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The Island Climate Update

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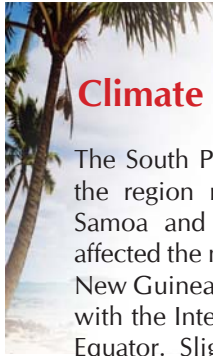
September's climate

- Large areas of enhanced convection affected the northwest Pacific, extending south towards Papua New Guinea and the Solomon Islands
- Suppressed convection existed over the region between Vanuatu and Eastern Kiribati, including Tuvalu and the Northern Cook Islands
- Above average rainfall in Niue, parts of Fiji, Tonga, and the Society Islands of French Polynesia
- Below average rainfall in the Austral Islands of French Polynesia, and much of New Caledonia
- Above average temperatures throughout much of the Southwest Pacific

El Niño/Southern Oscillation and seasonal rainfall forecasts

- Neutral El Niño/Southern Oscillation to continue in the equatorial Pacific
- Below average rainfall likely over Eastern Kiribati
- Near or below average rainfall over Western Kiribati and Tuvalu
- Near or above average rainfall likely in Papua New Guinea, the Solomon Islands, Samoa, Niue, the Cook Islands, and the Central French Polynesia.





Climate developments in September 2005

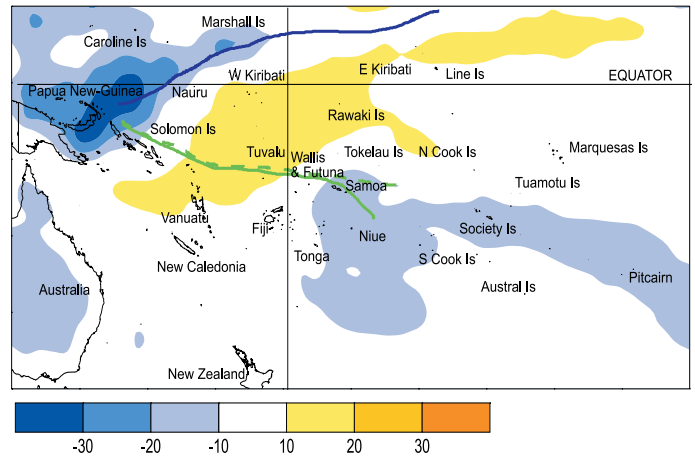
The South Pacific Convergence Zone (SPCZ) extended from the region northeast of Papua New Guinea and towards Samoa and Niue. A large area of enhanced convection affected the northwest Pacific, extending south towards Papua New Guinea and the Solomon Islands, and northeast to merge with the Inter-tropical Convergence Zone (ITCZ) north of the Equator. Slightly enhanced convection affected the region from Samoa east to the Society Islands of French Polynesia, and across to Pitcairn Island, including Niue and the Southern Cook Islands. Weakly suppressed convection existed over the regions between Vanuatu and Eastern Kiribati, including Tuvalu and the Northern Cook Islands.

Rainfall was more than 200% of average in Niue, and at least 125% of average in parts of Fiji, Tonga, and the Society Islands of French Polynesia. Torrential rainfall occurred in Fiji's Central division during the last week of September, leading to flooding in parts of Suva, Nausori and Tailevu. A large number of villages were evacuated and there was one fatality. Nausori Airport recorded 187 mm of rain on the 28th.

The months rainfall was less than 75% of average in the Austral Islands of French Polynesia, and less than 50% of normal in much of New Caledonia.

Mean air temperatures were above average throughout much of the Southwest Pacific.

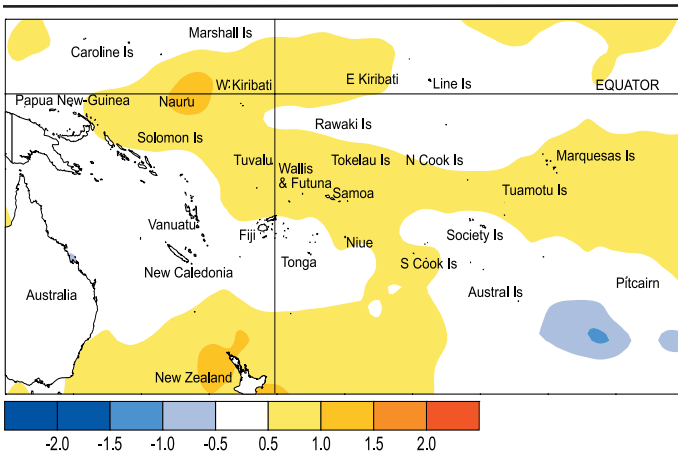
Tropical Southwest Pacific mean sea-level pressures were below average within about 15° north and south of the Equator, from about the



