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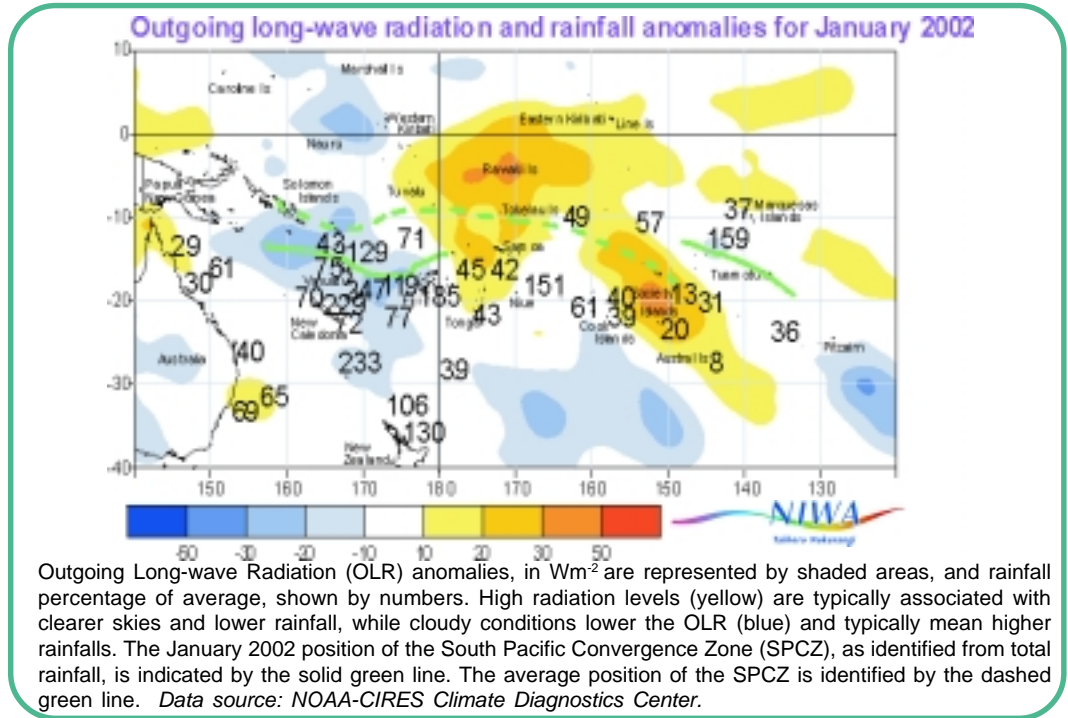
The Island Climate Update



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

January's climate

Rainfall patterns switched in January, with dry sunny conditions replacing the wet weather of December over much of Kiribati, Tuvalu, Tokelau, Samoa, Tonga, and most of French Polynesia - some sites having record low January rainfall. Rainfall was also well below average along the Queensland coast of Australia and in the Kermadecs. Enhanced convection occurred over the Coral Sea, Vanuatu, and Fiji, where the South Pacific Convergence Zone (SPCZ) was active and further south than usual. Rainfall was above average in areas of Fiji, Niue, and parts of the Marquesas, Vanuatu and New Caledonia. Only three tropical cyclones have occurred for the season to date. 'Waka' was the most recent and severe, devastating northern Tonga early in January. *More on Page 2.*



ENSO and sea surface temperatures

Variability has continued in the Southern Oscillation Index (SOI) over recent months, with the 3-month mean of -0.1 remaining in the neutral range. Trade winds were slightly enhanced in the central Equatorial Pacific, with westerly anomalies in the west. Equatorial sea surface temperature (SST) anomalies remain weak, but positive anomalies prevail in the tropics about and west of the dateline. Half of the global SST forecast models show strong indications of an evolution towards warm ENSO conditions in the months following the Southern Hemisphere wet season. *Details Page 2.*

The next three months (February to April 2002)

Below average rainfall is likely over a large part of the equatorial Pacific from Western Kiribati right across to the Marquesas Islands of northern French Polynesia. Areas of above average rainfall are expected in parts of the Solomon and Fiji island groups. Average rainfall is forecast for most other areas. *More on Page 3.*





Climate developments in January 2002

Low rainfall over Kiribati and islands east of the dateline

January rainfall and OLR anomalies were opposite those recorded in December throughout much of the region. Dry sunny conditions replaced wet weather, with less than 50% of average rainfall, over much of Kiribati, Tuvalu, Tokelau, Samoa, and Tonga. Most stations in French Polynesia measured only 10-40% of average rainfall. Rainfall was also less than 50% of average along the Queensland coast of Australia and in the Kermadecs.

