

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- A strong La Niña continues in the equatorial Pacific region. Most dynamical and statistical climate models project persistence of the event through Austral summer and into autumn 2011. A weak La Niña or ENSO neutral conditions are expected by the onset of Austral winter.

Update of tropical cyclone forecast for 2010-11 season

- Six tropical cyclones (TCs) have occurred in the SW Pacific region this season. Normal or above normal TC occurrence, and at least six more named storms, are expected between February and the end of April. Increased activity to the west of Fiji in the Coral Sea and North Tasman region is anticipated. Risk is elevated for Papua New Guinea, the Solomon Islands, New Caledonia, Vanuatu, and New Zealand.

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

- Below normal rainfall is forecast for the Western Kiribati, Eastern Kiribati, Tuvalu, Tokelau, the Northern Cook Islands and the Tuamotu Archipelago.
- The South Pacific Convergence Zone is expected to be displaced southwest of normal. Above normal rainfall is expected for New Caledonia, Vanuatu, Fiji, Niue, and Tonga.
- Below normal sea surface temperatures are forecast for the Marquesas, Western Kiribati and Eastern Kiribati. New Caledonia, Fiji, Niue, Tonga, and Vanuatu are expected to have above normal SSTs.

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

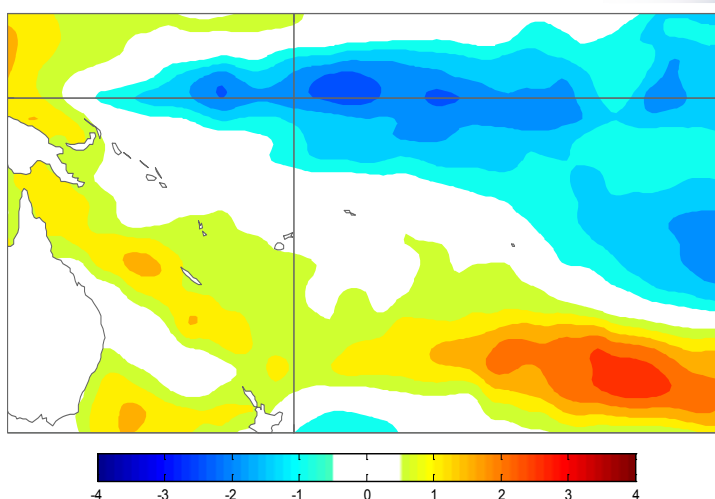
World Meteorological
Organization

MetService of
New Zealand



El Niño/Southern Oscillation (ENSO)

Strong La Niña conditions exist in the tropical Pacific, with continued intensity from last month. The 3-month mean SOI for NDJ 2010/11 was +2.0, remaining at virtually the same level since JAS 2010. NINO3 and NINO4 SST anomalies were around -1.3°C and -1.4°C respectively in January, holding close to values observed in December. The monthly TRMM ENSO index was -0.95 to 24 January, again showing minimal change from a value of -1.2 in December. Strong convection over the Maritime Continent and northern Australia occurred last month, with suppressed convection near the Equator in the western and central Pacific. The ITCZ and SPCZ are displaced poleward of their normal positions, and the easterly trade winds remain stronger than normal west of 150°W . A very prominent cold tongue is visible in the SST anomaly field, centred on the Equator and extending from 150°E to the South American coast. SST anomalies are positive in the far western Pacific and in the extra-tropics of both hemispheres. The eastward migration of a strong negative subsurface heat content anomaly centred near 120°W has slowed, and the positive anomaly seen in the western Pacific near 160°E has moved little since December. Last month, a region of MJO-related enhanced convection over the Australian/western Pacific region propagated eastward and strengthened. For the next two weeks, this eastward propagation is expected to continue, but then weaken rapidly as the reduced convection 'pole' transits across northern Australia.



Surface temperature anomalies ($^{\circ}\text{C}$) for January 2011

Almost all the models NIWA monitor predict continuation of La Niña over the coming three months, but with progressive weakening in intensity during this period. From mid-autumn, the global models suggest either weakening to ENSO-neutral conditions or La Niña persistence into austral winter a weaker intensity. The NCEP ENSO discussion of 6 January states that La Niña has neared a peak, and is likely to persist into southern autumn at lower intensity. The IRI summary of 20 January indicates a 88% probability for La Niña through February–April 2011, 67% through March–May 2011, and 46% through April–June 2011.

Update of Southwest Pacific tropical cyclone guidance for the 2010-11 season

There is an expectation of normal or above normal tropical cyclone (TC) activity for most islands west of the International Date Line in the southwest Pacific during the remainder of the 2010-11 season (February–April). Although risk is reduced east of the International Date Line, all communities should remain alert and prepared.

