Number 54, March 2005

The Island Climate Update

February's climate

- Very active South Pacific Convergence Zone, further north and east than usual
- Strongly suppressed convection across Australia, the Southwest Pacific, and south and west of the Date Line
- Four named tropical cyclones

El Niño/Southern Oscillation and Seasonal Rainfall Forecasts

- El Niño expected to continue to weaken over the coming months
- Above average rainfall over Western Kiribati
- Near average or below average rainfall over Fiji 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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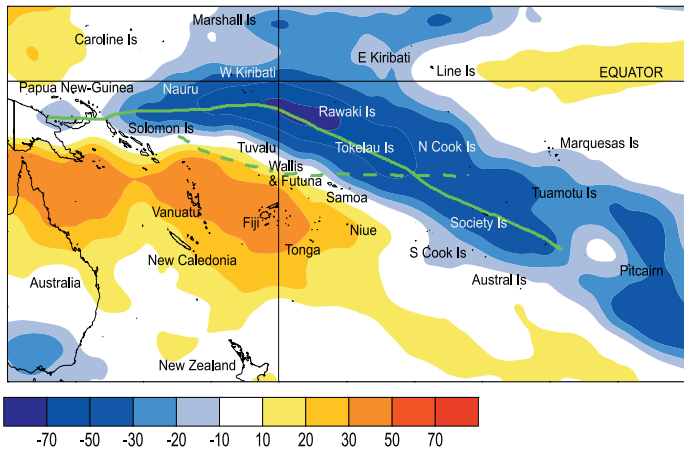
Taihoro Nukurangi

Climate developments in February 2005

There was a marked dipole in convection and very anomalous outgoing longwave radiation (OLR) over the Southwest Pacific in February. Strongly suppressed convection occurred over much of Australia and Indonesia, as well as Vanuatu, New Caledonia, and much of Fiji. Very enhanced convection occurred, associated with the South Pacific Convergence Zone (SPCZ) and the occurrence of several tropical cyclones, which extended from the east of the Solomon Islands to the region between Western Kiribati and Tuvalu and then southeast through Tokelau toward the Society Islands of French Polynesia. The OLR anomaly was the strongest in the region for several years, showing a clear northeastward movement and strengthening in the SPCZ. Enhanced convergence also affected the Caroline and Marshall Islands north of the Equator, as well as the Northern Cook Islands and Pitcairn Island.



Outgoing Long-wave Radiation (OLR) anomalies, in Wm^{-2}. The February 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).

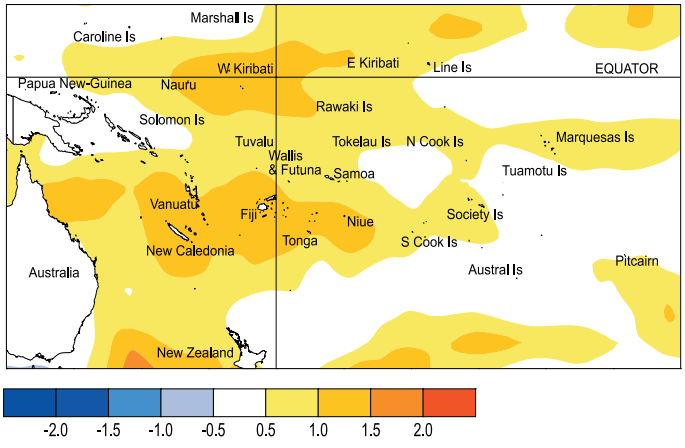
Rainfall was at least 125% of average in much of Tuvalu, Tokelau, and the Southern Cook Islands, and more than 200% of average in parts of Fiji's Northern Division and Northern and Central French Polynesia. Rainfall was less than 50% of average in the Coral Sea, New Caledonia, central and southern parts of Fiji, and also below average in Tonga.

It was slightly warmer than usual throughout much of the Southwest Pacific in February. Mean air temperatures were about 0.8ºC above average in New Caledonia, and 1.0ºC above average in Samoa. Temperatures were below average in Southern French Polynesia.