Outgoing Long-wave Radiation (OLR) anomalies, in Wm^{-2} . The September 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). The September position of the ITCZ is indicated by the solid blue line.

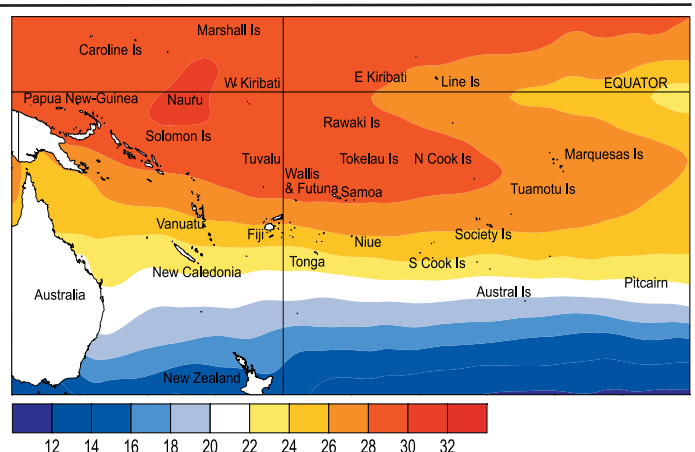
Date Line east towards South America, and above average at 30° south from New Zealand to southern French Polynesia. Equatorial surface easterlies were persistent along the Equator, occurring in 84% of observations at Tarawa.

Country	Location	Monthly Rainfall (mm)	% of average	Comments
Fiji	Nausori Airport	474	299	New high
Niue	Hanan Airport	348	419	Extremely high
Cook Islands	Aitutaki	194	242	Well above average
Australia	Cairns Airport	3	8	Extremely low
Australia	Townsville Airport	2	20	Well below average
New Caledonia	Koumac	7	18	Extremely low



Sea surface temperature anomalies ($^{\circ}C$) for September 2005.

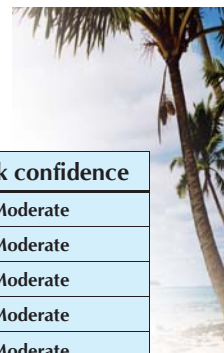
The tropical Pacific Ocean is in a neutral state (no El Niño or La Niña), with equatorial Pacific SSTs near average. The Southern Oscillation Index (SOI) was slightly positive in September (+0.3), and the 3-month July–September mean remained near zero (−0.2). The NINO4 sea surface temperature (SST) anomaly in September was about +0.5°C, showing little change from August. However, NINO3 decreased substantially to a small negative anomaly. This decrease in surface temperature coincided with stronger than normal easterly winds in the central and eastern equatorial Pacific during September. The cold subsurface temperature anomaly in the east has weakened since August. Equatorial OLR in September was near normal except for a region of suppressed convection on the Date Line and enhanced



Mean sea surface temperatures ($^{\circ}C$) for September 2005.

convection over Papua New Guinea and the Solomons.

Most available models indicate neutral conditions through the rest of 2005. Only two models show substantial departures from neutrality over the coming season. The Scripps/MPI dynamical model continues to develop a warm event (El Niño) over the summer. The Australian POAMA model, which over the past few months has shown a tendency for short-lived cooling after it is initialised, now develops a cool event (La Niña) over late spring-early summer. The latest NCEP/CPC statement is for neutral conditions over the next 3–6 months. The IRICP summary gives a 90–95% chance of neutral conditions persisting through to the end of 2005, and only a 5% chance of La Niña in this time period.



Tropical rainfall outlook: October to December 2005

A large region of enhanced convection is expected from Papua New Guinea eastwards to the Solomon Islands, and Samoa.

