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4 June 2004

The Island Climate Update



An overview of the present climate in the tropical South Pacific, with an outlook for the coming months

Contributors

Australian Bureau of Meteorology

Meteo France

Fiji Meteorological Service

Samoa Meteorological Service

NOAA National Weather Service

NOAA Climate Prediction Centre, CPC

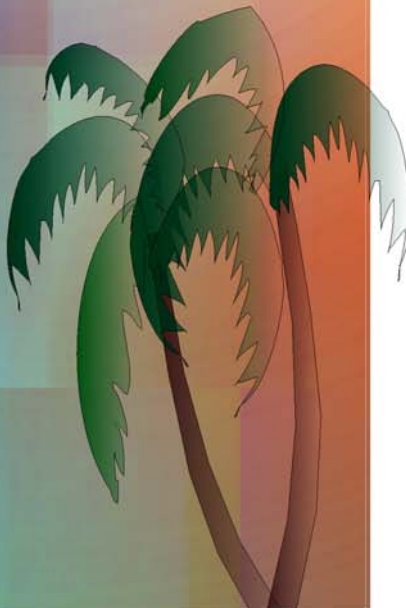
International Research Institute for Climate Prediction, IRI

European Centre for Medium Range Weather Forecasts, ECMWF

UK Met Office

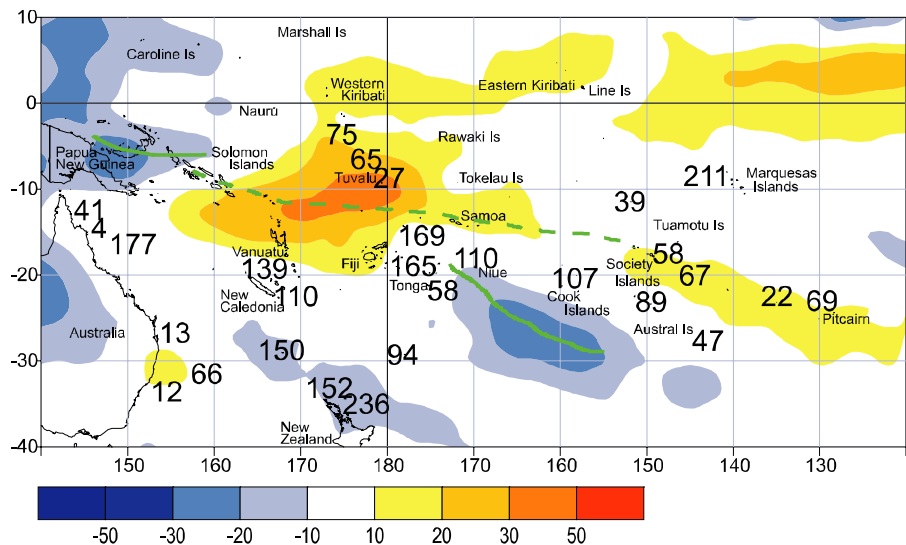
World Meteorological Organisation, WMO

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



May's climate

- South Pacific Convergence Zone inactive about and west of the Date Line.
- Suppressed convection and below average rainfall in many areas.
- Well above average rainfall in northern French Polynesia.
- An unusually 'quiet' tropical cyclone seasons.



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 May 2004 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 May Southern Oscillation Index (SOI) was +1.3.
- Neutral El Niño Southern Oscillation (ENSO) prevail till at least the southern hemisphere spring 2004.

The next three months June to August 2004

- Enhanced convection in the equatorial west Pacific, and central and southern French Polynesia and the Southern Cook Islands.
- Average or below average rainfall over the countries near the Date Line, including Vanuatu, Tuvalu, Tokelau, Fiji and Eastern Kiribati.



