



MINISTRY OF METEOROLOGY,  
ENERGY, INFORMATION, DISASTER  
MANAGEMENT, ENVIRONMENT,  
CLIMATE CHANGE AND  
COMMUNICATIONS (MEIDECC)  
NUKU'ALOFA, TONGA

## 2022–2023 Tropical Cyclone Season Outlook for Tonga

1. Expect lower than usual tropical cyclone activity (1 to 2 cyclones).
2. There is a moderate to high risk of Tonga being affected by at least 1 Severe Cyclone.
3. The peak months for tropical cyclone activity will be January and February.
4. There is a higher chance of cyclone activity to affect Ha'apai, Tongatapu and 'Eua.
5. Expect more than usual rainfall (up to twice as much) due to continued La Nina conditions.

(Date of Release: 24<sup>th</sup> October 2022)

### Summary

The Tropical Cyclone (TC) activity expected in the 2022/23 Tropical Cyclone Season to affect Tonga is likely to be below average (1 to 2 cyclones). Historical records also indicate that Tonga could expect at least 1 cyclone and at most 3 cyclones to occur with a moderate to high chance (60%) of at least 1 Severe Tropical Cyclone occurring.

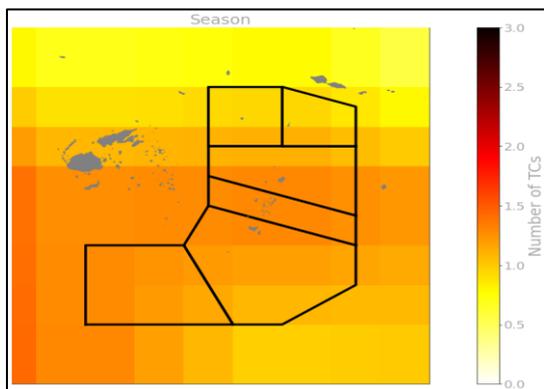


Figure 1: Expected number of Tropical Cyclones predicted to affect Tonga during the 2022-23 Tropical Cyclone Season

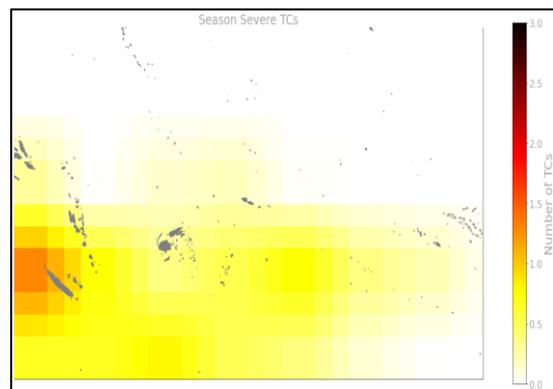


Figure 2 Expected number of Severe Tropical Cyclones expected to affect the Southwest Pacific in the 2022-23 Tropical Cyclone Season

Any tropical cyclones passing close to the country, associated active cloud with heavy rain bands may occasionally affect Tonga with marked rainfall and possible flooding, including sea flooding of low-lying coastal areas.

Tropical cyclones affecting Tonga in the 2022/2023 season should expect to be mostly coming from the West and North-West quadrants (Fiji Area: 67%) and the rest from the North, East and Northeast quadrants.

About 5 to 7 named Tropical Cyclones are expected for the South West Pacific Region (Nadi Area of Responsibility from 160E to 120W and from the Equator to 25S) for the 2022/2023 season, with 1 to 4 Tropical Cyclones reaching severe intensity (Category 3 to 5). Tropical Cyclone formation areas will be shifted to the warmer ocean temperatures in the Australia, Papua New Guinea and Solomon Island regions.

The 2022/23 Tropical Cyclone Season will likely bring above average rainfall to all island divisions of Tonga during the cyclone season due to La Nina conditions. In some island divisions, the average monthly rainfall can be doubled.

### **Tropical Cyclone Analysis and Outlook for Tonga**

The official 2022/2023 TC Season will begin on the 01 November 2022 and will officially end on the 30 April 2023. It should be noted that Tropical Cyclones have occasionally formed outside this period e.g. Tropical Cyclone “Keli” which affected Northern Tonga in June 1997. The peak time for the occurrence of Tropical Cyclones in Tonga is from January to March with most events occurring in February. Sea surface analysis indicates that the El Niño–Southern Oscillation (ENSO) is currently at a La Niña signal for the start of this Tropical Cyclone Season.

The Tropical Pacific Ocean is expected to remain in La Niña conditions for a short period of time lasting from October to December 2022 with indications of returning to Neutral Conditions in the second half of the season (January to April 2023).

During every Tropical Cyclone season there are active periods in which potential for tropical cyclone formation is increased. These active periods come around every 30 to 60 days on average and lasts for a duration of about 2 to 3 weeks in our region. On average, there are about 3 active periods during tropical cyclone season for the Southwest Pacific region.

Current dynamics indicates that the first tropical cyclone activity for this season in the South West Pacific region (including Tonga) to occur around December 2022 to January 2023. These active periods will be updated during the course of the cyclone season to aid with preparedness.

