

# NWS Guam Tropical Cyclone Watches and Warnings & the 2024 Western North Pacific TC Outlook



**Marcus Landon Aydlett**

Warning Coordination Meteorologist  
Marcus.Aydlett@noaa.gov

**NWS Weather Forecast Office Guam**

WFO Guam Regional Climate Conference  
Thursday, May 23, 2023

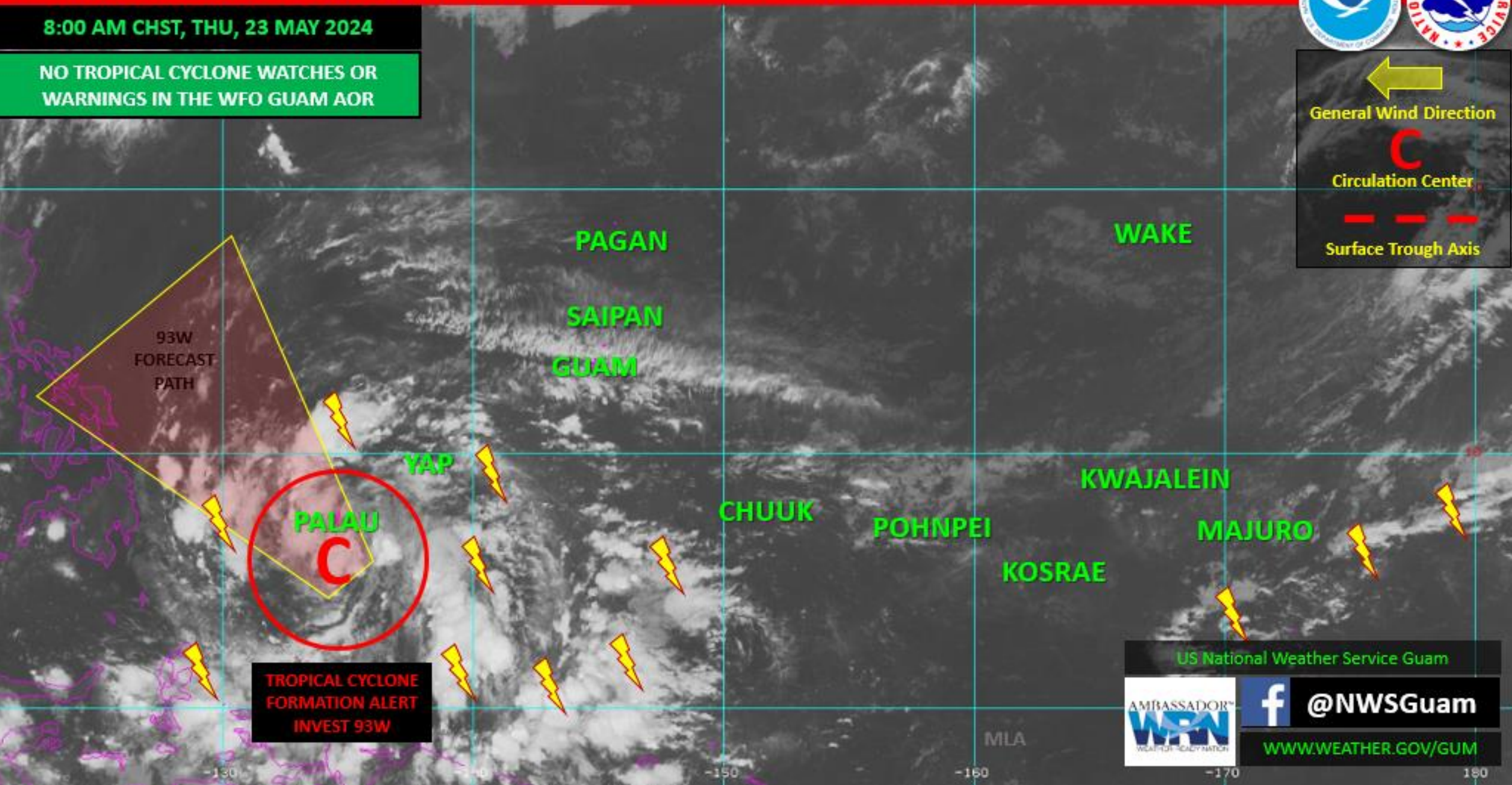
# TROPICAL CYCLONE FORMATION ALERT: INVEST 93W – SOUTH OF PALAU



8:00 AM CHST, THU, 23 MAY 2024

NO TROPICAL CYCLONE WATCHES OR WARNINGS IN THE WFO GUAM AOR

General Wind Direction  
Circulation Center  
Surface Trough Axis



93W  
FORECAST  
PATH

TROPICAL CYCLONE  
FORMATION ALERT  
INVEST 93W

US National Weather Service Guam

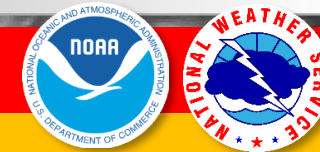


@NWSGuam

[WWW.WEATHER.GOV/GUM](http://WWW.WEATHER.GOV/GUM)

MLA

# TYPHOON MAWAR MAINTAINING COURSE TOWARD THE MARIANAS – NOW CAT-3 TY



8:00 AM CHST, TUE, 23 MAY 2023

FLASH FLOOD WATCH FOR MARIANAS, FLOOD ADVISORY FOR GUAM

**TYPHOON WARNING**  
GUAM – ROTA

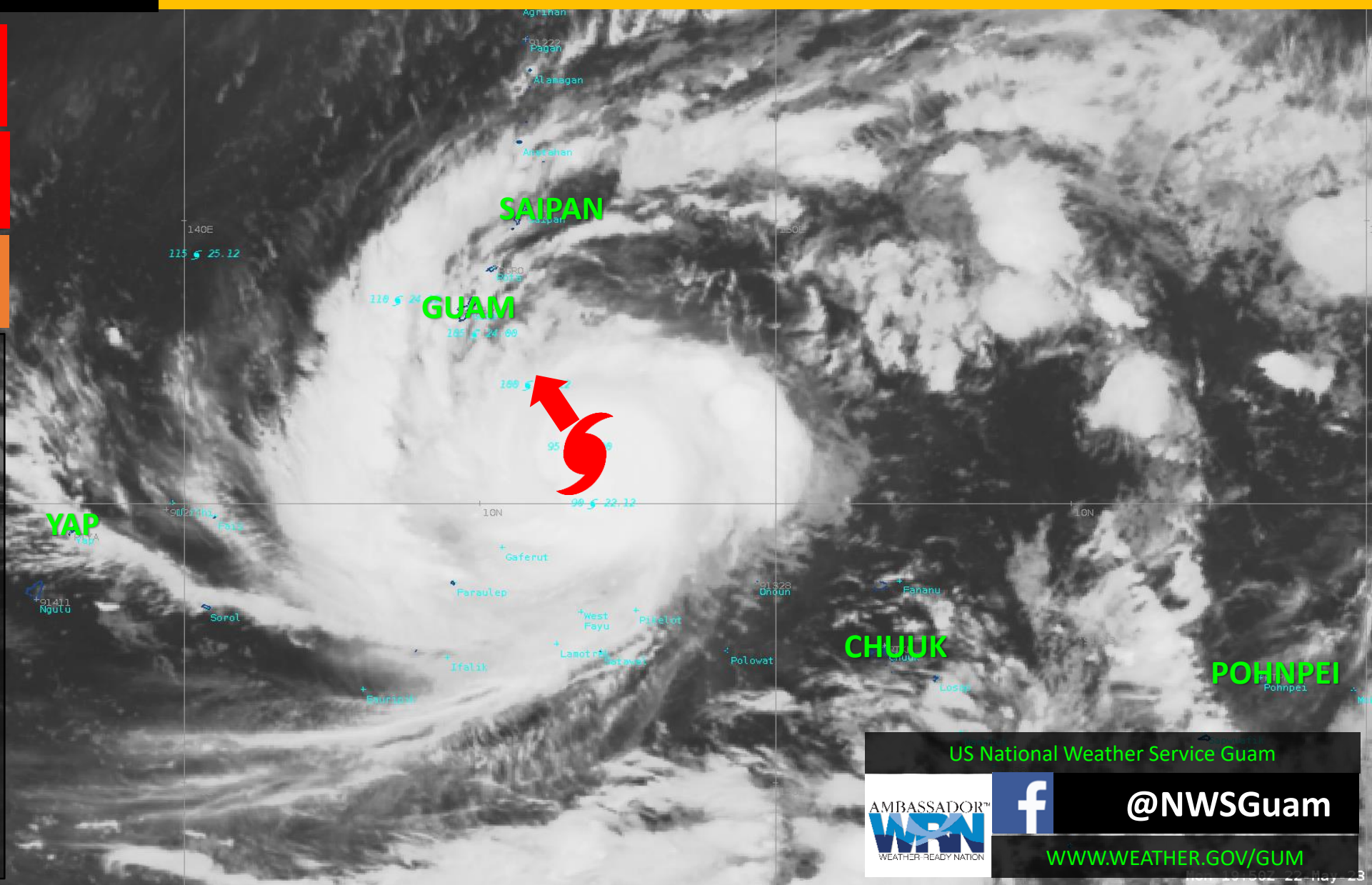
**TROPICAL STORM WARNING**  
TINIAN – SAIPAN

**TYPHOON WATCH**  
TINIAN – SAIPAN

**NWS Public Advisory #12**  
**Typhoon Mawar (02W)**  
**700 AM ChST, 23 May 2023**

**Located: 10.8N 146.7E**  
**Max Winds: 125 MPH**  
**Moving: N 7 mph**

**225 miles SE of Guam**  
**250 miles SSE of Rota**  
**300 miles SSE of Tinian**  
**305 miles SSE of Saipan**  
**420 miles NW of Chuuk**  
**590 miles E of Yap**



