

CLIMATE SUMMARY FEBRUARY 2019

Samoa Meteorology Division
Ministry of Natural Resources and Environment



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HIGHLIGHTS

- ◆ February 2019 recorded 'average to above average' rainfall across the country. **Pg 1 & 2**
- ◆ The warmest temperature of 34.3°C was registered on the 22nd at Vaiaata. The coolest temperature of 18.2°C registered at Afiamalu on the 15th. **Pg 3**
- ◆ North easterly winds dominate the islands in February. **Pg 4 & 5**
- ◆ El Nino Southern Oscillation (ENSO) remains Neutral with 50% chance of developing into an El Nino in the coming months. **Pg 6**
- ◆ Warm sub surface temperatures continue to weaken since beginning of the year with sea surface temperature following similar patterns. **Pg 6**
- ◆ On February 20th, king tide coupled with high swells resulted in coastal inundation for the northern areas.

ISSUED : MARCH 2019

Figure 1: SPCZ Position in February 2019

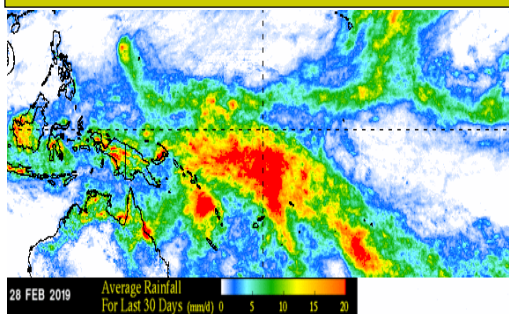
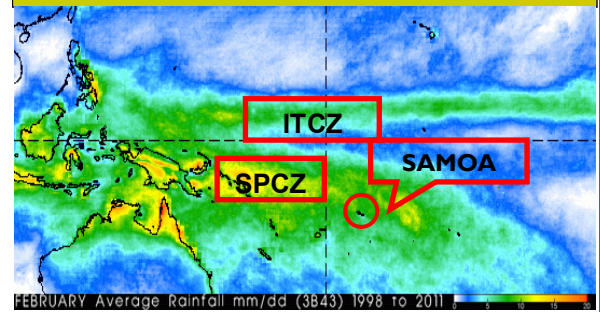


Figure 2: Normal Position of SPCZ in February



GLOBAL SCALE OBSERVATIONS

The February tropical rainfall measuring mission (TRMM) anomaly maps suggest the Inter-tropical Convergence Zone (ITCZ) may have linking up with the South Pacific Convergence Zone (SPCZ) in the central equatorial Pacific. The activeness of the SPCZ was enhanced and displaced northeast of its average February position. It is evident that the SPCZ split into two branches with the main SPCZ situated northeast Solomon Islands towards Southern Cook Islands while the other branch west of Date Line over Solomon Islands and Vanuatu which is possible tropical cyclone related. The convection activities were enhanced by a moderate pulse of the Madden Julian Oscillation (MJO) which impacted mostly other south pacific islands including Samoa.

LOCAL SCALE OBSERVATIONS

Generally, 'average to above average' rainfall was experienced throughout the country in February. Many tropical depressions (TD) were analyzed in the south pacific region during February which contributed to torrential rain over the island in some days with the existence of Tropical Cyclone (TC) Oma in further west affecting Vanuatu and the closest to our islands, TC Pola which formed north east of Tonga. Afiamalu recorded the highest monthly total of 896.0mm followed by 817.6mm at Aopo and 704.0mm at Vaiaata, Savaii. The lowest monthly total was received at Salailua with 314.2mm followed by 365.8mm at Vailoa, Aleipata. February 2019 was the 4th wettest on record for Togitogiga (37/40) and Faleolo (55/58) while it was the 5th wettest for Tiavea (25/29). The highest one - day fall was received at Afiamalu with amount of 159.8mm on the 25th. In comparison of the rainfall in February 2018 and the recent February, the significant difference in the two years precipitation is a result of the impact of the Tropical Cyclone (TC) Gita that made landfall in the early weeks of February 2018. (Pg7).

Table 1: Rainfall Statistics in February 2019

This table displays the rainfall status of all stations in the country in February 2019 comparing against the 30 year long term year in the period of 1981—2011.

