Climate and Oceans Monitoring and Prediction (COMP)

Pacific Islands - Online Climate Outlook Forum No. 95 Summary Report

Date: Tuesday 11 August 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 15 September) and Chair (Cook Islands).

Participants:

The Forum was attended by 21 climate officers from 11 partner PIC NMSs.

Cook Islands: Turi Tutai

Fiji: Arieta Baleisolomone

Kiribati: Mauna Eria, Kamaitia Rubetaake

Niue: Mellisa Douglas, Rossy Mitiepo

Papua New Guinea: Kisolel Posanau, Kila Kila and Nanao Bouauka

Republic of Marshall Islands: Nover Juria

Samoa: Faapisa Aiono, Faagalo Key

Solomon Islands: Max Norman, Lloyd Tahani

Tonga: Uinita Vea, Selubaia Finaulahi

Tuvalu: Meelina Ailesi, Eli Ene, Nico Iona

Vanuatu: Dephne Nalawas, Shanna Joseph

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

OCOF tables were received from 11 participating countries before and during the meeting.

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

Observations and Verification of May to July 2015 outlooks:

Observed rainfall for the one and three month periods ending July 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
Rarotonga, Cook Islands	July	10.6	1	117
Penrhyn, Cook Islands	May-Jul	121.6	3	76
Penang Mill, Fiji	July	3.6	4	106
Yasawa-i-rara, Fiji	July	15.6	3	62
Laucala Bay, Fiji	July	53.3	5	74
Labasa Airport, Fiji	July	0	1	60
Penang Mill, Fiji	May-Jul	90.4	7	106
Lautoka Mill, Fiji	May-Jul	47.2	3	116
Nadi Airport, Fiji	May-Jul	33.2	2	73
Yasawa-k-rara, Fiji	May-Jul	48.6	3	62
Laucala Bay, Fiji	May-Jul	203.1	3	74
Ono-i-lau, Fiji	May-Jul	129.8	4	65
Butaritari, Kiribati	July	87.8	2	74
Tarawa, Kiribati	May-Jul	993.6	62	66
Kiritimati, Kiribati	May-Jul	1017.7	88	90
Nadzab, PNG	July	24.6	3	41
Nafanua, Samoa	July	9.5	2	45
Apia, Samoa	July	4.6	2	126
Auki, Solomon Islands	July	396	53	54
Henderson, Solomon Islands	July	252	41	41
Honiara, Solomon Islands	July	219	58	60
Kirakira, Solomon Islands	July	903	49	49
Auki, Solomon Islands	May-Jul	1081	53	53
Henderson, Solomon Islands	May-Jul	708	40	40
Honiara, Solomon Islands	May-Jul	668	60	60
Kirakira, Solomon Islands	May-Jul	1646	49	49
Vava'u, Tonga	July	59.8	3	69
Fuaamotu, Tonga	July	20.8	1	36
Vava'u, Tonga	May-Jul	124.9	2	69
Nui, Tuvalu	July	503.7	68	70
Funafuti, Tuvalu	July	519.6	79	83
Nui, Tuvalu	May-Jul	834.8	65	70
Whitegrass, Vanuatu	July	163.9	41	43

Aneityum, Vanuatu	July	249	60	64
Whitegrass, Vanuatu	May-Jul	492.9	40	42

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

Validation of forecasts with observed rainfall for the May to July 2015 (OCOF #91) period showed 29 consistent, 14 near-consistent and 8 inconsistent outlooks (51 stations across 11 countries).

The largest inconsistency was at Kirakira, Solomon Islands, where above normal rainfall was observed (1646 mm) against outlook probabilities of 46/36/18 with good skill (LEPS=13.1%). The strongest consistent verification was at Misima, PNG, where below normal rainfall was observed (426.6 mm), with outlook probabilities of 58/36/6 and exceptional skill (LEPS= 36.5%).

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

Cook Islands (1C,1I); Fiji (10C,1I); Kiribati (3C); Niue (1NC); PNG (3C,1I); RMI (1C,1I); Samoa (2C,2NC); Solomon Islands (1C,2NC,4I); Tonga (5C, 1NC); Tuvalu (2C, 2NC); and Vanuatu (1C, 6NC).

Overall: 29C, 14NC, 8I.

September to November 2015 Outlooks:

Of the 11 countries contributing to OCOF #95, the following predictors and periods were selected: Three-month average NINO3.4 (May-July) – three countries, Two-month average NINO3.4 (June-July) – seven countries and one-month average NINO3.4 (July) – 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 55 stations outlooks had the highest probabilities in tercile 1, 2% in tercile 2 and 18% 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: twenty-seven percent of the 44 station outlooks favoured tercile 1, 37% tercile 2 and 36% tercile 3.

