Number 63, December 2005

The Island Climate Update

November's climate

- The South Pacific Convergence Zone (SPCZ) extended from Papua New Guinea towards the Austral Islands; high rainfall in parts of the Southern Cook Islands, Tonga, and northern and southern French Polynesia
- Suppressed convection occurred in the central equatorial Pacific; below average rainfall in much of Vanuatu, New Caledonia, the Northern Cook Islands, and central French Polynesia
- Above average air temperatures in Western Kiribati, Wallis and Futuna, Samoa, Tonga, central French Polynesia, and Tuvalu; below average in parts of Vanuatu
- No tropical cyclones so far, but a normal seasonal occurrence is expected

El Niño/Southern Oscillation and seasonal rainfall forecasts

- Tropical Pacific expected to remain in neutral El Niño/ Southern Oscillation phase into autumn 2006
- Below average rainfall likely over Western and Eastern Kiribati, the Northern Cook Islands, 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 and Society

European Centre for Medium Range Weather Forecasts

UK Met Office

World Meteorological Organization

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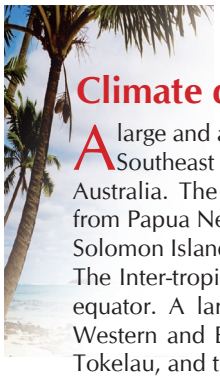
NIWA Taihoro Nukurangi



Climate developments in November 2005

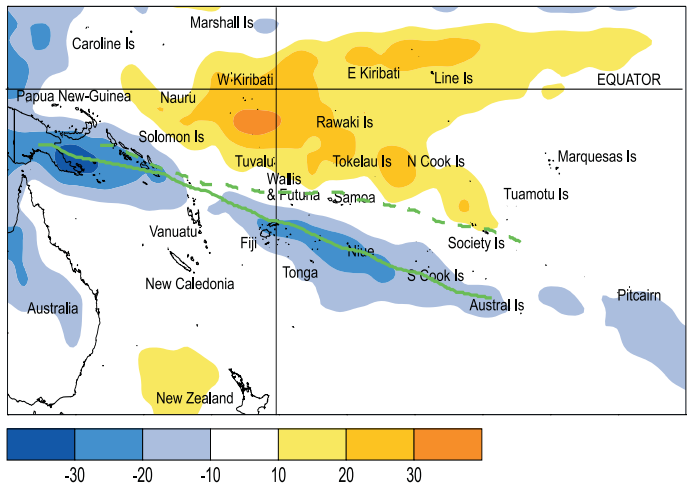
A large and active area of enhanced convection affected much of Southeast Asia, extending to Papua New Guinea and northern Australia. The South Pacific Convergence Zone (SPCZ) extended from Papua New Guinea towards the Austral Islands, including the Solomon Islands, Fiji, Tonga, Niue, and the Southern Cook Islands. The Inter-tropical Convergence Zone (ITCZ) was well north of the equator. A large region of suppressed convection encompassed Western and Eastern Kiribati, extending south to include Tuvalu, Tokelau, and the Northern Cook Islands.

Rainfall was more than 200% of average in parts of Tonga, the Southern Cook Islands, and northern and southern French Polynesia, and at least 125% of average in parts of Fiji. Vatukoula, Fiji, recorded rainfall totalling 119 mm on the 18th, a new record for that site. November rainfall was less than 75% of average in much of Vanuatu and New Caledonia, the Northern Cook Islands, and central French Polynesia.

Rainfall has been above average in five of the past six months in parts of Fiji's Eastern Division, Tonga, and Papua New Guinea.