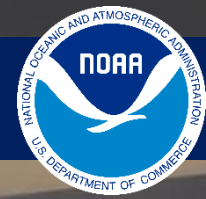
US National Weather Service Guam



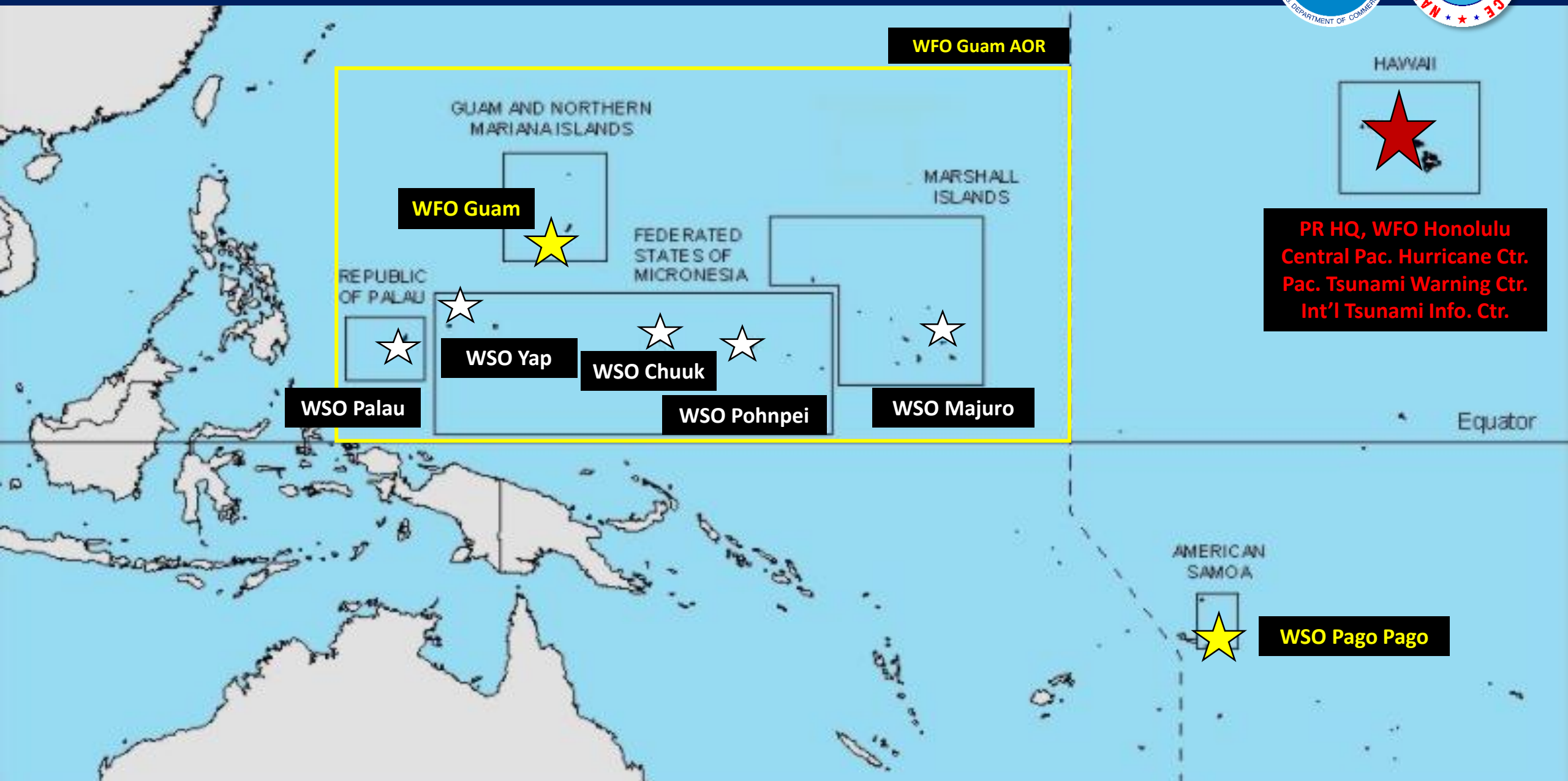
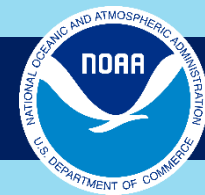
@NWSGuam

WWW.WEATHER.GOV/GUM

# Post-Mawar WFO Guam and the Drones



# WFO Guam and NWS Pacific Region



**WFO Guam AOR**

**WFO Guam**

**WSO Palau**

**WSO Yap**

**WSO Chuuk**

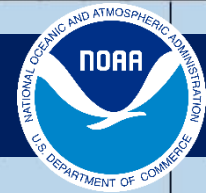
**WSO Pohnpei**

**WSO Majuro**

**PR HQ, WFO Honolulu  
Central Pac. Hurricane Ctr.  
Pac. Tsunami Warning Ctr.  
Int'l Tsunami Info. Ctr.**

**WSO Pago Pago**

# WFO Guam AOR: Tropical Cyclone Warning Points



## MARIANA ISLANDS

AGRIHAN  
PAGAN  
ALAMAGAN  
SAIPAN  
TINIAN  
ROTA  
GUAM

## FEDERATED STATES OF MICRONESIA

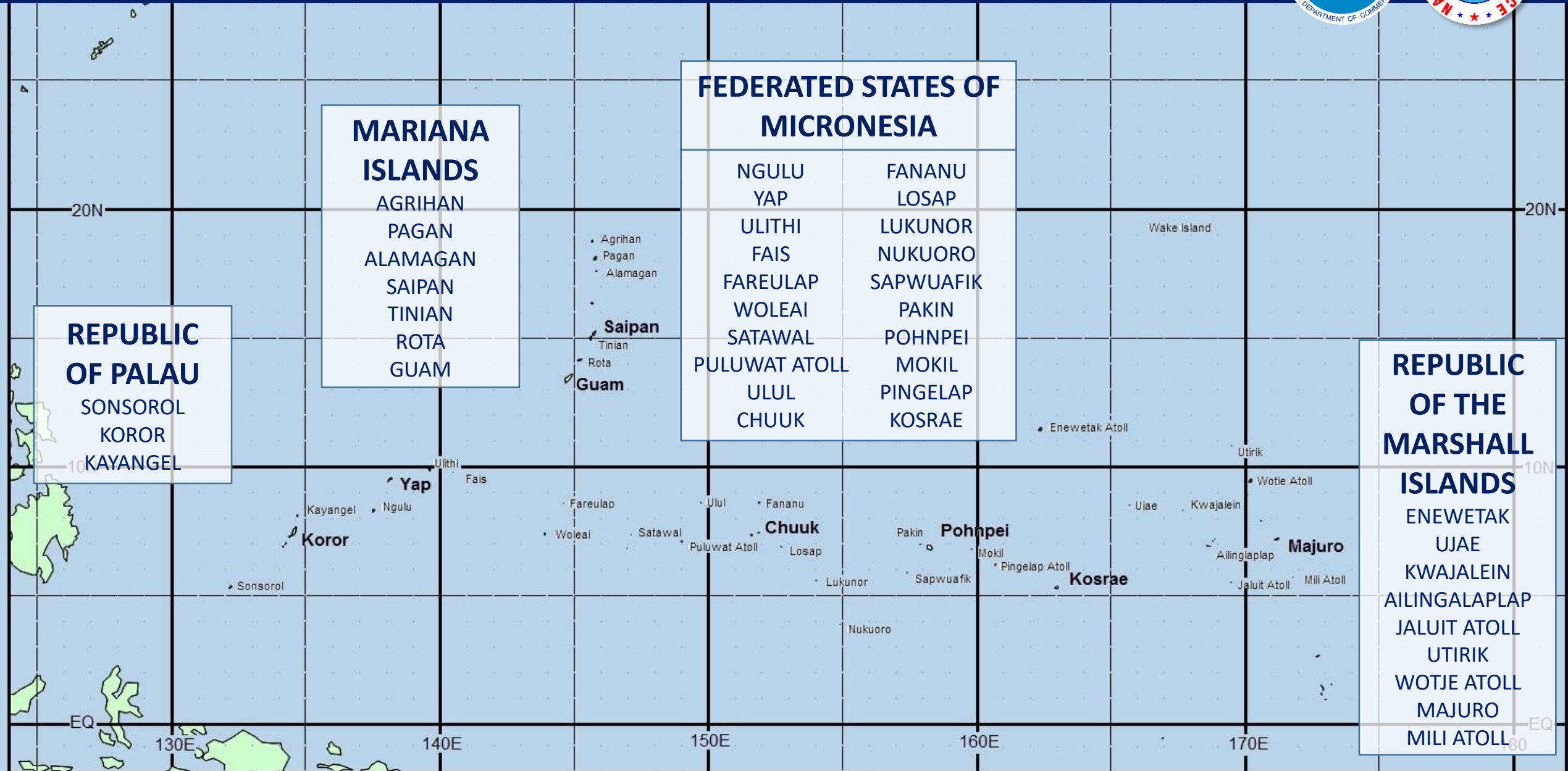
NGULU	FANANU
YAP	LOSAP
ULITHI	LUKUNOR
FAIS	NUKUORO
FAREULAP	SAPWUAFIK
WOLEAI	PAKIN
SATAWAL	POHNPEI
PULUWAT ATOLL	MOKIL
ULUL	PINGELAP
CHUUK	KOSRAE

## REPUBLIC OF PALAU

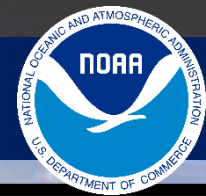
SONSOROL  
KOROR  
KAYANGEL

## REPUBLIC OF THE MARSHALL ISLANDS

ENEWETAK  
UJAE  
KWAJALEIN  
AILINGALAPLAP  
JALUIT ATOLL  
UTIRIK  
WOTJE ATOLL  
MAJURO  
MILI ATOLL



# 2024 Outlook: Current Climate Condition



FROM: ENSO DIAGNOSTIC DISCUSSION BY THE CLIMATE PREDICTION CENTER/NCEP/NWS ON 9 MAY 2024

## ENSO ALERT SYSTEM STATUS: **EL NIÑO ADVISORY** / **LA NIÑA WATCH**

A transition from El Niño to ENSO-neutral is likely in the next month. La Niña may develop in June-August (49% chance) or July-September (69% chance)

For the full discussion: [https://www.cpc.ncep.noaa.gov/products/analysis\\_monitoring/enso\\_advisory/ensodisc.shtml](https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.shtml)

### SST Anomalies (°C)

01 MAY 2024

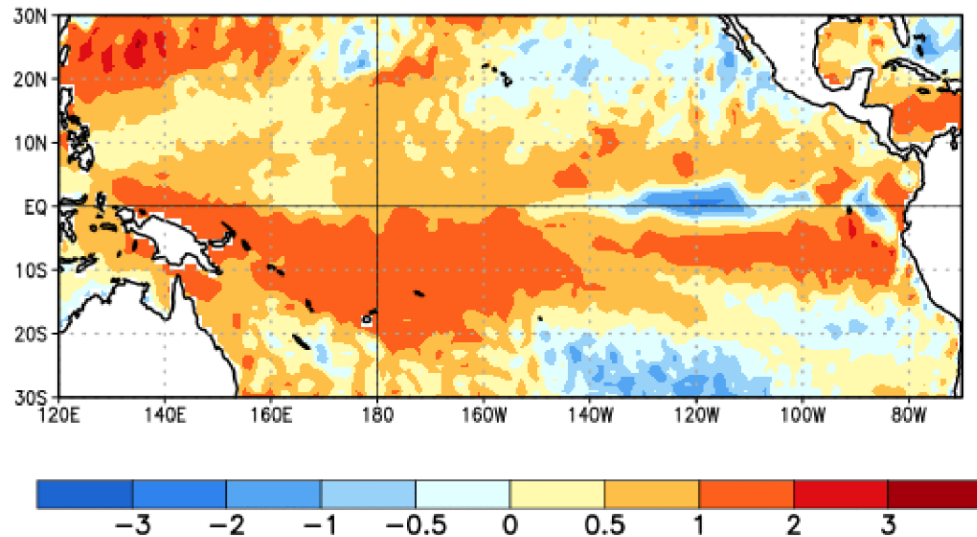


Figure 1. Average sea surface temperature (SST) anomalies (°C) for the week centered on 1 May 2024. Anomalies are computed with respect to the 1991-2020 base period weekly means.

