Number 174, March 2015

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- Sea surface temperatures in the Equatorial Pacific reflect weak El Niño conditions in February 2015.
- Regional atmospheric patterns indicate neutral to weak El Niño conditions.
- Probability for El Niño during March – May 2015 is about 45 %.

The South Pacific Convergence Zone (SPCZ)

- The SPCZ is expected to be positioned south of normal in the eastern 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 the Marquesas. Normal or below normal rainfall is forecast for New Caledonia, the Solomon Islands, Tuvalu, the northern Cook Islands and Papua New Guinea.
- Above normal rainfall is forecast for Western Kiribati. Near normal or above normal rainfall is forecast for eastern Kiribati, Samoa, Tokelau, Wallis & Futuna, the Federated States of Micronesia, the Austral Islands, the southern Cook Islands and the Society Islands.
- Above normal SSTs are forecast for eastern and western Kiribati. Normal or above normal SSTs are forecast for 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

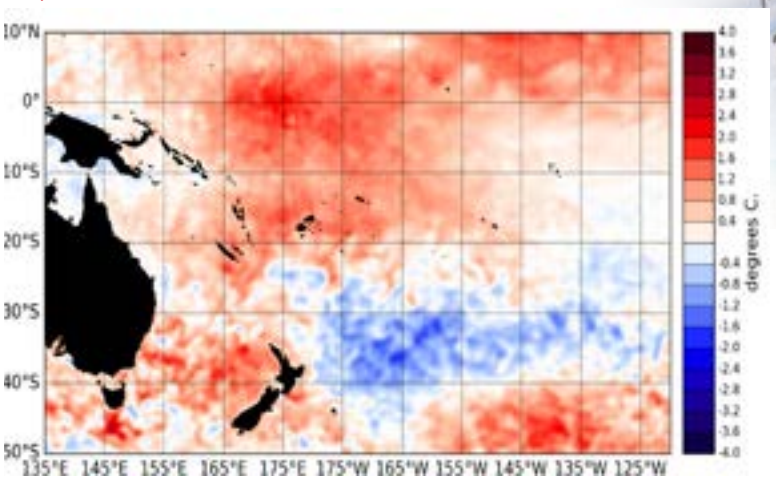
NOAA

SPREP

NIWA Taihoro Nukurangi

El Niño/Southern Oscillation (ENSO)

Sea Surface Temperatures (SSTs) across the Equatorial Pacific Ocean continued to reflect conditions between weak and neutral El Niño states in February 2015. Equatorial SSTs are warmer than normal in the central and western Pacific, and the anomalies in the eastern Pacific remain weak. The latest monthly anomaly values for the NINO SST indices are: +0.43°C for NINO3.4 (was +0.39°C in January), +0.18°C for NINO3 (was +0.10°C last month), and +0.87°C for NINO4. Subsurface ocean temperature anomalies have dramatically increased in the central Pacific and now reach over +4°C at about 150m depth just east of the International Dateline, these anomalies have also spread eastward and positive anomalies (+2°C) are present in the upper Ocean (~ 50m depth) in the eastern Equatorial Pacific. Positive upper Oceanic heat content anomalies (300m to surface) have also spread eastward to reach east of ~120°W. The Southern Oscillation Index (SOI) is at 0 for February 2015, but showed considerable short term variability related to the passage of two tropical cyclones over Northern Australia. Convection and rainfall was enhanced in the central and western Pacific, but the South Pacific Convergence Zone (SPCZ) was displaced south of normal in the eastern Pacific, leading to dry conditions in parts of French Polynesia. The latest value for the TRMM

