Number 176, May 2015

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- Warming of the sea surface across the equatorial Pacific Ocean continued in April 2015 and sea surface temperature (SST) anomalies currently reflect weak El Niño conditions.
- Regional atmospheric patterns are also consistent with weak El Niño conditions.
- Probability for El Niño during May – July 2015 is about 80 %.

The South Pacific Convergence Zone (SPCZ)

- The SPCZ is expected to be positioned north of climatology in the western Pacific for the coming three months.

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

- Below normal rainfall is forecast for Fiji, Papua New Guinea and Vanuatu. Normal or below normal rainfall is forecast for the southern Cook Islands, New Caledonia, Samoa, the Society Islands, Tokelau, the Tuamotu Archipelago, Wallis & Futuna, the northern Cook Islands, the Marquesas, Niue and Tonga.
- Above normal rainfall is forecast for eastern Kiribati and western Kiribati. Normal or above normal rainfall is forecast for Tuvalu.
- Above normal SSTs are forecast for Western Kiribati and Eastern Kiribati. Normal or above normal SSTs are forecast for New Caledonia, the northern Cook Islands, Samoa, Tokelau and Tuvalu.

Collaborators

Pacific Islands National Meteorological Services

Australian Bureau of Meteorology

Meteo France

NOAA National Weather Service

NOAA Climate Prediction Centre (CPC)

International Research Institute for Climate and Society

European Centre for Medium Range Weather Forecasts

UK Met Office

World Meteorological Organization

MetService of New Zealand

NEW ZEALAND MINISTRY OF FOREIGN AFFAIRS & TRADE Aid Programme

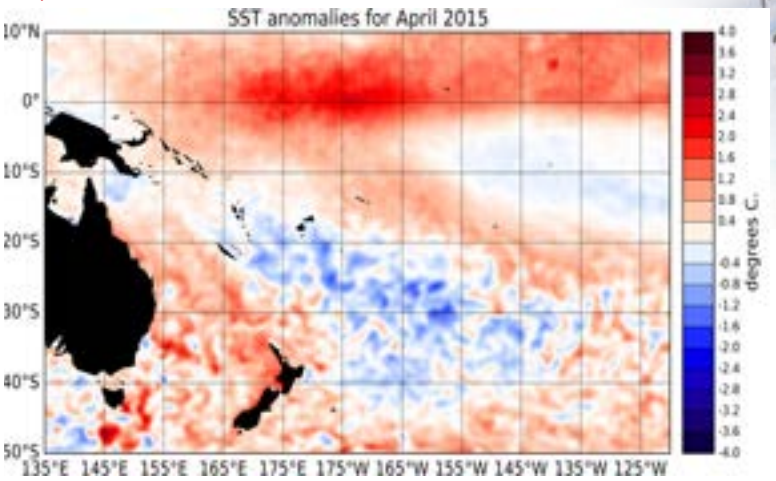
NOAA

SPREP

NIWA Taihoro Nukurangi

El Niño/Southern Oscillation (ENSO)

