

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- Strong El Niño conditions persisted in October 2015.
- Sea Surface Temperatures (SSTs) and precipitation anomalies continued to intensify in the central and eastern Pacific.
- El Niño is certain (100% chance) to continue over the coming season (November 2015 – January 2016).

Collaborators

Pacific Islands National
Meteorological Services

Australian Bureau of
Meteorology

Meteo France

NOAA National Weather
Service

NOAA Climate Prediction
Center (CPC)

International Research
Institute for Climate and
Society

European Centre for
Medium Range Weather
Forecasts

UK Met Office

World Meteorological
Organisation

MetService of New
Zealand

The South Pacific Convergence Zone

- The SPCZ is expected to be positioned north of climatology in the central Pacific.

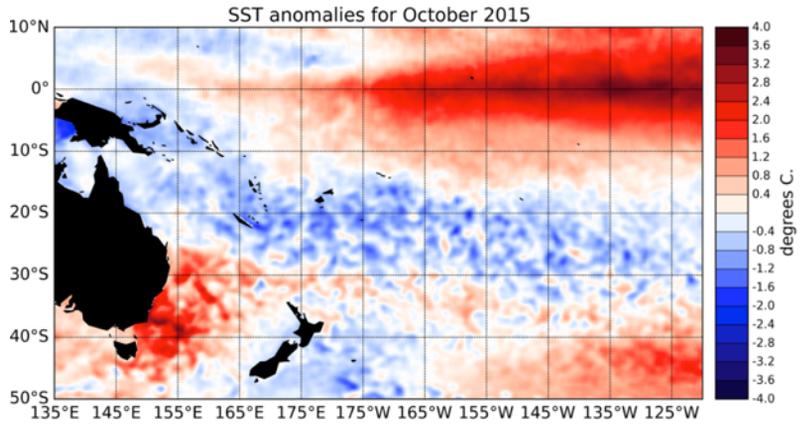
Multi-model Ensemble Tool for Pacific Island (METPI) rainfall and sea surface temperature forecasts

- Below normal rainfall is forecast for the Austral Islands, New Caledonia, Wallis & Futuna, Papua New Guinea, the Solomon Islands, Fiji, Samoa, Vanuatu, the Federated States of Micronesia, the southern Cook Islands, Niue and Tonga.
- Above normal rainfall is forecast for Eastern Kiribati, Western Kiribati, Tuvalu and Tokelau.
- Above normal SSTs are forecast for western Kiribati and eastern Kiribati.



El Niño/Southern Oscillation (ENSO)

Strong El Niño conditions continued in October 2015. Sea surface temperature (SST) anomalies in the central and eastern Pacific have increased since September and are close to or exceed +2.5°C in places. Sub-surface ocean temperatures in the eastern Pacific are at similar levels too September and exceed +6°C off the South American coast (east of about 120°W and at about 75 – 100m depth). The atmosphere is well coupled to these ocean anomalies. The Southern Oscillation Index (SOI) was strongly negative (-2.1 for October 2015). Westerly wind anomalies (implying weaker easterly trade-winds) have intensified further since September and moved further east to straddle the International Dateline. Consistent with these patterns, convection and rainfall was suppressed over Indonesia and large parts of the Maritime Continent, while enhanced convective activity and rainfall were observed in the central and eastern Equatorial Pacific. The South Pacific Convergence Zone (SPCZ) was again this month mostly suppressed in the southwest Pacific, and shifted towards the Equator in the central Pacific. The Inter-Tropical Convergence Zone (ITCZ) was displaced towards the Equator in the eastern and central Pacific and suppressed in the western Equatorial Pacific. The ENSO Precipitation Index (ESPI) reflects strong El Niño conditions with a value of +1.64 (value to the 4th of November 2015).

