

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)

- Multiple ENSO indicators show La Niña is re-emerging in the Equatorial Pacific Ocean. Many dynamical and statistical climate models suggest La Niña will continue to develop during late spring, and into early summer.

Summary of tropical cyclone activity for 2010 -11 season

- Nine tropical cyclones (TCs) occurred in the SW Pacific region this season, with an estimated cost of damages exceeding \$3.5 Billion USD.
- The tropical cyclone guidance for the 2011-12 season will be released on 18 October and summarised in the next ICU issue.

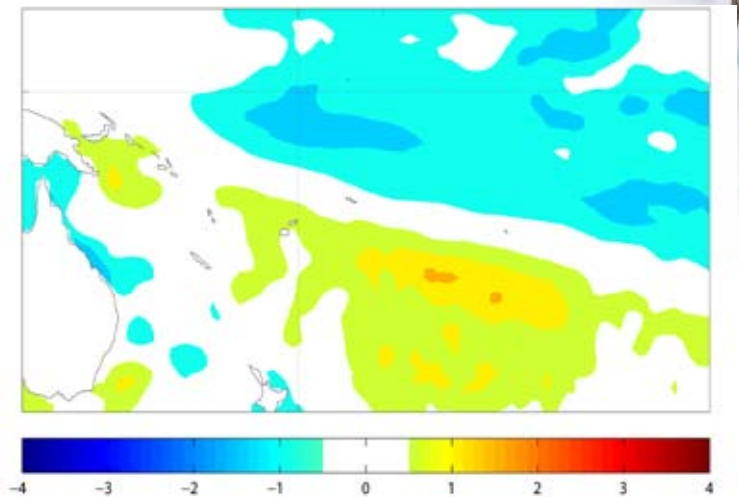
Multi-model Ensemble Tool for Pacific Island (METPI) rainfall and sea surface temperature forecasts

- Below normal rainfall is forecast for Tuvalu, Tokelau, the Tuamotu archipelago, Samoa, Pitcairn Island, Western Kiribati and the Northern Cook Islands in the three months ahead.
- Above normal rainfall is expected for Papua New Guinea, Vanuatu, Fiji, Tonga and Niue.
- Below normal sea surface temperatures (SSTs) are forecast for Western Kiribati and Samoa, while above normal SSTs are expected for the Austral Islands and Tonga.



El Niño/Southern Oscillation (ENSO)

The tropical Pacific is moving back towards La Niña conditions. The SOI for September was +1.1, with the 3-month mean for JAS at +0.8. The NINO3 and NINO4 indices have become more negative, $-0.4\text{ }^{\circ}\text{C}$ and $-0.2\text{ }^{\circ}\text{C}$ respectively, although for the month as a whole are below the La Niña threshold. The 19 September CPC/NCEP ENSO summary states the latest weekly values of NINO3 and NINO4 were $-0.7\text{ }^{\circ}\text{C}$ and $-0.5\text{ }^{\circ}\text{C}$. Subsurface temperature anomalies show a cold anomaly centred near 140°W , and a negative heat content anomaly (0–300m) that intensified in the central Pacific during September. In the extra-tropics, the remnant cool “horseshoe” from the previous La Niña (July 2010 – Apr 2011) is still evident. The TRMM ENSO index was -0.5 for the 30 days to 25 August. OLR anomalies are negative (enhanced convection) over and north of the Maritime Continent, and positive (suppressed convection) near the Date Line, south of the Equator. The Trades have strengthened near the Date Line, and the SPCZ is displaced southwest of its normal. An MJO pulse has been propagating across the Maritime Continent during September, and BoM’s Weekly Tropical Climate Note (27-Sep) suggests the MJO is expected to remain weak as it propagates into the western Pacific, but the NCEP GFS ensemble suggests at least moderate strength MJO activity.



Surface temperature anomalies ($^{\circ}\text{C}$) for September 2011

Seven of the 11 dynamical ENSO models NIWA monitor are now predicting La Niña conditions over the next 6 months. The NCEP ENSO discussion of 8 September states that “La Niña conditions have returned and are expected to gradually strengthen and continue” into the southern summer 2011-12. The IRI summary of 15 September agrees on a current (weak) La Niña being in place, and predicts a 52% probability for continuing La Niña during the September–November season, although a return to neutral conditions is still considered possible.

Summary of Southwest Pacific tropical cyclone activity for the 2010 -11 season

The tropical cyclone season for 2010–11 has now closed. The ICU forecast for this season indicated normal or above normal tropical cyclone (TC) activity for most islands west of the International Date Line in the southwest Pacific, with reduced activity east of the International Date Line due to La Niña conditions in the equatorial and tropical Pacific. A total of nine to 12 named TCs were forecast for the southwest Pacific (between 135°E to 120°W) for the period November 2010 through April 2011.

