

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- ENSO diagnostics indicate La Niña conditions exist in the Equatorial Pacific Ocean. Many dynamical and statistical climate models suggest La Niña will continue to persist at least moderate strength through mid-autumn.

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

Tropical cyclone forecast for 2011 - 12 season

- Normal or below average numbers are likely for most islands during the remainder of the southwest Pacific tropical cyclone season (February - April).
- Near normal TC numbers, with eight to ten named storms, is expected for the seasonal total.
- No named storms developed in the ICU forecast region during January 2012.

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

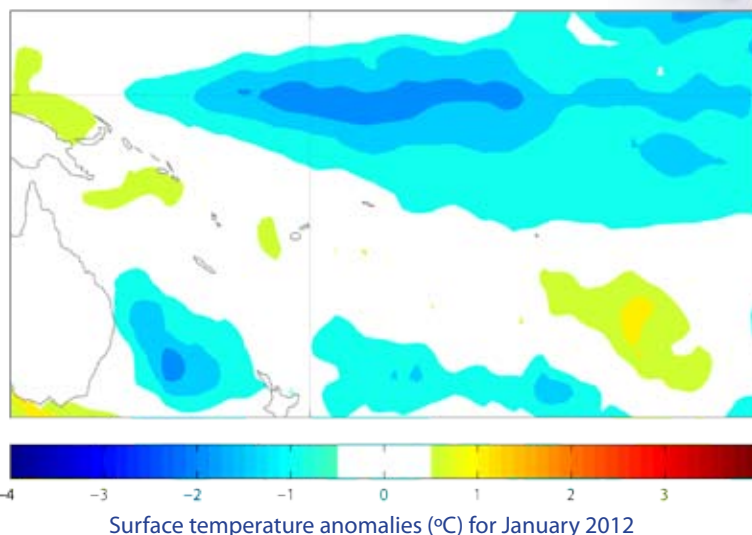
- Below normal rainfall is forecast for Tuvalu, Tokelau, and the Northern Cook Islands in the coming three months.
- Above normal rainfall is expected for Vanuatu, Tonga, and Fiji.
- Below normal sea surface temperatures (SSTs) are forecast for Western Kiribati, Eastern Kiribati, the Northern Cook Islands, and the Marquesas, and Tokelau while above normal SSTs are expected for the Austral Islands and Southern Cook Islands.



El Niño/Southern Oscillation (ENSO)

The tropical Pacific is currently in moderate La Niña conditions, and the ocean now appears to be fully coupled with the tropical atmosphere. The SOI eased to +1.0 in January (+2.3 in December), while the TRMM ENSO index was near-constant at -1.5 (-1.7 in December). Enhanced convection existed across northern Australia and a southwards-displaced SPCZ was positioned over Vanuatu and Fiji. SST anomalies strengthened, especially over the central equatorial Pacific, and NINO4 was -1.2°C in January, from -0.9°C in December, and NINO3.4 is now -1.1°C, up from 0.8°C in Nov-Dec. Sub-surface sea temperature/heat content anomalies (both negative and positive) intensified in January, suggesting another month or so of peak intensity before La Niña eases towards neutral. An MJO pulse is presently developing and is predicted to intensify and propagate into the western Pacific in early February, bringing enhanced convection over the western tropical Pacific. Such a pattern would work against the La Niña-related enhanced Walker circulation, and may act to weaken La Niña while increasing activity in the SPCZ.

Most of the dynamical models NIWA monitor predict La Niña conditions through to April. All of the dynamical models weaken conditions through into MJJ 2012, with



most predicting neutral conditions and one developing a warm El Niño state. Statistical models follow a similar trend. The latest IRI technical summary of global guidance suggest a 77% chance of La Niña through April, with a 23% chance of neutral conditions. The NCEP ENSO discussion of 5 January 2012 indicates that a weak to moderate La Niña should continue through February, then dissipate during March-May.

Southwest Pacific tropical cyclone guidance for the 2011 - 12 season

Normal or below normal tropical cyclone (TC) activity is likely for most islands in the southwest Pacific during the remainder of the 2011 - 2012 season. February through April (the late season) is typically the most active part of the TC season, although some storms have occurred outside of this time frame in the past. Two tropical cyclones were active in the ICU forecast region during December 2011 (TC Fina and TC Grant), and two are currently active in the southwest Pacific basin at the time this ICU issue was released.

