

## **Climate and Oceans Monitoring and Prediction (COMP)**

### **Pacific Islands - Online Climate Outlook Forum No. 97 Summary Report**

**Date:** Tuesday 20 October 2015

**Time:** Australian Eastern Daylight Time 11:00AM (01:00 UTC)

**Chair:** Bureau of Meteorology

**Main purpose for the OCOF:**

- To provide a regular forum for the 11 participating PIC NMSs to discuss the current ENSO status, recent one and three-month rainfall, drought (if present) and their seasonal climate outlooks with other countries and the COMP project team.

In addition it serves as an online training forum for recent SCOPIC<sup>\*</sup> development and gives the project team and the NMSs an opportunity to discuss other project related matters.

**Agenda:**

1. Brief introduction of PIC participants and the Bureau team.
2. Brief report on current ENSO status.
3. Each NMS report on their past one and three months rainfall in relation to the current ENSO situation (include ranking and verification), and their three-month outlooks. Wherever appropriate NMS to report on their drought status.
4. Round-table discussion: addressing general concerns/queries on outlooks and SCOPIC.
5. Feedback on COSPPac products and services.
6. Country statements with regards to drought or drought-like conditions, drought module issues/concerns.
7. Next meeting (Tuesday 10 November - TBC) and Chair (Kiribati).

**Participants:**

The Forum was attended by 9 climate officers from seven partner PIC NMSs.

**Cook Islands:**

**Fiji:** Arieta Baleisolomone and Swastika Devi

**Kiribati:** Mauna Eria

**Niue:**

**Papua New Guinea:** Kila Kila

**Republic of Marshall Islands:**

**Samoa:** Tile Tofaeono and Junior Lepale

**Solomon Islands:** Lloyd Tahani

**Tonga:** Uinita Vea

**Tuvalu:**

**Vanuatu:** Dephne Nalawas

**The Bureau team:** Grant Smith, Simon McGree and Elise Chandler

OCOFC tables were received from 10 participating countries before the meeting.

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\* Seasonal Climate Outlooks in the Pacific Island Countries: climate prediction software developed under the PI-CPP.

Australian Aid Project: Climate and Oceans Support Program in the Pacific (COSPPac)

**Observations and Verification of July to September 2015 outlooks:**

Observed rainfall for the one and three month periods ending September 2015 were discussed for each PIC. This month, several countries experienced extreme rainfall as shown in the following table:

Station	Period	Rainfall Amount (mm)	Rainfall Rank/Years of record	Year Records Begin
Rarotonga, Cook Islands	Sep	20.1	3/85	1929
Penrhyn, Cook Islands	Jul-Sep	93.7	4/77	1937
Rarotonga, Cook Islands	Jul-Sep	82.7	1/86	1929
Kiritmati, Kiribati	Sep	124.9	83/90	1921
Tarawa, Kiribati	Sep	358.5	64/66	1950
Kirimati, Kiribati	Jul-Sep	714.9	88/90	1921
Majuro, RMI	Jul-Sep	1195.1	56/61	1954
Nadzab, PNG	Sep	9.6	1/41	1974
Nadzab, PNG	Jul-Sep	75.6	2/39	1974
Port Moresby, PNG	Sep	2.2	9/118	1875
Momote, PNG	Jul-Sep	342.4	1/61	1950
Afiamalu, Samoa	Sep	27.3	1/59	1903
Apia, Samoa	Sep	7.8	4/126	1890
Nafanua, Samoa	Sep	5.9	3/41	1965
Apia, Samoa	Jul-Sep	74.9	5/126	1890
Faleolo, Samoa	Jul-Sep	107.3	4/51	1956
Nafanua, Samoa	Jul-Sep	117	2/41	1965
Lata, Solomon Is	Jul-Sep	668	4/41	1975
Munda, Solomon Is	Jul-Sep	464	3/54	1962
Lemap, Vanuatu	Sep	4.5	2/55	1961
Port Vila, Vanuatu	Sep	4	3/63	1953
Sola, Vanuatu	Sep	58.1	4/41	1971
Whitegrass, Vanuatu	Sep	0.4	2/43	1972
Lemap, Vanuatu	Jul-Sep	104	4/54	1961
Sola, Vanuatu	Jul-Sep	351.6	3/38	1971

[Note: The above data may not have undergone quality control]

Validation of forecasts with observed rainfall for the July to September 2015 (OCOF #93) period showed 25 consistent, 15 near-consistent and 6 inconsistent outlooks (48 stations across 10 countries).

