



CLIMATE SUMMARY SEPTEMBER 2018

Samoa Meteorology Division

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HIGHLIGHTS

- ◆ “Below Average” was generally the rainfall status across all stations. **Pg. 1 & 2**
- ◆ Mean daily temperatures ranged from 22.6°C to 27.6°C for September . **Pg. 3**
- ◆ Some variable wind directions for some stations with Easterly winds remaining dominant throughout the month. **Pg. 4 & 5**
- ◆ The warming of Sea Surface Temperatures are still ongoing, but remain within neutral range. Chances therefore of an El Nino event happening have increased up to 70%. **Pg. 6**
- ◆ Cooler anomalies that were developed over the shallow Eastern Equatorial region in August are sustaining with warmer anomalies concentrating in the Central Equatorial region, and sinking to depths of 350m. **Pg. 6.**

ISSUED: OCTOBER 2018

Figure 1: SPCZ Position in September 2018

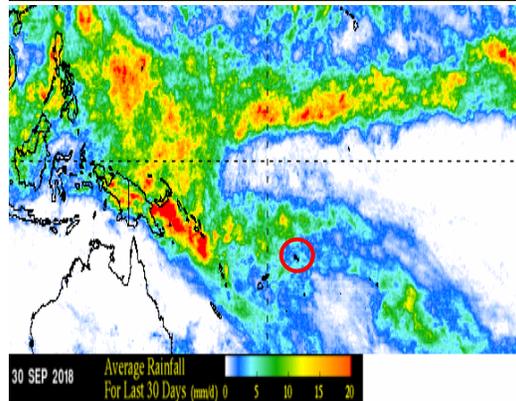
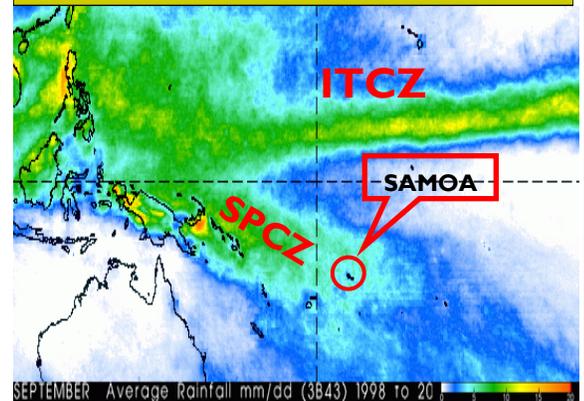


Figure 2: Normal Position of SPCZ in September



GLOBAL SCALE OBSERVATIONS

A great increase in Inter Tropical Convergence Zone (ITCZ) activity was observed for the month of September. A dry surge could be seen along the equator as seen in Figure 1, with most activity enhancing northward of its normal September position. Observations also recoded that the South Pacific Convergence Zone (SPCZ) was highly active over the Solomon Islands and the western parts of the Pacific Islands. With few weather systems passing over the Samoa, we experienced minimal rainfall and strong winds, as seen in Page 2 and 4.

LOCAL SCALE OBSERVATIONS

Easterly wind flow was the main weather feature that influenced the island in September with few troughs migrating from the east. With minimal weather features, precipitation received was significantly less than average as seen in page 2. Moreover, September registered Vaiaata as the wettest station, receiving 321.8mm of rainfall, with Tiavea as the second wettest with 246.6mm. In addition, Vaiaata and Tuasivi stations received the highest one day fall of 108.2mm and 103.2mm respectively. On the contrary, the driest station was registered at Salailua station, having received only 17.6mm, with the second driest at Faleolo station. Rainfall statistics showed that there were 3 stations with ‘Average’ rainfall, 9 stations with ‘Below Average’ and 6 stations registering ‘Well Below Average’ rainfall for the month of September. On page 7, a graphical representation of precipitation on September 2017 and September 2018 were plotted to show if there was any significant difference.

