Number 160, January 2014

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- The equatorial Pacific remains in a neutral ENSO state.
- Sea surface temperatures (SSTs) continue to be higher than normal in the central south Pacific.
- International guidance indicates that neutral ENSO conditions are extremely likely (96 % chance) to persist for the coming three months (January to March 2014).

The South Pacific Convergence Zone (SPCZ)

- The SPCZ is expected to be positioned slightly southwest of normal for the coming three months.

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

- Normal or below normal rainfall is forecast for the Northern Cook Islands, the Society Islands, the Marquesas and Eastern Kiribati.
- Near or above normal rainfall is forecast for Fiji, Niue, Tonga and the Federated States of Micronesia.
- Near normal SSTs are forecast for most Island groups, but no guidance is provided for most of the central and west Pacific.

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

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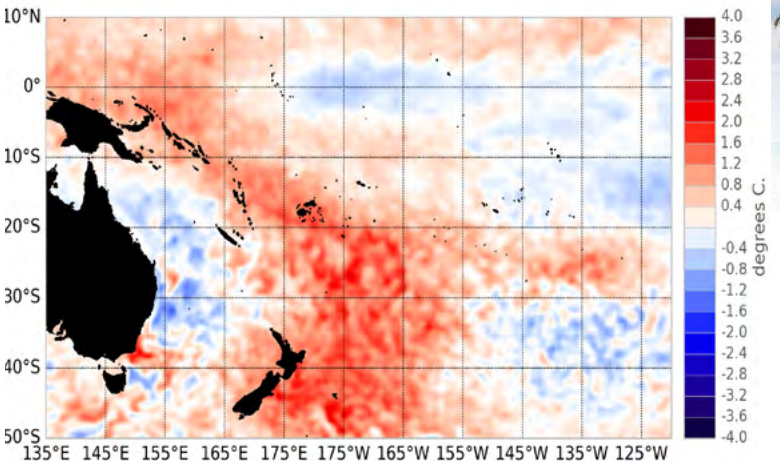
NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

SPREP

NIWA Taihoro Nukurangi

El Niño/Southern Oscillation (ENSO)

The tropical Pacific ocean remained in a neutral state (neither El Niño nor La Niña) in December 2013. The western Pacific ocean is still slightly warmer than normal but anomalies have declined compared to previous months. The NINO4 sea surface temperatures (SST) index (in the western Pacific) is at 0.3°C for December 2013 (down from 0.5°C in November). NINO 3 value is 0 for the month of December 2013 and NINO 3.4 is weakly positive at +0.12°C (was +0.16°C in November). The large area of higher than normal SSTs in the central east Pacific has been a persistent feature in the region for the past few months, and has extended further towards Fiji and intensified in December 2013. Subsurface waters (i.e. between the surface and about 150m depth) are currently warmer than normal accross the Pacific, with anomalies reaching more than 2°C in the eastern Pacific at 50m depth. The trade winds are currently (as of 7 January 2014) close to normal. Convection and rainfall withing the Intertropical Convergence Zone (ITCZ) was suppressed in the central and west Pacific. The South Pacific Convergence Zone (SPCZ) was displaced north of its climatological position in December 2013. The latest value for the TRMM ENSO index for the 30 days to 7 January is –1.07 (compared to –0.77 in November 2013). The SOI is currently very close to zero (–0.1 in December).

