Number 124, January 2011

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- A strong La Niña exists in the equatorial Pacific region. Most dynamical and statistical climate models project continuation of the event through Austral summer and into autumn 2011, with the expecation that neutral conditions will be achieved by winter.

Tropical cyclone forecast for 2010-11 season

- To date, one TC has occurred in the SW Pacific region this season. Normal or above normal tropical cyclone occurrence is expected, with increased activity to the west of Fiji in the Coral Sea and North Tasman region. Risk is elevated for Papua New Guinea, the Solomon Islands, New Caledonia, Vanuatu, and New Zealand.

Multi-model Ensemble Tool for Pacific Island (METPI) rainfall and sea surface temperature forecasts

- Below normal rainfall is forecast for the Western Kiribati, Eastern Kiribati, Tuvalu, Tokelau, the Northern Cook Islands and the Tuamotu Archipelago.

- The South Pacific Convergence Zone is expected to be displaced southwest of normal. Above normal rainfall is expected for New Caledonia, Vanuatu, Fiji, Niue, and Tonga.

- Below normal sea surface temperatures are forecast for the Marquesas, Western Kiribati and Eastern Kiribati. Papua New Guinea, New Caledoina and the Austral Islands are expected to have above normal SSTs.

Collaborators

Pacific Islands National Meteorological Services

Australian Bureau of Meteorology

Meteo France

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

MetService of New Zealand

nzaid

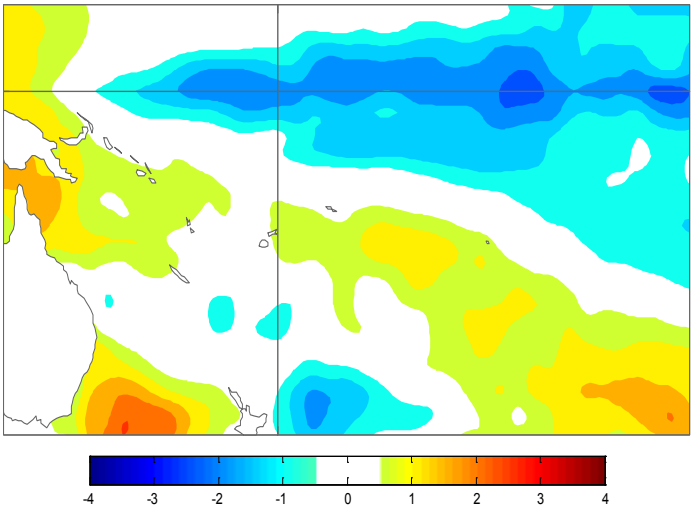
NOAA National Oceanic and Atmospheric Administration U.S. Department of Commerce

SPREP

NIWA Taihoro Nukurangi

El Niño/Southern Oscillation (ENSO)

A strong La Niña event is in place in the tropical Pacific, and it intensified during December. There is strongly enhanced convection over the Maritime Continent and northern Australia, and convection is strongly suppressed near the equator in the western and central Pacific. The ITCZ and SPCZ both remain displaced poleward of their normal position. The TRMM ENSO index was –1.2 for December (values of –1.0 or less are considered typical of La Niña conditions). The easterly trade winds were stronger than normal west of 150°W, and the SOI rose to +2.8 for December (+1.6 in November and +2.1 in the three–month mean for OND). A very prominent cold tongue is visible in the SST anomaly field, centred on the Equator and extending from 150°E to the South American coast. SST anomalies are positive in the far western Pacific and in the extra–tropics of both hemispheres. NINO3 and NINO4 SST anomalies were around –1.5°C and –1.3°C respectively, on average for December (OND averages –1.4°C and –1.2°C, respectively). A strong negative subsurface heat content anomaly continues to migrate eastwards along the Equator and continues to weaken slowly. A positive SST anomaly is gradually spreading eastwards in the western Pacific. There is a weak region of MJO–related convection over the Australian/western Pacific region which is expected to propagate eastwards across the Pacific during the rest of January, and may strengthen.



