

CLIMATE SUMMARY AUGUST 2016

Samoa Meteorology Division

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HIGHLIGHTS

- ◆ August 2016 registered “average to above average” rainfall. **Pg 1 & 2**
- ◆ Apia recorded the hottest day time temperature of 33.6°C on August 18th. Afiamalu recorded the lowest minimum temperature of 14.1°C on the 8th. **Pg 3**
- ◆ Generally, easterlies persist to dominate the island in August. Light winds (0-10km/hr) and gentle winds (10-20km/hr) were dominating. **Pg 4**
- ◆ Neutral phase continues in the Pacific in August with La Nina still in the forecast for late 2016. **Pg 5**
- ◆ Sea surface temperature continued to be cooler than normal in the central and equatorial Pacific region in August with weak cool anomalies of the sub surface temperature observed in comparison to July 2016. **Pg 6**

Issued : September 2016

Figure 1: SPCZ Position in August 2016

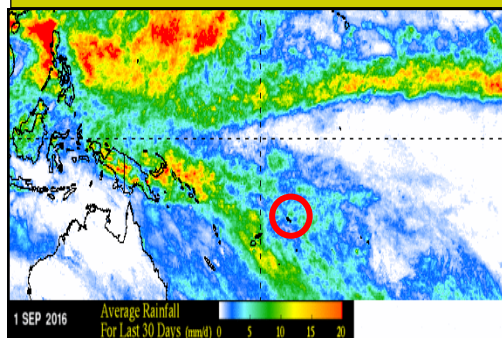
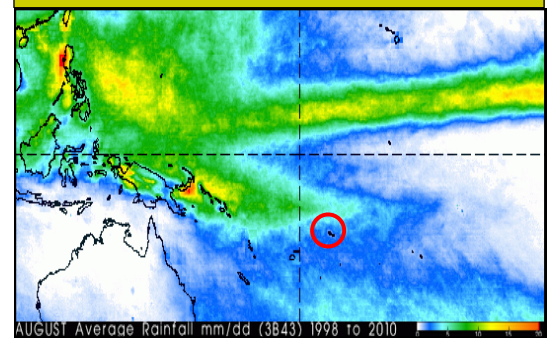


Figure 2: Normal Position of SPCZ in August



GLOBAL SCALE OBSERVATIONS

In August 2016, the Inter-tropical Convergence Zone (ITCZ) positioned further north of its normal position and it was enhanced to the further north of Papua New Guinea and far eastern region. The South Pacific Convergence Zone (SPCZ) on the other hand extended from the Solomon Islands towards the Tokelau group. Additionally, convection was enhanced in the south pacific over Fiji, southern of Tonga and further southeastward. (*COSSPAC Bulletin, August 2016*)

LOCAL SCALE OBSERVATIONS

August 2016 was considerably *wetter than usual* for Samoa with rainfall recorded being ‘average to above average’. In fact; out of 28 rainfall stations, 13 stations recorded ‘average’, 7 registered ‘above average’, 6 stations received ‘well above average’ and 2 stations from the north western of Savaii recorded ‘below average’ rainfall. The driest station in August was Letui recording 43.0mm of total rainfall followed by Fogasavaii with merely 46.0mm. Moreover, Lotofaga Aleipata was the wettest station during the month with 644.5mm of rainfall followed by Togitogiga, Nuusuatia and Salani with 644.5mm, 489.4mm and 370.0mm respectively. Notably, it is in fact the wettest August for Salani station since establishment. Additionally, Togitogiga observed the highest one day fall in 24 hours of 184.0mm followed by Lotofaga, Salani and Nuusuatia with 175.6mm, 144.8mm and 120.0mm of rainfall respectively on the same day - August 21st. Togitogiga recorded the highest number of rainy days of 28 followed by Tiavea with 26. On the other hand, Asau and Maota recorded the least number of rainy days of 5, followed by 7 at Neiafu.