Stations	February Rainfall (mm)	February 30 Year Long Term Average	% of Average	1 day fall (mm)	Date	# of Rainy Days	Rainfall Status
U P O L U							
Afiamalu	896.0	648	138	159.8	25 th	26	Above Average
Alafua	684.4	325	211	121.8	25 th	24	Well Above Average
Apia	554.0	356	156	102.0	25 th	20	Above Average
Faleolo	501.6	302	166	80.3	13 th	22	Well Above Average
Laulii	431.9	475	91	134.5	25 th	15	Average
Leauvaa Uta	616.0	438	141	126.4	25 th	21	Above Average
Lepa	458.6	347	132	89.4	23 rd	21	Above Average
Lotofaga	450.6	295	153	99.6	23 rd	16	Above Average
Nafanua	533.2	509	105	122.0	25 th	23	Average
Nuusuatia	459.2	323	142	72.8	25 th	21	Above Average
Saoluafata	518.2	569	91	102.0	25 th	25	Average
Saleilua	609.0	358	170	144.0	23 rd	16	Well Above Average
Tiavea	523.8	497	106	102.8	23 rd	21	Average
Togitogiga	635.6	331	192	83.0	25 th	28	Well Above Average
Vailoa Aleipata	365.8	314	116	59.0	25 th	19	Average
S A V A I I							
Aopo	817.6	517	158	96.6	10 th	22	Above Average
Falelima	529.6	252	210	79.6	10 th	20	Well Above Average
Salailua	314.2	370	85	50.0	26 th	16	Average
Tuasivi	541.6	414	131	80.0	10 th	20	Above Average
Vaiaata	704.0	675	104	117.8	10 th	23	Average

Well Below Average
<40%

Below Average
40%-80%

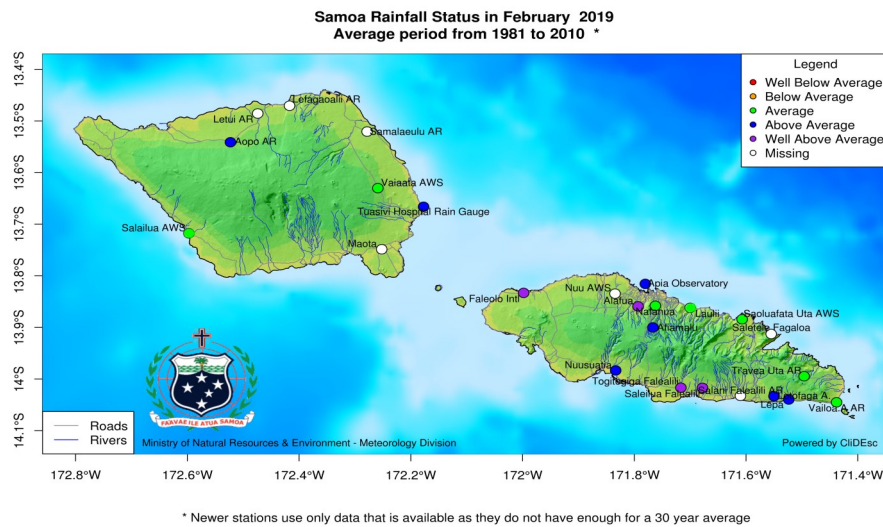
Average
80%-120%

Above Average
120%-160%

Well Above Average
>160%

Figure 3: Rainfall Status Map in February 2019

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 February 2019

Stations	Temperature (Degree Celsius)				
	Mean Daily Temperature (°C)	Extreme Temp Max (°C)	Date	Extreme Temp Min(°C)	Date
Afiamalu	N/A	N/A	N/A	18.2	15 th
Apia	28.0	32.7	4 th	29.2	19 th
Alafua	N/A	N/A	N/A	23.1	3 rd
Faleolo	N/A	N/A	N/A	24.0	1 st
Saoluafata	27.1	33.1	15 th	22.3	2 nd
Vaiaata	28.2	34.3	22 nd	23.9	15 th
Salailua	27.7	33.6	3 rd	23.4	4 th
N/A = Data Not Available					

The mean daily temperatures across the country in February ranges from 27.1 to 28.2°C. The highest recorded maximum temperature was 34.3°C at Vaiaata on the 15th. Conversely, the lowest recording temperature reading was 18.2°C at Afiamalu on the 15th in which Vaiaata also recorded its lowest of 23.9°C on the same day.

ATMOSPHERIC PRESSURE

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

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

Station	Highest MSL Pressure (hPa)	Date	Lowest MSL Pressure (hPa)	Date	Average MSL Pressure (hPa)
Apia	1010.5	28 th	1004.0	5 th	1007.3
Faleolo	1010.2	28 th	1004.3	5 th	1007.0

The highest MSL Pressure recorded at Apia on the 28th with 1010.5Pa whilst 1004.0hPa on the 5th registered as the lowest pressure. The average MSL Pressure recorded 1007.3 and 1007.0 at Apia and Faleolo respectively.

