Number 187, April 2016

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- El Niño conditions weakened in March 2016.
- El Niño conditions are still likely (80 % chance) to be present over the coming season (April – June 2016).
- All models forecast a return to neutral conditions or a transition to La Niña by July – September 2016.

The South Pacific Convergence Zone

- The SPCZ is expected to be positioned north 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, southern Vanuatu, the Federated States of Micronesia, Fiji, Tonga and northern Vanuatu.
- Above normal rainfall is forecast for the northern Cook Islands, western Kiribati, Tokelau 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

MetService of New Zealand

NEW ZEALAND MINISTRY OF FOREIGN AFFAIRS & TRADE Aid Programme

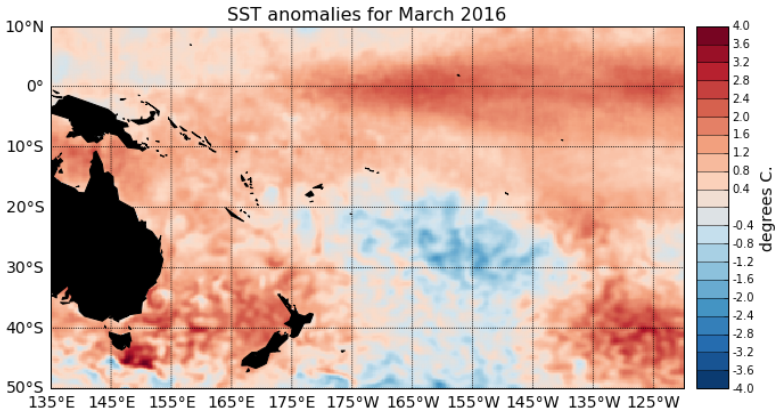
NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

SPREP

NIWA Taihoro Nukurangi

El Nino/Southern Oscillation (ENSO)

El Niño conditions continued in the Tropical Pacific during March 2016, but the current event has clearly entered its decaying phase. Sea surface temperature (SST) anomalies in the central and eastern Equatorial Pacific weakened further in March, with all NINO SST indices well below the +2°C mark. Sub-surface ocean temperature anomalies across the eastern Pacific have weakened and shoaled substantially and now barely exceed +2°C in the first ~50m of the ocean east of about 130°W, while deeper cooler waters have spread eastward from the western Pacific. These changes in sub-surface temperatures make it very likely that the current SST anomalies will retreat further towards average in the next few months. Meanwhile, the Southern Oscillation Index (SOI) also weakened over March 2014, with a value for March as a whole of -0.4. The strong westerly wind anomalies (weaker easterly trade-winds) that dominated the western and central Pacific until the beginning of 2016 have now almost dissipated. While convective activity and rainfall remains higher than normal in the Equatorial central and eastern Pacific, the dry conditions that affected the Maritime Continent have weakened significantly. The South Pacific Convergence Zone (SPCZ) was more intense than normal in the south eastern Pacific. The ENSO Precipitation Index (ESPI) reflects El Niño conditions with a value of +0.8 (value to the 6th of April 2016), a sharp decrease compared to previous months.

