

# The Island Climate Update

## El Niño/Southern Oscillation (ENSO)

- The Equatorial Pacific Ocean is currently in a neutral ENSO state, with remnant anomalies from the La Niña event that has just concluded. Most dynamical and statistical climate models suggest ENSO neutral conditions for late autumn and early winter. Some long range models indicate El Niño could develop by austral spring.

### 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 activity for 2011/12 season

- Normal or below average tropical cyclone (TC) activity was forecast for the February – April period. Overall, 5 – 8 TCs were expected for the whole season.
- April was a relatively quiet month in the southwest Pacific, with no named TCs having formed. The seasonal total for the ICU forecast region at the end of April was five named storms.

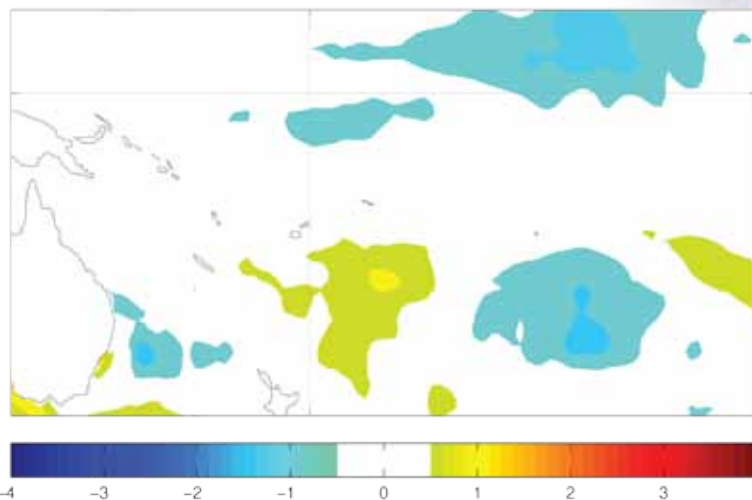
## Multi-model Ensemble Tool for Pacific Island (METPI) rainfall and sea surface temperature forecasts

- Below normal rainfall is forecast for Tuvalu, while normal or below normal rainfall Tokelau, the Tuamotu archipelago, Wallis and Futuna, the Society Islands, Samoa and the Northern Cook Islands.
- Normal or above normal rainfall is expected for Eastern Kiribati, Western Kiribati, Papua New Guinea, Fiji, Vanuatu and Tonga.
- The sea surface temperature anomalies associated La Niña are muted relative to prior months, and the forecast persists a 'weak' La Niña-like pattern across the southwest Pacific.



## El Niño/Southern Oscillation (ENSO)

Tropical Pacific conditions are in the neutral range, after the end of the 2011/12 La Niña event. The SOI is now significantly negative (below  $-0.5$  standard deviations) for (almost) the first time in two years. The three-month mean SOI (FMA) is near zero. Zonal wind anomalies were mostly positive across the equatorial Pacific in April, but strengthened trade winds were evident over the western Pacific toward the end of the month. The OLR anomaly field is losing its large-scale signature and no longer reflects a La Niña pattern. The TRMM ENSO index has eased considerably to  $-0.2$  for the 30 days to 25 April. SSTs are close to normal across much of the equatorial Pacific but are above normal near the South American coast. In April, NINO3.4 was around  $-0.3^{\circ}\text{C}$  (FMA mean  $0.5^{\circ}\text{C}$ ): NINO3 is now  $+0.4^{\circ}\text{C}$  while NINO4 remains negative at  $-0.3^{\circ}\text{C}$  (FMA means  $+0.2^{\circ}\text{C}$  and  $-0.6^{\circ}\text{C}$ , respectively). At the sub-surface, the positive heat content anomaly in the western Pacific continues to propagate eastwards after a pause in March, while the negative anomaly in the east has all but disappeared. After significant activity in March, the MJO has been weak in April, and is expected to remain so going in to May. Convection is presently enhanced in the SPCZ, which is lying near its normal position.



Surface temperature anomalies ( $^{\circ}\text{C}$ ) for April 2012

Eight of the ten dynamical models and all the statistical models NIWA monitor predict ENSO-neutral conditions for early winter (MJJ), with two dynamical models projecting El Niño conditions. Six of the dynamical models indicate development (or continuation) of El Niño conditions during ASO. The latest IRI technical summary of 19 April indicates around a 90% chance of neutral conditions for April–June (and  $\sim 10\%$  chance of La Niña). For JAS, El Niño conditions are given a likelihood of around 45%, with neutral conditions at 55%

## Southwest Pacific tropical cyclone guidance for the 2011 - 12 season

Normal or below normal tropical cyclone (TC) activity was forecast for most islands in the southwest Pacific during the 2011/12 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. A total of five named storms have occurred since the start of the season in November 2011, and no named storms occurred in the Southwest Pacific basin during April 2012. This concludes the 2011/12 TC season, which has experienced well below normal 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 was forecast 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. In the situation where a TC develops outside of the normal season in the May - October period, these storms would be 'credited' to the preceding forecast period. More details about TC forecasts and the science underpinning them

can be found at <http://www.niwa.co.nz>. In the Pacific Islands, consult with your local meteorological service for tropical cyclone guidance. The next regional TC forecast will be issued in October 2012.

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  $5^{\circ}$  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.



