Number 123, December 2010

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- La Niña exists in the equatorial Pacific region. Most dynamical and statistical climate models project continuation of La Niña through Austral summer. The event is expected to continue into autumn 2011, with the expecation that neutral conditions will be achieved by winter.

Tropical cyclone forecast for 2010-11 season

- Normal or above normal tropical cyclone occurrence is expected, with increased activity to the west of Fiji in the Coral Sea and North Tasman region. 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 Papua New Guinea, New Caledonia, Vanuatu, Fiji, Niue, Tonga and the Southern Cook Islands.

- Below normal sea surface temperatures are forecast for the Marquesas, Western Kiribati and Eastern Kiribati. Papua New Guinea, New Caledoina, Vanuatu, Fiji, Tonga, Niue, the Southern Cook Islands and the Austral Islands 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

nzaid

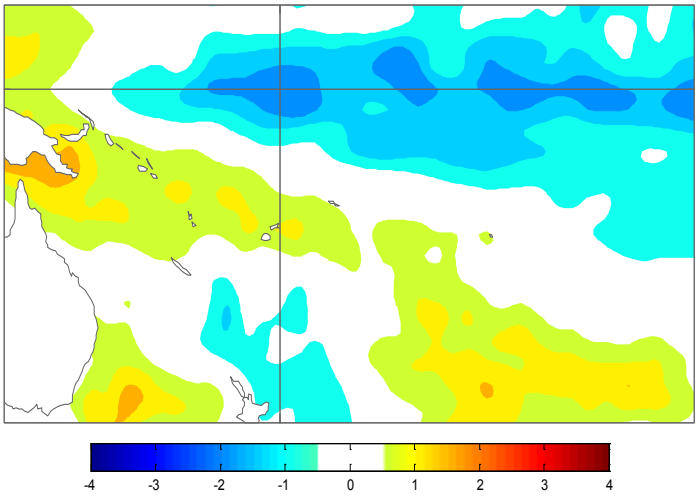
NOAA National Oceanic and Atmospheric Administration U.S. Department of Commerce

SPREP

NIWA Taihoro Nukurangi

El Niño/Southern Oscillation (ENSO)

A moderate to strong La Niña event is in place in the tropical Pacific, and appears to be near or just past its maximum intensity. There is strongly enhanced convection over the eastern tropical Indian Ocean, parts of the Maritime Continent and northern Australia. Convection is strongly suppressed near the equator in the western and central Pacific. The ITCZ and SPCZ both remain displaced poleward of their normal position. The TRMM ENSO index eased to –1.0 for November, reduced from –1.4 in October (values of –1.0 or less are considered typical of La Niña conditions). The easterly trade winds are stronger than normal west of 160°W and the SOI was +1.5 for November (+1.9 in the three–month mean for SON). A prominent cold tongue is visible in the SST anomaly field, centred on the Equator and extending from 160°E to the South American coast. SST anomalies are positive in the far western Pacific and in the extra–tropics of both hemispheres. NINO3 and NINO4 SST anomalies eased slightly in November, being about –1.3°C and –1.1°C respectively (SON averages –1.3°C and –1.2°C, respectively). A strong negative subsurface heat content anomaly continues to migrate eastwards along the Equator but has begun to weaken. A positive anomaly is near–stationary in the western Pacific. The MJO shows very little amplitude at present.



Surface temperature anomalies (ºC) for November 2010

Almost all the models NIWA monitor predict the tropical Pacific to be in a La Niña state over the coming three months, with most easing towards neutral conditions during autumn (MAM) and into winter. The NCEP ENSO discussion of 4 November states that La Niña conditions are likely to persist at least into southern autumn 2011. The IRI summary of 18 November indicates a 99% probability for moderate–strong La Niña conditions continuing through January 2011, 92% through March 2011, and at least 50% until April–June 2011. .

Southwest Pacific tropical cyclone guidance for the 2010-11 season

The expectation is that normal or above normal tropical cyclone (TC) activity will occur for most islands west of the International Date Line in the southwest Pacific during the November 2010 – April 2011 season. Although risk is reduced east of the International Date Line, all communities should remain alert and prepared.

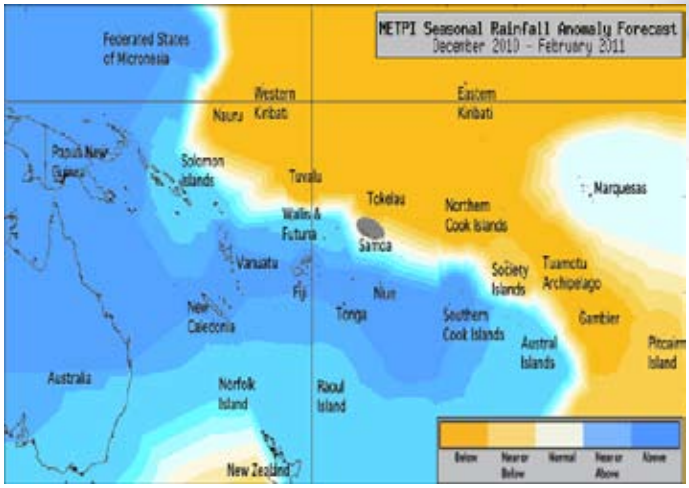
Nine to 12 named TCs are expected over the coming season for the southwest Pacific (between 135°E to 120°W). On average, nine tropical cyclones occur each year for the southwest Pacific region. Southwest Pacific TCs are grouped into classes ranging from 1 to 5, with 5 being the most dangerous. For the coming season, three cyclones are forecast to reach at least Category 3, and one system is expected to 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. Places like Vanuatu and New Caledonia typically experience the greatest activity in the region, with an average of about 3 TCs passing close to those countries each year. Projections show an increased risk of TCs for 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 this 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 the current La Niña continues to evolve with progression into Austral summer. Additional informaton about this forecast and supporting documentation can be found at www.niwa.co.nz. In the Pacific Islands, please contact your local national meteorological service for further information about this guidance.

