Number 62, November 2005

The Island Climate Update

October's climate

- South Pacific Convergence Zone (SPCZ) located from the Solomon Islands to the Southern Cook Islands and parts of Tonga
- Enhanced convection over Papua New Guinea and the northeast of Australia, suppressed convection from Vanuatu east to Pitcairn Island
- Well above average rainfall in the east of Fiji's main island. Below average rainfall throughout much of Vanuatu, New Caledonia, and central French Polynesia
- Above average temperatures throughout much of the Southwest Pacific

El Niño/Southern Oscillation and seasonal rainfall forecasts

- Above average rainfall expected over the Solomon Islands and the Southern Cook Islands
- Below average rainfall is likely in Eastern Kiribati
- Rainfall is likely to be near or below average over Tuvalu, Tokelau, 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

SOPAC SPREP nzaid NIWA Taihoro Nukurangi

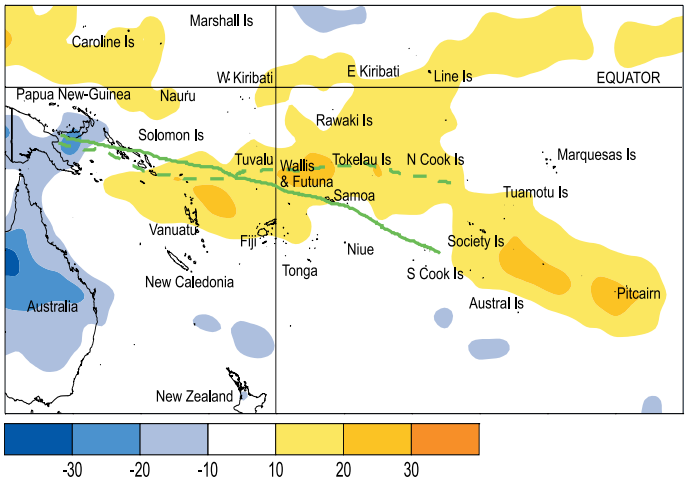
Climate developments in October 2005

An area of enhanced convection affected Papua New Guinea and also the northeast of Australia. The SPCZ extended from the region near the Solomon Islands towards Samoa and the Southern Cook Islands. The Inter-tropical Convergence Zone (ITCZ) was well north of the equator. Suppressed convection existed from Vanuatu east to Pitcairn Island, including Fiji, Tuvalu, Wallis and Futuna, Samoa, Tokelau, the Northern Cook Islands, and the Society Islands of French Polynesia.

Rainfall was more than 200% of average in the east of Fiji's main island (where more than 135 mm occurred on 29th October) and parts of Tonga, and at least 125% of average in Niue and parts of southern French Polynesia. October rainfall was less than 75% of average in central French Polynesia, and less than 50% of normal throughout much of Vanuatu and New Caledonia.

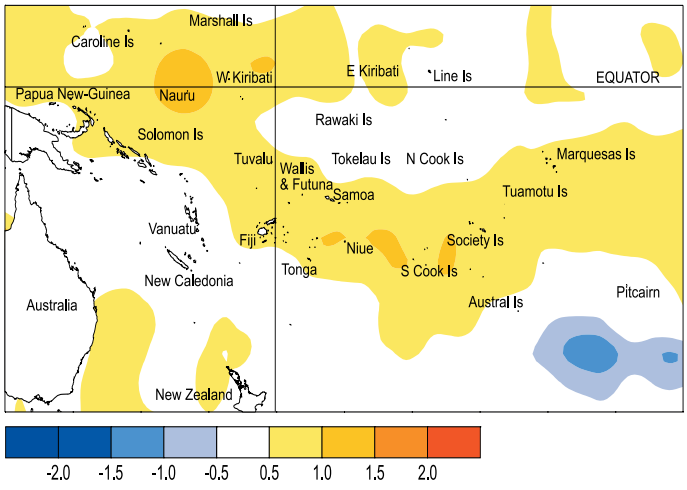
Mean air temperatures were more than 1.0 ºC above average in the Southern Cook Islands, about 1 ºC above average in Western Kiribati, Tuvalu, and much of central and southern French Polynesia, and at least 0.5 ºC above average in Fiji, Wallis and Futuna, and northern Tonga. In contrast, they were about 0.5 ºC below average in Vanuatu.