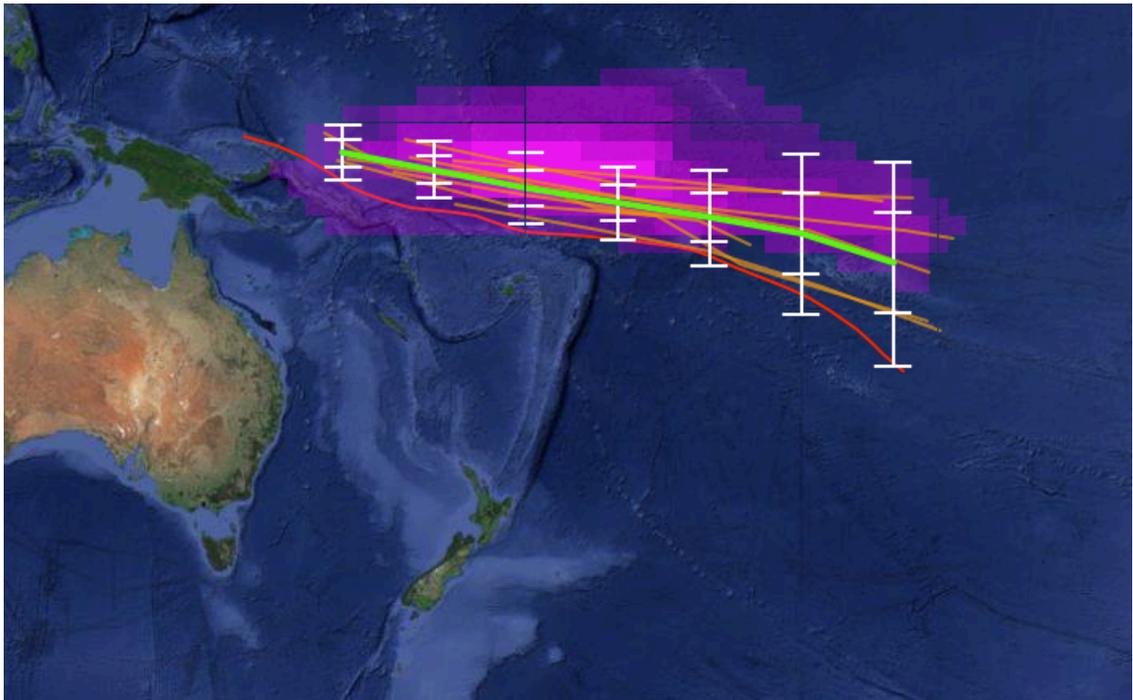


Surface temperature anomalies (°C) for October 2015, data is from the NOAA OISST Version 2 dataset, available at NOAA's Climate Data Center (<ftp://ftp.cdc.noaa.gov/Datasets/noaa.oisst.v2.hires/>)

The Madden-Julian Oscillation (MJO) was mostly inactive over the western Pacific during the past two weeks. At the forecast horizon of 14 days, the dynamical and statistical CPC forecasts diverge: the dynamical forecasts indicate a progressive in-place weakening of the region of high convective activity currently present in the Indian Ocean, while the statistical forecast has it propagating into the Maritime Continent. International guidance indicates that El Niño conditions are certain (100% chance) to continue over the next three month period (November 2015 – January 2016) and through to the summer (January – March 2016).

South Pacific Convergence Zone forecast November 2015 to January 2016

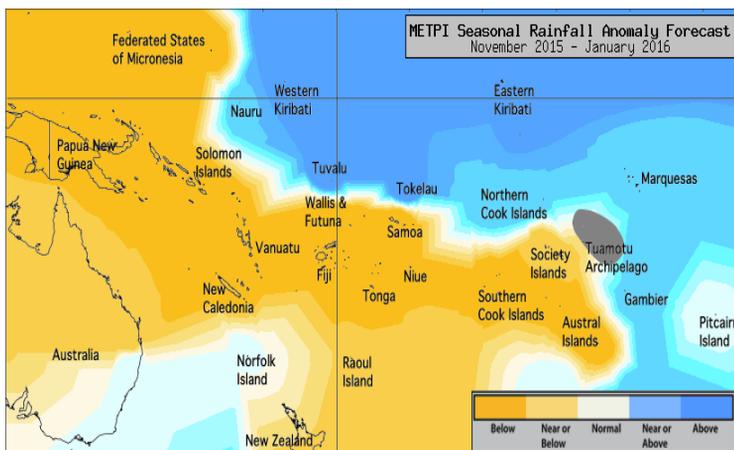
The ensemble of global climate models for rainfall that are used in METPI show an area of higher than normal rainfall associated with the SPCZ position. The green line indicates that average SPCZ position for the forecast period based on the average of eight climate models. The white vertical bars and 'whiskers' indicate the one and two standard deviations between the model projections of the SPCZ position every five degrees of longitude. The purple shading is proportional to the probability of intense convection developing within the SPCZ.



