Number 51, December 2004

The Island Climate Update

November's climate

- The South Pacific Convergence Zone was active between Papua New Guinea, Nauru and Tuvalu, extended southeast to the Southern Cook Islands
- High rainfall in parts of Tuvalu, Rotuma Island, and in some areas of the Austral Islands
- Continued low rainfall in the main islands of New Caledonia and Fiji
- Warmer in Western Kiribati, Tuvalu, Samoa, and much of French Polynesia
- Cooler in southern Vanuatu and parts of Tonga

El Niño/Southern Oscillation and Seasonal Rainfall Forecasts

- Weak El Niño conditions are expected to continue in the tropical Pacific
- Above average rainfall is likely in Western and Eastern Kiribati, Tuvalu, Tokelau, and the Northern Cook Islands
- Below average rainfall is expected in Papua New Guinea and the Marquesas Islands

Collaborators

Australian Bureau of Meteorology

Meteo France

Fiji Meteorological Service

NOAA National Weather Service

NOAA Climate Prediction Centre (CPC)

International Research Institute for Climate Prediction

European Centre for Medium Range Weather Forecasts

UK Met Office

World Meteorological Organization

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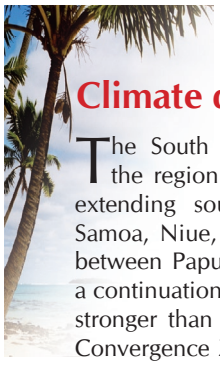


Climate developments in November 2004

The South Pacific Convergence Zone (SPCZ) was active in the region between Papua New Guinea, Nauru and Tuvalu, extending southeast to affect Rotuma Island (northern Fiji), Samoa, Niue, and the Southern Cook Islands. Enhanced rainfall between Papua New Guinea, Nauru and Tuvalu was caused by a continuation of cross-equatorial northwesterlies converging with stronger than normal southeast trade winds. The Inter-Tropical Convergence Zone (ITCZ) was active in the Pacific region (5-10º north of the Equator) about and east of the Date Line. Enhanced convergence also occurred in the region east of Pitcairn Island.

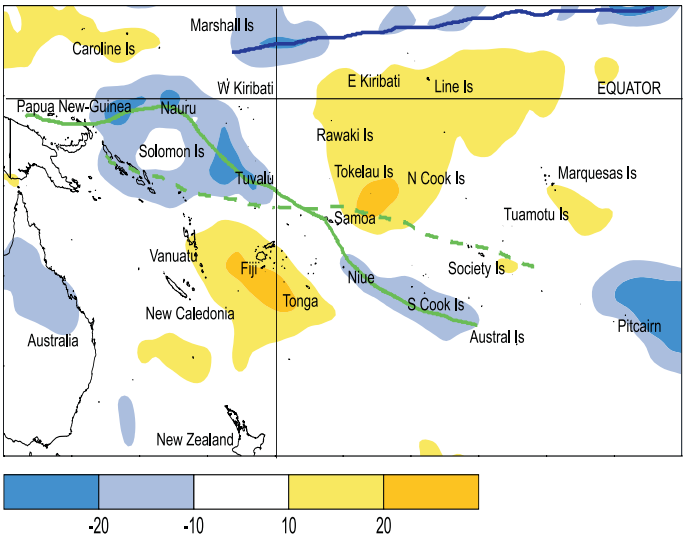
Rainfall was 200% or more of average in some areas of Tuvalu, Rotuma Island, and in some of the Austral Islands. At least 125% of average rainfall occurred in parts of central Tonga.

High 1-day total rainfalls were recorded at Rotuma Island (Fiji) on the 9th (144 mm) and Udu Point (Fiji) on the 11th (140 mm).

A large region of suppressed convection persisted over Southeast Asia, Indonesia, and parts of northern Australia. Other regions of suppressed convection affected parts of Fiji and Tonga, as well as Eastern Kiribati, Tokelau, and the Northern Cook Islands. Rainfall was well below average, being 25% or less of average, in much of New Caledonia and parts of the main island of Fiji, due to frequent ridges of high pressure extending north from the Tasman Sea. It was less than 50% of average in Tokelau, southern Tonga, parts of Samoa, and the Marquesas Islands.