Table 1: Rainfall Statistics in September 2018

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

Stations	September Rainfall (mm)	September 30 Year Long Term Average	% of Average	1 day fall (mm)	Date	# of Rainy Days	Rainfall Status
UPOLU							
Afiamalu	109.3	216	51	47.2	19 th	15	Below Average
Alafua	76.2	119	64	32.6	19 th	11	Below Average
Apia	113.7	152	75	56.9	19 th	14	Below Average
Faleolo	22.1	97	23	15.6	19 th	06	Well Below Average
Laulii	127.4	222	57	74.2	13 th	05	Below Average
Lepa	221.8	347	64	79.2	19 th	19	Below Average
Lotofaga	207.0	347	60	75.8	16 th	16	Below Average
Nafanua	84.1	141	60	32.0	19 th	15	Below Average
Saletele	64.7	303	21	8.4	28 th	27	Well Below Average
Saoluafata	102.6	294	35	32.2	13 th	23	Well Below Average
Tiavea	246.6	274	90	102.6	13 th	19	Average
Togitogiga	76.0	410	19	21.0	03 rd	17	Well Below Average
Vailoa.A	122.4	156	79	38.2	19 th	17	Below Average
Savaii							
Aopo	65.6	258	25	23.2	04 th	11	Well Below Average
Salailua	17.6	207	09	9.2	04 th	03	Well Below Average
Samalaeulu	183.4	216	85	83.6	19 th	20	Average
Tuasivi	157.6	153	103	103.2	19 th	13	Average
Vaiaata	321.8	411	78	108.2	19 th	24	Below Average

Well Below Average
<40%

Below Average
40%-80%

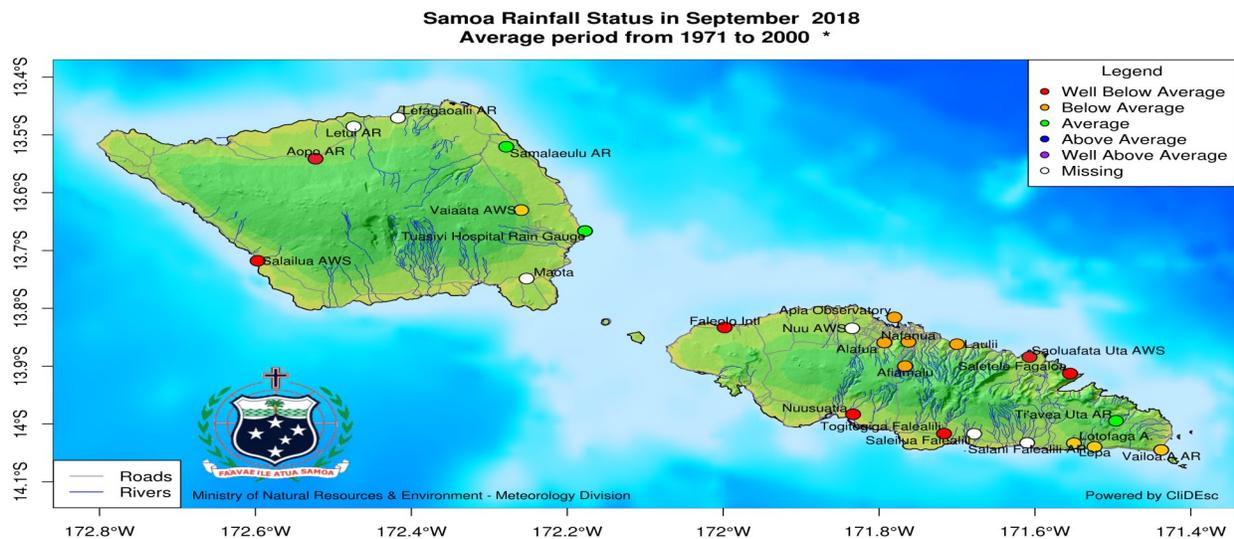
Average
80%-120%

Above Average
120%-160%

Well Above Average
>160%

Figure 3: Rainfall Status Map in September 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 September 2018