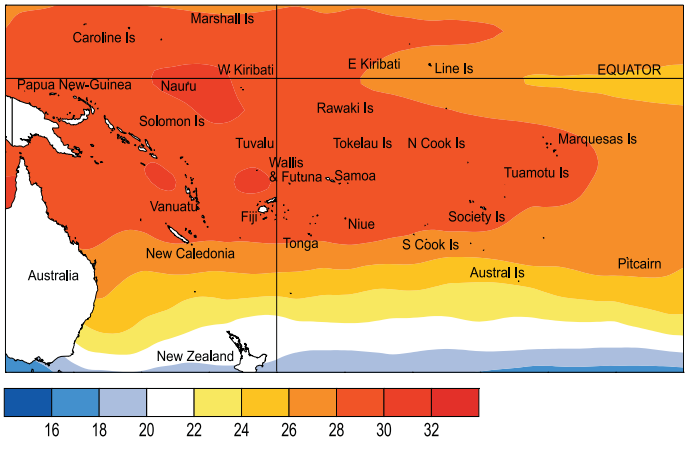
Tropical Southwest Pacific mean sea-level pressures continued above average well west of the Date Line. They also continued below average in the east, especially near the Southern Cook Islands, where they were more than 7 hPa below average (as a result of several tropical cyclones). Rarotonga's monthly mean MSL pressure of 1006.8 hPa (5 hPa below normal) was the lowest there for any month, in records that commenced in 1935.

Further east, Tahiti's monthly mean sea-level pressure of 1007.3 hPa was the lowest for February in records which commenced in 1876. Along the Equator, surface equatorial westerlies occurred in 40% of observations at Tarawa, their highest frequency since the end of the last moderate El Niño in November 2002.

Country	Location	Rainfall (mm)	% of average	Comments
Fiji	Udu Point	732	294	Extremely high
French Polynesia	Hiva Hoa, Atuona	207	249	Well above average
French Polynesia	Tahiti-Faaa	729	330	Extremely high
French Polynesia	Tuamotu, Takaroa	492	286	Record high
New Caledonia	Belep	48	24	Well below average
New Caledonia	La Roche	40	19	Extremely low
Fiji	Nadi Airport	64	22	Well below average
Fiji	Ono-I-Lau	24	12	Well below average
Fiji	Matuku	17	9	Extremely low



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



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

The tropical Pacific Ocean remains in a weak El Niño state, but there was a late surge of atmosphere-ocean coupling in February, resulting in large (probably short-term) changes in a number of indicators. The Southern Oscillation Index dropped dramatically from near zero in January to about -3 in February, when Tahiti recorded its lowest February monthly-mean sea level pressure, the lowest February value on record. Strong westerly zonal wind anomalies are evident in the west Equatorial Pacific. There is strongly suppressed convection over Australian longitudes and enhanced convection near the Date Line, and a clear northeastward movement and strengthening in the SPCZ. Many of these features are probably associated with the recent tropical cyclone activity in the Southwest Pacific.

A pulse of strongly positive temperature anomalies has developed in the subsurface across the central Equatorial Pacific, although sea surface temperatures remain relatively weak. The NINO3.4 average anomaly was about +0.3°C in February, having eased in recent weeks. NINO4 has weakened to near +0.8°C (from +1.2°C in January), and NINO3 has reduced from +0.6°C in January to near normal (zero anomaly) in February.

Despite recent events, almost all available models indicate the weak El Niño easing to neutral conditions (with positive NINO.4 anomalies) by May 2005, and over the winter.The chance of a La Niña developing is close to zero at present, and La Niña conditions are expected to remain very unlikely through much of 2005. However, it is likely that the region will continue to experience some El Niño-like climate conditions over the coming months.

Tropical rainfall outlook: March to May 2005

Weakening El Niño conditions are expected to continue influencing the climate patterns in the Pacific region over the coming months.

