

Number 119, August 2010

The Island Climate Update

El Niño/Southern Oscillation (ENSO)

- La Niña is building in the equatorial Pacific region. Many dynamical climate models project development of La Niña by the onset of Austral spring. The event is expected to continue through the end of the calendar year.

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

ICU feature article- Tropical Cyclone Oli impacts Tubuai

- A summary of the events in early February 2010 when TC Oli crossed French Polynesia, contributed by Sebastien Hugony, Meteo France.

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

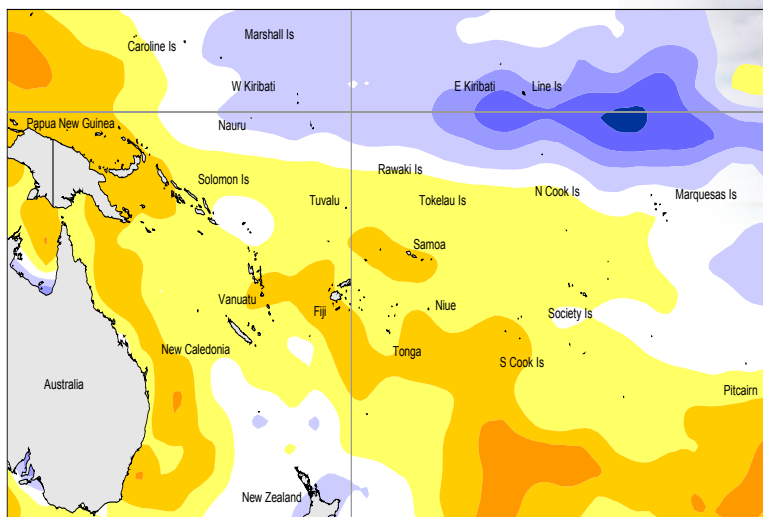
- Below normal rainfall is forecast for the Western Kiribati and Eastern Kiribati, while below near or below normal rainfall is expected for Pitcairn Island and the Marquesas.
- Above normal rainfall is expected for Papua New Guinea, the Solomon Islands, Vanuatu, Wallis & Futuna and Samoa.
- Near or below normal sea surface temperatures are forecast for the Marquesas, Western Kiribati and Eastern Kiribati.



El Niño/Southern Oscillation (ENSO)

The tropical Pacific has moved steadily towards La Niña conditions over the past few months. The tropical circulation exhibits suppressed convection near the Date Line and enhanced convection over Indonesia, with enhanced trade winds over the western Pacific. The Southern Oscillation Index rose in July to near +2, with the 3-month mean near +1. The TRMM ENSO index fell to -2 in the 30-day mean to 27 July (values of -1.0 or less are considered typical of La Niña conditions). A similar evolution is evident in the ocean. A "cold tongue" is evident along the Equator in to the east of the Date Line, with positive SST anomalies in the far west and in the extra-tropics (of the Southern Hemisphere). The NINO3 and NINO4 anomalies were around -0.7°C and -0.2°C, respectively, for July (MJJ averages of -0.1°C and +0.1°C, respectively). At the sub-surface, a strong negative heat content anomaly lies east of the Dateline and is propagating east. An MJO pulse is positioned over the Indian Ocean and is forecast to stay slow-moving over the coming two weeks. This may reinforce the present OLR pattern, with enhanced convection over Indonesia, and suppressed convection north of the Solomon Islands.

Most dynamical climate models monitored by NIWA indicate the tropical Pacific will be in a La Niña state over



Surface temperature anomalies (°C) for July 2010

the coming 6 months, and that the event will ease in early 2011. Statistical models indicate a weaker response, but are mostly in qualitative agreement with trends shown by the dynamical models. The NCEP ENSO discussion of 8 July states that La Niña conditions are likely to develop during July–August. The IRI summary of 15 July indicates a ~80% probability of La Niña conditions through the rest of 2010 (and 20% probability for neutral conditions).