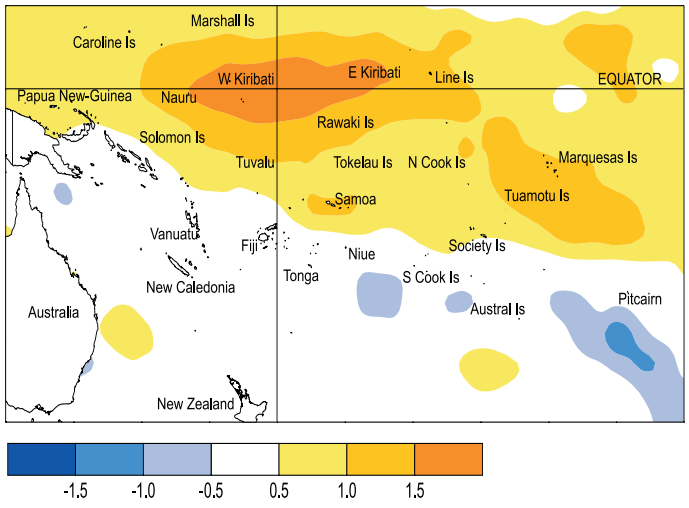
Mean air temperatures were about 1.0ºC above average in Western Kiribati, and at least 0.5ºC above average in Tuvalu, Samoa, and the Marquesas, Tuamotu, and Society Islands of French Polynesia, consistent with the warm sea surface temperatures affecting these regions. Mean air temperatures were about 0.5ºC below average in southern Vanuatu and parts of Tonga.

Mean sea-level pressures were above average about and west of the Date Line in the tropical Southwest Pacific.

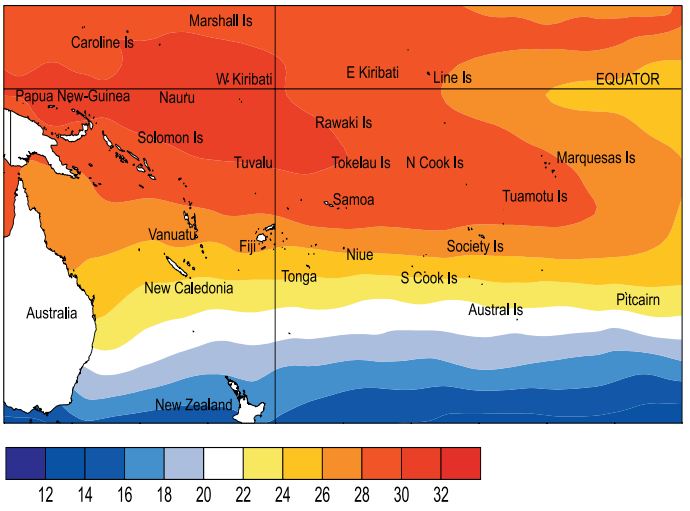


Outgoing Long-wave Radiation (OLR) anomalies, in Wm^{-2}. The November 2004 position of the SPCZ, as identified from total rainfall, is indicated by the solid green line. The average position of the SPCZ is identified by the dashed green line. The November 2004 position of the ITCZ is identified by the solid blue line.

Country	Location	Rainfall (mm)	% of average	Comments
Fiji	Rotuma Island	609	216	Well above average
Tuvalu	Nanumea	493	285	Extremely high
French Polynesia	Gambier, Rikitea	285	201	Well above average
New Caledonia	Koumac	6	11	Well below average
Fiji	Nadi Airport	26	20	Well below average
Fiji	Ono-I-Lau	11	9	Well below average



Sea surface temperature anomalies (°C) for November 2004.



Mean sea surface temperatures (°C) for November 2004.

The tropical Pacific Ocean continues in a weak El Niño state, but the atmosphere is still only partially coupled to the tropical ocean. The NINO3.4 average anomaly was +1.0°C in November (same as in October), and +1.0°C for September to November (up from +0.8 in August-October). Subsurface temperature anomalies were positive in the top 100 m across most of the Equatorial Pacific. Positive zonal wind anomalies were evident in November, but mostly west of the Date Line. Outgoing longwave radiation (OLR) and rainfall anomalies suggest the SPCZ is lying northeast of its normal location (west of the Date Line), and precipitation is suppressed over Indonesia, consistent with El Niño events. The Southern Oscillation Index (SOI) was –1.1 for November (three-month September-November mean –0.7), indicative of a weak mean signal in the tropical circulation.

