Number 180, September 2015

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- El Niño conditions continued to strengthen further during August 2015.
- Sea Surface Temperatures (SSTs) and precipitation anomalies continued to intensify in the eastern Pacific.
- El Niño conditions are certain (100% chance) to continue in September – November 2015.

The South Pacific Convergence Zone

- The SPCZ is expected to be positioned north of climatology.

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

- Below normal rainfall is forecast for the Southern Cook Islands, the Solomon Islands, Fiji, the Society Islands, Niue, Papua New Guinea, Tonga and Vanuatu. Normal or below normal rainfall is forecast for the Austral Islands, New Caledonia, Samoa, Tuamotu, Wallis and Futuna, the Northern Cook Islands and the Federated States of Micronesia.
- Above normal rainfall is forecast for Tuvalu, Tokelau, Western Kiribati and Eastern Kiribati. Normal or above normal rainfall is forecast for Pitcairn Island and Tokelau.
- Above normal SSTs are forecast for western Kiribati and eastern Kiribati.

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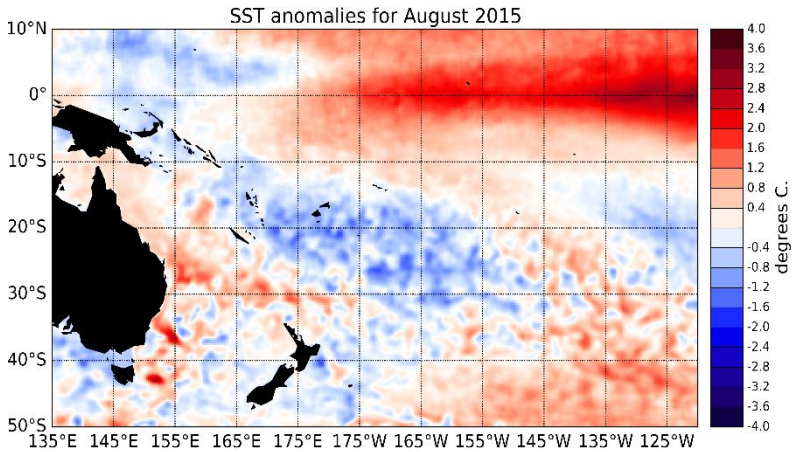
NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

SPREP

NIWA Taihoro Nukurangi

El Nino/Southern Oscillation (ENSO)

El Niño conditions strengthened further during August 2015 and reached the strong El Niño category. The Southern Oscillation Index (SOI) has also remained strongly negative and is at -2.0 for August 2015 as a whole (preliminary value). Westerly wind anomalies (weaker trade-winds) currently dominate the central and western equatorial Pacific, and convection has shifted east of the Dateline, indicating a strong coupling between the ocean and the atmosphere. The South Pacific Convergence Zone (SPCZ) appeared to have been mostly suppressed in the southwest Pacific. The ENSO Precipitation Index (ESPI) reflects strong El Niño conditions with a value of +2.15 (value to the 2nd of September). SST anomalies have continued to increase in the eastern and central Pacific in August 2015 with SST anomalies in both the NINO3.4 and the NINO3 indices now close to +2°C. (+1.81°C and +1.94°C above normal respectively). The NINO4 index (in the western Pacific) remains stable at +1.08°C. Sub-surface ocean temperature anomalies in the eastern Pacific have increased dramatically in the past few weeks and reach +7°C between ~ 50 and 100m depth east of ~ 120°W. Heat content anomalies (top 300m of the ocean) also intensified considerably during August and exceed +2.5°C between 140 and 120°W. These sub-surface anomalies have the potential to sustain and support a further increase of the strong surface anomalies.

