



## TONGA METEOROLOGICAL SERVICE DROUGHT REPORT 29 September 2023

### Rainfall Observations

Rainfall totals from last 6 months (mm): April – September 2023							Drought status	
Island Divisions	April	May	June	July	August	September	July – Sept Rainfall as per Drought Percentile Value	Drought status
Niuafo'ou	259.6	362.0	153.8	232.2	153.2	13.0	59.1	Drought alert
Niuatoputapu	102.5	644.4	167.5	106.0	169.0	16.0	49.3	Drought alert
Vava'u	101.0	357.6	103	130.0	307.6	17.0	26.6	Drought Warning
Ha'apai	110.6	338.8	113.5	99.5	109.8	22.0	32.8	Drought Warning
Fua'amotu	296.7	75.5	86.8	60.9	77.4	18.0	9.3	Drought Declaration
Nuku'alofa	198.5	119.5	89.5	56.5	72.5	18.0	7.6	Drought Declaration
'Eua	281.5	142.8	66.2	49.6	110.0	23.0	4.7	Drought Declaration
<b>Key for Rainfall Interpretation</b>								
Above Average Rainfall			Average Rainfall			Below Average Rainfall		

Table 1: Rainfall observations for April – September 2023.

### Drought Monitoring Thresholds

Percentile Value	Advisory Status
Rainfall observations $\geq$ 40 <sup>th</sup> Percentile	No Concern for Drought
Rainfall observations is within the 40 <sup>th</sup> to 25 <sup>th</sup> Percentile	Drought Alert
Rainfall observations is within the 25 <sup>th</sup> to 10 <sup>th</sup> Percentile	Drought Warning
Rainfall observations $\leq$ 10 <sup>th</sup> Percentile	Drought Declaration

**A Drought Alert is issued for all of Tonga or a specific area in Tonga when rainfall recorded is below the 40% percentile.**

- A drought alert is issued when rainfall for the previous 3 months is below the 40th percentile (i.e., within the driest 40% of all previous such 3-month(s) rainfall totals).

**A Drought Warning is issued following rainfall is below the 25% percentile.**

- A drought warning is issued when rainfall for the previous 3 months is below the 25th percentile (i.e., within the driest 25% of all previous such 3-month(s) rainfall totals).

**A Drought is declared when rainfall is below the 10% percentile.**

- A drought is only declared when rainfall is below the 10th percentile (i.e., within the driest 10% of all previous such 3-month(s) rainfall totals). A meteorological drought is only declared when rainfall is below the 10th percentile (i.e., within the driest 10% of all previous such 3-month(s) rainfall totals).

