



CLIMATE SUMMARY DECEMBER 2018

Samoa Meteorology Division

Ministry of Natural Resources and Environment

W: www.samet.gov.ws

Ph: (685) 20855/20856

F: www.facebook.com/Samoa Meteorological Services

HIGHLIGHTS

- ◆ Above Average rainfall was generally the status across the Island for December. **Pg. 1 & 2**
- ◆ The warmest temperature of 35.7°C was registered on the 04th of the month **Pg. 3**
- ◆ Easterly winds remain dominant for the group in December. **Pg 4 & 5**
- ◆ Sea surface temperatures are now within neutral range, but still leaning towards El Nino thresholds in the next few months, as suggested by climate models. **Pg 6**
- ◆ Warm sub surface temperatures that migrated eastward have now receded back to the Central Equatorial region, and was observed to cool down to neutral levels as seen in Figure 6 **Pg 6**.

ISSUED: JANUARY 2018

Figure 1: SPCZ Position in December 2018

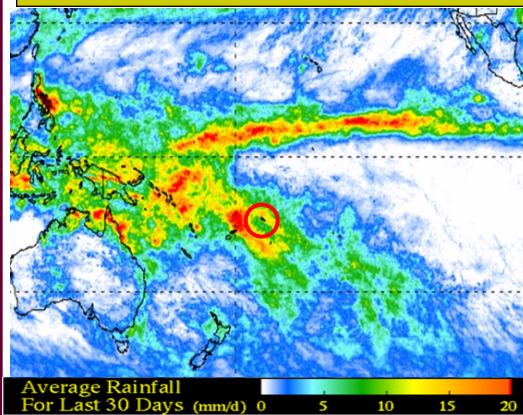
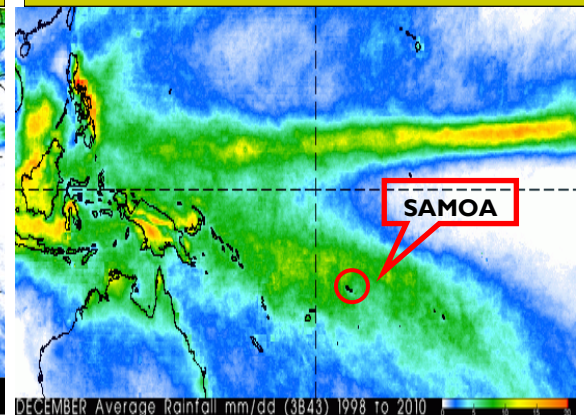


Figure 2: Normal Position of SPCZ in December



GLOBAL SCALE OBSERVATIONS

A northward fluctuation of the Inter Tropical Convergence Zone was observed for the month of November, and was generally more active than normal. The South Pacific Convergence Zone on the other hand was seen to be confined to the Western Equatorial Region, with enhanced rainfall activity, extending over the group. The positioning of the SPCZ provided fair amount of rainfall for Samoa in December 2018.

LOCAL SCALE OBSERVATIONS

The SPCZ fluctuated within the vicinity of the group due to the weakening and strengthening of the Subtropical highs to the far south of the island. This fluctuation activity allows moderate to heavy falls for most part of the country during the second week of December. In addition, the statistics generally showed above average precipitation, with the highest recorded at Afiamalu station of 810.0mm, and the second highest of 781.4mm over at Ti'avea. The second week of December was observed to be very wet, providing severe weather for the group, therefore, the highest and second highest 1 day fall of 303.4mm and 240.0mm were both recorded on the 10th of the month. On the other hand, the lowest December rainfall received during this period was registered at Saletele of 228.3mm, with the second lowest of 389.1mm at Faleolo station. Moreover, Table 1 shows that 1 station was registered *Below Average*, 7 with *Average*, 9 were *Above Average* and 2 more with *Well Above Average* rainfall.

