20
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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.

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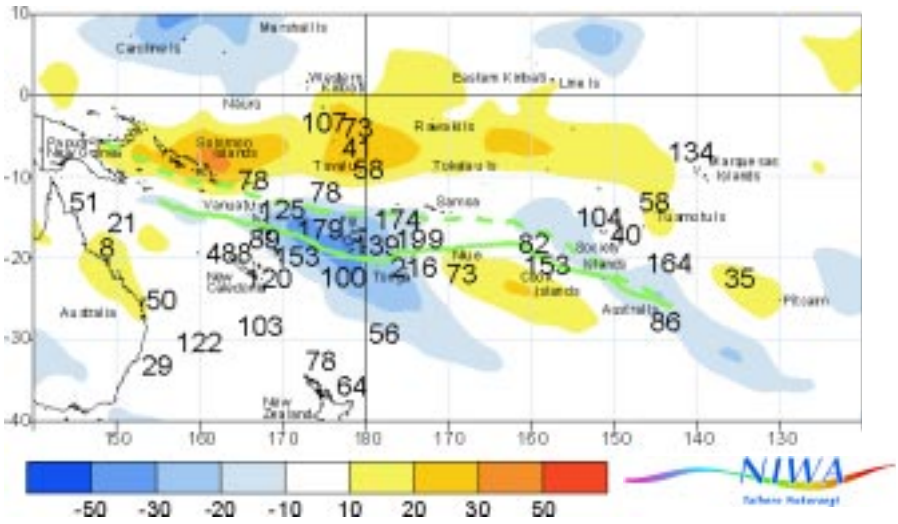
April's climate

The SPCZ was displaced further south than average about and west of the date line, with a large area of enhanced convection affecting Fiji and Tonga. Another convective band extended from the Southern Cook Islands to the south of French Polynesia. Rainfall was above average at many locations within these convective areas. Rainfall was also above average in northern areas of New Caledonia. An extensive band of divergence extended from the Solomon Islands to the east of the Northern Cook Islands, with below average rainfall in many areas. Rather dry conditions continued on the Queensland coast of Australia, extending into the western Coral Sea, Willis Island having now recorded 9 consecutive months with less than 75% of average rainfall. Exceptionally high mean air temperatures, associated with unusually warm sea surface temperatures, were measured in parts of Fiji and central French Polynesia. *More on Page 2.*



Outgoing Long-wave Radiation (OLR) anomalies, in Wm^{-2}, for February 2002 represented by shaded 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 April 2002 position of the South Pacific Convergence Zone (SPCZ), as identified from total rainfall, is indicated by the solid green line. The average climatological position of the SPCZ is identified by the dashed green line. Data source: NOAA-CIRES Climate Diagnostics Center.

ENSO and sea surface temperatures

It is still possible that an El Niño event will influence the Southwest Pacific climate by September this year. However it may only be weak, as any progress has been slow, with little change occurring in either atmospheric or oceanic conditions in the tropical Pacific over the past month. The Southern Oscillation Index is weakly negative and the equatorial Pacific Ocean remains warmer than average especially off the west coast of South America where enhanced rainfall continued. The next 4-6 weeks remain critical to the establishment of an El Niño episode this year. *Details Page 2.*

The next three months (May to July 2002)

Above average rainfall is likely in both Western and Eastern Kiribati, and Tonga, with average or above average totals in Vanuatu and in southern and central French Polynesia. Average to below average rainfall is expected from the Tokelaus to the Marquesas. *More on Page 3.*

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Climate developments in April 2002

Active convection over Fiji and Tonga

High rainfall in parts of New Caledonia

Low rainfall from the Solomon Islands across to the northern Cook Islands

CLIMATE EXTREMES IN APRIL 2002

Country	Location	Rainfall (mm)	% of normal	Comments
New Caledonia	Koumac	341	488	Highest
New Caledonia	Moue	314	243	Extremely high
Tonga	Fua'amotu Airport	327	216	2nd highest

