Number 178, July 2015

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- El Niño conditions consolidated in June 2015.
- Sea Surface Temperatures (SSTs) and precipitation anomalies intensified in the eastern Pacific.
- El Niño is extremely likely (95% chance) to continue in July – September 2015.

The South Pacific Convergence Zone

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

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

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

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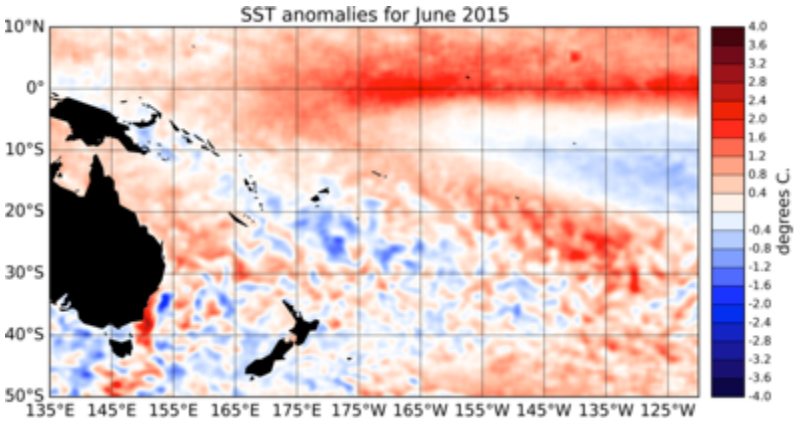
NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

SPREP

NIWA Taihoro Nukurangi

El Nino/Southern Oscillation (ENSO)

Sea Surface Temperatures (SSTs) have increased considerably in the central and eastern Pacific. After a brief excursion in the positive, the Southern Oscillation Index (SOI) has returned to negative values (*i.e.* El Niño) and is at -0.8 for June 2015 as a whole. Convection and rainfall anomalies intensified east of the International Dateline and the Inter-Tropical Convergence Zone (ITCZ) was shifted equatorward in the eastern Pacific. The South Pacific Convergence Zone (SPCZ) was north of its climatological position west of the International Dateline. The ENSO Precipitation Index (ESPI) is close to the El Niño threshold at +0.77 (value to the 30th of June). Monthly SST anomalies are again this month above the 1°C mark in all of the NINO regions: The NINO3.4 index value is +1.3°C, NINO4 (in the west-central Pacific) is currently at +1.1°C and the NINO3 index (in the eastern Pacific) continued to increase during June 2015, and now reaches +1.6°C above normal. Sub-surface ocean temperature anomalies in the eastern Pacific persisted (exceeding +5C between 50 and 100m depth), while cooler than normal ocean subsurface temperatures that were present in the western Pacific extended slightly eastward. Positive upper ocean heat content anomalies (upper 300m of the Ocean) have intensified in the eastern Pacific and now reach more than +2.5°C off the coast of South America