For the November 2015 – January 2016 forecast period, the South Pacific Convergence Zone (SPCZ) is expected to be shifted towards the Equator and to adopt a more zonal position. Areas of higher than normal convective activity associated with the SPCZ are expected in the central Pacific just south of the Equator and in the Intertropical Convergence Zone over and east of the international dateline.

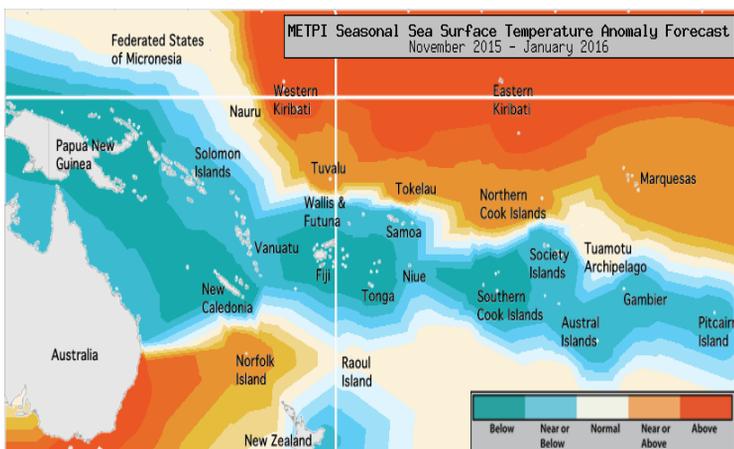
Tropical rainfall and SST outlook: November 2015 to January 2016

The dynamical models are all in agreement to forecast continuing strong El Niño conditions for the November 2015 – January 2016 period. As a consequence most regions of the southwest Pacific usually affected by the South Pacific Convergence Zone are forecast to experience a drier than normal November 2015 – January 2016 season. Below normal rainfall is forecast for the Austral Islands, New Caledonia, Wallis & Futuna, Papua New Guinea, the Solomon Islands, Fiji, Samoa, Vanuatu, the Federated States of Micronesia, the southern Cook Islands, Niue and Tonga. Normal or below normal rainfall is forecast for the Society Islands. Near normal rainfall is expected for Pitcairn Island. Normal or above normal rainfall is forecast for the Northern Cook Islands and the Marquesas. Above normal rainfall is forecast for Eastern Kiribati, Western Kiribati, Tuvalu and Tokelau.



Rainfall anomaly outlook map for November 2015 – January 2016

The global model ensemble forecast for SSTs indicates further intensification of the higher than normal SSTs present in the central and eastern equatorial Pacific. The region of cooler than normal SSTs currently observed in the western Pacific is also forecast to intensify. Above normal SSTs are forecast for western Kiribati and eastern Kiribati. Normal or above normal SSTs are forecast for the Marquesas, the Northern Cook Islands, Tokelau and Tuvalu. Near normal SSTs are forecast for the Federated States of Micronesia and the Tuamotu archipelago. Normal or below normal SSTs are forecast for the Solomon Islands, Vanuatu, Wallis & Futuna, Samoa, Niue, the Society Islands, the Austral Islands and Pitcairn Island. Below normal SSTs are forecast for Fiji, Tonga, New Caledonia, Papua New Guinea and the Southern Cook Islands.



SST anomaly outlook map for November 2015 – January 2016

The confidence for the rainfall outlooks is moderate to high. The average region-wide hit rate for rainfall forecasts issued for the November – January season is about 65%, two points higher than the average for all months combined. The confidence for the SST forecasts is also moderate to high.

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



The Island Climate Update

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Wendy St George,
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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 Sources 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, Federated States of Micronesia, Fiji, French Polynesia, Kiribati, New Caledonia, New Zealand, Niue, Papua New Guinea, Pitcairn Island, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, Wallis & 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.com>

Niue
<http://pi.gcos.org/index.php> (follow link to PI Met Services then Niue Met Service)

Papua New Guinea
<http://pi.gcos.org/index.php> (follow link 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>