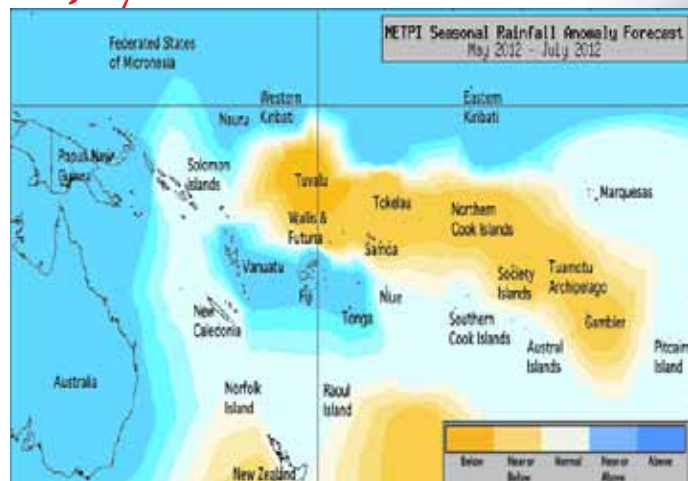
## Tropical rainfall and SST outlook: May to July 2012

The end of the recent La Niña event is now evident in many oceanic and atmospheric indicators. The ensemble of dynamical models indicate dry conditions over and to the East of the dateline south of the Equator, while wet conditions are expected north of the Equator and along a southwest-shifted South Pacific Convergence Zone. Near or above average rainfall is forecast for Fiji, Eastern Kiribati, Western Kiribati, Papua New Guinea, Vanuatu and Tonga. Near normal rainfall is expected for the Southern Cook Islands, the Marquesas, New Caledonia, Niue, Pitcairn, the Solomons and the Austral Islands. Average or below average rainfall is forecast for the Northern Cook Islands, Samoa, the Society Islands, Tokelau, Tuamotu and Wallis & Futuna. Below normal rainfall is forecast for Tuvalu.

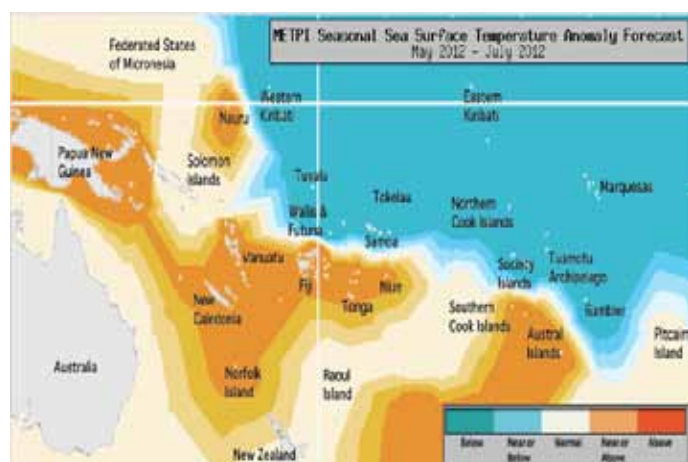
La Niña SSTa signals that have existed for past months continue to ease in the global model ensemble, and there is some indication warm anomalies could develop in the equatorial region to the east of the Dateline in the coming three months. Normal or below normal SSTs are forecast for Eastern Kiribati, Western Kiribati, Wallis & Futuna, Tuvalu, the Tuamotu Archipelago, the Society Islands, the Northern Cook Islands, Tokelau, the Marquesas and Samoa. Near normal or above normal sea surface temperatures are forecast for Papua New Guinea, New Caledonia, Vanuatu, Fiji, Tonga, the Austral Islands and Niue. Near normal SSTs are forecast for the Solomon Islands, the Southern Cook Islands and Pitcairn Island.

The confidence for the rainfall outlook is moderately high. The average region-wide hit rate for rainfall forecasts issued in May is 56%, seven percent lower than the long-term average for all months combined. The SST forecast confidence is moderate to high across the region, and uncertainty is greatest 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.

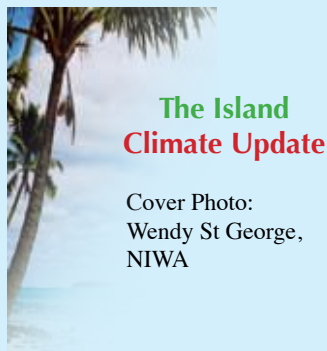


Rainfall anomaly outlook map for May to July 2012



SST anomaly outlook map for May to July 2012

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



## The Island Climate Update

Cover Photo:  
Wendy St George,  
NIWA

Visit The Island Climate Update at:  
[www.niwasience.co.nz/ncc/icu](http://www.niwasience.co.nz/ncc/icu)

Your comments and ideas about The Island Climate Update are welcome. Please contact:

Dr Andrew Lorrey, NIWA,  
41 Market Place, Auckland, New Zealand  
E-mail: [a.lorrey@niwa.co.nz](mailto:a.lorrey@niwa.co.nz)

### Forecasts:

Dr. Andrew Lorrey and Dr. Nicolas Fauchereau (South Pacific rainfall and SST forecasts) and the NIWA National Climate Centre (ENSO wrap)

### ICU Editorial team:

Andrew Lorrey: [a.lorrey@niwa.co.nz](mailto:a.lorrey@niwa.co.nz)  
James Renwick: [j.renwick@niwa.co.nz](mailto:j.renwick@niwa.co.nz)  
Nicolas Fauchereau: [n.fauchereau@niwa.co.nz](mailto:n.fauchereau@niwa.co.nz)

### Acknowledgements

This bulletin is produced by NIWA and made possible with financial support from the New Zealand Ministry of Foreign Affairs and Trad (MFAT), 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.

The contents of The Island Climate Update may be freely disseminated, provided the source is acknowledged.

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/>