**Numerical Weather Prediction (NWP) Model Analysis: October – December 2023**

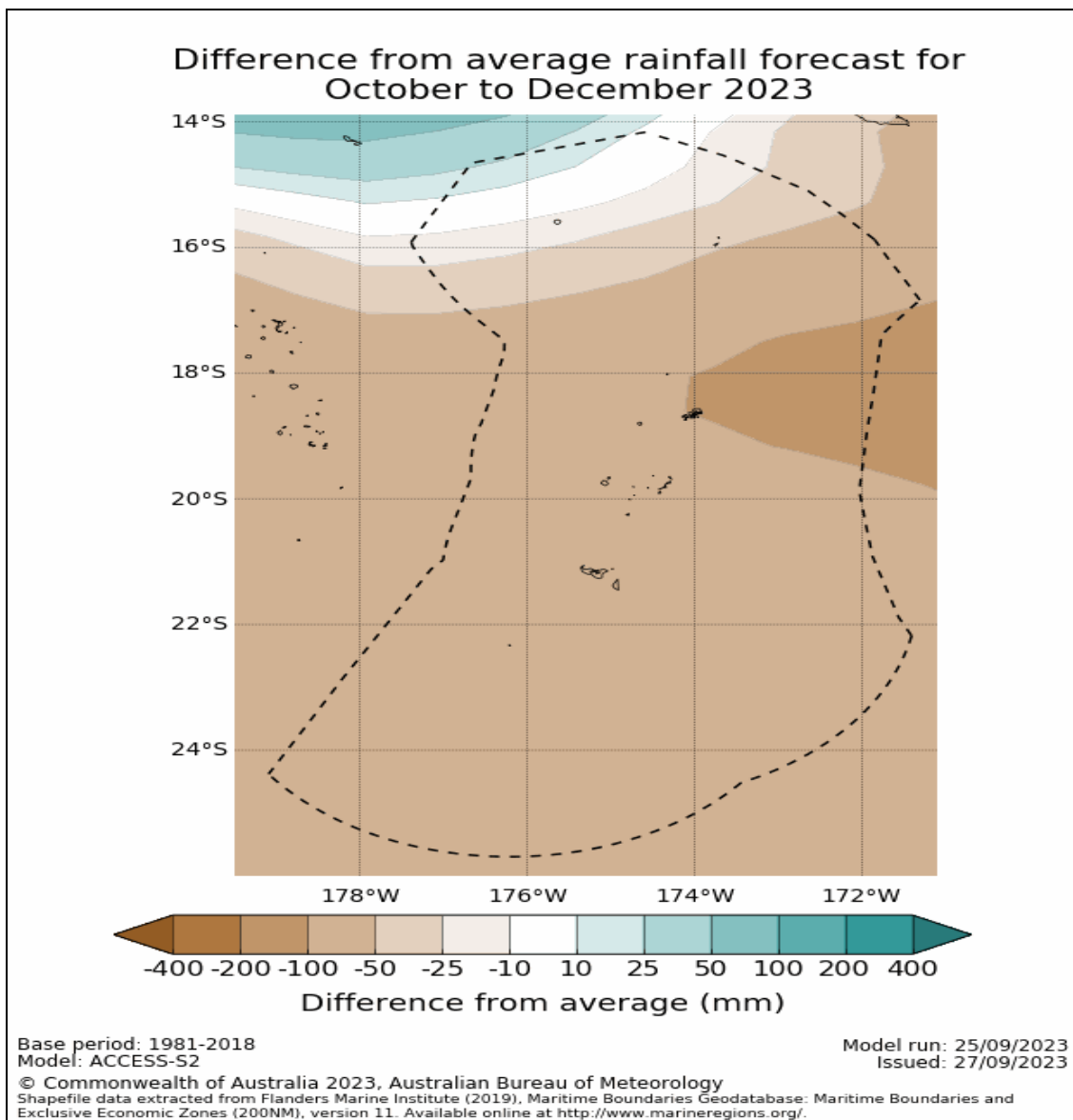


Figure 1: ACCESS-S Model Dynamical Prediction for the months October to December 2023, showing prediction for drier than normal conditions is expected for the whole of Tonga at negative 100mm of precipitation per day below the average.

### Rainfall Deficit Forecast for the next 3 months.

#### Rainfall deficit forecast for October 2023

Island Division	October Average Total rainfall (mm)	Expected Rainfall Deficit for October 2023
Niuafou'ou	173.0	-30%
Niuaotoputapu	169.5	-30%
Vava'u	141.8	-35%
Ha'apai	93.2	-55%
Nuku'alofa	85.7	-60%
Fua'amotu & 'Eua	92.0	-55%

#### Rainfall Deficit Forecast for November 2023

Island Division	November Average Total rainfall (mm)	Expected Rainfall Deficit for November 2023
Niuafou'ou	228.8	5% (surplus)
Niuaotoputapu	166.2	5% (surplus)
Vava'u	141.6	-20%
Ha'apai	107.2	-25%
Nuku'alofa	85.0	-30%
Fua'amotu & 'Eua	105.7	-25%