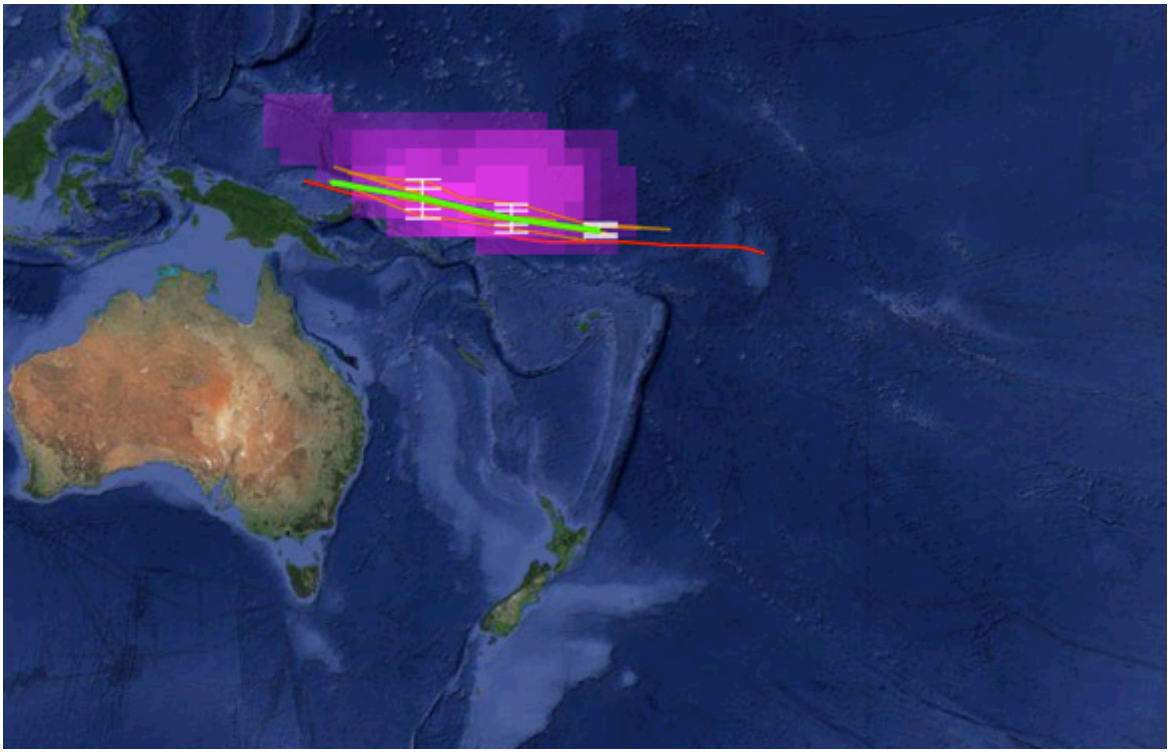


Surface temperature anomalies (°C) for June 2015, data is from the NOAA OISST Version 2 dataset, available at NOAA's Climate Data Center (ftp://ftp.cdc.noaa.gov/Datasets/noaa.oisst.v2.hires/)

A relatively strong MJO pulse reached into the western Pacific during June 2015. The dynamical CPC forecast indicate rapid in-place intensification of intra-seasonal convective activity related to the MJO in the western Pacific for the next two weeks, while the statistical CPC forecasts indicate that this MJO pulse will continue to propagate eastward and decay. International guidance indicates that El Niño conditions are extremely likely (> 95% chance) to continue over the next three months period (July – September 2015) and persist into the summer 2015 / 2016.

South Pacific Convergence Zone forecast July to September 2015

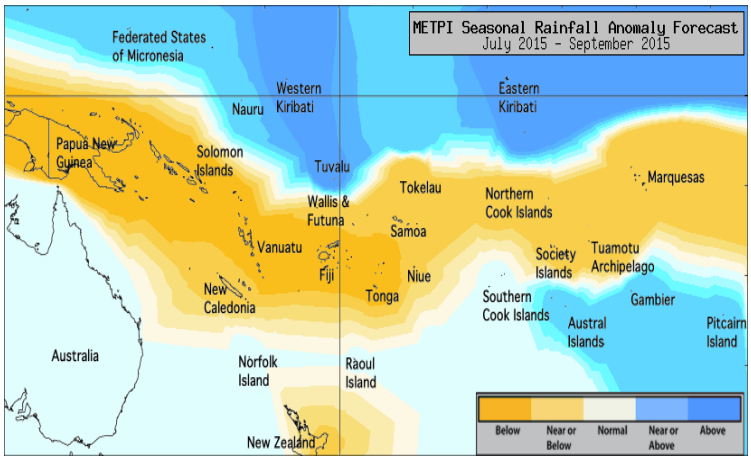
The ensemble of global climate models for rainfall that are used in METPI show an area of higher than normal rainfall associated with the SPCZ position. The green line indicates that average SPCZ position for the forecast period based on the average of eight climate models. The white vertical bars and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



During the July to September 2015 period, the South Pacific Convergence Zone (SPCZ) is forecast to be positioned north of climatology west of the International Dateline. The SPCZ is also expected to extend less eastward than normal. Areas of higher than normal convective activity are expected in the root zone of the SPCZ and in the Intertropical Convergence Zone just west of the International Dateline.