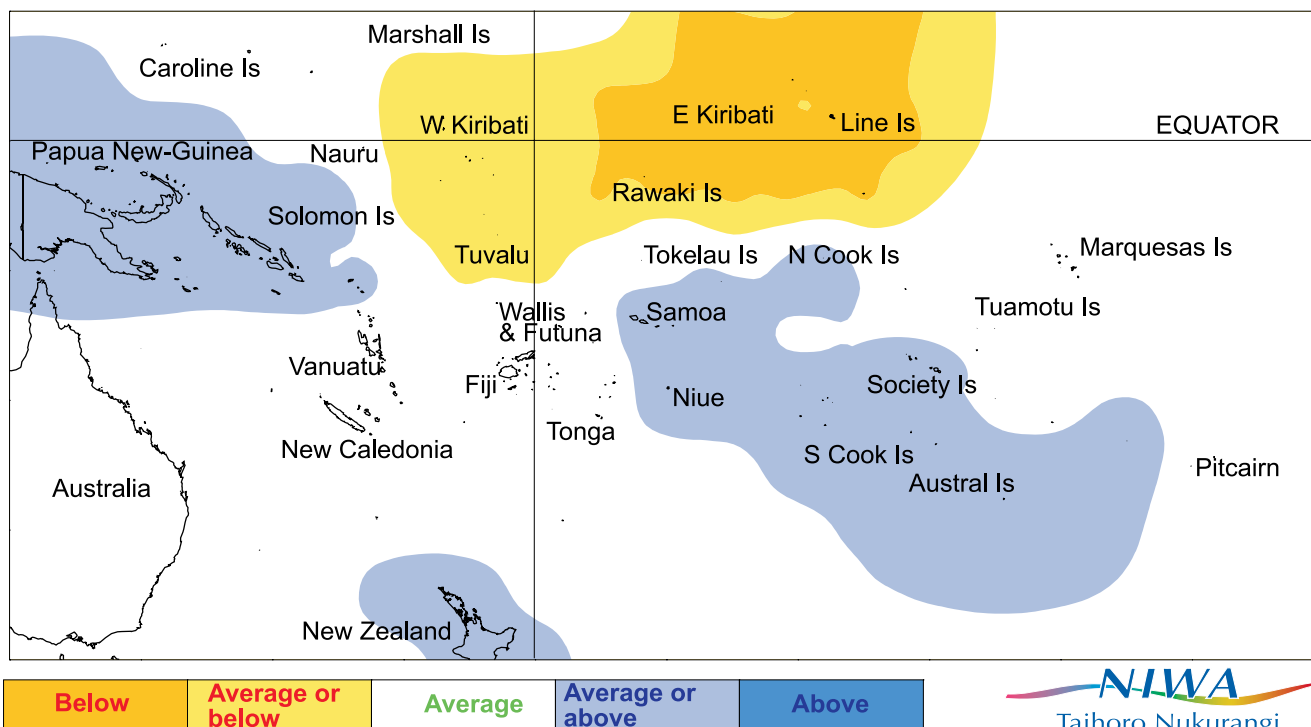
Another region of near or above average rainfall is likely from Niue east to the Austral Islands, including the Cook Islands and the Society Islands.

Rainfall is expected to be near or below average over Western Kiribati and Tuvalu. Below average rainfall is forecast for Eastern Kiribati.

The rainfall forecast model skill is low to moderate for this time of the year.

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.

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



Rainfall outlook map for October to December 2005.



Forecast validation: July to September 2005

Enhanced convection with average or above average rainfall was expected in areas from the Solomon Islands to the Marquesas Islands, including Western Kiribati, Tuvalu, Tokelau, and the Northern Cook Islands. Suppressed convection with near or below average rainfall was expected over Fiji, the Tuamotu Islands, and Pitcairn Island. Near average rainfall was expected elsewhere in the region.

Areas of enhanced convection affected northern areas of Papua New Guinea, northern parts of the Solomon Islands, Niue, and Pitcairn Island (higher than expected). Rainfall was above average in central French Polynesia. Convection was suppressed in Western and Eastern Kiribati, and Tokelau, and rainfall was below average in the Northern Cook Islands. The overall 'hit' rate for the July-September 2005 rainfall outlook was about 65%.

