Number 115, April 2010

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- Moderately strong El Niño conditions exist in the equatorial Pacific, but the event is weakening. Many dynamical climate models project the continuation of El Niño through autumn 2010, and neutral conditions for austral winter.

Tropical cyclone guidance

- For the remainder of the season, tropical cyclone risk is elevated for the Solomon Islands, and for countries to the east of the Date Line, including Niue, Tonga, and the Southern Cook Islands.

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

- Below normal rainfall is forecast for Vanuatu and the Marquesas.
- Above normal rainfall is expected for Western Kiribati and Eastern Kiribati.
- Above normal SSTs are forecast for Eastern Kiribati and Western Kiribati. SSTs are expected to be near or below normal around Niue, Tonga and Pitcairn Island.

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

nzaid

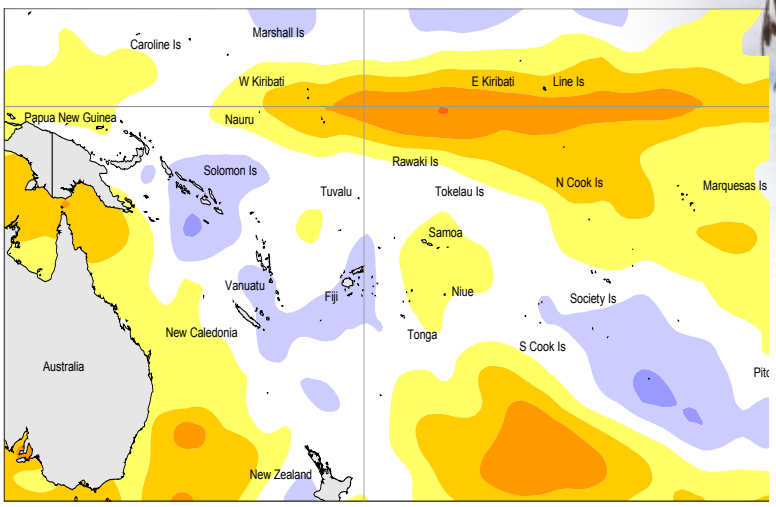
NOAA National Oceanic and Atmospheric Administration U.S. Department of Commerce

SPREP

NIWA Taihoro Nukurangi

El Niño/Southern Oscillation (ENSO)

Moderate-to-strong El Niño conditions continue in the equatorial Pacific, but the event is showing signs of weakening. The Southern Oscillation Index (SOI) has risen from a value of –1.7 in February to –1.4 in March, with the 3-month mean SOI steadied around –1.4. Tropical OLR anomalies weakened in March relative to the previous month, but still show strongly negative anomalies about and east of the Date Line and positive anomalies over Indonesia. The 30-day mean TRMM ENSO index stood at +0.5 in late March, and Trade winds across much of the equatorial Pacific have become re-established during following a westerly wind burst during February. The Equatorial sea surface temperature anomalies that weakened in February have also steadied somewhat in March. The NINO3 anomaly is around +0.7°C for March (JFM mean of +0.9°C), and the NINO4 anomaly is +1.2°C (JFM mean +1.2°C). Upper-ocean equatorial heat content is still strong in the central and eastern parts of the Equatorial Pacific and sub-surface warming (centred near 150m depth) has moved eastwards and risen to a depth of less than 100m. Moderate MJO activity in the Indian Ocean in late March is expected to weaken in early April.



Sea surface temperature anomalies (°C) for April 2010

Around half the dynamical models (but no statistical models) NIWA monitor show El Niño conditions through to the end of May 2010. All models show neutral conditions for the austral winter.

Tropical Cyclone guidance – forecast update

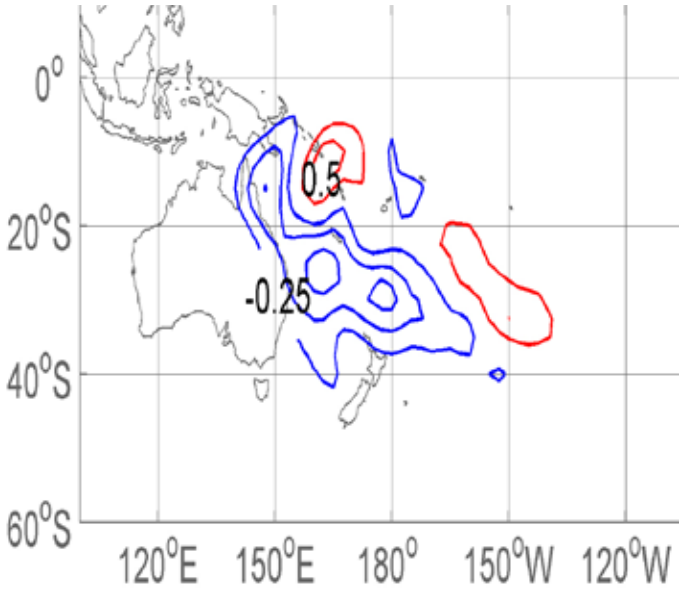
Near normal tropical cyclone (TC) activity is expected for most countries in the southwest Pacific during the remainder of the season (February – April 2010). Communities should remain alert and prepared.