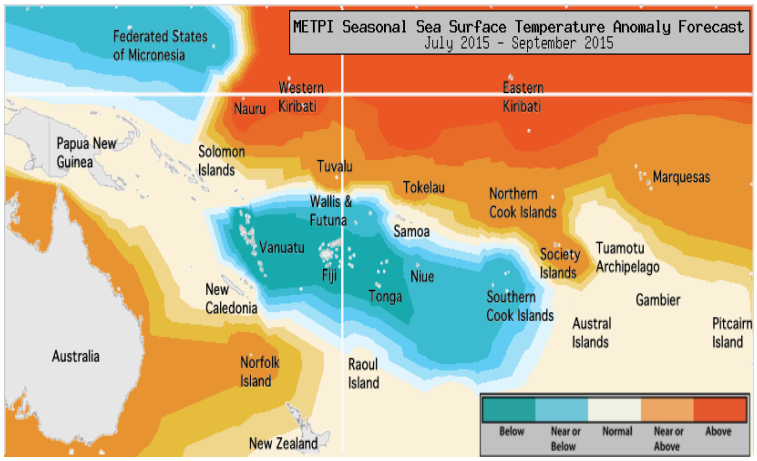
Tropical rainfall and SST outlook: July to September 2015

The dynamical model are all in agreement to forecast continuing El Niño conditions over the July – September 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 July- September season. Below normal rainfall is forecast for the Solomon Islands, Tonga, Vanuatu and Papua New Guinea. Normal or below normal rainfall is forecast for the Society Islands, the Northern Cook Islands, Fiji, the Marquesas, New Caledonia, Niue, Samoa, Tokelau, the Tuamotu archipelago and Wallis & Futuna. Near normal rainfall is expected for the Southern Cook Islands. Normal or above normal rainfall is forecast for the Federated States of Micronesia, the Austral Islands and Pitcairn Island. Above normal rainfall is forecast for Western Kiribati, Eastern Kiribati and Tuvalu.



Rainfall anomaly outlook map for July – September 2015

The global model ensemble forecast for SSTs indicates intensification of the higher than normal SSTs currently present in the central and eastern equatorial Pacific, while a large region of cooler than normal SSTs is forecast to develop in the southwest Pacific. Above normal SSTs are forecast for western Kiribati and eastern Kiribati. Normal or above normal SSTs are forecast for Tuvalu,the Society Islands, the Northern Cook Islands, the Marquesas and Tokelau. Normal or below normal SSTs are forecast for the Federated States of Micronesia, Niue and Wallis and Futuna. Below normal SSTs are forecast for Fiji, Tonga and Vanuatu.



SST anomaly outlook map for July – September 2015

The confidence for the rainfall outlooks is generally high. The average region-wide hit rate for rainfall forecasts issued for the July-September season is about 65%, two 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 (Western)	20:30:50 (Above)	High
Kiribati (Eastern)	20:35:45 (Above)	Moderate-High
Tuvalu	20:35:45 (Above)	High
FSM	25:35:40 (Normal or Above)	High
Austral Islands	25:40:35 (Normal or Above)	High
Pitcairn Island	25:40:35 (Normal or Above)	High
Cook Islands (Southern)	30:40:30 (Near normal)	High
Society Islands	35:40:25 (Normal or Below)	High
Cook Islands (Northern)	40:35:25 (Normal or Below)	High
Marquesas	40:35:25 (Normal or Below)	Moderate-High
New Caledonia	40:35:25 (Normal or Below)	High
Niue	40:35:25 (Normal or Below)	Moderate-High
Samoa	40:35:25 (Normal or Below)	Moderate-High
Tokelau	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
Fiji	45:35:20 (Below)	High
Solomon Islands	45:35:20 (Below)	High
Tonga	45:35:20 (Below)	High
Vanuatu	45:35:20 (Below)	High
Papua New Guinea	50:30:20 (Below)	High

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

The Island Climate Update

Cover Photo:
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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 Parnters

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