Most available models indicate weak El Niño conditions over the December to February of 2004-05, with only a few indicating El Niño conditions persisting into March to May 2005. Almost all models indicate neutral conditions by June to August 2005. No model is predicting substantial cooling in the equatorial Pacific over the next 9 months.

Tropical rainfall outlook: December 2004 to February 2005

The atmosphere is yet to fully couple with the tropical ocean. However, it is highly likely that the current weak El Niño event will still have some influence on rainfall patterns in the tropical Pacific region.

Rainfall is expected to be above average in the equatorial region of Western and Eastern Kiribati, extending south to include Tuvalu, Tokelau, and the Northern Cook Islands. Above average or near average rainfall is forecast for Pitcairn Island.

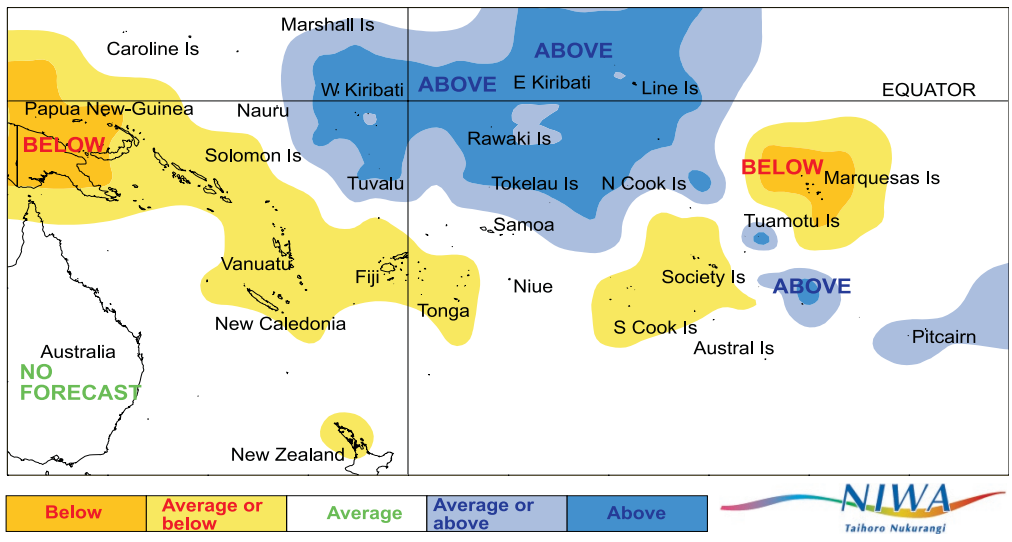
Suppressed convection is expected over the Solomon Islands, extending southeast to the Southern Cook Islands, including Vanuatu, New Caledonia, and Tonga, where rainfall is expected to be near average or below.

Below average rainfall is forecast for Papua New Guinea and the Marquesas Islands. Rainfall is expected to be near average elsewhere in the region.

The Pacific seasonal rainfall model skill is moderate for most islands.

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

NOTE: Rainfall estimates for Pacific Islands for the next three months are given in the above 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 December 2004 to February 2005

Forecast validation: September to November 2004

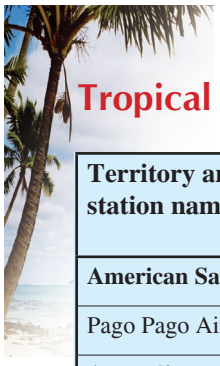
Enhanced convection was expected with above average rainfall over Eastern and Western Kiribati, with areas of average or above average rainfall in the Tuamotu Islands and Pitcairn Island. Suppressed convection with average or below average rainfall was expected in New Caledonia, Fiji, Tonga, and the Marquesas Islands. Rainfall was expected to be near average elsewhere in the region.