ENSO summary for the August 2015 OCOF

Ocean monitoring
Sea surface temperatures (SSTs)
The 2015 El Niño is now well-established. Sea surface temperatures in the central and western Pacific have continued to warm and cool anomalies in the western Pacific sub-surface eroded during July. In the coming weeks, the central tropical Pacific Ocean (i.e. the NINO3.4 region) may exceed the peak values reached during the 2002 and 2009 El Niño events, but current anomalies remain well short of the 1982 and 1997 peaks. Trade winds remain weak; a situation likely to contribute to more warming of the tropical Pacific Ocean.
July SST anomaly values for NINO3 were +1.9°C (up 0.3°C), NINO3.4 +1.5°C (up 0.2°C) and NINO4 +1.1°C (stable). The latest weekly values to 9 August are +1.9°C for NINO3, +1.7°C for NINO3.4 and +1.0°C for NINO4. In the far east Pacific NINO 1 & 2 anomalies are above 2.0°C.

Tropical subsurface
The Bureau of Meteorology sub-surface temperature anomalies profile to 6 August 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 strengthened slightly in early August 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 8 August shows warm anomalies in the central to eastern Pacific, reaching to in excess of +6ºC in the far east. Compared with a month ago, the El Niño warm anomalies have strengthened in depth, extent and intensity. Much weaker cool anomalies are shown persisting in the western Pacific.

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. The coral bleaching forecast shows the thermal stress will not change much over the next four weeks.

Sea Level Anomaly
The central and eastern Pacific sea level has risen over the past month showing a pattern that is consistent with the SST warming in line with the intensifying El Niño. Pockets of ocean reach as high as 30 cm above normal. Significantly lower sea levels persist over much of the Palau and FSM exclusive economic zones, with sea levels as low as 24 cm below average.

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 0.5 and 0.8 m/s.

Atmosphere monitoring
Southern Oscillation Index (SOI)
The July 2015 SOI was –14.7. The approximate 30-day SOI value to 8 August is –20 and the 90-day value –14. The SOI has remained firmly negative since July (and largely negative over the last 12 months), with current values typical of an El Niño.

Trade Winds
The TAO/TRITON image of trade winds for the 5 days ending 8 August 2015 shows they remain weak, i.e. westerly wind anomalies, in the western to central 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 9 August 2015 shows an enhanced ITCZ across the Pacific. In the south Pacific, the SPCZ was enhanced in the western Pacific and weakly enhanced east of the Date Line. Rainfall has been enhanced to the east of the Solomon Islands over Tuvalu, Nauru, Kiribati, Samoa and the northern Cook Islands.

Madden Julian Oscillation (MJO)
A strong Madden-Julian Oscillation (MJO) was present over the western Pacific in early July, but it weakened as it moved over the western hemisphere. The MJO signal has been indiscernible over the last week, and is therefore unlikely to have contributed significantly to tropical activity.

The MJO is forecast to remain weak for a few days before reappearing over the western tropical Pacific Ocean during the upcoming week. However, it is possible that climate models are detecting an El Niño signal rather than the MJO. If the MJO does reappear over the western Pacific Ocean, typical impacts at this time of year would include suppressed convection over the Indian Ocean and an increased chance of tropical activity over the northwest Pacific Ocean.

ENSO Outlook

The latest NINO3.4 forecasts (initialised in July) indicate the central tropical Pacific Ocean temperature is very likely to remain well above El Niño thresholds at least for the remainder of the year. The average of the model forecasts for December is high at +2.7 °C; this value of NINO3.4 has only been observed on a few occasions since 1980; during the 1982-83 and 1997-98 El Niño events. Individual model output ranges between +2.3 and +3.1 for October; all well above the El Niño threshold.

For up to date information on the state of ENSO please refer to the links below;
BoM ENSO Wrap Up - http://www.bom.gov.au/climate/enso/
BoM model survey - http://www.bom.gov.au/climate/ahead/ENSO-summary.shtml
IRI model summary - http://iri.columbia.edu/climate/ENSO/currentinfo/SST_table.html

Observed Rainfall and Validation

Country	July 2015	May to July 2015	Verification† for May-July 2015 outlooks
Cook Islands	Below normal	Below normal	Consistent to inconsistent
Fiji	Below normal to normal	Below normal	Consistent to inconsistent
Kiribati	Above normal to below normal	Above Normal	Consistent
Niue	Below normal	Below normal	Near consistent
Papua New Guinea	Below normal to above normal	Below normal to above normal	Consistent to inconsistent
RMI	Below normal to normal	Normal to above normal	Consistent to inconsistent
Samoa	Below normal [normal at Afiamalu]	Normal to below normal	Consistent to near consistent
Solomon Islands	Below normal to above normal	Normal to above normal	Consistent to inconsistent
Tonga	Below normal	Below normal	Consistent to near consistent
Tuvalu	Above normal	Above normal [normal at Nanumea]	Consistent to near consistent
Vanuatu	Below normal to above normal	Below normal to above normal	Consistent to near consistent

† 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).