Enhanced convection occurred over the Coral Sea, Vanuatu, and Fiji, where the SPCZ was active and further south than usual. The SPCZ then showed a split, resuming over French Polynesia and lying northeast of its usual position. Rainfall was about 150% of average in many areas of Vanua and Viti Levu in Fiji, Niue, and parts of the Marquesas. Rainfall anomalies were mixed over Vanuatu and New Caledonia, some areas being drier than average and some much wetter.

Warm seas about and west of the dateline; warm ENSO event probable later this year

SST anomalies remain fairly weak across the Equatorial Pacific, with negative temperature anomalies east of about 150°W and positive anomalies about the dateline (around Kiribati). Sub surface sea temperature observations now show positive anomalies (exceeding +4°C at 150 m depth) in the central Pacific. In the Southwest Pacific, an area of much warmer than usual water at the surface (at least 1.5°C above average) has moved east since December, and now lies between New Caledonia, Fiji and Tonga. SST anomalies were at least 1.0°C above average off the Queensland coast, in the Coral Sea, and south of the Southern Cook Islands. The warmest surface waters (30-31°C) surround the Solomon Islands and an area further east around Tuvalu. Half of the global SST forecast models suggest the development of warm ENSO conditions in the months following the southern hemisphere wet season, although forecast confidence is lowest at this time of year. The January Southern Oscillation Index (SOI) rose to +0.3 with a 3-month mean of -0.1. The trade winds were slightly enhanced in the central Equatorial Pacific, with westerly anomalies in the west.



Forecast validation

Forecast period: November 2000 to January 2002

The SPCZ was expected to remain south of its normal position east of the Dateline, with slightly enhanced trade winds in the central Pacific, resulting in average to below average rainfall throughout Tuvalu, Eastern Kiribati, the northern Cook Islands, Samoa, and the Marquesas Islands of French Polynesia. Average to above average rainfall was expected in Papua New Guinea, the Solomons, Vanuatu, and Western Kiribati, with

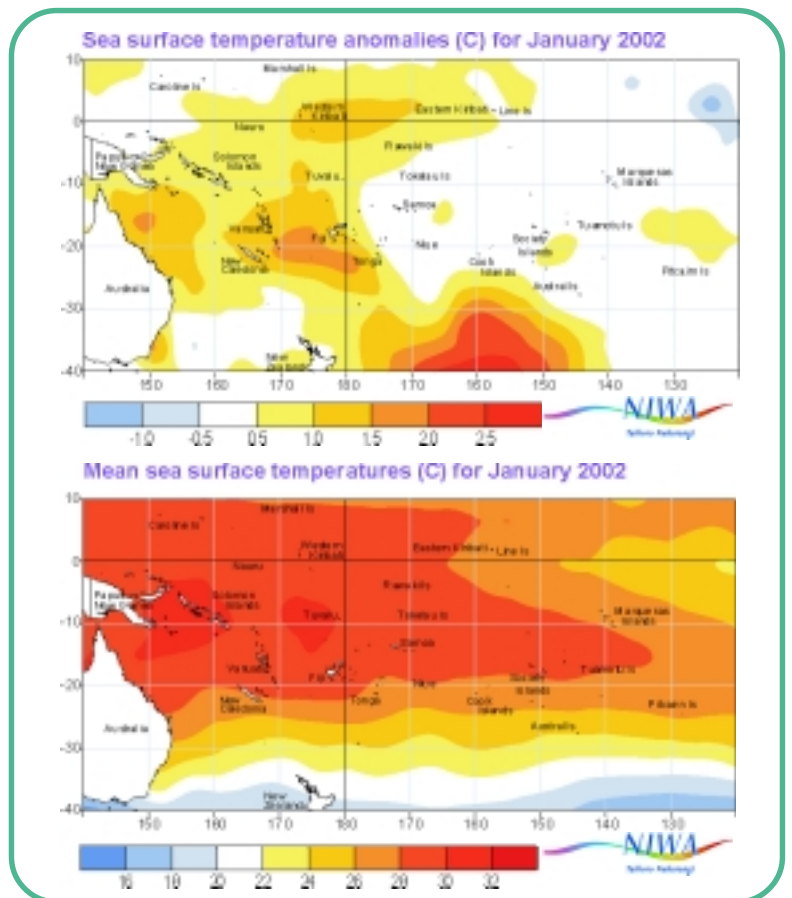
Extremely low January rainfall was recorded at:

Country	Location	Rainfall (mm)	% of normal	Comments
French Polynesia	Tahiti-Faaa	46	13	Lowest
French Polynesia	Rapa	25	8	Lowest

High January rainfall was recorded at:

Country	Location	Rainfall (mm)	% of normal	Comments
Australia	Norfolk Island	212	233	Very high
Vanuatu	Aneiyum	682	247	Very low
Fiji	Nausori	611	185	Very high

A few near or record high daytime maximum temperatures were measured in parts of Fiji, and on Hao Atoll in French Polynesia, the latter recording 32.9°C.