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





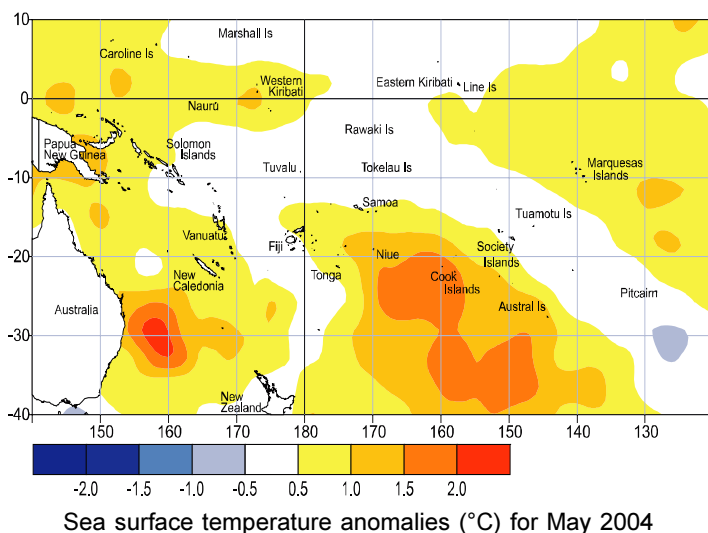
Climate developments in May 2004

Suppressed convection and below average rainfall predominated over a large region of the Southwest Pacific about and west of the Date Line, from Vanuatu to Samoa, including Fiji (where it was very dry and sunny in the west of the main island) and Tuvalu. Suppressed convection and below average rainfall also occurred over much of the central of southern French Polynesia across to Pitcairn Island, and along the Equator about and east of Eastern Kiribati. May rainfall was less than 75% of average over much of central French Polynesia and Pitcairn Island, and less than 50% over average in parts of Fiji, Tuvalu, and Vanuatu.

Enhanced convection and above average rainfall occurred over Northern Australia, parts of Indonesia, the Caroline Islands, and

Positive SOI during May Slightly above average SST west of the Date Line

The monthly SOI rose markedly in May to +1.3 with the three month mean (March - May) close to neutral (-0.2). The oceanic and atmospheric conditions indicated



CLIMATE EXTREMES IN MAY 2004

Country	Location	Rainfall (mm)	% of average	Comments
Australia	Townsville Airport	1	4	Extremely low
Tuvalu	Nuilakita Island	63	27	Record low
French Polynesia	Gambier, Rikitea	34	22	Record low

Country	Location	Min Temp (°C)	Dep. (°C)	Comments
Fiji	Laucala Bay	26.5		Record high
Fiji	Navua	24.8		Record high

Papua New Guinea. The SPCZ (South Pacific Convergence Zone) was largely confined about and west of the Date Line during May.

However, a region of active convection did occur east of the Date Line, from about Niue to the region south of the Southern Cook and Austral Islands. Rainfall was at least 200% of normal in the Marquesas Islands, and at least 125% of normal in parts of New Caledonia and Tonga. New Caledonia's May rainfall anomaly was due to a single high 1-day rainfall event (over 200 mm in some areas). May rainfall was also above average in northern New Zealand.

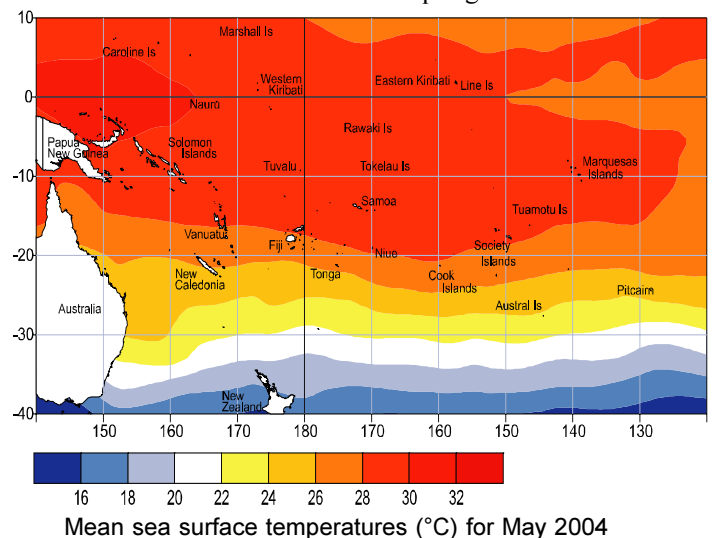
a neutral phase of El Niño Southern Oscillation (ENSO) during May 2004. May SSTs were warmer than average in the western and central equatorial Pacific (NINO3 and 4 regions) and cooler than average in the eastern equatorial Pacific (NINO1 and 2 regions). Subsurface temperatures show a positive anomaly in the

There have now been 5 consecutive months with above average rainfall in the Marquesas Islands.

Mean air temperatures were 1.0°C above average in the Southern Cook Islands, and about 0.5°C above average in southern Tonga and Samoa. Below average mean temperatures occurred in Vanuatu.