The outcome differed greatly from what was forecast, with above average rainfall (higher than expected) over the Solomon Islands and Tuvalu, and from Niue southeast to the Austral Islands. Rainfall was also above average and higher than expected in the Marquesas Islands. Rainfall was below average (and lower than expected) over Western and Eastern Kiribati and Tokelau, as well as Vanuatu, Wallis and Futuna, Samoa, and the Northern Cook Islands. Totals were near average elsewhere. The overall 'hit' rate for the September to November 2004 rainfall outlook was about 35% due to uncertainties in the strength of the climate response to the weak El Niño during the forecast period.

Tropical cyclone update

The tropical cyclone season began in November, and fortunately there have been no occurrences to date. The chances of tropical cyclone activity, for the December-May period, still remain higher than normal for some countries near and east of the Date Line. Some occurrences are also likely about and west of the Date Line, but with a more variable than normal frequency of occurrence.

The January issue of the ICU will provide an update on information relating to any occurrences of tropical cyclones in the region.



Tropical Pacific rainfall - November 2004

Territory and station name	November 2004 rainfall total (mm)	Long-term average (mm)	November 2004 percent of average	Lowest on record (mm)	Highest on record (mm)	Records began
American Samoa						
Pago Pago Airport	*100.3*	275	36			1966
Australia						
Cairns Airport	99.4	97	102	302	372.0	1941
Townsville Airport	23.8	61	39	0.2	359.0	1940
Brisbane Airport	114.4	97	118	1.3	408.4	1929
Sydney Airport	54.0	83	65			1929
Cook Islands						
Penrhyn	*89.6*	225	40	32	644	1937
Mauke	*62.8*	135	47	5	581	1929
Rarotonga Airport	151.1	136	111	9	385	1929
Fiji						
Rotuma	608.6	282	216	106	778	1912
Udu Point	343.5					1946
Nadi	26.4	132	20	4	323	1942
Nausori	68.5	245	28	28	646	1956
Ono-i-Lau	10.7	115	9	3	409	1943
French Polynesia						
Hiva Hoa, Atuona	24.8	58	43	3	147	1951
Tahiti - Faaa	144.0	148	97	5	463	1919
Tuamotu, Takaroa	217.8	178	122	30	612	1953
Gambier, Rikitea	284.8	142	201	20	315	1952
Tubuai	266.2	135	197	7	291	1953
Rapa	169.8	193	88	46	593	1951
Kiribati						
Tarawa	25.5	132	19	1	480	1946
Butaritari	70.2	222	32	7	657	1945
New Caledonia						
Ile Art, Belep	20.2	113	18	12	392	1962
Koumac	5.8	54	11	0	177	1951
Ouanaham	37.2	112	33	0	385	1961
Poindimie	61.4	179	34	18	492	1965
La Roche	20.4	108	19	18	554	1956
La Tontouta	11.6	51	23	0	342	1949
Noumea	13.8	53	26	0	484	1863
Moue	11.6	92	13	11	393	1972
Niue						
Hanan Airport	*264.3*	174	152	62	352	1996

Tropical Pacific rainfall - November 2004

Territory and station name	November 2004 rainfall total (mm)	Long-term average (mm)	November 2004 percent of average	Lowest on record (mm)	Highest on record (mm)	Records began
New Zealand						
Kaitaia	81.7	102	80	32	195	1985
Whangarei Aiport	41.4	89	47	18	258	1937
Auckland Airport	41.6	83	50	10	233	1962
North Tasman						
Lord Howe Island	34.8	117	30	14	292	1886
Norfolk Island	14.2	69	21	7	218	1921
Raoul Island	99.8	97	103	2	318	1937
Pitcairn Island	*213.8*	115	186	9	365	1940
Samoa						
Faleolo	132.6	232	57	100	538	1951
Apia	96.4	263	37	26	847	1890
Tokelau						
Nukunonu	*109.6*	226	48	42	423	1948
Tonga						
Lupepau'u	197.3	143	138	67	287	1995
Fua'amotu Airport	38.1	100	38	21	367	1980
Tuvalu						
Nanumea	493.2	173	285	28	494	1941
Nui Island	246.7	268	92	59	628	1941
Funafuti	211.7	237	89	51	703	1927
Nuilakita Island	395.5	278	142	78	658	1942
Vanuatu						
Pekoa	*29.2*	196	15	21	474	1951
Lamap	*26.0*	129	20	6	368	1960
Bauerfield	*14.7*	152	10	19	440	1985
Burtonfield	*1.8*	83	2	15	342	1961
Aneityum	*30.6*	149	21	20	544	1958
Wallis & Futuna						
Wallis Island, Hihifo	*279.8*	283	99	87	486	1951
Maopoopo, Futuna Island	*171.8*	294	58			

