Number 147, December 2012

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- The Tropical Pacific Ocean is still warmer than normal along the Equator, and atmospheric circulation is close to normal.
- It is unlikely that El Niño will develop during the 2012 – 2013 summer season. The forecast is for neutral conditions to persist through the first quarter of 2013.

The South Pacific Convergence Zone (SPCZ)

- For the coming three months, the SPCZ is forecast to be slightly south of its climatological position for most of the southwest Pacific to the east of the Dateline.

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

- Normal or below normal rainfall is forecast for the Eastern Kiribati, Tonga, the Marquesas and New Caledonia.
- Near or above normal rainfall is forecast for the Northern Cook Islands, Western Kiribati, Niue, Fiji, the Society Islands, the Solomon Islands and Tokelau.
- Sea surface temperatures are forecast to be warmer than normal especially around and west of the Dateline, and show a weak El Niño – like pattern.

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

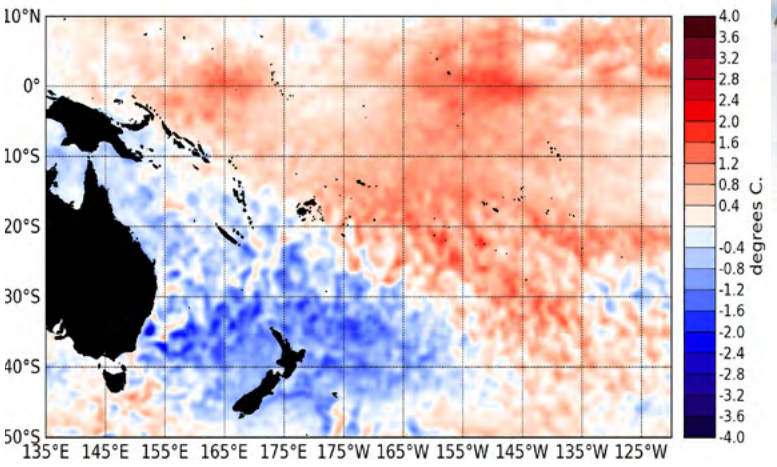
NOAA National Oceanic and Atmospheric Administration U.S. Department of Commerce

SPREP

NIWA Taihoro Nukurangi

El Niño/Southern Oscillation (ENSO)

