



CLIMATE SUMMARY SEPTEMBER 2019

Samoa Meteorology Division

Ministry of Natural Resources and Environment



(+685) 20855/20856



www.samet.gov.ws

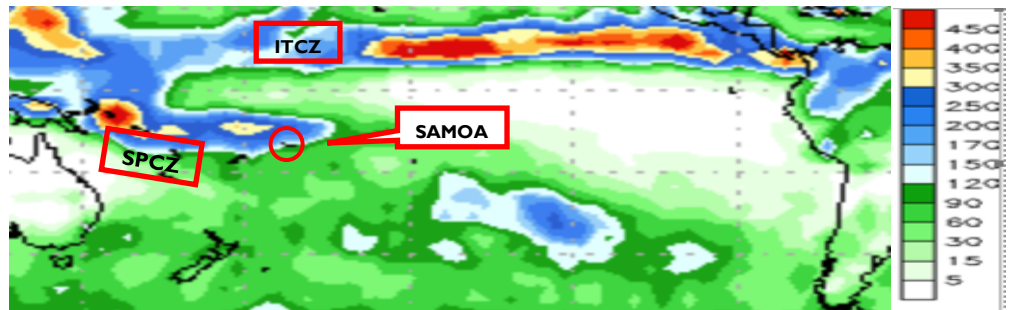


[www.facebook.com/Samoa Meteorological Services](https://www.facebook.com/Samoa-Meteorological-Services)

HIGHLIGHTS

- ◆ “Average to Below Average” rainfall was recorded for September 2019 **Pg 1 & 2**
- ◆ The coolest night time temperature of 14.8^oC was recorded on the 11th of September, 2019. **Pg 3**
- ◆ Easterlies remained dominant as well throughout the island in the previous month. **Pg 4 & 5.**
- ◆ Our El Nino Southern Oscillation (ENSO) status is now ‘Inactive’, meaning it neither leans to an El Nino nor La Nina event, **Page 6**
- ◆ Sub Surface temperatures continue to cool in the Eastern Equatorial region, **Pg 6**

Figure 1: SPCZ Position in September 2019



GLOBAL SCALE OBSERVATIONS

In Figure 1, the South Pacific Convergence Zone (SPCZ) was observed to displace slightly north of the group, with rainfall activity focusing mostly within the western equatorial region. This resulted in less rainfall activity for Samoa, as illustrated by Table 1. The Inter Tropical Convergence Zone (ITCZ) on the other hand was more active in the Central Pacific, extending through to the eastern coast of South America. According to the weather summary, the dominance of high pressure systems were evident throughout the month, and in return fine weather was generally the conditions for September 2019. On Page 7 of this report, a comparison between rainfall activity in September 2018 and September 2019 is illustrated in Figure 7.

LOCAL SCALE OBSERVATIONS

Dry conditions for Samoa in the previous month, where most stations recorded ‘Average’ to ‘Well Below Average’ rainfall. Further analysis shows Saletele as the wettest station with 242.5mm and Togitogiga as the second wettest with 221.4mm. A trough of low pressure in the early part of the month provided sufficient rainfall for the group, where Falelima station recorded the highest one day fall of 49.4mm on the 08th, and Saletele with the second highest of 43.0mm. On the other hand, Nu'u registered as the driest station having received only 25.8mm, with the second driest of 46.3mm at Alafua station.

(Refer to Table 1 for June rainfall statistics)

Table 1: Rainfall Statistics in September 2019

This table displays the rainfall status of all stations in the country in September 2019

Stations	September Rainfall (mm)	September 30 Year Long Term Average	% of Average	1 day fall (mm)	Date	# of Rainy Days	Rainfall Status
U P O L U							
Afiamalu	179.8	197	91	28.6	23 rd	19	Average
Afulilo	135.5	144	94	30.5	22 nd	20	Average
Alafua	46.3	141	32	17.9	13 th	11	Well Below Average
Apia	57.9	143	40	20.5	05 th	10	Below Average
Faleolo	69.5	98	71	40.0	08 th	08	Below Average
Lepa	109.0	347	31	35.6	25	12	Well Below Average
Lotofaga	100.0	210	47	38.2	25	07	Below Average
Nafanua	72.0	144	50	20.6	13 th	15	Below Average
Nuu	25.8	141	18	8.6	13 th	09	Well Below Average
Nuusuatia	127.8	173	74	34.2	07 th	16	Below Average
Saleilua	162.0	431	38	40.0	24 th	19	Well Below Average
Saletele	242.5	303	80	43.0	06 th	23	Average
Saoluafata	101.8	294	35	41.4	05 th	22	Well Below Average
Togitogiga	221.4	442	50	38.0	24 th	21	Below Average
Vailoa Aleipata	102.4	197	52	37.4	24 th	12	Below Average
S A V A I I							
Aopo	77.0	258	30	30.0	01 st	16	Well Below Average
Falelima	140.0	86	163	49.4	08 th	13	Well Above Average
Tuasivi	166.0	153	108	40.4	24 th	18	Average