(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 February

Figure 4a : Apia Station

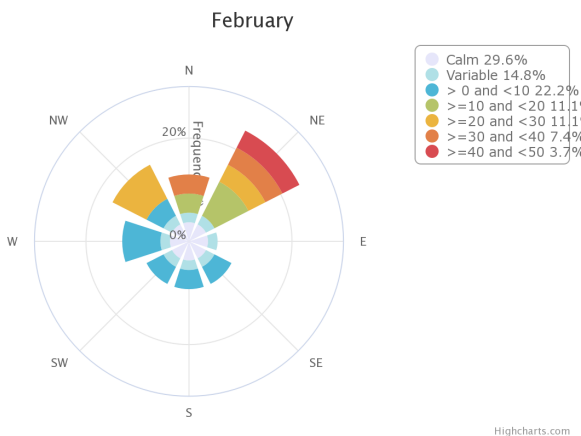
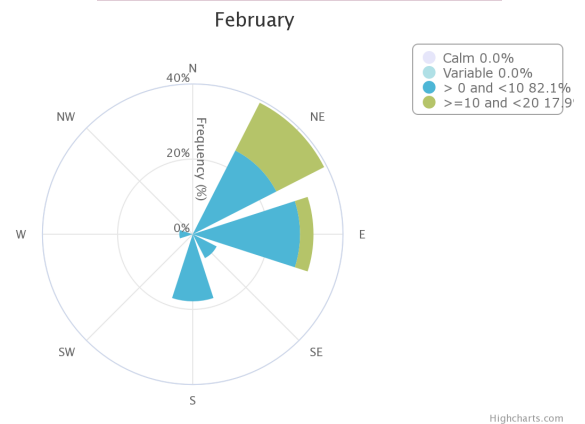


Figure 4b: Saoluafata Station



North easterlies dominated in both Apia and Saoluafata stations in February. Wind range from 10 km/hr upto 50km/hr were recorded at Apia whereas Saoluafata experienced much of light (1 - 10km/h) and gentle (11 - 20km/h). TDs mentioned earlier on contributed to the strong gusty winds recorded in Apia station.

Figure 4c : Afiamalu Station

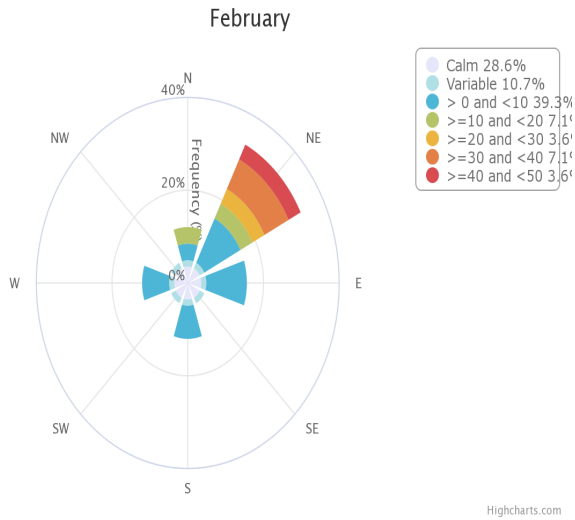


Figure 4d: Nafanua Station

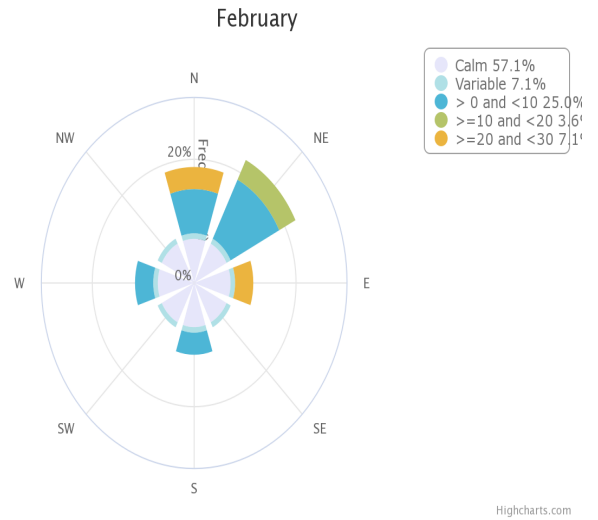
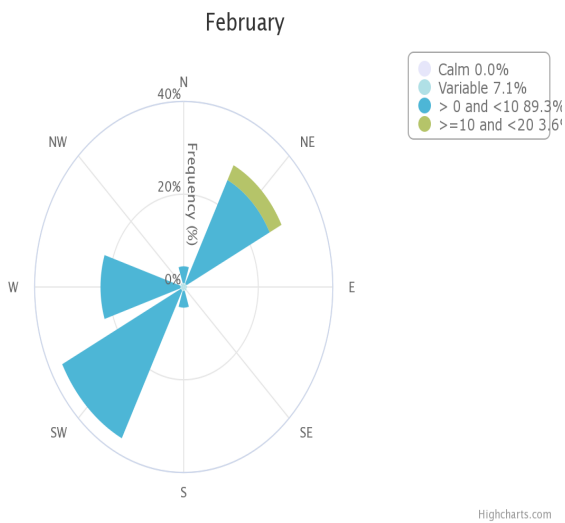