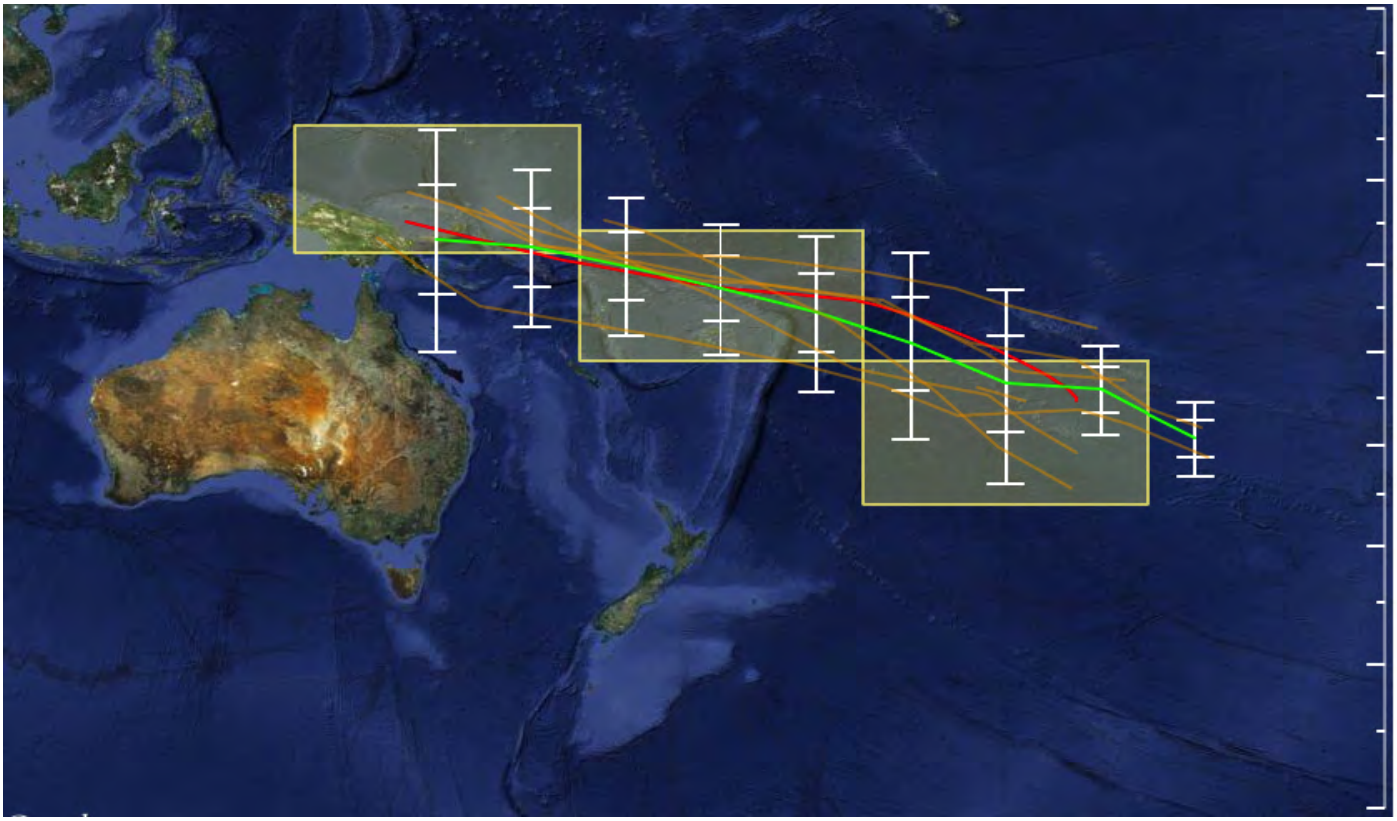
The equatorial Pacific Ocean remains warmer than normal, especially over and west of the Dateline. Atmospheric circulation is close to normal for this time of the year. Sea surface temperature anomalies have shown relatively little change along the Equator. The NINO4 index (150 °W – 160 °E) is still the warmest of all NINO indices (+ 1°C up from + 0.8 °C in October) and both the NINO3 and NINO3.4 indices are in the neutral range (+ 0.2 and + 0.4°C respectively). Warmer than normal subsurface temperature anomalies exist along the Equator at about 100m depth, but the surface expression is weak and heat content in the upper ocean (0 to 300 m) is currently close to normal. Surface winds along the Equator are also close to climatology. Convection and rainfall are still anomalously high just north of the Equator, to the west of the Dateline, indicating an ITCZ south of normal. The SPCZ switched from a very zonal orientation (positioned around 10°S) in October to a position south of normal, extending from the vicinity of Vanuatu to the subtropical central Pacific. The latest value for the TRMM ENSO index for the 30 days to December 2nd is –0.11 (neutral) and the monthly SOI for November is + 0.38 (on La Niña side of neutral). A weak Madden – Julian Oscillation moved into Australasian longitudes over the last two weeks of November but is forecast to weaken further as it propagates eastward. Based on the climate models that NIWA monitors and the international consensus, El Niño development during the summer is unlikely. The forecast is for neutral conditions to persist over the summer, with sea surface temperatures remaining generally warmer than average along the Equator.



Surface temperature anomalies (°C) for November 2012, data is from the NOAA OISST Version 2 dataset, available at the NOAA's Climate Data Center (ftp.cdc.noaa.gov/Datasets/noaa.oisst.v2.highres).