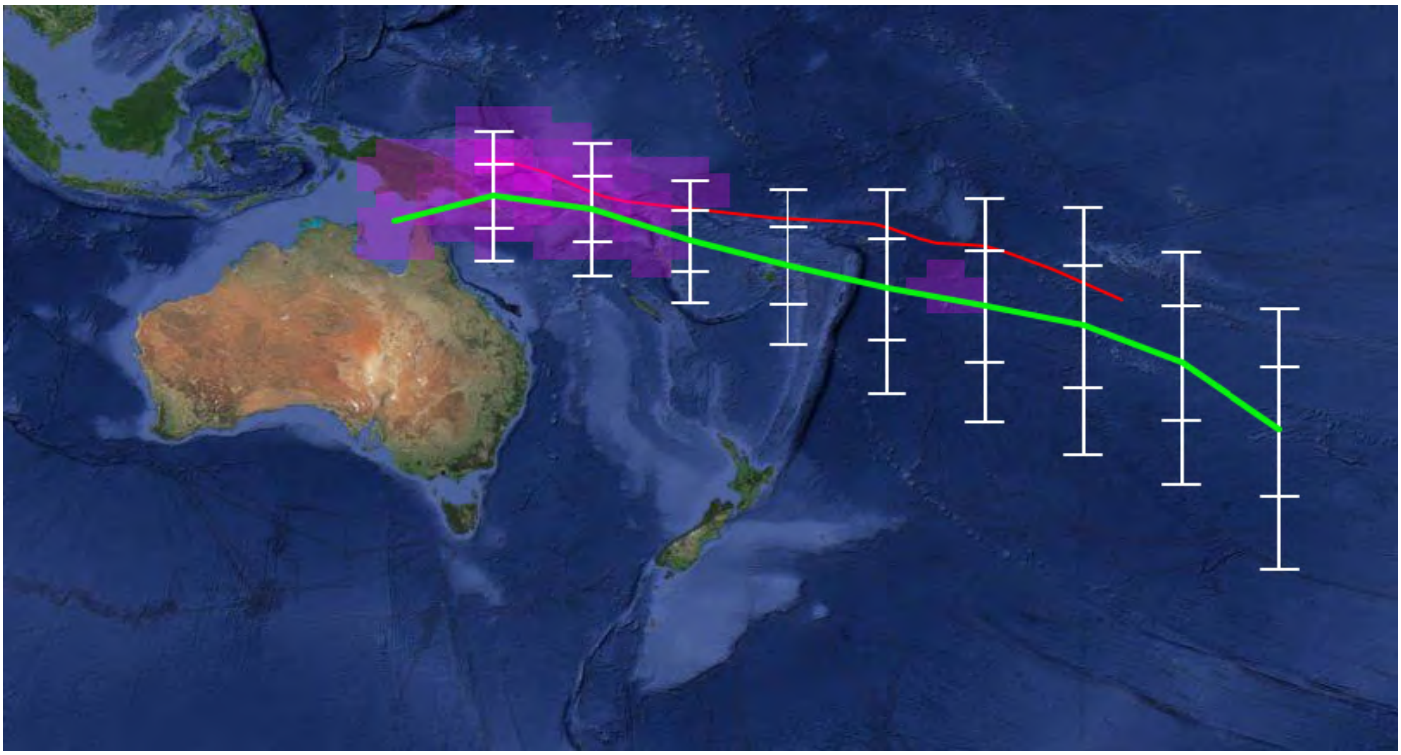


Surface temperature anomalies (°C) for December 2013, data is from the NOAA OISST Version 2 dataset, available at the NOAA's Climate Data Center (ftp://ftp.cdc.noaa.gov/Datasets/noaa.oisst.v2.highres/).

The Madden – Julian Oscillation (MJO) was mostly inactive in the western Pacific in December. The MJO forecasts for the next two weeks indicate possible intensified intra-seasonal convective activity over the maritime continent and western Pacific. The consensus forecast from IRI / CPC indicates that neutral ENSO conditions are extremely likely to persist over the January – March 2014 period, with 96 % chance, versus 2 % for La Niña and 2 % for El Niño.

South Pacific Convergence Zone forecast January to March 2014

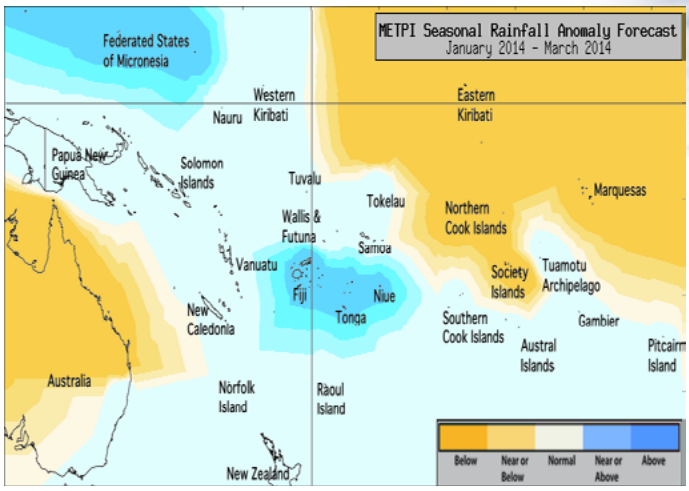
The ensemble of global climate models for rainfall that are used in METPI show an area of higher than normal rainfall associated with the SPCZ position. The green line indicates the average SPCZ position for the forecast period based on the average of 8 climate models. The white vertical bars and 'whiskers'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



