



Climate Update for Tonga

October 2011 Climate Summary December–February 2012 Rainfall Outlook

Issued 14th November 2011

October's Climate in Brief

- *October Rainfall was normal to above Normal throughout the country.*
- *Rainfall outlook for the December 2011 to February 2012 period favors Above normal throughout the country.*

October Rainfall throughout Tonga was Normal for the Southern and Above normal for the Central and the Northern Division.

Rainfall outlook for December 2011 to February 2012 period is generally for Above normal condition throughout the country.

La Niña continues to develop with atmospheric and oceanic indicators intensifying over the last two weeks. The majority of climate models surveyed by the Bureau of Meteorology predict the continuation of La Niña through the southern hemisphere summer. Based on current observations, it is likely that this La Niña will be considerably weaker than last year's strong event.

Temperature October 2011

Mean air temperatures were above normal across the country except Vava'u which was warmer than normal during October. The mean temperature for the month was 25.4°C which was 1.0°C warmer than normal. Daytime maximum was warmer than normal throughout the country. Night time minimum temperatures were warmer than normal across the country except for Vava'u which was cooler than normal.

Table 1: Temperature October 2011

Location	Highest Maximum Temp	Lowest Minimum Temp	Mean Temperature (°C)	Departure from Normal	Comments
Niuafu'ou	31.5	22.1	27.3	+1.1	Above normal
Niuaotupapu					NA
Vava'u	29.5	17.1	24.7	-0.1	Below normal
Ha'apai	29.5	21.7	25.9	+1.8	Above normal
Nuku'alofa	30.3	16.5	24.7	+1.6	Above normal
Fua'amotu	30.2	15.4	24.4	+1.9	Above normal

Rainfall October 2011

October Rainfall was Normal for the Southern Division and Above normal for the Northern and Central Divisions.

Table 2. Rainfall Totals for October 2011

Station (data period)	Aug Total (mm)	Sept. Total (mm)	Oct. Total (mm)	Forecast Probability			Comments
				33%tile Rainfall (mm)	67%tile Rainfall (mm)	Median Rainfall (mm)	
Niuafo'ou 1971-2010	91.0	159.0	189.6	131.7	181.0	154.0	Above Normal
Niuaotoputapu 1947-2010	122.4	95.1	416.9	112.0	212.0	149.0	Above Normal
Vava'u 1947-2010	100.6	252.9	332.5	99.0	172.0	137.9	Above Normal
Ha'apai 1947-2010	38.4	160.2	199.1	60.0	123.0	92.0	Above Normal
Nuku'alofa 1945-2010	83.3	198.2	60.3	53.0	130.0	99.0	Normal
Fua'amotu 1980-2010	87.9	200.6	71.3	43.0	111.0	62.0	Normal

Forecast Validation for the last 3 months, August—October 2011.

Table 3. August–October 2011 Rain-

Location	August-October. 2011 Forecast Range		Aug – Oct. 2011 Observed Data (mm)	Comments
	33%tile Rainfall (mm)	67%tile Rainfall (mm)		
	Niuafo'ou	312.7	471.7	
Niuaotoputapu	271.0	478.0	634.4	Above Normal
Vava'u	311.0	465.0	686.0	Above Normal
Ha'apai	236.0	355.0	397.7	Above Normal
Nuku'alofa	260.7	393.7	326.8	Normal
Fua'amotu	274.0	410.0	359.8	Normal

The rainfall outlook for the August to October period was for Normal to Above normal with a low to very high skill level. The observed rainfall for the last 3 months was normal in Niuafo'ou, Nuku'alofa and Fua'amotu and Above normal for the rest of the groups. The outlook was generally consistent to near consistent.

Current Conditions

Drought Update

There is no drought warning current.

El Niño Southern Oscillation (ENSO) UPDATE

La Niña continues to develop with atmospheric and oceanic indicators intensifying over the last two weeks. The majority of climate models surveyed by the Bureau of Meteorology predict the continuation of La Niña through the southern hemisphere summer. Based on current observations, it is likely that this La Niña will be considerably weaker than last year's strong event.

Seasonal Predictions for Tonga (December– February 2012)

SCOPIC model outlook for December to February 2012 period, generally is for rainfall to be Above normal for Tonga. The skill level of the forecast is very high.