Rainfall outlook: February to April 2002

SPCZ more active in the west

Below average rainfall in equatorial latitudes from Kiribati east

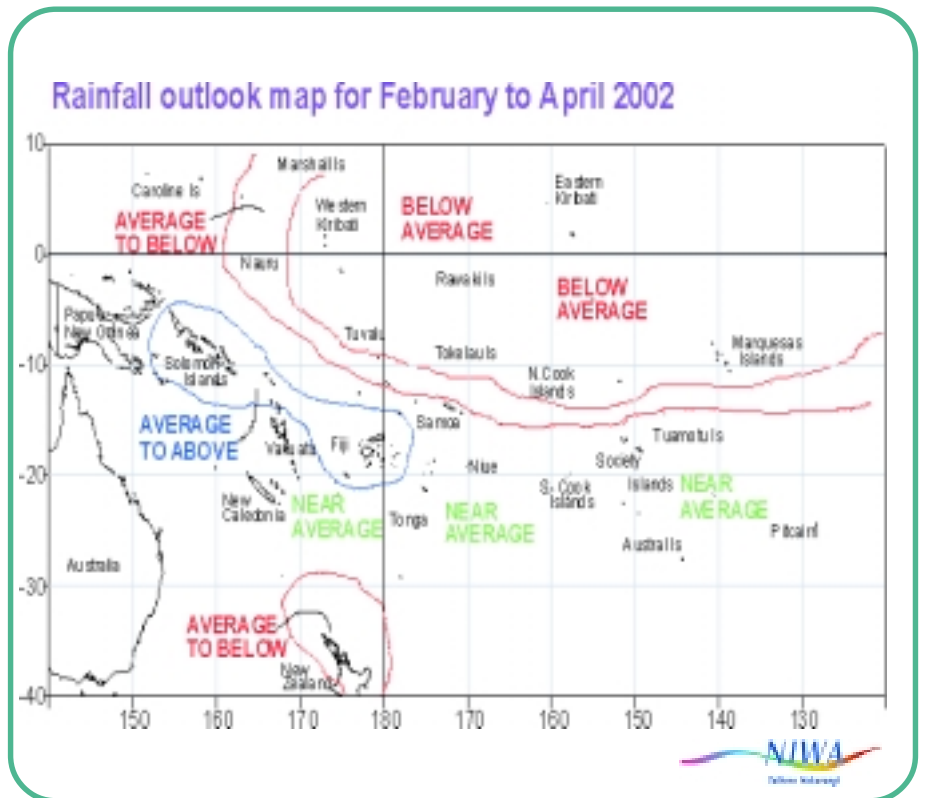
Trending towards above average in the Solomons and Fiji

Mainly average rainfall in other areas

The SPCZ is likely to be displaced slightly south of its normal location in the west, from February through April, with enhanced trades east of the dateline and weaker trades to the west.

Rainfall is projected to be below average in a large part of the equatorial Pacific from Western Kiribati across to the Marquesas Islands, including Tuvalu, the northern Cook Islands, Tokelau and Eastern Kiribati.

Areas of above average rainfall are likely in parts of the Solomon and Fiji island groups.



Average rainfall is expected in many other areas south of 15°S including Papua-New Guinea, Vanuatu, New Caledonia, Tonga and Niue, and from the Southern Cook Islands across to many parts of French Polynesia and Pitcairn Island.