Country	Location	Mean air temperature, °C	Departure from average	Comments
Fiji	Rotuma	28.6	+1.5	Extremely high
Fiji	Nabouwalu	27.7	+1.6	Extremely high
Fiji	Laucala Bay	27.6	+1.9	Extremely high
French Polynesia	Tahiti-Faaa	28.3	+1.2	Highest
French Polynesia	Tuamotu, Takaroa	29.3	+1.0	Extremely high

The SPCZ was displaced further south than average about and west of the date line, with a large area of enhanced convection affecting Fiji and Tonga, with another convective band further east extending from the Southern Cook Islands to the south of French Polynesia. Other regions of enhanced convection associated with the Inter-tropical Convergence Zone (ITCZ) affected regions north of the equator, including the Caroline and Marshall Islands and parts of eastern Kiribati. Rainfall was at least 125% of average at many locations within these convective regions. Rainfall was also at least 125% of average in northern areas of New Caledonia, due to high rainfall at the start of the month.

A very extensive region of divergence, with sunny conditions, extended from the Solomon Islands across to the east of the Northern Cook Islands, affecting most islands between 5 and 10ºS, with less than 75% of average rainfall in many areas. Low rainfall (less than 50% of average) rainfall continued on the Queensland coast of Australia, extending into the western Coral Sea. Willis Island having now recorded nine consecutive months with less than 75% of average rainfall.

High mean April air temperatures (1.0ºC or more above average), associated with unusually warm sea surface temperatures, were measured in Fiji and central French Polynesia.

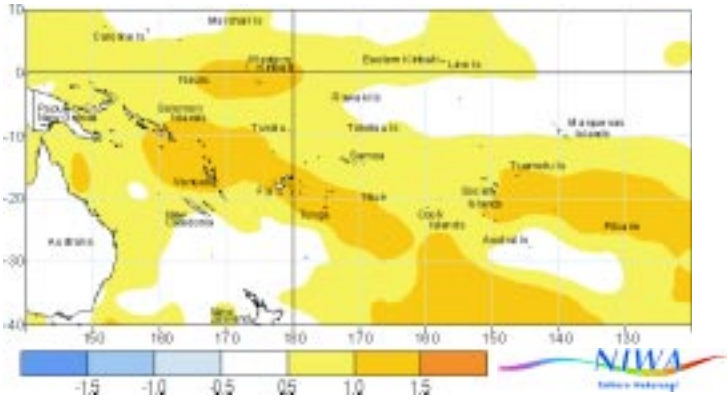
Warmer than average seas persist throughout much of the tropical Southwest Pacific

No further progress towards an El Niño in the last month

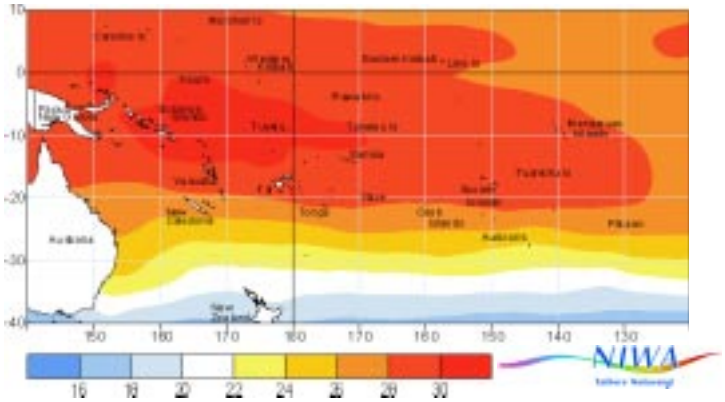
In the tropical Southwest Pacific, a band of much warmer than usual water at the surface (at least 1.0ºC above average) extends from the Solomon Islands southeast to affect Vanuatu, Fiji, Tonga, Niue, and the region south of the Southern Cook Islands. Surface waters at least 1.0ºC above average also encompass the region from central French Polynesia to the east of Pitcairn Island, as well as Western Kiribati. The warmest surface waters (30-31ºC) extend from the Solomon Islands across to Tokelau.