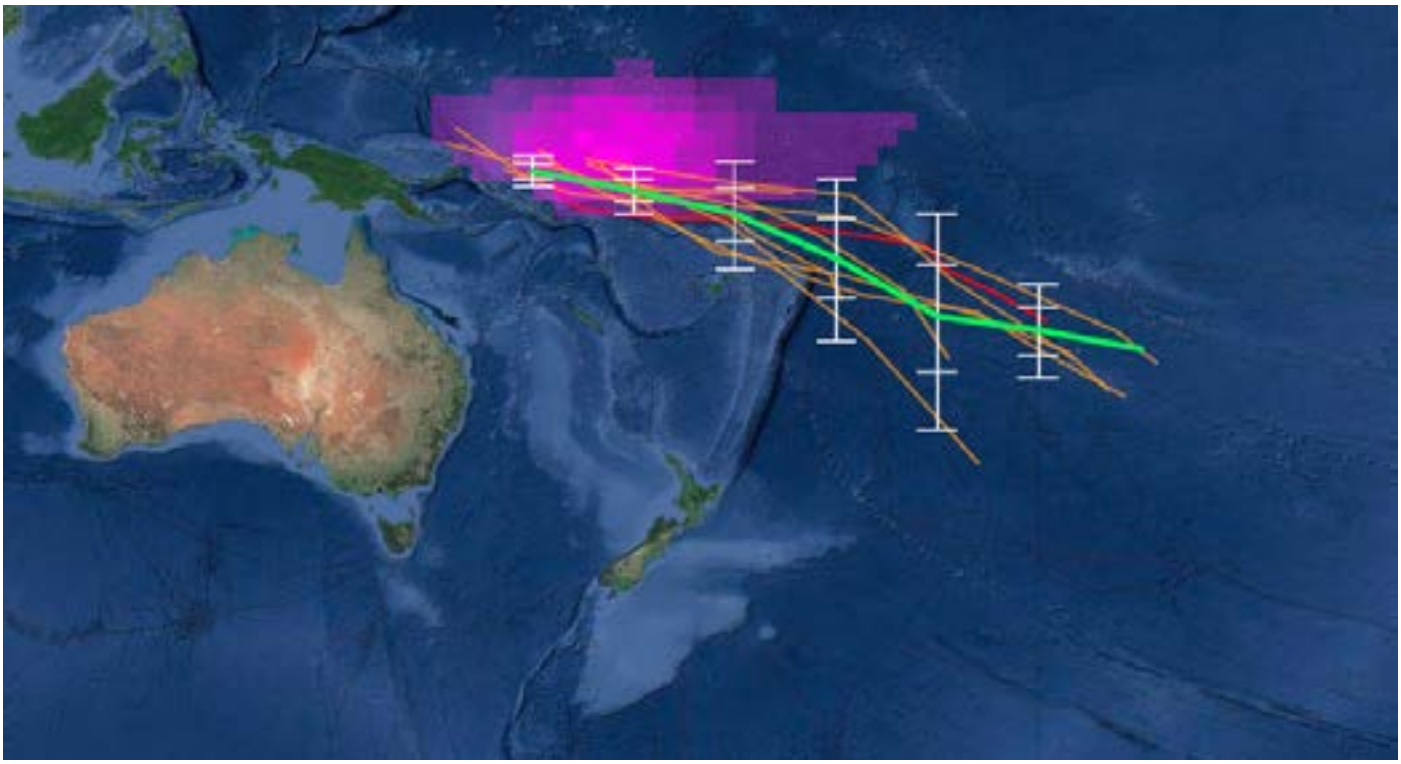


Surface temperature anomalies (°C) for February 2015, data is from the NOAA OISST Version 2 dataset, available at the NOAA's Climate Data Center (ftp://ftp.cdc.noaa.gov/Datasets/noaa.oisst.v2.highres/).

ENSO index for the 30 days to 4 March is -0.13 (reflecting neutral conditions). The MJO was mostly inactive in February. The CPC dynamical MJO forecast shows a very intense MJO event reaching in the western Pacific over the next two weeks. The consensus ENSO forecast from the IRI/CPC places the chance of El Niño developing over the March – May 2015 period at about 45%. The likelihood of El Niño increases later during the year to reach ~60% in June - August.

South Pacific Convergence Zone forecast March to May 2015

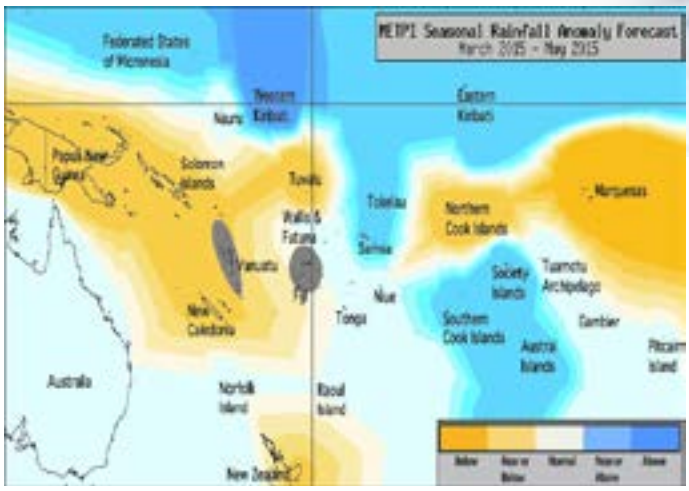
The ensemble of global climate models for rainfall that are used in METPI show an area of higher than normal rainfall associated with the SPCZ position. The green line indicates the average SPCZ position for the forecast period based on the average of eight climate models. The white vertical bars and '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 March to May 2015 period, the South Pacific Convergence Zone (SPCZ) is forecast to be positioned close to normal in the western Pacific and south of normal in the eastern Pacific. Areas of higher than normal convective activity are expected in the root zone of the SPCZ extending towards the International Dateline. Confidence in the forecast is lowest to the east of the International Dateline.

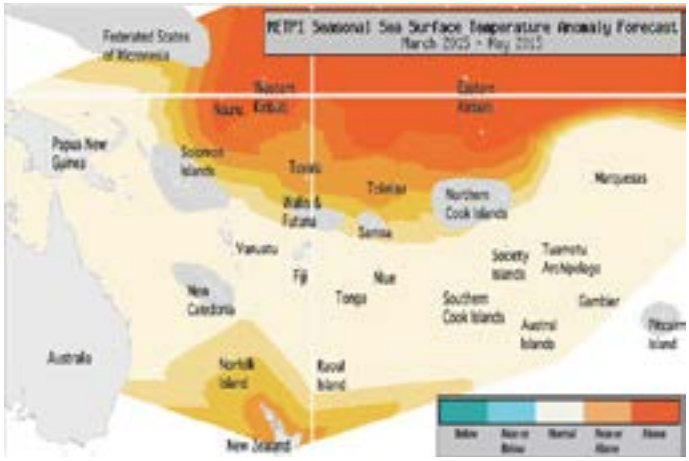
Tropical rainfall and SST outlook: March to May 2015

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



Rainfall anomaly outlook map for March - May 2015

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



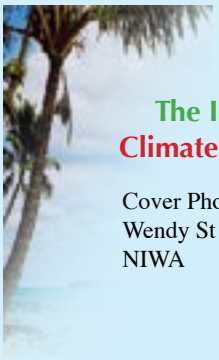
SST anomaly outlook map for March - May 2015

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 %, close to the average for all months combined. The confidence for the SSTs forecasts is generally high. Note that climatological forecasts (i.e. equal probability attributed to each tercile, meaning no guidance is available) are typically associated with moderate confidence.

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

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