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The Island Climate Update

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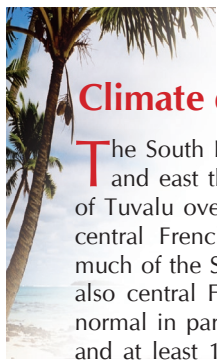
May's climate

- South Pacific Convergence Zone further north and east than usual, Intertropical Convergence Zone near the equator
- High rainfall in parts of New Caledonia and central French Polynesia, low rainfall in Fiji and northern Tonga
- Warmer in Western Kiribati, Tuvalu, Tonga, Fiji, and Vanuatu, cooler in southern French Polynesia and the Southern Cook Islands

El Niño/Southern Oscillation and seasonal rainfall forecasts

- Neutral El Niño/Southern Oscillation conditions expected through to southern hemisphere spring
- Above average rainfall expected over Eastern Kiribati
- Near or below average rainfall over Fiji and the Marquesas Islands





Climate developments in May 2005

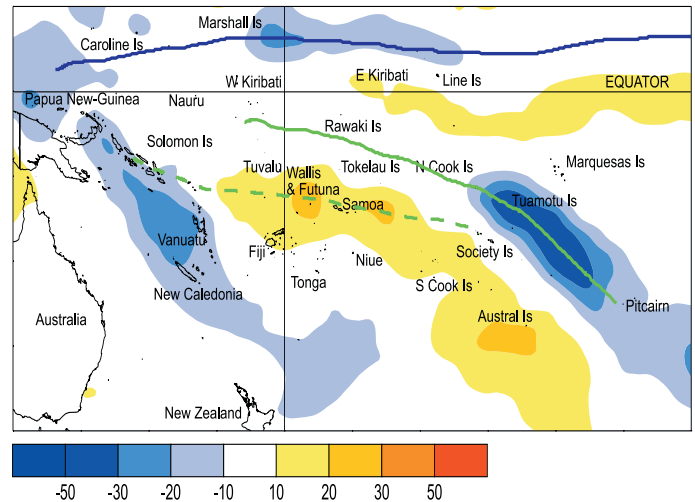
The South Pacific Convergence Zone (SPCZ) was further north and east than usual in May, extending from the region north of Tuvalu over the Northern Cook Islands and southeast through central French Polynesia. Enhanced convection occurred over much of the Solomon Islands, Vanuatu, and New Caledonia, and also central French Polynesia. May rainfall was about 300% of normal in parts of New Caledonia and central French Polynesia, and at least 125% of normal over much of Tuvalu. Other areas of enhanced convection were associated with the Intertropical Convergence Zone (ITCZ), which extended from near the Caroline Islands across the Date Line and further east, north of the equator.

Suppressed convection and below average rainfall occurred about and east of the Date Line, from Fiji to Samoa and southeast to Southern French Polynesia. Rainfall was well below average in parts of Fiji and northern Tonga, some locations recording less than 5 mm for the whole month. Convection was also suppressed over northern and eastern Australia.

Mean air temperatures were more than 1.0 °C above average in Western Kiribati, and at least 0.5 °C above average in Tuvalu, Tonga, Fiji, and Vanuatu. In contrast, they were more than 1.0 °C below average in Southern French Polynesia, and about 0.5 °C below average in the Southern Cook Islands.

Tropical Southwest Pacific mean sea-level pressures continued above average in many areas well west of the Date Line. They were below average along the equator east of the Date Line, and over central and northern French Polynesia.