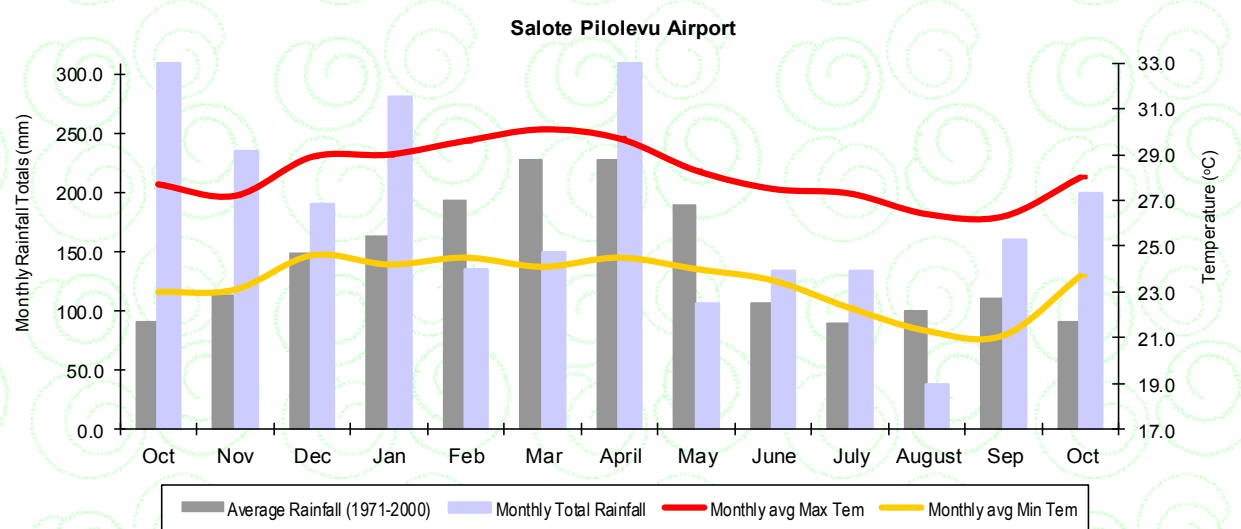
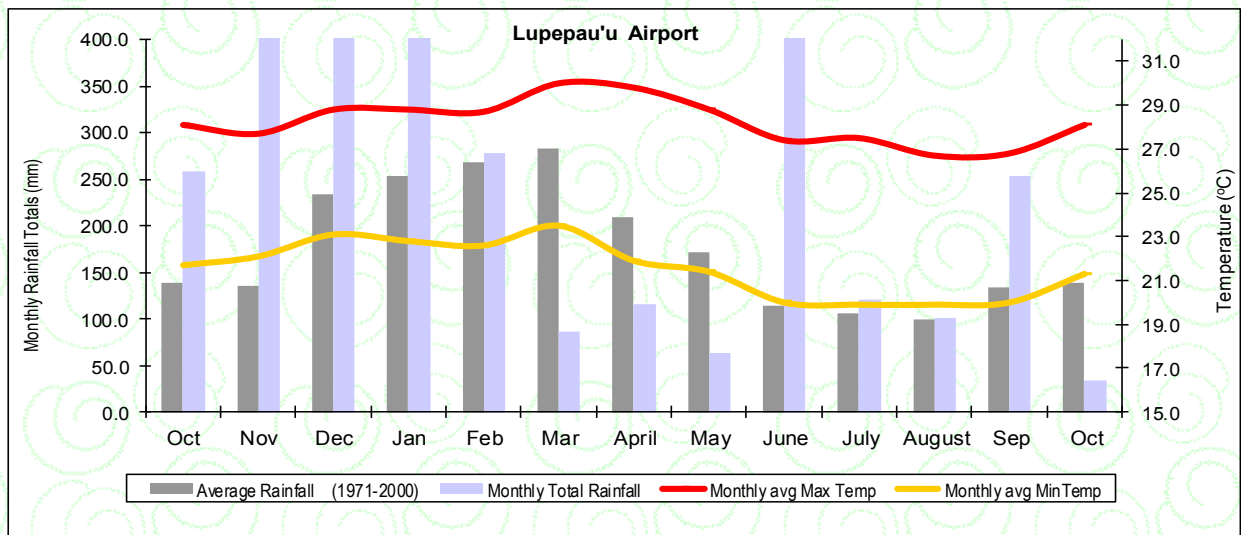
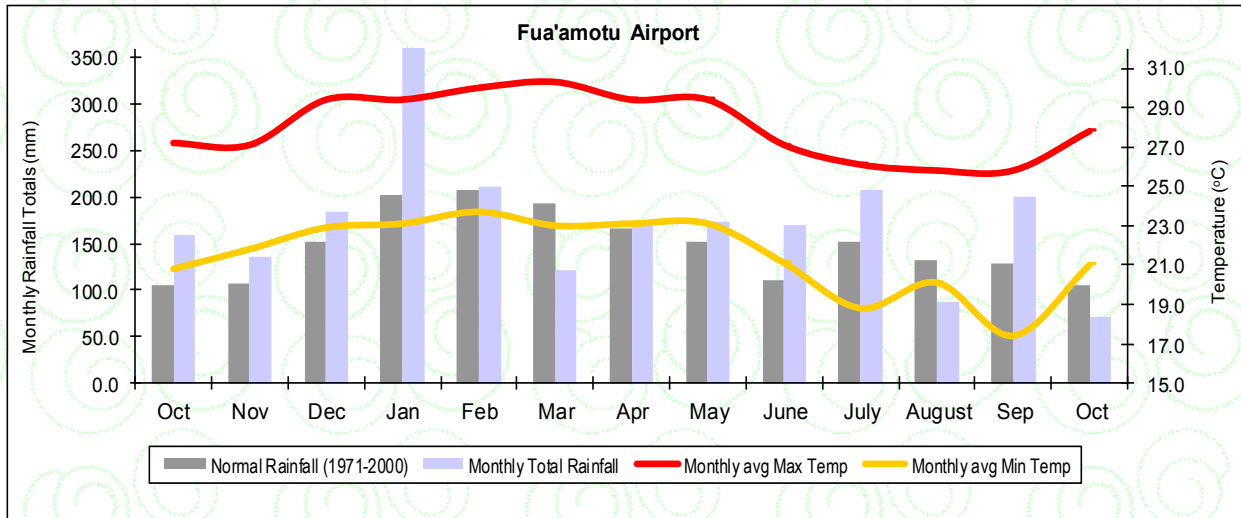
The confidence level in the outlook is related to how consistently the Pacific Ocean affects the rainfall in Tonga. Therefore the outlook confidence level for the December to February 2012 period according to climatological historical data shows this effect to be low ..

