

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- Strong El Niño conditions continued in January 2016.
- El Niño has probably reached its peak towards the end of 2015.
- El Niño is highly likely (96% chance) to continue over the coming season (February–April 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 and east of its climatological position.

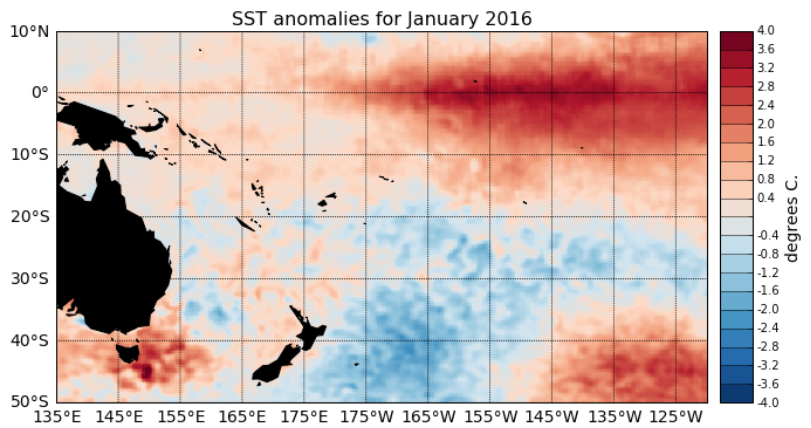
Multi-model Ensemble Tool for Pacific Island (METPI) rainfall and sea surface temperature forecasts

- Below normal rainfall is forecast for New Caledonia, Samoa, Tonga, northern Vanuatu, Wallis & Futuna, Niue, Fiji, southern Vanuatu and the Federated States of Micronesia.
- Above normal rainfall is forecast for Eastern Kiribati, Western Kiribati, Tuvalu, the Northern Cook Islands, the Marquesas and Tokelau.
- Above normal sea surface temperatures are forecast for western Kiribati, eastern Kiribati and the Marquesas.



El Niño/Southern Oscillation (ENSO)

Strong El Niño conditions continued during January 2016. Sea surface temperature (SST) anomalies still exceed +2°C in the central and eastern Pacific, but have weakened from the peak values in November-December 2015. The latest monthly SST anomalies in the NINO3.4 is at +2.14°C, while the NINO3 region (eastern Pacific: 90°W – 150°W) is currently sitting at +2.03°C. The NINO4 index value (in the western Pacific) is +1.33°C. The sub-surface ocean temperature anomalies in the eastern Pacific have decreased further since December, and reach now about +4°C at 75-100m depth near 120°W (compared to peak values of about 7°C in November 2015). Conversely, the Southern Oscillation Index (SOI) has strengthened to about -2.0 for the month of January. Strong westerly wind anomalies (weaker easterly trade-winds) continue to affect the western and central Pacific. The contrast in convective activity in the Maritime Continent and areas east of the Dateline has intensified: rainfall is much above normal along the equator from the Dateline to about 140°W, whereas there is a much more pronounced dry region over Indonesia and north of Australia during January 2016. The Intertropical Convergence Zone (ITCZ) was displaced towards the Equator in the central and eastern Pacific, and the South Pacific Convergence Zone (SPCZ) was shifted to the north and east of normal, both signals being consistent with El Niño. The ENSO Precipitation Index (ESPI) reflects El Niño conditions with a value of +1.74 (value to the 4th of February 2016).