Tropical Cyclone Oli in French Polynesia - Sebastien Hugony, Meteo France

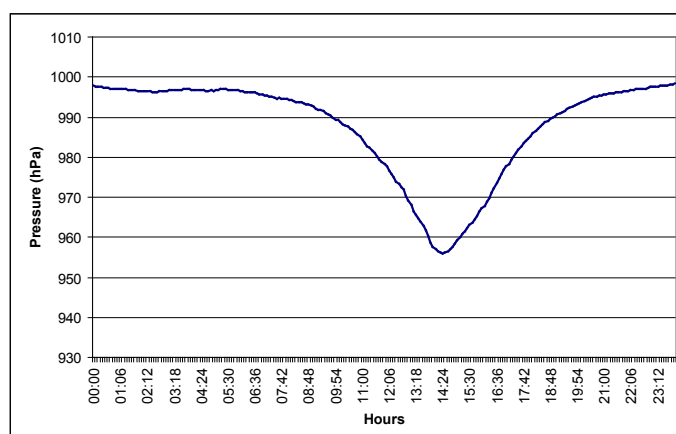
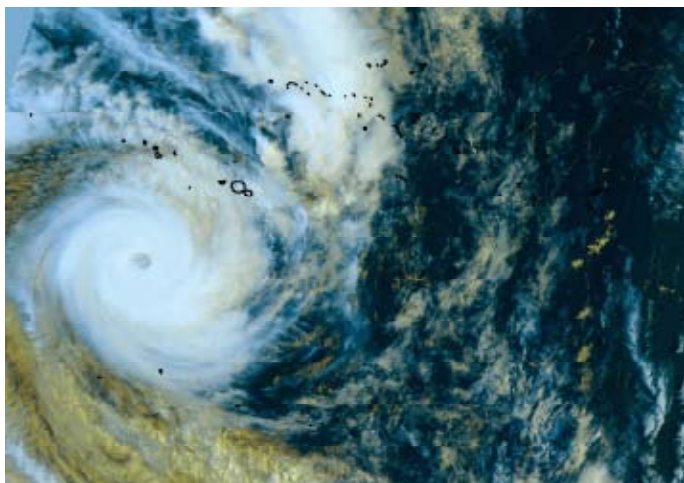
In the middle of the 2009/10 Tropical Cyclone (TC) season, Oli showed its power in French Polynesia by inducing strong swells and made a direct impact on the island of Tubuai. TC Oli crossed more than five thousand kilometers between 1 February and 6 February while in transit through the Southwest Pacific Ocean.

TC Oli reached Category 2 status, and passed near Mopelia Island and then to the southwest of the Windward Islands before closing on Tahiti and Moorea late on 3 February. 73 km/h maximal 10-minute sustained winds with gusts of up to 105 km/h were recorded at Bora-Bora, and very high seas were noted with waves from 6 to 7 meters across the Society Island group.

In Bora Bora, Raiatea, Tahaa, Maupiti and Huahine, several houses as well as some hotels were destroyed or partly

damaged by strong winds and waves. However, passage of TC Oli distal to Tahiti and Moorea caused only small damage, with only some roofs torn off and coastal detritus emplaced due to the significant wave activity.

TC Oli intensified after passing Tahiti, reaching Category 4 status, with damage on Rurutu and Raivavae caused by wind and waves with an estimated height of 8 meters. Only a few hours after the arrival of TC Oli on Tubuai, there was enormous damage up to 100 meters inland. The eye of TC Oli passed over Tubuai on 5 February, with a minimal sea level pressure of 955.8 hPa and recorded sustained winds of 101 km/h with gusts up to 170 km/h. The northern and northeastern coasts of Tubuai were devastated, in contrast with southern, sheltered coastal areas. TC Oli's storm track, travelling from Mopelia towards Tubuai in the southwest of the Society islands, is similar to past TCs, including TC Martin (November, 1997) and TC Wasa (December, 1991), which also experienced a direct hit.



Above: Satellite imagery of TC Oli passing through French Polynesia (left), and pressure minima recorded at Tubuai during the storm (right)..

