

Number 118, July 2010

# The Island Climate Update

## 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)

- La Niña signals are currently being observed in the equatorial Pacific region. Many dynamical climate models project development of La Niña by the onset of Austral spring.

## 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.

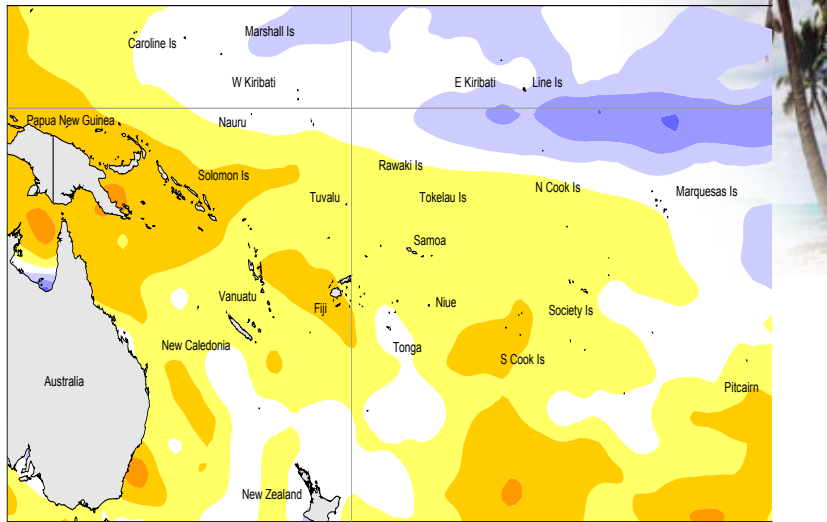
## Multi-model Ensemble Tool for Pacific Island (METPI) rainfall and sea surface temperature forecasts

- Near or below normal rainfall is forecast for the Marquesas, Western Kiribati and Pitcairn Island, while below normal rainfall is expected for Eastern Kiribati.
- 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, and below normal sea surface temperatures are projected for Eastern Kiribati.



## El Niño/Southern Oscillation (ENSO)

The tropical Pacific is in an ENSO-neutral state, but bordering on La Niña conditions. The Equatorial Pacific ocean circulation continues to trend towards La Niña, and there is evidence of atmospheric coupling. The NINO3 and NINO4 anomalies were around  $-0.2$  and  $+0.2^{\circ}\text{C}$  for June (AMJ means both around  $+0.5^{\circ}\text{C}$ ). The SST anomaly pattern across the tropical and subtropical Pacific is quite La Niña-like, with near-Equatorial negative anomalies east of the Date Line, and a warm "horseshoe" in the west, extending into the extra-tropics of both hemispheres. At the sub-surface, a strong negative heat content anomaly has developed east of the Dateline, with temperature anomalies as low as  $-4^{\circ}\text{C}$ . The SOI weakened to near zero on average in June (down from  $+1.0$  in May, and around  $+0.9$  for AMJ). OLR anomalies for June show strongly suppressed convection near the Solomons, extending to east of the Date Line. Consistent with this, the TRMM ENSO index has dropped further to  $-1.2$  in the 30-day mean to 27 June (values of  $-1.0$  or less are typical of La Niña conditions). The trade winds have been consistently stronger than normal west of the Date Line over the past month. The MJO has been weak recently, but an event is now developing with enhanced convection over the Indian Ocean. It is forecast to move only slowly eastwards through early July.



Surface temperature anomalies ( $^{\circ}\text{C}$ ) for June 2010

Most models monitored by NIWA predict the tropical Pacific to be in a La Niña state over the coming 6 months. The NCEP ENSO discussion of 3 June states that conditions are favourable for transition to La Niña conditions during JJA. The IRI summary of 17 June indicates a  $\sim 58\%$  probability for developing La Niña conditions from June through August (and  $41\%$  probability for maintaining neutral conditions), increasing to  $\sim 62\%$  probability of a La Niña from the August to October season through the remainder of 2010.

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

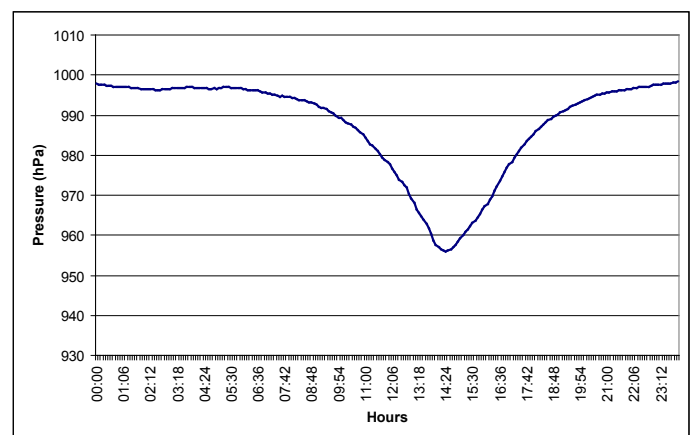
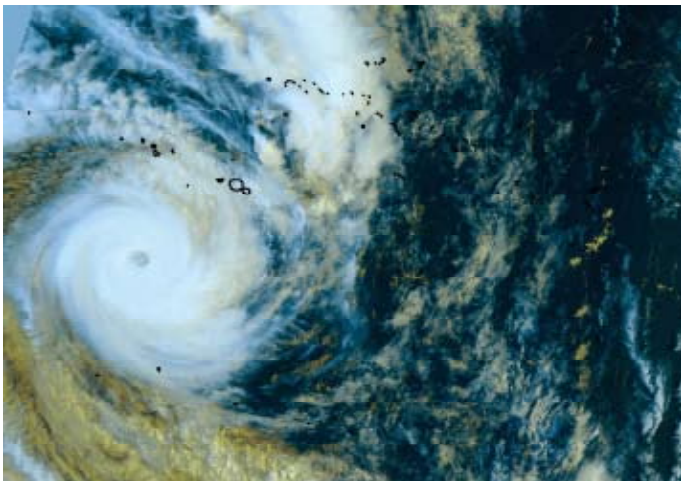
In the middle of the 2009/10 Tropical Cyclone (TC) season, Oli showed its power in French Polynesia by inducing strong swells and made a direct impact on the island of Tubuai. TC Oli crossed more than five thousand kilometers between 1 February and 6 February while in transit through the Southwest Pacific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



