Number 142, July 2012

# The Island Climate Update

## El Niño/Southern Oscillation (ENSO)

- The Equatorial Pacific Ocean is still in a neutral ENSO state, but if present warming rates continue El Nino should be reached by austral spring.

## The South Pacific Concergence Zone

- The South Pacific Convergence Zone is forecast to sit close to or slightly south of its climatological position.

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

- Normal or below normal rainfall is expected for the Northern Cook Islands, Samoa, the Society Islands, the Solomon Islands, Tokelau, Tuvalu and Wallis & Futuna.
- Normal or above normal rainfall is forecast for Western and Eastern Kiribati, Tonga, and Papua New Guinea.
- Sea surface temperatures are expected to continue to warm along the Equator east of the Dateline.

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

NEW ZEALAND MINISTRY OF FOREIGN AFFAIRS & TRADE Aid Programme

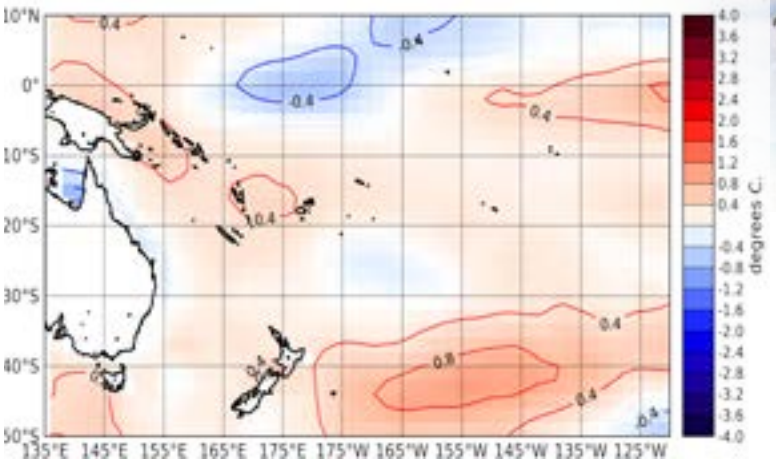
NOAA

SPREP

NIWA Taihoro Nukurangi

## El Niño/Southern Oscillation (ENSO)

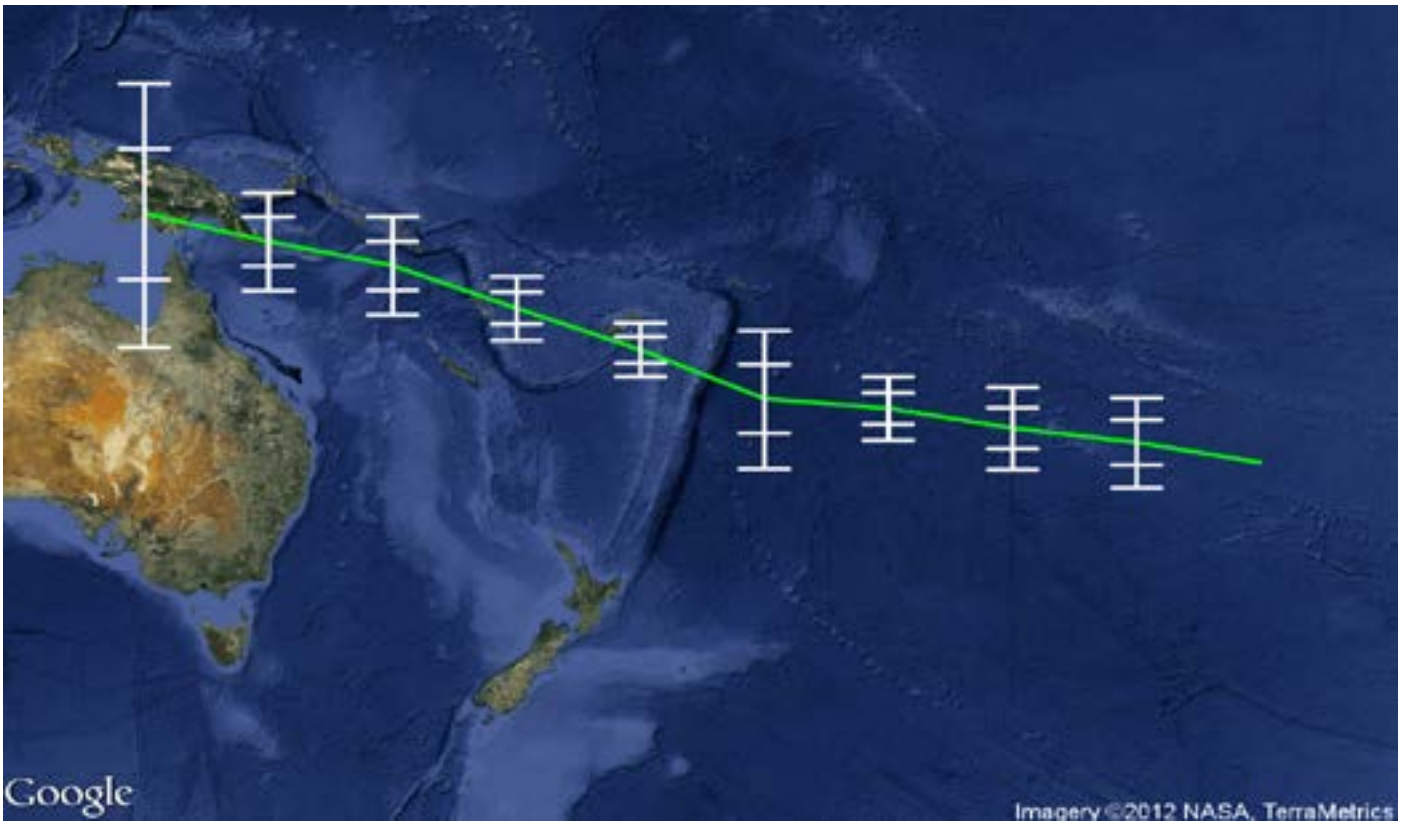
Tropical Pacific conditions are still in the neutral range, however, ocean surface warming has intensified along the equator east of the Dateline towards the South American coast. The latest weekly Nino3.4 index indicates central-western equatorial Pacific ocean temperatures are above normal (+ 0.6). The SOI is in its third consecutive month of negative values, and has droped from –0.3 standard deviations in May to –1.2 in June. The trade winds have weakened further over the past two weeks, and westerly anomalies exist from the Dateline east to about 130°W. Sub–surface temperatures and upper ocean heat content across the equatorial Pacific have continued