Table I: Dry conditions for Samoa in September, where most stations registered Average to Well Below Average rainfall.

Well Below Average
<40%

Below Average
40%-80%

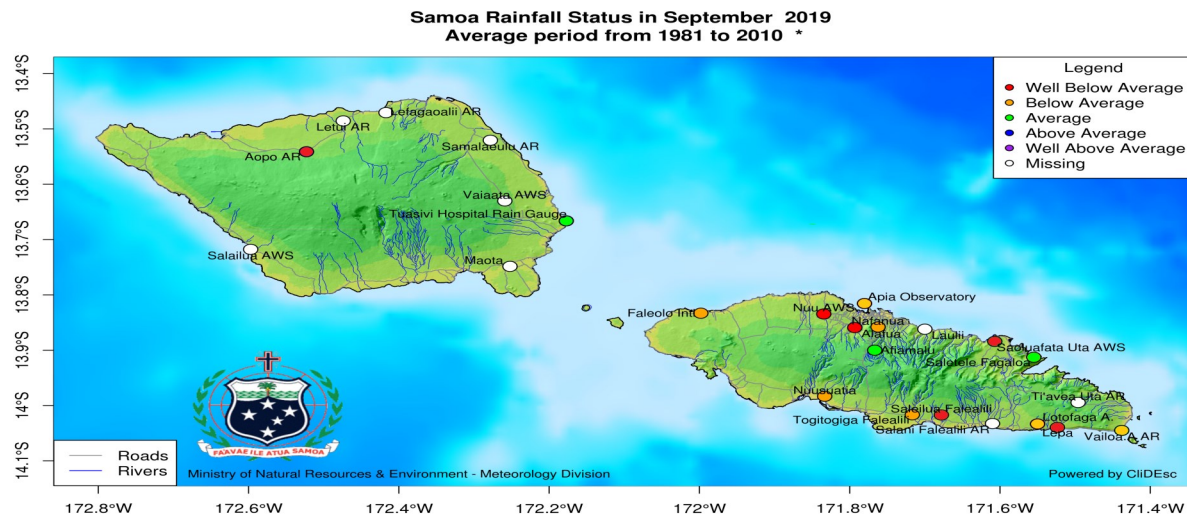
Average
80%-120%

Above Average
120%-160%

Well Above Average
>160%

Figure 3: Rainfall Status Map in September 2019

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 2019

Stations	Max Temperature (°C)			Stations	Min Temperature (°C)	
	Mean Daily Temperature (°C)	Extreme Temp Max (°C)	Date		Extreme Temp Min(°C)	Date
Apia	27.1	32.0	02 nd	Apia	21.7	20 th
Saoluaufata	26.5	32.0	13 th	Saoluaufata	20.7	20 th
Nuu	25.7	31.9	30 th	Faleolo	21.2	03 rd
				Afiamalu	14.8	11 th
				Alafua	20.7	20 th
				Nuu	19.0	11 th

Air temperatures were relatively warm in September, where the highest daytime temperature of 32.0°C were recorded at Apia and Saoluaufata on the 02nd and the 13th respectively. However, coolest night time temperatures were recorded on the 20th for most parts of the island, where Afiamalu registered the lowest of 14.8°C for the month of September 2019.

ATMOSPHERIC PRESSURE

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

This table displays the atmospheric statistics recorded across two stations in September 2019

Station	Highest MSL Pressure (hPa)	Date	Lowest MSL Pressure (hPa)	Date	Average MSL Pressure (hPa)
Apia	1016.7	30 th	1011.2	04 th	1014.4
Faleolo	1018.1	22 nd	1011.5	04 th	1014.6

The highest Atmospheric pressure was recorded on the 22nd of the month at Faleolo, with the value of 1018.1hPa. On the other hand, the lowest atmospheric pressure of 1011.2hPa was recorded at Apia on the 04th.