Stations	Temperature (Degree Celsius)				
	Mean Daily Temperature (°C)	Extreme Temp Max (°C)	Date	Extreme Temp Min(°C)	Date
Afiamalu	22.6	28.5	26 th	14.0	10 th
Apia	27.2	31.6	15 th	21.6	13 th
Alafua	N/A	N/A	N/A	20.1	10 th
Faleolo	N/A	N/A	N/A	20.9	13 th
Saoluafata	26.6	31.4	09 th	18.8	10 th
Togitogiga	N/A	N/A	N/A	20.5	04 th
Vaiaata	27.6	32.6	13 th	21.3	10 th

N/A = Data Not Available

For September, mean daily temperatures ranged from 22.6°C to 27.6°C. Vaiaata station remained the warmest having registered the highest daytime temperature of 32.6°C on the 13th, while Afiamalu recorded the coolest night time temperature of 14.0°C on the 10th. The descendent of a trough of low pressure over the islands brought rainfall and cold temperatures during the second week. Lowest temperatures were recorded in this period for most stations across the island.

ATMOSPHERIC PRESSURE

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

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

Station	Highest MSL Pressure (hPa)	Date	Lowest MSL Pressure (hPa)	Date	Average MSL Pressure (hPa)
Apia	1014.9	01 st	1011.4	19 th	1012.9
Faleolo	1015.1	01 st	1011.6	19 th	1013.1

The highest MSL pressure of 1015.1hPa was registered at Faleolo station on the 01st, while the lowest of 1011..4 was recorded at Apia station on the 19th. Observations showed September receiving minimal rainfall activity, with most of the wettest days recorded on the 19th of September, same day the trough of low pressure made landfall in Samoa. *(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 September 2018.

Figure 4a : Apia Station

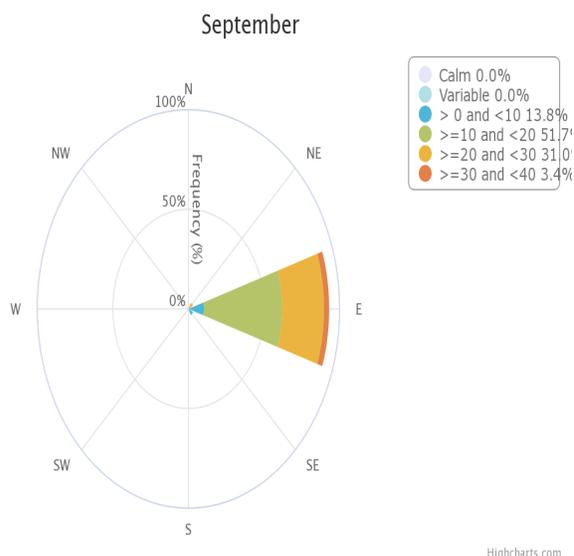
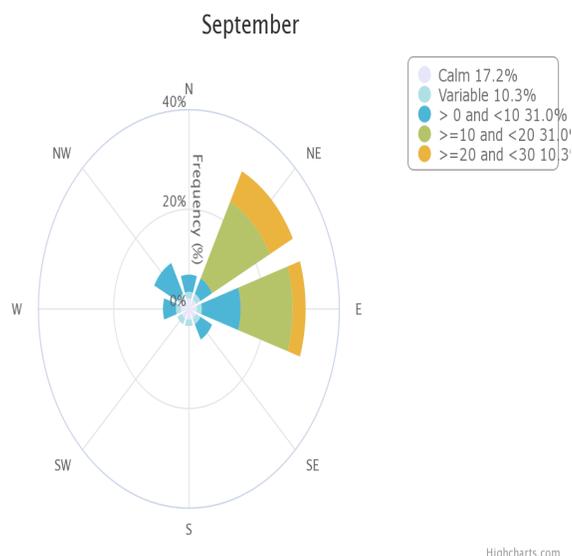


