

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- ENSO diagnostics indicate La Niña conditions exist in the Equatorial Pacific Ocean. Many dynamical and statistical climate models suggest La Niña will continue to persist at least moderate strength through summer.

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

Tropical cyclone forecast for 2011 -12 season

- Below average numbers likely, but increased activity in the late season near North Queensland and French Polynesia.
- Five to eight named storms are likely for the current season.
- Two named storms developed in the ICU forecast region during December 2011.

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

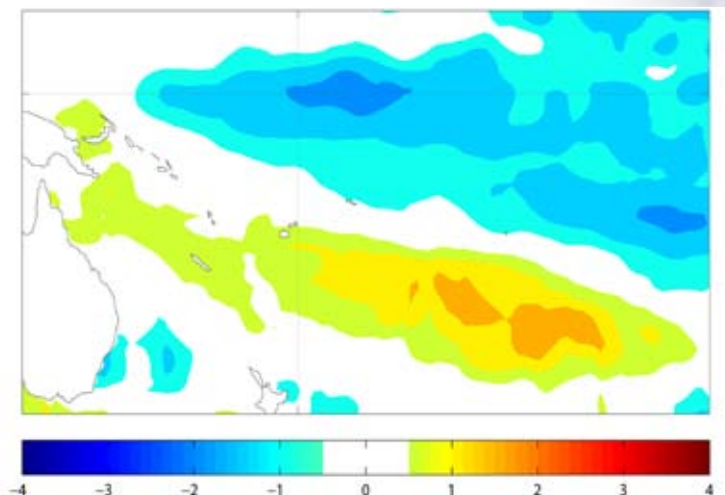
- Below normal rainfall is forecast for Tuvalu, Tokelau, the Tuamotu archipelago, Western Kiribati and the Northern Cook Islands in the coming three months.
- Above normal rainfall is expected for Vanuatu, New Caledonia, Tonga, Fiji, Niue and the Southern Cook Islands.
- Below normal sea surface temperatures (SSTs) are forecast for Tokelau, the Tuamotu Archipelago, Western Kiribati, Eastern Kiribati, the Northern Cook Islands, and the Marquesas, while above normal SSTs are expected for the Austral Islands, New Caledonia and Tonga.



El Niño/Southern Oscillation (ENSO)

The tropical Pacific is currently in a moderate La Niña state, with atmospheric indicators having intensified the last month. The SOI rose significantly to +2.3 in December (+1.3 in November), the TRMM ENSO index intensified to -1.7 (-0.6 in November), and tropical easterly wind anomalies strengthened west of the Date Line. The OLR pattern has become extremely intense near the Date Line, with very positive OLR (suppressed convection) along the equator from 150°E to 180, and strongly enhanced convection in a band from Indonesia (associated with a strengthening MJO) through Solomon Islands and New Caledonia to the north of New Zealand. Sea surface temperature anomalies have weakened slightly in the east-central equatorial Pacific (NINO3 was -0.6°C in December compared to -0.9°C in November), but the anomalies have become more negative near the Date Line (NINO4 intensifying from -0.4°C to -0.9°C). A negative sub-surface sea temperature anomaly exceeding -3°C remains prominent near 120°W and 100 m depth.

All but two dynamical ENSO models NIWA monitors predict La Niña conditions through to March, with weakened La Niña conditions through austral autumn 2012. The statistical models suggest La Niña through



Surface temperature anomalies (°C) for December 2011

austral summer. The Australia Bureau of Meteorology summary of global guidance states that La Niña is likely to persist through the north Australian wet season, and it is unlikely that the current event will be as strong as 2010-11. The NCEP ENSO discussion of 8 December 2011 indicates that La Niña may peak during summer and then gradually weaken. The models are roughly split between those that predict La Niña to remain weak (3-month average in the NINO3.4 region less than -0.9°C) and those that predict a stronger episode.