Equatorial Pacific Ocean temperatures continue warmer than average (US analysis, +1.0ºC) around the date line, and exceed +2ºC in a small region near the South American coast. NINO3 and NINO4 SST anomalies showed little change from March. Overall surface warming is still occurring, although it has been slow. Bands of previously cooler than normal water within 10º of the equator near 120ºW have now all but disappeared. The positive subsurface temperature anomalies the occurred in the upper 100m extending from 160 ºE to South America in March how now gone.

It is still possible that an El Niño event will influence the Southwest Pacific climate later this year but at this stage its progress has been slow, with little change in conditions in the tropical Pacific since March. Present indications show that if an El Niño event does occur it may be weak . *Further details on page 4.*



Sea surface temperature anomalies (°C) for April 2002



Mean sea surface temperatures (°C) for April 2002

Forecast validation

Forecast period: February to April 2002

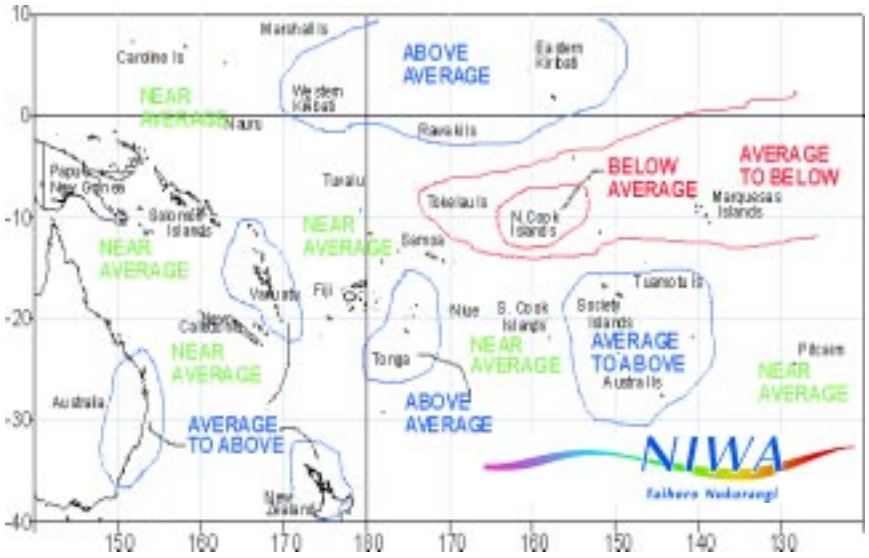
The SPCZ was expected to be more active and further south of its usual position west of the date line, with enhanced trade winds in the east. Areas of above average rainfall were forecast for parts of the Solomon Islands and Fiji. Below average rainfall was forecast for many islands from Western Kiribati across to the Marquesas Islands. Average rainfall was expected elsewhere.

The SPCZ was more active than usual west of the date line, but it affected a much wider area than predicted, resulting in higher rainfall than forecast in Papua-New Guinea, New Caledonia, Tuvalu and Tonga. Rainfall was also higher than expected in Kiribati and the Marquesas and Austral Islands. Rainfall was lower than expected from central French Polynesia across to Pitcairn Island.

The overall 'hit rate' for the February to April rainfall outlook was less than 50%.

Rainfall outlook: May to July 2002

- Above average rainfall in equatorial latitudes from west to east, including Tonga
- Average to below average rainfall from Tokelau to the Marquesas Islands
- Mainly average rainfall in other areas



Rainfall outlook map for May to July 2002

The South Pacific Convergence Zone was further south than average about and west of the date line during April, lying across southern Fiji, and extending east to the Southern Cook and Austral Islands. Rainfall is projected to be above average in Western and Eastern Kiribati, as well as Tonga. Rainfall is likely to be average or above average in Vanuatau and in southern and central French Polynesia. Average rainfall is expected in Papua New Guinea, trending southeast to the Southern Cooks. Average to below average rainfall is projected from Tokelau to the Marquesas. As the southern hemisphere dry season has commenced, the model skill tends to be lower than in previous months.