Tropical Southwest Pacific mean sea level pressures continued below average, within about 10º north and south of the equator, east of the Date Line. However, they were above average over much of French Polynesia. Equatorial surface easterlies were persistent along the equator, occurring in about 90% of observations at Tarawa.

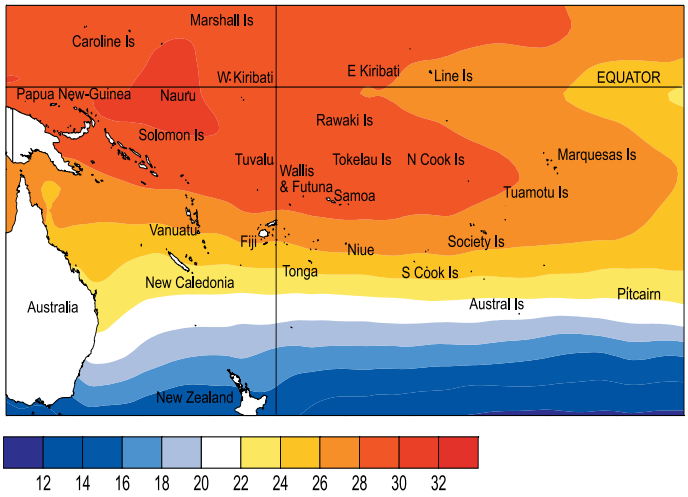


Outgoing Long-wave Radiation (OLR) anomalies, in Wm^{-2}. The October 2005 position of the SPCZ, as identified from total rainfall, is indicated by the solid green line. The average position of the SPCZ is identified by the dashed green line (blue equals high rainfall and yellow equals low rainfall).

Country	Location	Monthly Rainfall (mm)	% of average	Comments
Tonga	Fua'amotu Airport	317	308	Well above average
Fiji	Nausori Airport	417	203	Well above average
Vanuatu	Lamap	9	8	Extremely low
New Caledonia	Moue	12	14	Well below average
French Polynesia	Bora Bora	23	28	Record low



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



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

The tropical Pacific Ocean is in a neutral state (no El Niño or La Niña), although sea surface temperatures near the Date Line remain somewhat above average. The Southern Oscillation Index (SOI) was positive in October (+1.0), but the 3-month August–October average remained near zero (+0.1). The NINO4 sea surface temperature (SST) anomaly in October was about +0.6 °C, showing little change from September. The NINO3 SST anomaly remained small (+0.1°C), with negative anomalies near the South American coast. The cold subsurface temperature anomaly at about 100 m depth and 140 °W has also shown little change from September. Other indicators show typical climatological patterns, with no pronounced anomalies apparent in surface winds or convection (OLR).

Almost all available models indicate neutral conditions through to the end of autumn 2006. The Scripps/MPI dynamical model continues to develop a warm SST anomaly in the central Pacific, but this is not as pronounced in the latest model run as in the past three months. The latest US National Center for Environmental Prediction statement (6 October) is for neutral conditions over the next 3–6 months. The US International Research Institute for Climate Prediction summary gives a 95% chance of neutral conditions persisting through to the end of 2005, and only a 1% chance of La Niña in this time period.

Tropical rainfall outlook: November 2005 to January 2006

An area of enhanced convection is expected over the Solomon Islands and the Southern Cook Islands, where rainfall is forecast to be above average.