Figure 4b: Faleolo Station



Easterlies remain dominant for Apia station (Figure 4a) with persisting gentle winds (10– 19km/hr). There were noticeable gusts exceeding 30km/hr that were also recorded throughout the month of September. Variable wind directions for Faleolo station with Easterlies and North easterlies being dominant. Predominant light winds (1-9km/hr) were also recorded at Faleolo with some noticeable Moderate breeze (20-29km/hr) occurring throughout the month.

Figure 4c : Afiamalu Station

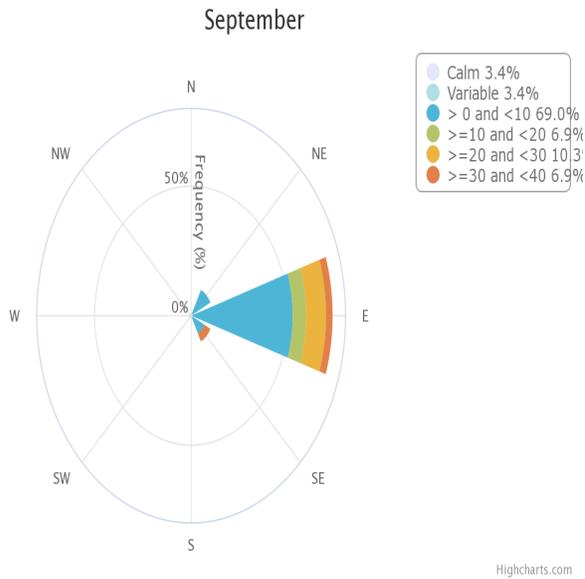
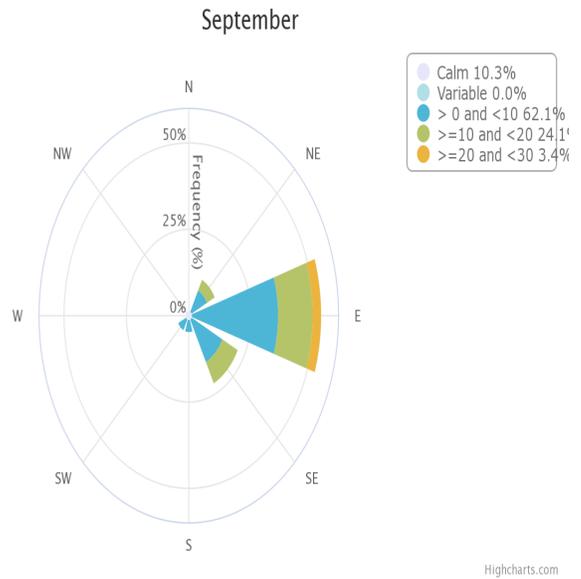


Figure 4d: Nafanua Station



For Afiamalu station (Figure 4c), Easterly winds were the dominant wind direction, with some winds registering from the north east and south. Light winds of 1-9km/hr were dominant for this station, with some few gusts exceeding 30km/hr

Dominant wind direction for Nafanua station (Figure 4d) were also registered as Easterlies, with prevailing light winds of 1-10km/hr. Gusts were monitored to reach more than 30km/hr during the month of September.

The persistence of the easterly wind flow were evident from the wind roses seen above, with few variable winds and gusts brought by intense high pressure systems over the islands during the first and second week of September

EL NINO SOUTHERN OSCILLATION (ENSO)

CURRENT ENSO STATUS

Although within neutral range, the gradual warming of sea surface temperatures have increased the probability of an El Niño event occurring late this year. As of now, the Bureau's ENSO Outlook is at "El Niño alert", meaning there is approximately a 70% chance of such an event to take place.