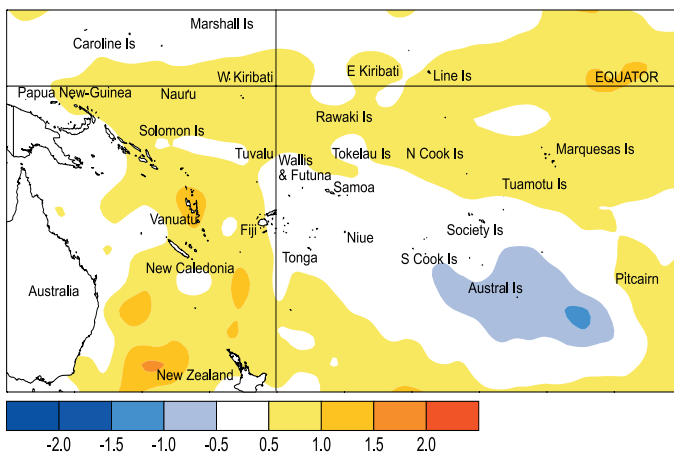
Along the equator, surface equatorial westerlies occurred in 19% of observations at Tarawa, reflecting a weakening of the easterlies.



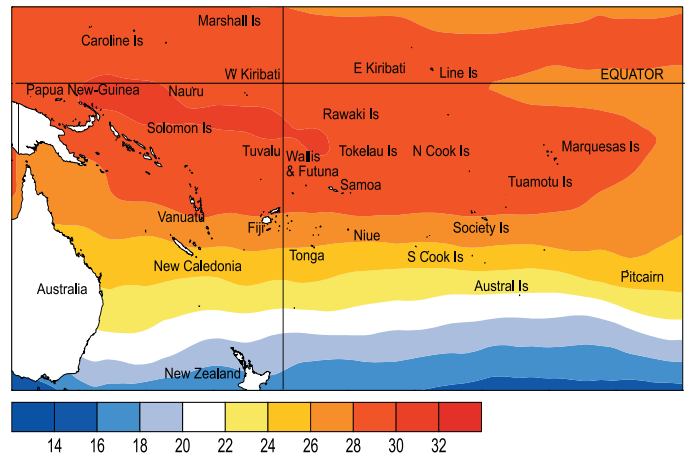
Outgoing Long-wave Radiation (OLR) anomalies, in Wm^{-2} . The May 2005 position of the SPCZ, as identified from total rainfall, is indicated by the solid green line. The average position of the SPCZ is identified by the dashed green line (blue equals high rainfall and yellow equals low rainfall). The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

Country	Location	Monthly Rainfall (mm)	% of average	Comments
New Caledonia	Koumac	228	312	Well above average
French Polynesia	Hiva Hoa Atuona	312	318	Extremely high
French Polynesia	Tuamotu, Takaroa	463	545	Extremely high
New Zealand	Raoul Island	237	191	Well above average
Tonga	Mata'aho Airport	2	1	Extremely low
Fiji	Nadi Airport	1	1	Record low
Fiji	Penang Mill	7.8	1	Record low

Correction: May issue of ICU mentioned "several fatalities in Fiji", which was not correct. There was only one fatality.



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

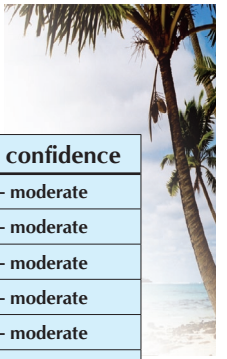


Mean sea surface temperatures (°C) for May 2005.

The tropical Pacific Ocean remains in a neutral but warm state (which may also be described as a weak El Niño state), much as it was in April. The rapid changes occurring in late April/early May, towards a possible El Niño state, appear to have been a short-lived perturbation. The Southern Oscillation Index (SOI) dropped slightly last month to -1.5, making the March–May mean -1.0. The NINO3 sea surface temperature (SST) anomaly rose rapidly in early May, with the May monthly average about +1.0 °C, while NINO4 was steady near +0.6 °C, and NINO3.4 was +0.7 °C. The March–May mean for NINO3.4 was about +0.6 °C. Subsurface temperature anomalies have eased in the equatorial Pacific, after a large positive anomaly surfaced in the east from late April. A significant Madden-Julian Oscillation (MJO) event came through the western Pacific in the first half of May, associated with positive surface zonal wind anomalies and a small rise in SST anomalies.

Activity weakened again towards the end of the month. Outgoing longwave radiation (OLR) anomalies for May show suppressed convection over Indonesia and northern Australia, but weaker anomalies further east.