(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 September 2019.

Figure 4a : Apia Station

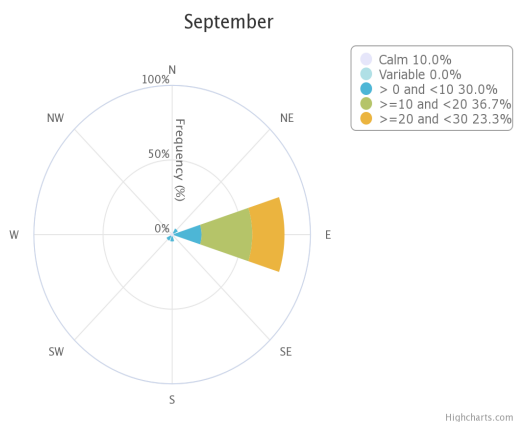
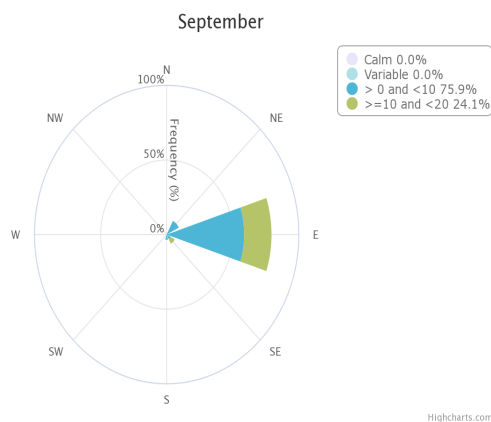


Figure 4b: Saoluafata Station



Both Apia and Saoluafata stations experienced dominant easterly winds, with moderate breeze (21-30km/hr) persisting at Apia, and slight breeze (1-10km/hr). The dominance of the easterly wind flow for Samoa can be reflected in Figures 4a and 4b above.

Figure 4c : Afiamalu Station

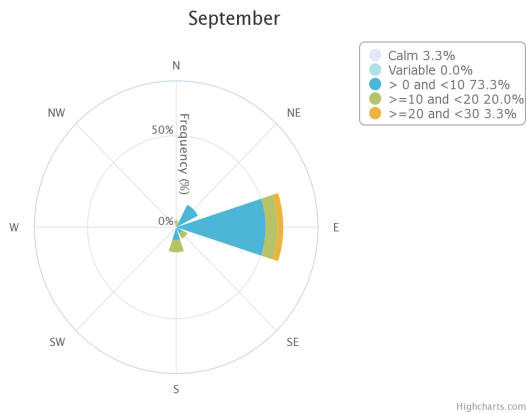


Figure 4d: Nafanua Station

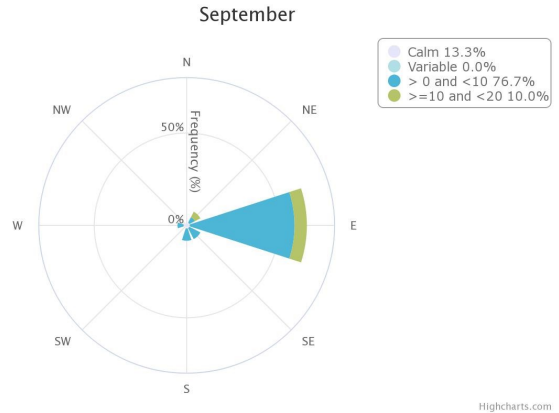
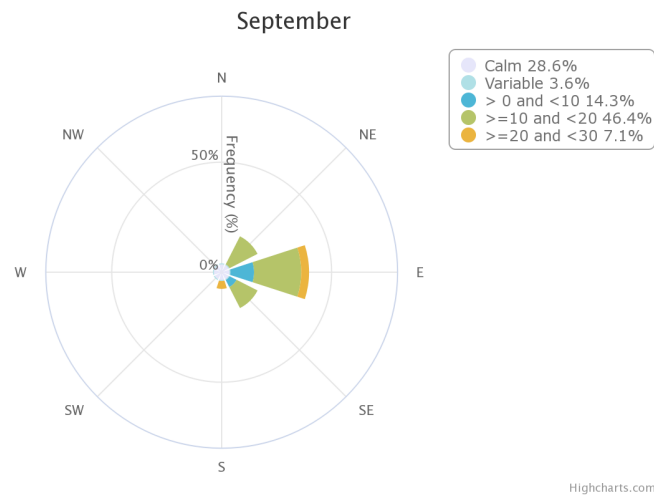


