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CLIMATE CHANGE AND
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NUKU'ALOFA, TONGA

Tropical Cyclone Outlook for Tonga for the 2023-24 Season

(Date of Release: 24th October 2023)

1. **Expect up to 3 tropical cyclones to impact Tonga.**
2. **Expect at least 1 severe tropical cyclone to impact Tonga.**
3. **Expect that the 2023/24 tropical cyclone season will be longer than usual from Oct 2023 to May 2024 due to El Nino conditions.**
4. **The months where most tropical cyclone are likely to occur is during the January to March 2024 period.**
5. **Below average rainfall and higher than normal sea level is expected throughout the tropical cyclone season due to El Nino.**

Summary

The Tropical Cyclone (TC) activity expected in the 2023/24 Tropical Cyclone Season to affect Tonga is likely to be average to above average (2 to 3 cyclones; see Figure 1) with at least 1 Severe Tropical Cyclone.

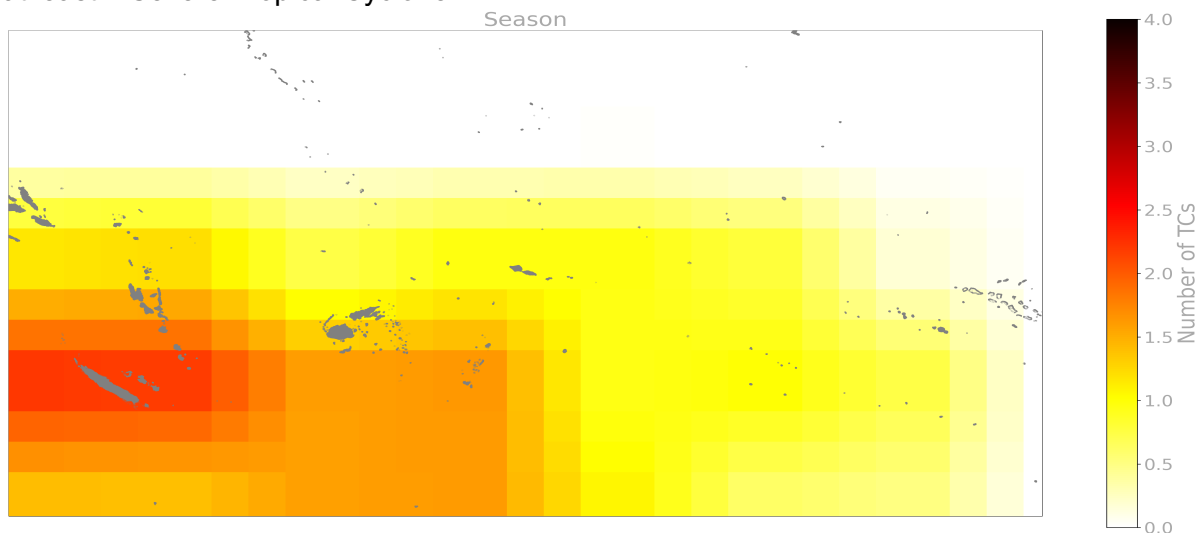


Figure 1: Expected number of Tropical Cyclones predicted to affect Tonga during the Tropical Cyclone Season 2023-24

Any tropical cyclones passing close to the country, associated active clouds 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 2023/2024 season should be expected 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 8 to 14 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 2023/2024 season, with 5 to 7 Tropical Cyclones reaching severe intensity (Category 3 to 5). Severe Tropical Cyclone “Lola” (Category 5) is the first Severe Tropical Cyclone for this season for the Southwest Pacific Region.

The 2023/24 Tropical Cyclone Season will likely bring below average rainfall to all island divisions of Tonga due to El Nino conditions. In some island divisions, the average monthly rainfall can be well below average resulting in drought events. Currently, Tongatapu and ‘Eua are already in drought conditions, Drought Warnings are in place for Ha’apai and Vava’u Island divisions and Drought Alerts are in place for Niuatoputapu and Niufo’ou.

Tropical Cyclone Analysis and Outlook for Tonga

The 2023/2024 TC Season will be longer than the official tropical cyclone season from November to April. Severe tropical Cyclone Lola (Cat5) has occurred in October which now marks the beginning of the 2023/24 season. This means that the cyclone season will be longer which could see the season lasting into May 2024. This is not unusual during El Nino years as Tropical Cyclones have occasionally formed outside this period. 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) condition should last until June 2024.

During every Tropical Cyclone season, there are active periods in which the potential for tropical cyclone formation is increased. These active periods come around every 30 to 60 days on average and last 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.

Historical Tropical Cyclone events that has affected Tonga during Cyclone Seasons similar to the upcoming 2023-24 Season.

Tropical Cyclones that have affected Tonga in the past where current and forecast conditions are similar to the 2023/2024 Tropical Cyclone Season are indicated in Table 1.

Tropical Cyclone Season	No. of Tropical Cyclones Occurring in our Area	No. of Severe Tropical Cyclones Occurring in our Area
1982-83	2	2
1987-88	-	-
1991-92	-	-
1997-98	2	2
2009-10	3	2
2015-16	6	4
Average	2.2	1.7

Table 1: Current Sea surface temperature patterns indicate that the 2023/24 Tropical Cyclone season is expected to be similar to 6 other Tropical Cyclone seasons in the recorded past (1982-83, 1987-88, 1991-92, 1997-98, 2009-10 and 2015-16).

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 Giant Taro.

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 and water sources will need to be tested regularly to ensure quality.

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 temperatures. 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 downtime 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 to 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 that people living with disabilities will need to be evacuated due to increased risk of cyclone frequency.

10. Coastal Communities

Need to plan for a higher number of cyclones expected during the season and the likelihood of higher sea levels 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 a 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 averages, dynamical and scientific-based prediction, including the influences of regional and global weather and climate variability drivers and indices. It should be noted that under similar conditions in the past the 2015-2016 season produced a total of 6 tropical cyclones over Tonga.

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 January 2024. For more information contact Tonga Meteorological Services at toll free 0800638.

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