

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- ENSO diagnostics indicate La Niña conditions exist in the Equatorial Pacific Ocean, but there are signs of weakening. Many dynamical and statistical climate models suggest La Niña will transition to a neutral state by the end of autumn.

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

- Normal or below average numbers are likely for most islands during the remainder of the southwest Pacific tropical cyclone season (February - April).
- Near normal TC numbers, with eight to ten named storms, is expected for the seasonal total.
- Two named storms (TC Cyril and TC Jasmine) developed in the ICU forecast region during February 2012.

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

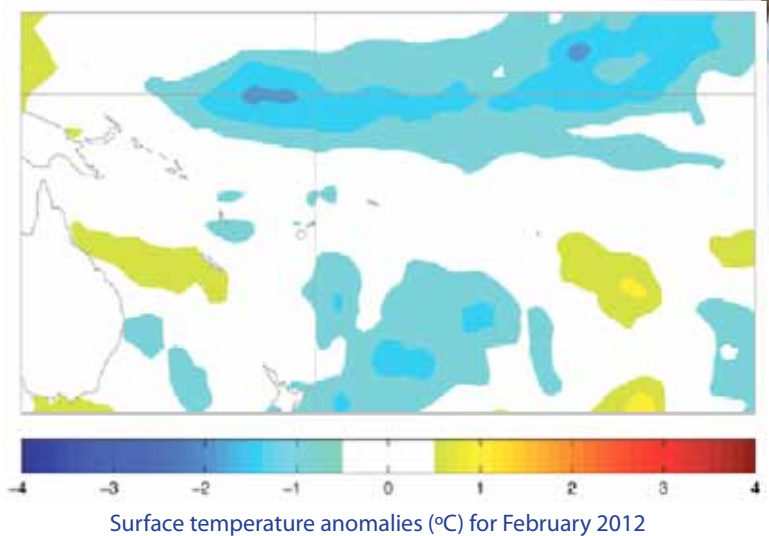
- Below normal rainfall is forecast for Tuvalu, Tokelau, and the Northern Cook Islands in the coming three months.
- Normal or above normal rainfall is expected for New Caledonia, Vanuatu, Tonga, Niue and Fiji.
- Below normal sea surface temperatures (SSTs) are forecast for Eastern Kiribati, the Northern Cook Islands, and the Marquesas, and Tokelau.



El Niño/Southern Oscillation (ENSO)

The mature La Niña is in place in the tropical Pacific, and is likely to ease to neutral during autumn 2012. The SOI eased sharply to +0.1 in February (down from +1.1 in January), while the TRMM ENSO index also eased (to -0.49, from -1.5 in January). Sea surface temperature anomalies have also shown recent change, especially over the eastern equatorial Pacific, associated with a brief easing of the trade winds: the weekly NINO3 estimated at 0.01°C (compare to -1.2°C in January), and weekly NINO3.4 is now estimated at around -0.5°C (compare to -1.1°C in January). Sub-surface sea temperature/heat content anomalies are also weakening in the eastern equatorial Pacific region.

Four of the ten dynamical models NIWA monitor predict neutral conditions for autumn (MAM); four predict La Niña, and 2 indicate neutral or cool. The majority of the dynamical and statistical models indicate neutral conditions for JJA, with three now developing El Niño. The latest IRI technical summary of 16 February indicates a gradual weakening of La Niña during the coming one to two months as subsurface heat content anomalies, SSTs, low-level winds and convection anomalies continue to weaken along with feedbacks between ocean and atmosphere. They forecast a 38% chance of La Niña and



62% chance of neutral conditions for March – May as a whole. Notably, they expect the highest likelihood of La Niña dissipation in the first half of April and note that past experience has shown that some models are biased in the direction of prolonging ENSO episodes for somewhat too long a period at the end of the typical ENSO cycle.

Southwest Pacific tropical cyclone guidance for the 2011 - 12 season

Normal or below normal tropical cyclone (TC) activity is likely for most islands in the southwest Pacific during the remainder of the 2011 – 2012 season. February through April (the late season) is typically the most active part of the TC season, although some storms have occurred outside of this time frame in the past. Two tropical cyclones were active during February 2012 (TC Cyril and TC Jasmine), bringing the seasonal total to four. An MJO convective pulse is expected over the maritime continent in late March 2012, which could result in additional TC activity.

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 TC forecast update indicates 8 – 10 named TCs are likely for whole season, with six to eight named storms forecast for the late 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 for late season averages). Near normal to below normal TC activity for the remainder of the 2011–12 season is likely for most islands. 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 forecast update indicates extra-tropical trajectories to the south of the Austral Islands and Society Islands are likely during the latter half of the TC season. All islands should remain vigilant as the current La Niña continues

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

Location	All Years (std. error)	Selected years (std. error)	Activity level
Vanuatu	2.4 (0.24)	2.3 (0.88)	Normal
New Caledonia	2.2 (0.23)	2.4 (0.89)	Normal
Fiji	2.0 (0.22)	1.2 (0.64)	Normal
S. Cooks	1.1 (0.16)	0.8 (0.52)	Normal
New Zealand	0.7 (0.13)	0.4 (0.37)	Normal
Society Is	0.5 (0.11)	0.3 (0.32)	Normal
Tuvalu	0.8 (0.14)	0.3 (0.32)	Normal-below
N. Cooks	0.6 (0.12)	0.2 (0.24)	Normal-below
Tonga	1.5 (0.19)	0.7 (0.49)	Below
Solomons	1.5 (0.19)	0.5 (0.42)	Below
Wallis & Futuna	1.5 (0.19)	0.6 (0.44)	Below
Niue	1.2 (0.17)	0.3 (0.31)	Below
Samoa	1.1 (0.17)	0.1 (0.22)	Below
Papua New Guinea	0.9 (0.15)	0.2 (0.29)	Below
Northern NZ	0.7 (0.13)	0.2 (0.29)	Below
Tokelau	0.6 (0.12)	0.0 (0.00)	Below
Austral Is	0.5 (0.11)	0.1 (0.19)	Below
Fr. Polynesia	0.5 (0.11)	0.0 (0.07)	Below
Tuamotu	0.3 (0.08)	0.2 (0.23)	Unlikely
Pitcairn	0.2 (0.08)	0.1 (0.20)	Unlikely
Marquesas	0.1 (0.04)	0.0 (0.00)	Unlikely
E. Kiribati	0.0 (0.01)	0.0 (0.00)	Unlikely
W. Kiribati	0.0 (0.00)	0.0 (0.00)	Unlikely