### Official NOAA CPC ENSO Probabilities (issued May 2024)

based on  $-0.5^{\circ}/+0.5^{\circ}\text{C}$  thresholds in ERSSTv5 Niño-3.4 index

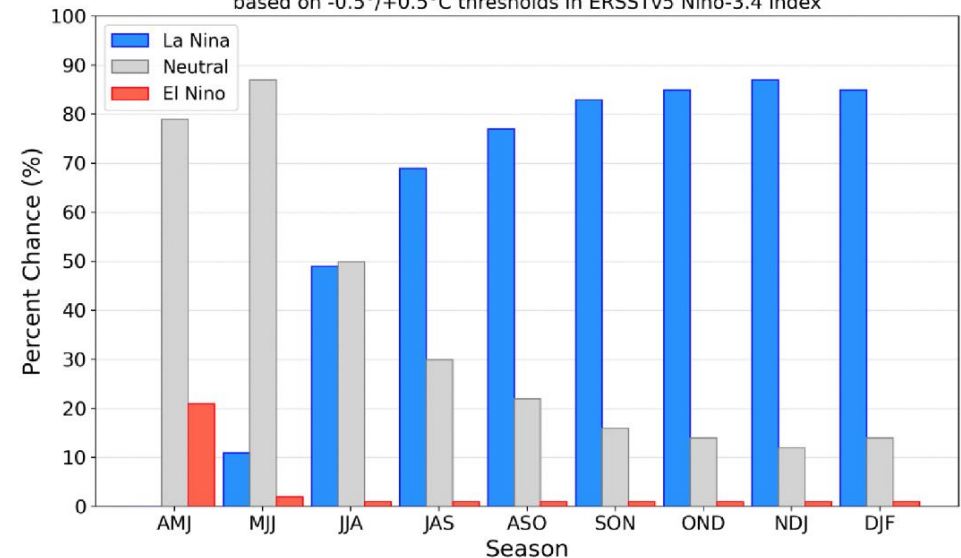
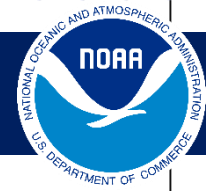


Figure 7. Official ENSO probabilities for the Niño 3.4 sea surface temperature index (5°N-5°S, 120°W-170°W). Figure updated 9 May 2024.

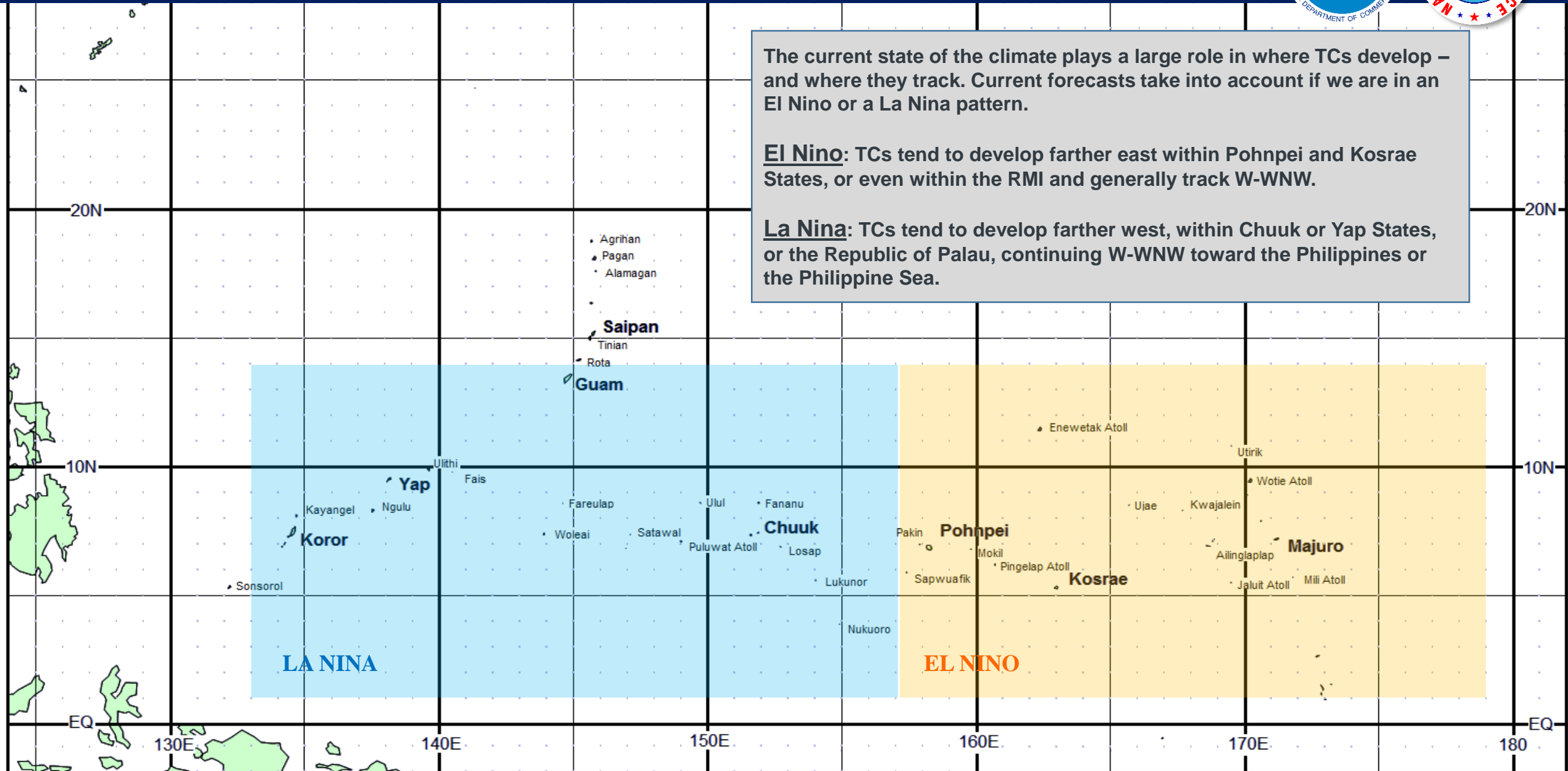
# 2023 Outlook: Current Climate Condition



The current state of the climate plays a large role in where TCs develop – and where they track. Current forecasts take into account if we are in an El Nino or a La Nina pattern.