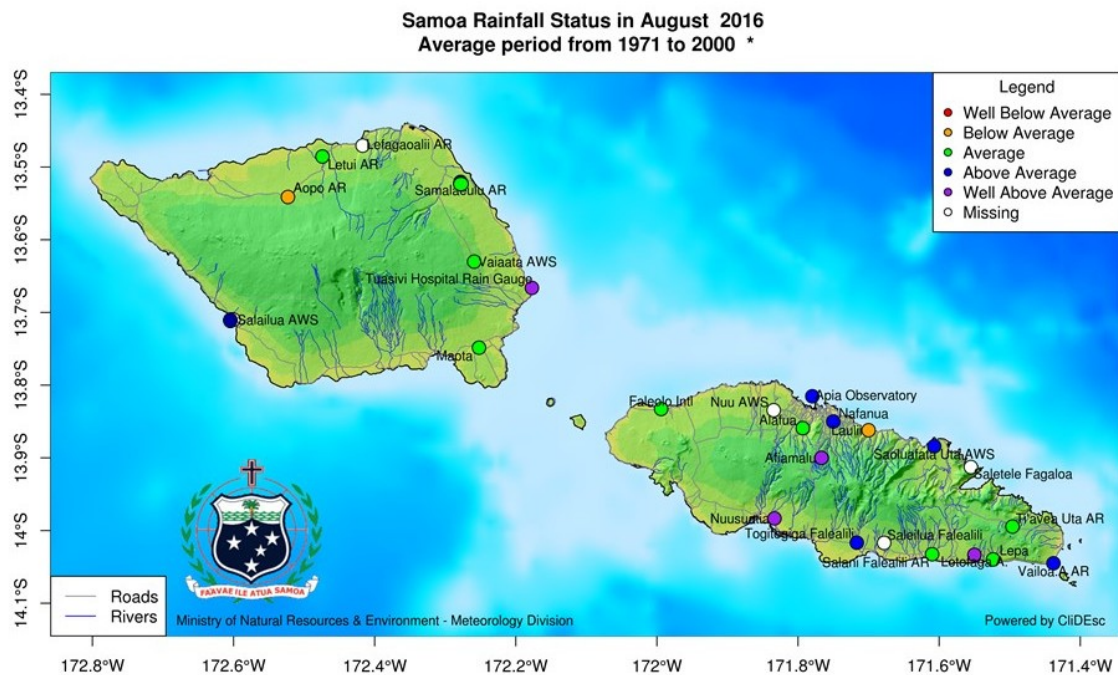
Table 1: Rainfall Statistics in August 2016

This table displays the rainfall status of all stations in the country in August 2016

Stations	August Rainfall (mm)	August 30 Year Long Term Average	% of Average	1 day fall (mm)	Date	# of Rainy Days	Rainfall Status
UPOLU							
Faleolo	122.2	114	108	50.0	23rd	18	Average
Fasitoo	94.6	93	102	32.1	7th	13	Average
Leauvaa	221.2	165	134	63.6	3rd	18	Above Average
Nafanua	132.1	103	128	45.0	23rd	22	Above Average
Afiamalu	271.6	169	161	120.0	24th	25	Well Above Average
Apia	163.4	110	149	52.5	23rd	17	Above Average
Savalalo	108.1	110	98	36.8	23rd	11	Average
Alafua	145.5	134	109	54.6	23rd	20	Average
Saoluafata	184.6	135	137	59.8	24th	21	Above Average
Ti'avea Uta	295.6	352	84	80.0	21st	26	Average
Lepa	234.0	205	114	42.2	21st	23	Average
Lotofaga	644.5	240	269	175.6	21st	20	Well Above Average
Salani Falealili	370.0	348	106	144.8	21st	22	Average
Vailoa Aleipata	207.6	147	141	82.6	21st	21	Above Average
Togitogiga	541.6	355	153	184.0	21st	28	Above Average
Nuusuatia	489.4	273	179	120.0	24th	21	Well Above Average
SAVAII							
Aopo	58.6	104	56	31.6	23rd	20	Below Average
Asau	48.7	84	58	27.1	24th	5	Below Average
Samalaeulu	165.6	200	83	95.6	23rd	24	Average
Tuasivi	209.6	114	185	85.8	23rd	18	Well Above Average
Maota	201.6	194	104	101.6	24th	5	Average
Letui	43.0	43	100	13.2	23rd	12	Average
Neiafu	148.6	68	219	49.0	24th	7	Well Above Average
Vaipouli	112.2	126	89	41.3	23rd	16	Average
Vaiaata	242.0	245	99	115.8	23rd	20	Average
Fogasavaii	46.0	52	85	18.8	23rd	8	Average
Lalomalava	238.6	141	169	88.0	23rd	19	Well Above Average
Salailua	204.9	162	126	64.4	21st	12	Above Average

