Number 186, March 2016

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- Strong El Niño conditions continued in February 2016.
- El Niño is currently in its decay phase, down from peak conditions reached towards the end of 2015.
- El Niño is extremely likely (99% chance) to continue over the coming season (March – May 2016).

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

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

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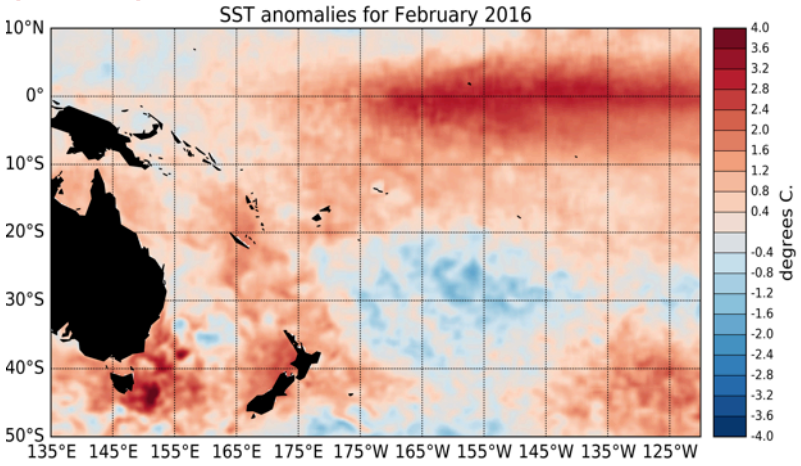
NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

SPREP

NIWA Taihoro Nukurangi

El Nino/Southern Oscillation (ENSO)

Strong El Niño conditions continued during February 2016, but the event is clearly in its decay phase, having reached a peak at the end of 2015. Sea Surface Temperature (SST) anomalies in the central and eastern Pacific have weakened significantly and are now below the +2ºC mark. The latest monthly SST anomaly in the NINO3.4 region is at +1.9°C, while the NINO3 region (eastern Pacific: 90ºW – 150ºW) is currently sitting at +1.6ºC. The NINO4 index value (in the western Pacific) is +1.3ºC. Sub-surface ocean temperature anomalies in the eastern Pacific cooled further in February 2016, and retreated to east of 120ºW. More significantly, the warm sub-surface anomaly is now confined above 75m depth. The Southern Oscillation Index (SOI) remained strongly negative during February, with a value similar to that of January at about -2.0. Westerly wind anomalies virtually disappeared west of the Dateline, but were still evident around 180-150°W. A contrast of weaker convection over the Maritime Continent, and enhanced convection from the Dateline eastwards, continued through February but was noticeably weaker than in January. The Intertropical Convergence Zone (ITCZ) was clearly 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 its climatological position, both signals being consistent with El Niño. The ENSO Precipitation Index (ESPI) reflects El Niño conditions with a value of +1.4 (value to the 6th of March 2016).