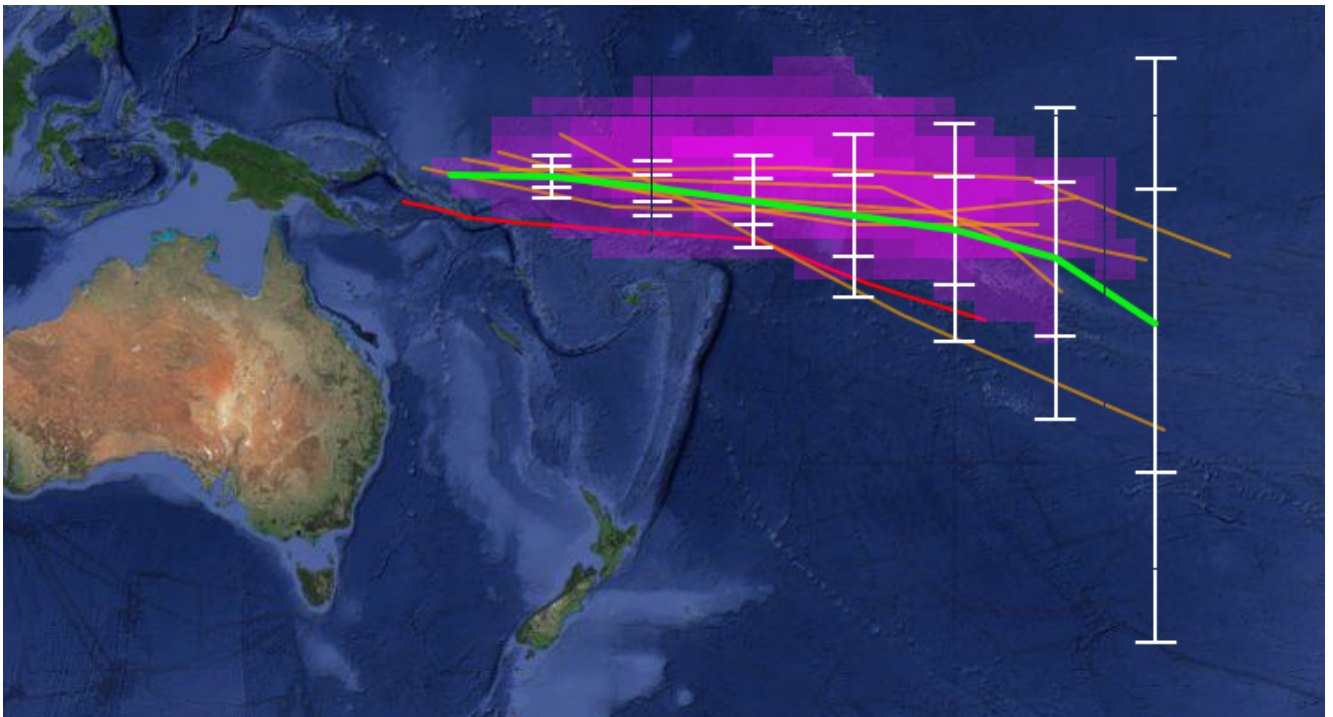


Surface temperature anomalies (°C) for January 2016, data is from the NOAA OISST Version 2 dataset, available at NOAA's Climate Data Center (<ftp://ftp.cdc.noaa.gov/Datasets/noaa.oisst.v2.hires/>)

A Madden-Julian Oscillation (MJO) pulse reached into the Maritime Continent over the last week of January and is forecast to intensify over the next two weeks, with increased intra-seasonal convective activity expected in the western Pacific, i.e. a pattern opposed to the background climate anomalies. This MJO activity could potentially trigger Tropical Cyclones initiation in the coming weeks. International guidance indicates that El Niño conditions will continue (96% probability) over the next three months (February – April 2016) and will rapidly decay thereafter, with a return to normal conditions or a transition to La Niña conditions by August – October 2016.