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 as received and may be subject to change after undergoing quality control checks. The data in italics are obtained from synoptic weather reports . These can sometimes differ from the true values, due to communications or station outage, etc.

What is PI-GCOS?

Dr Mark Morrisey* and Howard Diamond#

The Pacific Islands-Global Climate Observing System (PI-GCOS) programme started in Apia, Samoa, in 2000 as a result of the first regional Global Climate Observing System (GCOS) workshop organised by the Secretariat of the Pacific Regional Environment Programme (SPREP) and the international GCOS Secretariat. It is a sub-programme of the GCOS aimed specifically at meeting the observing needs of Pacific Islands. Since the Apia workshop, a number of activities have been completed. These include establishment of the PI-GCOS steering group, development of the PI-GCOS Action Plan (see Box 1) and appointment of a full-time PI-GCOS coordinator based in SPREP. At the international level, eight GCOS workshops have been held in other regions of the world, and according to observers, the Apia workshop is considered the most successful. This success is mainly attributed to the dedicated efforts of all stakeholders involved in the PI-GCOS programme to date.

Recent activities include the establishment of a Regional Committee (RC) which serves as the PI-GCOS steering group. Mr. Arona Ngari, the Director of the Cook Islands' National Meteorological and Hydrological Service (NMHS) was selected as the interim chair. The role of the RC is to guide the implementation of the PI-GCOS Action Plan and act as an advisory group to the PI-GCOS Coordinator.

One of the issues that was identified early during the consultation among PI-GCOS collaborating partners, is the need to build capacity of individual Pacific Islands NMHS if the goals of the PI-GCOS Action Plan are to be met. The first step in this direction was the establishment of the RC with the majority of its members being representatives of Pacific Islands NMHS. This is a reflection of the realisation that the PI-GCOS can be successful only if it is owned and primarily driven by the Pacific people themselves, as they will ultimately benefit from the programme.

Box 1: Goals of the PI-GCOS Action Plan

1. To continually advocate the importance of GCOS observing systems to policy applications on the part of national governments and other interested users (e.g. social, cultural and economic implications).

2. To fully support and operate ALL identified GCOS stations (e.g. Global Surface Networks (GSN), Global Terrestrial Observing Systems (GTOS), Global Upper Air Networks (GUAN) etc) in the region by 2005 and according to best practices by 2008.

3. To work with the Atmospheric Observation Panel for Climate to re-examine the spatial-distribution, criteria and coverage of GSN and GUAN stations in the region by 2003 and adjust networks as appropriate by 2005.

4. To respond to the September 1999 World Meteorological Organisation (WMO) request for the provision of historical GSN and GUAN (when requested), metadata and data by 2003, to rescue all existing climate data for the region by 2005 and fully archive quality controlled climate data in digital form for the Pacific region by 2008.

5. To establish a permanent GCOS infrastructure by the end of 2002 with professional capacity within the region as appropriate (e.g. National GCOS Coordinator, Regional or National Climate Centres, etc).

The PI-GCOS programme was recently showcased at the 10th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP10) held in Buenos Aires, Argentina, from 6-17 December 2004 with great success. The PI-GCOS programme success was touted as a good model for other regions, particularly in relation to the cooperativi partnership between developing and developed countries of the region, along with the key central roles that organisations such as SPREP and South Pacific Applied Geosciences Commission (SOPAC) have played to further the goals of PI-GCOS.

For more information on PI-GCOS please consult the programme web site at http://pi-gcos.org.

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The Island Climate Update

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Sources of South Pacific rainfal 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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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.