Southwest Pacific tropical cyclone guidance for the 2011 - 12 season

Below normal tropical cyclone (TC) activity is likely for most islands west of the International Date Line in the southwest Pacific during the November 2011 - April 2012 season, with normal or slightly elevated activity near the Gulf of Carpentaria and North Queensland, particularly late in the season. Tropical cyclone activity is likely to be near normal to the east of the International Date Line. Although reduced activity west of the International Date Line is likely, all communities should remain alert and prepared. Two tropical cyclones were active in the ICU forecast region during December 2011 (TC Fina and TC Grant).

On average, nine tropical cyclones occur each year for the southwest Pacific, and are grouped into classes ranging from 1 to 5, with 5 being the most dangerous. For the coming season, at least one cyclone is forecast to reach at least Category 3, with mean wind speeds of at least 64 knots or 118 km/h and one system may reach at least Category 4 strength, with mean wind speeds of at least 86 knots or 159 km/h. The ICU forecast indicates 5 - 8 named TCs are likely for the upcoming season.

Places like Vanuatu and New Caledonia typically experience the greatest TC activity, with an average of about 3 or 4 TCs passing close to those countries each year (see Table, right). Near normal to slightly increased TC activity for the 2011-12 season is likely over North Queensland, but lower than normal activity is indicated for most other regions to the west of the Dateline. Historical cyclone tracks indicate that TCs can affect parts of southwest French Polynesia, including the Society and Austral Islands, and the southern Cook Islands during La Niñas, especially late in the season. The Austral Islands and Society Islands are likely to experience slightly increased activity this year, particularly during the latter half of the TC season. All islands should

remain vigilant as the current La Niña continues to evolve with progression into summer. More details about this forecast and the science underpinning it can be found at <http://www.niwa.co.nz/node/103022>. In the Pacific Islands, consult with your local meteorological service for tropical cyclone guidance as the season progresses.

Location	All Years	Selected years	Difference (%)	Activity level
Society Islands	0.9	1.1	120	Normal - Elevated
Austral Islands	1	1.1	110	Normal - Elevated
Gulf of Carpentaria	1.5	1.6	105	Normal - Elevated
Southern Cook Islands	1.7	1.7	100	Near normal
French Polynesia	0.7	0.7	100	Near normal
Pitcairn	0.3	0.3	100	Near normal
Vanuatu	3.9	3	75	Normal - Reduced
New Caledonia	3.4	2.5	75	Normal - Reduced
Fiji	3.3	2.3	70	Normal - Reduced
Tonga	2.7	2	75	Normal - Reduced
Niue	2.2	1.7	75	Normal - Reduced
Northern Cook Islands	0.9	0.8	90	Normal - Reduced
Tuamotu	0.4	0.3	75	Normal - Reduced
Papua New Guinea	1.5	1	65	Reduced
Wallis & Futuna	2.4	1.4	60	Reduced
Samoa	1.9	1.1	60	Reduced
Tuvalu	1.7	1	60	Reduced
New Zealand	1.1	0.6	55	Reduced
Solomon Islands	2.2	1	45	Reduced
Tokelau	1.1	0.5	45	Low
Western Kiribati	0.2	0	0	Unlikely
Marquesas	0.1	0	0	Unlikely

Average number of TCs passing within 5° of the main island groups between November - April. Activity level (and associated risk) are indicative of how many storms might be expected for any given island group for the current season.