Tropical Pacific rainfall – September 2005

Territory and station name	September 2005 rainfall total (mm)	Long-term average (mm)	September 2005 percent of average	Lowest on record (mm)	Highest on record (mm)	Records began
American Samoa						
Pago Pago Airport						1966
Australia						
Cairns Airport	3.0	36	8	0	103	1941
Townsville Airport	2.2	11	20	0	81	1940
Brisbane Airport	21.8	35	62	0	104	1929
Sydney Airport	46.4	63	74	2	249	1929
Cook Islands						
Penryhn	119.7	148	81	4	447	1937
Rarotonga Airport	77.8	109	71	13	289	1929
Manihiki	103.5	143	72	17	454	1937
Fiji						
Rotuma	217.3	238	91	48	899	1912
Udu Point	145.2	113	128			1946
Nadi	34.8	70	50	0	279	1942
Nausori	493.7	165	299	12	473	1956
Ono-I-Lau	115.9	108	107	5	374	1943
French Polynesia						
Hiva Hoa, Atuona	56.0	69	81	5	148	1951
Bora Bora, Motu						1951
Tahiti - Faaa	66.2	51	130	1	297	1919
Tuamotu, Takaroa						1953
Tuamotu, Hereheretue						1962
Gambier, Rikitea	119.6	117	102	27	248	1952
Tubuai	34.2	121	28	10	330	1953
Rapa	74.8	196	38	46	597	1951
Kiribati						
Tarawa						1946
New Caledonia						
Ile Art, Belep	28.2	67	42	0	415	1962
Koumac	7.0	40	18	0	237	1951
Ouloup	91.6	57	161	2	253	1966
Ouanaham	31.2	77	41	2	412	1961
Poindimie	25.0	91	27	2	272	1965
La Roche	121.6	75	162	5	338	1956
La Tontouta	10.2	39	26	3	205	1949
Noumea	16.0	47	34	0	168	1863
Moue	23.4	58	40	7	217	1972

Tropical Pacific rainfall – September 2005



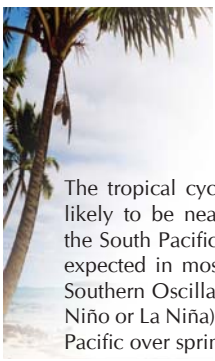
Territory and station name	September 2005 rainfall total (mm)	Long-term average (mm)	September 2005 percent of average	Lowest on record (mm)	Highest on record (mm)	Records began
New Zealand						
Kaitaia						1985
Whangarei Airport						1937
Auckland Airport						1962
Niue						
Hanan Airport	347.5	83	419	36	172	1996
North Tasman						
Lord Howe Island	105.8	141	75	27	322	1886
Norfolk Island	81.0	91	89	25	216	1921
Raoul Island						1937
Pitcairn Island						1940
Tonga						
Queen Lavinia	155.7	143	109	9	646	1971
Lupepau'u	287.8	122	236	13	385	1995
Niutoputapu	147.2	136	108	2	507	1947
Fua'amotu Airport	124.6	118	106	21	371	1980
Tuvalu						
Nanumea						1941
Nui Island						1941
Funafuti						1927
Nuilakita Island						1942
Vanuatu						
Sola						1958
Pekoa						1951
Lamap						1960
Bauerfield						1985
Port Vila						1947
Tanna, Whitegrass						
Burtonfield						1961
Aneityum						1958
Wallis & Futuna						
Wallis Island, Hihifo						1951
Maopopo, Futuna Island						

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.

Tropical cyclone guidance for the 2005/06 season

Dr Jim Salinger, Stuart Burgess and Dr Jim Renwick



The tropical cyclone season, from November – May, is likely to be near average intensity throughout much of the South Pacific, with a normal frequency of occurrence expected in most areas this season, due to the El Niño/Southern Oscillation (ENSO) neutral conditions (i.e. no El Niño or La Niña) that are expected to persist in the tropical Pacific over spring and summer (see Figure 1).

