



CLIMATE SUMMARY JULY 2018

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HIGHLIGHTS

- ◆ Generally "Average" rainfall was registered across all stations in July, 2018. **Pg. 1 & 2**
- ◆ Temperatures as low as 16.1°C was recorded at Afiamalu Station, while the highest temperature of 33.5°C was registered at Apia station. **Pg. 3**
- ◆ Significant wind speeds of up to 40km/hr recorded at Afiamalu. Light winds of 1-10km/hr were predominant throughout July. **Pg 4 & 5**
- ◆ Although at neutral levels, Climate models have suggested that there is a 50% chance of an El Nino occurring later on this year. **Pg 6**
- ◆ Warmer sub surface anomalies in the west continue their eastward propagation, and have now displaced the cooler anomalies. The Eastern equatorial region is now experiencing warm waters, which indicates a developing El Nino. **Pg 6.**

ISSUED: AUGUST 2018

Figure 1: SPCZ Position in July 2018

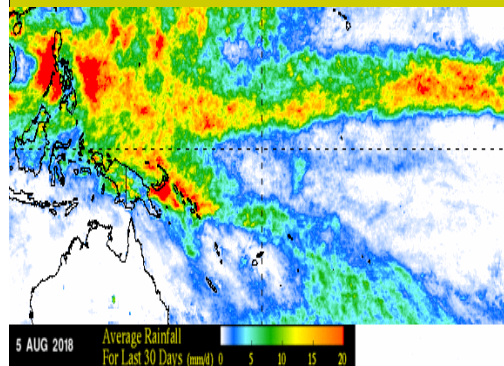
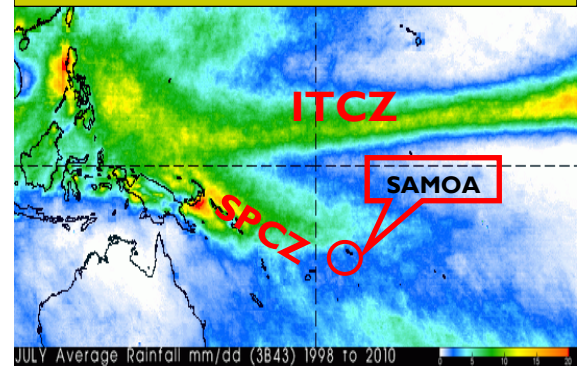


Figure 2: Normal Position of SPCZ in July



GLOBAL SCALE OBSERVATIONS

The Inter Tropical Convergence Zone in July 2018 was more active and was observed to have slightly moved north of its normal position. The South Pacific Convergence Zone (SPCZ) was also more active and displaced northward of its normal July position with not much effect over the Samoan region. According to the weather summary for July 2018, most of the precipitation received across the country was mainly through localized systems and topographical rainfall.

LOCAL SCALE OBSERVATIONS

During the first week of July, heavy rainfall was received throughout the country due to a descending convergence zone located north of the islands which associated with a trough of low pressure. The rest of the month of July was mainly influenced by the presence of the southern hemisphere mid-latitude high pressure system which maintained the south easterly (trade winds) wind flow over the country.

In details, the 06th of July was observed to be the wettest day where Lotofaga station recorded the highest one day fall of 275.8mm. Moreover, the highest precipitation of 440.4mm was also recorded at Lotofaga station, with the second highest of 365.8mm registered at Gagaifo Lefaga. On the contrary, Neiafu station received the least amount of rainfall of only 33.0mm, with the second lowest of 69.3mm recorded at Faleolo station. Statistically, 2 stations recorded 'well below average', 5 stations received 'below average', 11 stations observed 'average', 3 stations with 'above average' and 3 others recorded 'well above average' rainfall.