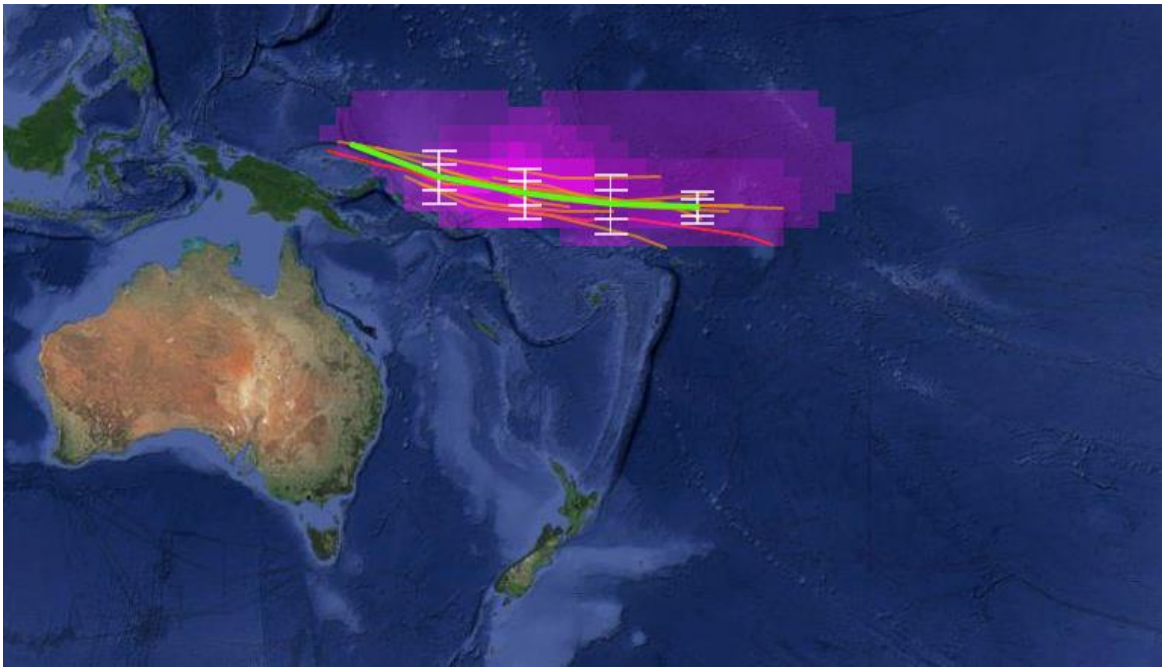


Surface temperature anomalies (°C) for August 2015, data is from the NOAA OISST Version 2 dataset, available at NOAA's Climate Data Center (ftp://ftp.cdc.noaa.gov/Datasets/noaa.oisst.v2.hires/)

The Madden-Julian Oscillation (MJO) was mostly inactive over the western Pacific during the past two weeks. At the forecast horizon of 14 days, both the dynamical and statistical CPC forecasts indicate very weak amplitudes of the MJO, accompanied with slightly reduced intra-seasonal convective activity in the western Pacific. International guidance indicates that El Niño conditions are certain (100% chance) to continue over the next three month period (September – November 2015) and virtually certain (99% chance) to carry on into the summer (December 2015 – February 2016).

South Pacific Convergence Zone forecast September to November 2015

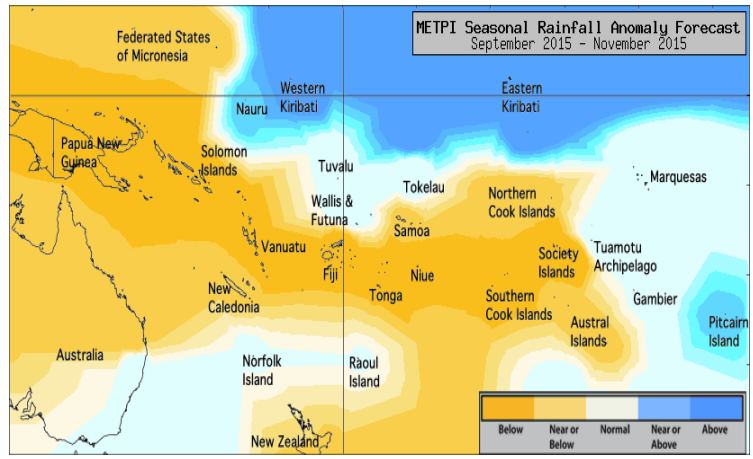
The ensemble of global climate models for rainfall that are used in METPI show an area of higher than normal rainfall associated with the SPCZ position. The green line indicates that average SPCZ position for the forecast period based on the average of eight climate models. The white vertical bars and '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 September - November 2015 forecast period, the South Pacific Convergence Zone (SPCZ) is expected to be situated north of its climatological position. Areas of higher than normal convective activity associated with the SPCZ are expected in the central Pacific just south of the Equator and in the Intertropical Convergence Zone over and east of the international dateline.

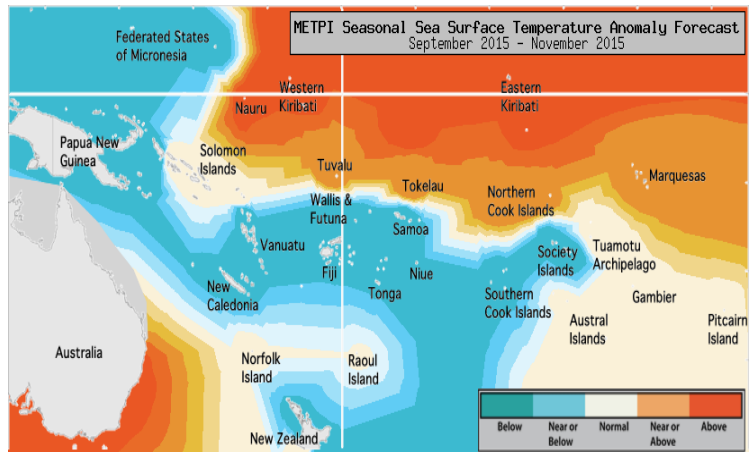
Tropical rainfall and SST outlook: September to November 2015