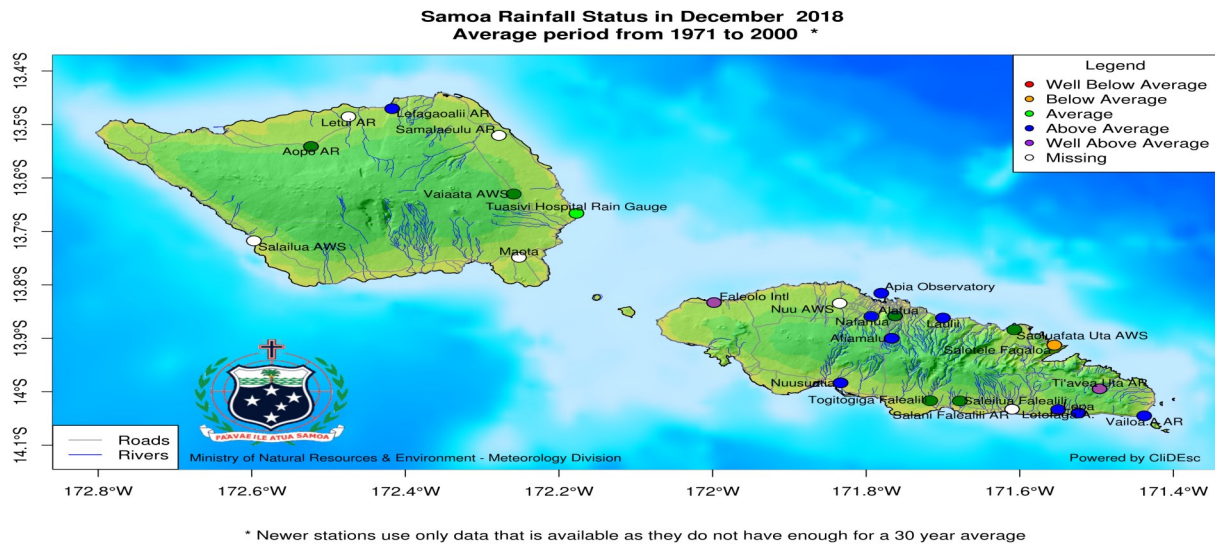
Table 1: Rainfall Statistics in December 2018

This table displays the rainfall status of all stations in the country in December 2018

Stations	December Rainfall (mm)	December 30 Year Long Term Average	% of Average	1 day fall (mm)	Date	# of Rainy Days	Rainfall Status	
UPOLU								
Afiamalu	810.2	578	140	167.0	10 th	27	Above Average	
Alafua	420.5	500	84	116.8	10 th	23	Average	
Apia	507.6	353	144	148.2	10 th	24	Above Average	
Faleolo	389.1	237	164	78.0	10 th	16	Well Above Average	
Laulii	524.2	399	131	160.5	10 th	17	Above Average	
Lepa	653.7	485	134	115.6	10 th	25	Above Average	
Lotofaga	573.6	378	151	117.6	26 th	27	Above Average	
Matautu Falelatai	500.2	578	87	96.2	10 th	22	Average	
Nafanua	521.7	385	135	143.0	10 th	28	Above Average	
Nuusuatia	548.8	348	158	92.4	11 th	24	Above Average	
Saleilua	432.0	420	103	137.2	10 th	20	Average	
Saletele	228.3	533	43	24	06 th	30	Below Average	
Saoluafata	492.4	462	107	153.8	10 th	31	Average	
Ti'avea	756.0	420	180	240.0	10 th	30	Well Above Average	
Togitogiga	456.0	435	105	79.4	09 th	29	Average	
Vailoa.A	543.2	391	139	227.6	10 th	27	Above Average	
Savaii								
Aopo	781.4	704	111	303.4	10 th	19	Average	
Lefagaoalii	475.2	334	142	82.0	08 th	19	Above Average	
Tuasivi	409.8	407	101	124.0	10 th	29	Average	
Vaiaata	674.0	630	107	119.6	10 th	29	Average	
Well Below Average <40%		Below Average 40%-80%		Average 80%-120%		Above Average 120%-160%		Well Above Average >160%