Most available models indicate neutral conditions (mostly with positive NINO3.4 anomalies) through winter and spring. The Australian POAMA model and the UK Meteorological Office model have both eased towards neutral forecasts (from El Niño and La Niña forecasts respectively last month). The latest US National Center for Environmental Prediction (NCEP/CPC) statement calls for neutral conditions through June–August, with an uncertain outlook for spring. The International Research Institute for Climate Prediction (IRICP) summary gives a 70% chance of neutral conditions persisting through July 2005, with a 30% chance of an El Niño developing.



Tropical rainfall outlook: June to August 2005

The Pacific region will continue to see the lingering effects of the warm event which dissipated earlier this year, especially on the rainfall patterns.

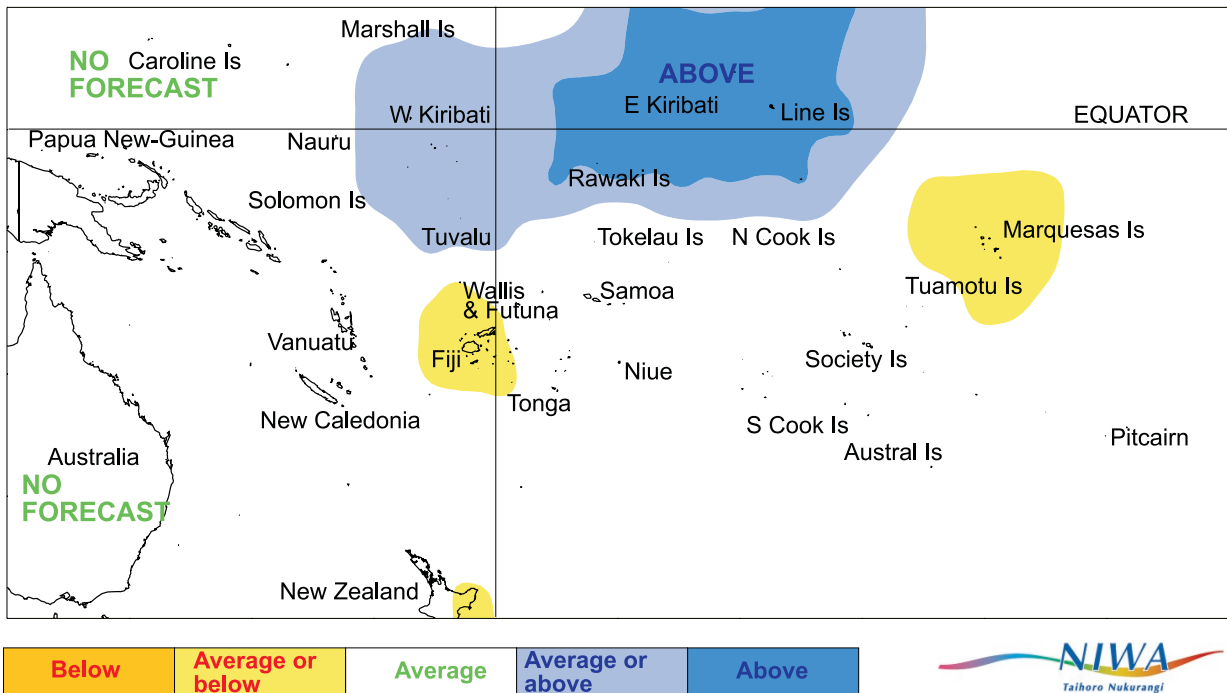
Based on the model guidance, enhanced convection is expected over Eastern Kiribati, where rainfall is forecast to be above average. Western Kiribati and Tuvalu are expected to experience near or above average rainfall.

Near or below average rainfall is expected over Fiji and the Marquesas Islands of French Polynesia. Near average rainfall is forecast for the rest of the countries in the region.

The skill of the models is reduced during this time of the year, as the dry season commences.