Figure 3: Rainfall Status Map in August 2016

This rainfall map is generated using observation data from Table 1



TEMPERATURE

Table 2: Air Temperature Statistics

This table displays the temperature statistics recorded across stations in August 2016

Stations	Temperature (Degree Celsius)				
	Mean Daily Temperature	Extreme Temp Max	Date	Extreme T Min	Date
Faleolo	27.4	33.0	12th	20.0	29th
Nafanua	N/A	N/A	N/A	19.1	26th
Afiamalua	21.6	28.1	4th	14.1	8th
Apia	28.1	33.6	18th	21.5	26th
Alafua	26.6	32.4	11th	19.0	26th
Togitogiga	N/A	N/A	N/A	20.5	26th
Saolua'ata	26.6	32.0	12th	18.7	8th

N/A = Data Not Available

Apia recorded the highest maximum temperature of 33.6°C on the 18th of August followed by the 33.0°C at Faleolo on the 12th. The lowest minimum temperature of 14.1°C was registered at Afiamalua on the 8th of August followed by 18.7°C on the same date at Saolua'ata. The mean daily temperature spanned from 21.6°C recorded at Afiamalua to 28.1°C that was registered at Apia station. The average daily temperature in Apia was 1.7°C warmer than its 30 year long term average of 26.4°C. This is possibly due to the significant amount of cloud cover on average for this month slowing the rate of radiative cooling overnight up to the time of the observation and also due to the location of the station, been exposed to warm breeze throughout the whole month.

ATMOSPHERIC PRESSURE

Table 3: Atmospheric Pressure at Mean Sea Level (MSL)

This table displays the atmospheric statistics recorded across two stations in August 2016

Station	Highest MSL Pressure (hPa)	Date	Lowest MSL Pressure (hPa)	Date	Average MSL Pressure (hPa)
Apia	1017.7	27th	1008.0	2nd	1012.0
Faleolo	1017.9	27th	1008.2	1st	1012.3

August 27th recorded the highest MSL pressure of 1017.7hPa and 1017.9hPa at Apia and Faleolo respectively. The lowest MSL pressure of 1008.0hPa was recorded on the 2nd at Apia. The average MSL pressure at Faleolo was 0.3hPa greater than the average MSL pressure at Apia. The average MSL pressure at Apia is 1012.0hPa and this is below normal compared to the 30 year long term average of 1012.7hPa.

(Note: High pressure systems associate with good weather conditions whereas low pressure systems associate with bad weather conditions)

WIND

Figure 4: Wind Speed and Directions

The following diagrams show the different wind speed and direction that recorded daily at 9am across the country in August 2016.