As previously forecast, overall activity is expected to be near normal, with 8–11 TCs expected for the total number of storms in the November 2009 – April 2010 period. On average, nine tropical cyclones occur each year for the southwest Pacific region. Southwest Pacific TCs are grouped into classes ranging from 1 to 5, with 5 being the most dangerous. For the present season, two or three storms were forecast to reach at least Category 3, and one storm was expected to reach at least Category 4, with mean wind speeds of at least 64 knots or 118 km/h.

Updated projections show an increased risk of tropical cyclones to the east of the Date Line, particularly for the Southern Cook Islands. Increased risk also exists for Niue and Tonga. There is also increased risk for the Solomon Islands during the end of this season. It should be noted that TCs can affect parts of southwest French Polynesia (Society and Austral Islands) during El Niño. These islands should remain vigilant as the event continues to evolve with progression into austral autumn. Though a moderate El Niño exists, the number for TCs entering a 550km radius of the New Zealand coast is expected to remain about normal.

In the Southwest Pacific, tropical cyclones (TCs) usually develop in the wet season, from November through to April, but occasionally occur in October and May, and have even occurred in June. Peak cyclone occurrence is usually from January to March. In seasons with similar background climate conditions to present, several tropical cyclones have occurred in the Coral Sea region between the Solomon Islands and New Caledonia, and near Vanuatu, Fiji and Tonga, while a few affect other areas.

On average, half of the tropical cyclones that developed since the 1969–70 season reached hurricane force with mean wind speeds of at least 64 knots (118 km/h). Since 1969, an average of two TCs have typically occurred in March while one has usually developed in April.



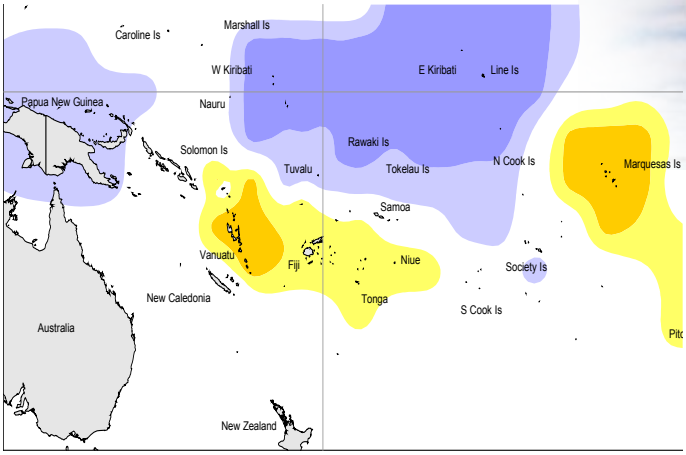
Expected departure from normal of the number of Tropical Cyclones occurring later in the season (February-June) in the southwest Pacific for 2009-10. This guidance is based on analogue years with similar SST anomalies and SOI to the present situation, with a weakly coupled El Niño in the prior Austral autumn/spring. The analogue years selected from the 1957-58 to 2008-09 period. Only three analogue seasons were found within the 1969-70 to 2008-09.

