

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- El Niño conditions weakened further in April 2016.
- Neutral conditions are forecast to return over the coming three months (May – July 2016).
- Chances for a transition to La Niña conditions later this year have increased.

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 east of its climatological position in the eastern Pacific.

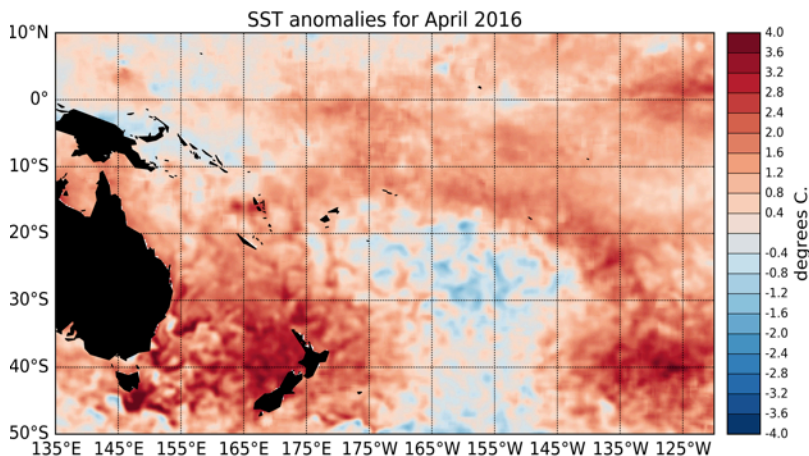
Multi-model Ensemble Tool for Pacific Island (METPI) rainfall and sea surface temperature forecasts

- Below normal rainfall is forecast for the southern Cook Islands, Niue, Tonga, southern Vanuatu, Fiji, northern Vanuatu and the Federated States of Micronesia.
- Above normal rainfall is forecast for the northern Cook Islands, Tokelau, Tuvalu and the Marquesas.
- Above normal sea surface temperatures are forecast for the Marquesas.



El Niño/Southern Oscillation (ENSO)

El Niño conditions eased in the tropical Pacific during April 2016, with sea surface temperatures (SSTs) now typically only about +1°C warmer than normal. The latest monthly SST anomaly in the NINO3.4 region is +1.13°C, the NINO3 region (eastern Pacific: 90°W – 150°W) is currently at +1.10°C, and the NINO4 index (in the western Pacific) is at +0.83°C. Moreover, cooler than normal sub-surface waters have spread eastward from the western Pacific, and temperatures are more than 3°C below normal between 50 and 100m depth east of 160°W. These changes in sub-surface temperatures mean the tropical Pacific is poised to make a rapid transition into La Niña conditions. Enhanced convective activity and rainfall near and east of the Dateline has weakened in April 2016, and the strong westerly wind anomalies (weaker easterly trade-winds) that dominated the western and central Pacific earlier in the year have now almost dissipated. Conversely, the Southern Oscillation Index (SOI) actually intensified (more negative) during April and is now at about -1.8, compared to -0.4 for March as a whole. The South Pacific Convergence Zone (SPCZ) was more intense than normal in the south eastern Pacific. The ENSO Precipitation Index (ESPI) still indicates El Niño conditions with a value of +0.95 (value to the 4th of May 2016). The Madden-Julian Oscillation (MJO) was weak in the western Pacific over April as a whole. At the forecast horizon or 14 days, the CPC