For the southwest Pacific, a tropical cyclone is a tropical low-pressure system, intense enough to produce sustained gale force winds (at least 34 knots or 63 km/h). A “severe tropical cyclone” produces sustained hurricane force winds (at least 64 knots or 118 km/h), and corresponds to the hurricanes in the North Atlantic and typhoons of the North Pacific. Southwest Pacific tropical cyclones are grouped into classes ranging from 1 to 5, with 5 being the strongest. On average, four per season reach at least class 4, with mean wind speeds of at least 64 knots or 118 km/h, while two usually reach class 5, with mean speeds in excess of 90 knots or 167 km/h.

In the USA, Hurricanes Katrina and Rita both reached class 5, their maximum sustained winds speeds reaching at least 135 knots or 250 km/h. In the 2004/05 season in the South Pacific, Cyclones Meena, Nancy, Olaf and Percy, which battered the Cook Islands, all reached at least class 4 in strength or higher. These were very destructive to Samoa and the Cook Islands.

About nine tropical cyclones on average can be expected over the entire Southwest Pacific region in an ENSO-neutral season. Tropical sea surface temperatures, which play an important role in the development of tropical cyclones, are presently above average over the seas to the north and east of the Date Line, but are near average elsewhere.

In the Southwest Pacific, tropical cyclones usually develop in the wet season, from November through April, but there can also be an occasional occurrence in May. Peak cyclone occurrence is usually during January, February and March.

In previous seasons similar to the present, several tropical cyclones usually occur (red) in the region around Vanuatu, New Caledonia, and the adjacent Coral Sea, some affecting other areas. For the entire region there is a 70% chance that at least one tropical cyclone will occur before 1 January, increasing to 97% by 1 February. About half of the tropical cyclones that develop reach hurricane force having mean wind speeds of at least 64 knots (118 km/h).

For further information: In the Pacific Islands - contact your local Meteorological Service

The full season: November to May

The following table shows the average number of tropical cyclones passing within 5° (550 km circle) of the main island groups of the Southwest Pacific over the full November through May period. Based on 35 years of data, and for tropical cyclones having mean wind speeds over 34 knots.

Country	Average over Neutral ENSO years	Average over all years	Comment
Fiji	2.4	2.3	Average risk
Tonga	2.3	2.1	Average risk
Niue	2.0	1.9	Average risk
Vanuatu	2.8	3.0	Average risk
New Caledonia	2.9	2.8	Average risk
Wallis and Futuna	1.8	1.7	Average risk
Southern Cook Islands	1.4	1.4	Average risk
Samoa	1.3	1.4	Average risk
Tuvalu	1.0	1.1	Average risk
Northern New Zealand	0.7	1.0	Average risk
Southern Papua New Guinea	0.5	0.6	Average risk
Tokelau	0.5	0.7	Average risk
Society Islands	0.6	0.8	Average risk
Austral Islands	0.5	0.8	Average risk
Tuamotu Islands	0.2	0.4	Average risk
Pitcairn Island	0.1	0.3	Average risk
Solomon Islands	0.9	1.4	Cyclones still likely
Northern Cook Islands	0.3	0.8	Cyclones still possible
Marquesas Islands	>0.1	0.1	Cyclones unlikely

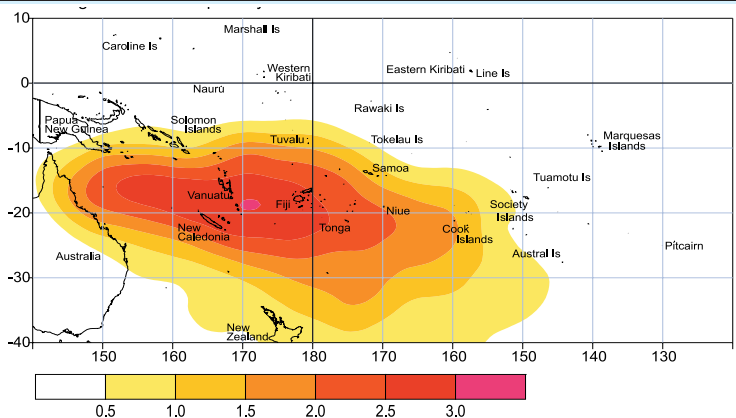


Figure 1 Average annual number of Tropical Cyclones, Neutral ENSO periods, Nov-May from 1970/71 to 2004/05



The Island Climate Update

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

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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

Cover Photo:
Wendy St George,
NIWA

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

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