Figure 3: Rainfall Status Map in December 2018

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 December 2018

Stations	Temperature (Degree Celsius)				
	Mean Daily Temperature (°C)	Extreme Temp Max (°C)	Date	Extreme Temp Min(°C)	Date
Afiamalu	NA	NA	NA	16.5	20 th
Apia	27.9	32.2	03 rd	23.1	13 th
Alafua	NA	NA	NA	22.7	13 th
Faleolo	NA	NA	NA	22.1	26 th
Saolufata	27.3	35.7	04 th	21.9	13 th
Vaiaata	28.4	34.2	17 th	23.5	21 st
N/A = Data Not Available					

According to table 2, December temperatures ranged from 27.3°C to 28.4°C. Moreover, cool nights were observed on the second and third week of the month, where the coolest night time temperature of 16.5°C was recorded at Afiamalu station. Observations for the first week however showed stable conditions, with the warmest of 35.7°C was recorded on the 04th at Saolufata station.

ATMOSPHERIC PRESSURE

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

This table displays the atmospheric statistics recorded across two stations in December 2018

Station	Highest MSL Pressure (hPa)	Date	Lowest MSL Pressure (hPa)	Date	Average MSL Pressure (hPa)
Apia	1013.5	19 th	1006.0	10 th	1010.1
Faleolo	1013.6	02 nd	1006.3	10 th	1009.9

The highest MSL pressure of 1013.6hPa for December was recorded at Faleolo station on the 02nd. On the other hand, the lowest was also recorded at Apia station of 1006.0hPa, on the 10th.

(Note: Generally, 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 December 2018.

Figure 4a : Apia Station

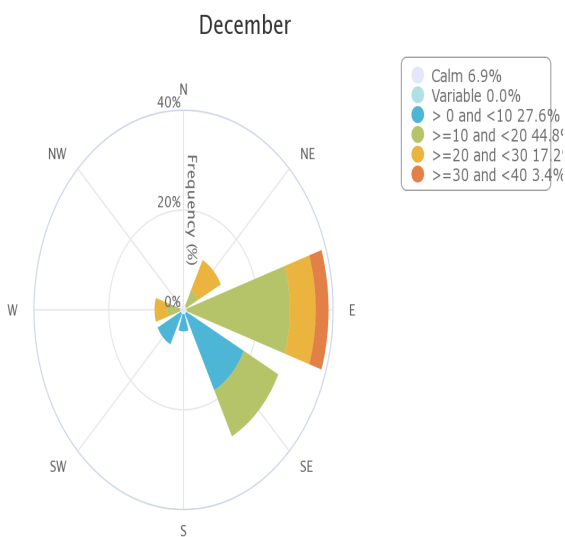
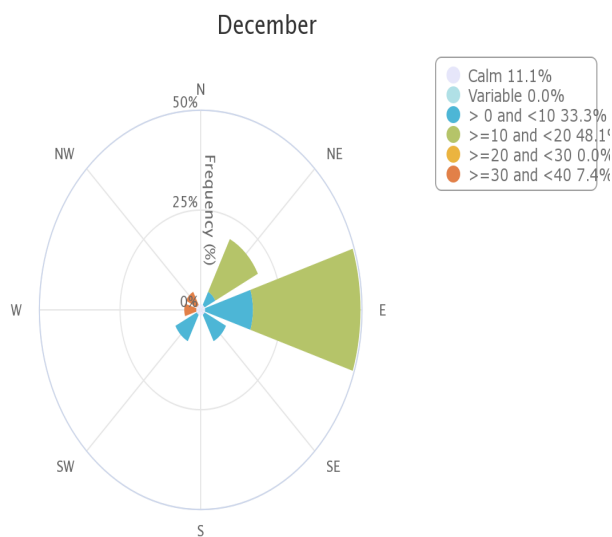


