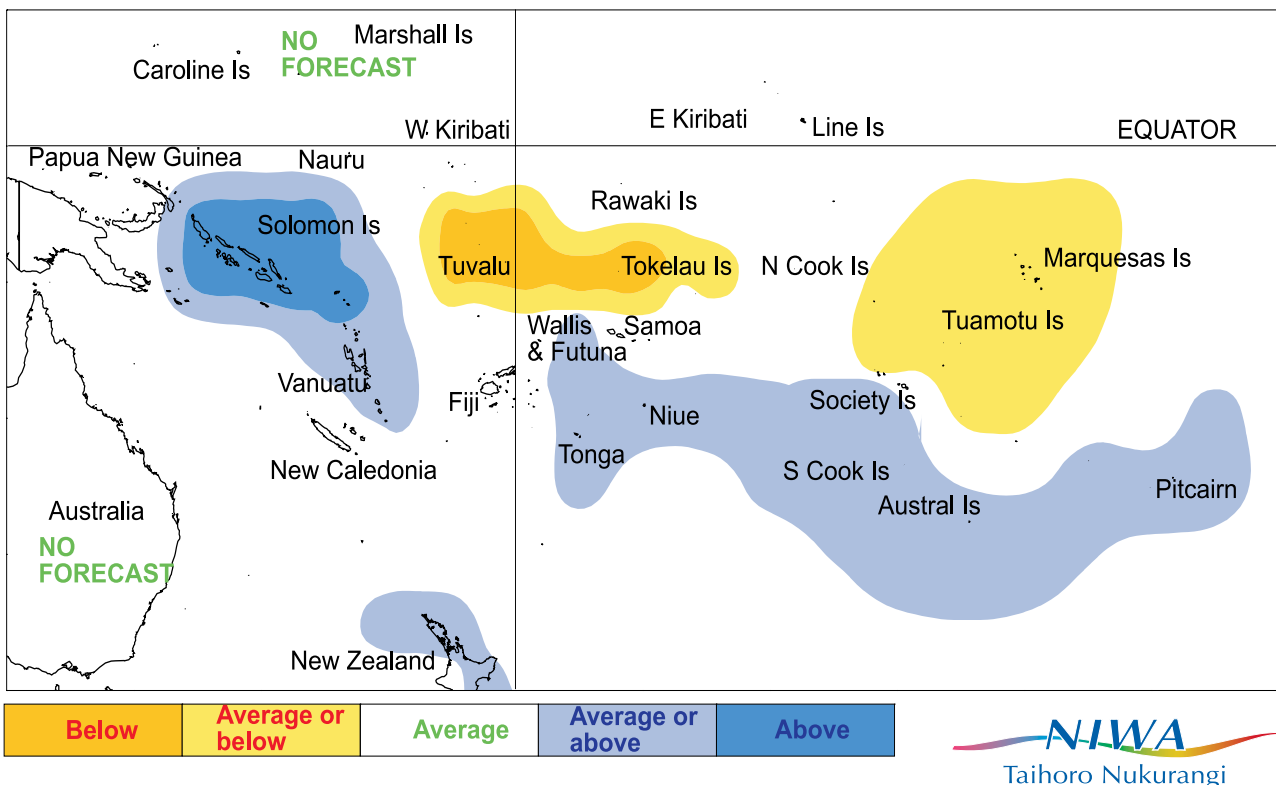
Suppressed convection is expected over Tuvalu and Tokelau, where rainfall is expected to be below average.

Near average rainfall is likely for the other countries in the region.

Confidence in the forecast model skill for this time of the year is about moderate for all the Pacific Island countries.