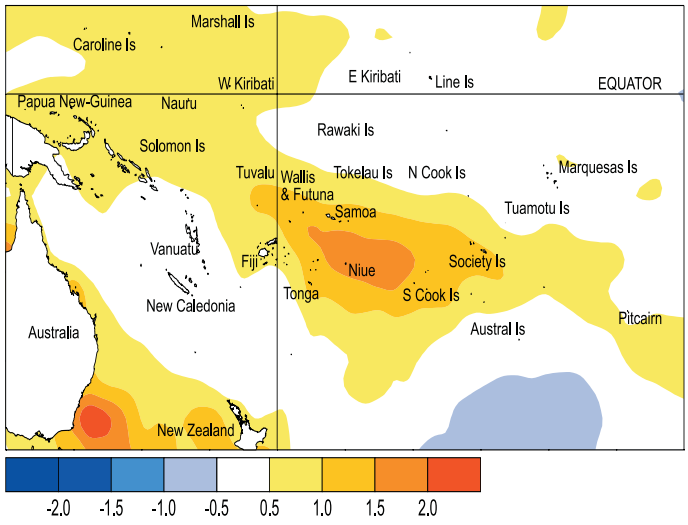
Mean air temperatures were about 1.0 ºC above average in Western Kiribati, Wallis and Futuna, Samoa, Tonga, and central French Polynesia, and at least 0.5 ºC above average in Tuvalu. In contrast, they were about 0.5 ºC below average in parts of Vanuatu. Tahiti-Faaa recorded an unusually warm November, with mean temperatures 1.4 ºC above average, and a record high November temperature maximum of 33.9 ºC.

Tropical Southwest Pacific mean sea-level pressures continued the tendency to be below average east of the Date Line, being 2 hPa below normal over the Southern Cook Islands. They were above average in the Tasman Sea. Equatorial surface easterlies were persistent along the equator, occurring in about 85% of observations at Tarawa.

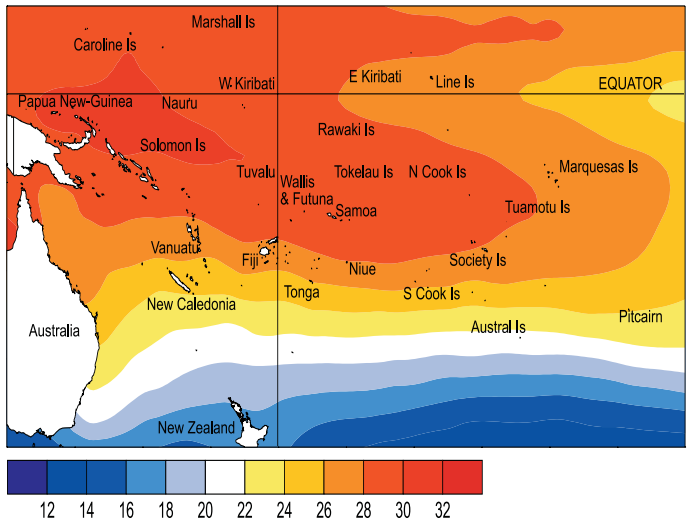


Outgoing Long-wave Radiation (OLR) anomalies, in Wm^{-2}. The November 2005 position of the SPCZ, as identified from total rainfall, is indicated by the solid green line. The average position of the SPCZ is identified by the dashed green line (blue equals high rainfall and yellow equals low rainfall).

Country	Location	Monthly Rainfall (mm)	% of average	Comments
Fiji	Vatukoula	353	236	Record high
Tonga	Niuafoo'u	486	213	Well above average
Cook Islands	Rarotonga EWS	282	207	Well above average
French Polynesia	Hiva Hoa, Autona	149	258	Extremely high
French Polynesia	Gambier, Rikitea	328	231	Extremely high
New Caledonia	Ouloup	13	13	Well below average



Sea surface temperature anomalies (°C) for November 2005.



Mean sea surface temperatures (°C) for November 2005.

The tropical Pacific Ocean is in a neutral state (no El Niño or La Niña), but negative sea surface temperature anomalies have strengthened off the South American coast, while those near the Date Line remain positive. The NINO3 SST anomaly was about -0.4°C in November (-0.1°C for September – November), while NINO4 was about +0.4°C (+0.5°C for September – November). The cold subsurface temperature anomaly at about 100 m depth and 140°W has strengthened a little but seems slow moving. The Southern Oscillation Index was weakly negative in November (-0.4), with the 3-month September – November average at +0.3. The equatorial trade winds are near normal in strength. Outgoing longwave radiation (OLR) anomalies indicate some suppression of convection near the Date Line, and enhancement north of Australia, with an enhanced SPCZ in November. The Madden-Julian Oscillation appears to be weak at the moment.