Surface temperature anomalies (°C) for December 2010

Almost all the global climate models NIWA monitor predict the tropical Pacific to be in a La Niña state over the coming three months, with most easing towards neutral conditions during autumn (MAM) and into winter. The NCEP ENSO discussion of 6 January states that La Niña conditions are near their peak and the event is likely to persist well into southern autumn 2011 at a lesser intensity. The IRI summary of 16 December indicates a 98% probability for moderate–strong La Niña conditions continuing through February 2011, 94% through March 2011, and at least 50% until April–June 2011.

Southwest Pacific tropical cyclone guidance for the 2010-11 season

The expectation is that normal or above normal tropical cyclone (TC) activity will occur for most islands west of the International Date Line in the southwest Pacific during the November 2010 – April 2011 season. Although risk is reduced east of the International Date Line, all communities should remain alert and prepared.

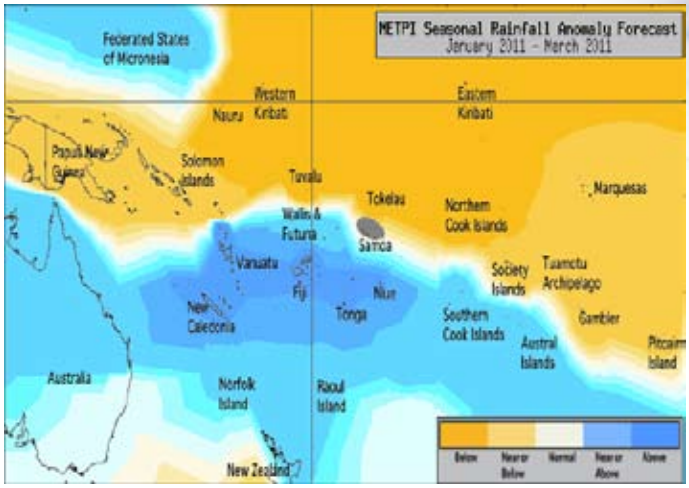
To date, one TC has occurred in the region covered by the ICU forecast. Nine to 12 named TCs are expected for the southwest Pacific (between 135°E to 120°W). On average, nine tropical cyclones occur each year for the southwest Pacific region. Southwest Pacific TCs are grouped into classes ranging from 1 to 5, with 5 being the most dangerous. For the coming season, three cyclones are forecast to reach at least Category 3, and one system is expected to reach at least Category 4, with mean wind speeds of at least 64 knots or 118 km/h.

Each year, TCs have a significant impact on the southwest Pacific. Places like Vanuatu and New Caledonia typically experience the greatest activity in the region, with an average of about 3 TCs passing close to those countries each year. Projections show an increased risk of TCs for the 2010–11 season over the Coral Sea and to the southwest of Fiji, particularly for Papua New Guinea, the Solomon Islands, Vanuatu, and New Caledonia. New Zealand is also at higher risk of experiencing an ex-tropical cyclone interaction this season. While risk is generally reduced for islands to the east of the International Date Line during La Niña, historical cyclone tracks indicate that TCs can affect parts of southwest French Polynesia, including the Society and Austral Islands, and the Cook Islands during La Niñas. All islands should remain vigilant as the current La Niña continues to evolve with progression into Austral summer and autumn. A mid-season update of the TC forecast will be released in the next Island Climate Update issue (ICU 125)..

Island Group	TC occurrence (All years)	TC forecast (Analogue years)	Risk
Papua New Guinea	0.5	0.7	Elevated
New Caledonia	2.6	3.6	Elevated
Solomon Islands	1.3	1.6	Elevated
New Zealand	0.9	1.1	Elevated
Vanuatu	2.9	3.5	Elevated
Austral Islands	0.8	0.7	Near normal
Fiji	2.3	2.0	Near normal
Tonga	2.0	1.7	Near normal
French Polynesia	0.7	0.5	Reduced
Pitcairn	0.3	0.2	Reduced
Wallis & Futuna	1.8	1.2	Reduced
Niue	1.8	1.2	Reduced
Samoa	1.5	1.0	Reduced
Society Islands	0.8	0.5	Reduced
Southern Cook Isl.	1.5	0.7	Low
Tokelau	0.8	0.3	Low
Tuvalu	1.1	0.4	Low
Northern Cook Isl.	0.8	0.2	Low
Tuamotu	0.4	0.1	Low
Marquesas	0.1	0	Unlikely
Eastern Kiribati	0	0	Unlikely
Western Kiribati	0	0	Unlikely