Table 1: Rainfall Statistics in July 2018

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

Stations	July Rainfall (mm)	July 30 Year Long Term Average	% of Average	1 day fall (mm)	Date	# of Rainy Days	Rainfall Status
UPOLU							
Afiamalu	139.2	201	69	28.0	06 th	24	Below Average
Alafua	97.0	104	93	29.2	06 th	14	Average
Apia	122.1	122	100	29.7	06 th	14	Average
Faleolo	69.3	92	75	46.0	06 th	06	Below Average
Gagaifo Lefaga	365.8	351	104	103.4	06 th	17	Average
Laulii	153.8	115	134	54.3	07 th	11	Above Average
Leauvaa	76.0	195	39	28.0	06 th	11	Well Below Average
Lepa	312.8	520	60	133.2	05 th	19	Below Average
Lotofaga	440.4	295	149	275.8	06 th	24	Above Average
Matautu Falelatai	110.5	201	55	35.0	07 th	20	Below Average
Nafanua	121.0	132	92	28.0	06 th	17	Average
Saleilua	361.4	364	99	104.0	06 th	22	Average
Saoluafata	132.4	232	57	44.6	06 th	27	Below Average
Savalalo	125.1	122	103	36.0	06 th	15	Average
Tiavea	318.0	352	90	98.6	06 th	26	Average
Togitogiga	353.4	374	94	74.4	06 th	27	Average
Savaii							
Aopo	92.2	101	91	39.0	06 th	12	Average
Asau	125.0	75	167	60.5	06 th	10	Well Above Average
Fogasavaii	76.2	56	136	24.2	06 th	10	Above Average
Neiafu	33.0	112	29	7.0	14 th	09	Well Below Average
Salailua	256.8	155	166	138.8	07 th	09	Well Above Average
Samalaeulu	350.0	124	282	67.8	31 st	29	Well Above Average
Tuasivi	162.2	184	88	55.2	06 th	17	Average
Vaiaata	322.2	377	85	52.6	06 th	29	Average

Well Below Average
<40%

Below Average
40%-80%

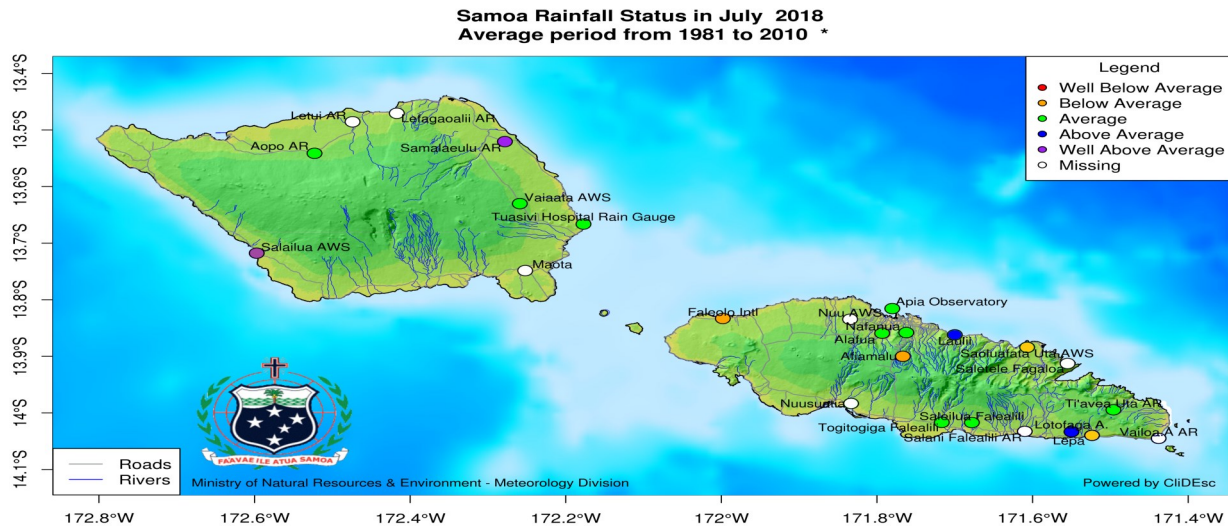
Average
80%-120%

Above Average
120%-160%

Well Above Average
>160%

Figure 3: Rainfall Status Map in July 2018

This rainfall map is generated using observation data from Table 1



* Newer stations use only data that is available as they do not have enough for a 30 year average