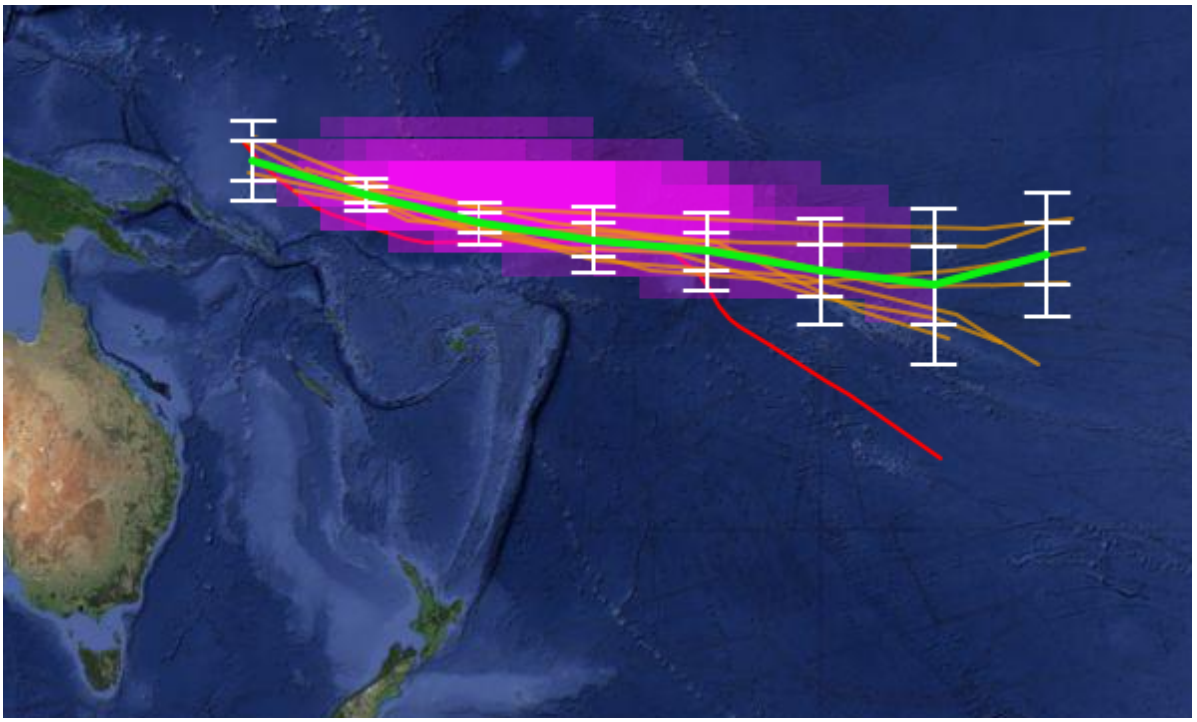


Surface temperature anomalies (°C) for March 2016, data is from the NOAA OISST Version 2 dataset, available at NOAA's Climate Data Center (ftp://ftp.cdc.noaa.gov/Datasets/noaa.oisst.v2.hires/)

The Madden-Julian Oscillation (MJO) was weak in the western Pacific over March as a whole. At the horizon of 14 days, the CPC forecasts indicate overall low chances of increased intra-seasonal convective activity in the western Pacific. International guidance indicates that El Niño conditions are very likely (80% chance) to continue over the next three months (April – June 2016) as a whole, but all models forecast El Niño to weaken further over the same period. A return to normal conditions (49% chance) or a transition to La Niña (40% chance) is expected by July – September 2016. La Niña conditions become increasingly likely towards the end of 2016 (over 45% chance for October – December 2016).

South Pacific Convergence Zone forecast April to June 2016

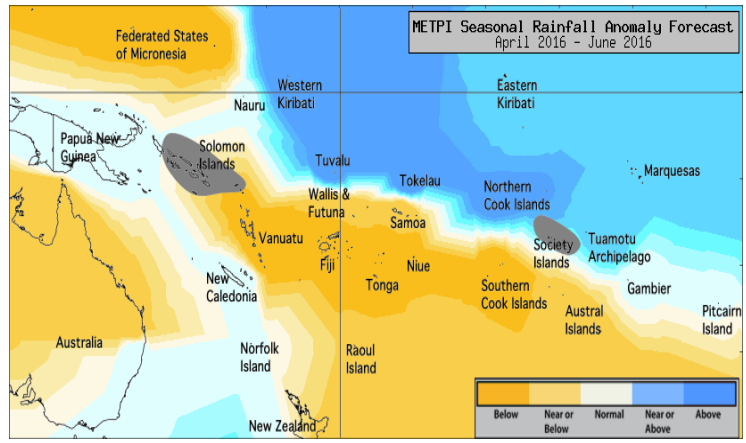
The ensemble of global climate models for rainfall that are used in METPI show an area of higher than normal rainfall associated with the SPCZ position. The green line indicates that average SPCZ position for the forecast period based on the average of eight climate models. The white vertical bars and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

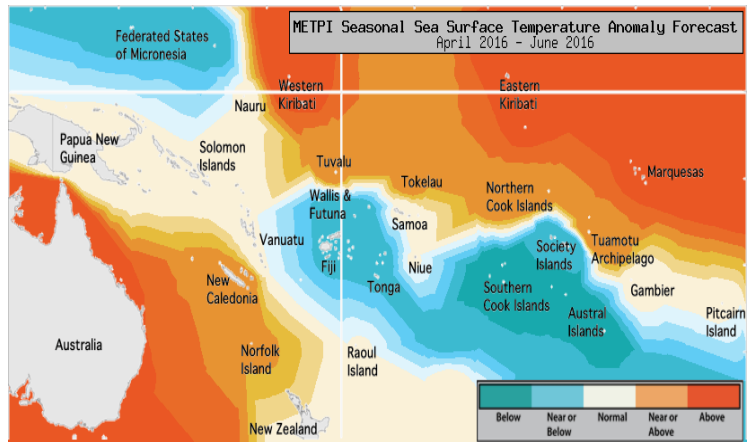
Tropical rainfall and SST outlook: April to June 2016