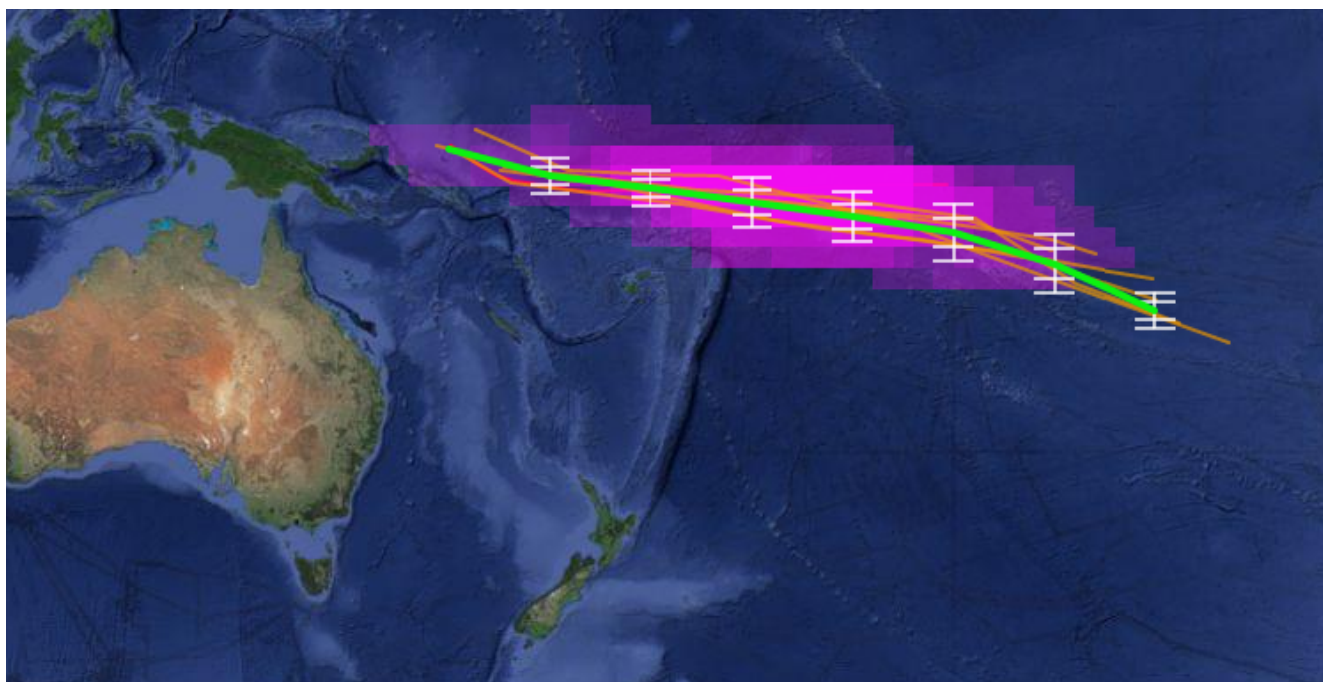
Surface temperature anomalies (°C) for April 2016, data is from the NOAA OISST Version 2 dataset, available at NOAA's Climate Data Center (<ftp://ftp.cdc.noaa.gov/Datasets/noaa.oisst.v2.hires/>)

forecasts indicate overall low chances of increased intra-seasonal convective activity in the western Pacific.

International guidance indicates that neutral ENSO conditions are very likely (76% chance) over the next three month period (May – July 2016), as a whole. The likelihood of La Niña development increases into early spring, with a 52% chance over August – October 2016 (according to the IRI 21 April discussion), and the likelihood increases further in early summer (60% over November 2016 – January 2017).

South Pacific Convergence Zone forecast May to July 2016

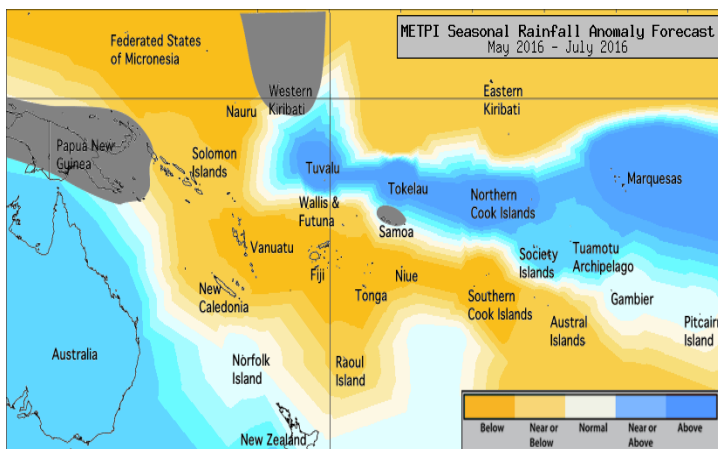
The ensemble of global climate models for rainfall that are used in METPI show an area of higher than normal rainfall associated with the SPCZ position. The green line indicates that average SPCZ position for the forecast period based on the average of eight climate models. The white vertical bars and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

