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NUKU'ALOFA, TONGA

2021–2022 Tropical Cyclone Season Outlook for Tonga

La Nina conditions will likely bring above average rainfall to Tonga during the upcoming Cyclone Season

Expect at least 2 Tropical Cyclones to cross Tonga waters this Season with a high chance that 1 will be Severe

There is a higher risk of Tongatapu and Eua being affected by a tropical cyclone this season than other parts of Tonga

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Summary

The Tropical Cyclone (TC) activity expected in the 2020/21 Tropical Cyclone Season to affect Tonga is likely to be around average (2 cyclones on average). Historical records indicate that Tonga could expect at least 1 cyclone and at most 3 cyclones to occur with a High chance (75%) of at least 1 Severe Tropical Cyclone occurring.

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 2021/2022 season should expect to be mostly coming from the West and North-West or from the direction of Fiji (70%) and the rest from the North, East and Northeast directions.

About 5 to 10 named Tropical Cyclones are expected for the whole South West Pacific Region for the 2021/2022 season, with 1 to 3 Tropical Cyclones reaching severe intensity (Category 3 to 5).

The 2021/22 Tropical Cyclone Season is expected to be largely influenced by La Nina conditions. This will bring above average rainfall to all island divisions of Tonga during the cyclone season with more cyclones to occur west of the Dateline and less East of the dateline.

Cyclone Analysis and Outlook for Tonga

The official 2021/2022 TC Season will begin on the 01st November 2021 and will officially end on the 30th April 2022. 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 Temperature analysis indicates that there is a high possibility for a moderate La Nina to occur in the SW Pacific this season.

The Tropical Pacific Ocean is expected to remain in La Niña conditions throughout the first half (November 2021 to January 2022) of the 2021/2022 Cyclone Season with indications of returning to Neutral Conditions in the second half of the season (February to April 2022).

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 around Tonga. On average, there are at least 3 Active Periods in a typical 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 could start from around Early to Mid-December 2021.

Historical Tropical Cyclone events that has affected Tonga during emerging La Nina Years (similar to this year)

Tropical Cyclones that have affected Tonga in the past where current and forecast conditions are similar to the 2021/2022 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
1970-71	1	0
1973-74	2	1
1974-75	2	1
1988-89	3	0
1998-99	1	1
1999-00	3	1
2000-01	1	1
2007-08	1	0
2010-11	2	2
2011-12	2	1
2017-18	2	2
2020- 21	4	2
Average	2	1

Table 1: Current sea surface temperatures patterns indicates that the 2021/22 Tropical Cyclone season is expected to be similar to 12 other Tropical Cyclone seasons in the past (1970/71, 1973/74, 1974/75, 1988/89, 1998/99, 1999/2000, 2000/01, 2007/08, 2010/11, 2011/12, 2017/18, 2020/21).

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

Island Group Affected	Severe Cyclone	Season
Niufo'ou	VAL (Cat 4)	1974/75
Ha'apai	NIGEL (Cat 3), ERIC (Cat 4)	1984/85
Tongatapu/Eua	MONA (Cat 3)	1999/00
Tongatapu/Eua	PAULA (Cat 4)	2000/01
Tongatapu/Eua	VAIANU (Cat 3)	2005/06
Tongatapu/Eua	GITA (Cat 4), KENI (Cat 3)	2017/18
Tongatapu/Eua	ANA (Cat 3), YASA (Cat 5)	2020/21

Table 2: Higher risk for a Severe Tropical Cyclone to affect Tongatapu and 'Eua land areas or waters during the 2021/22 Cyclone Season

Tropical Cyclone affecting Island Groups during La Nina Tropical Cyclone Seasons with Sea Surface Temperatures similar to this year