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
Eastern Kiribati	20:30:45 (Above)	Low – moderate
Western Kiribati	15:45:40 (Near average or above)	Low – moderate
Tuvalu	15:45:40 (Near average or above)	Low – moderate
Papua New Guinea	20:45:35 (Near average)	Low – moderate
Solomon Islands	20:45:35 (Near average)	Low – moderate
Vanuatu	25:45:30 (Near average)	Low – moderate
New Caledonia	35:35:30 (Near average/climatology)	Low
Wallis & Futuna	20:45:35 (Near average)	Low – moderate
Tokelau	30:45:25 (Near average)	Low – moderate
Samoa	25:45:30 (Near average)	Low – moderate
Northern Cook Islands	25:45:30 (Near average)	Moderate
Tonga	25:50:25 (Near average)	Low – moderate
Niue	25:45:30 (Near average)	Low – moderate
Southern Cook Islands	25:50:25 (Near average)	Low – moderate
Society Islands	20:50:30 (Near average)	Moderate
Austral Islands	25:55:20 (Near average)	Moderate
Tuamotu Island	25:55:20 (Near average)	Moderate
Pitcairn Island	20:50:30 (Near average)	Moderate
Fiji	40:40:20 (Near average or below)	Low – moderate
Marquesas Islands	40:45:15 (Near average or below)	Low – moderate



Rainfall outlook map for June to August 2005.

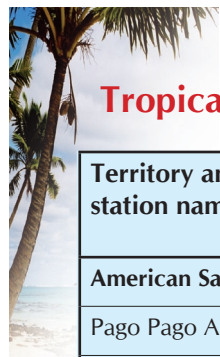
Forecast validation: March to May 2005

Enhanced convection and above average rainfall were expected over Western Kiribati, with average or above average rainfall over Eastern Kiribati, Tuvalu, Tokelau, the Austral Islands, and Pitcairn Island. Suppressed convection with below average rainfall was expected over the Marquesas Islands and rainfall was expected to be average or below average over Fiji. Near average rainfall was expected elsewhere.

A large region of below average rainfall occurred south of the equator, including Tokelau, parts of Samoa, the Northern Cook

Islands, and central and southern French Polynesia. Enhanced convection or above average rainfall occurred over the Caroline Islands, Vanuatu, the Tuamotu and Marquesas Islands, and Pitcairn Island. Rainfall was near average elsewhere.

Rainfall was higher than expected in Vanuatu, the Tuamotu and Marquesas Islands, and Pitcairn Island, and lower than expected in Western Kiribati, Samoa, Tokelau, the Cook Islands, and the Society and Austral Islands. The overall 'hit' rate for the March-May 2005 rainfall outlook was about 40%.



Tropical Pacific rainfall – May 2005

Territory and station name	May 2005 rainfall total (mm)	Long-term average (mm)	May 2005 percent of average	Lowest on record (mm)	Highest on record (mm)	Records began
American Samoa						
Pago Pago Airport	293.4	245	120			1966
Australia						
Cairns Airport	19.6	96	20	6	322	1941
Townsville Airport	21.0	36	58	0	206	1940
Brisbane Airport	52.8	99	53	3	617	1929
Sydney Airport	50.4	97	52	4	585	1929
Cook Islands						
Penryhn	93.6	183	51	24	437	1937
Mauke	25.6	154	17	3	499	1929
Rarotonga Airport	36.3	169	21	21	693	1929
Rarotonga EWS	33.4	169	20			2000
Fiji						
Rotuma	395.3	296	134	35	727	1912
Udu Point	25.6	167	15			1946
Nadi	0.7	89	1	1	332	1942
Nausori	72.2	248	29	28	535	1956
Ono-i-Lau	96.6	103	94	10	749	1943
French Polynesia						
Hiva Hoa, Atuona	311.8	98	318	17	278	1951
Bora Bora, Motu	128.8	155	83	40	358	1951
Tahiti - Faaa	138.4	102	136	0	347	1919
Tuamotu, Takaroa	463.0	85	545	12	274	1953
Tuamotu, Hereheretue	64.0	139	46	6	410	1962
Gambier, Rikitea	343	156	220	34	400	1952
Tubuai	115.4	150	77	10	435	1953
Rapa	77.6	262	30	52	578	1951
Kiribati						
Tarawa	114.6	193	59	4	578	1946
New Caledonia						
Ile Art, Belep	206.0	123	167	21	376	1962
Koumac	227.8	73	312	3	485	1951
Ouanaham	99.2	132	75	25	488	1961
Poindimie	205.6	189	109	53	519	1965
La Roche	76.4	131	58	10	424	1956
La Tontouta	99.2	71	140	1	258	1949
Noumea	132.8	97	137	12	399	1863
Moue	163.8	120	137	27	416	1972