Almost all available models indicate neutral conditions through to winter 2006. Many show a brief period of negative anomalies in NINO3.4, with a recovery by April 2006, and the NSIPP model cools enough to constitute a brief La Niña. The latest US National Center for Environmental Prediction statement calls for neutral conditions, or a weak La Niña, over the next 6–9 months. However, the International Research Institute for Climate and Society summary gives only a about 1% chance of either El Niño or La Niña in the next few months, with neutral conditions "virtually certain" through December.

Tropical rainfall outlook: December 2005 to February 2006

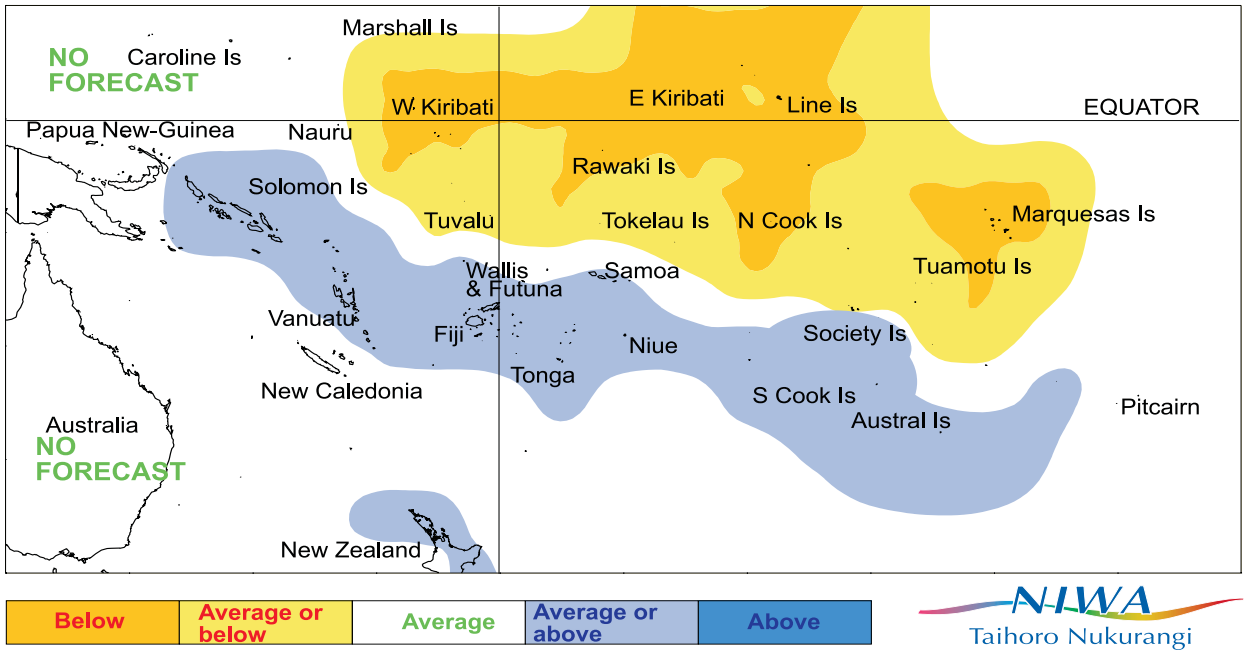
A large region of enhanced convection is expected from the Solomon Islands southeast to the Austral Islands including Vanuatu, Wallis and Futuna, Samoa, Fiji Tonga, Niue, Southern Cook Islands, and Society Islands.

Near or below average rainfall is likely over Tuvalu, Tokelau, and Pitcairn Island. Suppressed convection resulting in below average rainfall is likely in the equatorial region of Western and Eastern Kiribati, the Northern Cook Islands, and the Marquesas Islands.