The ensemble of dynamical forecasts indicates the SPCZ is expected to be displaced slightly southwest of normal for the time of year. The greatest uncertainty in its location is east of the International Dateline. Intense convection is suggested near the Bismarck archipelago east of Papua New Guinea and near the Solomon Islands..

Tropical rainfall and SST outlook: January to March 2014

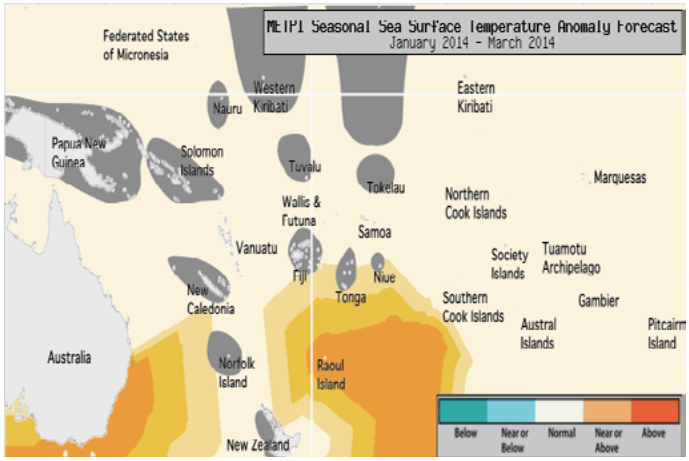
The dynamical models are in relative agreement to indicate drier conditions than normal for the January to March 2014 period in the far eastern Pacific, including parts of French Polynesia. Slightly wetter than normal conditions are expected in parts of the central Pacific south of the Equator as well as in the equatorial west Pacific. Near or above normal rainfall is forecast for Fiji, Niue, Tonga and the Federated States of Micronesia. Near normal rainfall is expected for the Austral Islands, the Southern Cook Islands, Western Kiribati, New Caledonia, Pitcairn Island, Samoa, the Solomon Islands, Tokelau, the Tuamotu archipelago, Tuvalu, Vanuatu and Wallis & Futuna. Normal or below normal rainfall is forecast for the Northern Cook Islands, the Society Islands, Eastern Kiribati and the Marquesas. No clear guidance is available for Papua New Guinea this month.



Rainfall anomaly outlook map for January - March 2014

The global model ensemble forecast for SST indicates that the region of higher than normal temperatures in the central south Pacific that has been present over the past seven months (see Figure on page 2) will persist through the summer (January – March 2014). Normal SSTs are forecast for the Federated States of Micronesia, Eastern Kiribati, the Northern Cook Islands, the Southern Cook Islands, the Society Islands, the Austral Islands, the Tuamotu archipelago, the Marquesas and Pitcairn Island. Elsewhere in the Pacific there is poor agreement between the dynamical model forecasts, leading to weak guidance (i.e. climatological probabilities).

The confidence for the rainfall outlook is generally high, except for Papua New Guinea, the Solomon Islands, the Tuamotu archipelago, Tuvalu and the Society Islands, where uncertainty is greater. The average region–wide hit rate for rainfall forecasts issued in January is 63 %, 3 % lower than the long–term average for all months combined. The confidence is moderate to high for the SSTs forecasts.

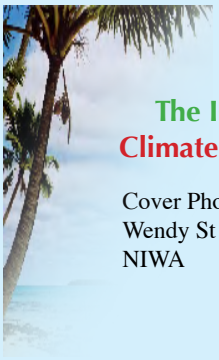


SST anomaly outlook map for January - March 2014

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

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



The Island Climate Update

Cover Photo:
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Acknowledgements

This bulletin is produced by NIWA and made possible with financial support from the New Zealand Ministry of Foreign Affairs and Trad (MFAT), with additional support from NOAA and the Secretariat for the Pacific Regional Environmental Programme (SPREP).

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