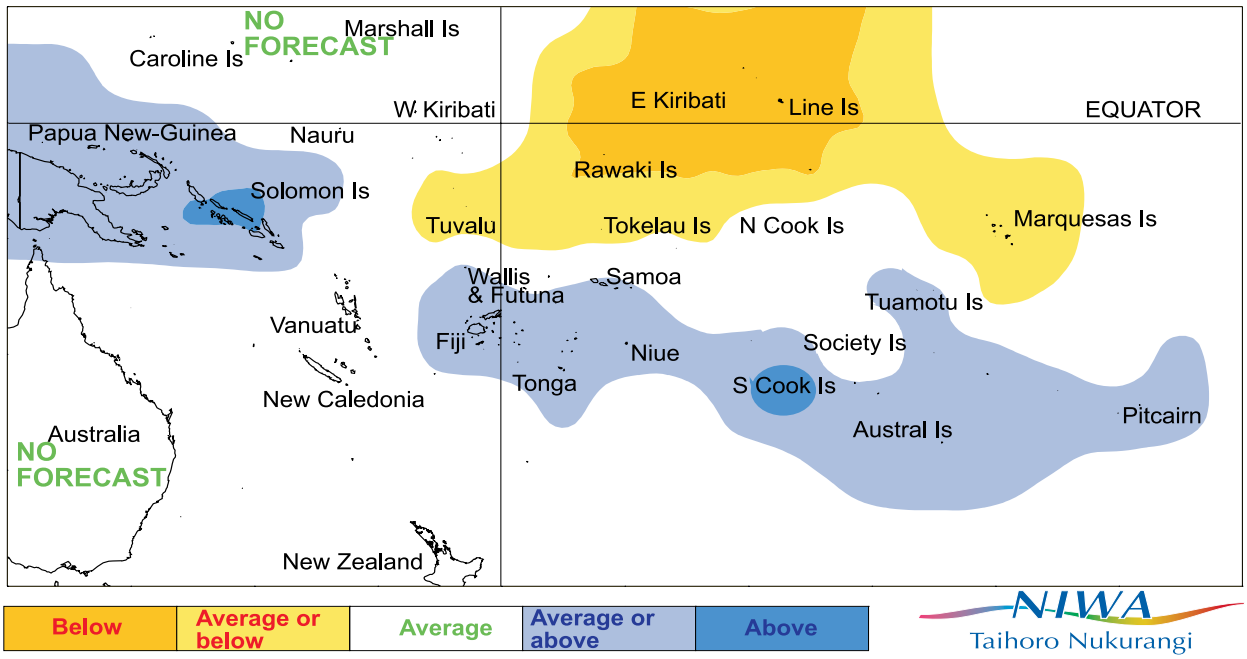
Another large area of near or above average rainfall is expected from Papua New Guinea east to southeast to Pitcairn Island including Wallis and Futuna, Samoa, Fiji, Tonga, Niue, the Austral Islands, and the Tuamotu Islands.

Near or below average rainfall is forecast for Tuvalu, Tokelau, and the Marquesas Islands. Below average rainfall is expected over Eastern Kiribati.

Near average rainfall is expected for the rest of the region. The skill levels of the forecast models are generally moderate during 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
Solomon Islands	20:25:55 (Above average)	Moderate
Southern Cook Islands	20:30:50 (Above average)	Moderate
Papua New Guinea	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
Austral Islands	20:40:40 (Near or above average)	Moderate
Tuamotu Islands	20:40:40 (Near or above average)	Low – moderate
Pitcairn Island	15:45:40 (Near or above average)	Moderate
Western Kiribati	35:45:20 (Near average)	Moderate
Vanuatu	25:50:25 (Near average)	Moderate
New Caledonia	35:35:30 (Near average)	Moderate
Northern Cook Islands	35:45:20 (Near average)	Moderate
Society Islands	20:45:35 (Near average)	Low – moderate
Tuvalu	45:40:15 (Near or below average)	Moderate
Tokelau	40:40:20 (Near or below average)	Moderate
Marquesas Islands	40:40:20 (Near or below average)	Low – moderate
Eastern Kiribati	50:30:20 (Below average)	Moderate



Rainfall outlook map for November 2005 to January 2006.

Forecast validation: August to October 2005

Enhanced convection with average or above average rainfall was expected over Papua New Guinea, the Solomon Islands, Wallis and Futuna, the Northern Cook Islands, and the Marquesas Islands. Suppressed convection with average or below average rainfall was expected over Western and Eastern Kiribati, as well as Fiji, the Southern Cook Islands, and Pitcairn Island. Near average rainfall was expected elsewhere.