Island Groups Affected	Number of Cyclones	Tropical Cyclone Season
Niuafo'ou	1	1974/75
Niuaatoputapu	1	1988/89
Niuaatoputapu	2	1999/2000
Vava'u	1	1973/74
Vava'u	2	1999/2000
Vava'u	1	2011/12
Vava'u	1	2020/21
Ha'apai,	2	1999/2000
Ha'apai	1	2007/08
Ha'apai	1	2010/11
Tongatapu & 'Eua	1	1973/74
Tongatapu & 'Eua	1	1988/89
Tongatapu & 'Eua	1	1998/1999
Tongatapu & 'Eua	2	1999/2000
Tongatapu & 'Eua	1	2000/01
Tongatapu & 'Eua	1	2007/08
Tongatapu & 'Eua	2	2010/11
Tongatapu & 'Eua	1	2011/12
Tongatapu & 'Eua	2	2017/18
Tongatapu & 'Eua	2	2020/21

Table 3: Tropical Cyclones that affected island groups during past similar Tropical Cyclone seasons to this upcoming Tropical Cyclone season 2021/22.

Past data in Table 3 above suggests that there is a higher risk of Tropical Cyclones crossing over Tongatapu and Eua than other parts of Tonga.

Rainfall Analysis for the 2021/22 Cyclone Season (Potential Moderate La Nina)

During La Niña events, Tonga normally receives above average rainfall activities. Current sea surface temperature patterns suggest that there is an 80% chance that a Moderate La Nina event may develop during the coming cyclone season. This will likely bring above normal rainfall over majority of Tonga during this Tropical Cyclone Season with increased risk of heavy rain events and possible flash flooding in low lying areas in Tonga during this Season.

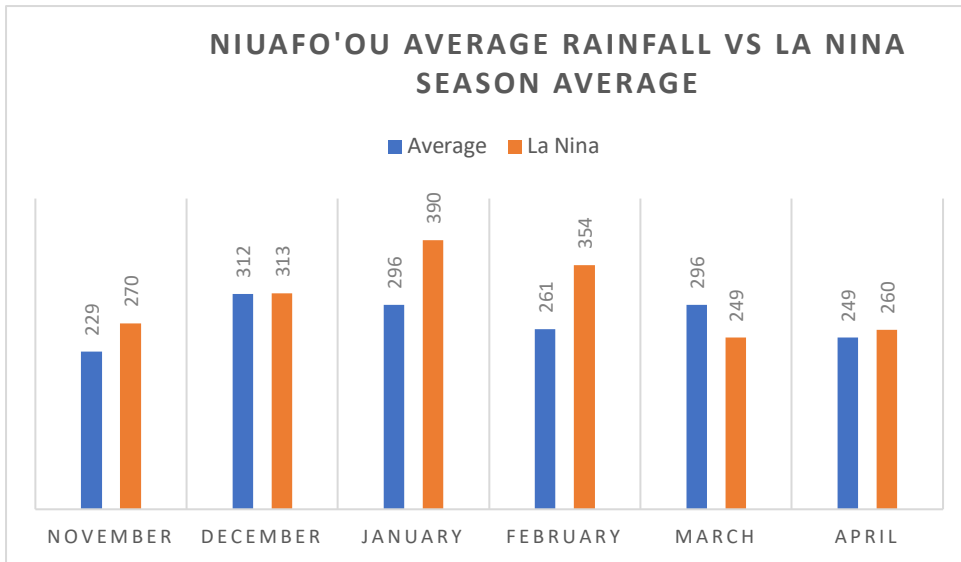


Figure 1: Expect peak above average rainfall in January and February for Niuafou'ou