Figure 4a : Apia Station

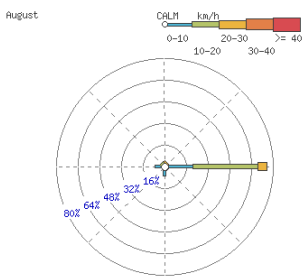


Figure 4b: Faleolo Station

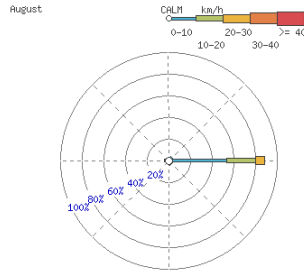


Figure 4c: Afiamalu Station

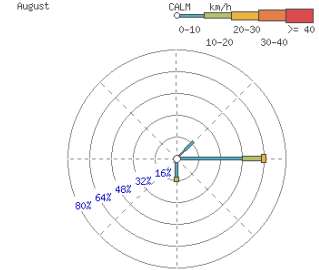


Figure 4d: Togitogiga Station

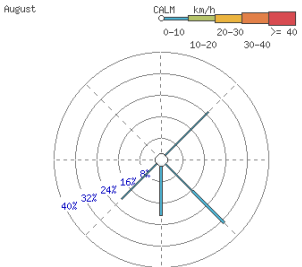


Figure 4e: Saoluafata Station

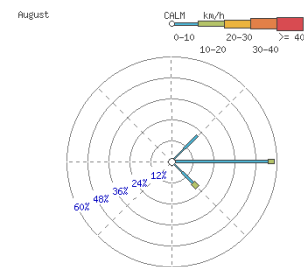
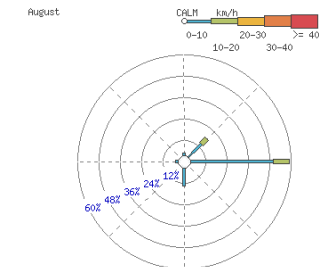


Figure 4f: Nafanua Station



Generally, easterlies accounted for most of the time in August across all stations with south westerlies recorded at Togitogiga at about 22% of the time. The most dominant wind speed of 0-10km/hr were commonly experienced at all stations with gentle winds (10-km/hr) the second most dominant. Moderate winds (20-30km/hr) observed at Apia, Afiamalu and Faleolo from the east.

EL NINO SOUTHERN OSCILLATION (ENSO)

CURRENT ENSO STATUS

ENSO—Neutral (neither EL Nino nor La Nina) continues in the Pacific.

ENSO Neutral conditions were observed in August although sea surface temperature (SST) were below average over the east –central equatorial Pacific Ocean. In terms of the sea surface temperature, cooler anomalies observed in July were weaker in August across the eastern Pacific with the warmer anomalies enhances on the west 170°W.

The Southern Oscillation Index (SOI) value for August was +5.3 which increased from +4.2 that was previously registered in July. Additionally, +7.5 value was recorded recently on the 10th September and this is already in threshold of a La Nina; however it has to remain at or above +7 as well as positive collaboration with the warm SST in order to consider a La Nina event.

*(Refer to “Seasonal Rainfall & Temperature Outlook : October to December 2016 by Samoa Meteorology Division for **ENSO OUTLOOK**)*

Impacts of La Nina on Samoa

- ◆ Above normal rainfall receive which may lead to flooding of low lying areas.
- ◆ Higher than normal sea level.
- ◆ Increase potential of water borne disease due to flooding.

The following sectors could be severely impacted as a consequence of abundant of rainfall:

- ◆ Agriculture
- ◆ Health
- ◆ Tourist (Accommodation Facilities)
- ◆ Forestry



Climate Information

La Nina is the positive phase of ENSO sometimes it is known as the ‘opposite of El Nino’. The recent La Nina event occurred in 2010-2012 which listed as one of the strongest on record.

La Nina Thresholds

La Nina is declared when any of the following three criteria is satisfied:

- ◆ **Sea surface temperature:** Temperatures in the NINO3 or NINO3.4 regions of the Pacific Ocean are 0.8 °C cooler than average.
- ◆ **Winds:** Trade winds have been stronger than average in the western equatorial Pacific Ocean during any three of the last four months.
- ◆ **SOI:** The three-month average SOI is +7 or higher.
- ◆ **Models:** A majority of surveyed climate models show cooling to at least 0.8 °C below average in the NINO3 or NINO3.4 regions of the Pacific Ocean until the end of the year.