Island group	Rainfall outlook	Outlook confidence
Solomon Islands	20:30:50 (Above average)	Moderate
Vanuatu	15:45:40 (Near or above average)	Moderate
Wallis & Futuna	20:40:40 (Near or above average)	Moderate
Tonga	20:40:40 (Near or above average)	Moderate
Niue	20:40:40 (Near or above average)	Moderate
Southern Cook Islands	20:40:40 (Near or above average)	Moderate
Society Islands	20:40:40 (Near or above average)	Moderate
Austral Islands	20:40:40 (Near or above average)	Moderate
Pitcairn Island	20:40:40 (Near or above average)	Moderate
Papua New Guinea	25:40:35 (Near average)	Moderate
New Caledonia	35:40:25 (Near average)	Moderate
Western Kiribati	30:40:30 (Near average)	Moderate
Eastern Kiribati	30:40:30 (Near average)	Moderate
Samoa	20:45:35 (Near average)	Moderate
Fiji	30:40:30 (Near average)	Moderate
Northern Cook Islands	35:45:20 (Near average)	Moderate
Tuamotu Islands	40:40:20 (Near or below average)	Moderate
Marquesas	40:40:20 (Near or below average)	Moderate
Tuvalu	45:35:20 (Below average)	Moderate
Tokelau	45:35:20 (Below average)	Moderate

NOTE: Rainfall estimates for Pacific Islands for the next three months are given in the 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.



Rainfall outlook map for August to October 2006.

South Pacific Sea level and Climate Monitoring Project

Philip Hall, SPSCLCMP & Mary Power, SOPAC

The South Pacific Sea Level and Climate Monitoring Project (SPSLCMP) commenced in 1991 with the primary goal of generating an accurate record of variance in long-term sea level for the South Pacific and to establish methods to make these data readily available and usable by Pacific Island Countries (PICs). The project provides high quality data for use by the international scientific community and PICs to better understand the potential impacts of climate change and to plan adaptation responses across many sectors including the planning and development of coastal resources, management of fresh water resources, agriculture, fisheries, tourism and infrastructure. The SPSLCMP has entered its fourth phase, which commenced on 1 January 2006 and extends to 31 December 2010.

AusAID has engaged the Australian Bureau of Meteorology (BoMET) to provide overall project management and coordination for Phase IV. BoMET is working with its implementing partners Geoscience Australia (GA) and South Pacific Geoscience Commission (SOPAC), the National Meteorology Services (NMSs) and South Pacific Regional Environment Programme (SPREP) to strengthen relationships with regional stakeholders and to maintain the collective focus on the SPSLCMP's primary purpose of sea level monitoring.

Phase IV will provide ongoing operation and maintenance of the existing 12 high resolution sea level (SEAFRAME) monitoring stations and 10 Continuous Global Positioning System (CGPS) sites located in the Cook Islands, Fiji, Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu; install two CGPS stations deferred from Phase III (Solomon Islands and Marshall Islands); manage presentation and analysis of sea level data; and develop data products to meet the needs of stakeholders, especially the NMSs in the participating PICs.

Phase IV also incorporates some changes in administration and funding mechanisms. To ensure continuity of data collection, recurrent costs for communications and utilities associated with project sites will now be absorbed by the project rather than be borne by the participating PICs. PICs will continue to provide in-country support and facilities required by the network, such as providing access

to associated land and infrastructure and performing "first-in" maintenance on behalf of BoMET, GA and SOPAC.

AusAID will undertake a strategic review of the Project in 2007 to ensure that the Project's long term directions provide for long-term sustainability and are effectively aligned with other emerging regional climate activities and priorities. Extension of the network to include SEAFRAME and CGPS sites in Niue and Palau will be considered within the context of the strategic review.

The SPSLCMP is succeeding in its goal to provide an accurate continuous long-term record of sea level in the Pacific region for partner countries and the international scientific community that enables them to respond to and manage climate-related impacts



For more information contact:

Philip Hall
Project Manager, SPSLCMP
Email: philip@faerberhall.com
Web: <http://www.bom.gov.au/pacificsealevel/>

Mary Power
Manager Ocean and Islands Programme
South Pacific Applied Geoscience Commission (SOPAC)
Email: Mary@sopac.org

The Island Climate Update

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Your comments and ideas about The Island Climate Update are welcome. Please contact:

Project Director: Dr Jim Salinger, NIWA, Private Bag 109 695, Newmarket, Auckland, New Zealand. E-mail: j.salinger@niwa.co.nz

Editors:
Ashmita Gosai Email: a.gosai@niwa.co.nz
Stuart Burgess Email: s.burgess@niwa.co.nz

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 Island, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu

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NIWA

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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 National Meteorological Services (NMHS). 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 content.

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