Tropical Pacific rainfall – May 2005

Territory and station name	May 2005 rainfall total (mm)	Long-term average (mm)	May 2005 percent of average	Lowest on record (mm)	Highest on record (mm)	Records began
New Zealand						
Kaitiaia	133.2	119	112	51	245	1985
Whangarei Airport	116.6	108	108	25	408	1937
Auckland Airport	150.2	92	163	34	217	1962
Niue						
Hanan Airport	104.3	145	72	11		1996
North Tasman						
Lord Howe Island	311.0	162	192	45	376	1886
Norfolk Island	92.0	143	64	26	383	1921
Raoul Island	236.8	124	191	40	335	1937
Tokelau						
Nukunonu	87.0	155	56	0	352	1946
Tonga						
Queen Lavinia	44.5	166	27	15	485	1971
Niutoputapu Airport	1.9	167	1	1	347	1947
Lupepau'u	199.2	191	104	30	411	1995
Sallote Pilolevu Airport	165.7	171	97	0	430	1947
Nuku'alofa	195.3	111	176	18	241	1944
Fua'amotu Airport	158.0	135	117	25	317	1980
Tuvalu						
Nanumea	332.1	225	148	75	475	1941
Nui Is	297.7	221	135	68	594	1941
Funafuti	323.5	250	129	46	670	1927
Nuilakita Island	186.5	235	79	63	559	1942
Vanuatu						
Sola	443.0	371	119	41	811	1958
Pekoa	173.5	214	81	18	693	1951
Lamap	128.8	166	78	20	590	1960
Bauerfield	57.7	149	39	37	491	1985
Port Vila	39.1	146	27	18	473	1947
Whitegrass	97.0					
Aneityum	97.2	155	63	36	389	1958
Wallis & Futuna						
Wallis Island, Hihifo	138.8	206	67	78	419	1951
Maopopo, Futuna Island	14.6	245	6			

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.

2004–05 Tropical Cyclone Season Summary

Stuart Burgess, NIWA

The 2004–05 Southwest Pacific tropical cyclone season had nine occurrences (east of 150° E), the same as the average number normally expected for the region in a season (see Figure 1). About half reached major hurricane strength, with sustained wind speeds of at least 168 km/h. All but one of the Southwest Pacific tropical cyclones (the tracks of which are shown in Figure 2) originated east of the Date Line and all occurred within the December to April period. This was compatible with the ICU forecast issued in November 2004 for more tropical cyclones than normal for the season, near and east of the Date Line.

SW Pacific Tropical cyclone frequencies

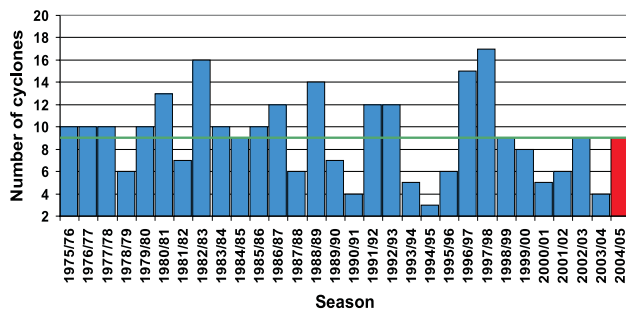


Figure 1. The number of Southwest Pacific tropical cyclones for the 2004/05 season (solid red bar) compared with frequencies during the past 30 years. The horizontal green line indicates the 30-year average.* Not including Ingrid which originated west of 150° E.