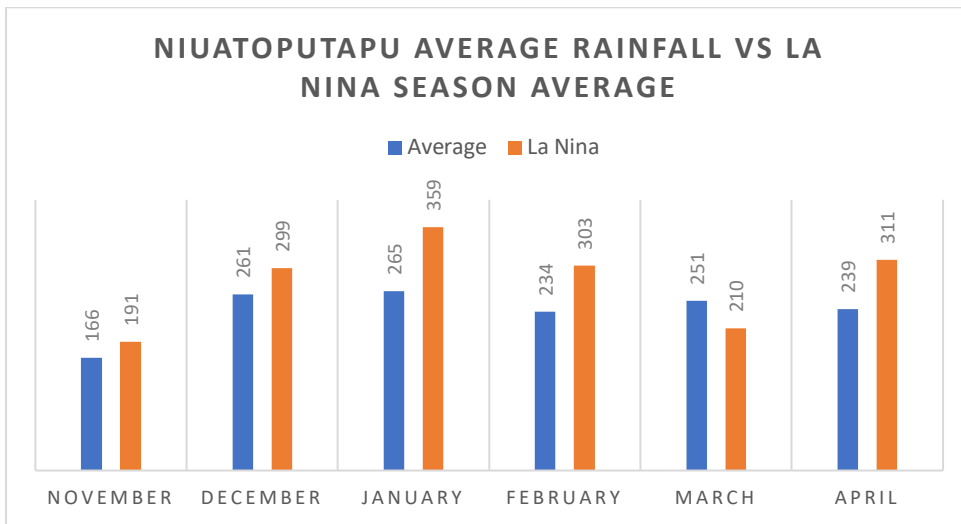


Figure 2: Expect peak above average rainfall in December, January and February for Niuatoputapu

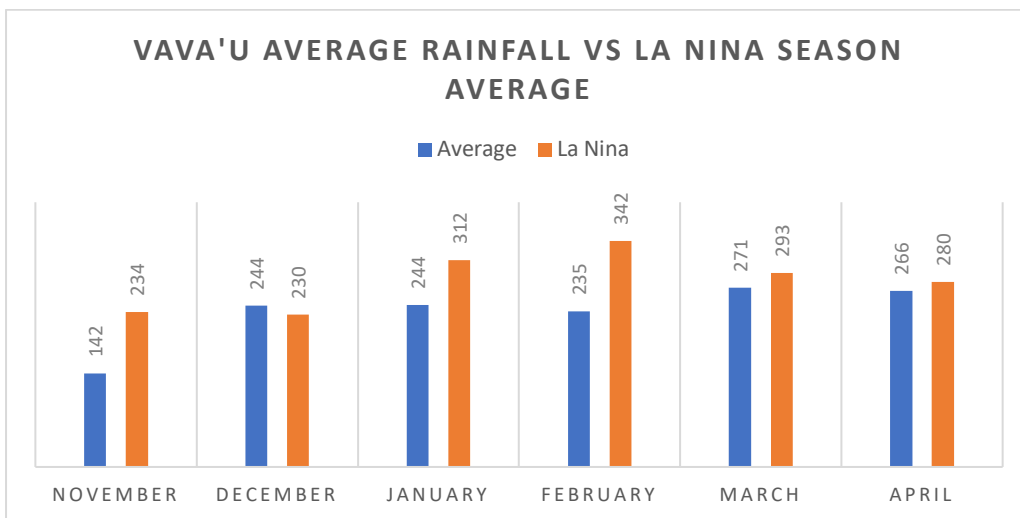


Figure 3: Expect peak above average rainfall in January, February, March and April for Vava'u