Oceanic Indicator of ENSO

Figure 5: Sea Surface Temperature in September 2018

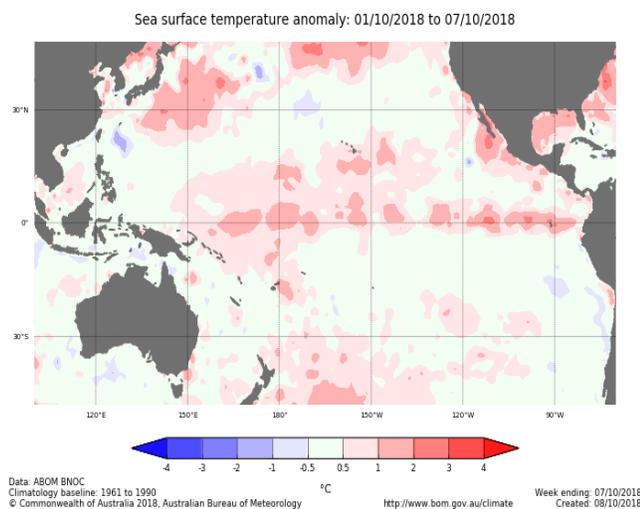
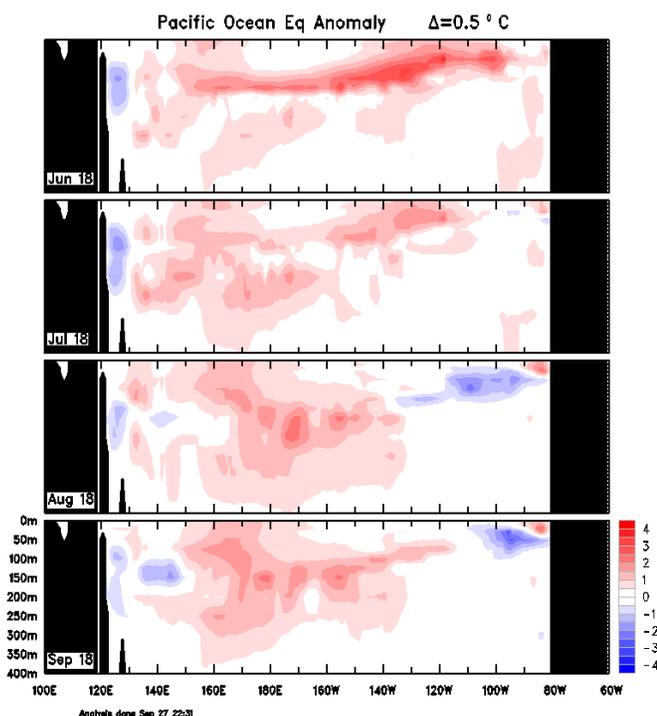


Figure 6: Sub-surface Temperature



Atmospheric Indicator of ENSO

Southern Oscillation Index (SOI)

The 30 day Southern Oscillation Index (SOI) to 7th of October was -7.7 , with the 90 day value of -4.5 . It was observed that the SOI value has transcended El Niño thresholds in the last two weeks.