SEA SURFACE TEMPERATURE

Figure 5 : Sea Surface Temperature in July 2016

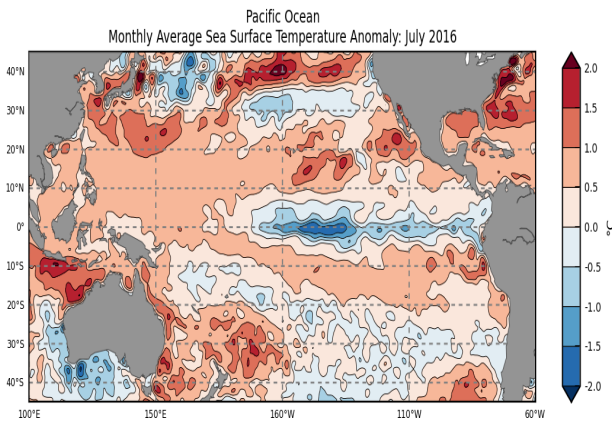
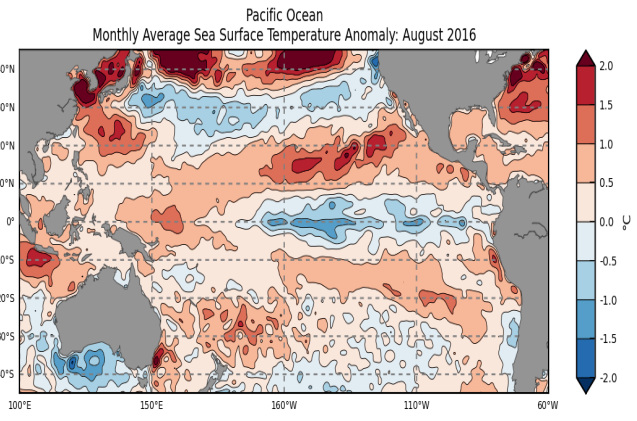


Figure 6 : Sea Surface Temperature in August 2016

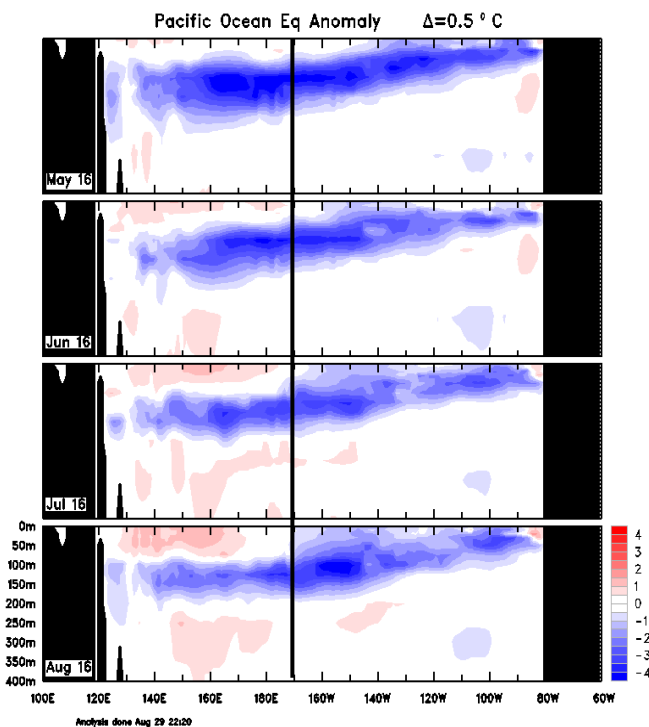


The sea surface temperature (SST) in August were cooler in a narrow band extending from the central to the eastern equatorial region; however it was weaker compared to July SST anomalies. Warmer SST registered on areas surrounding this cold band in the 10degN/S to 20degN/S latitude as well as areas surrounding Australia towards Cook Islands in the Pacific. The August value for the NINO3.4 region was $-0.4\text{ }^{\circ}\text{C}$, $0.1\text{ }^{\circ}\text{C}$ cooler than for July, while the value for the NINO4 region was $0.1\text{ }^{\circ}\text{C}$ warmer at $-0.2\text{ }^{\circ}\text{C}$, and NINO3 remained unchanged at $-0.3\text{ }^{\circ}\text{C}$.

SUB-SURFACE TEMPERATURE

Figure 7: Sub Sea Surface Temperature in August 2016

The sub surface temperature anomaly in August 2016 adapted from Bureau of Meteorology, Australia



The four monthly sequence of equatorial sub-surface water temperature plot to August extracted from Bureau of Meteorology displays cool anomalies observed at the entire width of the equatorial Pacific Ocean with the exception of the top 50 m of water west of 170°W which recorded slightly warmer than average. In comparison to the July sub-surface anomalies, these warm anomalies have enhanced whilst the pattern of cool anomalies remains similar. Samoa recorded cooler anomalies at 100m down to 200m depth.

(N.B : The black line indicates the position of Samoa)