

# The Island Climate Update

## 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

## El Niño/Southern Oscillation (ENSO)

- Moderately strong El Niño conditions exist in the equatorial Pacific. Many dynamical climate models project the continuation of El Niño through autumn 2010.

## Tropical cyclone guidance

- Tropical cyclone risk is elevated for the Solomon Islands, and for countries to the east of the Date Line, including Niue, Tonga, and the Southern Cook Islands for the remainder of the Tropical cyclone season.

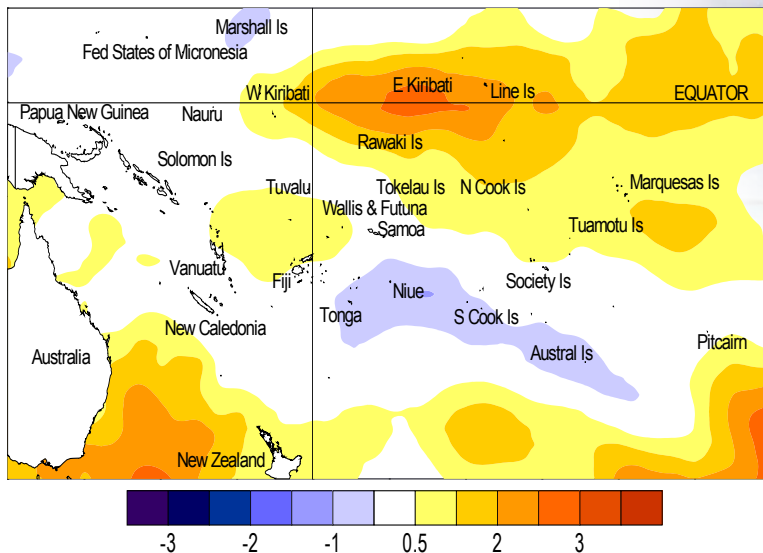
## Multi-model Ensemble Tool for Pacific Island (METPI) rainfall and sea surface temperature forecasts

- Below normal rainfall is forecast for Fiji, Vanuatu, Niue, Tonga and the Marquesas.
- Above normal rainfall is expected for Western Kiribati and Eastern Kiribati.
- Above normal SSTs are forecast for Eastern Kiribati and Western Kiribati. Normal or above normal SSTs are forecast for the Northern Cook Islands, Tuvalu, Tokelau, and the Marquesas. SSTs are expected to be near or below normal around Niue, Tonga and Pitcairn Island.



## El Niño/Southern Oscillation (ENSO)

Moderate El Niño conditions exist in the equatorial Pacific. The Southern Oscillation Index (SOI) strengthened considerably in recent weeks, with a February mean of around  $-2.0$  (roughly double the magnitude of the January value). Low-level westerly wind anomalies have been evident in February, especially over the western Pacific. However, Equatorial sea surface temperature anomalies have weakened recently. The NINO3 anomaly fell by about half, to  $+0.7^{\circ}\text{C}$  for February, and NINO4 decreased to  $+1.1^{\circ}\text{C}$  (from  $+1.5^{\circ}\text{C}$ ). Upper ocean equatorial heat content anomalies have weakened recently, but a new pulse is evident in the central Pacific, centred near 150m depth. The MJO is weak at present, but is currently configured to reinforce the El Niño pattern, and may have strengthened the atmospheric ENSO signal recently. The MJO is expected to be slow moving but weak over the coming two weeks.



Sea surface temperature anomalies ( $^{\circ}\text{C}$ ) for February 2010

Around half the dynamical models (but no statistical models) NIWA monitor show warm conditions through to the end of May 2010. All models show neutral conditions for winter. The NCEP ENSO discussion of 4 February suggests El Niño conditions weakening to neutral by the

end of autumn. The IRI summary of 18 February indicates El Niño conditions continuing with a probability of above 80% through May, then reducing towards climatological probabilities.

## Tropical Cyclone guidance – forecast update

Near normal tropical cyclone (TC) activity is expected for most countries in the southwest Pacific during the remainder of the season (February – April 2010). Communities should remain alert and prepared.