The Southwest Pacific tropical cyclone season began in November, and so far there have been no occurrences. However, on average, there is a 70% chance that at least one tropical cyclone will occur in the southwest Pacific before 1 January. Last season the first tropical cyclone occurred about Christmas Day. Tropical cyclone risk increases, to average two to three occurrences per month, in January and February. On the basis of previous ENSO-neutral seasons, about nine tropical cyclones can be expected, on average, for the complete season over the entire Southwest Pacific region (see ICU issue no. 61 for more detail). The January issue of the ICU will provide information on relating to any occurrences of tropical cyclones in the region.

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

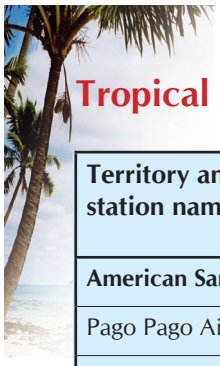


Rainfall outlook map for December 2005 to February 2006.

Forecast validation: September to November 2005

Enhanced convection with above average rainfall was expected over the Solomon Islands, with average or above average rainfall over Papua New Guinea, as well as Samoa, Niue, the Southern Cook Islands, Tuamotu Islands, and Marquesas Islands. Suppressed convection was expected over Eastern Kiribati, extending to Tuvalu, Vanuatu, and Fiji. Near average rainfall was forecast elsewhere in the region.

Areas of enhanced convection or above average rainfall affected Papua New Guinea and the northwest of the Solomon Islands, as well as the region from Niue east to the Southern Cook Islands. Suppressed convection or below average rainfall occurred in Western and Eastern Kiribati, Tuvalu, Tokelau, and the Northern Cook Islands. Rainfall was higher than expected in Tonga, and lower than forecast in New Caledonia, Tokelau, and the Society Islands. The overall 'hit' rate for the September – November 2005 rainfall outlook was very high, being about 75%. Outcomes for the Solomon Islands (based on OLR anomalies) have been consistent with forecasts for ten consecutive months.



Tropical Pacific rainfall – November 2005

Territory and station name	November 2005 rainfall total (mm)	Long-term average (mm)	November 2005 percent of average	Lowest on record (mm)	Highest on record (mm)	Records began
American Samoa						
Pago Pago Airport	*219.4*	275	80			1966
Australia						
Cairns Airport	29.4	97	30	3.2	372	1941
Townsville Airport	6.0	61	10	0.2	359	1940
Brisbane Airport	127.6	97	132	1.3	408.4	1929
Sydney Airport	93.0	83	112			1929
Cook Islands						
Penrhyn	*125.6*	225	56	32	644	1937
Rarotonga EWS	282.0	136	207	9	385	1929
Fiji						
Rotuma	395.5	282	140	106	778	1912
Udu Point	275.9	263	105	81	889	1946
Nadi	131.0	132	99	4	323	1942
Nausori	318.8	245	130	28	646	1956
Ono-I-Lau	97.4	115	85	3	409	1943
French Polynesia						
Hiva Hoa, Atuona	149.4	58	258	3	394	1951
Tahiti - Faaa	45.4	148	31	5	463	1919
Tuamotu, Takaroa	108.4	178	61	30	612	1953
Tuamotu, Hereheretue	109.2	165	66	8	359	1962
Gambier, Rikitea	327.8	142	231	20	702	1952
Tubuai	196.4	135	145	7	291	1953
Rapa	97.0	193	50	46	593	1951
Kiribati						
Tarawa	50.6	132	38	1	480	1946
Kanton Island	8.2	56	15	0	415	1937
New Caledonia						
Ile Art, Belep	102.4	113	91	12	392	1962
Koumac	31.4	54	58	0	177	1951
Ouloup	13.0	97	13	0	429	1966
Ouanaham	27.2	112	24	0	385	1961
Poindimie	112.2	179	63	18	492	1965
La Roche	42.8	108	40	18	554	1956
La Tontouta	14.6	51	29	0	342	1949
Noumea	30.8	53	58	0	484	1863
Moue	20.8	92	23	11	393	1972