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

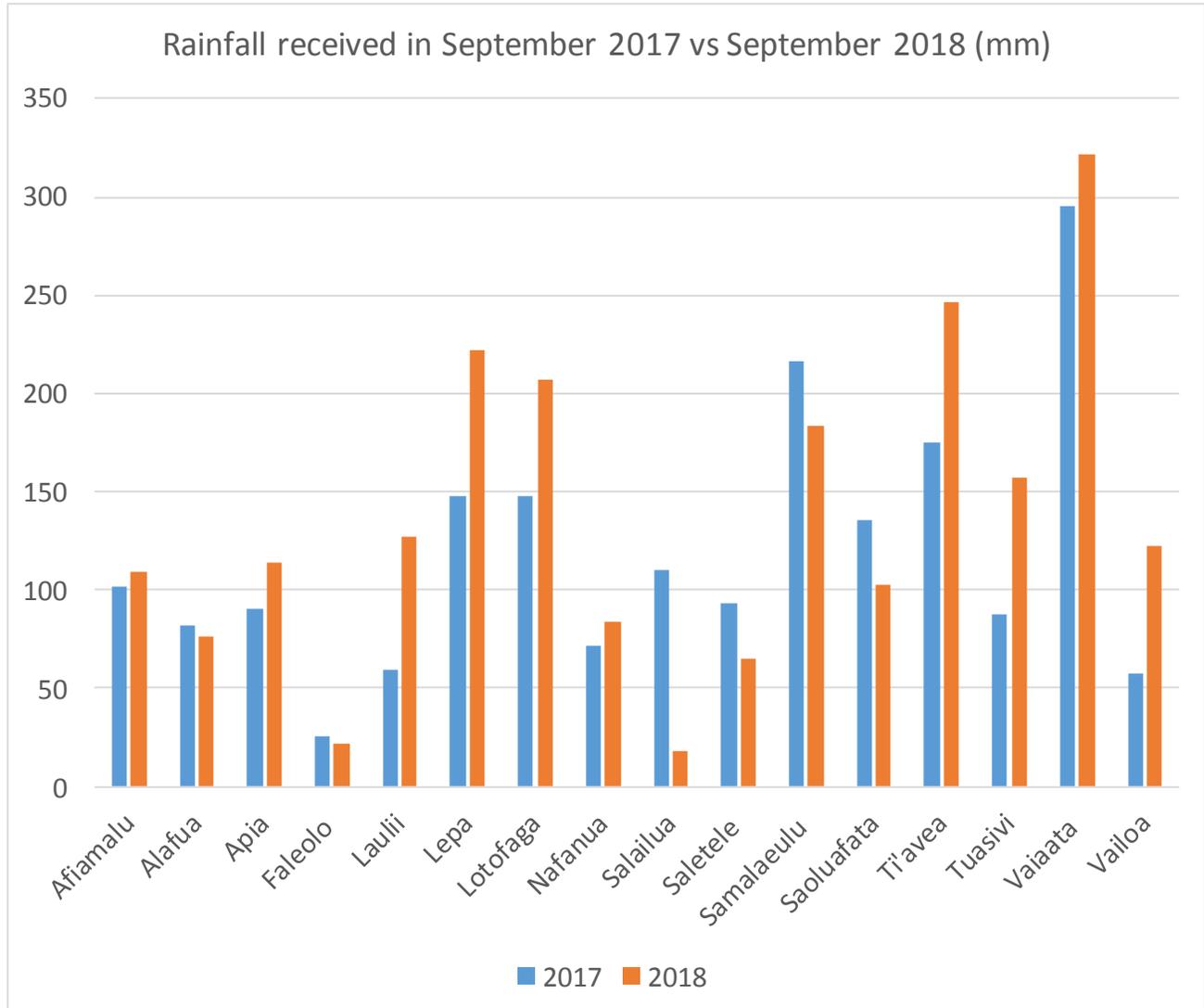
Referring to Figure 5, Sea Surface temperatures continue to warm in the Equatorial, Northern and Southern region in the Pacific Ocean. Warm anomalies were also observed along the coast of North America, which contributed to the development of several hurricanes in America last month.

In addition, the latest values for Niño indices are sustaining, with Niño 3 at $+0.3^\circ\text{C}$, Niño 3.4 at $+0.3^\circ\text{C}$ and Niño 4 at $+0.6^\circ\text{C}$.

Warm anomalies were observed to the central equatorial region, weakening both in strength and volume since last month. These warm anomalies as seen in Figure 6 extend to a depth of about 350m. On the other hand, cooler anomalies which appeared in August, are sustaining towards the East and far West in the shallow parts of the Pacific Ocean.

APPENDIX

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



The graph shown by Figure 7 does not illustrate any significant differences between rainfall received in September 2017 and September 2018.