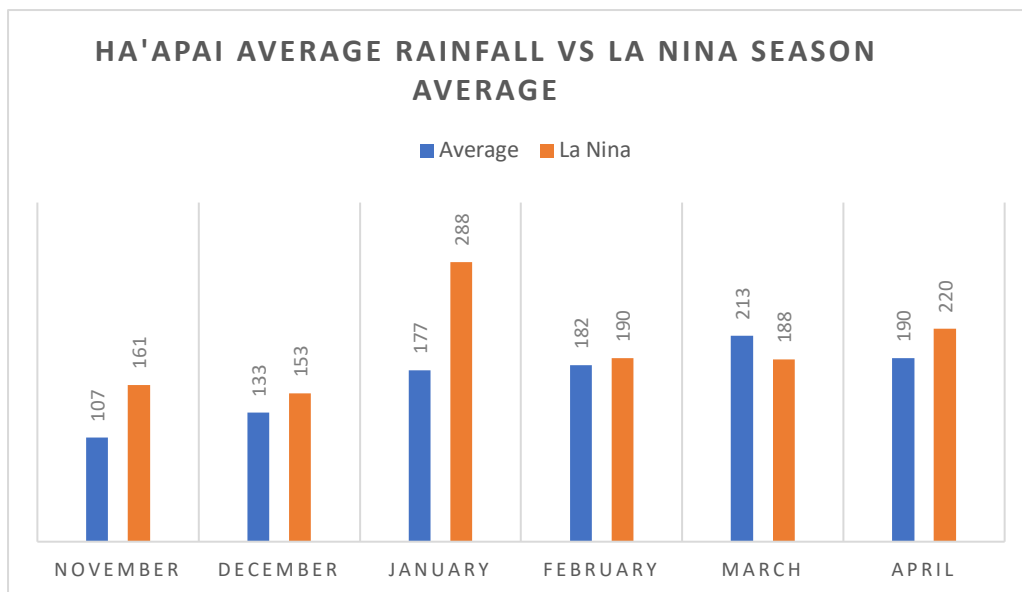


Figure 4: Expect peak above average rainfall in November, December, January and February for Ha'apai

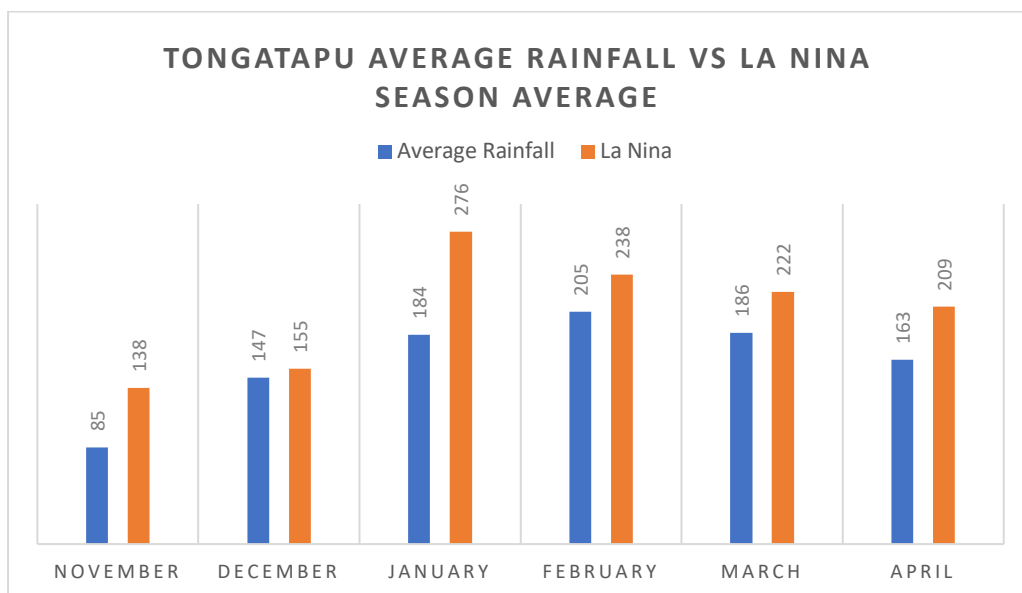


Figure 5: Expect peak above average rainfall in November 2020 to April 2021 for Tongatapu

Likely Sector Impacts during the 2021-2022 Tropical Cyclone Season

1. Agriculture

Although there is less likelihood of Cyclone occurrence, 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 rains ease off around April 2022. Clean roofs and replace guttering's.

3. Health

Higher risk of water contamination related diseases occurring due to above average rainfall. Mosquitoes will be abundant between December to March due to higher rainfall and higher temperatures so mosquito management will be key to lower risk mosquito transmitted diseases like dengue.

4. Infrastructure

There is an 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 high chance of a severe cyclone occurring and raining conditions.

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 and 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 of flooding and heavy rain related problems.

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 2021-2022 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 2022.

For further enquiries please contact us at email metstaff@met.gov.to or toll free number 0800638.

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