Figure 4b: Faleolo Station



With predominant easterly winds, Figure 4a illustrates the variable wind directions experienced at Apia station for December. Although fresh (290-38km/hr) at times, slight breeze of 6-11km/hr were predominant for Apia station. Faleolo station (Figure 4b) illustrates showed persistent easterly winds, with significant north westerly fresh breeze (29-38km/hr) observed as well. Nevertheless, slight breeze (6-11km/hr) were seen to be the dominant wind speeds at Faleolo station.

Figure 4c : Afiamalu Station

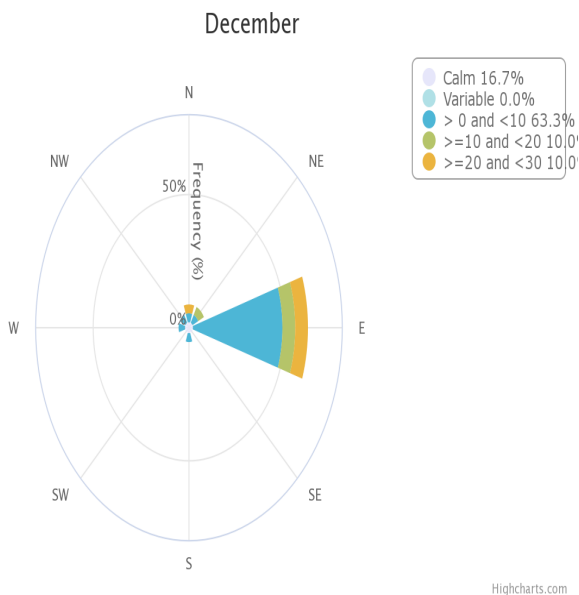
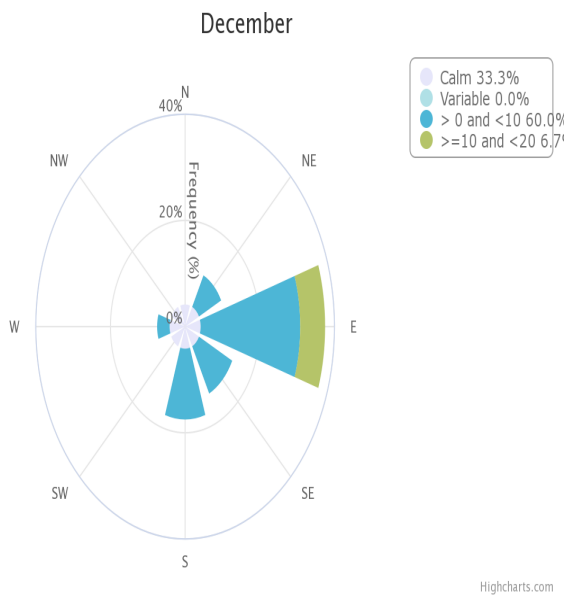


Figure 4d: Nafanua Station



For the rest of December, easterlies were dominant at Afiamalu station (Figure 4c). Wind speeds of 1-10km/hr were the dominant wind speeds for the highland station

For Nafanua, variable wind directions were recorded with the easterlies remaining dominant throughout the month. Calm winds (1-10km/hr) were seen to be the most occurring wind speeds, as seen in Figure 4d.

EL NINO SOUTHERN OSCILLATION (ENSO)

CURRENT ENSO STATUS

Although sea surface temperatures exceeded El Nino thresholds in the last few months, climate indicators now show that temperatures have now receded back to ENSO Neutral levels.