Figure 4e: Faleolo Station



Easterly winds also dominated Afiamalu (Figure 4c), Nafanua (Figure 4d) and Faleolo (Figure 4e) stations in September, due to dominant wind flow. While slight breeze (1-10km/hr) were typically the conditions at Afiamalu and Nafanua, Faleolo station registered gentle breeze (11-20km/hr) as prevailing wind strength, with noticeable north easterly and south easterly slight breeze (1-10km/hr)

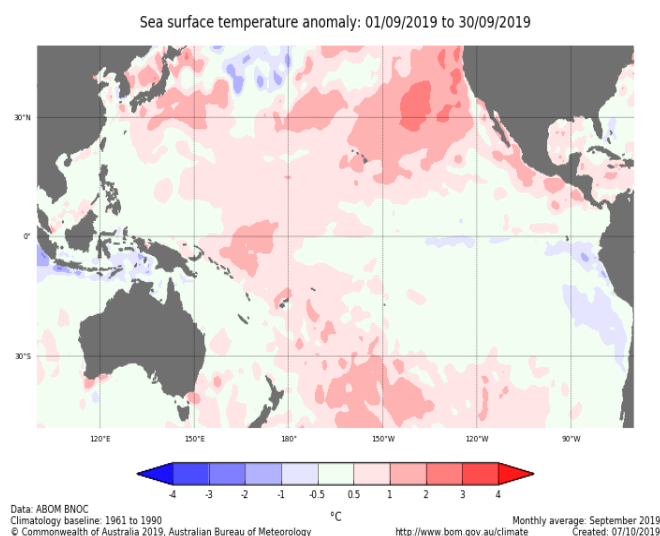
EL NINO SOUTHERN OSCILLATION (ENSO)

CURRENT ENSO STATUS

Both Oceanic and Atmospheric indicators show are within neutral thresholds, hence the current ENSO status still remains at Neutral, meaning it neither leans towards El Nino nor La Nina.

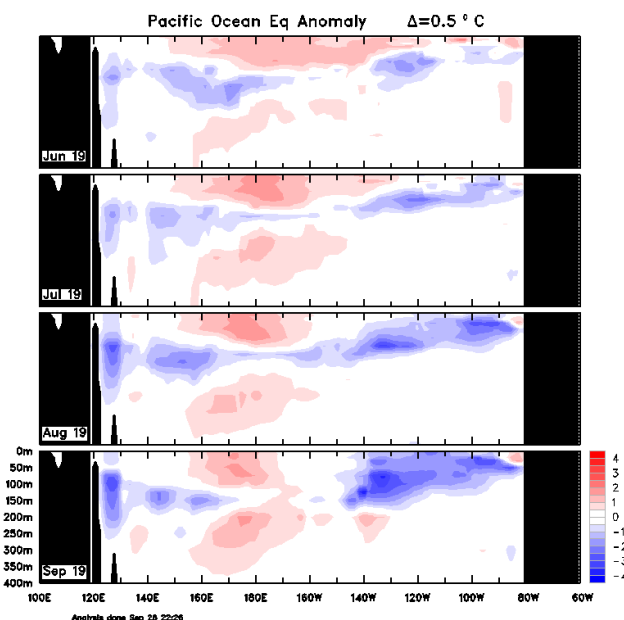
Oceanic Indicator of ENSO

Figure 5: Sea Surface Temperature in September 2019



September Sea Surface Temperatures (SSTs) were observed to be warmer than average for most parts, except for the eastern equatorial region where cooler anomalies strengthened. Further north of the equatorial region is experiencing warmer than average conditions as well. Furthermore, the Nino indices for September showed Nino 3 at -0.1°C , Nino 3.4 at 0.0°C and Nino 4 at $+0.7^{\circ}\text{C}$.