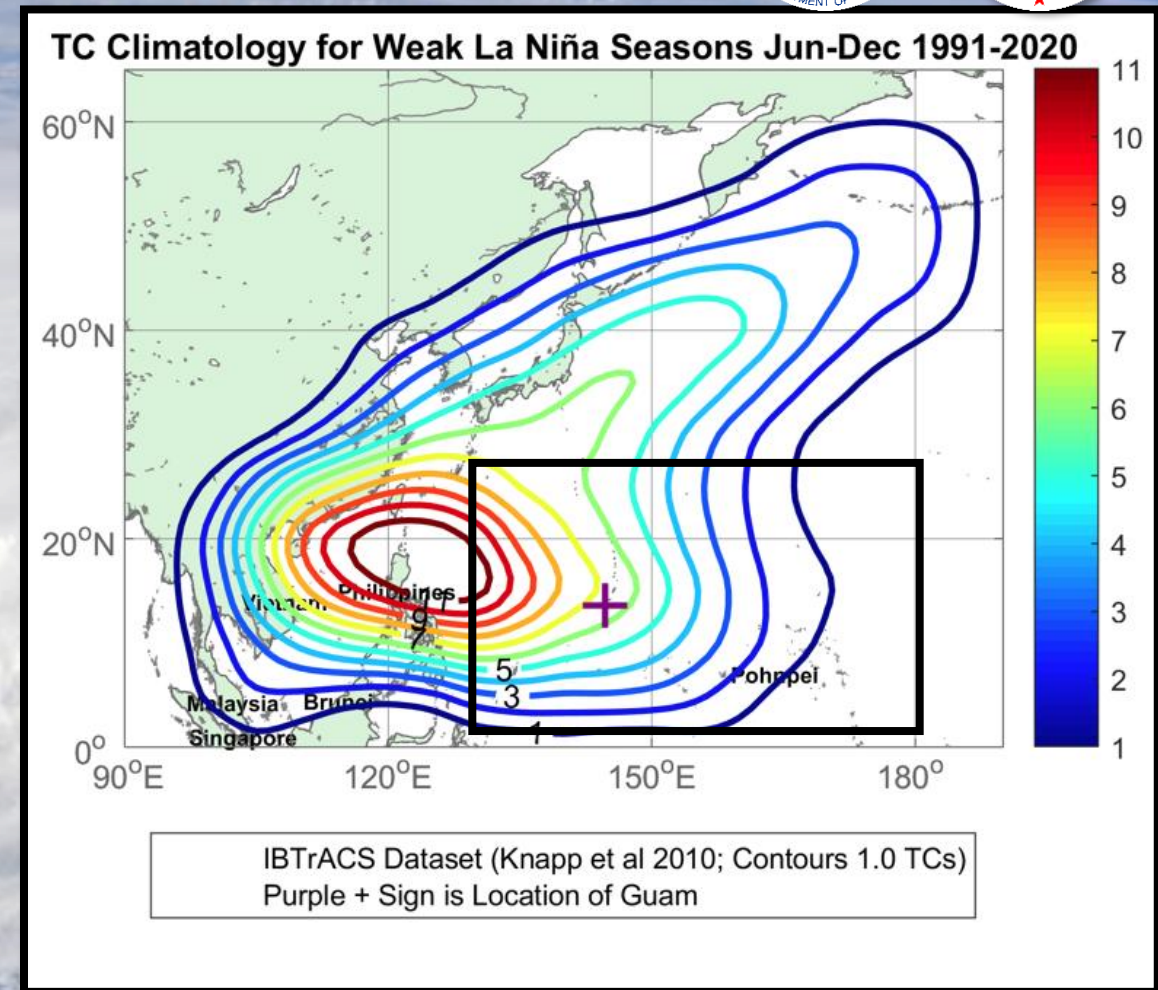
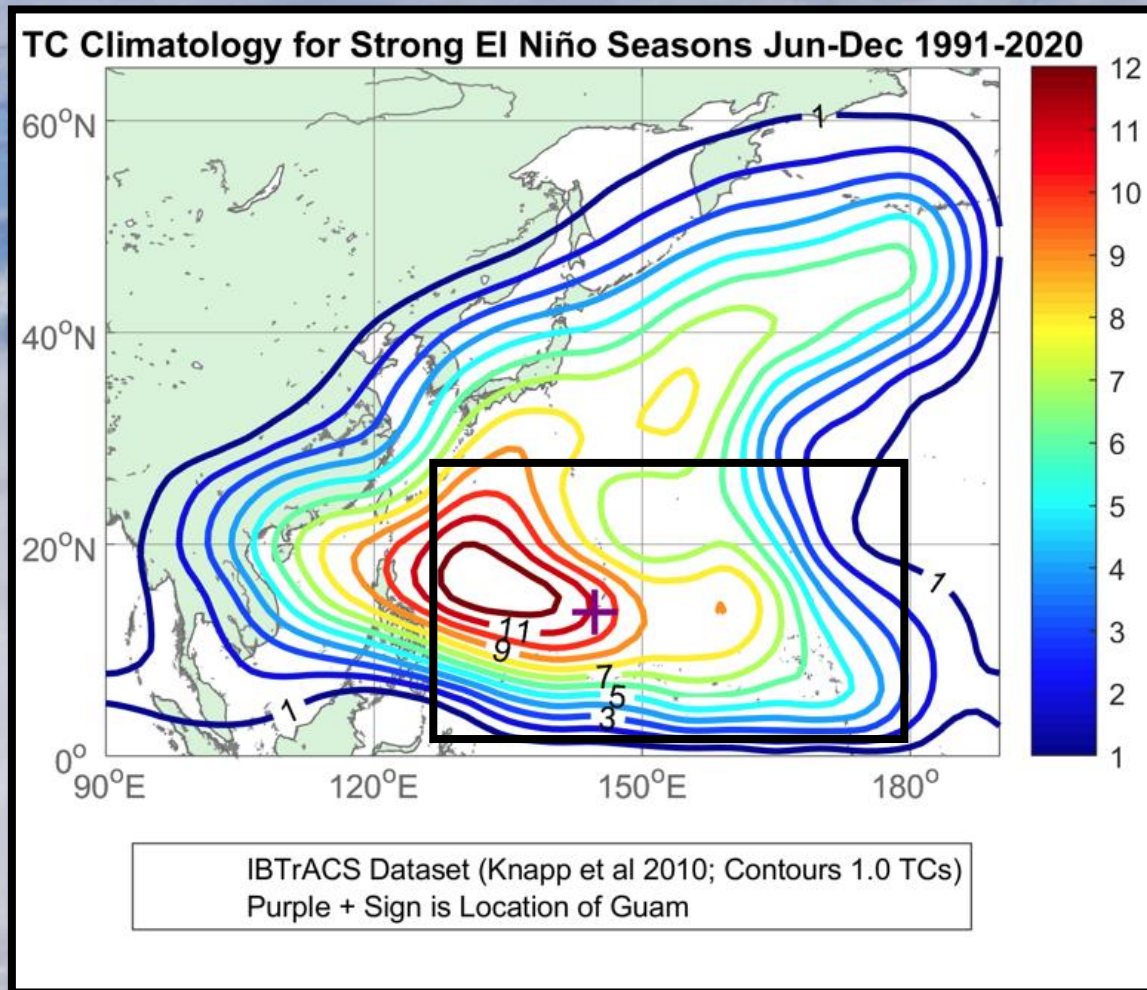
**El Nino:** TCs tend to develop farther east within Pohnpei and Kosrae States, or even within the RMI and generally track W-WNW.

**La Nina:** TCs tend to develop farther west, within Chuuk or Yap States, or the Republic of Palau, continuing W-WNW toward the Philippines or the Philippine Sea.





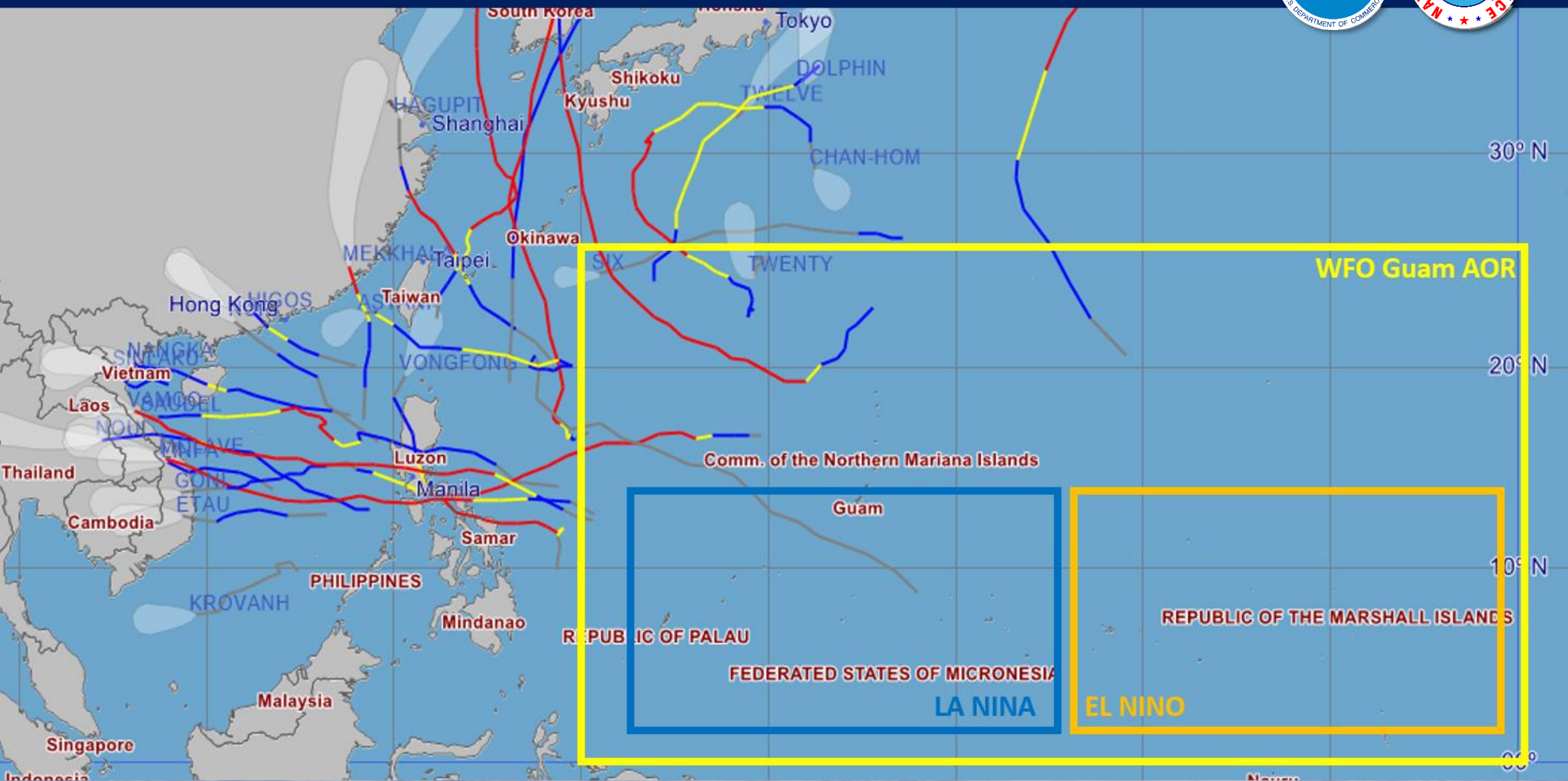
# La Niña vs El Niño: TC Frequencies



**TC Frequencies Increase across WFO Guam AOR in El Niño pattern when compared to La Niña; TC Genesis shifts westward in La Niña**