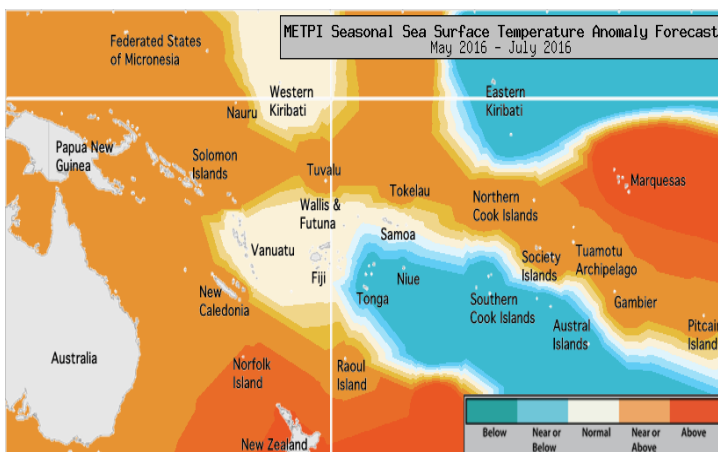
Tropical rainfall and SST outlook: May to July 2016

The dynamical models are in agreement to forecast rapidly weakening El Niño conditions for the May – July 2016 period, with a return to neutral conditions over the season as a whole the most likely outcome (76% chance). Clear signs of a probable transition to La Niña are present in the models forecasts, with the eastern equatorial Pacific now expected to experience normal or below normal rainfall. Below normal rainfall is forecast for the southern Cook Islands, Niue, Tonga, southern Vanuatu, Fiji, northern Vanuatu and the Federated States of Micronesia. Normal or below normal rainfall is forecast for New Caledonia, the Solomon Islands, eastern Kiribati and Wallis & Futuna. Above normal rainfall is forecast for the northern Cook Islands, Tokelau, Tuvalu and the Marquesas. Normal or above normal rainfall is forecast for the Tuamotu Archipelago and the Society Islands. No clear guidance is available this month for Samoa, western Kiribati and Papua New Guinea.



Rainfall anomaly outlook map for May – July 2016

The current El Niño is forecast to rapidly weaken over the May – July 2016 and a return to neutral conditions is expected over the same period. The first signs of a probable La Niña event developing later in 2016 have started to appear, with cooler than normal surface ocean waters in the eastern Equatorial Pacific. The warm ocean waters east of Australia and around New Zealand are forecast to persist. Above normal SSTs are forecast for the Marquesas. Normal or above normal SSTs are forecast for the Federated States of Micronesia, New Caledonia, the northern Cook Islands, Pitcairn Island, Papua New Guinea, the Society Islands, the Solomon Islands, Tokelau, the Tuamotu archipelago and Tuvalu. Normal or below normal SSTs are forecast for the Austral Islands, eastern Kiribati, Niue, the southern Cook Islands and Tonga. The average region-wide hit rate for rainfall forecasts issued for the May – July season is about 58%, 5% below the average for all months combined. The confidence for the SST forecasts is moderate to high.



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



The Island Climate Update

Cover Photo:
Wendy St George,
NIWA

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Your comments and ideas about the Island Climate Update are welcome. Please contact:

Dr Nicolas Fauchereau, NIWA,
41 Market Place, Auckland, New Zealand
E-mail: Nicolas.Fauchereau@niwa.co.nz

Forecasts:

Dr Nicolas Fauchereau and Dr Andrew Lorrey (South Pacific rainfall, SPCZ and SST forecasts) and the NIWA National Climate Centre (ENSO wrap)

ICU Editorial Team:

Nicolas Fauchereau:
Nicolas.Fauchereau@niwa.co.nz
Andrew Lorrey: Andrew.Lorrey@niwa.co.nz
Nava Fedaeff: Nava.Fedaeff@niwa.co.nz
Petra Pearce: Petra.Pearce@niwa.co.nz

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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>