to rise in the past month. The volume of above normal sub–surface water is now continuously spread across the equatorial Pacific, centred on a depth near 150m west of the Dateline to near the surface in the far east. TRMM ENSO index for the 30 days (ending the 27 May) has eased off to –1.2 (from –1.5 before), and is still in La Niña territory. The OLR pattern accross the equatorial Pacific still shows that enhanced convection is present over Indonesia, while convection is reduced north of the Equator east of the Dateline. The SPCZ is currently lying close to its climatological position. A MJO pulse crossed the Pacific during the first half of June. A new MJO event is expected to intensify in the Indian Ocean in the first week of July but this will not affect the Pacific before mid–July. International climate guidance is in consensus that the tropical Pacific Ocean is likely to warm further over the next three months and conditions are likely to cross the El Niño thresholds in a persistent manner by the end of the forecast period. Of the models NIWA monitor, no climate models favour a return to La Niña for the July –September period.



Surface temperature anomalies (°C) for June 2012

## South Pacific Convergence Zone (SPCZ) forecast July to September 2012

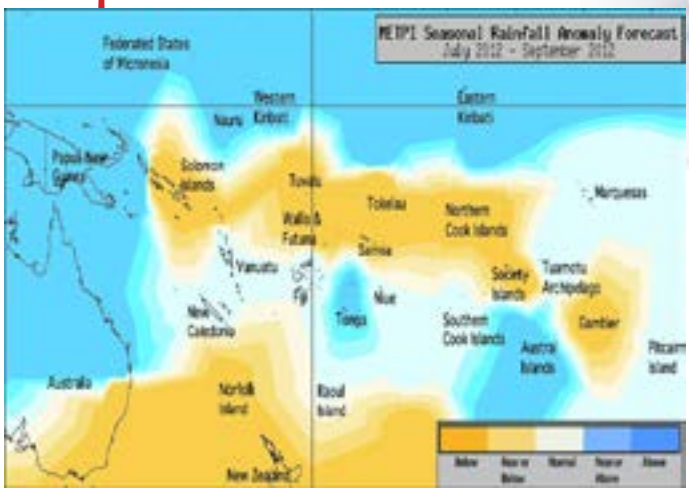
The ensemble of global climate models for rainfall that are used in METPI show an area of higher than normal rainfall associated with the SPCZ position. The green line indicates the averate SPCZ position for the forecast period based on the average of 8 climate models. The white vertical bars and 'whiskers' indicate the one and two standard deviations between the model projections of the SPCZ position every 5 degrees of longitude.