The most devastating tropical cyclones of the 2004–05 season were Meena, Nancy, Olaf, and Percy, all occurring in February. Most were triggered by an active phase of the Madden-Julian Oscillation which moved across the Southwest Pacific. Judy was the first tropical cyclone of the season (named on Christmas Day) and brought torrential rainfall to parts of the Tuamotu Islands of French Polynesia. Kerry developed northeast of Vanuatu on 6 January, passing over the Pentecost and Malekula Islands the next day, with pressures as low as 987 hPa, and maximum sustained wind speeds of 167 km/h. Lola affected the region near Tonga from 31 January through 2 February, with strong winds at Fua'amotu Airport. Meena, was east of Samoa on 3 February and tracked towards the Southern Cook Islands. Estimated maximum sustained wind speeds reached 232 km/h, with gusts to 287 km/h. Storm force winds occurred at Mauke on 6 February, with pressures as low as 986 hPa. Gale force winds and gusts to 115 km/h occurred

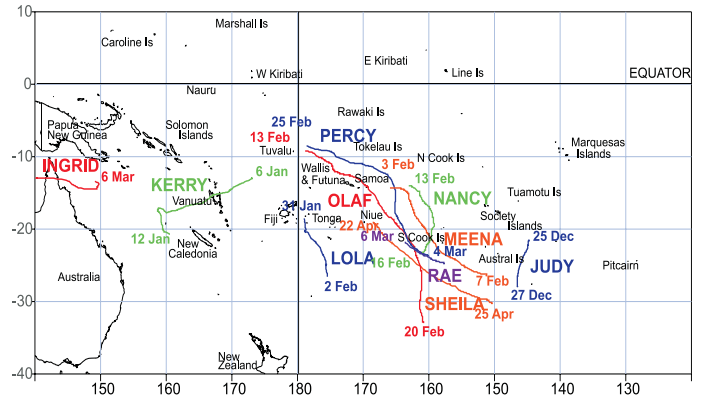


Figure 2. Southwest Pacific tropical cyclone tracks: for the 2004/05 season

in Rarotonga on the same day, preceded by heavy rainfall totalling about 100 mm. Nancy affected the Northern Cook Islands from 13 to 15 February tracking south, Aitutaki residents stocking up on emergency supplies and tourists evacuating resorts over 15–16 February. Estimated sustained maximum winds reached 232 km/h. Storm force winds gusted to 163 km/h in Rarotonga, with reports to 185 km/h elsewhere, preceded by heavy rainfall, pressures as low as 988 hPa, and huge seas. In Aitutaki, trees were uprooted, roofs damaged, and low lying areas flooded. Waves caused widespread destruction along the northern and eastern coasts of Rarotonga. The island of Mangaia was also badly hit. Olaf was named on 13 February, with maximum sustained winds near its centre later reaching 269 km/h. Winds exceeded 120 km/h in Samoa on 16 February, with roofing iron lifted. Both nations declared a state of emergency. Gales buffeted the Northern and Southern Cook Islands on 17 February (with gusts to 95 km/h in Rarotonga), residents stocking up on emergency supplies and tourists evacuating resorts beforehand. Percy was also destructive, with maximum sustained winds reaching 260 km/h. Gales, storm surge, and high tides affected Tokelau on 26 February, where it was said to be the worst tropical cyclone in living memory. Several homes were damaged and roads scoured, with water up to 1 m deep breaking over the sea wall to reach some areas. Rae followed (near the Southern Cook Islands) on 6 March, but was weak. Ingrid, which formed on 6 March in the Australian region (west of 150° E), was quite intense, forming in the Coral Sea south of Papua New Guinea, and then tracking west over Queensland and the Gulf of Carpentaria. Sheila formed east of Niue on 22 April, and tracked southeast, with maximum sustained winds reaching 65 km/h.

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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

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.

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The Island
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