Figure 6: Sub-surface Temperature



The sub surface temperatures in the central equatorial region showed cooler waters continue to strengthen in the Eastern part of the Pacific Ocean, whereas warmer anomalies continue to sustain above average conditions to depths of almost 400m below surface within the same region. The neutrality of the ENSO status can be reflected as well by Figure 6.

Atmospheric Indicator of ENSO

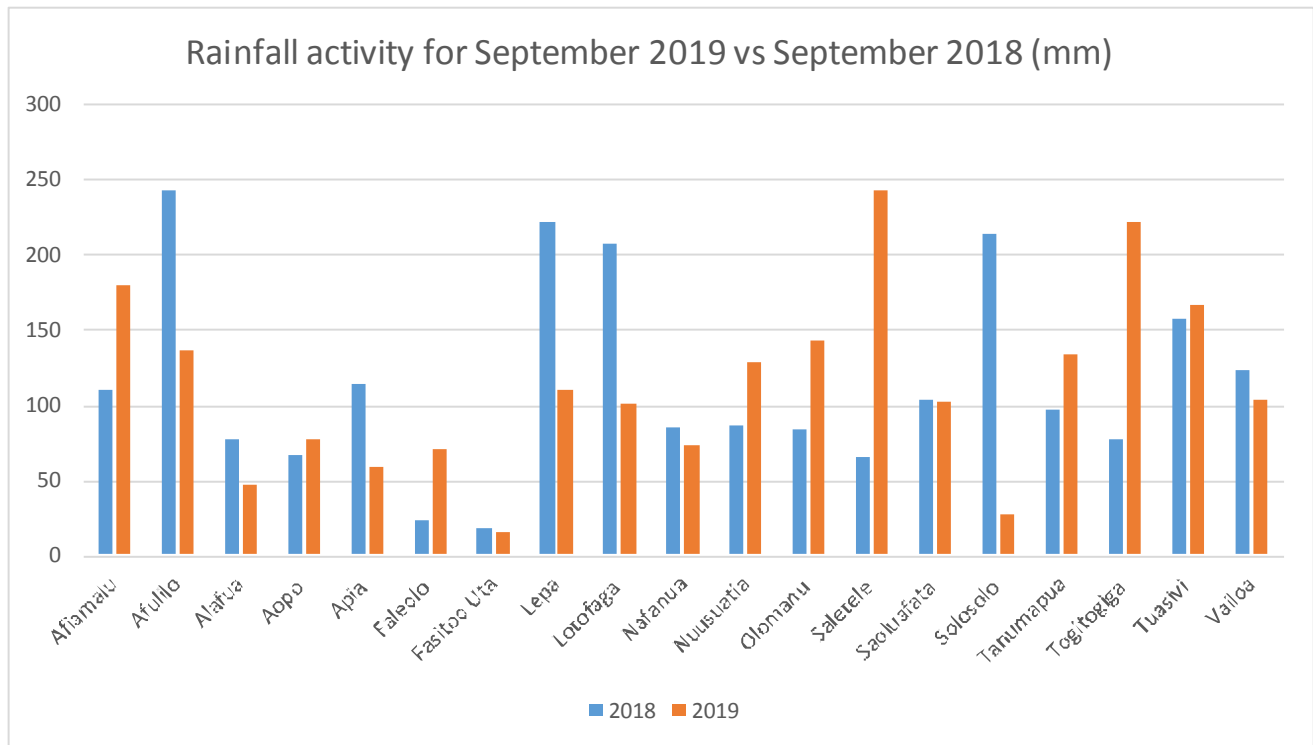
Southern Oscillation Index (SOI)

The approximate 30-day and 90-day Southern-Oscillation Index (SOI) values to 29th September 2019 were -12.8 and -9.0 respectively.

(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.)

APPENDIX

Figure 7: Graphical representation of total monthly rainfall in September 2018 vs September 2019 in all rainfall stations.



In figure 7, we can see that although some stations experienced relatively similar rainfall activity, stations situated in the southern part of the island seemed to have received a greater amount of rainfall in September 2019 compared to September 2018. Low amount of rainfall can be observed for stations in the northern region, having received less than 50 mm in some cases. Despite experiencing significant synoptic activity during September, observations from the weather summary highlighted the influence of tropical high pressures for most of the month, providing fine weather and less rainfall activity in this period.