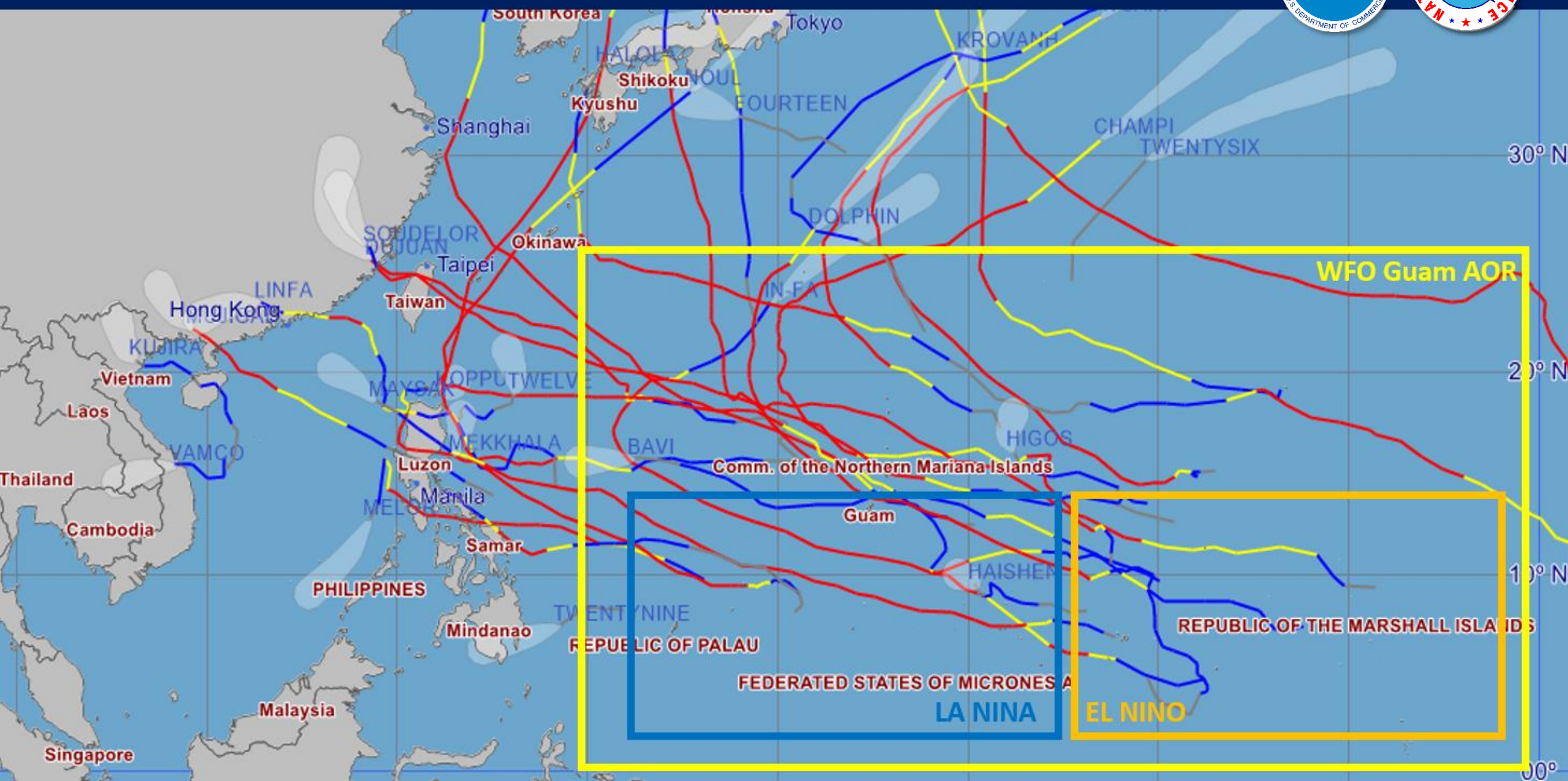


# La Niña vs El Niño: 2020 – La Niña

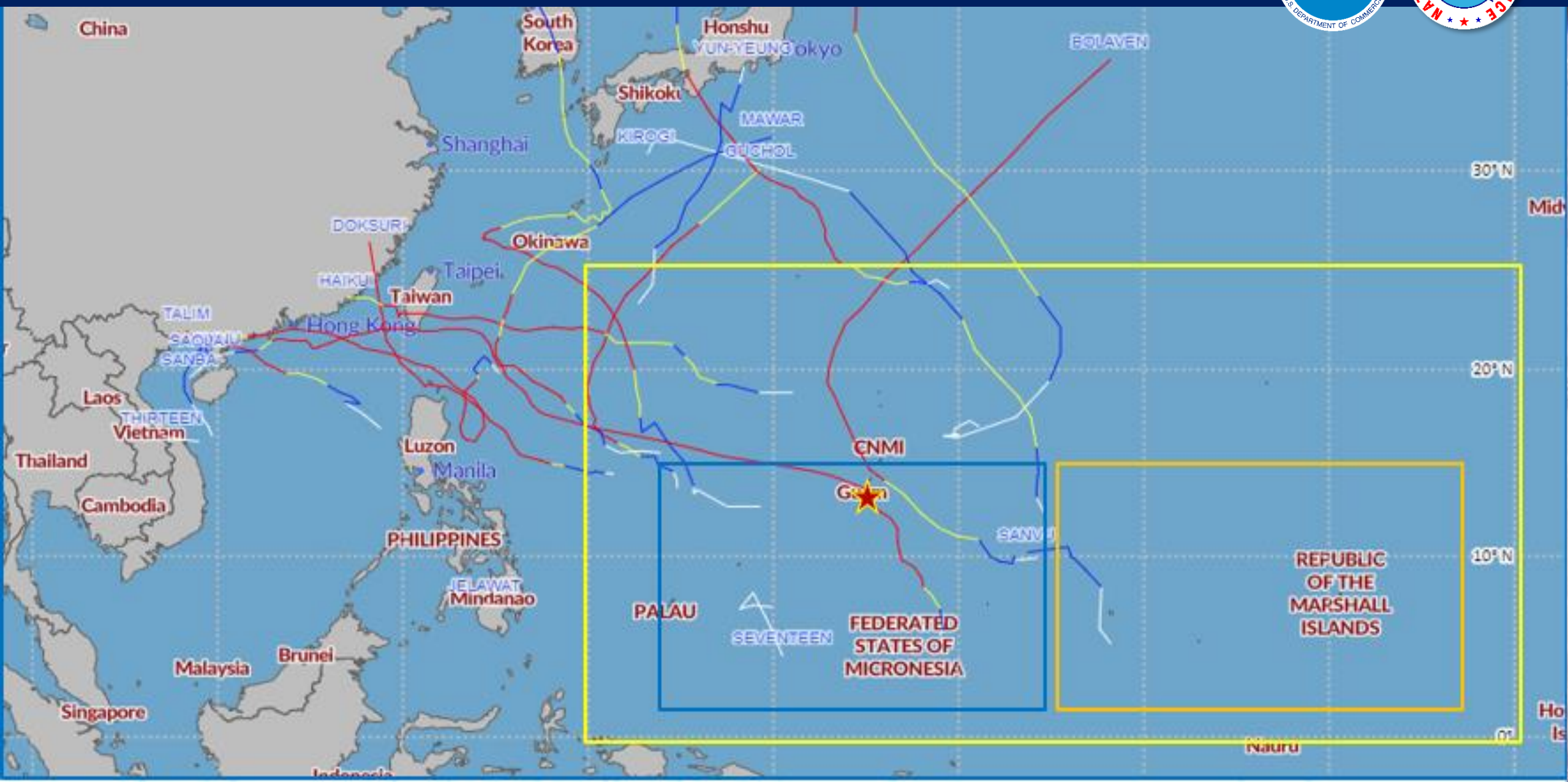
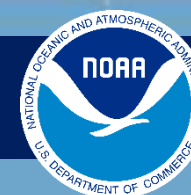




# La Niña vs El Niño: 2015 – El Niño



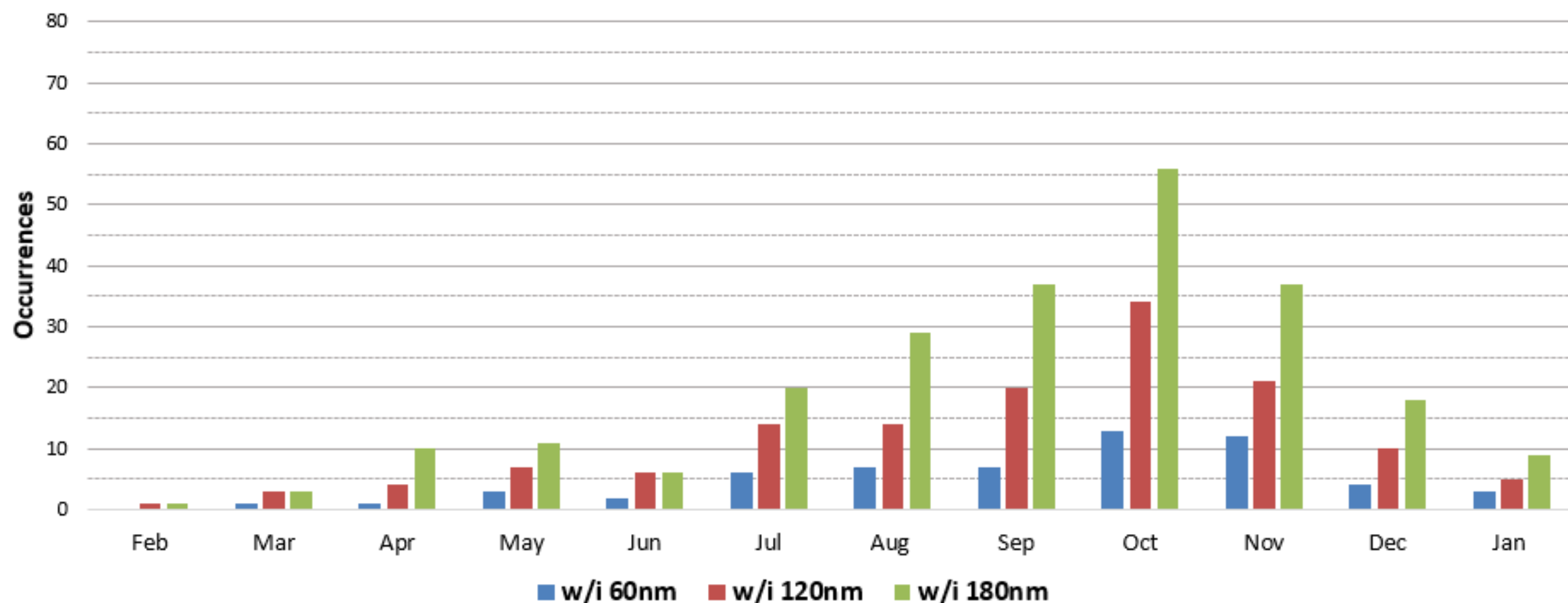
# La Niña vs El Niño: 2023 – El Niño



# Number of Typhoons and Tropical Storms within 60, 120, and 180 Nautical Miles of Guam by Month from 1945-2018

- Within 180 nautical miles (glancing blow) **237** typhoons and tropical storms **3.20 per year**
- Within 120 nautical miles (near miss) **139** typhoons and tropical storms **1.88 per year**
- Within 60 nautical miles (direct hit) **59** typhoons and tropical storms **0.80 per year**