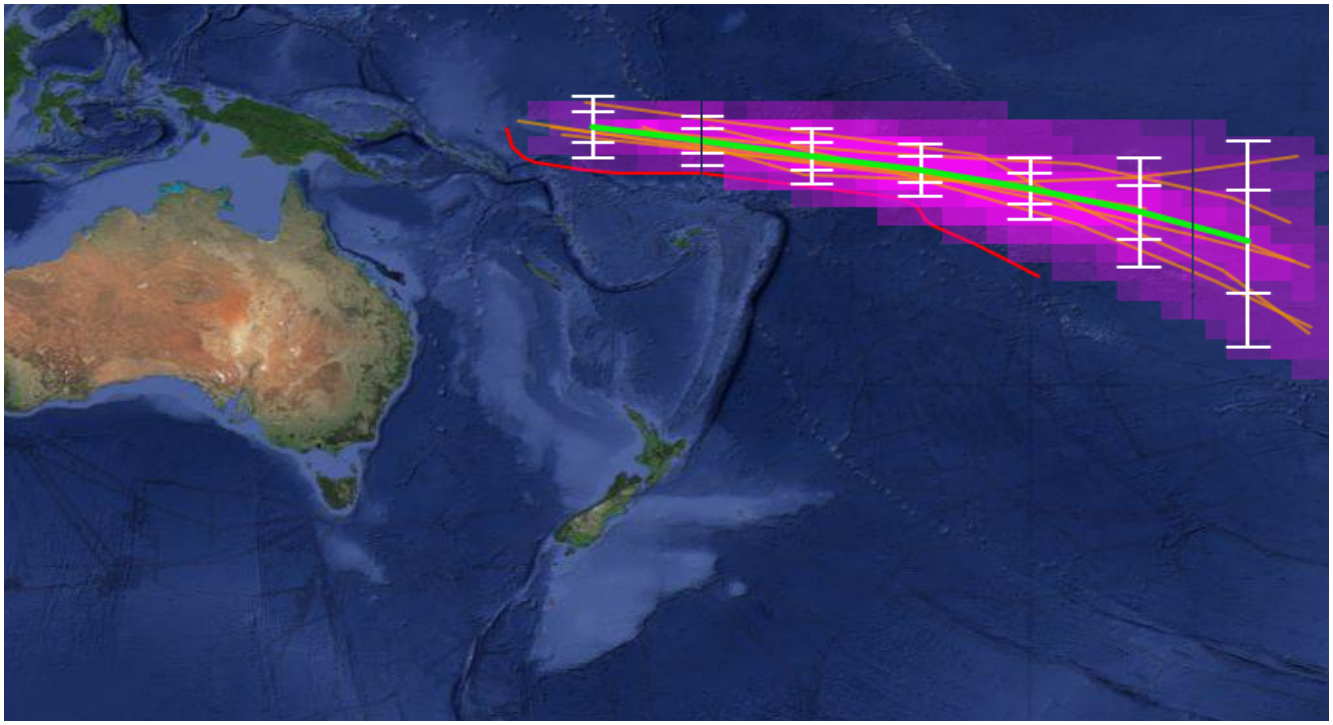


Surface temperature anomalies (ºC) for February 2016, data is from the NOAA OISST Version 2 dataset, available at NOAA's Climate Data Center (ftp://ftp.cdc.noaa.gov/Datasets/noaa.oisst.v2.hires/)

A strong Madden-Julian Oscillation (MJO) pulse reached into the Maritime Continent over the last week of February, associated with decreased convection over the Maritime Continent, but this pattern is expected to weaken over the next two weeks. International guidance indicates that El Niño conditions will continue (99% chance) over the next three months (March – May 2016) and will rapidly decay thereafter. In winter (June – August 2016), the international consensus indicate neutral conditions are most likely (56% chance), with only a 15% chance of El Niño conditions persisting through this season. For the September – November season, the models forecasts a 49% chance of La Niña conditions and 36% for neutral.

South Pacific Convergence Zone forecast March to May 2016

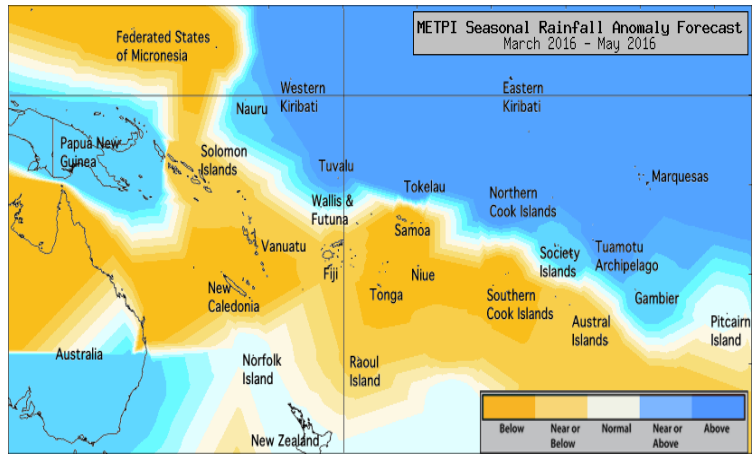
The ensemble of global climate models for rainfall that are used in METPI show an area of higher than normal rainfall associated with the SPCZ position. The green line indicates that average SPCZ position for the forecast period based on the average of eight climate models. The white vertical bars and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