Areas of enhanced convection, or above average rainfall, affected Papua New Guinea and northern parts of the Solomon Islands, as well as the region from Fiji east to the Austral Islands, including Samoa, Tonga, and Niue. Suppressed convection or below average rainfall occurred in Vanuatu, Western and Eastern Kiribati, the Northern Cook Islands, and the Marquesas Islands. Rainfall was higher than expected in Fiji, Samoa, Tonga, and Niue, and lower than forecast in Western and Eastern Kiribati, Tokelau, the Northern Cook Islands, and the Marquesas Islands. The overall 'hit' rate for the August–October 2005 rainfall outlook was about 55%.

Tropical Pacific rainfall – October 2005

Territory and station name	October 2005 rainfall total (mm)	Long-term average (mm)	October 2005 percent of average	Lowest on record (mm)	Highest on record (mm)	Records began
Australia						
Cairns Airport	8.2	41	20	0	205	1941
Townsville Airport	40.0	26	154	0	253	1940
Brisbane Airport	127.8	94	136	4	407	1929
Sydney Airport	44.0	78	56			1929
Cook Islands						
Rarotonga Airport	33.8	102	33	10	319	1929
Fiji						
Rotuma	248.6	340	73	80	656	1912
Udu Point	123.9	165	75	10	361	1946
Nadi	127.4	102	125	2	342	1942
Nausori	416.5	205	203	33	914	1956
Ono-I-Lau	117.3	86	136	2	342	1943
French Polynesia						
Hiva Hoa, Atuona	82.2	81	101	7	301	1951
Bora Bora, Motu	23.0	82	28	23	255	1951
Tahiti - Faaa	39.2	85	46	12	204	1919
Tuamotu, Takaroa	64.2	115	56	20	279	1953
Gambier, Rikitea	56.8	186	31	51	419	1952
Tubuai	94.6	113	84	7	297	1953
Rapa	305.2	172	177	67	521	1951
Kiribati						
Tarawa	92.2	127	72	0	433	1946
Butaritari	143.9	172	84	9	516	1945
New Caledonia						
Ile Art, Belep	37.2	54	69	4	208	1962
Koumac	8.2	28	29	0	177	1951
Ouloup	20.6	58	36	3	275	1966
Ouanaham	18.2	61	30	4	386	1961
Poindimie	108.0	119	91	10	644	1965
La Roche	40.8	84	49	0	230	1956
La Tontouta	13.4	43	31	0	213	1949
Noumea	9.8	49	20	0	208	1863
Moue	12.4	86	14	4	529	1972

Tropical Pacific rainfall – October 2005

Territory and station name	October 2005 rainfall total (mm)	Long-term average (mm)	October 2005 percent of average	Lowest on record (mm)	Highest on record (mm)	Records began
New Zealand						
Kaitaia	124.9	100	125	42	209	1985
Whangarei Aiport	121.0	111	109	18	313	1937
Auckland Airport	180.4	79	228	17	184	1962
Niue						
Hanan Airport	278.5	187	149	11	340	1996
North Tasman						
Lord Howe Island	91.6	134	68	35	337	1886
Norfolk Island	47.6	91	52	12	289	1921
Raoul Island	123.2	80	154	14	234	1937
Samoa						
Faleolo	186.2	233	80	57	479	1951
Apia	239.1	226	106	31	579	1890
Tonga						
Queen Lavinia	155.1	174	89	12	424	1971
Ha'apai	293.0	91	322	0	339	1947
Fua'amotu Airport	317.4	103	308	24	500	1980
Tuvalu						
Nui Island	218.4	194	113	71	540	1941
Funafuti	166.1	266	62	60	556	1927
Nuilakita Island	214.7	298	72	103	691	1942
Vanuatu						
Sola	219.4	362	61	7	970	1958
Pekoa	41.1	180	23	3	561	1951
Lamap	9.1	114	8	6	359	1960
Bauerfield	16.5	71	23	3	176	1985
Port Vila	14.4	92	16	0	264	1947
Aneityum	27.9	95	29	1	285	1958

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.