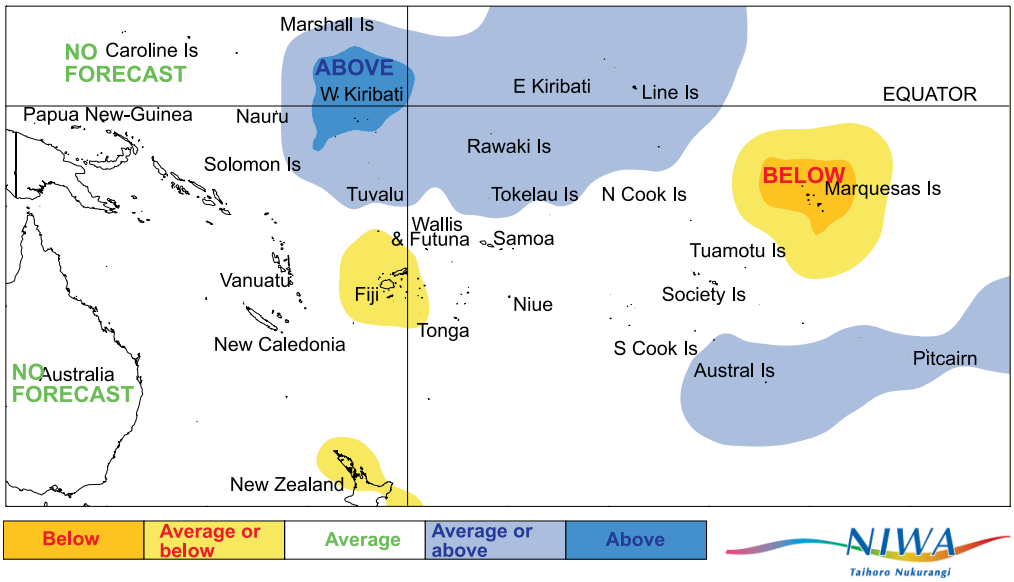
Enhanced convection is expected over the equatorial Pacific region, where rainfall is forecast to be above average for Western Kiribati. Enhanced convection with average or above average rainfall is over Eastern Kiribati, Tokelau and Tuvalu, as well as the Austral Islands and Pitcairn Island.

Suppressed convection is likely over Fiji and the Marquesas Islands, where rainfall is expected to be near or below average.

Rainfall is forecast to be near average for the rest of the region, with generally moderate model skills 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
Western Kiribati	25:30:45 (Above)	Moderate – high
Eastern Kiribati	15:45:40 (Near average or above)	Moderate
Tuvalu	20:40:40 (Near average or above)	Moderate
Tokelau	20:40:40 (Near average or above)	Moderate
Austral Islands	20:40:40 (Near average or above)	Moderate
Pitcairn Island	20:40:40 (Near average or above)	Moderate
Papua New Guinea	30:45:25 (Near average)	Moderate
Solomon Islands	30:50:20 (Near average)	Moderate
Vanuatu	30:45:25 (near average)	Moderate
Wallis and Futuna	25:50:25 (Near average)	Moderate
Samoa	20:50:30 (Near average)	Moderate
Tonga	30:45:25 (Near average)	Moderate
Niue	25:45:30 (Near average)	Moderate
Northern Cook Islands	25:45:30 (Near average)	Moderate
Southern Cook Islands	20:50:30 (Near average)	Moderate
Society Islands	30:45:25 (Near average)	Moderate
New Caledonia	35:40:25 (Near average)	Low – moderate
Tuamotu Islands	35:40:25 (Near average)	Moderate
Fiji	40:40:20 (Below or near average)	Low – moderate
Marquesas Islands	40:35:25 (Below or near average)	Moderate



Rainfall outlook map for March to May 2005.

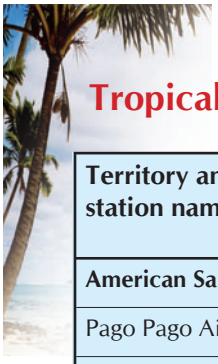
Forecast validation: December 2004 to February 2005

Enhanced convection and above average rainfall was expected over Eastern and Western Kiribati, Tuvalu, and Tokelau, extending to the Northern Cook Islands. Average or above average rainfall was expected in Pitcairn Island. Suppressed convection and below average rainfall was expected over Papua New Guinea, and also the Marquesas Islands, with average or below average rainfall over the Solomon Islands, New Caledonia, Vanuatu, Fiji, and Tonga, as well as the Southern Cook Islands and the Society Islands of central French Polynesia. Near average rainfall was expected elsewhere.

Rainfall was generally above average from east of the Solomon Islands toward the Date Line, and east over Tokelau to central and northern French Polynesia. Areas of below average rainfall occurred over New Caledonia, Fiji, and Tonga, as well as Eastern Kiribati and much of the Solomon Islands. Rainfall was near average elsewhere. Totals were higher than expected in Papua New Guinea and the Marquesas Islands, and lower than expected in Samoa and Western and Eastern Kiribati. The overall 'hit' rate for the December 2004 – February 2005 rainfall outlook was about 50%.