The dynamical models are in agreement to forecast continuing, but progressively weakening El Niño conditions for the April – June 2016 period (80% chance). The large-scale precipitation pattern anomaly for the next three months still broadly reflects typical El Niño impacts. Below normal rainfall is forecast for the southern Cook Islands, Niue, southern Vanuatu, the Federated States of Micronesia, Fiji, Tonga and northern Vanuatu. Normal or below normal rainfall is forecast for the Austral Islands, Samoa and Wallis & Futuna. Near normal rainfall is forecast for New Caledonia, Papua New Guinea and Pitcairn Island. Normal or above normal rainfall is forecast for eastern Kiribati, the Marquesas Islands and the Tuamotu archipelago. Above normal rainfall is forecast for the northern Cook Islands, western Kiribati, Tokelau and Tuvalu. No clear guidance is available this month for the Society Islands and the Solomon Islands.



Rainfall anomaly outlook map for April – June 2016

Despite the current El Niño forecast to weaken further over the forecast period (April – June 2016), Sea Surface Temperature (SST) in the eastern and central Pacific are still expected to remain higher than normal for the season as a whole. The region of cooler than normal SSTs present in the south Pacific is forecast to persist, while SST south and east of Australia are forecast to be well above normal. Above normal SSTs are forecast for western Kiribati, eastern Kiribati and the Marquesas. Normal or above normal SSTs are forecast for New Caledonia, the northern Cook Islands, Tokelau, Tuvalu and the Tuamotu archipelago. Normal or below normal SSTs are forecast for Fiji, the Federated States of Micronesia, the Society Islands, Tonga and Wallis & Futuna. Below normal SSTs are forecast for the Austral Islands and the southern Cook Islands. The average region-wide hit rate for rainfall forecasts issued for the April – June season is about 59%, 4% below the average for all months combined. The confidence for the SST forecasts is also moderate to high.



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

Island Group	SST Outlook	Outlook Confidence
Kiribati (Eastern)	20:30:50 (Above)	High
Kiribati (Western)	20:35:45(Above)	High
Marquesas	20:35:45 (Above)	Moderate-High
New Caledonia	25:35:40 (Normal or Above)	High
Cook Islands (Northern)	25:35:40 (Normal or Above)	High
Tokelau	25:35:40 (Normal or Above)	Moderate-High
Tuvalu	25:35:40 (Normal or Above)	Moderate
Tuamotu Islands	25:35:40 (Normal or Above)	Moderate-High
Niue	30:40:30 (Normall)	High
Pitcairn	30:40:30 (Normall)	Moderate
Papua New Guinea	30:40:30 (Normall)	Moderate
Samoa	30:40:30 (Normall)	Moderate-High
Solomon Islands	30:40:30 (Normall)	Moderate
Vanuatu (North)	30:40:30 (Normall)	Moderate
Vanuatu (South)	30:40:30 (Normall)	High
Fiji	40:35:25 (Normal or Below)	Moderate
FSM	40:35:25 (Normal or Below)	Moderate-High
Society Islands	40:35:25 (Normal or Below)	Moderate-High
Tonga	40:35:25 (Normal or Below)	Moderate
Wallis and Futuna	40:35:25 (Normal or Below)	Moderate-High
Austral Islands	45:35:20 (Below)	Moderate-High
Cook Islands (Southern)	50:30:20 (Below)	High

The Island Climate Update

Cover Photo:
Wendy St George,
NIWA

Visit the Island Climate Update at:
www.niwa.co.nz/climate/icu

Follow us on Twitter: @ICU_NIWA

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

Acknowledgements:
This bulletin is produced by NIWA and made possible with financial support from the New Zealand Ministry of Foreign Affairs and Trade (MFAT), with additional support from NOAA and the Secretariat for the Pacific Regional Environmental Programme (SPREP).

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