The largest inconsistency was at Penrhyn, Cook Islands, where below normal rainfall was observed (93.7 mm) against outlook probabilities of 8/21/71 with high skill (LEPS=15.6%). The strongest consistent verification was at Wewak, PNG, where below normal rainfall was observed (465.2 mm), with outlook probabilities of 84/13/3 and very high skill (LEPS= 27.4%).

A summary of results (C-consistent, NC-Near Consistent, I-Inconsistent, NA-not available) for each country for the July to September 2015 outlook is as follows:

## Australian Aid Project: Climate and Oceans Support Program in the Pacific (COSPPac)

Cook Islands (1C, 1I); Fiji (7C, 4NC); Kiribati (1C, 2NC, 1I); Niue (1NC); PNG (3C, 1I); RMI (1C, 1I); Samoa (2C, 2NC); Solomon Islands (2C, 2NC, 3I); Tonga (2C, 3NC); Tuvalu (1C, 2NC) and Vanuatu (6C, 1NC).

**Overall: 25C, 15NC, 6I.**

### November to January 2016 Outlooks:

Of the 10 countries contributing to OCOF #97, the following predictors and periods were selected: Three-month average NINO3.4 (July-September) – four countries, Two-month average NINO3.4 (August-September) – five countries and one-month average NINO3.4 (September) – one country. NINO3.4 two-month average is recommended as this predictor/period is associated with the highest three-month outlook skill on a regional scale.

Seventy-eight percent of the 51 stations outlooks had the highest probabilities in tercile 1, 12% in tercile 2 and 8% in tercile 3. The remaining 2% had either near equal probabilities in two terciles, near equal probabilities in three terciles or a mixed outlook.

POAMA outlooks: Seventy-seven percent of the 39 station outlooks favoured tercile 1, 3% tercile 2 and 20% tercile 3.

### ENSO summary for the October 2015 OCOF

#### ENSO Status and equatorial sea surface temperatures (SSTs)

The 2015 El Niño is now the strongest since the 1997-98 event. The strong El Niño is expected to last until at least the end of the year before declining in the first quarter of 2016. Sea surface temperatures (SSTs) in the central to eastern tropical Pacific continue to warm, further entrenching El Niño.

September SST anomaly values for NINO3 were +2.2°C (up 0.2°C), NINO3.4 +2.0°C (up 0.1°C) and NINO4 +1.1°C (stable). The latest weekly values to 18 October are +2.2°C for NINO3, +2.1°C for NINO3.4 and +1.2°C for NINO4.

Weekly tropical Pacific Ocean temperature anomalies (i.e. difference from normal) in the central Pacific are now at their highest values since 1997–98, though still remain more than half a degree below the peak observed during 1997–98.

#### Tropical subsurface

The Bureau of Meteorology sub-surface temperature anomalies profile to 15 October shows a large pool of warm anomalies largely east of the Date Line to a depth of ~200 m. This pool of warm water has remained largely unchanged since May, with consistent warmth east of the Date Line in regions exceeding +4°C. Weak cool anomalies west of the Date Line have weakened in strength over the last few weeks, although the extent of these anomalies has remained largely unchanged since August.

The TAO/TRITON sub-surface temperature anomaly profile for the 5 days ending 17 October shows warm anomalies in the central to eastern Pacific, reaching to in excess of +6°C in the far east. Compared with a month ago, the El Niño warm anomalies have strengthened in extent and intensity. Cool anomalies in the western Pacific have weakened compared with last month and are now around -1 °C.

#### Coral Bleaching Status

The coral bleaching status remains at alert level 2 across Kiribati which includes the Phoenix Islands (although it is retreating), the Gilbert Islands, and the Line Islands. At this alert level, coral mortality can be expected for many coral species. The coral bleaching forecast shows the thermal stress is largely unchanged over the next four weeks.