South Pacific Convergence Zone forecast December 2012 to February 2013

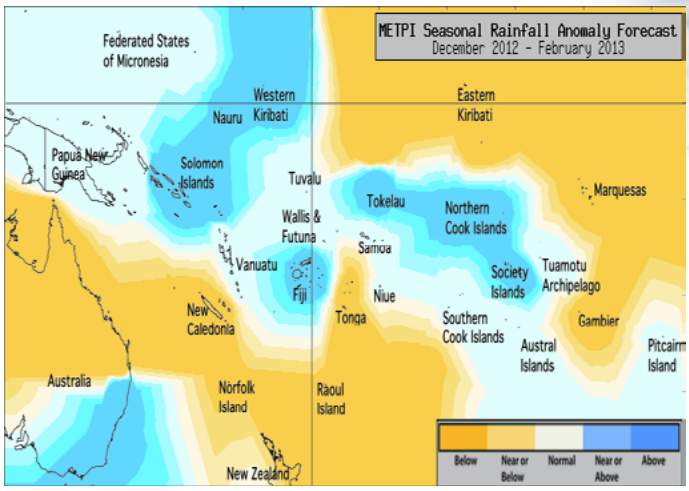
The ensemble of global climate models for rainfall that are used in METPI show an area of higher than normal rainfall associated with the SPCZ position. The green line indicates the average SPCZ position for the forecast period based on the average of 8 climate models. The white vertical bars and 'whiskers' indicate the one and two standard deviations between the model projections of the SPCZ position every 5 degrees of longitude.



For the coming three months, the dynamical models indicate that the South Pacific Convergence Zone (SPCZ) is likely to sit close to or just south of its climatological position over the southwest Pacific. The uncertainty in the SPCZ location for the forecast period is highest to the east of the Dateline.

Tropical rainfall and SST outlook: December 2012 to February 2013

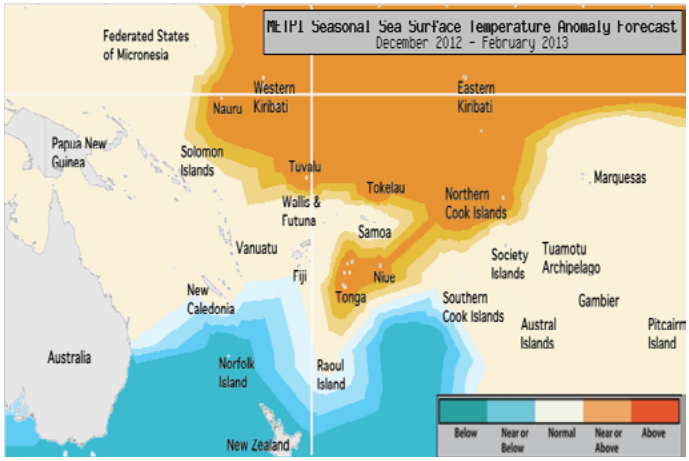
The tropical Pacific is still warmer than usual, but the atmospheric circulation is close to normal for this time of the year. The dynamical models indicate both the ITCZ and the SPCZ will be positioned south of normal for December 2012 – February 2013. Slightly drier – than – normal conditions are likely to affect areas south of the Equator to the east of the Dateline, as well as parts of the Coral Sea and the north Tasman Sea. Near or above normal rainfall is forecast for the Northern Cook Islands, Western Kiribati, Niue, Fiji, Samoa, the Society Islands, the Solomon Islands and Tokelau. Near normal rainfall is expected for the Austral Islands, the Southern Cook Islands, Papua New Guinea, Pitcairn Island, the Tuamotu archipelago, Tuvalu, Vanuatu, Wallis & Futuna and the Federated States of Micronesia. Normal or below normal rainfall is forecast for Eastern Kiribati, Tonga, the Marquesas and New Caledonia.



Rainfall anomaly outlook map for December 2012 to February 2013

The global model ensemble shows some patterns that are similar to a weak El Niño in the SST field, however those anomalies are weaker than in previous forecasts. Cooler than normal SST are forecast for the subtropical latitudes of the southwest Pacific. Near normal or above normal SSTs are forecast for Eastern Kiribati, Western Kiribati, the Northern Cook Islands, Tuvalu, Tokelau, Niue and Tonga. Normal sea surface temperatures are expected elsewhere.

The confidence for the rainfall outlook is moderate to high. The average region–wide hit rate for rainfall forecasts issued in December is 67%, four points higher than the long–term average for all months combined. The SST forecast confidence is moderate to high across the region, and uncertainty is greatest for Eastern Kiribati and the Marquesas.

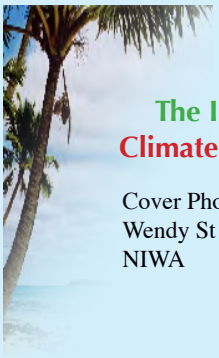


SST anomaly outlook map for December 2012 to February 2013

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

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



The Island Climate Update

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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, Fiji, 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.co.nz/

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
http://www.ecmwf.int/