



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

Update Tropical Cyclone Season (2023–2024) Outlook for Tonga

“There is a moderate chance (50%) for 1 to 2 Tropical Cyclone to affect Tonga for the remainder of the TC Season (February - April 2024)”

“There is a moderate chance (50%) that at least 1 Tropical Cyclone could be Severe”

“El Nino signals will gradually weaken in the Tropical Pacific for the remainder of the TC Season and return to Neutral conditions in May – June 2024. Therefore, there is a possibility that the TC season may extend into May and even June 2024.”

(Date of Release: 28th February 2024)

Recent Tropical Cyclone Activities

Since the official start of the 2023-2024 Tropical Cyclone (TC) season on the 1st November 2023, a total of 10 Tropical Disturbances (TD) had occurred. From these depressions a total of 5 Tropical Cyclones had developed (the prediction for the TC season is 8 to 14 cyclones).

Tropical System	Tropical Cyclone or Disturbance Strength	Area Affected	Time period
TD01F (TC Lola)	Category 5 (115 knots or 230km/hr)	Eastern Solomons, Northern and Central Vanuatu.	19 – 26 October 2023
TD02F (TC Mal)	Category 3 (60 knots or 120km/hr)	West and Southwest waters of Fiji and Southwest waters of Tonga	10 – 16 November 2023

TD03F (TC Jasper)	Tropical Disturbance (20-30 knots or 40-60 km/hr)	Solomon Islands	2 – 3 December 2023
TD04F	Tropical Disturbance (20-25 knots or 40-50 km/hr)	Open waters west of Fiji	25 January 2024
TD05F	Tropical Disturbance (20-30 knots or 40-60 km/hr)	Vanuatu and Fiji	02 – 27 February 2024
TD06F (TC Nat)	Category 2 (50 knots or 100 km/hr)	Over waters North of Southern Cook Islands and South of French Polynesia	03 – 21 February 2024
TD07F	Tropical Disturbance (20-30 knots or 40-60 km/hr)	French Polynesia	5 – 7 February 2024
TD08F (TC Osai)	Category 1 (45 knots or 90 km/hr)	Palmerston island, Southern Cook Islands	6 – 8 February 2024
TD09F	Tropical Disturbance (20-30 knots or 40-60 km/hr)	French Polynesia	11 – 12 February 2024
TD10F	Tropical Disturbance (20-30 knots or 40-60 km/hr)	Southern Cook Islands	14 – 17 February 2024

Table 1: Number of tropical systems that were recorded in the Southwest Pacific region since the beginning of the 2023-24 TC season up to present day. It also shows the areas affected and the timeline of each event.

Summary of the Updated TC Outlook for Tonga

The TC outlook released before the start of the TC in October 2023; the predictions was that Tonga would encounter at most 3 TCs. At present, only 1 TC has crossed the Tonga area which resulted in the activation of the Fua'amotu Tropical Cyclone Warning Centre in response to Severe TC Mal (Cat 3) in November 2023 which remained to the southwestern waters of Tongatapu and 'Eua.

During every cyclone season there are active periods in which potential for tropical cyclone formation is increased. These active periods come around every 30 to 60days on average and lasts for a duration of about 2 to 3 weeks. There are at least three active periods in a typical TC season for the Southwest Pacific region.

The next active period for the Southwest pacific region (including Tonga) which indicates higher chances of TC or TD formation is predicted to restart again in the *last week of March will until early to Mid-April 2024 in our region.*

The Tropical Cyclone (TC) activity expected for the remainder of the 2023/24 TC Season to affect Tonga is likely to be around average (1 to 2 cyclones). Historical and statistical records indicates that Tonga could expect 50% chance of at least 1 cyclone to occur for the remainder of this TC season. These cyclones will most probably occur between last week of

March to early – mid April with a 50% chance of at least 1 Severe TC occurring.

Any tropical cyclones passing close to the country, associated active cloud and rain bands may occasionally affect Tonga with marked rainfall and possible flooding, including sea flooding of low-lying coastal areas. Tropical cyclones likely to affect Tonga for the remainder of the 2023/2024 season should expect to be mostly coming from the Northwest (Fiji Area – 60%) and the rest from the West, North, East and Northeast. Tropical Cyclone formation areas is still expected to develop in the warmer ocean temperatures of the Australia, Papua New Guinea, Solomon Islands and Vanuatu regions.

The peak time for the occurrence of tropical cyclones in Tonga is from January to March. Sea surface analysis indicates that the El Niño conditions of the South-west pacific region has reached its peak strength and is indicating a cooling of the sea surface temperatures is likely over the coming months. Climate models are indicating a return of the El Niño Southern Oscillation (ENSO) to Neutral Conditions during May - June 2024.