TEMPERATURE

Table 2: Air Temperature Statistics

This table displays the temperature statistics recorded across stations in July 2018

Stations	Temperature (Degree Celsius)				
	Mean Daily Temperature (°C)	Extreme Temp Max (°C)	Date	Extreme Temp Min(°C)	Date
Faleolo	N/A	N/A	N/A	20.6	10 th
Afiamalu	21.8	28.8	15 th	16.1	21 st
Apia	27.4	33.5	28 th	21.2	07 th
Alafua	26.5	32.4	26 th	19.9	14 th
Togitogiga	N/A	N/A	N/A	20.5	06 th
Vaiaata	26.8	31.6	22 nd	21.6	08 th

N/A = Data Not Available

Temperatures in July showed that Apia registered the warmest daytime temperature of 33.5° C, with the second warmest of 32.4° C . On the other hand, Afiamalu remains the coolest station registering the lowest night time temperature of 16.1° C on the 21st. A series of high pressure systems of the mid-latitude belt propagating from the south over the last few weeks of the month has contributed greatly to the clear skies and cooler nights in July especially at Afiamalu station. Nonetheless, mean daily temperatures recorded ranged from 21.8° C to 26.8° C across the stations.

ATMOSPHERIC PRESSURE

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

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

Station	Highest MSL Pressure (hPa)	Date	Lowest MSL Pressure (hPa)	Date	Average MSL Pressure (hPa)
Apia	1015.4	20 th	1009.5	06 th	1013.1
Faleolo	1015.6	20 th	1009.2	01 st	1012.7

For the month of July, Faleolo registered the highest MSL pressure of 1015.6hPa and the lowest MSL pressure of 1009.2hPa, both in the first week of the month. The low pressures recorded were reflected by the rainfall status for July, as it brought along rainfall activities and strong winds (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 July 2018.

Figure 4a : Apia Station

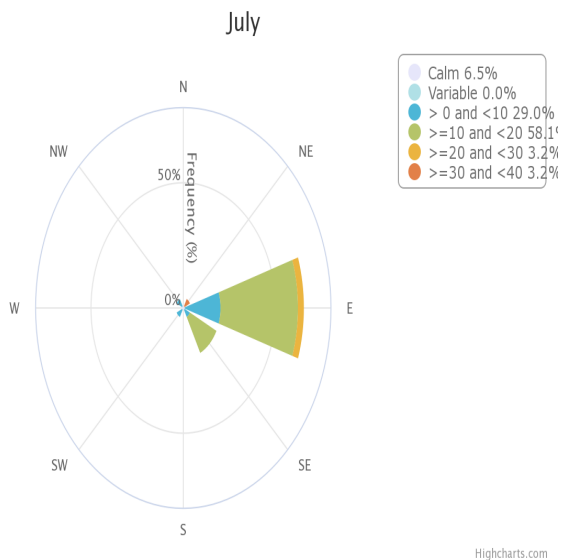
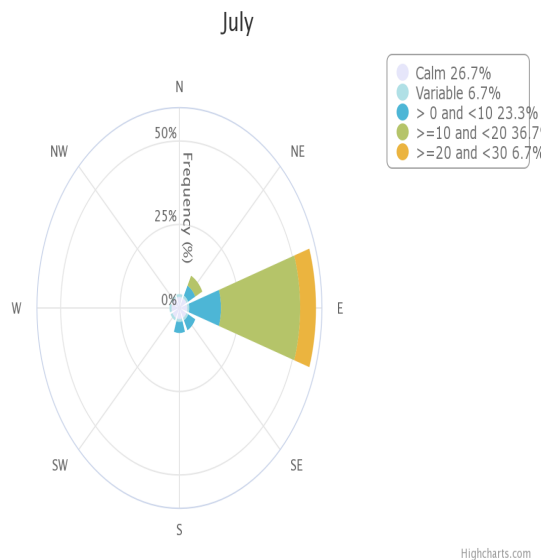