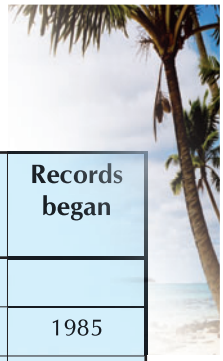
Tropical cyclone update

An active phase of the Madden-Julian Oscillation (MJO) moved across the Southwest Pacific during mid February, and helped trigger the development of tropical cyclones Meena, Nancy, and Olaf. All three affected the Cook Islands, with Olaf also affecting Samoa. Tropical cyclone Percy affected Tokelau on 26 February then tracked to Cook Islands before dissipating. It was the fourth tropical cyclone since the beginning of February, and the seventh named cyclone for the season. High frequencies of tropical cyclones east of the Date Line (6 of the 7 this season). These generally occur only during El Niño seasons. The April issue of the ICU will provide an update on information relating to any occurrences of tropical cyclones in our forecast region..



Tropical Pacific rainfall – February 2005

Territory and station name	February 2005 rainfall total (mm)	Long-term average (mm)	February 2005 percent of average	Lowest on record (mm)	Highest on record (mm)	Records began
American Samoa						
Pago Pago Airport	*284*	326	87			1966
Australia						
Cairns Airport	111.2	457	24	30	1287	1941
Townsville Airport	8.2	292	3	4	904	1940
Brisbane Airport	33.2	172	19	24	544	1929
Sydney Airport	109.0	106	103			1929
Cook Islands						
Rarotonga Airport	314.1	202	155	12	509	1929
Fiji						
Rotuma	147.5	322	46	111	925	1912
Udu Point	732.3	249	294	152	772	1946
Nadi	63.8	292	22	46	792	1942
Nausori	189.1	268	71	105	612	1956
Ono-i-Lau	23.7	194	12	17	492	1943
French Polynesia						
Hiva Hoa, Atuona	206.6	83	249	5	265	1951
Tahiti - Faaa	729.4	221	330	21	759	1919
Tuamotu, Takaroa	491.6	172	286	43	477	1953
Tuamotu, Hereheretue	212.6	144	148	37	305	1962
Gambier, Rikitea	114.0	164	70	31	404	1952
Tubuai	252.0	207	122	26	581	1953
Rapa	297.4	199	149	12	474	1951
Kiribati						
Tarawa	*92.6*	182	51	4	541	1946
New Caledonia						
Ile Art, Belep	48.0	198	24	40	624	1962
Koumac	86.6	160	54	19	473	1951
Ouloup	113.6	189	60	37	417	1966
Ouanaham	69.2	246	28	38	573	1961
Poindimie	213.1	383	56	101.8	1151	1965
La Roche	40.0	210	19	42	853	1956
La Tontouta	48.4	131	37	15	435	1949
Noumea	54.9	117	47	15	406	1863
Moue	52.0	161	32	47.2	555	1972
Niue						
Hanan Airport	227.0	237	96	34	538	1996



Tropical Pacific rainfall – February 2005

Territory and station name	February 2005 rainfall total (mm)	Long-term average (mm)	February 2005 percent of average	Lowest on record (mm)	Highest on record (mm)	Records began
New Zealand						
Kaitaia	91.7	101	91	14	309	1985
Whangarei Aiport	91.0	112	81	6	452	1937
Auckland Airport	62.8	82	77	8	272	1962
North Tasman						
Lord Howe Island	29.0	116	25	22	337	1886
Norfolk Island	68.8	81	85	3	298	1921
Raoul Island	220.2	148	149	11	731	1937
Solomon Islands						
Taro	149.1	303	49			1974
Munda	632.0	361	175			1954
Auki	365.8	381	96			1954
Honiara	250.0	293	85	81	554	1954
Henderson	149.4	285	52			1974
Santa Cruz, Lata	269.3	397	68			1970
Tuvalu						
Nanumea	496.9	276	180	0	720	1941
Funafuti	495.6	316	157	93	1139	1927
Nuilakita Island	270.4	320	85	63	673	1941
Vanuatu						
Sola	360.0	350	103	124	689	1958
Pekoa	*390.4*	314	124	24	805	1951
Lamap	*339.5*	256	133	20	719	1960
Bauerfield	*171.9*	261	66	89	628	1985
Burtonfield	*126.2*	213	59	49	604	
Aneityum	*87.2*	295	30	67	1084	1958
Wallis & Futuna						
Wallis Island, Hihifo	*160.8*	350	46	38	866	1951
Maopoopo, Futuna Island	*456.0*	352	130			

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 subjected 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.

Natural Disasters: Fijian Case Study

Irshad Ali, Save the Children Fiji

Natural disasters are regular occurrences in Fiji and affect people across the country in many ways – cyclones, floods, landslides, and drought. Although these disasters have some links with seasons, they are not completely predictable, nor are they assiduously tracked or mapped. Overall, a system–wide response to disasters is undertaken at national and local levels by aid agencies, non-governmental organisations (NGOs), and the government, which result in relief interventions.