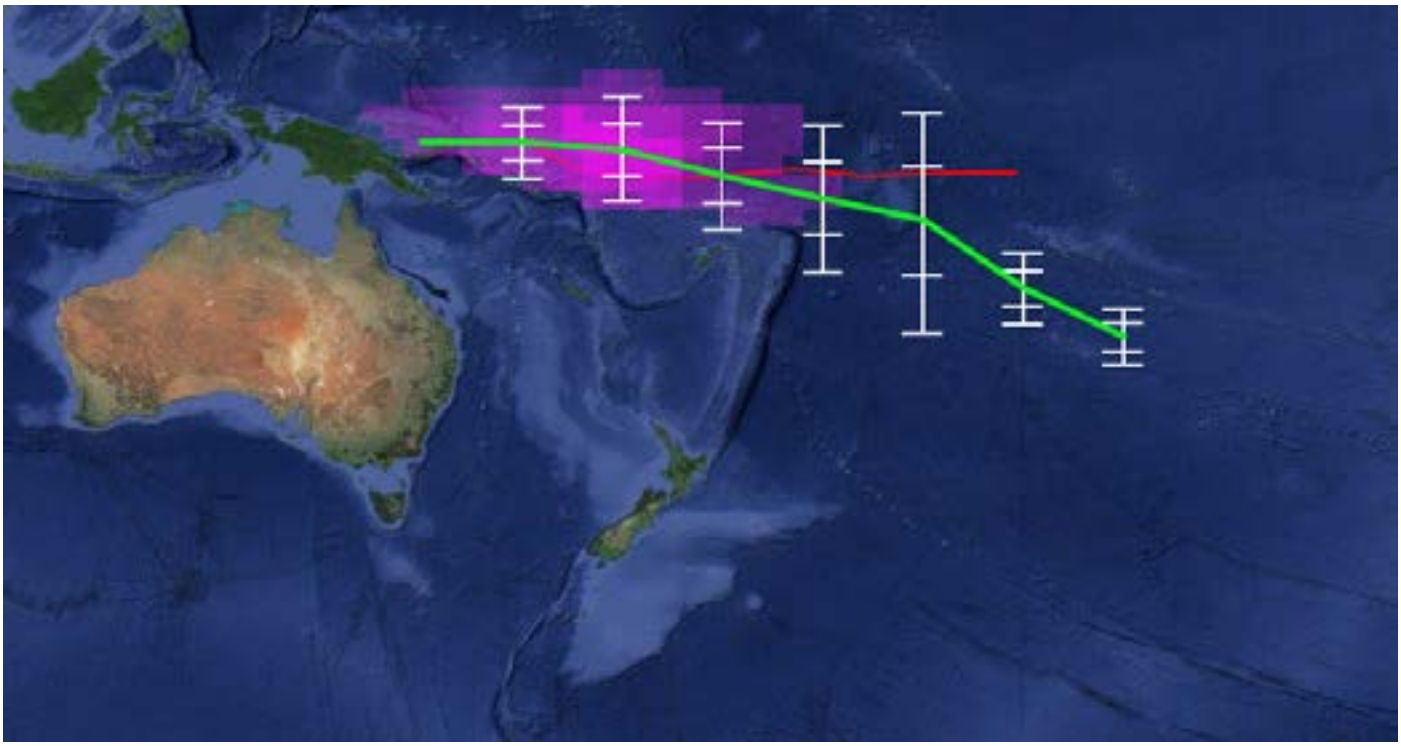
Sea surface temperature (SST) anomalies in the tropical Pacific continued to increase and expand eastward along the Equator during May 2015 and are currently showing a pattern consistent with weak El Niño conditions. The latest monthly anomaly values for the NINO SST indices are: +0.83°C for NINO3.4 (was +0.55°C in February), +0.87°C for NINO3 (was +0.26°C last month) and +1.07°C for NINO4 (was +1.05°C last month). Sub-surface ocean temperature anomalies in the Equatorial Pacific have also continued to intensify and propagate eastward. They now reach about +5°C around 130°W. Subsurface waters off the South American coast have warmed significantly and reach about +5°C at 50m depth. Positive upper ocean heat content anomalies (upper 300m of the Ocean) have intensified in the eastern Pacific Ocean and reach above +2°C between 140°W and 110°W. The Southern Oscillation Index (SOI) was slighty negative at about -0.3 in April 2015. Convection and rainfall was suppressed in the western Equatorial Pacific and intensified in the central Pacific, a pattern consistent with El Niño conditions. The latest value for the TRMM ENSO index for the 30 days to 3 May is +0.78 (on the El Niño side of neutral). The Madden-Julian Oscillation (MJO) was active at the beginning of April 2015 but weakened toward the middle of the month. The Climate Prediction Centre (CPC) dynamical model (ensemble GFS) and the CPC statistical model both predict weak MJO activity over the western Pacific sector over the next two weeks. The consensus ENSO forecast from the IRI/CPC places the chance of conventional El Niño threshold being crossed over the May – July 2015 period at about 80%.