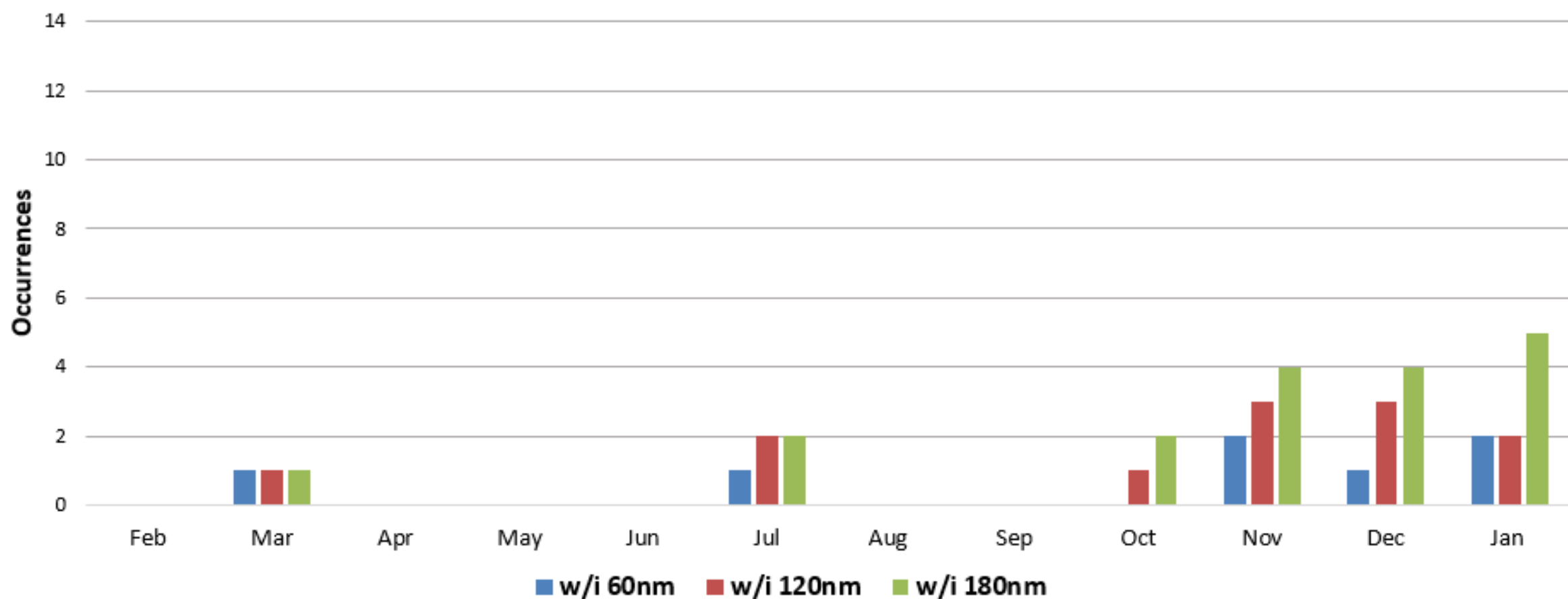
**Typhoons and Tropical Storms Affecting Guam from 1945-2018**



# Number of Typhoons and Tropical Storms within 60, 120, and 180 Nautical Miles of Marshall Islands by Month from 1945-2018

- 🌀 Within 180 nautical miles (glancing blow) **18** typhoons and tropical storms **0.24 per year**
- 🌀 Within 120 nautical miles (near miss) **12** typhoons and tropical storms **0.16 per year**
- 🌀 Within 60 nautical miles (direct hit) **7** typhoons and tropical storms **0.09 per year**

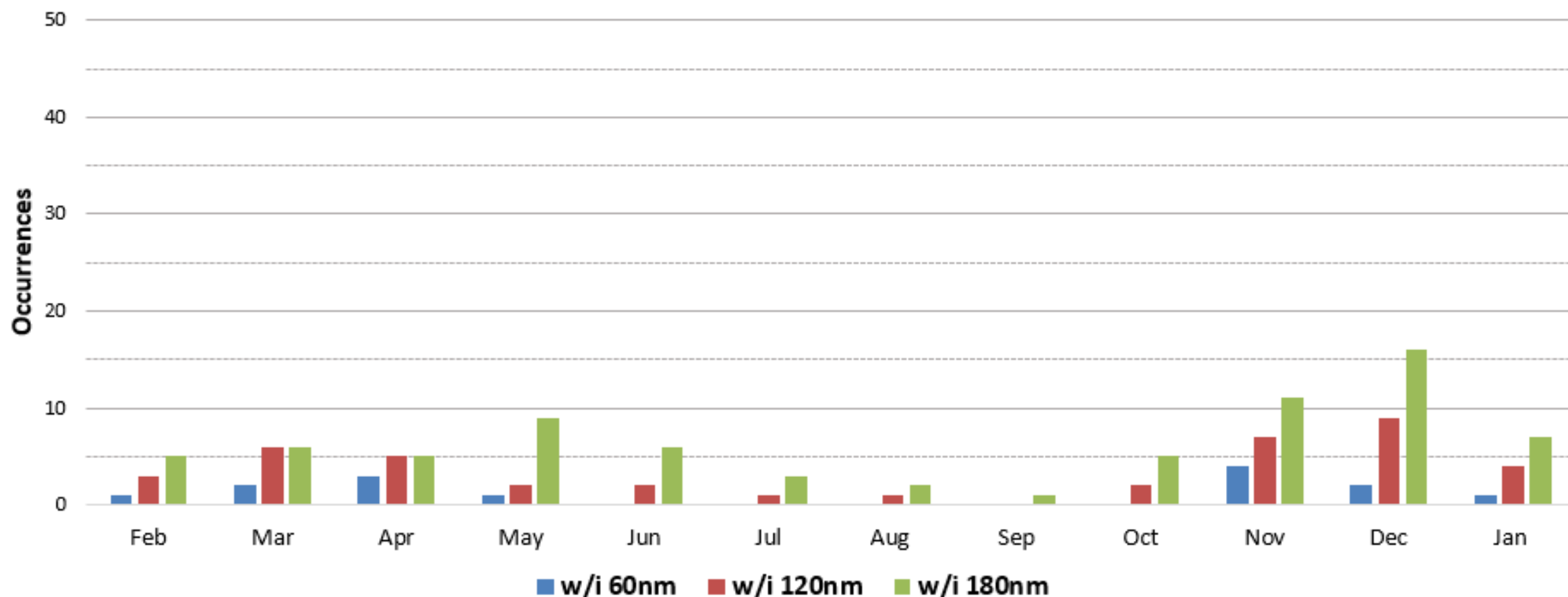
**Typhoons and Tropical Storms Affecting Marshall Islands from 1945-2018**



# Number of Typhoons and Tropical Storms within 60, 120, and 180 Nautical Miles of Palau by Month from 1945-2018

- Within 180 nautical miles (glancing blow) **76** typhoons and tropical storms **1.03 per year**
- Within 120 nautical miles (near miss) **42** typhoons and tropical storms **0.57 per year**
- Within 60 nautical miles (direct hit) **14** typhoons and tropical storms **0.19 per year**

**Typhoons and Tropical Storms Affecting Palau from 1945-2018**



# TROPICAL CYCLONE FORMATION ALERT: INVEST 93W – SOUTH OF PALAU

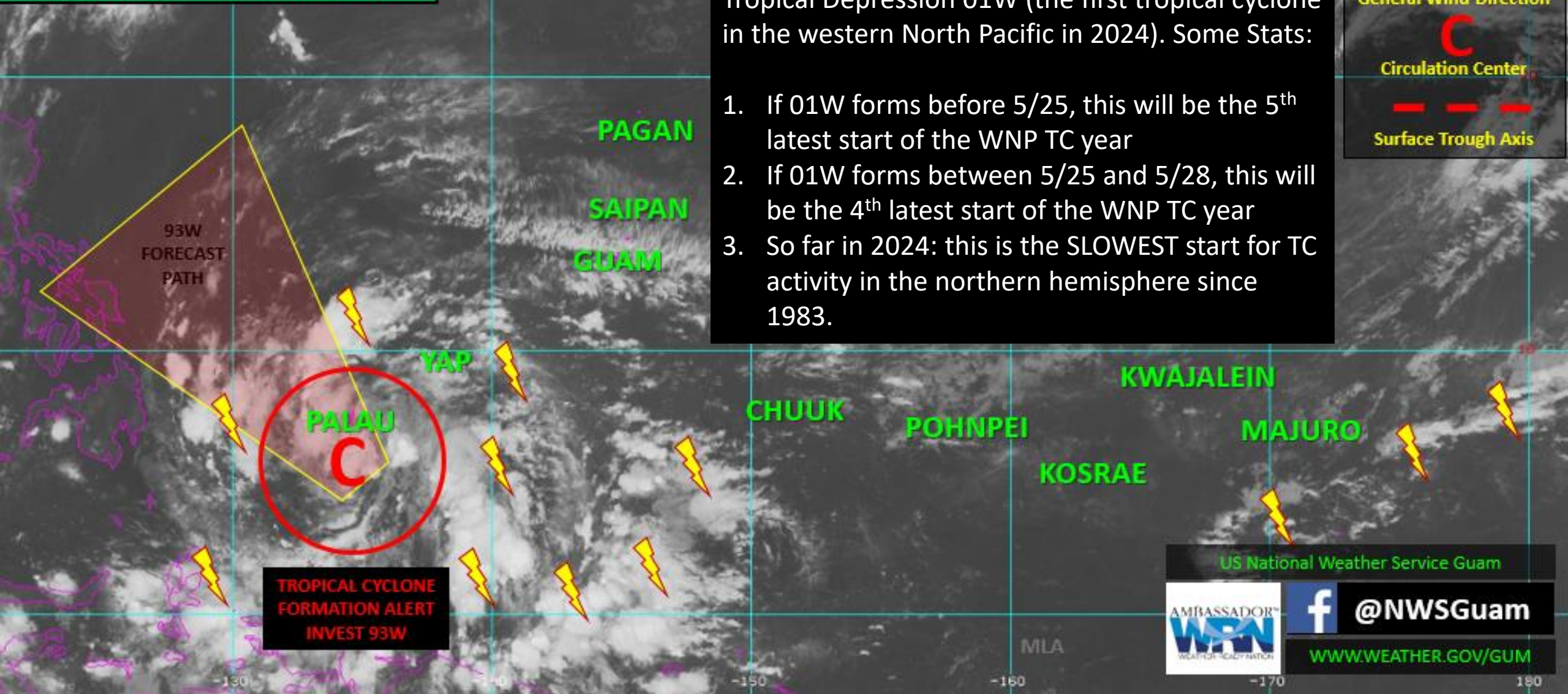
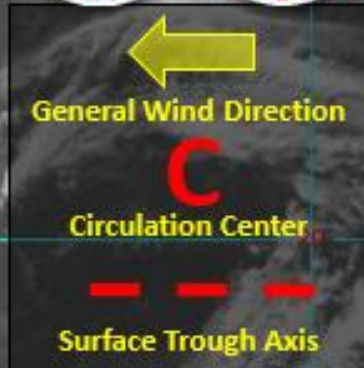


8:00 AM CHST, THU, 23 MAY 2024

NO TROPICAL CYCLONE WATCHES OR WARNINGS IN THE WFO GUAM AOR

If Invest 93W strengthens into a tropical depression this week, it would be labeled as Tropical Depression 01W (the first tropical cyclone in the western North Pacific in 2024). Some Stats:

1. If 01W forms before 5/25, this will be the 5<sup>th</sup> latest start of the WNP TC year
2. If 01W forms between 5/25 and 5/28, this will be the 4<sup>th</sup> latest start of the WNP TC year
3. So far in 2024: this is the SLOWEST start for TC activity in the northern hemisphere since 1983.