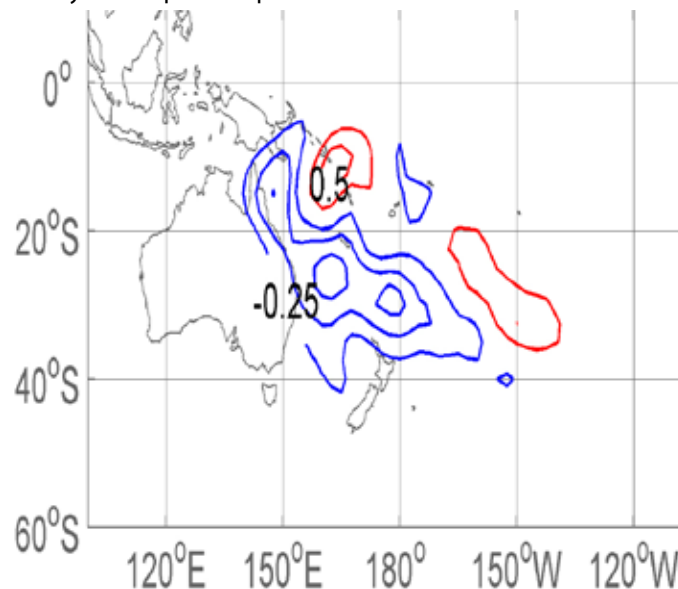
As previously forecast, overall activity is expected to be near normal, with 8–11 TCs expected for the total number of storms in the November 2009 – April 2010 period. On average, nine tropical cyclones occur each year for the southwest Pacific region. Southwest Pacific TCs are grouped into classes ranging from 1 to 5, with 5 being the most dangerous. For the present season, two or three storms were forecast to reach at least Category 3, and one storm was expected to reach at least Category 4, with mean wind speeds of at least 64 knots or 118 km/h.

Updated projections show an increased risk of tropical cyclones to the east of the Date Line, particularly for the Southern Cook Islands. Increased risk also exists for Niue and Tonga. There is also increased risk for the Solomon Islands during the end of this season. It should be noted that TCs can affect parts of southwest French Polynesia (Society and Austral Islands) during El Niño. These islands should remain vigilant as the event continues to evolve with progression into austral autumn. Though a moderate El Niño exists, the number for TCs entering a 550km radius of the New Zealand coast is expected to remain about normal.

In the Southwest Pacific, tropical cyclones (TCs) usually develop in the wet season, from November through to April, but occasionally occur in October and May, and have even occurred in June. Peak cyclone occurrence is usually from January to March. In seasons with similar background climate conditions to present, several tropical cyclones

have occurred in the Coral Sea region between the Solomon Islands and New Caledonia, and near Vanuatu, Fiji and Tonga, while a few affect other areas.

On average, half of the tropical cyclones that developed since the 1969-70 season reached hurricane force with mean wind speeds of at least 64 knots (118 km/h). Since 1969, an average of two TCs have typically occurred in March while one has usually developed in April.



Expected departure from normal of the number of Tropical Cyclones occurring later in the season (February-June) in the southwest Pacific for 2009-10. This guidance is based on analogue years with similar SST anomalies and SOI to the present situation, with a weakly coupled El Niño in the prior Austral autumn/spring. The analogue years selected from the 1957-58 to 2008-09 period. Only three analogue seasons were found within the 1969-70 to 2008-09.

## Tropical rainfall and SST outlook: March to May 2010

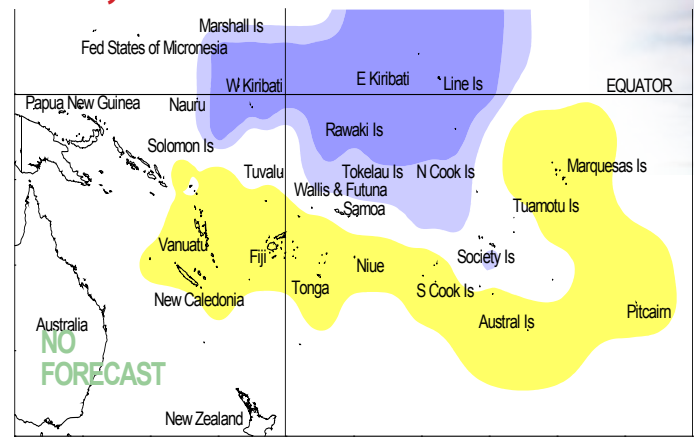
During March–May 2010, a region of suppressed convection is likely in the southwest Pacific encompassing Niue, Fiji, Tonga, Vanuatu and the Marquesas. Below average rainfall is expected for all of those island groups. Near or below normal rainfall is expected for Wallis & Futuna, Pitcairn Island, New Caledonia, the Southern Cook Islands, and the Austral Islands. Enhanced convection is likely along the Equator extending from Western to Eastern Kiribati, with an expectation of above average rainfall for those islands. Near or above average rainfall is forecast for the Northern Cook Islands, the Society Islands and Tokelau. Near normal rainfall is forecast for the Tuamotu Archipelago. No clear precipitation guidance is offered for Papua New Guinea, Samoa, Tuvalu and the Solomon Islands.