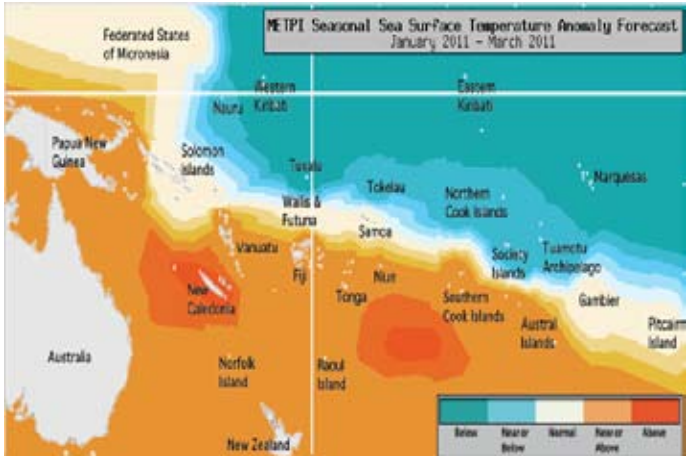
Tropical rainfall and SST outlook: January to March 2011

During January – March 2011, a region of suppressed convection is likely in the southwest Pacific encompassing Eastern Kiribati, Tuvalu, Tokelau, the Northern Cook Islands and Western Kiribati. Below average rainfall is expected for those island groups. Average or below average rainfall is expected for the Marquesas, Pitcairn Island, the Society Islands, Tuamotu, the Solomon Islands, and Papua New Guinea. Enhanced convection is likely along the Southwest Pacific Convergence Zone, which is expected to be displaced to the southwest of normal. Fiji, New Caledonia, Niue, Tonga, and Vanuatu are expected to receive above normal rainfall for the coming three month period. Near or above average rainfall is forecast for Wallis & Futuna, the Southern Cook Islands, and the Austral Islands. No clear precipitation guidance is offered for Samoa.



Rainfall anomaly outlook map for January to March 2011

The ensemble of global models show negative equatorial Pacific sea surface temperature anomalies in the coming months, but the warm signal in the sub-tropics appears weaker than in previous months forecasts. Above average SSTs are forecast for New Caledonia and the Austral Islands. Average or above average sea surface temperatures are forecast for Papua New Guinea, Vanuatu, Fiji, Tonga, and Niue. Near or below normal SSTs are forecast for the Northern Cook Islands, the Southern Cook Islands, the Society Islands, the Tuamotu Archipelago, Tuvalu and Tokelau. Below normal SSTs are anticipated for Western Kiribati, Eastern Kiribati, and the Marquesas. Near normal SSTs are forecast for Samoa, the Solomon Islands, Wallis & Futuna, and Pitcairn Island.



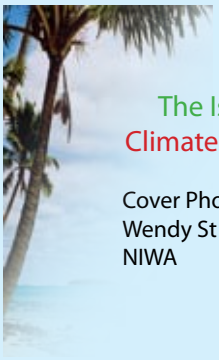
SST anomaly outlook map for January to March 2011

The forecast confidence for the rainfall outlook is moderately high. The average region–wide hit rate for rainfall forecasts issued in January is 58%, 2% lower than all months combined. The SST forecast confidence is mostly high or moderate-to-high, with uncertainty localised near Eastern Kiribati and the Marquesas.

NOTE: Rainfall and sea surface termperature estimates for Pacific Islands for the next three months are given in the tables below. The tercile probabilities (e.g., 20:30:50) are derived from the averages of several global climate models. They correspond to the odds of the observed rainfall or sea surface temperatures being in the lowest one third of the distribution, the middle one third, or the highest one third of the distribution. For the long term average, it is equally likely (33% chance) that conditions in any of the three terciles will occur. *If conditions are climatology, we expect an equal chance of the rainfall being in any tercile.