The action during this TC season began in late December with the formation of TC Tasha and concluded in late March with TC Bune. A total of nine TCs occurred in the region, which was consistent with the number of predicted storms based on the ICU analogue forecast. Five cyclones reached at least Category 3, and three systems reached at least Category 4, with mean wind speeds of at least 64 knots or 118 km/h. This activity was also in line with the prediction of at least three storms reaching Category 3 status and at least one storm reaching Category 4 strength. There

were more numerous TCs during the early part of the season, with peak activity occurring in January which had five named storms. Several tropical depressions also formed late in the season; however, none of them developed into a named storm. Damages associated with TC activity for the 2010–11 season are estimated to have exceeded at least \$3.5 billion USD, with a total of four reported fatalities.

ICU forecasts indicated an increased risk of TCs impacting island nations surrounding the Coral Sea and to the southwest of Fiji. New Zealand was also at higher risk of experiencing an ex-tropical cyclone interaction this season. The distribution of TC activity was certainly in line with expectations, with six ex-tropical cyclones entering the New Zealand sector (some having greater impacts than others). Australia was significantly affected by the strongest event of the season when TC Yasi made landfall in Queensland on 3 February. Yasi is estimated as the second costliest TC in Australian history. The forecast for the 2011–12 season will be released on 18 October and summarised in ICU 134.

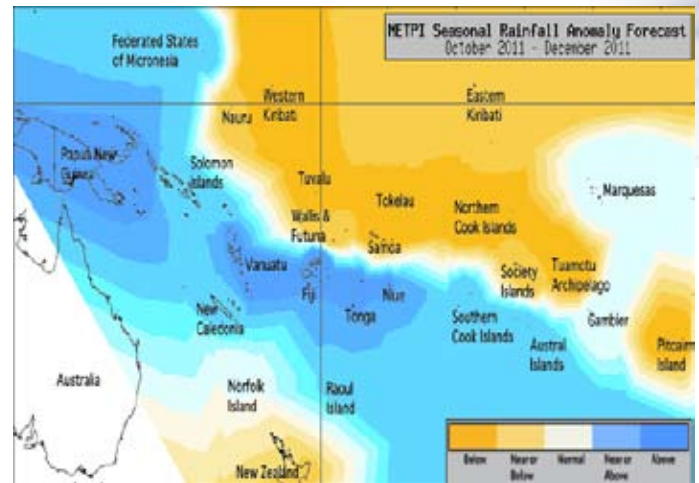
Tropical cyclone	Name	Category	Active dates	Island groups affected	Minimum low P (hPa)	Max.10-min. windspeed	Estimated damage	Fatalities
1	Tasha	1	December 20–25	Australia	993	75km/h	Not reported	
2	Vania	3	January 5–15	New Caledonia, Vanuatu, Fiji New Zealand	970	120km/h	\$11M USD	
3	Zelia	3	January 16–17	New Zealand	957	155km/h	Not reported	
4	Wilma	4	January 19–28	Samoa, Tonga, New Zealand	930	185km/h	\$22M USD	3
5	Anthony	2	January 21–30	Australia	984	100km/h	Not reported	
6	Yasi	5	January 26–February 3	Solomon Islands, Vanuatu, Australia	929	205km/h	\$ 3.5B USD	1
7	Zaka	2	February 5–7	Raoul Island, New Zealand	985	95km/h	Not reported	
8	Atu	4	February 13–24	New Caledonia, Vanuatu, New Zealand	937	165km/h	Not reported	
9	Bune	2	March 22–29	New Zealand	970	130km/h	Not reported	

Tropical rainfall and SST outlook: October to December 2011

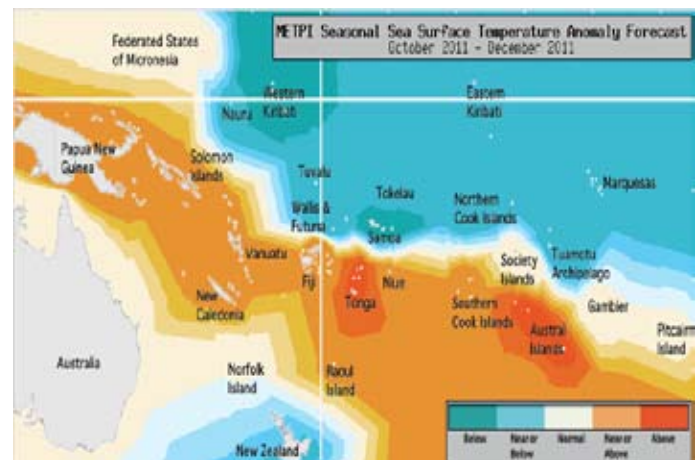
A La Nina pattern is re-emerging in the ensemble of global climate forecasts. Suppressed convection is expected in the southwest Pacific near Tuvalu, Tokelau, the Tuamotu Archipelago, the Northern Cook Islands, Samoa, Pitcairn Island, and Western Kiribati which are forecast to receive below normal rainfall in the coming three months. Average or below average rainfall is expected for the Society Islands, Eastern Kiribati, and Wallis & Futuna. Above normal rainfall is forecast for Papua New Guinea, Vanuatu, Fiji, Tonga and Niue. Near or above average rainfall is forecast for the Solomon Islands, the Austral Islands, New Caledonia, and the Southern Cook Islands. Near normal rainfall is expected for the Marquesas.