The impact of a drought is not so clearly visible, compared with cyclones and floods. Droughts are slow onset disasters and their impacts are usually underestimated. The community and aid agencies' responses to them also tend to be delayed, and therefore add to the hardships of vulnerable communities.

During 1997-98, Fiji faced its worst drought which nearly crippled the economy, as the sugar cane harvest was reduced by nearly 50%, and affected other traditional crops such as yaqona, coconuts, and cocoa, which took years to recover. Accompanying disasters are the social consequences ,including increased incidences of diseases, school absenteeism, and other social and family problems resulting from the stress of lost income.

Recently Fiji has been facing more drought-like conditions, especially in the last quarter of 2004, where the Western Division of Fiji's main island of Viti Levu (see map below) experienced dry conditions. These dry conditions prevailed in the sugarcane and agricultural belt from Ba, Tavua, and Rakiraki.

Impacts

In late 2004 and early 2005 Save the Children Fiji (SCF) assessed the impact of the current dry conditions on children. The first assessment revealed that families could only look forward to a bleak holiday period with a real possibility of farmers experiencing lingering effects of this event in early 2005. The SCF visited the Divisional Officers in the affected regions to ascertain the impacts of this event. The following section describes the findings in detail.

Rakiraki

The visit to Rakiraki Divisional Officers (DOs) showed that the worst areas affected stretched from Drauniivi to Navesau (close to Tailevu), with Nanuku being the most serious. From October 2004, the DOs office supplied emergency water to an estimated 2200 farmers or 22,000 of families.

Tavua

The Divisional Office – Tavua informed SCF that there are 23 areas in total that have been receiving emergency water since October 2004, involving 682 households, with a population of 3594.

Ba

The assessment for this region was through visits to the Health Inspectors, rather than the District Office. SCF was informed that the areas affected are mainly inland and areas which do not have piped water supply, involving 117 families or a population of 600.

School visits

The SCF team also visited schools in the areas affected to determine the direct effects on children.

- Enrolment numbers alone, although indicating a slight decline, do not show the true picture, as the majority of the students enroled are still to pay school fees, and buy books and uniforms.
- While children of farmers are also exposed to the adverse effects of the drought, it is the children of the farm labourers that are worst affected, as their parents choose to migrate to Nadi and Lautoka (larger towns and cities) in search of work. Whether or not they are able to continue school at their new homes is unclear.
- School principals are trying to encourage parents to send their children to school e.g. agreeing to a payment plan for the parents to meet their children's school fees etc.
- School principals believe that the worst is yet to come.

It has become increasingly clear through this assessment that the children who have been worst affected by the drought are those living in the Tavua areas and parts of Rakiraki. An estimate of the affected children is 5,000–8,000. The supply of emergency water to some of the affected areas is highly appreciated. However, much more concerted effort is needed to help retain children at school, and to avoid long-term effects on the education of children in the affected areas.

The immediate needs of children must be given thorough consideration. The nutritional situation of children is of grave concern. While health problems are not so visible among children visited, support is needed for nutritional interventions for children and families. Teachers observe progressive impoverishment of children. Food is in short supply – lacking fresh vegetables, pulses, and basic supplies. The decline in the quality of lunch children take to school is a concern raised by many teachers in the schools visited. Children under 5 and pregnant and lactating women, will be particularly vulnerable. Children will be adversely affected by lack of good nutrition. The lack of food and water may lead to other health risks. While major health conditions were not so evident among the children visited, many were reluctant to divulge information on the family food supply. Primary school children in most schools were encouraged to share lunch with those unable to afford it. According to teachers, secondary school children would rarely admit to not having lunch and make excuses to avoid embarrassment. They would rather do without lunch to avoid any embarrassment. Teachers have further observed irritable behaviour and a decline in concentration among children severely affected.

With a lack of employment opportunities in the area, many families are gradually becoming mobile. Reports indicate that the most affected are farm labourers who either move with their families or leave children in the care of one parent or relatives. A key issue will be to ensure that children remain with their families since they are their primary protectors. It is important to avoid separation of children as this tendency is likely to contribute towards larger social problems. Preventing separation and actively facilitating school-based interventions io the crisis must be key components of any emergency response.

The Island Climate Update

Cover Photo: Wendy St George, NIWA

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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.