Figure 4b: Faleolo Station



Predominant easterly winds were registered for both Apia (Figure 4a) and Faleolo (Figure 4b) stations, while gentle winds speeds (10-20km/hr) were the most occurring wind speeds for both stations as well.

Wind advisories were issued early into the month due to a strong high pressure located far south west of Samoa, which directed strong trade wind events for the island.

Figure 4c : Afiamalu Station

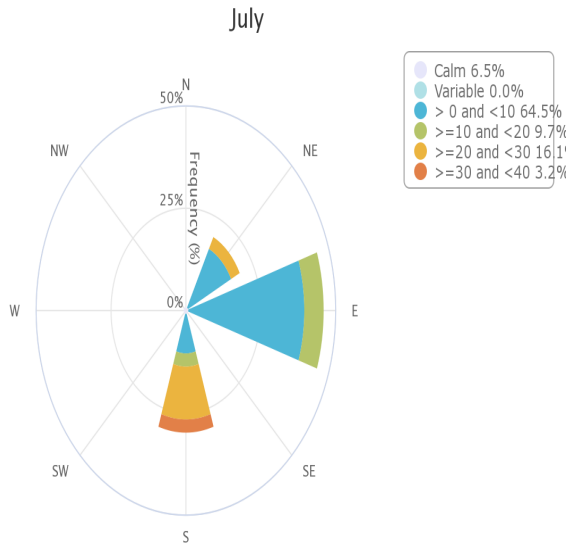
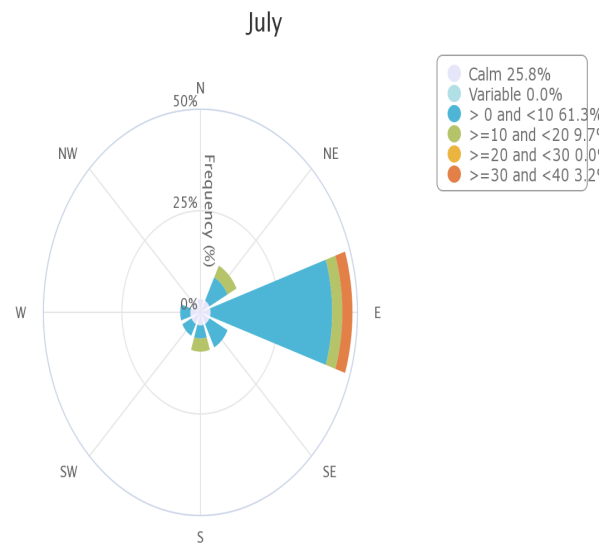


Figure 4d: Nafanua Station



Afiamalu station (Figure 4c) received variable wind directions for the month of July, with Easterlies slightly being the most occurring. Southerlies and North Easterly winds were also registered for the station. Moreover light winds (1-10km/hr) were the dominant wind speeds, with noticeable gentle (10-20km/hr) to moderate (20-30km/hr) winds speeds occurring throughout July. Variable winds were also registered for Nafanua, with Easterlies remaining dominant. In addition, light winds (1-10km/hr) were the dominant wind speeds as registered for the station, with moderate (20-30km/hr) wind speeds travelling from the east, as seen in Figure 4d.

EL NINO SOUTHERN OSCILLATION (ENSO)

CURRENT ENSO STATUS

Our current ENSO status still remains at neutral levels. However the Bureaus ENSO outlook is at El Nino watch, with more than half the models predicting an EL Nino event occurring late in the year 2018. El Nino watch means there's a 50% chance of an El Nino occurring in the coming months.

