Climate and Oceans Monitoring and Prediction (COMP)

Pacific Islands - Online Climate Outlook Forum No. 96 Summary Report

Date: Tuesday 15 September 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* 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 13 October - TBC) and Chair (Cook Islands).

Participants:

The Forum was attended by 12 climate officers from six partner PIC NMSs.

Cook Islands:

Fiji: Arieta Baleisolomone, Swastika Devi and Bipendra Prakash

Kiribati: Mauna Eria

Niue: Mellisa Douglas, Hingano Laufoli and Sean Tukutama

Papua New Guinea:

Republic of Marshall Islands:

Samoa: Faapisa Aiono, Tile Tofaeono and Junior Lepale

Solomon Islands:

Tonga: Uinita Vea

Tuvalu:

Vanuatu: Mercy Nalawas

The Bureau team: Grant Smith, Grant Beard and Simon McGree

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

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

Observations and Verification of June to August 2015 outlooks:

Observed rainfall for the one and three month periods ending August 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
Penrhyn, Cook Islands	Aug	22.4	3/78	1937
Penrhyn, Cook Islands	Jun-Aug	90.9	2/77	1937
Rarotonga, Cook Islands	Jun-Aug	149.9	6/86	1899
Penang Mill, Fiji	Jun-Aug	71.2	8/106	1910
Kiritmati, Kiribati	Aug	171.7	87/90	1923
Kiritimati, Kiribati	Jun-Aug	1018.6	90/90	1923
Momote, PNG	Aug	70.4	3/66	1949
Kavieng, PNG	Aug	2.6	2/85	1916
Port Moresby, PNG	Aug	0.0	1/118	1875
Momote, PNG	Jun-Aug	435.4	1/66	1949
Misima, PNG	Jun-Aug	118.4	2/87	1917
Faleolo Airport, Samoa	Jun-Aug	95.9	3/52	1961
Honiara, Solomon Islands	Aug	12	2/60	1954
Kirakira, Solomon Islands	Aug	71	4/48	1965
Munda, Solomon Islands	Aug	76	2/54	1962
Henderson Airport, Solomon Islands	Jun-Aug	708	40/40	1975
Nuku'alofa, Tonga	Aug	86.8	67/71	1944
Niulakita, Tuvalu	Aug	343.8	57/63	1952
Whitegrass, Vanuatu	Aug	162.2	41/44	1971
Whitegrass, Vanuatu	Jun-Aug	344.5	40/43	1971

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

Validation of forecasts with observed rainfall for the June to August 2015 (OCOF #92) period showed 25 consistent, 13 near-consistent and 13 inconsistent outlooks (51 stations across 10 countries).

The largest inconsistency was at Wewak, PNG, where above normal rainfall was observed (639 mm) against outlook probabilities of 75/18/7 with very high skill (LEPS=27.3%). The strongest consistent verification was at Misima, PNG, where below normal rainfall was observed (118.4 mm), with outlook probabilities of 76/21/3 and very high skill (LEPS= 30.5%).

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

Cook Islands (1C,1I); Fiji (9C, 2NC); Kiribati (1C, 2NC, 1I); Niue (1I); PNG (2C, 2NC, 1I); Samoa (3C, 1NC); Solomon Islands (1C, 6I); Tonga (1C, 4NC, 1I); Tuvalu (2C, 2NC) and Vanuatu (5C, 2I).

Overall: 25C, 13NC, 13I.

October to December 2015 Outlooks:

Of the 10 countries contributing to OCOF #96, the following predictors and periods were selected: Three-month average NINO3.4 (June-August) – four countries, Two-month average NINO3.4 (July-August) – five countries and one-month average NINO3.4 (August) – 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-five percent of the 55 stations outlooks had the highest probabilities in tercile 1, 7% in tercile 2 and 13% in tercile 3. The remaining 5% had either near equal probabilities in two terciles, near equal probabilities in three terciles or a mixed outlook.
POAMA outlooks: Seventy-two percent of the 44 station outlooks favoured tercile 1, 2% tercile 2 and 26% tercile 3.