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

South Pacific Convergence Zone forecast May to July 2015

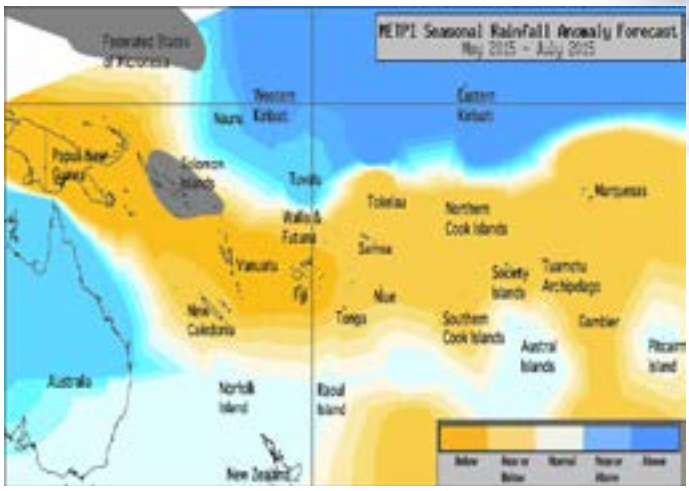
The ensemble of global climate models for rainfall that are used in METPI show an area of higher than normal rainfall associated with the SPCZ position. The green line indicates the average SPCZ position for the forecast period based on the average of eight climate models. The white vertical bars and '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.



During the May to July 2015 period, the South Pacific Convergence Zone (SPCZ) is expected to be north of normal to the west of the International Dateline. This region of the SPCZ is also expected to experience higher than normal convection and rainfall during the forecast period. Confidence about the SPCZ position is reduced to the east of the International Dateline.

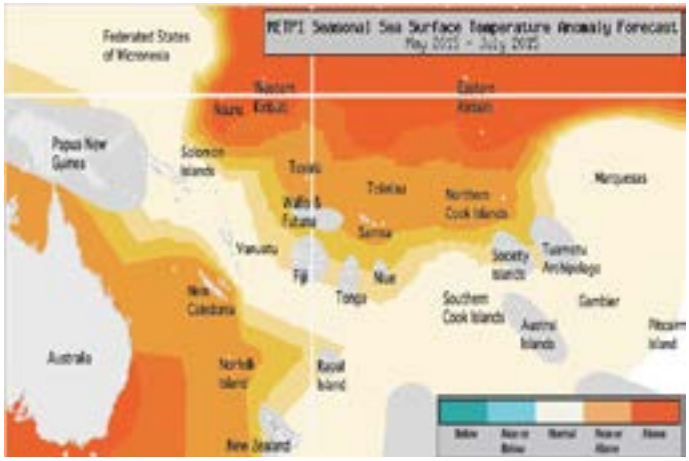
Tropical rainfall and SST outlook: May to July 2015

The dynamical model forecasts indicate that the central equatorial Pacific is likely to experience above normal rainfall in May – July 2015. In contrast, large areas in the western Pacific south of the Equator, as well as parts of the south eastern Pacific are expected to experience reduced rainfall. Below normal rainfall is forecast for Fiji, Papua New Guinea and Vanuatu. Normal or below normal rainfall is forecast for the southern Cook Islands, New Caledonia, Samoa, the Society Islands, Tokelau, the Tuamotu Archipelago, Wallis & Futuna, the northern Cook Islands, the Marquesas, Niue and Tonga. Near normal rainfall is expected for the Austral Islands and Pitcairn Island. Normal or above normal rainfall is forecast for Tuvalu. Above normal rainfall is forecast for eastern Kiribati and western Kiribati. No clear guidance is available this month for the Federated States of Micronesia and the Solomon Islands.