Figure 4f : Salailua Station



Afiamalu, Nafanua and Salailua were influenced mainly by the north easterlies wind range from light (1 - 10km/hr) up to great than 40km/hr wind. The strong gusty periods can be justified by the presence of the TDs in the vicinity of the islands in February. Calm conditions were also recorded at Afiamalu and Nafanua with also the presence of variable winds at minimal strength.

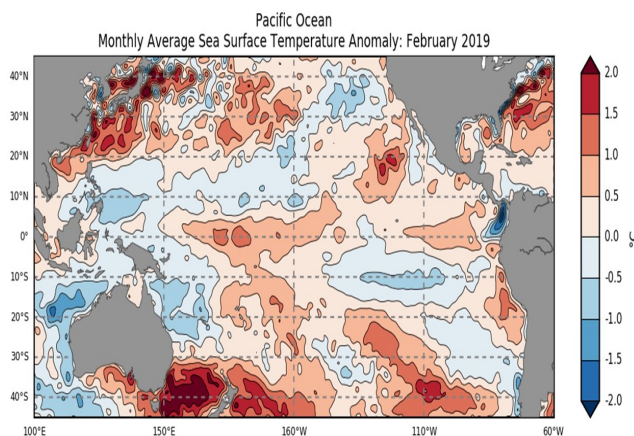
EL NINO SOUTHERN OSCILLATION (ENSO)

CURRENT ENSO STATUS

The current status of the El Niño Southern Oscillation continues to remain at neutral leaning towards El Niño. The Southern Oscillation Index (SOI) has recently dropped well into El Niño thresholds while the sea surface temperature (SST) has been warmer since last year and recently weakened. There has not been a coupling between the two, hence the delay in the occurrence of the El Niño.

OCEANIC INDICATOR OF ENSO

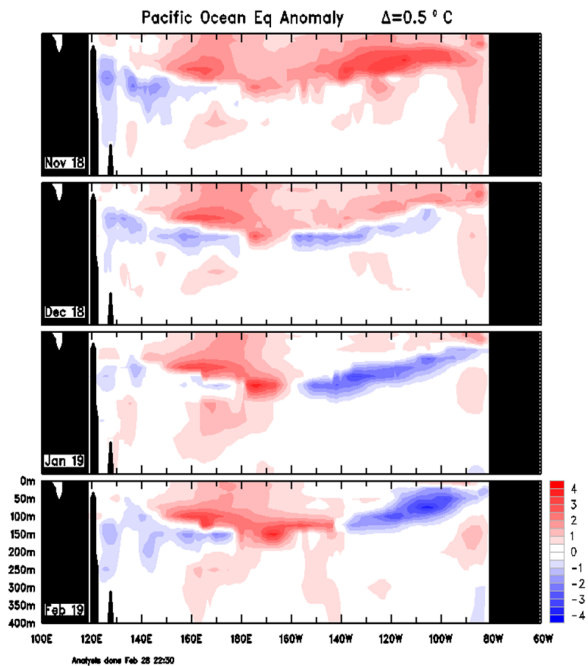
Figure 5: Sea Surface Temperature in February 2019



Sea surface temperatures (SSTs) for February were warmer than average along most of the equator in the Pacific Ocean, but close to average in the western tropical Pacific. Enhanced warming for a large part of the southern Pacific between about 170° E to 140°W in the mid-latitudes, and across most of the Pacific south of 30°S.

The February values for NINO3 were +0.5 °C, NINO3.4 +0.6 °C, and NINO4 +0.8 °C.