For the coming three months, the models are in agreement and indicate that the SPCZ is likely to sit in a position near or slightly south of climatology (orientation of the SPCZ very similar to climatology, with mean positional displacement southward). Uncertainty is greatest over Papua New Guinea and southeast of Samoa. It is likely to bring normal or above normal rainfall over the region extending from Papua New Guinea to the southwest towards Vanuatu and Tonga.

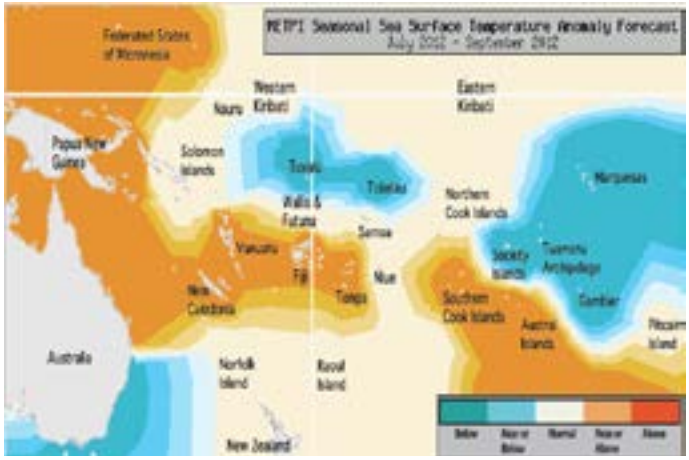
# Tropical rainfall and SST outlook: July to September 2012

Neutral ENSO conditions presently exist in the tropical Pacific, but El Niño is likely by the end of winter if the present warming rates continue. However, patterns of enhanced convection and cloudiness in the tropical Pacific still show the remnants of La Niña, indicating the ocean-atmosphere feedbacks necessary for El Niño development are not yet in place. The ITCZ is south of its normal position to the east of the Dateline, with below normal rainfall north of the Equator and above normal rainfall just south of the Equator. Near or above normal rainfall is forecast for Western and Eastern Kiribati, Tonga, and Papua New Guinea. Near normal rainfall is expected for the Austral Islands, the Southern Cook Islands, the Marquesas, New Caledonia, Vanuatu, Tuamotu and Pitcairn. Normal or below normal rainfall is forecast for the Northern Cook Islands, Samoa, the Society Islands, the Solomon Islands, Tokelau, Tuvalu and Wallis & Futuna. No clear guidance is offered for Fiji and Niue




Rainfall anomaly outlook map for July to September 2012

The global model ensemble continues to show the development of El Niño–like SST signals, with further east to west extension of warm anomalies in the equatorial region to the east of the Dateline in the coming three months. Normal or below normal SSTs are forecast for the Tuamotu Archipelago, the Society Islands, Tuvalu, Tokelau, and the Marquesas. Near normal or above normal sea surface temperatures are forecast for Papua New Guinea, New Caledonia, Vanuatu, Fiji, Tonga, the Austral Islands and the Southern Cook Islands. Near normal SSTs are forecast for Pitcairn Island, Wallis & Futuna, Western Kiribati, the Solomon Islands, the Northern Cook Islands, Niue and Samoa. No clear SST guidance is offered for Eastern Kiribati.



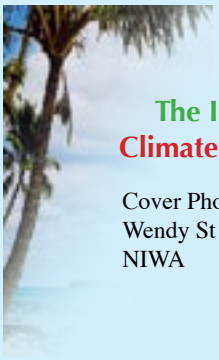

SST anomaly outlook map for July to September 2012

The confidence for the rainfall outlook is moderate to high. The average region–wide hit rate for rainfall forecasts issued in July is 65%, two percent higher 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 Niue and the Society Islands.

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

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

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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.



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/