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 TABLE (FEBRUARY - APRIL 2002)		
Island Group	Rainfall Outlook	Confidence in the Outlook
Solomon Islands	20:40:40 (Average to above average)	Moderate
Fiji	10:50:40 (Average to above average)	Moderate
Papua New Guinea	15:60:25 (Near average)	Moderate
Vanuatu	15:55:30 (Near average)	Moderate
New Caledonia	25:45:30 (Near average)	Moderate
Tonga	20:60:20 (Near average)	Moderate
Niue	15:55:30 (Near average)	Moderate
Southern Cook Islands	25:60:15 (Near average)	Moderate
Austral Islands	25:60:15 (Near average)	Moderate
Pitcairn Island	15:60:25 (Near average)	Moderate
Samoa	30:55:15 (Near average)	Moderate
Society & Tuamotu Islands	20:45:35 (Near average)	Moderate
Wallis & Futuna	40:40:20 (Average to below)	Low
Western Kiribati	55:35:10 (Below average)	Moderate
Tuvalu	55:35:10 (Below average)	Moderate
Tokelau	55:35:10 (Below average)	Moderate
Northern Cook Islands	60:30:10 (Below average)	Moderate
Eastern Kiribati	60:30:10 (Below average)	Moderate
Marquesas	60:25:15 (Below average)	High



Tropical cyclones

Only three tropical cyclones so far

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Three tropical cyclones have occurred so far this season. The season although relatively quiet has not been benign due to the devastation caused in northern Tonga by 'Waka' early in January. The usual period of peak tropical cyclone occurrence for the Southwest Pacific continues, with an average of two tropical cyclones in February and two in March for the whole region, in seasons similar to the present. On average, the highest frequencies have occurred over the Coral Sea east to Fiji, including Vanuatu and New Caledonia.

The March issue of the ICU will provide an update on tropical cyclone information.

The La Niña impact on rainfall distribution was evident in the annual OLR anomaly pattern (see figure below), even after a return to neutral ENSO conditions, as enhanced trade winds east of the dateline kept the SPCZ further south and west than usual for much of the year.

Below average rainfall was recorded in the central equatorial region (Western and central Kiribati, Tuvalu, Tokelau, and the Northern Cooks), where the first half of the year was very dry. SSTs were below average in the areas where below average rainfall occurred. Annual rainfall was less than 75% of average in some of these areas. Rainfall was also below average in the southwest Coral Sea and along the Queensland coast of Australia.

Areas of enhanced rainfall and below average outgoing longwave radiation occurred in the west, from Papua New Guinea to Tonga including the Solomons, and parts of Vanuatu and Fiji, with totals exceeding 120% of average on some islands. SSTs were above average in these areas. Rainfall was also above average over northern New Zealand.

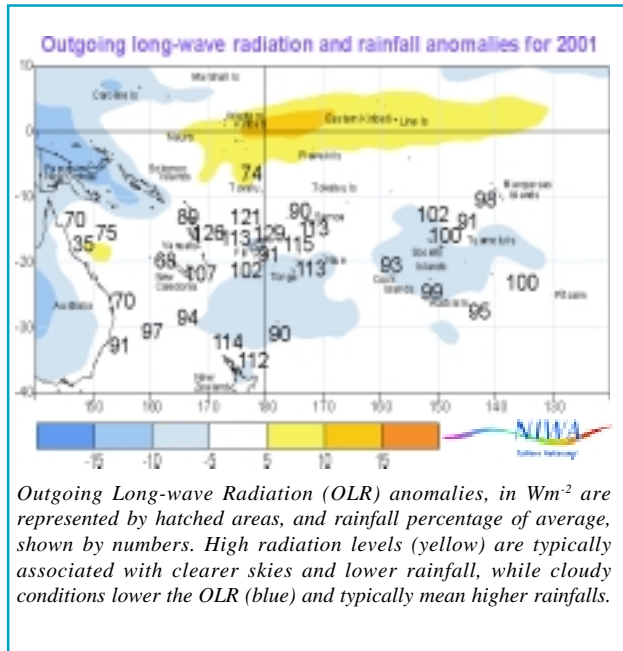
The Southwest Pacific Climate in 2001

By Stuart Burgess and Dr Jim Salinger, NIWA

The year 2001 was one of contrasts across the Southwest Pacific. Important drivers of the annual pattern were the fading of La Niña to neutral ENSO conditions, the strength of the trade winds and the distribution of warm and cool SST anomalies.

The Southwest Pacific tropical cyclone season of 2000/01 was the least active since that of 1994/95, and it had the latest start for any season in at least 30 years. There were only five cyclones overall, with four occurring in just a few weeks between 20 February and 5 March. Fortunately none resulted in severe damage or loss of life.

A noticeable shift from below to above average SSTs occurred from June onwards over Kiribati, with a return to neutral ENSO conditions. Mean air temperatures were 0.3 to 0.5°C above normal for the year in New Caledonia, Fiji, Tuvalu, Tonga, and parts of Vanuatu, and near average elsewhere.



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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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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