Tropical Southwest Pacific mean sea-level pressures continued above average west of the Date Line, and below average in the equatorial east. They were well above average however, in Southern French Polynesia.

top 100 m in the central Equatorial Pacific, which has propagated eastwards and upwards since April. May averaged OLR anomalies show a region of suppressed convection just west of the Date Line, with weakly enhanced convection in Australian longitudes, a partial reversal of the April picture. Most global models indicate neutral conditions into spring 2004.



Forecast validation

Forecast period:
March to
May 2004

Enhanced convection was expected in Western Kiribati, and over Wallis and Futuna, and the Society Islands, resulting in average or above rainfall there. Average or below average rainfall was expected in Pitcairn Island with suppressed convection over the Marquesas Islands where rainfall was forecast to be below average. Near average rainfall was expected elsewhere in the region.

Enhanced convection occurred in the western equatorial region, with above average rainfall over the Solomon Islands

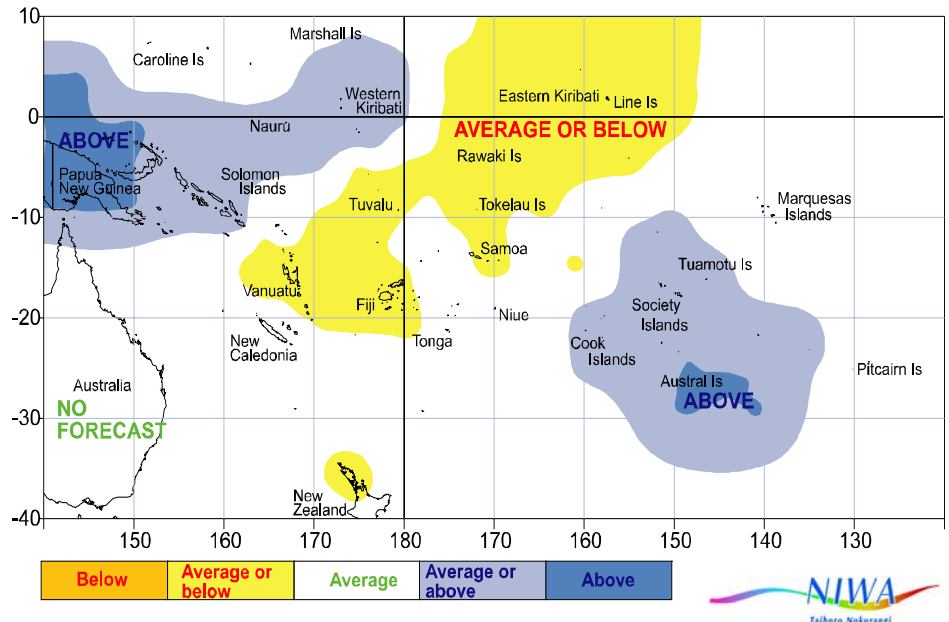
(higher than forecast) and parts of Western Kiribati. Rainfall was also above average in northern and central French Polynesia, and Pitcairn Island (all higher than expected). Rainfall was below average in Eastern Kiribati, and much of the region from the Wallis and Futuna Islands to the Austral Islands, including Niue and the Southern Cook Islands (all lower than expected). The overall 'hit' rate for the March to May 2004 rainfall outlook was about 40%, indicating decreased skill in this intraseasonal transition period.



Rainfall outlook: June to August 2004

• Above average rainfall in Papua New Guinea and the Austral Islands

• Average or below average just west and northeast of the Date Line



Rainfall outlook map for June to August 2004

Enhanced convection is expected in the equatorial west Pacific over Papua New Guinea, the Solomon Islands and Western Kiribati where rainfall is likely to be average or above average.

Another region of enhanced convection, with average or above average rainfall, is expected over French Polynesia

below average over Vanuati, Fiji, Tuvalu, Tokelau, Samoa and Eastern Kiribati. The skill level of seasonal rainfall forecast is generally between low to moderate during this time of the year.

Rainfall is expected to be average or

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 (JUNE - AUGUST 2004)

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

Southwest Pacific Tropical Cyclones Summary for 2003/2004 Season

Stuart Burgess, NIWA

The 2003/04 tropical cyclone season had only three occurrences, being equal lowest in the last 30 years (see Figure 1). About nine tropical cyclones can normally be expected in an average season. Two of the three 2003/04 tropical cyclones reached major hurricane strength, with sustained wind speeds of at least 168 km/h. Two of the 2003/04 tropical cyclones originated west of the date line (the tracks of which are shown in Figure 2), and all occurred in the December through March period.