South Pacific Convergence Zone forecast February to April 2016

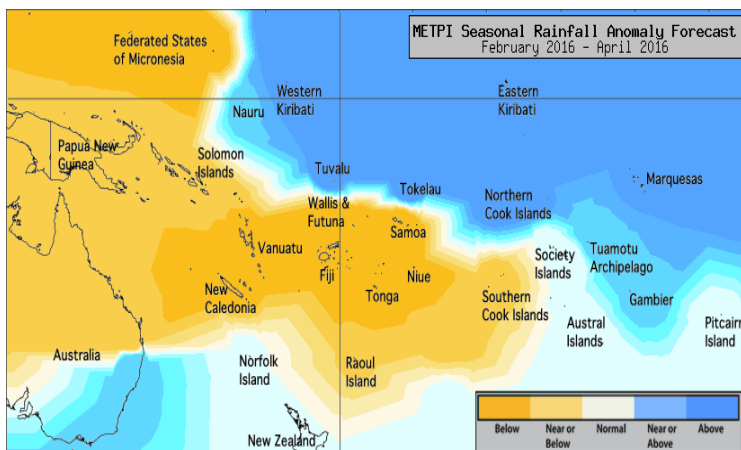
The ensemble of global climate models for rainfall that are used in METPI show an area of higher than normal rainfall associated with the SPCZ position. The green line indicates that average SPCZ position for the forecast period based on the average of eight climate models. The white vertical bars and '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 February – April 2016 forecast period, the South Pacific Convergence Zone (SPCZ) is expected to be shifted east and north of its climatological position. Areas of higher than normal convective activity associated with the SPCZ are expected in the central and eastern Pacific.

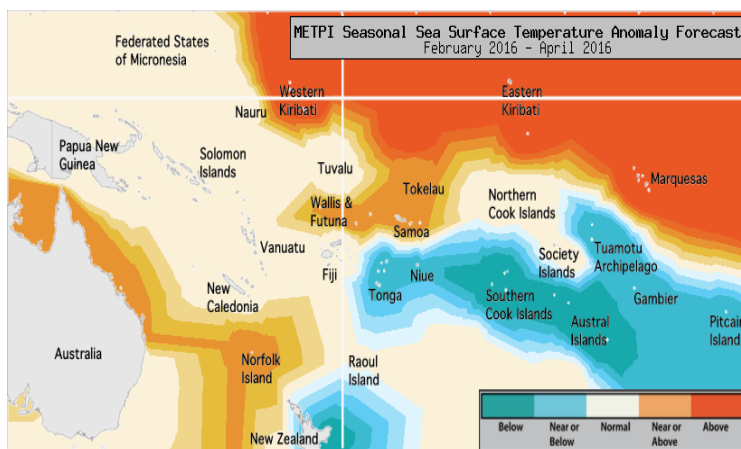
Tropical rainfall and SST outlook: February to April 2016

The dynamical models are in agreement to forecast continuing El Niño conditions for the February – April 2016 period (96% chance), and the SPCZ is forecast to be again displaced north and east of its normal position (see page 2), leading to many island groups in the southwest Pacific expected to experience drier than normal conditions over the forecast period (February – April 2016). Below normal rainfall is forecast for New Caledonia, Samoa, Tonga, northern Vanuatu, Wallis & Futuna, Niue, Fiji, southern Vanuatu and the Federated States of Micronesia. Normal or below normal rainfall is forecast for the southern Cook Islands, Papua New Guinea and the Solomon Islands. Normal or above normal rainfall is forecast for the Tuamotu archipelago. Above normal rainfall is forecast for Eastern Kiribati, Western Kiribati, Tuvalu, the Northern Cook Islands, the Marquesas and Tokelau. Near normal rainfall is forecast for the Austral Islands, Pitcairn and the Society Islands.



Rainfall anomaly outlook map for February – April 2016

As El Niño is forecast to continue over the February – April 2016 period, the large positive Sea Surface Temperature (SST) anomalies currently present in the central and eastern equatorial Pacific are expected to persist over the next three months. The region of cooler than normal SSTs present in the south Pacific is forecast to intensify. Above normal SSTs are forecast for western Kiribati, eastern Kiribati and the Marquesas. Normal or above normal SSTs are forecast for Tokelau, Samoa and Wallis & Futuna. Normal or below normal SSTs are forecast for Niue, Gambier, the Tuamotu archipelago, Tonga and Pitcairn Island. Below normal SSTs are forecast for the Southern Cook Islands and the Austral Islands. Near normal SSTs are forecast elsewhere. The confidence for the rainfall outlooks is moderate to high. The average region-wide hit rate for rainfall forecasts issued for the February – April season is about 63%, close to the average for all months combined. The confidence for the SST forecasts is also moderate to high.



SST anomaly outlook map for February – April 2016

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



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>