Figure 6: Sub-surface Temperature



The four-month sequence of sub-surface temperature anomalies (to February) shows warm anomalies present across most of the top 200 m of the western to central equatorial Pacific sub-surface, and cool anomalies in the top 150 m sub-surface of the eastern equatorial Pacific. An evident retreat of the warm anomalies in the sub-surface over late 2018 and early 2019 although small parts of the sub-surface to the west of the Date Line remain more than two and a half degrees warmer than average.

ATMOSPHERIC INDICATOR OF ENSO

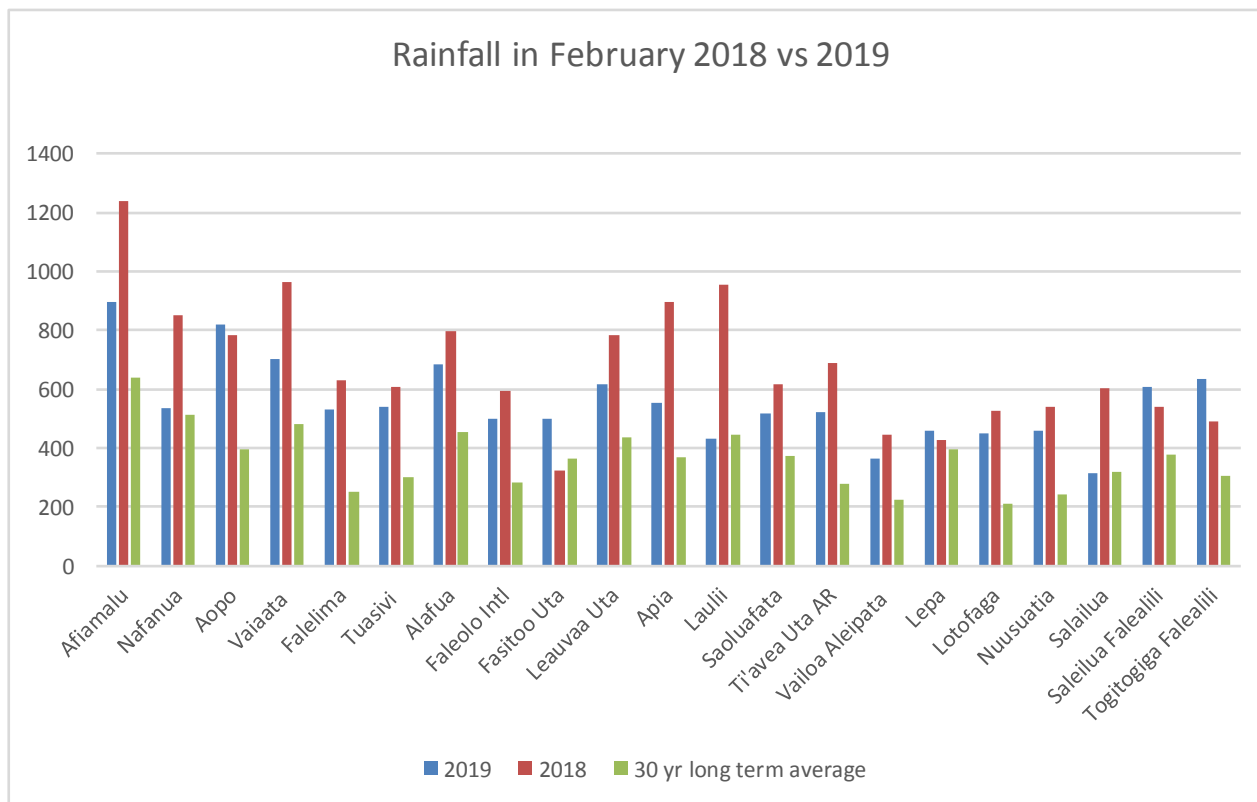
Southern Oscillation Index (SOI)

The 30-day Southern Oscillation Index (SOI) has continued to drop over the past two weeks, -12.5. The 30-day value has been within El Niño territory for almost two weeks. The 90-day SOI is well within neutral territory, at -2.2 for the 90 days ending 3 March.

(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

APPENDIX

Figure 7: Graphical representation of total monthly rainfall in February 2018 vs February 2019 against the 30 year long term average (1981-2011) in all rainfall stations.



In comparison of activities of February 2018 with February 2019, the rainfall across majority of the stations have exceeded their 30 year long term average. 17/21 stations in 2018 received more rainfall in comparison to the 2019 as a result of second named Tropical Cyclone (TC) Gita that affected the islands. On the other hand, the rainfall in February 2019, much of the precipitation fell on the highlands rather than the southern sides of the islands.