Tropical rainfall and SST outlook: January to March 2012

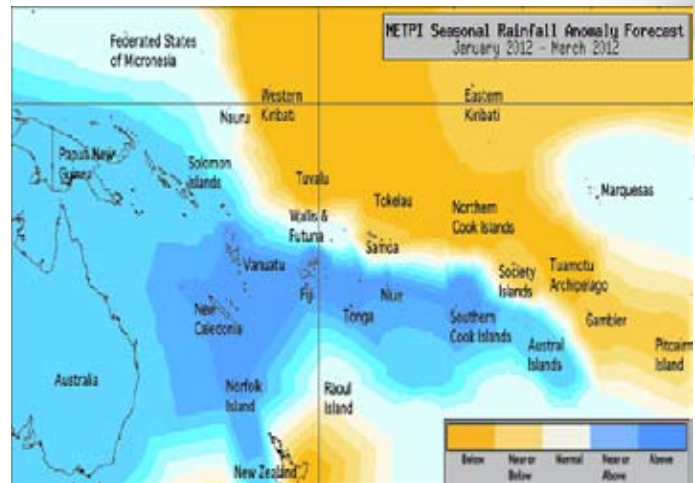
A La Niña pattern exists in the ensemble of global climate forecasts. Suppressed convection is expected in the southwest Pacific near Tuvalu, Tokelau, the Tuamotu Archipelago, the Northern Cook Islands, and Western Kiribati which are forecast to receive below normal rainfall in the coming three months. Despite intermittent rainfall, significant drought in Tuvalu, Tokelau and the Northern Cook Islands is expected to continue but is anticipated to ease as La Niña weakens in late summer. Average or below average rainfall is expected for the Society Islands, Eastern Kiribati, Samoa, and Pitcairn Island. The SPCZ is likely to be southwest of normal during the forecast period. Above normal rainfall is likely for Vanuatu, New Caledonia, Fiji, Tonga, Niue and the Southern Cook Islands. Near or above average rainfall is forecast for the Solomon Islands, Papua New Guinea and the Austral Islands. Near normal rainfall is expected for the Marquesas and Wallis & Futuna.

For the next three months, below normal SSTs are expected for Eastern Kiribati, Western Kiribati, Tokelau, the Tuamotu Archipelago, the Marquesas and the Northern Cook Islands. Normal or below normal SSTs are forecast for Tuvalu, the Society Islands, Wallis & Futuna and Samoa. Above normal SSTs are forecast for Tonga, New Caledonia, and the Austral Islands. Near normal or above normal sea surface temperatures are forecast for Papua New Guinea, Vanuatu, Fiji, and the Solomon Islands. Near normal SSTs are forecast for the Southern Cook Islands, Niue and Pitcairn Island.

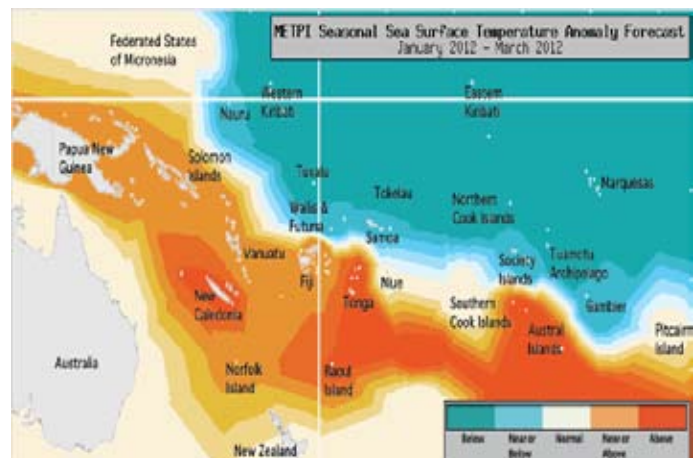
The confidence for the rainfall outlook is moderately high. The average region-wide hit rate for rainfall forecasts issued in January is 58%, four percent lower than the long-term average for all months combined. The SST forecast confidence is mostly high, with greatest uncertainty near the Marquesas and Eastern Kiribati.

NOTE: Rainfall and sea surface temperature 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.

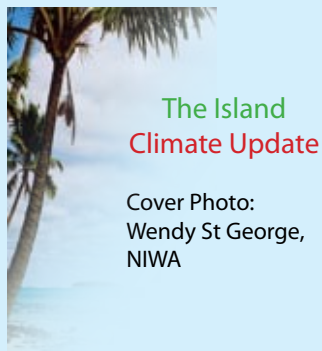
Island Group	Rainfall Outlook	Outlook confidence	Island Group	SST Outlook	Confidence
Tonga	15:30:55 (Above)	Moderate-High	Austral Islands	20:35:45 (Above)	High
Fiji	15:35:50 (Above)	Moderate-High	New Caledonia	20:35:45 (Above)	High
New Caledonia	15:35:50 (Above)	Moderate-High	Tonga	20:35:45 (Above)	High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



Rainfall anomaly outlook map for January to March 2012



SST anomaly outlook map for January to March 2012



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Cover Photo:
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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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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 Oceanic 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/>