Oceanic Indicator of ENSO

Figure 5: Sea Surface Temperature in November 2018

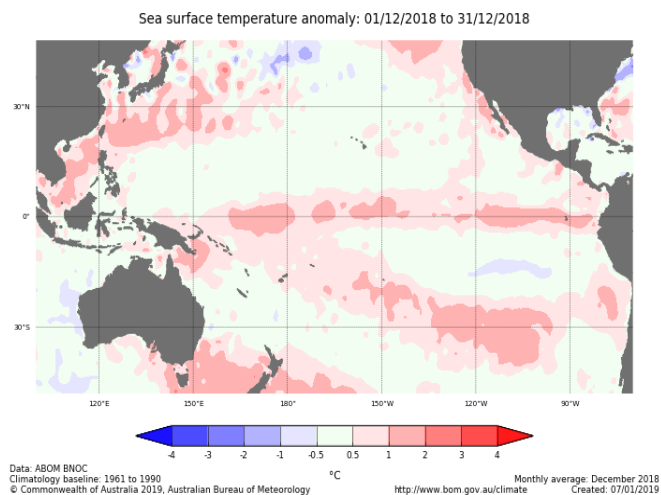
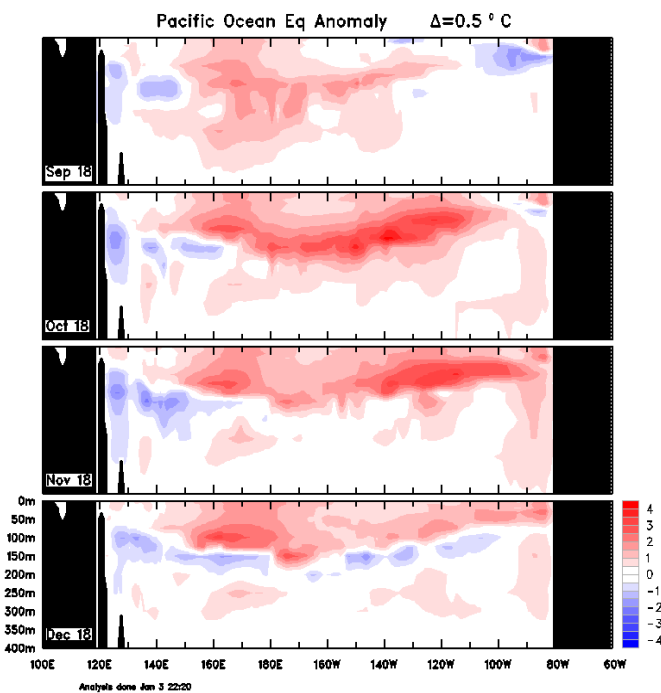


Figure 6: Sub-surface Temperature



Atmospheric Indicator of ENSO

Southern Oscillation Index (SOI)

The 30 day Southern Oscillation Index (SOI) to the 6th of January was +6.2, with the 90 day value of +4.0. These values have fluctuated in recent months, but still within neutral levels.

(Sustained positive values of the SOI above +7 indicate La Nina. Whereas sustained negative values below -7 indicate El Nino. Values within -7 and +7 shows neutral conditions.)