Rainfall anomaly outlook map for May - July 2015

The global model ensemble forecast for SSTs indicates higher than normal SSTs over the equatorial Pacific, with maximum anomalies now positioned east of the International Dateline. Above normal SSTs are forecast for Western Kiribati and Eastern Kiribati. Normal or above normal SSTs are forecast for New Caledonia, the northern Cook Islands, Samoa, Tokelau and Tuvalu. Near normal SSTs are forecast for the Marquesas, the Federated States of Micronesia, Pitcairn Island, the Solomon Islands, the southern Cook Islands and Vanuatu. No guidance is available this month for the Austral Islands, Fiji, Niue, Papua New Guinea, the Society Islands, Tonga, the Tuamotu archipelago and Wallis and Futuna.



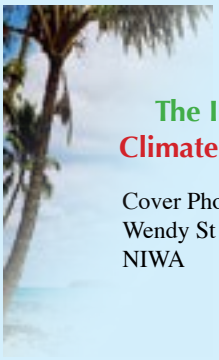
SST anomaly outlook map for May - July 2015

The confidence for the rainfall outlooks is generally high. The average region–wide hit rate for rainfall forecasts issued for the May – July season is about 58 %, five points less than the average for all months combined. The confidence for the SSTs forecasts is generally high.

NOTE: Rainfall and sea surface termperature 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)	20:35:45 (Above)	High
Kiribati (Western)	20:35:45 (Above)	High
Tuvalu	25:35:40 (Normal or Above)	Moderate-High
Austral Islands	30:40:30 (Near normal)	High
Pitcairn Island	30:40:30 (Near normal)	High
FSM	33:33:33 (Climatology)	Moderate
Solomon Islands	33:33:33 (Climatology)	Moderate
Cook Islands (Southern)	35:40:25 (Normal or Below)	Moderate-High
New Caledonia	35:40:25 (Normal or Below)	High
Samoa	35:40:25 (Normal or Below)	High
Society Islands	35:40:25 (Normal or Below)	Moderate-High
Tokelau	35:40:25 (Normal or Below)	Moderate-High
Tuamotu Islands	35:40:25 (Normal or Below)	Moderate-High
Wallis & Futuna	35:40:25 (Normal or Below)	Moderate-High
Cook Islands (Northern)	40:35:25 (Normal or Below)	High
Marquesas	40:35:25 (Normal or Below)	High
Niue	40:35:25 (Normal or Below)	High
Tonga	40:35:25 (Normal or Below)	High
Fiji	45:35:20 (Below)	High
Papua New Guinea	45:35:20 (Below)	High
Vanuatu	45:35:20 (Below)	High

Island Group	SST Outlook	confidence
Kiribati (Eastern)	20:30:50 (Above)	High
Kiribati (Western)	20:30:50 (Above)	High
New Caledonia	25:35:40 (Normal or Above)	High
Cook Islands (Northern)	25:35:40 (Normal or Above)	High
Samoa	25:35:40 (Normal or Above)	High
Tokelau	25:35:40 (Normal or Above)	High
Tuvalu	25:35:40 (Normal or Above)	High
Marquesas	30:40:30 (Near normal)	High
FSM	30:40:30 (Near normal)	High
Pitcairn Island	30:40:30 (Near normal)	High
Solomon Islands	30:40:30 (Near normal)	High
Cook Islands (Southern)	30:40:30 (Near normal)	High
Vanuatu	30:40:30 (Near normal)	High
Austral Islands	33:33:33 (Climatology)	Moderate
Fiji	33:33:33 (Climatology)	Moderate
Niue	33:33:33 (Climatology)	Moderate
Papua New Guinea	33:33:33 (Climatology)	Moderate
Society Islands	33:33:33 (Climatology)	Moderate
Tonga	33:33:33 (Climatology)	Moderate
Tuamotu Islands	33:33:33 (Climatology)	Moderate
Wallis & Futuna	33:33:33 (Climatology)	Moderate



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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 Services 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 MicronesiaFiji, French Polynesia, Kiribati, New Caledonia, New Zealand, Niue, Papua New Guinea, Pitcairn Island, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, Wallis and 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 to PI Met Services then Niue Met Service)

Papua New Guinea
http://pi-gcos.org/index.php (follow link to 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