Table 4. Seasonal Rainfall Outlook for December 2011 to February 2012.

Location	Below normal probability (%)	33%tile Rainfall (mm)	Normal Probability %	66%tile Rainfall (mm)	Above normal Probability (%)
Niufo'ou	12	722.0	36	925.0	52
Niuaotoputapu	9	640.0	40	867.0	51
Vava'u	13	605	39	891	48
Ha'apai	4	429	43	678	52
Nuku'alofa	14	436	29	718	57
Fua'amotu	16	408.7	16	770.5	68

:Note the rainfall values are for the three month period (December to February 2012).

Rainfall Recorded over the last 13 month October 2010 to October 2011



Note:

The Tonga Meteorological Service currently uses the **Seasonal Climate Outlook for Pacific Island Countries (SCOPIC)** Model for its seasonal rainfall prediction, validation and drought analysis. The system analyses current sea surface temperature patterns across the Pacific Ocean and then matches the most similar patterns experienced through the available historical period. The terms “**Below normal**” refers to rainfall in the lowest 33%, “**Normal**” refers to rainfall between the 33% and 67%, “**Above normal**” refers to rainfall in the highest 67%. Table 4 shows the percentage chance of receiving rainfall in each category from meteorological stations in Tonga. If conditions are **Climatology** then it means that we are forecasting an equal chance of rainfall to be in any tercile.

Average day time and **night time** temperature is the average daily maximum and minimum temperature recorded throughout Tonga.

The drought analysis summary is based on the ENSO phases on a 4 month aggregate drought index using the Standardised Precipitation Index (SPI) method. SCOPIC focuses mainly on meteorological drought as it uses only rainfall for analysis. “**Drought** is a weather-related natural disaster that occurs when there is not enough water for users' normal needs. As people use water in many different ways, there is no universal definition”. In this analysis we refer to **drought** as a prolonged period of **below-normal** rainfall (6-month rainfall that is below the 40th percentile).

In this issue the use of Southern Tonga refers to Tongatapu and ‘Eua, Central Tonga refers to Ha’apai and Vava’u, Northern Tonga is referred to Niuatoputapu and Niufo’ou.

Significant Event

- Highest maximum temperature was 31.5°C in Niufo’ou.
- Lowest temperature was 17.1°C recorded in Vava’u.
- Highest rainfall recorded in 24 hours was 149.2mm recorded in Fua’amotu on the 15th October.

Southwest Pacific Dry Season

Wet Season starts in November to the following February also known as the Warm Wet Season. This is also known as the cyclone season.

Disclaimer

This summary is prepared as soon as possible following the end of the month, once climate data is received from recording stations around Tonga so the values may change on receipt of later information and the ENSO information is received from various Meteorological Agencies. Delays in data collection, communication and processing occasionally arise. While every effort is made to verify observational data, the Tonga Meteorological Service does not guarantee the accuracy and reliability of the analysis and rainfall predictions presented, and accepts no liability for any losses incurred through the use of this summary and its contents. This information should be used as for guidance only. All requests for data and for further information about this forecast should be directed to the Director of the Tonga Meteorological Service, at P.O. Box 845, Nuku’alofa. Or email at fmt_met@met.gov.to