TROPICAL CYCLONE FORMATION ALERT INVEST 93W

US National Weather Service Guam

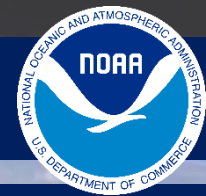


 @NWSGuam

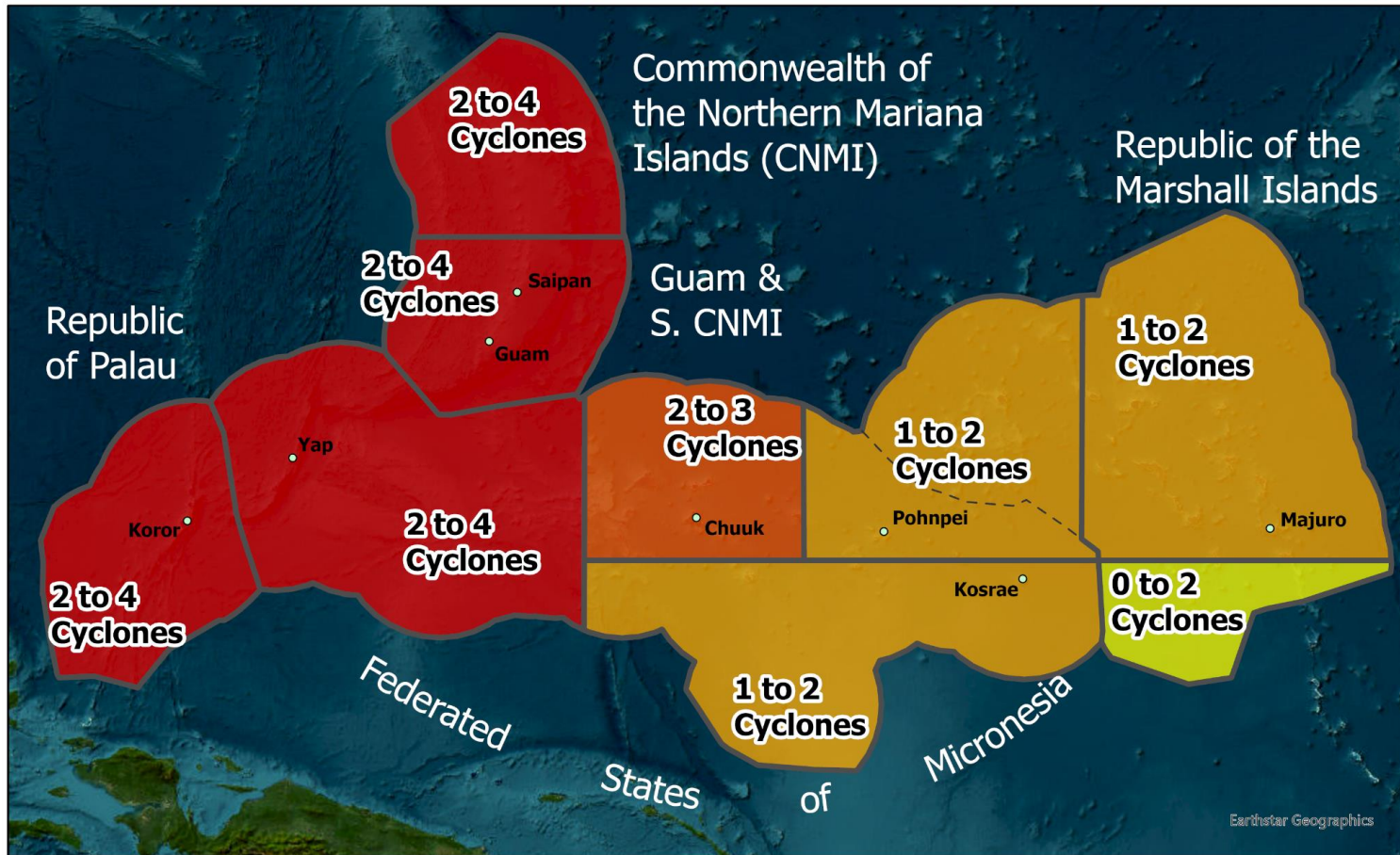
[WWW.WEATHER.GOV/GUM](http://WWW.WEATHER.GOV/GUM)



# 2024 Outlook for the Western North Pacific



## Predicted Number of Tropical Cyclones ( $\geq 39$ mph) in the Western North Pacific

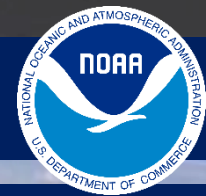


**A below-normal TC Outlook is predicted for the remainder of 2024 for Guam, the CNMI, FSM and RMI**

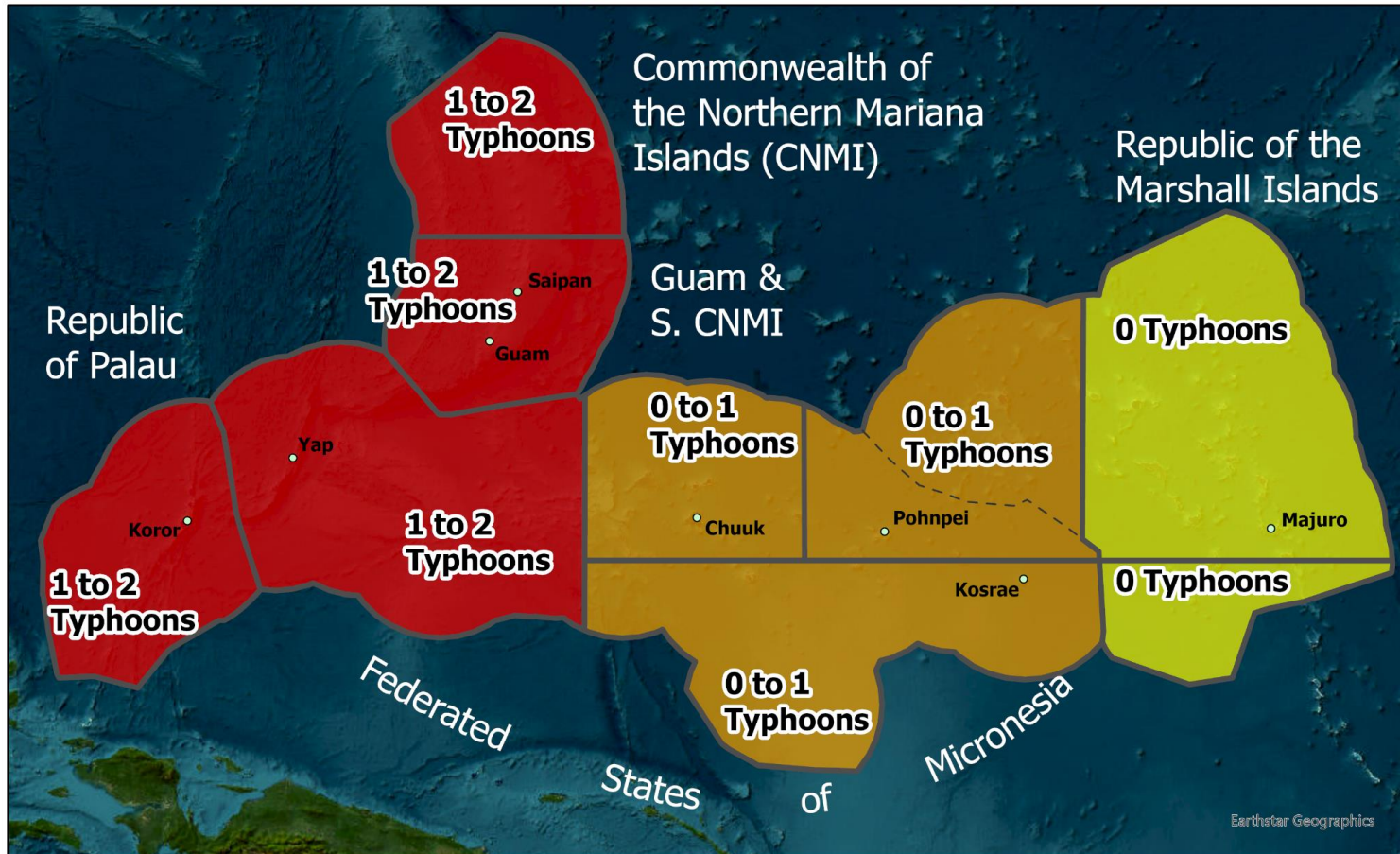
*Predicted number of tropical cyclones of tropical storm ( $\geq 39$  mph sustained winds) and typhoon ( $\geq 74$  mph sustained winds) intensity in the Western North Pacific*

**This Outlook indicates a comparatively slow year, similar to 2020, 2021, and 2022 (2023?\*\*)**

# 2024 Outlook for the Western North Pacific



## Predicted Number of Typhoons ( $\geq 74$ mph) in the Western North Pacific

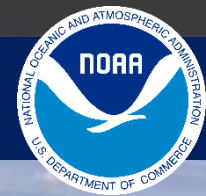


A below-normal TC Outlook is predicted for the remainder of 2024 for Guam, the CNMI, FSM and RMI

*Predicted number of typhoons ( $\geq 74$  mph sustained winds) in the Western North Pacific.*

This Outlook indicates a less-active year, similar to 2020-2022.