Figure 5: Sea-surface Temperature

Oceanic Indicator of ENSO

Figure 5: Sea Surface Temperature in July 2018

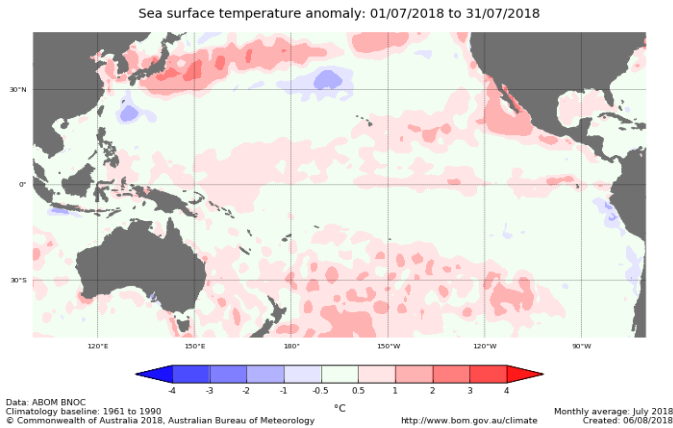
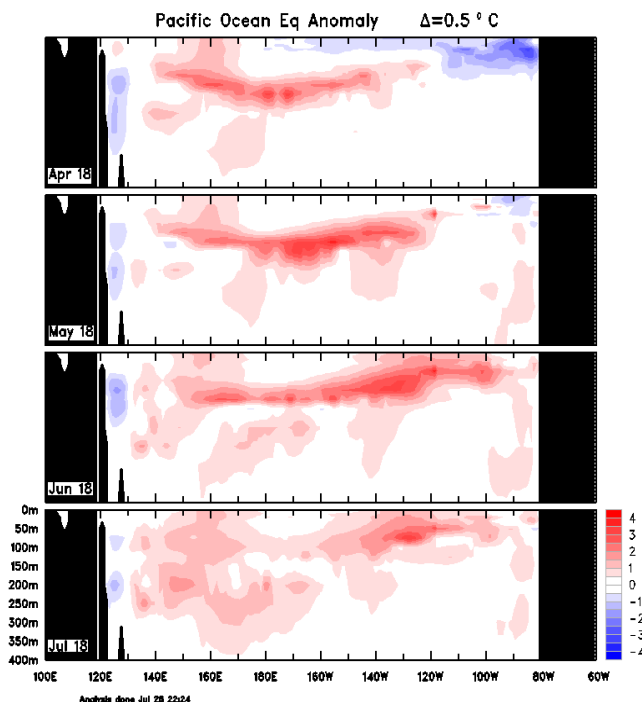


Figure 6: Sub-surface Temperature



Atmospheric Indicator of ENSO

Southern Oscillation Index (SOI)

The 30 day Southern Oscillation Index (SOI) to 29th of July was +2.2, with the 90 day value of -0.4. The SOI have been fluctuating but have mostly been in neutral range for the year 2018.

(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.)

In Figure 5, we can clearly see a significant increase in Sea Surface Temperatures. Warmer anomalies have concentrated mostly within the Southern Pacific Ocean, and continue to move eastward, where the cooler anomalies have been completely displaced. Further up north, intense warm SSTs have developed.

In addition, the July value for NINO3 was +0.4° C, NINO3.4 was +0.4° C and NINO4 was +0.4° C

Figure 6 illustrates the complete dominance of the warmer anomalies underneath the Sea surface. Since April 2018, cooler anomalies have weakened due to the continuous eastward movement of the warmer anomalies from the west. This is a clear indication that an El Nino event will likely to occur later on in the year.