The global models are continuing to show elevated temperatures in the near equatorial Pacific. Cold anomalies that existed around Tonga and Niue in previous months are expected to persist in the coming three month period. Above average sea surface temperatures are forecast for Eastern and Western Kiribati. A region of near or above average sea surface temperatures is forecast around Tokelau, Tuvalu, the Northern Cook Islands, and the Marquesas. Average or below average SSTs are forecast for Tonga, Niue, and Pitcairn Island. No clear SST guidance is offered for Fiji and the Tuamotu Archipelago. Near normal SSTs are forecast for the remainder of the southwest Pacific.

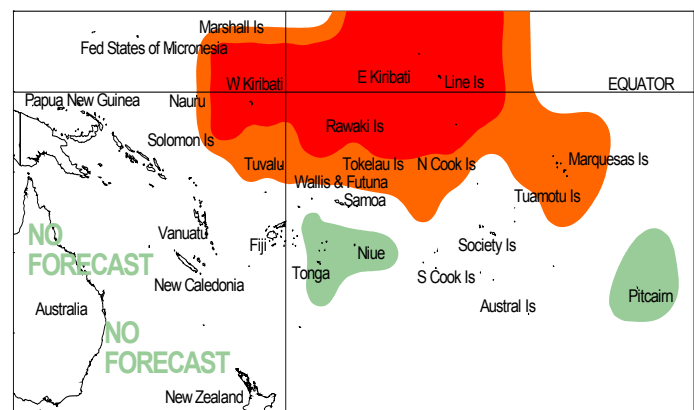
The confidence in the multi-model ensemble forecast skill for this seasonal rainfall outlook is moderate to moderately high. In the past, the average region-wide hit rate for rainfall forecasts issued in March is 63%, 2% higher than the long-term average for all months combined. The SST forecast confidence is mostly high, but the greatest uncertainty is localised around 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.

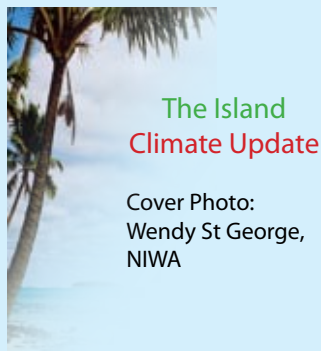
Island Group	Rainfall Outlook	Outlook confidence	Island Group	SST Outlook	Outlook confidence
Kiribati (Eastern)	15:30:55 (Above)	Moderate-High	Kiribati (Eastern)	15:30:55 (Above)	Moderate
Kiribati (Western)	15:30:55 (Above)	High	Kiribati (Western)	20:30:50 (Above)	High
Cook Islands (Northern)	25:35:40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



Rainfall outlook map for March to May 2010



SST outlook map for March to May 2010



## The Island Climate Update

Cover Photo:  
Wendy St George,  
NIWA

Visit The Island Climate Update at:  
[www.niwascience.co.nz/ncc/icu](http://www.niwascience.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 (South Pacific rainfall and SST forecasts) and the NIWA National Climate Centre (ENSO wrap)

### ICU Editors:

Andrew Lorrey Email: [a.lorrey@niwa.co.nz](mailto:a.lorrey@niwa.co.nz)  
James Renwick Email: [j.renwick@niwa.co.nz](mailto:j.renwick@niwa.co.nz)  
Harriet Palmer Email: [h.palmer@niwa.co.nz](mailto:h.palmer@niwa.co.nz)

### Acknowledgements

This bulletin is produced by NIWA and made possible with financial support from the New Zealand Agency for International Development (NZ Aid), 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.

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 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/>