On average, nine tropical cyclones occur each year for the southwest Pacific, and are grouped into classes ranging from 1 to 5, with 5 being the most dangerous. For the coming season, at least one cyclone is forecast to reach at least Category 3, with mean wind speeds of at least 64 knots or 118 km/h and one system may reach at least Category 4 strength, with mean wind speeds of at least 86 knots or 159 km/h. The ICU TC forecast update indicates 8 - 10 named TCs are likely for whole season, with six to eight named storms forecast for the late season.

Places like Vanuatu and New Caledonia typically experience the greatest TC activity, with an average of about 3 or 4 TCs passing close to those countries each year (see Table, right for late season averages). Near normal to below normal TC activity for the remainder of the 2011-12 season is likely for most islands. Historical cyclone tracks indicate that TCs can affect parts of southwest French Polynesia, including the Society and Austral Islands, and the southern Cook Islands during La Niñas, especially late in the season. The forecast update indicates extra-tropical trajectories to the south of the Austral Islands and Society Islands are likely during the latter half of the TC season. All islands should remain vigilant as the current La Niña continues

to evolve with progression into autumn. More details about this forecast and the science underpinning it can be found at <http://www.niwa.co.nz>. In the Pacific Islands, consult with your local meteorological service for tropical cyclone guidance as the season progresses.

| Location | All Years (std. error) | Selected years (std. error) | Activity level |
|------------------|------------------------|-----------------------------|----------------|
| Vanuatu | 2.4 (0.24) | 2.3 (0.88) | Normal |
| New Caledonia | 2.2 (0.23) | 2.4 (0.89) | Normal |
| Fiji | 2.0 (0.22) | 1.2 (0.64) | Normal |
| S. Cooks | 1.1 (0.16) | 0.8 (0.52) | Normal |
| New Zealand | 0.7 (0.13) | 0.4 (0.37) | Normal |
| Society Is | 0.5 (0.11) | 0.3 (0.32) | Normal |
| Tuvalu | 0.8 (0.14) | 0.3 (0.32) | Normal-below |
| N. Cooks | 0.6 (0.12) | 0.2 (0.24) | Normal-below |
| Tonga | 1.5 (0.19) | 0.7 (0.49) | Below |
| Solomons | 1.5 (0.19) | 0.5 (0.42) | Below |
| Wallis & Futuna | 1.5 (0.19) | 0.6 (0.44) | Below |
| Niue | 1.2 (0.17) | 0.3 (0.31) | Below |
| Samoa | 1.1 (0.17) | 0.1 (0.22) | Below |
| Papua New Guinea | 0.9 (0.15) | 0.2 (0.29) | Below |
| Northern NZ | 0.7 (0.13) | 0.2 (0.29) | Below |
| Tokelau | 0.6 (0.12) | 0.0 (0.00) | Below |
| Austral Is | 0.5 (0.11) | 0.1 (0.19) | Below |
| Fr. Polynesia | 0.5 (0.11) | 0.0 (0.07) | Below |
| Tuamotu | 0.3 (0.08) | 0.2 (0.23) | Unlikely |
| Pitcairn | 0.2 (0.08) | 0.1 (0.20) | Unlikely |
| Marquesas | 0.1 (0.04) | 0.0 (0.00) | Unlikely |
| E. Kiribati | 0.0 (0.01) | 0.0 (0.00) | Unlikely |
| W. Kiribati | 0.0 (0.00) | 0.0 (0.00) | Unlikely |

Average number of TCs passing within 5° of the main island groups between November - April. Activity level (and associated risk) are indicative of how many storms might be expected for any given island group for the current season.