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

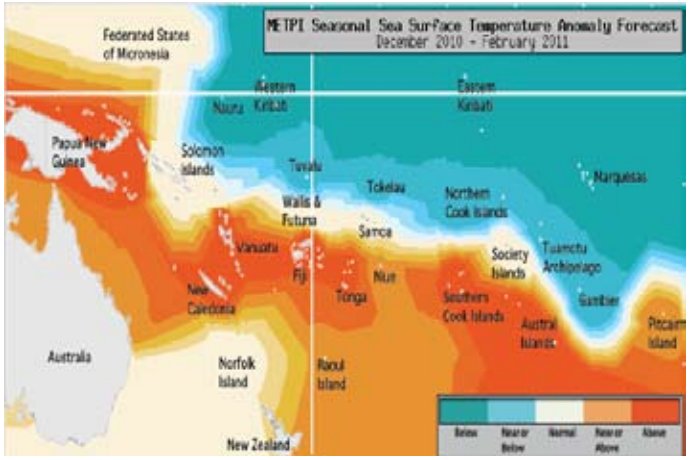
Tropical rainfall and SST outlook: December 2010 to February 2011

During December 2010 – February 2011, a region of suppressed convection is likely in the southwest Pacific encompassing Eastern Kiribati, Tuvalu, Tokelau, the Tuamotu Archipelago, the Northern Cook Islands and Western Kiribati. Below average rainfall is expected for those island groups. Average or below average rainfall is expected for Pitcairn Island and the Society Islands. Enhanced convection is likely along the Southwest Pacific Convergence Zone, which is expected to be displaced to the southwest of normal. Papua New Guinea, Fiji, New Caledonia, Niue, Tonga, Vanuatu, and the Southern Cook Islands are expected to receive above normal rainfall for the coming three month period. Near or above average rainfall is forecast for Wallis & Futuna, the Solomon Islands, and the Austral Islands. Near normal rainfall is forecast for the Marquesas. No clear precipitation guidance is offered for Samoa.



Rainfall anomaly outlook map for December 2010 to February 2011

The ensemble of global models continue to show negative equatorial Pacific sea surface temperature anomalies in the coming months, and a cold tongue spanning the International Date line. Above average SSTs are forecast for Papua New Guinea, Vanuatu, New Caledonia, Fiji, Niue, Tonga, the Southern Cook Islands and the Austral Islands. Average or above average sea surface temperatures are forecast for Pitcairn Island. Near or below normal SSTs are forecast for the Northern Cook Islands, the Tuamotu Archipelago, Tuvalu and Tokelau, while below normal SSTs are anticipated for Western Kiribati, Eastern Kiribati, and the Marquesas. Near normal SSTs are forecast for Samoa, the Solomon Islands, Wallis & Futuna, and the Society Islands.



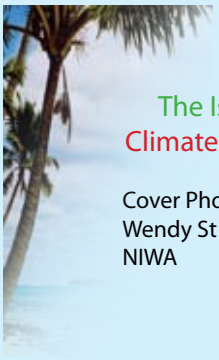
SST anomaly outlook map for December 2010 to February 2011

The forecast confidence for the rainfall outlook is moderately high. The average region–wide hit rate for rainfall forecasts issued in December is 69%, 8% higher than all months combined. The SST forecast confidence is mostly high, with uncertainty localised near Eastern Kiribati and the Marquesas.

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	15:30:55 (Above)	Moderate-High
New Caledonia	15:35:50 (Above)	Moderate-High
Niue	15:35:50 (Above)	Moderate-High
Tonga	15:35:50 (Above)	Moderate-High
Vanuatu	15:35:50 (Above)	Moderate-High
Cook Islands (Southern)	20:35:45 (Above)	Moderate-High
Papua New Guinea	20:35:45 (Above)	Moderate-High
Austral Islands	20:40:40 (Near or Above)	Moderate-High
Wallis & Futuna	20:40:40 (Near or Above)	Moderate-High
Solomon Islands	25:40:35 (Near or Above)	Moderate-High
Marquesas	30:40:30 (Near normal)	Moderate-High
Samoa	35:35:30 (Climatology)	Moderate
Pitcairn Island	35:40:25 (Near or Below)	High
Society Islands	40:35:25 (Near or Below)	Moderate-High
Cook Islands (Northern)	45:35:20 (Below)	Moderate-High
Kiribati (Eastern)	45:35:20 (Below)	Moderate-High
Tuamotu Islands	45:35:20 (Below)	Moderate-High
Tokelau	50:35:15 (Below)	Moderate-High
Tuvalu	50:35:15 (Below)	High
Kiribati (Western)	55:30:15 (Below)	High

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



The Island
Climate Update

Cover Photo:
Wendy St George,
NIWA

Visit The Island Climate Update at:
www.niwascience.co.nz/ncc/icu

Your comments and ideas about The Island Climate Update are welcome. Please contact:
Dr Andrew Lorrey, NIWA,
41 Market Place, Auckland, New Zealand
E-mail: a.lorrey@niwa.co.nz

Forecasts:
Dr. Andrew Lorrey (South Pacific rainfall and SST forecasts) and the NIWA National Climate Centre (ENSO wrap)

ICU Editors:
Andrew Lorrey Email: a.lorrey@niwa.co.nz
James Renwick Email: j.renwick@niwa.co.nz

Acknowledgements

This bulletin is produced by NIWA and made possible with financial support from the New Zealand Agency for International Development (NZAID), with additional support from the Pacific Islands Applied Geosciences Commission (SOPAC) 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, 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/