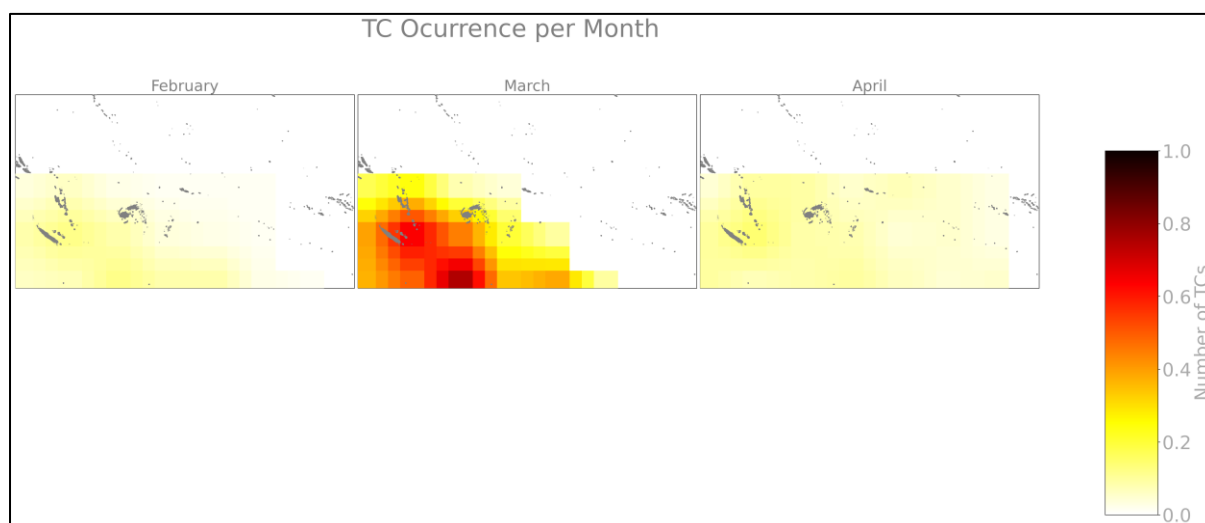


Figure 1: Expected tropical cyclone activity by month for the remainder of the 2023-24 cyclone seasons (February to April 2024).

Given the expected diminishing signals of this El Niño event at the moment and returning to Neutral conditions in the next 3 months. Tonga normally receives average or below average rainfall activities in Neutral conditions of the sea surface temperatures.

Climate models are also indicating that near normal or below normal rainfall over majority of Tonga during for the next 3 months. With current weakening conditions of El Niño and in the view of the rainfall outlook for Tonga, there is an increased risk of meteorological droughts in some islands of Tonga for the coming 3 to 6 months (May – October).

Historical Tropical Cyclone events that has affected Tonga during El Nino Years (similar to this TC Season 2023-24).

Tropical Cyclones that have affected Tonga in the past where current and forecast conditions are similar to the 2023/24 Cyclone Season during **February to April** are indicated in Table 1.

Tropical Cyclone Season	No. of Tropical Cyclone occurring in February to April timeframe of the cyclone season	No. of Severe Tropical Cyclone occurring in February to April timeframe of the cyclone season	Tropical Cyclone Name
1982-83	1	1	Severe TC Oscar
1987-88	-	-	-
1991-92	-	-	-
1997-98	-	-	-
2009-10	2	2	Severe TC Rene Severe TC Tomas
2015-16	3	3	Severe TC Amos Severe TC Winston Sever TC Zena
Average TC occurrence	1	Average of Severe TC occurrence	1

Table 2: Historical past Analogue Tropical Cyclone seasons with similar sea surface temperature patterns to the current Tropical Cyclone Season 2023-24

Likely Sector Impacts during the 2023-2024 Tropical Cyclone Season

1. Agriculture

Although there is an average to above average likelihood of Cyclone occurrence, it is the cyclone season strong wind events and below average rainfall will happen from time to time and crops prone to wind damage like Banana, Papaya and Breadfruit will be affected. At the same time, El Nino conditions will bring below average rainfall which will affect crops such as Kava, Taro, Banana and Kape.

2. Water

Water deficit during this season is to be expected. Therefore, rainwater should be collected and harvested this season as much as possible. Use water wisely.

3. Health

Higher risk of water contamination related diseases occurring due to below average rainfall expected and drought conditions. Drought related diseases will be elevated to a higher risk.

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 less abundant due to El Nino conditions so expect tuna fisheries to decrease during this season. Expect coral bleaching or algae blooms in areas with higher-than-normal sea temperature. These could occur over northern Tonga

7. Utilities

Moderate to high risk of Communications, Water and Power utilities failures due to tropical cyclone activity. Preparatory action now to trim trees near power lines could minimize down time during Cyclones.

8. Transport

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

9. Vulnerable Groups

There will be a need for establish support mechanisms and services to support the vulnerable groups in terms of water availability and quality related to prolonged drought and mobility issues as there is a higher probability of people living with disability that will need to be evacuated due to increase risk of cyclone frequency.

10. Coastal Communities

Need to plan for high number of cyclones expected during the season and the likelihood of higher sea level associated with El Nino. Coastal flooding from both cyclone frequency and higher sea levels could be more frequent.

11. Emergency Management Services and Disaster Reduction agencies.

Prepare for water shortage with high impact on the smaller outer islands and higher risk of bush fires and more responses to cyclone events.

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, dynamical 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 2023-2024 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 April 2024. For more information contact Tonga Meteorological Services at 0800638.

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