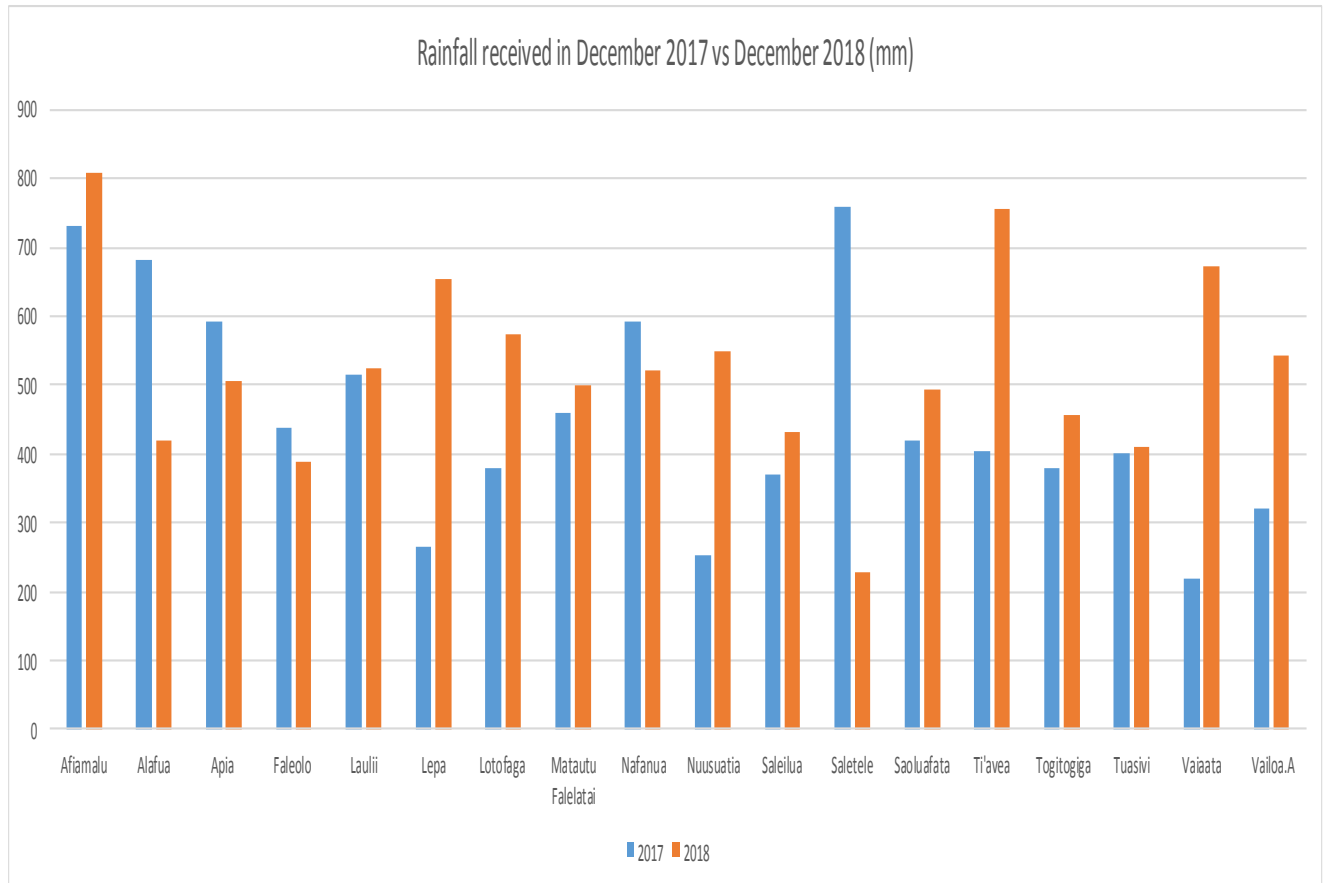
Figure 5 shows that warmer than normal sea surface temperatures were experienced in the equatorial region, and much of the Pacific region.

In addition, our Nino Indices showed a slight cooling in December, with Nino 3 at +0.8°C, Nino 3.4 at +0.8°C and Nino 4 at +0.9°C.

The gradual warming of sub sea surface temperatures towards the end of the previous year was evident, as seen in Figure 6. However in December, a slight cooling was observed in the equatorial region suggests a Neutral ENSO state as the current condition.

APPENDIX

Figure 7: Graphical representation of total monthly rainfall in December 2017 vs December 2018 in all rainfall stations.



Significant weather systems affected the islands for the month of December 2018, influencing heavy rainfall for most parts. Figure 7 showed that slightly more rainfall was received in December 2018 compared to December 2017. Moreover, heavy rain advisories were issued on the 8th, 26th and the 31st due to the fluctuation of the SPCZ and the development of a Tropical Disturbance (TD03F) west of the group