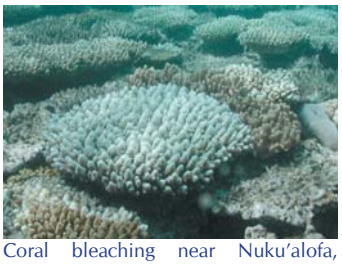
The Pacific Islands - Global Ocean Observing System (PI-GOOS)

Understanding the ocean for sustainable development in the South Pacific

Dr Sarah Grimes, SOPAC

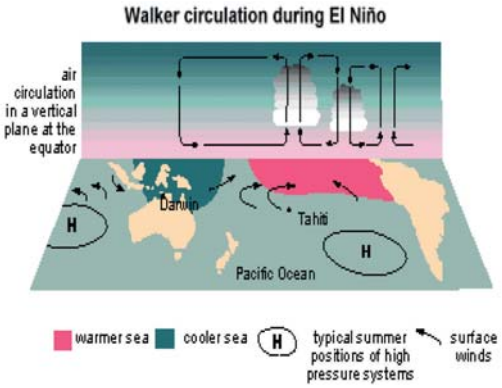
The Intergovernmental Oceanographic Commission's (IOC) Global Ocean Observing System (GOOS) was established in response to the 1992 Earth Summit, which specifically called for ongoing observations, modelling, and analysis of marine and ocean variables to support ocean and climate services worldwide. This enables effective sustainable management, development, and prediction of future change of the ocean environment, its resources, and related climate issues.

The Pacific Ocean is the largest in the world. Its open waters and coastal environments are of strategic, economic, environmental, and social importance to the Pacific Island countries (PICs). The PICs are the most vulnerable and at risk to the effects of accelerated climate change and associated sea level rise, salt water intrusion in coastal environments (especially fresh groundwater supplies), loss of biodiversity (both animal and plant), and the spin-off weakened social and economic structure. Furthermore, coral bleaching and coastal erosion (especially associated with increased coastal development) are becoming common in the Pacific. Significantly, ENSO (El Niño Southern Oscillation) is a Pacific–wide phenomenon that also affects the ecology, economy, and social structure of PICs.



Coral bleaching near Nuku'alofa, Tonga 2004. Photo courtesy of Dr Ed Lovell, USP.

Coastal erosion, Kiribati 2004. Photo courtesy of Mineral Unit, Kiribati



Walker Circulation during El Niño (Courtesy of Australian Bureau of Meteorology)

Increased vulnerability and needs of PICs to acquire an integrated and holistic approach to ensure sustainable management and development of its ocean environment, resources, and related climate issues led to the establishment of a Pacific Islands (PI)-GOOS in 1998. The PI-GOOS is dedicated to developing capacity in oceanography in the South Pacific region through a framework within which the systematic acquisition of oceanographic, marine, and related climate data, storage, analysis, monitoring, and forecasting are encouraged. The PI-GOOS works in collaboration with the Pacific Islands Global Climate Observing System (PI-GCOS) to achieve this.

Ultimately, long-term sustained ocean observation will enhance the scientific information and advice available to the region for improving:

- Marine and coastal water quality;
- Mariculture development (including pearl and seaweed industries);
- Coral reef health;
- Research interests in the region;
- Baseline information to climate observations; and
- Capacity building efforts.

This leads towards ecologically sustainable development and good governance for the region via the:

- Protection and restoration of ecosystem health;
- Sustainable development and management of natural resources;
- Promotion of economic development;
- Planning for efficient and safe marine operations; and
- Forecasting and mitigation of natural hazards and disasters.

The information acquired is being developed into useful products for dissemination to Pacific Island governments, regional and international scientific research, and the public to address marine and climate related issues in the South Pacific.

Further information is available on the new PI-GOOS website, the first ocean information portal developed for the region in mid 2005, accessible via the South Pacific Applied Geoscience Commission (SOPAC) home page (www.sopac.org). For other queries, or to discuss ocean/climate monitoring issues and potential projects in the South Pacific, please contact the PI-GOOS Co-ordinator, Dr Sarah Grimes, based at the PI-GOOS Secretariat in SOPAC, Fiji (sarahg@sopac.org) or PI-GCOS Co-ordinator, Mr Dean Solofa, based at the PI-GCOS Secretariat in SPREP, Samoa (deans@sprep.org.ws).

The Island Climate Update

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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

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.