As of the end of January 2011, six TCs occurred in the region covered by the ICU forecast. A total of nine to 12 named TCs were forecast for the southwest Pacific (between 135°E to 120°W) between November 2010 and April 2010. On average, nine tropical cyclones occur each year for the southwest Pacific region, which are grouped into classes ranging from 1 to 5, with 5 being the most dangerous. For this season, activity seen thus far has matched the October 2010 forecast that at least three cyclones would reach at least Category 3, and one system would reach at least Category 4, with mean wind speeds of at least 64 knots or 118 km/h.

Each year, TCs have a significant impact on the southwest Pacific. Projections continue to show an increased risk of TCs for the remainder of the 2010–11 season over the Coral Sea and to the southwest of Fiji, particularly for Papua New Guinea, the Solomon Islands, Vanuatu, and New Caledonia. New Zealand is also at higher risk of experiencing an ex-tropical cyclone interaction, even late in the season. While risk is generally reduced for islands to the east of the International Date Line during La Niña, historical cyclone tracks indicate that TCs can affect parts of southwest French Polynesia, including the Society and Austral Islands, and the Cook Islands during La Niñas. All

islands should remain vigilant as La Niña continues to evolve with progression through Austral summer and into autumn. The analogue years used in the 2010–11 forecast indicate the TC season may also extend into May, and at least six more TCs are expected to occur between February and the close of the season.

Island Group	TC occurrence (All years)	TC forecast (Analogue years)	Risk
Papua New Guinea	0.5	0.7	Elevated
New Caledonia	2.6	3.6	Elevated
Solomon Islands	1.3	1.6	Elevated
New Zealand	0.9	1.1	Elevated
Vanuatu	2.9	3.5	Elevated
Austral Islands	0.8	0.7	Near normal
Fiji	2.3	2.0	Near normal
Tonga	2.0	1.7	Near normal
French Polynesia	0.7	0.5	Reduced
Pitcairn	0.3	0.2	Reduced
Wallis & Futuna	1.8	1.2	Reduced
Niue	1.8	1.2	Reduced
Samoa	1.5	1.0	Reduced
Society Islands	0.8	0.5	Reduced
Southern Cook Isl.	1.5	0.7	Low
Tokelau	0.8	0.3	Low
Tuvalu	1.1	0.4	Low
Northern Cook Isl.	0.8	0.2	Low
Tuamotu	0.4	0.1	Low
Marquesas	0.1	0	Unlikely
Eastern Kiribati	0	0	Unlikely
Western Kiribati	0	0	Unlikely

Tropical rainfall and SST outlook: February to April 2011

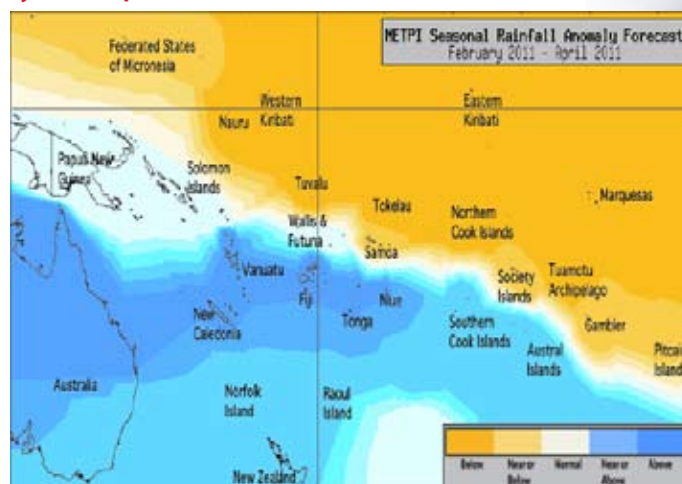
During February – April 2011, a region of suppressed convection is likely in the southwest Pacific encompassing Tuvalu, Tokelau, Eastern Kiribati, Western Kiribati, the Tuamotu Archipelago, and the Northern Cook Islands. Below average rainfall is expected for those island groups. Average or below average rainfall is expected for Pitcairn Island, the Society Islands, Samoa and the Marquesas. Enhanced convection is likely along the Southwest Pacific Convergence Zone, which is expected to be displaced to the southwest of normal. New Caledonia, Fiji, Niue, Tonga, and Vanuatu are expected to receive above normal rainfall for the coming three month period. Near or above average rainfall is forecast for the Austral Islands, Papua New Guinea, and the Southern Cook Islands. Near normal rainfall is forecast for the Solomon Islands and Wallis & Futuna.

The ensemble of global models show negative equatorial Pacific sea surface temperature anomalies in the coming months, but with a weakened equatorial cold SST anomaly from previous months forecasts. Above average SSTs are forecast for New Caledonia, Vanuatu, Fiji, Tonga, and Niue, while near or above average SSTs are forecast for the Southern Cook Islands and the Austral Islands. Near or below normal SSTs are forecast for the Northern Cook Islands, the Tuamotu Archipelago, Tuvalu and Tokelau. Below normal SSTs are anticipated for Western Kiribati, Eastern Kiribati, and the Marquesas. Near normal SSTs are forecast elsewhere.