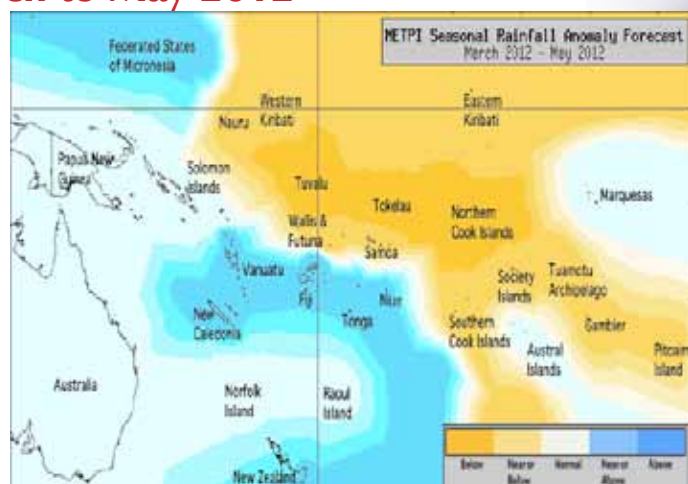
Average number of TCs passing within 5° of the main island groups between November - April. Activity level (and associated risk) are indicative of how many storms might be expected for any given island group for the current season.

Tropical rainfall and SST outlook: March to May 2012

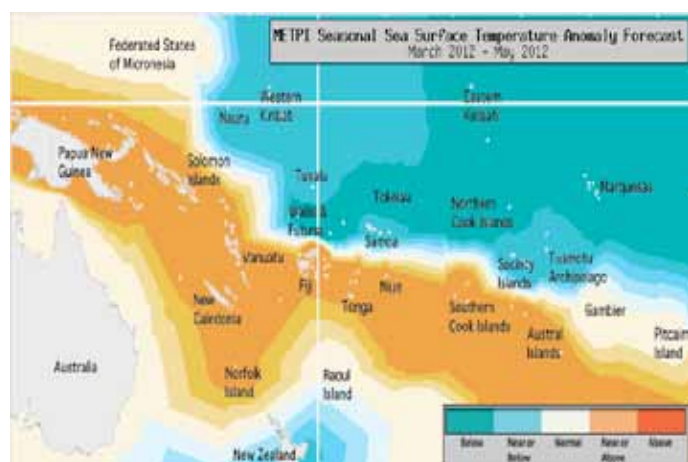
A Niña pattern is still expected in the ensemble of global climate forecasts over the forecast period, even though there are indications that a transition to neutral conditions might occur by mid-autumn. The South Pacific Convergence Zone is shifted to the Southwest and suppressed convection is expected near Tuvalu, Tokelau, and the Northern Cook Islands which are likely to receive below normal rainfall in the coming three months. Average or below average rainfall is expected for the Tuamotu Archipelago, Eastern and Western Kiribati, the Society Islands, Samoa, Pitcairn Island, the Southern Cook Islands and Wallis & Futuna. Near or above average rainfall is forecast for Fiji, New Caledonia, Niue, Tonga and Vanuatu. Near normal rainfall is expected for the Austral Islands, Marquesas, Papua New Guinea and the Solomon Islands.

La Niña SSTa signals that have existed in past months are easing in the global model ensemble. For the coming three months, cool sea surface anomalies are expected along and south of the Equator to the east of the Dateline encompassing Eastern Kiribati, the Northern Cook Islands, Tokelau and the Marquesas. Below normal SSTs are expected for those island groups. Normal or below normal SSTs are forecast for Western Kiribati, Wallis & Futuna, Tuvalu, the Tuamotu Archipelago, the Society Islands, and Samoa. Near normal or above normal sea surface temperatures are forecast for Papua New Guinea, the Solomon Islands, New Caledonia, Vanuatu, Fiji, Tonga, the Austral Islands, the Southern Cook Islands and Niue. Near normal SSTs are forecast for and Pitcairn Island.

The confidence for the rainfall outlook is high or moderately high. The average region-wide hit rate for rainfall forecasts issued in March is 63%, equal to the long-term average for all months combined. The SST forecast uncertainty is greatest near the Marquesas and Eastern Kiribati.



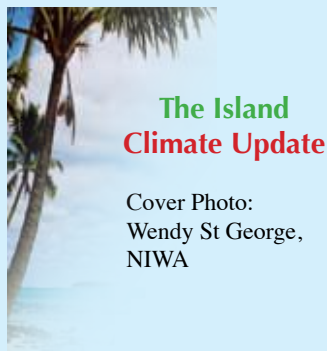
Rainfall anomaly outlook map for March to May 2012



SST anomaly outlook map for March to May 2012

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



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Cover Photo:
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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 NOAA 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.

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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/>