Island Group	Rainfall Outlook	Outlook confidence
Fiji	15:30:55 (Above)	Moderate-High
New Caledonia	15:35:50 (Above)	Moderate-High
Niue	15:35:50 (Above)	Moderate-High
Tonga	15:35:50 (Above)	Moderate-High
Vanuatu	15:35:50 (Above)	Moderate-High
Cook Islands (Southern)	20:40:40 (Near or Above)	Moderate
Austral Islands	20:40:40 (Near or Above)	Moderate-High
Wallis & Futuna	20:40:40 (Near or Above)	Moderate-High
Samoa	35:35:30 (Climatology)	Moderate
Papua New Guinea	35:40:25 (Near or Below)	Moderate
Pitcairn Island	35:40:25 (Near or Below)	Moderate
Marquesas	35:40:25 (Near or Below)	High
Solomon Islands	40:35:25 (Near or Below)	Moderate
Society Islands	40:35:25 (Near or Below)	Moderate
Tuamotu Islands	40:35:25 (Near or Below)	Moderate
Cook Islands (Northern)	45:35:20 (Below)	Moderate-High
Kiribati (Eastern)	45:35:20 (Below)	Moderate-High
Tokelau	50:35:15 (Below)	High
Tuvalu	50:35:15 (Below)	Moderate-High
Kiribati (Western)	55:30:15 (Below)	High

Island Group	SST Outlook	Outlook confidence
Austral Islands	20:35:45 (Above)	High
New Caledonia	20:35:45 (Above)	Moderate-High
Fiji	20:40:40 (Near or Above)	Moderate-High
Niue	20:40:40 (Near or Above	Moderate-High
Tonga	20:40:40 (Near or Above	Moderate-High
Vanuatu	20:40:40 (Near or Above	Moderate-High
Papua New Guinea	20:40:40 (Near or Above	Moderate-High
Pitcairn Island	30:40:30 (Near normal)	High
Solomon Islands	30:40:30 (Near normal)	High
Wallis & Futuna	30:40:30 (Near normal)	High
Samoa	30:40:30 (Near normal)	High
Tokelau	35:40:25 (Near or Below)	High
Tuamotu Islands	35:40:25 (Near or Below)	High
Tuvalu	40:40:20 (Near or Below)	Moderate-High
Society Islands	40:40:20 (Near or Below)	Moderate-High
Cook Islands (Southern)	35:40:25 (Near or Below)	High
Cook Islands (Northern)	40:40:20 (Near or Below)	High
Kiribati (Western)	45:35:20 (Below)	High
Kiribati (Eastern)	50:30:20 (Below)	Moderate
Marquesas	50:30:20 (Below)	Moderate



The Island
Climate Update

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Acknowledgements

This bulletin is produced by NIWA and made possible with financial support from the New Zealand Agency for International Development (NZAID), with additional support from the Pacific Islands Applied Geosciences Commission (SOPAC) and the Secretariat for the Pacific Regional Environmental Programme (SPREP).

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.

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

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, Wallis and Futuna.**

Web links to ICU partners:

South Pacific Meteorological Services:

Cook Islands
http://www.cookislands.pacificweather.org/

Fiji
http://www.met.gov.fj

Kiribati
http://pi-gcos.org/index.php (follow link to PI Met Services then Kiribati Met Service)

New Zealand
http://www.metservice.co.nz/

Niue
http://pi-gcos.org/index.php (follow link to to PI Met Services then Niue Met Service)

Papua New Guinea
http://pi-gcos.org/index.php (follow link to to PI Met Services then Papua New Guinea Met Service)

Samoa
http://www.mnre.gov.ws/meteorology/

Solomon Islands
http://www.met.gov.sb/

Tonga
http://www.met.gov.to/

Tuvalu
http://tuvalu.pacificweather.org/

Vanuatu
http://www.meteo.gov.vu/

International Partners

Meteo-France
New Caledonia: http://www.meteo.nc/
French Polynesia: http://www.meteo.pf/

Bureau of Meteorology (Australia)
http://www.bom.gov.au/

National Oceanographic and Atmospheric Administration (USA)
National Weather Service: http://www.nws.noaa.gov/
Climate Prediction Center: http://www.cpc.noaa.gov/

The International Research Institute for Climate and Society (USA):
http://portal.iri.columbia.edu/portal/server.pt

The UK Met Office
http://www.metoffice.gov.uk/

European Centre for Medium-term Weather Forecasts
http://www.ecmwf.int/