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
(MAY - JULY 2002)

Island Group	Rainfall Outlook	Confidence in the Outlook
Western Kiribati	10:30:60 (Above)	Moderate
Eastern Kiribati	20:30:50 (Above)	Moderate
Tonga	15:35:50 (Above)	Moderate
Vanuatu	20:40:40 (Average to above average)	Moderate
Society & Tuamotu Islands	20:40:40 (Average to above average)	Low
Austral Islands	20:40:40 (Average to above average)	Moderate
Papua-New Guinea	20:50:30 (Near average)	Moderate
Solomon Islands	15:50:30 (Near average)	Moderate
New Caledonia	25:40:35 (Near average)	Low
Tuvalu	30:50:20 (Near average)	Low
Wallis & Futuna	30:60:10 (Near average)	Moderate
Fiji	30:40:30 (Near average)	Low
Niue	10:60:30 (Near average)	Moderate
Samoa	30:60:10 (Near average)	Moderate
Pitcairn Island	25:45:30 (Near average)	Low
Southern Cook Islands	10:60:20 (Near average)	Moderate
Tokelau Islands	40:40:20 (Average to below average)	Low
Marquesas Islands	45:45:10 (Average to below average)	Moderate
Northern Cook Islands	55:25:20 (Below average)	Moderate

ENSO update

No further progress towards an El Niño in the last month

There is still about a 60% chance of an El Niño event affecting the Southwest Pacific climate by September this year. However, most key indicators remain in neutral values with little change in conditions in the tropical Pacific since March. Although outlook guidance for the Southwest Pacific doesn't indicate anything major at this stage, significant anomalies are still possible should an El Niño evolve.

Present situation and outlook

Historically, we are still in the period of year when transitions to an El Niño are most likely to occur, provided conditions are suitably favourable.

At present, Equatorial Pacific Ocean temperatures continue warmer than average (US analysis, +1.0ºC) around the date line, and exceed +2ºC in a small region near the South American coast. The NINO3 and NINO4 region SST anomalies showed little change from March, but overall surface warming is still occurring, although it has been slow. Bands of previously cooler than normal water within 10º of the equator near 120ºW have now all but disappeared. Previously warmer than average equatorial subsurface temperatures in the upper 100m west of South America have returned to normal.

The April OLR data showed positive anomalies (indicating decreased convection) over northern Australia and Queensland, with areas of enhanced convection observed over the anomalously warm waters off the west coast of South America near Ecuador. We would expect to see enhanced cloudiness developing over the central equatorial Pacific region (Kiribati) with the establishment of an El Niño.

The Southern Oscillation Index (SOI) was weakly negative in April (-0.5), but showed little change from March. The three-month SOI is still near neutral (-0.2).

About 60-70% of global ENSO forecast models continue to show that a warm event (El Niño) may occur at some time in the tropical Pacific over the next 6 to 9 months. However, about 30% of the models are consistently forecasting neutral conditions. Overall, although atmospheric and oceanic signals are present for the possible development of an El Niño later this year, recent progress has been slow and we are not in an El Niño yet.

An important 'ingredient' still required for the further development of an El Niño would be the onset of a significant westerly wind burst (like that of December 2001) in the Equatorial western Pacific, along with a weakening of the easterly trade winds in the central and eastern Pacific.

The next 4-6 weeks remain critical to any further development and establishment of an El Niño episode this year.

Tropical cyclones

April was a 'quiet' month

There were no further tropical cyclones in the Southwest Pacific during April. Five tropical cyclones have occurred so far this season, which is the same number as last season and well below average. There is a 50 percent chance of another tropical cyclone occurring in May.

The Island Climate Update

Visit The Island Climate Update website at: www.niwa.cri.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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