Tropical Pacific rainfall – November 2005

Territory and station name	November 2005 rainfall total (mm)	Long-term average (mm)	November 2005 percent of average	Lowest on record (mm)	Highest on record (mm)	Records began
New Zealand						
Kaitaia	29.0	102	28	32	195	1985
Whangarei Aiport	56.8	89	64	18	258	1937
Auckland Airport	40.8	83	49	10	233	1962
Niue						
Hanan Airport	172.6	174	99	62	352	1996
North Tasman						
Lord Howe Island	171.0	117	146	14	292	1886
Norfolk Island	89.0	69	129	7	218	1921
Raoul Island	107.6	97	111	2	318	1937
Samoa						
Faleolo	241.6	232	104	100	538	1951
Apia	248.2	263	94	26	847	1890
Tonga						
Queen Lavinia	485.9	288	213	49	556	1971
Niuatouptapu Airport	141.2	185	76	9	511	1947
Lupepau'u	275.0	143	192	67	287	1995
Salote Pilolevu Airport	52.2	114	46	3	512	1947
Fua'amotu Airport	179.0	100	179	21	367	1980
Tuvalu						
Nui Island	182.0	268	68	59	628	1941
Funafuti	421.4	237	178	51	703	1927
Nanumea	263.0	173	152	28	494	1941
Vanuatu						
Sola	533.7	320	167	55	726	1958
Pekoa	139.2	196	71	21	474	1951
Lamap	77.5	129	60	6	368	1960
Bauerfield	77.0	152	51	19	440	1985
Port Vila	39.2	154	25	18	513	1947
Aneityum	57.4	149	39	20	544	1958
Wallis & Futuna						
Wallis island, Hififo	*248.0*	283	88	87	486	1951

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. 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.

Pacific Islands Climate Data Rescue

Rod Hutchinson, Australian Bureau of Meteorology

Introduction

The Australian Bureau of Meteorology (the Bureau) has started a Data Rescue project in five Pacific Island Countries (PICs) close to Australia. The project is being undertaken in partnership with New Zealand under the Australian Greenhouse Office's Bilateral Climate Change Partnership program, and will be managed by the Bureau's National Climate Centre.

Program objectives

The program aims to prevent loss of national heritage through the deterioration or destruction of original records, and improve the potential for within-country services (e.g, seasonal climate prediction, and mitigation of the potential effects of climate change) to support important social and economic needs, and help ensure sustainable development.

Data rescue provides an opportunity to expand essential resources for climate change research at the national, regional, and global levels, and assist in capacity building for PIC meteorological staff in effective records management and data preservation methods.

Project description

The project will focus on climate data in the Solomon Islands, Kiribati, Vanuatu, Papua New Guinea, and Fiji.

Important project outputs include: an inventory of records (including metadata) available in both digital and non-digital forms, both within and outside the countries; recommended actions for the preservation of the records, and prioritisation of records identified as being most at risk of loss; being measures to immediately secure vulnerable records in safe storage, subject to the availability of resources and PIC agreement to taking this action.

In providing knowledge and skills in records management, this project will provide substantial capacity building, which will help to ensure sound management of these data, and increase the likelihood of improved climate records in future years.

Project outcome

Access to additional meteorological records will lead to an enhanced understanding of the climate of the South Pacific, which exerts a very strong influence on the climate of the entire Pacific basin and beyond, through the El Niño – Southern Oscillation phenomenon, and through longer-term climate variability.

Similarly, the records will lead to an improved documentation and understanding of climate change throughout the region, and will provide the basis for further studies on impacts and adaptation strategies in the Pacific and neighbouring countries.

Efforts to assist, in practical and meaningful ways, to manage climate variability and change in the Pacific is of high importance to the Australian Bureau of Meteorology.

Map showing PICs

Project m anagement

The Australian Bureau of Meteorology will implement and manage the project, which will run for twelve months ending on 30 June 2006. This project will be driven by the needs and priorities of PICs and no data will leave their islands without their consent.

The project team has considerable expertise in records management, digital imaging, data rescue, key entry, quality control of meteorological data, and data management.

FROM this TO this

For more details on the project, refer to the PI-CDR website: http://www.bom.gov.au/climate/pi-cdr/index.shtml

Rod Hutchinson is the Operations Manager for Climate Data Management at the National Climate Centre, Australian Bureau of Meteorology.

The Island Climate Update

Cover Photo: Wendy St George, NIWA

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

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

Acknowledgements

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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.