Tropical rainfall and SST outlook: February to April 2012

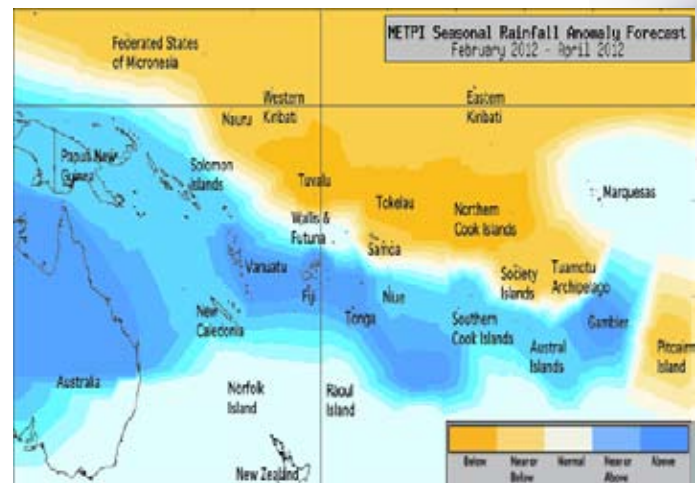
A La Nina pattern continues to be evident in the ensemble of global climate forecasts. Suppressed convection is expected in the southwest Pacific near Tuvalu, Tokelau, and the Northern Cook Islands which are forecast to receive below normal rainfall in the coming three months. Despite intermittent rainfall, significant drought that has existed in Tuvalu, Tokelau and the Northern Cook Islands is expected to continue through this period. Average or below average rainfall is expected for the Tuamotu Archipelago, Eastern Kiribati, Western Kiribati, the Society Islands, Samoa, Pitcairn Island. The SPCZ is likely to be displaced southwest of normal during the forecast period. Above normal rainfall is likely for Vanuatu, Fiji, and Tonga. Near or above average rainfall is forecast for Papua New Guinea, the Solomon Islands, New Caledonia, Niue, the Southern Cook Islands and the Austral Islands. Near normal rainfall is expected for the Marquesas and Wallis & Futuna.

For the coming three months, cool sea surface anomalies are expected along and south of the Equator and also to the east of the Dateline encompassing Eastern Kiribati, Western Kiribati, the Northern Cook Islands, Tokelau and the Marquesas. Below normal SSTs are expected for those island groups. Normal or below normal SSTs are forecast for Wallis & Futuna, Tuvalu, the Tuamotu Archipelago, the Society Islands, and Samoa. Above normal SSTs are forecast for the Austral Islands and Southern Cook Islands. Near normal or above normal sea surface temperatures are forecast for Papua New Guinea, the Solomon Islands, New Caledonia, Vanuatu, Fiji, Tonga and Niue. Near normal SSTs are forecast for and Pitcairn Island.

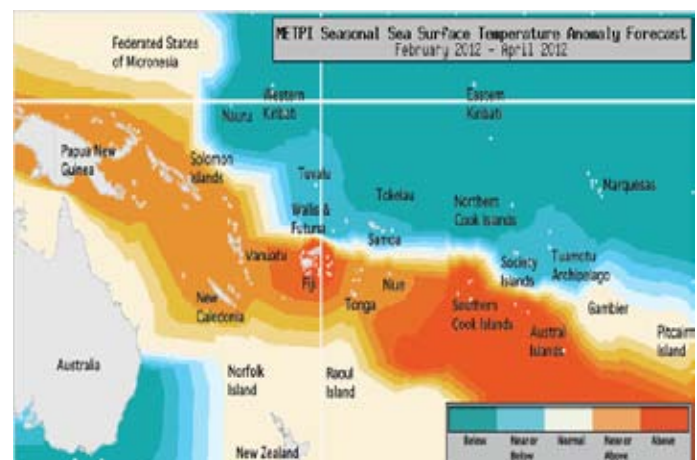
The confidence for the rainfall outlook is moderately high. The average region-wide hit rate for rainfall forecasts issued in February is 66%, three percent higher than the long-term

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

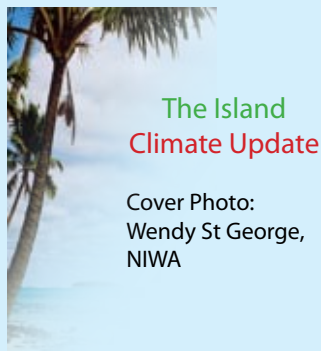


Rainfall anomaly outlook map for February to April 2012



SST anomaly outlook map for February to April 2012

average for all months combined. The SST forecast uncertainty is greatest near the Marquesas and Eastern Kiribati.



The Island Climate Update

Cover Photo:
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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/>