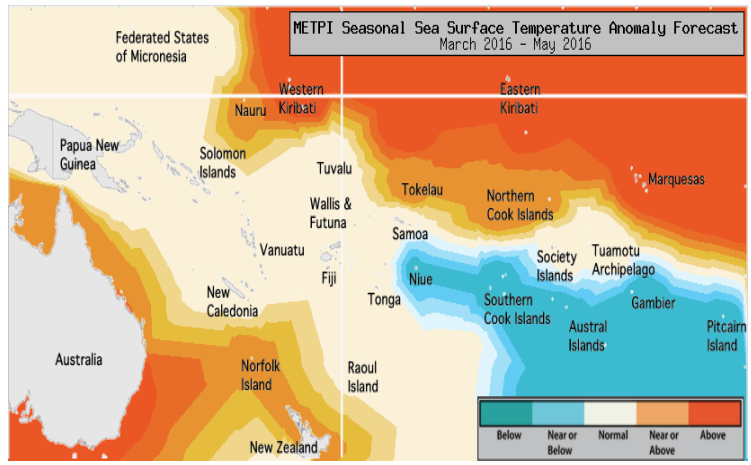
Tropical rainfall and SST outlook: March to May 2016

The dynamical models are in agreement to forecast continuing El Niño conditions for the March – May 2016 period (99% chance), and the SPCZ is forecast to be again displaced north of its climatological position (see page 2), leading to many island groups in the southwest Pacific forecast to experience drier than normal conditions over the forecast period (March – May 2016). Below normal rainfall is forecast for the southern Cook Islands, New Caledonia, Samoa, Tonga, southern Vanuatu, Wallis & Futuna, Fiji, Niue, northern Vanuatu and the Federated States of Micronesia. Normal or below normal rainfall is forecast for the Austral Islands and the Solomon Islands. Normal or above normal rainfall is forecast for Papua New Guinea and the Society Islands. Above normal rainfall is forecast for Eastern Kiribati, Western Kiribati, the Marquesas, the Northern Cook Islands, Tokelau, the Tuamotu archipelago and Tuvalu. Near normal rainfall is forecast for Pitcairn Island.



Rainfall anomaly outlook map for March – May 2016

As El Niño is forecast to continue over the March – May 2016 period, the large positive Sea Surface Temperature (SST) anomalies currently present in the central and eastern equatorial Pacific are expected to still be present persist over the next three months, although the anomalies are forecast to weaken significantly. The region of cooler than normal SSTs present in the south Pacific is forecast to persist. Above normal SSTs are forecast for western Kiribati, eastern Kiribati and the Marquesas. Normal or above normal SSTs are forecast for the Northern Cook Islands, Tokelau and Fiji. Normal or below normal SSTs are forecast for the Austral Islands, Niue, Pitcarin Island 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 March – May season is about 62%, 1% below the average for all months combined. The confidence for the SST forecasts is also moderate to high.



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

Island Group	SST Outlook	Outlook Confidence
Kiribati (Eastern)	20:30:50 (Above)	High
Kiribati (Western)	20:30:50 (Above)	High
Marquesas	20:30:50 (Above)	Moderate-High
Cook Islands (Northern)	25:35:40 (Normal or Above)	High
Tokelau	25:35:40 (Normal or Above)	High
Fiji	25:35:40 (Normal or Above)	Moderate-High
FSM	30:40:30 (Normall)	Moderate-High
New Caledonia	30:40:30 (Normall)	Moderate-High
Papua New Guinea	30:40:30 (Normall)	High
Samoa	30:40:30 (Normall)	Moderate
Society Islands	30:40:30 (Normall)	Moderate
Solomon Islands	30:40:30 (Normall)	Moderate
Tonga	30:40:30 (Normall)	Moderate
Tuamotu	30:40:30 (Normall)	Moderate
Tuvalu	30:40:30 (Normall)	High
Vanuatu (South)	30:40:30 (Normall)	Moderate-High
Vanuatu (North)	30:40:30 (Normall)	Moderate-High
Wallis & Futuna	30:40:30 (Normall)	Moderate-High
Austral Islands	40:35:25 (Normal or Below)	High
Niue	40:35:25 (Normal or Below)	Moderate-High
Pitcairn	40:35:25 (Normal or Below)	High
Austral Islands	40:35:25 (Normal or Below)	High

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.

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