Tropical rainfall and SST outlook: April to June 2010

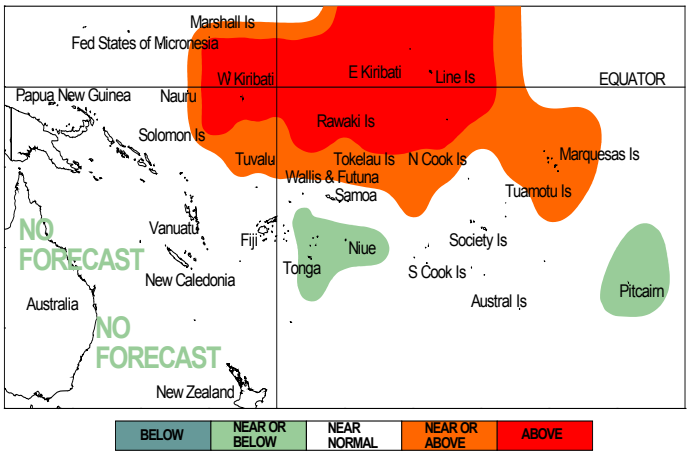
During April – June 2010, a region of suppressed convection is likely in the southwest Pacific encompassing the Marquesas and Vanuatu. Below average rainfall is expected for those island groups.Near or below normal rainfall is expected for Tonga, Niue, Fiji, and Pitcairn Island. Enhanced convection is likely along the Equator extending from Western to Eastern Kiribati, with an expectation of above average rainfall for those islands. Near or above average rainfall is forecast for Papua New Guinea, the Northern Cook Islands, Tuvalu, Tokelau, Samoa, and the Society Islands. Near normal rainfall is forecast for the Tuamotu Archipelago, the Southern Cook Islands, New Caledonia, and Wallis & Futuna. No clear precipitation guidance is offered for the Solomon Islands.

The global models are continuing to show elevated temperatures in the near equatorial Pacific. Cold anomalies that existed around Tonga and Niue in previous months are expected to persist in the coming three month period. Above average sea surface temperatures are forecast for Eastern and Western Kiribati. A region of near or above average sea surface temperatures is forecast around Tokelau, Tuvalu, the Northern Cook Islands, and the Marquesas. Average or below average SSTs are forecast for Tonga, Niue, and Pitcairn Island. No clear SST guidance is offered for Fiji. Near normal SSTs are forecast for the remainder of the southwest Pacific.

The confidence in the multi-model ensemble forecast skill for this seasonal rainfall outlook is moderate to moderately high. In the past, the average region-wide hit rate for rainfall forecasts issued in April is 55%, 6% lower than the long-term average for all months combined. The SST forecast confidence is mostly high, but the greatest uncertainty is localised around the Marquesas, Fiji, and Eastern Kiribati.



Rainfall outlook map for April to June 2010

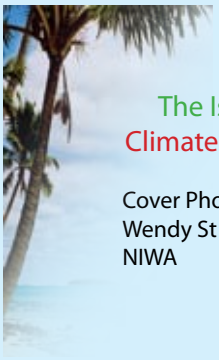


SST outlook map for April to June 2010

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 (Eastern)	15:30:55 (Above)	Moderate-High
Kiribati (Western)	15:30:55 (Above)	High
Cook Islands (Northern)	25:35:40 (Near or Above)	Moderate-High
Papua New Guinea	25:35:40 (Near or Above)	Moderate
Tokelau	25:35:40 (Near or Above)	Moderate
Tuvalu	25:35:40 (Near or Above)	Moderate-High
Samoa	25:40:35 (Near or Above)	Moderate
Society Islands	25:40:35 (Near or Above)	Moderate
Austral Islands	30:40:30 (Near normal)	High
Cook Islands (Southern)	30:40:30 (Near normal)	Moderate
Tuamotu Islands	30:40:30 (Near normal)	Moderate
Wallis & Futuna	30:40:30 (Near normal)	Moderate
New Caledonia	30:40:30 (Near normal)	Moderate
Solomon Islands	35:35:30 (Climatology)	Moderate
Pitcairn Island	35:40:25 (Near or Below)	Moderate
Fiji	40:35:25 (Near or Below)	Moderate-High
Niue	40:35:25 (Near or Below)	Moderate-High
Tonga	40:35:25 (Near or Below)	Moderate-High
Marquesas	45:35:20 (Below)	Moderate
Vanuatu	45:35:20 (Below)	Moderate

Island Group	SST Outlook	Outlook confidence
Kiribati (Eastern)	15:30:55 (Above)	Moderate
Kiribati (Western)	20:30:50 (Above)	High
Marquesas	25:35:40 (Near or Above)	Moderate
Tuvalu	25:35:40 (Near or Above)	Moderate-High
Tokelau	25:40:35 (Near or Above)	High
Austral Islands	30:40:30 (Near normal)	High
Cook Islands (Northern)	30:40:30 (Near normal)	Moderate-High
Cook Islands (Southern)	30:40:30 (Near normal)	High
New Caledonia	30:40:30 (Near normal)	Moderate-High
Papua New Guinea	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
Fiji	35:35:30 (Climatology)	Moderate
Pitcairn Island	35:40:25 (Near or Below)	Moderate-High
Niue	40:35:25 (Near or Below)	Moderate-High
Tonga	40:35:25 (Near or Below)	Moderate-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 Oceanographic 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/