### **Sea Level Anomaly**

The sea level patterns are fairly stable compared to the previous month. The central Pacific maximum sea level anomaly area is +300mm; this area has increased in size over the past month.

### **Ocean Currents**

Pacific Ocean currents are impacted by the change in wind patterns relating to El Niño. A strong north equatorial surface current anomaly is present from the western to the central Pacific, moving more warm water eastward at a rate of between 0.4 and 0.8 m/s. The westward travelling equatorial current has returned.

### **Southern Oscillation Index (SOI)**

The September 2015 SOI was  $-17.7$ , slightly higher than August's value of  $-19.8$ . The approximate 30-day SOI value to 19 October was  $-21.7$  and the 90-day value  $-20.2$ . The SOI has remained firmly negative since May (and largely negative over the last 15 months), with current values typical of an El Niño.

### **Trade Winds**

The TAO/TRITON image of trade winds for the 5 days ending 17 October 2015 shows they remain weak to the east of the Date Line and in some places have reversed direction, i.e. westerly wind anomalies. Trade winds have been consistently weaker than average, and on occasion reversed in direction, since the start of 2015.

### **Modes of Variability**

#### **South Pacific Convergence Zone (SPCZ), West Pacific Monsoon (WPM), Intertropical Convergence Zone (ITCZ)**

The TRMM 30-day rainfall anomaly map to 18 October 2015 shows an enhanced and southward displaced ITCZ across most of the tropical north Pacific with the exception of the far west Pacific (north of New Guinea). In the south Pacific, the SPCZ is displaced northeastward as a blob of enhanced activity and appears to have merged with the ITCZ. Rainfall has been strongly suppressed over PNG, the Solomon Islands and to a lesser extent Vanuatu and New Caledonia.

#### **Madden Julian Oscillation (MJO)**

There is little Madden–Julian Oscillation (MJO) activity at the current time and hasn't been much over the last month. The NCEP GEFS model favours an increase in MJO activity into the Western Hemisphere over the coming weeks.

### **ENSO Outlook**

The latest NINO3.4 forecasts (initialised in October) indicate that SSTs across the central tropical Pacific Ocean are likely to remain above El Niño thresholds through until at least early 2016. The average of the model forecasts for January is high at  $+2.5$  °C, but drops to  $+1.7$  °C by March. This value of NINO3.4 has only been observed on a few occasions since the late 1970s; during the 1982-83 and 1997-98 El Niño events. Individual model output ranges between  $+1.7$  and  $+3.0$  for January; all well above the El Niño threshold and indicative of a substantial El Niño.

**Observed Rainfall and Validation**

<b>Country</b>	<b>September 2015</b>	<b>July to September 2015</b>	<b>Verification<sup>†</sup> for July-September 2015 outlooks</b>
<b>Cook Islands</b>	Below normal	Below normal	Consistent to inconsistent
<b>Fiji</b>	Below normal to normal	Below normal to normal	Consistent to near consistent
<b>Kiribati</b>			
<b>Niue</b>	Below normal	Below normal	Near consistent
<b>Papua New Guinea</b>	Below normal	Below normal	Consistent to inconsistent
<b>RMI</b>	Normal to above normal	Above normal	Consistent to inconsistent
<b>Samoa</b>	Below normal	Below normal	Consistent to near consistent
<b>Solomon Islands</b>	Below normal to normal	Below normal to above normal	Consistent to inconsistent
<b>Tonga</b>	Normal to above normal	Below normal to normal	Consistent to near consistent
<b>Tuvalu</b>	Below normal to normal	Normal to above normal	Consistent to near consistent
<b>Vanuatu</b>	Below normal	Below normal (normal at Whitegrass)	Consistent and near consistent

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<sup>†</sup> Forecast is consistent when observed and predicted (tercile with the highest probability) categories coincide (are in the same tercile).

Forecast is near-consistent when observed and predicted (tercile with the highest probability) differ by only one category (i.e. terciles 1 and 2 or terciles 2 and 3).

Forecast is inconsistent when observed and predicted (tercile with the highest probability) differ by two categories (i.e. terciles 1 and 3).