The global model ensemble continues to show changes in the near equatorial Pacific sea surface temperature cold anomalies relative to past months. For the coming three months, below normal SSTs are expected for Samoa and Western Kiribati. Normal or below normal SSTs are forecast for Eastern Kiribati, the Tuamotu Archipelago, the Northern Cook Islands, Wallis & Futuna, the Marquesas, Tuvalu, and Tokelau. Above normal SSTs are forecast for the Austral Islands and Tonga. Near normal or above normal sea surface temperatures are forecast for Papua New Guinea, the Solomon Islands, New Caledonia, Vanuatu, Fiji, Niue, and the Southern Cook Islands. Near normal SSTs are forecast for the Society Islands and Pitcairn Island.

The confidence for the rainfall outlook is moderately high. The average region-wide hit rate for rainfall forecasts issued in October is 67%, four percent higher than the long-term average for all months combined. The SST forecast confidence is mostly high, with the greatest uncertainty near Eastern Kiribati and Samoa.



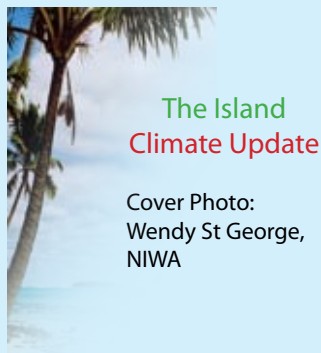
Rainfall anomaly outlook map for October to December 2011



SST anomaly outlook map for October to December 2011

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	10:30:60 (Above)	Moderate-High	Austral Islands	20:35:45 (Above)	High
Fiji	15:30:55 (Above)	Moderate-High	Tonga	20:35:45 (Above)	High
Niue	15:30:55 (Above)	Moderate-High	Niue	25:35:40 (Near or Above)	Moderate-High
Papua New Guinea	15:35:50 (Above)	Moderate-High	Cook Islands (Southern)	25:35:40 (Near or Above)	Moderate-High
Vanuatu	15:35:50 (Above)	Moderate-High	Solomon Islands	25:35:40 (Near or Above)	High
Cook Islands (Southern)	25:35:40 (Normal or Above)	High	Fiji	25:40:35 (Near or Above)	High
New Caledonia	25:35:40 (Normal or Above)	High	New Caledonia	25:40:35 (Near or Above)	High
Solomon Islands	25:35:40 (Normal or Above)	High	Papua New Guinea	25:40:35 (Near or Above)	Moderate-High
Austral Islands	25:40:35 (Normal or Above)	Moderate-High	Vanuatu	25:40:35 (Near or Above)	High
Marquesas	30:40:30 (Near normal)	Moderate-High	Pitcairn Island	30:40:30 (Near normal)	High
Kiribati (Eastern)	35:40:25 (Near or Below)	Moderate-High	Society Islands	30:40:30 (Near normal)	High
Wallis & Futuna	35:40:25 (Near or Below)	Moderate	Wallis & Futuna	35:40:25 (Near or Below)	High
Society Islands	40:35:25 (Near or Below)	High	Tokelau	35:40:25 (Near or Below)	High
Kiribati (Western)	45:35:20 (Below)	Moderate-High	Marquesas	35:40:25 (Near or Below)	High
Pitcairn Island	45:35:20 (Below)	Moderate-High	Tuvalu	35:40:25 (Near or Below)	High
Samoa	45:35:20 (Below)	Moderate-High	Tuamotu Islands	40:40:20 (Near or Below)	High
Cook Islands (Northern)	50:30:20 (Below)	Moderate-High	Cook Islands (Northern)	40:35:25 (Near or Below)	Moderate-High
Tokelau	50:30:20 (Below)	Moderate-High	Kiribati (Eastern)	40:35:25 (Near or Below)	Moderate
Tuamotu Islands	50:30:20 (Below)	Moderate-High	Kiribati (Western)	45:35:20 (Below)	High
Tuvalu	55:30:15 (Below)	Moderate-High	Samoa	45:35:20 (Below)	Moderate



The Island Climate Update

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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/>