The dynamical models are all in agreement to forecast continuing El Niño conditions over the September-November 2015 period. As a consequence, rainfall totals for the coming seasons are expected to be higher than normal along the Equator in the central and eastern Pacific, while many regions of the southwest Pacific are forecast to experience a drier than normal September-November season. Below normal rainfall is forecast for the Southern Cook Islands, the Solomon Islands, Fiji, the Society Islands, Niue, Papua New Guinea, Tonga and Vanuatu. Normal or below normal rainfall is forecast for the Austral Islands, New Caledonia, Samoa, Tuamotu, Wallis and Futuna, the Northern Cook Islands and the Federated States of Micronesia. Near normal rainfall is expected for the Marquesas. Normal or above normal rainfall is forecast for Pitcairn Island and Tokelau. Above normal rainfall is forecast for Tuvalu, Tokelau, Western Kiribati and Eastern Kiribati.



Rainfall anomaly outlook map for September – November 2015

The global model ensemble forecast for SSTs indicates persistence of the higher than normal SSTs present in the central and eastern equatorial Pacific, while the large region of cooler than normal SSTs in the southwest Pacific is forecast to expand further south. Above normal SSTs are forecast for western Kiribati and eastern Kiribati. Normal or above normal SSTs are forecast for Tuvalu, the Northern Cook Islands, Tokelau and the Marquesas. Near normal SSTs are forecast for the Austral Islands, Pitcairn Island, Tuamotu and the Solomon Islands. Normal or below normal SSTs are forecast for Fiji, the Federated States of Micronesia, New Caledonia, Niue, Papua New Guinea, Samoa, the Society Islands, the Southern Cooks Islands, Tonga, Vanuatu and Wallis and Futuna.



SST anomaly outlook map for September – November 2015

The confidence for the rainfall outlooks is generally high. The average region-wide hit rate for rainfall forecasts issued for the September-November season is about 66%, three points higher than the average for all months combined. The confidence for the SST forecasts is moderate to high.

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)	20:30:50 (Above)	High
Kiribati (Western)	20:30:50 (Above)	High
Tuvalu	20:35:45 (Above)	High
Tokelau	25:35:40 (Normal or Above)	High
Pitcairn Island	25:40:35 (Normal or Above)	Moderate-High
Marquesas	30:40:30 (Normal)	High
Austral Islands	40:35:25 (Normal or Below)	High
New Caledonia	40:35:25 (Normal or Below)	High
Samoa	40:35:25 (Normal or Below)	Moderate-High
Tuamotu Islands	40:35:25 (Normal or Below)	High
Wallis & Futuna	40:35:25 (Normal or Below)	Moderate-High
FSM	40:35:25 (Normal or Below)	Moderate-High
Cook Islands (Northern)	40:40:20 (Normal or Below)	High
Cook Islands (Southern)	45:35:20 (Below)	High
Solomon Islands	45:35:20 (Below)	Moderate-High
Fiji	50:35:20 (Below)	High
Society Islands	50:35:20 (Below)	High
Niue	50:35:20 (Below)	High
Papua New Guinea	50:35:20 (Below)	High
Tonga	60:30:10 (Below)	High
Vanuatu	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	25:35:40 (Normal or Above)	Moderate-high
Cook Islands (Northern)	25:35:40 (Normal or Above)	High
Tokelau	25:35:40 (Normal or Above)	High
Tuvalu	25:35:40 (Normal or Above)	High
Austral Islands	30:40:30 (Normal)	Moderate
Pitcairn Island	30:40:30 (Normal)	Moderate
Solomon Islands	30:40:30 (Normal)	High
Tuamotu	30:40:30 (Normal)	High
Fiji	40:35:25 (Normal or Below)	Moderate-high
FSM	40:35:25 (Normal or Below)	Moderate
New Caledonia	40:35:25 (Normal or Below)	Moderate
Niue	40:35:25 (Normal or Below)	High
Papua New Guinea	40:35:25 (Normal or Below)	Moderate
Samoa	40:35:25 (Normal or Below)	Moderate
Society Islands	40:35:25 (Normal or Below)	Moderate
Cook Islands (Southern)	40:35:25 (Normal or Below)	Moderate
Tonga	40:35:25 (Normal or Below)	High
Vanuatu	40:35:25 (Normal or Below)	High
Wallis & Futuna	40:35:25 (Normal or Below)	Moderate

The Island Climate Update

Cover Photo:
Wendy St George,
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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