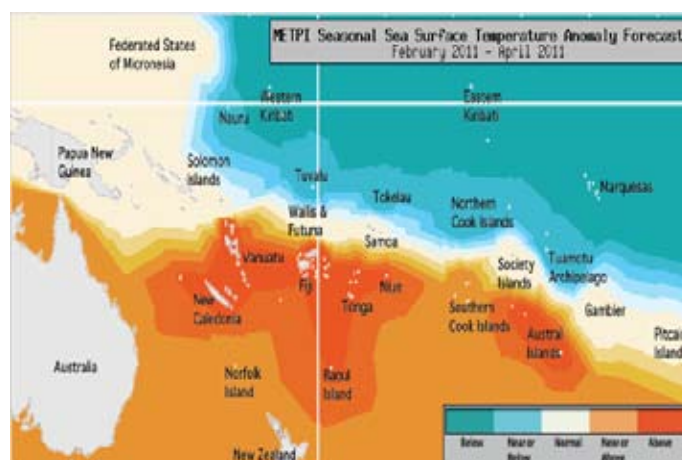
The forecast confidence for the rainfall outlook is moderately high. The average region-wide hit rate for rainfall forecasts issued in February is 63%, 2% higher than all months combined. The SST forecast confidence is mostly high or moderate-to-high, with uncertainty localised near Eastern Kiribati and the Marquesas.

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.

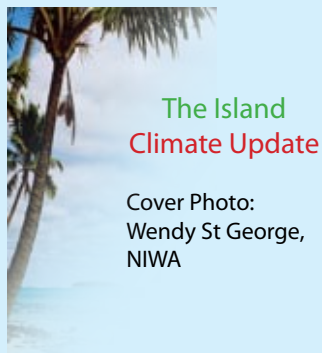
Island Group	Rainfall Outlook	Outlook confidence	Island Group	SST Outlook	Outlook confidence
New Caledonia	20:35:45 (Above)	Moderate-High	New Caledonia	20:35:45 (Above)	High
Niue	20:35:45 (Above)	Moderate-High	Fiji	20:35:45 (Above)	Moderate-High
Tonga	20:35:45 (Above)	Moderate-High	Niue	20:35:45 (Above)	Moderate-High
Vanuatu	20:35:45 (Above)	High	Tonga	20:35:45 (Above)	Moderate-High
Fiji	20:35:45 (Above)	Moderate-High	Vanuatu	20:35:45 (Above)	Moderate-High
Austral Islands	25:35:40 (Near or Above)	Moderate-High	Austral Islands	30:40:30 (Near or above)	Moderate-High
Cook Islands (Southern)	20:40:40 (Near or Above)	Moderate-High	Cook Islands (Southern)	30:40:30 (Near or above)	Moderate-High
Papua New Guinea	25:40:35 (Near or Above)	Moderate-High	Papua New Guinea	30:40:30 (Near normal)	High
Solomon Islands	30:40:30 (Near normal)	Moderate-High	Pitcairn Island	30:40:30 (Near normal)	High
Wallis & Futuna	30:40:30 (Near normal)	Moderate-High	Solomon Islands	30:40:30 (Near normal)	High
Society Islands	40:35:25 (Near or Below)	Moderate	Wallis & Futuna	30:40:30 (Near normal)	High
Marquesas	35:40:25 (Near or Below)	High	Samoa	30:40:30 (Near normal)	High
Pitcairn Island	35:40:25 (Near or Below)	Moderate-High	Society Islands	30:40:30 (Near normal)	High
Samoa	35:40:25 (Near or Below)	Moderate-High	Tuamotu Islands	40:40:20 (Near or Below)	Moderate-High
Kiribati (Eastern)	45:35:20 (Below)	Moderate-High	Tuvalu	40:40:20 (Near or Below)	Moderate-High
Tuamotu Islands	45:35:20 (Below)	Moderate-High	Tokelau	35:40:25 (Near or Below)	High
Cook Islands (Northern)	50:30:20 (Below)	Moderate-High	Cook Islands (Northern)	40:40:20 (Near or Below)	High
Kiribati (Western)	50:30:20 (Below)	High	Kiribati (Western)	45:35:20 (Below)	High
Tokelau	50:30:20 (Below)	Moderate-High	Kiribati (Eastern)	50:30:20 (Below)	Moderate
Tuvalu	50:35:15 (Below)	High	Marquesas	50:30:20 (Below)	Moderate



Rainfall anomaly outlook map for February to April 2011



SST anomaly outlook map for February to April 2011



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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/>