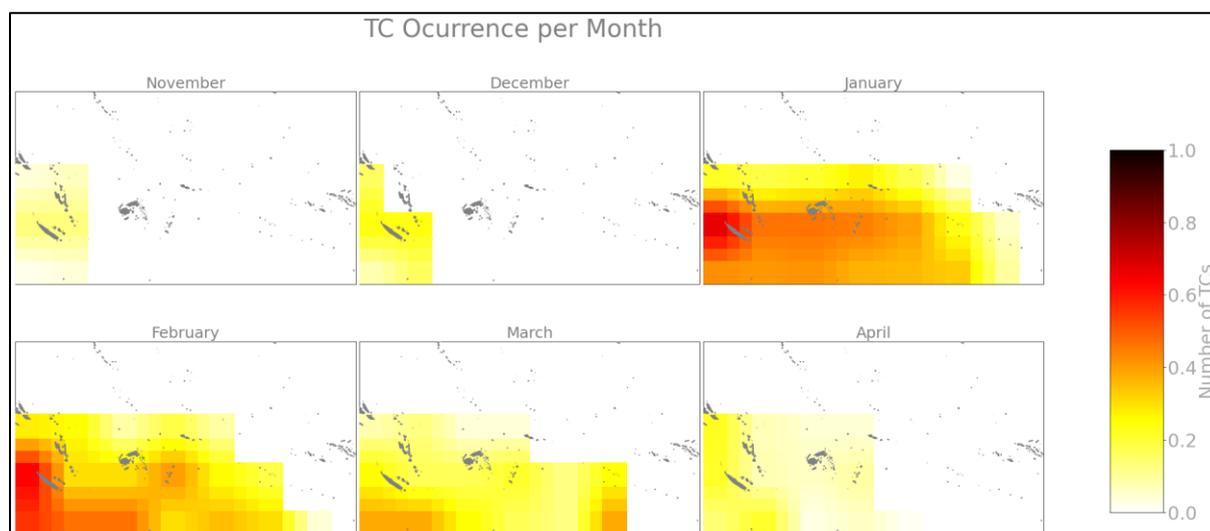


Figure 3: Expected tropical cyclone activity by month for the 2022-23 cyclone season indicates that most tropical cyclone activity should occur in the months of January and February 2023.

## **Historical Tropical Cyclone events that has affected Tonga during Cyclone Seasons similar to the upcoming 2022-23 Season.**

Tropical Cyclones that have affected Tonga in the past where current and forecast conditions are similar to the 2022/2023 Tropical Cyclone Season are indicated in Table 1.

<b>Tropical Cyclone Season</b>	<b>No. of Tropical Cyclones Occurring in our Area</b>	<b>No. of Severe Tropical Cyclones Occurring in our Area</b>
1971-72	0	0
1974-75	2	1
1984-85	3	1
2000-01	1	1
2008-09	2	0
2011-12	2	0
2017-18	2	2
<b>Average</b>	<b>1.7</b>	<b>0.7</b>

*Table 1: Current sea surface temperatures patterns indicates that the 2022/23 Tropical Cyclone season is expected to be similar to 7 other Tropical Cyclone seasons in the recorded past (1971-72, 1974-75, 1984-85, 2000-01, 2008-09, 2011-12, 2017-18).*

## **Severe Tropical Cyclones that have occurred in years similar of this coming Tropical Cyclone season**

<b>Island Group Affected</b>	<b>Severe Cyclone</b>	<b>Season</b>
Niufo'ou	VAL (Cat 4)	1974/75
Ha'apai	NIGEL (Cat 3), ERIC (Cat 4)	1984/85
Tongatapu/Eua	PAULA (Cat 4)	2000/01
Tongatapu/Eua	GITA (Cat 4), KENI (Cat 3)	2017/18

*Table 2: Statistically Severe Tropical Cyclone events that have occurred during La Nina years like this upcoming season.*

## **Likely Sector Impacts during the 2022-2023 Tropical Cyclone Season**

### **1. Agriculture**

Although there is less likelihood of Cyclone occurrence than usual, it is the cyclone season so strong wind events will happen from time to time and crops prone to wind damage like Banana, Papaya and Breadfruit will be affected. At the same time, La Nina conditions will bring above average rainfall which will good for planting higher rainfall (big leaf plants) crops such as Kava, Taro, Banana and Kape. Weed management will be a must this season in order to get a good harvest.

### **2. Water**

Water surplus during this season is to be expected. Therefore, rain water should be collected and harvested this season as much as possible to be used when the rainy season ends around April 2023. Clean roofs and replace guttering's.

### **3. Health**

Higher risk of water contamination related diseases occurring due to above average rainfall expected and flooding of low-lying areas. Mosquitoes will be a problem from the months of December to February due to higher rainfall and higher humidity so mosquito management will be key to prevent mosquito transmitted disease like dengue.

#### **4. Infrastructure**

There is a moderate to high chance of one severe cyclone happening this season, so the public are advised to fix shutters and trim trees near the house just in case we get a severe event.

#### **5. Tourism**

Moderate to High risk for Tourism activities due to moderate to high chance of a severe cyclone occurring.

#### **6. Fisheries**

Ocean nutrients will be abundant due to La Nina conditions so expect tuna fisheries to be good as well as trolleying. Expect low to moderate coral bleaching or algae blooms.

#### **7. Utilities**

Moderate to high risk of Communications, Water and Power utilities failures due to tropical cyclone activity. But high risk of flooding related problems.

#### **8. Transport**

Moderate to high risk of above than normal cancellations to ferry and aircraft operations due to stronger winds and tropical cyclone activity. Higher risk road and drainage flooding related problems due to higher expectation of above average rainfall.

### **Note of caution**

It should be noted that the information provided is only to be used as guidance and the given range of tropical cyclone numbers is indicative only. It is expected that the total number of tropical cyclones could be in the vicinity of the listed values, and not necessarily within the given range. The values are the most likely number of tropical cyclones based on statistical and scientific evidence, including the influences by regional and global weather and climate variability drivers and indices.

All communities should remain alert and prepared throughout the 2022-2023 Tropical Cyclone Season and take heed of tropical cyclone alerts, warnings and advisories seriously whenever it is issued to reduce the negative effects on life and property.

All communities are urged to be vigilant and follow forecast information provided by the Meteorology Department of the Ministry of MEIDECC throughout the season. An update to this outlook will be issued around the end of January 2023.

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