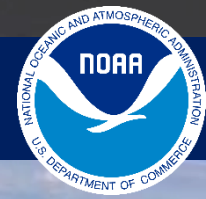
# 2024 Outlook for the Western North Pacific



**Below-normal TC activity is predicted for the remainder of 2024 for Guam, the CNMI, FSM and RMI; Near-normal activity for ROP**

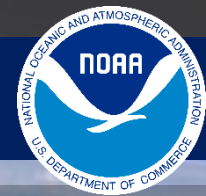
REGION	NAMED STORMS (≥39 mph max sust'd)	TYPHOONS (≥74 mph max sust'd)
Marshall Islands (north of 6N)	1 or 2	0
Marshall Islands (south of 6N)	0 to 2	0
Pohnpei State (north of 6N)	1 or 2	0 or 1
Chuuk State (north of 6N)	2 or 3	0 or 1
Kosrae, Pohnpei, Chuuk States (south of 6N)	1 or 2	0 or 1
Yap State	2 to 4	1 or 2
Palau	2 to 4	1 or 2
<b>Guam, Rota, Tinian and Saipan</b>	<b>2 to 4</b>	<b>1 or 2</b>
Northern CNMI	2 to 4	1 or 2

# 2024 Outlook: Key Notes



- Below-normal activity is consistent with the ongoing and expected transition from El Niño to ENSO-Neutral Conditions, and later to La Niña
- This Outlook indicates likelihood for a slow year similar to 2020, 2021 and 2022 (perhaps also 2023?)
- Due to long-range uncertainty, an updated outlook may be provided in August, if needed, to reflect any major changes
- TC activity varies considerably across the region from east to west, and from north to south
- This outlook is a general guide of the predicted overall TC activity across Micronesia; **it is not a prediction of how many systems will actually make landfall**
- While TC activity can fluctuate greatly from year to year, TCs can and do occur anytime throughout the year in the WNP
- Residents of the western North Pacific should always maintain weather readiness and be prepared for if, and when, disaster strikes
- Know where to find the most up-to-date weather forecasts and outlooks as well as Watches, Warnings and Advisories: [www.weather.gov/gum](http://www.weather.gov/gum)

# NWS Tropical Cyclone Text Products



## JTWC WARNINGS

Routine Tropical Cyclone Warning Text and Graphic

Uses UTC/Zulu Time  
Wind Speed in Knots  
Distance in Nautical Miles  
Provides Forecast CPAs to selected islands and forecast points

Issuance begins with formation of a Tropical Depression



## PUBLIC ADVISORIES

Primary NWS Product to disseminate TC information

Used to issue/cancel all TC Watches and Warnings (WaWas)

Provides TC location, distance in miles, movement in mph, and intensity in mph, using ChST

Gives a general forecast for direction/motion and intensity

Intermediates issued when WaWas are issued, Specials issued as needed for significant changes, new WaWas



## LOCAL STATEMENTS

Provides detailed, localized information for locations under WaWa on expected magnitude and timing of TCs threat

Recaps all WaWas in effect and current TC information

Provides evacuation, preparedness, precautionary actions from EMs

For Islands under a WaWa: Information includes Wind (onset, intensity), Rain Expectations, Marine/Surf Details

## TC UPDATES

Issued hourly when TC center is within radar range (approx. 230 miles from Guam)

Updates TC center location and movement, confidence based on radar imagery, and distance/bearing from Hagatna or an island of the CNMI

Updated positions are used in subsequent Public Advisories and Local Statements

### ISSUANCE TIME

Every 6 hours  
**1 & 7 am/pm (ChST)**

### ISSUANCE TIME

Scheduled: Every 6 hours  
**2 & 8 am/pm (ChST)**  
Intermediate: Every 6 hours (Watch/Warning in Effect)  
**5 & 11 am/pm (ChST)**

### ISSUANCE TIME

Every 6 hours  
**3 & 9 am/pm (ChST)**

### ISSUANCE TIME

**Hourly**  
**When in Range of Radar**

# Tropical Cyclone Watches and Warnings



## Tropical Storm & Typhoon

# WATCHES

Key Word:

**POSSIBLE**

Timing:

**48 Hours**

## Tropical Storm & Typhoon

# WARNINGS

Key Word:

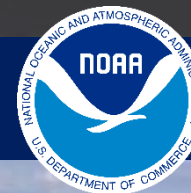
**EXPECTED**

Timing:

**24 Hours**

**BASIS: Onset of Damaging Winds**

# Winds and Tropical Cyclone Watches and Warnings



## Wind Terms

- **Damaging Winds:** Sustained surface winds of 39 mph or more (averaged over a 1-minute period).
- **Destructive Winds:** Sustained surface winds of 58 mph or more (averaged over a 1-minute period).

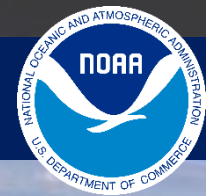
## Watch Timing

- **Tropical Storm Watch:** Damaging winds of 39-73 mph are possible from a TS (or developing TS) generally within 48 hours.
- **Typhoon Watch:** A TY (or developing TY) poses a possible threat. Damaging winds are possible within 48 hours.

## Warning Timing

- **Tropical Storm Warning:** Damaging winds are expected within 24 hours or are already occurring.
- **Typhoon Warning:** TY conditions are expected. Damaging winds are expected to begin within 24 hours or are occurring.

# Issuing Watches and Warnings

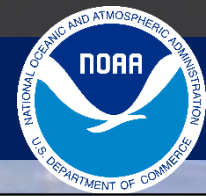


	<b>TS Watch</b>	<b>TY Watch</b>	<b>TS Warning</b>	<b>TY Warning</b>	<i>TS Warning WITH TY Watch</i>
<b>Meaning</b>	39-73 mph (Damaging) winds <b><u>possible</u></b>	74+ mph (typhoon force) winds <b><u>possible</u></b>	39-73 mph winds <b><u>expected</u></b>	74+ mph winds <b><u>expected</u></b>	A TY will pass by within 24hrs; however, TY winds are <b><u>possible</u></b> , but not <b><u>expected</u></b> .
<b>Timing</b>	Within 48hrs	Within 48hrs*	<b>Within 24hrs</b>	<b>Within 24hrs*</b>	

**All TY Watch / Warning timing is based on the onset of damaging winds of 39 mph**



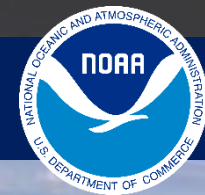
# Upcoming TC Names for the Western North Pacific



<b>Ewiniar</b>	<b>(Micronesia)</b>
<b>Maliksi</b>	<b>(Philippines)</b>
<b>Gaemi</b>	<b>(Republic of Korea)</b>
<b>Prapiroon</b>	<b>(Thailand)</b>
<b>Maria</b>	<b>(United States)</b>
<b>Son-Tinh</b>	<b>(Vietnam)</b>
<b>Ampil</b>	<b>(Cambodia)</b>
<b>Wukong</b>	<b>(China)</b>
<b>Jongdari</b>	<b>(DPR Korea)</b>
<b>Shanshan</b>	<b>(HK, China)</b>
<b>Yagi</b>	<b>(Japan)</b>
<b>Leepi</b>	<b>(Lao PDR)</b>
<b>Bebinca</b>	<b>(Macao, China)</b>
<b>Pulasan</b>	<b>(Malaysia)</b>
<b>Soulik</b>	<b>(Micronesia)</b>

<b>Cimaron</b>	<b>(Philippines)</b>
<b>Jebi</b>	<b>(Republic of Korea)</b>
<b>Krathon</b>	<b>(Thailand)</b>
<b>Barijat</b>	<b>(United States)</b>
<b>Trami</b>	<b>(Vietnam)</b>
<b>Kong-rey</b>	<b>(Cambodia)</b>
<b>Yinxing</b>	<b>(China)</b>
<b>Toraji</b>	<b>(DPR Korea)</b>
<b>Man-yi</b>	<b>(HK, China)</b>
<b>Usagi</b>	<b>(Japan)</b>
<b>Pabuk</b>	<b>(Lao PDR)</b>
<b>Wutip</b>	<b>(Macao, China)</b>
<b>Sepat</b>	<b>(Malaysia)</b>
<b>Mun</b>	<b>(Micronesia)</b>
<b>Danas</b>	<b>(Philippines)</b>

# NWS Guam Web Page: Where to Find TC Info



NATIONAL WEATHER SERVICE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME FORECAST PAST WEATHER SAFETY INFORMATION EDUCATION NEWS SEARCH ABOUT

Local forecast by "City, ST" or ZIP code  
Enter location ... Go

News Headlines  
• [Hafa Adal from the Guam Weather Forecast Office!](#)

Links for national weather info

NWS Forecast Office - Tiyan, Guam  
Weather.gov > Tiyan, GU

Current Hazards Current Conditions Radar Forecasts Rivers and Lakes Climate and Past Weather Local Programs

Click a location below for detailed forecast.

Watches, Warnings & Advisories  
There are no watches, warnings, or advisories at this time.

Text Product Selector (Selected product opens in new window)  
Latest Text Products Issued by GUM

NATIONAL WEATHER SERVICE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

MY FORECAST  
Tiyan GU

Tropical Cyclones  
Weather.gov > Tiyan, GU > Tropical Cyclones

Tiyan, GU  
Weather Forecast Office

Current Hazards Current Conditions Radar Forecasts Rivers and Lakes Climate and Past Weather Local Programs

NO active tropical cyclones at this time.  
Wed, Jun 16, 4:27 PM CHST

Click or hover over "Current Hazards" and select "Tropical Cyclones" to see our TC Page

Related Links  
[Post Storm Tropical Cyclone Report](#) Issued: 06/04/2021 07:34:54 PM CHST  
[NWS Guam Tropical Cyclone AoR](#)  
[Tropical Cyclone Products we issue](#)  
[Historical Tropical Cyclones Affecting Guam \(1671-1990\)](#)  
[Joint Typhoon Warning Center \(JTWC\)](#)  
[Guam Homeland Security Office of Civil Defense](#)  
[WMO Website Tropical Cyclone Information](#)  
[Emergency Management Office for CNM](#)

[www.weather.gov/gum](http://www.weather.gov/gum)

# Thank You!

## NWS Weather Forecast Office Guam

Marcus Landon Aydlett  
Warning Coordination Meteorologist  
[Marcus.Aydlett@noaa.gov](mailto:Marcus.Aydlett@noaa.gov)  
671-777-5337 (C)

WFO Guam Operations:  
[nws.gum.operations@noaa.gov](mailto:nws.gum.operations@noaa.gov)  
671-472-0900

WFO Guam: [www.weather.gov/gum](http://www.weather.gov/gum)  
Facebook: [www.facebook.com/NWSGuam](https://www.facebook.com/NWSGuam)  
Twitter: [www.twitter.com/NWSGuam](https://www.twitter.com/NWSGuam)

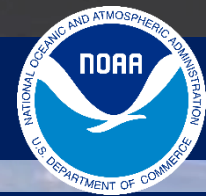
Join the NWS Guam  
Weather-Ready  
Nation Outreach  
Program to keep in  
touch with us



Guam Homeland Security/Ofc of Civil Defense  
[www.ghs.guam.gov](http://www.ghs.guam.gov)  
[www.facebook.com/GHSOCD](https://www.facebook.com/GHSOCD)



CNMI Homeland Security & Emergency Mgmt  
[www.cnmihssem.gov.mp](http://www.cnmihssem.gov.mp)  
[www.facebook.com/cnmieocswp](https://www.facebook.com/cnmieocswp)



[www.weather.gov/gum/WSOMajuro](http://www.weather.gov/gum/WSOMajuro)



Yokwe!



[www.weather.gov/gum/WSOPohnpei](http://www.weather.gov/gum/WSOPohnpei)



Kaselehlie!



[www.weather.gov/gum/WSOChuuk](http://www.weather.gov/gum/WSOChuuk)



Ran Annim!



[www.weather.gov/gum/WSOYap](http://www.weather.gov/gum/WSOYap)



Mogethin!



[www.weather.gov/gum/WSOPalau](http://www.weather.gov/gum/WSOPalau)



Alii!