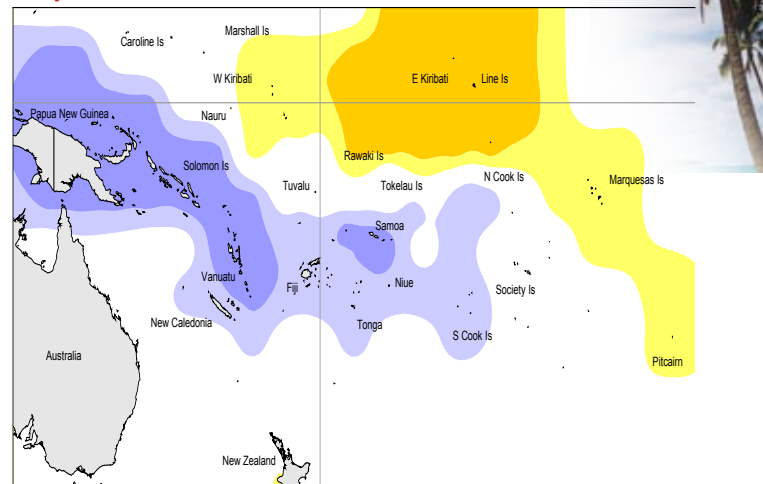
Above: Satellite imagery of TC Oli passing through French Polynesia (left), and pressure minima recorded at Tubuai during the storm (right)..

## Tropical rainfall and SST outlook: July to September 2010

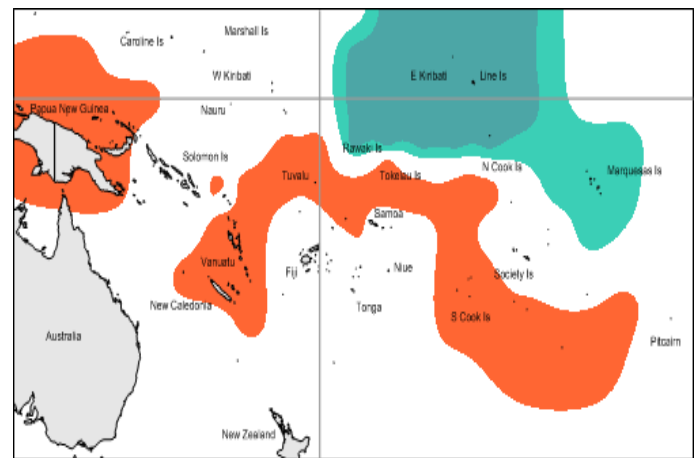
During July – September 2010, suppressed convection is likely in the southwest Pacific encompassing the Marquesas, the Tuamotu Archipelago, Eastern Kiribati, Pitcairn Island, and Western Kiribati. Near or below average rainfall is expected for those island groups, except for Eastern Kiribati where below 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 show a continued 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, while average or above average sea surface temperatures are forecast for Papua New Guinea, Vanuatu, New Caledonia, the Northern Cook Islands, the Austral Islands, Tokelau, Tuvalu and Wallis & Futuna. Near normal or below normal SSTs are forecast for the Marquesas, while Eastern Kiribati is expected to experience below normal SSTs. No clear SST guidance is offered for Fiji, Niue, the Society Islands, Tonga, and Western Kiribati. Near normal SSTs are forecast for the remainder of the southwest Pacific.

The multi-model ensemble forecast confidence for this rainfall outlook is moderately high. In the past, the average region-wide hit rate for rainfall forecasts issued in July is 64%, 3% higher than the long-term average for all months combined. The SST forecast confidence is mostly moderately



Rainfall outlook map for July to September 2010

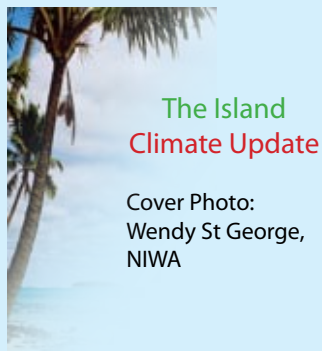


SST outlook map for July to September 2010

high, but the greatest uncertainty is localised around the International Date line..

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



## The Island Climate Update

Cover Photo:  
Wendy St George,  
NIWA

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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/>

#### 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/>