ENSO summary for the September 2015 OCOF

ENSO Status and equatorial sea surface temperatures (SSTs)

The 2015 El Niño is now the strongest since the 1997-98 event. The tropical Pacific Ocean and atmosphere are fully coupled, with sea surface temperatures (SSTs) well above El Niño thresholds, consistently weak trade winds, and a strongly negative Southern Oscillation Index (SOI). In recent weeks, SST anomalies have increased along much of the equator in the eastern to central Pacific and in the northwestern Pacific. Warm anomalies persist along the equator from the South American coastline to the Date Line and across most of the Pacific Ocean east of the Date Line in the northern hemisphere

August SST anomaly values for NINO3 were +2.0°C (up 0.1°C), NINO3.4 +1.9°C (up 0.4°C) and NINO4 +1.1°C (stable). The latest weekly values to 13 September are +2.0°C for NINO3, +1.9°C for NINO3.4 and +1.1°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 10 September 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 mostly unchanged since May, with consistent warmth east of the Date Line, exceeding +4°C in regions. Weak cool anomalies west of the Date Line have strengthened in the last six weeks and moved slightly eastwards after having been sustained at around 100-200m below the surface over the previous few months.

The TAO/TRITON sub-surface temperature anomaly profile for the 5 days ending 12 September shows warm anomalies in the central to eastern Pacific, reaching to in excess of +7ºC in the far east. Compared with a month ago, the El Niño warm anomalies have strengthened in depth, extent and intensity. Cool anomalies in the western Pacific are now below –3 ºC.

Coral Bleaching Status

The coral bleaching status remains at alert level 2 across Kiribati which includes the Phoenix Islands, the Gilbert Islands, and the Line Islands. At this alert level, coral mortality can be expected for many coral species. Alerts are becoming stronger in the Marshall Islands EEZ, reaching the level of ‘warning’ and ‘alert level 1’ (coral bleaching is expected at this alert level). The coral bleaching forecast shows the thermal stress is increasing north of 10°N latitude to alert level 2 in the central Pacific. This region includes the Marshall Islands EEZ.

Sea Level Anomaly

The sea level patterns are fairly stable compared to the previous month. The lower sea levels in the western-equatorial Pacific are slightly less severe, but still have pockets of sea level anomaly as low as –24 cm. Likewise in the central Pacific with similar patterns to last month having small regions of sea level over 30 cm higher than normal.

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.

Southern Oscillation Index (SOI)

The August 2015 SOI was –19.8. The approximate 30-day SOI value to 12 September was –18 and the 90-day value –19. The SOI has remained firmly negative since May (and largely negative over the last 15 months), with current values typical of a moderate to strong El Niño.

Trade Winds

The TAO/TRITON image of trade winds for the 5 days ending 12 September 2015 shows the trade winds remain weak, i.e. westerly wind anomalies, in the western Pacific. Winds are closer to their climatological normal east of 170° W. 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 13 September 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 narrow east-west elongated, enhanced band of activity and appears to have merged with the ITCZ. The northeastward displacement and smaller SPCZ has resulted in suppressed rainfall from the southern Solomon Islands southeast to the southern Cook Islands.

Madden Julian Oscillation (MJO)

There is little Madden–Julian Oscillation (MJO) activity at the current time. There is some disagreement amongst international climate models on the position of the MJO in the coming fortnight. The NCEP GEFS model favours continued marginal activity while the Bureau of Meteorology model (BOMM) favours enhanced MJO activity over the Indonesian and western Pacific region in the coming week.

ENSO Outlook

The latest NINO3.4 forecasts (initialised in August) 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 November is high at +2.8 °C, but drops to +2.5 °C by January. 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 +2.4 and +3.5 for November; all well above the El Niño threshold and indicative of a substantial El Niño.

Observed Rainfall and Validation

Country	August 2015	June to August 2015	Verification† for June-August 2015 outlooks
Cook Islands	Below normal	Below normal	Consistent to inconsistent
Fiji	Normal to above normal	Below normal to normal	Consistent to near consistent
Kiribati	Normal to above normal	Normal to above Normal	Consistent to inconsistent
Niue	Normal	Below normal	Inconsistent
Papua New Guinea	Below normal to above normal	Below normal and above normal	Consistent to inconsistent
RMI			
Samoa	Below normal to normal	Below normal to above normal	Consistent to near consistent
Solomon Islands	Below normal	Normal to above normal	Consistent and inconsistent
Tonga	Below normal to normal	Below normal to above normal	Consistent to inconsistent
Tuvalu	Below normal to above normal	Normal to above normal	Consistent to near consistent
Vanuatu	Normal to above normal	Below normal and above normal	Consistent and inconsistent

† 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).