APPENDIX

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

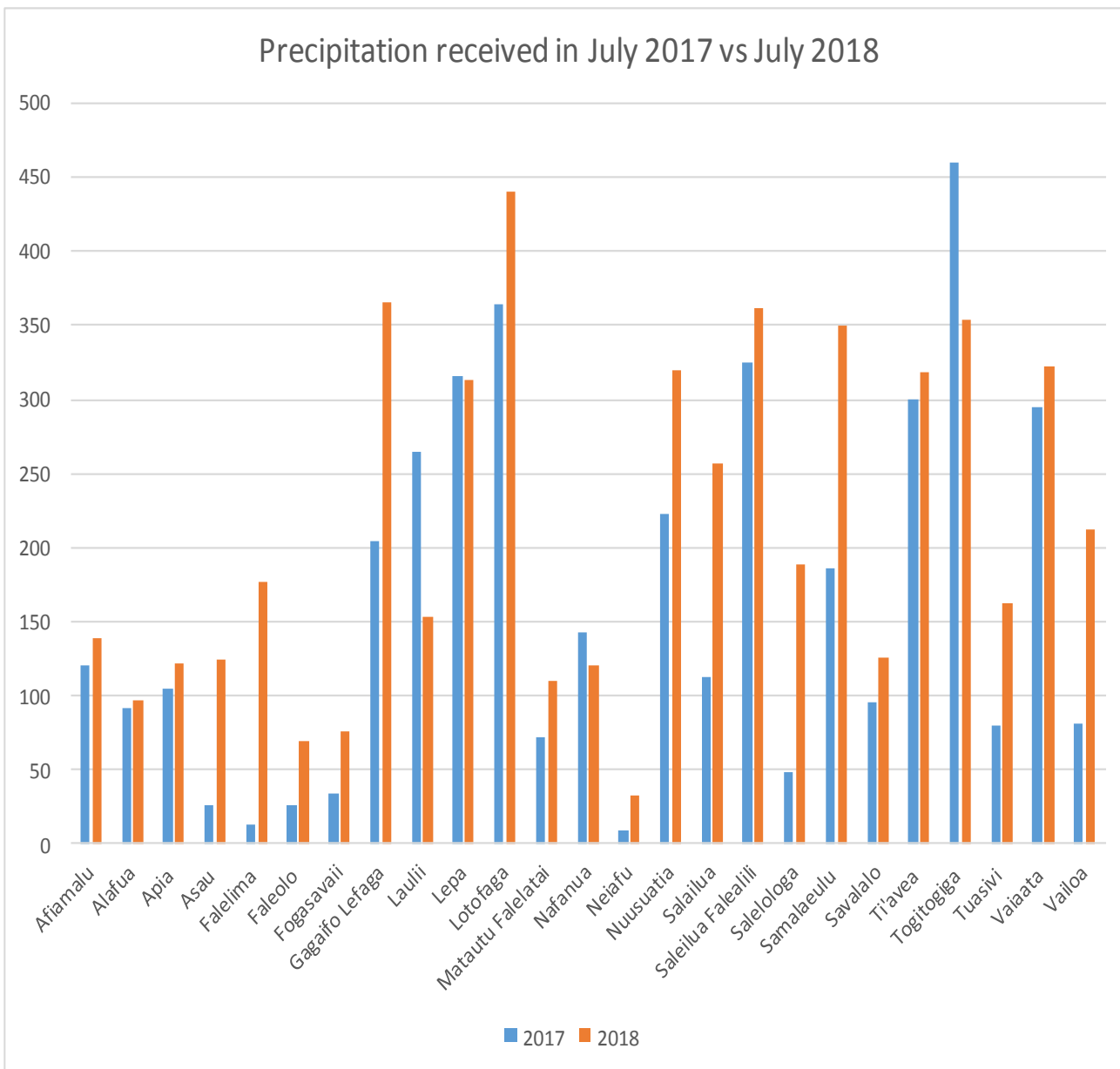


Figure 7 shows a side by side comparison of the month July in the years 2017 and 2018. Generally both years proved to be similar in their status, meaning there is not much difference between precipitation received in July 2017 and July 2018.