Tropical cyclone frequencies

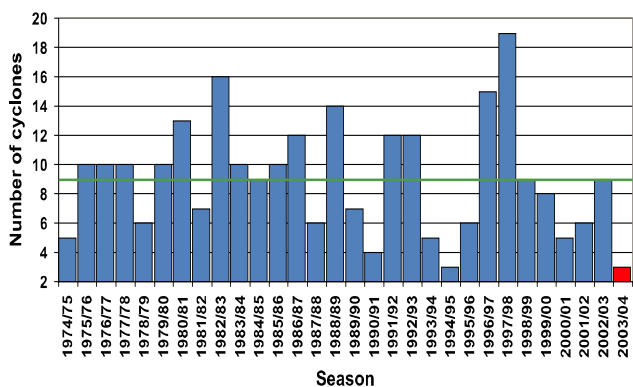


Figure 1. The number of Southwest Pacific tropical cyclones for the 2003/04 season (solid red bar) compared to frequencies during the past 30 years. The horizontal green line indicates the 30-year average.

Tropical Cyclones from November 2003 through April 2004

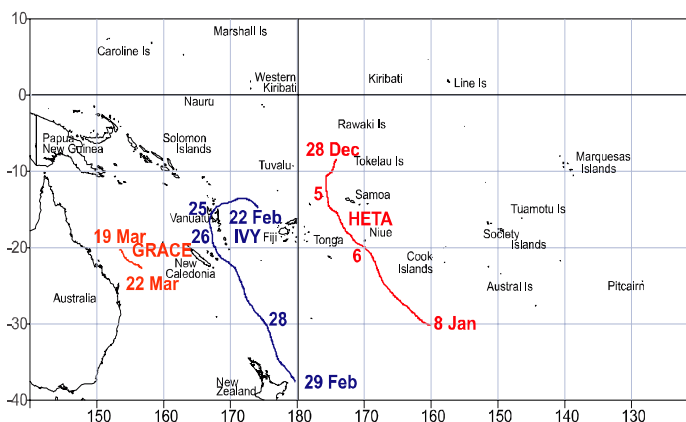


Figure 2. Southwest Pacific tropical cyclone tracks: for the 2003/04 season.

The most devastating tropical cyclone of the 2003/04 season was 'Heta', which originated north of Fiji on 28 December, developing into a tropical cyclone on 2 January. Heta passed west of Samoa on 5 January where high winds (145-160 km/h gusts) and heavy rainfall resulted in damage to property, crops, roads and bridges. Heta intensified further to become very destructive as its centre passed just west of Niue on 6 January, with estimated wind gusts of 275 km/h there. One person died, with several others injured, and many people were left homeless. A national disaster resulted, with considerable property destroyed, roads closed, telecommunications and electricity outages, and crops severely damaged. 'Ivy' formed west of Fiji on 22 February, bringing damaging winds (up to 130 km/h) and high rainfall to parts of Vanuatu on 25-26 February. 'Grace', originated in the Coral Sea west of New Caledonia on 19 March, but winds only reached gale force and it was rather short-lived. Strong winds and high, but not excessive rainfall affected parts of New Caledonia.

Name	Origin	Period of Occurrence	Estimated maximum sustained wind speed (km/h)	Classification
Heta	North of Fiji	28 Dec - 8 Jan	260	Major Hurricane
Ivy	West of Fiji	22 - 29 Feb	205	Major Hurricane
Grace	Coral Sea	19 - 22 Mar	65	Gale

Table 1. Estimates of maximum sustained wind speeds for named tropical cyclones in the 2003/04 season.

Sea surface temperatures were above average along with MJO enhanced convection in western equatorial regions during the season. These would normally assist tropical cyclones. However, most of the low level depressions that did occur during the season did not have the upper-level atmospheric support to develop into tropical cyclones.



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

The Editor: **Dr Jim Salinger**, NIWA, Private Bag 109 695, Newmarket, Auckland, New Zealand.

E-mail: j.salinger@niwa.co.nz Telephone: int + 64 9 375 2053 Facsimile: int +64 9 375 2051

Assistant Editor: **Ashmita Gosai**, NIWA, Private Bag 109 695, Newmarket, Auckland, New Zealand

E-mail: a.gosai@niwa.co.nz Telephone: int + 64 9 375 4506 Facsimile: int + 64 9 375 2051

Climatologist: **Stuart Burgess**, NIWA, PO Box 14-901, Wellington, New Zealand.

E-mail: s.burgess@niwa.co.nz Telephone: int + 64 4 386 0300 Facsimile: int +64 4 386 0341

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

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 National meteorological services (NMSs). 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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