Tropical rainfall and SST outlook: August to October 2010

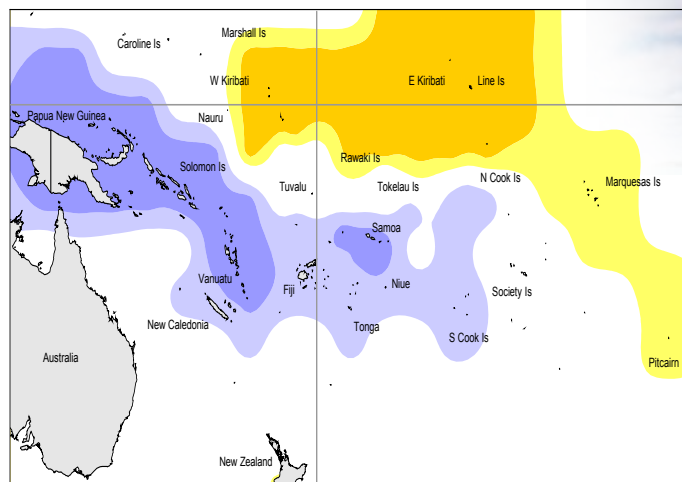
During August – October 2010, suppressed convection is likely in the southwest Pacific encompassing the Marquesas, the Tuamotu Archipelago, Eastern Kiribati, Pitcairn Island, and Western Kiribati. Near or below average rainfall is expected for those island groups, except for Eastern Kiribati and Western Kiribati where below normal rainfall is forecast. Enhanced convection is likely near the Equator in the far western Southwest Pacific, with Papua New Guinea, the Solomon Islands, Vanuatu, Wallis & Futuna and Samoa expected to receive above normal rainfall. Near or above average rainfall is forecast for the Northern Cook Islands, the Southern Cook Islands, Niue, Fiji and New Caledonia. Near normal rainfall is forecast for Tuvalu and the Austral Islands. No clear precipitation guidance is offered for Tokelau or the Society Islands.

Many global models continue to show strengthening in the near equatorial Pacific sea surface temperature anomalies in the coming months, and propagation of a cold tongue from east to west toward the Date line. Above average SSTs are forecast for the Southern Cook Islands, New Caledonia and Vanuatu, while average or above average sea surface temperatures are forecast for Papua New Guinea, the Northern Cook Islands, the Austral Islands, Tokelau, Tuvalu and Wallis & Futuna. Below normal SSTs are forecast for the Marquesas, Eastern Kiribati, and Western Kiribati. is expected to experience below normal SSTs. No clear SST guidance is offered for Fiji, Niue, the Society Islands, and Tonga. Near normal SSTs are forecast for the remainder of the southwest Pacific.

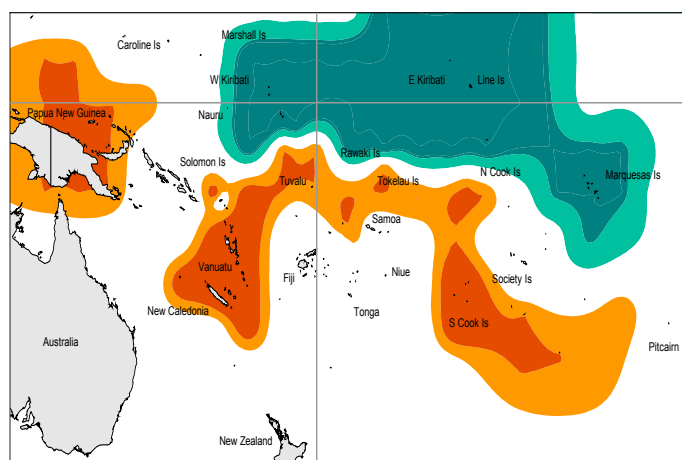
The forecast confidence for this rainfall outlook is moderately high. The average region-wide hit rate for rainfall forecasts issued in August is 61%, equal to the long-term average for all months combined. The SST forecast confidence is mostly

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



Rainfall outlook map for August to October 2010



SST outlook map for August to October 2010

moderately high, but the greatest uncertainty is localised around the International Date Line and near the Equator..



The Island Climate Update

Cover Photo:
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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.

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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/>

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French Polynesia: <http://www.meteo.pf/>

Bureau of Meteorology (Australia)
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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/>