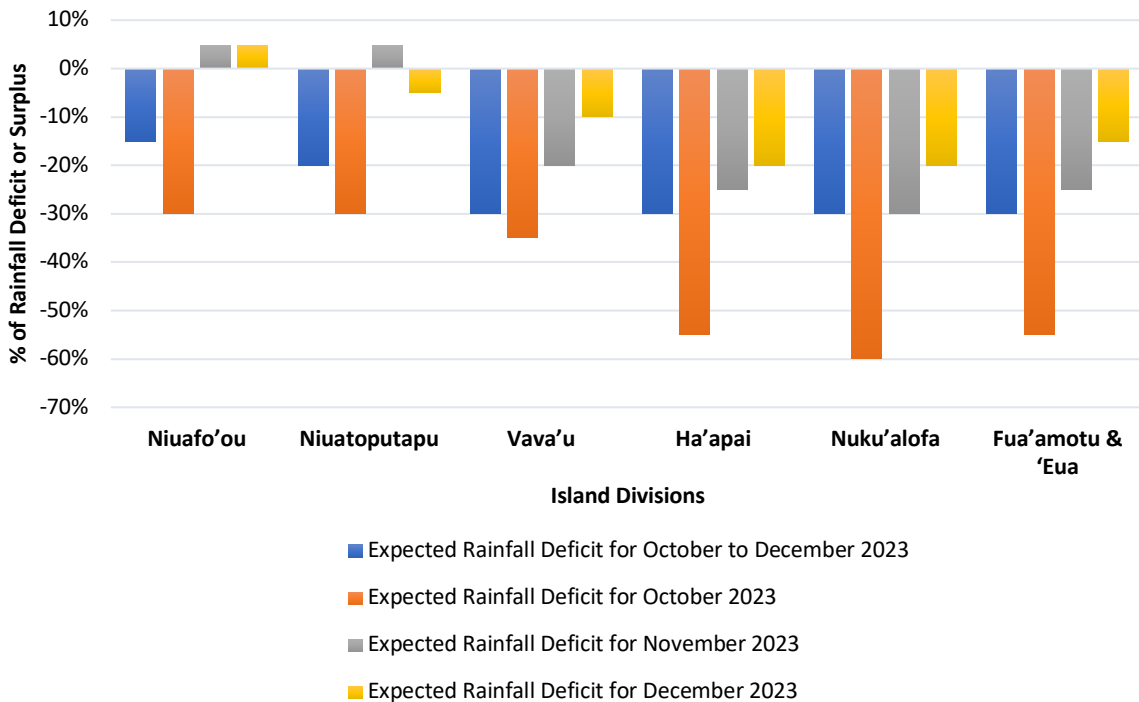
#### Rainfall Deficit Forecast for December 2023

Island Division	December Average Total rainfall (mm)	Expected Rainfall Deficit for December 2023
Niuafou'ou	311.6	5% (surplus)
Niuaotoputapu	260.6	-5%
Vava'u	244.0	-10%
Ha'apai	133.4	-20%
Nuku'alofa	146.9	-20%
Fua'amotu & 'Eua	158.9	-15%

#### Rainfall Deficit for the 3 months October to December 2023

Island Division	October – December (OND) Average Total rainfall (mm)	Expected Rainfall Deficit for October to December 2023
Niuafou'ou	713.4	-15%
Niuaotoputapu	596.3	-20%
Vava'u	527.4	-30%
Ha'apai	333.8	-30%
Nuku'alofa	317.6	-30%
Fua'amotu & 'Eua	356.6	-30%

## Monthly Rainfall Deficit from October - December 2023 & Combined Rainfall Deficit (OND)



### Alerts and warnings

1. Drought Alerts are for Niufo'ou and Niuatoputapu
2. Drought Warnings are in force for Ha'apai and Vava'u
3. Tongatapu and 'Eua are in drought.
4. For the next three months (October – December 2023):
  - a. Expect a 30% Rainfall deficiency for Vava'u, Ha'apai, Tongatapu and 'Eua.
  - b. Expect a 15 – 20% Rainfall deficiency for Niufo'ou and Niuatoputapu.
5. For the NEMC to note that the month of October 2023 is the month with the most predicted rainfall deficit for all island divisions of Tonga.
6. For the NEMC to strategically implement response based on the above drought status advisories and the percentage of the expected rainfall deficiency for each island division.